UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

FLOODS OF OCTOBER 1954 IN THE CHICAGO AREA
ILLINOIS AND INDIANA

By
Warren S. Daniels
and
Malcolm D. Hale

Prepared in cooperation with the

STATES OF ILLINOIS AND INDIANA

Open-file report

Washington, D. C., 1955

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PREFACE

This preliminary report on the floods of October 1954 in the Chicago area of Illinois and Indiana was prepared by the Water Resources Division, C. G. Paulsen, chief, under the general direction of J. V. B. Wells, chief, Surface Water Branch.

Basic records of discharge in the area covered by this report were collected in cooperation with the Illinois Department of Public Works and Buildings, Division of Waterways; the Indiana Flood Control and Water Resources Commission; and the Indiana Department of Conservation, Division of Water Resources.

The records of discharge were collected and computed under the direction of J. H. Morgan, district engineer, Champaign, Ill.; and D. M. Corbett, district engineer, Indianapolis, Ind. The data were computed and text prepared by the authors in the district offices in Illinois and Indiana. The report was assembled by the staff of the Technical Standards Section in Washington, D. C., Tate Dalrymple, chief.

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FLOODS OF OCTOBER 1954 IN THE CHICAGO AREA ILLINOIS AND INDIANA

INTRODUCTION

The greatest flood in the history of Chicago resulted from heavy showers and thunderstorms during the period October 9-11, 1954. The 24-hour rainfall on October 9 and 10 was the greatest in 69 years, and the 48-hour total was the greatest in the 84-year record of the Chicago station. The storms and floods extended into Indiana where previous records were broken. At 24 gaging stations in the area peak discharges exceeded previously recorded maxima.

Occurring in a region that is densely populated and highly industrialized, the floods caused unprecedented damage. Fortunately casualties were few. No lives were lost through causes directly attributable to the floods, although a dozen or more persons were killed in accidents indirectly associated with the storms and floods.

Data presented in this preliminary report include records of streamflow at 50 gaging stations and miscellaneous sites in Illinois and Indiana. A comprehensive flood report, one of a series of water supply papers dealing with the floods of 1954, will be published at a later date.

GENERAL DESCRIPTION OF FLOODS

Location

The area associated with floods discussed in this report is centered about Chicago, the Nation's second largest city, and the southern tip of Lake Michigan, including parts of northwestern Indiana and northeastern Illinois. It extends roughly 140 miles east and west, from South Bend and Plymouth, Ind., to Ottawa, Ill., and about 90 miles north and south from the northern edge of Cook County (Chicago metropolitan area) to Kankakee, Ill. Much of the region in each state is densely populated and highly industrialized. The map of figure 1 covers the general area of flooding.

There was a narrow belt of heavy rainfall and high runoff in Illinois which extended from Chicago to the Mississippi River in the vicinity of Rock Island, Ill., and Muscatine, Iowa. West of the Fox River basin the floods were not severe and damage was comparatively small. This farther western area has, therefore, been considered outside the scope of this report.

The streams affected by the storm and flood include all those tributary to Lake Michigan in Illinois and Indiana, lying in a relatively narrow area along the lake shore, the headwaters of the Kankakee River in Indiana, the entire Des Plaines River basin, and the Du Page and Fox River basins, which are tributary to the Illinois River on the north side of the river.

Figure 1 is a map of northeastern Illinois and northwestern Indiana showing flood-determination points. As there are 26 gaging stations operated in Cook County, figure 2 has been drawn to show that area in greater detail.

Little Calumet River Basin

The Little Calumet River basin is very flat and storm drainage has long been recognized as a problem. Not only did the Little Calumet River go over its banks to flood extensive areas, but inundation was severe along all the tributary streams in southern Cook County, Illinois. It was reported that every house in the village of Midlothian was surrounded with water, temporarily marooning 4,400 families. The industrial city of Harvey, 22 miles south of Chicago, was almost completely inundated south of the Grand Trunk railway embankment, including the main business district. Steel plants and oil refineries in Blue Island were damaged. Other towns hard hit were Palos Park, Worth, Oak Lawn, Alsip, Crestwood, Robbins, Posen, Markham, Hazel Crest, Garden Homes, and Homewood.

The experience of Geological Survey engineers in attempting to reach gaging stations in this area was described best as "frustrating", because of the many flooded and impassable highways. An ordinary fifteen-minute drive became a two-hour process of doubling around the maze of highways hunting an open road. The great concentration of railways about Chicago has resulted in construction of hundreds of underpasses to avoid grade crossings. Many of these underpasses filled with water and were closed for days after the streams had receded. No complete count is available, but at least 57 underpasses were closed in Cook County. A summary of road conditions on October 11 by the Cook County Highway Department listed 67 points as being under water and blocked to traffic.

Dredging has greatly modified the basin characteristics of the Little Calumet River. During low flow that portion of the drainage area west of a divide near Georgia Street at Gary, Ind., contributes flow which runs west to Lake Michigan or into the Calumet Sag Channel depending on the operation of locks into the Calumet Sag Channel; that portion east of Georgia Street contributes flow which runs east through Burns ditch to Lake Michigan. All of the flow of Deep River, Salt Creek, and that portion of Little Calumet River east of the mouth of Deep River flows into Lake Michigan through Burns ditch.

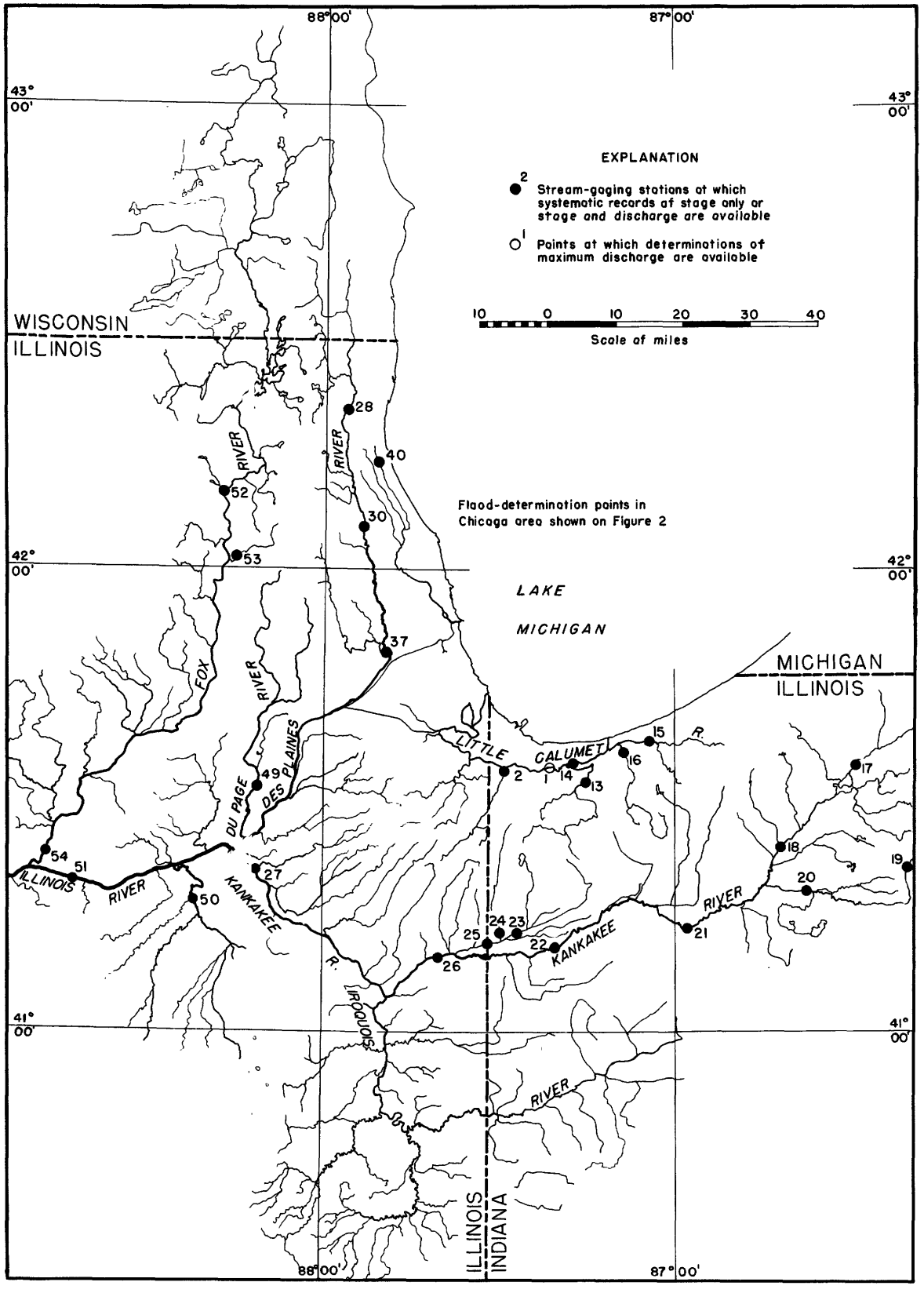

Figure 1.--Map of flood area showing location of flood-determination points

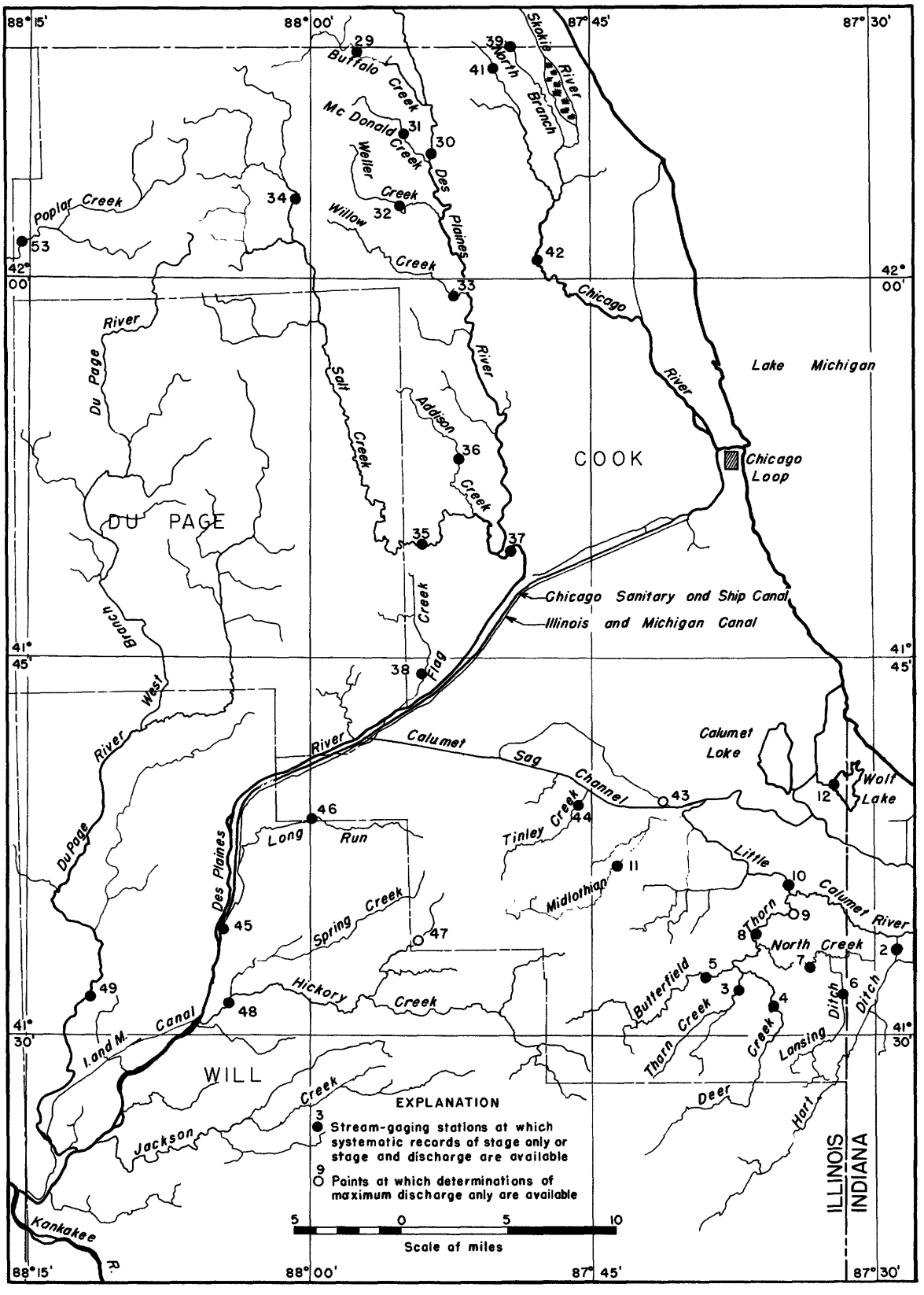

Figure 2.--Map of Chicago area, Cook County, showing location of flood-determination points

On the rising stage of this flood the flow at the mouth of Hart ditch ran both east and west in the Little Calumet River channel. Most of the flow to the east went into storage inundating the large area between Broadway, Gary, Ind., and Hawthorne Drive, Hammond, Ind. A small portion of the flow ran east through Burns ditch to Lake Michigan.

At the time of the peak stage at Grant Street, Gary, Ind., the discharge through a culvert was 244 cubic feet per second flowing east. Flood elevations show the dividing point for the flow at peak stage to be near Calumet Avenue, Hammond, Ind., west of the mouth of Hart ditch.

As the stage fell the direction of flow near Hart ditch reversed, water came out of storage, and flowed west. Prolonged inundation occurred over a large area in the basin.

Kankakee River Basin

Extreme flooding occurred in the upper portion of the Kankakee River basin. The Yellow River at Knox, Ind., had a peak discharge 80 percent greater than the previous maximum in 12 years of record. Because of the flat terrain large areas were flooded when the streams went out of their banks, resulting in some intermingling of flood waters across normal drainage divides. Wide-spread flooding of the flat terrain resulted in a large volume of storage and a very slow-moving flood crest along the main stem of the Kankakee River. At Shelby, Ind. the crest occurred on October 27, 17 days after the rain.

The lower Kankakee River (in Illinois) suffered only moderate flooding, but the peaks occurred earlier. The station at Momence, close to the Indiana line crested October 15. Nearer the mouth, at Wilmington station, the peak was recorded October 12. This progressively earlier cresting is attributed to heavier flood runoff from the tributary area on the right bank between the river and southern Cook County.

Des Plaines River Basin

Northwest and west of Chicago proper the Des Plaines River and tributaries caused considerable damage, although less than the Little Calumet River basin streams caused elsewhere.

Salt Creek and Addison Creek flood stages were higher than previously recorded although the discharge at Salt Creek at Western Spring, Ill., was less than for the March 1948 flood. Newspapers reported 5,000 basements flooded in La Grange and 600 in Western Springs. Thousands of calls for assistance in pumping

out cellars were received by fire departments throughout the Chicago area. Because of the potential hazard in having telephone service tied up, it was necessary to broadcast radio appeals to the public not to call fire departments except for fire emergencies. Higgins Road, the Northwest Highway, and North Road--all major highways--were flooded and temporarily closed.

Along the Des Plaines River to the southwest the tributaries were extremely high and local damage and blocking of roads resulted. The gently rolling and hilly topography differs from that of the flat lowland along the lake shore. Flag Creek and Long Run had the highest unit peak runoff determined in the flood area, 80.2 and 152 cubic feet per second per square mile, respectively, at the gaging station on each creek. Hickory Creek at Joliet, Ill., did not equal the April 1947 flood peak and damage was correspondingly less. However, hundreds of basements were flooded and the American Steel and Wire Plant was shut down for two days.

Chicago River Basin

The Chicago River is formed by the confluence of the North and South Branches, and reaches Lake Michigan just north of the Chicago Loop, heart of the great city. The North Branch Chicago River has its headwaters close to Lake Michigan, well north of the Cook County line, and outside the heavier storm area. Flood damage was chiefly in the flat areas of the Skokie Lagoons in Skokie and Evanston. The Edens Expressway and the Skokie Highway, major routes to the north, were blocked during the flood.

The South Branch Chicago River is short and has been developed as a navigation channel, forming part of the Chicago Sanitary and Ship Canal, which diverts water from Lake Michigan to the Des Plaines River at Lockport and thence into the Illinois and Mississippi Rivers. Since 1900, when a lock was completed at the mouth of the Chicago River, flow has been away from the lake into the Des Plaines River, with the Chicago River level being held usually about 3 feet lower than lake level. During this flood the river rose to the highest stage on record, 5.4 feet above Chicago City Datum or 585.3 feet above mean sea level, datum of 1929, at the mouth. This was about 3.4 feet higher than lake level at the time.

To relieve the flood, which was causing unprecedented damage and threatening an even greater disaster, the Sanitary District of Chicago ordered the lock gates at the mouth of the river to be opened, allowing the river to discharge into Lake Michigan for the first time in 54 years. The lock gates were operated as follows:

	Open	Closed
Oct. 10, 1954	6:25 p.m.	6:55 p.m.
	7:00 p.m.	8:31 p.m.
	8:50 p.m.	9:20 p.m.
	9:35 p.m.	11:15 p.m.

The three short periods of closure were for lockage of boats. The Sanitary District of Chicago has estimated the total discharge at this point into Lake Michigan to be approximately 129,600,000 cubic feet. During about the same period gates were opened to permit discharge into the lake from the North Shore Channel at Wilmette. The discharge here has been estimated at approximately 172,800,000 cubic feet by the Sanitary District of Chicago. Normally lake water is pumped into the North Shore Channel at Wilmette to flush storm and sanitary sewage from the northern district down into the North Branch Chicago River and the Chicago Sanitary and Ship Canal.

As the Chicago water supply is taken from Lake Michigan, possible contamination from the polluted river discharge was a grave threat. Emergency precautions were taken, including hourly sampling of lake water and increased chlorination at pumping stations. The city supply was pronounced safe, but residents in 17 southern and western suburbs depending on well-water supplies were cautioned to boil their drinking water.

Before the peak was reached the Chicago River had burst over its walled banks to flood railroad yards and the basements of many buildings. All 29 tracks of the Union Station were covered and water was 10 feet deep in the baggage room. Passengers on trains of the Burlington Railroad, Milwaukee Railroad, and Pennsylvania Railroad, detrained in yards or at outlying points and continued their way by street car or whatever means could be improvised. About 40,000 west-suburban commuters were delayed and through travelers were advised to make telephone inquiry on how and where to make railroad connections. The post office basement was flooded damaging more than 3,000 pieces of parcel-post mail. The Chicago Daily News had 42 feet of water in its basement and subbasement, forcing it to use the facilities of other newspapers for publication on October 11.

