

monthly water inventory report for ohio

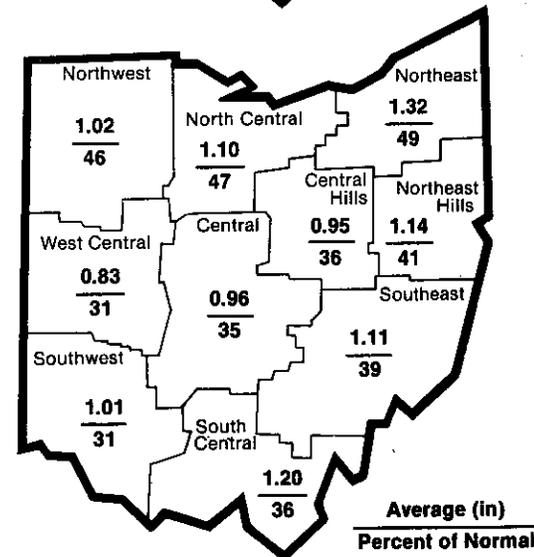
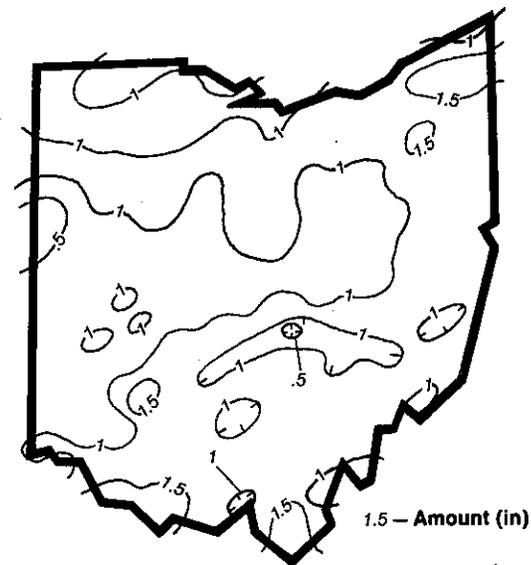
Compiled by Leonard J. Harstine

PRECIPITATION

PRECIPITATION for January was markedly below normal throughout the state. The average for the state as a whole was 1.06 inches, 1.70 inches below normal. Regional averages ranged from 1.32 inches, 1.35 inches below normal, for the Northeast region to 0.83 inch, 1.87 inches below normal, for the West Central region. Departures from normal ranged from 2.22 inches below normal, for the Southwest region to 1.21 inches below normal, for the Northwest region. Chardon, Geauga County, reported the greatest amount of precipitation for the month, 1.88 inches, and Rockford, Mercer County, reported the least amount, 0.17 inch.

The bulk of the month's precipitation came in the form of light snow flurries throughout the month; one exception was a fairly heavy snowstorm on the morning of the 30th when about 4 inches fell across most of the state. About two-thirds of the state received between 1 and 1.5 inches of precipitation for the month while the other one-third, primarily the West Central, Central, and the Southwest regions, received between 0.5 and 1 inch. Generally, snowfall was less than normal for most areas in the snowbelt regions; however, the Dayton Airport station reported 15 inches, more than twice that normally observed for the area. Most of the month's precipitation remained frozen on the ground at the month end. Thus, water supplies declined during the month, but remained near normal throughout the state due to good recharge in the previous three months.

Cumulative precipitation for the first four months of the 1984 water year remains noticeably above normal throughout the state. The average for the state as a whole is 14.59 inches, 4.33 inches above normal. Regional averages range from 15.85 inches, 4.65 inches above normal, for the Southwest region to 13.15 inches, 2.01 inches above normal, for the Northeast region. Departures from normal in the Northwest, North Central and Southeast regions are 5.63, 5.58, and 5.07 inches above normal respectively. Thus, the water supply situation for the first four months of the new recharge season remains favorable throughout the state.



DIVISION OF WATER

SUMMARY

Precipitation for January was noticeably below normal throughout the state. Streamflow, reservoir storage and ground-water storage declined during the month, but remained near normal. Lake Erie level declined slightly but remained noticeably above normal. The water supply situation remains favorable throughout the state despite the below normal precipitation.

NEW PUBLICATIONS

The Division of Water announces the availability of the following new publications on flooding and flood-plain management.

COMMON LEGAL QUESTIONS PERTAINING TO THE USE OF FLOOD-PLAINS AND WETLANDS by Jon A. Kusler and Rutherford H. Platt.

This 12-page brochure, prepared for the Association of State Flood-plain Managers, is considered by many land use managers and legal advisors to be the best single source of non-specific legal information available regarding flood-plain and wetland management.

FLOOD-PLAIN MANAGEMENT IN OHIO - A NONSTRUCTURAL APPROACH by Tracy C. Allen.

This publication illustrates and defines the different flood-proofing techniques and standards that Ohio communities have adopted as part of local land use regulations to implement flood-plain management programs. It includes numerous photographs illustrating various methods used to protect new developments.

HANDBOOK OF FLOOD-PLAIN HYDROLOGY AND HYDRAULICS by James R. Morris.

This handbook has been developed to help local flood plain administrators who need a general understanding of the technical aspects of flood-plain hydrology and hydraulics. This information would be helpful to Ohio communities that participate in the National Flood Insurance Program.

These publications are available free from the Ohio Department of Natural Resources, Division of Water, Flood-Plain Management Unit, Fountain Square, Bldg. E, 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.

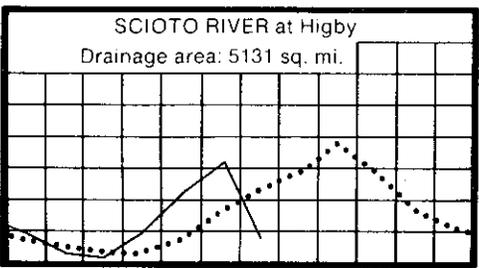
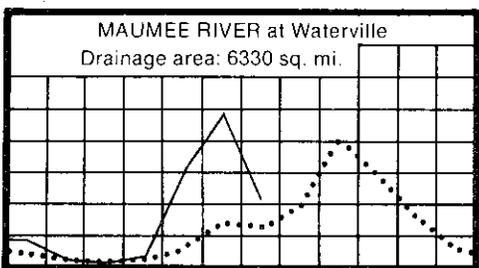
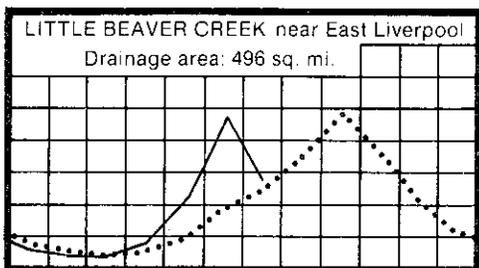
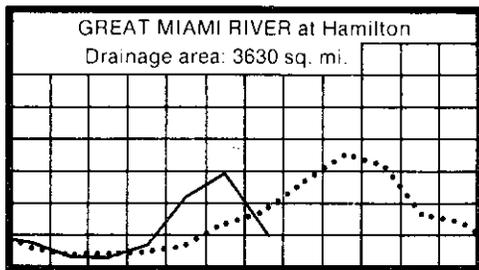
Lake Erie level data:

U.S. Corps of Engineers, Detroit District.



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

MEAN STREAM DISCHARGE

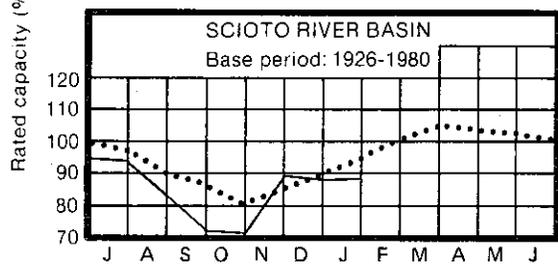
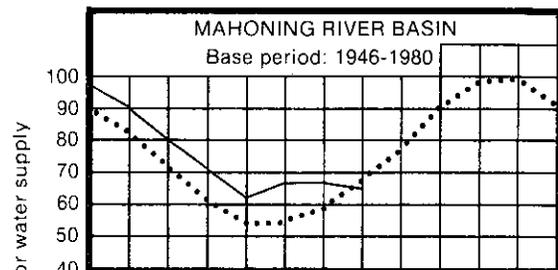


1983 1984

Base period for all streams: 1951-1980

normal current —

RESERVOIR STORAGE FOR WATER SUPPLY

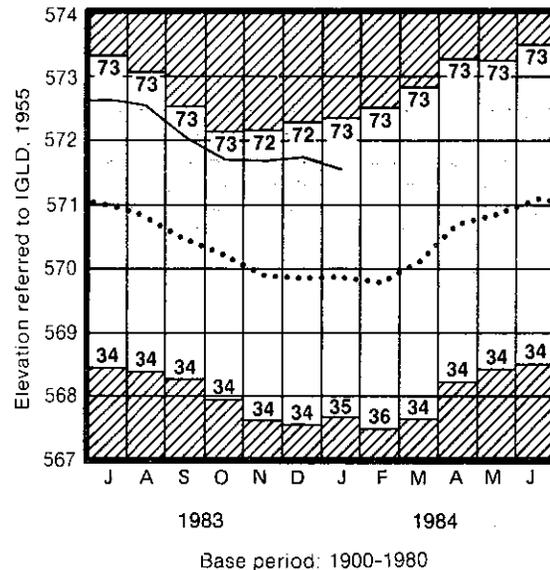


1983 1984

RESERVOIR STORAGE for water supply for January declined slightly in the Mahoning River basin and increased slightly in the Scioto River basin. Storage at the month end was slightly below normal in both the Mahoning River and Scioto River basins. Reservoir storage at the month end for the Mahoning basin index reservoirs was 64 percent of rated capacity for water supply compared to 67 percent for last month and 70 percent for January 1983. Storage at the month end for the Scioto River basin index reservoirs was 89 percent of rated capacity for water supply compared to 88 percent for last month and 82 percent for January 1983.

STREAMFLOW for January declined significantly throughout the state as a result of the below normal precipitation and also due to the fact that much of the precipitation remains frozen on the ground or as ice on the lakes and streams. This frozen ice on streams could cause some flooding problems as it thaws and breaks up in the weeks ahead. However, in many of the northern streams this is a common occurrence. Flows in both the Great Miami River and the Scioto River were near deficient for most of the month while flows at the index gaging stations in the northern portion of the state were above normal. Mean discharge and percent of normal for January at the index gaging stations were as follows: Great Miami River, 1,773 cfs, 54 percent; Little Beaver Creek, 664 cfs, 107 percent; Maumee River, 6,784 cfs, 175 percent; Scioto River, 2,073 cfs, 37 percent.

LAKE ERIE LEVELS

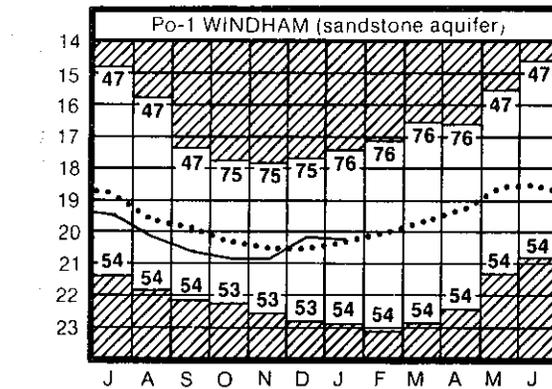
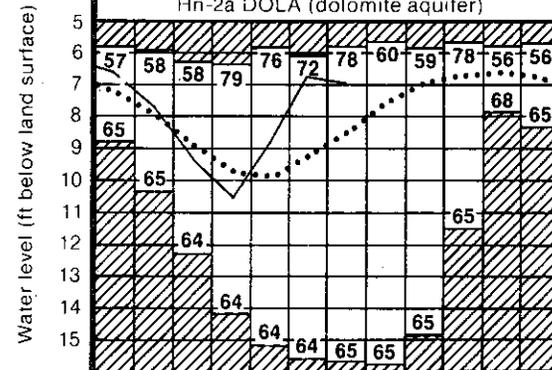
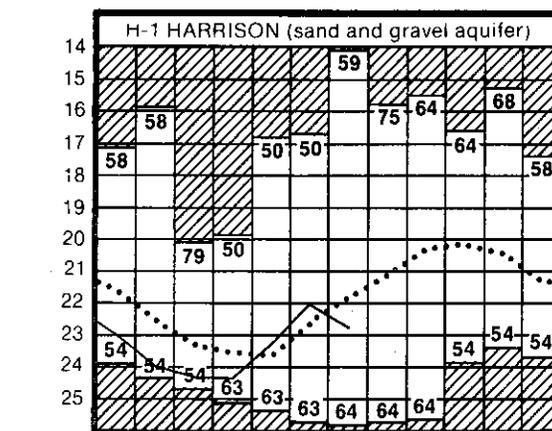


Base period: 1900-1980

LAKE ERIE mean level, which declined slightly in January, was 571.50 feet above IGLD (1955), 0.30 foot below last month's mean level and 1.68 feet above normal. The lake level is 0.03 foot below the level observed for January 1983 and 2.90 feet above Low Water Datum.

GROUND-WATER LEVELS for January showed marked declines in most areas of the state in response to the lack of recharge due to below normal precipitation and freezing temperatures. The only exception was index well Fr-10 at the OSU Farms, Franklin County, where water levels rose and recorded a net rise for the month. Generally, water levels show marked rises in January. Water levels representing unconsolidated aquifers are below normal for the month while those representing consolidated rock aquifers are at or above normal. Generally, ground-water levels are about 1 foot above the levels observed for January 1983. The ground-water storage situation remains very favorable throughout the state because of the unusual recharge in November and December 1983.

GROUND-WATER LEVELS



1983 1984

Base periods: H-1, 1951-1979. Hn-2a, 1955-1979. Po-1, 1947-1979

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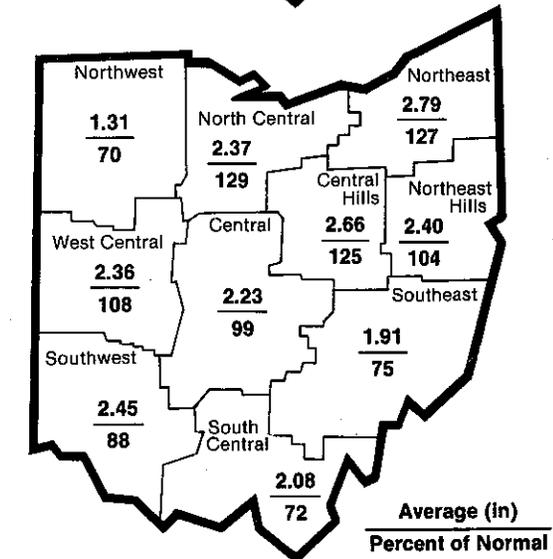
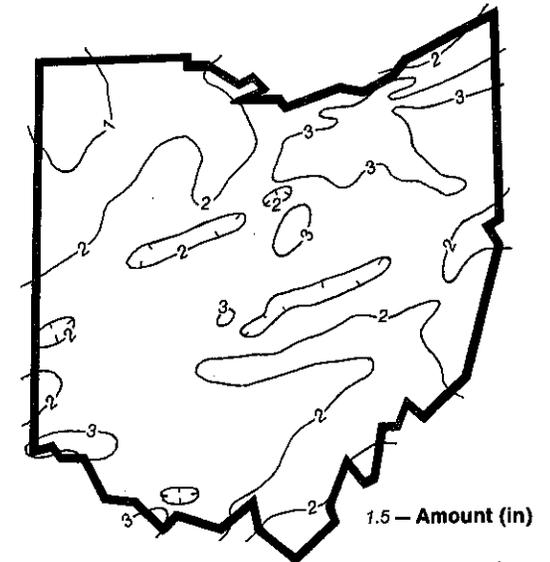
PRECIPITATION

PRECIPITATION for February was above normal in half the climatic regions of the state and below normal in the remaining half. The average for the state as a whole was 2.26 inches, 0.03 inch below normal. Regional averages ranged from 2.79 inches, 0.60 inch above normal, for the Northeast region to 1.31 inches, 0.55 inch below normal, for the Northwest region. Cleveland Hopkins Airport, Cuyahoga County, reported the greatest amount of precipitation for the month, 3.82 inches, and Montpelier, Williams County, reported the least amount, 0.59 inch.

The second and third weeks of the month were mild with small amounts of precipitation throughout the state. In fact, the traditional January thaw this year came during the middle of February. The climatic event of the month was the storm of the 27th and 28th when a large portion of the state was covered with 9 to 15 inches of snow. High winds and drifting of snow caused problems throughout the state during the storm period. However, the storm was not as severe as the blizzard of January 1978. Most of the snow from this storm lay frozen on the ground at the month end. The thaw during the early part of the month resulted in good recharge to water supplies and if the heavy snowpack on the ground at the month end is permitted to melt off slowly it will also produce substantial recharge to water supplies.

Cumulative precipitation for the first two months of the 1984 calendar year remains noticeably below normal throughout the state. The average for the state as a whole is 3.32 inches, 1.73 inches below normal. Regional averages range from 4.11 inches, 0.75 inch below normal, for the Northeast region to 2.33 inches, 1.76 inches below normal, for the Northwest region. Departures from normal range from 2.88 inches below normal, for the South Central region to 0.69 inch below normal, for the North Central region.

Cumulative precipitation for the first five months of the 1984 water year remains above normal throughout the state. The average for the state as a whole is 16.85 inches, 4.30 inches above normal. Regional averages range from 18.30 inches, 4.30 inches above normal, for the Southwest region to 15.90 inches, 3.94 inches above normal, for the Northeast Hills region. Other regions showing large surpluses for the water year thus far are: North Central, 6.11 inches; Northwest, 5.08 inches; West Central, 4.84 inches; Central, 4.50 inches; Southeast, 4.45 inches. Thus far it has been a good recharge season for water supplies. In fact, this is the best recharge season we have had in the past 10 years.



SUMMARY

Precipitation for February was slightly below normal for the state as a whole. Reservoir storage, streamflow, and ground-water storage generally increased during the month. Lake Erie mean level remained about the same as last month. The overall water supply situation improved during the month and remains very favorable for most areas of the state.

NEW PUBLICATION

The Division of Water announces the availability of the following new publication on dam inspection and maintenance.

OPERATION, MAINTENANCE AND INSPECTION MANUAL FOR DAMS, DIKES, AND LEVEES by George E. Mills.

Ohio law requires regular inspection of all dams, dikes, and levees over 10 feet high by the Dam Inspection Section of the Ohio Department of Natural Resources, Division of Water. This publication was developed to assist owners in their regular maintenance, operation and inspection activities. The information should also be a valuable asset to engineers involved in designing and inspecting dam structures. Emphasis has been placed on small earth structures, the dams most commonly found in Ohio. However, much of the information will apply to dams of all types and sizes and also to dikes and levees.

The manual is divided into four basic sections: dam failures and emergency procedures, maintenance of embankments, maintenance of spillway and control structures, and operation.

This publication is available free from the Ohio Department of Natural Resources, Division of Water, Dam Inspection Section, Fountain Square, Building E, Columbus, Ohio 43224.

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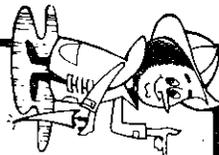
U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service; The Miami Company District; U.S. Army Corps of Engineers, Muskingum Area.

Streamflow and reservoir storage data:

U.S. Geological Survey, Water Resources Division.

Lake Erie level data:

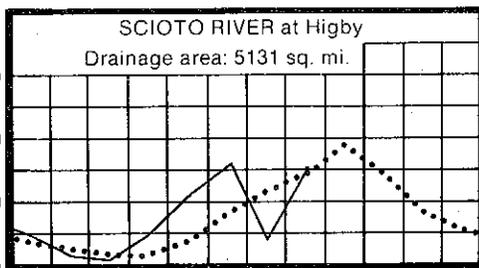
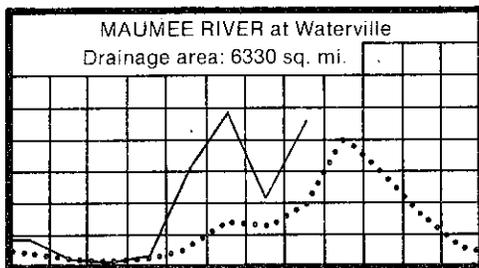
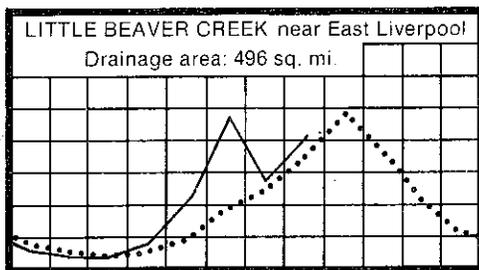
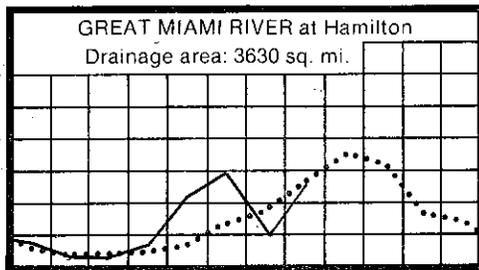
U.S. Corps of Engineers, Detroit District.



