

FLOODS IN THE LITTLE CALUMET RIVER BASIN NEAR CHICAGO HEIGHTS,
ILLINOIS IN 1954 AND 1957

This map shows the approximate areas inundated by the Little Calumet River and its tributaries, Thorn Creek, Deer Creek, and North Creek, in the vicinity of Chicago Heights, Ill., during the flood of July 1957, which was a major flood in the Little Calumet River basin. This flood is a historic fact and is shown on a topographic map base in order to record the flood hazard in graphical form. The flood of October 1954 inundated very nearly the same area as that covered by the flood of July 1957. Greater floods are possible, but no attempt has been made to show their probable limits on this map. Protective works built after the flood of July 1957 can reduce the frequency of flooding but will not necessarily eliminate the possibility of future flooding in the area. New highways and other cultural changes made after the flood of 1957 may influence the inundation pattern of future floods.

Flood height at a gaging station is stated in terms of the gage height or stage, and is the elevation of the water surface above a selected datum plane. Water surface elevations shown are in terms of feet above mean sea level datum. Gage heights or stages at gaging stations in the Little Calumet River basin can be converted to elevations above mean sea level by adding the gage height to the appropriate datum of gage listed below:

Gaging Station	Datum of gage above mean sea level (feet)
Thorn Creek at Glenwood (B and O Bridge)	610.97
Deer Creek near Chicago Heights (Joe Orr Road)	615.95
North Creek near Lansing (Torrence Avenue)	599.29
Thorn Creek at Thornton (Ridge Road)	586.43
Little Calumet River at South Holland (159th Street)	575.00

Gage height and year of occurrence of each annual flood (highest peak discharge each year) above 7.5-foot stage at the gaging station on Des Plaines River at Riverside, are shown in figure 1. The Riverside gaging station, located about 20 miles northwest of the Little Calumet River gaging station at South Holland, is used because it has a much longer period of record than the gaging stations in the Little Calumet River basin. Figure 1 shows that the 7.5-foot stage was exceeded 22 times in 70 years of record. The erratic nature of flood occurrence is evident. Although floods occurred on the average of about three per decade, only one was experienced in some decades, whereas six occurred during the period 1902-11.

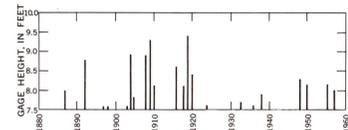


FIGURE 1.—ANNUAL FLOODS ABOVE 7.5-FOOT STAGE 1887-1891, 1892-1958 DES PLAINES RIVER AT RIVERSIDE, ILLINOIS

Frequency of flooding is derived from the short-term records (since 1945) of several U. S. Geological Survey gaging stations located in the Chicago lake plain region. Data for these stations are combined with the regional flood-frequency relation for central Illinois to develop limited frequency curves at gaging stations on Thorn Creek, Deer Creek, and North Creek. Extrapolation of flood-frequency curves may introduce large errors and should be avoided. Future studies based on longer and more complete records, or on changes in the relation of flood height to discharge at gaging stations in the Little Calumet River basin, may define somewhat different flood-frequency curves than those shown here.

Recurrence interval, as applied to flood events, is the number of years, on the average, that will elapse between occurrences of floods that equal or exceed a certain flood height. It is inversely related to the chance of a certain flood being equal or exceeded in any year. Thus, a so-called "20-year" flood would have 1 chance in 20 of being equal or exceeded in any year, or a "25-year" flood would have 1 chance in 25 of being equal or exceeded in any year.

The general relationship between recurrence interval and flood height at four gaging stations in the Thorn Creek basin is shown graphically in figure 2 and is tabulated below.

Estimated recurrence interval (years)	Elevation above mean sea level (feet)			
	Thorn Creek at Glenwood (B and O Bridge)	Deer Creek near Chicago Heights (Joe Orr Road)	North Creek near Lansing (Torrence Avenue)	Thorn Creek at Thornton (Ridge Road)
25	621.6	627.9	609.0	603.3
20	621.5	627.8	608.8	602.9
10	621.1	627.5	608.5	601.8
5	620.1	626.8	607.8	599.8

