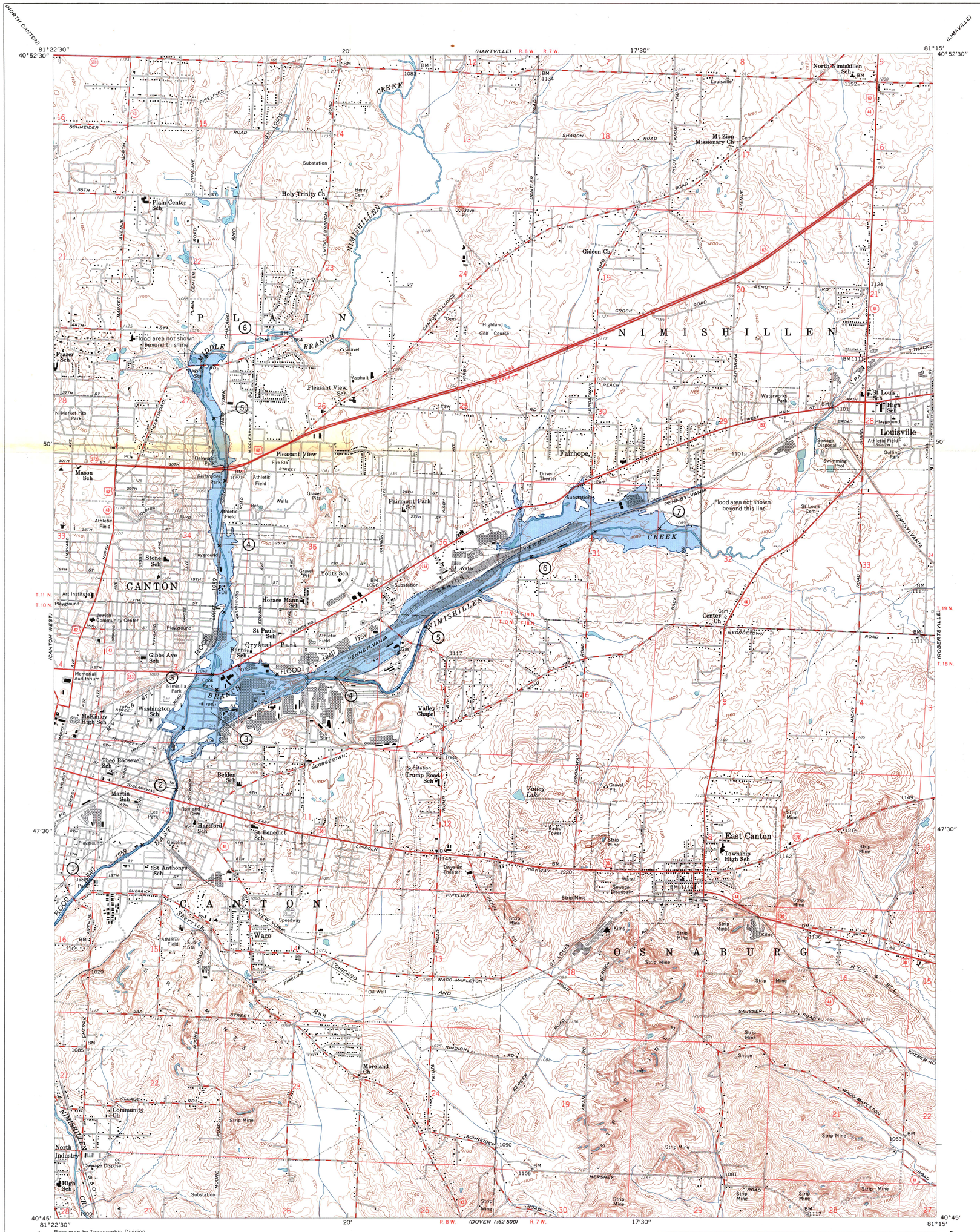
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
THOMAS B. NOLAN, DIRECTOR

PREPARED IN COOPERATION WITH
THE STATE OF OHIO
DEPARTMENT OF NATURAL RESOURCES
H. B. EAGON, DIRECTOR

HYDROLOGIC INVESTIGATIONS
ATLAS HA-50



Base map by Topographic Division
U.S. Geological Survey, 1958

MIDDLE BRANCH NIMISHILLEN CREEK FLOOD DATA

Flood heights recorded at the Geological Survey gaging station on Middle Branch Nimishillen Creek at Canton, Ohio, at the downstream side of bridge on Martindale Road.

