Prepared in cooperation with the
New Jersey Department of Environmental Protection

Streamflow Characteristics and Trends in New Jersey, Water Years 1897–2003

Scientific Investigations Report 2005-5105

**U.S. Department of the Interior
U.S. Geological Survey**

Cover. Photo on cover shows U.S. Geological Survey streamflow-gaging station 01396500, South Branch Raritan River near High Bridge, New Jersey. (Photograph by Rick Edwards, U.S. Geological Survey)

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By Kara M. Watson, Robert G. Reiser, Steven P. Nieswand, and Robert D. Schopp

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**U.S. Department of the Interior
U.S. Geological Survey**

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Conversion Factors and Datum

Inch/Pound to SI

Multiply	By	To obtain
Length		
inch (in.)	2.54	centimeter (cm)
inch (in.)	25.4	millimeter (mm)
Area		
square mile (mi ²)	259.0	hectare (ha)
square mile (mi ²)	2.590	square kilometer (km ²)
Flow rate		
cubic foot per second (ft ³ /s)	0.02832	cubic meter per second (m ³ /s)

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Streamflow Characteristics and Trends in New Jersey, Water Years 1897–2003

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Abstract

Streamflow statistics were computed for 111 continuous-record streamflow-gaging stations with 20 or more years of continuous record and for 500 low-flow partial-record stations, including 66 gaging stations with less than 20 years of continuous record. Daily mean streamflow data from water year 1897 through water year 2001 were used for the computations at the gaging stations. (The water year is the 12-month period, October 1 through September 30, designated by the calendar year in which it ends). The characteristics presented for the long-term continuous-record stations are daily streamflow, harmonic mean flow, flow frequency, daily flow durations, trend analysis, and streamflow variability.

Low-flow statistics for gaging stations with less than 20 years of record and for partial-record stations were estimated by correlating base-flow measurements with daily mean flows at long-term (more than 20 years) continuous-record stations. Instantaneous streamflow measurements through water year 2003 were used to estimate low-flow statistics at the partial-record stations. The characteristics presented for partial-record stations are mean annual flow; harmonic mean flow; and annual and winter low-flow frequency.

The annual 1-, 7-, and 30-day low- and high-flow data sets were tested for trends. The results of trend tests for high flows indicate relations between upward trends for high flows and stream regulation, and high flows and development in the basin. The relation between development and low-flow trends does not appear to be as strong as for development and high-flow trends.

Monthly, seasonal, and annual precipitation data for selected long-term meteorological stations also were tested for trends to analyze the effects of climate. A significant upward trend in precipitation in northern New Jersey, Climate Division 1 was identified. For Climate Division 2, no general increase in average precipitation was observed. Trend test results indicate that high flows at undeveloped, unregulated sites have not been affected by the increase in average precipitation.

The ratio of instantaneous peak flow to 3-day mean flow, ratios of flow duration, ratios of high-flow/low-flow frequency, and coefficient of variation were used to define streamflow variability. Streamflow variability was significantly greater

among the group of gaging stations located outside the Coastal Plain than among the group of gaging stations located in the Coastal Plain.

Introduction

Streamflow measurements and statistics are needed by water managers and planners. The magnitude and frequency of low and high streamflows in New Jersey are used for watershed management and planning purposes. High-flow statistics are used by engineers to design bridges, dams, and flood-control structures. Low-flow statistics are used by water-supply planners and regulatory agencies for reservoir design and for permitting purposes. Minimum passing flows and reservoir safe yields are concerns for water suppliers across New Jersey. The New Jersey Department of Environmental Protection (NJDEP) uses low-flow statistics for allocating surface-water withdrawals and for setting waste-load allocation limits for municipal and industrial facilities that discharge effluent to surface water. The statistics also are a critical part of studies of **total maximum daily loads**¹ (TMDLs) and studies of the effects of point and nonpoint sources of contamination on the chemical and biological qualities of streams.

The U.S. Geological Survey (USGS), in cooperation with other Federal, State, and local agencies, has collected **daily mean streamflow data** in New Jersey since 1897 (Gillespie and Schopp, 1982). Daily mean flows currently (2005) are recorded at 92 **continuous-record streamflow-gaging stations**² and previously were recorded at an additional 104 gaging stations (Reed and others, 2003). Daily mean flows are used to compute streamflow statistics such as flow duration, and high-flow and low-flow frequency. They are used to describe the volume of water flowing past a site and the frequency of occurrence of flows of a given magnitude. The last published report of low-flow and flow-duration statistics for New Jersey streams included data through the 1975 **water year**³ (Gillespie and Schopp, 1982). Since the 1975 water

¹ Words in bold are defined in the Glossary at the end of the report.

² Referred to as gaging station in this report.

³ Water year is the 12-month period, October 1 through September 30, designated by the calendar year in which it ends.

year, an additional 26 years of data has been collected at many **gaging stations**. Twenty or more years of data have been collected at some new gaging stations that did not have any data available for analysis in the last study (Gillespie and Schopp, 1982). Streamflow-gaging stations, streams, and climate divisions referenced in this report are shown in figures 1 and 2.

The USGS, in cooperation with the NJDEP, has analyzed the continuous records of streamflow through the 2001 water year and the low-flow instantaneous measurements of streamflow at **low-flow partial-record stations**⁴ through the 2003 water year to update low-flow statistics and flow-duration statistics and to compute other streamflow statistics for New Jersey streams. The additional data will provide more accurate long-term statistics for water managers. The statistics provided in this report, but not in previous reports, such as low-flow frequency for the winter season and harmonic mean flow, have been used by water managers in recent years for regulatory purposes. Statistics on high-flow frequencies for winter and annual periods, streamflow variability, and trend analysis also are provided in this report to assist those studying surface-water hydrology and hydraulics in New Jersey.

Purpose and Scope

The purpose of this report is to update and expand the previous information on flow characteristics and flow duration of New Jersey streams provided by Gillespie and Schopp (1982). This report provides a source of updated streamflow statistics for water-resource managers and planners. Streamflow characteristics are presented for 111 gaging stations with 20 or more years of record and 500 partial-record stations, including 42 gaging stations with less than 10 years of record and 24 gaging stations with 10 to 19 years of record, which were analyzed as partial-record stations. This report presents streamflow statistics for stations in New Jersey and a few stations in Pennsylvania and New York on major streams that could have an effect on New Jersey streams. Appendixes include an inventory of all gaging stations and partial-record stations analyzed in this study; maps of all continuous-record streamflow-gaging stations and low-flow partial-record stations in this report, by Watershed Management Area; and high and low-flow trend results.

Description of Study Area

New Jersey is divided into five water regions—the Passaic, Raritan, Upper Delaware, Lower Delaware, and Atlantic Coastal water regions. These regions are divided into 20 Watershed Management Areas (table 1), which are subdivided into more than 100 individual watersheds. These management areas were established by NJDEP to manage and protect the freshwater resources in New Jersey (Watt, 2000). The Raritan River Basin (Watershed Management Areas 7, 8, 9, and 10) comprises an area of 1,105 mi² in central and northern New

Jersey. It is the largest drainage basin entirely within the State of New Jersey (fig. 3).

New Jersey river basins drain areas spanning four physiographic provinces (fig. 4). The Piedmont, New England, and Valley and Ridge Provinces lie in northern New Jersey above the Fall line (fig. 4). The Coastal Plain Province encompasses southern New Jersey below the Fall line. The Valley and Ridge Province covers the northwestern part of the State in the Delaware River Basin and the Wallkill River Basin. The area is underlain by faulted and folded sedimentary layers of sandstone, shale, and limestone. Alternating belts of erosion-resistant sandstone and less-resistant eroded shale and limestone create the long, parallel, northeast-southwest-trending ridges and valleys that are characteristic of the province. The New England Province is underlain predominately by granite, gneiss, and small amounts of marble of Precambrian age. These rocks are resistant to erosion and create a hilly upland dissected by the deep steep-sided valleys of major streams. The Piedmont Physiographic Province is a broad lowland that contains ridges underlain by interbedded sandstone, shale, conglomerate, basalt, and diabase. The Coastal Plain is mainly flat and is underlain by unconsolidated layers of sand, silt, and clay (New Jersey Department of Environmental Protection and Energy, 1992).

Land-use information was derived for each of the drainage basins associated with the gaging stations studied. The land uses for gaging stations with **drainage areas** entirely in New Jersey were derived from a geographic information system (GIS) coverage developed from 1995/97 digital infrared aerial photos (N.J. Department of Environmental Protection, 2000) through use of the Anderson method of classification (Anderson and others, 1976). For these gaging stations, a 30-meter-grid digital elevation model (DEM) coverage of New Jersey and coordinates of the site location were used to create a basin boundary for each site. The 1995/97 land-use coverage was overlaid on the basin polygon. The size of the basin and the size of each land-use area within the basin were used to compute the land-use percentages. Land-use information for the Delaware, Neversink, Lehigh, and Schuylkill River gaging stations is from 1992 Multi-Resolution Land Characteristics/National Land Cover Data (MRLC/NLCD) produced by a Federal consortium at the Earth Resource Observation Systems (EROS) data center. The base data set was Landsat Thematic Mapper data, nominal-1992 acquisitions (Jeffrey Fischer, U.S. Geological Survey, written commun., 2003). Land use was characterized as developed or undeveloped on the basis of the percentages of urban, agricultural, forested, wetland, open water, and barren land in each basin. The urban land-use category is a composite of residential, commercial, and industrial uses. Developed land is defined as the sum of urban and agricultural land uses. Undeveloped land is defined as the sum of forested, wetland, open water, and barren land areas. For this study, 14 gaging stations with drainage basins in which 86 to 100 percent of the area is undeveloped were categorized as undeveloped (table 2).

⁴ Referred to as partial-record stations in this report.

Figure 1. Locations of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and streams within Climate Division 1, in New Jersey.

Figure 2. Locations of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and streams within Climate Division 2, in New Jersey.

The land uses in the drainage basins upstream from the gaging stations studied range from 100-percent undeveloped to 93-percent developed. Gaging stations on McDonalds Branch in Lebanon State Forest (01466500) and Middle Branch Mount Misery Brook in Lebanon State Forest (01466000) (fig. 5) are in areas that are 100-percent undeveloped. These two gaging stations are in the Pinelands area of southern New Jersey. A total of seven gaging stations in the Pinelands area of southern New Jersey, three gaging stations in northwestern New Jersey, and one gaging station on the east coast of New Jersey drain areas that are more than 90 percent undeveloped. More than 90-percent of the land use upstream from Second River at Belleville (01392500), Elizabeth River at Ursino Lake at Elizabeth (01393450), Third River at Passaic (01392210), and Weasel Brook at Clifton (01392000) (fig. 5) is urban. More than 70 percent of the land use upstream from West Branch Cohansey River at Seeley (01412500), Cohansey River at Seeley (01412800), and Salem River at Woodstown (01482500) (fig. 5) is agricultural.

Previous Investigations

The USGS began a statewide program of **base-flow** monitoring in 1958, in cooperation with the New Jersey Department of Conservation and Economic Development, Division of Water Policy and Supply. The purpose of the program was to determine minimum daily flow for streams in the State as required by a surface-water diversion law. Minimum daily flows at partial-record stations were estimated by graphically correlating base-flow measurements to daily mean flows at gaging stations. A report by Buchanan and others (1965) documents minimum daily flows at gaging stations and locations of partial-record stations and gives an example of the graphical correlation technique.

The monitoring program has been continued through the years as a cooperative project with NJDEP to collect base-flow data at locations with little or no streamflow data. Gillespie and Schopp (1982) computed 7-day 2-year low flow (7Q2), 7-day 10-year low flow (7Q10), and flow durations for 105 gaging stations in New Jersey and neighboring States. A regression method was used to calculate 7Q2 and 7Q10 for 417 low-flow partial-record stations and gaging stations in New Jersey with less than 7 years of record. The statistics were computed from flow data for gaging stations through water year 1975.

Methods of Study

Streamflow characteristics were analyzed for long-term gaging stations, partial-record stations, and gaging stations with less than 20 years of record analyzed as partial-record stations. The characteristics studied for gaging stations are daily streamflow, harmonic mean flow, flow frequency, daily flow durations, trend analysis, and streamflow variability.

Table 1. Watershed Management Areas in New Jersey.

[See figure 1 for New Jersey Department of Environmental Protection Watershed Management Areas]

Number	Watershed Management Area	Water region
	Name	
01	Upper Delaware	Upper Delaware
02	Wallkill	Upper Delaware
03	Pompton, Pequannock, Wanaque, Ramapo	Passaic
04	Lower Passaic, Saddle	Passaic
05	Hackensack, Hudson, Pascack	Passaic
06	Upper and Mid Passaic, Whippany, Rockaway	Passaic
07	Arthur Kill	Raritan
08	North and South Branch Raritan	Raritan
09	Lower Raritan, South River, Lawrence	Raritan
10	Millstone	Raritan
11	Central Delaware	Upper Delaware
12	Monmouth	Atlantic Coastal
13	Barneгат Bay	Atlantic Coastal
14	Mullica	Atlantic Coastal
15	Great Egg Harbor	Atlantic Coastal
16	Cape May	Atlantic Coastal
17	Maurice, Salem, Cohansey	Lower Delaware
18	Lower Delaware	Lower Delaware
19	Rancocas	Lower Delaware
20	Assiscunk, Crosswicks, Doctors	Lower Delaware

Characteristics studied for partial-record stations are mean annual flow, harmonic mean flow, and annual and winter low-flow frequency.

Continuous-Record Streamflow-Gaging Stations

Low-flow and high-flow statistics were computed from continuous records of streamflow collected at 111 gaging stations across New Jersey that have 20 or more years of record. Streamflow-gaging stations provide flow data at regular intervals throughout the day. The data, usually collected at 15-minute intervals, are used to compute daily mean-flow values. A series of data sets representing the lowest mean discharge for each year for a specified number of consecutive days are generated for each gaging station. A Log Pearson Type III frequency distribution typically is used to compute low-flow statistics for gaging stations.

Figure 3. Locations of continuous-record streamflow-gaging stations, low-flow partial-record stations, Watershed Management Areas, and water regions in New Jersey and vicinity. (Watershed Management Area names are listed in table 1.)

Base from U.S. Geological Survey digital line graph files, 1:24,000

Figure 4. Physiographic provinces, climate divisions, and locations of National Weather Service rain gages in New Jersey.

Table 2. Streamflow-gaging stations on unregulated streams that drain undeveloped basins in New Jersey.

[Undeveloped basins contain less than 15-percent developed land; %, percent; ID, identification; see figure 5 for gaging station locations with land use]

Station ID	Station name	Urban (%)	Agriculture (%)	Total developed (%)	Climate division
01384500	Ringwood Creek near Wanaque, N.J.	14.03	0.00	14.03	1
01409400	Mullica River near Batsto, N.J.	6.31	5.99	12.30	2
01379773	Green Pond Brook at Picatinny Arsenal, N.J.	11.53	.31	11.83	1
01411300	Tuckahoe River at Head of River, N.J.	3.96	7.75	11.71	2
01440000	Flat Brook near Flatbrookville, N.J.	3.03	5.34	8.37	1
01409810	West Branch Wading River near Jenkins, N.J.	.84	6.60	7.44	2
01409000	Cedar Creek at Lanoka Harbor, N.J.	5.41	.52	5.93	2
01386500	Blue Mine Brook near Wanaque, N.J.	5.01	.46	5.47	1
01409095	Oyster Creek near Brookville, N.J.	2.66	.65	3.31	2
01410000	Oswego River at Harrisville, N.J.	.93	1.85	2.78	2
01410150	East Branch Bass River near New Gretna, N.J.	2.00	.00	2.00	2
01409280	Westecunk Creek at Stafford Forge, N.J.	.80	.50	1.30	2
01466000	MB Mt Misery Bk in Lebanon State Forest, N.J.	.00	.00	.00	2
01466500	McDonalds Branch in Lebanon State Forest, N.J.	.00	.00	.00	2

A **low-flow frequency curve** is computed for each series of measurements as described in Riggs (1972). The statistics computed at the gaging stations are used as a basis for estimating low-flow statistics at ungaged sites and at the 66 gaging stations with less than 20 years of record.

Two exceptions were made to the guideline established for categorizing gaging stations with 20 or more years of record as continuous-record stations. The gaging station on Lawrence Brook at Westons Mills, N.J. (01405030) (fig. 1), has less than 20 years of continuous record. For this study, statistics were computed using the continuous-gage record because the flow passing the gaging station is regulated and statistically significant correlations with other long-term gaging stations do not exist. The other exception is the gaging station at Passaic River at Pine Brook, N.J. (01381900) (fig. 1), with 22 years of continuous record. This gaging station is considered to be a partial-record station for this study because of its proximity to other gaging stations upstream and downstream from the site with more than 70 years of record.

Flow-Duration Analysis

A **flow-duration curve** is a cumulative frequency curve that shows the percentage of time specified flows are equaled or exceeded for a given period of time (Searcy, 1959). Flow-duration curves were computed for each gaging station from daily mean flows for the entire period of record. Daily mean flows for the entire period of record were arranged in order

of magnitude and divided into 35 classes. A curve was drawn through the average discharge for each class in relation to the percentage of time that flow was equaled or exceeded. The flow-duration curve shows the daily mean flow that was exceeded for the indicated percentage of time.

The flow-duration curve is useful for analyzing the availability and variability of streamflow. The flow-duration curve, when based on many years of record, indicates the probable future behavior of a stream, assuming the basin will not be substantially altered by man's activities (Searcy, 1959). The shape of the flow-duration curve is indicative of hydrologic conditions in the drainage basin. A curve with a steep slope is indicative of a basin with highly variable flow with most of the streamflow coming from direct runoff. A gaging station on a stream that drains an area with steep topography and shallow soils will have a flow-duration curve with a steep slope. A flat flow-duration curve is typical of a stream that drains an area with flat topography and a high percentage of land area classified as wetlands. An appreciable part of streamflow at these gaging stations is contributed by ground water.

The flow-duration curves at two gaging stations with similar drainage areas are shown in figure 6. The Great Egg Harbor River (fig. 2) drains an area that is representative of flat topography in the Coastal Plain Physiographic Province of southern New Jersey. The South Branch Raritan River (fig. 1) drains an area of steeper topography in the New England Physiographic Province. The flow-duration curve for the South Branch Raritan River gaging station (01396500) has

Figure 5. Locations of continuous-record streamflow-gaging stations with land use in New Jersey, 1995–97.

Figure 6. Flow-duration curves for South Branch Raritan River at High Bridge, N.J., (01396500), and Great Egg Harbor River at Folsom, N.J. (01411000).

a steeper slope than the flow-duration curve for the Great Egg Harbor River gaging station (01411000). The flow per square mile at 1-percent flow duration at gaging station 01396500 is twice as high as at gaging station 01411000. Flows greater than 70-percent flow duration are higher and flows less than 80-percent flow duration are lower at gaging station 01396500 than at gaging station 01411000.

Harmonic Mean Flow

Harmonic mean flow is a statistic used as a **design flow** applied to water-quality criteria for the protection of human health under lifetime exposure to toxic contaminants (Rossman, 1990). The harmonic mean flow is defined as the reciprocal of the mean of the reciprocal of the daily flows or

$$Q_{HM} = \frac{N}{1/Q_1 + 1/Q_2 + \dots + 1/Q_N}, \quad (1)$$

where

Q_{HM} = harmonic mean flow,
 N = number of days,

and

Q_1 = streamflow on day 1.

The formula for harmonic mean flow cannot be used directly when daily mean flows of zero are present in the data set. To adjust for zero flows, the harmonic mean of the nonzero daily mean streamflows was multiplied by the ratio of

the number of nonzero daily mean flows to the total number of daily mean flows in the period of record analyzed (Martin and Ruhl, 1993). The proportional adjustment for zero flows is consistent with current U.S. Environmental Protection Agency design flow methodology (Rossman, 1990). Harmonic mean flow is always lower or equal to the arithmetic mean flow because harmonic mean gives greater weight to the lowest daily mean flows.

Frequency Analysis

A frequency curve relates the magnitude of a variable to frequency of occurrence (Riggs, 1968). Daily streamflow data were analyzed to determine the frequency of occurrence of low-flow and high-flow events. Frequency curves of low- and high-flow events were developed for both annual and winter periods (November–April). The magnitude of low- and high-flow events is inversely related to the frequency of occurrence. The **recurrence interval** is the average length of time between exceedances or non-exceedances of a particular magnitude (Riggs, 1968).

The minimum average flow for a given period of days is used to develop a low-flow frequency curve, and the maximum average flow is used to develop a high-flow frequency curve. The period of days used is referred to as the n -day period. For this study, frequency statistics were computed for the minimum and maximum average 1-day, 7-day, and 30-day flows for each year or season of each year for the period of record. When analyzing low flow, the probability that a streamflow is not exceeded for a given period of time (annual or winter season) is referred to as the non-exceedance probability. The probability that streamflow is exceeded for a given period of time is referred to as the exceedance probability.

A log Pearson Type III frequency distribution was used for this study because it usually fits the distribution of streamflows well. The log Pearson Type III frequency curves were examined for each gaging station using the USGS program SWSTAT (Flynn, and others, 1995). The log Pearson Type III distribution can be represented by the equation (Telis, 1991)

$$\log(Q_t) = X + K_t S, \quad (2)$$

where

- Q_t = n -day flow,
- t = recurrence interval in years,
- X = mean of the base 10 logarithms of the annual or seasonal n -day flows,
- K_t = frequency factor that is a function of the recurrence interval and the coefficient of skew,

and

- S = standard deviation of the logarithms of the annual or seasonal n -day flows.

A frequency curve was hand drawn on log probability paper when the SWSTAT method for log Pearson Type III curve did not fit the data. The program did not generate frequency curves for various data sets at seven gaging stations because of large skews in the data, mainly as a result of **regulation** at low streamflow.

An example of low-flow frequency curves for South Branch Raritan River at High Bridge, New Jersey (01396500) is shown in figure 7. The plot shows the frequency distribution for 1-day, 3-day, 7-day, 30-day, and 90-day annual low flows. The curves are log Pearson Type III frequency distributions.

Trend Analysis

The time series of selected streamflow characteristics at each gaging station with more than 10 years of daily streamflow records were evaluated for trends using the Kendall's Tau test (Helsel and Hirsch, 2002). The same test was applied to annual and monthly precipitation data, annual **coefficient of variation**, and peak-flow ratios. This is a nonparametric test designed for data that are not normally distributed. Kendall's Tau was used to identify changes in the streamflow and precipitation data over time. The test determines the probability that the null hypothesis of no significant trend can be rejected with a low risk of error. A p -value equal to 0.05 indicates there is a 95-percent chance that a trend is present. For this study, a trend test on the annual and monthly data series with a p -value of less than or equal to 0.05 is considered a significant result. A negative Kendall Tau coefficient indicates a downward trend. A positive Tau value indicates an upward trend.

Streamflow Variability

The variability at a gaging station was measured using a few different statistics. The coefficient of variation, the ratio of instantaneous **peak flow** to 3-day mean flow surrounding the peak, the ratios of 25-percent/75-percent and 10-percent/90-percent flow durations, and the ratios of 1-day 2-year high flow/1-day 2-year low flow and 1-day 20-year high flow/1-day 20-year low flow were tested as measures of streamflow variability. The ratio statistics were computed for the entire period of record.

The Wilcoxon rank sum test was used to test for differences in the means of two data sets. It is the non-parametric equivalent to a t -test. The null hypothesis (HO) states that mean rank of the streamflow variability statistics are equal between two groups. A p -value of 0.05 was used to minimize the chance that the difference occurred by chance alone. Comparisons were made between gaging stations grouped by physiographic province and by land use.

The coefficient of variation was computed for the entire period of record at all gaging stations with 20 or more years of record and for each complete water year in the record. The coefficient of variation is the standard deviation divided by the mean of the data set (Ott, 1988). The coefficient of variation

Figure 7. Low-flow frequency curves for South Branch Raritan River at High Bridge, N.J. (01396500).

allows for direct comparisons in variability of streamflow between gaging stations with differences in daily mean flows. The annual coefficient of variation was calculated for selected gaging stations and tested for trends.

The **peak ratio** is determined from annual peak flow, which is the maximum instantaneous streamflow value for the water year, divided by the 3-day mean flow for 3 consecutive days including the day before, day of, and day after the peak. Peak ratio is a measure of the magnitude of the rise and fall of a stream over a given period of time. Environmental factors can effect a change in the peak ratio at a gaging station for a given amount and duration of precipitation. Changes in the amount of impervious surfaces, vegetative cover in riparian areas, and land uses in a drainage area can cause changes in the capacity of a watershed to attenuate and store runoff, causing changes in the peak ratio over time. The peak ratio trend was determined for selected gaging stations using the Kendall's Tau test (Helsel and Hirsch, 2002). The test determines

the probability that the null hypothesis of no significant trend can be rejected with a low risk of error. A p -value equal to 0.05 indicates there is a 95-percent chance that a trend is present. For this study, a trend test on the peak ratio with a p -value of less than or equal to 0.05 is considered a significant result.

Partial-Record Stations

Instantaneous streamflow measurements made at base-flow conditions are used to estimate low-flow statistics at gaging stations with less than 20 years of record and at sites on streams without any continuous record of streamflow. Base-flow measurements are made periodically at low-flow partial-record stations, water-quality sampling sites, crest-stage gaging stations, and miscellaneous sites established for special USGS studies. From 1959 through 2003, base-flow measurements were made at 500 low-flow partial-record

stations. Currently (2005), base-flow conditions are measured 2 to 3 times a year at more than 40 low-flow sites. Typically, 10 to 12 base-flow measurements made over a 5- to 6-year period provide an adequate amount of data to establish a correlation between low-flow conditions at a continuous-record gaging station and those at the low-flow station. Recently, base flow has been measured at sites that had been inactive for many years in order to investigate possible changes in base flow. During water year 2001, one or more measurements of base flow were made at 105 active and previously inactive low-flow stations.

Instantaneous base-flow measurements at partial-record stations were correlated to daily mean flow at gaging stations in basins with similar hydrologic conditions. The low-flow statistics were estimated by using the Maintenance of Variance Extension Type 1 (MOVE1) method of correlation analysis (Hirsch, 1982) when an adequate number of base-flow measurements were available. The MOVE1 method fits a straight line to a data set. MOVE1, also known as the organic line of correlation, was proposed as a linear fitting procedure in hydrology and is further explained by Helsel and Hirsch (2002). The flows are transformed to logarithms to make the distribution of data more symmetrical and the relation more linear. The correlation coefficient and standard error of estimate are used as measures of accuracy. Daily mean flows from at least three gaging stations, referred to as index sites in the MOVE1 program, are correlated with measurements at each partial-record station. A weighted mean of all the estimates is computed on the basis of the standard error of estimate.

Only measurements made at base-flow conditions are used in the MOVE1 analysis. Tests to evaluate base-flow conditions at the index site and changes in stage at the low-flow station are used to determine whether measurements were made at base-flow conditions. A base-flow test is applied to the daily mean flows at the index site. Data are defined as being base flow when the daily mean flow at the index site drops by less than 30 percent or rises by less than 10 percent from the previous day. A test of conditions during streamflow measurement is made to reject measurements with a change in stage during the measurement of greater than 0.02 ft, unless a tide or control structure adjustment was made to the measured flow.

An additional test is sometimes performed on the previous two days of daily flow at the index site before the measurement was made. This test is performed only when measurements in the database are flagged as being base flow. If the daily flows do not pass the base-flow test, an estimated daily base flow is used for the index site when the base-flow measurement is flagged as such. Linear extrapolation of the daily mean flow from the previous 2 days is used to estimate the daily mean flow on the day the measurement was made. This procedure allows the use of base-flow data that otherwise would be removed from the analysis. An example of the need for this procedure is when a measurement at a partial-record station is made at base-flow conditions in the morning and precipitation in the afternoon causes the stream at the index

site to rise. Also, a test is available for base flow at stream-flow-gaging stations with very low flows. The absolute value of the change in flow must be less than 0.2 ft³/s from the previous day to the day in which the flow was measured to qualify as base flow. At very low flows, a change in stage of less than 0.01 ft (the precision of the instrumentation) can change the flow by greater than 20 percent.

Estimated statistics for a partial-record station are computed on the basis of a weighted mean of results from MOVE1 correlations typically run with data from three or more index sites. If the estimates of flow statistics from these correlations vary widely, additional correlations with nearby gaging stations are run to obtain better estimates. Results from as few as one correlation could be used at a partial-record station located on the same stream in close proximity to a gaging station. In that case, correlations with other gaging stations in the vicinity would not considerably improve the estimate. The estimates from each correlation are weighted together inversely, on the basis of the standard error of estimate. Correlations with a lower standard error have a stronger effect on the estimate. This standard error of estimate is a function of the scatter of the data about the line, the number of measurements used to develop the line, how far the relation is extended from the measurements to predict statistics at the partial-record station, and the standard error of the index-gage statistics (Telis, 1991).

A table of the estimated statistics and plots of the data is generated for each MOVE1 correlation. Examples of the outputs from a correlation between an index site—South Branch Raritan River at High Bridge (01396500) (fig. 1)—and a partial-record station—South Branch Raritan River at Middle Valley (01396280) (fig. 1)—are shown in figures 8 and 9. The statistics estimated from each correlation and a weighted mean of all the estimates based on the standard error are summarized in a table, as shown in figure 10, for each partial-record station.

The plots shown in figure 9 are used to assure the quality of the data and to look for trends in the relation between daily mean flows at the index site and instantaneous measurements of base flow at the low-flow sites. Outliers are identified by analyzing percent difference between actual and predicted values, as well as visual analysis of plots (fig. 9). When outliers are identified, the discharge measurement form on which the velocities, depths, and areas of measured flow were recorded is examined for mistakes. The flow on the measurement form is compared to the flow stored in the database, velocities on the form are compared with the rating table for the meter used, and measurement computations are checked. The residuals computed from the MOVE1 correlation program are defined as the difference between the predicted flow from the MOVE1 correlation equation and the measured flow at the partial-record station (predicted minus measured). The residuals are presented in plots as the percent difference between the MOVE1 predicted flow and the measured flow. The percent differences are plotted with index station flow, time, and season to examine changes in these relations.

LOW-FLOW SITE MEASURED FLOW AT 01396280 SOUTH BRANCH RARITAN RIVER AT MIDDLE VALLEY NJ INDEX STATION DAILY FLOW AT 01396500 SOUTH BRANCH RARITAN RIVER NEAR HIGH BRIDGE NJ	
FOR THE 7-DAY 10-YEAR LOW FLOW:	ESTIMATED STREAMFLOW STATISTICS
STND ERROR OF PREDICTION FOR LOW-FLOW SITE = 11.67%	CORRELATION COEFF = 0.989
STND ERROR OF ESTIMATE FOR LOW-FLOW SITE = 42.82%	FINAL EQUATION IS QP = (0.56274)QI(1.0428)
TIME SAMPLING ERROR FOR INDEX GAGE = 39.12%	
INDEX STATION STATISTICS FOR SITE 01396500	ESTIMATED LOW-FLOW STATISTICS FOR LOW-FLOW SITE 01396280
1-DAY 10-YEAR (ANNUAL) LOW-FLOW = 20.230	1-DAY 10-YEAR (ANNUAL) LOW-FLOW PREDICTION = 12.947
7-DAY 10-YEAR (ANNUAL) LOW-FLOW = 22.030	7-DAY 10-YEAR (ANNUAL) LOW-FLOW PREDICTION = 14.151
7-DAY 10-YEAR (NOV.-APR.) LOW-FLOW = 29.390	7-DAY 10-YEAR (NOV.-APR.) LOW-FLOW PREDICTION = 19.113
30-DAY 10-YEAR (ANNUAL) LOW-FLOW = 24.720	30-DAY 10-YEAR (ANNUAL) LOW-FLOW PREDICTION = 15.957
30-DAY 10-YEAR (NOV.-APR.) LOW-FLOW = 38.590	30-DAY 10-YEAR (NOV.-APR.) LOW-FLOW PREDICTION = 25.390
30-DAY 5-YEAR (ANNUAL) LOW-FLOW = 28.770	30-DAY 5-YEAR (ANNUAL) LOW-FLOW PREDICTION = 18.691
30-DAY 5-YEAR (NOV.-APR.) LOW-FLOW = 47.602	30-DAY 5-YEAR (NOV.-APR.) LOW-FLOW PREDICTION = 31.601
FLOW DURATIONS FOR INDEX STATION ARE:	PREDICTED FLOW DURATIONS FOR LOW-FLOW SITE ARE:
25% FLOW DURATION = 148.700	25% FLOW DURATION = 103.647
50% FLOW DURATION = 87.020	50% FLOW DURATION = 59.280
75% FLOW DURATION = 51.870	75% FLOW DURATION = 34.562
25%/75% FLOW DURATION RATIO = 2.867	25% / 75% FLOW DURATION RATIO = 2.999
INDEX STATION MEAN ANNUAL DISCHARGE = 122.600	PREDICTED MEAN ANNUAL DISCHARGE = 84.752
INDEX STATION HARMONIC MEAN = 69.870	PREDICTED HARMONIC MEAN = 47.152
YEARS OF DAILY DISCHARGE RECORD = 72	NUMBER OF DISCHARGE MEASUREMENTS USED = 29
TREND TEST RESULTS:	
KENDALLS TAU = 0.3793	
PROBABILITY = 0.0039	

Figure 8. Example of results generated by the MOVE1 correlation program listing statistics at an index site and the estimated statistics at a partial-record station in New Jersey. (Time sampling error, *t*-year recurrence interval for a continuous-record gaging station in percent; %, percent; stnd error of prediction, standard error of prediction is a measure of the fit of the correlation of discharge data for two stations; stnd error of estimate, standard error of estimate is function of the scatter of the data about the line, the number of measurements used to develop the line, how far the relation is extended from the measurements to predict statistics at the partial-record station, and the standard error of the index-gage statistics; correlation coeff, correlation coefficient is a measure of strength of the linear relation between two variables with values ranging from 0 to 1, and 1 is the strongest relation; index station and low-flow statistics are recorded in cubic feet per second.)