Flood waters from the South Branch Chicago River and the Chicago Sanitary and Ship Canal put out of operation the two largest electric generating plants of the Commonwealth Edison Co., Crawford Station on South Pulaski Road and Fish Station on Cermak Road. Loss of the 350,000 kilowatt output of these plants forced shutdown of manufacturing establishments and a 50 percent cut in consumption of power over a widespread area including The Loop. As an emergency measure the Illinois Bell Telephone Co. cut down its power demands by ordering diesel generators into operation at

exchange buildings. The power company was able to furnish adequate power to the Chicago Transit Authority so that street-car operation was not curtailed.

Du Page and Fox River Basins

The Du Page River at Troy, Ill., reached a new maximum for the 15-year period of record, exceeding the March 1948 flood. State Highways 53, 55, and 59 were blocked by high water near Lisle, Warrenville, and Plainfield, Ill., respectively, each town suffering extensively from the flood.

The Fox River, which has its headwaters in Wisconsin and flows through the Fox chain of lakes near the northern edge of Illinois, had only a small rise at Algonquin, downstream from the lakes. From Aurora south on the main stream and on the tributaries to the west, the storm caused record-breaking floods. The peak discharge at the gaging station at Dayton, with a drainage area not quite double that at Algonquin, was 60 percent greater than the previous maximum (March 1948) and the highest in 29 years of record. The National Guard was alerted and put on guard duty because of fear of failure of the powerplant dam at Dayton, which would have caused disaster at Ottawa, only a few miles downstream. It was necessary to sandbag the head race to the plant, but fortunately the flood was passed without damage to the dam.

Low-lying areas at Ottawa at the mouth of Fox River were flooded, both by the Fox River and by the crest which came down the Illinois River at about the same time. Residents were evacuated from the affected area, and an appeal was made for National Guard troops to prevent looting in waterfront areas.

GAGING-STATION RECORDS

Explanation of Data

This section of the report contains, in condensed form the streamflow information collected during the flood by the Geological Survey at the established gaging stations. Data for the 50 stations are presented in three parts: first, the station descriptions; second, a table of daily discharges (table 1); and third, discharge hydrographs at most of the gaging stations during the immediate period encompassing the peaks (figures 3-15).

At stream-gaging stations records of stage are obtained either from the continuous trace of a water-stage recorder or by periodic direct readings on a nonrecording gage. Discharge measurements are generally obtained by current meter and occasionally by indirect methods. A stage-discharge relation curve is developed on basis of the discharge measurements and the corresponding stages, and from this curve discharges for indicated stages are obtained.

The description for each gaging station gives information concerning the location and datum of gage, size of drainage area above the gage, nature of gage-height record obtained during the flood period, definition of the stage-discharge relation, maximum stage and discharge during the present flood, previous maximum of record, and other pertinent information.

Daily mean discharges for gaging stations are tabulated in table 1, which follows the group of station descriptions. Daily figures, in cubic feet per second, and the monthly mean discharge, in cubic feet per second, and runoff, in inches, are shown for the month of October. For the station, (12) Wolf Lake at Chicago, Ill., daily mean gage heights, in feet, are shown, discharge not being determined at this station.

Discharge hydrographs for most of the stations are presented for the period of flooding in figures 3-15. Because flooding was not extreme or because daily changes were not excessive, detailed hydrographs for the following stations were not included: (12) Wolf Lake at Chicago, Ill., (26) Kankakee River at Momence, Ill., (27) Kankakee River near Wilmington, Ill., and (28) Des Plaines River near Gurnee, Ill.

All gaging stations are numbered in downstream order, with the sequence of presentation being: streams tributary to Lake Michigan -- Little Calumet River Basin (western portion) and Little Calumet River Basin (eastern portion); and streams in the Illinois River Basin -- Kankakee River, Des Plaines River, Chicago River, Hickory Creek, Du Page River, Mazon River, and Fox River basins. Each gaging station carries its number on figures 1 and 2, in the station descriptions, in table 1, and on the discharge hydrographs, figures 3-15. The same numbering system is continued in the next section of the report, "Summary of Floods Stages and Discharges", where four miscellaneous sites (No's 1, 9, 43 and 47) are included also. These miscellaneous peak-discharge sites account for the apparent gap in numbers in this section of the report.

(2) Hart ditch at Munster, Ind.

Location.--Lat 41°33'35", long. 87°28'50", in N½ sec. 20, T. 36 N., R. 9 W., on left bank at city limits of Munster, a quarter of a mile downstream from U. S. Highway 6 and 0.4 mile upstream from mouth. Datum of gage is 591.21 ft above mean sea level, datum of 1929.
Drainage area.--69.2 sq mi (revised).
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. A backwater loop curve was used for the period 11 p.m. Oct. 10 to Oct. 23.
Maxima.--October 1954: Discharge, 2,600 cfs 5 to 10 a.m. Oct. 11; gage height, 7.83 ft 4 to 8 p.m. Oct. 11.
1942 to September 1954: Discharge, 2,490 cfs Apr. 6, 1947; gage height, 7.23 ft Mar. 15, 1944.
Remarks.--Hart ditch is tributary to Little Calumet River. At this point low flow of Little Calumet River runs west into Calumet Sag Channel or into Lake Michigan through Calumet River; flood flow at times runs east into channel storage or through Burns ditch to Lake Michigan.

(3) Thorn Creek at Glenwood, Ill.

Location.--Lat 41°31'50", long. 87°36'20", in SW¼SE¼ sec. 9, T. 35 N., R. 14 E., on right bank 20 ft downstream from Baltimore & Ohio Chicago Terminal Railroad bridge, 0.7 mile north of Chicago Heights, 0.8 mile south of Glenwood, and 1 mile upstream from Deer Creek. Datum of gage is 610.97 ft above mean sea level, datum of 1929.
Drainage area.--25.4 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 916 cfs 10 to 11 p.m. Oct. 10 (gage height, 9.88 ft).
1949 to September 1954: Discharge, 848 cfs June 10, 1953 (gage height, 9.63 ft).
Remarks.--Figures of discharge include about 6 cfs pumped from ground-water sources for municipal supply of Chicago Heights and undetermined amount of ground-water pumpage for industrial use above station. Undetermined amount of pumpage diverted by commercial livestock feeding pens above station.

(4) Deer Creek near Chicago Heights, Ill.

Location.--Lat 41°31'15", long. 87°35'25", 0.1 mile west of center of sec. 14, T. 35 N., R. 14 E., on left bank at bridge on Joe Orr Road, 0.4 mile east of Cottage Grove Avenue, 1 mile north of U. S. Highway 30, 1.5 miles northeast of Chicago Heights, and 1.6 miles west of Torrence Avenue. Datum of gage is 615.95 ft above mean sea level, datum of 1929.
Drainage area.--24.4 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 637 cfs 11 a.m. Oct. 11 (gage height, 11.19 ft).
1948 to September 1954: Discharge, 663 cfs May 10 or 11, 1948 (gage height, 11.52 ft, from floodmark).
Remarks.--Undetermined amount of flow diverted for irrigation above station.

(5) Butterfield Creek at Flossmoor, Ill.

Location.--Lat 41°32'25", long. 87°38'55", in NE¼NW¼ sec. 8, T. 35 N., R. 14 E., on left bank at Riegle Road Bridge at Homewood city limits, 0.1 mile north of Holbrook Road and three-quarters of a mile east of Flossmoor. Datum of gage is 616.80 ft above mean sea level, datum of 1929.
Drainage area.--22.9 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements below 540 cfs and extended to peak stage by logarithmic plotting.
Maxima.--October 1954: Discharge, 788 cfs 12 p.m. Oct. 10 (gage height, 10.92 ft).
1948 to September 1954: Discharge, 683 cfs Mar. 19, 1948, May 10 or 11, 1948 (gage heights, 10.29 and 10.28 ft, from floodmarks).

(6) Lansing ditch near Lansing, Ill.

Location.--Lat 41°31'40", long. 87°31'45", at north boundary of sec. 17, T. 35 N., R. 15 E., on right bank at upstream side of bridge on farm road, 0.2 mile west of Indiana State line, 0.5 mile east of Burnham Avenue, and 2 miles south of Lansing. Datum of gage is 607.16 ft above mean sea level, datum of 1929.
Drainage area.--8.3 sq mi, approximately.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.

Continued on next page

(6) Lansing ditch near Lansing, Ill.--Continued

Maxima.--October 1954: Discharge, 302 cfs 4 p.m. Oct. 11 (gage height, 10.18 ft).
1948 to September 1954: Discharge, 461 cfs May 10 or 11, 1948 (gage height, 9.24 ft, from floodmark).
Remarks.--Undetermined amount of flow diverted for irrigation above station. Some merging of basins and interbasin flow during flood period.

(7) North Creek near Lansing, Ill.

Location.--Lat 41°32'45", long. 87°33'30", in SE¼SE¼ sec. 1, T. 35 N., R. 14 E., on right bank at Torrence Avenue Bridge, 1.1 miles south of Lansing and 2.7 miles north of U. S. Highway 30. Datum of gage is 599.29 ft above mean sea level, datum of 1929.
Drainage area.--18.2 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 692 cfs 10 to 12 p.m. Oct. 10 (gage height, 8.96 ft).
1948 to September 1954: Discharge, 730 cfs (revised) Mar. 20, 1948 (gage height, 8.51 ft, revised, from floodmark).

(8) Thorn Creek at Thornton, Ill.

Location.--Lat 41°34'05", long. 87°36'30", near center of N½ sec. 34, T. 36 N., R. 14 E., on right bank at downstream side of Ridge Road Bridge in Thornton, 1 mile downstream from North Creek and 1½ miles upstream from Grand Trunk Railway. Datum of gage is 586.43 ft above mean sea level, datum of 1929.
Drainage area.--106 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 3,370 cfs 9 a.m. Oct. 11 (gage height, 14.70 ft).
1948 to September 1954: Discharge, 4,040 cfs Mar. 20, 1948 (gage height, 14.08 ft, from floodmark).
Flood of Apr. 5, 1947, reached a stage of 14.34 ft, from floodmark (discharge, 4,200 cfs).
Remarks.--Some diurnal fluctuation caused by pumping operations above station. Figures of discharge include about 6 cfs pumped from ground-water sources for municipal supply of Chicago Heights and undetermined amount of ground-water pumpage for industrial use above station.

(10) Little Calumet River at South Holland, Ill.

Location.--Lat 41°36'05", long. 87°34'38", in SW¼SW¼ sec. 13, T. 36 N., R. 14 E., on right bank at downstream side of bridge on U. S. Highway 6, 0.6 mile downstream from Thorn Creek and 1.6 miles east of South Holland, and 4.1 miles upstream from former gaging station at Harvey. Auxiliary gage at Dixmoor, 6.1 miles downstream. Datum of gages is 575.00 ft above mean sea level.
Gage-height record.--Water-stage recorder graphs from base and auxiliary gages.
Discharge record.--Computed by constant-fall method. Stage-fall-discharge relations defined by current-meter measurements.
Maxima.--October 1954: Discharge, 4,210 cfs 8 to 9 p.m. Oct. 11 (gage height, 19.39 ft).
1947 to September 1954: Discharge, 3,810 cfs May 11, 1948 (gage height, 17.33 ft).
Flood of Apr. 6, 1947, reached a stage of 19.24 ft, from floodmark (discharge, 4,760 cfs).
Remarks.--Flow from about 330 sq mi of upper Little Calumet River basin above a point in Gary, Indiana, is diverted to Lake Michigan by Burns ditch (see p. 14).

(11) Midlothian Creek at Oak Forest, Ill.

Location.--Lat 41°36'51", long. 87°43'46", in SE¼NW¼ sec. 15, T. 36 N., R. 13 E., on right bank at downstream side of highway bridge in Oak Forest, 4.4 miles upstream from mouth. Datum of gage is 620.41 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--12.7 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 569 cfs 12 p.m. Oct. 10 (gage height, 8.49 ft).
1950 to September 1954: Discharge, 384 cfs (revised) June 10, 1953 (gage height, 6.38 ft).
Remarks.--Diurnal fluctuation at low flow caused by industrial plants upstream.

(12) Wolf Lake at Chicago, Ill.

Location.--Lat 41°40'00", long. 87°32'15", in SW¼ sec. 29, T. 37 N., R. 15 E., at outlet on west shore in Chicago. Datum of gage is 580.45 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Gage-height record.--Water-stage recorder graph.
Maxima.--October 1954: Gage height, 3.00 ft 5 p.m. Oct. 11 to 7 a.m. Oct. 12.
1939 to September 1954: Hourly mean gage height, 2.32 ft June 27, 1952.
Remarks.--Hourly mean values used to determine extremes in order to dampen effects of wind action.

(13) Deep River at Lake George Outlet at Hobart, Ind.

Location.--Lat 41°32'03", long. 87°15'22", in NW¼NW¼ sec. 32, T. 36 N., R. 7 W., at northeast end of Lake George in Hobart, an eighth of a mile upstream from Duck Creek. Datum of gage is 600.00 ft above mean sea level, datum of 1929.
Drainage area.--125 sq mi (revised).
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 3,880 cfs 1:30 to 2 p.m. Oct. 11 (gage height, 7.68 ft).
1947 to September 1954: Discharge, 2,740 cfs May 11, 1948 (gage height, 5.86 ft).

(14) Burns ditch at Gary, Ind.

Location.--Lat 41°34'25", long. 87°17'15", in N½ sec. 13, T. 36 N., R. 8 W., near center of span on downstream side of bridge on Central Avenue, 0.5 mile east of Gary and 1¼ miles downstream from Deep River. Altitude of gage is 577 ft (from topographic map).
Drainage area.--About 160 sq mi (revised, approximate for flood flows).
Gage-height record.--Graph drawn on basis of twice-daily wire-weight gage readings except during peak when gage was read every two hours.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 3,430 cfs 2 to 6 p.m. Oct. 11; gage height, 15.90 ft 1 to 5 a.m. Oct. 12, from graph based on gage readings.
1943 to September 1954: Discharge, 2,660 cfs May 11, 1948; gage height, 16.44 ft Mar. 16, 1944, from graph based on gage readings.
Remarks.--Discharges not published for stages below 6 ft. Stage-discharge relation affected by backwater from Lake Michigan.

(15) Little Calumet River at Porter, Ind.

Location.--Lat 41°37'18", long. 87°05'13", in NE¼ sec. 34, T. 37 N., R. 6 W., near center of span on downstream side of highway bridge, three-quarters of a mile northwest of Porter and 4.5 miles upstream from Salt Creek. Datum of gage is 603.48 ft above mean sea level, datum of 1929.
Drainage area.--62.9 sq mi (revised).
Gage-height record.--Water-stage recorder graph.

Continued on next page

(15) Little Calumet River at Porter, Ind.--Continued

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 3,110 cfs 9 p.m. Oct. 10 (gage height, 11.66 ft).
1945 to September 1954: Discharge, 2,440 cfs June 28, 1945 (gage height, 9.88 ft, from graph based on gage readings).

(16) Salt Creek near McCool, Ind.

Location.--Lat 41°35'48", long. 87°08'40", in SE¼ sec. 6, T. 36 N., R. 6 W., near center of span on downstream side of highway bridge, just downstream from Michigan Central Railroad bridge, 1¼ miles north of McCool and 1.5 miles upstream from Little Calumet River. Altitude of gage is 595 ft (from topographic map).
Drainage area.--78.7 sq mi (revised).
Gage-height record.--Graph drawn on basis of floodmark and twice-daily wire-weight gage readings.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 3,180 cfs 6 a.m. Oct. 11 (gage height, 14.12 ft).
1945 to September 1954: Discharge, 1,910 cfs (revised) May 11, 1948 (gage height, 12.3 ft).

(17) Kankakee River near North Liberty, Ind.

Location.--Lat 41°33'50", long. 86°29'50", along north line sec. 23, T. 36 N., R. 1 W., near center of span on downstream side of county highway bridge at St. Joseph-La Porte County line, 4 miles northwest of North Liberty. Datum of gage is 680.04 ft above mean sea level, datum of 1929 (levels by Indiana Flood Control and Water Resources Commission).
Drainage area.--152 sq mi (revised).
Gage-height record.--Graph drawn on basis of once-daily wire-weight gage readings. No gage-height record Oct. 3, 10, 17, 24, 31, Nov. 7, 11, 14, 21, 25, and 28.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times. Discharge for periods of no gage-height record estimated on basis of records for downstream stations.
Maxima.--October 1954: Discharge, 686 cfs 3 to 4 p.m. Oct. 10; gage height, 8.64 ft 12 m. Oct. 12, from graph based on gage readings.
1951 to September 1954: Discharge, 680 cfs Nov. 14, 1951 (gage height, 6.97 ft, from graph based on gage readings).

(18) Kankakee River at Davis, Ind.

Location.--Lat 41°24', long. 86°42', in sec. 13, T. 34 N., R. 3 W., on left bank at downstream side of bridge on U. S. Highway 30 at Davis, half a mile downstream from Mill Creek and 4 miles east of Hanna. Datum of gage is 664.68 ft above mean sea level, datum of 1929.
Drainage area.--508 sq mi (revised).
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 1,620 cfs 10 p.m. Oct. 16 to 6 p.m. Oct. 18 (gage height, 11.76 ft).
1925-29, 1931 to September 1954: Discharge observed, about 1,700 cfs Dec. 15, 1927 (gage height, 9.50 ft, site and datum then in use), from rating curve extended above 520 cfs.

(19) Yellow River at Plymouth, Ind.

Location.--Lat 41°20', long. 86°18', in sec. 4, T. 33 N., R. 2 E., near center of span at La Porte Street footbridge in Plymouth, half a mile downstream from Baker ditch and 7 miles upstream from Wolf Creek. Datum of gage is 764.78 ft above mean sea level, datum of 1929.
Drainage area.--284 sq mi (revised).
Gage-height record.--Graph drawn on basis of twice-daily wire-weight gage readings except Oct. 12-15 when the gage was read approximately every thirty minutes. No gage-height record Nov. 6, 7, 14.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times. Discharge for Nov. 6, 7, 14 estimated on basis of records for Yellow River at Knox.
Maxima.--October 1954: Discharge, 5,390 cfs 8 p.m. Oct. 12 to 4 a.m. Oct. 13 (gage height, 17.13 ft).
1948 to September 1954: Discharge, 3,230 cfs July 12, 1951 (gage height, 13.39 ft).

(20) Yellow River at Knox, Ind.

Location.--Lat 41°18', long. 86°37', in sec. 14, T. 33 N., R. 2 W., on right bank 40 ft upstream from bridge on U. S. Highway 35 in Knox, 1½ miles downstream from Eagle Creek and 9 miles upstream from mouth. Datum of gage is 679.93 ft above mean sea level, datum of 1929 (Lafayette supplementary adjustment of 1951.
Drainage area.--425 sq mi (revised).
Gage-height record.--Water-stage recorder graph.

