

FLOOD ON CRAB CREEK AT YOUNGSTOWN, OHIO, IN 1959

The approximate area inundated by Crab Creek during the flood of January 22, 1959, in Youngstown, Ohio, is shown on a topographic map base to record the flood hazard in graphical form. Greater floods are possible but no attempt has been made to show their probable overflow limits. Protective works built after the flood of January 1959 may reduce the frequency of flooding in the area but will not necessarily eliminate future flooding. New highways and other cultural changes may influence the inundation pattern of future floods.

Crab Creek, which flows through the northwestern part of Youngstown, into Mahoning River, is about 8 miles long and drains about 20 square miles. It has a range in elevation from about 820 feet above mean sea level at the mouth, to more than 1,100 feet. During the January 1959 flood, the flow in the lower 1,500 feet was confined to the channel but overflow was general for 2 miles upstream from Oak Street. The lower reach of Crab Creek is affected by backwater from Mahoning River at times.

**Bench marks.**—Elevations shown are in feet above mean sea level. Several bench marks of known elevation, located along the Erie Railroad in the vicinity of Crab Creek, are shown on the map.

The following U.S. Coast and Geodetic Survey description pertains to a bench mark located near Hubbard Road: "109.1—At Youngstown, Mahoning County, on the Erie Railroad, at the city limit, about 70 feet south of the center line of Hubbard Road, 28 feet south of pole 69+34, 26 feet east of the east rail, at a 6-foot concrete box culvert, in the top of the south end of the east head wall, and about 2 feet lower than the track. A standard disk, stamped 'D 109 1955'."

**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 10-foot stage at the gaging station on West Branch of Mahoning River near Newton Falls, Ohio, are shown in figure 1.

any one 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 Crab Creek at Hubbard Road, in Youngstown, Ohio, is tabulated below.

Recurrence Interval (years)	Elevation above mean sea level Crab Creek at Hubbard Road (feet)
50	869.4
25	868.8
15	868.2
10	867.7
5	866.8
3	866.0

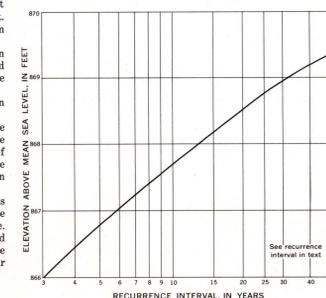


FIGURE 2.—Frequency of floods above 866-foot elevation at Hubbard Road on Crab Creek at Youngstown, Ohio

It is emphasized that recurrence intervals are average figures—the average number of years in which floods of specific gage height will be equaled or exceeded. Thus, a flood on Crab Creek that reaches an 868.8-foot elevation at Hubbard Street is said to have a 25-year recurrence interval. However, the 868.8-foot elevation may not be reached in any one 25-year period, or it may be reached more than once, because of the erratic nature of flood occurrence.

**Flood profiles.**—The profile of the water surface along Crab Creek, constructed from marks left by the flood of January 22, 1959, is shown in figure 3. Profiles of floods corresponding to other flood heights can be plotted on this diagram generally parallel to the 1959 flood profile, although occasionally backwater from high stages on the Mahoning River may affect the profile near the mouth of Crab Creek. The abrupt changes in the profile, shown at some points indicate the difference in water surface elevations at the upstream and downstream sides of the bridges or dams. The base line for the profile is located along the main channel. Distance in feet, measured upstream from the mouth, at Mahoning River, used for the profile in figure 3, are also marked along Crab Creek channel on the 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 of figure 3.

**Additional data.**—Other information pertaining to floods at Youngstown, 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, 1959, H. P., Floods of January-February 1959 in Ohio: U.S. Geol. Survey Circ. 418, 54 p.

Cross, W. P., and Webber, E. E., 1959, Floods in Ohio, Magnitude and Frequency: Ohio Dept. Nat. Resources, Div. of Water Bull. 32, 32 p.

Description and elevations of bench marks may be obtained from the Director, U.S. Coast and Geodetic Survey, Washington 25, D. C.

**Cooperation and acknowledgment.**—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 U.S. Geological Survey.

The topographic base map was prepared by the Geological Survey from Kelsh compilation furnished by Samuel T. Gould, Jr., Mahoning County Engineer, Youngstown, Ohio.

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

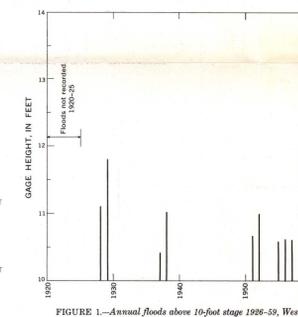


FIGURE 1.—Annual floods above 10-foot stage 1898-59, West Branch Mahoning River near Newton Falls, Ohio

The Newton Falls gaging station on West Branch Mahoning River, located about 20 miles northwest of Youngstown, is used because it is the nearest gaging station with the longest period of record on an unregulated stream. The Crab Creek drainage basin does not contain a gaging station. Figure 1 shows that the annual flood exceeded the 10-foot stage 10 times in 34 years of record. The irregular occurrence of floods is evident. Although annual floods above the 10-foot stage occurred on the average of about 3 times per decade, none were experienced in some decades, whereas 6 occurred during the period 1930-39.

