DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
COMMONWEALTH OF MASSACHUSETTS
WATER RESOURCES COMMISSION

HYDROLOGIC INVESTIGATIONS
ATLAS HA-500

FLOOD OF MARCH 1968 ON THE NEPONSET RIVER, MASSACHUSETTS

This report shows on a photomosaic base the extent of flooding along the Neponset River between Walpole and Milton Lower Mills, Mass., during the flood of March 1968. It also presents flood data for two gaging stations, two crest-stage stations, and a selected downstream site in the Neponset River basin. The report illustrates the magnitude of the March 1968 flood and can guide decisions pertaining to flood-plain use and to flood containment and prevention. It is one of a series covering the March 1968 floods on major rivers in eastern Massachusetts and northern Rhode Island.

The flood of March 1968 on the Neponset River was caused by an intense 3-day storm, which began on March 17. In a 36-hour period, rain, totaling from 5 to 7 inches, fell on ground already saturated by snowmelt and by heavy rain on March 12–13. For the periods of record at the two gaging stations—Neponset River at Norwood and East Branch Neponset River at Canton—maximum discharge of this flood was exceeded only by the flood of August 1955.

The Neponset River begins at the outlet of Neponset Reservoir in Foxboro. Along its course it is regulated by mills and reservoirs. It is also affected by diversions—to and from its basin—for both industrial and municipal use. Of these diversions, Mother Brook is the only one that has an appreciable effect on floodflow. At high flows, Mother Brook diverts about one-third of the flow of the Charles River at Dedham to the Neponset River at Hyde Park.

Flood damage along the Neponset River is caused primarily by inundation rather than by high velocity. During the flood of March 1968, basements were flooded, and trolley service between Ashmont and Mattapan was suspended when the tracks became flooded at Milton Lower Mills. The New England Division, Corps of Engineers, estimated flood losses—determined, for the most part, from news sources—to be about $1.5 million.

FLOODED AREAS

The extent of flooding along the Neponset River between Walpole and Milton Lower Mills is shown on the photomosaics. The areas covered by the photomosaics are outlined in figure 1.

The photomosaics have not been corrected for possible distortion caused by camera tilt or minor changes of altitude during flight. Although such distortions might cause slight error in the linear scale on the photomosaics, they have no effect on the boundaries of the flooding. Flooded areas masked by dense vegetation are outlined by a dashed line to indicate that the delineation of the flooded area is approximate. The photographs from which the photomosaics were compiled were taken after the river had reached its peak. Although the extent of flooding was—for the most part—clearly visible, it is possible that flooding may have extended beyond the outlined area in some reaches.

FLOOD DATA

Historical data indicate that the flood of 1886 was the greatest in the Neponset River basin since at least 1800 and probably since the early 1700's. The August 1955 flood is believed to be second in magnitude. Damaging floods also occurred in 1807, 1898, 1936, and 1938.

Flood-crest elevations for the 1968 flood, in feet above mean sea level, are shown on the photomosaics. The flood-crest marks—at sites from Walpole to Milton Lower Mills—were determined from actual field evidence.

Discharge of a stream is the volume of water that passes a given site in a given period of time. Discharge hydrographs for the March 1968 flood for the two gaging stations in the Neponset River basin are given in figure 2. Floodflows at both stations are affected by regulation of reservoirs and ponds.

Peak discharge is the maximum discharge during a flood. Peak-discharge data for the March 1968 flood at sites in the basin are compared with the previous maximum for the period of record in the following table:

Drainage area	Period of record (water years)	Date	Elevation (feet above mean sea level)	Discharge (cubic feet per second)
01104900 Mill Brook at Westwood				
1.52	1964–68	Mar. 18, 1968	[1]10.12	96
		Feb. 26, 1965	[1]7.05	31
		May 26, 1967	[1]7.05	31
01105000 Neponset River at Norwood				
35.2	1940–68	Mar. 18, 1968	54.52	1,140
		Aug. 19, 1955	58.69	1,490
01105500 East Branch Neponset River at Canton				
27.2	1953–68	Mar. 18, 1968	87.05	1,420
		Aug. 19, 1955	88.36	1,790
01105550 Plantingfield Brook at Norwood				
1.52	1964–68	Mar. 18, 1968	[1]15.06	178
		Sept. 29, 1967	[1]14.11	145
01104000 Mother Brook at Dedham				
	1932–68	Mar. 21, 1968	87.15	1,040
		Aug. 24, 1955	92.87	970
Neponset River at Hyde Park				
97.8	----------	Mar. 20, 1968	38.6	1,550

[1]Feet above gage datum.

