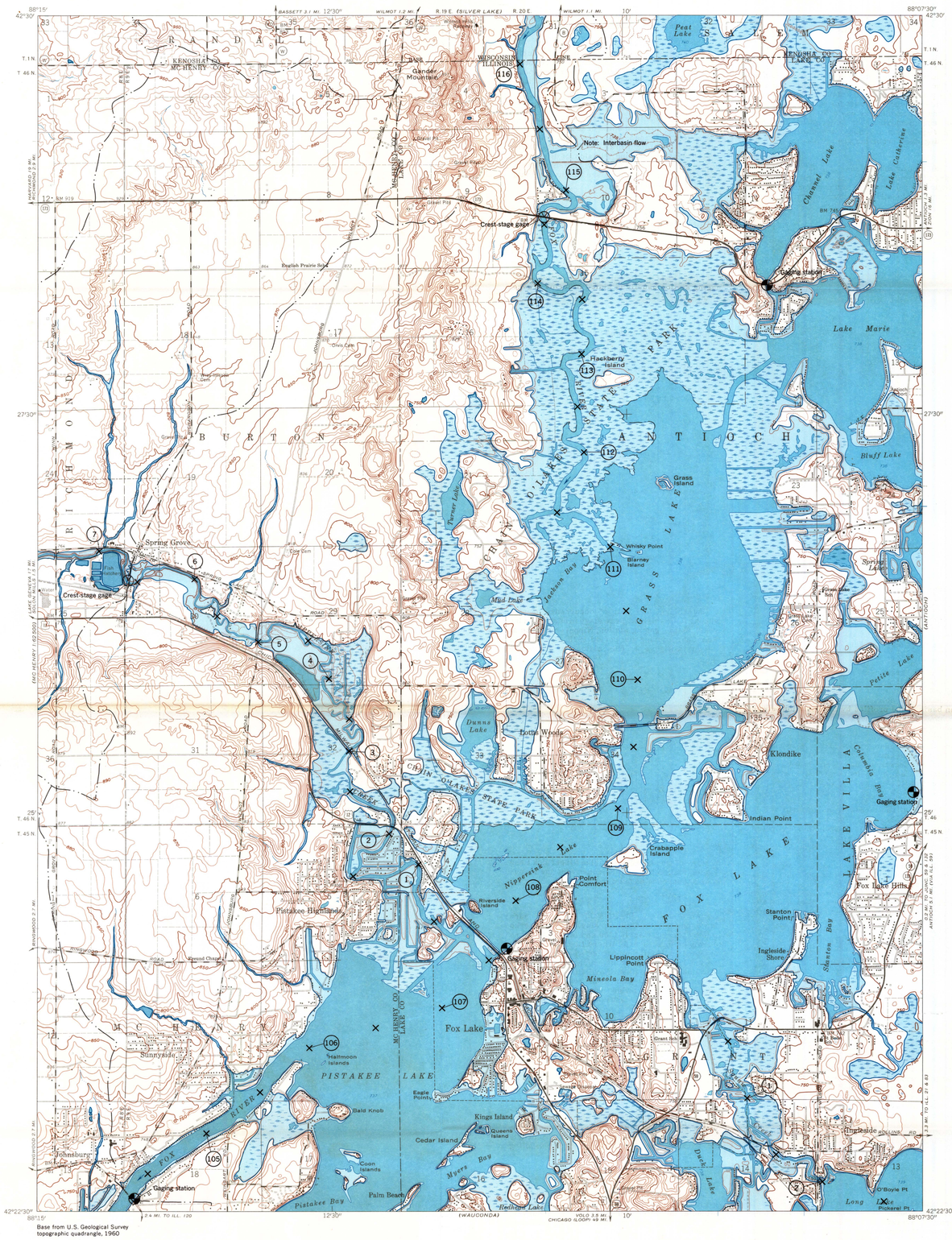
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
THE NORTHEASTERN ILLINOIS METROPOLITAN
AREA PLANNING COMMISSION

HYDROLOGIC INVESTIGATIONS
ATLAS HA-151



Base from U.S. Geological Survey topographic quadrangle, 1960

SCALE 1:24 000

1 0 ½ 0 1 MILE

1 0 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

APPROXIMATE MEAN DECLINATION, 1965

QUADRANGLE LOCATION

EXPLANATION

- Area flooded
- Boundary of 1960 flood
- Drainage divide
- River mile measured along stream channel (109)

FLOODS IN FOX LAKE QUADRANGLE NORTHEASTERN ILLINOIS

This report presents hydrologic data which can be used to evaluate 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 Fox Lake 7 1/2 minute quadrangle are delineated on a topographic map. The quadrangle location is shown in figure 1. Inundation shown on the map occurred during the flood of April 1960. Principal streams in the area are the Fox River, Nippersink Creek, and Squaw Creek. The highest flood on Nippersink Creek in the past 35 years occurred in July 1938 and was reported to have been higher than the 1960 flood by as much as 4 to 6 feet.

