**FLOODS IN LAKE CALUMET QUADRANGLE  
NORTHEASTERN ILLINOIS**

This report presents hydrologic data which can be used to evaluate the depth and extent of flooding that affect the economic development of flood plains. The data 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 and lakes in the Lake Calumet 7 1/2-minute quadrangle are delineated on a topographic map. The quadrangle location is shown in figure 1. Inundated areas are shown along Calumet River, Little Calumet River, Grand Calumet River, Lake Calumet, Wolf Lake, and several smaller lakes for the flood of October 1954.

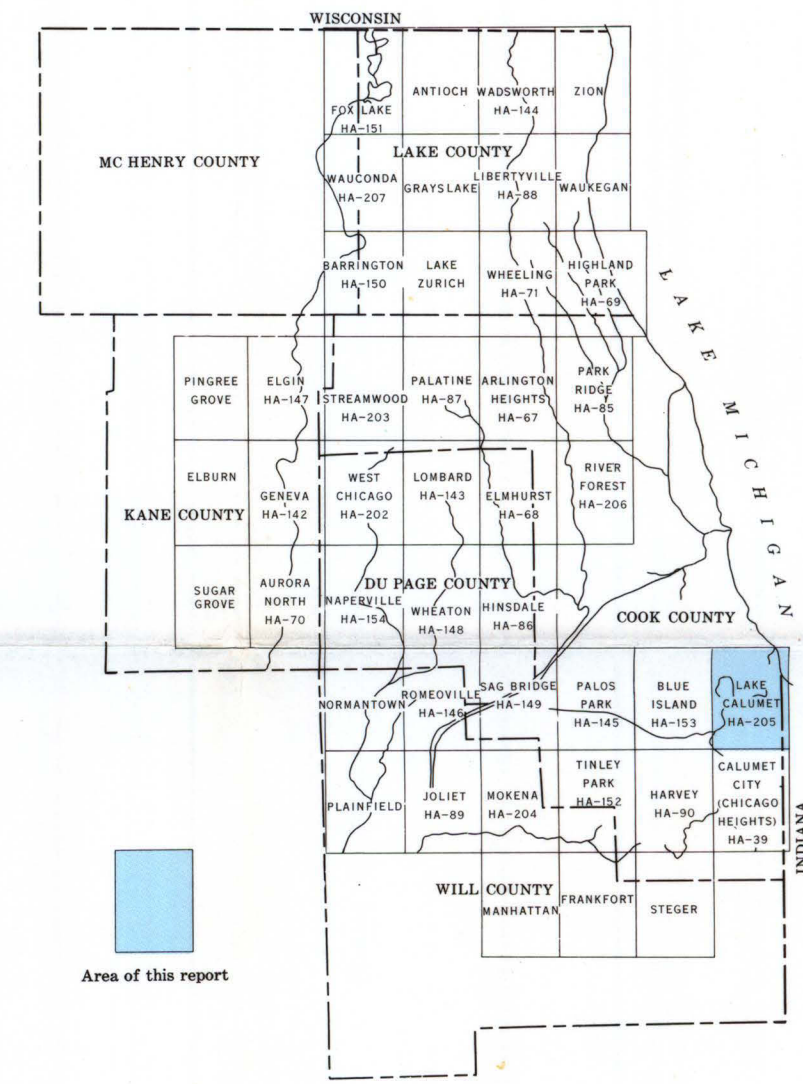


FIGURE 1.—Index map of northeastern Illinois showing location of quadrangle indicated in flood-hazard mapping program.

The general procedure used in defining flood limits was to construct flood profiles on the basis of available data. The extent of flooding delineated on the topographic map was derived from the profiles by interpolation between contours (lines of equal ground elevations) and by plotting overflow limits identified during 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 (5 feet) in relation to the slopes of streams in the area.

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 shown 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 that may have taken place after the floods occurred. Protective works built after the floods shown may reduce the frequency of flooding in the area but will not necessarily eliminate 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 Lake Calumet quadrangle where surface water accumulates because of inadequate drainage into the streams. Frequency and depth of flooding in these areas are 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 largely 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 flooded areas that were not detected during this investigation.