Figure 9. Example of plots generated by the Maintenance of Variance Extension Type 1 (MOVE1) correlation analysis program to evaluate the relation between base-flow measurements at a low-flow partial-record station and daily mean flow at an index site in New Jersey. (Q, flow in cubic feet per second; residuals, difference between predicted values and the actual values for the dependent variable; MOVE1 Q, relation between daily mean flow at the streamflow-gaging station and instantaneous flow at the partial-record site; OLS, ordinary least squares; 7Q10, 7-day 10-year low flow.)

A Kendall Tau trend test is used to examine the residuals ordered from the beginning to the end of the data set. The test determines the probability that the null hypothesis of no significant trend can be rejected with a low risk of error. A p -value equal to 0.05 indicates there is a 95-percent chance that a trend is present. For this study, a trend test with a p -value of less than or equal to 0.05 is considered a significant result. When a significant trend is detected, the data are examined more closely. If the plot of residuals in relation to time shows a noticeable shift in residuals at a particular point in time, the data after the shift may be examined separately.

The correlation between index site 01396500 and low-flow station 01396280 (fig. 1) is an example of a decrease in residuals over time or an increase in the percent difference of the predicted low flow from the measured flow. The Kendall Tau value (0.3793) and probability (0.0039) at the bottom of figure 8 show a significant positive trend in residuals. The plot of residuals in relation to time (fig. 9) shows the predicted flow from the equation as a percent difference from the actual measured flow. The plot shows a change starting in 1983. Ten of the 12 measurements after 1982 have a positive difference; flow predicted by the MOVE1 correlation equation is greater than the measured flow. Fourteen of the 17 measurements made before 1983 have a negative difference: flow predicted by the MOVE1 correlation equation is less than the measured flow. A correlation using only measurements made after 1982 would estimate lower streamflow statistics from data more indicative of recent hydrologic conditions.

The MOVE1 line does not fit the data at 9 partial-record stations. At these sites, a graphically determined best-fit line is used to determine the relation between the daily mean flows at the index gaging station and the measured flows at the partial-record station. The MOVE1 program cannot be run directly on zero flow data because the logarithm of zero is undefined. A constant of 0.01 ft³/s is added to adjust the flow at both index sites and low-flow sites to allow a logarithm to be taken. This constant can be adjusted to best fit the distribution of the nonzero flow data. The constant then is subtracted from the predicted statistics when appropriate. Another approach is to determine the frequency of flow at a nearby gaging station on the day the observed flow was zero at the low-flow site. For instance, if the flow at the gaging station is equal to the 7-day 2-year low flow (MA7CD2), it is estimated that the MA7CD2 flow and less frequently occurring non-exceedance frequencies (for example, 7-day 10-year low flow) at the low-flow site are zero.

Streamflow Characteristics

Flow Statistics

Streamflow at gaging stations is affected by changes in climate; natural factors such as river processes, sedimentation, and beaver dams; water-diversion trends, wastewater-discharge

trends, and human activities. Streamflow at some gaging stations has changed over time as a result. Gaging stations with long periods of record reflect more of the inherent long-term variability of streamflow. Therefore, streamflow statistics are evaluated on the basis of the length of record and on the climatic conditions during the period of record to account for those changes.

Streamflow statistics were computed at 111 gaging stations with 20 or more years of continuous record in New Jersey and at gaging stations in surrounding States in close proximity to New Jersey. Daily mean streamflow data through water year 2001 were used for the computations at the continuous-record streamflow-gaging stations. The characteristics presented in a table of summary statistics for the long-term continuous-record stations are minimum, maximum, and daily mean streamflow; harmonic mean flow; 1-, 7-, and 30-day minimum average low flow with 2-, 5-, 10-, and 20-year recurrence intervals; 1-, 7-, and 30-day maximum average high flow with 2-, 5-, 10-, and 25-year recurrence intervals; and 1-, 2-, 5-, 10-, 20-, 25-, 30-, 40-, 50-, 60-, 70-, 75-, 80-, 85-, 90-, 95-, 99-percent daily duration flows. The flow frequencies and flow durations are presented for both annual and winter (November through April) periods. The annual period used for frequency analysis is based on the **climatic year** (April 1 to March 31) for low-flow frequency analysis and the water year for high-flow frequency analysis. The annual 1-, 7-, and 30-day low- and high-flow data sets were tested for trends. Monthly, seasonal, and annual precipitation data for selected long-term meteorological stations (fig. 2) also were tested for trends to analyze the effect of climate on streamflow trends. The ratios of flow duration and high-flow to low-flow frequency, the ratio of instantaneous peak flow to 3-day mean flow, and the coefficient of variation were used to define streamflow variability.

Streamflow statistics were estimated for 500 partial-record stations including 66 gaging stations with less than 20 years of record. MOVE1 correlation analysis was used to relate instantaneous base-flow measurements at the partial-record stations to daily mean discharges at gaging stations. The characteristics presented for partial-record stations are daily mean flow; harmonic mean flow; and 1-, 7-, and 30-day minimum average low-flow with a 10-year recurrence interval for the annual and winter periods.

Streamflow statistics are presented in tables for each continuous-record streamflow-gaging station and partial-record station. The tables are available at the USGS World Wide Web site <http://pubs.water.usgs.gov/sir20055105/>. The tables are updated as new data become available. An example of the presentation of summary statistics for South Branch Raritan River near High Bridge, N.J. (01396500), a continuous-record streamflow-gaging station with more than 20 years of record is shown in figure 11. Section A begins with the basin name from the NJDEP list of 20 Watershed Management Areas (WMA's) in the State. The WMA is followed by the USGS station identification number. Each continuous-record streamflow-gaging station is assigned a unique identification number, which

A NORTH AND SOUTH BRANCH RARITAN BASIN
01396500 South Branch Raritan River near High Bridge, NJ

B
Location: Latitude 40° 40' 40", Longitude 74° 52' 45", Hunterdon County, Hydrologic Unit 02030105, on left bank 1.0 mi northeast of High Bridge, and 4.4 mi upstream from Spruce Run.
Drainage area: 65.3 mi²
Station type: Continuous-record gaging station
Period of record: 1919-2001

C Streamflow characteristics (cfs)
Period of record: 1919-2001
Mean annual flow: 123
Minimum daily flow: 13
Maximum daily flow: 3,340
Harmonic mean flow: 70

D Magnitude and frequency of lowflow for indicated periods						E Magnitude and frequency of high flow for indicated periods					
Period of record	Number of consecutive days	Annual minimum streamflow (cfs) for indicated recurrence interval in years				Period of record	Number of consecutive days	Annual maximum streamflow (cfs) for indicated recurrence interval in years			
1920-2001		2	5	10	20	1919-2001		2	5	10	25
Annual	1	31	24	20	18	Annual	1	1,070	1,540	1,890	2,360
(Apr.-Mar.)	7	33	26	22	19	(Oct.-Sept.)	7	473	641	752	891
	30	38	29	25	22		30	278	362	415	479
Winter	1	43	32	27	23	Winter	1	905	--	1,720	2,250
(Nov.-Apr.)	7	50	35	29	25	(Nov.-Apr.)	7	408	578	703	876
	30	70	48	39	32		30	259	347	406	481

F	Duration of daily flow																
	Period of record	Streamflow (cfs) that was exceeded for the indicated percentage of time															
		1	2	5	10	20	25	30	40	50	60	70	75	80	90	95	98
1919-2001																	
Annual	676	513	338	242	169	149	133	107	87	71	58	52	46	36	29	24	22
Winter	732	574	397	283	205	183	166	140	118	100	83	75	68	51	40	32	28

Figure 11. Example of summary statistics for continuous-record streamflow-gaging stations in New Jersey with 20 or more years of continuous streamflow record. (This example represents summaries as they are presented on the World Wide Web site. Identifying letters A, B, C, D, E, and F are used only to facilitate discussion in the text. mi, miles; mi², square miles; cfs, cubic feet per second; --, no value calculated.)

follows the “downstream order” system. The gaging station name is included in this table as well as the WMA name.

Section B is a description of the gaging station, including the location. The drainage area of the gaging station is recorded in square miles (mi²). The station type is continuous-record gaging station. A continuous-record gaging station records streamflow data at regular intervals throughout the day. The data, usually collected at 15-minute intervals, are used to compute daily mean-flow values. Gaging stations with less than 20 years of record were analyzed as partial-record stations and are labeled as such. The period of record is given in water years starting with the first complete year of record at that station.

Section C displays streamflow characteristics. In these summary statistics, **cubic feet per second** is abbreviated as cfs. This table contains five basic statistics for streamflow at the gaging station. The period of record for the station is in water years. Mean annual flow is the arithmetic mean of the individual daily mean discharges for the designated period. The minimum flow value is the minimum instantaneous discharge for the period of record. The maximum flow value is the maximum instantaneous discharge for the period of record. The value for harmonic mean flow is a statistic used as a design flow applied to water-quality criteria for the protection of human health under lifetime exposure to toxic contaminants (Rossman, 1990). Some gaging stations may have a split period of record as a result of the augmentation of regulation or the withdrawal of regulation.

Section D provides the magnitude and frequency of low flow for indicated periods separated into two categories, annual and winter. The period of record for annual low-flow data follows the climatic year, April through March, where the numeric year corresponds with January through March. Winter data are collected from November through April. The annual minimum streamflow for the indicated recurrence interval in years is listed in this table. For low-flow statistics, the recurrence interval is 2, 5, 10, and 20 years.

Section E presents the magnitude and frequency of high flow for indicated periods separated into annual and winter. The period of record for high-flow data follows the water year, October through September. Winter data are collected from November through April. This table lists the annual maximum streamflow for the indicated recurrence interval in years. For high-flow statistics, the recurrence interval is 2, 5, 10, and 25 years.

Section F presents the duration of daily flow, which is the output from the flow-duration curve. The flow-duration curve is a cumulative-frequency curve that shows the percentage of time that specified discharges are exceeded. The curve is based on the total period of record (water year), but the chronological sequence of flows is omitted from consideration in the preparation of the curve. Therefore, it is impossible to tell from the flow-duration curve alone whether varying periods of low flow all occurred during one drought period or were scattered over a number of years. The flow-duration curve is, however, useful for studying the flow characteristics

of a stream over its entire range of discharge (Gillespie and Schopp, 1982).

An example of the presentation of estimated statistics for South Branch Raritan River at Middle Valley, N.J. (01396280), a low-flow partial-record station, is shown in figure 12. Instantaneous base-flow measurements are correlated to daily mean flow at gaging stations in basins with similar hydrologic conditions. The low-flow statistics were estimated by using the Maintenance of Variance Extension Type 1 (MOVE1) method of correlation analysis (Hirsch, 1982) when ample base-flow measurements were available. Section A identifies of the station name and USGS station identification number, a unique identification number that follows the “downstream order” system. The WMA name from the NJDEP list of 20 WMA in the State also is displayed.

Section B is a description of the partial-record station, including the location. The drainage area of the partial-record station is recorded in square miles (mi²). The station type is low-flow partial-record station (partial-record station), or gaging station analyzed as partial-record station. A partial-record station is a site where discrete measurements are obtained over a period of time without continuous data being recorded or computed (Reed and others, 2003). The period of record is given in water years. Remarks identify stations used for the statistical correlations and the rating given to the subject station for the confidence of the correlations. A rating of good, fair, or poor is assigned to the estimates for each partial-record site. A weighted mean of the individual standard errors of estimate for each correlation is used to rate the estimated statistics. A frequency distribution of all the weighted mean standard errors is used as a guide for rating the estimates for each site. All sites with weighted mean errors less than the 50th percentile are rated good. Sites with weighted mean errors from the 50th to the 75th percentile are rated fair, and sites with errors greater than the 75th percentile are rated poor. Ratings of good, fair, and poor correspond to the standard errors of prediction of less than 45 percent, 45 percent to 143 percent, and greater than 143 percent, respectively.

Section C presents streamflow characteristics. In these summary statistics, cubic feet per second is abbreviated as cfs. Three basic statistics for a partial-record station are given in this table. The period of record for these statistics is in water years and is the period of record of base-flow measurements for that station. Mean annual flow is the arithmetic mean of the individual daily mean discharges for the designated period. The value for harmonic mean flow is a statistic used as a design flow applied to water-quality criteria for the protection of human health under lifetime exposure to toxic contaminants (Rossman, 1990).

Section D is the magnitude and frequency of low flow for indicated periods separated into two categories, annual and winter. The period of record for low-flow data follows the climatic year, April through March. Winter data are collected from November through April. The annual minimum streamflow for a 10-year recurrence interval is listed in this table.

A	NORTH AND SOUTH BRANCH RARITAN BASIN		
	01396280 South Branch Raritan River at Middle Valley, NJ		
B	Location: Latitude 40° 45' 40", Longitude 74° 49' 17", Morris County, Hydrologic Unit 02030105, at bridge in Middle Valley, 6.9 mi downstream from Drakes Brook.		
	Drainage area: 47.7 mi ²		
	Station type: Low-flow partial-record station		
	Period of record: 1963-1999		
	Remarks: Low-flow frequency estimates are based on correlations with gaging stations 01396500, 01398500, and 01399500. The correlations are considered good.		
C	Estimated streamflow characteristics (cfs)		
	Period of record	Mean annual flow	Harmonic mean flow
	1963-1999	82	47
D	Magnitude and frequency of low flow for indicated periods		
	Period of record	Number of consecutive days	Annual minimum streamflow (cfs) for a 10-year recurrence interval
	1963-1999		
	Annual	1	12
	(Apr.-Mar.)	7	13
		30	15
	Winter	1	18
	(Nov.-Apr.)	7	20
		30	27

Figure 12. Example of summary statistics for low-flow partial-record stations in New Jersey. (This example represents summaries as they are presented on the World Wide Web site. Identifying letters A, B, C, and D are used only to facilitate discussion in the text. mi, miles; mi², square miles; cfs, cubic feet per second.)

The **standard error of estimate** computed from the **standard error of prediction** of the MOVE1 line, and the error associated with statistics computed for the index sites, were used as measures of accuracy for estimates of summary statistics at the partial-record stations.

Harmonic mean flow was computed for all the continuous-record streamflow-gaging stations with 10 or more years of record and estimated for all partial-record stations. The statistic was computed for two separate periods of record at 20 gaging stations with 20 or more years for each separate period of record with a change in flow regulation at a given point in time. Harmonic mean flow for gaging stations ranged from 6,347 ft³/s at Delaware River at Trenton, N.J. (01463500) (fig. 2) to 0.17 ft³/s at Back Brook Tributary near Ringoes, N.J. (01398045) (fig. 1).

Harmonic mean flows at gaging stations were compared to statistics of flow duration and low-flow frequency by evaluating the percent differences at each site and by using ordinary least squares regression. This analysis was done to investigate other flow statistics that could be used as alternatives to the harmonic mean flow. Harmonic mean flow cannot be transferred accurately from one site on a stream to another site. The proportional adjustment used for zero flows is another limitation of using harmonic mean flow as a design-flow criterion. The adjustment was found to yield illogical results when low-flow values of zero or close to zero were changed slightly (Martin and Ruhl, 1993).

Linear relations between harmonic mean flow and 50-, 60-, 70-, 75-, 80-, 90-, 95-percent flow durations and 7-day 10-year and 7-day 2-year low flows were evaluated for comparability. All the relations with flow durations between 60- and 90-percent had r^2 values greater than 0.97, when all gaging stations for all periods of record were analyzed. The relations with low-flow frequency statistics resulted in lower r^2 values.

Harmonic mean flows from individual gaging stations and from groups of gaging stations in close proximity geographically and/or hydrologically were closest to flows ranging from 60- to 90-percent flow duration. Statistically the 75-percent flow duration is most closely associated with harmonic mean flow when evaluating all the gaging stations analyzed in this study (fig. 13). The 70- and 75-percent flow durations are closest to the harmonic mean flow. The harmonic mean averages 12 percent higher than the 75-percent flow duration and 2.5 percent less than the 70-percent flow duration. Differences at individual gaging stations range from 54 percent higher to 88 percent lower than the 75-percent flow and from 32 percent higher to 89 percent lower than the 70-percent flow. The regression analyses yield similar results; r^2 values were 0.999 and 0.997 when using untransformed values and 0.969 and 0.972 when using log-transformed values. The root mean square error was 61 percent for the regression with 70-percent flow duration and 38 percent for the regression with 75-percent flow duration. The 75-percent flow duration is considered to be the best alternative to the harmonic mean flow when making comparisons on a statewide

basis. These statistics vary by 40 percent or more for only a few gaging stations on highly regulated streams and a few gaging stations on streams in the Piedmont Physiographic Province with drainage areas less than 10 mi².

Harmonic mean flow was less than the 50-percent flow duration at all gaging stations for all periods of record analyzed. The harmonic mean flow was greater than the 90-percent flow duration at all gaging stations except two on the highly regulated Delaware & Raritan Canal and Lawrence Brook (fig. 1). Harmonic mean flow was greater than the 80-percent flow duration at all gaging stations except those with reservoir regulation and most gaging stations draining areas less than 10 mi² in the Piedmont Physiographic Province. Harmonic mean flow was greater than the 75-percent flow and the 70-percent flow for more than 75 percent and 35 percent of the gaging station periods of record analyzed, respectively.

The harmonic mean flow was within 10 percent of the 60-percent flow duration at most gaging stations without substantial regulation in the Coastal Plain. At most gaging stations, the two statistics agreed within 5 percent. At four gaging stations in the outer Coastal Plain along the Atlantic Ocean, however, the harmonic mean flow was more than 30 percent lower than the 60-percent flow duration. The harmonic mean flow at these sites was within 10-percent of the 70-percent flow duration.

The harmonic mean flow was also within 10 percent of the 60-percent flow duration at unregulated gaging stations on the Lamington River, Mulhockaway Creek, Musconetcong River, Pequest River, South Branch Raritan River, Spruce Run, and Whippany River (fig. 1) in the New England Physiographic Province. Also, harmonic mean flows at gaging stations on the Elizabeth River, Second River, and Third River (fig. 1) in the Piedmont Physiographic Province in northeastern New Jersey were within 10 percent of the 60-percent flow duration. At regulated gaging stations on the Assunpink Creek (fig. 2), Delaware River, Hackensack River, Pompton River, Raritan River, Saddle River, and South Branch Raritan River (fig. 1) harmonic mean flows were within 13 percent of the 60-percent flow. Harmonic mean flows were less than the 60-percent flow duration at most unregulated gaging stations in the Piedmont and Valley and Ridge Physiographic Provinces.

Harmonic mean flows matched the 70-percent flow duration to within 10 percent at all four unregulated gaging stations on the Flat Brook, Paulins Kill, Pequest River, and Wallkill River (fig. 1) in the Valley and Ridge Physiographic Province. There are no clear similarities in physiographic province or flow regulation at the remaining gaging stations where the harmonic mean flows were closest to the 70-, 75-, or 80-percent flow durations. The gaging stations in each group are located across different regions of the State and on streams with and without regulation.

The harmonic mean flow was closest to the 90-percent flow at seven gaging stations in the Piedmont Physiographic Province. Four of the gaging stations monitor unregulated flow; three of these gaging stations measure flow draining

Figure 13. Relation of harmonic mean flow to 75-percent flow duration for 158 periods of record at 138 gaging stations with greater than 10 years of record on selected streams in New Jersey. (r^2 , correlation coefficient; N, number of records.)

from less than 2.5 mi², and one gaging station measures flow draining from 7 mi². The other three gaging stations in the Piedmont Physiographic Province are on regulated streams.

Streamflow Variability

Streamflow variability as defined by the ratios of 25-percent/75-percent and 10-percent/90-percent flow durations, and the ratios of 1-day 2-year high flow/1-day 2-year low flow and 1-day 20-year high flow /1-day 20-year low flow was analyzed for all gaging stations with 10 or more years of record. Ratios at gaging stations in the Coastal Plain were compared with ratios at gaging stations located outside of the Coastal Plain. Comparisons also were made between gaging stations grouped by land-use category in the Coastal Plain and other physiographic provinces. Gaging stations affected by substantial regulation were removed from the groups before making comparisons.

Streamflow variability was substantially greater among the group of gaging stations located outside the Coastal Plain than the group of gaging stations located in the Coastal Plain. The median value of the 25-percent/75-percent ratio was 4.12 for the 38 analyzed stations outside the Coastal Plain and 2.16 for the 20 analyzed stations in the Coastal Plain. All four ratios were substantially higher for the group of gaging stations outside the Coastal Plain than for the group of gaging stations inside the Coastal Plain.

Streamflow variability was compared between gaging stations in different land-use categories. Gaging stations with greater than 30 percent of their drainage area categorized as developed land were compared with gaging stations with 70 percent or more of their land area categorized as undeveloped. Ratios of 1-day 2-year high flow/1-day 2-year low flow and 1-day 20-year high flow /1-day 20-year low flow were substantially higher at gaging stations draining developed basins than at gaging stations draining undeveloped basins in the Coastal Plain, indicating more variability in flow. No considerable differences in ratios of flow duration were observed between gaging stations in developed and undeveloped basins in the Coastal Plain. No considerable differences in streamflow variability were observed between the groups of gaging stations in developed and undeveloped basins located outside the Coastal Plain.

Developed sites were categorized as urban, agricultural, or mixed. Gaging stations with greater than 16-percent agricultural land were categorized as agricultural sites, and those with greater than 40-percent urban land use were categorized as urban sites. The ratios of high-flow to low-flow frequency were considerably different for gaging stations at undeveloped sites and both urban and agricultural sites in the Coastal Plain. Gaging stations that monitor flows from agricultural and urban areas had substantially higher streamflow variability than gaging stations with flows from undeveloped areas.

The coefficient of variation is another indicator of streamflow variability used to quantify the variability of daily mean

streamflow. Streams with the lowest coefficient of variation have the least variability in daily mean streamflow. The coefficient of variation was highest (from 207 to 405) for small unregulated streams in the southern area of the Piedmont Physiographic Province and lowest (from 41 to 93) for streams in the Pinelands area (fig. 5) of the Coastal Plain. The only gaging station with a coefficient of variation lower than the gaging stations in the Pinelands region was the Delaware and Raritan Canal at Port Mercer (01460440) (fig. 2), which had a value of 16.7. The flow in the Delaware and Raritan Canal is regulated at a fairly constant rate for water-supply purposes. Streams in the Pinelands region have lower variability in daily mean flow than streams in other areas of New Jersey because a high percentage of total annual streamflow originates from ground water. Base flow accounts for 70 to 90 percent of mean annual flow at these gaging stations (CH2M Hill and others, 1992). Base flow accounts for approximately 30 to 50 percent of mean annual flow at the gaging stations with the highest coefficients of variation.

Gaging stations on the Lamington River, Pequest River, and Musconetcong River (fig. 1) are the only sites, other than those in the Coastal Plain, with coefficients of variation less than 100. Base flow in these streams is a higher percentage of mean annual flow (78–84 percent) than in most other streams in the study area, except those in the Pinelands area (CH2M Hill and others, 1992). The only other sites outside the Piedmont Physiographic Province with a coefficient of variation greater than 200 are on the Salem River (fig. 2) in an agricultural area of the inner Coastal Plain, on Blue Mine Brook (fig. 1) in an undeveloped area of the New England Physiographic Province, and at four gaging stations on regulated streams scattered across the study area.

Trends in Streamflow

The goals of the streamflow trend analysis were to determine whether there were trends in specific annual *n*-day high flows and low flows and to provide a general assessment of the effects that development in watersheds upstream from streamflow-gaging stations could have on the trend results. A general assumption is that increased development in a watershed would result in lower streamflows during dry weather and higher streamflows during storms. Some of the factors that can cause these effects on streamflow are an increase in impervious cover, an increase in water use, an increase in stormwater-drainage systems, and an increase in wastewater sewers and treatment facilities. Development patterns in New Jersey have left a few watersheds that have been sparsely developed over the past 40 years, and much of this development has occurred upstream from the gaging stations used in this analysis.

Trend analysis was done for 138 gaging stations with a total of 159 different records. For 20 stations, the period of record (length of time that data is collected at a gaging station) was often split into two periods as a result of substantial hydrologic changes in the watershed upstream from the

station (for example, dams, diversions, wastewater discharges). Streamflow data through water year 2001 were used for the computations at the continuous-record stations. The Kendall Tau trend test was conducted with SWSTAT, a surface-water statistics program (Flynn, 1995), to analyze the annual 1-, 7-, and 30-day high- and low-flow data sets. The outcomes for each record were a Kendall Tau coefficient, a p -value, and a slope for each of the annual n -day high- and low-flow periods (table 3 and 4 [back of report]), the actual values are listed in appendix 3A–B). When the Kendall Tau coefficient is negative, there is a downward trend. When the Tau is positive, there is an upward trend. The p -value determines the significance of the results. A p -value equal to or less than 0.05 is considered a significant result. The results for three categories of gaging-station record—all gaging stations, regulated gaging stations, and unregulated gaging stations—for the 1-, 7-, and 30-day high- and low-flow are summarized in table 5a. The number and percentage of gaging stations with significant upward and downward trends are presented for each n -day flow condition in table 5b.

A stream is considered regulated if changes in the hydrologic characteristics of the drainage basin (reservoir, large sewage-treatment-plant discharge, large surface-water diversions) upstream from the gaging station could have a substantial effect on low flows and in some cases on high flows (Robert Schopp, U.S. Geological Survey, written commun., 2003). The unregulated gaging stations are those with man-made hydrologic changes in the drainage basin upstream from the gaging stations that are not considered substantial enough to affect low-flow statistics. Although these gaging stations are considered to be unregulated for this analysis, there have been some hydrologic modifications (ground-water diversions for example, wastewater-treatment facilities) over the period of record for some of the gaging stations. The designation of gaging stations as regulated or unregulated will be re-evaluated for any possible future flow-trend analysis studies performed by the USGS.

Trend results indicate upward trends at most sites for the annual 1-, 7-, and 30-consecutive-day high flows based on the Kendall Tau analysis; but not all results were statistically significant. The significant results for the 1- and 7-day high flows for records from all gaging stations indicate most trends were upward, but trends for 30-day high flows were almost evenly split. Five gaging stations had upward trends and six gaging stations had downward trends (table 5b). The percentages of all records with significant high-flow trends were 16, 11, and 7 for the 1-, 7-, and 30-day flows, respectively. The low-flow trends were essentially even for all records for each flow regime. The significant low-flow trend results for all records for all flow regimes were upward trends, though the 7-day flow was close to evenly split. The percentages of all records with significant low-flow trends were 25, 25, and 19 for the 1-, 7-, and 30-day periods, respectively.

Of the total 159 records, 86 records were for regulated gaging stations (appendix 1-A). Trend test results indicate an upward trend for the 1-, 7-, and 30-day high flows at most reg-

ulated gaging stations. Not all results were significant. Of the significant results, trends were mostly upward for the 1- and 7-day high flows, and for the 30-day high flows, four trends were downward and three were upward. The percentages of regulated gaging stations with significant trends were 19, 13, and 8 for the 1-, 7-, and 30-day high flows, respectively. Most of the low-flow trends for the regulated gaging stations were upward, and the significant results represent a relatively large percentage of the gaging station records compared with the results for the unregulated gaging station records. For the 1-, 7-, and 30-day low flows, the percentages of regulated gaging stations with significant results were 28, 33, and 26, respectively. It was expected that the statistics for low flows at regulated gaging stations might not be consistent with those for the unregulated stations, but it was not expected that most of the significant trend results for the low flows tested would be upward. An example of a regulated gaging station is Saddle River at Lodi (01391500), which has upward low-flow trends and upward high-flow trends. One factor that could have affected these trends is the addition of a major sewage-treatment plant upstream from the gaging station. Other factors that could affect the trend analysis are discussed below.

Seventy-three of the 159 periods of record analyzed are for unregulated gaging stations (appendix 1-A). Trend test results indicate an upward trend for the 1-, 7-, and 30-day high flows at most unregulated gaging stations. The significant high-flow trends were mainly upward for the 1- and 7-day flows. The significant 30-day flows were evenly split between upward and downward trends. The percentages of unregulated gaging stations with significant high-flow trends were 14, 12, and 5 for the 1-, 7-, and 30-day flows, respectively. Trend test results indicate a downward trend for the 1-, 7-, and 30-day low flows at most unregulated gaging stations. Most significant results were determined to be downward for the 7- and 30-day flows, and the 1-day flows were evenly split. The percentages of unregulated gaging stations with significant low-flow trends were 22, 16, and 12 for the 1-, 7-, and 30-day, respectively.

Fourteen gaging stations in the unregulated gaging station data set are on streams with little developed land (less than 15-percent) upstream from the gaging station; the streams are considered to be natural streams because the areas they drain are undeveloped (table 2). Because of the sparse development upstream from these sites, changes in streamflow trends at these sites would be related more to climate or precipitation than to regulation or development. The trends for high flows were almost evenly split between upward and downward. Only one trend for high flows was significant, and it was an upward trend for the 7-day flow. The low-flow trends were mostly downward (11 out of 14 gaging stations) with three significant downward trends each for the 1-, 7-, and 30-day low flows and one significant upward trend result for the 1-day low flow. The unregulated gaging stations with greater than 15-percent developed land had mostly upward trends for the high flows, and the significant results also were mostly upward. Most of the low-flow trends were downward, but the significant low-

Table 5a. Results of trend tests on records of highest and lowest annual n -day flow for streamflow-gaging stations in New Jersey.

[n , number of streamflow-gaging records; +, positive Kendall Tau value; -, negative Kendall Tau value; significant = p -value <0.05]

Number of records	Trend tests					
	1-Day		7-Day		30-Day	
	Trend	Percent (n)	Trend	Percent (n)	Trend	Percent (n)
Annual high-flow trends						
All gaging station records $n = 159$	+	57 (90)	+	57 (91)	+	55 (88)
Regulated gaging station records $n = 86$	+	62 (53)	+	57 (49)	+	55 (47)
Unregulated gaging station records $n = 73$	+	58 (42)	+	58 (42)	+	56 (41)
Annual low-flow trends						
All gaging station records $n = 159$	+	56 (89)	-	51 (81)	+	50 (80)
Regulated gaging station records $n = 86$	+	63 (54)	+	59 (51)	+	59 (51)
Unregulated gaging station records $n = 73$	-	52 (38)	-	63 (46)	-	60 (44)

Table 5b. Significant results of trend tests on records of highest and lowest annual n -day flow for streamflow-gaging stations in New Jersey.

[n , number of streamflow gaging records; +, positive Kendall Tau value; -, negative Kendall Tau value; significant = p -value <0.05]

	Trend tests								
	1-Day, significant			7-Day, significant			30-Day, significant		
	Number of stations	Trend	Percent (n)	Number of stations	Trend	Percent (n)	Number of stations	Trend	Percent (n)
Annual high-flow trends									
All gaging stations	26	+	77 (20)	18	+	78 (14)	11	-	55 (6)
Regulated gaging stations	16	+	69 (11)	11	+	73 (8)	7	-	57 (4)
Unregulated gaging stations	10	+	90 (9)	9	+	78 (7)	4	-	50 (2)
Annual low-flow trends									
All gaging stations	40	+	68 (27)	40	+	53 (21)	31	+	61 (19)
Regulated gaging stations	24	+	79 (19)	28	+	61 (17)	22	+	68 (15)
Unregulated gaging stations	16	+	50 (8)	12	-	67 (8)	9	-	56 (5)

flow trends were mixed. Of the 1-day low flow trends, seven were upward and five were downward. Of the 30-day low flow trends, four were upward and two downward, and of the 7-day low-flow trends, four were upward and five were downward.

