

FLOODS OF NOVEMBER 11-13, 1974, IN  
ST. CROIX, U.S. VIRGIN ISLANDS

ABSTRACT

This report presents information that can aid administrators, planners, engineers, and others concerned with development in areas subject to flooding on the island of St. Croix. The data presented may aid in making decisions concerning the use of floodprone areas.

This report is the result of hydrologic interpretation of data collected in field investigations immediately after the flood of November 11-13, 1974, by the U.S. Geological Survey.

U.S. Geological Survey benchmarks used for this survey, their description, location and elevation above mean sea level are provided in table 1. All elevations given are in feet above mean sea level.

For those readers who may prefer to use metric units rather than English units, the conversion factors for the terms used in this report are listed below.

Multiply	by	to obtain
English unit		metric unit
feet (ft)	0.3048	meters (m)
inches (in)	25.40	millimeters (mm)
miles (mi)	1.609	kilometers (km)
square miles (mi <sup>2</sup> )	2.590	square kilometers (km <sup>2</sup> )

The U.S. Virgin Islands consists of more than 40 islands and cays located about 1,100 miles east-southeast of Miami, Florida and about 50 miles east of Puerto Rico (fig. 1 on plate 1). The islands form part of the Antilles Island Arc, which separates the Atlantic Ocean from the Caribbean Sea. St. Croix is the largest of the group with a land area of about 82 mi<sup>2</sup> and is located 40 miles south of St. Thomas. (fig. 2).

St. Croix is mountainous on the north with steep to gently rolling hills to the south. The mountainous areas are separated by narrow steep-sided valleys which are natural drainageways for storm runoff. These drainageways are called "guts" by Virgin Islanders. The guts are intermittent, dry for long periods in most reaches, or flowing only after heavy rainfall. As a result, flood waters recede rapidly and inundation usually lasts less than a day.

FLOOD PROFILES

The maximum elevations of the water surface during the flood of November 11-13, 1974, on St. Croix are shown in figures 3 through 14; the locations of the baselines are shown on maps A through F. The baselines, used to determine the distance upstream from the mouth, were chosen to conform to the general direction of flow during floods. The stream channels for which baselines are drawn have been assigned the arbitrary names of Gut No. 1, Gut No. 2, and so on through Gut No. 12 for identification purposes in this report. Abrupt changes in the profiles indicate the difference in water-surface elevations at the upstream and downstream side of channel constrictions or changes in streambed slopes.

FLOOD FREQUENCY

The frequency or recurrence interval, as applied to flood events, is the average interval of time within which a given flood will be exceeded once. For example, two floods of at least the magnitude of a 50-year flood can be expected to occur in a 100-year period, on the average. Stated differently, a 50-year flood has one chance in 50 of being exceeded in any 1 year or a 2 percent chance of occurring in any year.

There is insufficient information to assign a flood frequency to the floods shown herein. Data obtained from the National Oceanic and Atmospheric Administration (1974) and analysis from the U.S. Weather Bureau's Technical Paper number 42 (1961) indicate the following recurrence intervals for observed 24-hour precipitation during the period of November 11-13, 1974 at the following sites.

Location	Observed 1-day precipitation, in inches	Estimated recurrence interval, in years
Alexander Hamilton Field	4.00	3
Christiansted Fort	5.92	6
Granard	7.27	25

Much of the rainfall shown above may have occurred in a much shorter time than 1 day and the resulting runoff may have had a higher recurrence interval than that shown for daily precipitation.

REFERENCES

- U.S. Weather Bureau, 1961, Generalized estimates of probable maximum precipitation and rainfall-frequency data for Puerto Rico and Virgin Islands: U.S. Weather Bur. Tech. rept., no. 42, 94 p.
- U.S. National Oceanic and Atmospheric Administration, 1974, Climatological data, Puerto Rico and Virgin Islands, November 1974: NOAA rept., v. 20, no. 11, 18 p.

INUNDATED AREAS

The areas inundated by the November 11-13, 1974, floods are shown on maps A to F, and plates 4 to 11. Flood boundaries were delineated from profiles of high-water marks recovered by U.S. Geological Survey personnel immediately after the flood. Depth of flooding can be estimated by subtracting the ground elevation, shown on the map by ground contours, from the elevation of the water surface shown by the water-surface contours.

The flood boundaries on the map are based on conditions existing when the floods occurred. The inundation pattern of future floods may be affected by changes in channel conditions, waterway openings at highways, changes in runoff characteristics of the streams caused by increased urbanization, and other cultural changes.

In addition to the flooded areas shown on the maps, there was sheet flow down many of the streets and the hillsides.

ACKNOWLEDGMENTS

Selection of the sites for this investigation was made in collaboration with the Government of the U.S. Virgin Islands.

ADDITIONAL INFORMATION

Supporting data and computations relating to this report are in the files of the U.S. Geological Survey, San Juan, Puerto Rico.

Table 1.--Reference marks established by the U.S. Geological Survey in St. Croix, U.S. Virgin Islands.

