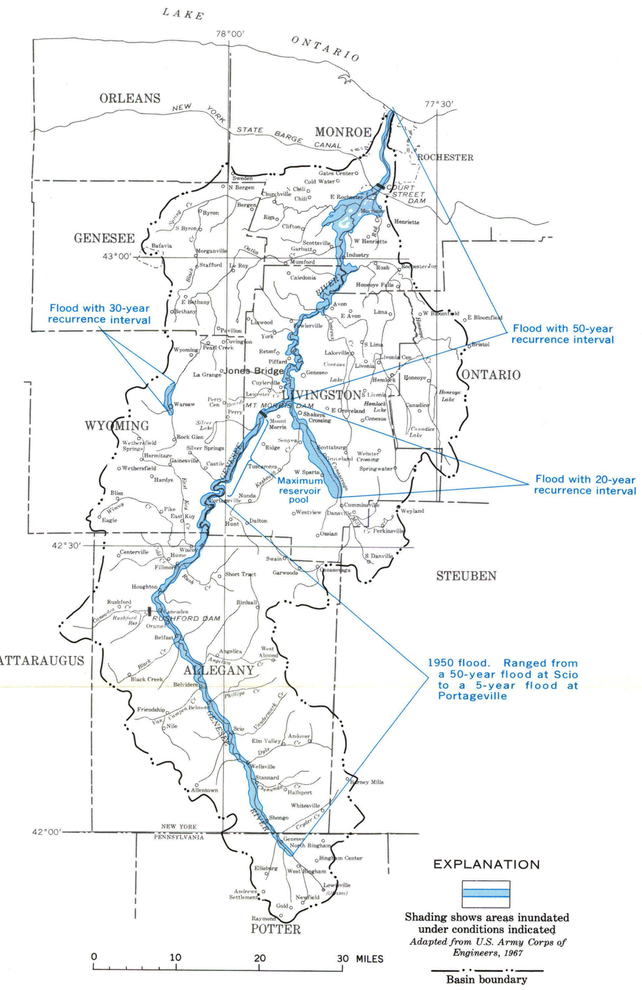
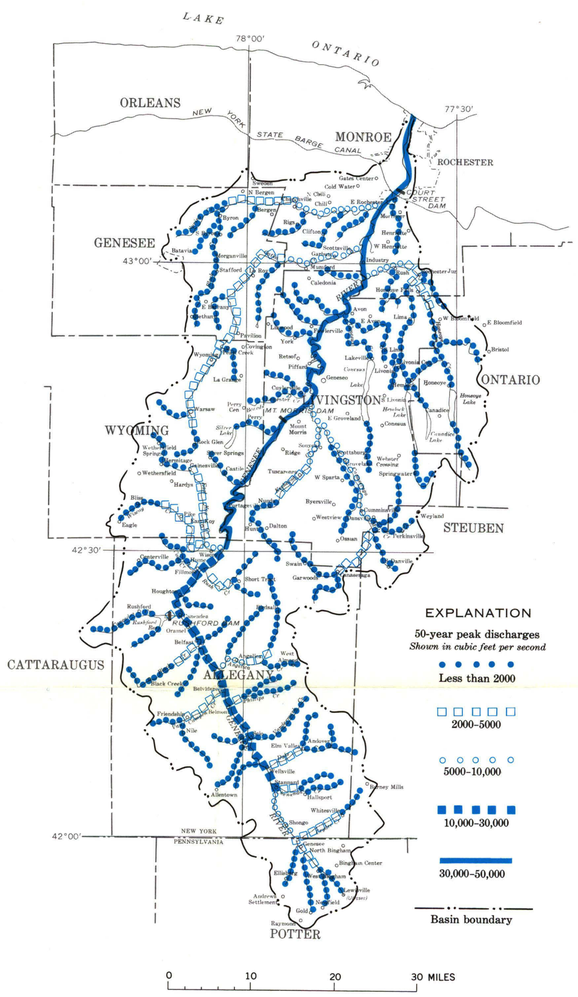
# FLOODS




FLOOD INUNDATION IN THE BASIN IS MOST SERIOUS ALONG THE REACH OF THE GENESEE RIVER FROM AVON TO THE NEW YORK STATE BARGE CANAL AND ALONG CANASERAGA CREEK FROM THE VICINITY OF CUMMINSVILLE TO MT. MORRIS.