Date of flood	Stage (feet)	Elevation above mean sea level (feet)
January 22, 1959	6.50	1,053.1
August 1, 1958	6.15	1,052.75
January 27, 1952	5.77	1,052.37
February 10, 1959	5.60	1,052.2

Note.—Limits of only the January 22, 1959, flood are mapped.

FLOODS ON MIDDLE BRANCH AND EAST BRANCH NIMISHILLEN CREEK AT CANTON, OHIO

The approximate area inundated at Canton, Ohio, by the Middle Branch and the East Branch Nimishillen Creek during the flood of January 21-22, 1959, is shown on a topographic map base in order to record the flood hazard in graphical form. Greater floods are possible but no attempt has been made to show their probable overflow limits. The flood of January 21-22, 1959, at Canton, was the highest since at least 1886. A flood on February 10, 1959, reached nearly the same stage and inundated very nearly the same area as the flood of January 21-22, 1959. Future protective works may reduce the frequency of flooding in the area but will not necessarily eliminate flooding. New highways and other cultural changes made after the floods of 1959 may influence the inundation pattern of future floods.

Flood height.—The height of a flood at a gaging station is usually stated in terms of gage height, or stage, which is the elevation of the water surface above a selected datum plane. Gage heights or stages of the gaging station on Middle Branch Nimishillen Creek at Canton, located at Martindale Road, may be converted to elevations above mean sea level by adding 1,046.6 feet.

Gage height and year of occurrence of each annual flood (greatest flood each year) which exceeded the 8-foot stage at the gaging station on Nimishillen Creek at North Industry, Ohio, are shown in figure 1. The North Industry gaging station, located about 5 miles downstream from Canton, is used because it has a much longer period of record than the gaging station on Middle Branch Nimishillen Creek at Canton. The irregular occurrence of floods is evident. The annual flood exceeded the 8-foot stage 12 times in 38 years of record, (fig. 1). Although annual floods above an 8-foot stage occurred on the average of about 3 times per decade, 1 was experienced in some decades, whereas 4 occurred during the periods 1934-43 and 1945-54.

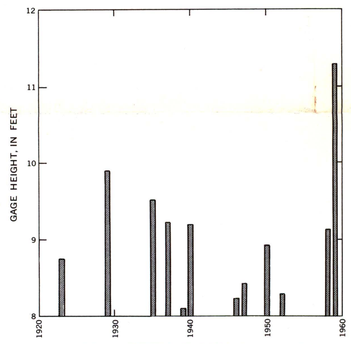


FIGURE 1.—ANNUAL FLOODS ABOVE 8-FOOT STAGE, 1922-59, NIMISHILLEN CREEK AT NORTH INDUSTRY, OHIO

Flood frequency.—Frequency of flooding on Middle Branch Nimishillen Creek has been derived from a regional flood-frequency relation for all streams in Ohio except those in the Maumee River basin. Frequency of flooding on East Branch Nimishillen Creek at Canton, is not shown. Large errors may result if the flood-frequency curve is extrapolated beyond the limits shown.

Recurrence intervals.—As applied to flood events, recurrence interval is the number of years, on the average, within which a given flood height will be equaled or exceeded once. It is inversely related to the chance of a specific flood being equaled or exceeded in any one year. Thus, a 20-year flood would have 1 chance in 20 of being equaled or exceeded in any year, or a 25-year flood would have 1 chance in 25 of being equaled or exceeded in any one year.

The general relationship between recurrence interval and flood height on Middle Branch Nimishillen Creek, at Canton, at Martindale Road (figure 2), is tabulated in the next column.