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(20) Yellow River at Knox, Ind.--Continued

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 5,660 cfs 10 p.m. Oct. 15, 4 a.m. Oct. 16 (gage height, 13.75 ft).
1943 to September 1954: Discharge, 3,160 cfs Apr. 7, 1950 (gage height, 10.42 ft).

(21) Kankakee River at Dunns Bridge, Ind.

Location.--Lat 41°13'17", long. 86°57'52", in sec. 15, T. 32 N., R. 5 W., near center of span on upstream side of county highway bridge at Dunns Bridge, 1¾ miles north of Tefft and 3½ miles upstream from Davis ditch. Datum of gage is 649.65 ft above mean sea level, datum of 1929, Lafayette supplementary adjustment of 1951 (levels by Indiana Flood Control and Water Resources Commission).
Drainage area.--1,308 sq mi (revised).
Gage-height record.--Graph drawn on basis of twice-daily wire-weight gage readings.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 5,300 cfs 3 to 11 a.m. Oct. 22 (gage height, 13.20 ft).
1948 to September 1954: Discharge, 5,200 cfs Apr. 12, 1950 (gage height, 13.08 ft).

(22) Kankakee River at Shelby, Ind.

Location.--Lat 41°11', long. 87°21', in sec. 33, T. 32 N., R. 8 W., on left bank 25 ft downstream from Chicago, Indianapolis & Louisville Railway bridge, 1 mile south of Shelby, and 9 miles upstream from Beaver Lake Creek. Datum of gage is 628.13 ft above mean sea level, datum of 1929.
Drainage area.--1,753 sq mi (revised).
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 5,040 cfs 12 m. to 10 p.m. Oct. 27 (gage height, 10.60 ft).
1922 to September 1954: Discharge observed, 7,200 cfs Dec. 21, 1927 (gage height, 11.40 ft, present datum, site then in use), from rating curve extended above 3,000 cfs by gage-height relation study with that of present site.

(23) Singleton ditch at Schneider, Ind.

Location.--Lat 41°12'44", long. 87°26'44", on line between NE¼ sec. 21 and NW¼ sec. 22, T. 32 N., R. 9 W., on left bank about 15 ft upstream from bridge on U. S. Highway 41, half a mile upstream from Bruce ditch, 1½ miles downstream from Cedar Creek, and 1 2/3 miles north of Schneider. Datum of gage is 623.67 ft above mean sea level, datum of 1929.
Drainage area.--122 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 953 cfs 10 p.m. Oct. 11 to 1 a.m. Oct. 12, 5 to 11 a.m. Oct. 12 (gage height, 10.10 ft).
1948 to September 1954: Daily discharge, 1,100 cfs Apr. 10, 1950.

(24) West Creek near Schneider, Ind.

Location.--Lat 41°12'52", long. 87°29'36", in NW¼NE¼ sec. 19, T. 32 N., R. 9 W., near center of span on upstream side of county highway bridge, 1.2 miles upstream from Singleton ditch and 2¾ miles northwest of Schneider. Altitude of gage is 631 ft (by altimeter).
Drainage area.--54.5 sq mi (revised).
Gage-height record.--Graph drawn on basis of floodmark and twice-daily wire-weight gage readings.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 1,870 cfs 11 p.m. Oct. 10 to 1 a.m. Oct. 11 (gage height, 8.09 ft).
1948-51, January to September 1954: Discharge, 1,050 cfs Dec. 22, 1949 (gage height, 6.56 ft).

(25) Singleton ditch at Illinoi, Ill.

Location.--Lat 41°11'20", long. 87°31'35", in SW¼NW¼ sec. 8, T. 31 N., R. 15 E., near center of span on downstream side of county highway bridge in Illinoi, beside the Cleveland, Cincinnati, Chicago & St. Louis Railroad and at Indiana-Illinois State line. Datum of gage is 620.33 ft above mean sea level, datum of 1929.
Drainage area.--219 sq mi (revised).
Gage-height record.--Water-stage recorder graph. No gage-height record Nov. 14-22.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times. Discharge for period Nov. 14-22 estimated on basis of records for stations on nearby streams.
Maxima.--October 1954: Discharge, 2,110 cfs 7 to 8 p.m. Oct. 11 (gage height, 9.81 ft).
1944 to September 1954: Discharge, 1,850 cfs Apr. 11, 1950 (gage height, 9.26 ft).

(26) Kankakee River at Momence, Ill.

Location.--Lat 41°09'36", long. 87°40'01", in NE¼ sec. 24, T. 31 N., R. 13 E., on right bank a quarter of a mile downstream from highway bridge in Momence and 1¼ miles upstream from Tower Creek. Datum of gage is 610.18 ft above mean sea level, datum of 1929.
Drainage area.--2,340 sq mi, approximately.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October-November 1954: Discharge, 5,400 cfs 4 a.m. to 11 p.m. Oct. 15 (gage height, 3.07 ft).
1905-6, 1914 to September 1954: Discharge, 10,100 cfs Apr. 25, 1950 (gage height, 5.06 ft); maximum gage height observed, 8.09 ft Jan. 25, 1930 (ice jam) at site a quarter of a mile upstream.

(27) Kankakee River near Wilmington, Ill.

Location.--Lat 41°20'48", long. 88°11'11", in NW¼ sec. 15, T. 33 N., R. 9 E., on right bank 0.4 mile downstream from Prairie Creek and 5 miles downstream from Wilmington. Datum of gage is 511.10 ft above mean sea level, datum of 1929.
Drainage area.--5,250 sq mi, approximately.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October, November 1954: Discharge, 10,200 cfs 8 to 9 a.m. Oct. 12 (gage height, 3.60 ft).
1935 to September 1954: Discharge, 48,000 cfs May 21, 1943 (gage height, 8.87 ft); gage height, 11.57 ft Feb. 1, 1949 (ice jam).
Maximum stage known, 16.73 ft in 1883, 1887.
Remarks.--Slight diurnal fluctuation at low flow caused by power plants above station.

(28) Des Plaines River near Gurnee, Ill.

Location.--Lat 42°20'40", long. 87°56'30", in SW¼ sec. 27, T. 45 N., R. 11 E., on right bank at upstream side of bridge on State Highway 120, 600 ft east of intersection of State Highways 120 and 63, 2½ miles southwest of Gurnee, 2½ miles upstream from Bull Creek, and 6 miles downstream from Mill Creek. Datum of gage is 650.3 ft above mean sea level, datum of 1929 (Corps of Engineers benchmark).
Drainage area.--215 sq mi.
Gage-height record.--Water-stage recorder graph.

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(28) Des Plaines River near Gurnee, Ill.--Continued

Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 442 cfs 3 to 9 a.m. Oct. 13 (gage height, 4.38 ft).
1945 to September 1954: Discharge, 2,620 cfs Mar. 21, 1948 (gage height, 9.21 ft).

(29) Buffalo Creek near Wheeling, Ill.

Location.--Lat 42°09'05", long. 87°57'25", in NE¼NW¼ sec. 4, T. 42 N., R. 11 E., on left bank at downstream side of highway bridge, 1 mile downstream from unnamed tributary, and 2.5 miles west of Wheeling. Datum of gage is 658.60 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--19.4 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements below 80 cfs and extended to peak stage by logarithmic plotting.
Maxima.--October 1954: Discharge, 161 cfs 10:30 p.m. Oct. 10 (gage height, 4.62 ft).
1952 to September 1954: Discharge, 268 cfs Apr. 25, 1954 (gage height, 5.40 ft).

(30) Des Plaines River near Des Plaines, Ill.

Location.--Lat 42°04'55", long. 87°53'25", in SE¼SE¼ sec. 25, T. 42 N., R. 11 E., on right bank 50 ft upstream from dam No. 2 of Cook County Forest Preserve, 0.3 mile downstream from Lake Avenue Bridge, 1.2 miles upstream from Central Road Bridge, and 2½ miles north of Des Plaines. Datum of gage is 626.31 ft above mean sea level, datum of 1929.
Drainage area.--374 sq mi.
Gage-height record.--Water-stage recorder graph except for period Oct. 25-31.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Discharge for period of no gage-height record Oct. 25-31 estimated on basis of recorded range in stage and records for station near Gurnee.
Maxima.--October 1954: Discharge, 1,800 cfs 9 to 11 a.m. Oct. 11 (gage height, 3.25 ft).
1940 to September 1954: Discharge, 4,040 cfs Apr. 25, 1950 (gage height, 7.78 ft).
Flood of July 4, 1938, reached a stage of 9.7 ft, from floodmark (discharge, 5,500 cfs).

(31) McDonald Creek near Mt. Prospect, Ill.

Location.--Lat 42°05'42", long. 87°54'46", in NW¼NE¼ sec. 26, T. 42 N., R. 11 E., on right bank at downstream side of bridge on McDonald Road, 2 miles upstream from mouth, and 2.5 miles northeast of Mt. Prospect. Datum of gage is 638.12 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--7.52 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements below 80 cfs and extended to peak stage by logarithmic plotting. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 146 cfs 6 a.m. Oct. 11 (gage height, 7.31 ft).
1952 to September 1954: Discharge, 103 cfs June 3, 1954 (gage height, 6.46 ft).

(32) Weller Creek at Des Plaines, Ill.

Location.--Lat 42°02'57", long. 87°55'05", in NW¼NW¼ sec. 18, T. 41 N., R. 12 E., on right bank at downstream side of bridge on State Highway 58 in Des Plaines, 2 miles west of U. S. Highway 45 and 3.0 miles upstream from mouth. Datum of gage is 635.02 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--13.1 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements below 160 cfs and extended to peak stage by logarithmic plotting. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 535 cfs 6 p.m. Oct. 10 (gage height, 10.83 ft).
1950 to September 1954: Discharge, 461 cfs Apr. 25, 1954 (gage height, 9.83 ft).

(33) Willow Creek near Park Ridge, Ill.

Location.--Lat 41°59'22", long. 87°52'24", in SW¼NE¼ sec. 4, T. 40 N., R. 12 E., on right bank at downstream side of bridge on Byron Street, 0.4 mile south of State Highway 72, 1.3 miles upstream from mouth, and 2½ miles southwest of Park Ridge. Datum of gage is 620.95 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--19.6 sq mi.
Gage-height record.--Water-stage recorder graph except for the period 12 m. Oct. 5 to 10 a.m. Oct. 6, for which graph was drawn on basis of recorded range in stage and recorder graph for Weller Creek at Des Plaines.

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(33) Willow Creek near Park Ridge, Ill.--Continued

Discharge record.--Stage-discharge relation defined by current-meter measurements below 160 cfs and extended to peak stage by logarithmic plotting.
Maxima.--October 1954: Discharge, 382 cfs 6 a.m. Oct. 11 (gage height, 8.32 ft).
1950 to September 1954: Discharge, 283 cfs Apr. 25, 1954 (gage height, 7.15 ft).

(34) Salt Creek near Arlington Heights, Ill.

Location.--Lat 42°03'02", long. 88°00'37", on north boundary of sec. 17, T. 41 N., R. 11 E., on right bank at downstream side of bridge on State Highway 58, $2\frac{3}{4}$ miles southwest of Arlington Heights. Datum of gage is 682.22 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--33.7 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 516 cfs 11 to 12 p.m. Oct. 10 (gage height, 8.28 ft).
1950 to September 1954: Discharge, 540 cfs Apr. 25, 1954 (gage height, 8.43 ft).

(35) Salt Creek at Western Springs, Ill.

Location.--Lat 41°49'35", long. 87°54'00", on boundary between secs. 31 and 32, T. 39 N., R. 12 E., on left bank at upstream side of bridge on Wolf Road, in Cook County Forest Preserve, half a mile north of Western Springs and 8.8 miles upstream from mouth. Datum of gage is 624.81 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--122 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 1,710 cfs 12 p.m. Oct. 10 to 1 a.m. Oct. 11, 11 a.m. to 12 m. Oct. 11 (gage height, 8.27 ft).
1945 to September 1954: Discharge, 1,920 cfs Mar. 20, 1948 (gage height, 8.06 ft).
Remarks.--Occasional regulation by dam above station. Some diversion for irrigation above station.

(36) Addison Creek at Bellwood, Ill.

Location.--Lat 41°52'48", long. 87°52'07", in SE¼ sec. 9, T. 39 N., R. 12 E., on right bank at downstream side of bridge on Washington Boulevard in Bellwood, 500 ft upstream from Chicago Great Western Railroad bridge and 3.2 miles upstream from mouth. Datum of gage is 617.65 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--18.2 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements below 190 cfs and extended to peak stage by logarithmic plotting. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 598 cfs 1 to 2 a.m. Oct. 11 (gage height, 9.48 ft).
1950 to September 1954: Discharge, 548 cfs Mar. 25, 1954 (gage height, 6.39 ft), from rating curve extended above 62 cfs by logarithmic plotting.

(37) Des Plaines River at Riverside, Ill.

Location.--Lat 41°49'20", long. 87°49'15", in SW¼SW¼ sec. 36, T. 39 N., R. 12 E., on left bank 300 ft downstream from Barry Point Road Bridge in Riverside, 200 ft northwest of Riverside-Lyons boundary, 500 ft downstream from Hoffman Dam, 4,000 ft downstream from Salt Creek, and 1½ miles downstream from Chicago, Burlington & Quincy Railroad bridge. Datum of gage is 594.68 ft above mean sea level, datum of 1929.
Drainage area.--635 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 6,340 cfs 6 p.m. Oct. 11 (gage height, 8.15 ft).
1943 to September 1954: Discharge, 6,510 cfs Mar. 20, 1948 (gage height, 8.28 ft).
Remarks.--Occasional regulation by gates at Hoffman Dam.

(38) Flag Creek near Willow Springs, Ill.

Location.--Lat 41°44'20", long. 87°53'48", in SE¼NE¼ sec. 31, T. 38 N., R. 12 E., on left bank at upstream side of bridge on German Church Road, 1.1 miles northwest of Willow Springs and 2.3 miles upstream from mouth. Datum of gage is 609.64 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--16.2 sq mi.
Gage-height record.--Water-stage recorder graph.

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(38) Flag Creek near Willow Springs, Ill.--Continued

Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 1,300 cfs 8 p.m. Oct. 10 (gage height, 6.88 ft).
1951 to September 1954: Discharge, 770 cfs Mar. 25, 1954 (gage height, 5.42 ft).

(39) North Branch Chicago River at Deerfield, Ill.

Location.--Lat 42°09'09", long. 87°49'05", in NW¼NE¼ sec. 3, T. 42 N., R. 12 E., on left bank at downstream side of bridge on County Line Road, 1.7 miles southeast of Deerfield, and 5.7 miles upstream from Skokie River. Datum of gage 638.88 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--20.7 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 211 cfs 3 to 9 a.m. Oct. 11 (gage height, 9.08 ft).
1952 to September 1954: Discharge, 247 cfs Mar. 25, 1954 (gage height, 9.35 ft).

(40) Skokie River at Lake Forest, Ill.

Location.--Lat 42°13'57", long. 87°50'41", in NW¼SW¼ sec. 4, T. 43 N., R. 12 E., on left bank at downstream side of bridge on State Highway 59A at Lake Forest, 12 miles upstream from mouth. Datum of gage is 648.69 ft above mean sea level, datum of 1929.
Drainage area.--12.8 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 188 cfs 10 p.m. Oct. 10 (gage height, 5.42 ft).
1951 to September 1954: Discharge, 321 cfs Nov. 13, 1951 (gage height, 7.16 ft).
Remarks.--Diurnal fluctuation at low flow.

(41) West Fork of North Branch Chicago River at Northbrook, Ill.

Location.--Lat 42°08'18", long. 87°50'04", in SW¼SE¼ sec. 4, T. 42 N., R. 12 E., on left bank at upstream side of bridge on State Highway 68, 2.0 miles northwest of Northbrook, and 7.9 miles above mouth. Datum of gage is 637.98 ft above mean sea level, datum of 1929 (Cook County Highway Department benchmark).
Drainage area.--11.5 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 301 cfs 2 a.m. Oct. 11 (gage height, 8.18 ft).
1952 to September 1954: Discharge, 411 cfs Mar. 25, 1954 (gage height, 8.56 ft).

(42) North Branch Chicago River at Niles, Ill.

Location.--Lat 42°00'44", long. 87°47'45", in SW¼SE¼ sec. 30, T. 41 N., R. 13 E., on right bank at downstream side of bridge on Touhy Avenue in Niles, 3.6 miles downstream from West Fork of North Branch, 7.9 miles upstream from North Shore Channel, and 15.6 miles upstream from mouth. Datum of gage is 601.99 ft above mean sea level, datum of 1929.
Drainage area.--102 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 1,700 cfs 3 a.m. Oct. 11 (gage height, 9.01 ft).
1950 to September 1954: Discharge, 1,510 cfs Apr. 26, 1954 (gage height, 8.56 ft).
Remarks.--Considerable regulation at low flow.

(44) Tinley Creek near Palos Park, Ill.

Location.--Lat 41°38'48", long. 87°45'59", in SW¼SE¼ sec. 32, T. 37 N., R. 13 E., on left bank at downstream side of 135th Street Bridge, 1.5 miles west of U. S. Highway 50, 1.5 miles upstream from mouth, and 3 miles southeast of Palos Park. Datum of gage is 607.40 ft above mean sea level, datum of 1929.
Drainage area.--11.3 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements below 800 cfs and extended to peak stage by logarithmic plotting. Shifting-control method used at times.
Maxima.--October 1954: Discharge, 1,120 cfs 7 a.m. Oct. 10 (gage height, 10.30 ft).
1951 to September 1954: Discharge, 530 cfs June 10, 1953 (gage height, 8.43 ft).

(45) Chicago Sanitary and Ship Canal at Lockport, Ill.

Location.--Lat 41°34'11", long. 88°04'42", in SW¼ sec. 27, T. 36 N., R. 10 E., at upper end of 9-foot navigation channel in Des Plaines River at Lockport.

Discharge record.--Total mean daily discharge includes governmental and private pumpage, inflow from Des Plaines River basin, and diversion from Lake Michigan. This total is obtained by adding the mean daily discharges, based on half-hourly discharge readings at dams, sluice gates, lockages, exciter turbines in operation and main turbines in operation as corrected for variable efficiencies, and the leakage of lock gates, dams, sluice gates, and turbines not in operation.

Chicago pumpage includes water from Lake Michigan to supply Chicago metropolitan area, water from wells within the main channel drainage area including pumpage to municipalities served by Chicago, and an average of about 136 cfs from agencies not served by Chicago.

Mean net diversion is obtained by deducting from total discharge the Chicago pumpage and inflow from Des Plaines River basin.

