



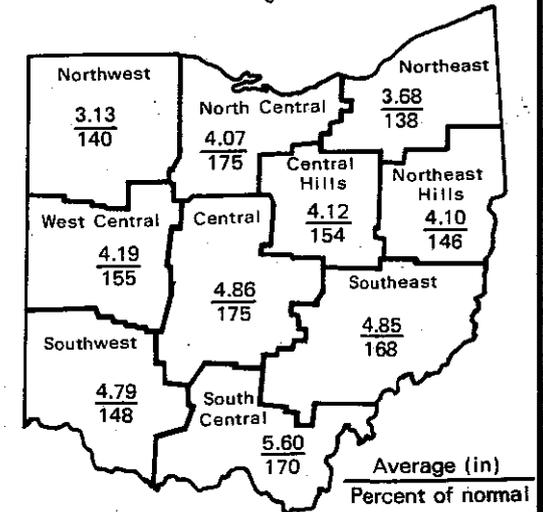
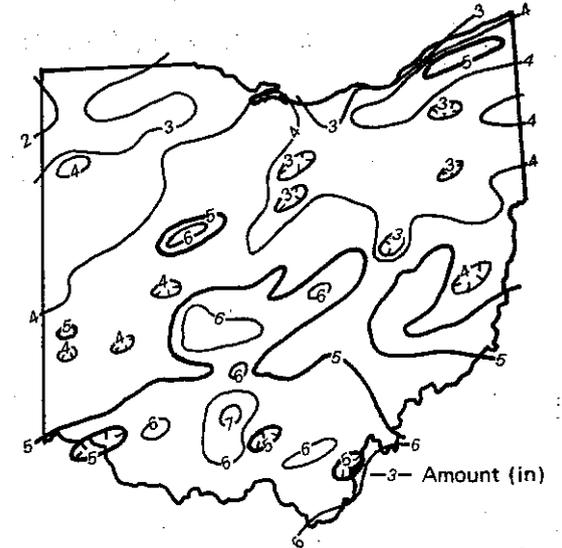
# monthly water inventory report for ohio

Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for January was noticeably above normal throughout the state; this is the second consecutive month for which precipitation has been noticeably above normal throughout the state, and the eighth consecutive month that precipitation has been above normal for the state as a whole. The average for the state as a whole for January was 4.34 inches, 1.58 inches above normal. Regional averages ranged from 5.60 inches, 2.31 inches above normal, for the South Central region to 3.13 inches, 0.90 inch above normal, for the Northwest region. Bournville, Ross County, reported the greatest amount of precipitation, 7.36 inches, for the month, and Hicksville, Defiance County, reported the least amount, 1.70 inches. January proved to be a record-breaking month for weather throughout the state. There were noticeable amounts of precipitation, mostly in the form of snow, during every week of the month. On the morning of January 26th, the state experienced a BLIZZARD which broke every record for a winter storm throughout the state. The following weather-related records were set for many observation stations throughout the state: greatest snow depth; highest wind speeds; lowest barometric pressure; greatest snowfall during a 24-hour period; most severe storm for any season. Thus the first month of the 1978 calendar year was off to a whirling start. However, most of the precipitation remained on the ground at the month end.

Precipitation for the first four months of the 1978 water year for the state as a whole averages 14.07 inches, 3.81 inches above normal. Regional averages range from 16.83 inches, 5.63 inches above normal, for the Southwest region to 11.12 inches, 1.70 inches above normal, for the Northwest region. This was nearly three times the amount of precipitation observed for the same period last year and the wettest first four months of a nominal water-supply recharge season in more than two decades. A sizeable portion of this precipitation lay frozen on the ground at the month end. This augurs well for continued recharge to water supplies this season throughout the state.



DIVISION OF WATER

Wayne S. Nichols, Chief

## SUMMARY

The water-supply situation for January is considered to be very favorable throughout the state. Precipitation was noticeably above normal for the second consecutive month. Streamflow, reservoir storage, and ground-water storage were generally normal. Lake Erie level rose slightly for the second consecutive month and was noticeably above normal. On January 26th the state experienced a BLIZZARD which broke every record for a winter storm throughout the state.

## NOTES AND COMMENTS

### FLOOD INFORMATION CENTER

The Ohio Department of Natural Resources has established a Flood Information Center to operate in the event of a flood emergency in Ohio. The center will insure that the Governor's Office, the Ohio Disaster Services Agency, and other agencies involved in flood disasters have the best possible information regarding the flooding situation.

One of the first priorities of the center is to provide the flood-forecasting hydrologist of the National Weather Service Office at Cleveland Hopkins Airport with supplemental rainfall information to help improve the flood-forecasting capabilities of that office. The Flood Information Center also will help coordinate flood information for the State Disaster Center, obtain specific on-site flooding reports, respond to requests from other cooperating agencies, and record the extent of flooding with aerial photography.

The Flood Information Center is located in the Division of Water, Building E, Fountain Square, Columbus, and will be manned on a 24-hour basis during actual flood emergencies. Mr. Roy Winkle, Deputy for Engineering in the Division of Water, is in charge of the center. The center phone numbers are 614-466-4768 and 466-6020. The Ohio Department of Natural Resources intends to take full advantage of this new information center to insure that the citizens of Ohio are kept fully aware of impending flood dangers.

## 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. Corps of Engineers, Detroit District.

Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.



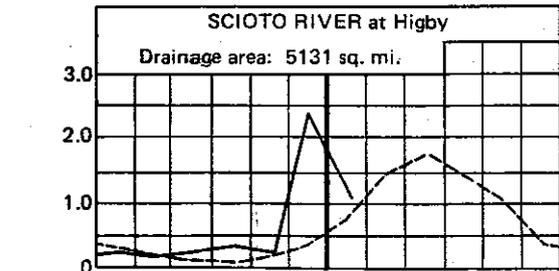
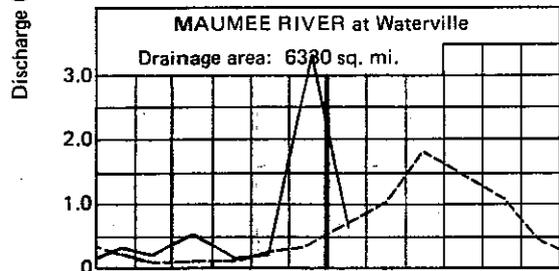
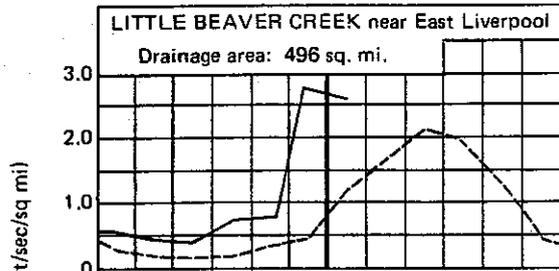
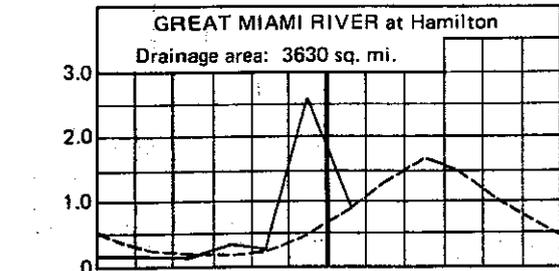
OHIO DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF WATER  
FOUNTAIN SQUARE  
COLUMBUS, OHIO 43224

## MEAN STREAM DISCHARGE

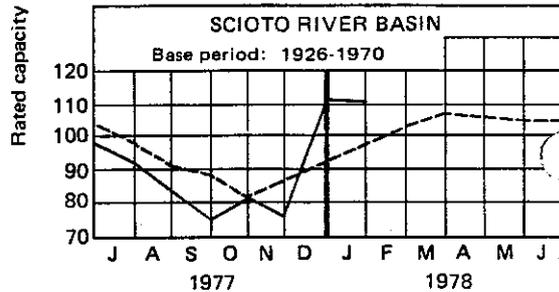
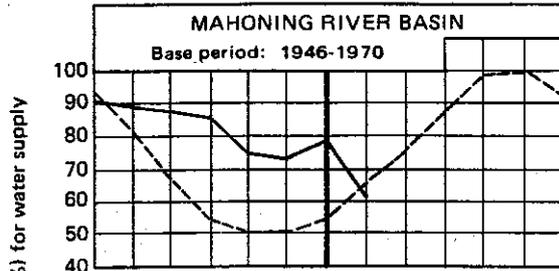
## RESERVOIR STORAGE FOR WATER SUPPLY

## LAKE ERIE LEVELS

## GROUND-WATER LEVELS

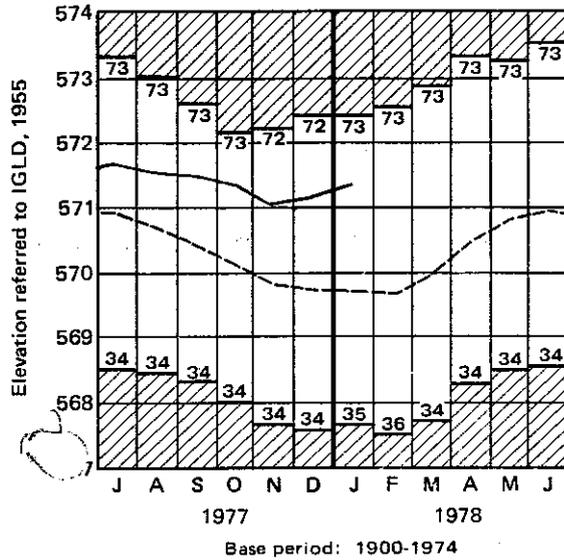


Base period for all streams: 1941-1970



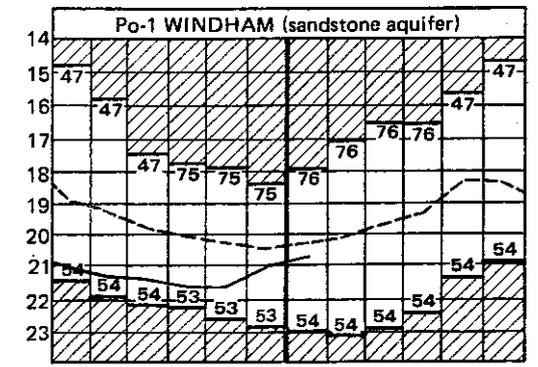
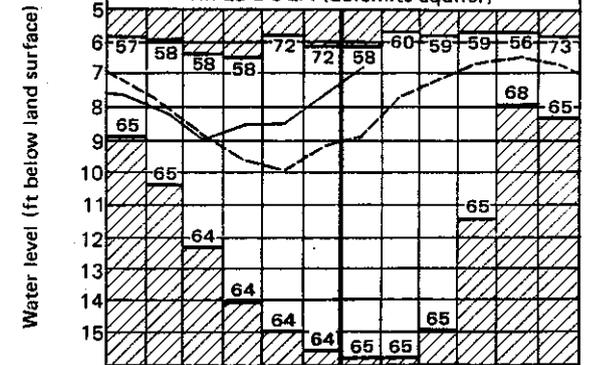
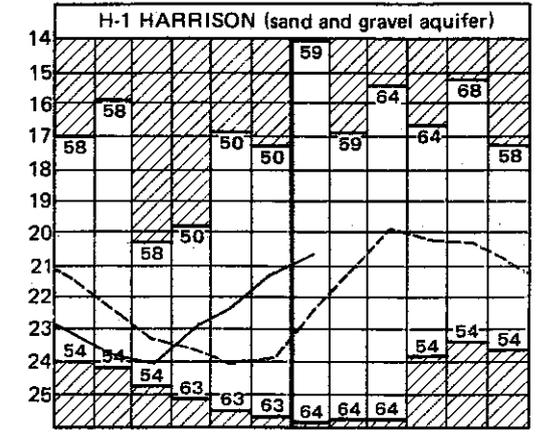
RESERVOIR STORAGE for water supply remains very satisfactory throughout the state. Storage in both the Mahoning River basin and the Scioto River basin index reservoirs declined during January. Storage in the Mahoning basin index reservoirs was 61 percent of rated capacity for water supply compared to 79 percent for last month and 52 percent for January 1977. Storage in the Scioto basin index reservoirs was 111 percent of rated capacity for water supply compared to 112 percent for last month and 61 percent for January 1977.

STREAMFLOW for January was generally normal throughout most of the state; the only exception was the eastern portion of the state, where streamflow was excessive for the seventh consecutive month. Mean discharge and percent of normal at the index gaging stations were as follows: Great Miami River, 3,254 cfs, 112 percent; Little Beaver Creek, 1,279 cfs, 227 percent; Maumee River, 4,244 cfs, 100 percent; Scioto River, 5,550 cfs, 147 percent.



LAKE ERIE mean level for January was 571.32 feet above IGLD (1955), 0.14 foot above last month's mean level and 1.61 feet above normal. The lake level is 0.89 foot above the level observed for January 1977 and 2.72 feet above Low Water Datum.

GROUND-WATER LEVELS continued to rise in most areas of the state during January; the only exception was the unconsolidated sand and gravel aquifers in the northeastern portion of the state. Net gains in water level were slightly less than that normally observed for January because the bulk of the month's precipitation remained frozen on the ground at the month end. Water levels are generally normal to 2 feet above normal for January; levels were generally 2 to 3 feet below normal at this time last year. Ground-water levels in the consolidated-rock aquifers in the northeastern portion of the state remain below normal. Recharge to ground-water storage should increase noticeably during the coming months as the snow cover begins to melt. The ground-water storage situation is considered to be very favorable thus far this water year.



Base periods: H-1, 1951-1964; Hn-2a, 1955-1973; Po-1, 1947-1964

normal ----- current



# monthly water inventory report for ohio

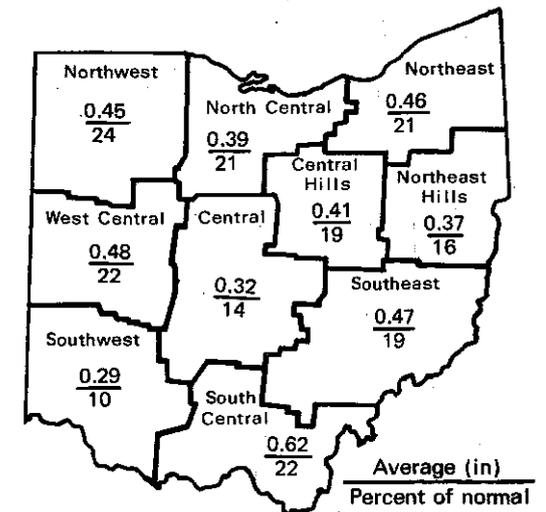
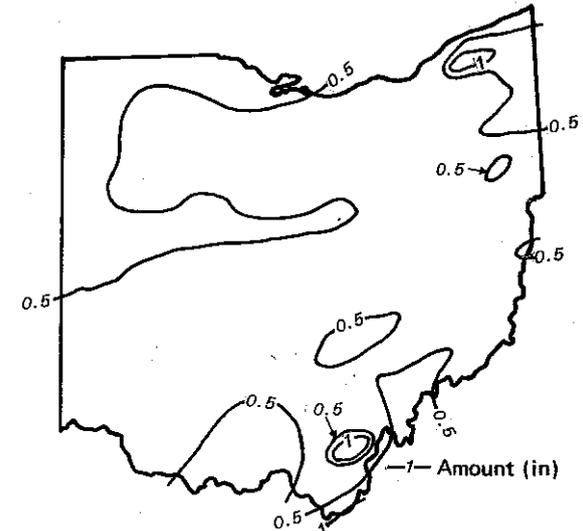
Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for February was the lowest of record for this century for most National Weather Service stations in Ohio. The average for the state as a whole was 0.43 inch, 1.86 inches below normal. Regional averages ranged from 0.29 inch, 2.51 inches below normal, for the Southwest region to 0.62 inch, 2.25 inches below normal, for the South Central region. Waterloo, Lawrence County, reported the greatest amount of precipitation, 1.24 inches, for the month. Chardon, Geauga County, the only other Ohio station reporting more than 1.0 inch of precipitation for the month, reported 1.05 inches. Hamilton, Butler County, and Derby, Pickaway County, reported the least amount of precipitation, 0.06 inch. There were traces of precipitation in the form of snow during every week of the month throughout the state. It is rather phenomenal that for the second consecutive month many climatic records were broken throughout most of the state; for many stations it was the coldest and driest February of record. Points of distinction for February 1978 are: fewest number of days for which temperatures were above freezing, least precipitation for the period of record in terms of water equivalent, persistent snow cover throughout the entire month, and the lowest daily temperature for the month being a record low for the day and in most cases the lowest for this winter. February's monthly average temperatures fell noticeably below previous records for the month. At the end of February there had been 51 consecutive days of snow on the ground; this duration broke previous records by more than twice the number of consecutive days with snow cover, especially for the southern portion of the state. Precipitation for the first two months of the 1978 calendar year was below normal throughout most of the state; the only exceptions were the North Central, Central, and South Central regions, where precipitation was slightly above normal. The average for the state as a whole is 4.77 inches, 0.28 inch below normal. Regional averages range from 6.22 inches, 0.06 inch above normal, for the South Central region to 3.58 inches, 0.51 inch below normal, for the Northwest region.

Precipitation for the first five months of the 1978 water year is above normal throughout the state. The average for the state as a whole is 14.50 inches, 1.95 inches above normal. Regional averages range from 17.12 inches, 3.12 inches above normal, for the Southwest region to 11.57 inches, 0.29 inch above normal, for the Northwest region.

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DIVISION OF WATER

Wayne S. Nichols, Chief

## PRECIPITATION—continued

There was little effect on water supplies during February. Recharge to water supplies during February generally comes from melting snow or rainfall; there was no rainfall and most of the snow of January and February lay frozen on the ground at the month end. It is hoped that the snow will melt slowly and produce considerable recharge to water supplies in March.

## SUMMARY

The water-supply situation for February remains very favorable throughout the state despite the lack of recharge. Precipitation was the lowest of record for February for most areas of the state, and most of the previous month's precipitation remained frozen on the ground at the month end. As a result, streamflow, reservoir storage, and ground-water storage generally showed slight declines for the month. Lake Erie level declined slightly following two months of unusual rises.

## NOTES AND COMMENTS

The Division of Water announces the availability of the reports listed below; these reports may be obtained free by contacting the respective sections of the Division of Water, Ohio Department of Natural Resources, Building E, Fountain Square, Columbus, Ohio 43224.

Coastal Zone Management Section  
Bruce McPherson, Supervisor

Overall program design for the Ohio Coastal Zone Management Program. September 1977, 185 p.  
Ohio Coastal Zone Management Program second year report. October 1977, 26 p.

Resource Analysis Section, Remote Sensing Unit  
Gary M. Schaal, Supervisor

Miscellaneous Report No. 17. Land use/land cover classification system, prepared by Gary M. Schaal. April 1977, 14 p.

Miscellaneous Report No. 19. Ohio land use inventory final report, edited by Gary M. Schaal. July 1977, 26 p.

Miscellaneous Report No. 20. An inventory of Ohio's land use/land cover as seen by LANDSAT, by Gary M. Schaal. October 1977, 93 p.

## ACKNOWLEDGMENTS

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Precipitation data:

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Streamflow and reservoir storage data:

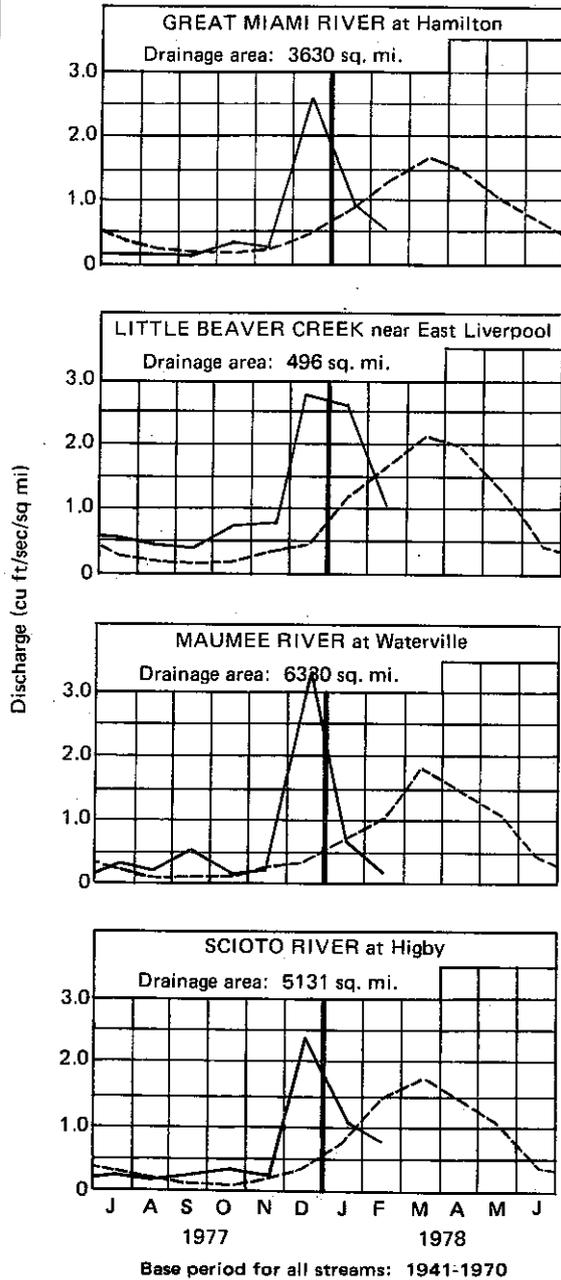
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U.S. Corps of Engineers, Detroit District.

Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.

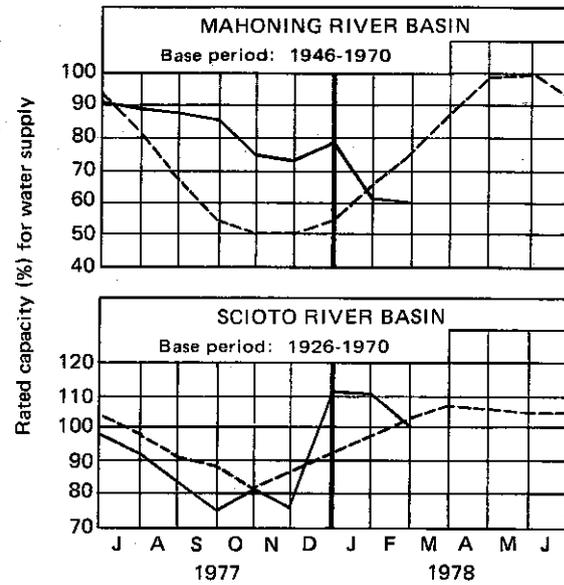


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## MEAN STREAM DISCHARGE



## RESERVOIR STORAGE FOR WATER SUPPLY

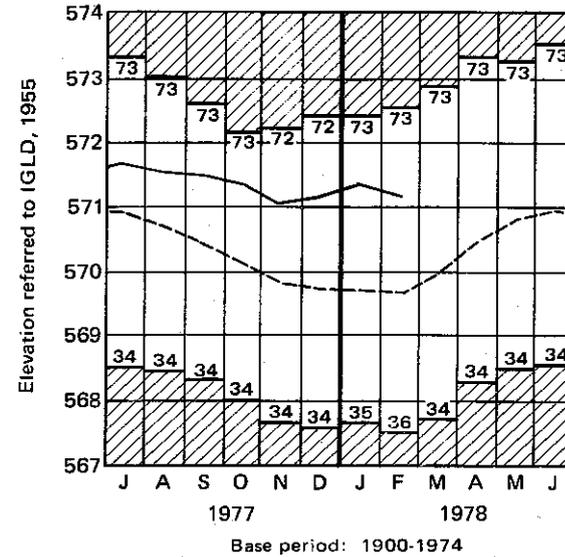


RESERVOIR STORAGE for water supply for February declined for the second consecutive month in both the Mahoning River basin and the Scioto River basin index reservoirs; storage generally increases in February. Storage in the Mahoning basin index reservoirs was 60 percent of rated capacity for water supply compared to 61 percent for last month and 55 percent for February 1977. Storage in the Scioto basin index reservoirs was 100 percent of rated capacity for water supply compared to 111 percent for last month and 62 percent for February 1977. Reservoir storage was below normal in both index river basins at the month end.

STREAMFLOW for February was deficient throughout the state except in the eastern portion of the state, where streamflow was normal. The deficient streamflow is due primarily to the effect of ice on the normal flow conditions of the streams. Mean discharge and percent of normal at the index gaging stations were as follows: Great Miami River, 1,864 cfs, 39 percent; Little Beaver Creek, 510 cfs, 62 percent; Maumee River, 895 cfs, 14 percent; Scioto River, 3,526 cfs, 46 percent. Flows declined during the entire month throughout the state and were noticeably deficient at the month end.

normal----- current——

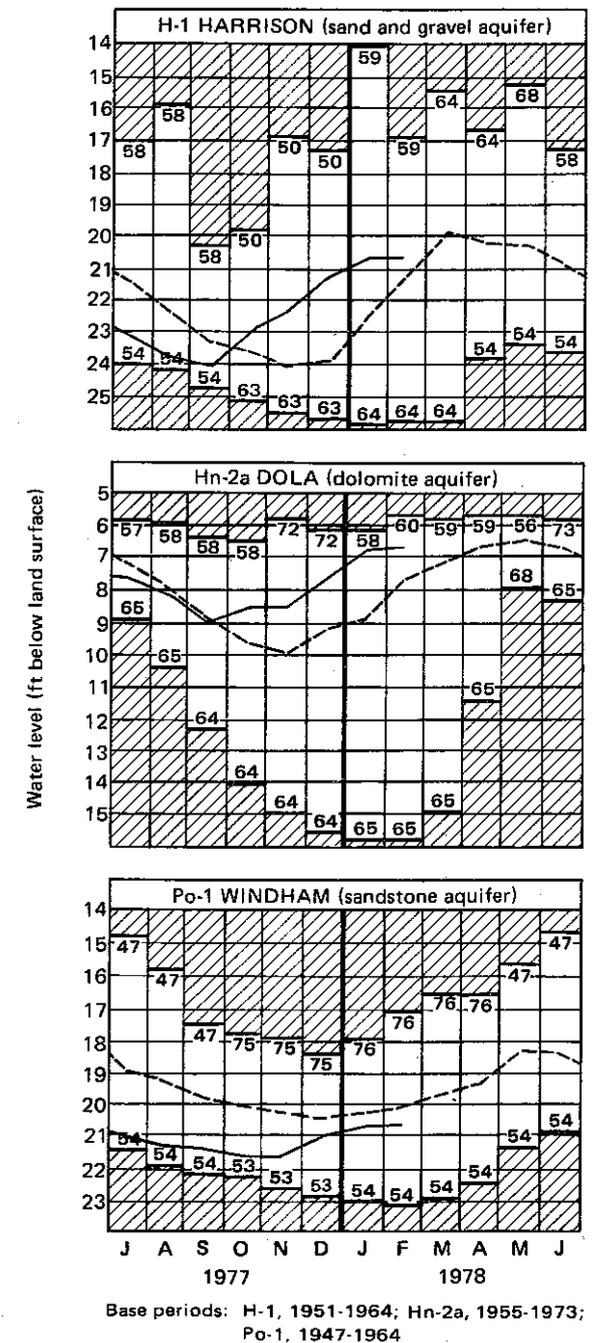
## LAKE ERIE LEVELS



LAKE ERIE mean level for February declined following unusual rises in both December 1977 and January 1978. The mean level for the month was 571.18 feet above IGLD (1955), 0.14 foot below last month's mean level and 1.49 feet above normal. The lake level is 0.97 foot below the mean level for February 1977 and 2.58 feet above Low Water Datum.

GROUND-WATER LEVELS in February generally showed slight rises in consolidated-rock aquifers and steady declines in unconsolidated sand and gravel aquifers as a result of the lack of recharge during the month. Past experience show that the greatest recharge to ground-water supplies generally occurs in January and February. Recharge this February was minimal because most of the precipitation for both January and February lay frozen on the ground at the month end. Ground-water levels for February range from slightly below normal in consolidated-rock aquifers to 2 feet above normal in unconsolidated aquifers; last February water levels were 2 to 5 feet below normal. Ground-water levels in the key index wells are the same as to 6 feet above those levels observed for February 1977. The ground-water storage situation remains very favorable despite the fact that there was practically no recharge this month, and the situation should improve noticeably as the snow on the ground melts.

## GROUND-WATER LEVELS





# monthly water inventory report for ohio

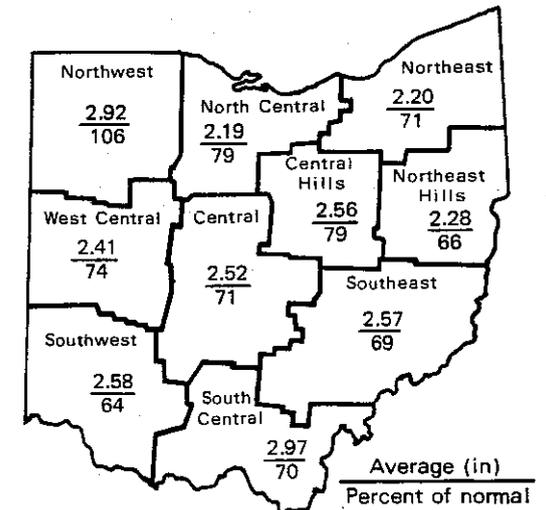
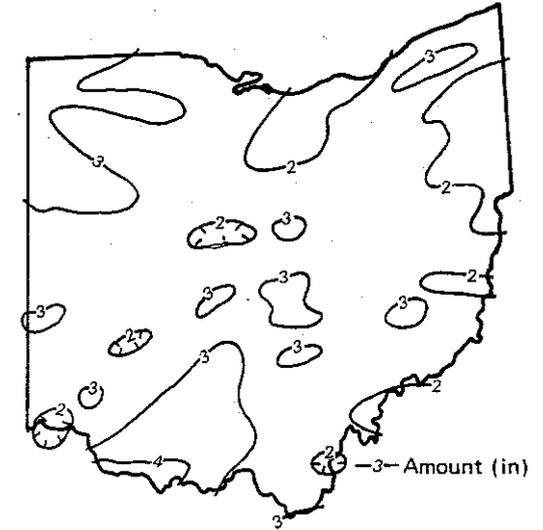
Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for March was below normal throughout the state; the only exception was the Northwest region, where precipitation was slightly above normal. This is the second consecutive month for which precipitation has been noticeably below normal for the state. The average for the state as a whole was 2.52 inches, 0.89 inch below normal. Regional averages ranged from 2.97 inches, 1.26 inches below normal, for the South Central region to 2.19 inches, 0.58 inch below normal, for the North Central region. West Union, Adams County, reported the greatest amount of precipitation, 4.16 inches, for the month, and New Cumberland Lock and Dam, Jefferson County, reported the least amount, 1.58 inches. There was precipitation during every week of March in most areas of the state. The bulk of the month's precipitation fell during the last 10 days. Only a few areas in the state received less than 2.0 inches or more than 3.0 inches of precipitation for the month. However, because of the large amount of snow on the ground at the beginning of the month, the deficient precipitation had little effect on the water-supply situation. In fact, the below-normal precipitation was most instrumental in alleviating serious flooding throughout the state. The slow melting of the snow on the ground provided unusually good recharge to water supplies during the month. Precipitation for the first three months of the 1978 calendar year was below normal throughout the state. The average for the state as a whole was 7.29 inches, 1.17 inches below normal. Regional averages ranged from 9.19 inches, 1.20 inches below normal, for the South Central region to 6.34 inches, 1.60 inches below normal, for the Northeast region. Departures from normal ranged from 2.40 inches below normal for the Southwest region to 0.28 inch below normal for the North Central region.

Precipitation for the first six months of the 1978 water year remains above normal throughout most of the state; the only exceptions are the South Central and Southeast regions, where precipitation is slightly below normal. The average for the state as a whole is 17.02 inches, 1.06 inches above normal. Regional averages range from 19.70 inches, 1.67 inches above normal, for the Southwest region to 14.49 inches, 0.45 inch above normal, for the Northwest region. Departures from normal range from 2.38 inches above normal for the Central Hills region to 0.24 inch below normal for the South Central region. The above-normal precipitation

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DIVISION OF WATER

Wayne S. Nichols, Chief

## PRECIPITATION—continued

for the water year thus far has provided good recharge to water supplies, and the current recharge season should continue for at least one more month.

## STREAMFLOW—continued

percent. Cumulative runoff and departures from normal for the first six months of the 1978 water year at the index gaging stations are as follows: Great Miami River, 9.16 inches, 3.90 inches above normal; Little Beaver Creek, 12.60 inches, 6.25 inches above normal; Maumee River, 10.36 inches, 4.93 inches above normal; Scioto River, 9.95 inches, 3.94 inches above normal. Flows at the month end were generally excessive throughout the state except in the northeastern area, where flows were above normal.

## SUMMARY

The water-supply situation improved markedly during March in response to the excellent recharge from the melting of the snow on the ground and the month's precipitation. Precipitation for March for the state as a whole was below normal. Streamflow, reservoir storage, and ground-water storage showed marked improvements in response to the recharge. Lake Erie level rose and remains noticeably above normal.

## NOTES AND COMMENTS

### TOPOGRAPHIC MAPS

The 7½-minute series of topographic maps published by the U.S. Geological Survey are available for all parts of Ohio. All maps are at a scale of 1:24,000 (about 2½ inches to the mile) and show elevations above sea level, relief of the land surface, streams and lakes, and wooded areas, as well as cultural features such as towns, roads, and quarries. An Index to Topographic Mapping in Ohio is available at no charge from the Ohio Division of Geological Survey, Building B, Fountain Square, Columbus, Ohio 43224. This index shows the name of and area covered by each quadrangle.

Maps in this series are \$1.25 apiece plus 5 cents tax in Ohio. There is a 10% handling charge if maps are to be mailed. Payment must accompany all orders. Maps may be purchased from the Ohio Division of Geological Survey. Other firms which deal in topographic maps are listed in the Index to Topographic Mapping in Ohio.

## ACKNOWLEDGMENTS

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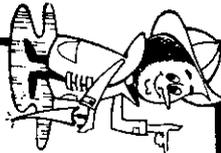
Precipitation data:

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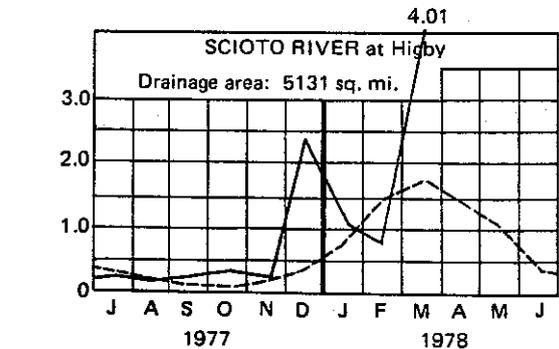
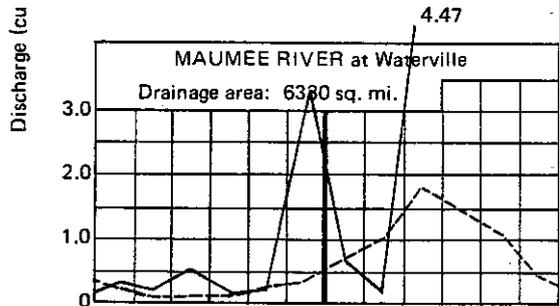
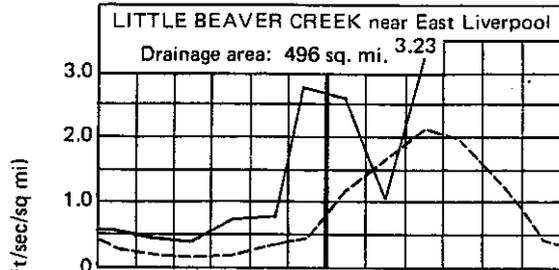
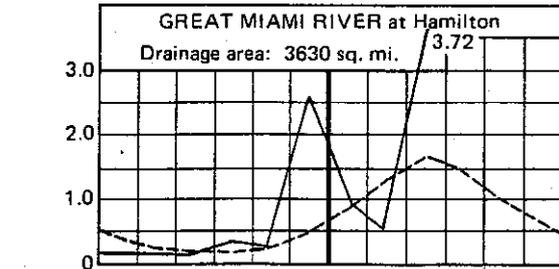
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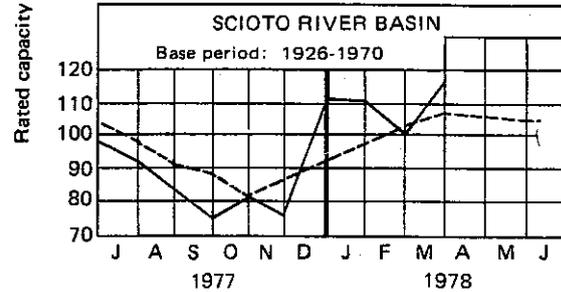
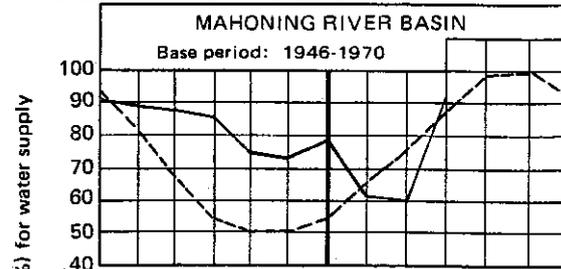
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## MEAN STREAM DISCHARGE



Base period for all streams: 1941-1970

## RESERVOIR STORAGE FOR WATER SUPPLY



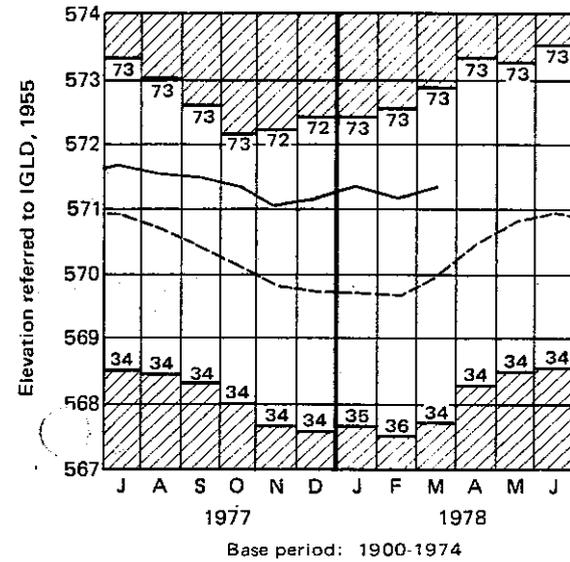
RESERVOIR STORAGE for water supply increased markedly throughout the state during March despite the below-normal precipitation; this was due primarily to the high water content of the melting snow which was on the ground at the beginning of the month. Reservoir storage at the month end was above normal for both the Mahoning River basin and the Scioto River basin. Storage in the Mahoning River basin index reservoirs was 92 percent of rated capacity for water supply compared to 60 percent for last month and 95 percent for March 1977. Storage in the Scioto River basin index reservoirs was 117 percent of rated capacity for water supply compared to 100 percent for last month and 100 percent for March 1977.

STREAMFLOW for March was excessive throughout the state in response to the rain and high water content of the melting snow. Minor flooding occurred in most areas of the state; some serious flooding in small tributaries in the north and northeast resulted from ice jams, and heavy rains in Indiana and Michigan produced noticeably high flows and minor flooding in the Maumee River basin. The U.S. Geological Survey, Water Resources Division, reports that, on the basis of provisional data, the peak flow on March 23 for the Maumee River at Waterville appears to be a new record; this was approximately a 25-year flood occurrence. Mean discharge and percent of normal for the month at the index gaging stations were as follows: Great Miami River, 13,521 cfs, 222 percent; Little Beaver Creek, 1,603 cfs, 158 percent; Maumee River, 28,315 cfs, 248 percent; Scioto River, 20,597 cfs, 200 percent.

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normal----- current-----

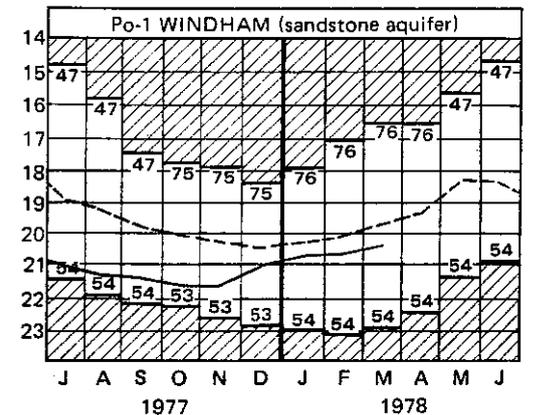
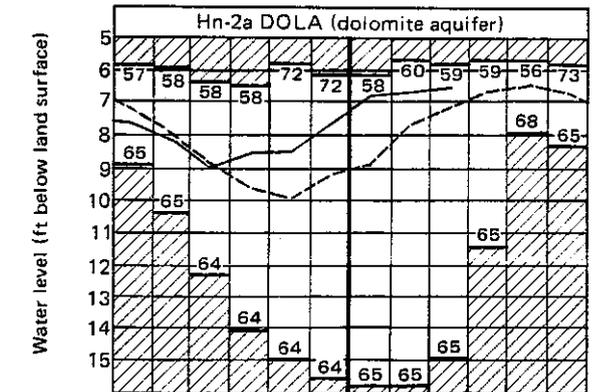
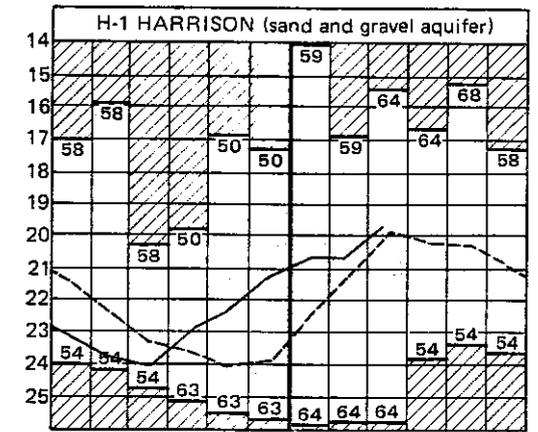
## LAKE ERIE LEVELS



LAKE ERIE mean level for March was 571.33 feet above IGLD (1955), 0.15 foot above last month's mean level and 1.41 feet above normal. The lake level is 0.50 foot above the mean level for March 1977 and 2.73 feet above Low Water Datum. (Correction: the lake level for February 1978 should have read 0.97 foot above the mean level for February 1977.)

