UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SELECTED LOW-FLOW CHARACTERISTICS OF STREAMS IN THE VICINITY OF WARWICK, ORANGE COUNTY, NEW YORK

U.S. GEOLOGICAL SURVEY

Open-File Report 78-811

Prepared in cooperation with
the Town of Warwick

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

[Reports-Open file series]

SELECTED LOW-FLOW CHARACTERISTICS OF STREAMS IN THE VICINITY OF WARWICK, ORANGE COUNTY, NEW YORK

by Benjamin B. Eissler

Open-File Report 78-811

Prepared in cooperation with
the Town of Warwick

Albany, New York

1978

CONTENTS

ILLUSTRATIONS

TABLES

CONVERSION FACTORS AND ABBREVIATIONS

U.S. Customary units	Multiply by	To obtain SI units
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
square mile (mi^2)	2.590	square kilometer (km^2)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)

SELECTED LOW-FLOW CHARACTERISTICS OF STREAMS IN THE VICINITY OF WARWICK, ORANGE COUNTY, NEW YORK

By

Benjamin B. Eissler

ABSTRACT

Base flows were measured during 1971-76 at 10 partial-record sites and three continuous-record stations on major streams in and bordering the Town of Warwick. Discharge measurements at the partial-record sites were correlated with records from three suitable continuous-record gaging stations near the town to determine 7-day, 2-year low flows and 7-day, 10-year low flows. Measurement-site descriptions are included. The information presented provides a data base that planners and managers can use in making water-management decisions.

INTRODUCTION

The Town of Warwick, in Orange County, New York is expected to undergo substantial population growth in the near future. This, in turn, will increase the demand for water for consumption and wastewater disposal.

As part of a cooperative program to measure low flows in the Town of Warwick, the U.S. Geological Survey investigated major streams within and adjacent to the town. Locations of the streams and measurement sites are shown in figure 1; measurement-site descriptions are given in tables 1 and 2.

Purpose and Scope of Study

Low-flow investigations were made during 1971-76 on 10 representative streams (fig. 1) to determine minimum average 7-consecutive-day flows at a 2- and 10-year recurrence interval. (The 7-day low flows will be less than the 7-day 2-year [or 10-year] low flow at intervals averaging 2 years [or 10 years] in length. The probability is 1/2 [or 1/10] that the 7-day low flow will be less than the 7-day 2-year [or 10-year] low flow in any year.) Discharges were obtained from current-meter measurements during base-flow conditions, or when precipitation had been zero for at least 5 days, so that streamflow consisted entirely of ground-water outflow.

In addition, flow durations (the discharges that were equaled or exceeded for selected percentages of time during a given period) were computed for several continuous-record gaging stations in the vicinity of Warwick. Site-location descriptions, drainage areas, and 7-day, 2-year low flows and 7-day, 10-year low flows are given for all sites shown in table 1. Descriptions of continuous-record gages are given in table 2, with low-flow discharges and durations. (Site descriptions are from U.S. Geological Survey, 1976.) For partial-record stations, site descriptions, discharges measured, the dates of measurements, and the computed 7-day, 2-year and 7-day, 10-year discharges are listed in table 3.

Acknowledgment

The study of low flows in principal streams in the vicinity of Warwick was done in cooperation with the Town of Warwick.

METHODS OF COMPUTATION

The statistics most commonly used to describe the magnitude of a stream's low flow are the 7-day, 2-year low flow and 7-day, 10-year low flow. Where a daily-discharge record is available, annual 7-day minimum flows are obtained from the daily discharge record. A frequency curve of the annual minimums is prepared as described in Riggs (1968, 1972) and discharges at 2-year and 10-year recurrence intervals are taken from that curve. At least 10 years of low-flow record should be used for this analysis.

Continuous-record stations were not numerous enough to provide the data needed for this study, so low-flow partial-record sites were established at selected locations. (See fig. 1 and table 3.) At a partial-record site, seven or more base-flow measurements made over a period of several years were correlated with concurrent daily mean discharges at a continuous-record station; the low-flow characteristics at the continuous-record station were transferred through that relation to obtain those values for the partial-record site. The method is described by Riggs (1972). The continuous-record or "index" sites used were selected on the basis of proximity and hydrologic similarity to the partial-record sites. The index stations used in this correlation were the following (locations are shown in fig. 1):

01366650 Sandburg Creek at Ellenville
01372800 Fishkill Creek at Hopewell Hunction
01387450 Mahwah River near Suffern

Accuracy of the estimates at partial-record sites values was tested by procedures described in Hardison (1969) and Hardison and Moss (1972). At the gaging stations, the estimated standard error of 7-day, 10-year low flow ranged from 11 percent to 58 percent, with a median of 18 percent. The standard error of the estimates for the low-flow partial-record sites ranged from 40 percent to more than 100 percent, with a median value of 69 percent.

