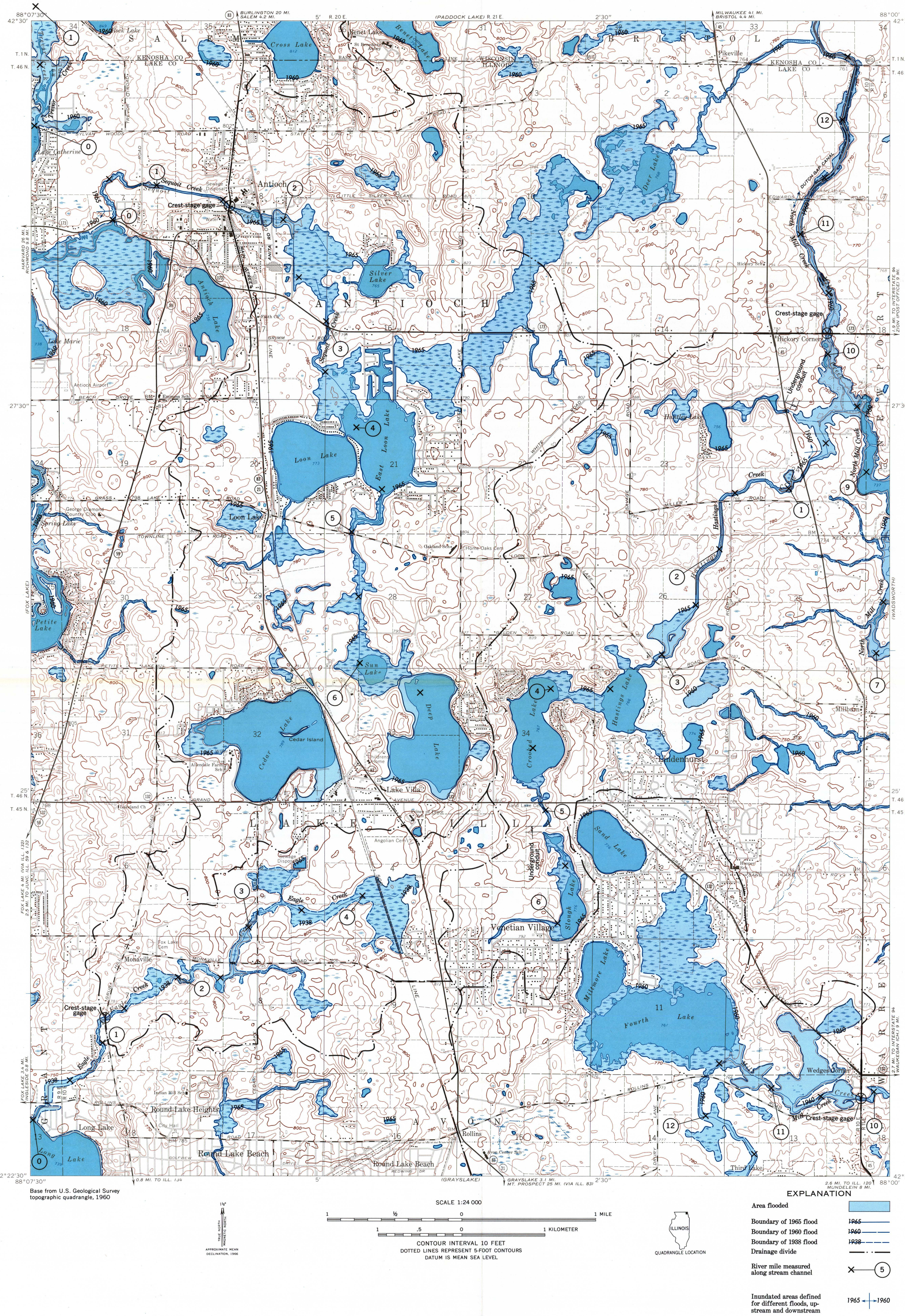
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
THE NORTHEASTERN ILLINOIS METROPOLITAN
AREA PLANNING COMMISSION

HYDROLOGIC INVESTIGATIONS
ATLAS HA-226



FLOODS IN ANTIOCH QUADRANGLE, NORTHEASTERN ILLINOIS

This report presents hydrologic data that can be used to evaluate the depth and extent of flooding that affect the economic development of flood plains in the Antioch quadrangle, northeastern Illinois. It is intended to aid individuals, governmental agencies, and others responsible for solving existing flood problems and for formulating effective flood-plain regulations that would minimize the creation of new flood problems.

