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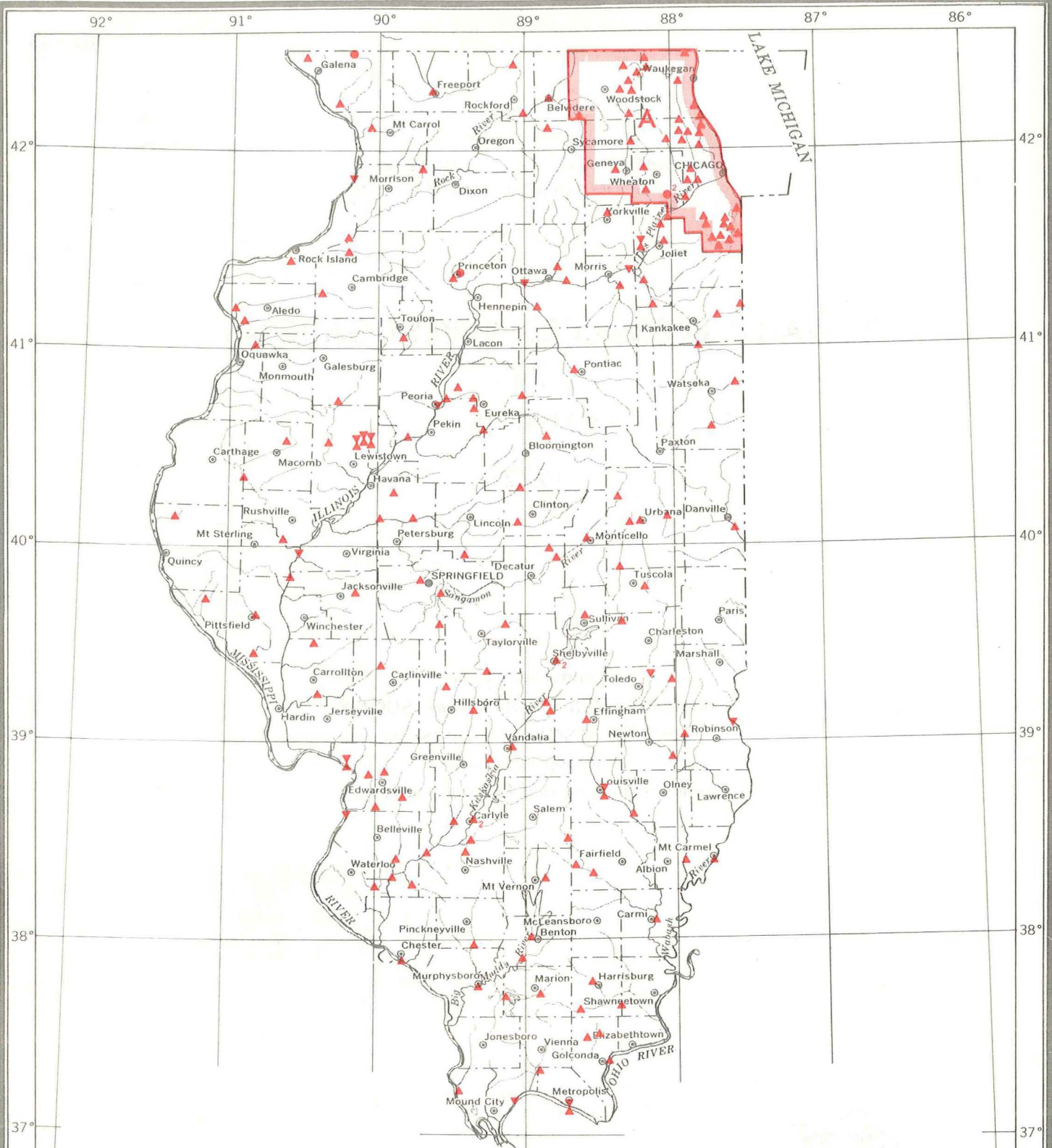
WATER RESOURCES INVESTIGATIONS  
IN  
ILLINOIS  
1972



Conducted by the  
UNITED STATES GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION  
in cooperation with  
State, Municipal, and Federal Agencies



INQUIRIES MAY BE ADDRESSED TO  
District Chief, Water Resources Division  
U.S. Geological Survey  
P. O. Box 1026  
Champaign, Illinois 61820  
Telephone: (217) 359-3918  
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Chief Hydrologist  
U.S. Geological Survey  
Washington, D. C. 20242