Most flooding along the Neponset River in March 1968 occurred in the swamps and meadows in the Norwood-Canton-Dedham area. The modifying effect of this natural storage is shown by a comparison of the peak discharge computed for a site downstream from the swamp area with the peak discharges at the gaging stations, which are upstream from the area. The peak discharge at Hyde Park, the downstream site, included the Mother Brook diversion. Yet it was only 130 cfs higher than the peak of 1,420 cfs at the gage on the largest tributary, East Branch Neponset River at Canton.

FLOOD FREQUENCY

The frequency of a flood may be expressed in terms of recurrence interval or of probability of occurrence. The recurrence interval is the average interval of time within which a flood of a given magnitude will be exceeded once.

The frequency with which a flood of given magnitude can be expected on the Neponset River at Norwood can be determined from figure 3. The graph was determined from stream-flow records for the period 1940–68 and from historical data. The elevation-discharge relation used is based on channel conditions existing in 1968. However, the relation between elevation and discharge can vary from time to time because of changes in the channel or in the flood plain.

Figure 3 shows that at the station at Norwood, a flood equal to the March 1968 flood has a recurrence interval of about 40 years. However, floods do not occur at regular intervals. A flood greater than the March 1968 flood had occurred at Norwood in August 1955—only 13 years earlier.

Probability is virtually the reciprocal of the recurrence interval for floods greater than the 10-year flood. When stated as a probability, a flood exceeding the March 1968 flood has 1 chance in 40 of occurring in any given year.

COOPERATION AND ACKNOWLEDGMENTS

This report was prepared by the U.S. Geological Survey under the administrative direction of C.E. Knox, district chief, in cooperation with the Commonwealth of Massachusetts, Water Resources Commission. The aerial photographs for the photomosaics were taken by Lockwood, Kessler, and Bartlett, Inc., Syosset, New York. Extent of flooding was delineated by W.J. Schneider and Antonio Jurado of the U.S. Geological Survey. The flood-crest elevations shown on the photomosaics were furnished by the Massachusetts Department of Public Works and the Metropolitan District Commission, Construction Division.

ADDITIONAL INFORMATION

Additional information pertaining to floods in the Neponset River basin can be obtained at the offices of the U.S. Geological Survey in Boston and from the following reports:

Bogart, D.B., 1960, Floods of August–October 1955 New England to North Carolina: U.S. Geol. Survey Water-Supply Paper 1420, 854 p.

Green, A.R., 1964, Magnitude and frequency of floods in the United States, pt. 1-A, North Atlantic slope basins, Maine to Connecticut: U.S. Geol. Survey Water-Supply Paper 1671, 260 p.

Grover, N.C., 1937, The floods of March 1936, pt. 1, New England rivers: U.S. Geol. Survey Water-Supply Paper 798, 466 p.

Thomson, M.T., and others, 1964, Historical floods in New England: U.S. Geol. Survey Water-Supply Paper 1779-M, 105 p.

Wood, G.K., and others, 1970, Flood of March 1968 in eastern Massachusetts and Rhode Island: U.S. Geol. Survey open-file report, 81 p.

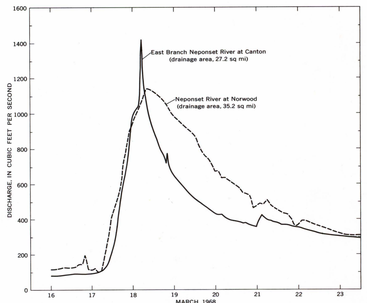


FIGURE 2.—*Discharge hydrographs for gaging stations in the Neponset River basin.*