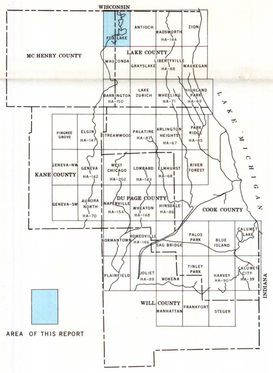


FIGURE 1.—*Index map of northeastern Illinois showing location of quadrangles in the flood-hazard mapping program.*

The general procedure used in defining flood limits was, first, to define flood profiles by use of all available data. Secondly, the extent of flooding was delineated on the topographic map on basis of the profiles by interpolation between contours (lines of equal ground 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 flood of April 1960 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 Fox Lake quadrangle where surface water accumulates because of inadequate drainage to 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 such 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. Financial support for the preparation of this report was provided by Lake and McHenry Counties.

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, and Division of Highways; Corps of Engineers, U.S. Army; McHenry County Highway Department; and Lake County Regional Planning Commission.

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

Gaging station	Type of gage[1]	Datum of gage above mean sea level (feet)	Drainage area (square miles)
Fox River:			
Near Channel Lake (State Highway 173)	C	740.05	883
At Johnsburg (Wooster Road)	R	735.20	1,219
Nippersink Creek at Spring Grove (Richardson Road)	C	751.86	208
Lake stations:			
Channel Lake near Antioch (State Highway 173)	R	735.26	—
Fox Lake near Lake Villa (East shore of Columbia Bay)	R	735.21	—
Nippersink Lake at Fox Lake (300ft upstream from Chicago, Milwaukee, St. Paul, and Pacific Railroad)	R	735.06	—

[1] C, Crest-stage gage; R, Water-stage recorder.

Gage height and year of occurrence of each annual flood (highest peak stage in each calendar year) at the gaging station, Nippersink Lake at Fox Lake, during the period 1938, 1940-63 are shown in figure 2. This histogram shows the history of floods recorded at the Nippersink Lake gaging station and also demonstrates the irregular occurrence of flood events.

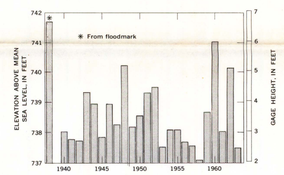


FIGURE 2.—*Annual peaks, 1938, 1940-63 Nippersink Lake at Fox Lake*

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 at gaging stations in the Fox Lake 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 (except lake stations) is shown in the table and the subbasin drainage divides from which the areas were determined are shown on the flood map.

Flood profiles — Profiles of the water surface, based primarily on elevations of marks left by floods of April 1960 and March 1962 are shown in figures 3-5. Where floodmarks could not be identified, the profiles were constructed on the basis of elevations of lower floods and streambeds, the extent of overflows 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.

Stages along Fox River (fig. 3) are controlled to some extent by operation of McHenry Dam and Lock which are at river mile 98.96.

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 3-5. 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 Fox Lake quadrangle can be obtained at the office of the U.S. Geological Survey, Oak Park, Ill., and from the following published reports:

Illinois Department of Public Works and Buildings, Division of Waterways, 1962, Survey report for development of Fox River for recreational navigation, 204 p.

——— 1962, Report on water levels and McHenry Dam, Fox Chain of Lakes Region, McHenry and Lake Counties, 45 p.

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

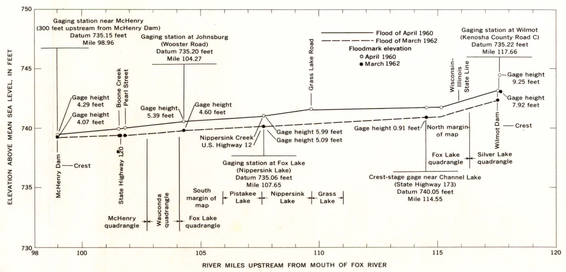


FIGURE 3.—*Profiles of floods on Fox River*

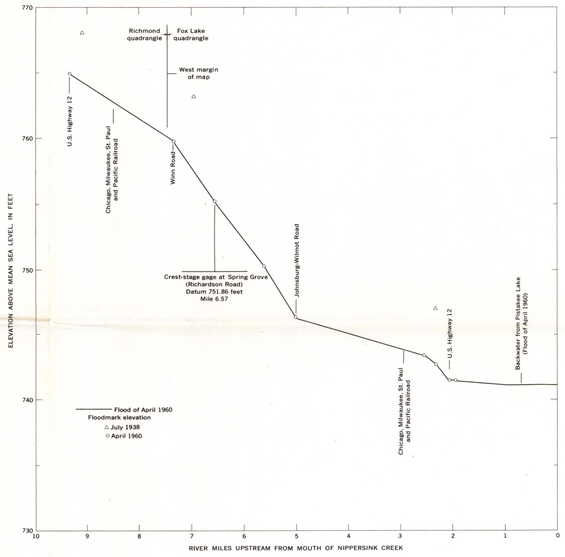


FIGURE 4.—*Profile of flood on Nippersink Creek*

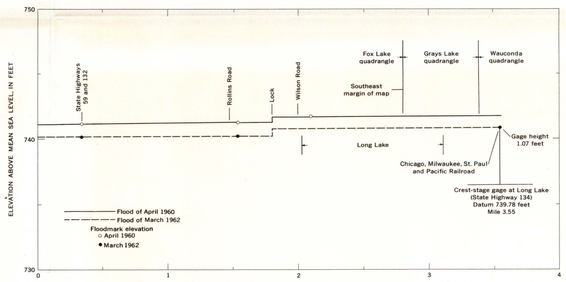


FIGURE 5.—*Profiles of floods on Squaw Creek*

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—1965—W65220

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