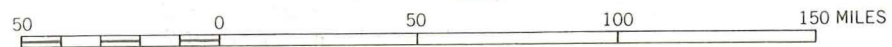
### HYDROLOGIC-DATA STATION ACTIVITIES AND INVESTIGATIONS IN PROGRESS IN ILLINOIS AS OF JUNE 1972

- ▲<sup>2</sup> Surface-water station (figure indicates number of closely spaced stations)

●<sup>2</sup> Observation well (figure indicates number of closely spaced wells)
- ▼ Water-quality station

▲ NOTE: Combined symbols indicate water-quality data also collected at surface- and/or ground-water stations

A Investigations in progress—see text



# WATER RESOURCES INVESTIGATIONS IN ILLINOIS

## INTRODUCTION

The water-resources program of the U.S. Geological Survey consists of the collection of basic information through its hydrologic-data stations, areal hydrologic and interpretive studies, and research projects. The basic data collected, the results of the areal studies, and the research findings are presented mainly in publications of the U.S. Geological Survey and Illinois agencies, but some appear also in technical journals and other publications. This folder contains a brief description of the water-resources investigations in Illinois in which the U.S. Geological Survey participates, and a list of selected references. Additional or more detailed information can be obtained from the District Chief, Water Resources Division, in Champaign.

Much of the work is a cooperative effort in which the planning and financial support are shared by State and local governments and other Federal agencies. In Illinois, various parts of the program are conducted in cooperation with: Illinois Department of Registration and Education, State Water Survey Division; Illinois Department of Transportation, Division of Water Resource Management, and Division of Highways; Illinois Institute for Environmental Quality; Northeastern Illinois Planning Commission; Metropolitan Sanitary District of Greater Chicago; Sanitary District of Bloom Township; McHenry County Planning Commission; Fountain Head Drainage District; Cook County Forest Preserve District; University of Illinois; City of Springfield; U.S. Army Corps of Engineers; and the U.S. Atomic Energy Commission.

## HYDROLOGIC-DATA STATION ACTIVITIES

### SURFACE WATER

The frequency of measurement and the number of stations at which surface-water flow (discharge) and stage (height) are measured are as follows:

Stream stations - - - - -		614
Continuous records:		
Discharge and stage - - - - -	164	
Stage only- - - - -	3	
Partial record:		
Peak flow and stage - - - - -	171	
Peak flow only- - - - -	252	
Low flow only - - - - -	22	
Peak and low flow - - - - -	2	
Lake and reservoir stations- - - - -		8
Stage and contents - - - - -	3	
Stage only- - - - -	5	
Total - - - - -		<u>622</u>

Continuous-record stream stations and lake and reservoir stations are shown on the principal map. Stations not shown on the map include partial-record stations and 47 discontinued stations from which adequate records have been obtained for general hydrologic purposes.

# WATER RESOURCES INVESTIGATIONS IN ILLINOIS

## HYDROLOGIC-DATA STATION ACTIVITIES—CONTINUED

### SURFACE WATER—CONTINUED

Water-quality data are obtained at 7 of the continuous-record stream stations listed above and also at 8 other surface-water sites where discharge and stage are not measured. The type of data collected at these stations and the frequency of sampling are as follows:

Chemical quality:		
Daily - - - - -	-----	2
Monthly - - - - -	-----	1
Weekly - - - - -	-----	1
Temperature:		
Continuously - - - - -	-----	12
Daily - - - - -	-----	2
Weekly - - - - -	-----	2
Specific conductance:		
Continuously - - - - -	-----	5
Sediment:		
Suspended:		
Daily - - - - -	-----	2

The above water-quality stations are shown on the principal map. Not included in the tabulation above nor shown on the map are monthly temperatures, which are obtained at the 164 continuous-record stations and the 24 low-flow partial-record stations, and monthly water samples, which are obtained at 24 continuous-record and 24 low-flow partial-record stations. Records also have been collected at 2 discontinued quality stations that are not shown on the map.

### GROUND WATER

The frequency of measurement and the number of observation wells at which water levels are measured are as follows:

Water levels in wells- - - - -	-----	4
Continuously - - - - -	-----	3
Weekly - - - - -	-----	1

These wells are shown on the principal map.

Water-quality data are available from two discontinued wells not shown on the map.