From the headwaters in Pennsylvania to Portageville, the Genesee River often floods local low-lying areas causing occasional damage to scattered buildings and farmlands. The village of Wellsville, however, is the scene of more frequent and heavier damage. Inundation from Portageville to Mt. Morris (the Letchworth Park reach) is largely limited to the pool created by flood-control operation of Mt. Morris Dam. Most of the time, such operations also restrict flood problems in the reach between Mt. Morris and Avon to minor agricultural damages. From Avon to the Barge Canal, floods have significantly damaged highways, farms, homes, and businesses. Such damage was a significant consideration in the construction of Mt. Morris Dam. The Genesee River flows from the canal to Lake Ontario in a channel lined by flood walls and through a deep gorge. These factors, together with Mt. Morris Dam, provide the city of Rochester with substantial flood protection.

Inundation in the fertile valley of Canaseraga Creek usually occurs at least once annually. Parts of the valley have been ponded for as long as several months. Floods there prevent early planting and cause damage to roads, crops, and nursery stock, depending on the season of the year. Other areas in the basin that are subject to inundation are on Oatka Creek in the vicinity of Warsaw, on Red Creek near Rochester, and around Conesus and Honeoye Lakes.




THE 50-YEAR FLOOD ON THE GENESEE RIVER (A PEAK FLOW WHICH MAY BE EXPECTED TO OCCUR ONCE EVERY 50 YEARS, ON THE AVERAGE) RANGES FROM ALMOST 25,000 CFS AT SCIO, TO ABOUT 45,000 CFS AT PORTAGEVILLE, TO JUST UNDER 50,000 CFS AT ROCHESTER.

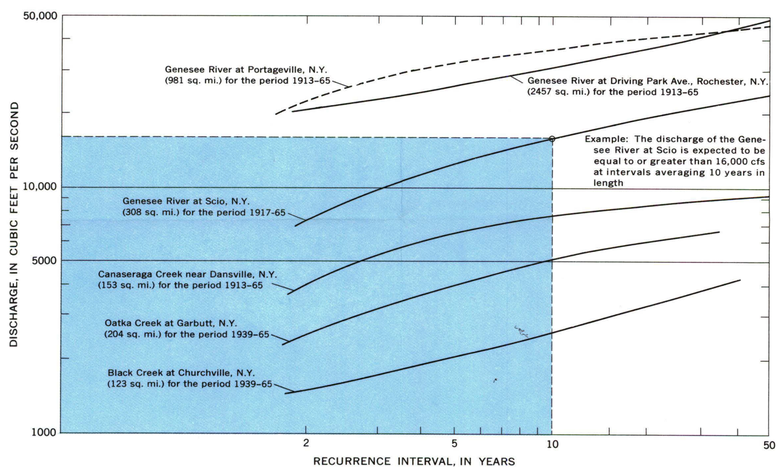
ALTHOUGH THE VAST MAJORITY OF ANNUAL PEAK FLOWS OCCUR DURING MARCH AND APRIL, ANNUAL PEAKS HAVE TAKEN PLACE IN EVERY MONTH EXCEPT AUGUST.

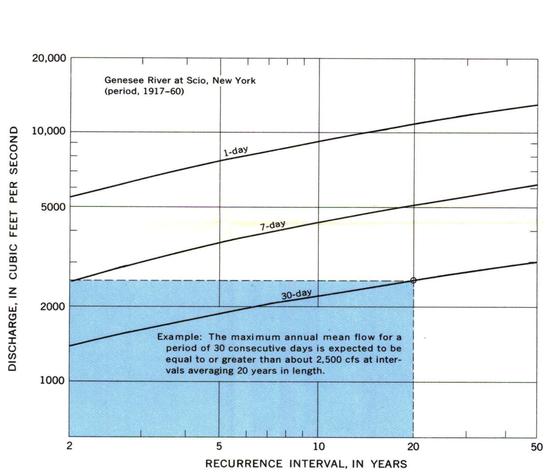
For instance, the maximum flow of record for Canaseraga Creek near Dansville occurred in July and that for the Genesee River at Portageville occurred in May. However, maximum flows do generally follow a pattern of being high, medium, or low throughout the area in any one year.

