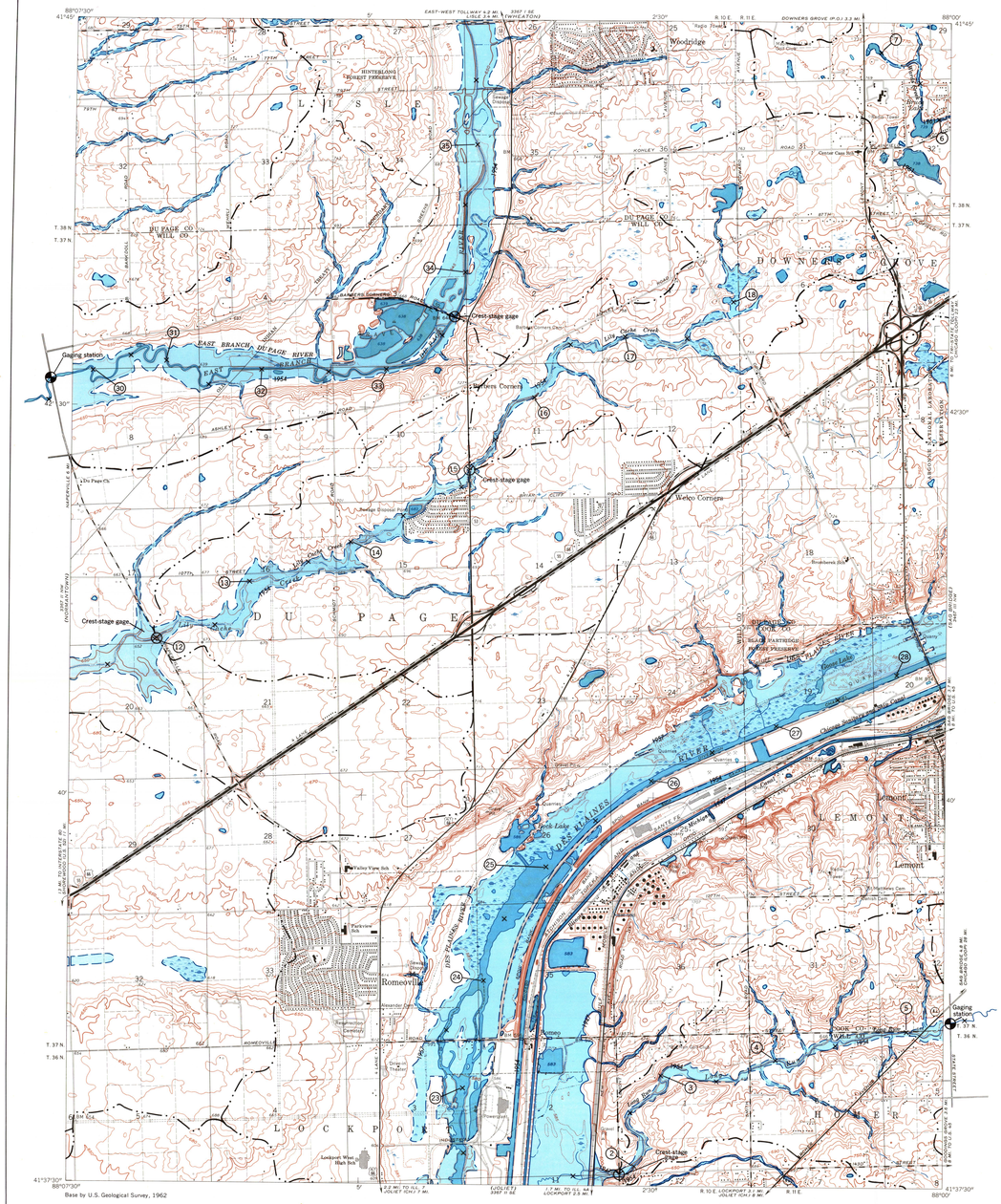
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
THE NORTHEASTERN ILLINOIS METROPOLITAN
AREA PLANNING COMMISSION

HYDROLOGIC INVESTIGATIONS
ATLAS HA-146



FLOODS IN ROMEOVILLE QUADRANGLE, ILLINOIS

This report summarizes hydrologic data useful for evaluating the depth and frequency of flooding that affect the economic development of flood plains. The report is intended to be used as a planning tool, and the data contained herein provide a technical basis for making sound decisions concerning the use of flood-plain lands. No recommendations or suggestions for land-use regulations are made and no solutions of existing flood problems are proposed.