The approximate areas inundated by floods along streams and lakes in the Antioch 7 1/2-minute quadrangle are delineated on a topographic map. The quadrangle location is shown in figure 1. Inundated areas are shown along Eagle Creek for the flood of July 1938; along Mill Creek, North Mill Creek, Dutch Gap Canal, and Trevor Creek for the flood of March-April 1960; and along Hastings Creek and Sequoit Creek for the flood of April 1965. The flood of July 1938 on Eagle Creek was reported to have been the highest observed in the past 47 years.

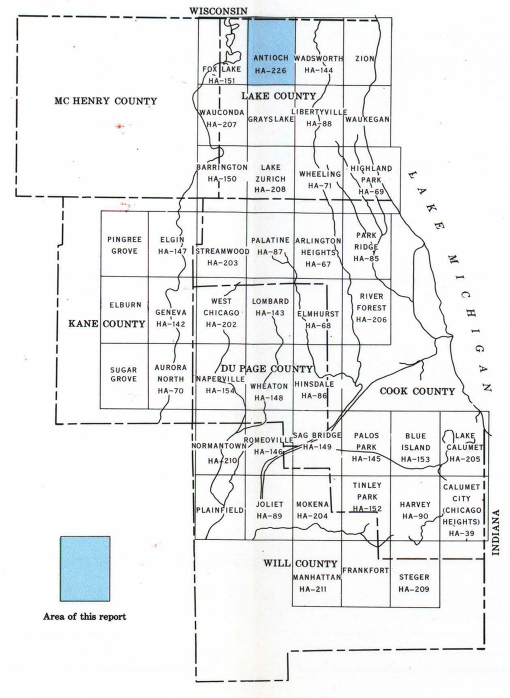


FIGURE 1.—*Index map of northeastern Illinois showing location of quadrangles included in the flood-hazard mapping program.*

Greater floods than those shown on the map are possible. The flood boundaries shown provide a record of historic fact that reflect channel conditions existing when the floods occurred. Changes in channel conditions, waterway openings at highways and railroads, or changes in runoff characteristics of the streams caused by increased urbanization that may have taken place subsequent to the floods shown on the map could affect the flood height reached by future floods of comparable discharge.

The general procedure used in defining flood boundaries was to construct profiles from elevations of floodmarks identified in the field. The extent of flooding 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 portrayal of flood boundaries is consistent with the scale of the map (1 inch = 2,000 feet; contour interval, 5 feet and 10 feet).

There are numerous depressions or lowland areas in the Antioch 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 boundaries are shown for all such areas that were detected in this investigation.

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 Du Page 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 Lake 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. Scheaffer, 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 agency that supplied some of the data on which this report is based: Lake County Highway Department.

Additional data were obtained from officials of municipalities located 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 Antioch 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. The 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)
Mill Creek at Wedges Corner (U.S. Highway 45)	757.63	17.1
North Mill Creek at Hickory Corners (State Highway 173)	744.17	19.6
Sequoit Creek at Antioch (Main Street)	761.23	13.0
Eagle Creek near Long Lake (Grub Hill Road)	757.68	3.53

Gage height and year of occurrence of each annual flood (highest peak stage in each calendar year) at the gaging station, Channel Lake near Antioch, during the period 1940-64 are shown in figure 2. The gaging station is at State Highway 173 and 1 mile west of the Antioch quadrangle. This histogram shows the history of floods recorded at the Channel Lake gaging station and also demonstrates the irregular occurrence of flood events.

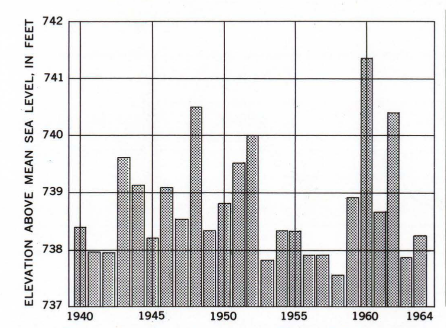


FIGURE 2.—*Annual peaks, 1940-64, Channal Lake near Antioch, Ill. (State Highway 173).*

Lake elevations.— There are many natural lakes throughout the Antioch quadrangle. Although controlled outlets have been constructed on some of those lakes, the observed ranges in stage are generally less than three feet. During this investigation the water-surface elevation was determined for some of the lakes and a previous higher stage was determined for those lakes where sufficient information could be obtained. Listed in the following table are the elevations that were determined.