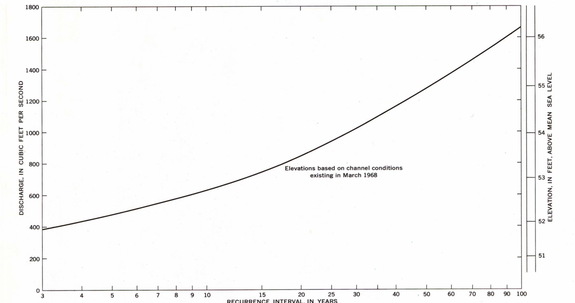
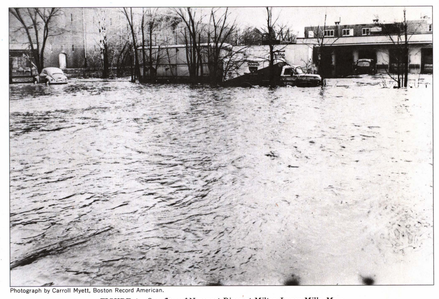
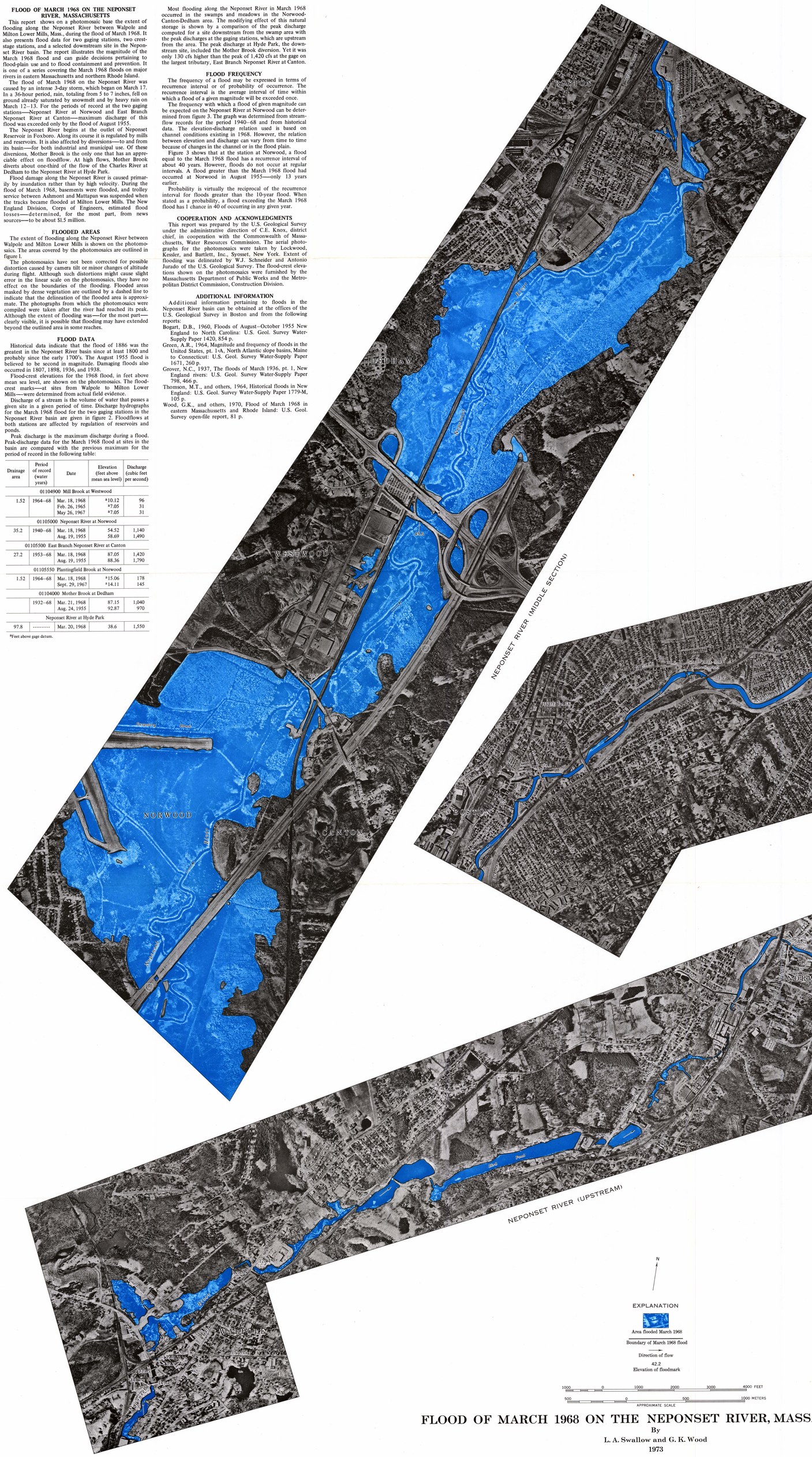


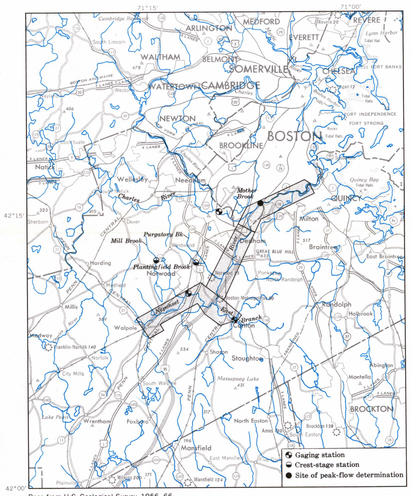
FIGURE 3.—*Frequency of floods on Neponset River at Norwood.*



Photograph by Carroll Myett, Boston Record American.

FIGURE 4.—*Overflow of Neponset River at Milton Lower Mills, Mass.*





Base from U.S. Geological Survey, 1956–66

SCALE 1:250 000

2 0 2 4 6 8 MILES

2 0 2 4 6 8 KILOMETERS

FIGURE 1.—*Index map showing location of aerial photomosaics of the Neponset River.*

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1973

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1974—W73051