The approximate areas inundated by floods along streams in the Romeoville 7 1/2-minute quadrangle are delineated on a topographic map. The quadrangle location is shown in figure 1.

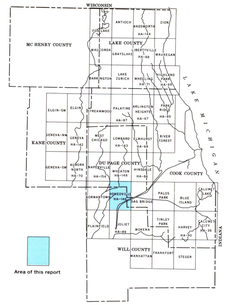


FIGURE 1.—*Index map of northeastern Illinois showing location of quadrangles in the flood-hazard mapping program.*

Inundated areas are shown along Illinois and Michigan Canal and along Long Run below mile 1.9 for the flood of April 1947; along East Branch Du Page River, Lily Cache Creek, Chicago Sanitary and Ship Canal, and Long Run above mile 1.9 for the flood of October 1954; along Des Plaines River for the flood of July 1957; and along Wards Creek for the flood of September 1961.

The general procedure used in defining flood limits was to define flood profiles from elevations of floodmarks identified in the field. The extent of flooding delineated on the topographic map was derived from the profiles by interpolation between contours (lines of equal elevation) and by plotting overflow limits established by field investigations and surveys. The flood limits shown on the map are approximate because the map scale is small (1 inch = 2,000 feet), and the contour interval is relatively large (10 feet, supplemented by 5-foot-interval contours in some areas).

The flood limits shown on the map are not necessarily those for the highest floods expected. Greater floods are possible, but definition of their probable overflow limits is not within the scope of this report. The flood limits reflect channel conditions existing when the floods occurred. No appraisals are made of the effect of changes in channel conditions, waterway openings at highways and railroads, or possible changes in runoff characteristics of the streams caused by increased urbanization after the floods occurred. Protective works built after the floods of 1947, 1954, 1957, and 1961 may reduce the frequency of flooding in the area but will not necessarily eliminate all future flooding. The inundation pattern of future floods may be affected by new highways and bridges, relocation and improvement of stream channels, and other cultural changes.

There are numerous depressions or lowland areas in the Romeoville quadrangle where surface water accumulates because of inadequate drainage to the streams. Frequency and depth of flooding in these areas is unrelated to the water-surface elevation along the streams. Some areas are flooded only briefly after periods of heavy rainfall or snowmelt, whereas others remain inundated continuously, depending, to some extent, upon the rates of evaporation and seepage into the ground. Flood limits are shown for many of these areas but there may have been other areas that were not detected during this investigation.

Flood limits are not defined for areas that were inundated as a result of backup in storm drains

Cooperation and acknowledgment —The preparation of this report is a part of an extensive flood-mapping program financed through a cooperative agreement between The Northeastern Illinois Metropolitan Area Planning Commission and the U.S. Geological Survey whereby flood maps will be prepared for the 7 1/2-minute quadrangles shown in figure 1. The program includes parts of Cook, Kane, McHenry, and Will Counties, and all of Du Page and Lake Counties. The six counties cooperate financially in the program through separate agreements with the Planning Commission. The Romeoville quadrangle is in Will, Du Page and Cook Counties. Financial support for the preparation of this report was provided by Will County.

The cooperative program is administered on behalf of the Planning Commission by Matthew L. Rockwell, Executive Director, and is directly coordinated by John R. Sheaffer, Chief Planner.

The flood maps are prepared by the U.S. Geological Survey under the administrative direction of William D. Mitchell, district engineer, and under the immediate supervision of Davis W. Ellis, engineer-in-charge of the project.

Acknowledgment is made to the following agencies that supplied some of the flood data on which this report is based: the State of Illinois, Department of Public Works and Buildings, Division of Waterways; the State of Illinois, Department of Registration and Education, Water Survey Division; the Corps of Engineers, U.S. Army; and the Department of Highways of Cook, Du Page, and Will Counties. The Division of Waterways also furnished 2-foot-interval contour maps along East Branch Du Page River and Lily Cache Creek.

Additional data were obtained from officials of municipalities in the area and from field investigations.