Lake	Elevation of water surface in feet above mean sea level			
	Observed stage		Previous stage	
	Date (1965)	Elevation	Date	Elevation
Antioch Lake	Sept. 14	755.8		
Cedar Lake	July 29	790.0		
Crooked Lake	Aug. 26	767.2	Apr. 1965	767.5
Deer Lake	Sept. 14	769.4		
Deep Lake	Aug. 18	779.1	Apr. 1965	779.7
East Loon Lake and Loon Lake	July 29	772.6	Apr. 1965	775.4
Fourth Lake and Miltmore Lake	Sept. 14	760.8	Apr. 1965	763.4
Hastings Lake	Aug. 27	766.0	Apr. 1965	766.3
Huntley Lake	Sept. 13	757.0		
Lake Catherine	July 29	736.6	Apr. 1960	741.2
Lake Marie	July 28	736.7	Apr. 1960	741.2
Long Lake	Sept. 16	739.0	Apr. 1965	740.6
Sand Lake	Sept. 13	776.9		
Silver Lake	Sept. 14	765.2		
Slough Lake	Sept. 15	777.5	Apr. 1965	777.5

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. Discharge rates usually are expressed in cubic feet per second (cfs). Peak discharge, the maximum discharge attained by 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 time of the peak discharge may not coincide with that of the maximum stage. For example, backwater from an ice jam may cause a high stage during a period of relatively low discharge.

Flood profiles.— Profiles of the water surface, based primarily on elevations of marks left by floods of July 1938, March-April 1960, and April or July 1965, are shown in figures 3-7. Where floodmarks could not be obtained, the profiles were constructed on the basis of flood crests determined from reports of local residents, and on 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 3-7. The approximate ground elevation can be determined from contours on the map, although more nearly accurate elevations can be obtained by leveling from nearby bench marks.

Additional data.— Other information pertaining to floods in the Antioch quadrangle can be obtained at the office of the U.S. Geological Survey, Oak Park, Ill.