The overall results of the trends analysis show that high-flow trends for the regulated and unregulated gaging stations were upward. The gaging stations with significant trend results also showed an upward trend for the regulated and unregulated gaging stations for the 1- and 7-day flows, whereas the 30-day flows were approximately evenly split between upward and downward trends. The trend results for the unregulated gaging stations at sites identified as undeveloped did not show high-flow trends. The high-flow trend results indicate a relation between upward high-flow trends and stream regulation and development. An increase in development leads to increased impervious cover and, therefore, increased high and low flows.

The low-flow trend results for regulated gaging stations indicate that most of the gaging stations had an upward trend, and the significant trend results indicate that most of the gaging stations had upward trends. The results indicate a relation between regulated gaging stations and upward trends. Most of the low-flow trends for the unregulated gaging stations were downward, and most of the significant results were downward trends for the 7- and 30-day low flows. Significant results were evenly split for the 1-day low flows. In addition, the results might indicate a relation between downward flow trends and unregulated gaging stations and development, but the trend results for the undeveloped sites also were downward. This downward trend could indicate that there are other variables affecting the trends for the unregulated gaging stations. The relation of development to low-flow trends does not appear to be as strong as development to high-flow trends. The winter trend results for both high and low flows for each gaging station, in general, were similar to the trend results based on the annual data.

The trends results for two streamflow-gaging stations representing an undeveloped site and a drainage area undergoing development were compared to better assess the overall results of the trends analysis. Because both gaging stations are located in the same climate division, it was assumed that any trends in rainfall would have a similar effect on each gaging station. The two gaging stations are Flat Brook near Flatbrookville (01440000) (fig. 1), which is considered to represent an undeveloped, unregulated gaging station in northern New Jersey, and Rockaway River above Reservoir at Boonton (01380500) (fig. 1) in northern New Jersey, which is considered in the trend analysis to be an unregulated gaging station with development. Although the watershed is only 30-percent developed, the development has occurred throughout the period of record. In addition, the volume of ground-water withdrawals in the Rockaway River Basin has increased considerably over the period of record along with the amount of wastewater generated in the basin but discharged downstream from the gaging station. The trends for these two gaging stations for the 1-day high flow and 7-day low flow are illustrated in figure 14. The station at Flat

Brook near Flatbrookville had no significant results for low or high flows, although the trend was downward for all low flows and upward for all high flows. The station at Rockaway River above Reservoir at Boonton had a significant upward trend for the 1-day high flow and upward trends for the 7- and 30-day high flows. The low-flow trend results were downward for the 1- and 7-day low flows and upward for the 30-day low flow. No significant results were obtained for low-flow trends. Although this comparison is limited, it indicates a relation between development and high-flow trends and no strong relation between development and low-flow trends.

A greater number of significant trend results were expected for gaging stations with land-use changes during their period of record than were obtained. A number of variables directly affect streamflow and probably affected the results of the analysis. Some of these variables are precipitation trends, land-use changes, water-diversion trends, location of withdrawals, wastewater-discharge trends, location of discharges, and the period of record for the streamflow-gaging station being analyzed.

Long-term trends in precipitation have an obvious effect on streamflow trends, but short-term events can greatly affect the analysis. Data for 138 gaging stations with different periods of record (10 to 83 years of record) were used in the analysis. As the record used in the analysis gets shorter, the effects of a short-term event, such as the drought of the 1960s (4 to 5 year drought) (Bauersfeld and others, 1988) or the sharp increase in annual rainfall in the 1970s (fig. 15), could be significant. For example, if a gaging station period of record started in 1960 and ended in 1980 (20 years), the record would probably show a significant upward trend in low and high flows no matter how much development occurred in the drainage area. A plot of the 10-year moving average for the 7-day low flow at 01396500 South Branch Raritan River near High Bridge, N.J., is shown in figure 16. A definite downward slope during the late 1960s and an upward slope through the mid- to late 1970s is seen.

The drainage basins upstream from some gaging stations in New Jersey have had a dramatic increase in population and water use over the years of gaging-station record. In some areas, a large percentage of the water supply is coming from a source outside the basin, and the resultant wastewater is discharged upstream from the gaging station. In this situation, the increase in wastewater discharged could counteract an increase in impervious cover (decrease in infiltration) and result in no trend or an upward trend for low flow, especially where the discharge is a large percentage of low flow (Saddle River at Lodi, 01391500, fig. 1). In addition, many watersheds in New Jersey have changed from agricultural land use to suburban land use with an actual increase in forested acreage. In the Raritan River Basin, an estimated 13 percent of the land use was forested in the early 1900s (Smock, 1897), whereas in 1996 forested land use was estimated to be 35 percent of the watershed (Reiser and O'Brien, 1998). Use of watershed rainfall-runoff model, done for this study, rather than a statistical analysis probably could produce a better evaluation of the

Figure 14. Kendal Tau trend lines for 1-day high and 7-day low flows at continuous-record streamflow-gaging stations on Flat Brook near Flatbrookville, N.J. (01440000), and Rockaway River above the Reservoir at Boonton, N.J. (01380500).

Figure 15. Total annual precipitation for New Jersey Climatic Divisions 1 and 2, water years 1895–2001.

Figure 16. Annual 7-day low flow from water year 1919 through 2001 with a 10-year moving average line for the continuous-record streamflow-gaging station South Branch Raritan River near High Bridge, N.J. (01396500).

effects of land-use changes on streamflow trends. Even subtle land-use changes can affect flow trends. As stated previously, it is expected that suburban sprawl will decrease low flows and increase high flows because of greater withdrawals, more impervious cover, and larger stormwater systems. Since approximately the beginning of the 1980s, there has been a large increase in the use of detention/recharge basins to control storm runoff in housing developments in New Jersey. Such structures tend to modify streamflows and affect streamflow trends.

Stream regulation in a basin also can affect conditions in a watershed to various degrees. Increased wastewater discharges likely result in an upward trend for low and high flows as discussed above, whereas water-supply withdrawals likely result in a downward trend for low and high flows. Retention of water in a reservoir on a stream with a minimum passing flow could result in higher low flows but lower high flows by modifying peak runoff. The difficulty in analyzing the trend results is that many of these changes are occurring at different times and at varying rates in watersheds throughout New Jersey, and much of the data (long-term point-source discharge data, long-term withdrawal data, land-use data, and long-term streamflow data) needed to fully analyze flow trends are difficult to obtain or have not been collected.

Comparison of Trends in Precipitation to Trends in Flow at Undeveloped Sites

Precipitation trends can affect streamflow trends. An upward trend in precipitation likely results in an upward trend in high and low flows; the reverse likely results with a downward trend in precipitation. The season of the year along with

an upward or downward precipitation trend may not affect the low or high streamflows. If the trend in precipitation is upward in winter and spring and downward in summer and fall, the result could be an upward trend for high flows but a downward trend for low flows. As presented in the streamflow trend analysis, short-term climate events (drought for 2–3 years or above average precipitation for 2–3 years) also can affect streamflow trends when one or both of these events constitute a large percentage of the gaging station record.

Monthly precipitation records for New Jersey Climate Divisions 1 and 2 and for eight individual rain gages in New Jersey were retrieved from the National Oceanic and Atmospheric Administration National Climatic Data Center (National Oceanic and Atmospheric Administration, 2000). Average annual precipitation values are given below. The long-term average annual precipitation for 1895 to 2001 in northern New Jersey Climate Division 1, which includes the Piedmont, New England, and Valley and Ridge Physiographic Provinces (fig. 4), is 46.1 in. The average annual precipitation for 1895 to 2001 in southern New Jersey Climate Division 2, which includes the Coastal Plain and part of the Piedmont Physiographic Province (fig. 4), is 44.2 in.

Climate division (fig. 4)	Average annual precipitation, in inches		
	1895–2001	1895–1970	1971–2001
1	46.1	44.6	49.8
2	44.2	43.7	45.6

The Wilcoxon rank-sum nonparametric test was used to determine whether precipitation totals significantly differed from the 1895–1970 to the 1971–2001 periods. Total annual precipitation was significantly greater during the 1971–2001

period than during the 1895–1970 period in northern New Jersey (Climate Division 1). No significant difference was observed between the two periods in Climate Division 2. Total monthly precipitation also was compared between the two periods. The only significant difference found between the 1895–1970 and the 1971–2001 periods were greater precipitation in May in both Climate Divisions during 1971–2001 than during 1895–1970.

A Kendall Tau trend test was performed on the total annual (table 6) and total monthly precipitation data for Climate Divisions 1 and 2 and for each of the eight individual gages. Trend tests also were run on total precipitation during the growing season and during the non-growing season at the individual rain gages. Data for the period of precipitation that most closely matched the nearby gaging-station record were used for trend analysis. Significant upward trends were detected for total annual precipitation and total monthly precipitation for May and November during 1895–2001 in Climate Division 1 in northern New Jersey. The only significant trend in the precipitation data for Climate Division 2 was a downward trend in February during 1895–2001. Of the eight rain gages, the Wertsville gage (fig. 17) in Climate Division 1 had the highest number of significant trends. A significant increase was observed in annual, growing season, non-growing season, and monthly totals from January through March, May, and September during 1956–2001. Upward trends for annual precipitation were observed for the Boonton gage (fig. 17). October precipitation significantly increased during 1938–97 at the Boonton gage. No trends were observed in precipitation data for the Newton, Long Valley, Ringwood, and Long Branch gages. Precipitation in January and May significantly increased at the Pemberton gage during 1954–2001. June precipitation significantly decreased at the Indian Mills gage.

Precipitation data were compared to the trend results for the gaging stations in undeveloped sites (less than 15 percent developed). There are 4 gaging stations at undeveloped sites in Climate Division 1 and 10 in Climate Division 2 (table 2).

Table 6. Results from Kendall Tau trend analysis for total annual precipitation at selected sites in New Jersey.

Rain gage	Period of record	Tau	p-value	Trend
Boonton	1926–97	0.2074	0.010	Upward
Indian Mills	1926–2001	-.0561	.473	None
Long Branch	1928–2001	.0026	.974	None
Long Valley	1931–2001	.0535	.509	None
Newton	1949–2001	.0639	.500	None
Pemberton	1949–2001	.0464	.624	None
Ringwood	1949–2001	-.0145	.878	None
Wertsville	1957–2001	.3212	.002	Upward
Climatic Division 1	1895–2001	.1469	.025	Upward
Climatic Division 2	1895–2001	.0180	.784	None

Overall, for the undeveloped sites, 11 of 14 gaging stations had downward trends for two or more low flows, and 8 of 14 gaging stations had upward trends for high flows. In Climate Division 1, two gaging stations had significant downward trends for at least one low flow, and one gaging station had a significant upward trend for one high flow. In Climate Division 2, one gaging station had a significant downward trend for at least one low flow. Although average rainfall in each Climate Division has increased between the period of 1895–1970 and 1971–2001 and Climate Division 1 had a significant upward trend for annual data, results of trend tests indicate downward low-flow trends for the undeveloped sites, which is contrary to the precipitation results.

Trend analysis was run on precipitation data for the five rain gages in Climate Division 1—Boonton, Ringwood, Newton, Wertsville, and Long Valley—and the three in Climate Division 2—Indian Mills, Long Branch, and Pemberton—to compare to streamflow trend data for gaging stations in undeveloped basins. Results of analysis indicated significant upward trends in precipitation at two of the rain gages, Boonton and Wertsville (fig. 4). No significant downward trends were determined at any rain gage. Significant downward trend results were determined for the 7- and 30-day low flows for Green Pond Brook at Picatinny Arsenal (01379773) (fig. 4), which is in the same drainage basin as the Boonton rain gage. Significant downward trends were observed for the 1-, 7-, and 30-day low flows at Blue Mine Brook near Wanaque (01386500) (fig. 4), and a significant upward trend was determined for the 7-day high flow. This gaging station is near the Ringwood rain gage, which did not have a significant precipitation trend. No significant trends were determined for Ringwood Creek near Wanaque (01384500) (fig. 4), but low flows decreased for each flow regime, and the high flow trend increased for the 7- and 30-day flow but decreased for the 1-day flow. A significant downward trend resulted for the 1-, 7-, and 30-day low flows at the gaging station at McDonalds Branch in Lebanon State Forest (01466500) (fig. 4) in Climate Division 2; no significant annual trends resulted for the precipitation gages Pemberton and Indian Mills in the same general area. A significant downward trend for June resulted for the Indian Mills rain gage, which could indicate the cause of the downward low-flow trends at the McDonalds Branch streamflow-gaging station.

The results of the comparison of the precipitation trend with the trend for streamflow in undeveloped basins, although limited, indicate that variables other than precipitation affect low flows in the State. Only one undeveloped site had significant upward high-flow trends, and the trends are nearly evenly split between upward and downward for other undeveloped sites for high flows. A general increase has occurred in average precipitation in Climate Division 2, and a significant increase has occurred in Climate Division 1. This result indicates that high flows from undeveloped, unregulated sites have not been affected by the increase in average precipitation and that the upward high-flow trends for the regulated and unregulated gaging stations are associated with increased development.

Figure 17. Results from Kendall Tau trend analysis of annual precipitation in New Jersey (a) Climatic Divisions 1 and (b) 2 and from rain gages at (c) Boonton and (d) Wertsville, New Jersey.

Trends in Peak Ratio at Selected Streamflow-Gaging Stations

Peak-ratio trend analysis was run on streamflow data for 28 gaging stations. These stations were chosen as representative of various levels of development and regulation throughout the State. Many of the gaging stations in regulated and unregulated areas have had substantial changes in land use and water use over the past 20 to 40 years. All gaging stations that were used in this analysis have minimal regulation at high flow and are considered appropriate for high-flow analysis.

The peak ratio is determined from annual peak flow, which is the value of the maximum instantaneous streamflow occurring in the water year divided by the 3-day mean flow for 3 consecutive days, including the days before, during, and after the peak. Peak ratio is a measure of the magnitude of the rise and fall of a stream over a given period of time. The peak ratio can be used as a method to define the flashiness of a stream. The higher the value, the greater the flashiness of the stream. The peak-ratio trend was determined for selected gaging stations using the Kendall's Tau test (Helsel and Hirsch, 2002). The test determines the probability that the null hypothesis of no significant trend can be rejected with a low risk of error. A *p*-value equal to 0.05 indicates there is a 95-percent chance that a trend is present.

Kendall's Tau trend test was used to analyze whether increased development and urbanization of New Jersey basins was increasing the variability/flashiness of streams. As presented in the discussion on streamflow trends, there are some basins in New Jersey that have not had an appreciable increase in suburban sprawl over the last 20 to 30 years. Some of this sprawl has resulted in a decrease in forested lands, whereas some has resulted in a decrease in farmland. In some areas, forested land has increased along with an increase in suburban sprawl and a decrease in agricultural land.

The results of the analysis show that six gaging stations had significant upward trends (table 7). Five of the six gaging stations are located in northern New Jersey in the New England and Piedmont Physiographic Provinces. Three gaging stations had a significant downward trend. Two are located in the Atlantic Coastal Plain, and the other one in the New England Physiographic Province. The remaining 19 gaging stations had no significant peak-ratio trend. These gaging stations are distributed fairly evenly throughout the State (fig. 18).

Land use was determined for areas upstream from the 28 gaging stations. Results of peak-ratio trends at gaging stations are listed in table 7 in descending order of the percentage of land considered developed. A total of 17 gaging stations had positive Kendal Tau values, indicating a general upward trend, whereas 11 had negative Kendal Tau values, indicating downward trends. All six gaging stations with significant upward trends have greater than 30-percent developed land use with a

large percentage of the developed land designated urban land use. Three gaging stations had significant downward trends; one has greater than 30-percent developed land use, and the other two have 21-percent and 17-percent developed land use. Gaging stations at three undeveloped sites were included in the analysis; no significant trends were observed at these sites. Although the increase in average precipitation and the upward precipitation trend in Climate Division 1 could be the cause of the upward trends in peak ratio, the peak-ratio trend results indicate that there is a relation between an increase in peak ratio and developed land use.

Estimates of Low-Flow Statistics at Ungaged Sites

The USGS receives many requests for low-flow statistics for stream sites that lack streamflow data, for example, points upstream from the outfall of permitted point-source discharges and surface-water intakes. The statistics are requested by Federal, State, and local agencies and by private consultants. The New Jersey Water Science Center has developed procedures for estimating low-flow statistics at these locations. Statistics, such as the 7-day 10-year low flow (7Q10), 1-day 10-year low flow, 30-day 10-year low flow for both the summer and winter periods, harmonic mean, mean annual flow, and flow durations (the flow that was exceeded for an indicated percentage of time less than or equal to the median flow), are the most commonly requested data. Long-term continuous records of daily streamflow at gaging stations and base-flow discharge measurements at low-flow sites are the data on which estimates of low-flow statistics at sites with no streamflow data—ungaged sites—are based.

An accurate location of the ungaged site is needed to provide the best estimate of streamflow. The location of tributaries, reservoir releases, surface-water withdrawals, point-source discharges, and well fields affects the low flow along a stream. The estimate of a low-flow statistic can vary substantially for a location upstream and a location downstream from these features.

Accuracy of the low-flow estimates at ungaged sites is a function of the sum of errors inherent in the collection and computation of streamflow data, the statistical methods used to compute the statistics at the gaging stations and low-flow sites, and the error involved in transferring those statistics to another stream site. These errors include discharge-measurement errors at the index site and at the low-flow sites (± 5 percent), errors in the computation of the daily mean flows at the index site, the standard error of prediction of the MOVE1 correlation between daily mean flows at the index site, and instantaneous measurements of flow at the low-flow sites. For these reasons, the estimates of flow are rounded to the nearest 0.1 ft³/s.

Table 7. Results of analysis for trends in peak ratios at selected streamflow-gaging stations in New Jersey.

[ID, identification; R, regulated gaging station; <, less than; %, percent]

Station ID	Station name	Significant peak-ratio trend	Tau	p-value	Percent urban (%)	Percent agricultural (%)	Total developed (%)	Physiographic province
01391500	Saddle River at Lodi, N.J. (R)	Upward	0.5502	<.0001	81	1	82	Piedmont
01394500	Rahway River near Springfield, N.J. (R)	Upward	.4060	<.0001	77	0	77	Piedmont
01475000	Mantua Creek at Pitman, N.J.	None	.0329	.6099	60	15	75	Coastal Plain
01398000	Neshanic River at Reaville, N.J.	None	-.0875	.0663	24	46	70	Piedmont
01400730	Millstone River at Plainsboro, N.J.	None	.2564	.2224	26	40	66	Coastal Plain
01377000	Hackensack River at Rivervale, N.J. (R)	Upward	.5377	<.0001	62	1	63	Piedmont
01402000	Millstone River at Blackwells Mills, N.J. (R)	None	-.0750	.0911	30	28	58	Piedmont
01403500	Green Brook at Plainfield, N.J. (R)	None	-.0647	.5258	52	1	53	Piedmont
01408000	Manasquan River at Squankum, N.J.	None	.0532	.2336	34	19	53	Coastal Plain
01381500	Whippany River at Morristown, N.J.	None	.0399	.6006	49	3	52	Piedmont
01400000	North Branch Raritan River near Raritan, N.J.	None	-.0073	.8829	28	22	50	Piedmont
01464500	Crosswicks Creek at Extontville, N.J.	None	.0437	.3048	15	32	47	Coastal Plain
01379000	Passaic River near Millington, N.J. (R)	None	.0341	.4512	36	9	45	Piedmont
01396500	South Branch Raritan River near High Bridge, N.J.	None	-.0406	.3995	28	15	43	New England
01398500	North Branch Raritan River near Far Hills, N.J.	None	-.0013	.9778	32	10	42	New England
01411000	Great Egg Harbor River at Folsom, N.J.	Upward	.3542	<.0001	29	8	37	Coastal Plain
01457000	Musconetcong River near Bloomsbury, N.J.	Downward	-.1066	.0088	20	17	37	New England
01445500	Pequest River at Pequest, N.J.	Upward	.1440	.0016	12	23	35	New England
01443500	Paulins Kill at Blairstown, N.J.	None	.0152	.7263	14	19	33	Valley and Ridge
01465850	South Branch Rancocas Creek at Vincentown, N.J.	None	-.0390	.6680	10	22	32	Coastal Plain
01380500	Rockaway River above Reservoir at Boonton, N.J.	Upward	.2153	.0119	29	1	30	Piedmont
01387500	Ramapo River near Mahwah, N.J.	None	.0204	.6724	19	2	21	Piedmont
01408500	Toms River near Toms River, N.J.	Downward	-.1795	.0300	18	3	21	Coastal Plain
01383500	Wanaque River at Awosting, N.J. (R)	None	.0610	.1277	16	1	17	New England
01409500	Batsto River at Batsto, N.J.	Downward	-.2747	.0006	5	12	17	Coastal Plain
01384500	Ringwood Creek near Wanaque, N.J.	None	-.0314	.5374	14	0	14	New England
01440000	Flat Brook near Flatbrookville, N.J.	None	.0362	.4527	3	5	8	Valley and Ridge
01466500	McDonalds Branch in Lebanon State Forest, N.J.	None	.0748	.2725	0	0	0	Coastal Plain

Figure 18. Results of peak-ratio trend analysis, by physiographic province, in New Jersey.

Ungaged Sites on Streams with Streamflow Data and No Regulation

Streamflow data from gaged sites located along the same stream as the ungaged site are the best sources of information on which to base an estimate of a low-flow statistic when no point-source discharges, diversions, or withdrawals occur between the sites. Drainage area is an essential factor used to transfer low-flow statistics from a gaged site to an ungaged site along a stream reach. The location of the ungaged site is used to calculate the drainage area upstream from the site. If the ungaged site is upstream or downstream from a gaging station or low-flow site on an unregulated stream, then a drainage-area ratio is used to transfer the low-flow data at the gaged site to the ungaged site. The flow contributed per unit area upstream from the gaged site is presumed to be same for the ungaged site.

The stream reach along the South Branch Raritan River from the low-flow site at Middle Valley (01396280) (fig. 19) downstream to the gaging station at High Bridge (01396500) (fig. 19) does not receive any discharge from point sources or lose any flow to withdrawals. In the previous section, data from these sites were used to demonstrate the MOVE1 correlation method of transferring statistics from a gaging station to a low-flow site. The drainage-area ratio method also can be used to transfer low-flow statistics from the gaging station to the site at Middle Valley. For the purpose of this example, the South Branch Raritan River at Middle Valley is treated as an ungaged site. In this example, the 7Q10 low flow is transferred from the gaging station at High Bridge to a low-flow site upstream on the South Branch Raritan River at Middle Valley. Estimates from the drainage-area ratio and the MOVE1 correlation technique are compared.

7Q10 flow is transferred from gaging station 01396500 South Branch Raritan River at High Bridge to a site upstream, 01396280 South Branch Raritan River at Middle Valley. The drainage area at gaging station 01396500 is 65.3 mi². The drainage area at the site at Middle Valley is 47.7 mi². The 7Q10 flow for gaging station 01396500 is 22.0 ft³/s. The 7Q10 flow for station 01396280 is to be determined.

- (1) Determine the drainage area (*DA*) ratio (no limits on the *DA* were used):

$$DA_{\text{ungaged}}/DA_{\text{gage}} = 47.7/65.3 = 0.73$$

- (2) Multiply the calculated ratio by the low-flow statistic for the gaging station:

$$0.73 \times 22.0 \text{ ft}^3/\text{s} = 16.5 \text{ ft}^3/\text{s} \text{ (7Q10 flow)}$$

The MOVE1 correlation analysis between the base-flow measurements at South Branch Raritan River at Middle Valley (01396280) and daily mean flows at gaging station 01396500 predicts a 7Q10 low flow of 14.1 ft³/s at 01396280 (fig. 8). The flow estimated from drainage-area adjustment is about 17 percent higher than the flow computed from the MOVE1 analysis. This example shows the difference between the estimate of 7Q10 low flow at a low-flow site using base-flow measurements and the estimate for the same site when no streamflow data are available. If no base-flow measurements had been made at the site, the result from the drainage-area ratio method would be used. Base-flow measurements allow for a more accurate estimate of 7Q10 low flow. Periods of base flow at the gaging station at High Bridge can be related directly to the base-flow measurements at the site at Middle Valley.

Ungaged Sites on Streams with Streamflow Data and Regulation

Surface-water withdrawals and point-source discharges are important factors to consider when transferring streamflow statistics from one site to another along a stream reach. When low-flow statistics are requested for a site downstream from a known withdrawal or point source, it is most effective to use data that reflect these human alterations. The drainage-area ratio method is not used to transfer the low-flow data from the gaged site to the ungaged site along a regulated stream reach. The Hackensack River Basin is an example of a highly regulated basin with streamflow-gaging stations and low-flow sites within the basin.

The streamflow in the Hackensack River downstream from the Oradell Reservoir is regulated by the DeForest Lake, Lake Tappan, Woodcliff Lake, and Oradell Reservoir (fig. 20). Water is diverted from Oradell Reservoir, DeForest Lake, and Hackensack River at West Nyack, New York, for municipal supply. Gaging stations on the Hackensack River at West Nyack, New York (01376800), at Rivervale, New Jersey (01377000), at New Milford, New Jersey (01378500), and Pascack Brook at Westwood, New Jersey (01377500) (fig. 20) record streamflows in the basin.

This following example shows the procedure for estimating the 7Q10 low flow at an ungaged site on the Hackensack River at Hackensack (fig. 21). The gaging station on the Hackensack River at New Milford (01378500) (fig. 21) is the most downstream streamflow-gaging station in the basin. This station records the flow in the Hackensack River downstream from all withdrawals and diversions. The Hackensack River between the gaging station and the city of Hackensack receives water from the regulated releases on the river and

Figure 19. Location of continuous-record streamflow-gaging stations and low-flow partial-record stations in the North and South Branch Raritan Watershed Management Area (WMA) in New Jersey.

Figure 20. Location of lakes, reservoirs, and selected streamflow-gaging stations upstream from the Hackensack River in New Jersey and vicinity.

Figure 21. Locations of continuous-record streamflow-gaging stations, low-flow partial-record stations, and an ungaged site in the Hackensack and Pascack and the Lower Passaic and Saddle Watershed Management Areas, New Jersey.

from various tributaries that drain to the river. The drainage-area method cannot be used to accurately transfer the low-flow statistics from the gaging station to the site on the Hackensack River at Hackensack because the intervening area receives streamflow from unregulated sources.

The drainage area at the point of interest along the Hackensack River at Hackensack is essential information for analysis. The drainage area delineated for the ungaged site is 131 mi². The drainage area at the gaging station is 113 mi². The 7Q10 flow at the gaging stations is known. The 7Q10 flow for the 18 mi² intervening area is unknown and will be estimated from data on unregulated low-flow sites in the area.

Three major tributaries with drainage areas greater than 0.5 mi² in size—Coles Brook, French Brook and Hirschfeld Brook—drain into the Hackensack River along the reach (fig. 21). A low-flow site is present on each of the three major tributaries. The MOVE1 correlation analysis, as explained in the section on low-flow sites, is used to compute the 7Q10 flow at each of these sites. The 7Q10 flow from the gaging station and the three low-flow sites were added together. The drainage areas at the gaging station in New Milford (01378500) (fig. 21) and at the three low-flow sites also were added together. The drainage areas at these sites total 125 mi², which is subtracted from the total drainage area at the Hackensack River at Hackensack. The remaining 6.00 mi² is the intervening area that contributes an unknown amount of flow to the Hackensack River. The flow estimated at the low-flow sites is representative of flow from this intervening area. The 7Q10 flow at each low-flow site is divided by the drainage area to give a flow per square mile value. The average 7Q10 flow per square mile for the three low-flow sites is used to estimate the contribution from the intervening area. In this case, the average 7Q10 flow per square mile is 0.145 ft³/s.

The total 7Q10 flow, in cubic feet per second, at the Hackensack River at Hackensack, New Jersey, is the sum of the following computed and estimated 7Q10 flows:

New Milford (0.0 ft³/s) + Coles Brook (0.92 ft³/s) +
French Brook at mouth (0.07 ft³/s) +
Hirschfeld Brook at mouth (0.83 ft³/s) +
intervening area (0.145 ft³/s/mi² × 6.0 mi²) = 2.7 ft³/s

Ungaged Sites on Streams with No Streamflow Data and No Regulation

If no streamflow data are available for the stream on which the ungaged site is located, averages of the flow per square mile at three to six nearby gaging stations or partial-record stations are used to estimate flows at the site of interest. No limits were set on distance from site, physiographic area, or drainage area. A map of gaging stations and partial-record stations in the area is used to locate the sites closest to the ungaged location. At least three gaging stations and (or) partial-record stations are chosen for the estimation of low-flow statistics at the ungaged site. Sites affected by known point

sources or withdrawals are not chosen. The drainage area at the ungaged site, again, is an essential factor in estimating low-flow statistics. The low-flow values from each of the nearby sites are divided by the drainage area to give a flow per square mile value. The average flow per square mile from the nearby sites is multiplied by the drainage area at the ungaged site to obtain an estimated low-flow value.

The following example represents a calculation of determining the 1-, 7-, and 30-day 10-year low flows on an unnamed tributary to Lake Iliff. Lake Iliff is located on an unnamed tributary to the Pequest River (fig. 22). No streamflow data are available for the unnamed tributary to the Pequest River. The drainage basin at the specified location was delineated and found to drain an area of 0.28 mi². The low-flow sites on the Pequest River at Huntsville (01445000), the Wallkill River at the outlet of Lake Mohawk at Sparta (01367620), and the discontinued gaging station on the East Branch Paulins Kill tributary 2 at Woodruff (01443260) (fig. 22) were chosen to represent low flows in the area. All three sites are located within a 5-mile radius of the ungaged site. The flow statistics at each of the three sites were computed from MOVE1 correlation analysis. The statistics were converted to a flow-per-square-mile value and averaged with the flow-per-square-mile values estimated at the other two sites. For the 7Q10 flow, the flow-per-square-mile values were very close. The three values ranged from 0.062 ft³/s/mi² to 0.075 ft³/s/mi². The average flow per square mile (0.068 ft³/s/mi²) was multiplied by the drainage area of 0.28 mi² to give an estimate of 0.019 ft³/s. Estimated flows are rounded to the nearest 0.1 ft³/s, resulting in an estimate of 0.0 ft³/s.

Ungaged Sites Downstream from a Permitted Point Source

Low-flow statistics at ungaged sites downstream from major permitted point sources can be estimated from data for gaging stations or low-flow sites, including sites affected by permitted point-source discharge, or from data for sites that are unaffected by the discharge. Streamflow data for sites on the stream are preferred and are used when available. The flow-per-square-mile value at a site located downstream from the major point source is used when point-source discharge is included in the estimate. When natural streamflow estimates are requested, statistics are computed from streamflow data for gaging stations and partial-record stations upstream from the point source and other sites on unregulated streams in the area. Streamflow statistics for these sites are divided by the drainage area at the site. The flow-per-square-mile values for all the sites chosen in the area are averaged. The average value is multiplied by the drainage area at the ungaged site. When natural streamflow estimates are requested, data from sites downstream from the major point source are not used because the permitted discharge cannot be deducted accurately from the streamflow data because historical records of point-source

Figure 22. Locations of an ungaged site on an unnamed tributary to Lake Iliff and continuous-record streamflow-gaging stations and low-flow partial-record stations in the Upper Delaware and Wallkill Watershed Management Areas in New Jersey.

discharge usually are not readily available. Current data (2005) on discharges from permitted point sources are more readily available than historical data; however, discharges vary over time and accurate adjustments to historical streamflow cannot be computed.

Summary and Conclusions

Streamflow measurements and statistics are needed by engineers, water managers, and planners. High-flow statistics are used to design bridges, dams, and flood-control structures, whereas low-flow statistics are used for allocating surface-water withdrawals and for setting waste-load allocation limits. The statistics also are a critical part of studies of total maximum daily loads. In order to update streamflow statistics for New Jersey the U.S. Geological Survey (USGS), in cooperation with the New Jersey Department of Environmental Protection (NJDEP), analyzed the continuous records of streamflow at 111 gaging stations throughout New Jersey with 20 or more years of record through the 2001 water year. The characteristics presented for the long-term continuous-record stations are minimum, maximum, and mean daily streamflow; harmonic mean flow; 1-, 7-, and 30-day minimum average low flow with 2-, 5-, 10-, and 20-year recurrence intervals; 1-, 7-, and 30-day maximum average high flow with 2-, 5-, 10-, and 25-year recurrence intervals; and 1-, 2-, 5-, 10-, 20-, 25-, 30-, 40-, 50-, 60-, 70-, 75-, 80-, 85-, 90-, 95-, 99-percent daily flow durations. Flow frequencies and flow durations are presented for both annual and winter (November through April) periods.

Instantaneous measurements of streamflow at low-flow conditions at 500 partial-record stations, including 66 gaging stations with less than 20 years of record, were used to estimate streamflow statistics for these sites. MOVE1 correlation analysis was used to relate instantaneous base-flow measurements at the partial-record stations to daily mean discharges at long-term continuous-record gaging stations. The characteristics presented for the partial-record stations are daily mean flow; harmonic mean flow; and 1-, 7-, and 30-day minimum average low flow with a 10-year recurrence interval for the annual and winter periods.