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MEAN STREAM DISCHARGE

Discharge (cu ft/sec/sq mi)

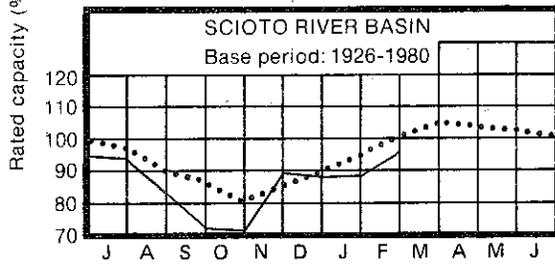
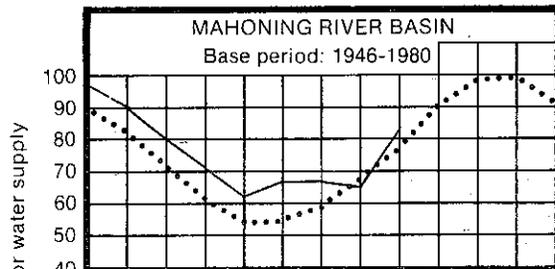


1983 1984

Base period for all streams: 1951-1980

normal current ———

RESERVOIR STORAGE FOR WATER SUPPLY



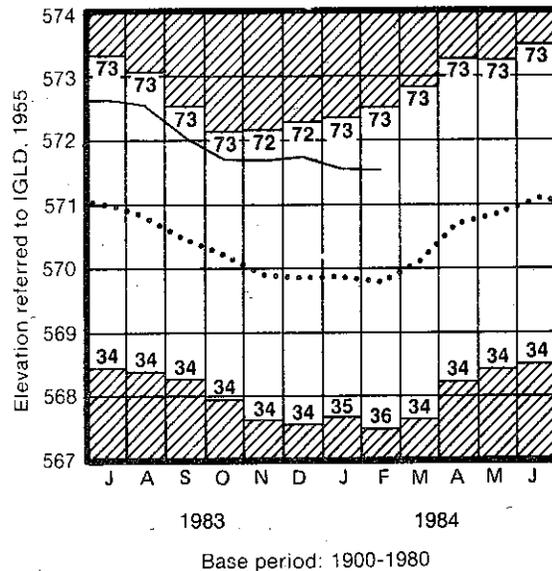
1983 1984

RESERVOIR STORAGE for water supply for February increased during the month in both the Mahoning River and the Scioto River basins. Storage at the month end was slightly above normal in the Mahoning River basin and remained slightly below normal in the Scioto River basin. Reservoir storage at the month end for the Mahoning Basin index reservoirs was 82 percent of rated capacity for water supply compared to 64 percent for last month and 79 percent for February 1983. Storage at the month end for the Scioto basin index reservoirs was 96 percent of rated capacity for water supply compared to 89 percent for last month and 86 percent for February 1983.

STREAMFLOW for February was normal in the southwest, slightly above normal in the central and eastern portions of the state and excessive in the northwest. The excessive flow in the Maumee River was produced by the melt of the heavy snowpack over the drainage basin during the second week of February when above normal temperatures resulted in a big thaw throughout the state. Much of January's precipitation, which remained frozen in the tributaries at the month end, melted during this thaw and contributed to higher streamflows at the index gaging stations during February.

Mean discharge and percent of normal for February at the index gaging stations were as follows: Great Miami River, 4,672 cfs, 97 percent; Little Beaver Creek, 1,009 cfs, 123 percent; Maumee River, 14,649 cfs, 239 percent; Scioto River, 7,820 cfs, 109 percent. Runoff was slightly above normal in the southern portion of the state and noticeably above normal in the northern portion.

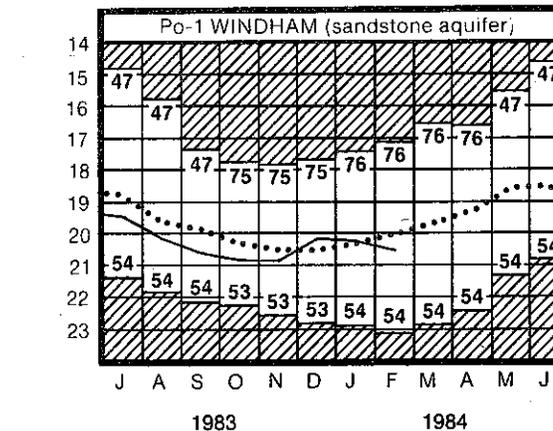
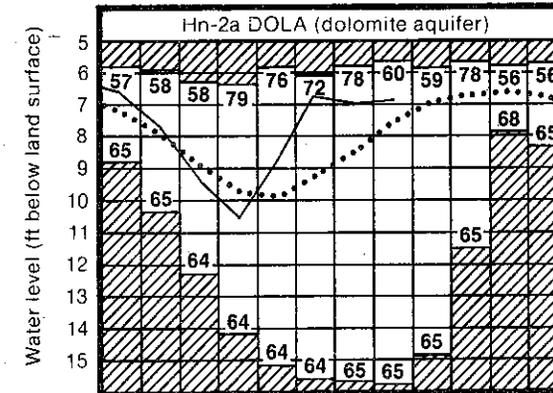
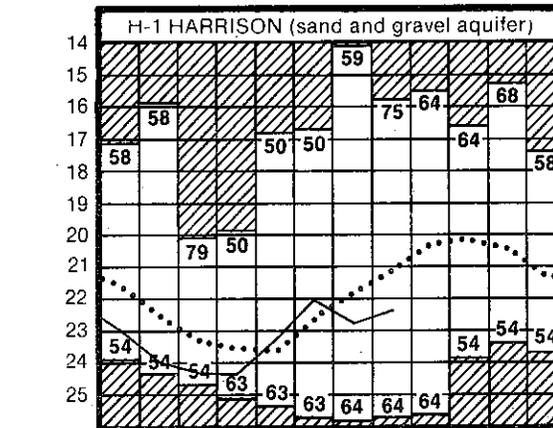
LAKE ERIE LEVELS



LAKE ERIE mean level rose just slightly during the month and was 571.53 feet above IGLD (1955), 0.03 foot above last month's mean level and 1.73 feet above normal. The lake level is 0.07 foot above the level observed for February 1983 and 2.03 feet above Low Water Datum.

GROUND-WATER LEVELS for February remained stable or declined during the first two weeks of the month and rose in response to recharge from the thaw during the last two weeks. Water levels in consolidated aquifers have fallen since last month and have risen in unconsolidated aquifers. Water levels throughout the state are from 2 feet above to 2 feet below normal. Most generally water levels in unconsolidated aquifers are below normal while those representing consolidated aquifers are above normal. An exception is observation well F-1 at West Rushville, Fairfield County, representing a consolidated aquifer in which the water level is nearly 2 feet below normal. Generally water levels are about 0.5 to 1.5 feet above those levels observed for February 1983. The melt of the heavy snow cover at the month end should produce substantial recharge to groundwater in the near future. At this point the ground-water supply situation remains favorable for most areas of the state.

GROUND-WATER LEVELS

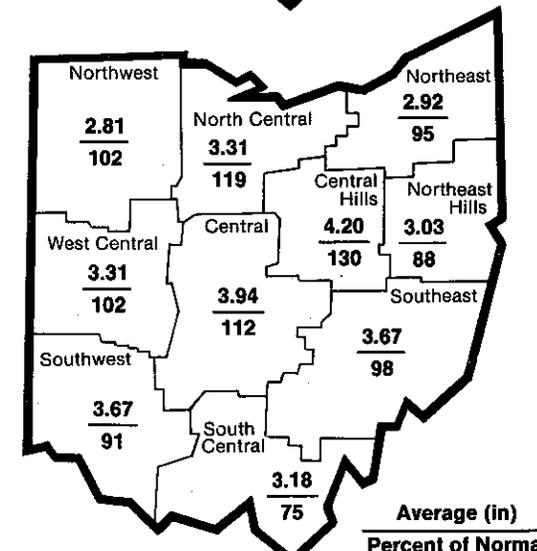
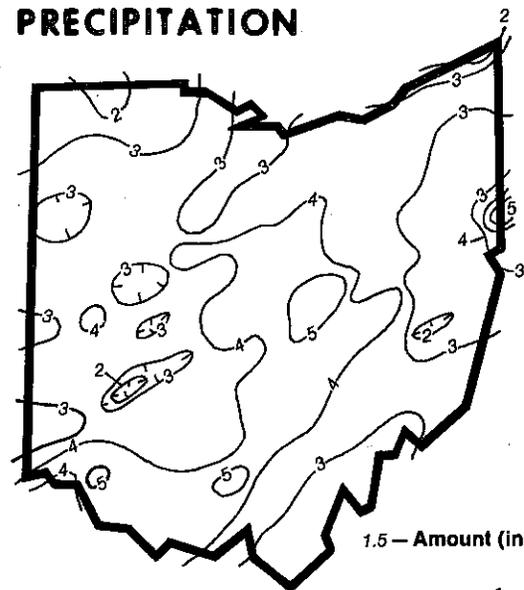


Base periods: H-1, 1951-1979. Hn-2a, 1955-1979. Po-1, 1947-1979

monthly water inventory report for ohio

Compiled by Leonard J. Harstine

PRECIPITATION



PRECIPITATION for March was generally above normal in the northern half of the state and below normal in the southern half. The average for the state as a whole was 3.40 inches, 0.01 inch below normal. Regional averages ranged from 4.20 inches, 0.96 inch above normal, for the Central Hills region to 2.81 inches, 0.05 inch above normal, for the Northwest region. Departures from normal ranged from 0.96 inch above normal, for the Central Hills region to 1.05 inches below normal, for the South Central region. Mohawk Dam, near Warsaw, Coshocton County, reported the greatest amount of precipitation for the month, 5.47 inches and Ashtabula, Ashtabula County, reported the least amount, 1.45 inches.

There were substantial amounts of precipitation during every week of the month. Notable storm periods occurred on the 21st, when the central portion of the state received 1 to 1.5 inches of precipitation and on the 29th, when the central portion received nearly 1 inch again. Precipitation during the first half of the month was mostly in the form of snow. The near normal precipitation combined with the heavy accumulation of snow on the ground produced above normal runoff throughout the state. As a result, streams reached flood stages in many areas which are normally subject to flooding at this time of year. This March proved to be one of the coldest on record for many areas in the state. The temperature dropped to a record 6 degrees below zero on March 9th; the coldest ever recorded for Columbus for March. Record low temperatures were observed at many other stations throughout the state.

Cumulative precipitation for the first three months of the 1984 calendar year was below normal throughout the state. The average for the state as a whole is 6.72 inches, 1.74 inches below normal. Regional averages range from 7.81 inches, 0.22 inch below normal, for the Central Hills region to 5.14 inches, 1.71 inches below normal, for the Northwest region. Departures from normal range from 3.93 inches below normal, for the South Central region to 0.15 inch below normal, for the North Central region.

Cumulative precipitation for the first six months of the 1984 water year remains noticeably above normal throughout the state. The average for the state as a whole is 20.25 inches, 4.29 inches above normal. Regional averages range from 21.97 inches, 3.94 inches above normal, for the Southwest region to 18.86 inches, 2.45 inches above normal, for the Northeast region. Departures from normal range from 6.65 inches above normal, for the North Central region to 2.45 inches above normal for the Northeast and South Central regions.

SUMMARY

Precipitation for March was generally about normal throughout the state. Streamflow, reservoir storage and ground-water storage increased significantly. Lake Erie mean level showed a marked rise and was noticeably above normal and less than 1 foot below the record high observed in 1973. The water supply situation is very favorable throughout the state.

NOTES AND COMMENTS

Ohio Department of Natural Resources Director Lt. Gov. Myrl H. Shoemaker has announced the appointment of Robert L. Goettemoeller as chief of the Division of Water effective March 23, 1984. Goettemoeller has served as acting chief of the Division since September 1983.

As chief of the Division of Water, he will administer programs affecting ground and surface water inventory, dam and dike safety, coastal zone management on the Lake Erie shoreline and water resource development including water planning, flood plain planning and community water assistance. Among the responsibilities of the Division are: developing state water plans and assisting communities with planning and supplying water needs, issuing permits for the construction of dams, performing safety inspections to evaluate the condition of existing dams, coordinating the National Flood Insurance Program for the state and providing flood plain planning assistance, giving advice and assistance on development of ground-water supplies and monitoring ground-water and surface water supplies.

Mr. Goettemoeller joined ODNR in 1969 when the Ohio Soil and Water Conservation Committee staff, on which he served, became ODNR's Division of Soil and Water Conservation. He was a soil and water specialist for the division until his appointment as acting chief of the Division of Water. Goettemoeller also served five years with the U.S. Soil Conservation Service. While with the Division of Soil and Water Conservation he played an important role in the development of Ohio's agricultural pollution and urban sediment pollution abatement programs. He was responsible for implementation of these programs through ODNR and local conservation districts since 1979. Goettemoeller is also president-elect for the All Ohio Chapter of the Soil Conservation Society of America, and is a member of the Water Management Association of Ohio, The National Wildlife Federation and the Ohio State University Alumni Association.

NEW PUBLICATION

The Division of Water announces the availability of the following new publication.

THE GROUND-WATER RESOURCES OF MIAMI COUNTY
by James J. Schmidt.

This map is one of a series of 42 county resources maps which have been completed for the state thus far. The maps are designed as a guide to locating new ground-water supplies or as an aid for expanding supplies already established. They will be useful to homeowners, developers and planners.

The map is available for \$2.50 plus \$.14 tax and \$.25 mailing charge from the Publications Center, Ohio Department of Natural Resources, Fountain Square, Columbus, Ohio 43224. Checks or money orders should be made payable to the ODNR Publications Center.

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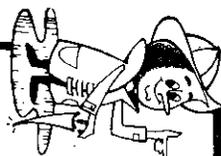
U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service; The Miami Conservancy District; U.S. Army Corps of Engineers, Muskingum Area.

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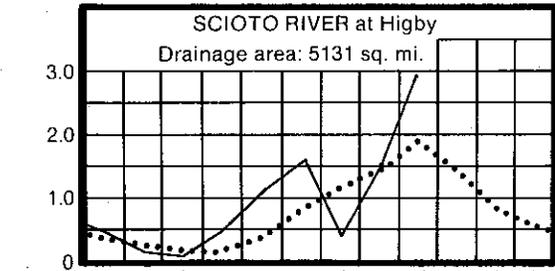
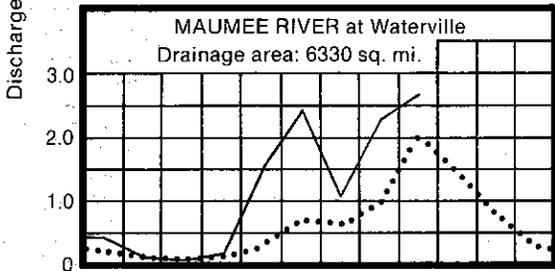
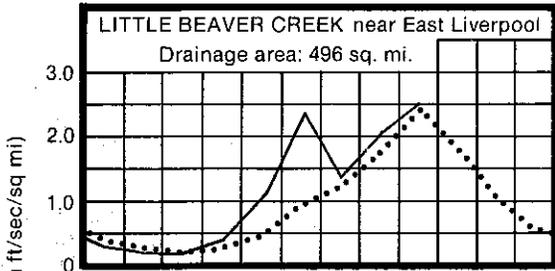
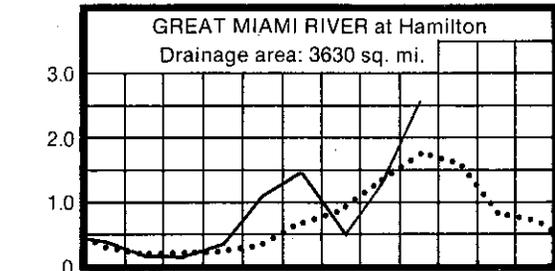
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DIVISION OF WATER
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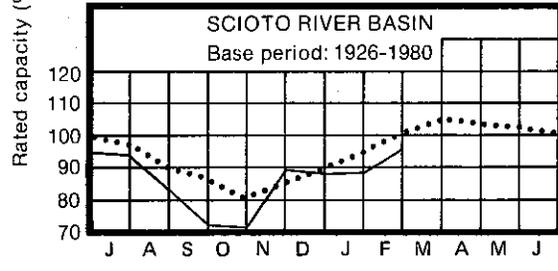
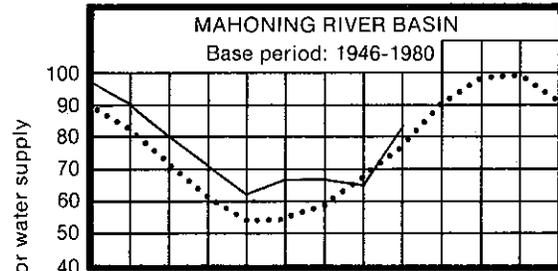
MEAN STREAM DISCHARGE



Base period for all streams: 1951-1980

normal current ———

RESERVOIR STORAGE FOR WATER SUPPLY

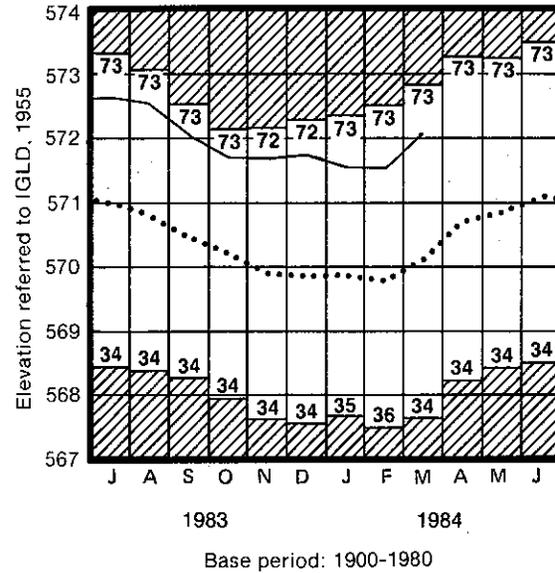


RESERVOIR STORAGE for water supply for March increased significantly and was above normal for both the Mahoning River and the Scioto River basins. Noticeable increases in runoff and storage resulted from the fact that considerable water lay on the ground at the beginning of the month in the form of snow, and precipitation for March was at or above normal for most of the state. Reservoir storage at the month end for the Mahoning basin index reservoirs was 101 percent of rated capacity for water supply compared to 82 percent for last month and 98 percent for March 1983. Storage at the month end for the Scioto basin index reservoirs was 106 percent of rated capacity for water supply compared to 96 percent for last month and 83 percent for March 1983. Storage for the Scioto basin index reservoirs was the highest observed since March 1978 when it was 107 percent of rated capacity for water supply.

STREAMFLOW for March was normal throughout most of the state; exceptions were in the northwest and central portions where it was noticeably above normal. Runoff for the month was noticeably above normal for the northwest, central and southwest areas. Much of the excess runoff in March resulted from the large amount of snow on the ground at the beginning of the month from the storm of February 27th and 28th which produced 9 to 15 inches of snow over a large portion of the state.

Mean discharge and percent of normal for March at the index gaging stations were as follows: Great Miami River, 9,209 cfs, 151 percent; Little Beaver Creek, 1,241 cfs, 103 percent; Maumee River, 16,920 cfs, 132 percent; Scioto River, 14,890 cfs, 154 percent.

LAKE ERIE LEVELS

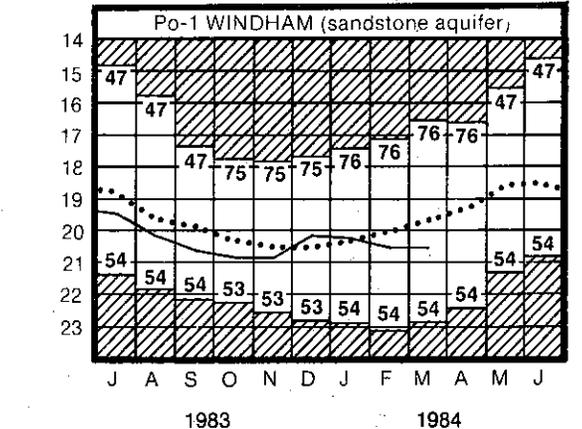
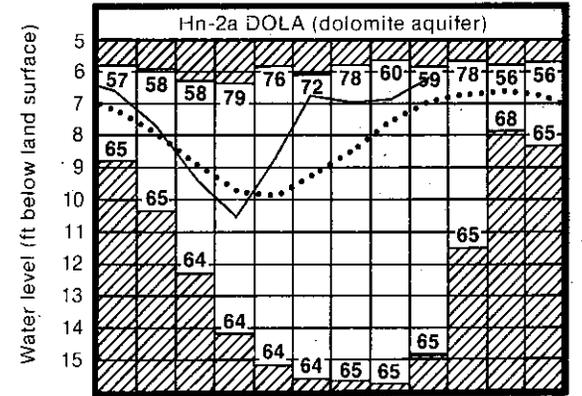
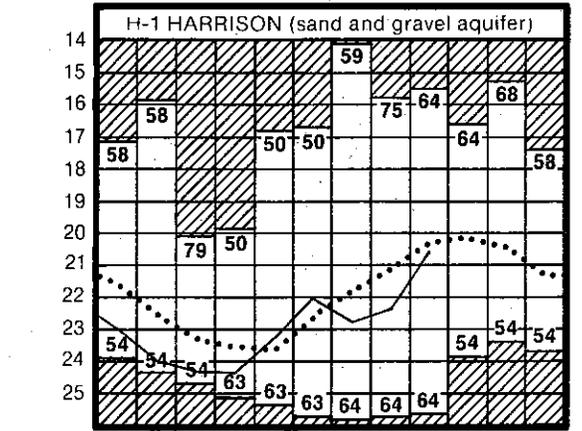


LAKE ERIE mean level showed a marked rise for March and is only 0.83 foot below the record high for March set in 1973. The mean level was 572.05 feet above IGLD (1955), 0.52 foot above last month's mean level and 2.00 feet above normal. The lake level is 0.49 foot above the level observed for March 1983 and 3.45 feet above Low Water Datum.

