

FLOOD OF OCTOBER 1972 AT PETERSBURG AND COLONIAL HEIGHTS, VIRGINIA

The approximate areas inundated by the Appomattox River at Petersburg, Va., and by Swift Creek at Colonial Heights, Va., during the flood of October 1972 are shown on a topographic base map. The flood, the highest known on the Appomattox River, was caused by heavy rains which accompanied a low-pressure system that stagnated off the Virginia-North Carolina Coast.

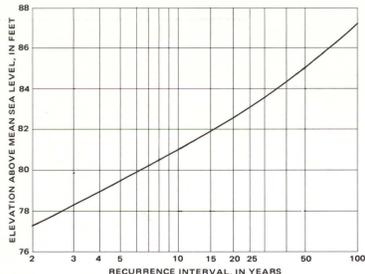
Floodmarks used to delineate the flooded areas were identified at the Virginia Bureau of Water Resources gaging station on the Appomattox River at Matoaca and along a 7-mile reach of the Appomattox River. Elevations of the marks were determined by leveling to bench marks. Flood boundaries were verified by field inspection, particularly in the urban areas.

Acknowledgment.—Acknowledgment is made to the U.S. Army Corps of Engineers, Virginia Bureau of Water Resources, City of Colonial Heights, and City of Petersburg for furnishing some of the data on which this report is based.

Flood History.—The flood of October 1972 reached an elevation of 86.69 feet above mean sea level (msl) at the gaging station on the Appomattox River at Matoaca, Va., (drainage area, 1,344 sq mi) and was the highest since records began in October 1969. The flood of August 1940 is known to have reached an elevation of 83.6 feet, msl, at State Highway 600 where the gage is located. The flood of August 1940 was the highest for the period of record (1926–66) at the gaging station, Appomattox River near Petersburg, Va., (drainage area 1,335 sq mi) which was located about 4 miles upstream from Matoaca gage. The site is now inundated by Lake Chesdin.

The peak discharge on October 7, 1972, was 40,800 cfs at Matoaca as compared with a peak discharge of 28,000 cfs on August 20, 1940.

Flood frequency.—The stage-frequency relation for the Appomattox River in the vicinity of Petersburg derived from the record of annual floods for period 1927–66 at the U.S. Geological Survey gaging station near Petersburg and for period 1970–72 at the Virginia Bureau of Water Resources gaging station at Matoaca is shown in figure 1.



This general relationship between recurrence interval and flood height for the Appomattox River in the vicinity of Petersburg indicates that the 1972 flood had a recurrence interval of about 80 years whereas the 1940 flood had a recurrence interval of about 30 years.

Recurrence intervals.—As applied to flood events, the recurrence interval is the average interval of time within which a given flood will be equaled or exceeded once. Recurrence interval is inversely related to the chance of a flood of a specific height 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 50-year flood would have 1 chance in 50 of being equaled or exceeded in any year.

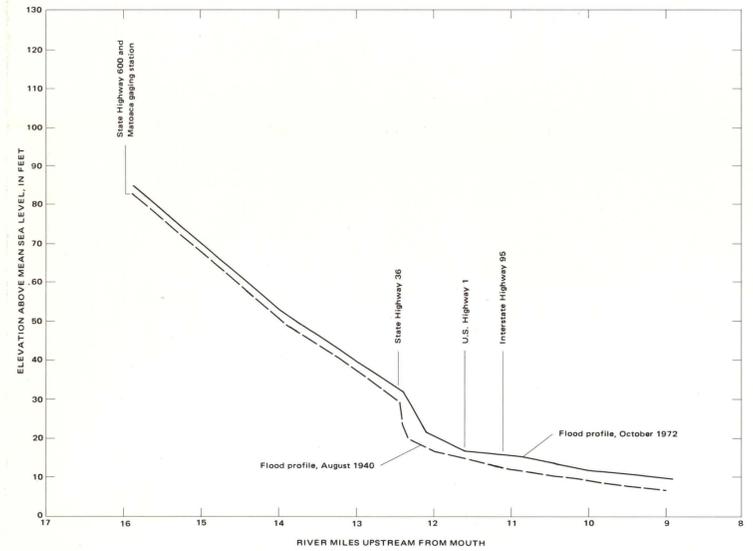
It is emphasized that recurrence intervals are average figures—the average number of years that will elapse between the occurrences of floods that equal or exceed a given magnitude. The fact that a major flood occurs does not reduce the probability of occurrence of a flood as great or greater in the next year or even in the next week.

Flood profiles.—Profiles of the water surface of the Appomattox River during the floods of October 1972 and August 1940 are shown in figure 2. Distance in miles upstream from the mouth of the Appomattox River used for the profiles correspond to those marked at 1-mile intervals on the flood map.

Depth of water at any point can be estimated by subtracting the ground elevation from the water-surface elevation indicated by the profiles. Ground elevation can be estimated from the contours on the map; however, more accurate elevations can be obtained by leveling to bench marks.

Additional data.—Other information pertaining to floods at Petersburg, Va., may be obtained at the office of the U.S. Geological Survey, Water Resources Division, Richmond, Va., and from the following reports:

Miller, E. M., 1969, Floods in Virginia—magnitude and frequency: U.S. Geol. Survey open-file report, 371 p.
Speer, P. R., and Gamble, C. R., 1964, Magnitude and frequency of floods in the United States, part 2-A, South Atlantic slope basins, James River to Savannah River: U.S. Geol. Survey Water-Supply Paper 1673, 329 p.
U.S. Geological Survey, 1949, Floods of August 1940 in the Southeastern States: U.S. Geol. Survey Water-Supply Paper 1066, 554 p.



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