Reference-mark number (see plates for locations)	Elevation above mean sea level, feet	Description
RM-1	9.88	At Campo Rico; 1.9 mi southeast of Frederiksted on south side of manhole at intersection on roads; chiseled square painted green.
RM-2	126.15	At Whim; 1.7 mi southeast of Frederiksted; on second step of concrete stair of bus stop shelter at Centerline Road; chiseled square painted green.
RM-3	127.48	At Carlton; 2.2 mi southeast of Frederiksted at Centerline Road; on north side of culvert headwall; chiseled square painted green.
RM-4	89.67	At Plessen; 4.5 mi east of Frederiksted; at Centerline Road; 150 ft west of intersection of road to airport; on north side of culvert headwall; chiseled square painted green.
RM-5	8.85	At Christiansted; in front of lot 27A; on corner of ditch; chiseled square painted green near the corner of North and Market streets.
RM-6	27.36	At Tide Village; 1.4 mi east of Christiansted; on upstream side of culvert headwall; in front of Pearl B. Larson School; chiseled square painted green.

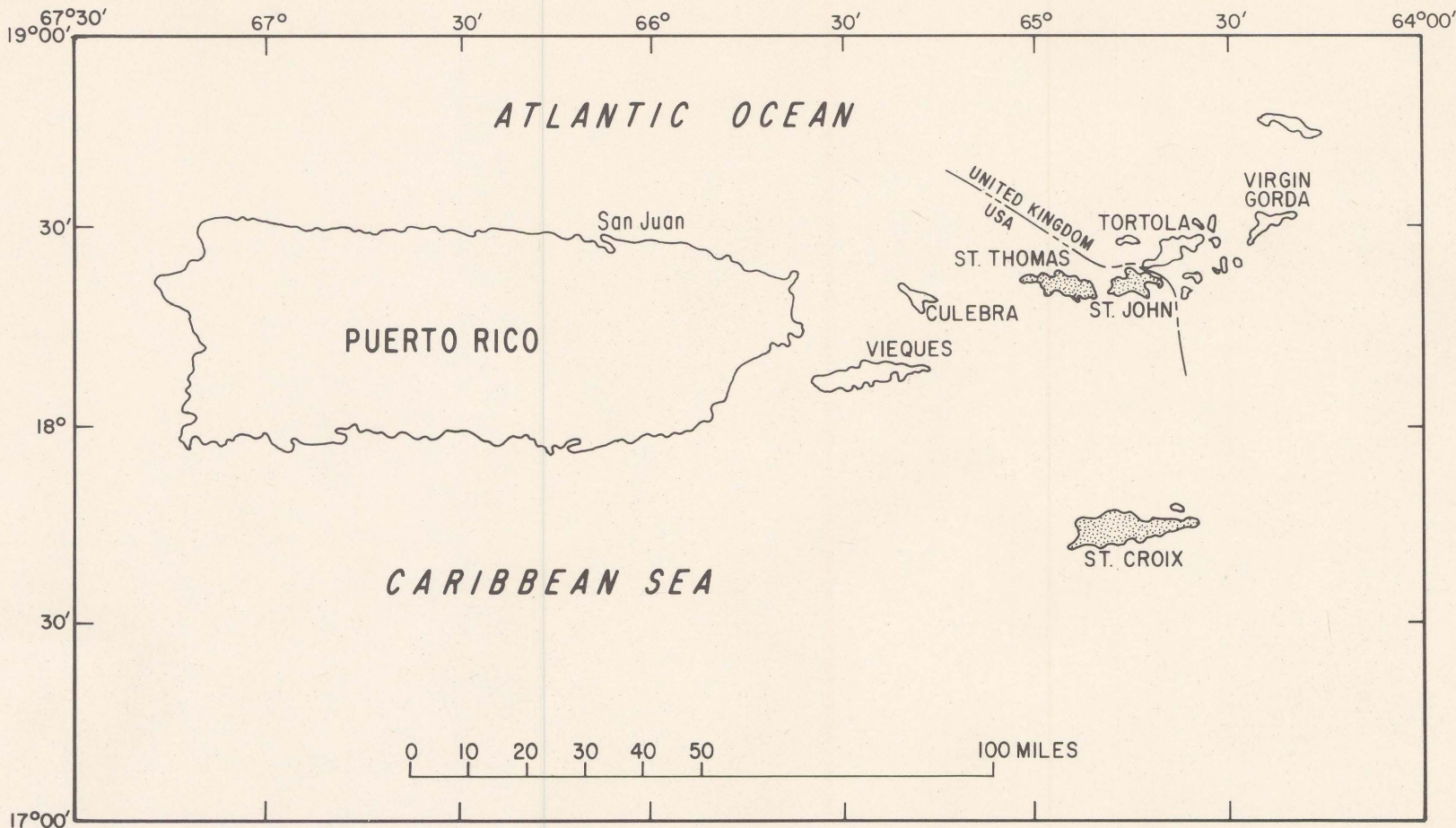
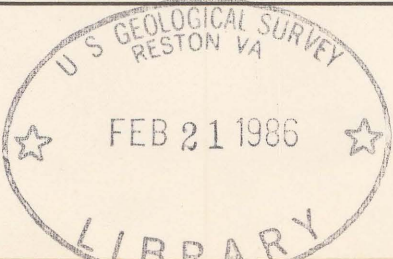


FIGURE 1.--Location of the U.S. Virgin Islands.



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1978



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