## INVESTIGATIONS IN PROGRESS

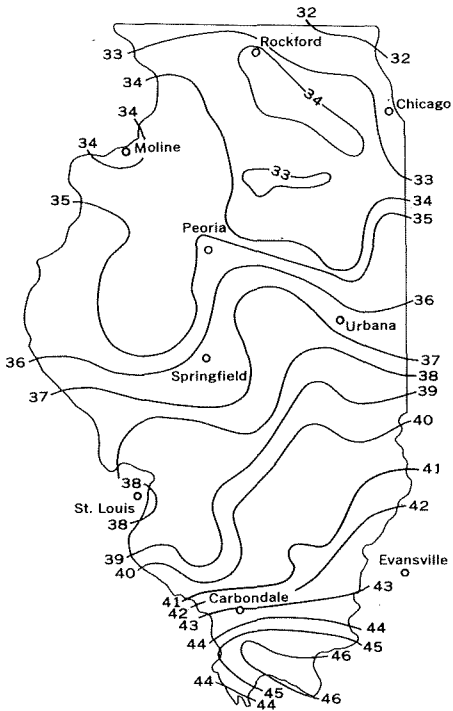
### SHOWN ON MAP

A. Flood-inundation mapping in northeastern Illinois metropolitan area.

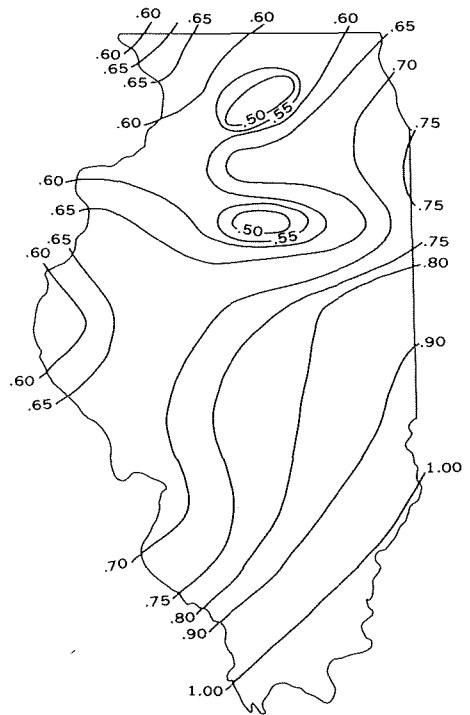
### NOT SHOWN ON MAP

Hydrologic and channel-hydraulic analyses at bridge at bridge sites--38 bridge-site reports have been prepared since the program began in 1956,  
Floods in Illinois--magnitude and frequency.  
Statewide drainage area project.

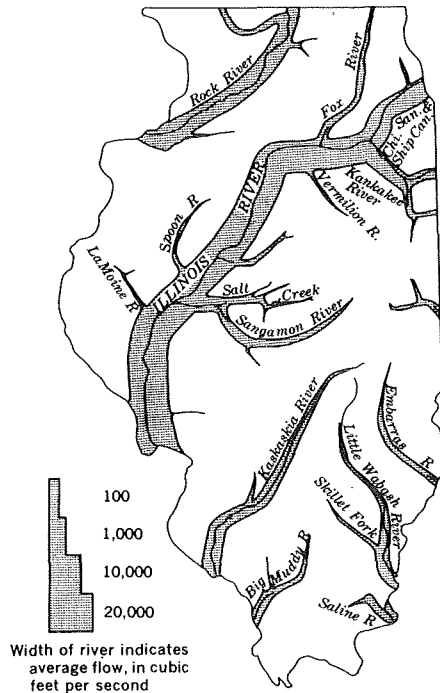
# WATER RESOURCES INVESTIGATIONS IN ILLINOIS



AVERAGE ANNUAL PRECIPITATION, IN INCHES, 1906-55  
(Data from Illinois State Water Survey)