Maxima.--October 1954: Total discharge, 24,585 cfs 8:30 p.m. Oct. 10.

1900 to September 1954: Total discharge, 24,567 cfs (revised) Mar. 19, 1948.

Remarks.--Records furnished by Sanitary District of Chicago. The Federal permit of June 26, 1930, issued by the Secretary of War, limits the diversion of water from Lake Michigan to an annual average of 1,500 cfs, exclusive of pumpage for municipal supplies.

(46) Long Run near Lemont, Ill.

Location.--Lat 41°38'33", long. 87°59'57", in SW¼SE¼ sec. 32, T., 37 N., R. 11 E., on left bank at downstream side of highway bridge, 2 miles south of Lemont and 5.4 miles upstream from mouth. Datum of gage is 637.10 ft above mean sea level, datum of 1929.

Drainage area.--20.8 sq mi.

Gage-height record.--Water-stage recorder graph.

Discharge record.--Stage-discharge relation defined by current-meter measurements below 1,300 cfs and extended to peak stage by logarithmic plotting.

Maxima.--October 1954: Discharge, 3,160 cfs 6 a.m. Oct. 10 (gage height, 9.91 ft).

1951 to September 1954: Discharge, 1,000 cfs (revised) June 13, 1952 (gage height, 8.18 ft).

(48) Hickory Creek at Joliet, Ill.

Location.--Lat 41°31'10", long. 88°04'10", in SW¼NE¼ sec. 15, T. 35 N., R. 10 E., on right bank at Third Avenue in Joliet, 0.25 mile downstream from Spring Creek and 1¾ miles upstream from mouth. Datum of gage is 527.00 ft above mean level, datum of 1929.
Drainage area.--107 sq mi.
Gage-height record.--Water-stage recorder graph except for period 9 a.m. Oct. 11 to 3:30 p.m. Oct. 12, for which graph was drawn on basis of recorded range in stage and slope of adjoining graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 8,130 cfs 2 a.m. Oct. 11 (gage height, 9.82 ft).
1944 to September 1954: Discharge, 10,200 cfs Apr. 5, 1947 (gage height, 10.68 ft).

(49) Du Page River at Troy, Ill.

Location.--Lat 41°31'20", long. 88°11'35", in SE¼SW¼ sec. 10, T. 35 N., R. 9 E., on left bank at Troy (formerly known as Grinton), 400 ft upstream from U. S. Highway 52 and 3.8 miles downstream from Lilly Cache Creek. Datum of gage is 564.62 ft above mean sea level, datum of 1929 (Illinois Division of Waterways bench-mark).
Drainage area.--325 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 12,000 cfs 8 a.m. Oct. 11 (gage height, 11.06 ft).
1940 to September 1954: Discharge, 11,000 cfs Mar. 19, 1948 (gage height, 10.10 ft).

(50) Mazon River near Coal City, Ill.

Location.--Lat 41°17'10", long. 88°21'35", in SW¼SW¼ sec. 31, T. 33 N., R. 8 E., on right bank at downstream side of bridge on State Highway 113S, a quarter of a mile downstream from Johnny Run and 4 miles west of Coal City. Datum of gage is 527.41 ft above mean sea level, datum of 1929.
Drainage area.--470 sq mi.
Gage-height record.--Water-stage recorder graph.

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(50) Mazon River near Coal City, Ill.--Continued

Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 707 cfs 3 p.m., 6:30 p.m. Oct. 11 (gage height, 4.41 ft).
1939 to September 1954: Discharge, 17,300 cfs Apr. 25, 1950 (gage height, 18.50 ft).
Maximum stage known, about 21 ft Aug. 8, 1924.

(51) Illinois River at Marseilles, Ill.

Location.--Lat 41°19'40", long. 88°43'10", in SE¼SW¼ sec. 13, T. 33 N., R. 4 E., on right bank 0.4 mile downstream from dam in Marseilles, 6.9 miles upstream from Fox River, and at mile 246.6. Datum of gage is 462.91 ft above mean sea level, datum of 1929.
Drainage area.--7,640 sq mi, approximately. Since Jan. 17, 1900, flow has included diversion from Lake Michigan through Chicago Sanitary and Ship Canal.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 56,600 cfs 7 a.m. Oct. 12 (gage height, 11.39 ft).
1919 to September 1954: Discharge, 83,300 cfs Apr. 26, 1950 (gage height, 14.91 ft).
A stage of 25.4 ft (ice jam) occurred at present site on Jan. 21, 1916.
Remarks.--Figures of daily discharge include flow through navigation locks. Flow regulated by power plants and navigation dam above station.

(52) Fox River at Algonquin, Ill.

Location.--Lat 42°09'59", long. 88°17'25", in NW¼ sec. 34, T. 43 N., R. 8 E., on right bank 20 ft upstream from Chicago Street Bridge at Algonquin and 400 ft upstream from Crystal Lake outlet. Datum of gage is 729.48 ft above mean sea level, datum of 1929.
Drainage area.--1,364 sq mi.
Gage-height record.--Water-stage recorder graph, except Oct. 26, 28, for which graph was drawn based on fragmentary record.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
1915 to September 1954: Discharge, 5,850 cfs Apr. 1, 2, 1916; gage height, 4.50 ft Apr. 1, 1916, from graph based on gage readings.
Remarks.--Flow occasionally regulated by dam near McHenry, 16 miles above station, and occasionally affected by wind action on Fox chain of lakes.

(53) Poplar Creek at Elgin, Ill.

Location.--Lat 42°01'35", long. 88°15'20", in SE¼NW¼ sec. 19, T. 41 N., R. 9 E., on right bank just upstream from bridge on U. S. Highway 20 in Elgin and 2 miles upstream from mouth. Datum of gage is 715.91 ft above mean sea level, datum of 1929.
Drainage area.--35.8 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements.
Maxima.--October 1954: Discharge, 291 cfs 12 p.m. Oct. 10 (gage height, 3.72 ft).
1951 to September 1954 (revised): Discharge, 310 cfs Apr. 25, 1954 (gage height, 3.83 ft).

(54) Fox River at Dayton, Ill.

Location.--Lat 41°23'14", long. 88°47'21", in SE¼ sec. 29, T. 34 N., R. 4 E., on right bank in tailwater of plant of North Counties Hydro-Electric Co. at Dayton, 5.6 miles upstream from mouth. Datum of gage is 462.30 ft above mean sea level, datum of 1929.
Drainage area.--2,570 sq mi.
Gage-height record.--Water-stage recorder graph.
Discharge record.--Stage-discharge relation defined by current-meter measurements below 15,000 cfs and by computation of peak flow over dam.
Maxima.--October 1954: Discharge, 47,100 cfs 3:30 p.m. Oct. 11 (gage height, 24.63 ft).
1925 to September 1954: Discharge, 29,000 cfs Mar. 19, 1948 (gage height, 19.65 ft); gage height, 32.04 ft Jan. 30, 1952 (ice jam).
Remarks.--Low flow regulated by powerplant above station.

Table 1.--Daily and monthly discharge, in cubic feet per second, and runoff, in inches, at gaging stations

Oct. 1954	Station number								
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(10)	(11)
1	8.0	19	0.3	1.7	0.8	0.5	25	37	1.0
2	6.4	17	.3	1.6	.8	.3	22	31	1.0
3	9.6	18	.3	1.9	.9	.4	28	77	5.3
4	8.0	21	.3	2.4	1.0	.6	28	78	2.8
5	14	36	.6	5.4	3.0	1.6	59	67	12
6	14	22	1.0	3.0	1.8	2.7	42	90	12
7	11	19	.9	1.7	1.1	1.2	33	69	6.1
8	9.5	19	.7	1.4	1.0	.7	30	55	3.3
9	10	23	1.1	2.8	1.8	.8	31	58	7.9
10	1,320	727	323	492	171	426	1,260	1,930	427
11	2,570	682	594	608	293	555	3,140	3,940	448
12	1,780	243	316	253	282	484	2,090	3,850	325
13	763	96	129	116	205	397	1,110	2,650	232
14	504	60	75	87	101	282	717	1,510	167
15	389	56	72	75	63	180	583	1,030	107
16	256	54	44	59	39	97	416	762	76
17	178	44	32	49	25	64	295	555	59
18	140	40	24	39	18	45	206	454	46
19	117	39	20	35	15	38	156	399	39
20	94	34	16	30	11	33	124	353	33
21	77	30	13	26	9.3	26	103	301	28
22	66	30	11	22	7.8	22	84	268	24
23	56	30	9.8	20	6.7	18	69	231	21
24	51	29	8.2	16	6.1	15	60	198	19
25	45	28	7.4	14	5.6	13	55	181	17
26	43	28	6.8	12	5.2	12	52	164	16
27	42	27	6.4	11	4.9	11	48	153	15
28	42	27	5.9	10	4.4	9.7	46	143	14
29	39	27	5.6	10	4.3	9.2	45	118	12
30	36	25	5.1	9.1	3.8	8.2	40	115	12
31	33	22	4.6	8.4	3.4	6.8	35	114	11
Mean	282	83.0	55.9	65.3	41.8	89.1	356	645	71.0
In.	4.70	3.77	2.64	3.29	5.81	5.64	3.91	---	6.44

Table 1.--Daily and monthly discharge, in cubic feet per second, and runoff, in inches, at gaging stations--Continued

Oct. 1954	Station number								
	[a](12)	(13)	[b](14)	(15)	(16)	(17)	(18)	(19)	(20)
1	1.65	28	--	44	40	89	310	46	144
2	1.66	22	--	37	42	89	310	43	142
3	2.00	32	--	327	335	101	385	334	234
4	2.17	28	--	1,220	410	140	570	840	620
5	2.29	30	--	460	250	146	570	865	970
6	2.30	30	--	385	180	164	621	890	1,060
7	2.30	26	--	229	98	149	587	640	1,030
8	2.29	22	--	145	73	137	522	350	940
9	2.34	22	--	118	62	131	492	292	664
10	2.82	729	1,140	1,780	1,190	567	971	1,800	785
11	2.98	3,340	3,230	2,600	2,740	655	1,360	4,050	1,630
12	2.98	2,600	3,110	1,110	1,280	599	1,420	5,210	2,920
13	2.96	1,480	2,490	546	662	458	1,430	5,310	3,960
14	2.89	961	1,870	374	415	435	1,440	4,830	5,030
15	2.87	738	1,540	420	385	485	1,500	4,010	5,600
16	2.82	599	1,300	672	382	536	1,570	3,270	5,550
17	2.76	458	1,130	638	416	509	1,620	2,710	5,020
18	2.71	381	985	330	273	442	1,620	2,280	4,300
19	2.70	320	872	231	185	367	1,590	1,950	3,550
20	2.65	253	749	180	130	328	1,580	1,670	2,870
21	2.60	210	627	144	107	297	1,540	1,390	2,360
22	2.52	188	542	122	89	271	1,520	1,120	1,920
23	2.44	162	465	100	82	249	1,490	908	1,560
24	2.36	144	--	91	77	232	1,460	754	1,300
25	2.30	126	--	82	76	221	1,440	654	1,100
26	2.26	108	--	79	72	220	1,410	588	960
27	2.20	98	--	79	71	220	1,390	530	878
28	2.13	88	--	79	68	220	1,360	481	816
29	2.07	77	--	74	66	220	1,340	446	770
30	2.04	70	--	74	62	220	1,320	419	730
31	2.00	64	--	69	55	220	1,290	396	687
Mean	--	433	--	414	335	294	1,160	1,580	1,940
In.	--	3.99	--	7.59	4.91	2.22	2.63	6.41	5.26

a Figures given are daily mean stage, in feet--discharge not determined at this station.

b See Remarks paragraph of station description.

Table 1.--Daily and monthly discharge, in cubic feet per second, and runoff, in inches, at gaging stations--Continued

Oct. 1954	Station number (21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)
1	550	642	16	9.2	28	795	754	15	0.1
2	575	660	15	8.0	25	810	754	27	.1
3	600	678	15	8.0	29	840	790	117	1.4
4	1,050	852	16	8.4	29	896	844	169	.6
5	1,480	1,270	16	11	31	1,060	980	181	1.2
6	1,660	1,550	17	9.6	35	1,320	1,230	183	2.0
7	1,840	1,710	16	8.0	28	1,540	1,500	177	1.8
8	1,760	1,750	15	7.7	28	1,720	1,750	161	1.6
9	1,600	1,730	15	7.4	33	1,870	1,950	140	1.6
10	1,650	1,810	368	869	780	2,810	2,780	179	73
11	2,370	2,660	924	1,570	1,930	4,900	8,000	350	134
12	2,940	3,470	947	914	1,940	5,260	9,700	423	105
13	3,330	3,850	888	491	1,770	5,120	7,990	441	72
14	3,670	4,020	734	290	1,420	5,280	7,180	433	53
15	3,940	4,090	595	171	1,090	5,400	7,400	433	42
16	4,200	4,180	452	129	777	5,300	7,270	425	34
17	4,370	4,260	358	104	572	5,160	6,780	401	26
18	4,550	4,340	291	87	494	5,040	6,460	360	20
19	4,840	4,360	242	74	425	4,960	6,190	301	17
20	5,070	4,470	201	66	367	4,900	6,010	238	15
21	5,240	4,580	169	58	319	4,900	5,830	190	13
22	5,290	4,690	148	50	283	4,900	5,650	155	12
23	5,260	4,770	134	42	259	4,940	5,600	134	10
24	5,170	4,830	122	40	237	5,000	5,600	115	9.4
25	5,030	4,890	112	37	225	5,060	5,600	107	8.9
26	4,880	4,990	106	34	216	5,100	5,650	101	9.1
27	4,710	5,030	100	32	209	5,120	5,650	102	9.1
28	4,510	4,920	94	30	202	5,220	5,650	107	8.6
29	4,340	4,830	91	28	198	5,220	5,700	102	7.9
30	4,200	4,750	88	27	191	5,200	5,650	95	7.2
31	4,050	4,770	86	26	182	5,100	5,560	84	6.6
Mean	3,380	3,400	238	169	463	3,895	4,790	208	22.7
In.	2.97	2.24	2.25	3.57	2.43	1.92	1.05	1.12	1.35

Table 1.--Daily and monthly discharge, in cubic feet per second, and runoff, in inches, at gaging stations--Continued

Oct. 1954	Station number								
	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)	(38)
1	23	0	5.0	0.2	1.0	9.0	0.9	38	3.4
2	30	0	8.8	1.1	.8	8.2	.8	36	3.2
3	74	.6	31	40	13	101	14	430	173
4	158	2.1	4.3	16	3.7	82	14	320	73
5	200	2.0	21	44	11	119	23	529	97
6	206	3.3	5.6	34	7.9	117	24	500	55
7	200	2.5	4.2	20	5.0	90	17	392	30
8	195	2.1	4.2	15	4.0	67	11	329	21
9	191	3.4	48	32	10	60	15	350	50
10	785	67	329	228	268	812	289	2,720	945
11	1,750	131	210	337	422	1,670	496	5,870	567
12	1,260	68	90	218	263	1,500	187	5,360	291
13	869	36	55	149	193	1,270	80	3,990	165
14	794	30	54	120	160	884	41	2,790	106
15	749	30	38	109	131	669	35	2,170	76
16	688	22	28	84	99	520	26	1,760	61
17	633	17	22	66	76	390	20	1,460	52
18	587	14	20	57	59	272	17	1,230	47
19	526	12	16	49	50	220	17	1,080	40
20	444	11	14	41	44	182	15	938	35
21	358	9.1	12	36	38	162	13	792	30
22	295	8.0	11	31	34	147	12	663	27
23	246	7.3	9.6	27	31	132	11	561	25
24	217	6.6	8.8	23	28	123	9.7	484	22
25	190	5.9	8.8	21	25	113	8.4	420	22
26	180	5.8	8.6	20	24	110	8.4	392	20
27	175	5.9	8.1	19	23	106	8.0	378	18
28	170	5.6	7.8	16	21	95	7.6	350	17
29	160	5.2	7.6	15	19	82	6.8	332	15
30	150	5.0	6.7	12	16	73	6.4	314	13
31	140	4.6	6.3	10	15	67	6.4	290	13
Mean	408	16.9	35.6	61.0	67.6	331	46.5	1,202	100
In.	1.26	2.59	3.13	3.59	2.31	3.13	2.94	2.18	7.15

Table 1.--Daily and monthly discharge, in cubic feet per second, and runoff, in inches, at gaging stations--Continued

Oct. 1954	Station number								
	(39)	(40)	(41)	(42)	(44)	[c](45)	[d](45)	[e](45)	(46)
1	0.6	4.0	0.3	9.7	0	3,471	1,800	1,533	0.3
2	.6	8.0	.3	11	0	3,393	1,684	1,555	.4
3	4.8	29	14	109	72	8,668	1,590	6,760	196
4	6.2	7.7	3.0	54	28	4,778	1,816	2,650	127
5	3.9	8.8	11	88	42	5,813	1,750	3,700	114
6	3.9	7.2	6.1	39	24	3,654	1,750	1,603	69
7	2.9	4.7	2.0	26	13	3,419	1,725	1,440	35
8	2.0	3.7	1.8	19	8.4	3,520	1,720	1,574	26
9	1.7	3.9	1.6	63	33	5,022	1,646	3,132	60
10	80	114	132	961	891	21,429	1,505	16,940	2,010
11	208	131	211	1,500	546	20,417	1,736	11,758	789
12	147	52	72	1,030	270	13,760	1,766	5,974	410
13	60	29	30	642	112	8,090	1,758	3,055	272
14	41	28	26	436	79	5,935	1,744	2,289	190
15	38	25	25	378	68	4,517	1,725	1,685	151
16	28	20	16	275	57	3,960	1,604	1,685	108
17	21	16	11	195	51	3,387	1,474	1,417	78
18	18	15	11	149	46	3,186	1,685	1,048	62
19	16	14	11	152	43	3,361	1,710	1,245	51
20	13	12	7.7	106	41	2,962	1,718	875	45
21	11	9.2	6.2	82	39	2,609	1,714	556	40
22	9.2	7.7	4.8	64	36	2,705	1,715	684	36
23	7.8	6.5	3.9	49	34	2,636	1,617	736	31
24	6.4	6.0	3.2	38	32	2,478	1,499	709	27
25	5.5	6.3	2.8	34	29	2,506	1,710	533	23
26	5.2	7.2	3.7	31	26	2,816	1,709	857	20
27	5.4	8.0	3.0	32	24	2,565	1,706	615	20
28	4.7	7.0	2.6	33	19	2,492	1,700	542	18
29	4.4	6.5	2.4	29	12	2,605	1,682	681	17
30	3.8	6.0	2.5	26	11	2,405	1,565	615	16
31	3.3	4.3	1.7	22	9.4	2,631	1,460	955	15
Mean	24.6	19.6	20.3	216	87.0	5,200	1,677	2,561	163
In.	1.37	1.77	2.04	2.44	8.87	--	--	--	9.04

c Total discharge
d Chicago pumpage
e Net diversion

Table 1.--Daily and monthly discharge, in cubic feet per second, and runoff, in inches, at gaging stations--Continued