GROUND-WATER LEVELS in general showed marked rises during March in response to the excellent recharge conditions, which resulted primarily from the slow melting of the snow on the ground. Water levels in general were above normal in the unconsolidated aquifers and remained slightly below normal in the consolidated-rock aquifers. Net rises in wells in unconsolidated sand and gravel aquifers adjacent to streams were nearly twice that normally observed for March. Water levels in these aquifers were noticeably higher than levels observed last month but were only about 2 feet above those levels observed for March 1977. Net rises in consolidated-rock aquifers were only about half that normally observed for March because of delayed recharge, a normal condition for these aquifers; consolidated-rock aquifers should continue to show substantial recharge in April. Water levels in these aquifers were slightly below those levels observed last month but were 1 to 4 feet above those levels observed for March 1977. Ground-water levels in general are 2 to 7 feet higher than they were in February 1977, when the lowest water levels during last year's drought were observed. The ground-water storage situation is very favorable at the present time and should improve during the remainder of the recharge season.

## GROUND-WATER LEVELS



Base periods: H-1, 1951-1964; Hn-2a, 1955-1973; Po-1, 1947-1964



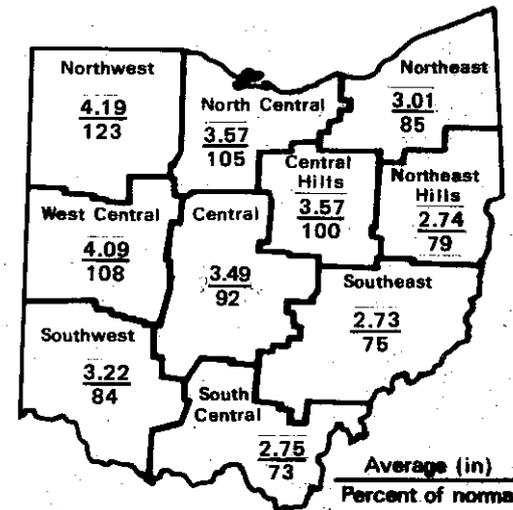
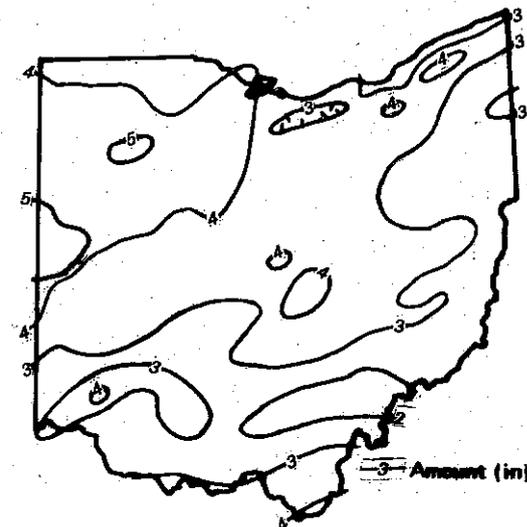
# monthly water inventory report for ohio

Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for April was below normal throughout most of the state; the only exceptions were the Northwest, North Central, West Central, and Central Hills regions, where precipitation was normal or above normal. The average for the state as a whole was 3.34 inches, 0.28 inch below normal. Regional averages ranged from 4.19 inches, 0.78 inch above normal, for the Northwest region to 2.73 inches, 0.90 inch below normal, for the Southeast region. Versailles, Darke County, reported the greatest amount of precipitation; 5.38 inches, for the month, and Piketon, Pike County, reported the least amount, 1.48 inches. There was measurable precipitation during every week of the month. In fact, April could be considered a wet month insofar as agriculture was concerned. Generally, the southern and eastern portions of the state received less than 3.0 inches of precipitation, the central and northeastern portions received between 3 and 4 inches, and the western and northwestern portions received in excess of 4.0 inches. Precipitation for the first four months of the 1978 calendar year for the state as a whole averaged 10.63 inches, 1.45 inches below normal. Regional averages ranged from 11.94 inches, 2.20 inches below normal, for the South Central region to 9.35 inches, 2.15 inches below normal, for the Northeast region. Departures from normal ranged from 0.43 inch above normal for the Northwest region to 3.02 inches below normal for the Southwest region.

Precipitation for the first seven months of the 1978 water year is above normal for most of the state; the only exceptions are the Northeast Hills, South Central, and Southeast regions, where precipitation for the water year thus far is below normal. The average for the state as a whole is 20.36 inches, 0.78 inch above normal. Regional averages range from 22.92 inches, 1.05 inches above normal, for the Southwest region to 18.53 inches, 1.32 inches above normal, for the North Central region. Departures from normal range from 2.38 inches above normal for the Central Hills region to 1.24 inches below normal for the South Central region. Recharge to water supplies throughout most of the state continues to be about normal for the water year.



## SUMMARY

The water-supply situation remains very favorable throughout the state. Precipitation for April for the state as a whole was slightly below normal. Streamflow, reservoir storage, and ground-water storage were generally about normal. Lake Erie level rose sharply and was the highest since August 1976.

## NOTES AND COMMENTS

### INFORMATION BOOKLET: THE ROLE OF VEGETATION IN SHORELINE MANAGEMENT

The Division of Water announces the availability of a booklet, *The role of vegetation in shoreline management, a guide for Great Lakes shoreline property owners*, produced by the Great Lakes Basin Commission. The booklet provides shoreline property owners along the Great Lakes with (1) a comprehensive view of shoreline and bluff erosion problems, (2) an explanation of why these problems occur, (3) guidelines to help property owners identify their problems, and (4) some suggestions on how property owners can remedy these problems. The solutions emphasize vegetation establishment and management and the role of vegetation in shoreline stabilization. This booklet may be obtained free from the Coastal Zone Management Section, Division of Water, Ohio Department of Natural Resources, Building E, Fountain Square, Columbus, Ohio 43224.

## 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. Corps of Engineers, Detroit District.

Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.



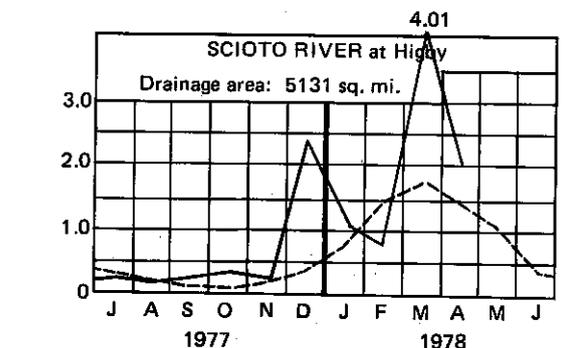
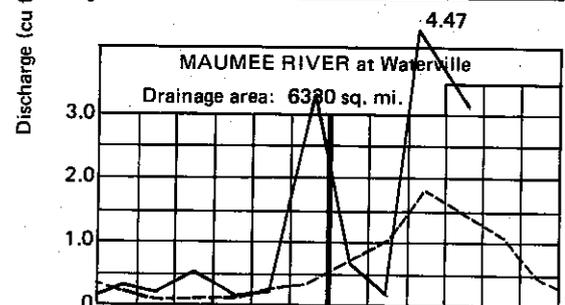
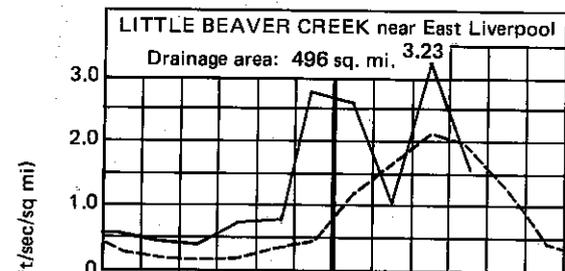
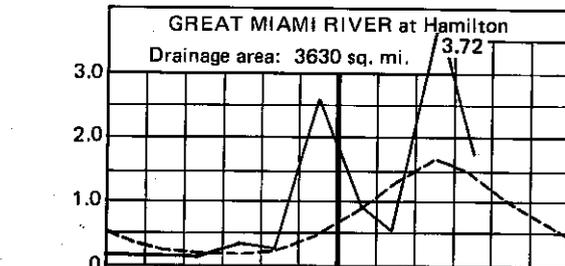
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DIVISION OF WATER  
FOUNTAIN SQUARE  
COLUMBUS, OHIO 43224

## MEAN STREAM DISCHARGE

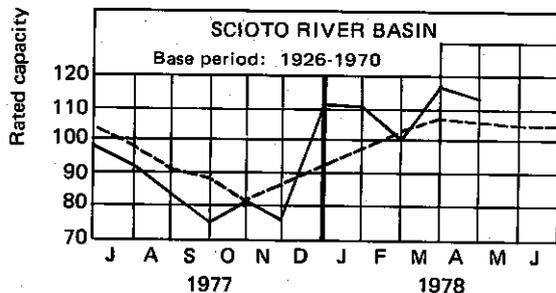
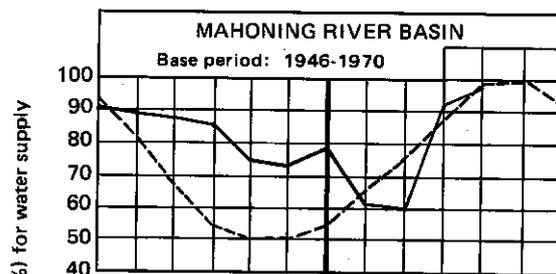
## RESERVOIR STORAGE FOR WATER SUPPLY

## LAKE ERIE LEVELS

## GROUND-WATER LEVELS

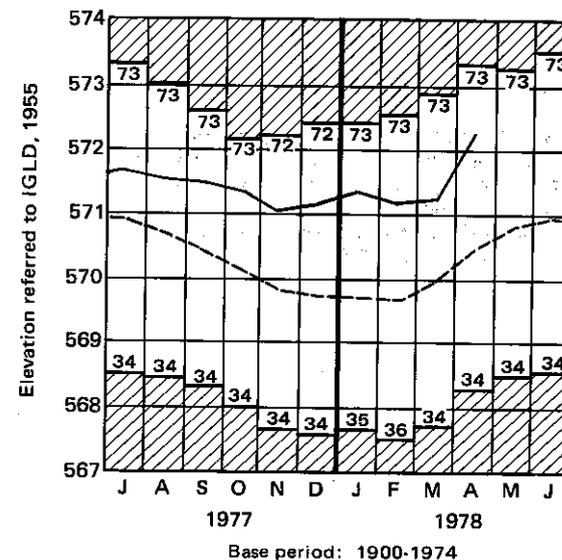


Base period for all streams: 1941-1970



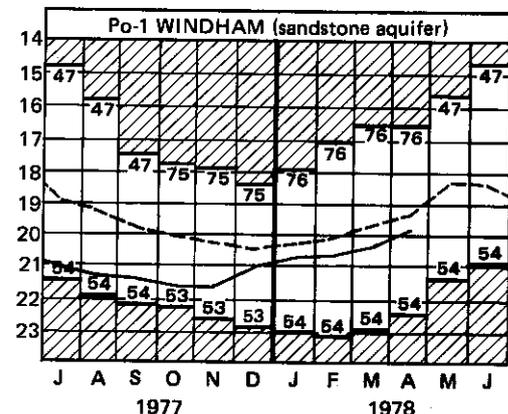
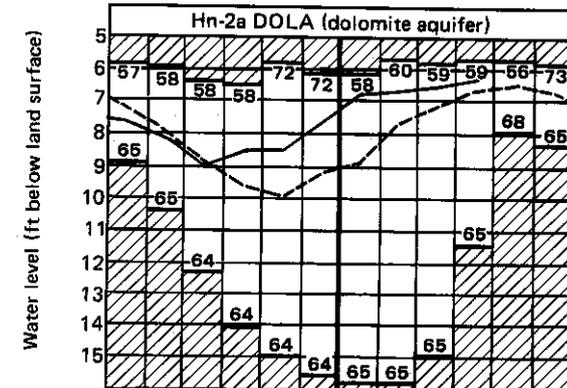
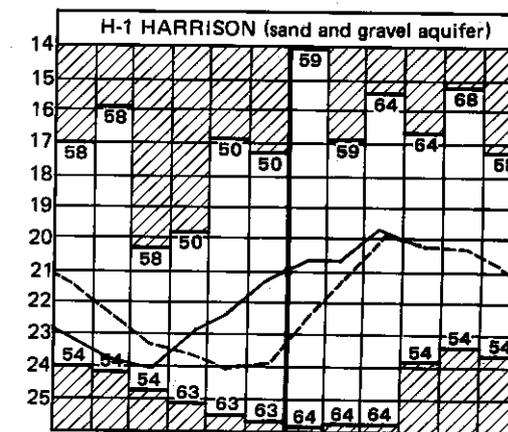
RESERVOIR STORAGE for water supply for April remains very favorable for both the Mahoning River basin and the Scioto River basin index reservoirs. Reservoir storage at the month end for the Mahoning basin index reservoirs was 97 percent of rated capacity for water supply compared to 92 percent for last month and 104 percent for April 1977. Reservoir storage for the Scioto basin index reservoirs was 113 percent of rated capacity for water supply compared to 117 percent for last month and 108 percent for April 1977.

STREAMFLOW for April was normal for most of the state; the only exception was the Northwest region, where streamflow was excessive. Mean discharge and percent of normal for the month at the index gaging stations were as follows: Great Miami River, 6,475 cfs, 125 percent; Little Beaver Creek, 781 cfs, 86 percent; Maumee River, 20,189 cfs, 222 percent; Scioto River, 10,317 cfs, 139 percent.



LAKE ERIE mean level for April was 572.26 feet above IGLD (1955), 0.98 foot above last month's mean level and 1.78 feet above normal. The lake level was 0.74 foot above the level observed for April 1977 and 3.66 feet above Low Water Datum. The sharp rise in the lake level can be attributed to the above-normal precipitation during the current recharge season and the below-normal evaporation due to persistent below-normal temperatures. (Correction: the lake level for March 1978 was adjusted after publication of the March report and was 571.28 feet above IGLD).

GROUND-WATER LEVELS in most unconsolidated sand and gravel aquifers declined slightly during April; levels in wells representing consolidated-rock aquifers continued to show marked rises in response to delayed recharge from the above-normal precipitation in March. Ground-water levels were generally above those levels observed last month and noticeably above those levels observed in April 1977. Water levels in most unconsolidated sand and gravel aquifers are above normal for April; levels in most consolidated-rock aquifers remain below normal. The ground-water storage situation is considered to be very favorable at the present time.



Base periods: H-1, 1951-1964; Hn-2a, 1955-1973; Po-1, 1947-1964

normal----- current———



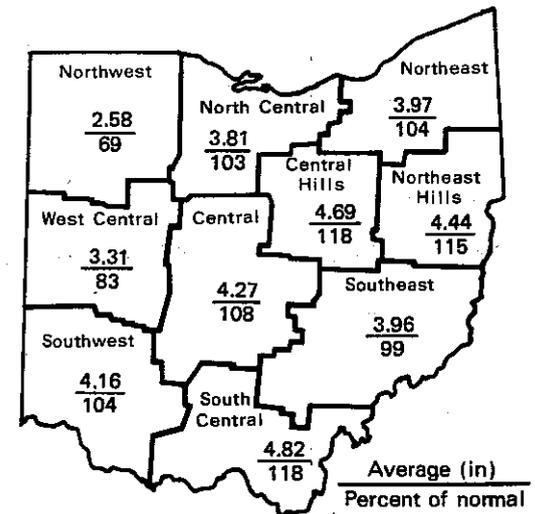
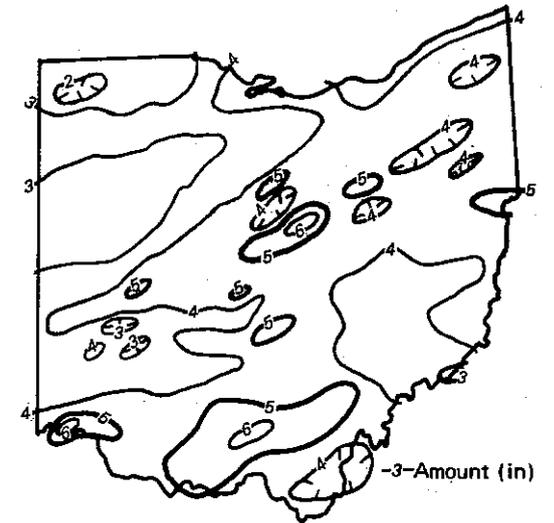
# monthly water inventory report for ohio

Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for May was above normal throughout the state; the only exceptions were the Northwest, West Central, and Southeast regions, where precipitation was below normal. The average for the state as a whole was 4.00 inches, 0.09 inch above normal. Regional averages ranged from 4.82 inches, 0.75 inch above normal, for the South Central region to 2.58 inches, 1.16 inches below normal, for the Northwest region. Fredericktown, Knox County, reported the greatest amount of precipitation, 6.29 inches, for the month, and Stryker, Williams County, reported the least amount, 1.57 inches. Generally, there was precipitation somewhere in the state during every week of the month. The bulk of the precipitation was produced by scattered local thunderstorms; storms produced amounts greater than 1 inch at many stations on the 13th, 24th, and 31st of the month. A very localized storm on the night of May 23-24 produced unofficial reports of 4.50 inches of precipitation at Radnor, Delaware County. During the second and third week of May there was a trace or more of precipitation on 12 of the 14 days in many areas of the state. As a result, agricultural progress was hampered throughout the state. In general it was a good month insofar as water supplies were concerned. Precipitation for the first five months of the 1978 calendar year averaged 14.63 inches, 1.36 inches below normal. Regional averages ranged from 16.76 inches, 1.45 inches below normal, for the South Central region to 13.27 inches, 0.73 inch below normal, for the Northwest region. Departures from normal ranged from 2.86 inches below normal for the Southwest region to normal for the North Central region.

Precipitation for the first eight months of the 1978 water year for the state as a whole averaged 24.36 inches, 0.87 inch above normal. Regional averages ranged from 27.08 inches, 1.21 inches above normal, for the Southwest region to 21.26 inches, 0.07 inch above normal, for the Northwest region. Departures from normal for the water year thus far ranged from 3.08 inches above normal for the Central Hills region to 1.11 inches below normal for the Southeast region. The water-supply situation remains very favorable throughout most of the state despite below-normal precipitation in February, March, and April.



DIVISION OF WATER

Wayne S. Nichols, Chief

## SUMMARY

The water-supply situation continues to be very favorable throughout the state. The above-normal precipitation for May provided excellent recharge conditions during the month. Reservoir storage, streamflow, and ground-water storage remain near normal for most areas of the state. Lake Erie level rose for the third consecutive month and continues to be noticeably above normal.

## NOTES AND COMMENTS

### PUBLICATIONS OF THE DIVISION OF GEOLOGICAL SURVEY

The following publications are now available from the Division of Geological Survey, Building B, Fountain Square, Columbus, Ohio 43224:

Report of Investigations No. 103. *Trace elements in Ohio coals*, by Norman F. Knapp. 12 p., 2 figs., 8 tables, 1977. \$1.00 plus 4 cents tax and 10 cents mailing charge.

Report of Investigations No. 104. *The occurrence of sulfide and associated minerals in Ohio*, by George Botoman and Ronald D. Stieglitz. 11 p., 4 figs., 2 tables, 1978. \$1.00 plus 4 cents tax in Ohio and 10 cents mailing charge.

The following publications are in press and will be available soon:

Bulletin 66. *Geology and mineral resources of Washington County, Ohio*, by Horace R. Collins and Bradley E. Smith.

Report of Investigations No. 105. *Structure on the Pittsburgh (No. 8) coal in the Belmont field, Ohio*, by Richard M. DeLong.

Report of Investigations No. 106. *Resources of the Pittsburgh (No. 8) coal in the Belmont field, Ohio*, by Michael L. Couchot.

Information Circular No. 47. *Analyses of Ohio coals*, by George Botoman and David A. Stith.

## ACKNOWLEDGMENTS

This report has been compiled from Division of Water data and from information supplied by the following:

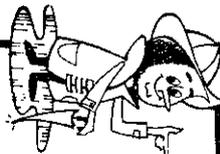
Precipitation data:

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:

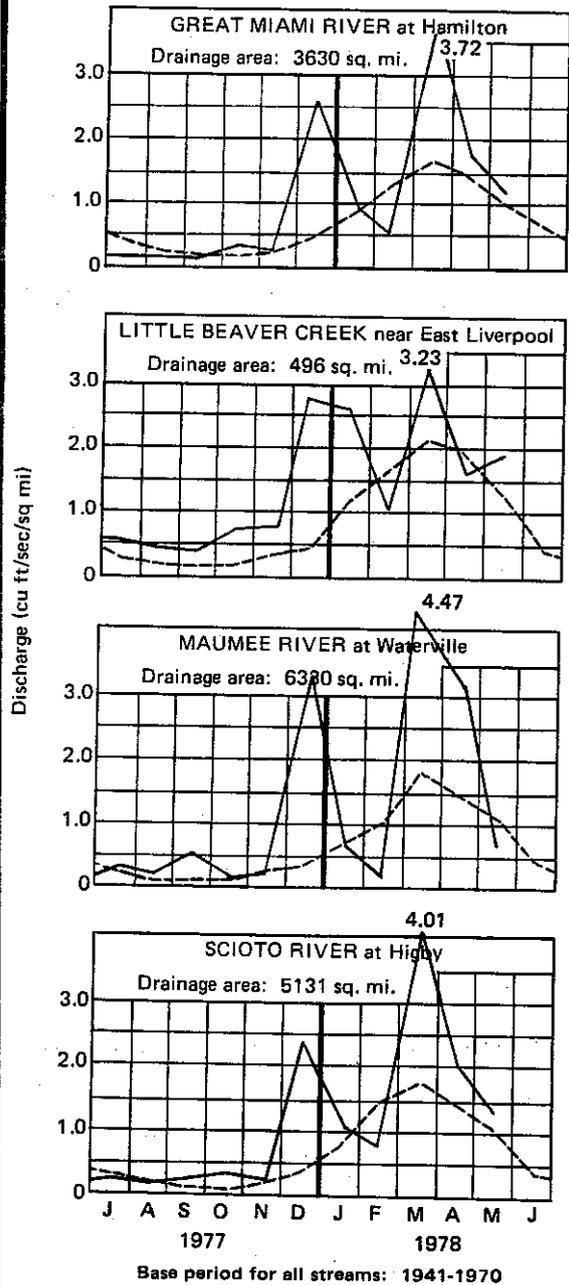
U.S. Geological Survey, Water Resources Division,  
Lake Erie level data:  
U.S. Corps of Engineers, Detroit District.

Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.

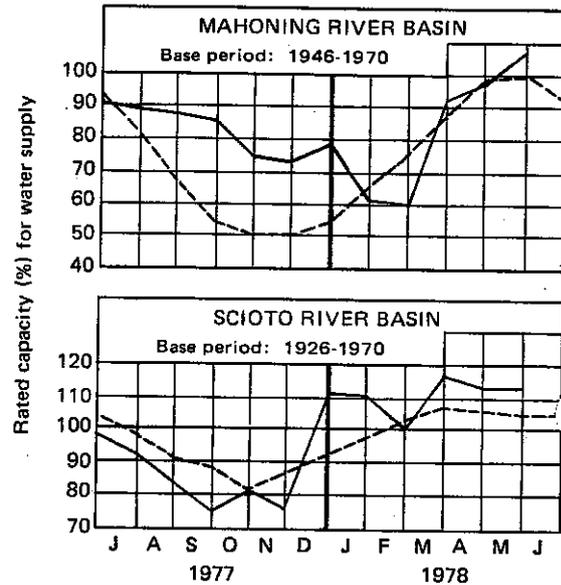


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## MEAN STREAM DISCHARGE



## RESERVOIR STORAGE FOR WATER SUPPLY

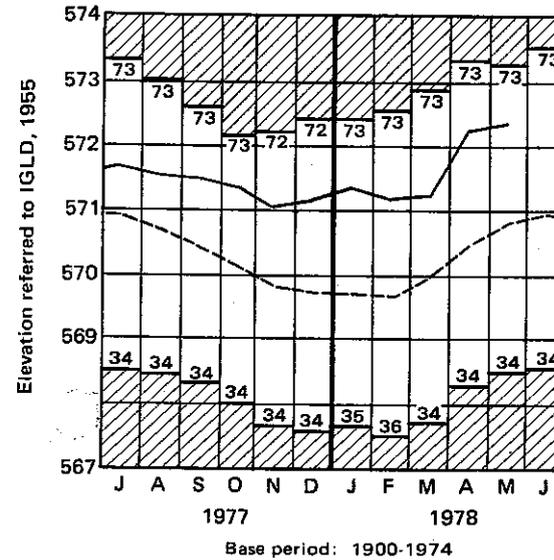


RESERVOIR STORAGE for water supply for May was above normal in both the Mahoning River basin and the Scioto River basin. Storage for water supply increased noticeably in the Mahoning River basin index reservoirs and remained unchanged during the month in the Scioto River basin index reservoirs. Reservoir storage at the month end for the Mahoning basin index reservoirs was 108 percent of rated capacity for water supply compared to 97 percent for last month and 99 percent for May 1977. Reservoir storage for the Scioto basin index reservoirs was 113 percent of rated capacity for water supply compared to 113 percent for last month and 107 percent for May 1977.

STREAMFLOW for May was normal throughout the state; the only exception was the eastern portion of the state, where streamflow was excessive for the month. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 4,236 cfs, 125 percent; Little Beaver Creek, 927 cfs, 149 percent; Maumee River, 4,324 cfs, 65 percent; Scioto River, 6,867 cfs, 121 percent. Cumulative runoff and departures from normal for the water year thus far for the index gaging stations are as follows: Great Miami River, 12.50 inches, 4.57 inches above normal; Little Beaver Creek, 16.51 inches, 6.11 inches above normal; Maumee River, 14.71 inches, 6.39 inches above normal; Scioto River, 13.73 inches, 4.12 inches above normal. Flows at the month end were normal throughout the state.

normal----- current-----

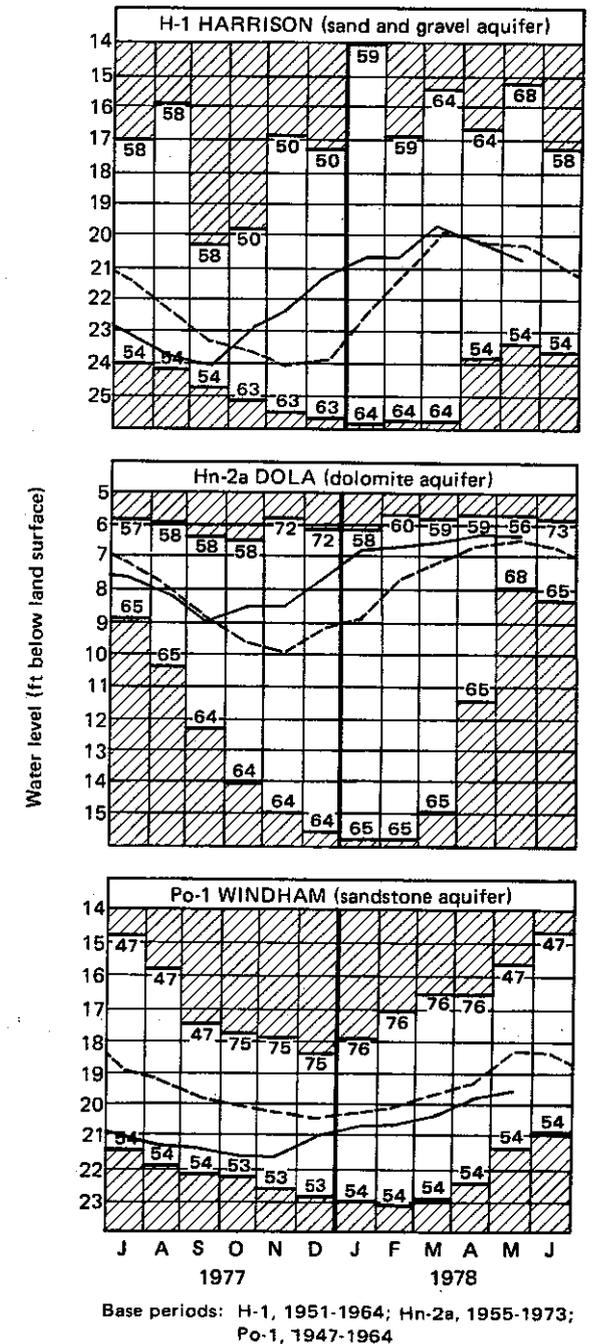
## LAKE ERIE LEVELS



LAKE ERIE level continued to rise during May and was noticeably above normal. The mean level for May was 572.38 feet above IGLD (1955), 0.12 foot above last month's mean level and 1.58 feet above normal. The lake level was 0.51 foot above the level observed for May 1977 and 3.78 feet above Low Water Datum.

GROUND-WATER LEVELS in May responded to the favorable recharge conditions produced by the above-normal precipitation and below-normal temperatures during most of the month. Generally, water levels in unconsolidated sand and gravel aquifers showed net declines for the month; water levels in consolidated-rock aquifers continued to show slight rises or leveled off during the month. Ground-water levels throughout the state are noticeably above those levels observed for May 1977. Water levels in general are near normal throughout the state; the only exceptions are the central portion of the state, where levels remain noticeably above normal, and the southeastern portion, where levels remain noticeably below normal. The water-supply situation remains very favorable insofar as ground-water storage is concerned.

## GROUND-WATER LEVELS





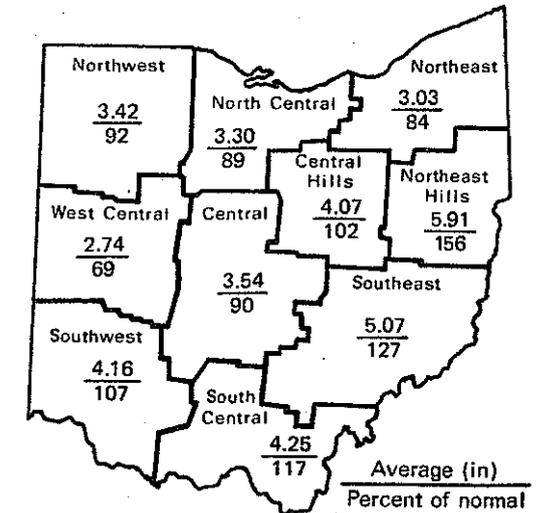
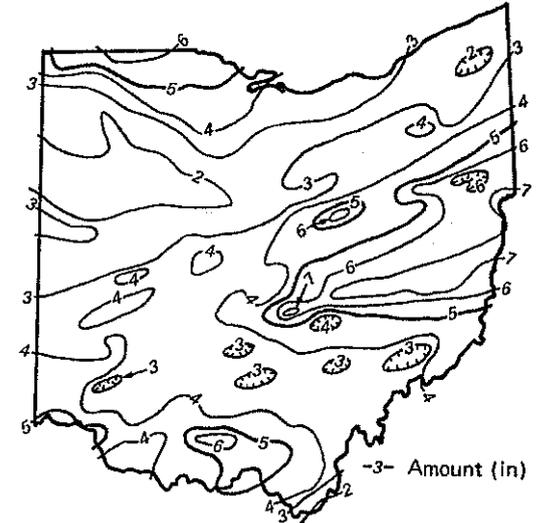
# monthly water inventory report for ohio

Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for June was above normal for the Central Hills, Northeast Hills, Southwest, South Central, and Southeast regions and below normal for the Northwest, North Central, Northeast, West Central, and Central regions. The average for the state as a whole was 3.95 inches, 0.13 inch above normal. Regional averages ranged from 5.91 inches, 2.12 inches above normal, for the Northeast Hills region to 2.74 inches, 1.23 inches below normal, for the West Central region. Pike Island Lock and Dam on the Ohio River near Martins Ferry, Belmont County, reported the greatest amount of precipitation, 7.77 inches, for the month, and Lima, Allen County, reported the least amount, 1.35 inches. Precipitation in June was generally produced by very isolated thundershowers, some of which were of rather high intensity. There was an unofficial report of 7.0 inches of rain in two hours just south of Thornville, Fairfield County, during the evening of June 18th. The rain resulted in considerable local flooding, including washed-out road culverts in the area. A storm on June 26th produced precipitation in excess of 2 inches at several stations in the north-central portion of the state. Other stations reporting 7.0 inches or more of precipitation for the month were: Barnesville, Belmont County; Norwich, Muskingum County; Middlebourne and Senecaville Lake, Guernsey County. Precipitation for the first six months of the 1978 calendar year for the state as a whole averaged 18.58 inches, 1.23 inches below normal. Regional averages ranged from 21.01 inches, 0.84 inch below normal, for the South Central region to 16.35 inches, 2.56 inches below normal, for the Northeast region. Departures from normal for the calendar year ranged from 0.18 inch above normal for the Northeast Hills region to 2.63 inches below normal for the West Central region.

Precipitation for the first nine months of the 1978 water year for the state as a whole averaged 28.29 inches, 0.98 inch above normal. Regional averages ranged from 31.24 inches, 1.50 inches above normal, for the Southwest region to 24.68 inches, 0.24 inch below normal, for the Northwest region. Departures from normal ranged from 3.17 inches above normal for the Central Hills region to 0.26 inch below normal for the Northeast region.



DIVISION OF WATER

Wayne S. Nichols, Chief

## SUMMARY

The water-supply situation thus far remains very favorable throughout the state. Precipitation in June was generally below normal in the northern portion of the state and above normal in the southern portion. Reservoir storage, streamflow, and ground-water storage are generally about normal. Lake Erie level declined, but remained noticeably above normal for the month.

## NOTES AND COMMENTS

### ASHTABULA COUNTY GROUND-WATER RESOURCES MAP AVAILABLE

The Division of Water announces the availability of *The ground-water resources of Ashtabula County*, the first of a series of county ground-water resources maps. The multicolored 28- by 46-inch map showing the ground-water resources of Ashtabula County was prepared by Glen W. Hartzell, geologist with the Division of Water. The map is designed as a guide to locating new ground-water supplies or as an aid for expanding supplies already established. Copies of the map may be ordered from Publications, Ohio Department of Natural Resources, Division of Geological Survey, Building B, Fountain Square, Columbus, Ohio 43224 at a cost of \$3.42, including tax and mailing.

## ACKNOWLEDGMENTS

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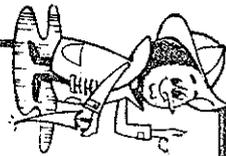
Precipitation data:

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:

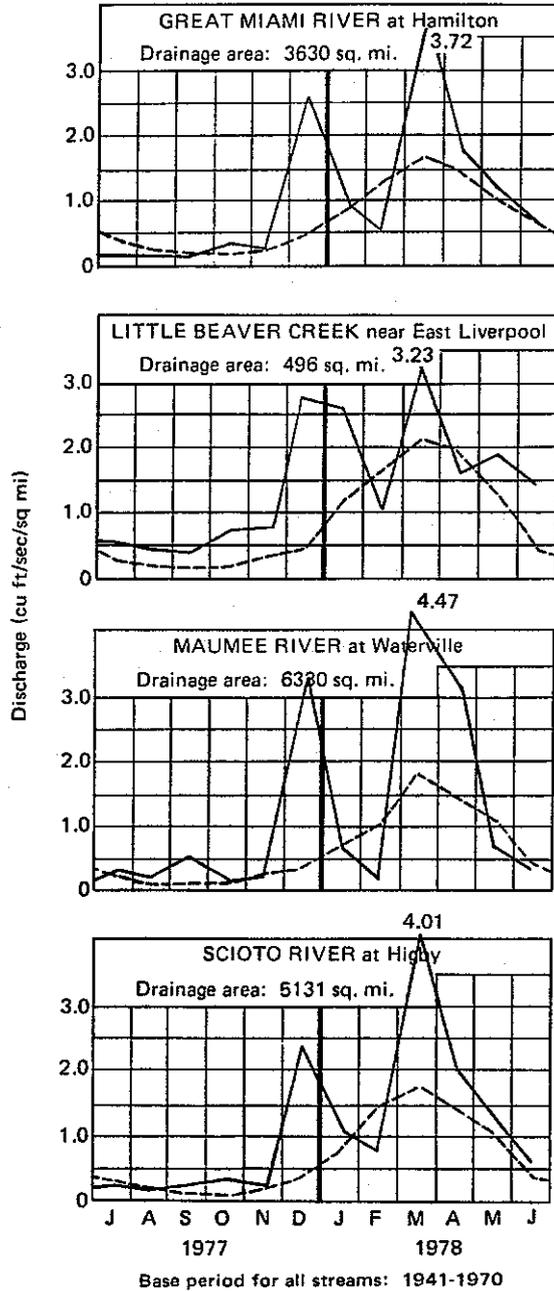
U.S. Geological Survey, Water Resources Division.  
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Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.

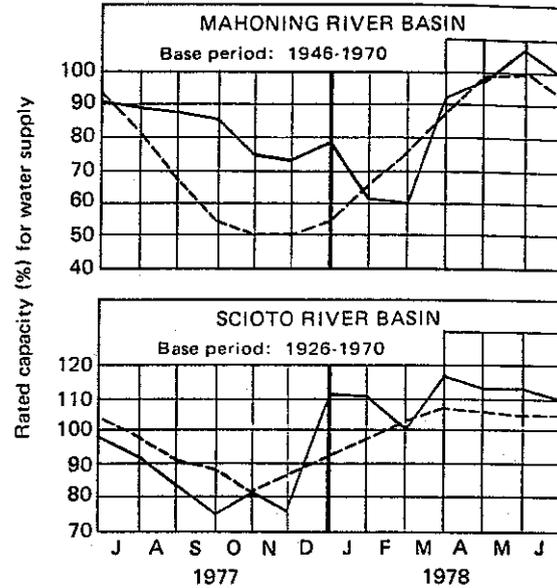


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## MEAN STREAM DISCHARGE



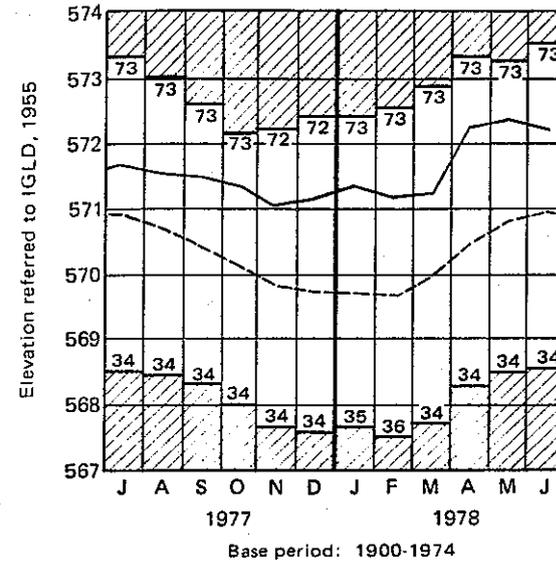
## RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply for June showed normal declines and was above normal at the month end in both the Mahoning River basin and Scioto River basin. Storage at the month end for the Mahoning basin index reservoirs was 98 percent of rated capacity for water supply compared to 108 percent for last month and 91 percent for June 1977. Storage at the month end for the Scioto basin index reservoirs was 110 percent of rated capacity for water supply compared to 113 percent for last month and 98 percent for June 1977.

STREAMFLOW for June was normal throughout the state; the only exception was in the eastern portion of the state, especially in the Mahoning basin, where it was excessive. The excessive rains which fell on June 18th southwest of Thornville, Fairfield County, caused flash flooding with minor property damage and washed out a portion of Ohio Route 188. The U.S. Geological Survey, Water Resources Division preliminary report indicates that the flood frequency will probably exceed a 200-year flood recurrence. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 2,164 cfs, 100 percent; Little Beaver Creek, 732 cfs, 332 percent; Maumee River, 2,276 cfs, 87 percent; Scioto River, 3,270 cfs, 160 percent.

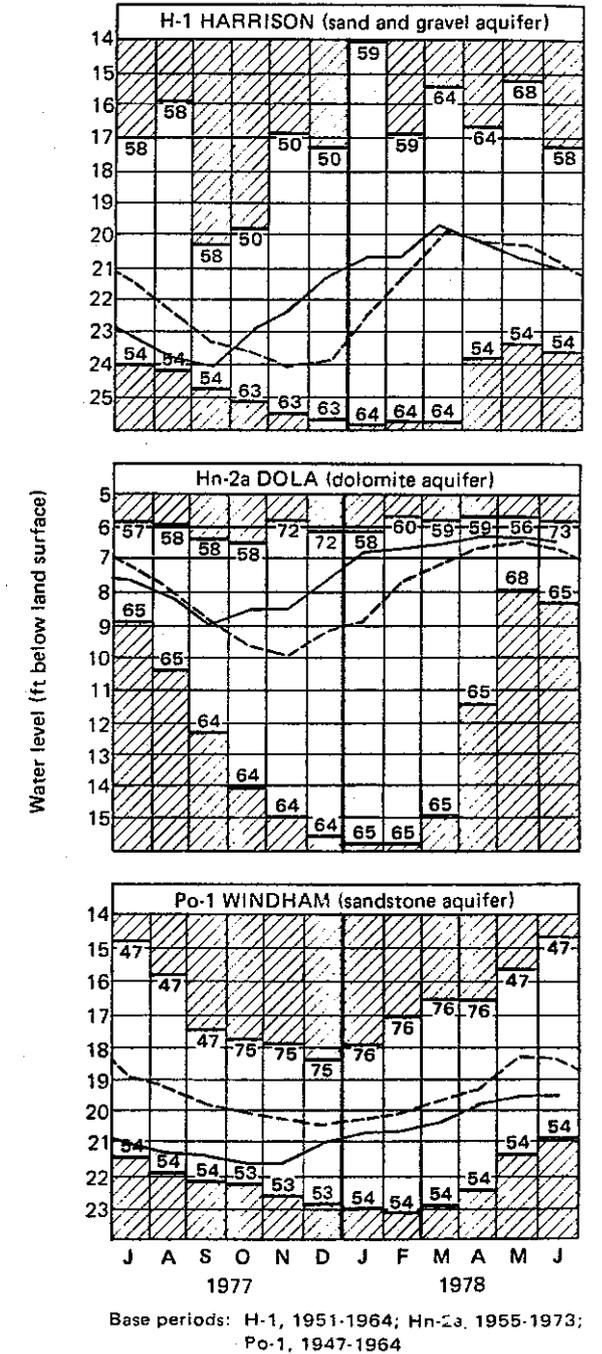
## LAKE ERIE LEVELS



LAKE ERIE mean level for June was 572.25 feet above IGLD (1955), 0.13 foot below last month's mean level and 1.31 feet above normal. The lake level is 0.58 foot above the level observed for June 1977 and 3.65 feet above Low Water Datum.

GROUND-WATER LEVELS in June generally were below normal in the southern portion of the state and above normal in the northern portion. In most areas, water levels began their seasonal declines; however, the declines were not as great as commonly observed for June. Ground-water levels generally are 1 to 2 feet above levels observed for June 1977. The ground-water supply situation thus far remains very favorable throughout the state.