GROUND-WATER LEVELS for March rose significantly throughout the state. Even so, net rises for the month were about normal compared to past records for March. Water levels throughout the state were above those levels observed last month and were generally above normal in consolidated aquifers and remained below normal in unconsolidated aquifers. Generally, ground-water levels throughout the state were noticeably above those levels observed for March 1983. The water level in observation well Hn-2a at Dola, Hardin County, representing a consolidated rock aquifer recorded an all time record high level for the period of record beginning in 1955.

Ground-water levels have shown marked rises during the 1984 recharge season in response to the above normal precipitation for the water year thus far. However, they still remain only about normal compared to past records. This is partially due to the noticeably low levels at the beginning of the water year and the lack of recharge in January and February due to below normal precipitation for these months. Even so, the ground-water storage situation is very favorable throughout the state.

GROUND-WATER LEVELS



Base periods: H-1, 1951-1979. Hn-2a, 1955-1979. Po-1, 1947-1979

monthly water inventory report for ohio

Compiled by Leonard J. Harstine

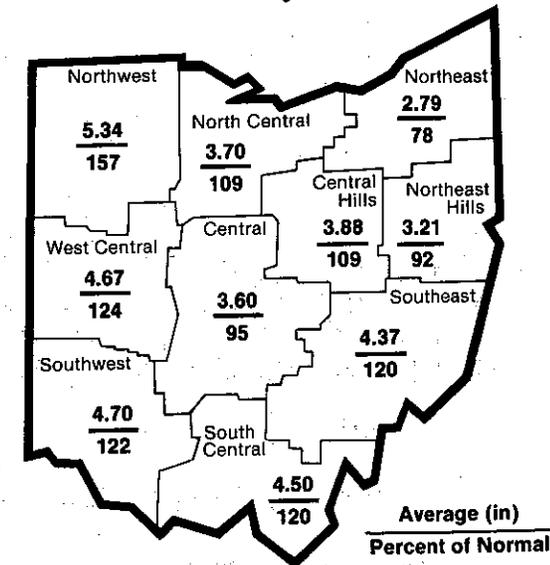
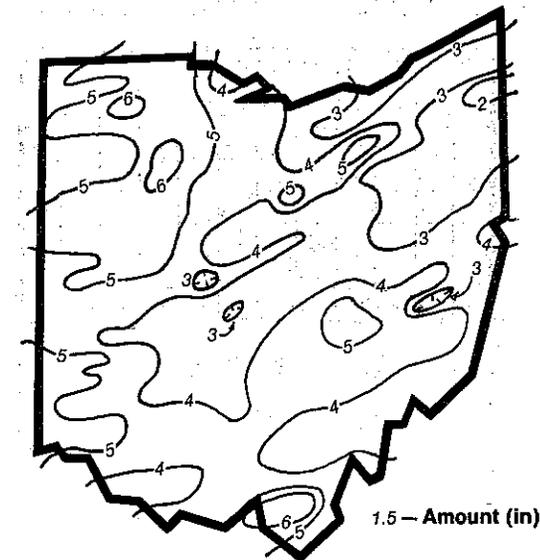
PRECIPITATION

Precipitation for April was above normal for most of the state; the only exceptions were in the Northeast, Central and Northeast Hills regions where precipitation was below normal. This is the first month in 1984 that precipitation was generally above normal. The average for the state as a whole was 4.08 inches, 0.46 inch above normal. Regional averages ranged from 5.34 inches, 1.93 inches above normal, for the Northwest region to 2.79 inches, 0.77 inch below normal, for the Northeast region. Napoleon, Henry County, reported the greatest amount of precipitation for the month, 6.87 inches, and Colebrook, Ashtabula County, reported the least amount, 1.79 inches.

Substantial amounts of precipitation fell during every week of the month. Amounts of more than one inch were recorded for many locations throughout the state on the 5th and 6th and also on the 22nd and 23rd. The fact is that, for the most part, it was a wet month. This contributed greatly to water supplies, but for agriculture it left very few days for field work.

Cumulative precipitation for the first four months of the 1984 calendar year continued to be below normal for most of the state; exceptions were the Northwest, North Central and Central Hills regions where precipitation is above normal for the first time this year. The average for the state as a whole is 10.80 inches, 1.28 inches below normal. Regional averages range from 11.83 inches, 2.07 inches below normal, for the Southwest region to 9.78 inches, 2.24 inches below normal, for the Northeast Hills region. Departures from normal range from 0.22 inch above normal for the Northwest region to 3.18 inches below normal, for the South Central region.

Cumulative precipitation for the 1984 water year remains above normal throughout the state. The average for the state as a whole is 24.33 inches, 4.75 inches above normal. Regional averages range from 26.67 inches, 4.80 inches above normal, for the Southwest region to 21.65 inches, 1.68 inches above normal, for the Northeast region. The Northwest and North Central regions show the greatest departures from normal, being 7.06 and 6.96 inches above normal respectively.



DIVISION OF WATER

SUMMARY

Precipitation for April was generally above normal for the state for the first time in 1984. Reservoir storage, streamflow and ground-water storage remained near normal. Lake Erie level rose slightly and remained markedly high.

NOTES AND COMMENTS

GROUND-WATER INFORMATION AVAILABLE

The Ground-Water Inventory Section of the ODNR's Division of Water collects and disseminates information pertaining to the ground-water resources of the state. Water well drillers in Ohio are required to submit a driller's log for each well to the ODNR Division of Water. The division has on file more than one-half million such logs which have been collected over the past 35 years.

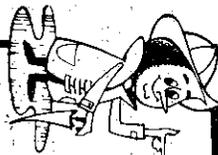
These logs include location, property owner, driller's interpretation of the formations encountered, depth, static water level, well construction and bailing or pumping test information. The staff of hydrogeologists can answer questions about your water needs. The well records are available for examination in the Division's office at Fountain Square and are widely referred to by the general public (home owners, consultants, farmers, realtors, industrial developers, etc.).

These records have also been used to produce a series of county ground-water resources maps. Maps are available for 43 counties at the present time, a list of which has been published in previous copies of this report. The section also maintains a network of ground-water level observation wells representing the major aquifers of the state, as well as a comprehensive file of precipitation data for stations throughout Ohio.

ACKNOWLEDGMENTS

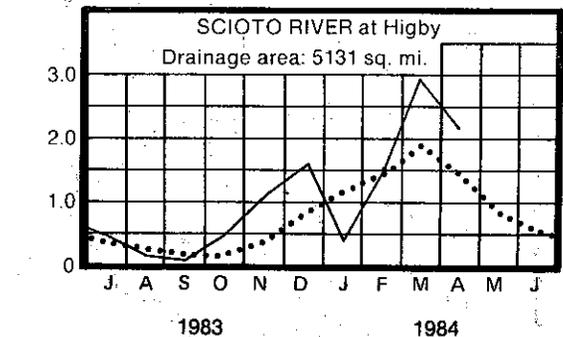
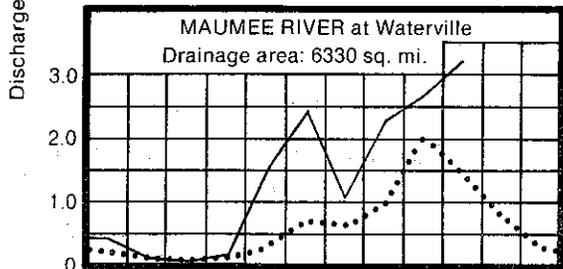
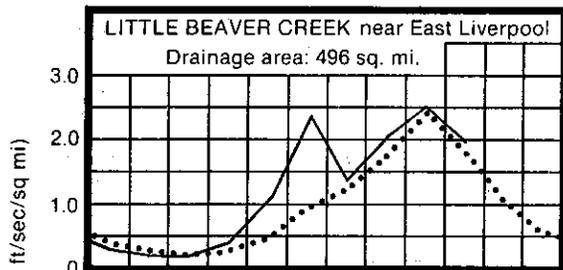
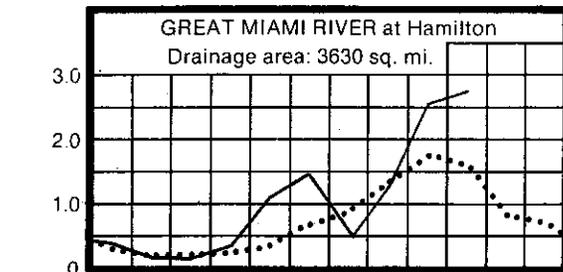
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Streamflow and reservoir storage data:
U.S. Geological Survey, Water Resources Division.
Lake Erie level data:
U.S. Corps of Engineers, Detroit District.



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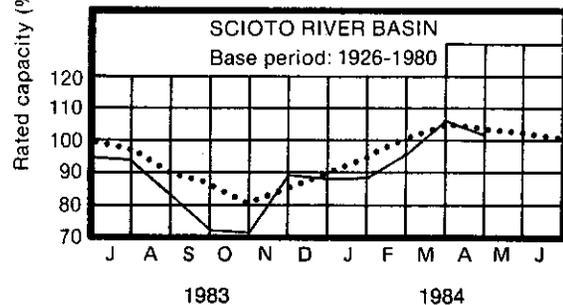
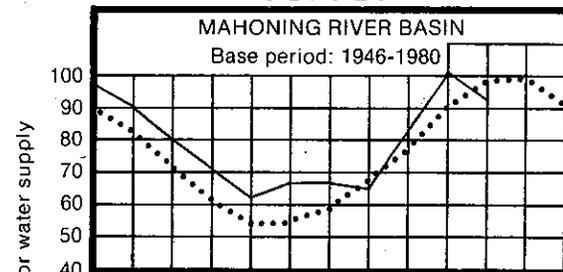
MEAN STREAM DISCHARGE



Base period for all streams: 1951-1980

normal current —

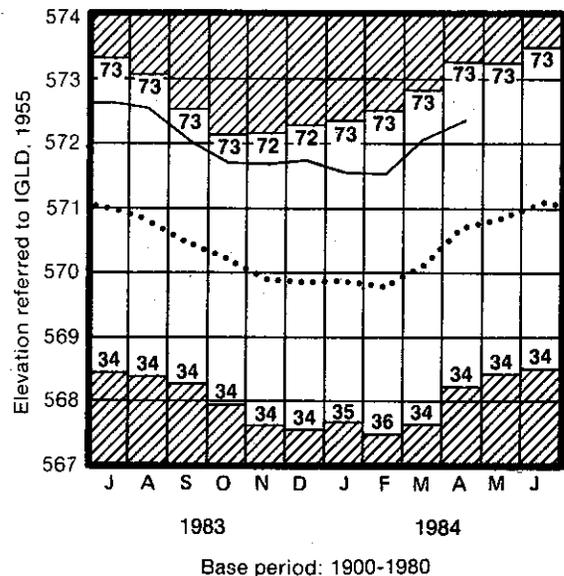
RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply for April declined slightly and was normal for both the Mahoning River and the Scioto River basins. Reservoir storage at the month end for the Mahoning basin index reservoirs was 99 percent of rated capacity for water supply compared to 101 percent for last month and 102 percent for April 1983. Storage at the month end for the Scioto basin index reservoirs was 102 percent of rated capacity for water supply compared to 106 percent for last month and 100 percent for April 1983.

STREAMFLOW for April was normal for most of the state; the only exception was for the western portion where it was excessive. Runoff for the western portion of the state was noticeably above that observed for last month, while it was slightly below in most other areas. There was only minor or normal flooding in the low-lying areas despite the substantial amount of precipitation. Surface flooding was noticeable, especially in the northwest on poorly drained soils. Mean discharge and percent of normal for April at the index stations were as follows: Great Miami River, 9,991 cfs, 178 percent; Little Beaver Creek, 974 cfs, 106 percent; Maumee River, 20,250 cfs, 215 percent; Scioto River, 11,230 cfs, 151 percent.

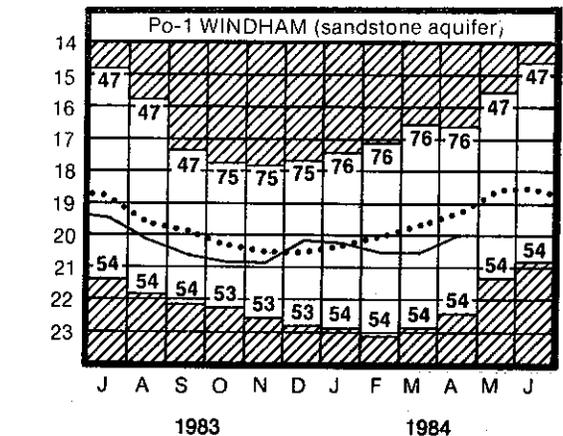
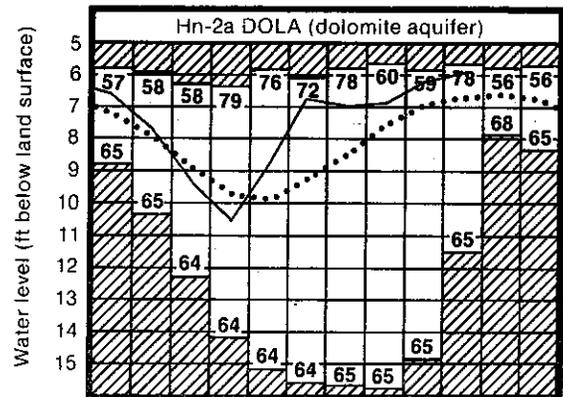
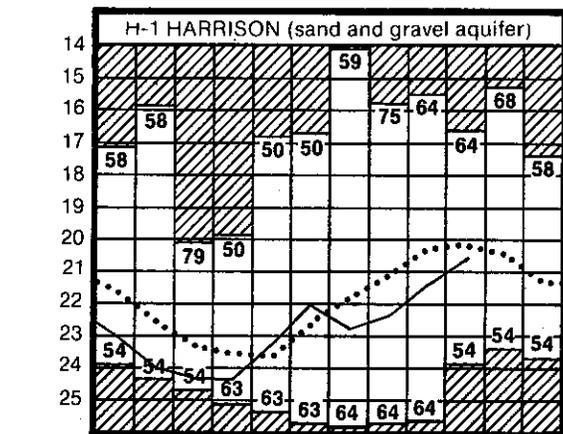
LAKE ERIE LEVELS



LAKE ERIE mean level continued its seasonal rise and remained unusually high, as has been the case for the past several years. The mean level was 572.33 feet above IGLD (1955), 0.28 foot above last month's mean level and 1.72 feet above normal. The lake level is 0.35 foot above the level observed for April 1983 and 3.73 feet above Low Water Datum.

GROUND-WATER LEVELS for April rose slightly in consolidated aquifers and declined slightly in unconsolidated aquifers. The only exception was observation well Hn-2a at Dola, Hardin County, representing a consolidated aquifer where the water level declined slightly. Even so, this well recorded a record high level for April following an all time record high level in March. Net rises for the month were noticeably above those usually observed for April. Water levels were noticeably above those levels observed last month and for April 1983. Ground-water levels are generally above normal in consolidated aquifers and below normal in unconsolidated aquifers. An exception is observation well PO-1 at Windham, Portage County, representing a consolidated aquifer in which the water level remains below normal. The ground-water storage situation remains favorable throughout the state for what is generally considered the end of the nominal recharge season.

GROUND-WATER LEVELS



Base periods: H-1, 1951-1979. Hn-2a, 1955-1979. Po-1, 1947-1979

MONTHLY WATER INVENTORY REPORT FOR OHIO

Compiled by Leonard J. Harstine

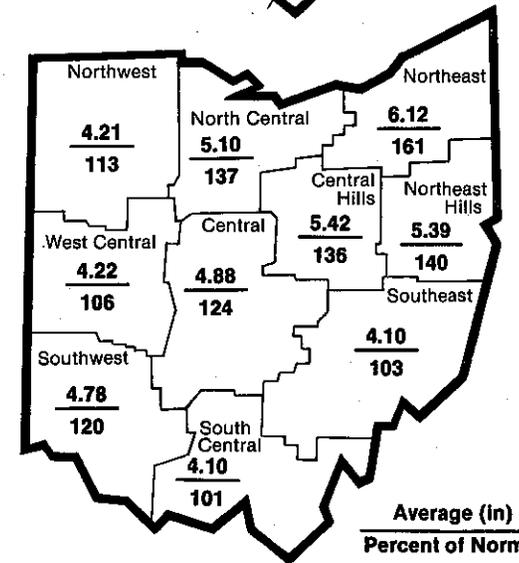
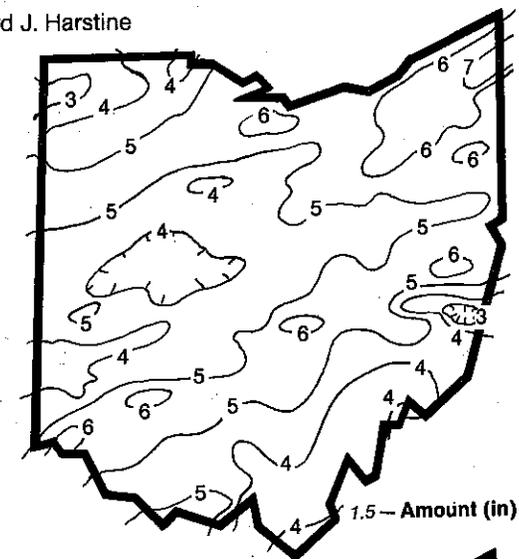
PRECIPITATION

PRECIPITATION for May was above normal throughout the state. The average for the state as a whole was 4.83 inches, 0.92 inch above normal. Regional averages ranged from 6.12 inches, 2.31 inches above normal, for the Northeast region to 4.10 inches for both the South Central and Southeast regions, 0.03 and 0.12 inch above normal respectively. Andover, Ashtabula County, reported the greatest amount of precipitation for the month, 7.99 inches; Colebrook, about 7 miles southwest of Andover, reported 7.11 inches. Barkcamp State Park near St. Clairsville, Belmont County, reported the least amount, 2.32 inches.

About half of the state received between 3 and 5 inches of precipitation and the other half received from 5 to nearly 8 inches. A large portion of the northeast section and numerous other isolated areas throughout the state received more than 6 inches for the month. Precipitation was unusually heavy along the lakeshore region where surface drainage is very poor. There was some precipitation during every week of the month. Amounts of one inch or more fell in many areas of the state on the 3rd and 4th and on the 21st and 22nd. Although the above normal precipitation did not add substantially to our water supplies, it did help to sustain the favorable position it has maintained over the past several months.

Cumulative precipitation for the first five months of the 1984 calendar year is generally from 1.5 inches above to 1.5 inches below normal for most of the state; one exception is the Southwest region where it is 3.15 inches below normal. The average for the state as a whole is 15.63 inches, 0.36 inch below normal. Regional averages range from 17.11 inches, 1.52 inches above normal, for the Central Hills region to 14.69 inches, 0.69 inch above normal, for the Northwest region. Departures from normal range from 1.55 inches above normal for the North Central region to 3.15 inches below normal, for the South Central region.

Cumulative precipitation for the 1984 water year thus far continues to be above normal throughout the state. The average for the state as a whole is 29.16 inches, 5.67 inches above normal. Regional averages range from 31.45 inches, 5.58 inches above normal, for the Southwest region to 27.77 inches, 3.99 inches above normal, for the Northeast region. Departures from normal range from 8.35 inches above normal for the North Central region to 3.23 inches above normal for the South Central region.



observed last month. In general, water levels are above those levels observed in 1983 in consolidated aquifers and below those levels observed last year in unconsolidated aquifers. About half the observation wells show water levels above normal for May and the remaining half are below normal; no pattern as to unconsolidated or consolidated aquifers is apparent.