REFERENCES CITED

Hardison, C. H., 1969, Accuracy of streamflow characteristics: in Geological Survey Research, 1969, Chap. D: U.S. Geological Survey Professional Paper 650-D, p. D210-D214.

Hardison, C. H., and Moss, M. E., 1972, Accuracy of low-flow characteristics estimated by correlation of base-flow measurements: U.S. Geological Survey Water-Supply Paper 1542-B, 55 p.

Riggs, H. C., 1968, Frequency Curves: U.S. Geological Survey Techniques of Water-Resources Investigations, book 4, chap. A2, 15 p.

_____, 1972, Low flow investigations: U.S. Geological Survey Techniques of Water-Resources Invvestigations, book 4, chap. B1, 18 p.

U.S. Geological Survey, 1976, Water Resources Data for New York, Water Year 1975, Volume 1--New York excluding Long Island: U.S. Geological Survey Water-Data Report NY-76-1, 615 p.

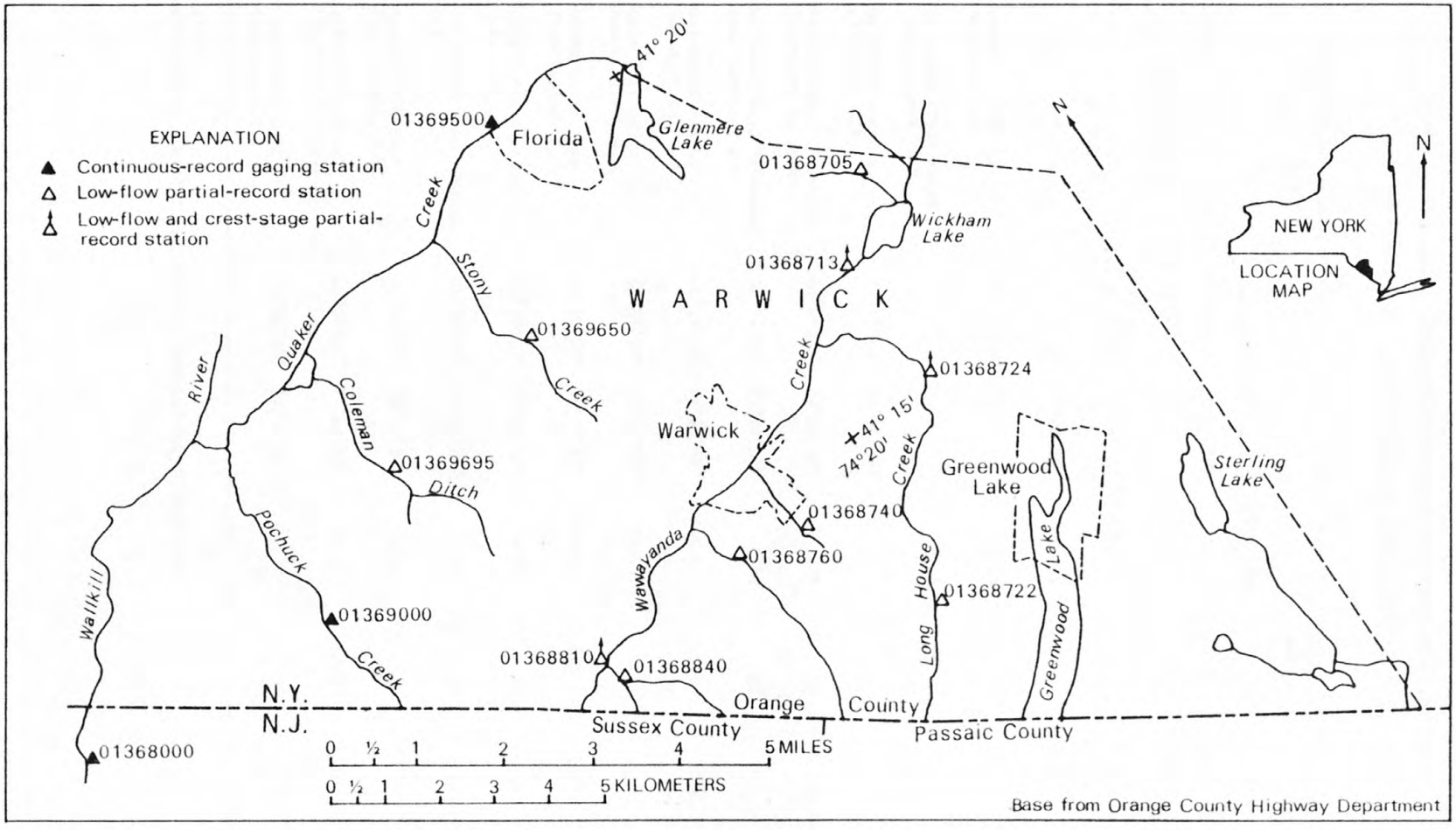

Figure 1.--Location of streamflow-measurement sites in Town of Warwick, N.Y.

Table 1.--Location of discharge-measurement sites, and corresponding minimum annual 7-day, 2-year and 7-day, 10-year low flows

Station	and name	Location		Drainage area (mi^2)	Minimum annual 7-day, 2-year flow (ft^3/s)	Minimum annual 7-day, 10-year flow (ft^3/s)	Remarks[2/]
		Latitude	Longitude				
01366650	Sandburg Creek at Ellenville, N.Y.[1/]	41°42'54"	74°23'21"	56.7	12	6.8	G
01368000	Walkill River near Unionville, N.Y.	41°15'36"	74°32'56"	140	21	8.3	G
01368705	Wickham Lake Tributary at Lake, N.Y.	41°17'48"	74°17'33"	.68	.01	0	P
01368713	Wawayanda Creek at Durland, N.Y.	41°16'44"	74°18'20"	5.15	.2	.05	P
01368722	Long House Creek below Cascade Lake, N.Y.	41°12'53"	74°20'02"	8.35	.4	.1	P
01368724	Long House Creek at Bellvale, N.Y.	41°15'10"	74°18'30"	11.8	.6	.2	P
01368740	Warwick Reservoir Outlet Tributary at Warwick, N.Y.	41°14'31"	74°21'14"	.56	.03	.01	P