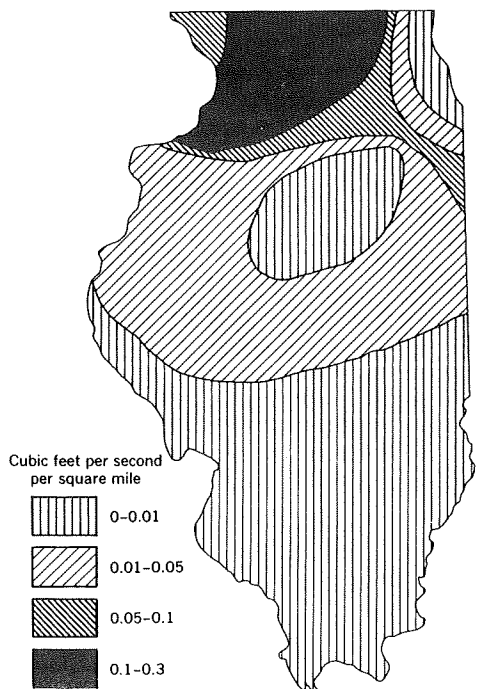
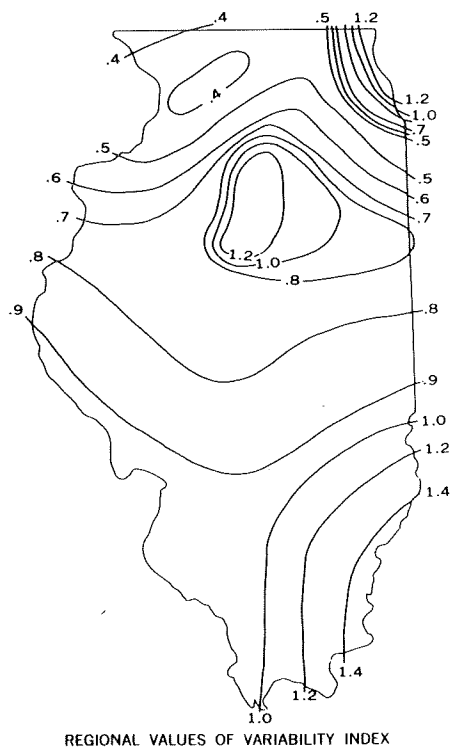
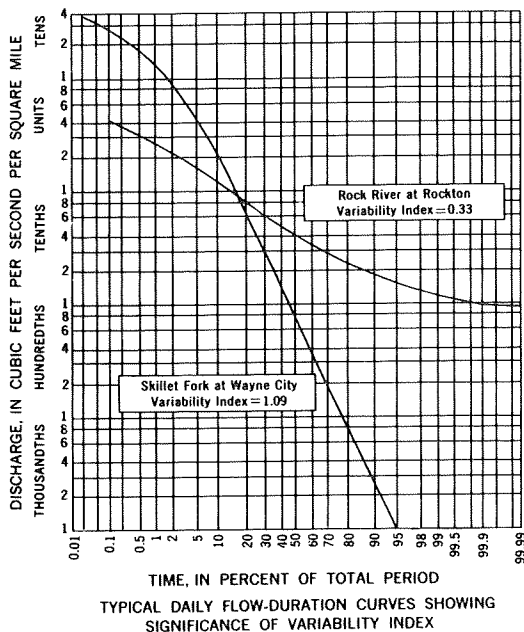
AVERAGE DISCHARGE, IN CUBIC FEET PER SECOND PER SQUARE MILE



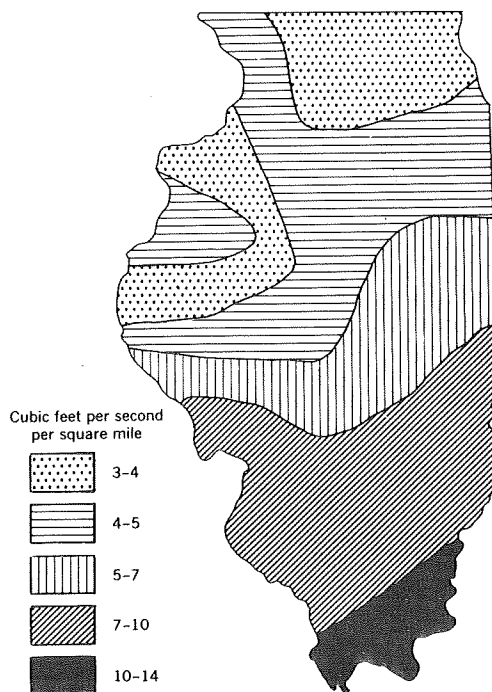
AVERAGE DISCHARGE OF THE PRINCIPAL RIVERS

# WATER RESOURCES INVESTIGATIONS IN ILLINOIS

Variability refers to the variations that occur among the daily discharges of a given stream and is expressed by a flow-duration curve. The variability index, as used on the accompanying diagrams, is the mathematical expression of the slope of the flow-duration curve. Differences in the variability index indicate differences in the variability between one stream or region and another. The higher the variability index, the steeper the slope of the flow-duration curve and the greater the range of discharge to be expected.