Tables of the streamflow statistics reported in this document are available on the USGS World Wide Web site at <http://pubs.water.usgs.gov/sir20055105/>. Information presented on the Web site will be updated to include revised estimates of statistics at partial-record stations as new data are collected and MOVE1 correlations are rerun and analyzed.

Harmonic mean flow was computed for all the gaging stations with 10 or more years of record and estimated for all partial-record stations. Harmonic mean flows at gaging stations were compared to statistics of flow duration and low-flow frequency by evaluating percent differences at each

site and by using ordinary least squares regression. The statistic most closely related to the harmonic mean flow, when studying all gaging stations in the study area, was the 75-percent flow.

The variability in streamflow at a gaging station was measured using the coefficient of variation, the ratio of instantaneous peak flow to 3-day mean flow surrounding the peak, the ratios of 25-percent/75-percent and 10-percent/90-percent flow durations, and the ratios of 1-day 2-year high flow/1-day 2-year low flow and 1-day 20-year high flow /1-day 20-year low flow. Streamflow variability was significantly greater among the group of gaging stations located outside the Coastal Plain than the group of gaging stations located inside the Coastal Plain. The median value of the 25-percent/75-percent ratio was 4.12 for the 38 analyzed gaging stations outside the Coastal Plain and 2.16 for the 20 analyzed gaging stations in the Coastal Plain. Streamflow variability also was compared between gaging stations in different land-use categories. In the Coastal Plain, significant differences in streamflow variability were found between gaging stations draining areas with more than 30-percent developed land and those draining areas with more than 70-percent undeveloped land. Variability was greater in the developed basins.

Trend tests were run on the annual 1-, 7-, and 30-day high- and low-flow data sets. The percentages of gaging stations with significant high-flow trends were 16, 13, and 7 for the annual 1-, 7-, and 30-day periods, respectively. The percentages of gaging stations with significant low-flow trends were 25, 25, and 20 for the annual 1-, 7-, and 30-consecutive-day periods, respectively.

The trend analysis for the unregulated gaging stations identified as undeveloped sites did not indicate high-flow trends, except for the 7-day mean at one gaging station. The results of trend tests for high flows indicate relations between upward trends for high flows and stream regulation, and high flows and development in the basin. The relation between development and low-flow trends does not appear to be as strong as for development and high-flow trends.

A significant upward trend in precipitation in northern New Jersey, Climate Division 1 was identified. For Climatic Division 2, no general increase in average precipitation was observed. Trend test results indicate that high flows at undeveloped, unregulated sites have not been affected by the increase in average precipitation. The high-flow trends at regulated and unregulated gaging stations could be associated with increased development.

Low-flow statistics are estimated for stream sites with no flow data. Procedures are presented for estimating statistics at ungaged sites on streams with (1) streamflow data and no regulation, (2) streamflow data and regulation, (3) no streamflow data and no regulation, and (4) no streamflow data downstream from a permitted point source.

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Glossary

B

base flow Sustained or fair weather streamflow in the absence of direct runoff. It includes natural and human-induced streamflows. Natural base flow is sustained largely by ground-water discharge.

C

climatic year A continuous 12-month period during which a complete annual cycle occurs, arbitrarily selected for the presentation of data relative to hydrologic or meteorologic phenomena. The climatic year is usually designated by the calendar year during which the most of the 12 months occur.

coefficient of variation The standard deviation divided by the mean for a given data series, a dimensionless measure of relative variability.

continuous-record streamflow-gaging station (gaging station) A site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained, a site where data are recorded with sufficient frequency to define daily mean values and variations within a day.

cubic foot per second (ft³/s or cfs) The rate of streamflow representing a volume of 1 cubic foot passing a given point in 1 second.

D

daily mean streamflow data Average of the continuous record of streamflow at regular, pre-determined intervals during the day.

design flow The regulatory streamflow used to establish New Jersey Department of Environmental Protection water-quality criteria and permit requirements.

diversion In this report, a diversion is the taking of water from a stream or other body of water into a canal, pipe, or other conduit.

drainage area Land area measured in the horizontal plane, upstream from a specific

location on a stream where runoff from precipitation and discharge from ground-water sources drain by gravity into the stream.

F

flow, natural The flow of a stream as it occurs under natural conditions; that is, not subjected to any regulation or diversion.

flow, regulated The flow of a stream that has been subjected to any artificial or man-made storage, augmentation, or diversion.

flow-duration curve A cumulative-frequency curve that shows the percentage of time that specified discharges are exceeded. The flow-duration curve is based on daily mean flow from the period of record, but the chronologic sequence of flows is omitted from consideration in the preparation of the curve. Therefore, it is impossible to tell from the flow-duration curve alone whether varying periods of low flow all occurred during one drought period or were scattered over a number of years. The flow-duration curve is, however, useful for studying the flow characteristics of a stream over its entire range of discharge.

G

gaging station A site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained.

L

low-flow frequency curve A graph showing the relation between the magnitude and frequency of the annual lowest mean flow for a given number of consecutive days. Low-flow frequency is expressed as the average interval, in years, between recurrences of an annual minimum flow less than that shown by the magnitude scale. The low-flow frequency relation is commonly presented as a family of curves with a separate curve for each number of consecutive days.

low-flow partial-record station (partial-record station) A site where discrete measurements of one or more hydrologic characteristics are obtained over a period of time without continuous data being recorded or computed.

P

peak flow The maximum instantaneous flow of a stream or river at a given location. This flow usually occurs at or near the time of maximum stage.

peak ratio Computed from annual peak flow, which is the maximum instantaneous streamflow value for the water year, divided by the 3-day mean flow for 3 consecutive days including the day before, day of, and day after the peak. Peak ratio is a measure of the magnitude of the rise and fall of a stream over a given period of time.

R

regulation Artificial manipulation of the flow of a stream, such as artificial lakes, the operation of reservoirs, and for example cranberry bogs in Southern New Jersey.

recurrence interval The time interval, in years, within which a given hydrologic event will, on the average, be less or more than a

given value one time. It is the reciprocal of the probability that the given hydrologic event will not be exceeded or will be exceeded in any one year. For example, a 20-year low flow is one that has a 5 percent chance of not being exceeded in any one year.

S

standard error of estimate Computed using the standard error of prediction of the MOVE.1 line and the time-sampling error for the index station (Telis, 1991).

standard error of prediction Measure of the fit of the correlation of discharge data for two stations for a MOVE.1 line (Telis, 1991).

T

total maximum daily loads (TMDLs) The maximum quantity of a contaminant that can enter a water body without adversely affecting the beneficial uses of the water body (Jarrell, 1999).

W

water year In U.S. Geological Survey reports dealing with surface-water supply, the water year is the 12-month period, October 1 through September 30, designated by the calendar year in which it ends.

Tables 3 and 4

Table 3. Results of trend tests on the lowest annual *n*-day flow for the climatic year ending March 31 and the winter period from November through April at 138 streamflow-gaging stations in New Jersey.

USGS station number	Station name	Period of record		Kendall Tau trend test					
				Annual low flow			Winter low flow		
		Begin	End	1-day	7-day	30-day	1-day	7-day	30-day
01368000	Wallkill River near Unionville, N.Y.	10/1/1937	9/30/1981	*	*	*	*	*	*
01369000	Pochuck Creek near Pine Island, N.Y.	10/1/1937	9/30/1978	*	*	*	*	*	*
01376280	Sparkill Creek at Sparkill, N.Y.	10/1/1959	9/30/1980	*	*	*	*	*	*
01376800	Hackensack River at West Nyack, N.Y.	10/1/1959	9/30/2001	*	*	*	*	*	*
01377000	Hackensack River at Rivervale, N.J.	10/1/1956	9/30/2001	*	*	*	*	*	*
01377000	Hackensack River at Rivervale, N.J.	10/1/1941	9/30/1956	*	*	*	*	*	*
01377500	Pascack Brook at Westwood, N.J.	10/1/1934	9/30/2001	+	+	+	*	*	*
01378500	Hackensack River at New Milford, N.J.	10/1/1921	9/30/2001	+	+	*	+	*	-
01379000	Passaic River near Millington, N.J.	10/1/1903	9/30/2001	*	*	*	*	*	*
01379000	Passaic River near Millington, N.J.	10/1/1979	9/30/2001	*	*	*	*	*	*
01379000	Passaic River near Millington, N.J.	10/1/1903	9/30/1979	*	-	*	*	*	*
01379500	Passaic River near Chatham, N.J.	10/1/1903	9/30/2001	+	+	+	+	+	+
01379700	Rockaway River at Berkshire Valley, N.J.	10/1/1984	9/30/1996	*	*	*	*	*	*
01379773	Green Pond Brook at Picatinny Arsenal, N.J.	10/1/1982	9/30/2000	*	-	-	*	*	*
01379780	Green Pd Bk BI Picatinny Lk at Picatinny Arsenal, N.J.	10/1/1984	9/30/2001	*	*	*	*	*	*
01379790	Green Pond Brook at Wharton, N.J.	10/1/1982	9/30/2001	-	-	-	*	*	*
01380000	Beaver Bk at outlet of Splitrock Res, N.J.	10/1/1925	9/30/1989	+	+	+	*	*	*
01380500	Rockaway River above Reservoir at Boonton, N.J.	10/1/1937	9/30/2001	*	*	*	*	*	*
01381000	Rockaway River below Reservoir at Boonton, N.J.	10/1/1925	9/30/2001	+	+	+	+	+	*
01381500	Whippany River at Morristown, N.J.	10/1/1921	9/30/2001	+	+	+	+	+	+
01381900	Passaic River at Pine Brook, N.J.	10/1/1979	9/30/2001	*	*	*	*	*	+
01382500	Pequannock River at Macopin Intake Dam, N.J.	10/1/1961	9/30/2001	+	+	+	+	*	+
01382500	Pequannock River at Macopin Intake Dam, N.J.	10/1/1922	9/30/1961	*	*	*	*	*	*
01383500	Wanaque River at Awosting, N.J.	10/1/1918	9/30/2001	*	*	*	*	*	*
01384000	Wanaque River at Monks, N.J.	10/1/1934	9/30/1985	-	-	-	*	*	*
01384500	Ringwood Creek near Wanaque, N.J.	10/1/1934	9/30/2001	*	*	*	*	*	*
01385000	Cupsaw Bk near Wanaque, N.J.	10/1/1934	9/30/1958	-	-	-	*	*	*
01386000	West Brook near Wanaque, N.J.	10/1/1934	9/30/1978	*	*	*	*	*	*

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Table 3. Results of trend tests on the lowest annual *n*-day flow for the climatic year ending March 31 and the winter period from November through April at 138 streamflow-gaging stations in New Jersey.—Continued

[+, significant upward trend; -, significant downward trend; *, no significant trend was detected; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		Kendall Tau trend test					
				Annual low flow			Winter low flow		
		Begin	End	1-day	7-day	30-day	1-day	7-day	30-day
01386500	Blue Mine Brook near Wanaque, N.J.	10/1/1934	9/30/1958	-	-	-	-	-	*
01387000	Wanaque River at Wanaque, N.J.	10/1/1928	9/30/2001	*	*	*	*	*	*
01387000	Wanaque River at Wanaque, N.J.	10/1/1911	9/30/1928	*	*	*	*	*	*
01387400	Ramapo River at Ramapo, N.Y.	10/1/1978	9/30/2001	*	*	*	*	*	*
01387420	Ramapo River at Suffern, N.Y.	10/1/1978	9/30/2001	*	*	*	*	*	*
01387450	Mahwah River near Suffern, N.Y.	10/1/1958	9/30/1995	*	*	*	*	-	-
01387500	Ramapo River near Mahwah, N.J.	10/1/1903	9/30/2001	*	*	*	*	*	*
01388000	Ramapo River at Pompton Lakes, N.J.	10/1/1921	9/30/2001	+	*	*	*	*	*
01388500	Pompton River at Pompton Plains, N.J.	10/1/1903	9/30/2001	*	-	*	*	*	*
01389500	Passaic River at Little Falls, N.J.	10/1/1927	9/30/2001	+	*	*	*	*	*
01389500	Passaic River at Little Falls, N.J.	10/1/1896	9/30/1927	*	-	-	-	-	*
01390500	Saddle River at Ridgewood, N.J.	10/1/1954	9/30/2001	-	-	*	-	-	-
01391000	Hohokus Brook at Ho-ho-kus, N.J.	10/1/1954	9/30/1996	+	+	+	+	+	+
01391500	Saddle River at Lodi, N.J.	10/1/1965	9/30/2001	*	*	*	*	*	*
01391500	Saddle River at Lodi, N.J.	10/1/1923	9/30/1965	*	*	*	*	*	*
01392000	Weasel Bk at Clifton, N.J.	10/1/1951	9/30/1962	*	*	+	*	*	*
01392000	Weasel Bk at Clifton, N.J.	10/1/1936	9/30/1950	*	*	*	*	*	*
01392210	Third River at Passaic, N.J.	10/1/1976	9/30/1997	*	*	*	*	*	*
01392500	Second River at Belleville, N.J.	10/1/1936	9/30/1964	*	*	*	*	*	*
01393450	Elizabeth River at Ursino Lake at Elizabeth, N.J.	10/1/1951	9/30/2001	*	-	-	*	-	*
01393450	Elizabeth River at Ursino Lake at Elizabeth, N.J.	10/1/1921	9/30/1951	+	+	+	+	+	+
01394000	WB Rahway River at Millburn, N.J.	10/1/1940	9/30/1950	*	*	*	*	-	-
01394500	Rahway River near Springfield, N.J.	10/1/1938	9/30/2001	+	+	+	+	+	+
01395000	Rahway River at Rahway, N.J.	10/1/1921	9/30/2001	-	-	*	-	*	*
01396000	Robinsons Branch at Rahway, N.J.	10/1/1939	9/30/1999	*	*	+	+	+	+
01396500	South Branch Raritan River near High Bridge, N.J.	10/1/1918	9/30/2001	*	*	*	*	*	*
01396580	Spruce Run at Glen Gardner, N.J.	10/1/1977	9/30/2001	*	*	*	*	*	*
01396660	Mulhockaway Creek at Van Syckel, N.J.	10/1/1976	9/30/2001	*	*	*	*	*	*

Table 3. Results of trend tests on the lowest annual *n*-day flow for the climatic year ending March 31 and the winter period from November through April at 138 streamflow-gaging stations in New Jersey.—Continued

USGS station number										Kendall Tau trend test					
Station name		Period of record		Annual low flow			Winter low flow								
				1-day	7-day	30-day	1-day	7-day	30-day						
01396800	Spruce Run at Clinton, N.J.	10/1/1963	9/30/2001	*	*	*	*	*	*						
01397000	SB Raritan River at Stanton, N.J.	10/1/1963	9/30/2001	*	*	*	*	*	*						
01397000	SB Raritan River at Stanton, N.J.	10/1/1903	9/30/1963	*	*	*	*	*	*						
01397500	Walnut Brook near Flemington, N.J.	10/1/1935	9/30/1961	*	*	*	*	*	*						
01398000	Neshanic River at Reaville, N.J.	10/1/1930	9/30/2001	*	*	*	*	*	*						
01398045	Back Brook Tributary near Ringoes, N.J.	10/1/1976	9/30/1988	*	*	*	*	*	*						
01398107	Holland Brook at Readington, N.J.	10/1/1977	9/30/1996	*	*	*	*	*	*						
01398500	NB Raritan River near Far Hills, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*						
01399190	Lamington (Black) River at Succasunna, N.J.	10/1/1976	9/30/1987	*	*	*	*	*	*						
01399200	Lamington (Black) River near Ironia, N.J.	10/1/1940	9/30/1987	*	*	*	*	*	*						
01399500	Lamington (Black) River near Pottersville, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*						
01399510	Upper Cold Brook near Pottersville, N.J.	10/1/1972	9/30/1997	+	*	*	*	*	*						
01399525	Axle Brook near Pottersville, N.J.	10/1/1977	9/30/1989	*	*	*	*	*	*						
01399670	SB Rockaway Creek at Whitehouse Station, N.J.	10/1/1976	9/30/2001	-	-	*	*	*	*						
01400000	North Branch Raritan River near Raritan, N.J.	10/1/1923	9/30/2001	+	*	*	+	+	+						
01400300	Peters Brook near Raritan, N.J.	10/1/1977	9/30/1996	*	*	*	+	+	+						
01400350	Macs Brook at Somerville, N.J.	10/1/1981	9/30/1996	*	*	*	*	*	*						
01400500	Raritan River at Manville, N.J.	10/1/1963	9/30/2001	+	+	*	*	*	*						
01400500	Raritan River at Manville, N.J.	10/1/1903	9/30/1963	*	-	*	*	*	*						
01400730	Millstone River at Plainsboro, N.J.	10/1/1963	9/30/1990	*	*	*	*	+	*						
01401000	Stony Brook at Princeton, N.J.	10/1/1953	9/30/2001	+	+	*	+	*	*						
01401500	Millstone River near Kingston, N.J.	10/1/1933	9/30/1949	*	*	*	*	*	*						
01401650	Pike Run at Belle Mead, N.J.	10/1/1979	9/30/2001	*	*	*	*	*	*						
01402000	Millstone River at Blackwells Mills, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*						
01402600	Royce Brook Tributary near Belle Mead, N.J.	10/1/1966	9/30/1996	+	+	+	*	*	*						
01403060	Raritan River below Calco Dam at Bound Brook, N.J.	10/1/1963	9/30/2001	*	*	*	*	*	*						
01403060	Raritan River below Calco Dam at Bound Brook, N.J.	10/1/1902	9/30/1963	-	-	-	*	*	*						
01403150	West Branch Middle Brook near Martinsville, N.J.	10/1/1978	9/30/2001	*	*	*	*	*	*						

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[+, significant upward trend; -, significant downward trend; *, no significant trend was detected; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		Kendall Tau trend test					
				Annual low flow			Winter low flow		
		Begin	End	1-day	7-day	30-day	1-day	7-day	30-day
01403400	Green Brook at Seeley Mills, N.J.	10/1/1978	9/30/2001	*	*	*	*	*	*
01403500	Green Brook at Plainfield, N.J.	10/1/1938	9/30/1985	*	*	*	*	*	*
01403535	EB Stony Brook at Best Lake at Watchung, N.J.	10/1/1979	9/30/2001	*	*	*	*	*	*
01403540	Stony Brook at Watchung, N.J.	10/1/1974	9/30/2001	*	*	*	*	*	*
01405000	Lawrence Brook at Farrington Dam, N.J.	10/1/1926	9/30/1990	+	*	*	*	*	*
01405030	Lawrence Bk at Westons Mills, N.J.	10/1/1988	9/30/2001	*	*	*	*	*	*
01405300	Matchaponix Brook at Spotswood, N.J.	10/1/1956	9/30/1967	*	*	*	*	*	*
01405400	Manalapan Brook at Spotswood, N.J.	10/1/1956	9/30/2001	*	*	*	*	-	-
01405500	South River at Old Bridge, N.J.	10/1/1938	9/30/1989	*	*	*	*	*	*
01407000	Matawan C at Matawan, N.J.	10/1/1931	9/30/1955	*	*	*	*	*	*
01407500	Swimming River near Red Bank, N.J.	10/1/1921	9/30/2001	-	-	-	-	-	-
01407705	Shark River near Neptune City, N.J.	10/1/1966	9/30/2001	*	*	*	*	*	*
01407760	Jumping Brook near Neptune City, N.J.	10/1/1966	9/30/2001	*	*	*	+	*	*
01408000	Manasquan River at Squankum, N.J.	10/1/1931	9/30/2001	*	*	*	*	*	*
01408029	Manasquan River near Allenwood, N.J.	10/1/1989	9/30/2001	*	-	-	*	*	*
01408120	North Branch Metedeconk River near Lakewood, N.J.	10/1/1972	9/30/2001	*	*	*	*	*	*
01408500	Toms River near Toms River, N.J.	10/1/1966	9/30/2001	*	*	*	*	-	*
01408500	Toms River near Toms River, N.J.	10/1/1928	9/30/1966	*	*	*	*	*	*
01409000	Cedar Creek at Lanoka Harbor, N.J.	10/1/1931	9/30/1971	-	*	*	-	*	*
01409095	Oyster Creek near Brookville, N.J.	10/1/1964	9/30/1985	*	*	*	*	*	*
01409280	Westecunk Creek at Stafford Forge, N.J.	10/1/1973	9/30/1988	*	*	*	*	*	*
01409400	Mullica River near Batsto, N.J.	10/1/1956	9/30/2001	*	*	*	*	*	*
01409500	Batsto River at Batsto, N.J.	10/1/1927	9/30/2001	*	*	*	*	*	*
01409810	West Branch Wading River near Jenkins, N.J.	10/1/1974	9/30/1997	*	*	*	*	*	*
01410000	Oswego River at Harrisville, N.J.	10/1/1930	9/30/2001	*	*	*	*	*	*
01410150	East Branch Bass River near New Gretna, N.J.	10/1/1977	9/30/2001	+	*	*	+	+	+
01410500	Absecon Creek at Absecon, N.J.	10/1/1945	9/30/1985	+	+	+	+	+	+
01411000	Great Egg Harbor River at Folsom, N.J.	10/1/1924	9/30/2001	*	*	*	*	*	*

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		Begin	End	1-day	7-day	30-day	1-day	7-day	30-day
01411300	Tuckahoe River at Head of River, N.J.	10/1/1969	9/30/2001	*	*	*	*	*	*
01411456	Little Ease Rn near Clayton, N.J.	10/1/1987	9/30/2001	*	*	*	*	*	*
01411500	Maurice River at Norma, N.J.	10/1/1932	9/30/2001	*	*	*	*	-	-
01412000	Menanico Creek near Millville, N.J.	10/1/1930	9/30/1985	+	*	*	*	*	*
01412500	WB Cohansey River at Seeley, N.J.	10/1/1950	9/30/1967	*	*	*	*	*	-
01412800	Cohansey River at Seeley, N.J.	10/1/1977	9/30/1988	-	-	*	*	*	*
01434000	Delaware River at Port Jervis, N.Y.	10/1/1954	9/30/2001	+	+	*	*	*	*
01434000	Delaware River at Port Jervis, N.Y.	10/1/1904	9/30/1954	*	+	+	*	*	+
01437500	Neversink River at Godeffroy, N.Y.	10/1/1954	9/30/2001	*	*	*	+	+	+
01437500	Neversink River at Godeffroy, N.Y.	10/1/1937	9/30/1954	*	*	*	-	*	*
01438500	Delaware River at Montague, N.J.	10/1/1954	9/30/2001	*	*	*	*	*	*
01438500	Delaware River at Montague, N.J.	10/1/1939	9/30/1954	*	*	*	*	*	+
01440000	Flat Brook near Flatbrookville, N.J.	10/1/1923	9/30/2001	*	*	*	*	*	*
01440200	Delaware River near Delaware Water Gap, Pa.	10/1/1963	9/30/1996	*	*	*	*	*	*
01443500	Paulins Kill at Blairstown, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*
01443900	Yards Creek near Blairstown, N.J.	10/1/1966	9/30/2001	+	+	+	+	+	*
01445000	Pequest River at Huntsville, N.J.	10/1/1939	9/30/1962	*	*	*	*	*	*
01445500	Pequest River at Pequest, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*
01446000	Beaver Brook near Belvidere, N.J.	10/1/1922	9/30/1961	*	*	*	*	*	*
01446500	Delaware River at Belvidere, N.J.	10/1/1954	9/30/2001	*	*	*	*	*	*
01446500	Delaware River at Belvidere, N.J.	10/1/1922	9/30/1954	*	*	*	*	*	+
01453000	Lehigh River at Bethlehem, Pa.	10/1/1902	9/30/1990	+	+	+	+	+	+
01455200	Pohatcong Creek at New Village, N.J.	10/1/1959	9/30/1969	*	*	*	*	*	*
01455500	Musconetcong River at out of Lake Hopatcong, N.J.	10/1/1927	9/30/1976	-	-	-	-	-	-
01456000	Musconetcong River near Hackettstown, N.J.	10/1/1921	9/30/1974	*	*	*	*	*	*
01457000	Musconetcong River near Bloomsbury, N.J.	10/1/1903	9/30/2001	*	*	*	*	*	*
01457500	Delaware River at Riegelsville, N.J.	10/1/1954	9/30/1971	*	*	*	*	*	*
01457500	Delaware River at Riegelsville, N.J.	10/1/1905	9/30/1954	+	+	+	*	+	+

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USGS station number	Station name	Period of record		Kendall Tau trend test					
				Annual low flow			Winter low flow		
		Begin	End	1-day	7-day	30-day	1-day	7-day	30-day
01460440	Delaware and Raritan Ca at Port Mercer, N.J.	10/1/1989	9/30/2001	*	*	*	*	*	*
01460500	Delaware and Raritan Canal at Kingston, N.J.	10/1/1946	9/30/1992	*	*	*	+	+	+
01463500	Delaware River at Trenton, N.J.	10/1/1954	9/30/2001	*	*	*	*	*	*
01463500	Delaware River at Trenton, N.J.	10/1/1912	9/30/1954	*	*	*	*	*	+
01464000	Assunpink Creek at Trenton, N.J.	10/1/1954	9/30/2001	*	*	*	*	*	*
01464000	Assunpink Creek at Trenton, N.J.	10/1/1923	9/30/1954	+	*	*	+	*	+
01464500	Crosswicks Creek at Extonville, N.J.	10/1/1939	9/30/2001	*	*	*	*	*	*
01465850	SB Rancocas C at Vincentown, N.J.	10/1/1960	9/30/2001	*	*	*	*	*	*
01466000	MB Mt Misery Bk in Lebanon State Forest, N.J.	10/1/1952	9/30/1977	*	*	*	*	*	*
01466500	McDonalds Branch in Lebanon State Forest, N.J.	10/1/1953	9/30/2001	-	-	-	-	-	-
01467000	North Branch Rancocas Creek at Pemberton, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*
01467081	South Branch Pennsauken Creek at Cherry Hill, N.J.	10/1/1967	9/30/2001	*	*	*	*	*	*
01467150	Cooper River at Haddonfield, N.J.	10/1/1987	9/30/2001	*	*	*	*	*	*
01467150	Cooper River at Haddonfield, N.J.	10/1/1963	9/30/1987	+	+	+	+	+	+
01474500	Schuylkill River at Philadelphia, Pa.	10/1/1931	9/30/1991	+	+	+	+	*	*
01475000	Mantua Creek at Pitman, N.J.	10/1/1939	9/30/1977	*	*	*	*	*	*
01477120	Raccoon Creek near Swedesboro, N.J.	10/1/1965	9/30/2001	*	*	*	*	*	*
01482500	Salem River at Woodstown, N.J.	10/1/1939	9/30/1990	*	*	*	*	*	*
01483000	Alloway Creek at Alloway, N.J.	10/1/1952	9/30/1973	*	*	*	*	*	*

Table 4. Results of trend tests on the highest annual *n*-day flow for the water year ending September 30 and the winter period from November through April at 138 streamflow-gaging stations in New Jersey.

USGS station number	Station name	Period of record		Kendall Tau trend test					
				Annual low flow			Winter low flow		
		Begin	End	1-day	7-day	30-day	1-day	7-day	30-day
01368000	Wallkill River near Unionville, N.Y.	10/1/1937	9/30/1981	*	*	*	*	*	*
01369000	Pochuck Creek near Pine Island, N.Y.	10/1/1937	9/30/1978	*	*	*	*	*	*
01376280	Sparkill Creek at Sparkill, N.Y.	10/1/1959	9/30/1980	*	*	*	*	*	*
01376800	Hackensack River at West Nyack, N.Y.	10/1/1959	9/30/2001	*	*	*	*	*	*
01377000	Hackensack River at Rivervale, N.J.	10/1/1956	9/30/2001	+	*	*	*	*	*
01377000	Hackensack River at Rivervale, N.J.	10/1/1941	9/30/1956	*	*	*	*	*	*
01377500	Pascack Brook at Westwood, N.J.	10/1/1934	9/30/2001	*	*	*	*	*	*
01378500	Hackensack River at New Milford, N.J.	10/1/1921	9/30/2001	*	*	-	*	-	*
01379000	Passaic River near Millington, N.J.	10/1/1903	9/30/2001	+	+	*	*	*	*
01379000	Passaic River near Millington, N.J.	10/1/1979	9/30/2001	*	*	*	*	*	*
01379000	Passaic River near Millington, N.J.	10/1/1903	9/30/1979	+	+	*	*	*	*
01379500	Passaic River near Chatham, N.J.	10/1/1903	9/30/2001	*	*	*	*	*	*
01379700	Rockaway River at Berkshire Valley, N.J.	10/1/1984	9/30/1996	*	*	*	*	*	*
01379773	Green Pond Brook at Picatinny Arsenal, N.J.	10/1/1982	9/30/2000	*	*	*	*	*	*
01379780	Green Pd Bk Bl Picatinny Lk at Picatinny Arsenal, N.J.	10/1/1984	9/30/2001	*	*	*	*	*	*
01379790	Green Pond Brook at Wharton, N.J.	10/1/1982	9/30/2001	*	*	*	*	*	*
01380000	Beaver Bk at outlet of Splitrock Res, N.J.	10/1/1925	9/30/1989	*	*	*	+	*	*
01380500	Rockaway River above Reservoir at Boonton, N.J.	10/1/1937	9/30/2001	+	*	*	*	*	*
01381000	Rockaway River below Reservoir at Boonton, N.J.	10/1/1925	9/30/2001	+	+	+	+	+	+
01381500	Whippany River at Morristown, N.J.	10/1/1921	9/30/2001	+	+	+	+	+	+
01381900	Passaic River at Pine Brook, N.J.	10/1/1979	9/30/2001	*	*	*	*	*	*
01382500	Pequannock R at Macopin Intake Dam, N.J.	10/1/1961	9/30/2001	*	*	+	+	+	+
01382500	Pequannock R at Macopin Intake Dam, N.J.	10/1/1922	9/30/1961	*	*	*	*	*	*
01383500	Wanaque River at Awosting, N.J.	10/1/1918	9/30/2001	+	+	*	+	+	*
01384000	Wanaque River at Monks, N.J.	10/1/1934	9/30/1985	*	+	*	*	+	*
01386000	West Brook near Wanaque, N.J.	10/1/1934	9/30/1978	*	*	*	*	*	*
01386500	Blue Mine Brook near Wanaque, N.J.	10/1/1934	9/30/1958	*	+	*	*	*	*
01387000	Wanaque R at Wanaque, N.J.	10/1/1928	9/30/2001	*	*	*	*	*	*

Table 4. Results of trend tests on the highest annual *n*-day flow for the water year ending September 30 and the winter period from November through April at 138 streamflow-gaging stations in New Jersey.—Continued

[+, significant upward trend; -, significant downward trend; *, no significant trend was detected; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		Kendall Tau trend test					
				Annual low flow			Winter low flow		
		Begin	End	1-day	7-day	30-day	1-day	7-day	30-day
01387000	Wanaque R at Wanaque, N.J.	10/1/1911	9/30/1928	*	*	*	*	-	-
01387400	Ramapo River at Ramapo, N.Y.	10/1/1978	9/30/2001	*	*	*	*	*	*
01387420	Ramapo River at Suffern, N.Y.	10/1/1978	9/30/2001	*	*	*	*	*	*
01387450	Mahwah River near Suffern, N.Y.	10/1/1958	9/30/1995	*	*	*	*	*	*
01387500	Ramapo River near Mahwah, N.J.	10/1/1903	9/30/2001	*	*	*	*	*	*
01388000	Ramapo River at Pompton Lakes, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*
01388500	Pompton River at Pompton Plains, N.J.	10/1/1903	9/30/2001	*	*	*	*	*	*
01389500	Passaic River at Little Falls, N.J.	10/1/1927	9/30/2001	*	*	*	*	*	*
01389500	Passaic River at Little Falls, N.J.	10/1/1896	9/30/1927	-	-	-	-	-	-
01390500	Saddle R at Ridgewood, N.J.	10/1/1954	9/30/2001	*	*	*	*	*	*
01391000	Hohokus Brook at Ho-ho-kus, N.J.	10/1/1954	9/30/1996	*	*	*	*	*	*
01391500	Saddle River at Lodi, N.J.	10/1/1965	9/30/2001	-	*	*	+	*	*
01391500	Saddle River at Lodi, N.J.	10/1/1923	9/30/1965	*	*	*	*	*	*
01392000	Weasel Bk at Clifton, N.J.	10/1/1951	9/30/1962	*	*	*	*	*	*
01392000	Weasel Bk at Clifton, N.J.	10/1/1936	9/30/1950	*	*	*	*	*	*
01392210	Third River at Passaic, N.J.	10/1/1976	9/30/1997	*	*	*	-	-	*
01392500	Second River at Belleville, N.J.	10/1/1936	9/30/1964	*	*	*	*	*	*
01393450	Elizabeth R at Ursino Lake at Elizabeth, N.J.	10/1/1951	9/30/2001	*	*	*	*	*	*
01393450	Elizabeth R at Ursino Lake at Elizabeth, N.J.	10/1/1921	9/30/1951	*	*	*	*	*	*
01394000	WB Rahway River at Millburn, N.J.	10/1/1940	9/30/1950	*	*	*	*	*	*
01394500	Rahway R near Springfield, N.J.	10/1/1938	9/30/2001	+	*	*	*	*	*
01395000	Rahway River at Rahway, N.J.	10/1/1921	9/30/2001	+	+	*	+	*	*
01396580	Spruce Run at Glen Gardner, N.J.	10/1/1977	9/30/2001	*	*	*	*	*	*
01396660	Mulhockaway Creek at Van Syckel, N.J.	10/1/1976	9/30/2001	*	*	*	*	*	*
01396800	Spruce Run at Clinton, N.J.	10/1/1963	9/30/2001	*	*	*	*	*	*
01397000	SB Raritan River at Stanton, N.J.	10/1/1963	9/30/2001	*	*	*	*	*	*
01397000	SB Raritan River at Stanton, N.J.	10/1/1903	9/30/1963	*	*	*	*	*	*
01397500	Walnut Brook near Flemington, N.J.	10/1/1935	9/30/1961	*	*	*	*	*	*