The ground-water storage situation remains fairly satisfactory in most areas of the state. However, ground-water storage did not fare nearly as well as expected in view of the above normal precipitation during the first six months of the 1984 water year, the nominal recharge period for ground-water. This was partially due to the fact that water levels were near record low levels at the end of the 1983 water year in many areas of the state. Also, the soil moisture zone which has first priority to recharge was extremely dry as a result of the severe drought conditions which persisted throughout the state during the summer of 1983. Although recharge began early in October, recharge to ground-water storage was not as great as expected. Then, in January and February, below normal precipitation resulted in a decline in recharge when it is usually the greatest. Thus, recharge for the nominal recharge season was not as good as it should have been considering the noticeably above normal precipitation during the same period. As a result, ground-water storage was only about normal at the end of the nominal recharge period.

Ground-water levels have already begun their seasonal declines in most areas of the state. Thus, it would be advisable for those depending on ground-water for their water supplies to monitor their situations closely and plan accordingly.

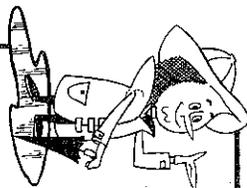
SUMMARY

Precipitation for May was above normal throughout the state. Reservoir storage, streamflow, and ground-water storage are about normal. Lake Erie mean level declined for the month but remained noticeably above normal. The water supply situation continues to be favorable throughout the state.

ACKNOWLEDGEMENTS

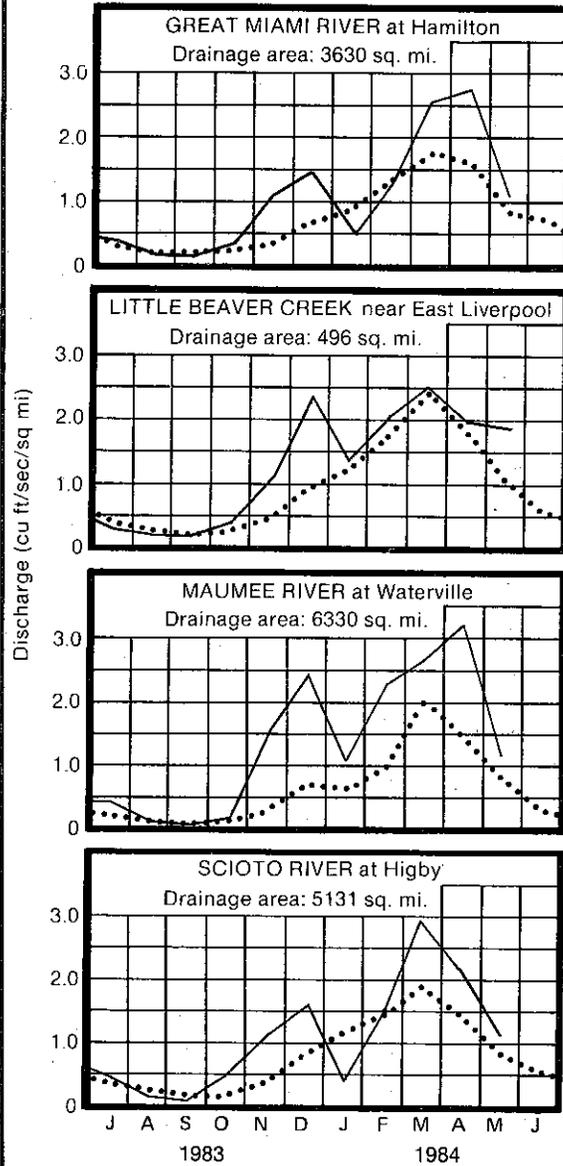
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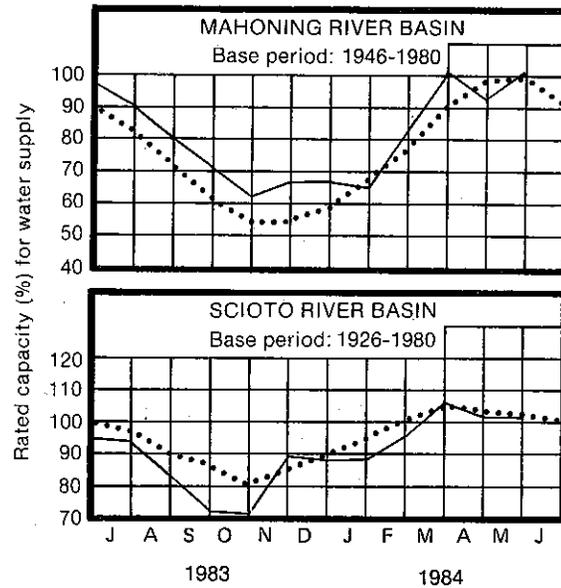


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MEAN STREAM DISCHARGE



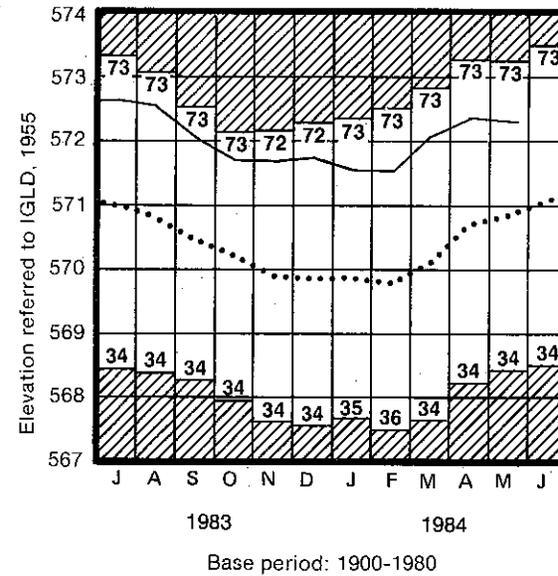
RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply for May increased slightly in the Mahoning River basin and remained the same for the Scioto River basin. Reservoir storage continues to be about normal for both the Mahoning River and the Scioto River basins. Reservoir storage at the month end for the Mahoning basin index reservoirs was 101 percent of rated capacity for water supply compared to 99 percent for last month and 101 percent for May 1983. Storage at the month end for the Scioto basin index reservoirs was 102 percent of rated capacity for water supply compared to the same for last month and 101 percent for May 1983.

STREAMFLOW for May was above normal for most of the state; the exception was in the northwest where it was excessive for the fourth consecutive month. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 4,301 cfs, 140 percent; Little Beaver Creek, 924 cfs, 159 percent; Maumee River, 8,175 cfs, 162 percent; Scioto River 5,765 cfs, 122 percent.

LAKE ERIE LEVELS

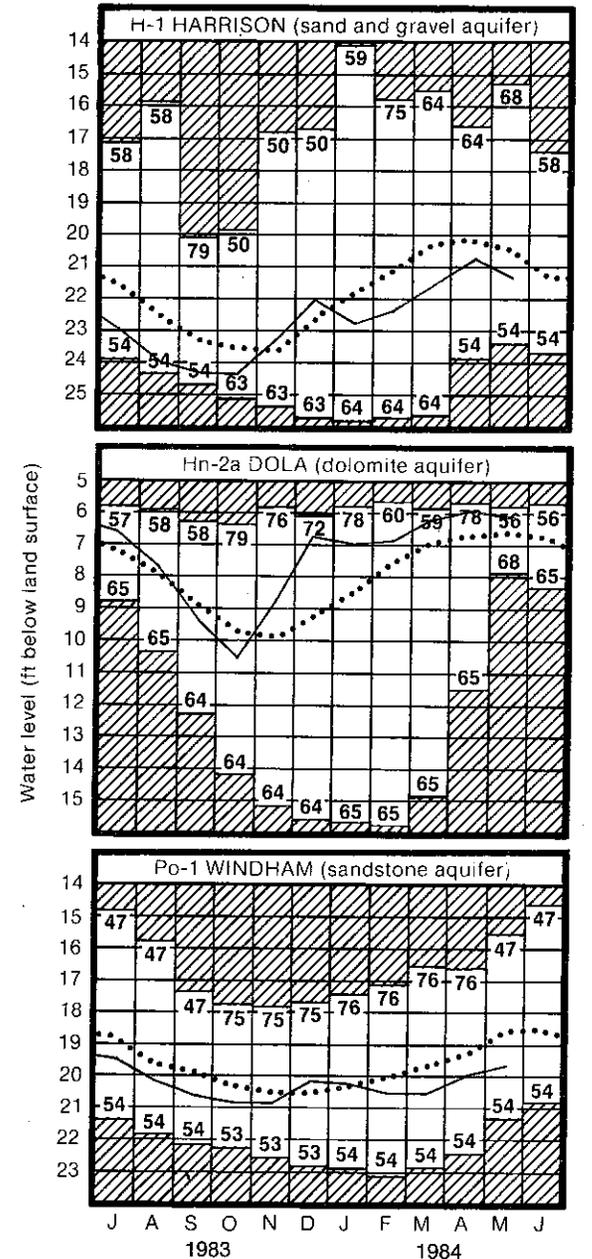


LAKE ERIE mean level declined slightly which is partially due to the backup of water in Lake Michigan and Lake Huron as a result of the severe winter which caused a tremendous ice jam on the St. Clair River. It is expected that the release of additional water following the breakup of this ice jam will affect the level of Lake Erie for about 3 years. The mean level for May was 572.24 feet above IGLD (1955), 0.09 foot below last month's mean level and 1.32 feet above normal. The lake level is 0.27 foot below the level observed for May 1983 and 3.64 feet above Low Water Datum.

GROUND-WATER LEVELS for May generally declined during the month, the only exception was observation well Po-1 at Windham, Portage County, where the water level showed a substantial rise in response to delayed recharge. Net declines for the month were greater than usually observed despite the above normal precipitation. Water levels in the key index observation wells were generally below those levels

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GROUND-WATER LEVELS



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DIVISION OF WATER

MONTHLY WATER INVENTORY REPORT FOR OHIO

Compiled by Leonard J. Harstine

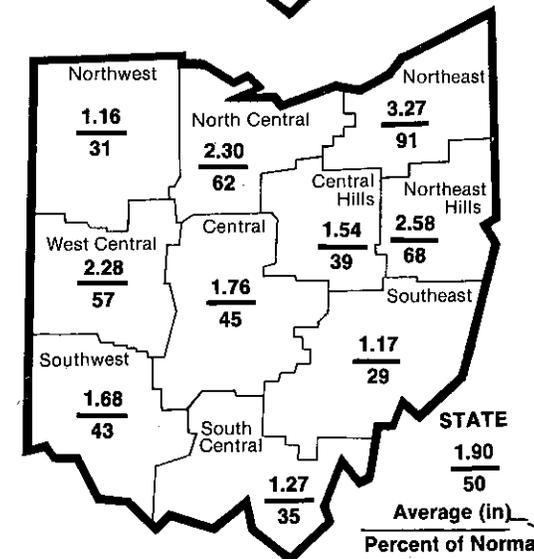
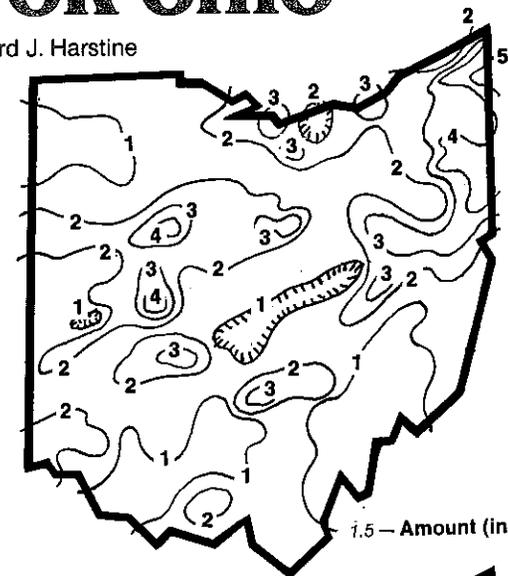
PRECIPITATION

PRECIPITATION for June was sparse in many areas of the state. The average for the state as a whole was 1.90 inches, 1.92 inches below normal. This was the third lowest average precipitation for June for the state in 100 years; previous lows were 1.68 inches in 1936 and 1.82 inches in 1933. Many stations in the northwest, central, and southern portions of the state reported record-low amounts of precipitation for their respective periods of record. However, areas in the northeast reported from 3 to more than 5.5 inches for the month. Regional averages ranged from 3.27 inches, 0.33 inch below normal, for the Northeast region to 1.16 inches, 2.57 inches below normal, for the Northwest region. The Southeast region showed the greatest departure, 2.81 inches below normal. Andover, Ashtabula County, reported the greatest amount of precipitation for the month, 5.57 inches and Middlebourne, Guernsey County, reported the least amount, 0.25 inch.

The month's precipitation came mostly in the form of widely scattered summer type thundershowers. Even the areas in the northeast where precipitation was greatest received rain on only 7 days during the month. In most areas there were only nominal amounts of precipitation which with the dry conditions was hardly noticeable. Most of the month's precipitation fell on the 18th and 24th and these showers were of moderate duration which was of some benefit to agriculture where it was most needed. The dry month has not made its mark on water supplies thus far; however, if these conditions should continue throughout the summer it could have a dramatic effect on water supplies in late summer.

Cumulative precipitation for the first six months of the 1984 calendar year continues to be noticeably below normal throughout the state; the only exception was in the North Central and Northeast regions where it was slightly above normal. The average for the state as a whole was 17.53 inches, 2.28 inches below normal. Regional averages ranged from 19.21 inches, 0.30 inch above normal, for the Northeast region to 15.85 inches, 1.88 inches below normal, for the Northwest region. The greatest deficiencies for the calendar year are in the southern portion of the state where precipitation is 5.52 inches below normal for

Continued on inside page -



situation remains favorable for most areas of the state thus far despite the droughty conditions which have persisted during June. A continuation of the droughty conditions in the southern portion of the state where marginal water supplies are a common factor could present problems later on in the year.

SUMMARY

Precipitation for June was noticeably below normal throughout most of the state with many areas reporting record-low amounts for their respective periods of record. Reservoir storage, streamflow, and ground-water storage continues to be favorable. Lake Erie level rose markedly and continues to be noticeably above normal. The water supply situation continues to be favorable throughout the state despite the droughty conditions; however, this could change dramatically in the pursuing months if these conditions should continue.

GOVERNOR CELESTE SIGNS WATER DIVERSION BILL

On July 13, 1984, Gov. Richard Celeste signed Substitute Senate Bill 360 at a ceremony at Mentor Beach Park in Mentor, Ohio. Sub. S.B. 360 gives the Director of ODNR the authority to regulate by permit any proposed diversion of water from the Lake Erie drainage basin within Ohio or from the Ohio River drainage basin within Ohio to another drainage basin. All existing diversions in Ohio shall be issued a permit at no cost to the applicant. The permit requirement applies only to diversions of more than 100,000 gallons per day. The law will become effective in mid-October, 90 days after the governor signed the bill.

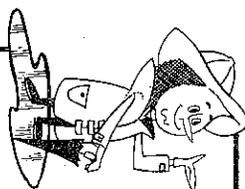
Ohio is one of the first Great Lakes states to pass legislation on diversion of water from the Great Lakes. The impetus for Ohio and other Great Lakes states to consider such legislation is the concern that western and high plains states are looking at the Great Lakes for their future water supply. The world's largest aquifer—the Ogallala Aquifer—is being used for irrigation faster than rainfall can replenish it. One suggested solution would be to pipe water 600 miles from Lake Superior to the Missouri River basin. Another threat to Great Lakes waters are coal slurry pipelines. It has been proposed to transport coal from the western fields in Wyoming to the industrial centers in the midwest utilizing water from the Great Lakes.

Another section of Sub. S.B. 360 creates an Ohio Water Advisory Council to the Division of Water in ODNR. The seven member council shall have expertise in several areas including, but not limited to, dam safety, surface water, ground water, and flood plain management. The general responsibilities of the advisory council will be to recommend policy and legislation with respect to water management and conservation; review and make recommendations on the development of plans and programs for long-term, comprehensive water management throughout the state; and recommend ways to enhance cooperation among agencies having an interest in water to encourage wise use and protection of the state's ground and surface waters.

ACKNOWLEDGEMENTS

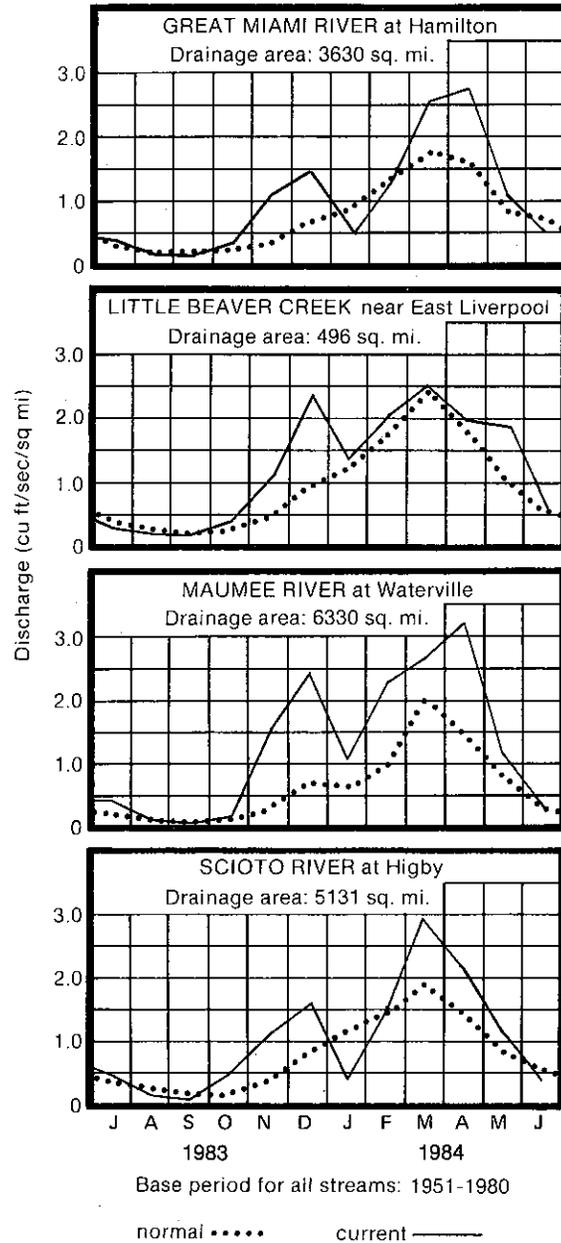
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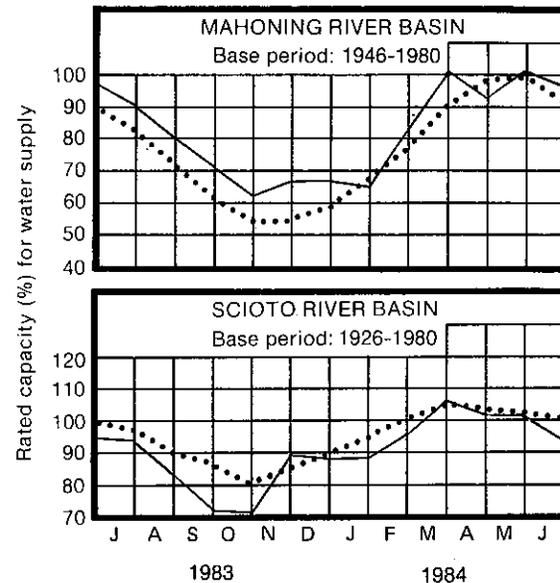


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MEAN STREAM DISCHARGE



RESERVOIR STORAGE FOR WATER SUPPLY

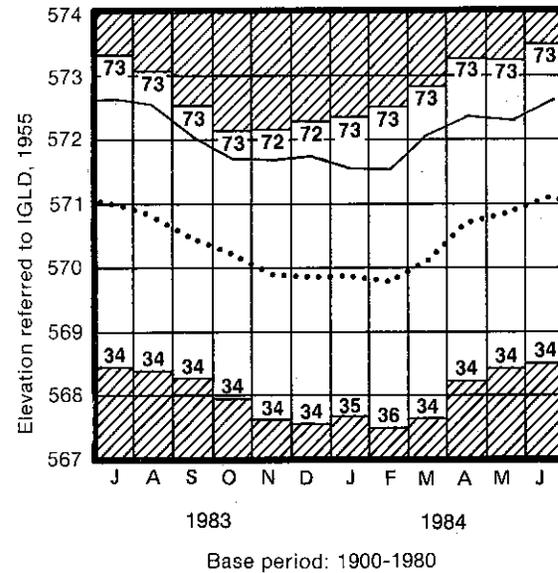


the South Central region, 4.40 inches below normal for the Southeast region, and 3.48 inches below normal for the Southwest region.

Cumulative precipitation for the 1984 water year continues to be above normal throughout the state. The average for the state as a whole was 31.06 inches, 3.75 inches above normal. Regional averages ranged from 33.13 inches, 3.39 inches above normal, for the Southwest region to 29.98 inches, 4.96 inches above normal, for the Northwest region. Departures from normal range from 6.95 inches above normal, for the North Central region to 0.86 inch above normal, for the South Central region.