Oct. 1954	Station number						
	(48)	(49)	(50)	(51)	(52)	(53)	(54)
1	9.7	55	0.4	5,100	394	8.7	585
2	9.7	55	.7	4,840	437	8.7	575
3	8.9	194	1.6	8,690	549	15	637
4	9.7	586	1.6	8,800	840	8.7	1,590
5	25	503	3.4	10,100	1,180	14	1,600
6	23	622	6.0	6,780	1,350	14	2,140
7	26	499	6.9	6,600	1,390	10	2,080
8	22	335	6.9	6,970	1,400	8.5	2,000
9	23	269	5.6	6,780	1,370	8.7	1,980
10	3,220	6,590	21	22,900	1,540	165	8,650
11	5,060	11,400	503	46,600	1,710	243	37,900
12	1,900	7,150	520	54,500	1,830	174	23,400
13	1,020	3,370	359	42,000	1,960	142	10,300
14	636	2,240	250	27,100	1,980	121	7,580
15	418	1,740	201	20,400	2,110	105	6,520
16	283	1,340	164	18,200	2,110	90	5,870
17	218	1,100	125	15,900	2,020	78	5,460
18	172	935	95	14,100	1,940	68	5,060
19	145	821	76	14,000	1,810	59	4,730
20	125	742	63	12,700	1,630	51	4,410
21	111	675	57	11,500	1,300	43	4,070
22	101	615	49	11,500	1,140	36	3,560
23	92	561	43	10,400	1,040	30	3,180
24	83	520	40	10,500	855	26	2,930
25	77	481	36	9,900	780	25	2,640
26	74	455	36	10,500	753	24	2,440
27	68	425	36	9,900	766	22	2,320
28	65	395	33	9,510	699	20	2,210
29	58	377	31	9,330	699	19	2,100
30	55	347	30	9,600	740	17	2,000
31	50	302	28	9,230	712	15	1,900
Mean	458	1,474	91.3	15,000	1,260	53.8	5,239
In.	4.93	5.23	.22	--	1.06	1.73	2.35

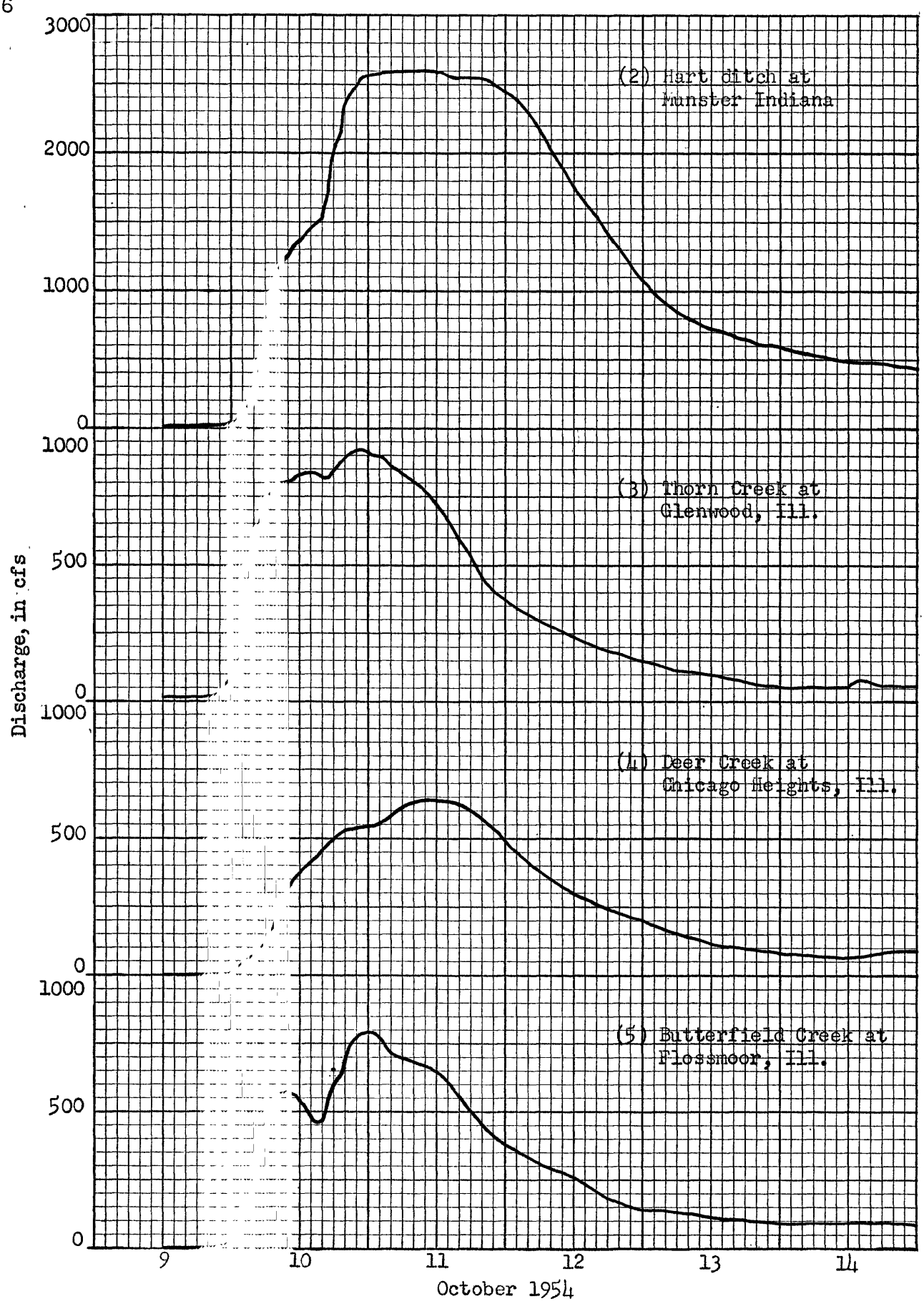


Figure 3.--Hydrographs for stations 2-5

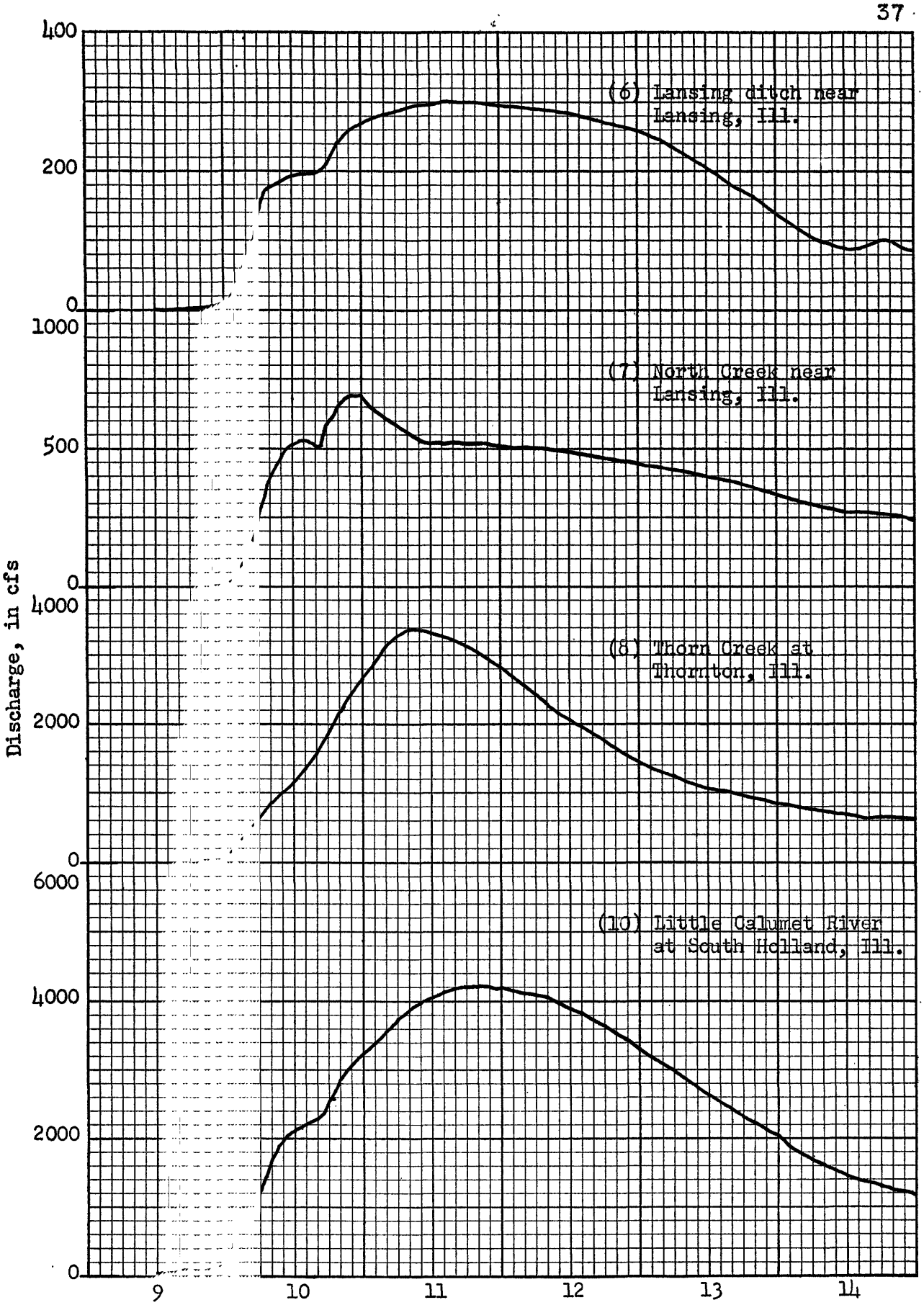


Figure 4.--Hydrographs for stations 6-8, 10

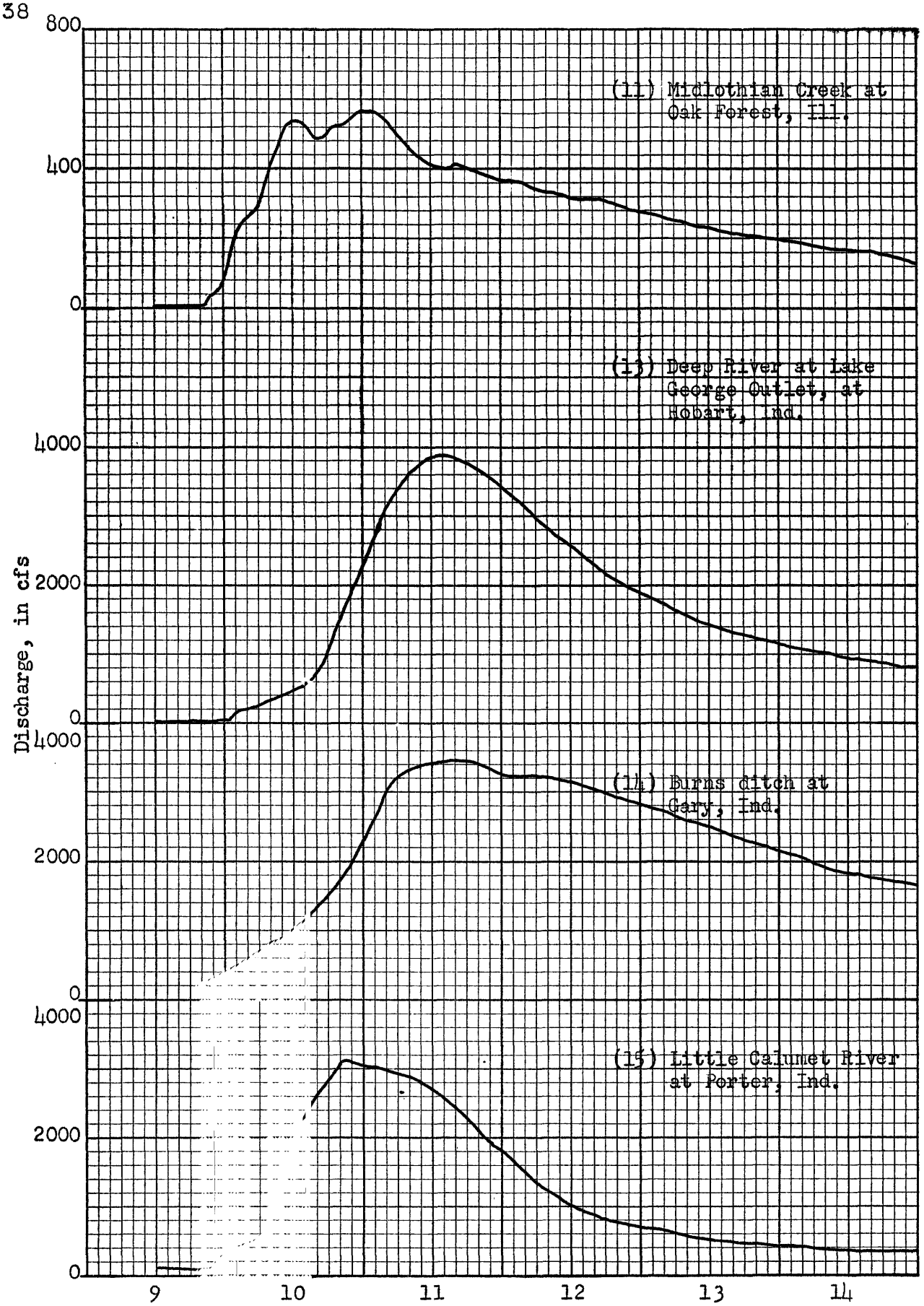
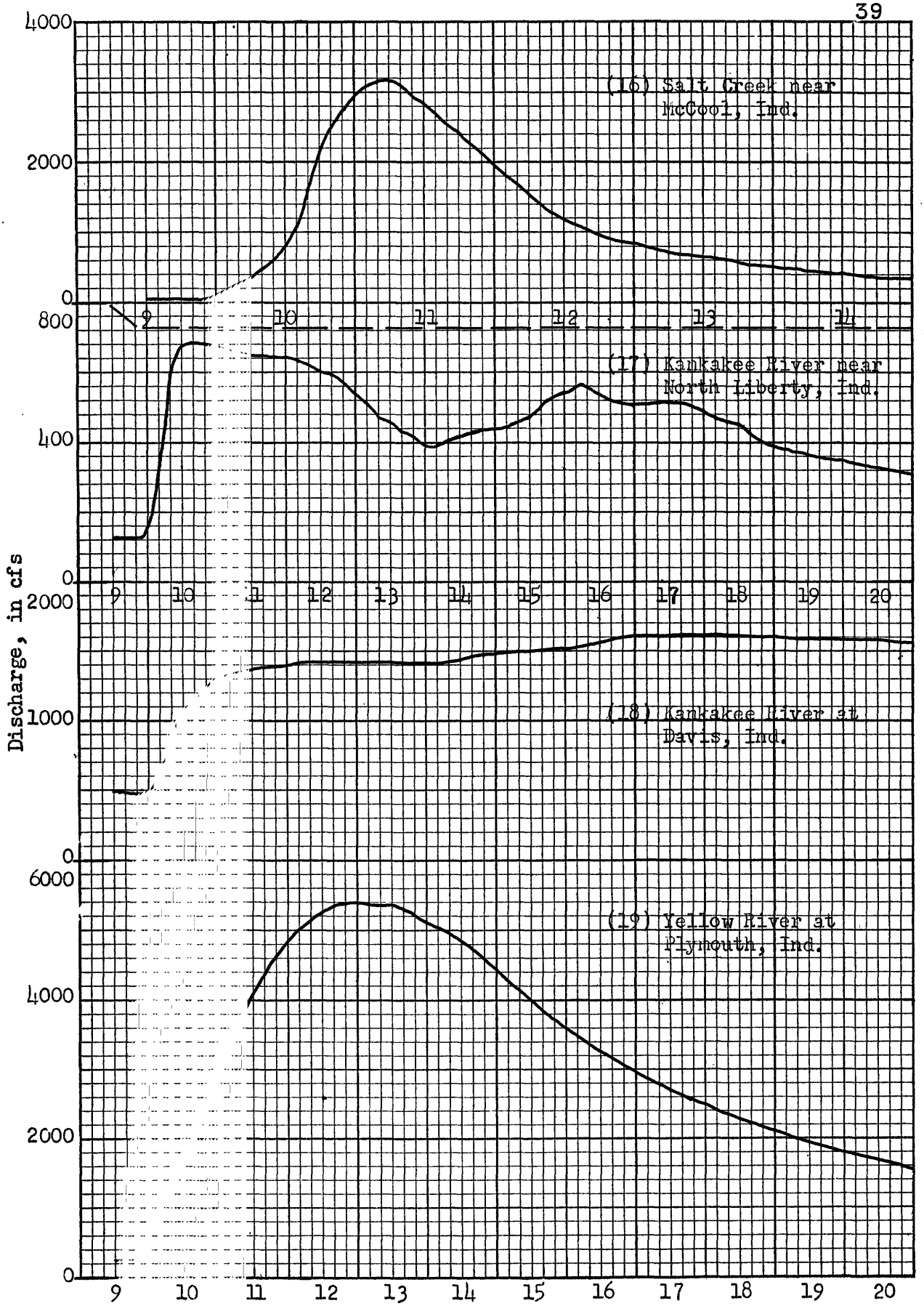