**Flood frequency.**—Frequency of flooding on Crab Creek has been 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 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

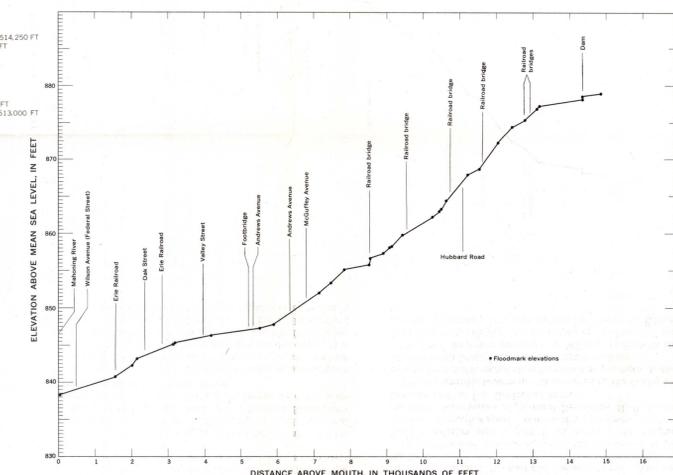
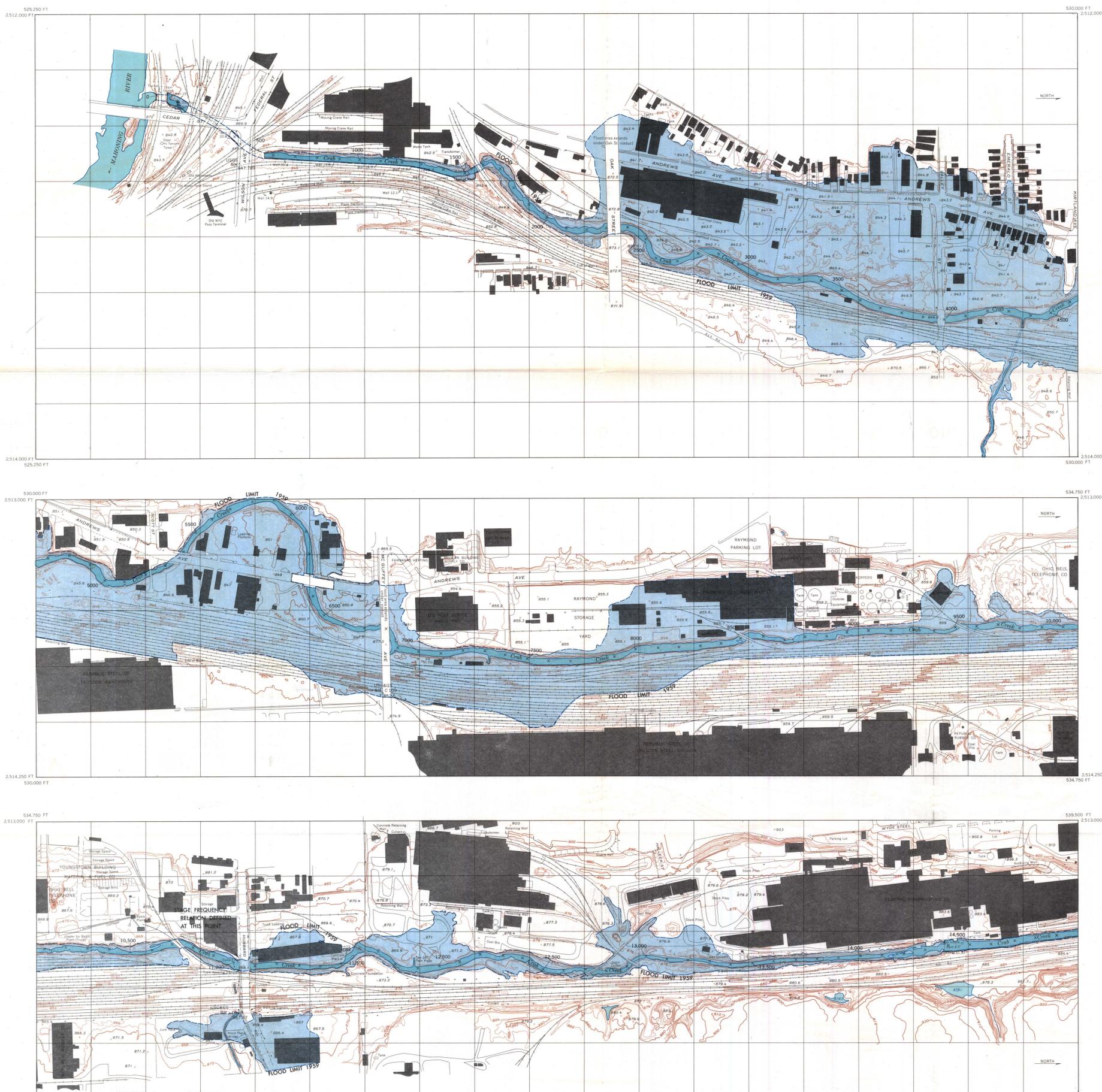


FIGURE 3.—Profile of floods of January 22, 1959, Crab Creek at Youngstown, Ohio

CRAB CREEK FLOOD HEIGHT

Flood height at Hubbard Road on Crab Creek at Youngstown, Ohio

Date of flood	Elevation above mean sea level (feet)
January 22, 1959	866.5



Base map prepared by U.S. Geological Survey from Kelsh compilation by Mahoning County, Ohio

SCALE 1:2400

CONTOUR INTERVAL 2 FEET  
DATUM IS MEAN SEA LEVEL

EXPLANATION

Flood limits January 1959

14,500

Distance in feet, measured upstream from the mouth

MAGNETIC NORTH  
TRUE NORTH  
APPROXIMATE MEAN DECLINATION, 1962

FLOODS ON CRAB CREEK AT YOUNGSTOWN, OHIO

By

George W. Edelen, Jr., William P. Cross, and William P. Somers