RESERVOIR STORAGE for water supply for June declined in both the Mahoning River and the Scioto River basins. Storage remained above normal for the Mahoning basin index reservoirs and below normal for the Scioto basin index reservoirs. Reservoir storage throughout the state continues to maintain favorable levels despite the near record-low rainfall for June. Reservoir storage at the month end for the Mahoning basin index reservoirs was 97 percent of rated capacity for water supply compared to 101 percent for last month and 97 percent for June 1983. Storage at the month end for the Scioto basin index reservoirs was 93 percent of rated capacity for water supply compared to 102 percent for last month and 96 percent for June 1983.

LAKE ERIE LEVELS



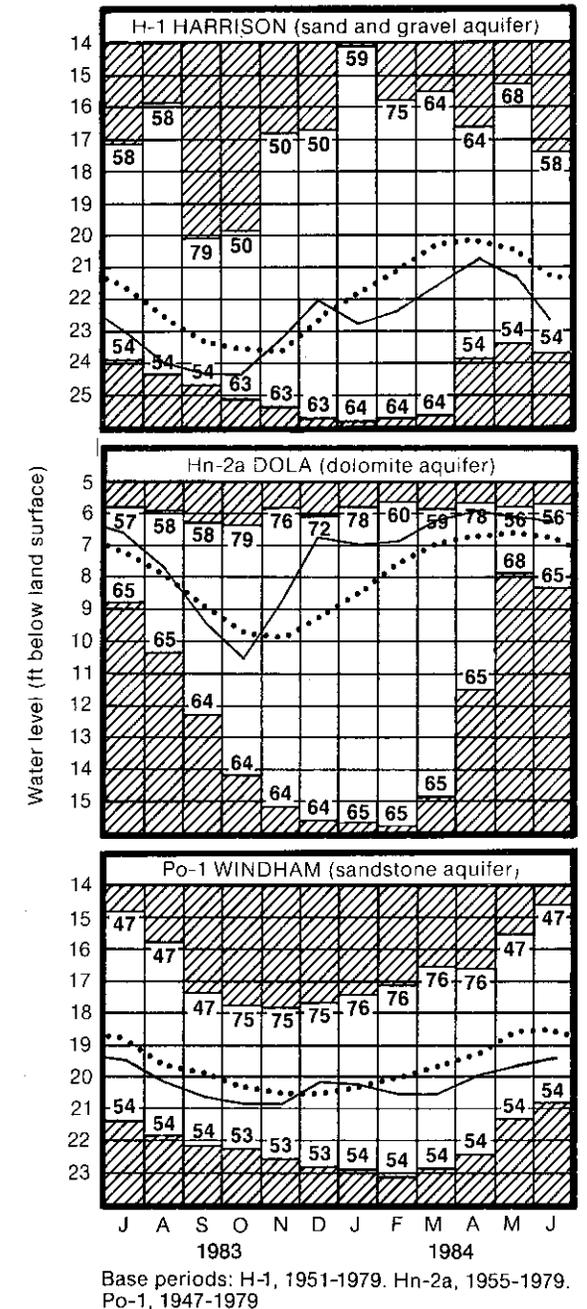
STREAMFLOW for June was normal throughout the state. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 1,924 cfs, 88 percent; Little Beaver Creek, 336 cfs, 113 percent; Maumee River, 2,447 cfs, 111 percent; Scioto River, 1,993 cfs, 66 percent.

LAKE ERIE mean level showed a significant rise in June, probably as a result of releases from Lake Michigan and Huron following the breakup of the record ice jam on the St. Clair River as reported last month. The mean level for June was 572.55 feet above IGLD (1955), 0.31 foot above last month's mean level and 1.50 feet above normal. The lake level was the same as that observed for June 1983 and 3.95 feet above Low Water Datum.

GROUND-WATER LEVELS showed a marked decline for June throughout the state. Generally, the net declines were nearly twice that usually observed for June at the index gaging stations. The only exception was observation well Po-1 at Windham, Portage County, where the water level showed a net rise for the month. Generally, ground-water levels were noticeably below those levels observed last month and nearly the same as those levels observed for June 1983. Water levels in general continue to be above normal in consolidated aquifers and below normal in unconsolidated aquifers. The ground-water storage

Continued on back page -

GROUND-WATER LEVELS



MONTHLY WATER INVENTORY REPORT FOR OHIO

Compiled by Leonard J. Harstine

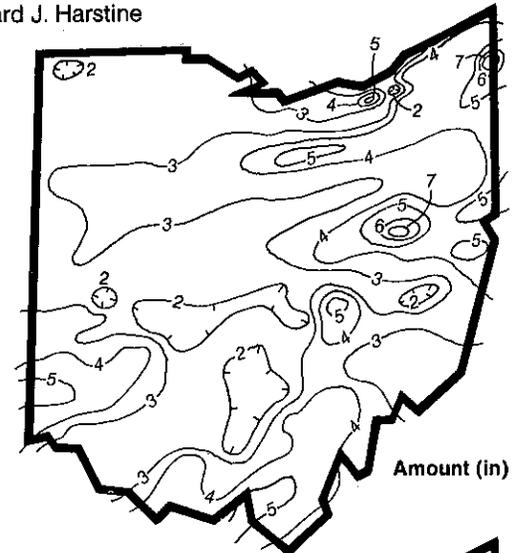
PRECIPITATION

PRECIPITATION for July was generally below normal for most areas of the state for the second consecutive month; exceptions were in the Northeast and Northeast Hills regions where precipitation was slightly above normal. The average for the state as a whole was 3.30 inches, 0.68 inch below normal. Regional averages ranged from 4.48 inches, 0.33 inch above normal, for the Northeast region to 2.07 inches, 1.93 inches below normal, for the Central region. New Philadelphia, Tuscarawas County, reported the greatest amount of precipitation for the month, 7.14 inches of which 3.73 inches fell during the 24 hour period ending at 8:00 a.m. on the 5th. Middlebourne, Guernsey County, reported the least amount for the month, 1.15 inches.

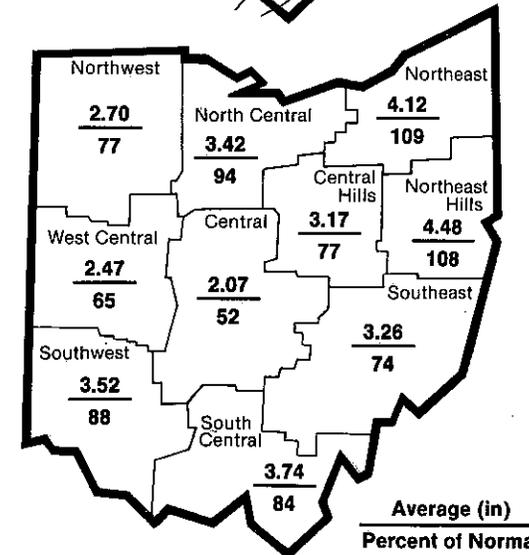
The month's precipitation fell mostly during the first week and the last week of the month. There was rain on an average of 12 days during the month; generally the amounts were less than 0.50 inch. For the most part it was generally hot and dry. Thus far, the below normal precipitation has not had a dramatic effect on the water supply situation in most areas of the state.

Cumulative precipitation for 1984 calendar year thus far continued to be below normal throughout most of the state; the only exception was in the Northeast region where it has been above normal for the past three months. The average for the state as a whole was 20.83 inches, 2.96 inches below normal. Regional averages range from 23.33 inches, 0.64 inch above normal, for the Northeast region to 18.55 inches, 2.69 inches below normal, for the Northwest region. Other regions with greater deficiencies for the calendar year thus far are: Central, 4.79 inches below normal; Southwest, 3.97 inches below normal; South Central, 6.21 inches below normal; and Southeast, 5.52 inches below normal.

Cumulative precipitation for the 1984 water year continues to be above normal throughout the state. The average for the state as a whole was 34.36 inches, 3.07 inches above normal. Regional averages ranged from 36.65 inches, 2.90 inches above normal, for the Southwest region to 32.58 inches, 4.15 inches above normal, for the Northwest region.



Amount (in)



Average (in)
Percent of Normal

SUMMARY

Precipitation for July for the state as a whole was below normal for the second consecutive month. The average for the state was 3.30 inches, 0.68 inch below normal. Streamflow, reservoir storage and ground-water storage remained at or below normal for most areas of the state. Lake Erie level declined slightly but remained noticeably above normal.

NOTES AND COMMENTS

BEES FIND NEW HEADQUARTERS

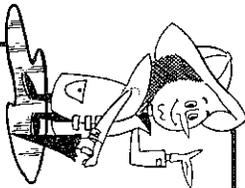
When David Cashell, environmental scientist for the Water Inventory Section of the Division of Water serviced the ground-water monitoring station M-2 at London, Ohio on July 18th, he was surprised to find that a swarm of honeybees had settled in and built their honeycombs in the top of the well casing. After some hesitation, he decided he was not equipped to take the critters on and thereby returned to the office for assistance. Art Woldorf, a planner for the Division of Water, is also a professional beekeeper and offered his assistance to remedy the situation. Art said this was the first time he had ever heard of bees settling down in a well casing.

On July 26, Dave and Art returned to the site to evict the new inhabitants. Equipped with all the paraphernalia of a beekeeper, Art approached the shelter with caution and removed the partly filled comb with eggs, queen bee, and all her workers to a container where they were kept in the back of his car until he returned home and put them into a hive. Interestingly enough, no one got stung during the ordeal. Last reports were that the queen bee did not survive and the remaining bees have adopted other quarters in the Woldorf apiary.

ACKNOWLEDGEMENTS

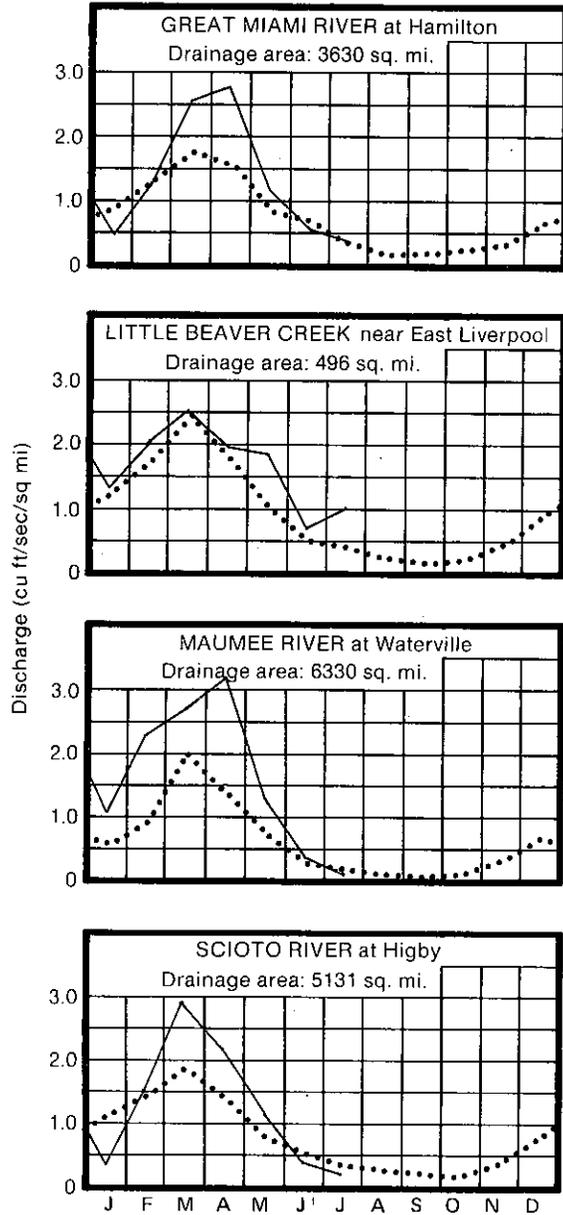
This report has been compiled from Division of Water data and from information supplied by the following:

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.



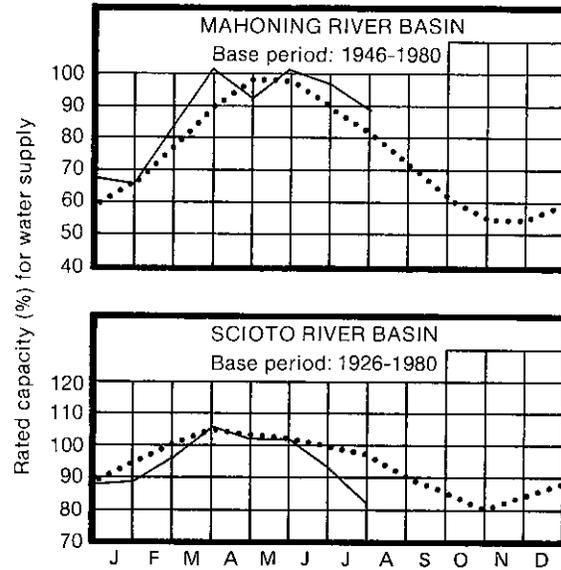
OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER
FOUNTAIN SQUARE
COLUMBUS, OHIO 43224

MEAN STREAM DISCHARGE



Base period for all streams: 1951-1980
normal current —

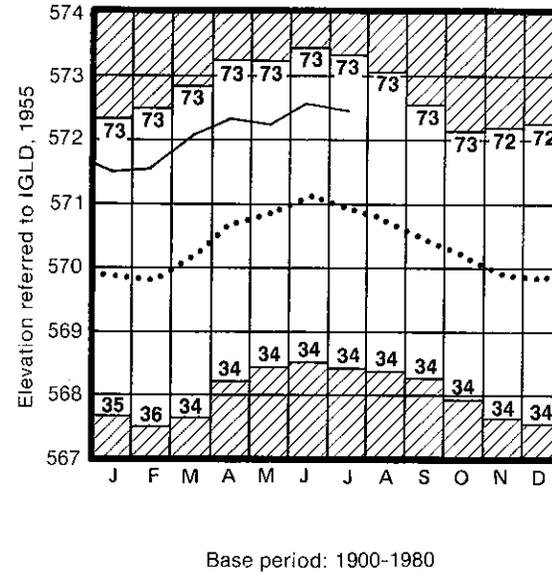
RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply for July declined in both the Mahoning River and the Scioto River basins. Storage remained above normal in the Mahoning basin index reservoirs while it fell noticeably below normal for the Scioto basin index reservoirs. Reservoir storage at the month end for the Mahoning basin index reservoirs was 89 percent of rated capacity for water supply compared to 97 percent for last month and 90 percent for July 1983. Storage at the month end for the Scioto basin index reservoirs was 82 percent of rated capacity for water supply compared to 93 percent for last month and 95 percent for July 1983.

STREAMFLOW for July was above normal in the northeast, below normal for the northwest, central, south central and southeast and normal in the southwest. The topography of the northeast area lends itself to allow for more rapid runoff resulting in a marked increase in streamflow in response to the above normal precipitation in that area. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 1,385 cfs, 103 percent; Little Beaver Creek, 503 cfs, 238 percent; Maumee River, 710 cfs, 53 percent; Scioto River, 1,039 cfs, 62 percent.

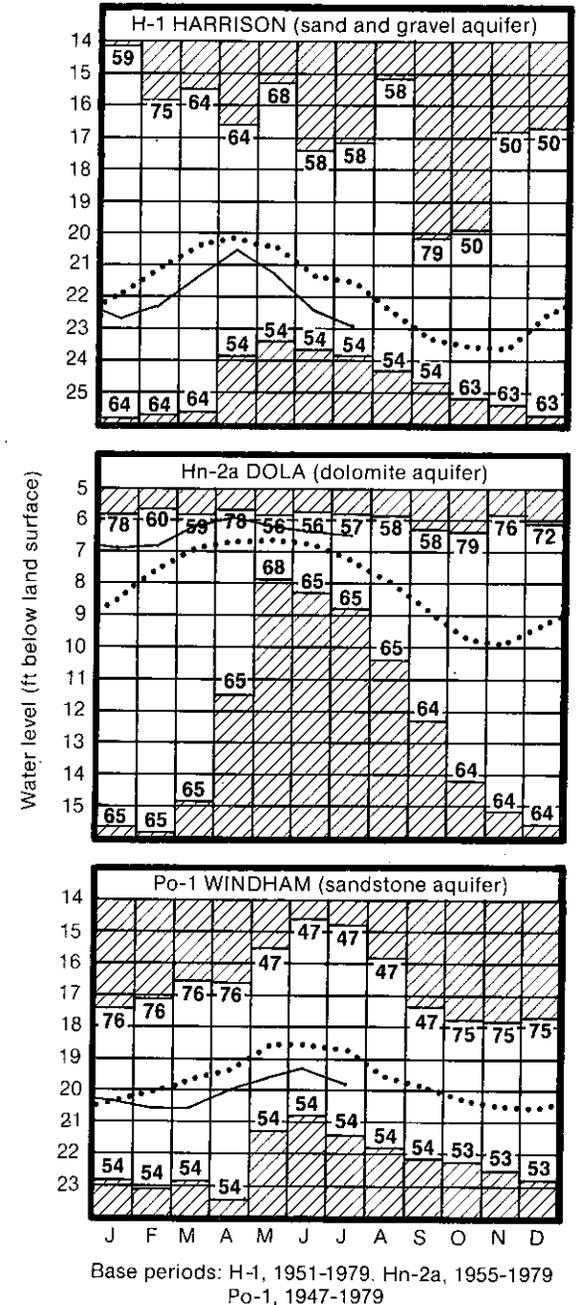
LAKE ERIE LEVELS



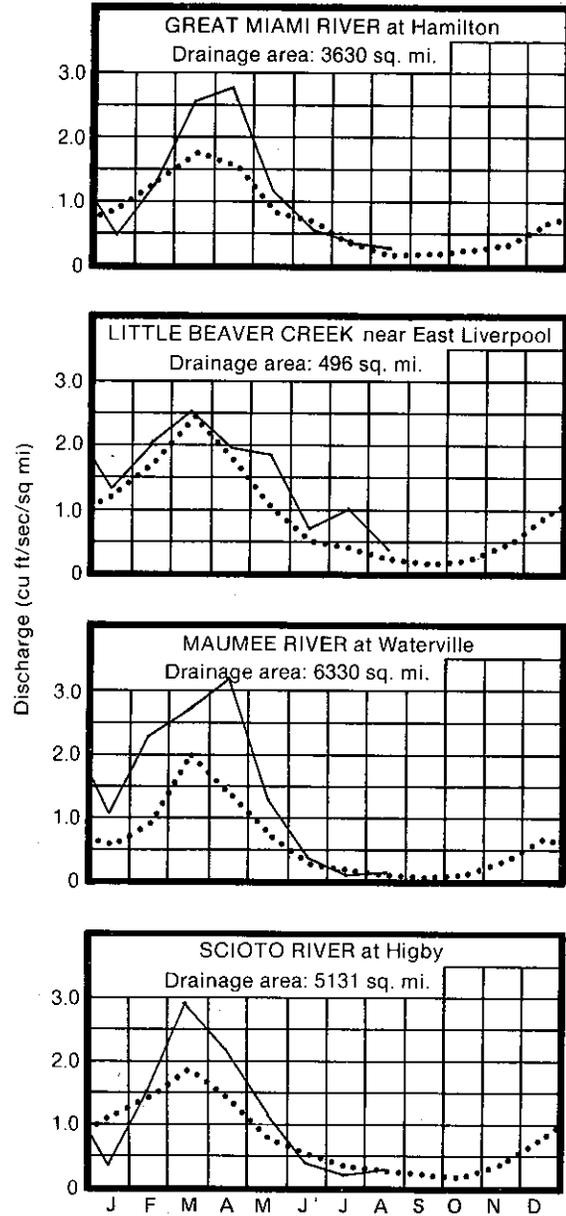
LAKE ERIE mean level for July declined slightly from last month and was 572.47 feet above IGLD(1955), 0.08 foot below last month's mean level and 1.47 feet above normal. The mean level is 0.10 foot below the mean level observed for July 1983 and 3.87 feet above Low Water Datum.

GROUND-WATER LEVELS for July showed marked declines throughout the state. Net declines for the month were twice that usually observed in unconsolidated aquifers and about the same as usually observed in consolidated aquifers. Water levels are generally from 0.50 to 2 feet below those levels observed for last month and generally near or below those levels observed for July 1983. Ground-water levels in general are above normal in the northern half of the state and below normal in the southern half.