01368760	Wawayanda Creek Tributary near Warwick, N.Y.	41°14'34"	74°22'18"	2.96	.02	0	P
01368810	Wawayanda Creek at New Milford, N.Y.	41°14'18"	74°25'03"	45.0	7.4	3.3	P
01368840	Double Kill at New Milford, N.Y.	41°14'10"	74°24'58"	15.6	1.6	.6	P
01369000	Pochuck Creek near Pine Island, N.Y.	41°16'32"	74°28'18"	98.0	11	3.6	G
01369500	Quaker Creek at Florida, N.Y.	41°20'21"	74°21'45"	9.74	.38	.19	G
01369650	Stony Creek near Florida, N.Y.	41°18'06"	74°23'14"	2.62	.08	.02	P
01369695	Coleman Ditch near Pine Island, N.Y.	41°17'37"	74°26'10"	1.60	.1	.04	P
01372800	Fishkill Creek at Hopewell Junction, N.Y.[1/]	41°34'22"	73°48'25"	57.3	7.2	1.3	G
01387450	Mahwah River near Suffern, N.Y.[1/]	41°08'27"	74°07'01"	12.3	1.5	.78	G

[1/] Index stations.
[2/] G, continuous gaging station; P, low-flow, partial-record stations.

Table 2.--Description of continuous-record stations in study area, with flow-duration tables

01366650 SANDBURG CREEK AT ELLENVILLE, NY

LOCATION.--Lat 41°42'54", long 74°23'21', Ulster County, Hydrologic Unit 02020007, on right bank at upstream side of bridge on Canal Street, at Ellenville, 800 ft (244 m) downstream from North Gully, 0.5 mi (0.8 km) upstream from Beer Kill, and 1.7 mi (2.7 km) upstream from mouth.

DRAINAGE AREA.--56.7 mi^2 (147 km^2).

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1943, 1949-50, 1955-57. April 1957 to September 1976.

GAGE.--Water-stage recorder (nonrecording gage before Aug. 28, 1957). Datum of gage is 303.22 ft (92.421 m) above mean sea level. Prior to Aug. 28, 1957, nonrecording gage.

REMARKS.--Occasional regulation when swimming pools or small ponds upstream from station are being filled.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,660 ft^3/s (132 m^3/s) on Aug. 19, 1960; gage height, 7.01 ft (2.137 m); minimum discharge, 3.2 ft^3/s (0.091 m^3/s) on Oct. 14, 1964.