## GROUND-WATER LEVELS





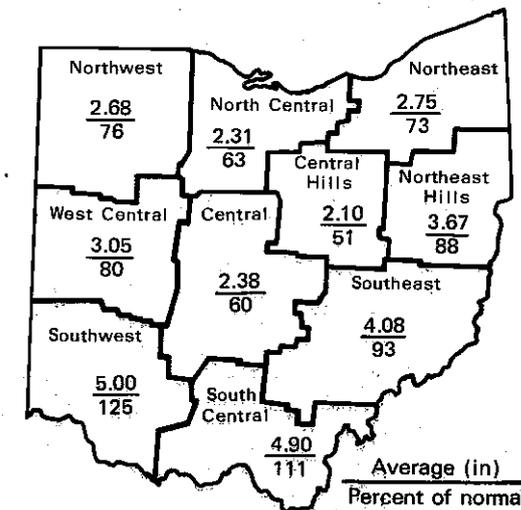
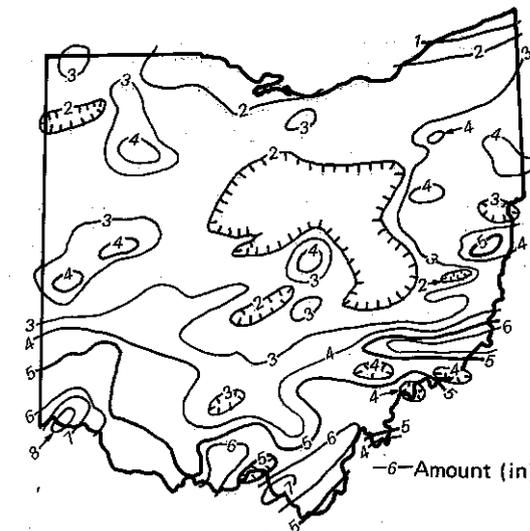
# monthly water inventory report for ohio

Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for July was below normal throughout most of the state; the only exceptions were the Southwest and South Central regions, where precipitation was above normal. The average for the state as a whole was 3.29 inches, 0.69 inch below normal. Regional averages ranged from 5.00 inches, 0.99 inch above normal, for the Southwest region to 2.10 inches, 2.03 inches below normal, for the Central Hills region. Fernbank, Hamilton County, reported the greatest amount of precipitation, 8.18 inches, for the month, and Ashtabula, Ashtabula County, reported the least amount, 0.96 inch. In general most of the state received between 2 and 4 inches of precipitation for the month; greater amounts, ranging from 5.0 to 8.2 inches, were received along the Ohio River valley. The bulk of the month's precipitation was produced by very heavy local thunderstorms during the first 10 days and the last 10 days of the month. Precipitation for the first seven months of the 1978 calendar year was below normal throughout the state. The average for the state as a whole was 21.87 inches, 1.92 inches below normal. Regional averages ranged from 25.91 inches, 0.37 inch below normal, for the South Central region to 19.10 inches, 3.59 inches below normal, for the Northeast region. The below-normal precipitation for the month has not had a detrimental effect on the water-supply situation thus far.

Precipitation for the 1978 water year thus far for the state as a whole averaged 31.58 inches, 0.29 inch above normal. Regional averages ranged from 36.24 inches, 2.49 inches above normal, for the Southwest region to 27.36 inches, 1.07 inches below normal, for the Northwest region. Departures from normal ranged from 2.49 inches above normal for the Southwest region to 1.29 inches below normal for the Northeast region.



DIVISION OF WATER

Wayne S. Nichols, Chief

## SUMMARY

The water-supply situation continues to be very favorable throughout the state. Precipitation for July was below normal throughout most of the state; the only exception was along the Ohio River valley, where precipitation was above normal. Reservoir storage, streamflow, and ground-water storage continue to be very satisfactory. Lake Erie level declined and remains about 1 foot above normal.

## NOTES AND COMMENTS

### INDUSTRIAL WATER-USE SURVEY BEING CONDUCTED BY THE OHIO DEPARTMENT OF NATURAL RESOURCES

The Ohio Department of Natural Resources (ODNR) is conducting a pilot survey of industrial water use in Delaware and Licking Counties as a part of a statewide study to determine the amount of water used by Ohio industries. The Division of Water is conducting the survey by mail in cooperation with the U.S. Geological Survey. Following completion of the initial survey of Delaware and Licking Counties, ODNR will query the remainder of the approximately 18,000 Ohio industries, which employ about 1.5 million individuals.

"The water-use study will enable us to compare present water use to available water supply in order to ensure that our surface and ground-water resources will be sufficient to meet new demands," said Wayne Nichols, ODNR Deputy Director of Resource Protection. "Industrial water use in Ohio, excluding electric power, amounts to about 3 billion gallons daily," Nichols said. "This is almost 15 percent of the state's total water use."

Information gathered through the water-use survey will include type and amount of water supply, source of water intake, purpose of water use, and amount of water discharge. Survey data will be evaluated and computerized in order to make the information easily accessible to local officials and planners responsible for building water-supply systems. Ohio is one of the five leading states in industrial water use. Ohio has plentiful water resources from Lake Erie, the Ohio River, and ground-water supplies.

## ACKNOWLEDGMENTS

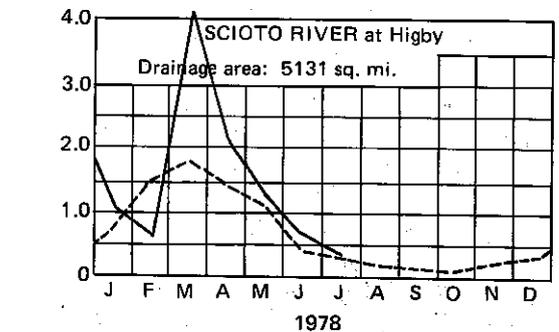
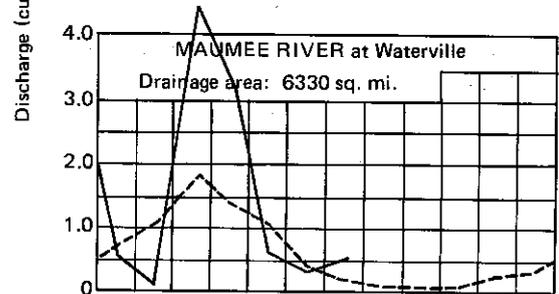
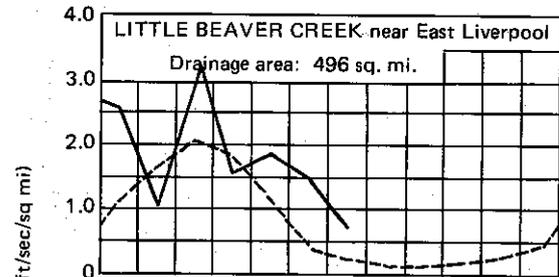
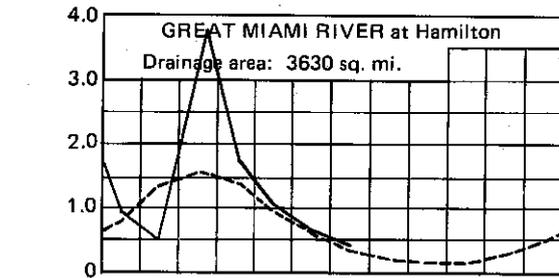
This report has been compiled from Division of Water data and from information supplied by the following:

- 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. Corps of Engineers, Detroit District.
- Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.



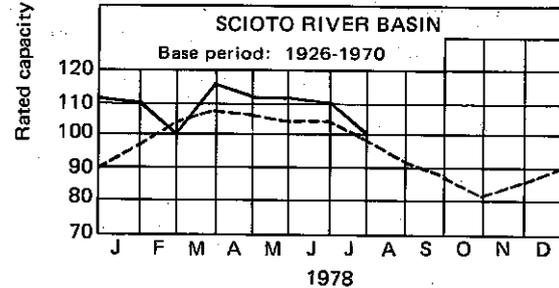
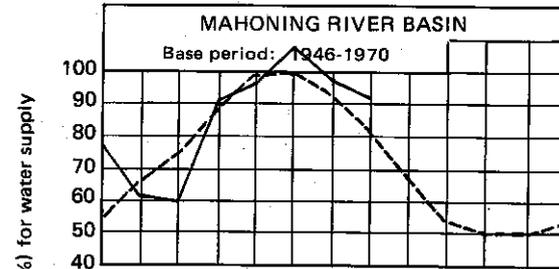
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FOUNTAIN SQUARE  
COLUMBUS, OHIO 43224

## MEAN STREAM DISCHARGE



Base period for all streams: 1941-1970

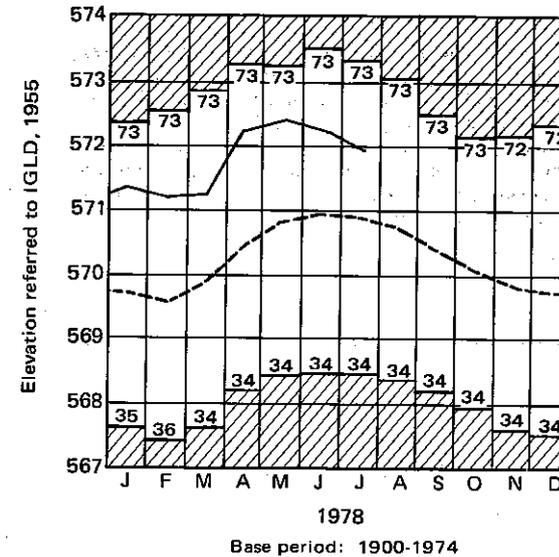
## RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply for July declined, but continued to be above normal at the month end for the Mahoning River basin and the Scioto River basin. Storage at the month end for the Mahoning basin index reservoirs was 93 percent of rated capacity for water supply compared to 98 percent for last month and 89 percent for July 1977. Storage for the Scioto basin index reservoirs was 101 percent of rated capacity for water supply compared to 110 percent for last month and 92 percent for July 1977. The Water Resources Development Section, Water Supply Unit, of the Ohio Division of Water reports that upground reservoirs in which the state has an equity have pool elevations at or above normal for July.

STREAMFLOW for July was normal in the southwestern and central portions of the state and excessive in the northwestern and eastern portions. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 1,682 cfs, 125 percent; Little Beaver Creek, 371 cfs, 325 percent; Maumee River, 3,273 cfs, 244 percent; Scioto River, 1,710 cfs, 108 percent. Streamflow at the month end was about normal throughout the state.

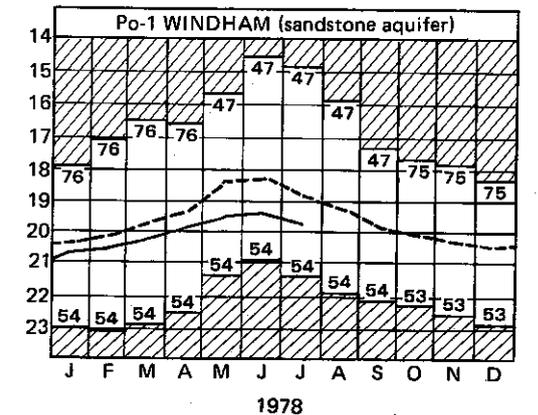
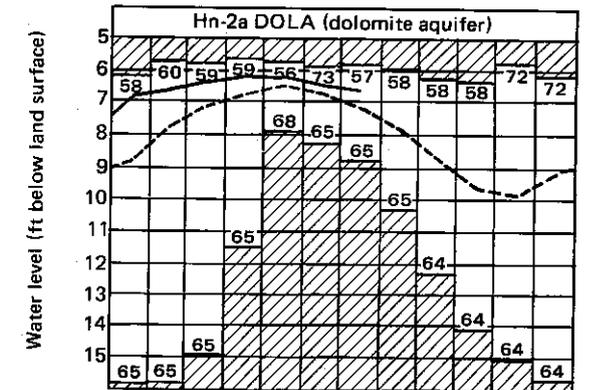
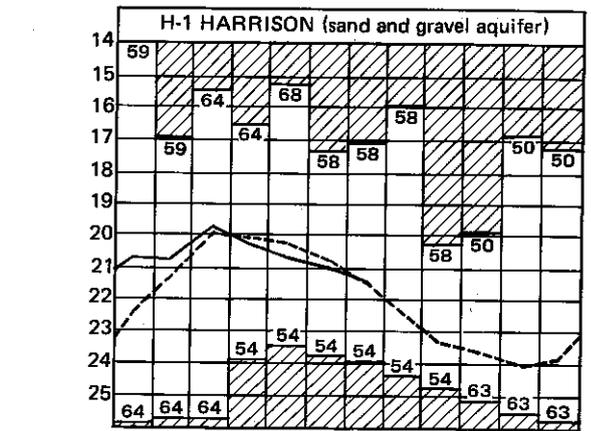
## LAKE ERIE LEVELS



LAKE ERIE mean level for July was 571.95 feet above IGLD (1955), 0.30 foot below last month's mean level and 1.05 feet above normal. The lake level is 0.27 foot above the level observed for July 1977 and 3.35 feet above Low Water Datum.

GROUND-WATER LEVELS in July generally showed normal declines; the only exception was for index well F-1 at West Rushville, Fairfield County, in which the decline was rather pronounced. Water levels throughout the state are noticeably higher now than they were for July 1977. Generally, water levels range from 2 feet above normal in the central and northern portions of the state to 2 feet below normal in the southern portion. Thus, the ground-water storage situation remains very favorable despite the lack of precipitation during the month.

## GROUND-WATER LEVELS



Base periods: H-1, 1951-1964; Hn-2a, 1955-1973; Po-1, 1947-1964

normal----- current-----



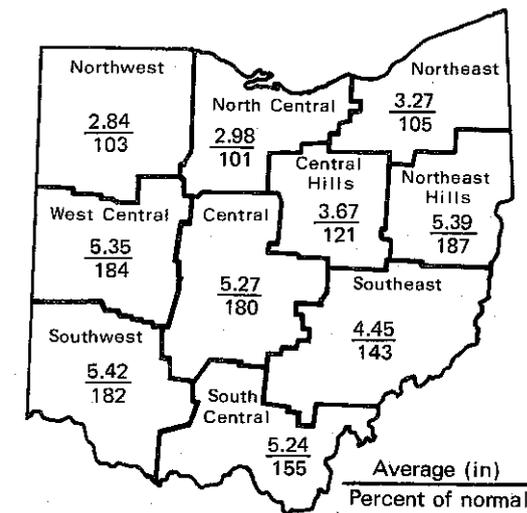
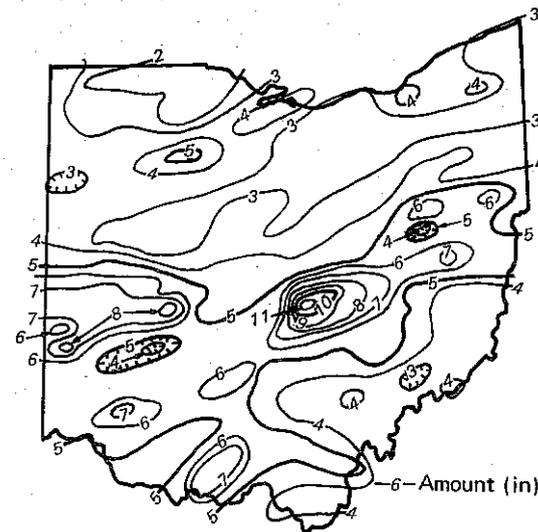
# monthly water inventory report for ohio

Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for August was above normal throughout the state. Precipitation was only slightly above normal in the northern portion of the state and was excessive in the western and southern portions. The average for the state as a whole was 4.39 inches, 1.39 inches above normal. Regional averages ranged from 5.42 inches, 2.44 inches above normal, for the Southwest region to 2.84 inches, 0.08 inch above normal, for the Northwest region. Departures from normal for the month ranged from 2.50 inches above normal for the Northeast Hills region to 0.04 inch above normal for the North Central region. Ash, Licking County, reported the greatest amount of precipitation, 11.89 inches, for the month, and Bowling Green, Wood County, reported the least amount, 1.35 inches. Other reports of excessive amounts of precipitation in the vicinity of Ash were: Newark, 10.52 inches; Buckeye Lake, 9.98 inches; and Dillon Dam, 8.87 inches. In general, the half of the state north of a line from Versailles through Columbus, Mt. Vernon, and Canton and a large area in the southeastern portion of the state received between 2 and 5 inches of precipitation for the month. The central and southwestern portions of Ohio generally received between 5 and 12 inches. There were noticeable amounts of precipitation during every week of the month; the bulk of the precipitation was produced by very widely scattered heavy thundershowers throughout the state. The Cleveland Regional Sewer District reported 1.65 inches of precipitation in 20 minutes during the afternoon of August 19 in the Shaker Heights area. Precipitation for the first eight months of the 1978 calendar year remained below normal throughout most of the state; the only exceptions were the Northeast Hills, Southwest, and South Central regions, where it was above normal. The average for the state as a whole was 26.26 inches, 0.53 inch below normal. Regional averages ranged from 31.15 inches, 1.49 inches above normal, for the South Central region to 22.21 inches, 1.79 inches below normal, for the Northwest region. Departures from normal ranged from 2.20 inches above normal for the Northeast Hills region to 3.44 inches below normal for the Northeast region.

Precipitation for the 1978 water year thus far averages 35.97 inches, 1.68 inches above normal. Regional averages range from 41.66 inches, 4.93 inches above normal, for the Southwest region to 30.20 inches, 0.99 inch below normal, for the Northwest region.



DIVISION OF WATER

Wayne S. Nichols, Chief

## SUMMARY

The water-supply situation in general is very favorable throughout the state. Precipitation for August was above normal to excessive throughout the state. Streamflow, reservoir storage, and ground-water storage continue to show marked improvements compared to last year. Lake Erie level declined and is less than 1 foot above normal.

## NOTES AND COMMENTS

### NEW PUBLICATIONS

The Division of Water announces the availability of *Ground water resources of Medina County*, the second of a series of county ground-water resources maps. The multicolored 21- by 28-inch map showing the ground-water resources of Medina County was prepared by James J. Schmidt, hydrogeologist with the Division of Water. The map is designed as a guide to locating new ground-water supplies or as an aid for expanding supplies already established. It will be useful to homeowners, developers, and planners. Copies of the map may be ordered from Publications, Ohio Department of Natural Resources, Division of Geological Survey, Building B, Fountain Square, Columbus, Ohio 43224 at a cost of \$2.28, including tax and mailing.

The Division of Geological Survey announces the publication of Information Circular No. 47, *Analyses of Ohio coals*, by George Botoman and David A. Stith. This study of the chemistry of Ohio coal was done in cooperation with the U.S. Geological Survey. Over 100 analytical determinations were made on major, minor, and trace elements of coal and ash. Proximate and ultimate analyses, sulfur levels, and Btu values also were determined. Information Circular 47 is available from the Division of Geological Survey, Ohio Department of Natural Resources, Building B, Fountain Square, Columbus, Ohio 43224 at a cost of \$3.42, including tax and mailing.

## ACKNOWLEDGMENTS

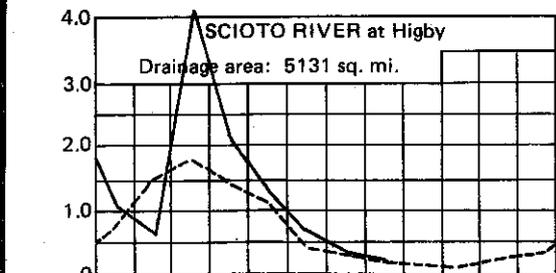
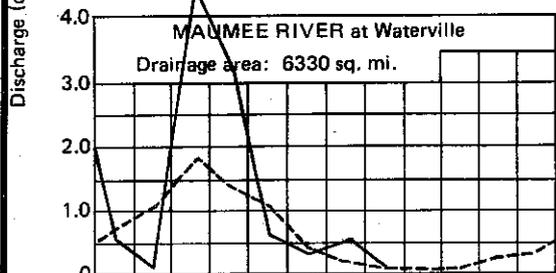
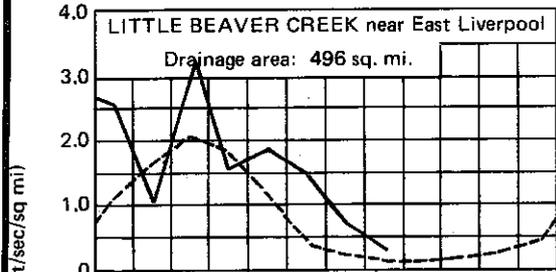
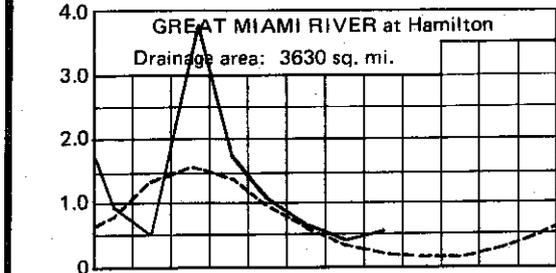
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- Streamflow and reservoir storage data: U.S. Geological Survey, Water Resources Division.
- Lake Erie level data: U.S. Corps of Engineers, Detroit District.
- Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.