GROUND-WATER LEVELS

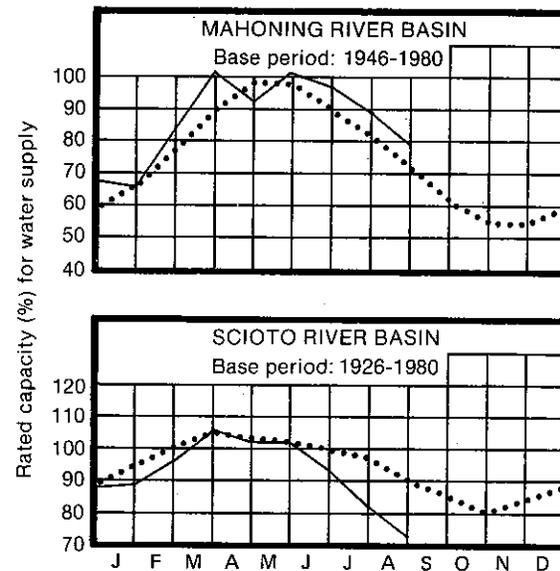


MEAN STREAM DISCHARGE



Base period for all streams: 1951-1980
normal current —

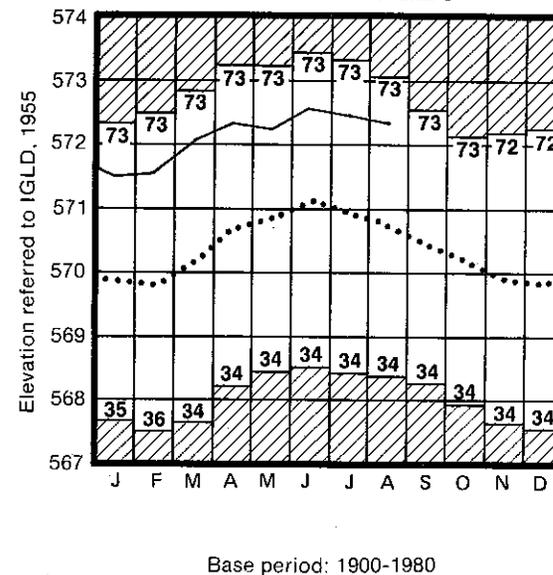
RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply for August showed near normal declines for the month. Storage in the Mahoning River basin remained above normal while it continued to be noticeably below normal for the Scioto River basin. Reservoir storage at the month end for the Mahoning basin index reservoirs was 79 percent of rated capacity for water supply compared to 89 percent for last month and 80 percent for August 1983. Storage at the month end for the Scioto basin index reservoirs was 72 percent of rated capacity for water supply compared to 82 percent for last month and 83 percent for August 1983.

STREAMFLOW for August declined throughout most of the state; an exception was the Maumee River where flow increased slightly from last month. However, monthly mean discharges at the index gaging stations were above normal for August. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 945 cfs, 124 percent; Little Beaver Creek, 189 cfs, 172 percent; Maumee River, 868 cfs, 142 percent; Scioto River, 1,530 cfs, 125 percent.

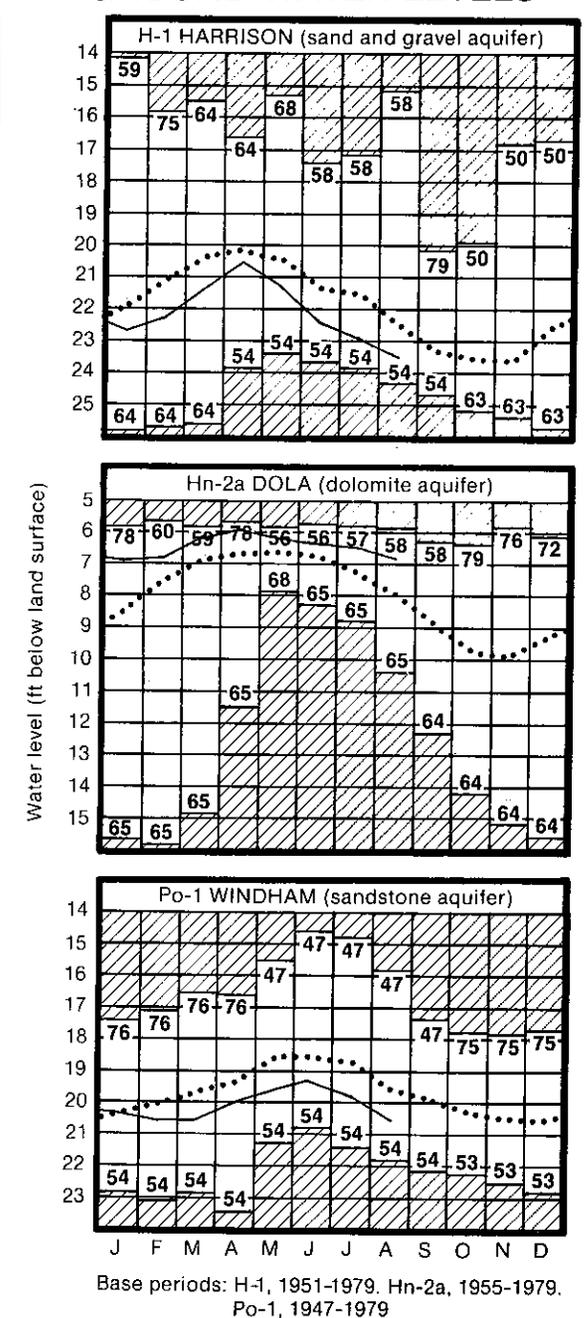
LAKE ERIE LEVELS



LAKE ERIE mean level for August was 572.27 feet above IGLD (1955), 0.20 foot below last month's mean level and 1.46 feet above normal. The lake level is 0.26 foot below the level observed for August 1983 and 3.67 feet above Low Water Datum.

GROUND-WATER LEVELS for August generally showed marked declines throughout the state. Net declines from last month's levels were nearly twice that usually observed for August. Water levels in half of the index observation wells are above those levels observed last year. Generally, water levels are above normal in consolidated aquifers and below normal in unconsolidated aquifers. Although it has been extremely dry in many areas of the state, ground-water levels have not been adversely affected to any large extent thus far. There have been reports of many dug wells, springs and shallow wells going dry, but these generally represent aquifers which yield only marginal supplies. Generally, ground-water storage continues to be favorable throughout the state.

GROUND-WATER LEVELS



DIVISION OF WATER

MONTHLY WATER INVENTORY REPORT FOR OHIO

Compiled by Leonard J. Harstine

PRECIPITATION

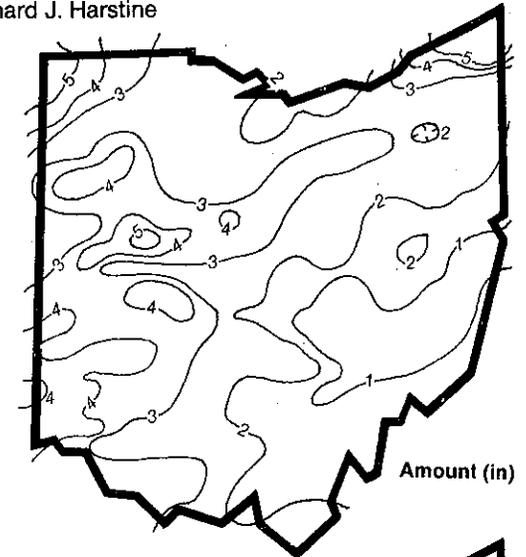
PRECIPITATION for September was above normal for most of the western and northern portions of the state and below normal for the central and southeastern portions. The average for the state as a whole was 2.62 inches, 0.13 inch below normal. Regional averages ranged from 3.86 inches, 1.10 inches above normal, for the Southwest region to 0.98 inch, 1.75 inches below normal, for the Southeast region. Montpelier, Williams County, reported the greatest amount of precipitation for the month, 5.45 inches, and Middlebourne, Guernsey County, reported the least amount, 0.35 inch.

Generally there was about 0.50 inch of precipitation during every week of the month. The rains were generally of moderate intensity which mainly benefitted soil moisture content. Although the rains produced enough runoff to maintain normal September flows in most areas of the state, the month's precipitation was not enough to produce recharge to water supplies.

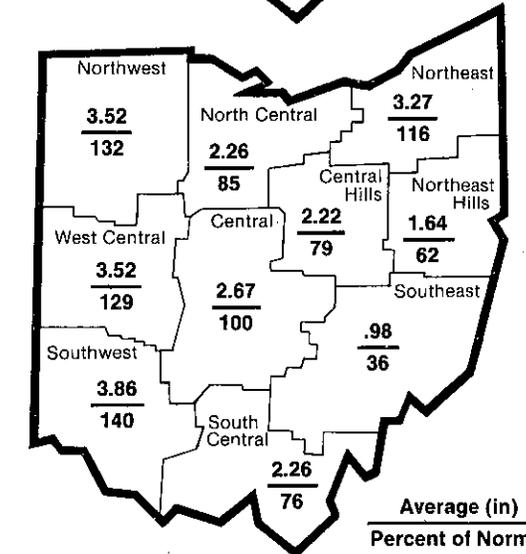
Cumulative precipitation for the first nine months of the 1984 calendar year continues to be below normal for most of the state; the only exception is in the Northeast region where it has been above normal for the past four months. The average for the state as a whole is 26.88 inches, 2.66 inches below normal. Regional averages range from 30.71 inches, 2.08 inches above normal, for the Northeast region to 23.84 inches, 7.11 inches below normal, for the Southeast region.

Precipitation for the 1984 water year which ended Sept. 30, 1984, was above normal throughout the year in most areas of the state. An isohyetal map of regional averages and departures from normal for the 1984 water year appears on the last page of this report. The average for the state as a whole was 40.41 inches, 3.37 inches above normal. Regional averages ranged from 42.54 inches, 5.44 inches above normal, for the Northeast region to 38.17 inches, 0.27 inch below normal, for the Southeast region. Andover, Ashtabula County, reported the greatest amount of precipitation for the year, 57.77 inches and Nelsonville, Athens County, reported the least amount, 31.05 inches.

Precipitation for the 1984 water year was markedly above normal for the first three months of the recharge period and below normal for the remaining three months. Above normal precipitation in April and May extended the recharge period a full two months. Even so, water supplies were generally about normal at the peak of the recharge period. Precipitation was generally below normal for the last four months of the water year. As a result, water supplies declined rather sharply in most areas of the state and were reaching rather low levels by the end of the water year. Generally, water supplies were favorable in the northern half of the state and noticeably below normal in the southern half for the 1984 water year.



Amount (in)

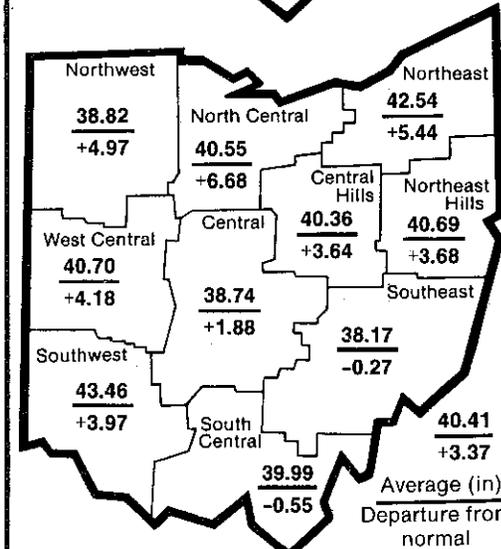
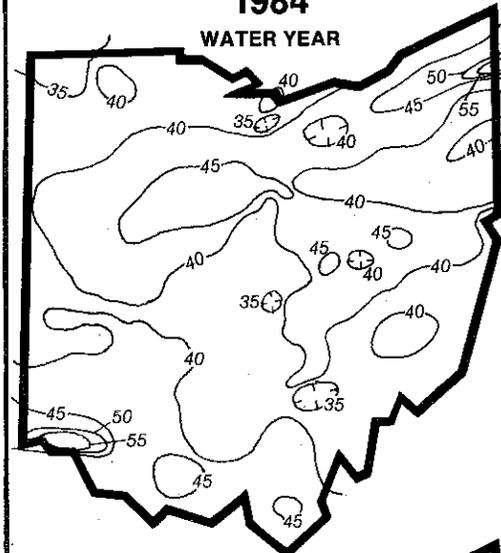


Average (in)
Percent of Normal

SUMMARY

Precipitation for September was slightly below normal for the state as a whole. Streamflow was about normal while reservoir storage and ground-water storage was normal in some areas in the northern portion of the state and below normal in most other areas. Lake Erie level declined slightly but remained noticeably above normal. The water supply situation was generally favorable throughout the state during the 1984 water year. However, reservoir storage and ground-water storage at the water year end was noticeably low as a result of the below normal precipitation in the last four months of the 1984 water year.

PRECIPITATION 1984 WATER YEAR



ACKNOWLEDGEMENTS

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

Precipitation data:

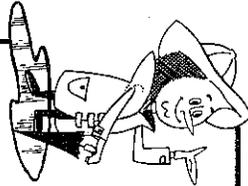
U.S. Department of Commerce, National Oceanic and Atmospheric Administration,
National Weather Service; The Miami Conservancy District; U.S. Army Corps of Engineers, Muskingum Area.

Streamflow and reservoir storage data:

U.S. Geological Survey, Water Resources Division.

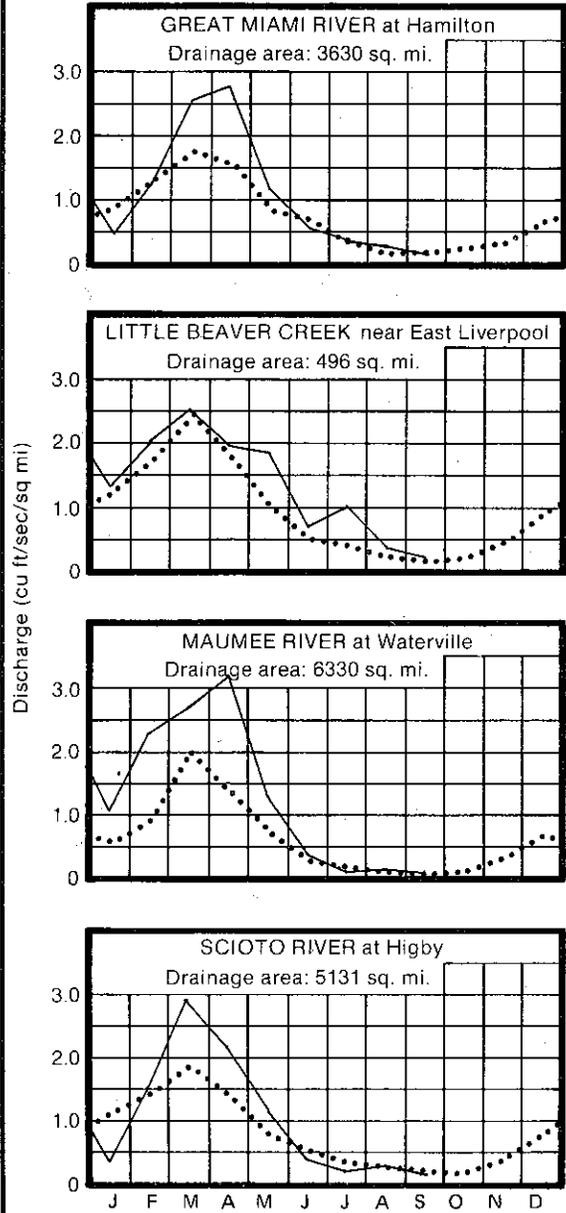
Lake Erie level data:

U.S. Corps of Engineers, Detroit District.



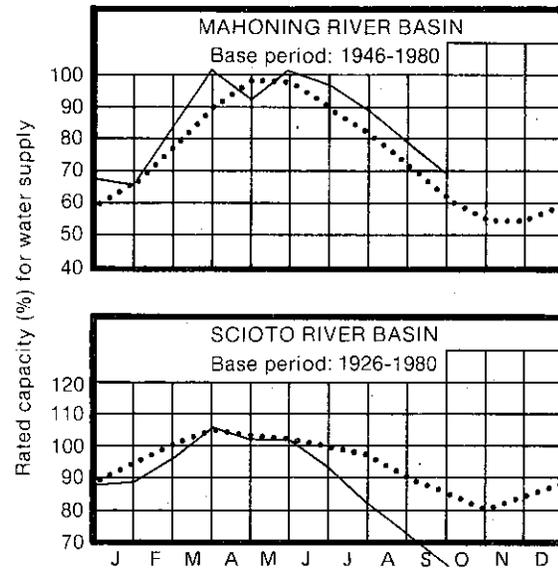
OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER
FOUNTAIN SQUARE
COLUMBUS, OHIO 43224

MEAN STREAM DISCHARGE



Base period for all streams: 1951-1980
normal current —

RESERVOIR STORAGE FOR WATER SUPPLY

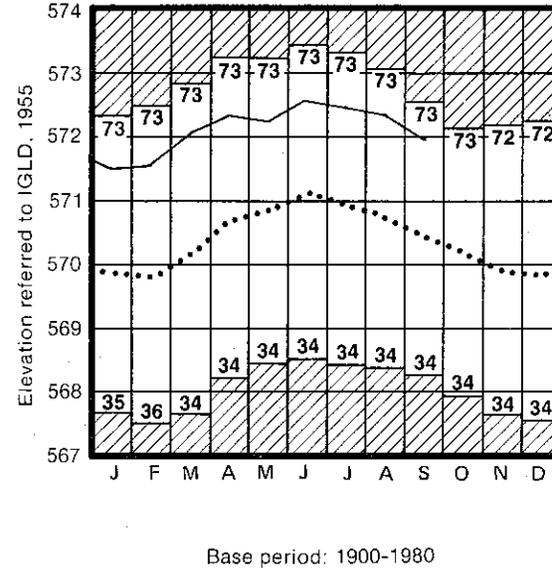


RESERVOIR STORAGE for water supply for September showed marked declines in both the Mahoning River and the Scioto River Storage basins. Reservoir storage remained above normal in the Mahoning basin index reservoirs but was noticeably below normal in the Scioto basin index reservoirs. Reservoir storage at the month end for the Mahoning basin index reservoirs was 69 percent of rated capacity for water supply compared to 79 percent for last month and 72 percent for September 1983. Storage at the month end in the Scioto basin index reservoirs was 63 percent of rated capacity for water supply compared to 72 percent for last month and 72 percent for September 1983. Reservoir storage for water supply was favorable throughout the state for the 1984 water year.

STREAMFLOW for September was normal for most of the state; the only exception was the Scioto River basin where it was noticeably below normal as a result of the below normal precipitation in the lower portion of the basin. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 740 cfs, 111 percent; Little Beaver Creek, 121 cfs, 154 percent; Maumee River, 725 cfs, 186 percent; Scioto River, 548 cfs, 52 percent.

Streamflows were generally above normal to excessive during the first half of the 1984 water year and normal during the last half. Although there was some flooding in low-lying areas of the state, there were no serious floods during the 1984 water year. Mean discharge and percent of normal for the 1984 water year for the index gaging stations were as follows: Great Miami River, 3,797 cfs, 116 percent; Little Beaver Creek, 654 cfs, 116 percent; Maumee River, 8,097 cfs, 159 percent; Scioto River, 5,255 cfs, 113 percent.

LAKE ERIE LEVELS

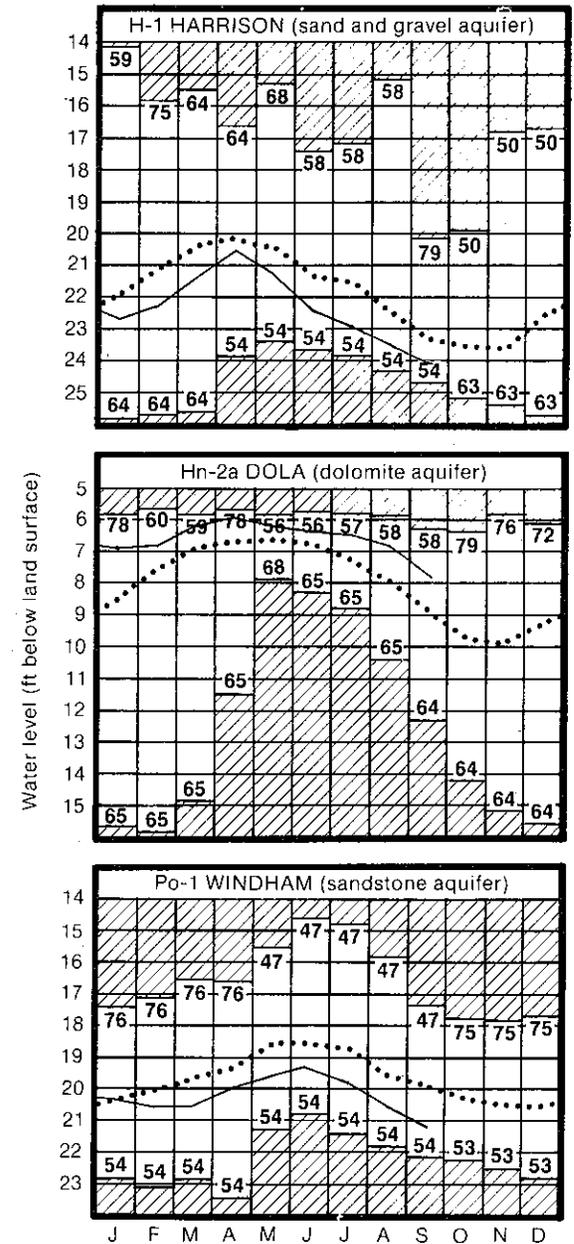


LAKE ERIE mean level for September was 571.97 feet above IGLD (1955), 0.30 foot below last month's mean level and 1.45 feet above normal. The lake level was 0.07 foot below the level observed for September 1983 and 3.37 feet above Low Water Datum. The lake level continued to be markedly above normal throughout the 1984 water year as it has been for the past several years.

