

FLOODS ON SANDUSKY RIVER AT FREMONT, OHIO IN 1959

The approximate area inundated at Fremont, Ohio, by the Sandusky River, during the flood of February 11, 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 February 11, 1959, the second highest in Fremont since 1907, and perhaps earlier, resulted from a combination of high rate of discharge and back-water from ice jams which had formed downstream from Fremont. The flood of March 26, 1913, was 3.5 feet higher than that of February 11, 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 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 the gage height or stage, which is the elevation of the water surface above a selected datum plane. Gage heights or stages of gaging stations on the Sandusky River in the vicinity of Fremont, can be converted to elevations above mean sea level by adding the gage height to the appropriate datum of gage listed below:

Gaging station	Location	Datum of gage above mean sea level (feet)
U.S. Geological Survey gage Sandusky River near Fremont	2.3 miles upstream from Ballville Dam	626.3
U.S. Weather Bureau gage Sandusky River at Fremont	At State Street Bridge	571.1

Gage height and year of each annual flood (highest peak stage each year) which exceeded elevation 582 feet at the U.S. Weather Bureau gaging station located at the State Street Bridge, in Fremont, are shown in figure 1. The irregular occurrence of floods is evident. The 11-foot stage, which corresponds to an elevation of 582 feet, was exceeded 21 times in 54 years of record (fig. 1). Although annual floods above an 11-foot stage occurred on the average of about 3 times per decade, two were experienced in some decades, whereas seven occurred during the period 1908-17.

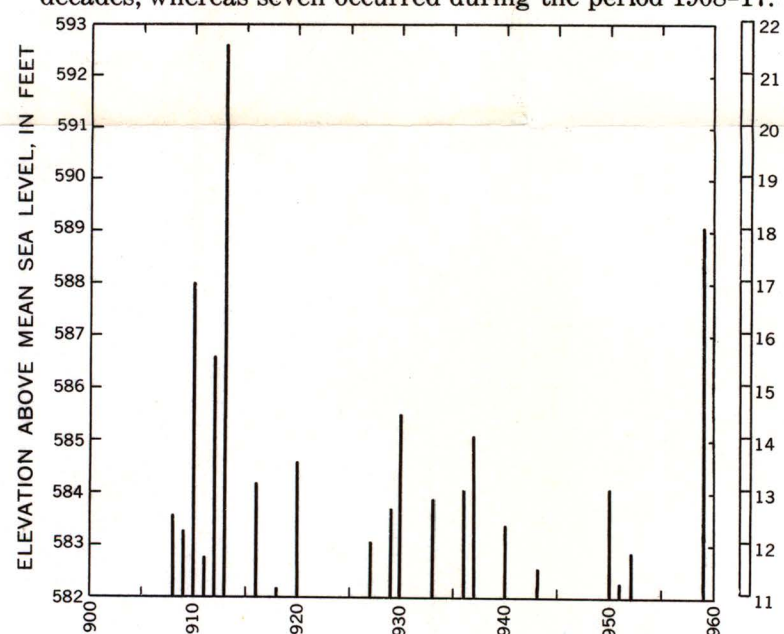


FIGURE 1.—ANNUAL FLOODS ABOVE ELEVATION 582 FEET AT STATE STREET BRIDGE GAGING STATION ON SANDUSKY RIVER AT FREMONT, OHIO 1907-60

Flood frequency.—Frequency of flooding is derived from the historical record of floods at the U.S. Weather Bureau, State Street Bridge gaging station, which began in 1907. Large errors may result if the 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 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.