LOWEST AVERAGE DISCHARGE PER SQUARE MILE, ON RECORD,  
FOR 30 CONSECUTIVE DAYS



HIGHEST AVERAGE DISCHARGE PER SQUARE MILE, ON RECORD,  
FOR 30 CONSECUTIVE DAYS

# WATER RESOURCES INVESTIGATIONS IN ILLINOIS

## REPORTS OF INVESTIGATIONS—SELECTED REFERENCES—CONTINUED

### PUBLICATIONS OF THE U.S. GEOLOGICAL SURVEY—CONTINUED

Floods.--Notable floods are summarized in an annual report "Floods of 19\_\_." Methods for estimating the frequency and magnitude of floods for particular streams are given in the WSP series "Magnitude and Frequency of Floods in the United States," which comprises reports released in parts by drainage basins; data for ILLINOIS are in Parts 3, 4 and 5. The U.S. Geological Survey is outlining flood-prone areas on topographic maps as part of a recent nationwide Federal program for managing flood losses. Excerpts from these topographic maps showing urban areas with flood problems are being published as pamphlets. In ILLINOIS, 102 topographic maps and 29 urban-area pamphlets have been completed. Information on these maps and pamphlets is available from the District Chief, Water Resources Division, at the address given on the cover of this folder.

Ground-water data.--Ground-water levels and artesian pressures in observation wells are reported by geographic areas in a 5-year WSP series. Data for ILLINOIS are in "Ground-Water Levels in the United States, North-Central States."

Quality of water data.--Data on quality of surface water are given in the WSP series "Quality of Surface Waters of the United States," which also is released in numbered parts as determined by natural drainage basins. Data for ILLINOIS are in Parts 3, 4, and 5. As of the 1964 water year these data also are being released annually on a State basis; such reports are listed in this folder under "Open-File Reports of the U.S. Geological Survey."

Research in progress and results of completed investigations are given by fiscal year in Geological Survey Research (Professional Paper series): 1967, PP 575-A; 1968, PP 600-A; 1969, PP 650-A; 1970, PP 700-A; 1971, PP 750-A.

A more complete State list of reports of the U.S. Geological Survey is given in a pamphlet "Geologic and Water-Supply Reports and Maps--ILLINOIS." Summary statements about the water situation are presented in the "Water Resources Review," which is issued monthly. The State list and the Review may be obtained free on application to the U.S. Geological Survey, Washington, D.C. 20242.

### OPEN-FILE REPORTS OF THE U.S. GEOLOGICAL SURVEY

Open-file reports are available for consultation in the Illinois and Washington, D.C., offices of the U.S. Geological Survey, but copies ordinarily are not reproduced for distribution. Information on their availability may be obtained from the District Chief, Water Resources Division, U.S. Geological Survey, P. O. Box 1026, Champaign, Illinois 61820.

Allen, H. E. and Noehre, A. W., Floods in Arlington Heights quadrangle, Illinois; supplement to Hydrologic Investigations Atlas, HA-67: 1971.

Curtis, G. W., Statistical summaries of Illinois stream-flow data: 1969.

Ellis, D. W., Floodflows from small drainage areas in Illinois; preliminary flood-frequency relations: 1968.

Sieber, C. R., A proposed streamflow data program for Illinois: 1970.

U.S. Geological Survey, Surface water records of Illinois: 1961, 1962, 1963, 1964, 1965.

Quality of water records of Illinois: 1964, 1965.

Water resources data for Illinois--Part 1, Surface water records; Part 2, Water quality records: 1966, 1967, 1968, 1969, 1970.

### OTHER PUBLICATIONS

(Address inquiries about availability of these reports to the publishers)

Carns, J. M., 1972, Magnitude and frequency of floods in Illinois: Illinois Dept. Transportation, Div. Water Resource Management, (in press)

Illinois Department of Public Works and Buildings, 1943, The floods of May 1943 in Illinois: Illinois Dept. Public Works and Bldgs., Div. Waterways.

Illinois Department of Registration and Education, 1952, The storm of July 8, 1951, in northcentral Illinois: Illinois State Water Survey Div. Rept. Inv. 14.

Lara, O. G., 1970, Low-flow frequencies of Illinois streams: Illinois Dept. Public Works and Bldgs., Div. Waterways.

Larson, B. O., Hiser, H. W., and Daniels, W. S., 1955, The storm of July 18-19, 1952, Rockford, Illinois, and vicinity: Illinois State Water Survey Div. Rept. Inv. 24.