Figure 5.--Hydrographs for stations 11, 13-15



October 1954

Figure 6.--Hydrographs for stations 16-19

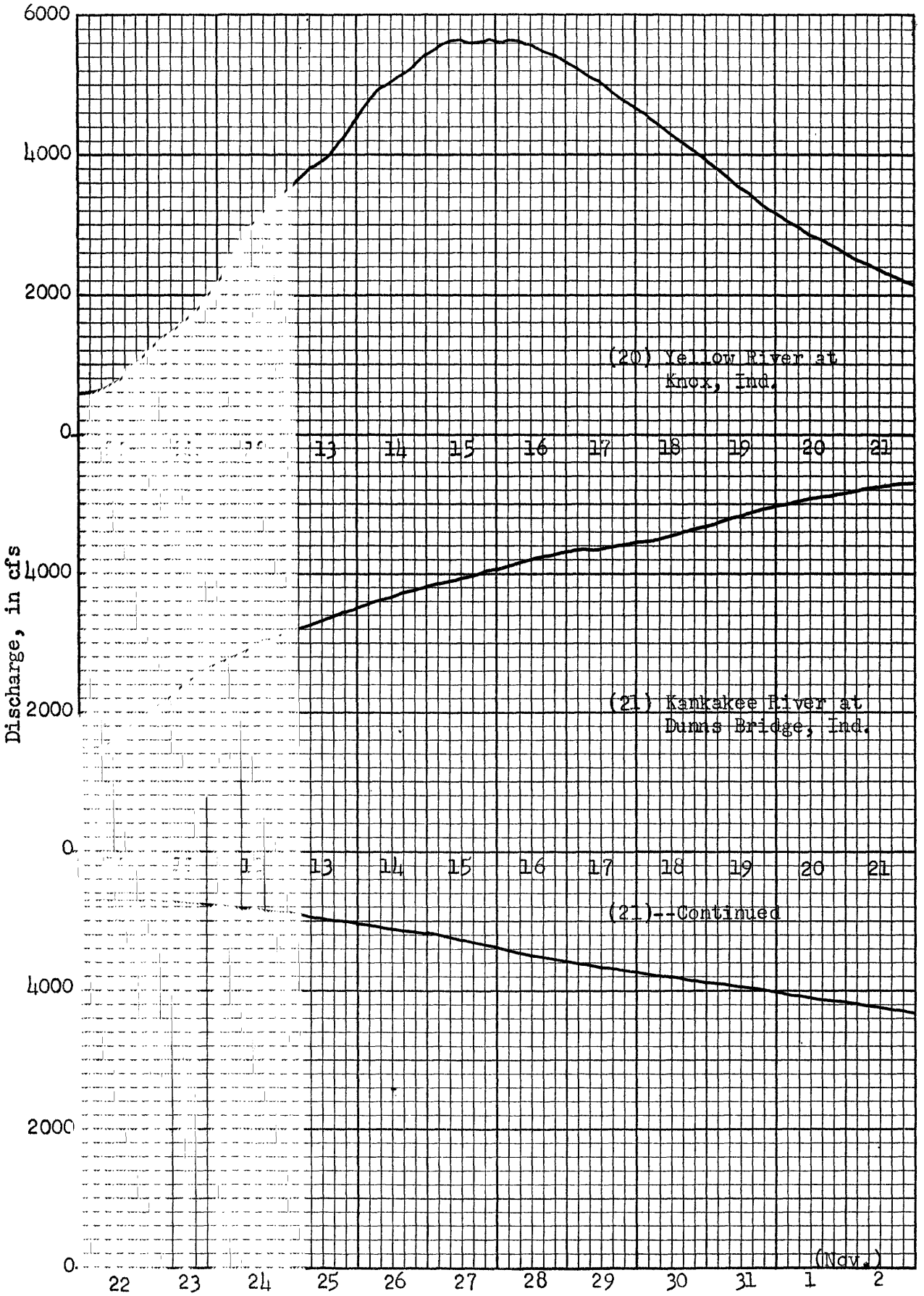


Figure 7.-- Hydrographs for stations 20, 21

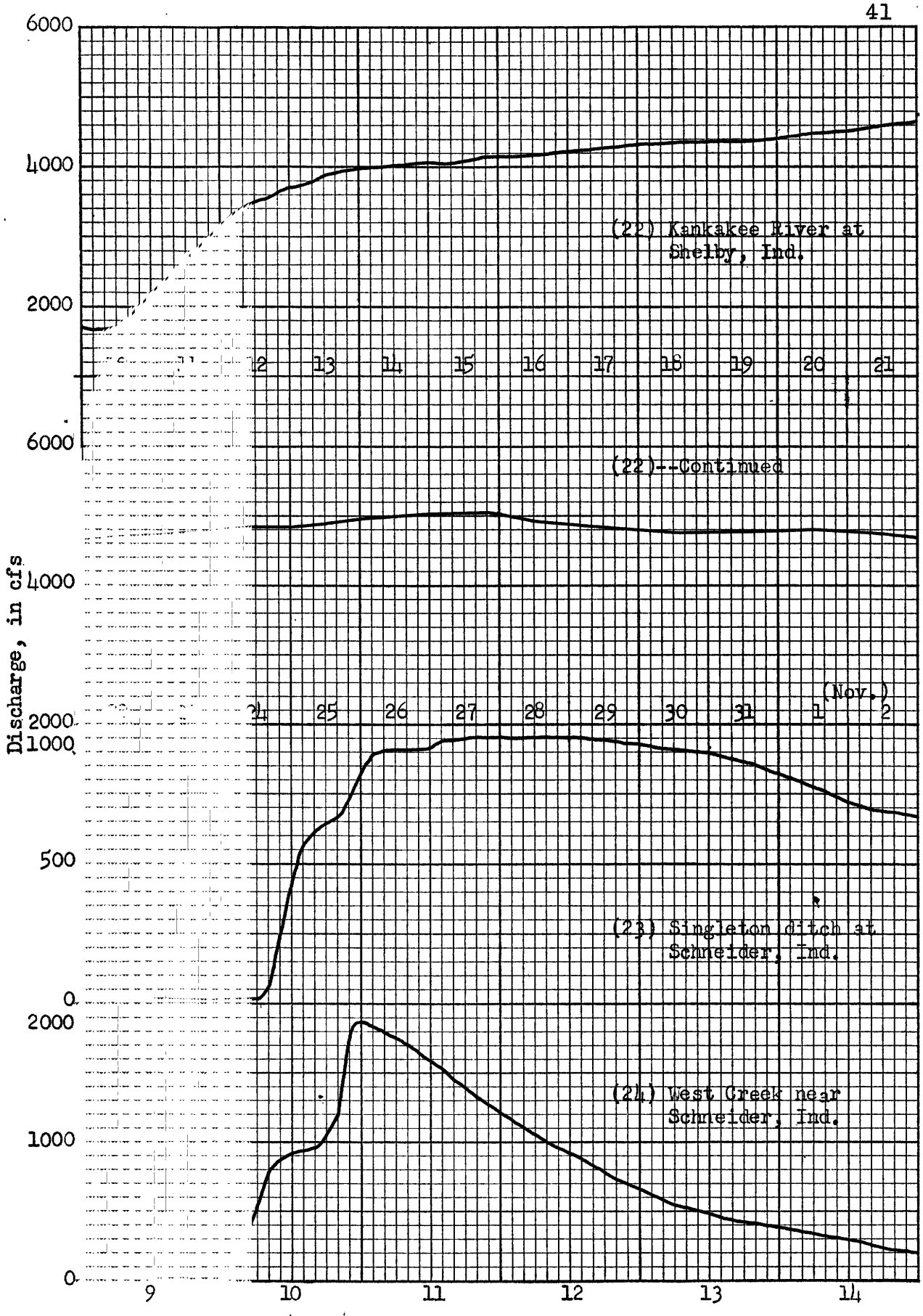


Figure 8.--Hydrographs for stations 22-24

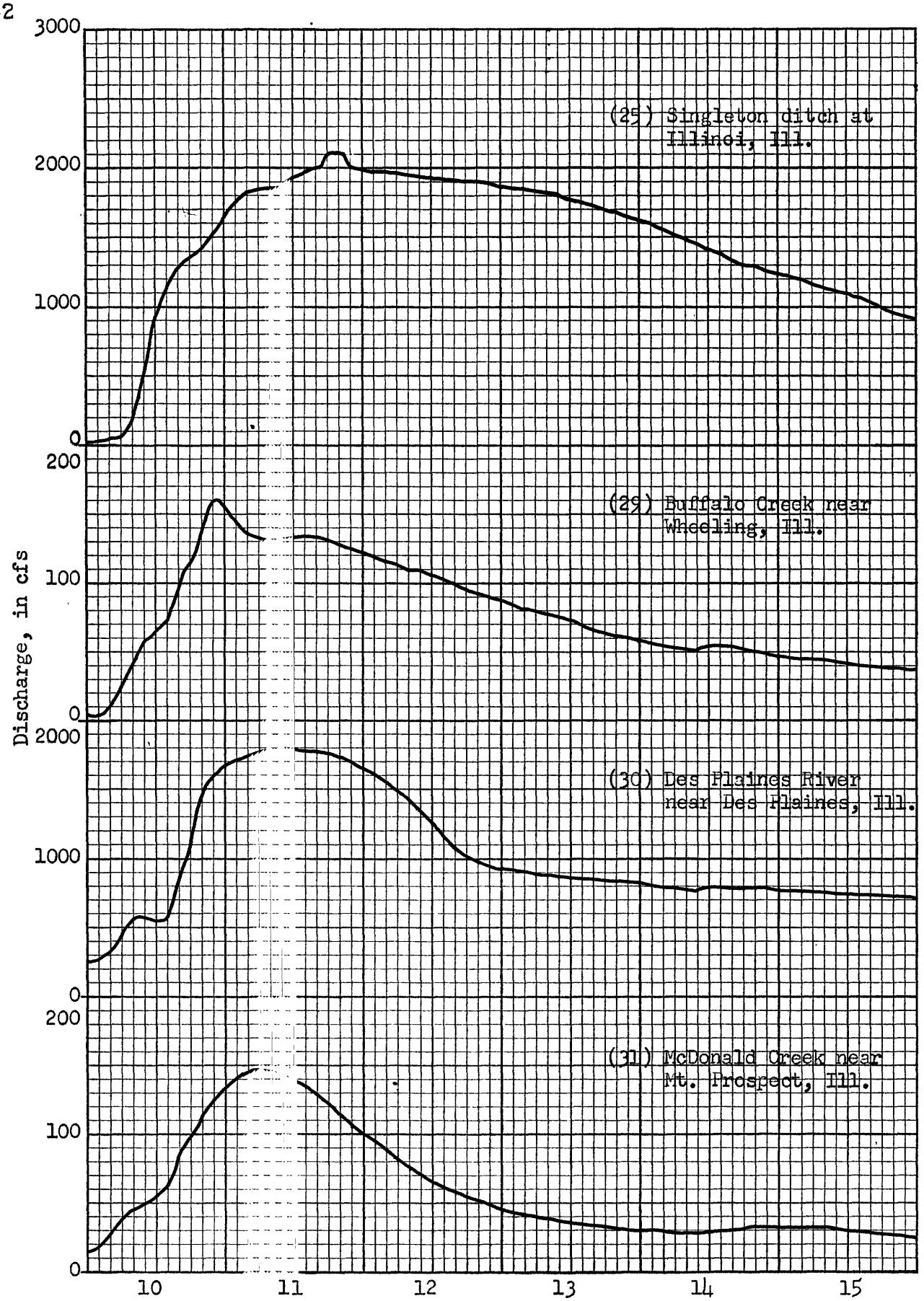


Figure 9.--Hydrographs for stations 25, 29-31

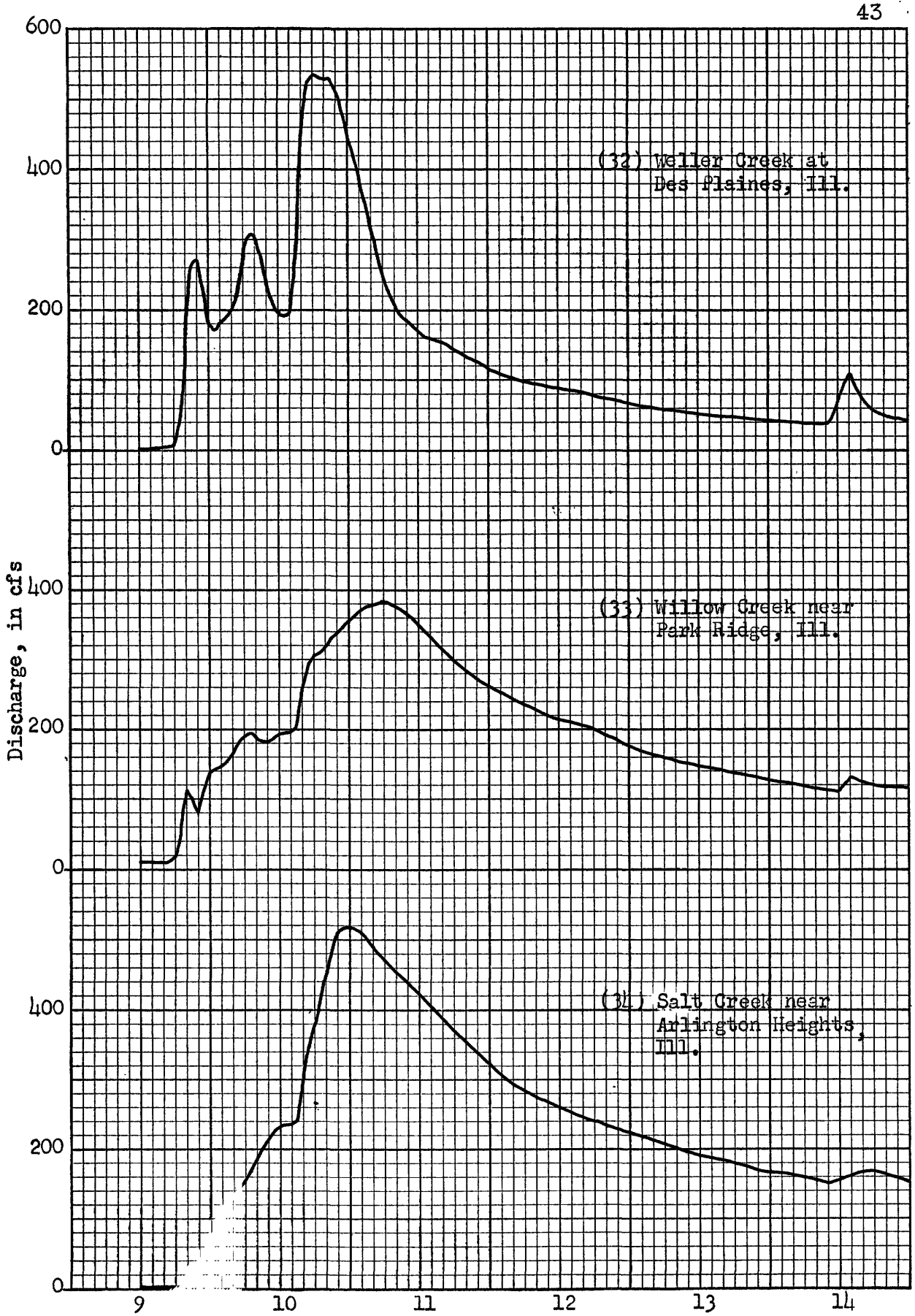


Figure 10.--Hydrographs for stations 32-34

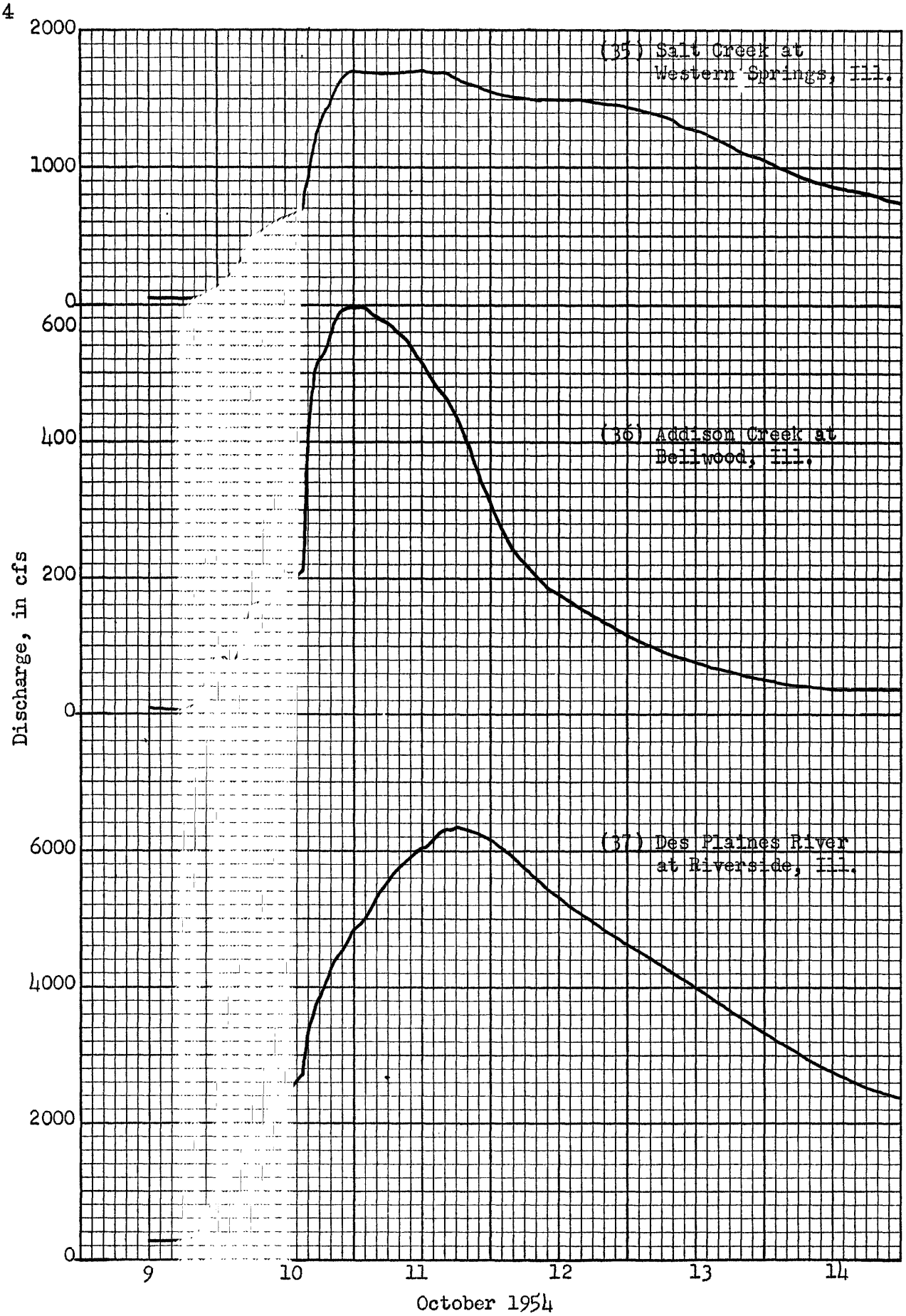


Figure 11.--Hydrographs for stations 35-37

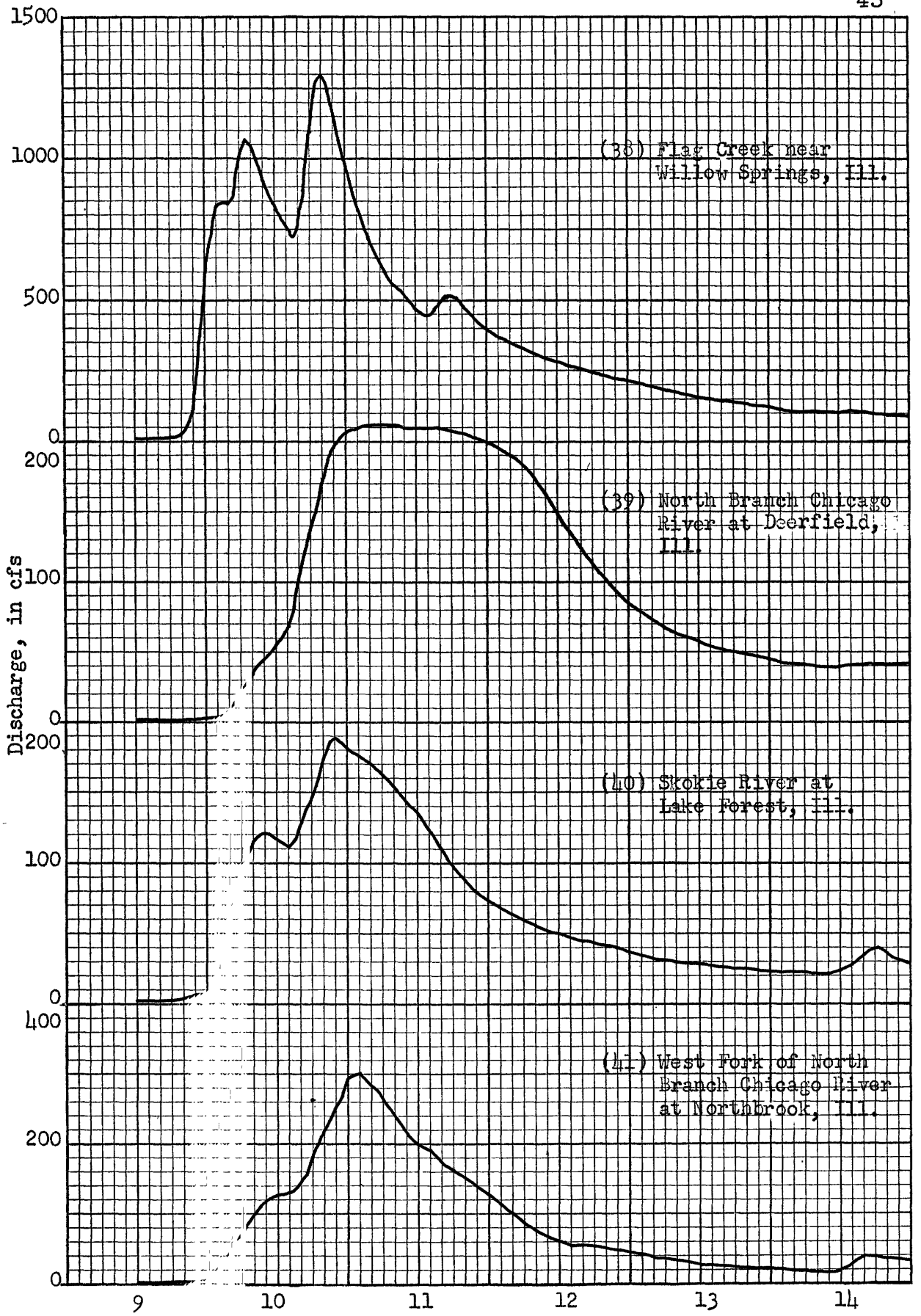


Figure 12.--Hydrographs for stations 38-41

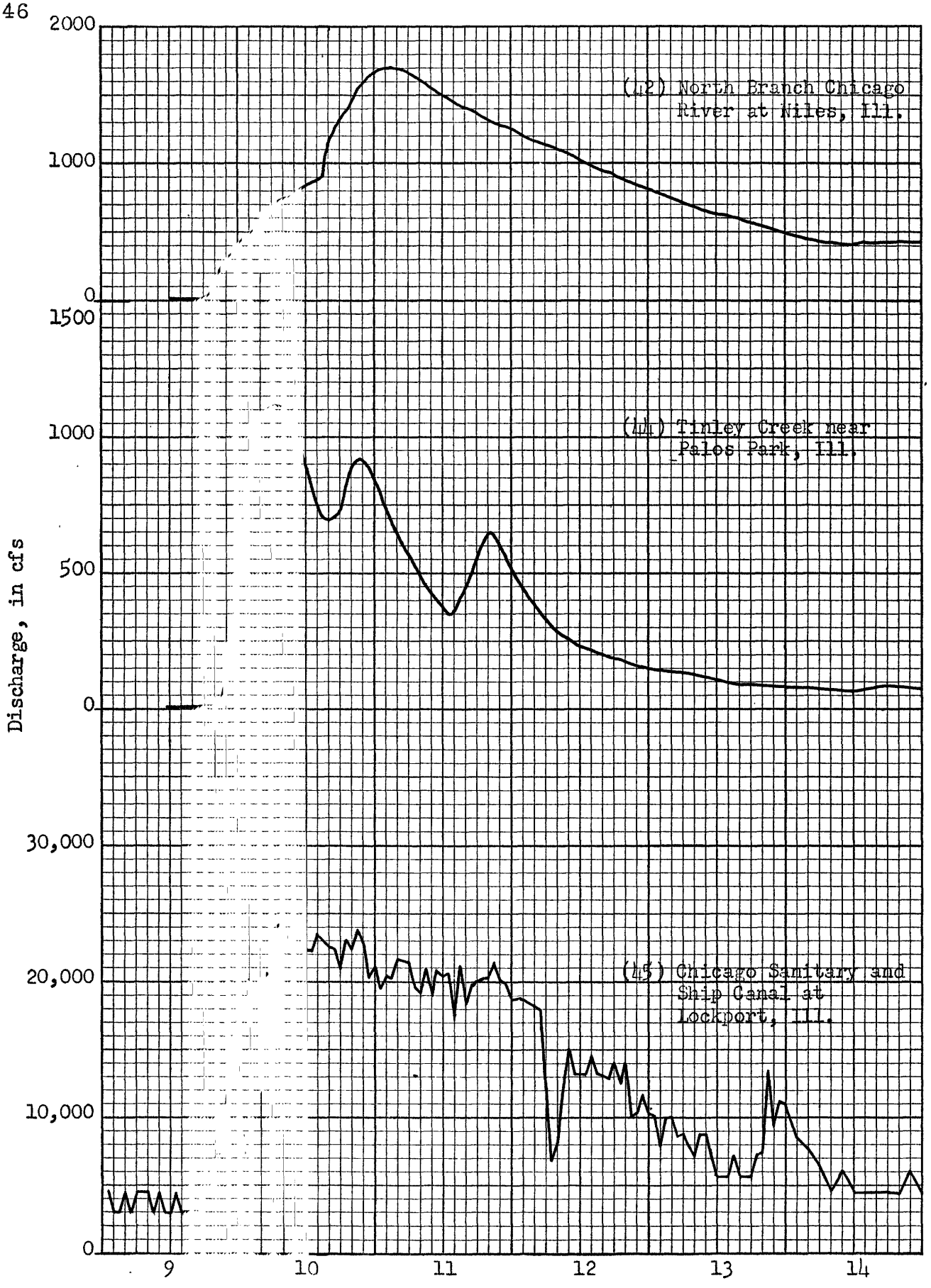


Figure 13.--Hydrographs for stations 42, 44, 45

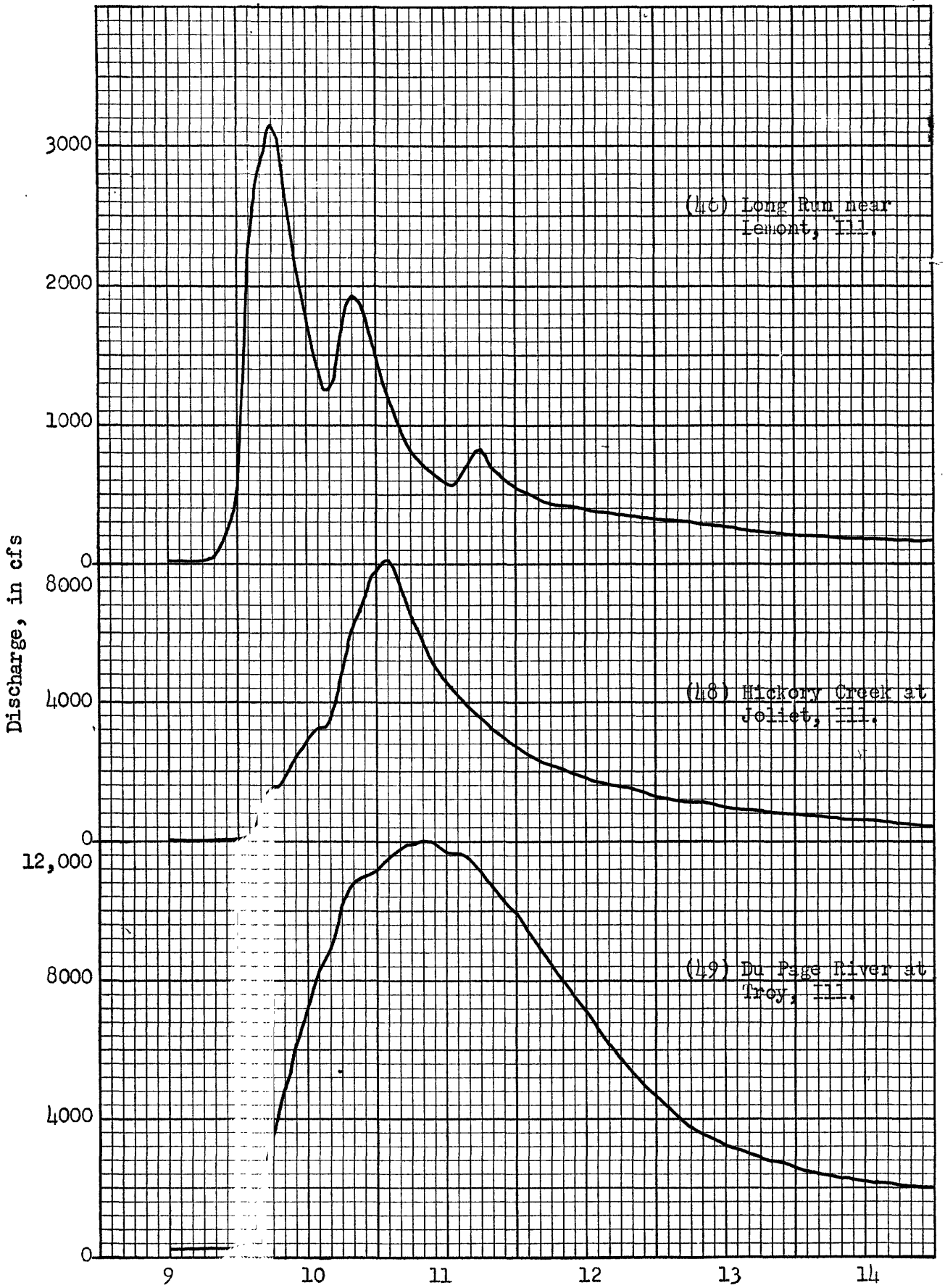


Figure 14.--Hydrographs for stations 46, 48, 49

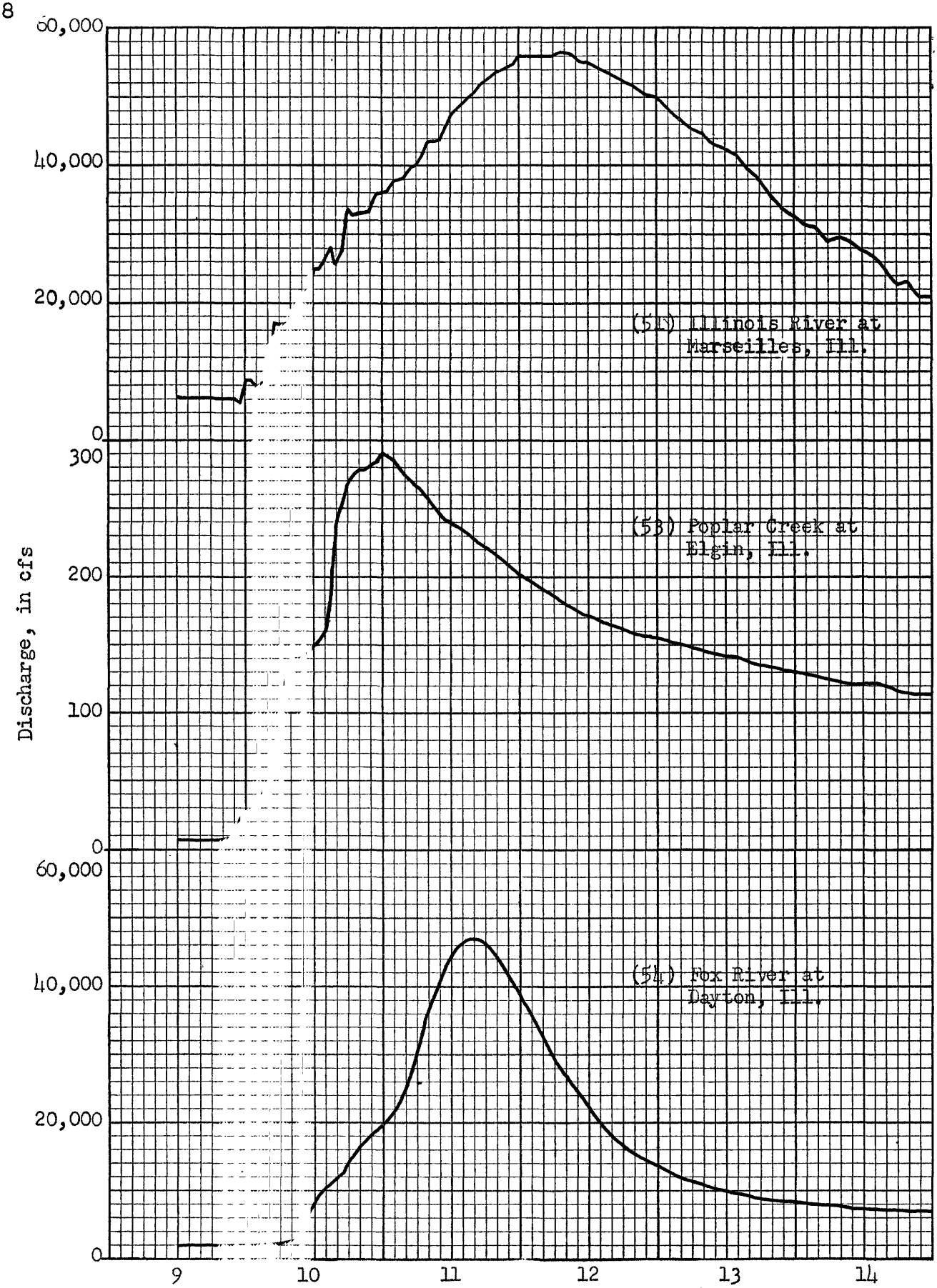


Figure 15.--Hydrographs for stations 51, 53, 54

SUMMARY OF FLOOD STAGES AND DISCHARGES

The results of the determinations of maximum stages and discharges at the 50 established stream-gaging stations and 4 miscellaneous ungaged points in the area are summarized and presented in table 2. The reference numbers correspond to those assigned in the foregoing section, "Stages and discharges at stream-gaging stations", and in figures 1 and 2.

The discharges listed in table 2 were determined at the established stream-gaging stations as explained in the descriptions of those stations. At the points where peak discharges were not determined by gaging-station operations, a general note at the end of the table indicates the method of determination. The peak-discharge values are given as actually determined; that is, no adjustments for artificial storage, regulation or diversions have been attempted.

For some stations the peak discharge did not occur simultaneously with peak stage due to effects of slope, backwater, or for other reasons. In such instances, the maxima are given separately; first, the peak discharge and its date and time, and second, the peak stage and its date and time. A second line, also, is used to present data on floods prior to the period of gaging-station operation, where such historical information is available.