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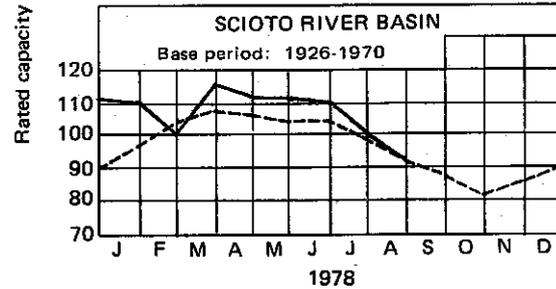
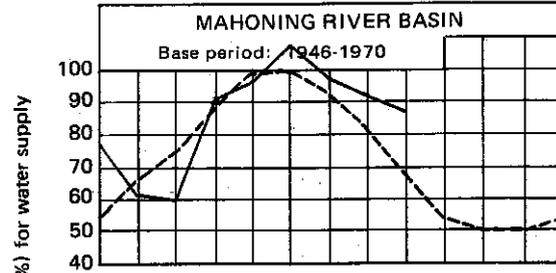
## MEAN STREAM DISCHARGE



1978

Base period for all streams: 1941-1970

## RESERVOIR STORAGE FOR WATER SUPPLY

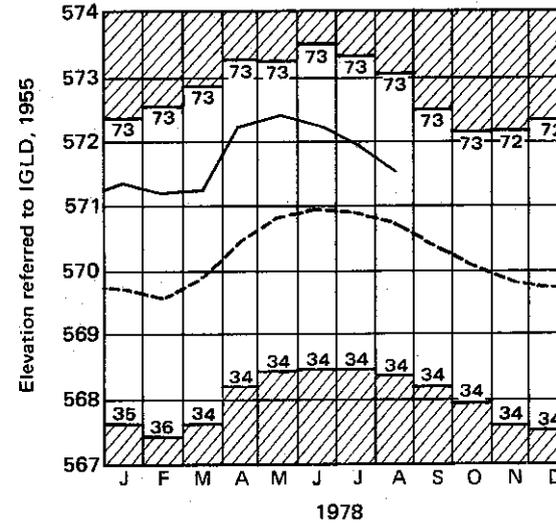


RESERVOIR STORAGE for water supply in August remained at or above normal in both the Mahoning River basin and the Scioto River basin. Reservoir storage for the Mahoning basin index reservoirs was 87 percent of rated capacity for water supply compared to 93 percent for last month and 88 percent for August 1977. Reservoir storage for the Scioto basin index reservoirs was 91 percent of rated capacity for water supply compared to 101 percent for last month and 83 percent for August 1977.

STREAMFLOW for August was normal throughout most of the state; the only exceptions were the southwestern and eastern portions of the state, where streamflow was excessive. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 1,931 cfs, 248 percent; Little Beaver Creek, 191 cfs, 279 percent; Maumee River, 820 cfs, 138 percent; Scioto River, 1,460 cfs, 162 percent.

normal----- current-----

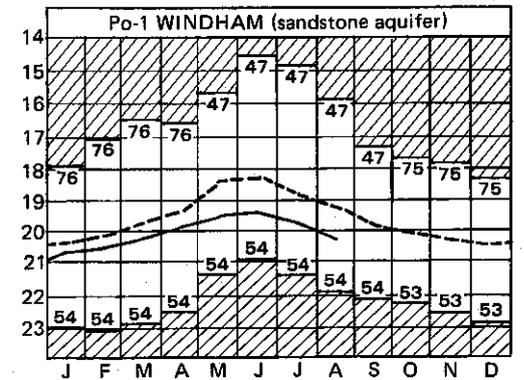
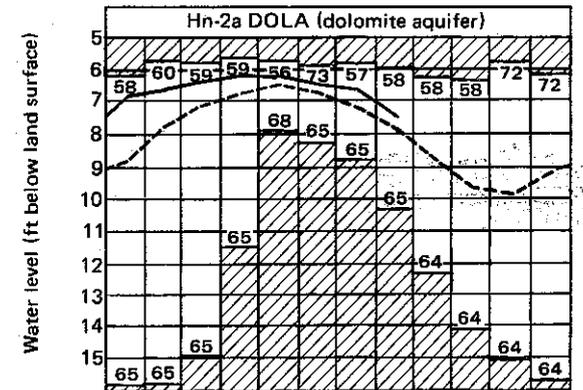
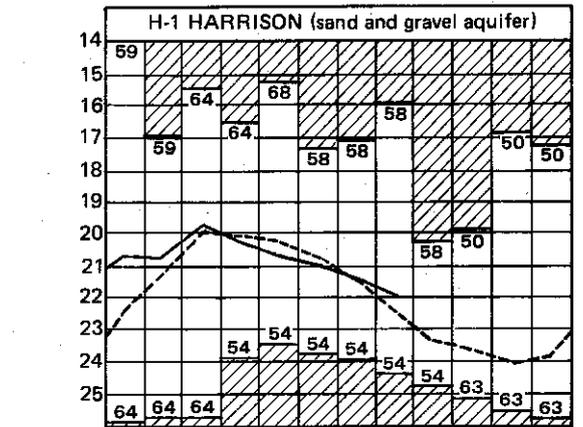
## LAKE ERIE LEVELS



LAKE ERIE mean level for August was 571.66 feet above IGLD (1955), 0.29 foot below last month's mean level and 0.95 foot above normal. The lake level was 0.13 foot above the level observed for August 1977 and 3.06 feet above Low Water Datum.

GROUND-WATER LEVELS for August showed noticeable net declines throughout the state; some marked rises in response to the heavy rains during the last three days of the month were noted at the month end in wells representing unconsolidated sand and gravel aquifers. Water levels are generally 1 to 1.5 feet above those levels observed for August 1977 and are near normal for August. The only exceptions are in index well F-1 at West Rushville, Fairfield County, which is noticeably below normal, and index well Fr-10 at Ohio State University Farms, Columbus, Franklin County, which is noticeably above normal. The water level for Fr-10 has been noticeably above normal for several years. The ground-water storage situation remains very satisfactory at this time.

## GROUND-WATER LEVELS



1978

Base periods: H-1, 1951-1964; Hn-2a, 1955-1973; Po-1, 1947-1964



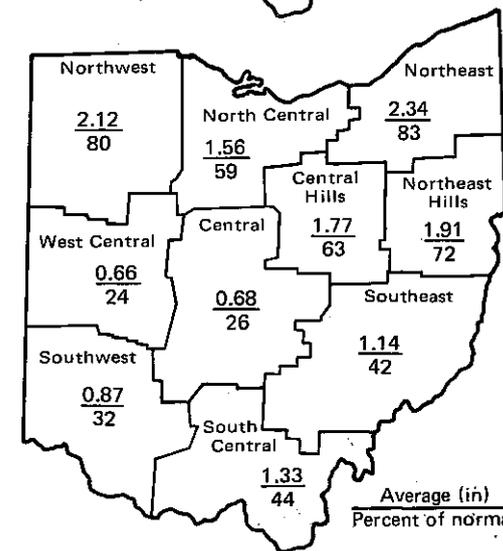
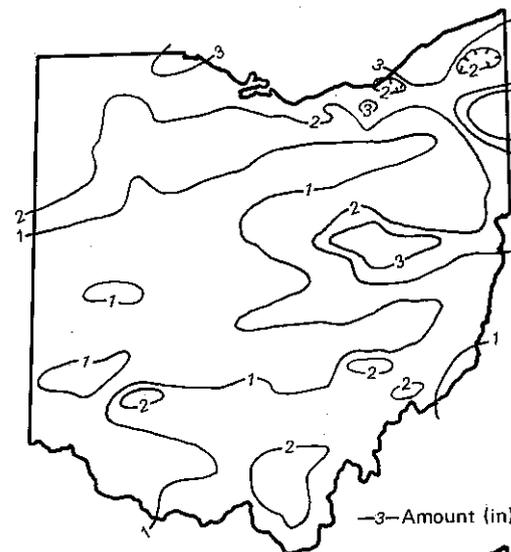
# monthly water inventory report for ohio

Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for September was below normal throughout the state. The average for the state as a whole was 1.44 inches, 1.31 inches below normal. Regional averages ranged from 2.34 inches, 0.48 inch below normal, for the Northeast region to 0.66 inch, 2.06 inches below normal, for the West Central region. Youngstown Airport Weather Service Office, Trumbull County, reported the greatest amount of precipitation, 4.23 inches, for the month, and Lithopolis, Fairfield County, reported the least amount, 0.13 inch. Generally there was between 0.5 and 2 inches of precipitation throughout most of the state; the only exception was the northern portion of the state, which received between 2 and 4 inches of precipitation. The bulk of the precipitation was recorded during the third week of the month; there was little or no precipitation during the first two weeks and the last week of September. There was noticeable precipitation throughout the state on the last day of the month; however, because the normal observation time at most stations is 8:00 a.m., this precipitation will be tabulated on the 1st day of October. Precipitation for the first nine months of the 1978 calendar year was generally below normal. The only exception was the Northeast Hills region, where it was above normal. The average for the state as a whole was 27.70 inches, 1.84 inches below normal. Regional averages ranged from 32.48 inches, 0.17 inch below normal, for the South Central region to 24.18 inches, 2.80 inches below normal, for the North Central region. Departures from normal ranged from 1.45 inches above normal for the Northeast Hills region to 3.92 inches below normal for the Northeast region.

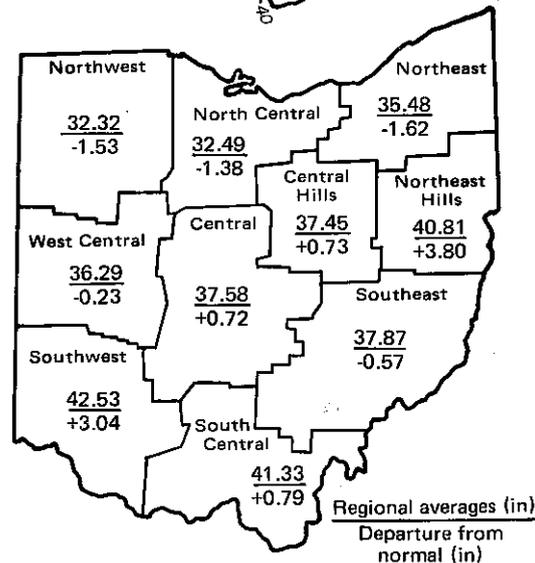
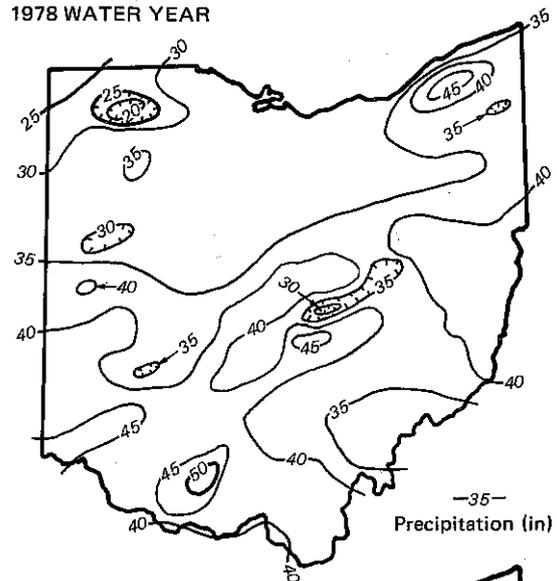
Precipitation for the 1978 water year was below normal in the northern and southeastern portions of the state and above normal in the central and southwestern portions. The average for the state as a whole was 37.41 inches, 0.37 inch above normal. An isohyetal map and regional averages and departures from normal for the 1978 water year appear on the last page of this report. Regional averages ranged from 42.53 inches, 3.04 inches above normal, for the Southwest region to 32.32 inches, 1.53 inches below normal, for the Northwest region. Departures from normal ranged from 3.80 inches above normal for the Northeast Hills region to 1.62 inches below normal for the Northeast region. Precipitation was generally above normal during the first four months of the water year and normal or below normal during the remaining eight months; the only exception was August, when precipitation was noticeably above normal for most of the state. The above-normal precipitation during the first four months provided excellent recharge to water supplies, and by the end of the nominal recharge period the water-supply situation had improved markedly compared to that of the 1977 water year. The water-supply situation remained very favorable throughout the state during the remainder of the water year, despite the deficient precipitation.



## SUMMARY

The water-supply situation improved markedly during the recharge season of the 1978 water year in response to above-normal precipitation. Water supply continued to be very favorable throughout the remainder of the water year, despite the deficient precipitation during the water-supply depletion period. Precipitation for September was below normal throughout the state. Streamflow, reservoir storage, and ground-water storage were generally about normal throughout the state. Lake Erie level declined for the fourth consecutive month and was less than 1 foot above normal.

## 1978 WATER YEAR



## ACKNOWLEDGMENTS

This report has been compiled from Division of Water data and from information supplied by the following:

Precipitation data:

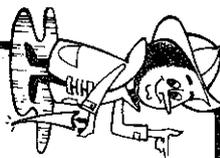
U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service; The Miami Conservancy District; U.S. Army Corps of Engineers, Muskingum Area.

Streamflow and reservoir storage data:

U.S. Geological Survey, Water Resources Division; U.S. Corps of Engineers, Detroit District.

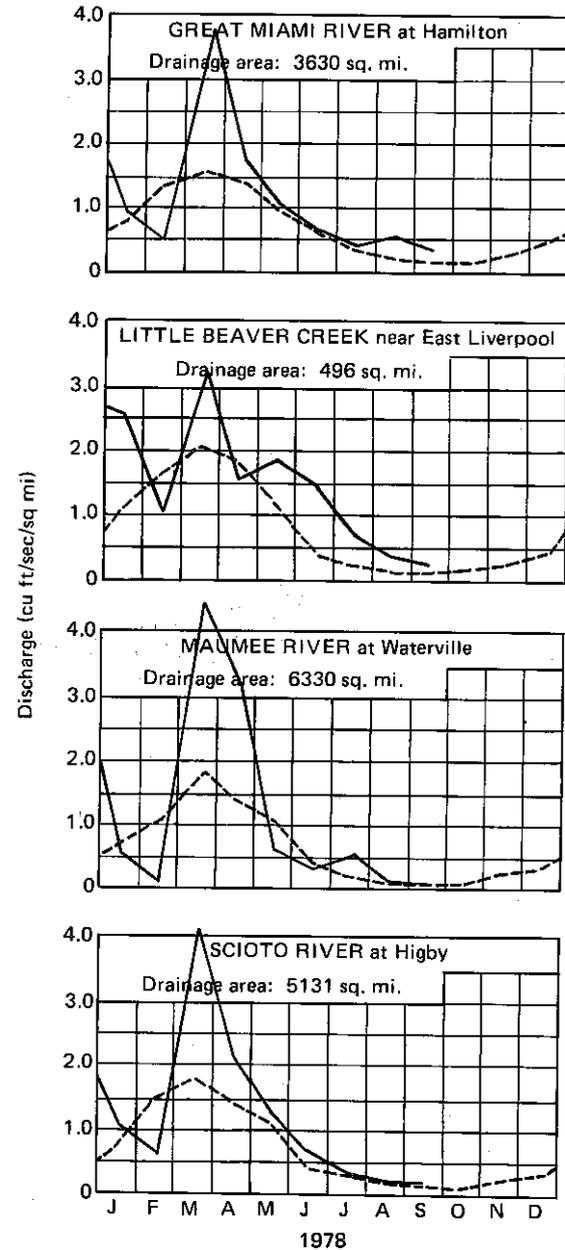
Lake Erie level data: U.S. Corps of Engineers, Detroit District.

Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.



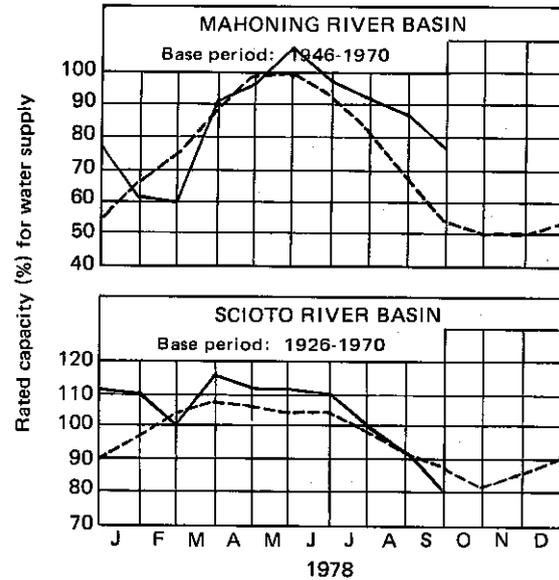
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DIVISION OF WATER  
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COLUMBUS, OHIO 43224

## MEAN STREAM DISCHARGE



Base period for all streams: 1941-1970

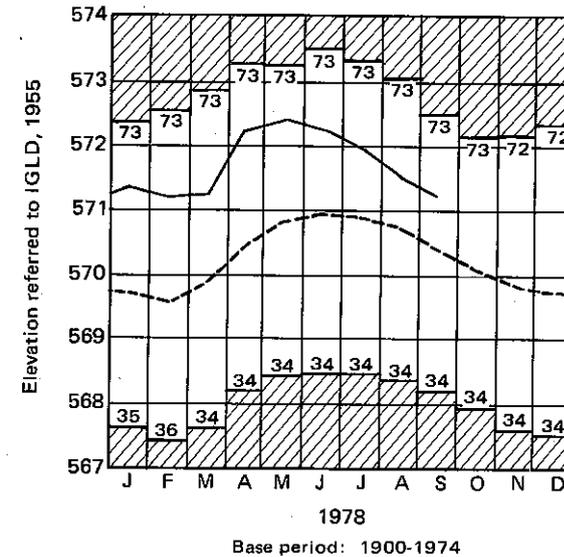
## RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply for September showed marked decline in response to the deficient precipitation; however, storage at the month end was above normal for the Mahoning River basin and below normal for the Scioto River basin. Storage at the month end for the Mahoning basin index reservoirs was 77 percent of rated capacity for water supply compared to 87 percent for last month and 86 percent for September 1977. Storage at the month end for the Scioto basin index reservoirs was 80 percent of rated capacity for water supply compared to 91 percent for last month and 75 percent for September 1977. Reservoir storage, which had improved during the first three months of the 1978 water year, declined rather sharply in January and February in response to the adverse weather conditions, but recovered during the remainder of the year and is considered to be good at the end of the water year.

STREAMFLOW for September was normal in the northwestern area of the state and excessive in the remainder of the state, despite the deficient precipitation. This was primarily a result of excessive flow at the beginning of the month, sustained throughout the month by contributions from ground-water storage. Even so, streamflow throughout the state declined during the month and was below normal at the month end. Mean discharge and percent of normal for September for the index gaging stations were as follows: Great Miami River, 1,227 cfs, 202 percent; Little Beaver Creek, 142 cfs, 233 percent; Maumee River, 574 cfs, 155 percent; Scioto River, 1,345 cfs, 223 percent. Streamflow for the 1978 water year was above normal to excessive. The only exception was in February, when flow was deficient throughout the state as a result of the extreme cold weather, which

## LAKE ERIE LEVELS



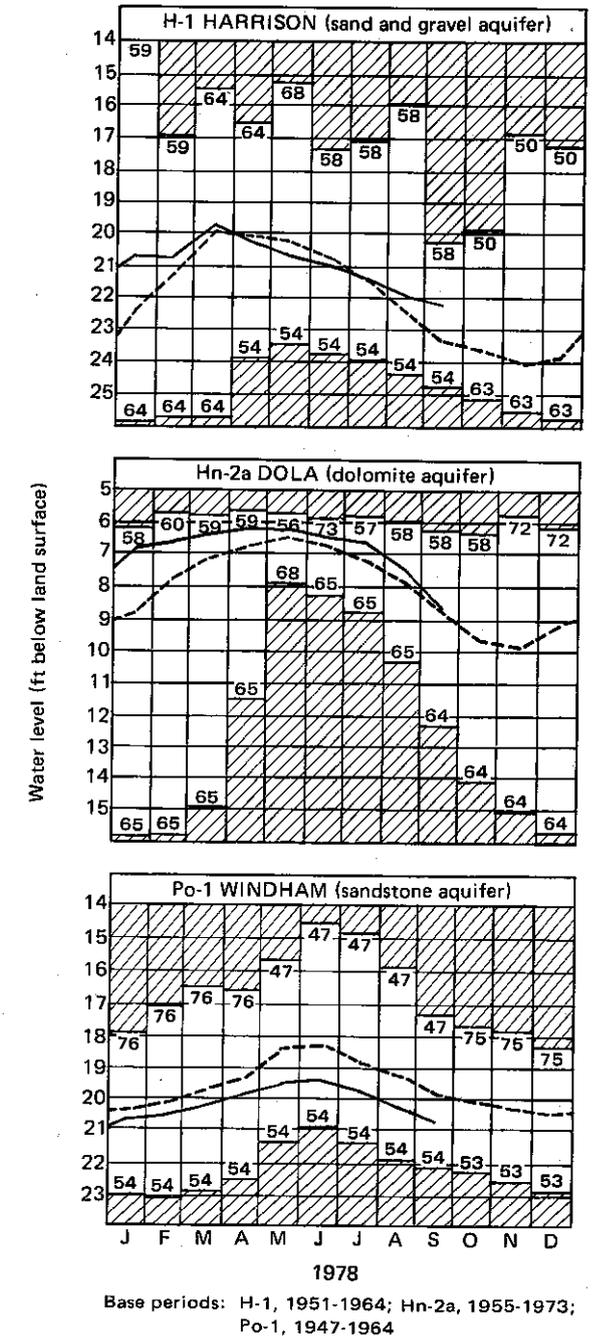
LAKE ERIE mean level for September was 571.29 feet above IGLD (1955), 0.37 foot below last month's mean level and 0.88 foot above normal. The lake level is 0.21 foot below the level observed for September 1977 and 2.69 feet above Low Water Datum. The lake level was noticeably above normal throughout the 1978 water year.