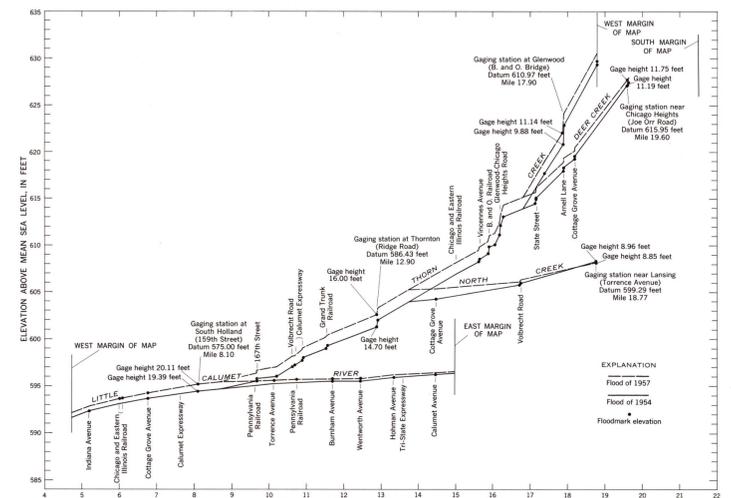


FIGURE 3.—FLOOD PROFILES OF LITTLE CALUMET RIVER, THORN CREEK, DEER CREEK, AND NORTH CREEK

LITTLE CALUMET RIVER FLOOD AREA

This map shows the area covered by the 1957 flood on the Little Calumet River and its tributaries, Thorn Creek, North Creek, and Deer Creek. Heavy blue dashed lines represent approximate limits of the flood of 1957. Indicated flood heights are those recorded at U. S. Geological Survey gaging stations.

Gaging Station	Flood of Oct. 10-11, 1954		Flood of July 13-14, 1957	
	Stage (feet)	Elevation above mean sea level (feet)	Stage (feet)	Elevation above mean sea level (feet)
Thorn Creek at Glenwood (B and O Bridge)	9.88	620.85	11.14	622.11
Deer Creek near Chicago Heights (Joe Orr Road)	11.19	627.14	11.75	627.70
North Creek near Lansing (Torrence Avenue)	8.96	608.25	8.85	608.14
Thorn Creek at Thornton (Ridge Road)	14.70	601.13	16.00	602.43
Little Calumet River at South Holland (159th Street)	19.89	594.39	20.11	595.11

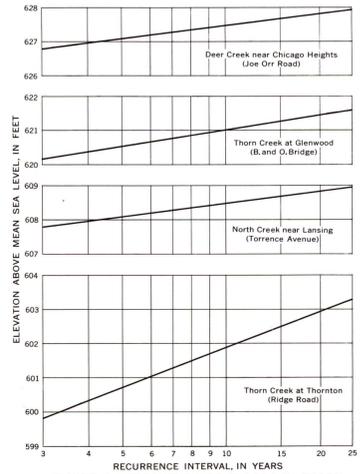


FIGURE 2.—FREQUENCY OF FLOODS IN THORN CREEK BASIN NEAR CHICAGO HEIGHTS, ILLINOIS

Flood-frequency relationships have not been defined for the main stem of the Little Calumet River.

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 certain flood height. Thus, on Thorn Creek at Glenwood, a flood that reaches a 621.6-foot elevation is said to have a 25-year recurrence interval. However, because of the erratic nature of flood occurrence, the 621.6-foot elevation may not be reached in any one 25-year period, or it may be reached more than once.

Flood profiles.—Flood characteristics in the Little Calumet River basin are irregular, and data for several gaging stations are required for adequate definition of flood conditions. Profiles of the water surface, constructed from marks left by floods of October 1954 and July 1957, are shown in figure 3. The abrupt changes in the profiles shown at some street locations indicate the difference in water surface elevations at the upstream and downstream sides of bridges. Profiles of floods corresponding to other flood heights can be plotted on this diagram, generally parallel to those shown.

