DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
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PREPARED IN COOPERATION WITH
THE STATE OF OHIO
DEPARTMENT OF NATURAL RESOURCES
H. B. EAGON, DIRECTOR

HYDROLOGIC INVESTIGATIONS
ATLAS HA-49

FLOODS ON TUSCARAWAS RIVER AND WOLF CREEK AT BARBERTON, OHIO, IN 1959

The approximate area inundated at Barberton, Ohio, by the Tuscarawas River and Wolf Creek during the flood of January 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 22, 1959, was the highest since March 1913 on Tuscarawas River and Wolf Creek at Barberton, but was several feet lower than the flood of March 1913. 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 flood 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 height and year of occurrence of each annual flood (greatest flood each year) which exceeded the 12-foot stage at the gaging station on the Tuscarawas River at Clinton, Ohio, are shown on figure 1. The Clinton gaging station, located about 7 miles downstream from Barberton is the nearest U. S. Geological Survey gaging station on the Tuscarawas River. The irregular occurrence of floods is evident. The annual flood exceeded the 12-foot stage 14 times in 34 years of record (figure 1). Although annual floods above a 12-foot stage occurred on the average of about 4 times per decade, 3 were experienced in some decades, whereas 5 occurred during the period 1935–44.

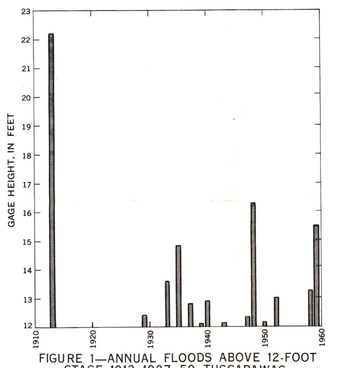

FIGURE 1—ANNUAL FLOODS ABOVE 12-FOOT STAGE 1913, 1927–59, TUSCARAWAS RIVER AT CLINTON, OHIO

Flood frequency.—Frequency of flooding on Tascarawas River was derived from a regional flood-frequency relation for all streams in Ohio except those in the Maumee River basin. Large errors may result if the flood-frequency curves are 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 one chance in 20 of being equaled or exceeded in any one year, or a 25-year flood would have one chance in 25 of being equaled or exceeded in any one year.

Recurrence interval (years)	Elevation above mean sea level (feet)	
	Tuscarawas River at Manchester Road Bridge	Tuscarawas River and Wolf Creek at Snyder Avenue Bridge
50	966.1	962.5
25	965.9	962.1
10	965.7	961.4
3	965.4	959.2

The general relationship between recurrence interval and flood height on the Tuscarawas River at Manchester Road and at Snyder Avenue, in Barberton (figure 2) is tabulated below.

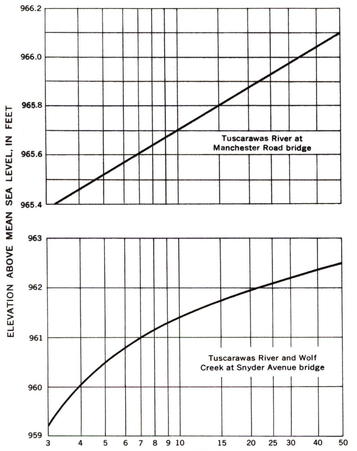

FIGURE 2—FREQUENCY OF FLOODS ON TUSCARAWAS RIVER AND WOLF CREEK AT BARBERTON, OHIO

At Snyder Avenue bridge, located immediately above the mouth of Wolf Creek, the stage-frequency relation shown applies to both Tuscarawas River and Wolf Creek. There is a greater range-in-stage at Snyder Avenue, than at Manchester Road near the outlet to Long Lake.

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, a flood that reaches a 962.1-foot elevation at the Snyder Avenue bridge is said to have a 25-year recurrence interval. However, because of the erratic nature of flood occurrence, the 962.1-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 Tuscarawas River and Wolf Creek, constructed from marks left by the flood of January 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, although backwater from high stages on either Tuscarawas River or Wolf Creek may affect the profiles at times. Base lines for the profiles are located generally along the main channels. River miles above the mouth of Wolf Creek, used for the profiles of figure 3, are also marked along the channels on the flood inundation map.

Additional data.—Other information pertaining to floods at Barberton, 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 Circ. 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.

Cooperation and acknowledgement.—The preparation of this flood inundation map is part of an investigation program financed through a special cooperative agreement between the Ohio Department of Natural Resources, H. B. Eagon, Director, and the Geological Survey.

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

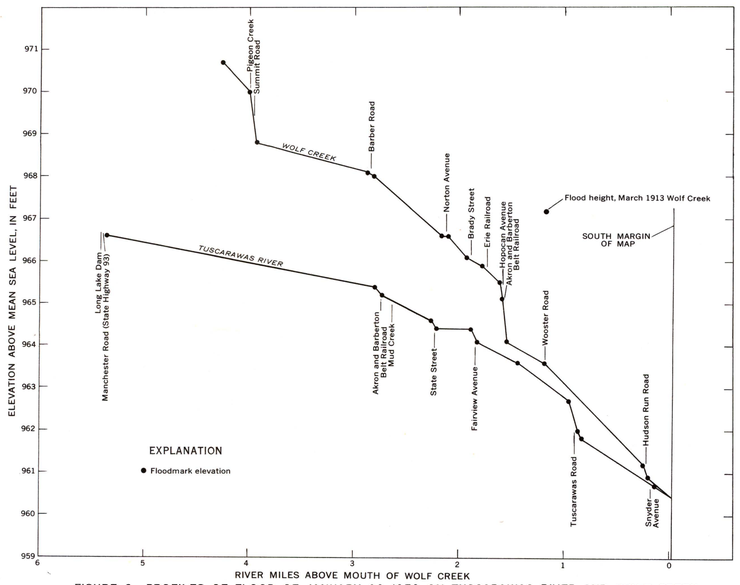

FIGURE 3—PROFILES OF FLOOD OF JANUARY 22, 1959, ON TUSCARAWAS RIVER AND WOLF CREEK

TUSCARAWAS RIVER FLOOD DATA

Flood heights determined from floodmarks on Tuscarawas River and Wolf Creek at Barberton. Overflow limits for only the flood of January 22, 1959, are shown.

Location	Elevation above mean sea level (feet)	
	Flood of March 1913	Flood of January 22, 1959
Tuscarawas River at Manchester Road	——	966.6
at Snyder Avenue	——	961.0
Wolf Creek near Wooster Road	967.2	963.6
at Snyder Avenue	——	961.0

Base from U. S. Geological Survey topographic quadrangle, 1958

SCALE 1:24 000

1 ½ 0 1 MILE

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

1962

EXPLANATION

Flood limit 1959

5 River miles above mouth of Wolf Creek

APPROXIMATE MEAN DECLINATION, 1958

OHIO
QUADRANGLE LOCATION

FLOODS AT BARBERTON, OHIO

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—61424

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