GROUND-WATER LEVELS for September showed greater declines than usual throughout the state. Net declines from last month were generally 1½ times that usually observed for September. Water levels were below those levels observed for last month in all the index observation wells, but were generally above the levels observed for September 1983. However, one observation well in the central portion of the state, Fr-3 near Reese Station, Franklin County, representing an unconsolidated aquifer, recorded a record low level for September. Water levels are generally above normal in consolidated aquifers and below normal in unconsolidated aquifers. The only exception was in observation well Po-1 at Windham, Portage County, representing a consolidated aquifer, where the water level has been below normal throughout most of the water year.

Ground-water storage was favorable throughout the state for most of the 1984 water year. However, storages at the end of the year were beginning to show the effects of the deficient precipitation during the last four months and as a result storages were noticeably low at the water year end. If precipitation should continue to be below normal in the ensuing months of the new water year, it could present some serious situations for those depending on ground-water for their water supplies.

GROUND-WATER LEVELS



Base periods: H-1, 1951-1979. Hn-2a, 1955-1979.
Po-1, 1947-1979

MONTHLY WATER INVENTORY REPORT FOR OHIO

Compiled by Leonard J. Harstine

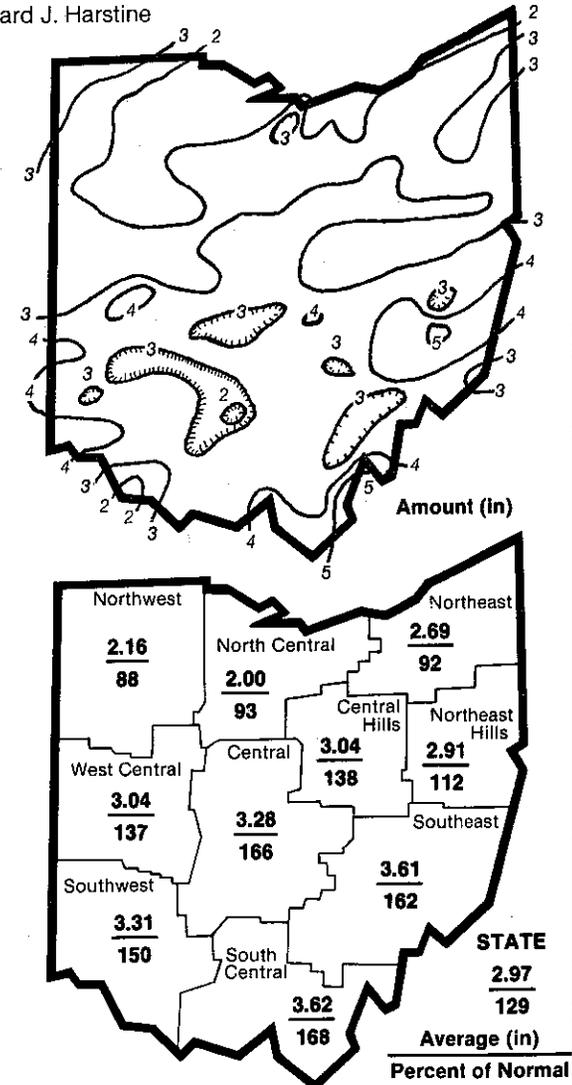
PRECIPITATION

PRECIPITATION for October was below normal across the northern portion of the state and above normal elsewhere. The average for the state as a whole was 2.97 inches, 0.66 inch above normal. Regional averages ranged from 3.62 inches, 1.46 inches above normal, for the South Central region to 2.00 inches, 0.14 inch below normal, for the North Central region. Gallipolis, Gallia County, reported the greatest amount of precipitation for the month, 5.83 inches and Sandusky, Erie County, reported the least amount, 1.08 inches.

There were measurable amounts of precipitation during every week of the month throughout the state. Storms producing more than 1 inch were observed in the southern portion of the state on the 22nd and 23rd, and on the 29th. The rains were a welcome relief from the continued droughty conditions which persisted throughout most of the summer. However, thus far, it was not enough to produce noticeable recharge to water supplies in most areas of the state.

Cumulative precipitation for the first 10 months of the 1984 calendar year continues to be below normal throughout most of the state; the only exception is in the Northeast region where precipitation has been above normal for several months. The average for the state as a whole was 29.85 inches, 2.00 inches below normal. Regional averages ranged from 33.40 inches, 1.85 inches above normal, for the Northeast region to 26.95 inches, 2.16 inches below normal, for the Northwest region. Regions showing the greatest deficiencies for the calendar year are: Southeast, 5.73 inches below normal; South Central, 5.47 inches below normal; and Central, 3.16 inches below normal.

This is the first month of the 1985 water year which began Oct. 1, 1984, and ends Sept. 30, 1985. The water year is a common reference period for both surface water and ground-water reports. October is considered to be the beginning of the recharge period for water supplies. Precipitation for the first month of the new water year was above normal for the central and southern portions of the state and below normal in the northern portion.



SUMMARY

Precipitation for October was below normal in the northern portion of the state and above normal elsewhere. Reservoir storage and ground-water storage for water supply continued to decrease slightly while streamflow was about normal. Lake Erie level declined slightly but remained markedly above normal. The water supply situation continues to be favorable for most areas of the state.

NOTES AND COMMENTS

The purpose of this report is to disseminate current hydrologic data in brief form. Observation points have been selected which are considered to be sufficiently representative of water conditions in the state to permit an evaluation of the current water-supply situation. These key observation stations offer the best available data on the basis of: (1) accuracy and length of record, (2) minimal artificial effects on data, and (3) availability of records. Data from these stations are collected by various agencies at the end of each month and processed immediately.

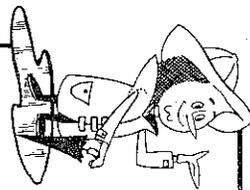
Because of the time limitations involved, all data must be considered preliminary and may be subject to revision before publication in regular form by the agencies involved. The remarks in this report include the writer's opinions of the cause and significance of the phenomena reported therein. The reader is urged to examine the data and formulate his own evaluation. The author is indebted to the various agencies and individuals who make these data available.

More complete and detailed information can be obtained by writing to the Ohio Division of Water, Bldg. E, Fountain Square, Columbus, Ohio 43224.

ACKNOWLEDGEMENTS

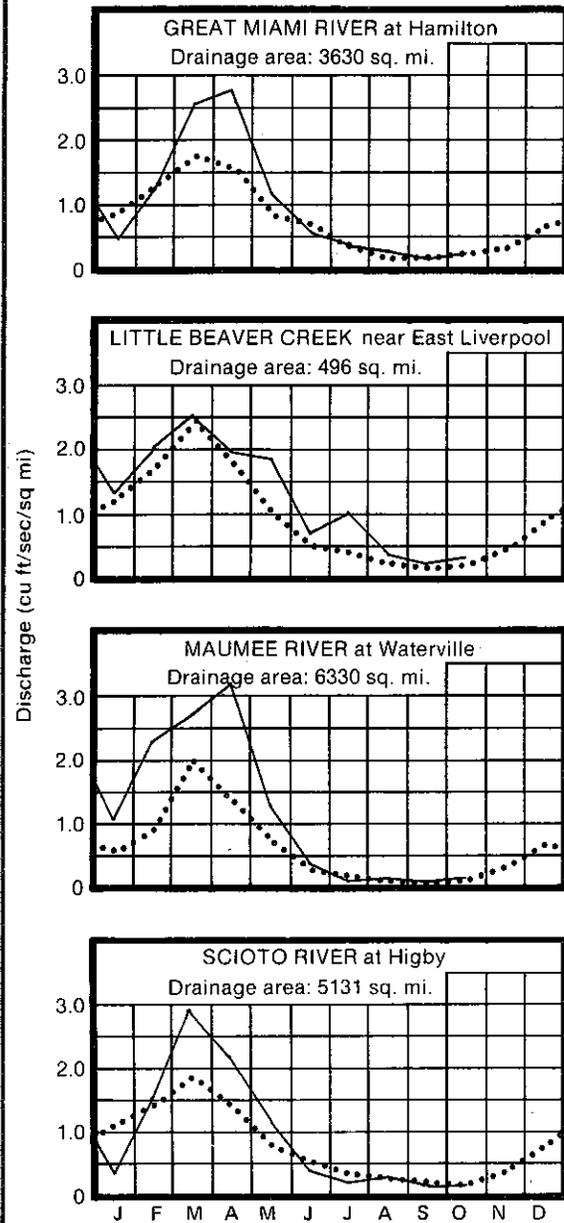
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 - National Weather Service; The Miami Conservancy District; U.S. Army Corps of Engineers, Muskingum Area.
- Streamflow and reservoir storage data:
 - U.S. Geological Survey, Water Resources Division;
 - Lake Erie level data:
 - U.S. Corps of Engineers, Detroit District.



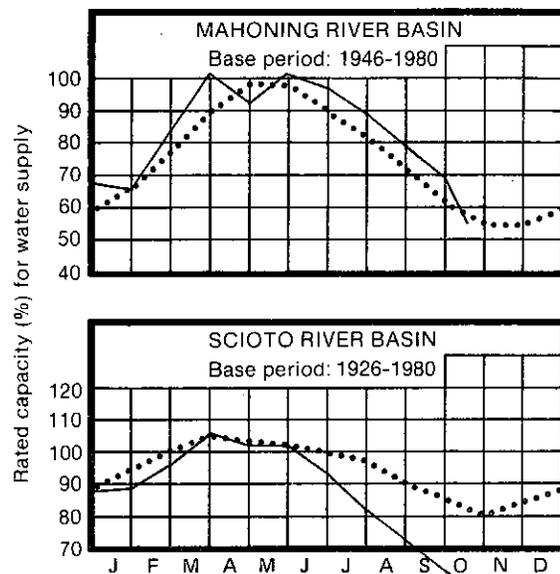
ODNR
OHIO DEPARTMENT OF
NATURAL RESOURCES
DIVISION OF WATER
FOUNTAIN SQUARE
COLUMBUS, OHIO 43224

MEAN STREAM DISCHARGE



Base period for all streams: 1951-1980
normal current —

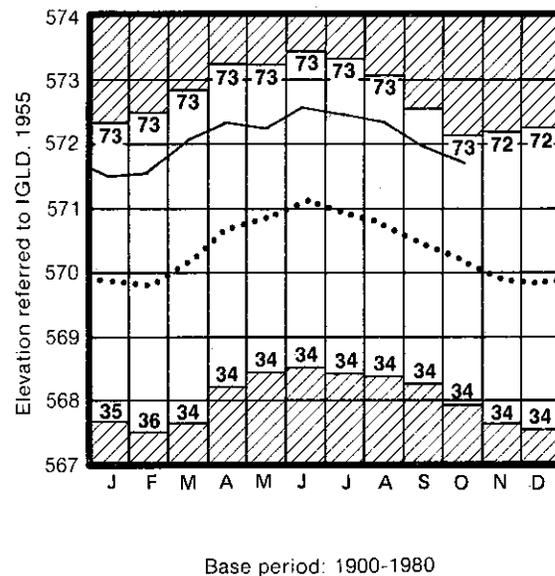
RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply for October declined sharply in both the Mahoning River and the Scioto River basins. Storage in the Mahoning River basin remained slightly above normal while in the Scioto River basin it continued to be noticeably below normal. However, storage in the Mahoning River basin is significantly lower than would be expected because the level of Mosquito Creek Reservoir was lowered significantly for repair work. Reservoir storage at the month end for the Mahoning basin index reservoirs was 56 percent of rated capacity for water supply compared to 69 percent for last month and 64 percent for October 1983. Storage at the month end for the Scioto basin index reservoirs was 54 percent of rated capacity for water supply compared to 63 percent for last month and 71 percent for October 1983.

STREAMFLOW in October increased and was near or above normal throughout the state. The above normal precipitation for the month produced above normal runoff in most areas of the state; an exception was in the Scioto River basin where runoff was below normal. Mean discharge and percent of normal at the index gaging stations were as follows: Great Miami River, 943 cfs, 139 percent; Little Beaver Creek, 156 cfs, 143 percent; Maumee River, 1,099 cfs, 198 percent; Scioto River, 721 cfs, 95 percent.

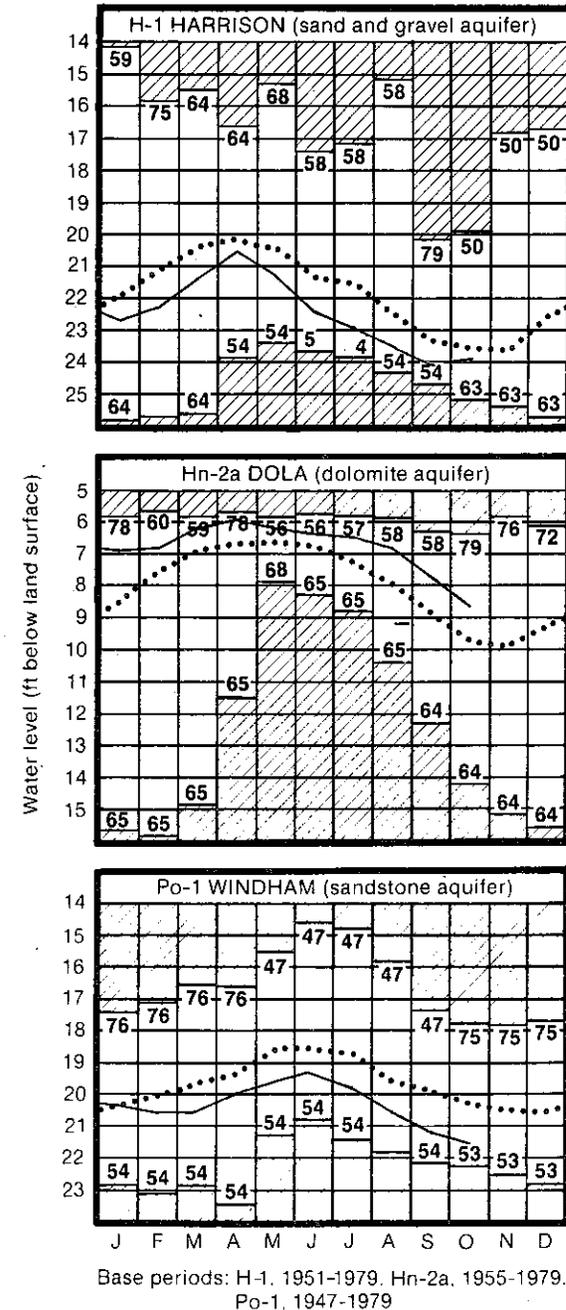
LAKE ERIE LEVELS



LAKE ERIE mean level for October declined slightly and was only 0.38 foot below the all time high for October recorded in 1973. The mean level for October was 571.76 feet above IGLD (1955), 0.21 foot below last month's mean level and 1.56 feet above normal. The lake level is 0.13 foot above the level observed for October 1983 and 3.16 feet above Low Water Datum.

GROUND-WATER LEVELS for October continued to decline in most areas of the state; exceptions were in unconsolidated aquifers adjacent to streams where water levels rose slightly during the month. Ground-water levels were generally below those levels observed last month and above those levels observed for October 1983. Generally, ground-water levels are from 1 to 2 feet below normal throughout the state. An exception to this is in the consolidated aquifers in the northwestern portion of the state where water levels are about 1 foot above normal. Ground-water levels in southeastern Ohio continue to be noticeably low in response to the deficient precipitation. Ground-water storage for water supply remains favorable throughout the state. Most of those depending on groundwater for water supplies have made provisions and are prepared for these dry periods.

GROUND-WATER LEVELS



MONTHLY WATER INVENTORY REPORT FOR OHIO

Compiled by Leonard J. Harstine

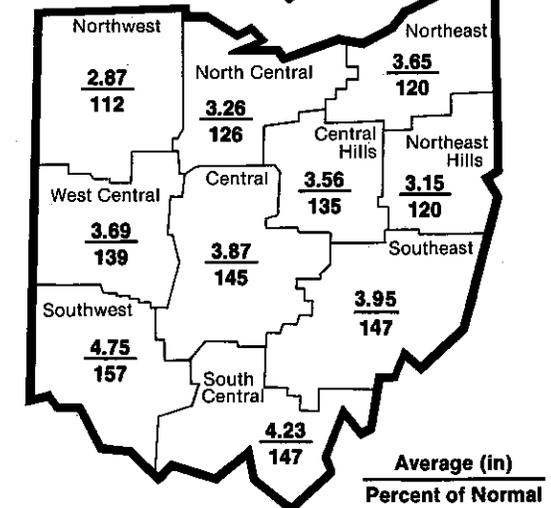
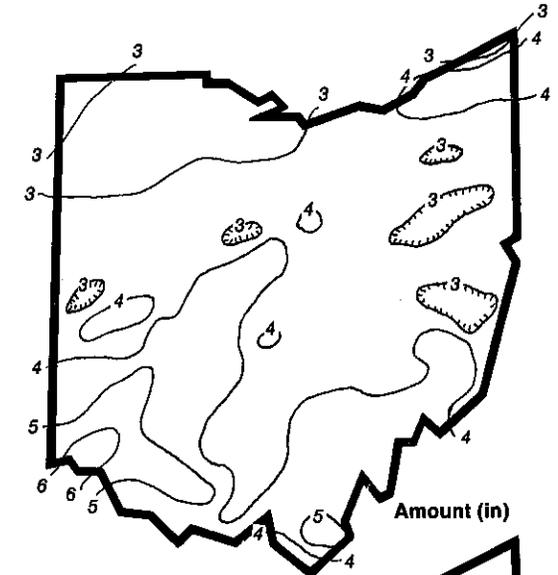
PRECIPITATION

PRECIPITATION for November was above normal throughout the state. The average for the state as a whole was 3.70 inches, 0.96 inch above normal. Regional averages ranged from 4.75 inches, 1.72 inches above normal, for the Southwest region to 2.87 inches, 0.31 inch above normal, for the Northwest region. Milford, Clermont County, reported the greatest amount of precipitation for the month, 6.61 inches, and Bowling Green, Wood County, and Sandusky, Erie County, both reported 2.21 inches, the least amount.

The bulk of the month's precipitation fell during the first two weeks and the last two days. There were only small amounts between the 16th and the 26th. Snowfall was generally limited to the northeastern snowbelt area; however, there was snow in the southern portion of the state on the 18th. Chardon, Geauga County, reported 9.3 inches of snow for the month, which was slightly below normal. The above normal precipitation in November, combined with generally above normal precipitation in October, produced noticeable recharge to water supplies in most areas of the state.

Cumulative precipitation for the 1984 calendar year thus far remains noticeably below normal for most areas of the state; exceptions are in the North Central, Northeast and Central Hills regions where cumulative precipitation is above normal. The average for the 1984 calendar year thus far for the state as a whole is 33.55 inches, 1.04 inches below normal. Regional averages ranged from 36.68 inches, 0.08 inch below normal, for the Southwest region to 29.82 inches, 1.85 inches below normal, for the Northwest region. Departures from normal range from 2.45 inches above normal for the Northeast region to 4.47 inches below normal for the Southeast region.

Cumulative precipitation for the first two months of the 1985 water year for the state as a whole averaged 6.67 inches, 1.62 inches above normal. Regional averages ranged from 8.06 inches, 2.82 inches above normal, for the Southwest region to 5.03 inches, 0.02 inch above normal, for the Northwest region.



SUMMARY

Precipitation for November was above normal throughout the state. Reservoir storage is generally below normal while streamflow and ground-water storage is above normal. Lake Erie level continues its seasonal decline, but remains markedly above normal. The water supply situation remains favorable throughout the state.

NOTES AND COMMENTS

Governor Announces Ohio Water Advisory Council Members

July 13, 1984, Gov. Celeste signed into law a bill which, among other provisions, established the Ohio Water Advisory Council (Am. Sub. S.B. No. 360). The law specifies that the council shall consist of seven members who have a demonstrated interest in water management. The council shall have representation from the four functional areas of water management—dam safety, groundwater, surface water, and floodplain management—as well as three other members.

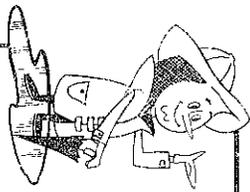
The council's purpose is to advise the chief of the Division of Water, to recommend policy and legislation on water management and conservation, review plans and programs for comprehensive water management in Ohio, and recommend ways to enhance cooperation among governmental water agencies to encourage wise use and protection of the state's ground- and surface waters.

The governor has announced the appointment of the following persons to serve on the council: Marquita McLean, Cincinnati, public member; Bayliss (Rock) Prater, Melmore, public member; Alexandria (Sandy) Buchanan, Columbus, public member; James L. Rozelle, Centerville, dam safety; George H. Mayhew, Orrville, groundwater; Karl M. Schurr, Bowling Green, surface water; and Lloyd E. Overly, Chillicothe, floodplain management.