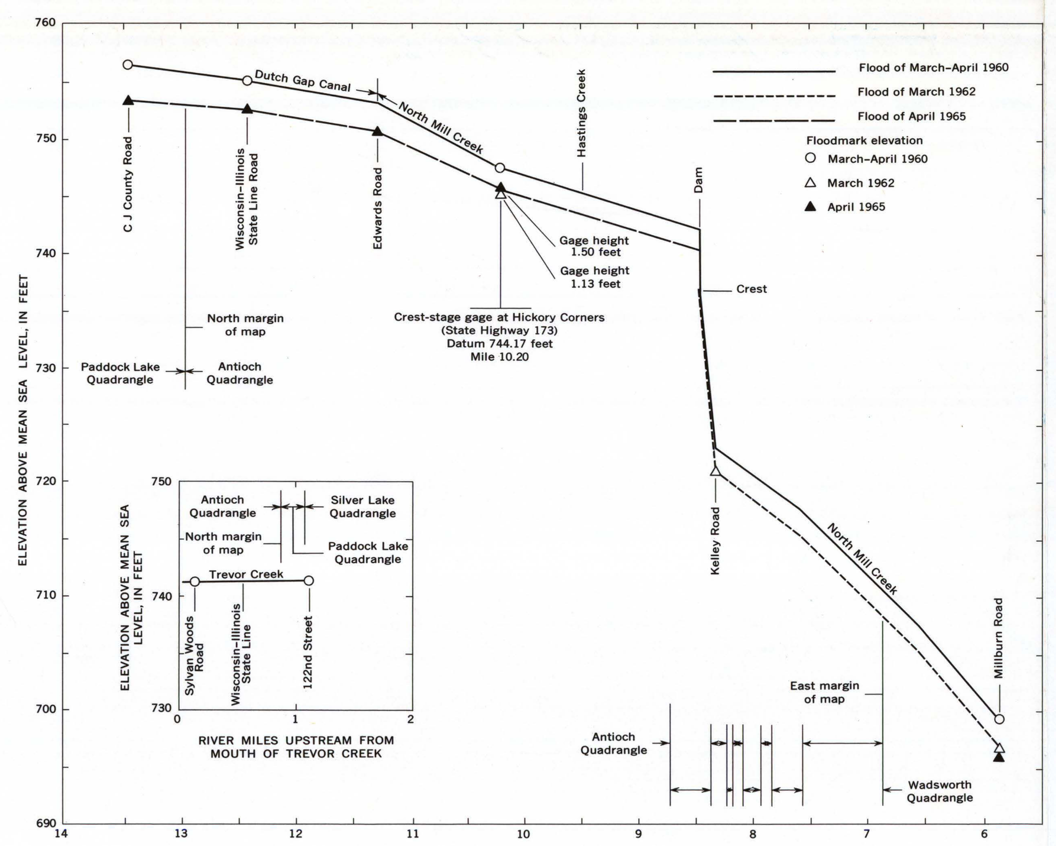


FIGURE 3.—*Profiles of floods on North Mill Creek, Dutch Gap Canal, and Trevor Creek.*