Peak discharges, in cubic feet per second per square mile, plotted against corresponding drainage areas are shown in figure 16. The reference numbers used throughout the report have been shown alongside the highest plotted points for gaging-station identity.

Table 2.--Summary of flood stages and discharges

No.	Stream and Place of Determination	Drainage Area (Square miles)	Period of Record	Maximum Flood Previously Known				Maximum During Present Flood				Remarks
				Date	Gage height (Feet)	Discharge		Time	Gage height (Feet)	Discharge		
						Second-feet	Second-feet per square mile			Second-feet	Second-feet per square mile	
	STREAMS TRIBUTARY TO LAKE MICHIGAN											
1	Little Calumet River (western portion) at Grant Street, Gary, Ind.	----	-----	-------	---	----	---	Oct. 11, ---	---	a 244A	---	
2	Hart ditch at Munster, Ind.	69.2	1942-54	Apr. 6, 1947	---	2,490	36.0	Oct. 11, 5-10a.m.	---	2,600	37.6	
				Mar. 15, 1944	7.23	-----	----	Oct. 11, 4-8 p.m.	7.83	----	---	
3	Thorn Creek at Glenwood, Ill.	25.4	1949-54	June 10, 1953	9.63	848	33.4	Oct. 10, 10-11 p.m.	9.88	916	36.1	
4	Deer Creek near Chicago Heights, Ill.	24.4	1948-54	May 10 or 11, 1948	[b]11.52	663	27.2	Oct. 11, 11 a.m.	11.19	637	26.1	
5	Butterfield Creek at Flossmoor, Ill.	22.9	1948-54	Mar. 19, 1948	[b]10.29	683	29.8	Oct. 10, 12 p.m.	10.92	788	34.4	
				May 10 or 11, 1948	[b]10.28	683						
6	Lansing ditch near Lansing, Ill.	[c]8.3	1948-54	May 10 or 11, 1948	[b]9.24	461	55.5	Oct. 11, 4 p.m.	10.18	302	36.4	
7	North Creek near Lansing, Ill.	18.2	1948-54	Mar. 20, 1948	8.51	730	40.1	Oct. 10, 10-12 p.m.	8.96	692	38.0	
8	Thorn Creek at Thornton, Ill.	106	1948-54	Apr. 5, 1947	[b]14.34	4,200	39.6	Oct. 11, 9 a.m.	14.70	3,370	31.8	
9	Thorn Creek near Lansing, Ill.	-----	-----	----------	---	----	---	Oct. 11, 1:30 p.m.	11.08	3,430B	----	
10	Little Calumet River at South Holland, Ill.	-----	1947-54	Apr. 6, 1947	[b]19.24	4,760	---	Oct. 11, 8-9 p.m.	19.39	4,210	----	

See footnotes at end of table.