Terrain in the Lake Calumet quadrangle is relatively flat and the area is largely urbanized. Consequently, street and basement flooding is experienced frequently after moderate to heavy rainfalls. Flood limits are not defined for areas that are 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. Under the agreement, 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 DuPage and Lake Counties. The six counties cooperate in the program

financially through separate agreements with the Planning Commission. Financial support for the preparation of this report was provided by the County of Cook, the Metropolitan Sanitary District of Greater Chicago, and the Forest Preserve District of Cook 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 report was 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 data on which this report is based: the State of Illinois, Department of Public Works and Buildings, Division of Waterways; the Department of Highways, Cook County; the Corps of Engineers, U.S. Army; the Metropolitan Sanitary District of Greater Chicago; and the Indiana Flood Control and Water Resources Commission.

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

**Flood heights.**—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 gaging stations in the Lake Calumet 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.

Gaging station	Type of gage <sup>1</sup>	Datum of gage above mean sea level (feet)
Wolf Lake at Chicago (At outlet on west shore)	R	580.45
Grand Calumet River near Burnham (Burnham Avenue)	C	582.21

<sup>1</sup>R, Water-stage recorder; C, Crest-stage gage

Flooding along the Calumet River, Little Calumet River, and Grand Calumet River is influenced to some extent by the water level of Lake Michigan. The effect of Lake Michigan on stages in the rivers upstream from mile 6.8 on the Calumet River may be eliminated when the Thomas J. O'Brien Lock and Dam is put into operation. The maximum and minimum monthly mean water levels of Lake Michigan at Calumet Harbor, for each calendar year, for the period 1904-64 are shown in figure 2.

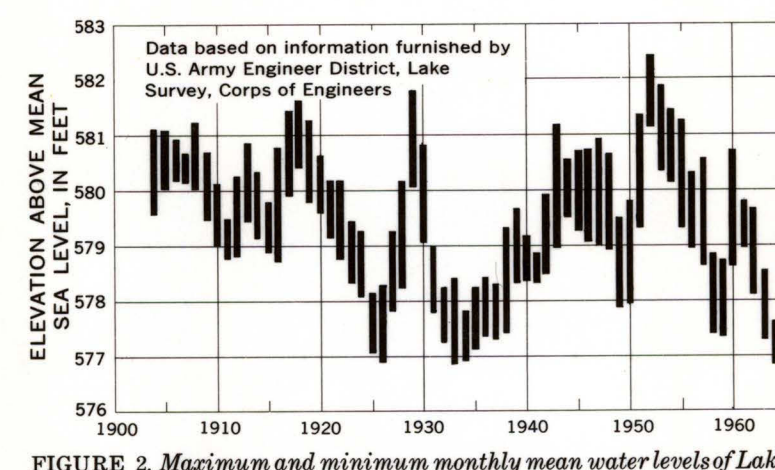


FIGURE 2.—Maximum and minimum monthly mean water level Lake Michigan at Calumet Harbor, Illinois, for each calendar year, 1904-64.

The annual floods (highest peak stage in each calendar year) during the period 1940-64 at the gaging station on Wolf Lake are shown in figure 3. The gaging station is at the outlet on the west shore of Wolf Lake.

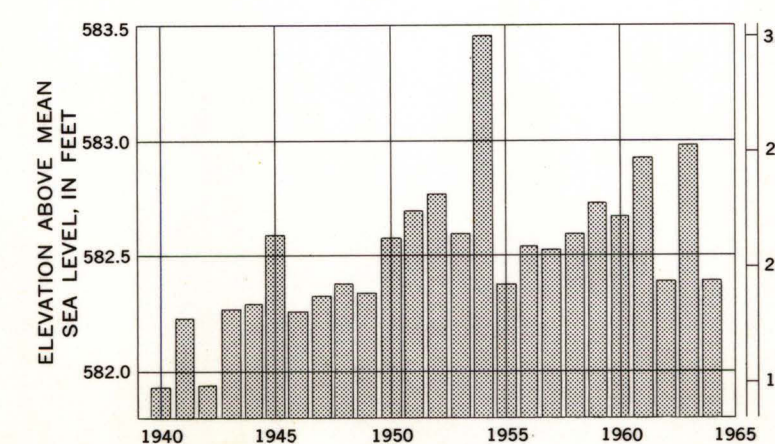


FIGURE 3.—Annual peaks, 1940-64, Wolf Lake at Chicago, Illinois.

**Flood profiles.**—Profiles of the water surface, based primarily on elevations of marks left by floods of April 1947, October 1954, July 1955, and July 1957 are shown in figures 4 and 5. Where floodmarks could not be obtained, the profiles were constructed on the basis of reports of local residents and of elevations of streambeds and lower flood stages. River miles used for the profiles correspond to those marked along the streams on the flood map.