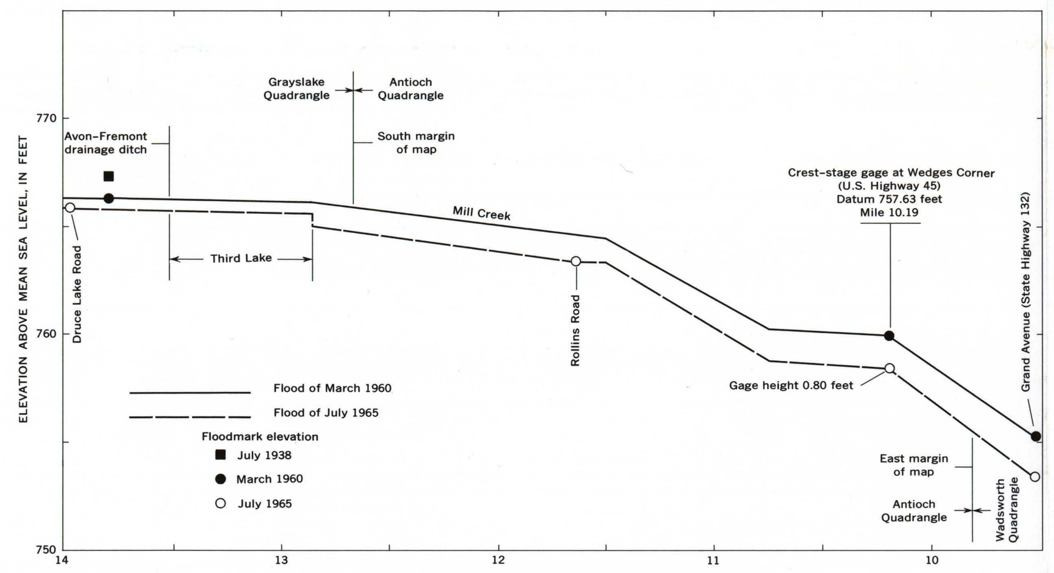


FIGURE 4.—*Profiles of floods on Mill Creek and Avon-Fremont drainage ditch.*

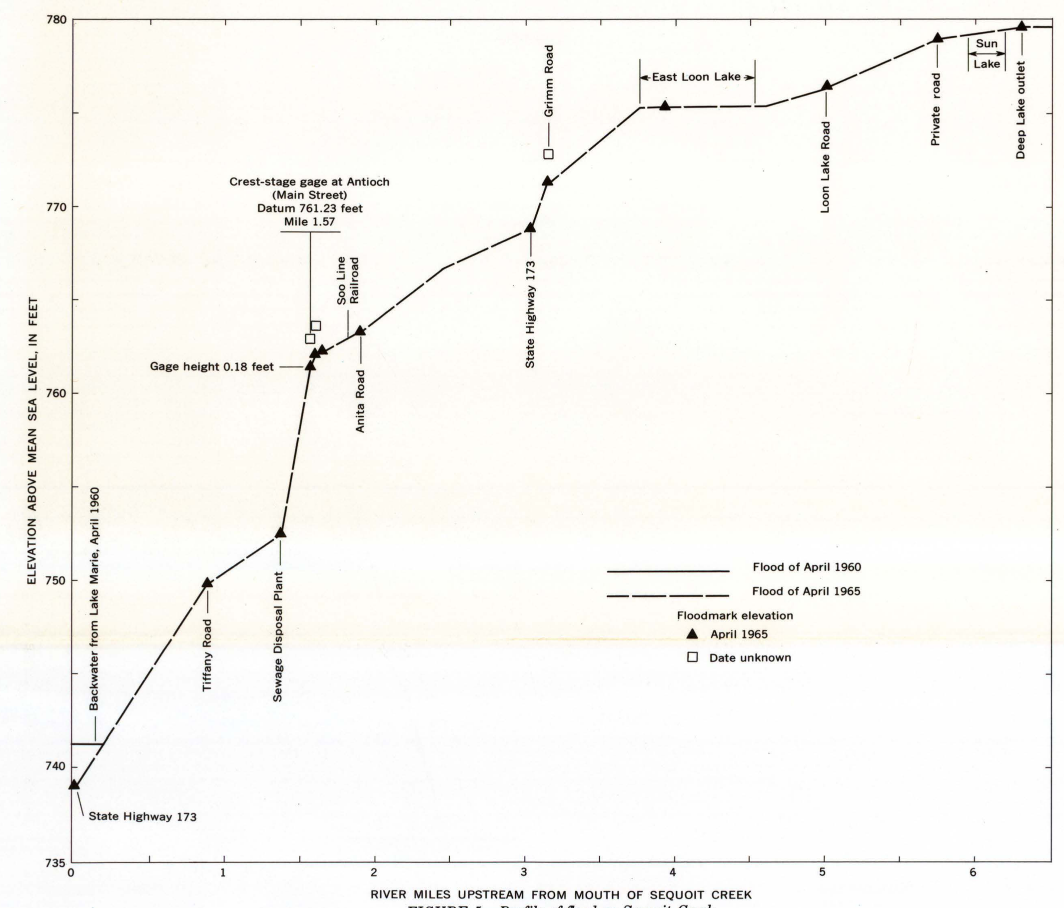


FIGURE 5.—*Profile of flood on Sequoit Creek.*