7-day, 2-year low flow.--12 ft^3/s.

7-day, 10-year low flow.--6.8 ft^3/s.

	Percentage of time flow is exceeded						
	99	95	90	75	50	25	10
Discharge, in ft^3/s	7.0	11	15	28	57	120	230

Table 2.--Description of continuous-record stations in study area, with flow-duration tables (continued)

01368000 WALKILL RIVER NEAR UNIONVILLE, NY

LOCATION.--Lat 41°15'36", long 74°32'56", Sussex County, New Jersey, Hydrologic Unit 02020007, on right bank on downstream side of bridge on the Bassetts Bridge Road, 0.6 mi (1.0 km) upstream from small tributary, 2.0 mi (3.2 km) south of the New York-New Jersey State line, and 3.0 mi (4.8 km) south of Unionville. Water-quality sampling site at discharge station.

DRAINAGE AREA.--140 mi^2 (363 km^2).

PERIOD OF RECORD.--September 1937 to September 1976.

GAGE.--Water-stage recorder. Altitude of gage is 390 ft (119 m), from topographic map. Prior to Nov. 16, 1949, nonrecording gage at same site and datum.

REMARKS.--Water diverted from Morris Lake, upstream from station, by the Newton Water and Sewer Authority for municipal use. After use, the water is released into Paulins Kill (Delaware River basin); records furnished by the Delaware River basin); records furnished by the Delaware River Basin Commission (see station 01367630 in New Jersey report).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,880 ft^3/s (195 m^3/s) Aug. 19, 1955, gage height, 13.35 ft (4.069 m); minimum daily, 4.2 ft^3/s (0.12 m^3/s) Aug. 8-10, 1966.

7-day, 2-year low flow.--21 ft^3/s.

7-day, 10-year low flow.--8.3 ft^3/s.

	Percentage of time flow is exceeded						
	99	95	90	75	50	25	10
Discharge, in ft^3/s	9.8	18	26	54	130	270	530

Table 2.--Description of continuous-record stations in study area, with flow-duration tables (continued)

01369000 POCHUCK CREEK NEAR PINE ISLAND, NY

LOCATION.--Lat 41°16'32", long 74°28'18", Orange County, Hydrologic Unit 02020007, on right bank 75 ft (23 m) downstream from bridge on Newport Bridge Road at Newport, 1.5 mi (2.4 km) south of Pine Island, 3.2 mi (5.1 km) west of Edenville, and 4.1 mi (6.6 km) upstream from mouth.

DRAINAGE AREA.--98.0 mi^2 (254 mi^2).

PERIOD OF RECORD.--September 1937 to September 1976.

GAGE.--Water-stage recorder. Datum of gage is 382.39 ft (116.552 m) above mean sea level (levels by Corps of Engineers). Modified concrete control from July 1944 to April 1960.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft^3/s (87.5 m^3/s) Oct. 16, 1955, gage height, 8.62 ft (2.627 m); minimum, 1.1 ft^3/s (0.031 m^3/s) Aug. 30, 1966.

7-day, 2-year low flow.--11 ft^3/s.

7-day, 10-year low flow.--3.6 ft^3/s.

	Percentage of time flow is exceeded						
	99	95	90	75	50	25	10
Discharge, in ft^3/s	5.6	8.2	14	38	100	220	400

Table 2.--Description of continuous-record stations in study area, with flow-duration tables (continued)

01369500 QUAKER CREEK AT FLORIDA, NY

LOCATION.--Lat 41°20'21", long 74°21'45", Orange County, Hydrologic Unit 02020007, on right bank at downstream side of private bridge, just downstream from Browns Creek, at Florida, and 5.0 mi (8.0 km) southwest of Goshen.

DRAINAGE AREA.--9.74 mi^2 (25.2 km^2).

PERIOD OF RECORD.--September 1937 to September 1976.

GAGE.--Water-stage recorder. Concrete control since August 1943. Datum of gage is 393.32 ft (119.884 m) above mean sea level (levels by Soil Conservation Service). Prior to Dec. 12, 1949, nonrecording gage at same site and datum.