GROUND-WATER LEVELS in September generally declined throughout the state. The only exception was observation well Fa-1 at Jasper Mills, Fayette County, which showed a noticeable rise. The net declines for the month were generally about equal to those generally observed for September. Ground-water levels in general are above normal and above those levels observed for September 1977. The only exceptions are in index wells in the eastern and northeastern portions of the state, where levels are below normal. Ground-water levels throughout the state received excellent recharge during the first six months of the 1978 water year, the nominal recharge period, and were generally only slightly above or below normal during the year. Ground-water storage for the state as a whole was very favorable throughout the water year; this was a marked improvement from the uncertainties during the 1977 water year.

### STREAMFLOW—Continued

produced very little runoff during the month. Mean discharge and percent of normal for the 1978 water year at the index gaging stations were as follows: Great Miami River, 4,030 cfs, 123 percent; Little Beaver Creek, 723 cfs, 167 percent; Maumee River, 7,435 cfs, 152 percent; Scioto River, 5,851 cfs, 129 percent.

## GROUND-WATER LEVELS





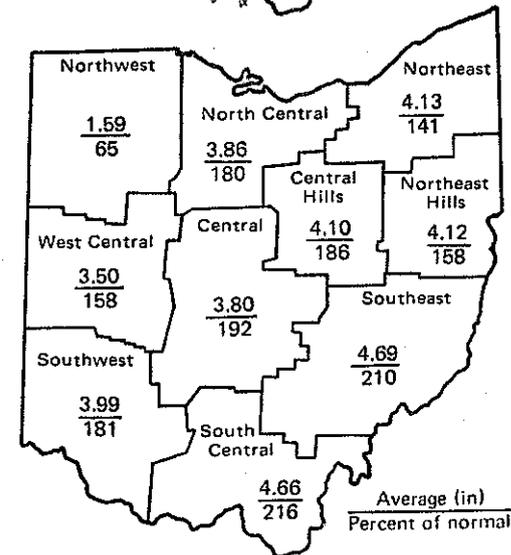
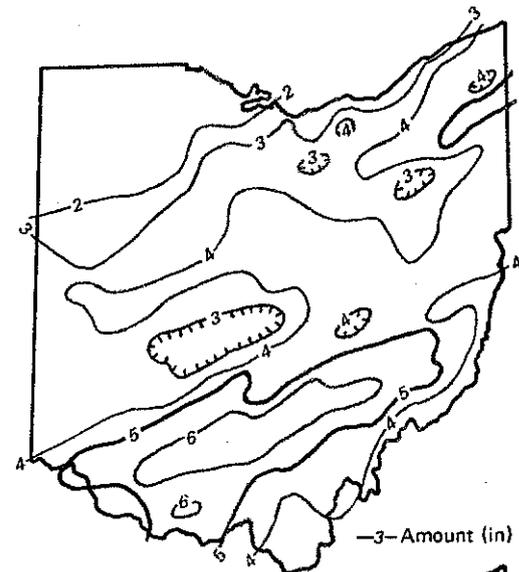
# monthly water inventory report for ohio

Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for October was above normal throughout most of the state; the only exception was the Northwest region, where precipitation was noticeably below normal. The average for the state as a whole was 3.84 inches, 1.53 inches above normal. Regional averages ranged from 4.69 inches, 2.46 inches above normal, for the Southeast region to 1.59 inches, 0.86 inch below normal, for the Northwest region. Chillicothe-Mound City, Ross County, reported the greatest amount of precipitation, 6.96 inches, for the month, and Montpelier, Williams County, reported the least amount, 1.20 inches. There was precipitation during every week of the month throughout most of the state. The bulk of the precipitation fell between the 11th and 15th of October; many areas in the southern portion of the state reported between 2 and 4 inches of precipitation during this time. Precipitation for the first 10 months of the calendar year for the state as a whole was generally below normal in the northern half of the state and above normal in the southern half. The average for the state as a whole was 31.54 inches, 0.31 inch below normal. Regional averages ranged from 37.14 inches, 2.33 inches above normal, for the South Central region to 25.92 inches, 3.19 inches below normal, for the Northwest region.

This is the first month of the 1979 water year, which began October 1, 1978, and ends September 30, 1979. The water year, a common reference period for surface-water reports, also is useful in discussion of ground-water phenomena. Precipitation for the first month of the 1979 water year was generally above normal for most of the state, but did not produce any significant recharge to water supplies.



## SUMMARY

The water-supply situation remains favorable throughout the state. Precipitation during the first month of the 1979 water year was above normal for most of the state. Streamflow, reservoir storage, and ground-water storage were generally about normal for October. Lake Erie level declined for the fifth consecutive month and is less than 1 foot above normal.

## NOTES AND COMMENTS

### NEW FILM: WHAT ON EARTH IS OCAP?

*What on earth is OCAP?* is a new 25-minute color film that explains the Ohio Capability Analysis Program (OCAP). OCAP, which is administered by the Resource Analysis Section of the Division of Water, is a computer system for analyzing land capability by evaluating the natural resources of an area. Detailed soil, ground-water and geologic maps are only a few examples of resource information input. These data are manipulated to produce township maps which indicate development potentials and limitations.

These capability maps are a guide for development and a basis for determining the best use of land and water resources. OCAP analyses have been completed for 15 counties, are in progress for 7 counties, and are scheduled for another 4 counties; several other counties have expressed an interest in the program. Publications are available which explain OCAP in greater detail. For more information, write OCAP, Ohio Department of Natural Resources, Fountain Square, Building E, Columbus, Ohio 43224 or phone 614-466-6294.

### PUBLICATIONS OF THE DIVISION OF GEOLOGICAL SURVEY

The following publications are now available from Publications, Division of Geological Survey, Building B, Fountain Square, Columbus, Ohio 43224:

Bulletin 66. *Geology and mineral resources of Washington County, Ohio*, by Horace R. Collins and Bradley E. Smith. 134 p., 41 figs., 21 tables, 11 pls. (including color geologic map), 1977. \$10.00 plus 40 cents tax in Ohio and \$1.00 mailing charge.

Report of Investigations No. 105. *Resources of the Pittsburgh (No. 8) coal in the Belmont field, Ohio*, by Michael L. Couchot. 12 p., 2 figs., 2 tables, 1 pl. (4 sheets), 1978. \$3.00 plus 12 cents tax in Ohio and 30 cents mailing charge.

Report of Investigations No. 106. *Structure on the Pittsburgh (No. 8) coal in the Belmont field, Ohio* by Richard M. DeLong. Map (2 sheets), 1978. \$1.50 plus 6 cents tax in Ohio and 15 cents mailing charge.

## ACKNOWLEDGMENTS

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Precipitation data:

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service; The Miami Company District; U.S. Army Corps of Engineers, Mustangum Area.

U.S. Geological Survey, Water Resources

Division,

Lake Erie level data:

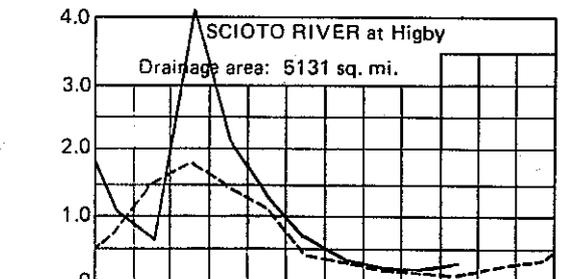
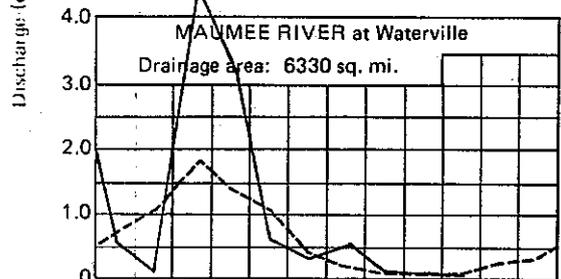
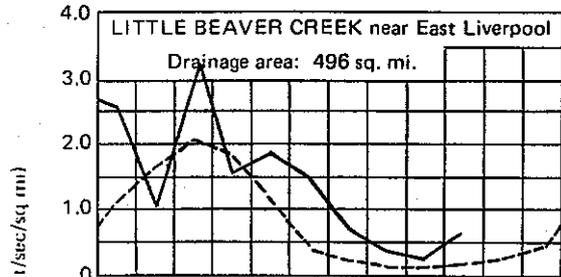
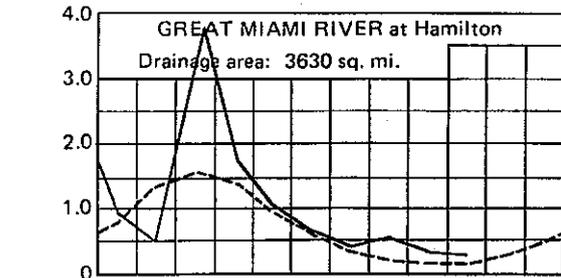
U.S. Corps of Engineers, Detroit District.

Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.



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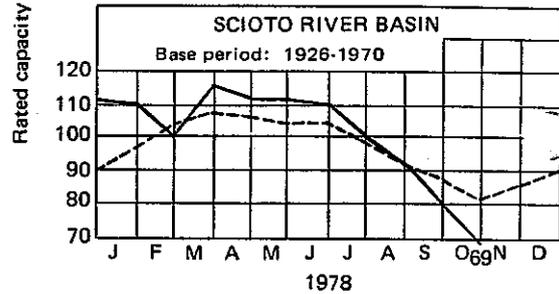
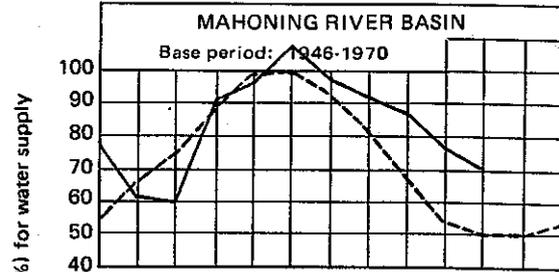
## MEAN STREAM DISCHARGE



1978

Base period for all streams: 1941-1970

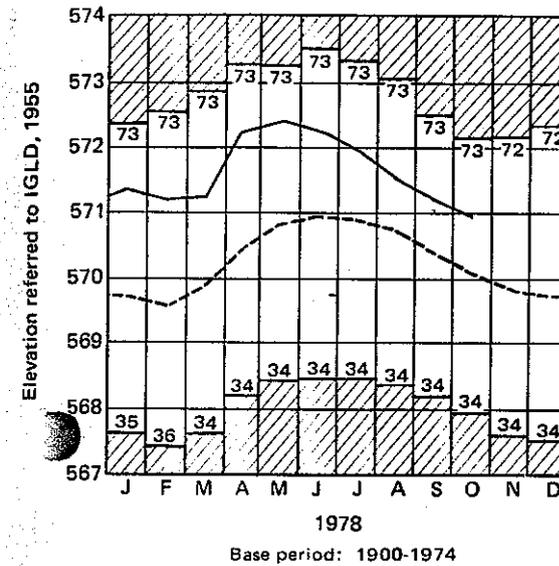
## RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply in October showed normal declines in the Mahoning River basin but remained noticeably above normal; storage in the Scioto River basin declined sharply and was noticeably below normal for the month. Reservoir storage at the month end for the Mahoning basin index reservoirs was 71 percent of rated capacity for water supply compared to 77 percent for last month and 75 percent for October 1977. Storage at the month end for the Scioto basin index reservoirs was 69 percent of rated capacity for water supply compared to 80 percent for last month and 81 percent for October 1977.

STREAMFLOW for October was excessive throughout most of the state; the only exception was in northwestern Ohio, where it was normal. The heavy rains during the middle of the month resulted in greater than normal runoff, which produced the excessive streamflow. Mean discharge and percent of normal for October for the index gaging stations were as follows: Great Miami River, 1,154 cfs, 193 percent; Little Beaver Creek, 315 cfs, 416 percent; Maumee River, 437 cfs, 86 percent; Scioto River, 1,719 cfs, 295 percent.

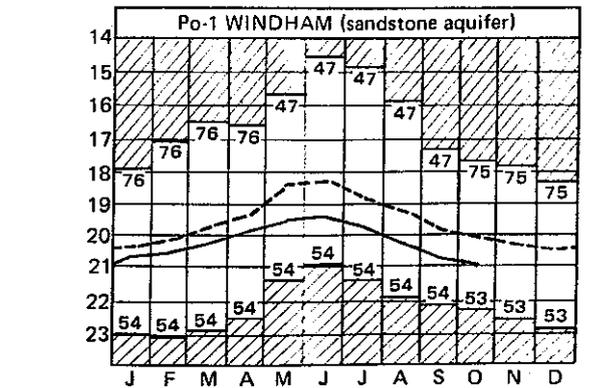
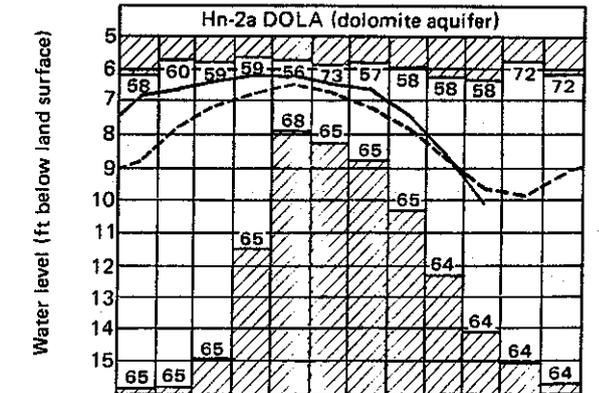
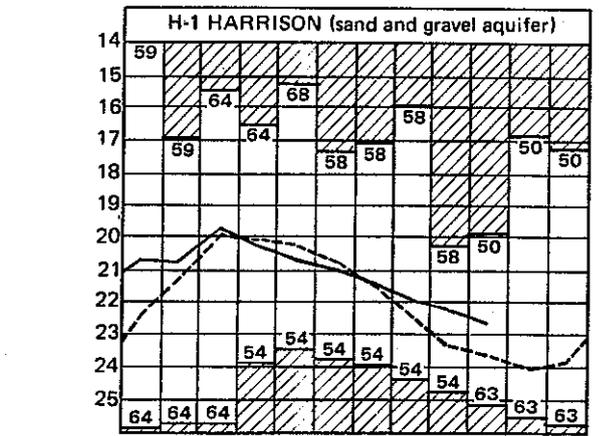
## LAKE ERIE LEVELS



LAKE ERIE mean level for October was 570.99 feet above IGLD (1955), 0.30 foot below last month's mean level and 0.90 foot above normal. The lake level is 0.37 foot below the level observed for October 1977 and 2.39 feet above Low Water Datum.

GROUND-WATER LEVELS continued to decline during October; however, the declines were generally about half the amount normally observed. There was evidence that considerable recharge resulted from the heavy precipitation during the middle of the month, but water levels generally were showing a downward trend at the month end. Water levels in the southern and northeastern portions of the state are generally above normal and above those levels observed for October 1977, but levels in the northwestern and central portions of the state are generally below normal and below those levels observed for October 1977. The ground-water storage situation remains very favorable throughout the state. Conditions are very promising for good recharge to ground-water storage during the normal recharge period of the new water year, provided there is ample precipitation.

## GROUND-WATER LEVELS



Base periods: H-1, 1951-1964; Hn-2a, 1955-1973; Po-1, 1947-1964

normal - - - - - current



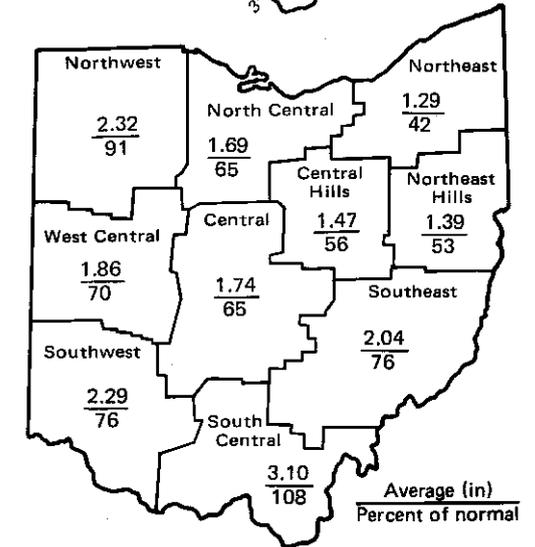
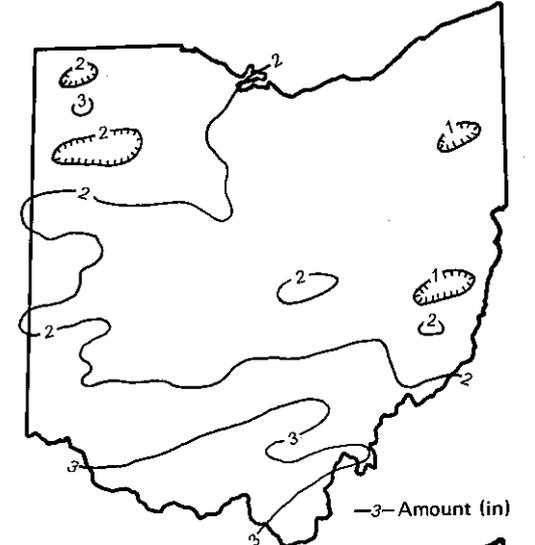
# monthly water inventory report for ohio

Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for November was below normal for most of the state; the only exception was the South Central region, where precipitation was slightly above normal. The average for the state as a whole was 1.92 inches, 0.82 inch below normal. Regional averages ranged from 3.10 inches, 0.23 inch above normal, for the South Central region to 1.29 inches, 1.76 inches below normal, for the Northeast region. Peebles, Adams County, reported the greatest amount of precipitation, 3.81 inches, for the month, and Middlebourne, Guernsey County, reported the least amount, 0.89 inch. There were nominal amounts of precipitation during every week of the month throughout most of the state. Heavier precipitation was observed in the southern portion of the state between the 15th and 18th of November. Generally the amount of precipitation was so minor that, insofar as agriculture and water supplies were concerned, November was a dry month. Precipitation for the first 11 months of the 1978 calendar year for the state as a whole averaged 33.46 inches, 1.13 inches below normal. Regional averages ranged from 40.24 inches, 2.56 inches above normal, for the South Central region to 28.24 inches, 3.43 inches below normal, for the Northwest region.

Precipitation for the first two months of the 1979 water year for the state as a whole averaged 5.76 inches, 0.71 inch above normal. Regional averages ranged from 7.76 inches, 2.73 inches above normal, for the South Central region to 3.91 inches, 1.10 inches below normal, for the Northwest region. This is the second consecutive year in which precipitation for the first two months of the recharge season has been above normal throughout most of the state. This is a good omen for continued improvement in the water-supply situation during the current recharge season.



DIVISION OF WATER

Wayne S. Nichols, Chief

## SUMMARY

The water-supply situation continues to be favorable throughout the state. Precipitation for November was below normal throughout most of the state, and reservoir storage showed marked declines in the Mahoning and the Scioto basins. Streamflow and ground-water storage were generally about normal. Lake Erie level declined to the lowest level observed since February 1977 but remained about 1 foot above normal.

## NOTES AND COMMENTS

### NEW PUBLICATION

The Division of Water announces the availability of *The ground water resources of Columbiana County*, the third in a series of county ground-water maps. The multicolored 30- by 32-inch map showing the ground-water resources of Columbiana County was prepared by Katie Crowell, hydrogeologist with the Division of Water. The map is designed as a guide to locating new ground-water supplies or as an aid for expanding supplies already established. It will be useful to homeowners, developers, and planners. Copies of the map may be ordered from Publications, Ohio Department of Natural Resources, Division of Geological Survey, Building B, Fountain Square, Columbus, Ohio 43224 at a cost of \$2.85, including tax and mailing.

## 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. Corps of Engineers, Detroit District.

Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.