Table 4. Results of trend tests on the highest annual *n*-day flow for the water year ending September 30 and the winter period from November through April at 138 streamflow-gaging stations in New Jersey.—Continued

USGS station number	Station name	Period of record		Kendall Tau trend test					
				Annual low flow			Winter low flow		
		Begin	End	1-day	7-day	30-day	1-day	7-day	30-day
01398000	Neshanic River at Reaville, N.J.	10/1/1930	9/30/2001	+	+	*	*	*	*
01398045	Back Brook Tributary near Ringoes, N.J.	10/1/1976	9/30/1988	*	*	*	*	*	*
01398107	Holland Brook at Readington, N.J.	10/1/1977	9/30/1996	-	*	*	-	*	*
01398500	NB Raritan River near Far Hills, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*
01399190	Lamington (Black) River at Succasunna, N.J.	10/1/1976	9/30/1987	*	*	*	*	*	*
01399200	Lamington (Black) R near Ironia, N.J.	10/1/1940	9/30/1987	*	*	*	*	*	*
01399500	Lamington (Black) River near Pottersville, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*
01399510	Upper Cold Brook near Pottersville, N.J.	10/1/1972	9/30/1997	*	*	*	*	*	*
01399525	Axle Brook near Pottersville, N.J.	10/1/1977	9/30/1989	*	-	-	-	-	-
01399670	SB Rockaway Creek at Whitehouse Station, N.J.	10/1/1976	9/30/2001	*	*	*	-	*	*
01400000	North Branch Raritan River near Raritan, N.J.	10/1/1923	9/30/2001	*	*	*	*	*	*
01400300	Peters Brook near Raritan, N.J.	10/1/1977	9/30/1996	*	*	-	*	-	-
01400350	Macs Brook at Somerville, N.J.	10/1/1981	9/30/1996	-	-	*	-	-	*
01400500	Raritan River at Manville, N.J.	10/1/1963	9/30/2001	*	*	*	*	*	*
01400500	Raritan River at Manville, N.J.	10/1/1903	9/30/1963	*	*	*	-	*	*
01400730	Millstone River at Plainsboro, N.J.	10/1/1963	9/30/1990	*	+	+	*	*	*
01401000	Stony Brook at Princeton, N.J.	10/1/1953	9/30/2001	*	*	*	*	+	*
01401500	Millstone R near Kingston, N.J.	10/1/1933	9/30/1949	*	*	*	*	*	*
01401650	Pike Run at Belle Mead, N.J.	10/1/1979	9/30/2001	*	*	*	*	*	*
01403060	Raritan River below Calco Dam at Bound Brook, N.J.	10/1/1963	9/30/2001	*	*	*	-	*	*
01403060	Raritan River below Calco Dam at Bound Brook, N.J.	10/1/1902	9/30/1963	*	*	*	-	*	*
01403150	West Branch Middle Brook near Martinsville, N.J.	10/1/1978	9/30/2001	*	*	*	*	*	*
01403400	Green Brook at Seeley Mills, N.J.	10/1/1978	9/30/2001	*	*	*	-	*	*
01403500	Green Brook at Plainfield, N.J.	10/1/1938	9/30/1985	+	+	+	+	+	+
01403535	EB Stony Brook at Best Lake at Watchung, N.J.	10/1/1979	9/30/2001	*	*	*	*	*	*
01403540	Stony Brook at Watchung, N.J.	10/1/1974	9/30/2001	*	*	*	*	-	*
01405000	Lawrence Brook at Farrington Dam, N.J.	10/1/1926	9/30/1990	*	*	*	*	*	*
01405030	Lawrence Bk at Westons Mills, N.J.	10/1/1988	9/30/2001	*	*	*	*	*	*

Table 4. Results of trend tests on the highest annual *n*-day flow for the water year ending September 30 and the winter period from November through April at 138 streamflow-gaging stations in New Jersey.—Continued

[+, significant upward trend; -, significant downward trend; *, no significant trend was detected; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		Annual low flow			Kendall Tau trend test		
				1-day	7-day	30-day	1-day	7-day	30-day
		Begin	End						
01405300	Matchaponix Brook at Spotswood, N.J.	10/1/1956	9/30/1967	*	*	-	*	*	*
01405400	Manalapan Brook at Spotswood, N.J.	10/1/1956	9/30/2001	*	*	*	*	*	*
01405500	South River at Old Bridge, N.J.	10/1/1938	9/30/1989	*	*	*	*	+	*
01407000	Matawan C at Matawan, N.J.	10/1/1931	9/30/1955	*	*	*	*	*	*
01407500	Swimming River near Red Bank, N.J.	10/1/1921	9/30/2001	+	*	*	*	*	*
01407705	Shark River near Neptune City, N.J.	10/1/1966	9/30/2001	*	*	*	*	*	*
01407760	Jumping Brook near Neptune City, N.J.	10/1/1966	9/30/2001	*	*	*	*	*	*
01408000	Manasquan River at Squankum, N.J.	10/1/1931	9/30/2001	*	*	*	*	*	*
01408029	Manasquan R near Allenwood, N.J.	10/1/1989	9/30/2001	*	*	*	*	*	*
01408120	North Branch Metedeconk River near Lakewood, N.J.	10/1/1972	9/30/2001	*	*	*	*	*	*
01408500	Toms River near Toms River, N.J.	10/1/1966	9/30/2001	*	*	*	*	*	*
01408500	Toms River near Toms River, N.J.	10/1/1928	9/30/1966	*	*	*	*	*	*
01409000	Cedar Creek at Lanoka Harbor, N.J.	10/1/1931	9/30/1971	*	*	*	*	*	*
01409095	Oyster Creek near Brookville, N.J.	10/1/1964	9/30/1985	*	*	*	*	+	*
01409500	Batsto River at Batsto, N.J.	10/1/1927	9/30/2001	*	*	*	*	*	*
01409810	West Branch Wading River near Jenkins, N.J.	10/1/1974	9/30/1997	*	*	*	*	*	*
01410000	Oswego River at Harrisville, N.J.	10/1/1930	9/30/2001	*	*	*	*	*	*
01410150	East Branch Bass River near New Gretna, N.J.	10/1/1977	9/30/2001	*	*	*	*	*	*
01410500	Absecon Creek at Absecon, N.J.	10/1/1945	9/30/1985	*	*	*	*	*	*
01411000	Great Egg Harbor River at Folsom, N.J.	10/1/1924	9/30/2001	+	*	*	+	*	*
01411300	Tuckahoe River at Head Of River, N.J.	10/1/1969	9/30/2001	*	*	*	*	*	*
01411456	Little Ease Rn near Clayton, N.J.	10/1/1987	9/30/2001	*	*	*	*	*	*
01411500	Maurice River at Norma, N.J.	10/1/1932	9/30/2001	*	*	*	*	*	*
01412000	Menantic Creek near Millville, N.J.	10/1/1930	9/30/1985	*	*	*	*	*	*
01412500	WB Cohansey River at Seeley, N.J.	10/1/1950	9/30/1967	-	-	*	-	-	*

Table 4. Results of trend tests on the highest annual *n*-day flow for the water year ending September 30 and the winter period from November through April at 138 streamflow-gaging stations in New Jersey.—Continued

USGS station number	Station name	Period of record		Kendall Tau trend test					
				Annual low flow			Winter low flow		
		Begin	End	1-day	7-day	30-day	1-day	7-day	30-day
01412800	Cohansey River at Seeley, N.J.	10/1/1977	9/30/1988	*	*	*	*	*	*
01434000	Delaware River at Port Jervis, N.Y.	10/1/1954	9/30/2001	*	*	*	*	*	*
01434000	Delaware River at Port Jervis, N.Y.	10/1/1904	9/30/1954	*	*	-	*	*	-
01437500	Neversink River at Godeffroy, N.Y.	10/1/1954	9/30/2001	*	*	*	*	*	*
01437500	Neversink River at Godeffroy, N.Y.	10/1/1937	9/30/1954	*	*	*	*	*	*
01438500	Delaware River at Montague, N.J.	10/1/1954	9/30/2001	*	*	*	*	*	*
01438500	Delaware River at Montague, N.J.	10/1/1939	9/30/1954	*	*	*	*	*	*
01440000	Flat Brook near Flatbrookville, N.J.	10/1/1923	9/30/2001	*	*	*	*	*	*
01440200	Delaware River near Delaware Water Gap, Pa.	10/1/1963	9/30/1996	*	*	*	*	*	*
01443500	Paulins Kill at Blairstown, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*
01443900	Yards Creek near Blairstown, N.J.	10/1/1966	9/30/2001	*	*	*	*	*	*
01445000	Pequest River at Huntsville, N.J.	10/1/1939	9/30/1962	*	*	*	*	*	*
01446500	Delaware River at Belvidere, N.J.	10/1/1954	9/30/2001	*	*	*	*	*	*
01446500	Delaware River at Belvidere, N.J.	10/1/1922	9/30/1954	*	*	*	*	*	*
01453000	Lehigh River at Bethlehem, Pa.	10/1/1902	9/30/1990	*	*	*	*	*	*
01455200	Pohatcong Creek at New Village, N.J.	10/1/1959	9/30/1969	*	*	-	-	-	-
01455500	Musconetcong R at out of Lake Hopatcong, N.J.	10/1/1927	9/30/1976	*	*	+	+	+	+
01456000	Musconetcong R near Hackettstown, N.J.	10/1/1921	9/30/1974	*	*	*	*	*	*
01457000	Musconetcong River near Bloomsbury, N.J.	10/1/1903	9/30/2001	+	+	*	*	*	*
01457500	Delaware R at Riegelsville, N.J.	10/1/1954	9/30/1971	-	-	*	*	*	*
01457500	Delaware R at Riegelsville, N.J.	10/1/1905	9/30/1954	*	*	*	*	*	*
01460440	Delaware and Raritan Ca at Port Mercer, N.J.	10/1/1989	9/30/2001	*	*	*	*	*	*
01460500	Delaware and Raritan Canal at Kingston, N.J.	10/1/1946	9/30/1992	+	+	+	+	+	+
01463500	Delaware River at Trenton, N.J.	10/1/1954	9/30/2001	*	*	*	*	*	*
01463500	Delaware River at Trenton, N.J.	10/1/1912	9/30/1954	*	*	*	*	*	*

[+, significant upward trend; -, significant downward trend; *, no significant trend was detected; USGS, U.S. Geological Survey]

Table 4. Results of trend tests on the highest annual *n*-day flow for the water year ending September 30 and the winter period from November through April at 138 streamflow-gaging stations in New Jersey.—Continued

[+, significant upward trend; -, significant downward trend; *, no significant trend was detected; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		Kendall Tau trend test					
				Annual low flow			Winter low flow		
		Begin	End	1-day	7-day	30-day	1-day	7-day	30-day
01464000	Assunpink Creek at Trenton, N.J.	10/1/1954	9/30/2001	*	*	*	*	*	*
01464000	Assunpink Creek at Trenton, N.J.	10/1/1923	9/30/1954	*	*	*	*	*	*
01464500	Crosswicks Creek at Extonville, N.J.	10/1/1939	9/30/2001	+	*	*	*	*	*
01465850	SB Rancocas C at Vincentown, N.J.	10/1/1960	9/30/2001	*	*	*	*	*	*
01466000	MB Mt Misery Bk in Lebanon State Forest, N.J.	10/1/1952	9/30/1977	*	*	*	*	*	*
01466500	McDonalds Branch in Lebanon State Forest, N.J.	10/1/1953	9/30/2001	*	*	*	*	*	*
01467000	North Branch Rancocas Creek at Pemberton, N.J.	10/1/1921	9/30/2001	*	*	*	*	*	*
01467081	South Branch Pennsauken Creek at Cherry Hill, N.J.	10/1/1967	9/30/2001	*	*	*	*	*	*
01467150	Cooper River at Haddonfield, N.J.	10/1/1987	9/30/2001	*	*	*	*	*	*
01475000	Mantua Creek at Pitman, N.J.	10/1/1939	9/30/1977	+	+	*	+	+	*
01477120	Raccoon Creek near Swedesboro, N.J.	10/1/1965	9/30/2001	*	*	*	*	*	*
01482500	Salem River at Woodstown, N.J.	10/1/1939	9/30/1990	*	*	*	*	*	*
01483000	Alloway Creek at Alloway, N.J.	10/1/1952	9/30/1973	*	*	*	*	*	*

Appendix 1

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01367620	Wallkill River at outflow of Lake Mohawk at Sparta, N.J.	Low-flow partial-record station		02
01367700	Wallkill River at Franklin, N.J.	Low-flow partial-record station		02
01367750	Beaver Run near Hamburg, N.J.	Low-flow partial-record station		02
01367770	Wallkill River near Sussex, N.J.	Low-flow partial-record station		02
01367800	Papakating Creek at Pelletstown, N.J.	Low-flow partial-record station		02
01367850	West Branch Papakating Creek at McCoys Corner, N.J.	Low-flow partial-record station		02
01367890	Clove Brook above Clove Acres Lake, at Sussex, N.J.	Low-flow partial-record station		02
01367900	Clove Brook at Sussex, N.J.	Low-flow partial-record station		02
01367910	Papakating Creek at Sussex, N.J.	Low-flow partial-record station		02
01368000	Wallkill River near Unionville, N.Y.	Continuous-record gaging station		02
01368810	Wawayanda Creek at New Milford, N.Y.	Low-flow partial-record station		23
01368820	Double Kill at Wawayanda, N.J.	Low-flow partial-record station		02
01368840	Double Kill at New Milford, N.Y.	Low-flow partial-record station		23
01368950	Black Creek near Vernon, N.J.	Low-flow partial-record station		02
01369000	Pochuck Creek near Pine Island, N.Y.	Continuous-record gaging station		23
01376800	Hackensack River at West Nyack, N.Y.	Continuous-record gaging station	Yes	25
01377000	Hackensack River at Rivervale, N.J.	Continuous-record gaging station	Yes	05
01377300	Pascack Brook at Pearl River, N.Y.	Low-flow partial-record station		25
01377475	Musquapsink Brook near Westwood, N.J.	Low-flow partial-record station		05
01377500	Pascack Brook at Westwood, N.J.	Continuous-record gaging station	Yes	05
01378350	Tenakill Brook at Cresskill, N.J.	Low-flow partial-record station		05
01378385	Tenakill Brook at Closter, N.J.	Low-flow partial-record station		05
01378410	Dwars Kill at Norwood, N.J.	Low-flow partial-record station		05
01378430	Norwood Brook at Norwood, N.J.	Low-flow partial-record station		05
01378500	Hackensack River at New Milford, N.J.	Continuous-record gaging station	Yes	05
01378520	Hirshfeld Brook at New Milford, N.J.	Low-flow partial-record station		05
01378530	French Brook at New Bridge, N.J.	Low-flow partial-record station		05
01378560	Coles Brook at Hackensack, N.J.	Low-flow partial-record station		05
01378590	Metzler Brook at Englewood, N.J.	Low-flow partial-record station		05
01378615	Wolf Creek at Ridgefield, N.J.	Low-flow partial-record station		05
01378690	Passaic River near Bernardsville, N.J.	Gaging station analyzed as a partial-record station		06
01378700	Passaic River at outlet of Osborn Pond, N.J.	Low-flow partial-record station		06
01378750	Great Brook at Green Village, N.J.	Low-flow partial-record station		06
01378800	Primrose Brook near New Vernon, N.J.	Low-flow partial-record station		06
01378850	Great Brook near Basking Ridge, N.J.	Low-flow partial-record station		06
01378900	Black Brook near Meyersville, N.J.	Low-flow partial-record station		06
01379000	Passaic River near Millington, N.J.	Continuous-record gaging station	Yes	06

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01379150	Harrisons Brook at Liberty Corner, N.J.	Low-flow partial-record station		06
01379200	Dead River near Millington, N.J.	Low-flow partial-record station		06
01379300	Passaic River at Stirling, N.J.	Low-flow partial-record station		06
01379500	Passaic River near Chatham, N.J.	Continuous-record gaging station	Yes	06
01379525	Canoe Brook near Millburn, N.J.	Low-flow partial-record station		06
01379570	Passaic River at Hanover, N.J.	Low-flow partial-record station		06
01379630	Russia Brook Tributary at Milton, N.J.	Gaging station analyzed as a partial-record station		06
01379700	Rockaway River at Berkshire Valley, N.J.	Gaging station analyzed as a partial-record station		06
01379750	Rockaway River at Dover, N.J.	Low-flow partial-record station		06
01379773	Green Pond Brook at Picatinny Arsenal, N.J.	Gaging station analyzed as a partial-record station		06
01379780	Green Pond Brook below Picatinny Lk at Picatinny Arsenal, N.J.	Gaging station analyzed as a partial-record station	Yes	06
01379790	Green Pond Brook at Wharton, N.J.	Gaging station analyzed as a partial-record station		06
01380000	Beaver Brook at outlet of Splitrock Res, N.J.	Continuous-record gaging station	Yes	06
01380050	Hibernia Brook at outlet of Lake Telemark, N.J.	Low-flow partial-record station		06
01380100	Beaver Brook at Rockaway, N.J.	Low-flow partial-record station		06
01380300	Stony Brook near Rockaway Valley, N.J.	Low-flow partial-record station		06
01380500	Rockaway River above Reservoir at Boonton, N.J.	Continuous-record gaging station		06
01381000	Rockaway River below Reservoir at Boonton, N.J.	Continuous-record gaging station	Yes	06
01381150	Crooked Brook near Boonton, N.J.	Low-flow partial-record station		06
01381200	Rockaway River at Pine Brook, N.J.	Low-flow partial-record station		06
01381400	Whippany River near Morristown, N.J.	Gaging station analyzed as a partial-record station		06
01381470	Jaquis Brook at Greystone Park State Hospital, N.J.	Low-flow partial-record station		06
01381490	Watnong Brook at Morris Plains, N.J.	Low-flow partial-record station		06
01381500	Whippany River at Morristown, N.J.	Continuous-record gaging station		06
01381550	Malapardis Brook at Whippany, N.J.	Low-flow partial-record station		06
01381600	Whippany River near Whippany, N.J.	Low-flow partial-record station		06
01381700	Troy Brook at Troy Hills, N.J.	Low-flow partial-record station		06
01381750	West Brook at Troy Hills, N.J.	Low-flow partial-record station		06
01381800	Whippany River near Pine Brook, N.J.	Gaging station analyzed as a partial-record station		06
01381900	Passaic River at Pine Brook, N.J.	Low-flow partial-record station	Yes	06
01382000	Passaic River at Two Bridges, N.J.	Low-flow partial-record station		06
01382050	Pequannock River near Stockholm, N.J.	Low-flow partial-record station		03
01382360	Kanouse Brook at Newfoundland, N.J.	Low-flow partial-record station		03

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01382450	Macopin River at Macopin Reservoir, N.J.	Low-flow partial-record station		03
01382500	Pequannock River at Macopin Intake Dam, N.J.	Continuous-record gaging station	Yes	03
01382550	Pequannock River Tributary 1 at Kinnelon, N.J.	Low-flow partial-record station		03
01382700	Stone House Brook at Kinnelon, N.J.	Low-flow partial-record station		03
01382800	Pequannock River at Riverdale, N.J.	Gaging station analyzed as a partial-record station		03
01382870	Belcher Creek at Stowaway Road at West Milford, N.J.	Low-flow partial-record station		03
01382880	Belcher Creek Tributary at West Milford, N.J.	Low-flow partial-record station		03
01382890	Belcher Creek at West Milford, N.J.	Low-flow partial-record station		03
01382910	Morsetown Brook at West Milford, N.J.	Low-flow partial-record station		03
01382960	Green Brook near West Milford, N.J.	Low-flow partial-record station		03
01382990	Cooley Brook near West Milford, N.J.	Low-flow partial-record station		03
01383500	Wanaque River at Awosting, N.J.	Continuous-record gaging station	Yes	03
01384000	Wanaque River at Monks, N.J.	Continuous-record gaging station	Yes	03
01384500	Ringwood Creek near Wanaque, N.J.	Continuous-record gaging station		03
01385000	Cupsaw Brook near Wanaque, N.J.	Continuous-record gaging station		03
01385500	Erschine Brook near Wanaque, N.J.	Gaging station analyzed as a partial-record station		03
01386000	West Brook near Wanaque, N.J.	Continuous-record gaging station		03
01386500	Blue Mine Brook near Wanaque, N.J.	Continuous-record gaging station		03
01387000	Wanaque River at Wanaque, N.J.	Continuous-record gaging station	Yes	03
01387400	Ramapo River at Ramapo, N.Y.	Continuous-record gaging station	Yes	24
01387420	Ramapo River at Suffern, N.Y.	Continuous-record gaging station	Yes	24
01387450	Mahwah River near Suffern, N.Y.	Continuous-record gaging station		24
01387480	Mahwah River at Suffern, N.Y.	Low-flow partial-record station		24
01387490	Masonicus Brook at West Mahwah, N.J.	Low-flow partial-record station		03
01387500	Ramapo River near Mahwah, N.J.	Continuous-record gaging station		03
01387520	Stag Brook near Mahwah, N.J.	Low-flow partial-record station		03
01387600	Darlington Brook near Darlington, N.J.	Low-flow partial-record station		03
01387670	Ramapo River near Darlington, N.J.	Low-flow partial-record station		03
01387700	Bear Swamp Brook near Oakland, N.J.	Low-flow partial-record station		03
01387884	Pond Brook at US Route 202 at Oakland, N.J.	Low-flow partial-record station		03
01387930	Ramapo River Tributary No. 5 at Oakland, N.J.	Low-flow partial-record station		03
01387950	Acid Brook at Pompton Lakes, N.J.	Low-flow partial-record station		03
01387980	Haycock Brook at Pompton Lakes, N.J.	Low-flow partial-record station		03
01388000	Ramapo River at Pompton Lakes, N.J.	Continuous-record gaging station	Yes	03
01388500	Pompton River at Pompton Plains, N.J.	Continuous-record gaging station	Yes	03

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01388700	Beaver Dam Brook at Lincoln Park, N.J.	Low-flow partial-record station		03
01388720	Beaver Dam Brook at Ryerson Road, at Lincoln Park, N.J.	Low-flow partial-record station		03
01389000	Pompton River at Two Bridges, N.J.	Low-flow partial-record station		06
01389100	Singac Brook at Singac, N.J.	Low-flow partial-record station		04
01389110	Passaic River at Route 46, at Singac, N.J.	Low-flow partial-record station		04
01389140	Deepavaal Brook at Two Bridges, N.J.	Low-flow partial-record station		04
01389500	Passaic River at Little Falls, N.J.	Continuous-record gaging station	Yes	04
01389534	Peckman River at Ozone Avenue, at Verona, N.J.	Low-flow partial-record station		04
01389600	Peckman River at West Paterson, N.J.	Low-flow partial-record station		04
01389765	Molly Ann Brook at North Haledon, N.J.	Low-flow partial-record station		04
01389790	Molly Ann Brook at Paterson, N.J.	Low-flow partial-record station		04
01389850	Goffle Brook at Hawthorne, N.J.	Low-flow partial-record station		04
01389905	Fleischer Brook at Elmwood Park, N.J.	Low-flow partial-record station		04
01390450	Saddle River at Upper Saddle River, N.J.	Low-flow partial-record station		04
01390500	Saddle River at Ridgewood, N.J.	Continuous-record gaging station		04
01390700	Hohokus Brook at Wyckoff, N.J.	Low-flow partial-record station		04
01390800	Valentine Brook at Allendale, N.J.	Low-flow partial-record station		04
01390900	Ramsey Brook at Allendale, N.J.	Low-flow partial-record station		04
01391000	Hohokus Brook at Ho-Ho-Kus, N.J.	Continuous-record gaging station		04
01391110	Saddle River at Paramus, N.J.	Low-flow partial-record station		04
01391485	Sprout Brook at Rochelle Park, N.J.	Low-flow partial-record station		04
01391500	Saddle River at Lodi, N.J.	Continuous-record gaging station	Yes	04
01392000	Weasel Brook at Clifton, N.J.	Continuous-record gaging station	Yes	04
01392200	Third River at Nutley, N.J.	Low-flow partial-record station		04
01392210	Third River at Passaic, N.J.	Continuous-record gaging station		04
01392500	Second River at Belleville, N.J.	Continuous-record gaging station		04
01393000	Elizabeth River at Irvington, N.J.	Gaging station analyzed as a partial-record station		07
01393200	Elizabeth River below Chancellor Avenue Bridge at Irvington, N.J.	Low-flow partial-record station		07
01393350	West Branch Elizabeth River near Union, N.J.	Low-flow partial-record station		07
01393450	Elizabeth River at Ursino Lake at Elizabeth, N.J.	Continuous-record gaging station	Yes	07
01393800	East Fork East Branch Rahway River at West Orange, N.J.	Gaging station analyzed as a partial-record station		07
01393890	East Branch Rahway River at Maplewood, N.J.	Low-flow partial-record station		07
01394000	West Branch Rahway River at Millburn, N.J.	Gaging station analyzed as a partial-record station	Yes	07
01394400	Van Winkle Brook at Springfield, N.J.	Low-flow partial-record station		07
01394500	Rahway River near Springfield, N.J.	Continuous-record gaging station	Yes	07

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01394600	Nomahegan Brook near Mountainside, N.J.	Low-flow partial-record station		07
01395000	Rahway River at Rahway, N.J.	Continuous-record gaging station	Yes	07
01395500	Robinsons Branch at Goodmans, N.J.	Gaging station analyzed as a partial-record station		07
01396000	Robinsons Branch at Rahway, N.J.	Continuous-record gaging station		07
01396030	South Branch Rahway River at Colonia, N.J.	Low-flow partial-record station		07
01396070	South Branch Raritan River Tributary 6 at Budd Lake, N.J.	Low-flow partial-record station		08
01396080	South Branch Raritan River Tributary 7 at Budd Lake, N.J.	Low-flow partial-record station		08
01396090	South Branch Raritan River at outlet of Budd Lake, N.J.	Low-flow partial-record station		08
01396120	South Branch Raritan River at Bartley, N.J.	Low-flow partial-record station		08
01396180	Drakes Brook at Bartley, N.J.	Low-flow partial-record station		08
01396190	South Branch Raritan River at Four Bridges, N.J.	Gaging station analyzed as a partial-record station		08
01396220	Stony Brook at Naughtight, N.J.	Low-flow partial-record station		08
01396240	Electric Brook at Long Valley, N.J.	Low-flow partial-record station		08
01396280	South Branch Raritan River at Middle Valley, N.J.	Low-flow partial-record station		08
01396350	South Branch Raritan River at Califon, N.J.	Low-flow partial-record station		08
01396500	South Branch Raritan River near High Bridge, N.J.	Continuous-record gaging station		08
01396535	South Branch Raritan River at Arch Street at High Bridge, N.J.	Low-flow partial-record station		08
01396550	Spruce Run at Newport, N.J.	Low-flow partial-record station		08
01396580	Spruce Run at Glen Gardner, N.J.	Continuous-record gaging station		08
01396588	Spruce Run near Glen Gardner, N.J.	Low-flow partial-record station		08
01396590	Spruce Run near High Bridge, N.J.	Low-flow partial-record station		08
01396600	Spruce Run near Clinton, N.J.	Low-flow partial-record station		08
01396660	Mulhockaway Creek at Van Syckel, N.J.	Continuous-record gaging station		08
01396670	Mulhockaway Creek Tributary at Van Syckel, N.J.	Low-flow partial-record station		08
01396700	Mulhockaway Creek near Clinton, N.J.	Low-flow partial-record station		08
01396800	Spruce Run at Clinton, N.J.	Continuous-record gaging station	Yes	08
01396865	Sidney Brook at Grandin, N.J.	Low-flow partial-record station		08
01396900	Capoolong Creek at Lansdowne, N.J.	Low-flow partial-record station		08
01397000	South Branch Raritan River at Stanton, N.J.	Continuous-record gaging station	Yes	08
01397100	Prescott Brook at Round Valley, N.J.	Low-flow partial-record station		08
01397290	Assiscong Creek at Bartles Corners, N.J.	Low-flow partial-record station		08
01397500	Walnut Brook near Flemington, N.J.	Continuous-record gaging station		08
01397800	Neshanic River near Flemington, N.J.	Low-flow partial-record station		08
01397900	Third Neshanic River near Ringoes, N.J.	Low-flow partial-record station		08
01398000	Neshanic River at Reaville, N.J.	Continuous-record gaging station		08

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01398045	Back Brook Tributary near Ringoes, N.J.	Gaging station analyzed as a partial-record station	Yes	08
01398052	Back Brook near Reaville, N.J.	Low-flow partial-record station		08
01398075	Pleasant Run at Centerville, N.J.	Low-flow partial-record station		08
01398102	South Branch Raritan River at South Branch, N.J.	Low-flow partial-record station		08
01398107	Holland Brook at Readington, N.J.	Gaging station analyzed as a partial-record station	Yes	08
01398220	India Brook near Mendham, N.J.	Low-flow partial-record station		08
01398260	North Branch Raritan River near Chester, N.J.	Low-flow partial-record station		08
01398300	Dawsons Brook near Ironia, N.J.	Low-flow partial-record station		08
01398360	Burnett Brook near Chester, N.J.	Low-flow partial-record station		08
01398500	Nb Raritan River near Far Hills, N.J.	Continuous-record gaging station		08
01398700	Peapack Brook at Gladstone, N.J.	Low-flow partial-record station		08
01398850	Peapack Brook at Far Hills, N.J.	Low-flow partial-record station		08
01398950	Mine Brook at Far Hills, N.J.	Low-flow partial-record station		08
01399100	Middle Brook at Burnt Mills, N.J.	Low-flow partial-record station		08
01399120	North Branch Raritan River at Burnt Mills, N.J.	Low-flow partial-record station		08
01399190	Lamington (Black) River at Succasunna, N.J.	Gaging station analyzed as a partial-record station	Yes	08
01399194	Succasunna Brook near Succasunna, N.J.	Low-flow partial-record station		08
01399200	Lamington (Black) River near Ironia, N.J.	Gaging station analyzed as a partial-record station		08
01399295	Tanners Brook near Milltown, N.J.	Low-flow partial-record station		08
01399300	Lamington River at Milltown, N.J.	Low-flow partial-record station		08
01399500	Lamington (Black) River near Pottersville, N.J.	Continuous-record gaging station		08
01399510	Upper Cold Brook near Pottersville, N.J.	Continuous-record gaging station		08
01399525	Axle Brook near Pottersville, N.J.	Gaging station analyzed as a partial-record station		08
01399540	Cold Brook at Oldwick, N.J.	Low-flow partial-record station		08
01399570	Rockaway Creek at McCrea Mills, N.J.	Low-flow partial-record station		08
01399600	South Branch Rockaway Creek tributary at Lebanon, N.J.	Low-flow partial-record station		08
01399670	South Branch Rockaway Creek at Whitehouse Station, N.J.	Continuous-record gaging station		08
01399690	South Branch Rockaway Creek at Whitehouse, N.J.	Low-flow partial-record station		08
01399700	Rockaway Creek at Whitehouse, N.J.	Gaging station analyzed as a partial-record station		08
01399820	Chambers Brook near North Branch, N.J.	Low-flow partial-record station		08
01399830	North Branch Raritan River at North Branch, N.J.	Gaging station analyzed as a partial-record station		08
01399900	Chambers Brook at North Branch Depot, N.J.	Low-flow partial-record station		08
01400000	North Branch Raritan River near Raritan, N.J.	Continuous-record gaging station		08