Flood height —The height of a flood at a gaging station usually is stated in terms of gage height or stage, which is the elevation of the water surface above a selected datum plane. Elevations shown on the map are in feet above mean sea level. Gage heights for crest-stage gages in the Romeoville quadrangle can be converted to elevations above mean sea level by adding the gage height to the appropriate datum of gage listed in the following table. Size of drainage area for each station also is shown in the table. The subbasin divides from which the areas were determined are shown on the flood map.

Crest-stage gage	Datum of gage above mean sea level (feet)	Drainage area (square miles)
East Branch Du Page River at Barbers Corners (Barbers Corners Road)	642.55	76.5
Lily Cache Creek: At Barbers Corners (State Highway 53)	698.69	3.93
Near Romeoville (Naperville Road)	651.68	8.97
Long Run at Romeoville (Lemont Road)	596.55	24.4

Gage height and year of occurrence of each annual flood (highest peak discharge in each calendar year) above 571-foot elevation at the gaging station on Du Page River at Troy during the period 1941-63 are shown in figure 2. The Troy gaging station is located at U.S. Highway 52, about 8 miles southwest of the Romeoville quadrangle, and at mile 10.6. The irregular occurrence of floods is evident.

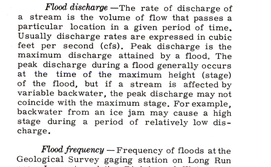


FIGURE 2.—*Annual floods above 571-foot elevation, 1941-63, Du Page River at Troy.*

Flood discharge —The rate of discharge of a stream is the volume of flow that passes a particular location in a given period of time. Usually discharge rates are expressed in cubic feet per second (cfs). Peak discharge is the maximum discharge attained by a flood. The peak discharge during a flood generally occurs at the time of the maximum height (stage) of the flood, but if a stream is affected by variable backwater, the peak discharge may not coincide with the maximum stage. For example, backwater from an ice jam may cause a high stage during a period of relatively low discharge.

Flood frequency —Frequency of floods at the Geological Survey gaging station on Long Run near Lemont and the Division of Waterways gaging station on East Branch Du Page River near Naperville was derived from streamflow records of these stations combined with records of nearby stations and with the regional flood-frequency relation for streams in northern Illinois (Mitchell, 1954). The Lemont gage is at State Street, 200 feet east of the Romeoville quadrangle, and at mile 5.4. The Naperville gage is at Naperville Road, 600 feet west of the Romeoville quadrangle, and 2 miles upstream from West Branch Du Page River. The general relations between frequency and discharge are shown in figures 3 and 4, and the general relations between frequency and stage are shown in figures 5 and 6. The relation between flood stage and frequency is dependent on the relation of flood stage to discharge which is affected by changes in physical conditions of channels and constrictions. The frequency curves shown in figures 5 and 6 are based on channel conditions existing in 1963. Longer records and future changes in channel conditions may define somewhat different flood-frequency curves. Extrapolation of the curves beyond the limits shown is not recommended.

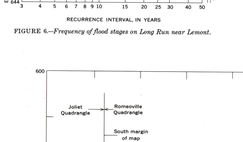


FIGURE 3.—*Frequency of flood discharges on East Branch Du Page River near Naperville.*

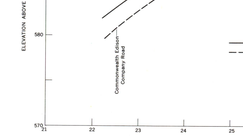


FIGURE 4.—*Frequency of flood discharges on Long Run near Lemont.*

FIGURE 5.—*Frequency of flood stages on East Branch Du Page River near Naperville.*

FIGURE 6.—*Frequency of flood stages on Long Run near Lemont.*

Recurrence intervals —As applied to flood events, recurrence interval is the average interval of time within which a given flood will be equaled or exceeded once. Frequencies of floods can be stated in terms of their probabilities of occurrence(virtually reciprocals of their recurrence intervals for floods larger than the 10-year flood). For example, a flood with a 25-year recurrence interval would have a 4-percent chance of being equaled or exceeded in any given year, or a flood with a 50-year recurrence interval would have a 2-percent chance of being equaled or exceeded in any given year.