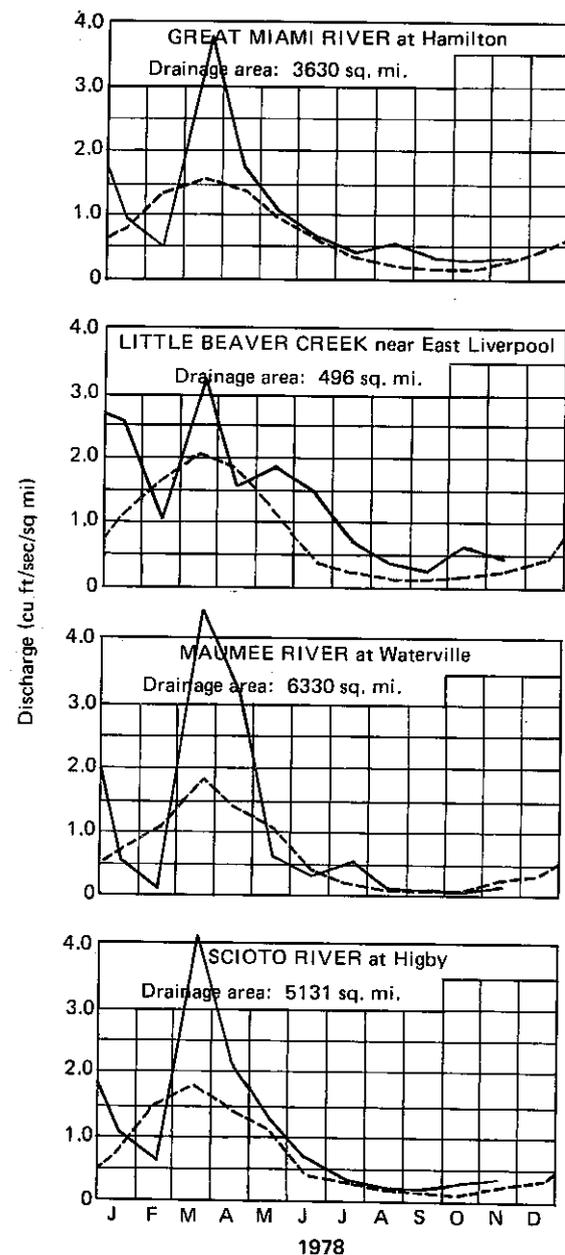
OHIO DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF WATER  
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COLUMBUS, OHIO 43224

## MEAN STREAM DISCHARGE

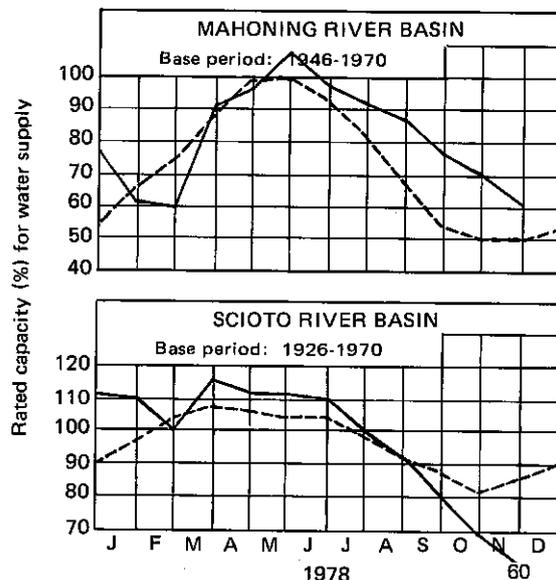
## RESERVOIR STORAGE FOR WATER SUPPLY

## LAKE ERIE LEVELS

## GROUND-WATER LEVELS



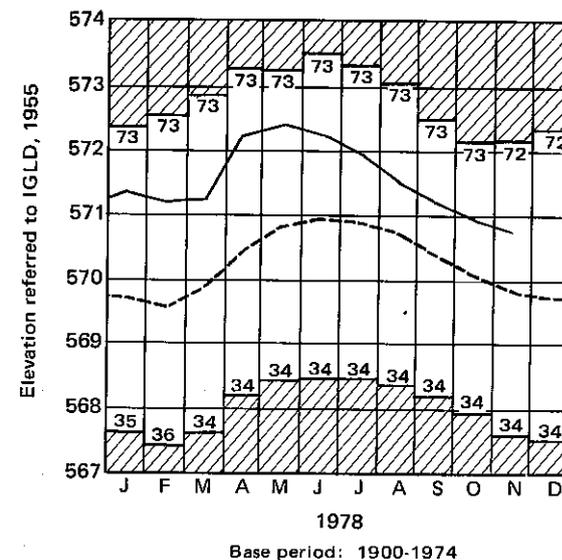
Base period for all streams: 1941-1970



RESERVOIR STORAGE for water supply in November remained above normal in the Mahoning River basin and was markedly below normal in the Scioto River basin. In fact, the November month-end storage for the Scioto basin index reservoirs is the lowest observed for any month since November 1971. Reservoir storage at the month end for the Mahoning basin index reservoirs was 61 percent of rated capacity for water supply compared to 71 percent for last month and 73 percent for November 1977. Storage at the month end for the Scioto basin index reservoirs was 60 percent of rated capacity for water supply compared to 69 percent for last month and 76 percent for November 1977.

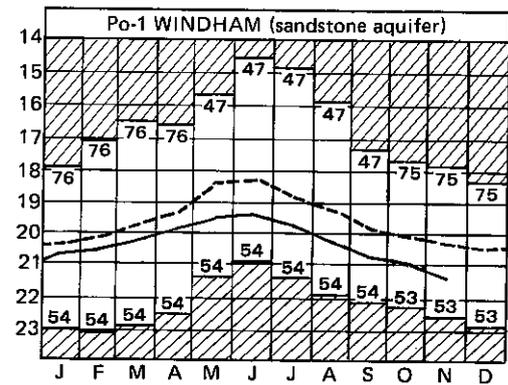
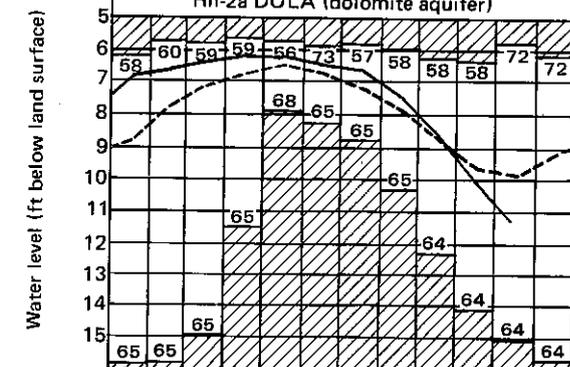
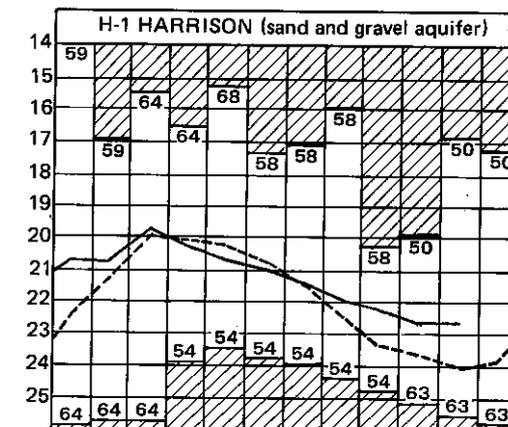
STREAMFLOW for November was normal throughout the state. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 1,247 cfs, 125 percent; Little Beaver Creek, 215 cfs, 148 percent; Maumee River, 776 cfs, 50 percent; Scioto River, 2,011 cfs, 178 percent. Cumulative runoff for the first two months of the water year was generally above normal throughout most of the state; the only exception was the northwestern portion of the state, where it was below normal.

normal----- current——



LAKE ERIE level in November continued to decline for the sixth consecutive month and was the lowest level observed since February 1977. The mean level for November was 570.74 feet above IGLD (1955), 0.25 foot below last month's mean level and 0.92 foot above normal. The lake level is 0.28 foot below the level observed for November 1977 and 2.14 feet above Low Water Datum.

GROUND-WATER LEVELS in November in the southern portion of the state declined during the first half of the month and rose in response to recharge during the latter half of the month; ground-water levels in the northern portion of the state continued to decline owing to lack of recharge during the entire month. Generally water levels in November were slightly lower than levels observed last month and for November 1977; the only exceptions are wells in the southern portion of the state, where the levels are slightly higher than last month. Water levels are above normal in the central and southern portions of the state and below normal in the northern portion. Ground-water storage continues to be very favorable throughout the state.



Base periods: H-1, 1951-1964; Hn-2a, 1955-1973; Po-1, 1947-1964



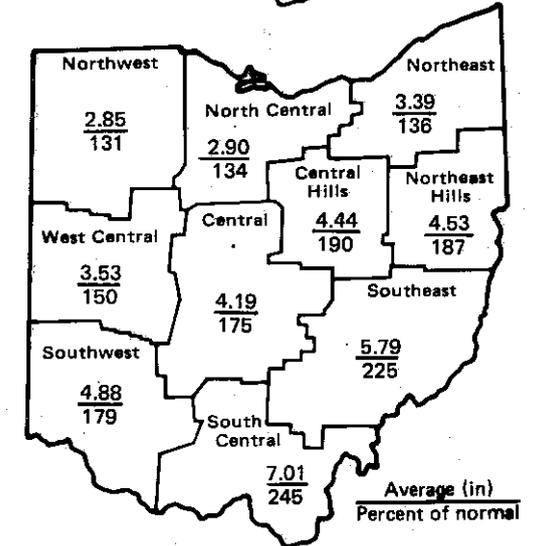
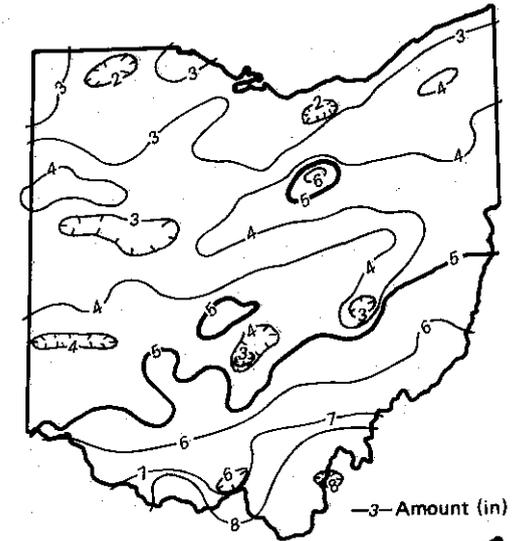
# monthly water inventory report for ohio

Compiled by Leonard J. Harstine

## PRECIPITATION

PRECIPITATION for December was noticeably above normal for the northern and central portions of the state and excessive in the southern portion. The average for the state as a whole was 4.35 inches, 1.90 inches above normal. Regional averages ranged from 7.01 inches, 4.15 inches above normal, for the South Central region to 2.85 inches, 0.67 inch above normal, for the Northwest region. Racine Lock and Dam, Meigs County, reported the greatest amount of precipitation, 8.61 inches, for December, and Wauseon, Fulton County, reported the least amount, 1.80 inches. There were measurable amounts of precipitation during every week of the month throughout most of the state. However, the bulk of the month's precipitation resulted from heavy rains during three periods: Dec. 2-3, Dec. 7-8, and Dec. 30-31. The storm of the 7th and 8th occurred mostly in the southern portion of the state and produced some serious flooding in many areas along the Ohio River and its tributaries. Snowfall was all but forgotten in December this year; Chardon, Geauga County, reported only 4.5 inches compared to 45.6 inches for December 1977 and a normal of 24 inches.

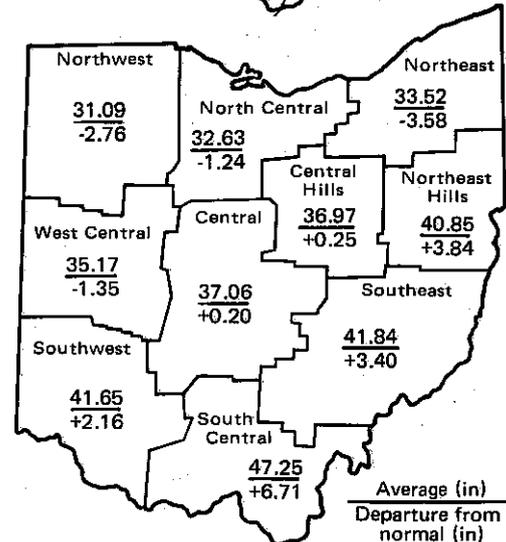
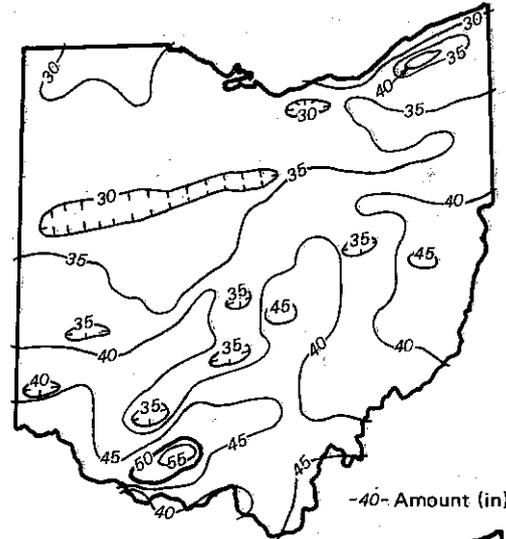
Precipitation for the 1978 calendar year was generally below normal in the northern portion of the state and above normal in the southern portion. The average for the state as a whole was 37.81 inches, 0.77 inch above normal. Regional averages ranged from 47.25 inches, 6.71 inches above normal, for the South Central region to 31.09 inches, 2.76 inches below normal, for the Northwest region. An isohyetal map and regional averages and departures from normal for the 1978 calendar year appear on the last page of this report. Preliminary data indicate that Peebles, Adams County, reported the greatest amount of precipitation, 56.59 inches, for the year, and Stryker, Williams County, reported the least amount, 26.63 inches. The 1978 calendar year was certainly a notable one; it started off on January 26 with a BLIZZARD which broke every record for a winter storm throughout the state. Several records also were broken in February: fewest number of days with above-freezing temperatures, least precipitation for the month, greatest number of consecutive days of below-freezing temperatures, and greatest number of consecutive days with snow on the ground. Climatic conditions for the remainder of the year were generally about normal; the water-supply situation improved markedly and was very satisfactory throughout most of the state at the year end.



## SUMMARY

The water-supply situation for December remains very favorable throughout the state. Precipitation was above normal to excessive for the month. Reservoir storage, streamflow, and ground-water storage showed noticeable improvements. Lake Erie level declined slightly but remained above normal.

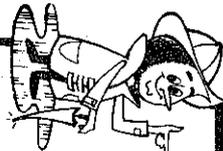
PRECIPITATION 1978 CALENDAR YEAR



## ACKNOWLEDGMENTS

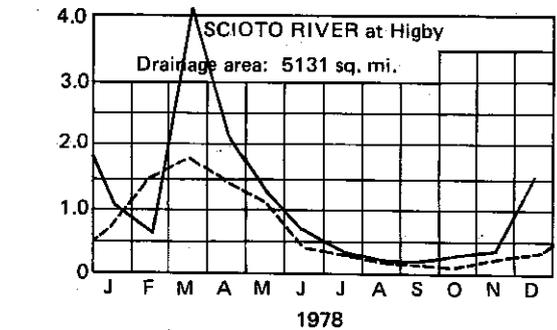
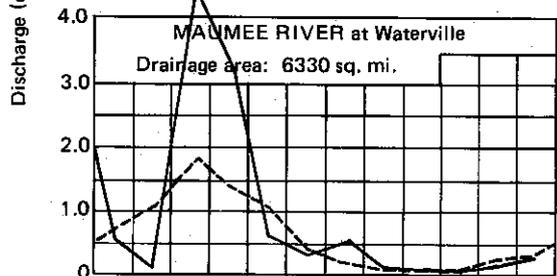
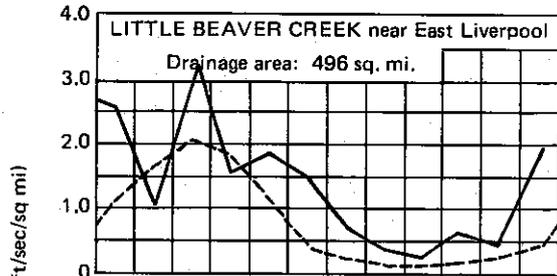
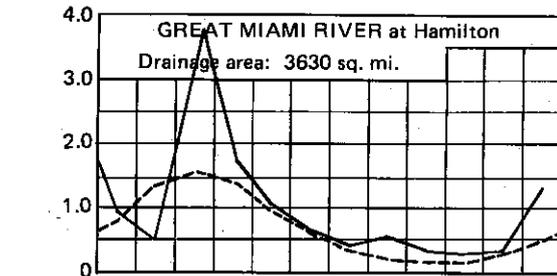
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  - Lake Erie level data: U.S. Corps of Engineers, Detroit District.
- Editing, cartography, and production by staff of the Division of Geological Survey, Ohio Department of Natural Resources.



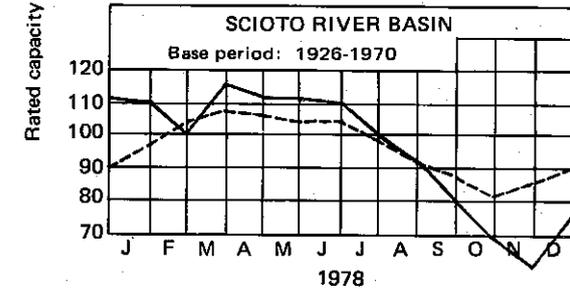
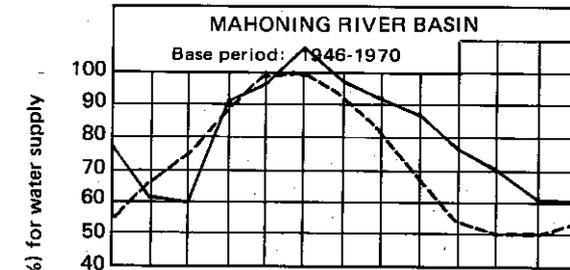
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COLUMBUS, OHIO 43224

## MEAN STREAM DISCHARGE



Base period for all streams: 1941-1970

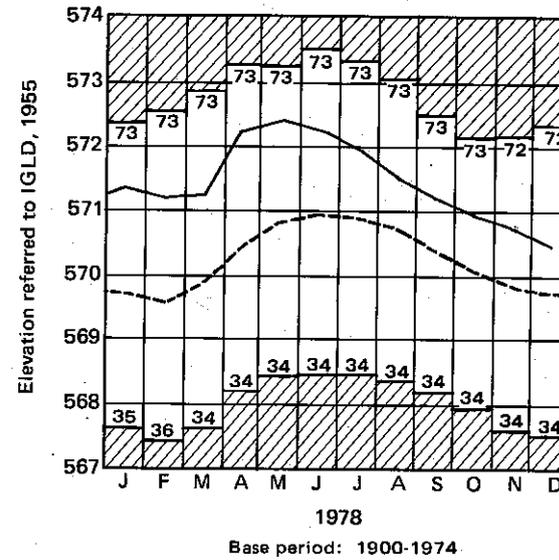
## RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply for December in the Mahoning River basin remained about the same and continued to be above normal; storage for water supply in the Scioto River basin increased but remained below normal. Reservoir storage at the month end for the Mahoning basin index reservoirs was 60 percent of rated capacity for water supply compared to 61 percent for last month and 79 percent for December 1977. Storage at the month end for the Scioto basin index reservoirs was 75 percent of rated capacity for water supply compared to 60 percent for last month and 112 percent for December 1977.

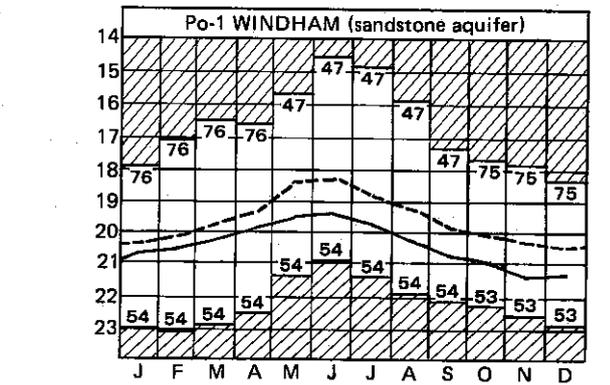
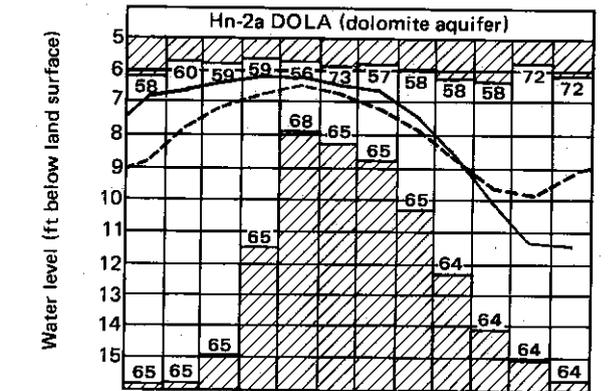
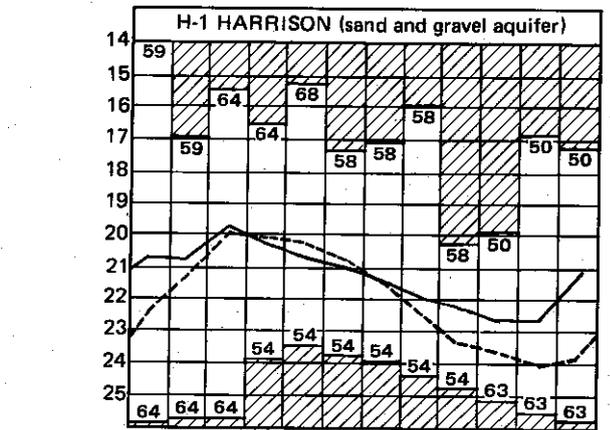
STREAMFLOW for December was excessive throughout most of the state; the only exception was the northwestern portion, where it was normal. Heavy rains on December 7th and 8th resulted in considerable flooding along the Ohio River and its tributaries. Mean discharge and percent of normal for December for the index gaging stations were as follows: Great Miami River, 4,807 cfs, 297 percent; Little Beaver Creek, 975 cfs, 411 percent; Maumee River, 1,863 cfs, 83 percent; Scioto River, 7,779 cfs, 478 percent.

## LAKE ERIE LEVELS



LAKE ERIE mean level for December was 570.52 feet above IGLD (1955), 0.22 foot below last month's mean level and 0.77 foot above normal. The lake level is 0.66 foot below the level observed for December 1977 and 1.92 feet above Low Water Datum.

## GROUND-WATER LEVELS



Base periods: H-1, 1951-1964; Hn-2a, 1955-1973; Po-1, 1947-1964

normal----- current——