Mitchell, W. D., 1948, Unit hydrographs in Illinois: Illinois Dept. Public Works and Bldgs., Div. Waterways.

1950, Water-supply characteristics of Illinois streams: Illinois Dept. Public Works and Bldgs., Div. Waterways.

1954, Floods in Illinois; magnitude and frequency: Illinois Dept. Public Works and Bldgs., Div. Waterways.

1957, Flow duration of Illinois streams: Illinois Dept. Public Works and Bldgs., Div. Waterways.



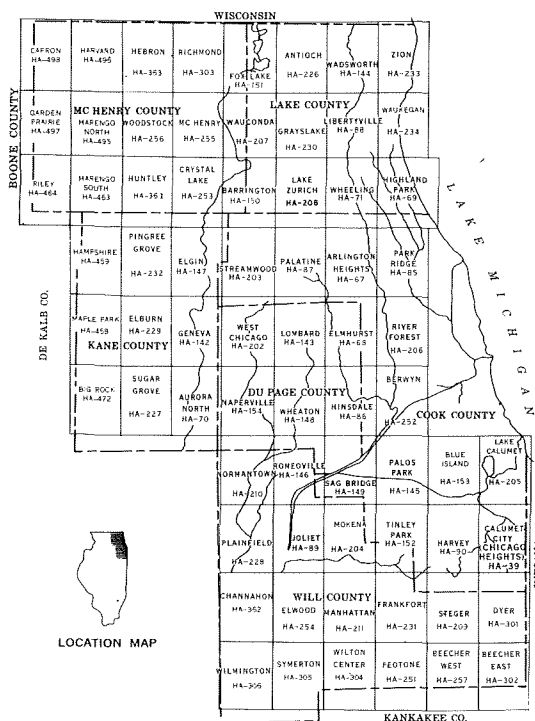
# WATER RESOURCES INVESTIGATIONS IN ILLINOIS

## REPORTS OF INVESTIGATIONS—SELECTED REFERENCES—CONTINUED

### PUBLICATIONS OF THE U.S. GEOLOGICAL SURVEY—CONTINUED

#### Hydrologic Investigations Atlases--Continued

- HA-202 Floods in \*\*\* quadrangle, Illinois, 1965-66. 202, to-211. West Chicago. 203, Streamwood. 204, Mokena. 205, Lake Calumet. 206, River Forest. 207, Wauconda. 208, Lake Zurich. 209, Steger. 210, Normantown. 211, Manhattan.
- HA-226 Floods in \*\*\* quadrangle, in northeastern to-234. Illinois, 1966-67. 226, Antioch. 227, Sugar Grove. 228, Plainfield. 229, Elburn. 230, Grayslake. 231, Frankfort. 232, Pingree Grove. 233, Zion. 234, Waukegan.
- HA-251 Floods in \*\*\* quadrangle, in northeastern to 257. Illinois. 1967-68. 251, Peotone. 252, Berwyn. 253, Crystal Lake. 254, Elwood. 255, McHenry. 256, Woodstock. 257, Beecher West.
- HA-301 Floods in \*\*\* quadrangle, in northeastern to 306. Illinois, 1968-71. 301, Dyer. 302, Beecher East. 303, Richmond. 304, Wilton Center. 305, Symerton. 306, Wilmington.
- HA-361 Floods in \*\*\* quadrangle, in northeastern to 363. Illinois. 1971. 361, Huntley. 362, Channahon. 363, Hebron.
- HA-458 Floods in \*\*\* quadrangle, in northeastern to 459. Illinois. 1972. (in press) 458, Maple Park. 459, Hampshire.
- HA-463 Floods in \*\*\* quadrangle, in northeastern to 464. Illinois. 1972. (in press) 463, Marengo South. 464, Riley.
- HA-472 Floods in Big Rock quadrangle, in northeastern Illinois. 1972. (in press)
- HA-495 Floods in \*\*\* quadrangle, in northeastern to 498. Illinois. 1972. (in press) 495, Marengo North. 496, Harvard. 497, Garden Prairie. 498, Capron.



AREAS OF FLOOD-INUNDATION MAPPING IN NORTHEASTERN ILLINOIS  
(PUBLISHED OR IN STAGE OF PUBLICATION AS HYDROLOGIC INVESTIGATIONS ATLASES)

Records of streamflow, floods, ground-water levels, and quality of water are published as Geological Survey Water-Supply Papers (WSP) in the series that follow. For further information on these series refer to the "State list" mentioned below or contact the District Chief, Water Resources Division, at the address given on the cover of this folder.