The general relation between recurrence interval and flood height at the gaging stations on East Branch Du Page River near Naperville (fig.5) and Long Run near Lemont (fig.6) is tabulated below:

Recurrence interval (years)	Elevation above mean sea level (feet)	
	East Branch Du Page River near Naperville (Naperville Road)	Long Run near Lemont (State Street)
50	635.9	647.0
40	635.8	646.9
30	635.7	646.7
20	635.6	646.4
10	635.2	645.8
5	634.9	645.3
3	634.5	644.8

It is emphasized that recurrence intervals are average figures—the average number of years that will elapse between occurrences of floods that equal or exceed a given magnitude. The fact that a major flood is experienced in one year does not reduce the probability of that flood being exceeded in the next year or in the next week.

Flood profiles —Profiles of the water surface, based primarily on elevations of marks left by floods of April 1947, October 1954, July 1957, April 1960, and March 1962, are shown in figures 7-10. Where floodmarks could not be identified, the profiles were constructed on the basis of elevations of lower floods and streambeds, and of flood crests determined from photographs and from reports of local residents. River miles used for the profiles correspond to those marked along the streams on the flood map.

The abrupt changes in the profiles, shown at some road crossings, indicate the difference in water-surface elevations at the upstream and downstream sides of bridges that produce channel constrictions. The drop in water surface through bridge openings during future floods may be different from that shown on the profiles. An increase in channel capacity through a bridge opening would reduce the flood height on the upstream side. An accumulation of debris at a bridge would reduce the channel capacity and tend to increase the upstream flood height. Channel changes through bridge openings may also change the overflow pattern of future floods.

Flood depths —Depth of flooding at any point can be estimated by subtracting the ground elevation from the water-surface elevation indicated by the profiles in figures 7-10. The approximate ground elevation can be determined from contours on the map, although more nearly accurate elevations can be obtained by leveling to nearby bench marks.

Additional data —Other information pertaining to floods in the Romeoville quadrangle can be obtained at the office of the U.S. Geological Survey, Oak Park, Ill., and from the following published reports:

Daniels, W. S., and Hale, M. D., 1958, Floods of October 1954 in the Chicago area, Illinois and Indiana: U.S. Geol. Survey Water-Supply Paper 1370-B, p. 107-200.

Illinois Department of Public Works and Buildings, Division of Waterways, 1951, Survey report for flood control, Illinois and Michigan Canal and tributaries, 69 p.

——— 1962, Survey report for flood control, Du Page River, 200 p.

Mitchell, W. D., 1954, Floods in Illinois, magnitude and frequency: Illinois Dept. Public Works and Bldgs., Div. of Waterways, 386 p.

Ramey, H. P., 1959, Storm water drainage in the Chicago area: Am. Soc. Civil Engineers Proc., v. 85, no. HY 4., p. 11-37.

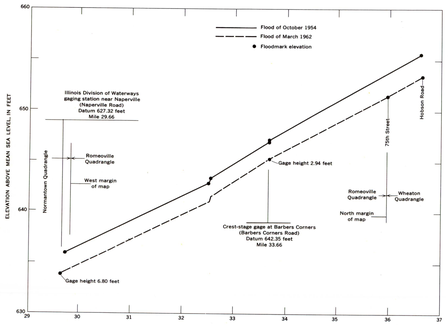


FIGURE 8.—*Profiles of floods on East Branch Du Page River.*

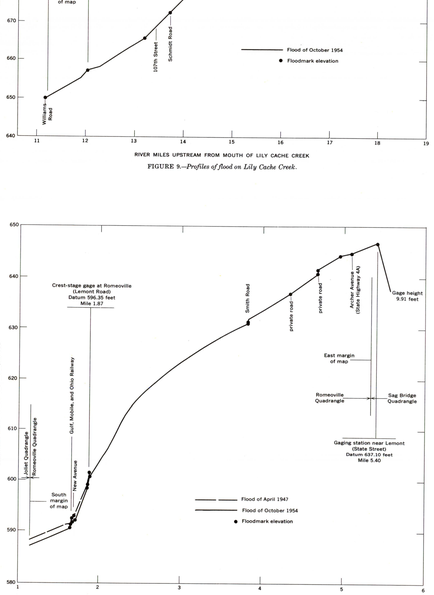


FIGURE 9.—*Profiles of flood on Lily Cache Creek.*

FIGURE 7.—*Profiles of floods on Des Plaines River.*

FIGURE 10.—*Profiles of floods on Long Run.*

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