The general relationship between recurrence interval and flood height at the State Street Bridge gaging station (figure 2) is tabulated below:

Recurrence interval (years)	Elevation above mean sea level at State Street Bridge (feet)
50	588.1
40	587.7
30	587.2
20	586.6
10	585.3
5	583.9
3	582.7

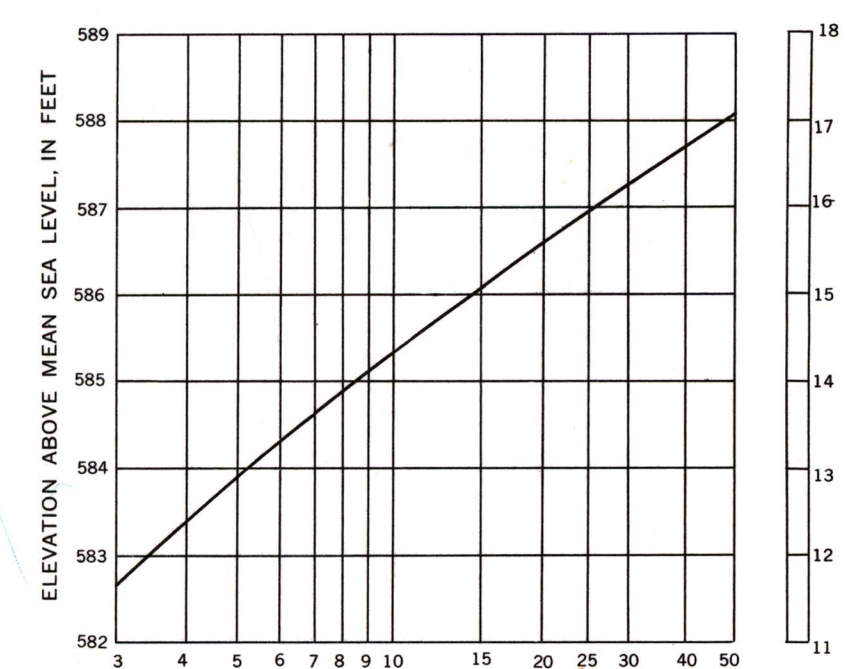


FIGURE 2.—FREQUENCY OF FLOODS ABOVE 582-FOOT ELEVATION AT STATE STREET BRIDGE ON SANDUSKY RIVER AT FREMONT, OHIO

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 height. Thus, a flood that reaches a 586.6-foot elevation at State Street Bridge is said to have a 20-year recurrence interval. However, because of the erratic nature of flood occurrence, the 586.6-foot elevation may not be reached in any one 20-year period, or it may be reached more than once.

Flood profiles.—The profile of the water surface along Sandusky River, constructed from marks left by the flood of February 11, 1959, is shown in figure 3. Profiles of floods corresponding to other flood heights can be plotted on this diagram generally parallel to that shown.

The abrupt changes in the profile shown at the Ballville Dam, and at some bridges, indicate the difference in water surface elevations at the upstream and downstream sides of the structures. Base line for the profile is located generally along the main channel. River miles above the mouth of Sandusky River, at Lake Erie, used for the profile of figure 3, are also marked along the channel on the flood inundation map.

Additional data.—Other information pertaining to floods at Fremont, 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.

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Floodmark elevations were furnished by the City of Fremont.

Gage-height record for Sandusky River at the State Street gaging station was furnished by the U.S. Weather Bureau.

The aerial photograph was furnished by George Demmel. 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.