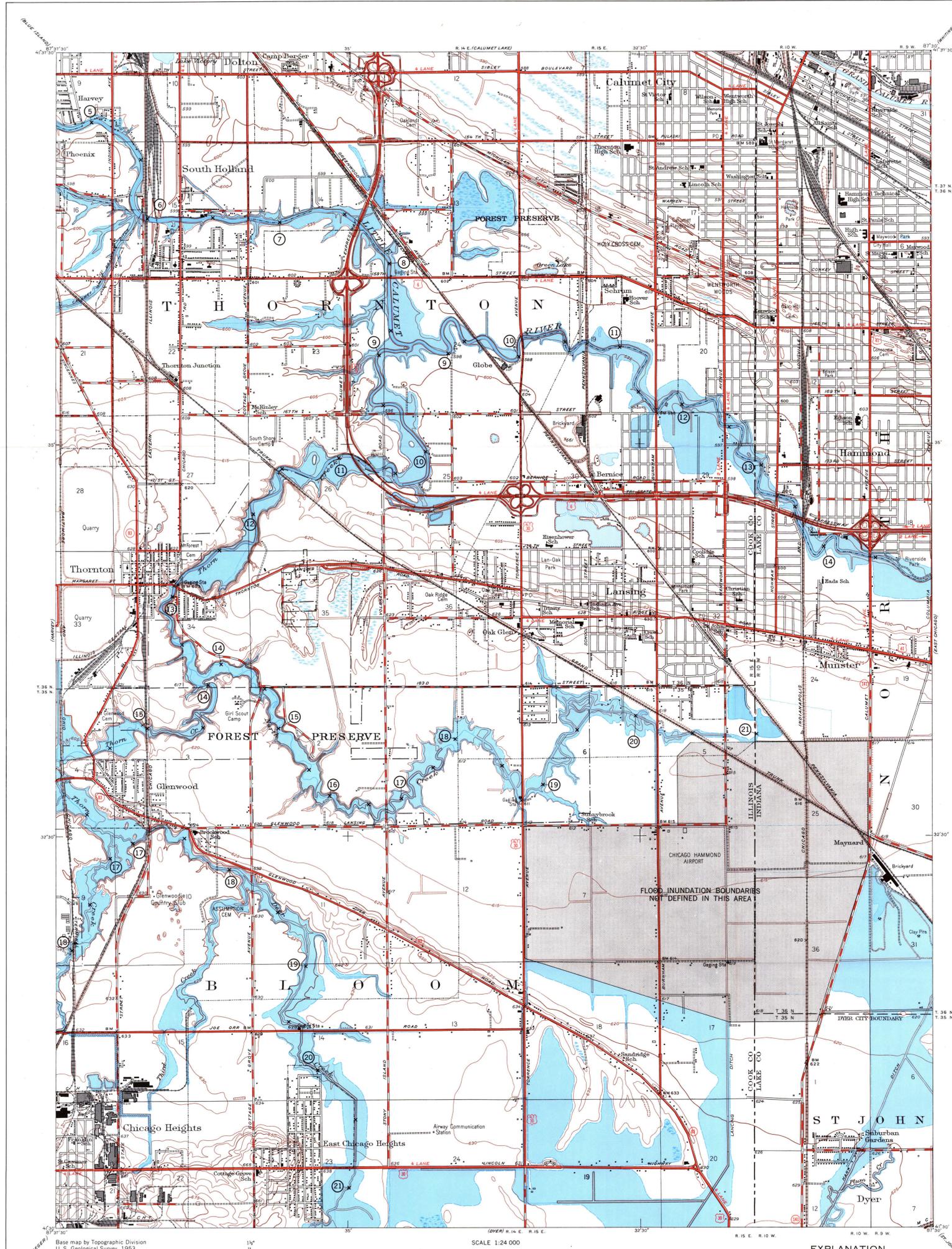
Depth of flooding at any point can be estimated by subtracting the ground elevation (shown by contours on the map) from the water surface elevation indicated by the profile in figure 3. River miles above the mouth of the Little Calumet River, used for the profiles in figure 3, are also marked along the streams on the map.

Remarks.—Few data are available on overflows along Lansing Ditch in the upstream reaches of North Creek on the southwest part of the map, and inundation boundaries are not shown in this area. Flood data for the limited reach of the Grand Calumet River in the extreme northeast corner of the map have also been omitted.

Additional information may be obtained at the office of the U. S. Geological Survey, 605 South Neil Street, Champaign, Ill., and from the following published report: Warren S. Daniels and Malcolm D. Hale, 1957. Floods of October 1954 in the Chicago area, Illinois and Indiana, U. S. Geological Survey Water-Supply Paper 1370-B.

Flood profile data were furnished by the Illinois Division of Waterways and by the Corps of Engineers.

The flood map was prepared by Jack M. Carns, Oscar G. Lara, and Howard E. Allen. The flood-frequency relations were developed by Wm. D. Mitchell and the explanatory text was written by George W. Edelen, Jr.



Base map by Topographic Division U. S. Geological Survey, 1953

SCALE 1:24 000

CONTOUR INTERVAL 5 FEET DATUM IS MEAN SEA LEVEL

1960

EXPLANATION

Flood limit 1957

River miles measured upstream from mouth of Little Calumet River

FLOODS NEAR CHICAGO HEIGHTS, ILLINOIS

By
U. S. Geological Survey
1960
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