REMARKS.--Minor amount of diversion upstream during low-flow periods for irrigation purposes. Some diversion from Glenmore Lake for village of Florida water supply.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,050 ft^3/s (29.7 m^3/s) Sept. 21, 1938, gage height, 6.0 ft (1.83 m), from floodmarks, from rating curve extended above 230 ft^3/s (6.51 m^3/s) on basis of contracted-opening measurement at gage height 5.8 ft (1.77 m); minimum, no flow Aug. 30, 1966 (result of temporary pumping from gage pool).

7-day, 2-year low flow.--0.38 ft^3/s.

10-day, 2-year low flow.--.19 ft^3/s.

	Percentage of time flow is exceeded						
	99	95	90	75	50	25	10
Discharge, in ft^3/s	.3	.4	.6	1.4	5.3	15	32

Table 2.--Description of continuous-record stations in study area, with flow-duration tables (continued)

01372800 FISHKILL CREEK AT HOPEWELL JUNCTION, NY

LOCATION.--Lat 41°34'22", long 73°48'25", Dutchess County, Hydrologic Unit 02020008, on right bank 400 ft (122 m) upstream from bridge on State Highway 376, 500 ft (152 m) upstream from small tributary, 0.6 mi (1.0 km) south of State Highway 82, at Hopewell Junction. Water-quality sampling site at discharge station.

DRAINAGE AREA.--57.3 mi^2 (148 km^2).

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1956-57. October 1957 to December 1975 (discontinued). Prior to March 1963, no winter records.

GAGE.--Water-stage recorder. Datum of gage is 229.53 ft (69.961 m) above mean sea level. Prior to October 1963, water-stage recorder at site 400 ft (122 m) downstream at datum 0.17 ft (0.052 m) lower.

REMARKS.--Occasional regulation during low flow from unknown source.

EXTREMES FOR PERIOD OF RECORD.--Maximum duscharge, 2,770 ft^3/s (78.4 m^3/s) Dec. 21, 1973, gage height, 9.19 ft (2.801 m), from rating curve extended above 1,100 ft^3/s (31.2 m^3/s); minimum, 0.92 ft^3/s (0.026 m^3/s) Sept. 2, 3, 1966, gage height, 0.75 ft (0.229 m).

7-day, 2-year low flow.--7.2 ft^3/s.

7-day, 10-year low flow.--1.3 ft^3/s.

	Percentage of time flow is exceeded						
	99	95	90	75	50	25	10
Discharge, in ft^3/s	1.9	4.4	7.8	19	53	110	200

Table 2.--Description of continuous-record stations in study area, with flow-duration tables (continued)

01387450 MAHWAH RIVER NEAR SUFFERN, NY

LOCATION.--Lat 41°08'27", long 74°07'01", Rockland County, Hydrologic Unit 02030103, on right bank at upstream side of bridge on U.S. Highway 202, 2.5 mi (4.0 km) northeast of Suffern, and 4.8 mi (7.7 km) upstream from mouth.

DRAINAGE AREA.--12.3 mi^2 (31.9 km^2).

PERIOD OF RECORD.--August 1958 to September 1976.

GAGE.--Water-stage recorder. Datum of gage is 321.57 ft (98.015 m) above mean sea level.

REMARKS.--Occasional regulation from unknown source.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,650 ft^3/s (46.7 m^3/s) May 29, 1968, 7.78 ft (2.371 m), from rating curve extended above 850 ft^3/s (24.1 m^3/s) on basis of contracted-opening measurement of peak flow; minimum, 0.05 ft^3/s (0.001 m^3/s) Oct. 20, 21, 1970, result of temporary pumping from gage pool.

7-day, 2-year low flow.--1.5 ft^3/s.

7-day, 10-year low flow.--.78 ft^3/s.

	Percentage of time flow is exceeded						
	99	95	90	75	50	25	10
Discharge, in ft^3/s	0.9	1.7	2.4	6.3	16	29	54

Table 3.--Description of low-flow, partial-record stations, with base flows and dates of measurement

Station number and name		Site description	Drainage area (square miles)
01368705	Wickham Lake Tributary at Lake, N.Y.	Lat 41°17'48", long 74°17'33", Orange County, at bridge on Kings Highway, at Lake, 0.6 mi upstream from mouth, and 4.2 mi northeast of Warwick.	0.68

DISCHARGES AND DATES OF MEASUREMENT

[Discharges are in cubic feet per second]