ACKNOWLEDGEMENTS

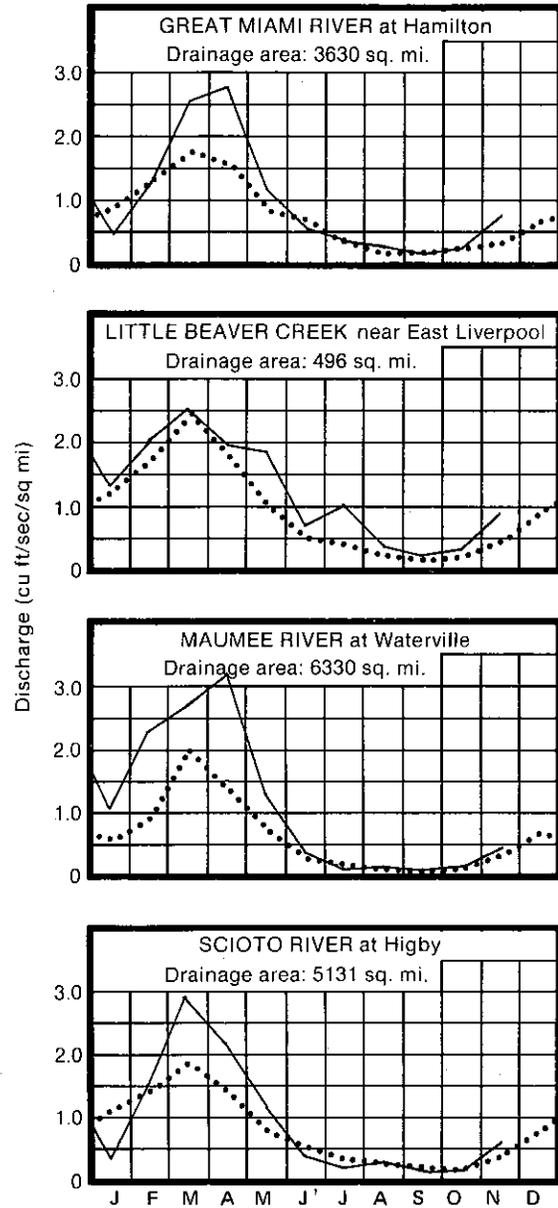
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Precipitation data:
U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service; The Miami Conservancy District; U.S. Army Corps of Engineers, Muskingum Area.
Streamflow and reservoir storage data:
U.S. Geological Survey, Water Resources Division.
Lake Erie level data:
U.S. Corps of Engineers, Detroit District.

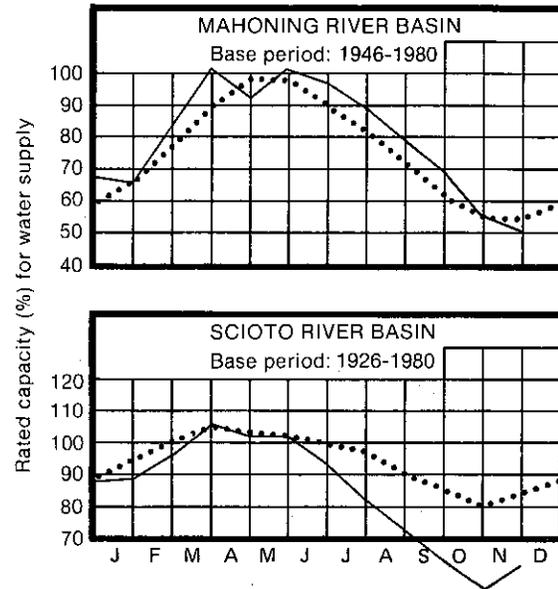


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FOUNTAIN SQUARE
COLUMBUS, OHIO 43224

MEAN STREAM DISCHARGE



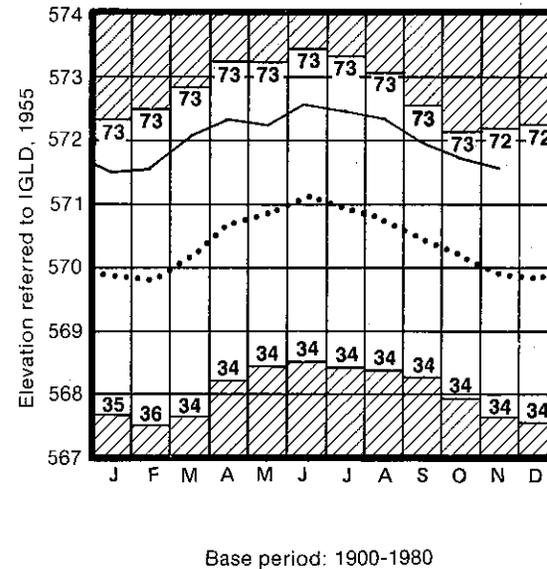
RESERVOIR STORAGE FOR WATER SUPPLY



RESERVOIR STORAGE for water supply for November decreased to below normal levels in the Mahoning River basin index reservoirs; this was primarily due to the lowering of the water level in Berlin Reservoir for construction purposes. Reservoir storage for the Scioto River basin increased but remained noticeably below normal as has been the case during the past five months. Reservoir storage at the month end for the Mahoning basin index reservoirs was 50 percent of rated capacity for water supply compared to 56 percent for last month and 67 percent for November 1983. Storage at the month end for the Scioto basin index reservoirs was 61 percent of rated capacity for water supply compared to 54 percent for last month and 89 percent for November 1983.

STREAMFLOW for November increased during the month and was excessive for most areas of the state; the only exception was in the northwest where streamflow was normal. Mean discharge and percent of normal for the index gaging stations were as follows: Great Miami River, 2,945 cfs, 268 percent; Little Beaver Creek, 450 cfs, 223 percent; Maumee River, 2,797 cfs, 173 percent; Scioto River, 3,219 cfs, 198 percent.

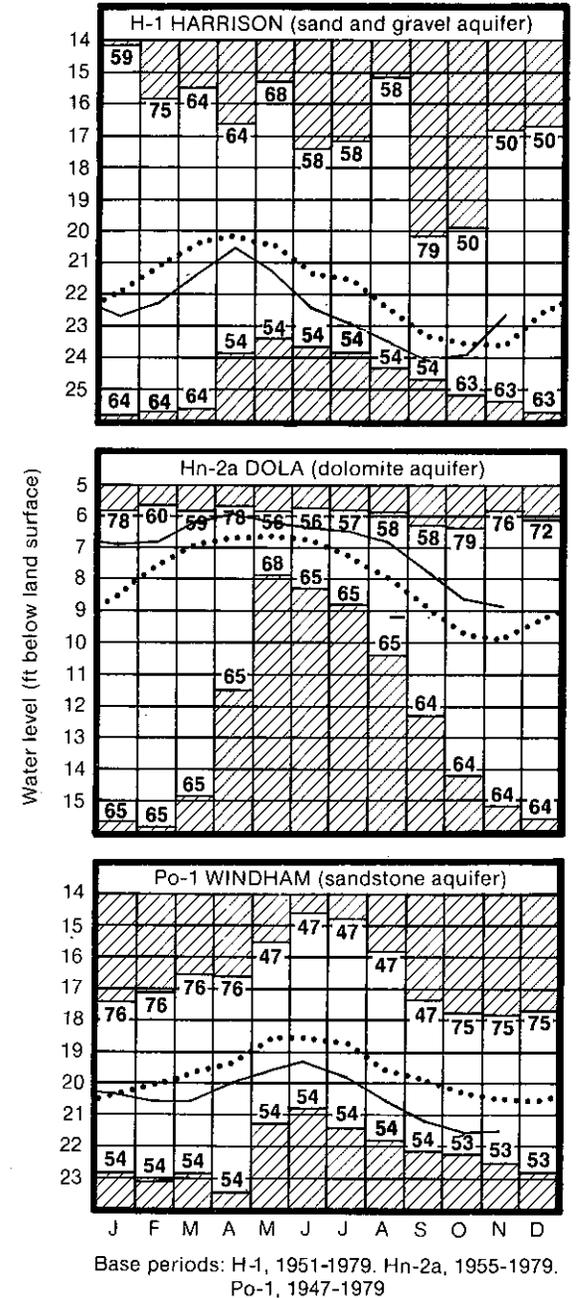
LAKE ERIE LEVELS



LAKE ERIE mean level declined slightly during the month. The mean level for November was 571.56 feet above IGLD (1955), 0.20 foot below last month's mean level and 1.64 feet above normal. The lake level is 0.01 foot below the level observed for November 1983 and 2.97 feet above Low Water Datum.

GROUND-WATER LEVELS showed noticeable rises during November throughout the state, whereas they usually show net declines or remain stable. The above normal precipitation in both October and November resulted in good recharge to ground-water storage in November. As a result, ground-water levels were noticeably above levels observed last month in most areas of the state; the only exception was in the consolidated aquifers in the northwest which received the least amount of precipitation. Ground-water levels are generally below those levels observed for November 1983. Water levels are above normal for most areas of the state; exceptions are in isolated areas in the Northeast Hills and Southeast regions where precipitation continues to be below normal for the calendar year.

GROUND-WATER LEVELS



MONTHLY WATER INVENTORY REPORT FOR OHIO

Compiled by Leonard J. Harstine

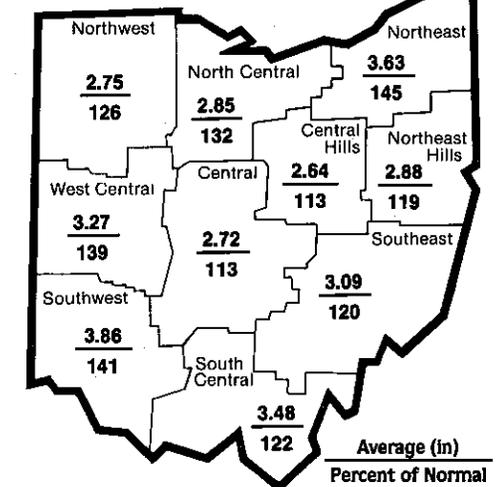
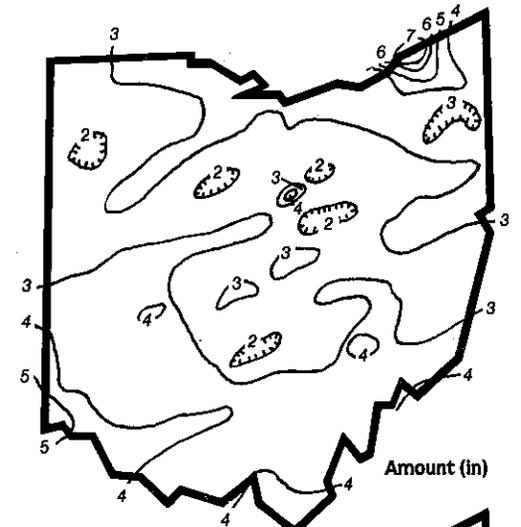
PRECIPITATION

PRECIPITATION for December was above normal throughout the state for the third consecutive month. The average for the state as a whole was 3.12 inches, 0.67 inch above normal. Regional averages ranged from 3.86 inches, 1.13 inches above normal, for the Southwest region to 2.64 inches, 0.30 inch above normal, for the Central Hills region. Painesville, Lake County, reported the greatest amount of precipitation for the month, 7.24 inches, of which 3.70 inches fell Dec. 22 and 5.75 inches fell during the last 10 days of the month. Greer, Knox County, reported the least amount of precipitation for the month, 1.05 inches.

There were measurable amounts of precipitation during every week of the month although precipitation was heaviest during the last 10 days in most areas of the state. Most of the month's precipitation came in the form of rain; however, Chardon, Geauga County, reported 20.8 inches of snow which was slightly below normal. In general, most areas of the state received between 2.5 and 3.5 inches of precipitation. The above normal precipitation during the first three months of the 1985 recharge season has produced significant amounts of recharge to water supplies.

Precipitation for the 1984 calendar year was generally above normal in the southwestern and northeastern portions of the state and below normal in the northwest, central and southeastern portions. The average for the state as a whole was 36.67 inches, 0.37 inch below normal. Regional averages ranged from 40.68 inches, 3.58 inches above normal, for the Northeast region to 32.57 inches, 1.28 inches below normal, for the Northwest region. Andover, Ashtabula County, received the greatest amount of precipitation for the year, 54.11 inches and Grover Hill, Paulding County, received the least amount, 29.65 inches. An isohyetal map, and regional averages and departures from normal appear on the last page of this report.

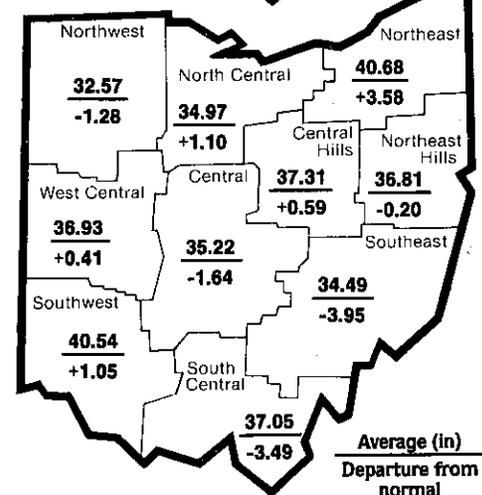
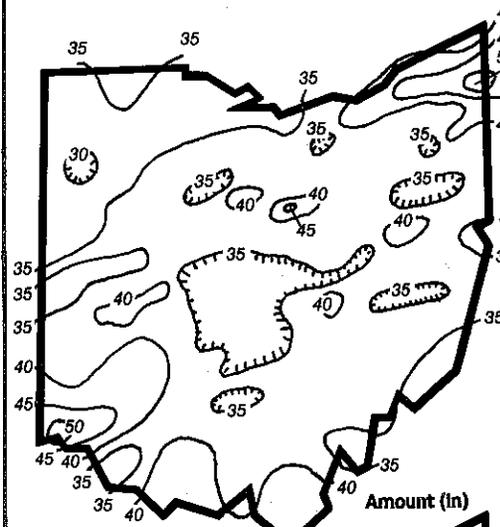
Cumulative precipitation for the first three months of the 1985 water year is above normal throughout the state. The average for the state as a whole is 9.79 inches, 2.29 inches above normal. Regional averages range from 11.92 inches, 3.95 inches above normal, for the Southwest region to 7.78 inches, 0.59 inch above normal, for the Northwest region.



SUMMARY

Precipitation for December was above normal throughout the state. Streamflow was above normal and reservoir storage and ground-water storage showed noticeable increases. Lake Erie level declined but continued to be markedly above normal.

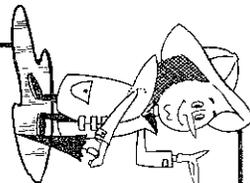
PRECIPITATION 1984



ACKNOWLEDGEMENTS

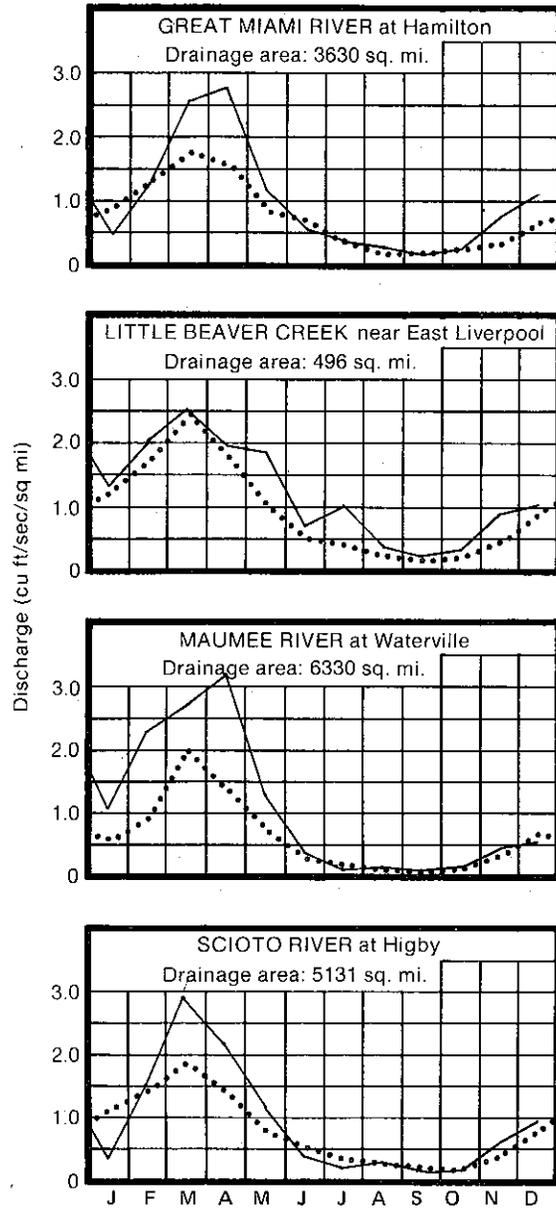
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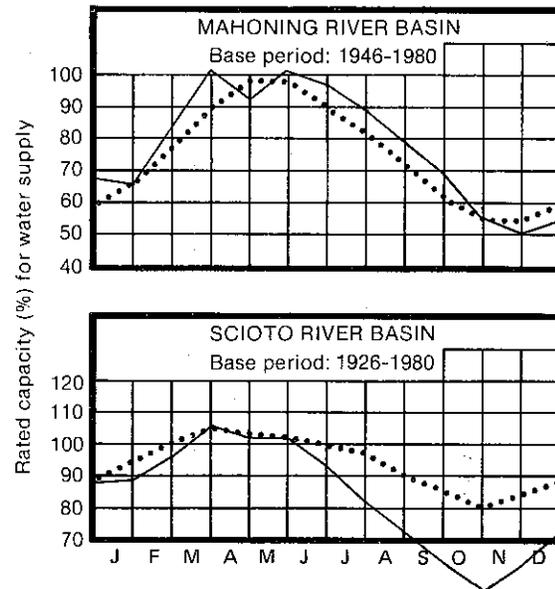
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MEAN STREAM DISCHARGE



Base period for all streams: 1951-1980
normal current ———

RESERVOIR STORAGE FOR WATER SUPPLY

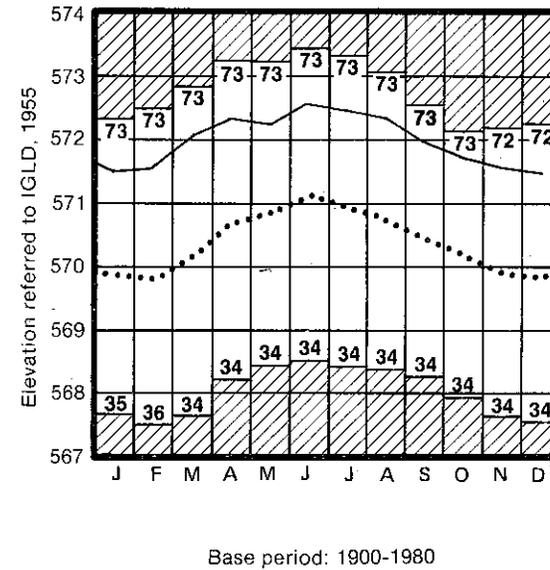


RESERVOIR STORAGE for water supply for December increased but remained below normal in both the Mahoning River and the Scioto River basins. Storage in the Mahoning River basin was slightly below normal while that in the Scioto River basin was noticeably below normal. Reservoir storage in both the Mahoning and the Scioto basins was noticeably below the storage observed for December 1983. Reservoir storage at the month end for the Mahoning basin index reservoirs was 54 percent of rated capacity for water supply compared to 50 percent for last month and 67 percent for December 1983. Storage at the month end for the Scioto basin index reservoirs was 70 percent of rated capacity for water supply compared to 61 percent for last month and 88 percent for December 1983.

STREAMFLOW for December was above normal throughout the state. Mean discharge and percent of normal at the index gaging stations were as follows: Great Miami River, 4,307 cfs, 181 percent; Little Beaver Creek, 523 cfs, 112 percent; Maumee River, 3,599 cfs, 81 percent; Scioto River, 4,615 cfs, 114 percent.

Cumulative runoff and departures from normal for the first three months of the 1985 water year at the index gaging stations were as follows: Great Miami River, 2.57 inches, 1.05 inches above normal; Little Beaver Creek, 2.59 inches, 0.89 inch above normal;

LAKE ERIE LEVELS



Maumee River, 1.35 inches, 0.23 inch below normal; Scioto River, 1.90 inches, 0.44 inch above normal. Runoff was considerably less throughout the state than at this time last year. However, most streams in December had sufficient flow to allow for pumpage to storage in upground reservoirs.

LAKE ERIE mean level declined slightly but remained noticeably above normal. The mean level for December was 571.42 feet above IGLD (1955), 0.14 foot below last month's mean level and 1.57 feet above normal. The mean level was 0.38 foot below the level observed for December 1983 and 2.82 feet above Low Water Datum.

GROUND-WATER LEVELS for December showed significant rises in all areas of the state in response to recharge from above normal precipitation during the past three months. Generally, the rises were equal to or greater than usually observed for December. Water levels in all areas of the state were higher than last month but below those levels observed for December 1983. Ground-water levels are generally above normal throughout the state; the only exceptions are in aquifers in the eastern portion of the state where water levels are about 1 foot below normal. The ground-water storage situation, therefore, appears to be in excellent condition for this recharge season thus far.

GROUND-WATER LEVELS