Streamflow data.--Records of daily flows of streams are given in the WSP series "Surface Water Supply of the United States," which is released in numbered parts as determined by natural drainage basins. Before 1961 this was an annual series, but beginning with 1961-65 a 5-year series is being used (for Illinois WSP 1909, 1910, 1911, 1914, and 1915). Monthly and yearly summaries of streamflow data from the annual WSP series are given in two compilations, which cover the same areas as those used for the annual series: "Compilation of Records of Surface Waters of the United States through September 1950" (for Illinois WSP 1305, 1307, and 1308), and "Compilation of Records of Surface Waters of the United States, October 1950 to September 1960" (for Illinois WSP 1725, 1727, and 1728). Data for ILLINOIS are given in Parts 3, 4, and 5. Also of interest are daily streamflow records that have been released annually since 1961 on a State basis; these reports are listed in this folder under "Open-File Reports of the U.S. Geological Survey."



# WATER RESOURCES INVESTIGATIONS IN ILLINOIS

## REPORTS OF INVESTIGATIONS—SELECTED REFERENCES—CONTINUED

### PUBLICATIONS OF THE U.S. GEOLOGICAL SURVEY—CONTINUED

#### Circulars

216. Water resources of the St. Louis area, Missouri and Illinois, by J. R. Searcy, R. C. Baker, and W. H. Durum, 1952.
456. Estimated use of water in the United States, 1960, by K. A. MacKichan and J. C. Kammerer, 1961.
476. Principal lakes of the United States, by C. D. Bue, 1963.
536. Are we running out of water?, by R. L. Nace, 1967.
554. Hydrology for urban land planning—a guidebook on the hydrologic effects of urban land use, by L. B. Leopold, 1968.
556. Estimated use of water in the United States, 1965, by C. R. Murray, 1968.
- 601-A. Water for the cities--the outlook, by W. J. Schneider and A. M. Spieker, 1969.
- 601-C. Flood hazard mapping in metropolitan Chicago, by J. R. Sheaffer, D. W. Ellis, and A. M. Spieker, 1970.
- 601-D. Water as an urban resource and nuisance, by H. E. Thomas and W. J. Schneider, 1970.
- 601-E. Sediment problems in urban areas, by H. P. Guy, 1970.
- 601-F. Hydrologic implications of solid-waste disposal, by W. J. Schneider, 1970.
- 601-G. Real-estate lakes, by D. A. Rickert and A. M. Spieker, 1972.
631. Disposal of liquid wastes by injection underground--Neither myth nor millennium, by A. M. Piper, 1969.
643. Reconnaissance of selected minor elements in surface waters of the United States, October 1970, by W. H. Durum, J. D. Hem, and S. G. Heidel, 1971.
645. A procedure for evaluating environmental impact, by L. B. Leopold, F. E. Clarke, B. B. Hanshaw, and J. R. Balsley, 1971.
676. Estimated use of water in the United States in 1970, by C. R. Murray and E. B. Reeves, 1972.

#### Hydrologic Investigations Atlases

##### Chemical Quality

- HA-61. Stream composition of the conterminous United States, by F. H. Rainwater, 1962.
- HA-199. Preliminary map of the conterminous United States showing depth to and quality of shallowest ground water containing more than 1,000 parts per million dissolved solids, by J. H. Feth and others, 1965.
- HA-200. Chemical quality of public water supplies of the United States and Puerto Rico, 1962, by C. N. Durfor and Edith Becker, 1964.
- HA-235. Temperature of surface waters in the conterminous United States by J. F. Blakey, 1966.

##### Ground Water

- HA-194. Generalized map showing annual runoff and productive aquifers in the conterminous United States, compiled by C. L. McGuinness, 1964.