Table 2.--Summary of flood stages and discharges--Continued

No.	Stream and Place of Determination	Drainage Area (Square miles)	Period of Record	Maximum Flood Previously Known				Maximum During Present Flood				Remarks
				Date	Gage height (Feet)	Discharge		Time	Gage height (Feet)	Discharge		
						Second-feet	Second-feet per square mile			Second-feet	Second-feet per square mile	
11	Midlothian Creek at Oak Forest, Ill.	12.7	1950-54	June 10, 1953	6.38	384	30.2	Oct. 10, 12 p.m.	8.49	569	44.8	
12	Wolf Lake at Chicago, Ill.	-----	1939-54	June 27, 1952	2.32	----	----	Oct. 11, 5 p.m, to Oct. 12, 7 a.m.	3.00	-----	----	
13	Deep River at Lake George Outlet, at Hobart, Ind.	125	1947-54	May 11, 1948	5.86	2,740	21.9	Oct. 11, 1:30 to 2 p.m.	7.68	3,880	31.0	
14	Burns ditch at Gary, Ind.	[d]160	1943-54	May 11, 1948	---	2,660	16.6	Oct. 11, 2-6 p.m.	---	3,430	21.4	
				Mar. 16, 1944	16.44	----	----	Oct. 12, 1-5 a.m.	15.90	----	---	
15	Little Calumet River (eastern portion) at Porter, Ind.	62.9	1945-54	June 28, 1945	9.88	2,440	38.8	Oct. 10, 9 p.m.	11.66	3,110	49.4	
16	Salt Creek near McCool, Ind.	78.7	1945-54	May 11, 1948	12.3	1,910	24.3	Oct. 11, 6 a.m.	14.12	3,180	40.4	
	ILLINOIS RIVER BASIN											
17	Kankakee River near North Liberty, Ind.	152	1951-54	Nov. 14, 1951	6.97	680	4.47	Oct. 10, 3-4 p.m.	---	686	4.51	
								Oct. 12, 12 m.	8.64	----	---	
18	Kankakee River at Davis, Ind.	508	1925-29, 1931-54	Dec. 15, 1927	[e]9.50	[c]1,700	3.35	Oct. 16, 10 p.m., to Oct. 18, 6 p.m.	11.76	1,620	3.19	
19	Yellow River at Plymouth, Ind.	284	1948-54	July 12, 1951	13.39	3,230	11.4	Oct. 12, 8 p.m, to Oct. 13, 4 a.m.	17.13	5,390	19.0	
20	Yellow River at Knox, Ind.	425	1943-54	Apr. 7, 1950	10.42	3,160	7.44	Oct. 15, 10 p.m. and Oct. 16, 4 a.m.	13.75	5,660	13.3	

See footnotes at end of table.

Table 2.--Summary of flood stages and discharges--Continued

No.	Stream and Place of Determination	Drainage Area (Square miles)	Period of Record	Maximum Flood Previously Known				Maximum During Present Flood				Remarks
				Date	Gage height (Feet)	Discharge		Time	Gage height (Feet)	Discharge		
						Second-feet	Second-feet per square mile			Second-feet	Second-feet per square mile	
21	Kankakee River at Dunns Bridge, Ind.	1,308	1948-54	Apr. 12, 1950	13.08	5,200	3.98	Oct. 22, 3-11 a.m.	13.20	5,300	4.05	
22	Kankakee River at Shelby, Ind.	1,753	1922-54	Dec. 21, 1927	[f]11.40	[g]7,200	4.11	Oct. 27, 12 m. to 10 p.m.	10.60	5,040	2.88	
23	Singleton ditch at Schneider, Ind.	122	1948-54	Apr. 10, 1950	---	[h]1,100	9.02	Oct. 10, 10 p.m. to Oct. 12, 1 a.m.; Oct. 12, 5-11 a.m.	10.10	953	7.81	
24	West Creek near Schneider, Ind.	54.5	1948-51, 1954	Dec. 22, 1949	6.56	1,050	19.3	Oct. 10, 11 p.m. to Oct. 11, 1 a.m.	8.09	1,870	34.3	
25	Singleton ditch at Illinoi, Ill.	219	1944-54	Apr. 11, 1950	9.26	1,850	8.45	Oct. 11, 7-8 p.m.	9.81	2,110	9.63	
26	Kankakee River at Momence, Ill.	[c]2,340	1905-06, 1914-54	Apr. 25, 1950	5.06	10,100	4.32	Oct. 15, 4 a.m. to 11 p.m.	3.07	5,400	2.31	
				Jan. 25, 1930	[i]8.09	----	---					
27	Kankakee River at Wilmington, Ill.	[c]5,250	1935-54	May 21, 1943	8.87	48,000	9.14	Oct. 12, 8-9 a.m.	3.60	10,200	1.94	
				1883, 1887	16.73	(j)	---					
28	Des Plaines River near Gurnee, Ill.	215	1945-54	Mar. 21, 1948	9.21	2,620	12.2	Oct. 13, 3-9 a.m.	4.38	442	2.06	
29	Buffalo Creek near Wheeling, Ill.	19.4	1952-54	Apr. 25, 1954	5.40	268	13.8	Oct. 10, 10:30 p.m.	4.62	161	8.30	
30	Des Plaines River near Des Plaines, Ill.	374	1940-54	Apr. 25, 1950	7.78	4,040	10.8	Oct. 11, 9-11 a.m.	3.25	1,800	4.81	
				July 4, 1938	[b]9.7	5,500	14.7					
31	McDonald Creek near Mt. Prospect, Ill.	7.52	1952-54	June 3, 1954	6.46	103	13.7	Oct. 11, 6 a.m.	7.31	146	19.4	

See footnotes at end of table.

Table 2.--Summary of flood stages and discharges--Continued

No.	Stream and Place of Determination	Drainage Area (Square miles)	Period of Record	Maximum Flood Previously Known				Maximum During Present Flood				Remarks
				Date	Gage height (Feet)	Discharge		Time	Gage height (Feet)	Discharge		
						Second-feet	Second-feet per square mile			Second-feet	Second-feet per square mile	
32	Weller Creek at Des Plaines, Ill.	13.1	1950-54	Apr. 25, 1954	9.83	461	35.2	Oct. 10, 6 p.m.	10.83	535	40.8	
33	Willow Creek near Park Ridge, Ill.	19.6	1950-54	Apr. 25, 1954	7.15	283	14.4	Oct. 11, 6 a.m.	8.32	382	19.5	
34	Salt Creek near Arlington Heights, Ill.	33.7	1950-54	Apr. 25, 1954	8.43	540	16.0	Oct. 10, 11-12 p.m.	8.28	516	15.3	
35	Salt Creek at Western Springs, Ill.	122	1945-54	Mar. 20, 1948	8.06	1,920	15.7	Oct. 10, 12 p.m. to 1 a.m., Oct. 11, 11 a.m. to 12 m.	8.27	1,710	14.0	
36	Addison Creek at Bellwood, Ill.	18.2	1950-54	Mar. 25, 1954	6.39	548	30.1	Oct. 11, 1-2 a.m.	9.48	598	32.9	
37	Des Plaines River at Riverside, Ill.	635	1943-54	Mar. 20, 1948	8.28	6,510	10.3	Oct. 11, 6 p.m.	8.15	6,340	9.98	
38	Flag Creek near Willow Springs, Ill.	16.2	1951-54	Mar. 25, 1954	5.42	770	47.5	Oct. 10, 8 p.m.	6.88	1,300	80.2	
39	North Branch Chicago River at Deerfield, Ill.	20.7	1952-54	Mar. 25, 1954	9.35	247	11.9	Oct. 11, 3-9 a.m.	9.08	211	10.2	
40	Skokie River at Lake Forest, Ill.	12.8	1951-54	Nov. 13, 1951	7.16	321	25.1	Oct. 10, 10 p.m.	5.42	188	14.7	
41	West Fork of North Branch Chicago River at Northbrook, Ill.	11.5	1952-54	Mar. 25, 1954	8.56	411	35.7	Oct. 11, 2 a.m.	8.18	301	26.2	

See footnotes at end of table.

Table 2.--Summary of flood stages and discharges--Continued

No.	Stream and Place of Determination	Drainage Area (Square miles)	Period of Record	Maximum Flood Previously Known				Maximum During Present Flood				Remarks
				Date	Gage height (Feet)	Discharge		Time	Gage height (Feet)	Discharge		
						Second-feet	Second-feet per square mile			Second-feet	Second-feet per square mile	
42	North Branch Chicago River at Niles, Ill.	102	1950-54	Apr. 26, 1954	8.56	1,510	14.8	Oct. 11, 3 a.m.	9.01	1,700	16.7	
43	Stony Creek (East) at Blue Island, Ill.	18.1	-----	-------	---	---	---	Oct. 10 or 11	5.88	432C	23.9	
44	Tinley Creek near Palos Park, Ill.	11.3	1951-54	June 10, 1953	8.43	530	46.9	Oct. 10, 7 a.m.	10.30	1,120	99.1	
45	Chicago Sanitary and Ship Canal at Lockport, Ill.	-----	[k]1900-54	Mar. 19, 1948	---	24,567	---	Oct. 10, 8:30 p.m.	---	24,585	---	
46	Long Run near Lemont, Ill.	20.8	1951-54	June 13, 1952	8.18	1,000	48.1	Oct. 10, 6 a.m.	9.91	3,160	152	
47	Marley Creek near Mokena, Ill.	8.38	----	-------	---	---	---	Oct. 10 or 11	---	501C	59.8	
48	Hickory Creek at Joliet, Ill.	107	1944-54	Apr. 5, 1947	10.68	10,200	95.3	Oct. 11, 2 a.m.	9.82	8,130	76.0	
49	Du Page River at Troy, Ill.	325	1940-54	Mar. 19, 1948	10.10	11,000	33.8	Oct. 11, 8 a.m.	11.06	12,000	36.9	
50	Mazon River near Coal City, Ill.	470	1939-54	Apr. 25, 1950	18.50	17,300	36.8	Oct. 11, 3 and 6:30 p.m.	4.41	707	1.50	
51	Illinois River at Marseilles, Ill.	[m]7,640	1919-54	Apr. 26, 1950	14.91	83,300	---	Oct. 12, 7 a.m.	11.39	56,600	---	
52	Fox River at Algonquin, Ill.	1,364	1915-54	Apr. 12, 1916	4.50	5,850	4.29	Oct. 16, 1 a.m.	2.34	2,130	1.56	
53	Poplar Creek at Elgin, Ill.	35.8	1951-54	Apr. 25, 1954	3.83	310	8.66	Oct. 10, 12 p.m.	3.72	291	8.13	
54	Fox River at Dayton, Ill.	2,570	1925-54	Mar. 19, 1948	19.65	29,000	11.3	Oct. 11, 3:30 p.m.	24.63	47,100	18.3	
				Jan. 30, 1952	[i]32.04	----	----					

See footnotes on next page.

Table 2.--Summary of flood stages and discharges--Continued

Footnotes to Table 2

a Flow eastward into Burns ditch at time of maximum stage at Grant Street; may not have been maximum discharge eastward nor westward.
b From floodmarks.
c Approximately.
d Does not include unknown amount of contributing area from Little Calumet River (western portion) during present flood.
e Site and datum then in use.
f Site then in use, present datum.
g Maximum observed.
h Daily mean discharge.
i Ice jam.
j Discharge unknown.
k Records prior to 1936 published in State report, Stream-flow data of Illinois, 1937.
m Since Jan. 17, 1900, flow has included diversion from Lake Michigan through Chicago Sanitary and Ship Canal.

Note.--Maximum discharges for floods of October 1954 were obtained from gaging station records except as otherwise indicated by the following symbols: A, measurement by flow-through-culvert method; B, current-meter measurement at peak; C, measurement by contracted-opening method.

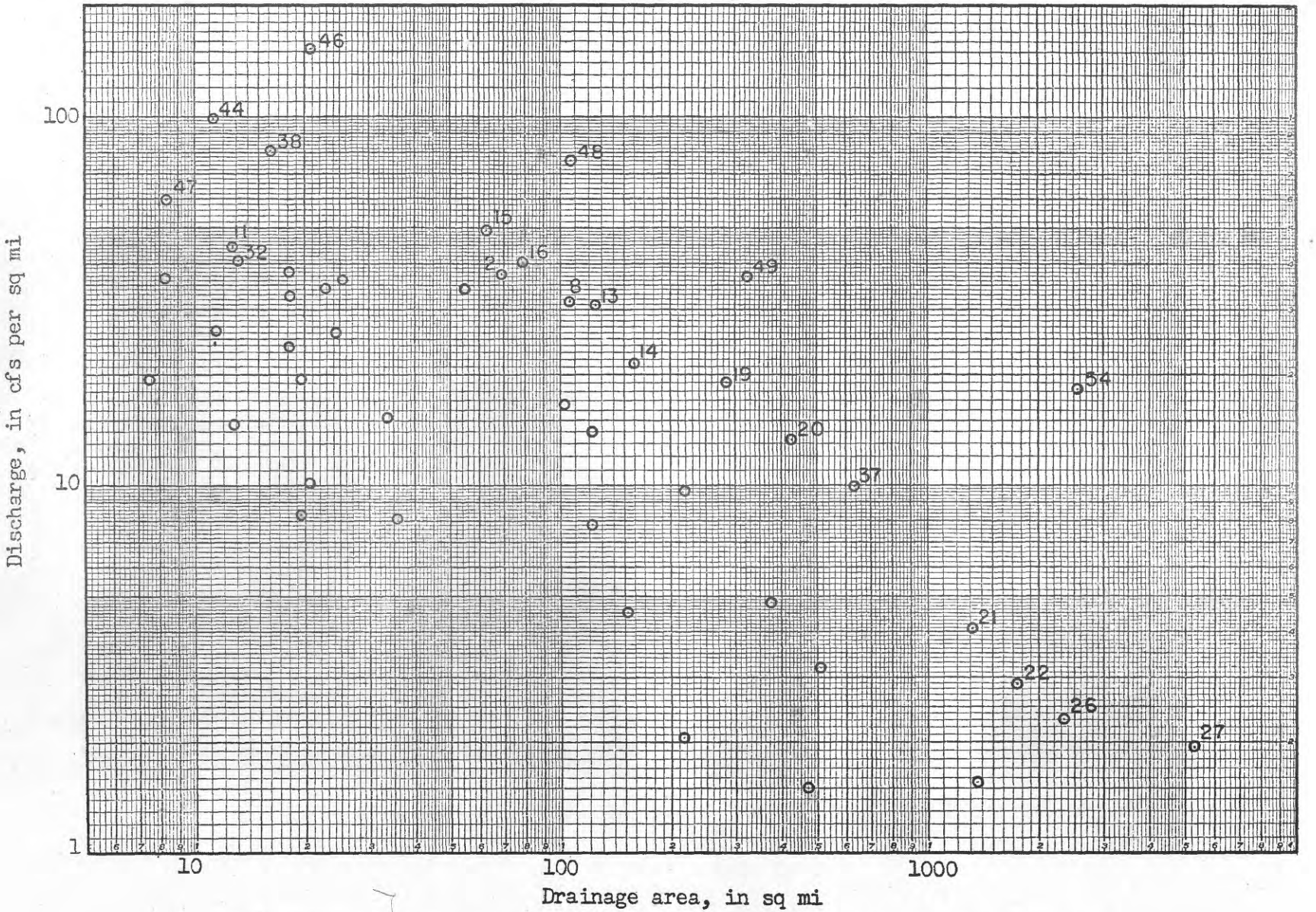


Figure 16.--Variation of unit discharge with drainage area

FLOOD-FREQUENCY

By reference to a plot of crest discharge, in cfs per sq mi, versus size of drainage area (see figure 16) it will be noted that the highest crest discharges for this flood may be closely approximated by the formula

$$Q = 925 \sqrt{\text{drainage area}}$$

whereas highest crest discharges for the flood of 1943 in central Illinois[1], when analyzed in a similar manner, led to the formula

$$Q = 1850 \sqrt{\text{drainage area}}$$

From these circumstances it might be inferred that the more recent flood was not of a magnitude that would justify unusual attention. To draw such a conclusion, however, is to disregard the difference in runoff characteristics between the two flood areas. Not only is northern Illinois generally subject to lighter rainfall than central Illinois, but also the land slopes are flatter, and the drainage patterns are less well developed. Hence the normal rates of runoff for the northern portion of the state should be expected to be less than for the central portion. To emphasize the unusual nature of the 1954 flood, it should be compared with other floods on a basis which will allow for the difference in runoff characteristics. This is most conveniently done by making estimates of the probable recurrence interval.

Unfortunately, hydrologic data are too meager to provide close estimates for recurrence interval of the more outstanding floods. However, a recent analysis of floods in Illinois does provide a basis for some generalized comparisons[2]. By reference to that report it will be noted that, for the 1943 flood, there are no stations for which the recurrence interval appears to be much in excess of 100 years, and only a few stations for which the recurrence interval appears to be much in excess of 50 years. Using the curves from that same report, it will be noted that, for the 1954 flood, the recurrence interval for Du Page River at Troy appears to be about 80 years, and for Hickory Creek at Joliet and Fox River at Dayton it appears to be in excess of 100 years.

---

[1] The Floods of May 1943 in Illinois, 1943, Ill. Dept. of Public Works and Buildings, Div. of Waterways, Springfield, Ill.

[2] Mitchell, W. D., 1954, Floods in Illinois: Magnitude and Frequency, Ill. Dept. of Public Works and Buildings, Div. of Waterways, Springfield, Ill.

Flood-frequency curves have been developed for a few other stations within the area covered by the present report, but the drainage areas for these stations are generally outside the area of very high precipitation, so that the crest discharges were not unusually high. For the several stations of small drainage area which are located within the area of high precipitation, such as those which are tributary to Little Calumet River, the periods of record are so short that no magnitude-frequency relations have yet been developed. However, for several of these small areas, the basin lag has been computed from observed hydrographs. If it is assumed that climatological factors for these areas are similar to those which have been derived and published for the adjacent Wheaton morainal region, the probable recurrence interval may be estimated from the observed values of lag. Such estimates indicate that, for at least a few of the small gaged areas which are tributary to Little Calumet River, as well as for Long Run near Lemont, the recurrence interval of the 1954 flood may be in excess of 100 years.

On the other hand, it should be pointed out that for one of these small areas, Thorn Creek at Thornton, the crest discharge of the October 1954 flood has been exceeded twice during the eight years of record. On the basis of this information alone, the recurrence interval at Thornton would appear to be only a very few years; otherwise it is necessary to assume that three very unusual floods have occurred within the eight years of record. Obviously, a reliable estimate of recurrence interval in this section of the flood area must be postponed until longer records are available.