**Flood depths.**—Depth of flooding at any point can be estimated by subtracting the ground elevation from the water-surface elevation, at the same point, indicated by the profiles in figures 4 and 5. The approximate ground elevation can be determined from contours on the map, although more accurate elevations can be obtained by leveling from nearby bench marks.

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

Mitchell, W. D., 1954, Floods in Illinois, magnitude and frequency: Illinois Dept. of Public Works and Buildings, 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.

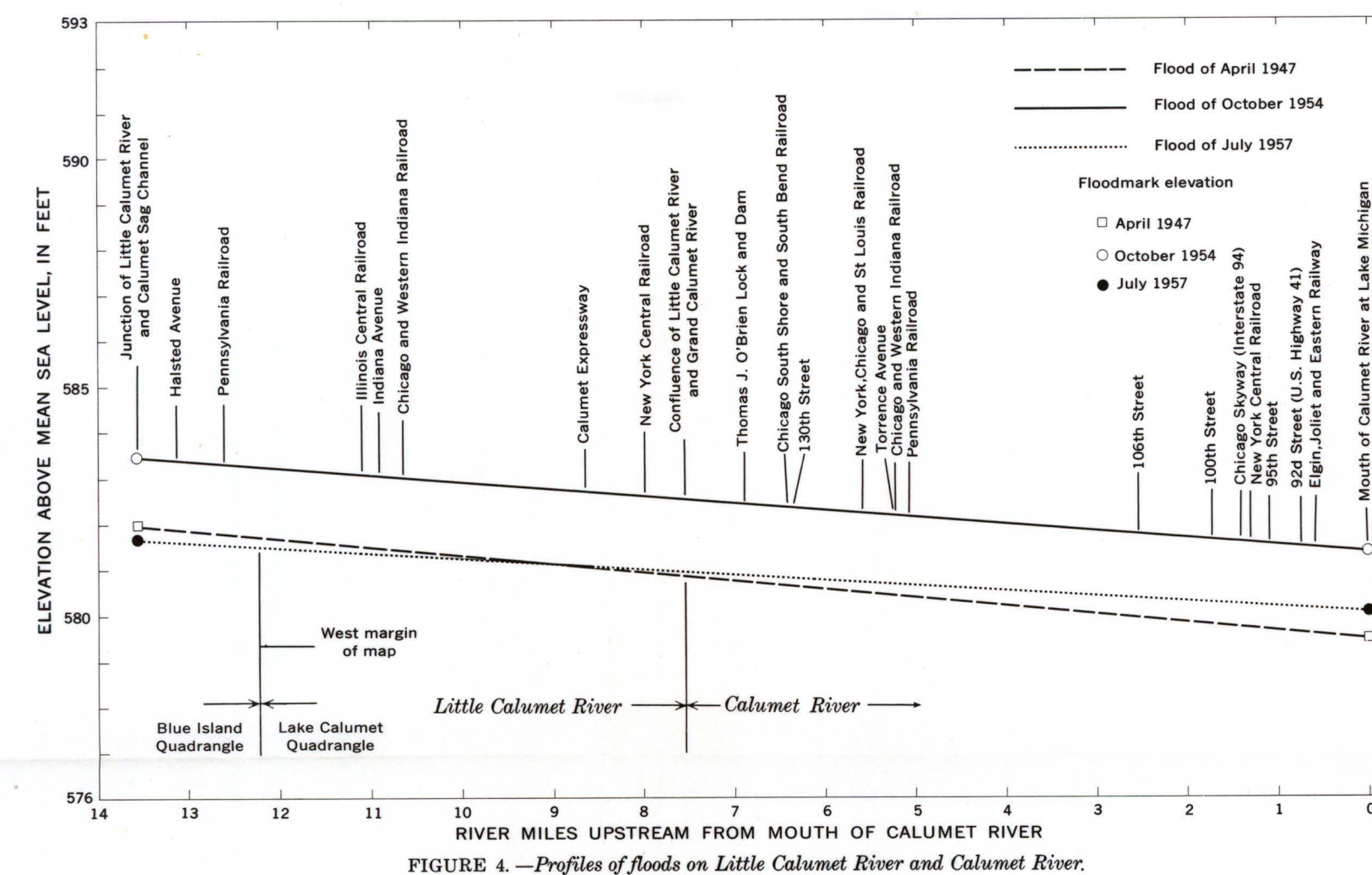


FIGURE 4.—Profiles of floods on Little Calumet River and Calumet River.