##### Surface Water

- HA-212. Annual runoff in the conterminous United States, by M. W. Busby, 1966.
- HA-282. River discharge to the sea from the shores of the conterminous United States--A contribution to the International Hydrological Decade, compiled by Alfonso Wilson and others, 1967.
- HA-449. Floods on Loop Creek and Richland Creek near Belleville, Illinois, by J. D. Camp, 1972. (in press)

##### Floods in Northeastern Illinois

- HA-39. Floods near Chicago Heights, Illinois, 1960.
- HA-67. Floods in \*\*\* quadrangle, Illinois, 1963, 67, to 71. Arlington Heights, 68, Elmhurst, 69, Highland Park, 70, Aurora North, 71, Wheeling.
- HA-85. Floods in \*\*\* quadrangle, Illinois, 1964, 85, to 90. Park Ridge, 86, Hinsdale, 87, Palatine, 88, Libertyville, 89, Joliet, 90, Harvey.
- HA-142. Floods in \*\*\* quadrangle, Illinois, 1964-66, 142, to-154. Geneva, 143, Lombard, 144, Wadsworth, 145, Palos Park, 146, Romeoville, 147, Elgin, 148, Wheaton, 149, Sag Bridge, 150, Barrington, 151, Fox Lake, 152, Tinley Park, 153, Blue Island, 154, Naperville.

# WATER RESOURCES INVESTIGATIONS IN ILLINOIS

## REPORTS OF INVESTIGATIONS—SELECTED REFERENCES

Selected references on water in Illinois follow; many of them are available for reference at one of the offices shown on the title page and at the larger public and university libraries.

### PUBLICATIONS OF THE U.S. GEOLOGICAL SURVEY

Professional Papers and Water-Supply Papers are sold by the Superintendent of Documents, Washington, D.C. 20402. Circulars are free on application to the U.S. Geological Survey, Washington, D.C. 20242. Hydrologic Investigations Atlases and other map series are sold by the U.S. Geological Survey, Washington, D.C. 20242. For those interested in forthcoming reports, subscriptions to a monthly list "New Publications of the Geological Survey" are available free on application to the U.S. Geological Survey, Washington, D.C. 20242.

#### Professional Papers

218. Geology and mineral resources of the Hardin and Brussels quadrangles (in Illinois), by W. W. Rubey, 1952.
- 448-H. Low-flow characteristics of streams in the Mississippi embayment in Tennessee, Kentucky, and Illinois, by P. R. Speer, W. J. Perry, J. A. McCabe, O. G. Lara, and others, with a section on Quality of the water, by H. G. Jeffery. 1965.
492. Thermal springs of the United States and other countries of the world--A summary, by G. A. Waring. 1965.
831. Ground-water development and management opportunity in the Ohio River region, by R. M. Boyd, Jr. 1972. (in press)

#### Water-Supply Papers

334. The Ohio Valley flood of March-April 1913, including comparisons with some earlier floods, by A. H. Horton and H. J. Jackson. 1913.
838. Floods of Ohio and Mississippi Rivers, January-February 1937, by N. C. Grover; with a section on the Flood deposits of the Ohio River, January-February 1937, by G. R. Mansfield. 1938.
- 1260-C. Floods of 1952 in the basins of the upper Mississippi River and Red River of the North, 1955.
1299. The industrial utility of public water supplies in the United States, 1952, pt. 1, States east of the Mississippi River, by E. W. Lohr and S. K. Love. 1954.
- 1370-B. Floods of October 1954 in the Chicago area, Illinois and Indiana, by W. S. Daniels and M. D. Hale. 1958.

#### Water-Supply Papers--Continued

1473. Study and interpretation of the chemical characteristics of natural water, 2d edition, by J. D. Hem. 1970.
- 1669-O. Ground-water conditions at Argonne National Laboratory, Illinois, 1948-60, by D. B. Knowles, W. J. Drescher, and E. F. LeRoux. 1963.
- 1669-S. Yearly variations in runoff for the conterminous United States, 1931-60, by M. W. Busby. 1963.
1797. Has the United States enough water?, by A. M. Piper. 1965.
1800. The role of ground water in the national water situation, by C. L. McGuinness. 1963.
1812. Public water supplies of the 100 largest cities in the United States, 1962, by C. N. Durfor and Edith Becker. 1964.
1838. Reservoirs in the United States, by R. O. R. Martin and R. L. Hanson. 1966.
1871. Water data for metropolitan areas in the United States--A summary of data from 222 areas, compiled by W. J. Schneider. 1968.
- 1899-I. Streamflow from the United States into the Atlantic Ocean during 1931-60, by C. D. Bue. 1970.
1990. Annotated bibliography on artificial recharge of ground water, 1955-67, by D. C. Signor, D. J. Growitz, and William Kam. 1970.
2002. Water in urban planning, Salt Creek basin, Illinois, by A. M. Spieker. 1970.
2005. Model hydrographs, by W. D. Mitchell. 1972.
2020. Subsurface waste disposal by means of wells--A selective annotated bibliography, by D. R. Rima, E. B. Chase, and B. M. Myers. 1971.