Date	Discharge	Date	Discharge	Date	Discharge
06-03-71	*0.32	09-06-72	0	07-23-74	0
07-27-71	0	11-06-72	*.21	09-09-74	.30
09-27-71	*.31	03-20-73	*1.3	03-10-75	*.27
11-10-71	*.53	05-02-73	*.4	04-30-75	*.17
12-09-71	1.9	08-21-73	0	06-16-75	.06
01-19-72	*1.3	09-27-73	0	07-22-75	.72
03-09-72	1.4	11-30-73	.04	08-22-75	0
04-10-72	*.37	02-24-74	.79	10-16-75	.68
05-24-72	*.94	04-08-74	1.8	12-01-75	1.8
07-31-72	*.11	05-16-74	.41	07-23-76	0

Minimum average 7-day, 2-year flow 0.01 ft^3/s

Minimum average 7-day, 10-year flow 0 ft^3/s

* Base flow

Table 3.--Description of low-flow, partial-record stations, with base flows and dates of measurement (cont.)

Station number and name		Site description	Drainage area (square miles)
01368713	Wawayanda Creek at Durland, N.Y.	Lat 41°16'44", long 74°18'20", Orange County, at bridge on State School Road, at Durland, 0.1 mile downstream from Wickham Lake and 2.5 miles northeast of Warwick.	5.15

DISCHARGES AND DATES OF MEASUREMENT

[Discharges are in cubic feet per second]

Date	Discharge	Date	Discharge	Date	Discharge
07-20-67	*1.45	09-06-72	*.96	07-23-74	*.21
06-09-71	*5.22	11-06-72	*2.5	09-09-74	4.6
07-28-71	*.01	03-20-73	*18	03-10-75	*10
09-27-71	*4.37	05-02-73	*11	05-02-75	*4.9
11-10-71	*5.8	07-05-73	33	06-16-75	3.9
12-09-71	23	08-21-73	*.62	07-22-75	18
01-19-72	*7.4	09-27-73	*.14	08-22-75	*1.5
03-03-72	46	11-30-73	2.1	10-16-75	7.2
04-10-72	*7.2	02-24-74	14	12-01-75	13
05-24-72	*14	04-18-74	30	07-23-76	*1.60
07-31-72	*3.2	05-16-74	12		

Minimum average 7-day, 2-year flow 0.2 ft^3/s

Minimum average 7-day, 10-year flow .05 ft^3/s

* Base flow

Table 3.--Description of low-flow, partial-record stations, with base flows and dates of measurement (cont.)

Station number and name		Site description	Drainage area (square miles)
01368722	Long House Creek, below Cascade Lake, N.Y.	Lat 41°12'53", long 74°20'02", Orange County, at bridge on Cascade Road, 1.0 mile downstream from Cascade Lake, and 3.0 miles southwest of Bellvale.	8.35

DISCHARGES AND DATES OF MEASUREMENT

[Discharges are in cubic feet per second]

Date	Discharge	Date	Discharge	Date	Discharge
03-20-73	30	04-11-74	58	06-16-75	13
05-31-73	25	05-20-74	*7.7	07-22-75	51
08-21-73	3.5	07-23-74	*.34	08-29-75	*5.9
09-27-73	*.65	09-10-74	12	10-16-75	8.6
11-30-73	13	03-10-75	*12	12-03-75	14
02-24-74	25	05-01-75	*6.6	07-26-76	*2.87

Minimum average 7-day, 2-year flow 0.4 ft^3/s

Minimum average 7-day, 10-year flow 0.1 ft^3/s

* Base flow

Table 3.--Description of low-flow, partial-record stations, with base flows and dates of measurement (cont.)

Station number and name		Site description	Drainage area (square miles)
01368724	Long House Creek at Bellvale, N.Y.	Lat 41°15'10", long 74°18'30", Orange County, at bridge on Iron Forge Road, at Bellvale, and 1.9 miles upstream from mouth.	11.8

DISCHARGES AND DATES OF MEASUREMENT

[Discharges are in cubic feet per second]

Date	Discharge	Date	Discharge	Date	Discharge
06-09-71	*13.6	11-06-72	*12	07-23-74	*.83
07-28-71	*.69	03-20-73	*46	09-10-74	16
10-12-71	35	05-31-73	48	03-10-75	*18
11-10-71	*22	07-05-73	59	05-01-75	*11
12-09-71	55	08-21-73	*4.0	06-16-75	14.8
01-19-72	*18	09-21-73	*.86	07-21-75	76.7
03-03-72	121	11-03-73	15	08-22-75	*1.90
04-10-72	*16	02-24-74	32	10-16-75	12
05-25-72	*38	04-11-74	82	12-03-75	22
08-01-72	5.6	05-20-74	*12	07-26-76	*4.41
09-06-72	*.87				

Minimum average 7-day, 2-year flow 0.6 ft^3/s

Minimum average 7-day, 10-year flow 0.2 ft^3/s

* Base flow

Table 3.--Description of low-flow, partial-record stations, with base flows and dates of measurement (cont.)