Recurrence interval (years)	Elevation above mean sea level of Middle Branch Nimishillen Creek at Canton, at downstream side of bridge on Martindale Road (feet)
50	1,052.8
25	1,052.6
15	1,052.5
10	1,052.4
5	1,052.1

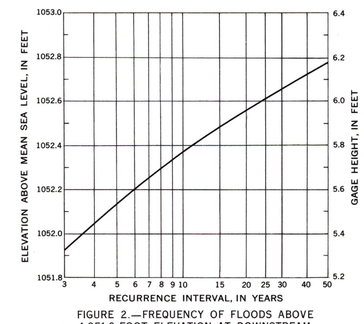


FIGURE 2.—FREQUENCY OF FLOODS ABOVE 1,051.9-FOOT ELEVATION AT DOWNSTREAM SIDE OF BRIDGE ON MARTINDALE ROAD ON MIDDLE BRANCH NIMISHILLEN CREEK AT CANTON, OHIO

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 Middle Branch Nimishillen Creek, a flood that reaches a 1,052.6-foot elevation at the downstream side of the bridge on Martindale Road is said to have a 25-year recurrence interval. However, because of the erratic nature of flood occurrence, the 1,052.6-foot elevation may not be reached in any one 25-year period, or it may be reached more than once.

Flood profiles.—The profiles of the water surface along Middle Branch and East Branch Nimishillen Creek, constructed from marks left by the flood of January 21-22, 1959, are shown in figure 3. Profiles of floods corresponding to other flood heights can be plotted on this diagram generally parallel to those shown. 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. Base lines for the profiles are located generally along the main channels. River miles above the mouth of East Branch Nimishillen Creek, used for the profiles of figure 3, are also marked along the channels on the flood inundation map.

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.

Additional data.—Other information pertaining to floods at Canton, Ohio, may be obtained at the office of the U.S. Geological Survey, 1509 Hess Street, Columbus, Ohio, and from the following published reports:

Cross, W. P., and Brooks, H. P., Floods of January-February 1959 in Ohio: U.S. Geol. Survey Cir. 418, 54 p.

Cross, W. P., and Webber, E. E., Floods in Ohio, Magnitude and Frequency: Ohio Dept. Nat. Resources, Div. of Water Bull. 32, 325 p.

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Supplemental flood profile data were furnished by the Ohio Department of Natural Resources, Division of Water, and by the City Engineer of Canton.

The flood map was prepared by William P. Somers, the flood-frequency relation was developed by William P. Cross, and the text was written by George W. Edelen, Jr., Geological Survey.

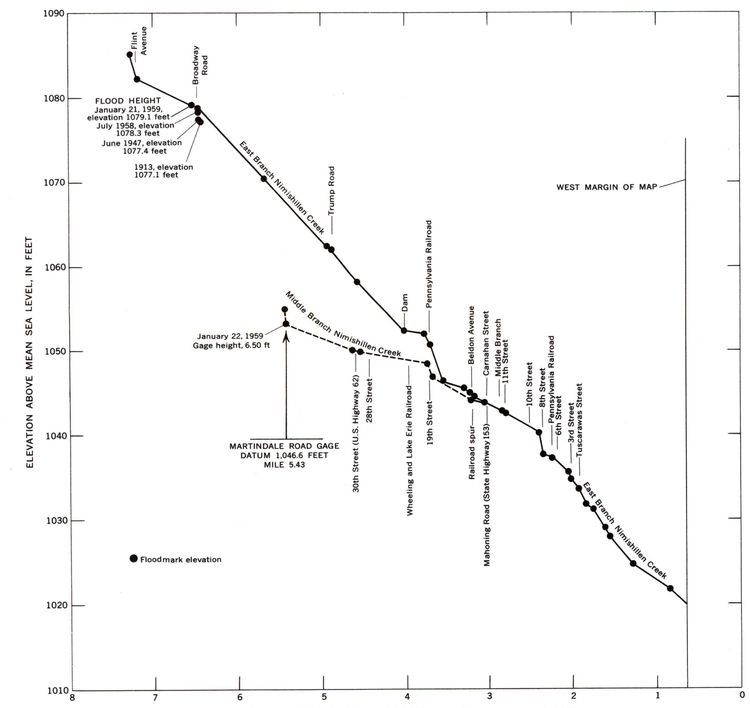

FIGURE 3.—PROFILES OF JANUARY 21-22, 1959, FLOOD ON MIDDLE BRANCH AND EAST BRANCH NIMISHILLEN CREEK

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FLOODS AT CANTON, OHIO

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