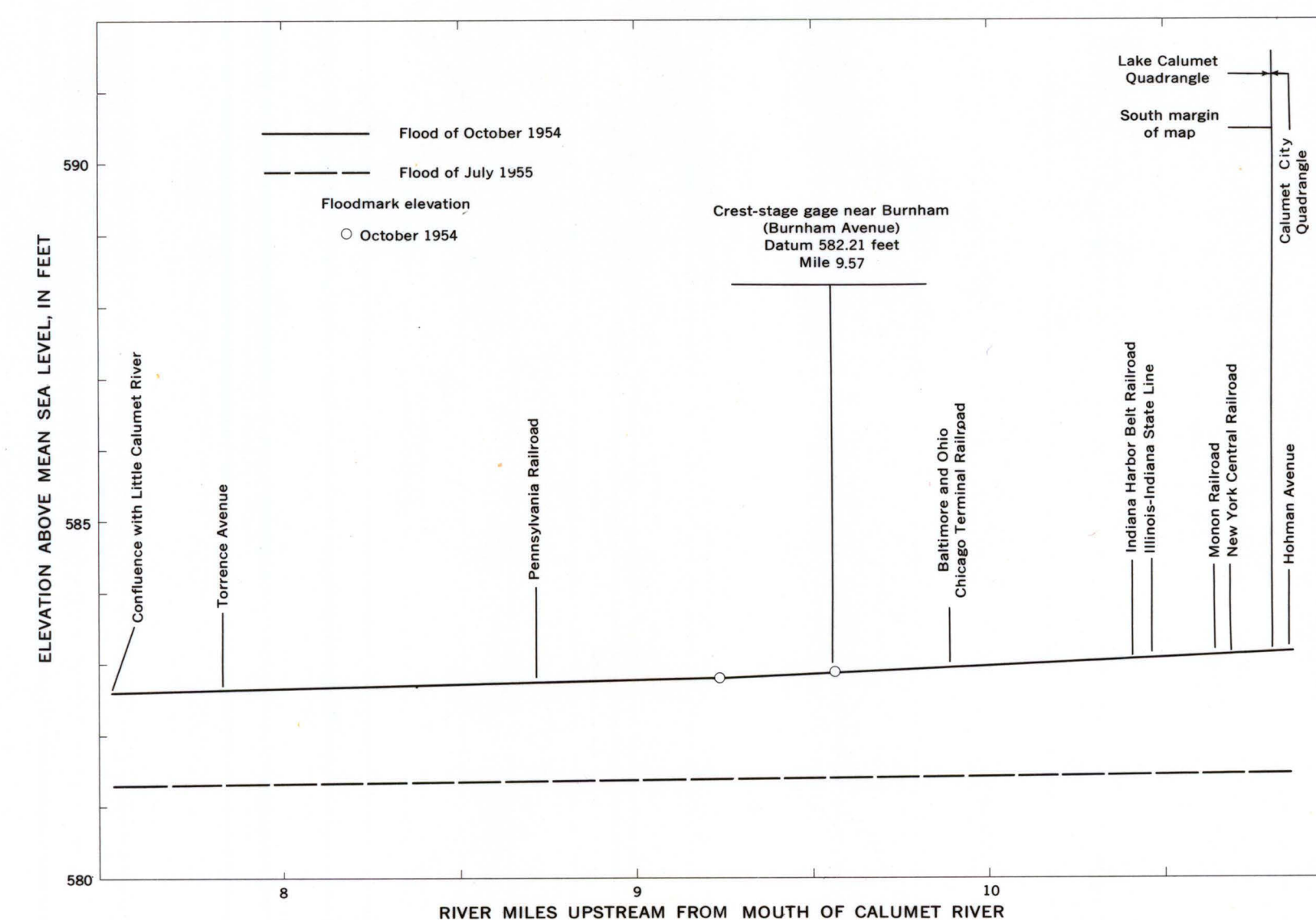


FIGURE 5.—Profiles of floods on Grand Calumet River.

**FLOODS IN LAKE CALUMET QUADRANGLE, NORTHEASTERN ILLINOIS**

By  
Howard E. Allen  
1966