Table 4.—*Maximum known discharges of selected streams in the Genesee River basin.*

| Stream site (listed in downstream order) | County | Drainage area (sq mi) | Period of record (water years) | Date | Known maximum | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Gage height (feet) | Elevation | Discharge (cfs) | Discharge (csm) |
| Dyke Creek near Andover | Allegany | 37.8 | 1964–67 | 9–28–67 | 6.71 | | [1]4,000 | 106 |
| Dyke Creek at Wellsville | do | 71.9 | 1955–60, 1964–65 | 6–15–60 | 16.10 | 1,508.28 | 5,230 | 72.7 |
| Genesee River at Scio | do | 308 | 1916–67 | 11–25–50 | 11.22 | 1,450.05 | 23,300 | 75.6 |
| Van Campen Creek at Friendship | do | 45.8 | 1964–67 | 3– 5–64 | 10.56 | | 4,950 | 108 |
| | | | | 9–28–67 | 13.11 | | 13,400 | 293 |
| Angelica Creek at Transit Bridge | do | 86.5 | 1964–67 | 9–28–67 | 10.16 | | [1]10,000 | 116 |
| Genesee River at Belfast | do | 642 | 1964–66 | 3– 5–64 | 15.66 | 1,266.68 | 33,200 | 51.7 |
| Caneadea Creek at Caneadea | do | 62.0 | 1949–67 | 9–28–67 | 13.09 | 1,253.51 | [1]13,800 | |
| East Koy Creek at East Koy | Wyoming | 46.2 | 1964–67 | 3– 5–64 | 7.15 | | 1,240 | 26.8 |
| | | | | 2–10–65 | 8.52 | | | |
| Genesee River at Portageville | do | 981 | 1908–67 | 5–17–16 | | | 44,000 | 44.9 |
| | | | | 3– 7–56 | 21.70 | 1,104.30 | | |
| Genesee River at St. Helena | do | 1,017 | 1908–50 | 5–17–16 | 12.81 | | 44,400 | 43.7 |
| Genesee River at Mt. Morris | Livingston | 1,078 | 1903–09 | 5–21–1894 | | | 42,000 | 39.0 |
| Canaseraga Creek near Dansville | do | 153 | 1910–12, 1915–17, 1919–67 | 7–23–40 | 13.1 | 653.1 | 8,830 | 57.7 |
| Keshequa Creek at Craig Colony, Sonyea | do | 68.8 | 1910–12, 1917–32 | 3–14–18 | | | 5,940 | 86.3 |
| Canaseraga Creek at Shakers Crossing | do | 333 | 1915–22, 1958–67 | 5–17–16 | 23.62 | 568.92 | | |
| | | | | 4–26–61 | 12.07 | 557.37 | 4,430 | 13.3 |
| Genesee River at Jones Bridge near Mt. Morris | do | 1,417 | 1903–06, 1908–14, 1915–67 | 5–17–16 | 25.44 | 565.44 | 55,100 | 38.9 |
| Conesus Creek near Lakeville | do | 71.9 | 1919–34 | 12–1–2–27 | | | 625 | 8.7 |
| Genesee River at Avon | do | 1,667 | 1955–67 | 3– 7–56 | 37.20 | 537.20 | 15,600 | 9.36 |
| Honeoye Creek at Honeoye Falls | Monroe | 195 | 1945–67 | 3–28–50 | 6.42 | 616.40 | 4,630 | 23.7 |
| Oatka Creek at Garbutt | Genesee | 204 | 1945–67 | 3–31–60 | 8.64 | 569.53 | 6,920 | 33.9 |
| Black Creek at Churchville | Monroe | 123 | 1945–67 | 3–31–60 | 9.44 | 561.89 | 4,880 | 39.7 |
| Genesee River at Elmwood Ave., Rochester | do | 2,446 | 1905–18 | 3–30–16 | 12.3 | 519.15 | 48,300 | 19.7 |
| Genesee River at Driving Park Ave., Rochester | do | 2,457 | 1904–67 | 4– 2–40 | 17.08 | | | |
| | | | | 3–18–1865 | | | 54,000 | 22.0 |

[1] Estimated.