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01400300	Peters Brook near Raritan, N.J.	Gaging station analyzed as a partial-record station	Yes	10
01400350	Macs Brook at Somerville, N.J.	Gaging station analyzed as a partial-record station		10
01400500	Raritan River at Manville, N.J.	Continuous-record gaging station	Yes	09
01400540	Millstone River near Manalapan, N.J.	Low-flow partial-record station		10
01400560	Millstone River at Applegarth, N.J.	Low-flow partial-record station		10
01400580	Millstone River at Hightstown, N.J.	Low-flow partial-record station		10
01400593	Rocky Brook at Hightstown, N.J.	Low-flow partial-record station		10
01400596	Peddie Brook at Hightstown, N.J.	Low-flow partial-record station		10
01400600	Millstone River at Locust Corner, N.J.	Low-flow partial-record station		10
01400640	Millstone River near Grovers Mill, N.J.	Low-flow partial-record station		10
01400670	Cranbury Brook at Old Church, N.J.	Low-flow partial-record station		10
01400700	Cranbury Brook at Cranbury Station, N.J.	Low-flow partial-record station		10
01400725	Cranbury Brook at Plainsboro, N.J.	Low-flow partial-record station		10
01400730	Millstone River at Plainsboro, N.J.	Gaging station analyzed as a partial-record station		10
01400750	Bear Brook near Hickory Corner, N.J.	Low-flow partial-record station		10
01400770	Little Bear Brook at Hickory Corner, N.J.	Low-flow partial-record station		10
01400800	Bear Brook near Grovers Mill, N.J.	Low-flow partial-record station		10
01400810	Bear Brook at Princeton Junction, N.J.	Low-flow partial-record station		10
01400850	Woodsville Brook at Woodsville, N.J.	Low-flow partial-record station		10
01400900	Stony Brook at Glenmoore, N.J.	Low-flow partial-record station		10
01400930	Baldwins Creek at Pennington, N.J.	Low-flow partial-record station		10
01400932	Baldwins Creek at Baldwin Lake near Pennington, N.J.	Gaging station analyzed as a partial-record station		10
01400947	Stony Brook at Pennington, N.J.	Low-flow partial-record station		10
01400953	Honey Branch near Pennington, N.J.	Gaging station analyzed as a partial-record station		10
01400970	Honey Branch near Rosedale, N.J.	Low-flow partial-record station		10
01401000	Stony Brook at Princeton, N.J.	Continuous-record gaging station		10
01401100	Stony Brook at Clarksville, N.J.	Low-flow partial-record station		10
01401200	Duck Pond Run at Clarksville, N.J.	Low-flow partial-record station		10
01401301	Millstone River at Carnegie Lake at Princeton, N.J.	Gaging station analyzed as a partial-record station		10
01401400	Heathcote Brook at Kingston, N.J.	Low-flow partial-record station		10
01401500	Millstone River near Kingston, N.J.	Gaging station analyzed as a partial-record station	Yes	10
01401520	Beden Brook near Hopewell, N.J.	Low-flow partial-record station		10
01401590	Rock Brook at Blawenburg, N.J.	Low-flow partial-record station		10

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01401600	Beden Brook near Rocky Hill, N.J.	Low-flow partial-record station		10
01401650	Pike Run at Belle Mead, N.J.	Continuous-record gaging station		10
01401700	Pike Run near Rocky Hill, N.J.	Low-flow partial-record station		10
01401800	Ten Mile Run near Blackwells Mills, N.J.	Low-flow partial-record station		10
01401900	Six Mile Run at Blackwells Mills, N.J.	Low-flow partial-record station		10
01402000	Millstone River at Blackwells Mills, N.J.	Continuous-record gaging station	Yes	10
01402590	Royce Brook Tributary at Frankfort, N.J.	Gaging station analyzed as a partial-record station		10
01402600	Royce Brook Tributary near Belle Mead, N.J.	Continuous-record gaging station		10
01402700	Royce Brook at Manville, N.J.	Low-flow partial-record station		10
01403060	Raritan River below Calco Dam at Bound Brook, N.J.	Continuous-record gaging station	Yes	09
01403100	East Branch Middle Brook at Martinsville, N.J.	Low-flow partial-record station		09
01403150	West Branch Middle Brook near Martinsville, N.J.	Continuous-record gaging station	Yes	09
01403160	West Branch Middle Brook near Somerville, N.J.	Gaging station analyzed as a partial-record station		09
01403330	Bound Brook at South Plainfield, N.J.	Low-flow partial-record station		09
01403350	Cedar Brook at South Plainfield, N.J.	Low-flow partial-record station		09
01403385	Bound Brook at Route 28 at Middlesex, N.J.	Low-flow partial-record station		09
01403395	Blue Brook at Seeleys Pond Dam near Berkeley Heights, N.J.	Low-flow partial-record station		09
01403400	Green Brook at Seeley Mills, N.J.	Continuous-record gaging station		09
01403500	Green Brook at Plainfield, N.J.	Continuous-record gaging station	Yes	09
01403535	East Branch Stony Brook at Best Lake at Watchung, N.J.	Continuous-record gaging station		09
01403540	Stony Brook at Watchung, N.J.	Continuous-record gaging station		09
01403900	Bound Brook at Middlesex, N.J.	Gaging station analyzed as a partial-record station		09
01404060	Ambrose Brook at Middlesex, N.J.	Low-flow partial-record station		09
01404180	Mill Brook at Highland Park, N.J.	Low-flow partial-record station		09
01404300	Lawrence Brook at outlet of Davidsons Mill Pond, N.J.	Low-flow partial-record station		09
01404400	Oakeys Brook near Patricks Corner, N.J.	Low-flow partial-record station		09
01404470	Ireland Brook at Patricks Corner, N.J.	Low-flow partial-record station		09
01404500	Lawrence Brook at Patricks Corner, N.J.	Gaging station analyzed as a partial-record station		09
01404700	Beaverdam Brook near Patricks Corner, N.J.	Low-flow partial-record station		09
01405000	Lawrence Brook at Farrington Dam, N.J.	Continuous-record gaging station	Yes	09
01405030	Lawrence Brook at Westons Mills, N.J.	Continuous-record gaging station	Yes	09
01405170	Milford Brook at Englishtown, N.J.	Low-flow partial-record station		09
01405180	Mcgellairds Brook at Englishtown, N.J.	Low-flow partial-record station		09
01405210	Pine Brook at Clarks Mills, N.J.	Low-flow partial-record station		09
01405240	Matchaponix Brook near Englishtown, N.J.	Low-flow partial-record station		09

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01405285	Barclay Brook near Englishtown, N.J.	Low-flow partial-record station		09
01405290	Matchaponix Brook at Texas, N.J.	Low-flow partial-record station		09
01405300	Matchaponix Brook at Spotswood, N.J.	Gaging station analyzed as a partial-record station		09
01405302	Matchaponix Brook at Mundy Avenue at Spotswood, N.J.	Low-flow partial-record station		09
01405335	Manalapan Brook near Manalapan, N.J.	Low-flow partial-record station		09
01405340	Manalapan Brook at Federal Road near Manalapan, N.J.	Low-flow partial-record station		09
01405400	Manalapan Brook at Spotswood, N.J.	Continuous-record gaging station	Yes	09
01405435	Cedar Brook at Spotswood, N.J.	Low-flow partial-record station		09
01405440	Manalapan Brook at Bridge Street at Spotswood, N.J.	Low-flow partial-record station		09
01405470	Iresick Brook at East Spotswood, N.J.	Low-flow partial-record station		09
01405500	South River at Old Bridge, N.J.	Continuous-record gaging station	Yes	09
01406000	Deep Run near Browntown, N.J.	Gaging station analyzed as a partial-record station		09
01406040	Deep Run at Route 516, near Old Bridge, N.J.	Low-flow partial-record station		09
01406050	Deep Run at Old Bridge, N.J.	Gaging station analyzed as a partial-record station		09
01406500	Tennent Brook near Browntown, N.J.	Gaging station analyzed as a partial-record station		09
01407000	Matawan Creek at Matawan, N.J.	Continuous-record gaging station	Yes	12
01407012	Gravelly Brook at Church Street, at Matawan, N.J.	Low-flow partial-record station		12
01407026	Mohingson (Wilkson) Creek at Church Street, at Matawan, N.J.	Low-flow partial-record station		12
01407055	East Creek at North Centerville, N.J.	Low-flow partial-record station		12
01407065	Mahoras Brook at Hendrickson Corners, N.J.	Low-flow partial-record station		12
01407070	Waackaack Creek near Keansburg, N.J.	Low-flow partial-record station		12
01407102	Town Brook at Church Street, at New Monmouth, N.J.	Low-flow partial-record station		12
01407200	Hop Brook at Holmdel, N.J.	Low-flow partial-record station		12
01407250	Willow Brook at Holmdel, N.J.	Low-flow partial-record station		12
01407300	Big Brook at Vanderburg, N.J.	Low-flow partial-record station		12
01407400	Yellow Brook at Colts Neck, N.J.	Low-flow partial-record station		12
01407450	Mine Brook at Colts Neck, N.J.	Low-flow partial-record station		12
01407500	Swimming River near Red Bank, N.J.	Continuous-record gaging station	Yes	12
01407532	Poricy Brook at Red Bank, N.J.	Low-flow partial-record station		12
01407618	Whale Pond Brook near Oakhurst, N.J.	Low-flow partial-record station		12
01407628	Poplar Brook near Deal, N.J.	Low-flow partial-record station		12
01407636	Harvey Brook at West Allenhurst, N.J.	Low-flow partial-record station		12
01407700	Shark River at Glendola, N.J.	Low-flow partial-record station		12
01407705	Shark River near Neptune City, N.J.	Continuous-record gaging station	Yes	12
01407755	Jumping Brook above reservoir, near Neptune City, N.J.	Low-flow partial-record station		12

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01407760	Jumping Brook near Neptune City, N.J.	Continuous-record gaging station	Yes	12
01407780	Polly Pond Brook at South Belmar, N.J.	Low-flow partial-record station		12
01407800	Wreck Pond Brook near Spring Lake, N.J.	Low-flow partial-record station		12
01407806	Hannabrand Brook at Old Mill Road, near Spring Lake Heights, N.J.	Low-flow partial-record station		12
01407830	Manasquan River near Georgia, N.J.	Low-flow partial-record station		12
01407860	Debois Creek at Adelphia, N.J.	Low-flow partial-record station		12
01407900	Manasquan River at West Farms, N.J.	Low-flow partial-record station		12
01407970	Timber Swamp Creek near Farmingdale, N.J.	Low-flow partial-record station		12
01408000	Manasquan River at Squankum, N.J.	Continuous-record gaging station		12
01408015	Mingamahone Brook at Farmingdale, N.J.	Low-flow partial-record station		12
01408020	Mingamahone Brook at Squankum, N.J.	Low-flow partial-record station		12
01408029	Manasquan River near Allenwood, N.J.	Gaging station analyzed as a partial-record station	Yes	12
01408030	Manasquan River at Allenwood, N.J.	Low-flow partial-record station		12
01408100	North Branch Metedeconk River at Lakewood, N.J.	Low-flow partial-record station		13
01408120	North Branch Metedeconk River near Lakewood, N.J.	Continuous-record gaging station		13
01408140	South Branch Metedeconk River at Lakewood, N.J.	Gaging station analyzed as a partial-record station		13
01408150	South Branch Metedeconk River near Lakewood, N.J.	Gaging station analyzed as a partial-record station		13
01408300	Toms River at Whitesville, N.J.	Low-flow partial-record station		13
01408440	Union Brook at Lakehurst, N.J.	Low-flow partial-record station		13
01408460	Manapagua Brook at Lakehurst, N.J.	Low-flow partial-record station		13
01408490	Ridgeway Branch near Lakehurst, N.J.	Low-flow partial-record station		13
01408500	Toms River near Toms River, N.J.	Continuous-record gaging station		13
01408592	Wrangel Brook at Mule Road, near Toms River, N.J.	Low-flow partial-record station		13
01408620	Davenport Branch near Dover Forge, N.J.	Low-flow partial-record station		13
01408728	Long Swamp Creek at Toms River, N.J.	Low-flow partial-record station		13
01408800	Webbs Mill Branch near Whiting, N.J.	Low-flow partial-record station		13
01408810	Webbs Mill Branch tributary near Whiting, N.J.	Low-flow partial-record station		13
01408830	Cedar Creek at Cedar Crest, N.J.	Low-flow partial-record station		13
01409000	Cedar Creek at Lanoka Harbor, N.J.	Continuous-record gaging station		13
01409050	North Branch Forked River near Forked River, N.J.	Low-flow partial-record station		13
01409080	South Branch Forked River near Forked River, N.J.	Low-flow partial-record station		13
01409095	Oyster Creek near Brookville, N.J.	Gaging station analyzed as a partial-record station		13
01409100	Oyster Creek near Waretown, N.J.	Low-flow partial-record station		13
01409150	Mill Creek near Manahawkin, N.J.	Low-flow partial-record station		13

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01409200	Fourmile Branch near Manahawkin, N.J.	Low-flow partial-record station		13
01409250	Cedar Run near Manahawkin, N.J.	Low-flow partial-record station		13
01409280	Westecunk Creek at Stafford Forge, N.J.	Gaging station analyzed as a partial-record station		13
01409300	Mill Branch near Tuckerton, N.J.	Low-flow partial-record station		13
01409375	Mullica River near Atco, N.J.	Low-flow partial-record station		14
01409387	Mullica River at outlet of Atsion Lake, at Atsion, N.J.	Low-flow partial-record station		14
01409390	Mullica River at Atsion, N.J.	Low-flow partial-record station		14
01409395	Mullica River Tributary near Atsion, N.J.	Low-flow partial-record station		14
01409400	Mullica River near Batsto, N.J.	Continuous-record gaging station		14
01409401	Hays Mill Creek at Atco, N.J.	Low-flow partial-record station		14
01409403	Wildcat Branch at Chesilhurst, N.J.	Low-flow partial-record station		14
01409404	Sleeper Branch at US Rt 206 near Atsion, N.J.	Low-flow partial-record station		14
01409405	Clark Branch at US Rt 206, near Atsion, N.J.	Low-flow partial-record station		14
01409406	Sleeper Branch at Batsto, N.J.	Low-flow partial-record station		14
01409407	Pump Branch near Blue Anchor, N.J.	Low-flow partial-record station		14
01409408	Pump Branch near Waterford Works, N.J.	Low-flow partial-record station		14
01409409	Blue Anchor Brook near Blue Anchor, N.J.	Low-flow partial-record station		14
01409410	Albertson Brook near Hammonton, N.J.	Low-flow partial-record station		14
01409411	Nescochague Creek at Pleasant Mills, N.J.	Low-flow partial-record station		14
01409416	Hammonton Creek at Wescoatville, N.J.	Low-flow partial-record station		14
01409450	Springers Brook near Indian Mills, N.J.	Low-flow partial-record station		14
01409460	Springers Brook near Atsion, N.J.	Low-flow partial-record station		14
01409500	Batsto River at Batsto, N.J.	Continuous-record gaging station		14
01409575	Landing Creek at Philadelphia Avenue at Egg Harbor City, N.J.	Low-flow partial-record station		14
01409730	West Branch Wading River near Chatsworth, N.J.	Low-flow partial-record station		14
01409780	Tulpehocken Creek near Jenkins, N.J.	Low-flow partial-record station		14
01409800	West Branch Wading River near Harrisville, N.J.	Low-flow partial-record station		14
01409810	West Branch Wading River near Jenkins, N.J.	Continuous-record gaging station		14
01409815	West Branch Wading River at Maxwell, N.J.	Low-flow partial-record station		14
01409970	Oswego River at Oswego Lake, N.J.	Low-flow partial-record station		14
01410000	Oswego River at Harrisville, N.J.	Continuous-record gaging station		14
01410150	East Branch Bass River near New Gretna, N.J.	Continuous-record gaging station		14
01410200	West Branch Bass River near New Gretna, N.J.	Low-flow partial-record station		14
01410215	Clarks Mill Stream at Port Republic, N.J.	Low-flow partial-record station		14
01410225	Morses Mill Stream at Port Republic, N.J.	Low-flow partial-record station		14
01410500	Absecon Creek at Absecon, N.J.	Continuous-record gaging station	Yes	15
01410775	Great Egg Harbor River at Berlin, N.J.	Low-flow partial-record station		15

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01410784	Great Egg Harbor River near Sicklerville, N.J.	Gaging station analyzed as a partial-record station		15
01410787	Great Egg Harbor River Tributary at Sicklerville, N.J.	Gaging station analyzed as a partial-record station		15
01410800	Fourmile Branch near Williamstown, N.J.	Low-flow partial-record station		15
01410803	Fourmile Branch at Winslow Crossing, N.J.	Low-flow partial-record station		15
01410810	Fourmile Branch at New Brooklyn, N.J.	Gaging station analyzed as a partial-record station		15
01410820	Great Egg Harbor River near Blue Anchor, N.J.	Gaging station analyzed as a partial-record station		15
01410855	Squankum Brook above sewage treatment plant, at Williamstown, N.J.	Low-flow partial-record station		15
01410865	Squankum Branch at Malaga Road, near Williamstown, N.J.	Low-flow partial-record station		15
01411000	Great Egg Harbor River at Folsom, N.J.	Continuous-record gaging station		15
01411020	Penny Pot Stream near Folsom, N.J.	Low-flow partial-record station		15
01411035	Hospitality Branch at Blue Bell Road, near Cecil, N.J.	Low-flow partial-record station		15
01411040	Hospitality Branch near Cecil, N.J.	Low-flow partial-record station		15
01411042	Whitehall Branch near Cecil, N.J.	Low-flow partial-record station		15
01411047	Whitehall Branch below Victory Lakes, near Cecil, N.J.	Low-flow partial-record station		15
01411053	Hospitality Branch at Berryland, N.J.	Low-flow partial-record station		15
01411110	Great Egg Harbor River at Weymouth, N.J.	Low-flow partial-record station		15
01411140	Deep Run at Weymouth, N.J.	Low-flow partial-record station		15
01411170	Great Egg Harbor River at Mays Landing, N.J.	Low-flow partial-record station		15
01411196	Babcock Creek near Mays Landing, N.J.	Low-flow partial-record station		15
01411200	Babcock Creek at Mays Landing, N.J.	Low-flow partial-record station		15
01411220	South River near Belcoville, N.J.	Low-flow partial-record station		15
01411250	English Creek near Scullville, N.J.	Low-flow partial-record station		15
01411299	Tarkiln Brook near Head of River, N.J.	Low-flow partial-record station		15
01411300	Tuckahoe River at Head of River, N.J.	Continuous-record gaging station		15
01411302	Mill Creek near Steelmantown, N.J.	Low-flow partial-record station		15
01411305	Mill Branch near Northfield, N.J.	Low-flow partial-record station		15
01411351	Mill Creek at outlet Magnolia Lake at Ocean View, N.J.	Low-flow partial-record station		16
01411388	Mill Creek at Cold Spring, N.J.	Low-flow partial-record station		16
01411400	Fishing Creek at Rio Grande, N.J.	Low-flow partial-record station		16
01411404	Green Creek at Green Creek, N.J.	Low-flow partial-record station		16
01411408	Dias Creek near Cape May Court House, N.J.	Low-flow partial-record station		16
01411410	Bidwell Creek tributary near Cape May Court House, N.J.	Low-flow partial-record station		16
01411412	Bidwell Creek tributary 2 near Cape May Court House, N.J.	Low-flow partial-record station		16
01411418	Goshen Creek at Goshen, N.J.	Low-flow partial-record station		16

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01411428	Dennis Creek Tributary 2 at Dennisville, N.J.	Low-flow partial-record station		16
01411430	Sluice Creek at Clermont, N.J.	Low-flow partial-record station		16
01411434	Sluice Creek at outlet Clint Mill Pond at South Dennis, N.J.	Low-flow partial-record station		16
01411438	Dennis Creek Tributary 1 near North Dennis, N.J.	Low-flow partial-record station		16
01411442	East Creek near Eldora, N.J.	Low-flow partial-record station		16
01411444	West Creek near Leesburg, N.J.	Low-flow partial-record station		16
01411445	West Creek near Eldora, N.J.	Low-flow partial-record station		16
01411450	Still Run at Aura, N.J.	Low-flow partial-record station		17
01411456	Little Ease Run near Clayton, N.J.	Gaging station analyzed as a partial-record station		17
01411460	Scotland Run near Williamstown, N.J.	Low-flow partial-record station		17
01411461	Scotland Run at Fries Mill, N.J.	Low-flow partial-record station		17
01411462	Scotland Run at Franklinville, N.J.	Low-flow partial-record station		17
01411466	Indian Brook near Malaga, N.J.	Low-flow partial-record station		17
01411485	Maurice River at Brotmanville, N.J.	Gaging station analyzed as a partial-record station		17
01411495	Blackwater Branch at Norma, N.J.	Gaging station analyzed as a partial-record station		17
01411500	Maurice River at Norma, N.J.	Continuous-record gaging station		17
01411650	Muddy Run near Elmer, N.J.	Low-flow partial-record station		17
01411680	Palatine Branch at Palatine, N.J.	Low-flow partial-record station		17
01411700	Muddy Run at Centerton, N.J.	Low-flow partial-record station		17
01411800	Maurice River near Millville, N.J.	Gaging station analyzed as a partial-record station		17
01411850	Mill Creek near Millville, N.J.	Low-flow partial-record station		17
01411878	Maurice River at Union Lake Dam at Millville, N.J.	Gaging station analyzed as a partial-record station		17
01411880	Maurice River at Sharp Street at Millville, N.J.	Low-flow partial-record station		17
01411950	Buckshutem Creek near Laurel Lake, N.J.	Low-flow partial-record station		17
01411955	Gravelly Run at Laurel Lake, N.J.	Low-flow partial-record station		17
01412000	Menantico Creek near Millville, N.J.	Continuous-record gaging station		17
01412100	Manumuskin River near Manumuskin, N.J.	Low-flow partial-record station		17
01412120	Muskee Creek near Port Elizabeth, N.J.	Low-flow partial-record station		17
01412405	Cohansey River near Beals Mill, N.J.	Low-flow partial-record station		17
01412500	West Branch Cohansey River at Seeley, N.J.	Gaging station analyzed as a partial-record station	Yes	17
01412800	Cohansey River at Seeley, N.J.	Gaging station analyzed as a partial-record station		17
01413010	Barrett Run near Bridgeton, N.J.	Low-flow partial-record station		17
01413020	Indian Fields Branch at Bridgeton, N.J.	Low-flow partial-record station		17

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01413050	Stow Creek at Jericho, N.J.	Low-flow partial-record station		17
01413060	Canton Drain near Canton, N.J.	Low-flow partial-record station		17
01413080	Raccoon D at Davis Mill, N.J.	Low-flow partial-record station		17
01434000	Delaware River at Port Jervis, N.Y.	Continuous-record gaging station	Yes	21
01437500	Neversink River at Godeffroy, N.Y.	Continuous-record gaging station	Yes	21
01438090	Clove Brook at N.J. Route 23 at Duttonville, N.J.	Low-flow partial-record station		01
01438400	Shimers Brook near Montague, N.J.	Low-flow partial-record station		01
01438500	Delaware River at Montague, N.J.	Continuous-record gaging station	Yes	01
01439800	Big Flat Brook near Hainesville, N.J.	Low-flow partial-record station		01
01439830	Big Flat Brook at Tuttles Corner, N.J.	Low-flow partial-record station		01
01439900	Little Flat Brook at Hainesville, N.J.	Low-flow partial-record station		01
01439920	Little Flat Brook at Peters Valley, N.J.	Low-flow partial-record station		01
01440000	Flat Brook near Flatbrookville, N.J.	Continuous-record gaging station		01
01440100	Vancampens Brook near Millbrook, N.J.	Low-flow partial-record station		01
01440200	Delaware River near Delaware Water Gap, Pa.	Continuous-record gaging station	Yes	01
01442760	Dunnfield Creek at Dunnfield, N.J.	Low-flow partial-record station		01
01442800	Stony Brook near Columbia, N.J.	Low-flow partial-record station		01
01443260	East Branch Paulins Kill Tributary 2 near Woodruffs Gap, N.J.	Low-flow partial-record station		01
01443275	East Branch Paulins Kill Tributary 1 near Lafayette, N.J.	Low-flow partial-record station		01
01443280	East Branch Paulins Kill near Lafayette, N.J.	Gaging station analyzed as a partial-record station		01
01443300	Paulins Kill at Lafayette, N.J.	Low-flow partial-record station		01
01443400	Culvers Creek at Branchville, N.J.	Low-flow partial-record station		01
01443409	Dry Brook at Mill Road, at Branchville, N.J.	Low-flow partial-record station		01
01443450	Paulins Kill near Newton, N.J.	Low-flow partial-record station		01
01443460	Paulins Kill at Paulins Kill, N.J.	Low-flow partial-record station		01
01443475	Trout Brook near Middleville, N.J.	Low-flow partial-record station		01
01443500	Paulins Kill at Blairstown, N.J.	Continuous-record gaging station		01
01443510	Blair Creek at Blairstown, N.J.	Low-flow partial-record station		01
01443900	Yards Creek near Blairstown, N.J.	Continuous-record gaging station	Yes	01
01445000	Pequest River at Huntsville, N.J.	Continuous-record gaging station		01
01445160	Bear Brook at Dark Moon Road near Johnsonburg, N.J.	Low-flow partial-record station		01
01445200	Bear Creek near Johnsonburg, N.J.	Low-flow partial-record station		01
01445430	Pequest River at Townsburry, N.J.	Gaging station analyzed as a partial-record station		01
01445490	Furnace Brook at Oxford, N.J.	Low-flow partial-record station		01
01445500	Pequest River at Pequest, N.J.	Continuous-record gaging station		01

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01445520	Mountain Lake Brook near Pequest, N.J.	Low-flow partial-record station		01
01445800	Honey Run near Ramseyburg, N.J.	Low-flow partial-record station		01
01445900	Honey Run near Hope, N.J.	Low-flow partial-record station		01
01446000	Beaver Brook near Belvidere, N.J.	Continuous-record gaging station		01
01446400	Pequest River at Belvidere, N.J.	Low-flow partial-record station		01
01446500	Delaware River at Belvidere, N.J.	Continuous-record gaging station	Yes	01
01446520	Pophandusing Brook at Belvidere, N.J.	Low-flow partial-record station		01
01446568	Buckhorn Creek at Hutchinson Road, at Hutchinson, N.J.	Low-flow partial-record station		01
01453000	Lehigh River at Bethlehem, Pa.	Continuous-record gaging station	Yes	22
01455100	Lopatcong Creek at Phillipsburg, N.J.	Low-flow partial-record station		01
01455135	Pohatcong Creek at Tunnel Hill Road, near Washington, N.J.	Low-flow partial-record station		01
01455160	Brass Castle Creek near Washington, N.J.	Low-flow partial-record station		01
01455200	Pohatcong Creek at New Village, N.J.	Gaging station analyzed as a partial-record station		01
01455230	Merrill Creek at Coopersville, N.J.	Low-flow partial-record station		01
01455300	Pohatcong Creek at Carpentersville, N.J.	Low-flow partial-record station		01
01455350	Weldon Brook near Woodport, N.J.	Low-flow partial-record station		01
01455355	Beaver Brook near Weldon, N.J.	Gaging station analyzed as a partial-record station		01
01455360	Beaver Brook near Woodport, N.J.	Low-flow partial-record station		01
01455370	Weldon Brook at Hurdtown, N.J.	Low-flow partial-record station		01
01455500	Musconetcong River at outlet of Lake Hopatcong, N.J.	Continuous-record gaging station	Yes	01
01455550	Musconetcong River at Stanhope, N.J.	Low-flow partial-record station		01
01455780	Lubbers Run at Lockwood, N.J.	Low-flow partial-record station		01
01456000	Musconetcong River near Hackettstown, N.J.	Continuous-record gaging station		01
01456080	Mine Brook near Hackettstown, N.J.	Low-flow partial-record station		01
01456100	Hatchery Brook at Hackettstown, N.J.	Low-flow partial-record station		01
01456210	Hances Brook near Beattystown, N.J.	Low-flow partial-record station		01
01457000	Musconetcong River near Bloomsbury, N.J.	Continuous-record gaging station		01
01457400	Musconetcong River at Riegelsville, N.J.	Low-flow partial-record station		01
01457500	Delaware River at Riegelsville, N.J.	Continuous-record gaging station	Yes	01
01458100	Hakihokake Creek at Milford, N.J.	Low-flow partial-record station		11
01458400	Hakihokake Creek near Frenchtown, N.J.	Low-flow partial-record station		11
01458570	Nishisakawick Creek near Frenchtown, N.J.	Low-flow partial-record station		11
01458600	Nishisakawick Creek at Frenchtown, N.J.	Low-flow partial-record station		11
01458700	Little Nishisakawick Creek at Frenchtown, N.J.	Low-flow partial-record station		11
01460500	Delaware and Raritan Canal at Kingston, N.J.	Continuous-record gaging station	Yes	10

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regu- lation	Watershed Manage- ment Area
01460900	Lockatong Creek near Raven Rock, N.J.	Low-flow partial-record station		11
01461300	Wickecheoke Creek at Stockton, N.J.	Low-flow partial-record station		11
01461900	Alexauken Creek near Lambertville, N.J.	Low-flow partial-record station		11
01462200	Moore's Creek near Titusville, N.J.	Low-flow partial-record station		11
01462800	Jacobs Creek at Somerset, N.J.	Low-flow partial-record station		11
01463500	Delaware River at Trenton, N.J.	Continuous-record gaging station	Yes	11
01463620	Assunpink Creek near Clarksville, N.J.	Gaging station analyzed as a partial-record station		11
01463650	Shipetaukin Creek at Lawrenceville, N.J.	Low-flow partial-record station		11
01463670	Shipetaukin Creek at Bakersville, N.J.	Low-flow partial-record station		11
01463690	Little Shabakunk Creek at Bakersville, N.J.	Gaging station analyzed as a partial-record station		11
01463750	Shabakunk Creek at Ewingville, N.J.	Low-flow partial-record station		11
01463790	West Branch Shabakunk Creek near Ewingville, N.J.	Low-flow partial-record station		11
01463830	Miry Run at Robbinsville, N.J.	Low-flow partial-record station		11
01463860	Miry Run at Mercerville, N.J.	Low-flow partial-record station		11
01463980	Pond Run at Trenton, N.J.	Low-flow partial-record station		11
01464000	Assunpink Creek at Trenton, N.J.	Continuous-record gaging station	Yes	11
01464300	Crosswicks Creek near Cookstown, N.J.	Low-flow partial-record station		20
01464380	North Run at Cookstown, N.J.	Low-flow partial-record station		20
01464460	Lahaway Creek near Hornerstown, N.J.	Low-flow partial-record station		20
01464480	Miry Run at Holmes Mills, N.J.	Low-flow partial-record station		20
01464500	Crosswicks Creek at Extonville, N.J.	Continuous-record gaging station		20
01464504	Crosswicks Creek at Groveville Road, at Groveville, N.J.	Low-flow partial-record station		20
01464515	Doctors Creek at Allentown, N.J.	Low-flow partial-record station		20
01464525	Thorton Creek at Bordentown, N.J.	Gaging station analyzed as a partial-record station		20
01464530	Blacks Creek at Mansfield Sqaure, N.J.	Low-flow partial-record station		20
01464540	Crafts Creek at Hedding, N.J.	Low-flow partial-record station		20
01464580	Assiscunk Creek at Columbus, N.J.	Low-flow partial-record station		20
01464590	Assiscunk Creek near Burlington, N.J.	Low-flow partial-record station		20
01465847	Jade Run at Vincentown, N.J.	Low-flow partial-record station		19
01465850	South Branch Rancocas Creek at Vincentown, N.J.	Gaging station analyzed as a partial-record station		19
01465865	Barton Run at Tuckerton Road, near Medford, N.J.	Low-flow partial-record station		19
01465880	Southwest Branch Rancocas Creek at Medford, N.J.	Low-flow partial-record station		19
01465884	Sharps Run at Route 541 at Medford, N.J.	Low-flow partial-record station		19
01465898	Little Creek near Lumberton, N.J.	Low-flow partial-record station		19
01465900	Southwest Branch Rancocas at Eayerstown, N.J.	Low-flow partial-record station		19