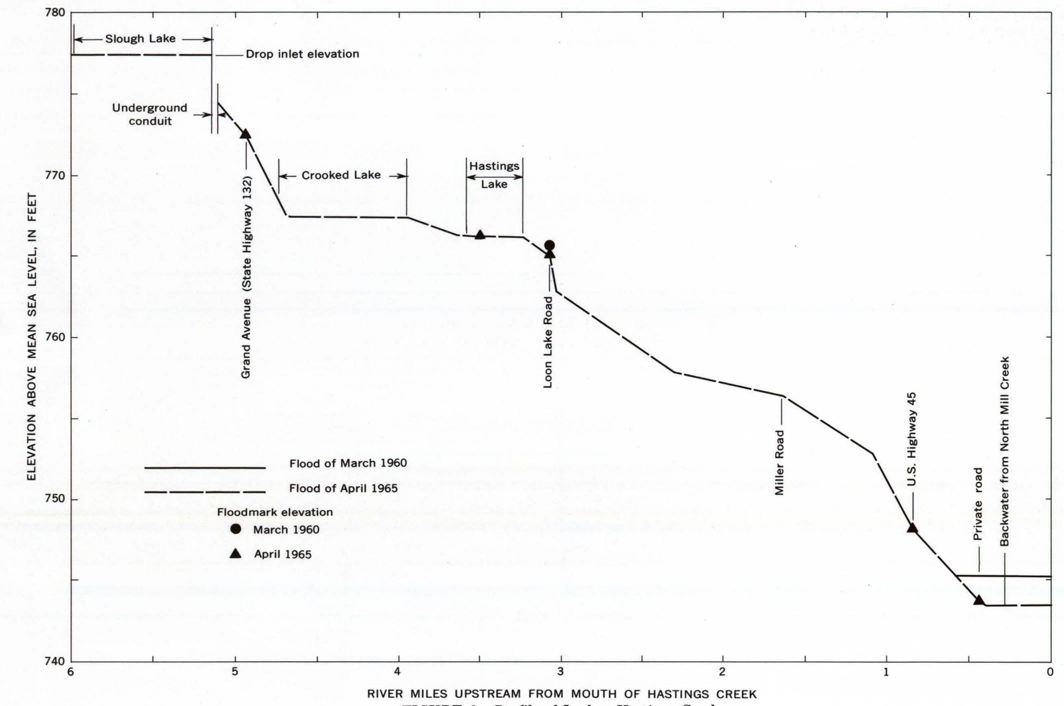


FIGURE 6.—*Profile of flood on Hastings Creek.*

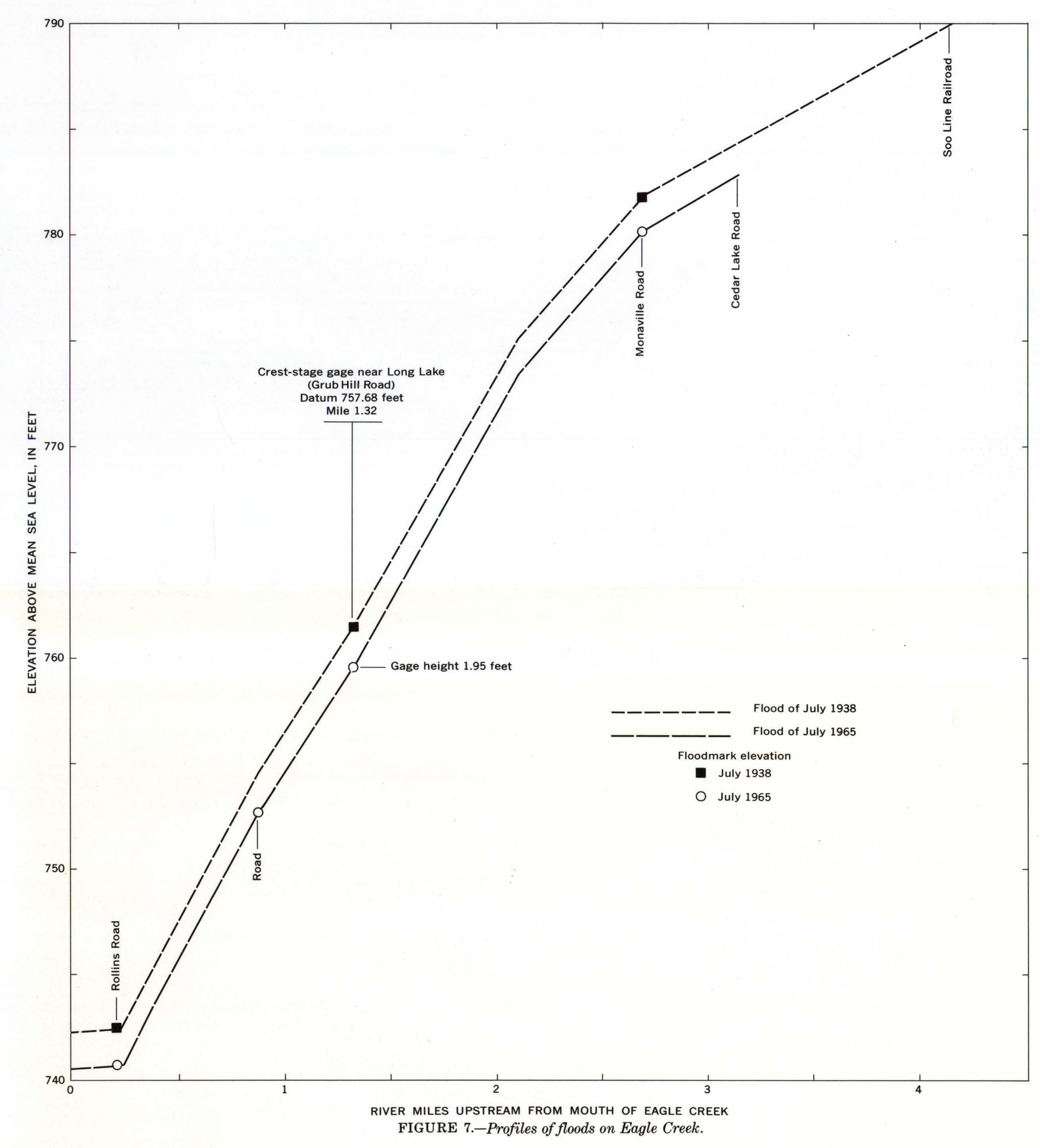


FIGURE 7.—*Profiles of floods on Eagle Creek.*

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