Station number and name		Site description	Drainage area (square miles)
01368740	Warwick Reservoir Outlet Tributary at Warwick, N.Y.	Lat 41°14'31", long 74°21'14", Orange County, at bridge on Ball Road, 0.5 mile upstream from mouth, and 1.0 mile from Warwick.	0.56

DISCHARGES AND DATES OF MEASUREMENT

[Discharges are in cubic feet per second]

Date	Discharge	Date	Discharge	Date	Discharge
06-03-71	*0.88	09-06-72	*.03	07-22-74	*.05
07-27-71	*.04	11-06-72	*.35	09-09-74	.26
10-12-71	1.1	03-20-73	3.8	02-27-75	5.1
11-10-71	*1.1	05-02-73	*1.2	05-02-75	*.55
12-09-71	3.5	08-21-73	*.07	06-11-75	*.29
01-19-72	*1.0	09-21-73	*.02	07-21-75	1.7
03-09-72	2.1	11-30-73	.26	08-20-75	*.13
04-10-72	*.83	02-24-74	1.3	10-14-75	1.3
05-24-72	2.2	04-08-74	2.3	12-01-75	1.6
08-01-72	*.32	05-16-74	1.8	07-23-76	*.23

Minimum average 7-day, 2-year flow 0.03 ft^3/s

Minimum average 7-day, 10-year flow 0.01 ft^3/s

* Base flow

Table 3.--Description of low-flow, partial-record stations, with base flows and dates of measurement (cont.)

Station number and name		Site description	Drainage area (square miles)
01368760	Wawayanda Creek Tributary near Warwick, N.Y.	Lat 41°14'34", long 74°22'18", Orange County, at bridge on State Highway 94 (New Milford Road), 0.8 mile upstream from mouth, and 1.2 miles southwest of Warwick.	2.96

DISCHARGES AND DATES OF MEASUREMENT

[Discharges are in cubic feet per second]

Date	Discharge	Date	Discharge	Date	Discharge
06-03-71	*4.48	09-06-72	*.02	09-09-74	1.1
07-27-71	*.10	11-06-72	*1.6	02-27-75	11
08-30-71	7.67	03-20-73	8.2	04-23-75	*1.6
10-12-71	4.2	05-02-73	*6.2	06-11-75	*.76
11-10-71	*3.4	08-21-73	*.13	07-21-75	9.2
12-09-71	11	09-21-73	*0	08-25-75	2.2
01-19-72	*3.4	11-30-73	2.0	09-24-75	23
03-09-72	6.3	02-21-74	2.6	10-14-75	2.6
04-10-72	*2.3	04-08-74	9.0	12-01-75	6.0
05-24-72	*6.5	05-16-74	6.3	07-23-76	*.58
07-31-72	*.52	07-22-74	*.06		

Minimum average 7-day, 2-year flow 0.02 ft^3/s

Minimum average 7-day, 10-year flow 0 ft^3/s

* Base flow

Table 3.--Description of low-flow, partial-record stations, with base flows and dates of measurement (cont.)

Station number and name		Site description	Drainage area (square miles)
01368810	Wawayanda Creek at New Milford, N.Y.	Lat 41°14'18", long 74°25'03", Orange County, at bridge on Ryerson Road at New Milford, 0.2 mile upstream from Double Kill.	45.0

DISCHARGES AND DATES OF MEASUREMENT

[Discharges are in cubic feet per second]

Date	Discharge	Date	Discharge	Date	Discharge
06-03-71	80.5	11-06-72	*41	07-22-74	*11
07-27-71	*7.98	03-20-73	154	09-09-74	49
09-27-71	*53.4	05-02-73	*103	03-10-75	*70
11-01-71	80	07-05-73	276	04-28-75	68
12-09-71	210	08-21-73	*16	06-11-75	*32
01-19-72	*61	09-21-73	*7.9	07-21-75	227
03-03-72	589	11-30-73	42	08-20-75	*15
04-10-72	*68	02-21-74	91	10-14-75	66
05-25-72	*115	04-08-74	186	12-03-75	88
07-31-72	*32	05-16-74	136	07-23-76	*16
09-06-72	*12				

Minimum average 7-day, 2-year flow 7.4 ft^3/s

Minimum average 7-day, 10-year flow 3.3 ft^3/s

* Base flow

Table 3.--Description of low-flow, partial-record stations, with base flows and dates of measurement (cont.)