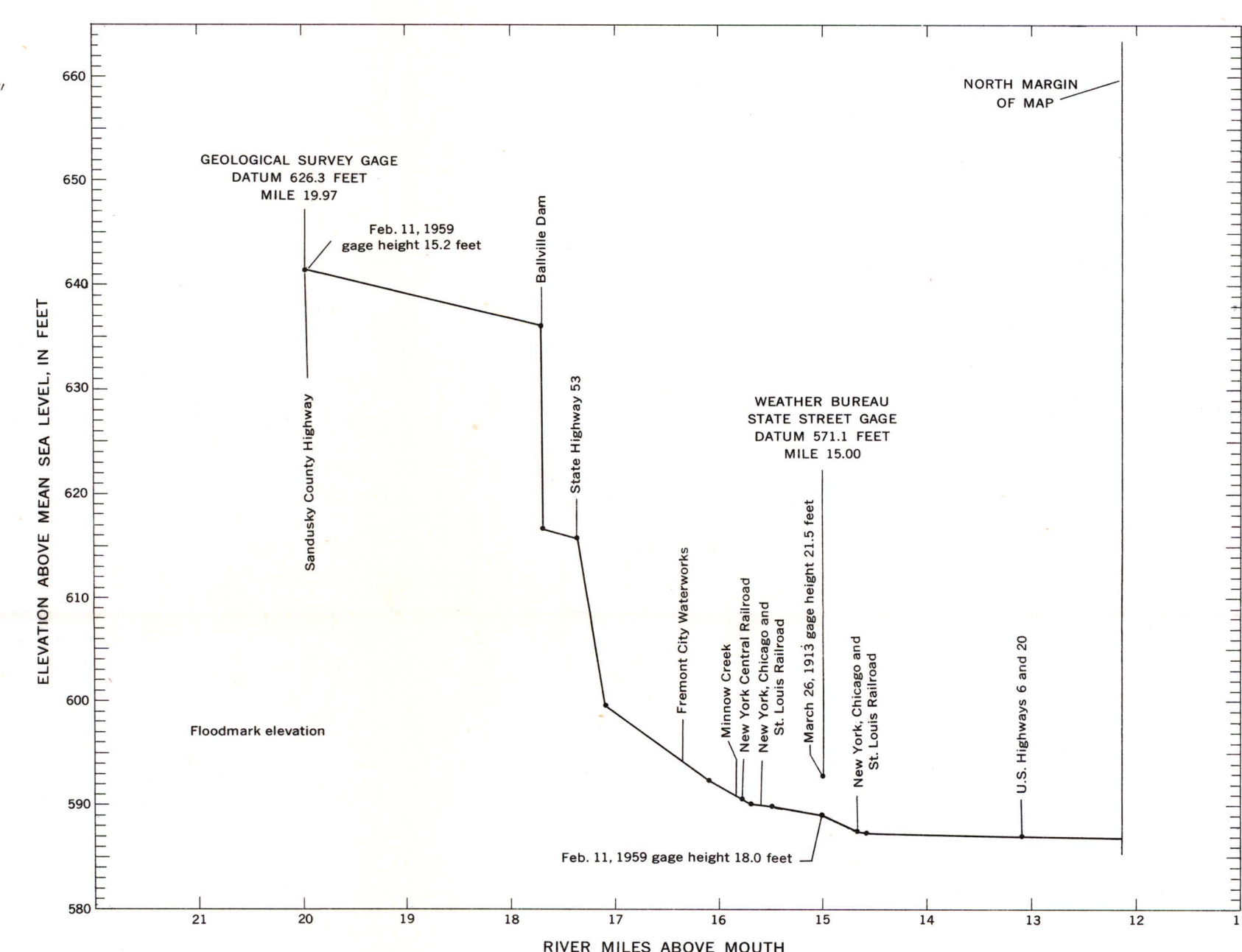


FIGURE 3.—PROFILE OF FEBRUARY 11, 1959 FLOOD ON SANDUSKY RIVER

SANDUSKY RIVER FLOOD AREA
Flood heights recorded at the U.S. Weather Bureau gaging station at State Street Bridge. Overflow limits for only the February 11, 1959, flood are shown.

Date of flood	Stage (feet)	Elevation above mean sea level (feet)
March 26, 1913	21.5	592.6
February 11, 1959	18.9	589.1
March 1, 1910	16.9	588.0

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

APPROXIMATE MEAN DECLINATION, 1958

SCALE 1:24 000
CONTOUR INTERVAL 5 FEET
DATUM IS MEAN SEA LEVEL

1962

EXPLANATION

Flood limit 1959

River miles above mouth



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