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01465965	Ong Run at Browns Mills, N.J.	Low-flow partial-record station		19
01466000	Middle Branch Mount Misery Brook in Lebanon State Forest, N.J.	Gaging station analyzed as a partial-record station		19
01466500	Mcdonalds Branch in Lebanon State Forest, N.J.	Continuous-record gaging station		19
01466900	Greenwood Brook at New Lisbon, N.J.	Gaging station analyzed as a partial-record station		19
01467000	North Branch Rancocas Creek at Pemberton, N.J.	Continuous-record gaging station		19
01467005	North Branch Rancocas Creek at Iron Works Park, at Mount Holly, N.J.	Low-flow partial-record station		19
01467010	Parkers Creek near Mount Laurel, N.J.	Low-flow partial-record station		19
01467019	Mill Creek near Willingboro, N.J.	Gaging station analyzed as a partial-record station		19
01467020	Mill Creek at Willingboro, N.J.	Low-flow partial-record station		19
01467021	Mill Creek at Levitt Parkway at Willingboro, N.J.	Gaging station analyzed as a partial-record station		19
01467057	Pompeston Creek at Cinnaminson, N.J.	Low-flow partial-record station		18
01467070	North Branch Pennsauken Creek at Maple Shade, N.J.	Low-flow partial-record station		18
01467080	South Branch Pennsauken Creek at Maple Shade, N.J.	Low-flow partial-record station		18
01467081	South Branch Pennsauken Creek at Cherry Hill, N.J.	Continuous-record gaging station		18
01467130	Cooper River at Kirkwood, N.J.	Low-flow partial-record station		18
01467140	Cooper River at Lawnside, N.J.	Low-flow partial-record station		18
01467150	Cooper River at Haddonfield, N.J.	Continuous-record gaging station	Yes	18
01467160	North Branch Cooper River near Marlton, N.J.	Low-flow partial-record station		18
01467180	North Branch Cooper River at Ellisburg, N.J.	Low-flow partial-record station		18
01467305	Newton Creek at Collingswood, N.J.	Low-flow partial-record station		18
01467312	Newton Creek at West Collingswood, N.J.	Low-flow partial-record station		18
01467315	South Branch Newton Creek at Glover Av at Haddon Heights, N.J.	Low-flow partial-record station		18
01467317	South Branch Newton Creek at Haddon Heights, N.J.	Low-flow partial-record station		18
01467329	South Branch Big Timber Creek at Blackwood Terrace, N.J.	Low-flow partial-record station		18
01467330	South Branch Big Timber Creek at Blackwood, N.J.	Low-flow partial-record station		18
01467350	North Branch Big Timber Creek at Laurel Springs, N.J.	Low-flow partial-record station		18
01474500	Schuylkill River at Philadelphia, Pa.	Continuous-record gaging station	Yes	26
01474950	Mantua Creek at Glassboro, N.J.	Low-flow partial-record station		18
01474970	Mantua Creek at Greentree Road, at Glassboro, N.J.	Low-flow partial-record station		18
01475000	Mantua Creek at Pitman, N.J.	Continuous-record gaging station		18
01475020	Mantua Creek at Sewell, N.J.	Low-flow partial-record station		18
01476600	Still Run near Mickleton, N.J.	Gaging station analyzed as a partial-record station		18
01476640	Pargey Creek at Swedesboro Avenue at Repaupo, N.J.	Low-flow partial-record station		18

Table 1-1. Index, by station identification number, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regu- lation	Watershed Manage- ment Area
01477100	Raccoon Creek near Mullica Hill, N.J.	Low-flow partial-record station		18
01477110	Raccoon Creek at Mullica Hill, N.J.	Low-flow partial-record station		18
01477118	South Branch Raccoon Creek near Mullica Hill, N.J.	Low-flow partial-record station		18
01477120	Raccoon Creek near Swedesboro, N.J.	Continuous-record gaging station		18
01477130	Basgalore Creek at Russell Mill Road, near Swedesboro, N.J.	Low-flow partial-record station		18
01477510	Oldmans Creek at Porches Mill, N.J.	Low-flow partial-record station		18
01482500	Salem River at Woodstown, N.J.	Continuous-record gaging station	Yes	17
01482510	Nichomus Run near Woodstown, N.J.	Low-flow partial-record station		17
01482520	Salem River at Sharptown, N.J.	Low-flow partial-record station		17
01482530	Major Run at Sharptown, N.J.	Low-flow partial-record station		17
01482900	Cool Run near Alloway, N.J.	Low-flow partial-record station		17
01482950	Cedar Brook near Alloway, N.J.	Low-flow partial-record station		17
01483000	Alloway Creek at Alloway, N.J.	Continuous-record gaging station	Yes	17
01483010	Deep Run near Alloway, N.J.	Low-flow partial-record station		17
0140940200	Hays Mill Creek near Chesilhurst, N.J.	Low-flow partial-record station		14
0140940250	Cooper Branch near Chesilhurst, N.J.	Low-flow partial-record station		14
0140940310	Wildcat Branch near Chesilhurst, N.J.	Low-flow partial-record station		14
0140940360	Sleeper Branch above diversion, near Atsion, N.J.	Low-flow partial-record station		14
0140940370	Sleeper Branch near Atsion, N.J.	Low-flow partial-record station		14
0140940480	Clark Branch near Atsion, N.J.	Low-flow partial-record station		14
0140940950	Blue Anchor Brook at Elm, N.J.	Low-flow partial-record station		14
0140940970	Albertson Branch near Elm, N.J.	Low-flow partial-record station		14
0140941050	Great Swamp Branch at Elm, N.J.	Low-flow partial-record station		14
0146700260	Indian Run at Birmingham, N.J.	Low-flow partial-record station		19

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01410500	Absecon Creek at Absecon, N.J.	Continuous-record gaging station	Yes	15
01387950	Acid Brook at Pompton Lakes, N.J.	Low-flow partial-record station		03
0140940970	Albertson Branch near Elm, N.J.	Low-flow partial-record station		14
01409410	Albertson Brook near Hammonton, N.J.	Low-flow partial-record station		14
01461900	Alexauken Creek near Lambertville, N.J.	Low-flow partial-record station		11
01483000	Alloway Creek at Alloway, N.J.	Continuous-record gaging station	Yes	17
01404060	Ambrose Brook at Middlesex, N.J.	Low-flow partial-record station		09
01397290	Assiscong Creek at Bartles Corners, N.J.	Low-flow partial-record station		08
01464580	Assiscunk Creek at Columbus, N.J.	Low-flow partial-record station		20
01464590	Assiscunk Creek near Burlington, N.J.	Low-flow partial-record station		20
01464000	Assunpink Creek at Trenton, N.J.	Continuous-record gaging station	Yes	11
01463620	Assunpink Creek near Clarksville, N.J.	Gaging station analyzed as a partial-record station		11
01399525	Axle Brook near Pottersville, N.J.	Gaging station analyzed as a partial-record station		08
01411200	Babcock Creek at Mays Landing, N.J.	Low-flow partial-record station		15
01411196	Babcock Creek near Mays Landing, N.J.	Low-flow partial-record station		15
01398052	Back Brook near Reaville, N.J.	Low-flow partial-record station		08
01398045	Back Brook Tributary near Ringoes, N.J.	Gaging station analyzed as a partial-record station	Yes	08
01400932	Baldwins Creek at Baldwin Lake near Pennington, N.J.	Gaging station analyzed as a partial-record station		10
01400930	Baldwins Creek at Pennington, N.J.	Low-flow partial-record station		10
01405285	Barclay Brook near Englishtown, N.J.	Low-flow partial-record station		09
01413010	Barrett Run near Bridgeton, N.J.	Low-flow partial-record station		17
01465865	Barton Run at Tuckerton Road, near Medford, N.J.	Low-flow partial-record station		19
01477130	Basgalore Creek at Russell Mill Road, near Swedesboro, N.J.	Low-flow partial-record station		18
01409500	Batsto River at Batsto, N.J.	Continuous-record gaging station		14
01445160	Bear Brook at Dark Moon Road near Johnsonburg, N.J.	Low-flow partial-record station		01
01400810	Bear Brook at Princeton Junction, N.J.	Low-flow partial-record station		10
01400800	Bear Brook near Grovers Mill, N.J.	Low-flow partial-record station		10
01400750	Bear Brook near Hickory Corner, N.J.	Low-flow partial-record station		10
01445200	Bear Creek near Johnsonburg, N.J.	Low-flow partial-record station		01
01387700	Bear Swamp Brook near Oakland, N.J.	Low-flow partial-record station		03
01380000	Beaver Brook at outlet of Splitrock Res, N.J.	Continuous-record gaging station	Yes	06
01380100	Beaver Brook at Rockaway, N.J.	Low-flow partial-record station		06
01446000	Beaver Brook near Belvidere, N.J.	Continuous-record gaging station		01
01455355	Beaver Brook near Weldon, N.J.	Gaging station analyzed as a partial-record station		01

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01455360	Beaver Brook near Woodport, N.J.	Low-flow partial-record station		01
01388700	Beaver Dam Brook at Lincoln Park, N.J.	Low-flow partial-record station		03
01388720	Beaver Dam Brook at Ryerson Road, at Lincoln Park, N.J.	Low-flow partial-record station		03
01367750	Beaver Run near Hamburg, N.J.	Low-flow partial-record station		02
01404700	Beaverdam Brook near Patricks Corner, N.J.	Low-flow partial-record station		09
01401520	Beden Brook near Hopewell, N.J.	Low-flow partial-record station		10
01401600	Beden Brook near Rocky Hill, N.J.	Low-flow partial-record station		10
01382870	Belcher Creek at Stowaway Road at West Milford, N.J.	Low-flow partial-record station		03
01382890	Belcher Creek at West Milford, N.J.	Low-flow partial-record station		03
01382880	Belcher Creek Tributary at West Milford, N.J.	Low-flow partial-record station		03
01411412	Bidwell Creek Tributary 2 near Cape May Court House, N.J.	Low-flow partial-record station		16
01411410	Bidwell Creek Tributary near Cape May Court House, N.J.	Low-flow partial-record station		16
01407300	Big Brook at Vanderburg, N.J.	Low-flow partial-record station		12
01439830	Big Flat Brook at Tuttles Corner, N.J.	Low-flow partial-record station		01
01439800	Big Flat Brook near Hainesville, N.J.	Low-flow partial-record station		01
01378900	Black Brook near Meyersville, N.J.	Low-flow partial-record station		06
01368950	Black Creek near Vernon, N.J.	Low-flow partial-record station		02
01464530	Blacks Creek at Mansfield Square, N.J.	Low-flow partial-record station		20
01411495	Blackwater Branch at Norma, N.J.	Gaging station analyzed as a partial-record station		17
01443510	Blair Creek at Blairstown, N.J.	Low-flow partial-record station		01
0140940950	Blue Anchor Brook at Elm, N.J.	Low-flow partial-record station		14
01409409	Blue Anchor Brook near Blue Anchor, N.J.	Low-flow partial-record station		14
01403395	Blue Brook at Seeleys Pond Dam near Berkeley Heights, N.J.	Low-flow partial-record station		09
01386500	Blue Mine Brook near Wanaque, N.J.	Continuous-record gaging station		03
01403900	Bound Brook at Middlesex, N.J.	Gaging station analyzed as a partial-record station		09
01403385	Bound Brook at Route 28 at Middlesex, N.J.	Low-flow partial-record station		09
01403330	Bound Brook at South Plainfield, N.J.	Low-flow partial-record station		09
01455160	Brass Castle Creek near Washington, N.J.	Low-flow partial-record station		01
01446568	Buckhorn Creek at Hutchinson Road, at Hutchinson, N.J.	Low-flow partial-record station		01
01411950	Buckshutem Creek near Laurel Lake, N.J.	Low-flow partial-record station		17
01398360	Burnett Brook near Chester, N.J.	Low-flow partial-record station		08
01379525	Canoe Brook near Millburn, N.J.	Low-flow partial-record station		06
01413060	Canton Drain near Canton, N.J.	Low-flow partial-record station		17
01396900	Capoolong Creek at Lansdowne, N.J.	Low-flow partial-record station		08
01403350	Cedar Brook at South Plainfield, N.J.	Low-flow partial-record station		09

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01405435	Cedar Brook at Spotswood, N.J.	Low-flow partial-record station		09
01482950	Cedar Brook near Alloway, N.J.	Low-flow partial-record station		17
01408830	Cedar Creek at Cedar Crest, N.J.	Low-flow partial-record station		13
01409000	Cedar Creek at Lanoka Harbor, N.J.	Continuous-record gaging station		13
01409250	Cedar Run near Manahawkin, N.J.	Low-flow partial-record station		13
01399900	Chambers Brook at North Branch Depot, N.J.	Low-flow partial-record station		08
01399820	Chambers Brook near North Branch, N.J.	Low-flow partial-record station		08
01409405	Clark Branch at US Rt 206, near Atsion, N.J.	Low-flow partial-record station		14
0140940480	Clark Branch near Atsion, N.J.	Low-flow partial-record station		14
01410215	Clarks Mill Stream at Port Republic, N.J.	Low-flow partial-record station		14
01367890	Clove Brook above Clove Acres Lake, at Sussex, N.J.	Low-flow partial-record station		02
01438090	Clove Brook at N.J. Route 23 at Duttonville, N.J.	Low-flow partial-record station		01
01367900	Clove Brook at Sussex, N.J.	Low-flow partial-record station		02
01412800	Cohansey River at Seeley, N.J.	Gaging station analyzed as a partial-record station		17
01412405	Cohansey River near Beals Mill, N.J.	Low-flow partial-record station		17
01399540	Cold Brook at Oldwick, N.J.	Low-flow partial-record station		08
01378560	Coles Brook at Hackensack, N.J.	Low-flow partial-record station		05
01482900	Cool Run near Alloway, N.J.	Low-flow partial-record station		17
01382990	Cooley Brook near West Milford, N.J.	Low-flow partial-record station		03
0140940250	Cooper Branch near Chesilhurst, N.J.	Low-flow partial-record station		14
01467150	Cooper River at Haddonfield, N.J.	Continuous-record gaging station	Yes	18
01467130	Cooper River at Kirkwood, N.J.	Low-flow partial-record station		18
01467140	Cooper River at Lawnside, N.J.	Low-flow partial-record station		18
01464540	Crafts Creek at Hedding, N.J.	Low-flow partial-record station		20
01400700	Cranbury Brook at Cranbury Station, N.J.	Low-flow partial-record station		10
01400670	Cranbury Brook at Old Church, N.J.	Low-flow partial-record station		10
01400725	Cranbury Brook at Plainsboro, N.J.	Low-flow partial-record station		10
01381150	Crooked Brook near Boonton, N.J.	Low-flow partial-record station		06
01464500	Crosswicks Creek at Extonville, N.J.	Continuous-record gaging station		20
01464504	Crosswicks Creek at Groveville Road, at Groveville, N.J.	Low-flow partial-record station		20
01464300	Crosswicks Creek near Cookstown, N.J.	Low-flow partial-record station		20
01443400	Culvers Creek at Branchville, N.J.	Low-flow partial-record station		01
01385000	Cupsaw Brook near Wanaque, N.J.	Continuous-record gaging station		03
01387600	Darlington Brook near Darlington, N.J.	Low-flow partial-record station		03
01408620	Davenport Branch near Dover Forge, N.J.	Low-flow partial-record station		13
01398300	Dawsons Brook near Ironia, N.J.	Low-flow partial-record station		08
01379200	Dead River near Millington, N.J.	Low-flow partial-record station		06

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01407860	Debois Creek at Adelphia, N.J.	Low-flow partial-record station		12
01406050	Deep Run at Old Bridge, N.J.	Gaging station analyzed as a partial-record station		09
01406040	Deep Run at Route 516, near Old Bridge, N.J.	Low-flow partial-record station		09
01411140	Deep Run at Weymouth, N.J.	Low-flow partial-record station		15
01483010	Deep Run near Alloway, N.J.	Low-flow partial-record station		17
01406000	Deep Run near Browntown, N.J.	Gaging station analyzed as a partial-record station		09
01389140	Deepavaal Brook at Two Bridges, N.J.	Low-flow partial-record station		04
01460500	Delaware and Raritan Canal at Kingston, N.J.	Continuous-record gaging station	Yes	10
01446500	Delaware River at Belvidere, N.J.	Continuous-record gaging station	Yes	01
01438500	Delaware River at Montague, N.J.	Continuous-record gaging station	Yes	01
01434000	Delaware River at Port Jervis, N.Y.	Continuous-record gaging station	Yes	21
01457500	Delaware River at Riegelsville, N.J.	Continuous-record gaging station	Yes	01
01463500	Delaware River at Trenton, N.J.	Continuous-record gaging station	Yes	11
01440200	Delaware River near Delaware Water Gap, Pa.	Continuous-record gaging station	Yes	01
01411438	Dennis Creek Tributary 1 near North Dennis, N.J.	Low-flow partial-record station		16
01411428	Dennis Creek Tributary 2 at Dennisville, N.J.	Low-flow partial-record station		16
01411408	Dias Creek near Cape May Court House, N.J.	Low-flow partial-record station		16
01464515	Doctors Creek at Allentown, N.J.	Low-flow partial-record station		20
01368840	Double Kill at New Milford, N.Y.	Low-flow partial-record station		23
01368820	Double Kill at Wawayanda, N.J.	Low-flow partial-record station		02
01396180	Drakes Brook at Bartley, N.J.	Low-flow partial-record station		08
01443409	Dry Brook at Mill Road, at Branchville, N.J.	Low-flow partial-record station		01
01401200	Duck Pond Run at Clarksville, N.J.	Low-flow partial-record station		10
01442760	Dunnfield Creek at Dunnfield, N.J.	Low-flow partial-record station		01
01378410	Dwars Kill at Norwood, N.J.	Low-flow partial-record station		05
01410150	East Branch Bass River near New Gretna, N.J.	Continuous-record gaging station		14
01403100	East Branch Middle Brook at Martinsville, N.J.	Low-flow partial-record station		09
01443280	East Branch Paulins Kill near Lafayette, N.J.	Gaging station analyzed as a partial-record station		01
01443275	East Branch Paulins Kill Tributary 1 near Lafayette, N.J.	Low-flow partial-record station		01
01443260	East Branch Paulins Kill Tributary 2 near Woodruffs Gap, N.J.	Low-flow partial-record station		01
01393890	East Branch Rahway River at Maplewood, N.J.	Low-flow partial-record station		07
01403535	East Branch Stony Brook at Best Lake at Watchung, N.J.	Continuous-record gaging station		09
01407055	East Creek at North Centerville, N.J.	Low-flow partial-record station		12
01411442	East Creek near Eldora, N.J.	Low-flow partial-record station		16
01393800	East Fork East Branch Rahway River at West Orange, N.J.	Gaging station analyzed as a partial-record station		07

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01396240	Electric Brook at Long Valley, N.J.	Low-flow partial-record station		08
01393000	Elizabeth River at Irvington, N.J.	Gaging station analyzed as a partial-record station		07
01393450	Elizabeth River at Ursino Lake at Elizabeth, N.J.	Continuous-record gaging station	Yes	07
01393200	Elizabeth River below Chancellor Avenue Bridge at Irvington, N.J.	Low-flow partial-record station		07
01411250	English Creek near Scullville, N.J.	Low-flow partial-record station		15
01385500	Erskine Brook near Wanaque, N.J.	Gaging station analyzed as a partial-record station		03
01411400	Fishing Creek at Rio Grande, N.J.	Low-flow partial-record station		16
01440000	Flat Brook near Flatbrookville, N.J.	Continuous-record gaging station		01
01389905	Fleischer Brook at Elmwood Park, N.J.	Low-flow partial-record station		04
01410810	Fourmile Branch at New Brooklyn, N.J.	Gaging station analyzed as a partial-record station		15
01410803	Fourmile Branch at Winslow Crossing, N.J.	Low-flow partial-record station		15
01409200	Fourmile Branch near Manahawkin, N.J.	Low-flow partial-record station		13
01410800	Fourmile Branch near Williamstown, N.J.	Low-flow partial-record station		15
01378530	French Brook at New Bridge, N.J.	Low-flow partial-record station		05
01445490	Furnace Brook at Oxford, N.J.	Low-flow partial-record station		01
01389850	Goffle Brook at Hawthorne, N.J.	Low-flow partial-record station		04
01411418	Goshen Creek at Goshen, N.J.	Low-flow partial-record station		16
01407012	Gravelly Brook at Church Street, at Matawan, N.J.	Low-flow partial-record station		12
01411955	Gravelly Run at Laurel Lake, N.J.	Low-flow partial-record station		17
01378750	Great Brook at Green Village, N.J.	Low-flow partial-record station		06
01378850	Great Brook near Basking Ridge, N.J.	Low-flow partial-record station		06
01410775	Great Egg Harbor River at Berlin, N.J.	Low-flow partial-record station		15
01411000	Great Egg Harbor River at Folsom, N.J.	Continuous-record gaging station		15
01411170	Great Egg Harbor River at Mays Landing, N.J.	Low-flow partial-record station		15
01411110	Great Egg Harbor River at Weymouth, N.J.	Low-flow partial-record station		15
01410820	Great Egg Harbor River near Blue Anchor, N.J.	Gaging station analyzed as a partial-record station		15
01410784	Great Egg Harbor River near Sicklerville, N.J.	Gaging station analyzed as a partial-record station		15
01410787	Great Egg Harbor River Tributary at Sicklerville, N.J.	Gaging station analyzed as a partial-record station		15
0140941050	Great Swamp Branch at Elm, N.J.	Low-flow partial-record station		14
01403500	Green Brook at Plainfield, N.J.	Continuous-record gaging station	Yes	09
01403400	Green Brook at Seeley Mills, N.J.	Continuous-record gaging station		09
01382960	Green Brook near West Milford, N.J.	Low-flow partial-record station		03
01411404	Green Creek at Green Creek, N.J.	Low-flow partial-record station		16

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01379773	Green Pond Brook at Picatinny Arsenal, N.J.	Gaging station analyzed as a partial-record station		06
01379790	Green Pond Brook at Wharton, N.J.	Gaging station analyzed as a partial-record station		06
01379780	Green Pond Brook below Picatinny Lk at Picatinny Arsenal, N.J.	Gaging station analyzed as a partial-record station	Yes	06
01466900	Greenwood Brook at New Lisbon, N.J.	Gaging station analyzed as a partial-record station		19
01378500	Hackensack River at New Milford, N.J.	Continuous-record gaging station	Yes	05
01377000	Hackensack River at Rivervale, N.J.	Continuous-record gaging station	Yes	05
01376800	Hackensack River at West Nyack, N.Y.	Continuous-record gaging station	Yes	25
01458100	Hakihokake Creek at Milford, N.J.	Low-flow partial-record station		11
01458400	Hakihokake Creek near Frenchtown, N.J.	Low-flow partial-record station		11
01409416	Hammonton Creek at Wescoatville, N.J.	Low-flow partial-record station		14
01456210	Hances Brook near Beattystown, N.J.	Low-flow partial-record station		01
01407806	Hannabrand Brook at Old Mill Road, near Spring Lake Heights, N.J.	Low-flow partial-record station		12
01379150	Harrisons Brook at Liberty Corner, N.J.	Low-flow partial-record station		06
01407636	Harvey Brook at West Allenhurst, N.J.	Low-flow partial-record station		12
01456100	Hatchery Brook at Hackettstown, N.J.	Low-flow partial-record station		01
01387980	Haycock Brook at Pompton Lakes, N.J.	Low-flow partial-record station		03
01409401	Hays Mill Creek at Atco, N.J.	Low-flow partial-record station		14
0140940200	Hays Mill Creek near Chesilhurst, N.J.	Low-flow partial-record station		14
01401400	Heathcote Brook at Kingston, N.J.	Low-flow partial-record station		10
01380050	Hibernia Brook at outlet of Lake Telemark, N.J.	Low-flow partial-record station		06
01378520	Hirshfeld Brook at New Milford, N.J.	Low-flow partial-record station		05
01391000	Hohokus Brook at Ho-Ho-Kus, N.J.	Continuous-record gaging station		04
01390700	Hohokus Brook at Wyckoff, N.J.	Low-flow partial-record station		04
01398107	Holland Brook at Readington, N.J.	Gaging station analyzed as a partial-record station	Yes	08
01400953	Honey Branch near Pennington, N.J.	Gaging station analyzed as a partial-record station		10
01400970	Honey Branch near Rosedale, N.J.	Low-flow partial-record station		10
01445900	Honey Run near Hope, N.J.	Low-flow partial-record station		01
01445800	Honey Run near Ramseyburg, N.J.	Low-flow partial-record station		01
01407200	Hop Brook at Holmdel, N.J.	Low-flow partial-record station		12
01411053	Hospitality Branch at Berryland, N.J.	Low-flow partial-record station		15
01411035	Hospitality Branch at Blue Bell Road, near Cecil, N.J.	Low-flow partial-record station		15
01411040	Hospitality Branch near Cecil, N.J.	Low-flow partial-record station		15
01398220	India Brook near Mendham, N.J.	Low-flow partial-record station		08

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01411466	Indian Brook near Malaga, N.J.	Low-flow partial-record station		17
01413020	Indian Fields Branch at Bridgeton, N.J.	Low-flow partial-record station		17
0146700260	Indian Run at Birmingham, N.J.	Low-flow partial-record station		19
01404470	Ireland Brook at Patricks Corner, N.J.	Low-flow partial-record station		09
01405470	Iresick Brook at East Spotswood, N.J.	Low-flow partial-record station		09
01462800	Jacobs Creek at Somerset, N.J.	Low-flow partial-record station		11
01465847	Jade Run at Vincentown, N.J.	Low-flow partial-record station		19
01381470	Jaquis Brook at Greystone Park State Hospital, N.J.	Low-flow partial-record station		06
01407755	Jumping Brook above reservoir, near Neptune City, N.J.	Low-flow partial-record station		12
01407760	Jumping Brook near Neptune City, N.J.	Continuous-record gaging station	Yes	12
01382360	Kanouse Brook at Newfoundland, N.J.	Low-flow partial-record station		03
01464460	Lahaway Creek near Hornerstown, N.J.	Low-flow partial-record station		20
01399190	Lamington (Black) River at Succasunna, N.J.	Gaging station analyzed as a partial-record station	Yes	08
01399200	Lamington (Black) River near Ironia, N.J.	Gaging station analyzed as a partial-record station		08
01399500	Lamington (Black) River near Pottersville, N.J.	Continuous-record gaging station		08
01399300	Lamington River at Milltown, N.J.	Low-flow partial-record station		08
01409575	Landing Creek at Philadelphia Avenue at Egg Harbor City, N.J.	Low-flow partial-record station		14
01405000	Lawrence Brook at Farrington Dam, N.J.	Continuous-record gaging station	Yes	09
01404300	Lawrence Brook at outlet of Davidsons Mill Pond, N.J.	Low-flow partial-record station		09
01404500	Lawrence Brook at Patricks Corner, N.J.	Gaging station analyzed as a partial-record station		09
01405030	Lawrence Brook at Westons Mills, N.J.	Continuous-record gaging station	Yes	09
01453000	Lehigh River at Bethlehem, Pa.	Continuous-record gaging station	Yes	22
01400770	Little Bear Brook at Hickory Corner, N.J.	Low-flow partial-record station		10
01465898	Little Creek near Lumberton, N.J.	Low-flow partial-record station		19
01411456	Little Ease Run near Clayton, N.J.	Gaging station analyzed as a partial-record station		17
01439900	Little Flat Brook at Hainesville, N.J.	Low-flow partial-record station		01
01439920	Little Flat Brook at Peters Valley, N.J.	Low-flow partial-record station		01
01458700	Little Nishisakawick Creek at Frenchtown, N.J.	Low-flow partial-record station		11
01463690	Little Shabakunk Creek at Bakersville, N.J.	Gaging station analyzed as a partial-record station		11
01460900	Lockatong Creek near Raven Rock, N.J.	Low-flow partial-record station		11
01408728	Long Swamp Creek at Toms River, N.J.	Low-flow partial-record station		13
01455100	Lopatcong Creek at Phillipsburg, N.J.	Low-flow partial-record station		01
01455780	Lubbers Run at Lockwood, N.J.	Low-flow partial-record station		01
01382450	Macopin River at Macopin Reservoir, N.J.	Low-flow partial-record station		03

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01400350	Macs Brook at Somerville, N.J.	Gaging station analyzed as a partial-record station		10
01407065	Mahoras Brook at Hendrickson Corners, N.J.	Low-flow partial-record station		12
01387480	Mahwah River at Suffern, N.Y.	Low-flow partial-record station		24
01387450	Mahwah River near Suffern, N.Y.	Continuous-record gaging station		24
01482530	Major Run at Sharptown, N.J.	Low-flow partial-record station		17
01381550	Malapardis Brook at Whippany, N.J.	Low-flow partial-record station		06
01405440	Manalapan Brook at Bridge Street at Spotswood, N.J.	Low-flow partial-record station		09
01405340	Manalapan Brook at Federal Road near Manalapan, N.J.	Low-flow partial-record station		09
01405400	Manalapan Brook at Spotswood, N.J.	Continuous-record gaging station	Yes	09
01405335	Manalapan Brook near Manalapan, N.J.	Low-flow partial-record station		09
01408460	Manapaqua Brook at Lakehurst, N.J.	Low-flow partial-record station		13
01408030	Manasquan River at Allenwood, N.J.	Low-flow partial-record station		12
01408000	Manasquan River at Squankum, N.J.	Continuous-record gaging station		12
01407900	Manasquan River at West Farms, N.J.	Low-flow partial-record station		12
01408029	Manasquan River near Allenwood, N.J.	Gaging station analyzed as a partial-record station	Yes	12
01407830	Manasquan River near Georgia, N.J.	Low-flow partial-record station		12
01474950	Mantua Creek at Glassboro, N.J.	Low-flow partial-record station		18
01474970	Mantua Creek at Greentree Road, at Glassboro, N.J.	Low-flow partial-record station		18
01475000	Mantua Creek at Pitman, N.J.	Continuous-record gaging station		18
01475020	Mantua Creek at Sewell, N.J.	Low-flow partial-record station		18
01412100	Manumuskin River near Manumuskin, N.J.	Low-flow partial-record station		17
01387490	Masonic Brook at West Mahwah, N.J.	Low-flow partial-record station		03
01407000	Matawan Creek at Matawan, N.J.	Continuous-record gaging station	Yes	12
01405302	Matchaponix Brook at Mundy Avenue at Spotswood, N.J.	Low-flow partial-record station		09
01405300	Matchaponix Brook at Spotswood, N.J.	Gaging station analyzed as a partial-record station		09
01405290	Matchaponix Brook at Texas, N.J.	Low-flow partial-record station		09
01405240	Matchaponix Brook near Englishtown, N.J.	Low-flow partial-record station		09
01411485	Maurice River at Brotmanville, N.J.	Gaging station analyzed as a partial-record station		17
01411500	Maurice River at Norma, N.J.	Continuous-record gaging station		17
01411880	Maurice River at Sharp Street at Millville, N.J.	Low-flow partial-record station		17
01411878	Maurice River at Union Lake Dam at Millville, N.J.	Gaging station analyzed as a partial-record station		17
01411800	Maurice River near Millville, N.J.	Gaging station analyzed as a partial-record station		17
01466500	Mcdonalds Branch in Lebanon State Forest, N.J.	Continuous-record gaging station		19
01405180	Mcgellairs Brook at Englishtown, N.J.	Low-flow partial-record station		09

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01412000	Menantico Creek near Millville, N.J.	Continuous-record gaging station		17
01455230	Merrill Creek at Coopersville, N.J.	Low-flow partial-record station		01
01378590	Metzler Brook at Englewood, N.J.	Low-flow partial-record station		05
01466000	Middle Branch Mount Misery Brook in Lebanon State Forest, N.J.	Gaging station analyzed as a partial-record station		19
01399100	Middle Brook at Burnt Mills, N.J.	Low-flow partial-record station		08
01405170	Milford Brook at Englishtown, N.J.	Low-flow partial-record station		09
01411305	Mill Branch near Northfield, N.J.	Low-flow partial-record station		15
01409300	Mill Branch near Tuckerton, N.J.	Low-flow partial-record station		13
01404180	Mill Brook at Highland Park, N.J.	Low-flow partial-record station		09
01411388	Mill Creek at Cold Spring, N.J.	Low-flow partial-record station		16
01467021	Mill Creek at Levitt Parkway at Willingboro, N.J.	Gaging station analyzed as a partial-record station		19
01411351	Mill Creek at outlet Magnolia Lake at Ocean View, N.J.	Low-flow partial-record station		16
01467020	Mill Creek at Willingboro, N.J.	Low-flow partial-record station		19
01409150	Mill Creek near Manahawkin, N.J.	Low-flow partial-record station		13
01411850	Mill Creek near Millville, N.J.	Low-flow partial-record station		17
01411302	Mill Creek near Steelmantown, N.J.	Low-flow partial-record station		15
01467019	Mill Creek near Willingboro, N.J.	Gaging station analyzed as a partial-record station		19
01400560	Millstone River at Applegarth, N.J.	Low-flow partial-record station		10
01402000	Millstone River at Blackwells Mills, N.J.	Continuous-record gaging station	Yes	10
01401301	Millstone River at Carnegie Lake at Princeton, N.J.	Gaging station analyzed as a partial-record station		10
01400580	Millstone River at Hightstown, N.J.	Low-flow partial-record station		10
01400600	Millstone River at Locust Corner, N.J.	Low-flow partial-record station		10
01400730	Millstone River at Plainsboro, N.J.	Gaging station analyzed as a partial-record station		10
01400640	Millstone River near Grovers Mill, N.J.	Low-flow partial-record station		10
01401500	Millstone River near Kingston, N.J.	Gaging station analyzed as a partial-record station	Yes	10
01400540	Millstone River near Manalapan, N.J.	Low-flow partial-record station		10
01407450	Mine Brook at Colts Neck, N.J.	Low-flow partial-record station		12
01398950	Mine Brook at Far Hills, N.J.	Low-flow partial-record station		08
01456080	Mine Brook near Hackettstown, N.J.	Low-flow partial-record station		01
01408015	Mingamahone Brook at Farmingdale, N.J.	Low-flow partial-record station		12
01408020	Mingamahone Brook at Squankum, N.J.	Low-flow partial-record station		12
01464480	Miry Run at Holmes Mills, N.J.	Low-flow partial-record station		20
01463860	Miry Run at Mercerville, N.J.	Low-flow partial-record station		11
01463830	Miry Run at Robbinsville, N.J.	Low-flow partial-record station		11