Station number and name		Site description	Drainage area (square miles)
01368840	Double Kill at New Milford, N.Y.	Lat 41°14'10", long 74°24'58", Orange County, at bridge on Ryerson Road, at New Milford, and 0.3 mile upstream from mouth.	15.6

DISCHARGES AND DATES OF MEASUREMENT

[Discharges are in cubic feet per second]

Date	Discharge	Date	Discharge	Date	Discharge
06-03-71	34.1	09-06-72	*1.0	07-22-74	*2.2
07-27-71	*2.38	11-06-72	*16	09-09-74	63
09-27-71	*29.7	03-20-73	56	03-10-75	*25
11-01-71	46	05-02-73	53	05-02-75	*27
12-09-71	98	08-21-73	*12	06-11-75	*11
01-19-72	*37	09-21-73	*1.8	07-21-75	123
03-09-72	120	11-30-73	19	08-20-75	*4.0
04-10-72	*36	02-21-74	35	10-14-75	27
05-25-72	67	04-08-74	88	12-03-75	36
07-31-72	*16	05-16-74	95	07-23-76	*8.78

Minimum average 7-day, 2-year flow 1.6 ft^3/s

Minimum average 7-day, 10-year flow 0.6 ft^3/s

* Base flow

Table 3.--Description of low-flow, partial-record stations, with base flows and dates of measurement (cont.)

Station number and name		Site description	Drainage area (square miles)
01369650	Stony Creek near Florida, N.Y.	Lat 41°18'06", long 74°23'14", Orange County, at bridge on Union Corners Road, 0.7 mile upstream from mouth, and 2.6 miles southwest of Florida.	2.62

DISCHARGES AND DATES OF MEASUREMENT

[Discharges are in cubic feet per second]

Date	Discharge	Date	Discharge	Date	Discharge
06-02-71	*2.45	09-06-72	*.18	07-22-74	*.25
07-27-71	*.07	11-06-72	*1.3	09-09-74	1.3
08-16-71	*.08	03-20-73	*6.4	02-27-74	12.8
09-27-71	*1.52	05-02-73	*4.5	04-22-75	*1.6
11-10-71	*3.3	08-21-73	*.53	06-11-75	*.85
12-09-71	10	09-21-73	*.16	07-18-75	3.1
01-13-72	5.3	11-30-73	.81	08-21-75	*.39
03-09-72	*5.2	02-21-74	4.3	10-14-75	4.2
04-10-72	*2.3	04-08-74	10	12-01-75	7.7
05-24-72	*4.7	05-16-74	3.5	07-23-76	*.36
07-31-72	*1.1				

Minimum average 7-day, 2-year flow 0.08 ft^3/s

Minimum average 7-day, 10-year flow 0.02 ft^3/s

* Base flow

Table 3.--Description of low-flow, partial-record stations, with base flows and dates of measurement (cont.)

Station number and name		Site description	Drainage area (square miles)
01369695	Coleman Ditch near Pine Island, N.Y.	Lat 41°17'37", long 74°26'10", Orange County, at bridge on Little York Road, 0.4 mile upstream from mouth, and 1.4 miles east of Pine Island.	1.60

DISCHARGES AND DATES OF MEASUREMENT

[Discharges are in cubic feet per second]

Date	Discharge	Date	Discharge	Date	Discharge
06-02-71	*1.63	09-06-72	*.07	07-22-74	*.21
07-27-71	*.04	11-06-72	*.99	09-09-74	1.2
09-27-71	*.44	03-20-73	*4.6	02-27-75	9.6
11-01-71	*2.0	05-02-73	*3.6	04-23-75	*1.8
12-09-71	8.7	08-21-73	*.34	06-11-75	*.88
01-13-72	4.2	09-21-73	*.28	07-18-75	2.2
03-09-72	*5.1	11-30-73	1.3	08-21-75	*.36
04-10-72	*2.1	02-21-74	3.4	10-14-75	2.9
05-24-72	*2.4	04-08-74	6.9	12-01-75	4.8
07-31-72	*1.4	05-16-74	2.3	07-23-76	*.42

Minimum average 7-day, 2-year flow 0.1 ft^3/s

Minimum average 7-day, 10-year flow .04 ft^3/s

* Base flow