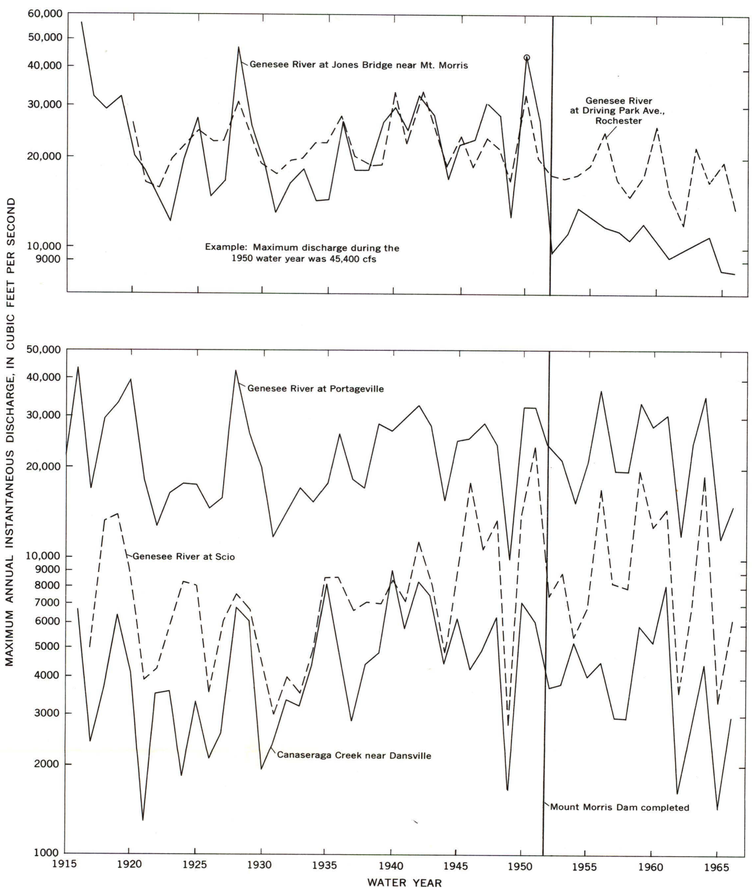




STUDIES OF THE EXPECTED FREQUENCY OF OCCURRENCE OF FLOOD FLOWS ARE OF MAJOR SIGNIFICANCE IN AN ANALYSIS OF THE HYDROLOGIC SYSTEM.

The recurrence interval of any discharge can be computed by assigning each discharge a rank number, starting with the highest as number 1, and using the formula:

Recurrence interval $= \frac{n+1}{m}$, where $n$ is the number of annual events and $m$ is the rank number.

Frequency analyses of high flows are usually made for instantaneous peaks as well as for flows over periods of one or more consecutive days. This analysis is based on an annual series of peaks. Wiitala (1965) lists all peaks above selected base discharges for 15 gaging stations in the basin for use in a partial-duration series analysis.




SINCE 1952, THE OPERATION OF MOUNT MORRIS DAM HAS SIGNIFICANTLY REDUCED PEAK FLOOD FLOWS FROM APPROXIMATELY THE UPSTREAM HALF OF THE BASIN.

Comparison of records from the gaging station at Portageville upstream from Mt. Morris Dam with those for the Jones Bridge gage downstream shows the effect the dam has had. However, records at Rochester show that, although the peaks have been attenuated to some extent, the dam has not produced so marked an effect on flood flows there. Prior to 1952, gages on the Genesee River at Portageville, Jones Bridge, and Rochester recorded peak flows that were close in magnitude, despite the fact that the gage at Rochester was recording streamflow from a drainage area more than twice the size of the area above Portageville. This similarity in flood volume despite differences in drainage area is due to the equalizing differences between upland and lowland conditions in the basin. The lowlands include a larger drainage area than the uplands, but tend to have less precipitation per square mile and the flatter land surfaces provide a great deal more natural storage. One result of the difference in conditions between lowland and upland is that the uplands produce flashier floods whereas floods on the lowlands are more similar in volume to normal flows. Records for Canaseraga Creek near Dansville, predominantly an upland stream, show that the maximum annual instantaneous discharges are often more than twice the maximum annual daily discharges.

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# HYDROLOGY OF THE GENESEE RIVER BASIN, NEW YORK AND PENNSYLVANIA

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1971