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01407026	Mohingson (Wilkson) Creek at Church Street, at Matawan, N.J.	Low-flow partial-record station		12
01389765	Molly Ann Brook at North Haledon, N.J.	Low-flow partial-record station		04
01389790	Molly Ann Brook at Paterson, N.J.	Low-flow partial-record station		04
01462200	Moore's Creek near Titusville, N.J.	Low-flow partial-record station		11
01410225	Morses Mill Stream at Port Republic, N.J.	Low-flow partial-record station		14
01382910	Morsetown Brook at West Milford, N.J.	Low-flow partial-record station		03
01445520	Mountain Lake Brook near Pequest, N.J.	Low-flow partial-record station		01
01411700	Muddy Run at Centerton, N.J.	Low-flow partial-record station		17
01411650	Muddy Run near Elmer, N.J.	Low-flow partial-record station		17
01396660	Mulhockaway Creek at Van Syckel, N.J.	Continuous-record gaging station		08
01396700	Mulhockaway Creek near Clinton, N.J.	Low-flow partial-record station		08
01396670	Mulhockaway Creek Tributary at Van Syckel, N.J.	Low-flow partial-record station		08
01409390	Mullica River at Atsion, N.J.	Low-flow partial-record station		14
01409387	Mullica River at outlet of Atsion Lake, at Atsion, N.J.	Low-flow partial-record station		14
01409375	Mullica River near Atco, N.J.	Low-flow partial-record station		14
01409400	Mullica River near Batsto, N.J.	Continuous-record gaging station		14
01409395	Mullica River Tributary near Atsion, N.J.	Low-flow partial-record station		14
01455500	Musconetcong River at outlet of Lake Hopatcong, N.J.	Continuous-record gaging station	Yes	01
01457400	Musconetcong River at Riegelsville, N.J.	Low-flow partial-record station		01
01455550	Musconetcong River at Stanhope, N.J.	Low-flow partial-record station		01
01457000	Musconetcong River near Bloomsbury, N.J.	Continuous-record gaging station		01
01456000	Musconetcong River near Hackettstown, N.J.	Continuous-record gaging station		01
01412120	Muskee Creek near Port Elizabeth, N.J.	Low-flow partial-record station		17
01377475	Musquapsink Brook near Westwood, N.J.	Low-flow partial-record station		05
01398500	Nb Raritan River near Far Hills, N.J.	Continuous-record gaging station		08
01409411	Nescochague Creek at Pleasant Mills, N.J.	Low-flow partial-record station		14
01398000	Neshanic River at Reaville, N.J.	Continuous-record gaging station		08
01397800	Neshanic River near Flemington, N.J.	Low-flow partial-record station		08
01437500	Neversink River at Godeffroy, N.Y.	Continuous-record gaging station	Yes	21
01467305	Newton Creek at Collingswood, N.J.	Low-flow partial-record station		18
01467312	Newton Creek at West Collingswood, N.J.	Low-flow partial-record station		18
01482510	Nichomus Run near Woodstown, N.J.	Low-flow partial-record station		17
01458600	Nishisakawick Creek at Frenchtown, N.J.	Low-flow partial-record station		11
01458570	Nishisakawick Creek near Frenchtown, N.J.	Low-flow partial-record station		11
01394600	Nomahegan Brook near Mountainside, N.J.	Low-flow partial-record station		07
01467350	North Branch Big Timber Creek at Laurel Springs, N.J.	Low-flow partial-record station		18
01467180	North Branch Cooper River at Ellisburg, N.J.	Low-flow partial-record station		18
01467160	North Branch Cooper River near Marlton, N.J.	Low-flow partial-record station		18

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01409050	North Branch Forked River near Forked River, N.J.	Low-flow partial-record station		13
01408100	North Branch Metedeconk River at Lakewood, N.J.	Low-flow partial-record station		13
01408120	North Branch Metedeconk River near Lakewood, N.J.	Continuous-record gaging station		13
01467070	North Branch Pennsauken Creek at Maple Shade, N.J.	Low-flow partial-record station		18
01467005	North Branch Rancocas Creek at Iron Works Park, at Mount Holly, N.J.	Low-flow partial-record station		19
01467000	North Branch Rancocas Creek at Pemberton, N.J.	Continuous-record gaging station		19
01399120	North Branch Raritan River at Burnt Mills, N.J.	Low-flow partial-record station		08
01399830	North Branch Raritan River at North Branch, N.J.	Gaging station analyzed as a partial-record station		08
01398260	North Branch Raritan River near Chester, N.J.	Low-flow partial-record station		08
01400000	North Branch Raritan River near Raritan, N.J.	Continuous-record gaging station		08
01464380	North Run at Cookstown, N.J.	Low-flow partial-record station		20
01378430	Norwood Brook at Norwood, N.J.	Low-flow partial-record station		05
01404400	Oakeys Brook near Patricks Corner, N.J.	Low-flow partial-record station		09
01477510	Oldmans Creek at Porches Mill, N.J.	Low-flow partial-record station		18
01465965	Ong Run at Browns Mills, N.J.	Low-flow partial-record station		19
01410000	Oswego River at Harrisville, N.J.	Continuous-record gaging station		14
01409970	Oswego River at Oswego Lake, N.J.	Low-flow partial-record station		14
01409095	Oyster Creek near Brookville, N.J.	Gaging station analyzed as a partial-record station		13
01409100	Oyster Creek near Waretown, N.J.	Low-flow partial-record station		13
01411680	Palatine Branch at Palatine, N.J.	Low-flow partial-record station		17
01367800	Papakating Creek at Pelletstown, N.J.	Low-flow partial-record station		02
01367910	Papakating Creek at Sussex, N.J.	Low-flow partial-record station		02
01476640	Pargey Creek at Swedesboro Avenue at Repaupo, N.J.	Low-flow partial-record station		18
01467010	Parkers Creek near Mount Laurel, N.J.	Low-flow partial-record station		19
01377300	Pascack Brook at Pearl River, N.Y.	Low-flow partial-record station		25
01377500	Pascack Brook at Westwood, N.J.	Continuous-record gaging station	Yes	05
01379570	Passaic River at Hanover, N.J.	Low-flow partial-record station		06
01389500	Passaic River at Little Falls, N.J.	Continuous-record gaging station	Yes	04
01378700	Passaic River at outlet of Osborn Pond, N.J.	Low-flow partial-record station		06
01381900	Passaic River at Pine Brook, N.J.	Low-flow partial-record station	Yes	06
01389110	Passaic River at Route 46, at Singac, N.J.	Low-flow partial-record station		04
01379300	Passaic River at Stirling, N.J.	Low-flow partial-record station		06
01382000	Passaic River at Two Bridges, N.J.	Low-flow partial-record station		06
01378690	Passaic River near Bernardsville, N.J.	Gaging station analyzed as a partial-record station		06
01379500	Passaic River near Chatham, N.J.	Continuous-record gaging station	Yes	06

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01379000	Passaic River near Millington, N.J.	Continuous-record gaging station	Yes	06
01443500	Paulins Kill at Blairstown, N.J.	Continuous-record gaging station		01
01443300	Paulins Kill at Lafayette, N.J.	Low-flow partial-record station		01
01443460	Paulins Kill at Paulins Kill, N.J.	Low-flow partial-record station		01
01443450	Paulins Kill near Newton, N.J.	Low-flow partial-record station		01
01398850	Peapack Brook at Far Hills, N.J.	Low-flow partial-record station		08
01398700	Peapack Brook at Gladstone, N.J.	Low-flow partial-record station		08
01389534	Peckman River at Ozone Avenue, at Verona, N.J.	Low-flow partial-record station		04
01389600	Peckman River at West Paterson, N.J.	Low-flow partial-record station		04
01400596	Peddie Brook at Hightstown, N.J.	Low-flow partial-record station		10
01411020	Penny Pot Stream near Folsom, N.J.	Low-flow partial-record station		15
01382500	Pequannock River at Macopin Intake Dam, N.J.	Continuous-record gaging station	Yes	03
01382800	Pequannock River at Riverdale, N.J.	Gaging station analyzed as a partial-record station		03
01382050	Pequannock River near Stockholm, N.J.	Low-flow partial-record station		03
01382550	Pequannock River Tributary 1 at Kinnelon, N.J.	Low-flow partial-record station		03
01446400	Pequest River at Belvidere, N.J.	Low-flow partial-record station		01
01445000	Pequest River at Huntsville, N.J.	Continuous-record gaging station		01
01445500	Pequest River at Pequest, N.J.	Continuous-record gaging station		01
01445430	Pequest River at Townsburys, N.J.	Gaging station analyzed as a partial-record station		01
01400300	Peters Brook near Raritan, N.J.	Gaging station analyzed as a partial-record station	Yes	10
01401650	Pike Run at Belle Mead, N.J.	Continuous-record gaging station		10
01401700	Pike Run near Rocky Hill, N.J.	Low-flow partial-record station		10
01405210	Pine Brook at Clarks Mills, N.J.	Low-flow partial-record station		09
01398075	Pleasant Run at Centerville, N.J.	Low-flow partial-record station		08
01369000	Pochuck Creek near Pine Island, N.Y.	Continuous-record gaging station		23
01455300	Pohatcong Creek at Carpentersville, N.J.	Low-flow partial-record station		01
01455200	Pohatcong Creek at New Village, N.J.	Gaging station analyzed as a partial-record station		01
01455135	Pohatcong Creek at Tunnel Hill Road, near Washington, N.J.	Low-flow partial-record station		01
01407780	Polly Pond Brook at South Belmar, N.J.	Low-flow partial-record station		12
01467057	Pompeston Creek at Cinnaminson, N.J.	Low-flow partial-record station		18
01388500	Pompton River at Pompton Plains, N.J.	Continuous-record gaging station	Yes	03
01389000	Pompton River at Two Bridges, N.J.	Low-flow partial-record station		06
01387884	Pond Brook at US Route 202 at Oakland, N.J.	Low-flow partial-record station		03
01463980	Pond Run at Trenton, N.J.	Low-flow partial-record station		11
01446520	Pophandusing Brook at Belvidere, N.J.	Low-flow partial-record station		01

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01407628	Poplar Brook near Deal, N.J.	Low-flow partial-record station		12
01407532	Poricy Brook at Red Bank, N.J.	Low-flow partial-record station		12
01397100	Prescott Brook at Round Valley, N.J.	Low-flow partial-record station		08
01378800	Primrose Brook near New Vernon, N.J.	Low-flow partial-record station		06
01409407	Pump Branch near Blue Anchor, N.J.	Low-flow partial-record station		14
01409408	Pump Branch near Waterford Works, N.J.	Low-flow partial-record station		14
01477110	Raccoon Creek at Mullica Hill, N.J.	Low-flow partial-record station		18
01477100	Raccoon Creek near Mullica Hill, N.J.	Low-flow partial-record station		18
01477120	Raccoon Creek near Swedesboro, N.J.	Continuous-record gaging station		18
01413080	Raccoon D at Davis Mill, N.J.	Low-flow partial-record station		17
01395000	Rahway River at Rahway, N.J.	Continuous-record gaging station	Yes	07
01394500	Rahway River near Springfield, N.J.	Continuous-record gaging station	Yes	07
01388000	Ramapo River at Pompton Lakes, N.J.	Continuous-record gaging station	Yes	03
01387400	Ramapo River at Ramapo, N.Y.	Continuous-record gaging station	Yes	24
01387420	Ramapo River at Suffern, N.Y.	Continuous-record gaging station	Yes	24
01387670	Ramapo River near Darlington, N.J.	Low-flow partial-record station		03
01387500	Ramapo River near Mahwah, N.J.	Continuous-record gaging station		03
01387930	Ramapo River Tributary No. 5 at Oakland, N.J.	Low-flow partial-record station		03
01390900	Ramsey Brook at Allendale, N.J.	Low-flow partial-record station		04
01400500	Raritan River at Manville, N.J.	Continuous-record gaging station	Yes	09
01403060	Raritan River below Calco Dam at Bound Brook, N.J.	Continuous-record gaging station	Yes	09
01408490	Ridgeway Branch near Lakehurst, N.J.	Low-flow partial-record station		13
01384500	Ringwood Creek near Wanaque, N.J.	Continuous-record gaging station		03
01395500	Robinsons Branch at Goodmans, N.J.	Gaging station analyzed as a partial-record station		07
01396000	Robinsons Branch at Rahway, N.J.	Continuous-record gaging station		07
01401590	Rock Brook at Blawenburg, N.J.	Low-flow partial-record station		10
01399570	Rockaway Creek at McCrea Mills, N.J.	Low-flow partial-record station		08
01399700	Rockaway Creek at Whitehouse, N.J.	Gaging station analyzed as a partial-record station		08
01380500	Rockaway River above Reservoir at Boonton, N.J.	Continuous-record gaging station		06
01379700	Rockaway River at Berkshire Valley, N.J.	Gaging station analyzed as a partial-record station		06
01379750	Rockaway River at Dover, N.J.	Low-flow partial-record station		06
01381200	Rockaway River at Pine Brook, N.J.	Low-flow partial-record station		06
01381000	Rockaway River below Reservoir at Boonton, N.J.	Continuous-record gaging station	Yes	06
01400593	Rocky Brook at Hightstown, N.J.	Low-flow partial-record station		10
01402700	Royce Brook at Manville, N.J.	Low-flow partial-record station		10

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01402590	Royce Brook Tributary at Frankfort, N.J.	Gaging station analyzed as a partial-record station		10
01402600	Royce Brook Tributary near Belle Mead, N.J.	Continuous-record gaging station		10
01379630	Russia Brook Tributary at Milton, N.J.	Gaging station analyzed as a partial-record station		06
01391500	Saddle River at Lodi, N.J.	Continuous-record gaging station	Yes	04
01391110	Saddle River at Paramus, N.J.	Low-flow partial-record station		04
01390500	Saddle River at Ridgewood, N.J.	Continuous-record gaging station		04
01390450	Saddle River at Upper Saddle River, N.J.	Low-flow partial-record station		04
01482520	Salem River at Sharptown, N.J.	Low-flow partial-record station		17
01482500	Salem River at Woodstown, N.J.	Continuous-record gaging station	Yes	17
01474500	Schuylkill River at Philadelphia, Pa.	Continuous-record gaging station	Yes	26
01411462	Scotland Run at Franklinville, N.J.	Low-flow partial-record station		17
01411461	Scotland Run at Fries Mill, N.J.	Low-flow partial-record station		17
01411460	Scotland Run near Williamstown, N.J.	Low-flow partial-record station		17
01392500	Second River at Belleville, N.J.	Continuous-record gaging station		04
01463750	Shabakunk Creek at Ewingville, N.J.	Low-flow partial-record station		11
01407700	Shark River at Glendola, N.J.	Low-flow partial-record station		12
01407705	Shark River near Neptune City, N.J.	Continuous-record gaging station	Yes	12
01465884	Sharps Run at Route 541 at Medford, N.J.	Low-flow partial-record station		19
01438400	Shimers Brook near Montague, N.J.	Low-flow partial-record station		01
01463670	Shipetaukin Creek at Bakersville, N.J.	Low-flow partial-record station		11
01463650	Shipetaukin Creek at Lawrenceville, N.J.	Low-flow partial-record station		11
01396865	Sidney Brook at Grandin, N.J.	Low-flow partial-record station		08
01389100	Singac Brook at Singac, N.J.	Low-flow partial-record station		04
01401900	Six Mile Run at Blackwells Mills, N.J.	Low-flow partial-record station		10
0140940360	Sleeper Branch above diversion, near Atsion, N.J.	Low-flow partial-record station		14
01409406	Sleeper Branch at Batsto, N.J.	Low-flow partial-record station		14
01409404	Sleeper Branch at Us Rt 206 near Atsion, N.J.	Low-flow partial-record station		14
0140940370	Sleeper Branch near Atsion, N.J.	Low-flow partial-record station		14
01411430	Sluice Creek at Clermont, N.J.	Low-flow partial-record station		16
01411434	Sluice Creek at outlet Clint Mill Pond at South Dennis, N.J.	Low-flow partial-record station		16
01467329	South Branch Big Timber Creek at Blackwood Terrace, N.J.	Low-flow partial-record station		18
01467330	South Branch Big Timber Creek at Blackwood, N.J.	Low-flow partial-record station		18
01409080	South Branch Forked River near Forked River, N.J.	Low-flow partial-record station		13
01408140	South Branch Metedeconk River at Lakewood, N.J.	Gaging station analyzed as a partial-record station		13
01408150	South Branch Metedeconk River near Lakewood, N.J.	Gaging station analyzed as a partial-record station		13

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01467315	South Branch Newton Creek at Glover Av at Haddon Heights, N.J.	Low-flow partial-record station		18
01467317	South Branch Newton Creek at Haddon Heights, N.J.	Low-flow partial-record station		18
01467081	South Branch Pennsauken Creek at Cherry Hill, N.J.	Continuous-record gaging station		18
01467080	South Branch Pennsauken Creek at Maple Shade, N.J.	Low-flow partial-record station		18
01477118	South Branch Raccoon Creek near Mullica Hill, N.J.	Low-flow partial-record station		18
01396030	South Branch Rahway River at Colonia, N.J.	Low-flow partial-record station		07
01465850	South Branch Rancocas Creek at Vincentown, N.J.	Gaging station analyzed as a partial-record station		19
01396535	South Branch Raritan River at Arch Street at High Bridge, N.J.	Low-flow partial-record station		08
01396120	South Branch Raritan River at Bartley, N.J.	Low-flow partial-record station		08
01396350	South Branch Raritan River at Califon, N.J.	Low-flow partial-record station		08
01396190	South Branch Raritan River at Four Bridges, N.J.	Gaging station analyzed as a partial-record station		08
01396280	South Branch Raritan River at Middle Valley, N.J.	Low-flow partial-record station		08
01396090	South Branch Raritan River at outlet of Budd Lake, N.J.	Low-flow partial-record station		08
01398102	South Branch Raritan River at South Branch, N.J.	Low-flow partial-record station		08
01397000	South Branch Raritan River at Stanton, N.J.	Continuous-record gaging station	Yes	08
01396500	South Branch Raritan River near High Bridge, N.J.	Continuous-record gaging station		08
01396070	South Branch Raritan River Tributary 6 at Budd Lake, N.J.	Low-flow partial-record station		08
01396080	South Branch Raritan River Tributary 7 at Budd Lake, N.J.	Low-flow partial-record station		08
01399670	South Branch Rockaway Creek at Whitehouse Station, N.J.	Continuous-record gaging station		08
01399690	South Branch Rockaway Creek at Whitehouse, N.J.	Low-flow partial-record station		08
01399600	South Branch Rockaway Creek Tributary at Lebanon, N.J.	Low-flow partial-record station		08
01405500	South River at Old Bridge, N.J.	Continuous-record gaging station	Yes	09
01411220	South River near Belcoville, N.J.	Low-flow partial-record station		15
01465900	Southwest Branch Rancocas at Eayerstown, N.J.	Low-flow partial-record station		19
01465880	Southwest Branch Rancocas Creek at Medford, N.J.	Low-flow partial-record station		19
01409460	Springers Brook near Atsion, N.J.	Low-flow partial-record station		14
01409450	Springers Brook near Indian Mills, N.J.	Low-flow partial-record station		14
01391485	Sprout Brook at Rochelle Park, N.J.	Low-flow partial-record station		04
01396800	Spruce Run at Clinton, N.J.	Continuous-record gaging station	Yes	08
01396580	Spruce Run at Glen Gardner, N.J.	Continuous-record gaging station		08
01396550	Spruce Run at Newport, N.J.	Low-flow partial-record station		08
01396600	Spruce Run near Clinton, N.J.	Low-flow partial-record station		08
01396588	Spruce Run near Glen Gardner, N.J.	Low-flow partial-record station		08
01396590	Spruce Run near High Bridge, N.J.	Low-flow partial-record station		08
01410865	Squankum Branch at Malaga Road, near Williamstown, N.J.	Low-flow partial-record station		15

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01410855	Squankum Brook above sewage treatment plant, at Williamstown, N.J.	Low-flow partial-record station		15
01387520	Stag Brook near Mahwah, N.J.	Low-flow partial-record station		03
01411450	Still Run at Aura, N.J.	Low-flow partial-record station		17
01476600	Still Run near Mickleton, N.J.	Gaging station analyzed as a partial-record station		18
01382700	Stone House Brook at Kinnelon, N.J.	Low-flow partial-record station		03
01401100	Stony Brook at Clarksville, N.J.	Low-flow partial-record station		10
01400900	Stony Brook at Glenmoore, N.J.	Low-flow partial-record station		10
01396220	Stony Brook at Naughtright, N.J.	Low-flow partial-record station		08
01400947	Stony Brook at Pennington, N.J.	Low-flow partial-record station		10
01401000	Stony Brook at Princeton, N.J.	Continuous-record gaging station		10
01403540	Stony Brook at Watchung, N.J.	Continuous-record gaging station		09
01442800	Stony Brook near Columbia, N.J.	Low-flow partial-record station		01
01380300	Stony Brook near Rockaway Valley, N.J.	Low-flow partial-record station		06
01413050	Stow Creek at Jericho, N.J.	Low-flow partial-record station		17
01399194	Succasunna Brook near Succasunna, N.J.	Low-flow partial-record station		08
01407500	Swimming River near Red Bank, N.J.	Continuous-record gaging station	Yes	12
01399295	Tanners Brook near Milltown, N.J.	Low-flow partial-record station		08
01411299	Tarkiln Brook near Head of River, N.J.	Low-flow partial-record station		15
01401800	Ten Mile Run near Blackwells Mills, N.J.	Low-flow partial-record station		10
01378385	Tenakill Brook at Closter, N.J.	Low-flow partial-record station		05
01378350	Tenakill Brook at Cresskill, N.J.	Low-flow partial-record station		05
01406500	Tennent Brook near Browntown, N.J.	Gaging station analyzed as a partial-record station		09
01397900	Third Neshanic River near Ringoes, N.J.	Low-flow partial-record station		08
01392200	Third River at Nutley, N.J.	Low-flow partial-record station		04
01392210	Third River at Passaic, N.J.	Continuous-record gaging station		04
01464525	Thorton Creek at Bordentown,, N.J.	Gaging station analyzed as a partial-record station		20
01407970	Timber Swamp Creek near Farmingdale, N.J.	Low-flow partial-record station		12
01408300	Toms River at Whitesville, N.J.	Low-flow partial-record station		13
01408500	Toms River near Toms River, N.J.	Continuous-record gaging station		13
01407102	Town Brook at Church Street, at New Monmouth, N.J.	Low-flow partial-record station		12
01443475	Trout Brook near Middleville, N.J.	Low-flow partial-record station		01
01381700	Troy Brook at Troy Hills, N.J.	Low-flow partial-record station		06
01411300	Tuckahoe River at Head of River, N.J.	Continuous-record gaging station		15
01409780	Tulpehocken Creek near Jenkins, N.J.	Low-flow partial-record station		14
01408440	Union Brook at Lakehurst, N.J.	Low-flow partial-record station		13

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regulation	Watershed Management Area
01399510	Upper Cold Brook near Pottersville, N.J.	Continuous-record gaging station		08
01390800	Valentine Brook at Allendale, N.J.	Low-flow partial-record station		04
01394400	Van Winkle Brook at Springfield, N.J.	Low-flow partial-record station		07
01440100	Vancampens Brook near Millbrook, N.J.	Low-flow partial-record station		01
01407070	Waackaack Creek near Keansburg, N.J.	Low-flow partial-record station		12
01367700	Wallkill River at Franklin, N.J.	Low-flow partial-record station		02
01367620	Wallkill River at outflow of Lake Mohawk at Sparta, N.J.	Low-flow partial-record station		02
01367770	Wallkill River near Sussex, N.J.	Low-flow partial-record station		02
01368000	Wallkill River near Unionville, N.Y.	Continuous-record gaging station		02
01397500	Walnut Brook near Flemington, N.J.	Continuous-record gaging station		08
01383500	Wanaque River at Awosting, N.J.	Continuous-record gaging station	Yes	03
01384000	Wanaque River at Monks, N.J.	Continuous-record gaging station	Yes	03
01387000	Wanaque River at Wanaque, N.J.	Continuous-record gaging station	Yes	03
01381490	Watnong Brook at Morris Plains, N.J.	Low-flow partial-record station		06
01368810	Wawayanda Creek at New Milford, N.Y.	Low-flow partial-record station		23
01392000	Weasel Brook at Clifton, N.J.	Continuous-record gaging station	Yes	04
01408800	Webbs Mill Branch near Whiting, N.J.	Low-flow partial-record station		13
01408810	Webbs Mill Branch Tributary near Whiting, N.J.	Low-flow partial-record station		13
01455370	Weldon Brook at Hurdton, N.J.	Low-flow partial-record station		01
01455350	Weldon Brook near Woodport, N.J.	Low-flow partial-record station		01
01410200	West Branch Bass River near New Gretna, N.J.	Low-flow partial-record station		14
01412500	West Branch Cohansey River at Seeley, N.J.	Gaging station analyzed as a partial-record station	Yes	17
01393350	West Branch Elizabeth River near Union, N.J.	Low-flow partial-record station		07
01403150	West Branch Middle Brook near Martinsville, N.J.	Continuous-record gaging station	Yes	09
01403160	West Branch Middle Brook near Somerville, N.J.	Gaging station analyzed as a partial-record station		09
01367850	West Branch Papakating Creek at McCoys Corner, N.J.	Low-flow partial-record station		02
01394000	West Branch Rahway River at Millburn, N.J.	Gaging station analyzed as a partial-record station	Yes	07
01463790	West Branch Shabakunk Creek near Ewingville, N.J.	Low-flow partial-record station		11
01409815	West Branch Wading River at Maxwell, N.J.	Low-flow partial-record station		14
01409730	West Branch Wading River near Chatsworth, N.J.	Low-flow partial-record station		14
01409800	West Branch Wading River near Harrisville, N.J.	Low-flow partial-record station		14
01409810	West Branch Wading River near Jenkins, N.J.	Continuous-record gaging station		14
01381750	West Brook at Troy Hills, N.J.	Low-flow partial-record station		06
01386000	West Brook near Wanaque, N.J.	Continuous-record gaging station		03
01411445	West Creek near Eldora, N.J.	Low-flow partial-record station		16

Table 1-2. Index, by station name, of selected continuous-record streamflow-gaging stations, low-flow partial-record stations, and gaging stations analyzed as a partial-record stations in New Jersey, New York, and Pennsylvania.—Continued

[Stations are listed in downstream order; ID, identification number]

Station ID	Station name	Station type	Regu- lation	Watershed Manage- ment Area
01411444	West Creek near Leesburg, N.J.	Low-flow partial-record station		16
01409280	Westecunk Creek at Stafford Forge, N.J.	Gaging station analyzed as a partial-record station		13
01407618	Whale Pond Brook near Oakhurst, N.J.	Low-flow partial-record station		12
01381500	Whippany River at Morristown, N.J.	Continuous-record gaging station		06
01381400	Whippany River near Morristown, N.J.	Gaging station analyzed as a partial-record station		06
01381800	Whippany River near Pine Brook, N.J.	Gaging station analyzed as a partial-record station		06
01381600	Whippany River near Whippany, N.J.	Low-flow partial-record station		06
01411047	Whitehall Branch below Victory Lakes, near Cecil, N.J.	Low-flow partial-record station		15
01411042	Whitehall Branch near Cecil, N.J.	Low-flow partial-record station		15
01461300	Wickecheoke Creek at Stockton, N.J.	Low-flow partial-record station		11
01409403	Wildcat Branch at Chesilhurst, N.J.	Low-flow partial-record station		14
0140940310	Wildcat Branch near Chesilhurst, N.J.	Low-flow partial-record station		14
01407250	Willow Brook at Holmdel, N.J.	Low-flow partial-record station		12
01378615	Wolf Creek at Ridgefield, N.J.	Low-flow partial-record station		05
01400850	Woodsville Brook at Woodsville, N.J.	Low-flow partial-record station		10
01408592	Wrangel Brook at Mule Road, near Toms River, N.J.	Low-flow partial-record station		13
01407800	Wreck Pond Brook near Spring Lake, N.J.	Low-flow partial-record station		12
01443900	Yards Creek near Blairstown, N.J.	Continuous-record gaging station	Yes	01
01407400	Yellow Brook at Colts Neck, N.J.	Low-flow partial-record station		12

Appendix 2

Figure 2-2. Location of streamflow-gaging stations in Watershed Management Area 2 (Wallkill) in New Jersey and in New York.

Figure 2-3. Location of streamflow-gaging stations in Watershed Management Area 3 (Pompton, Wanaque, Ramapo) in New Jersey and in New York.

Figure 2-4. Location of streamflow-gaging stations in Watershed Management Area 4 (Lower Passaic and Saddle) in New Jersey.

Figure 2-5. Location of streamflow-gaging stations in Watershed Management Area 5 (Hackensack and Pascack) in New Jersey and in New York.

Figure 2-6. Location of streamflow-gaging stations in Watershed Management Area 6 (Upper Passaic, Whippany, and Rockaway) in New Jersey.

Figure 2-7. Location of streamflow-gaging stations in Watershed Management Area 7 (Arthur Kill) in New Jersey.

Figure 2-8. Location of streamflow-gaging stations in Watershed Management Area 8 (North and South Branch Raritan) in New Jersey.

Figure 2-9. Location of streamflow-gaging stations in Watershed Management Area 9 (Lower Raritan, South River and Lawrence) in New Jersey.

Figure 2-10. Location of streamflow-gaging stations in Watershed Management Area 10 (Millstone) in New Jersey.

Figure 2-11. Location of streamflow-gaging stations in Watershed Management Area 11 (Central Delaware) in New Jersey.

Figure 2-12. Location of streamflow-gaging stations in Watershed Management Area 12 (Monmouth) in New Jersey.

Figure 2-13. Location of streamflow-gaging stations in Watershed Management Area 13 (Barnegat Bay) in New Jersey.

Figure 2-14. Location of streamflow-gaging stations in Watershed Management Area 14 (Mullica) in New Jersey.

Figure 2-15. Location of streamflow-gaging stations in Watershed Management Area 15 (Great Egg Harbor) in New Jersey.

Figure 2-16. Location of streamflow-gaging stations in Watershed Management Area 16 (Cape May) in New Jersey.

Figure 2-17. Location of streamflow-gaging stations in Watershed Management Area 17 (Maurice, Salem, and Cohansey) in New Jersey.

Figure 2-18. Location of streamflow-gaging stations in Watershed Management Area 18 (Lower Delaware) in New Jersey and in Pennsylvania.

Figure 2-19. Location of streamflow-gaging stations in Watershed Management Area 19 (Rancocas) in New Jersey.

Figure 2-20. Location of streamflow-gaging stations in Watershed Management Area 20 (Assiscunk, Crosswicks, and Doctors) in New Jersey.

Appendix 3

Table 3-1. Results of trend tests on annual *n*-day low flow at 138 streamflow-gaging stations in New Jersey, New York, and Pennsylvania.

[Bold blue indicates a significant upward trend and bold red indicates a significant downward trend; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		1-day low flow		7-day low flow		30-day low flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01368000	Wallkill River near Unionville, N.Y.	1937/10/1	1981/9/30	0.031	0.777	0.007	0.958	0.052	0.630
01369000	Pochuck Creek near Pine Island, N.Y.	1937/10/1	1978/9/30	.093	.410	.109	.333	.101	.371
01376280	Sparkill Creek at Sparkill, N.Y.	1959/10/1	1980/9/30	-.133	.848	-.067	1.000	-.333	.452
01376800	Hackensack River at West Nyack, N.Y.	1959/10/1	2001/9/30	.123	.267	.123	.268	.036	.753
01377000	Hackensack River at Rivervale, N.J.	1956/10/1	2001/9/30	.132	.209	.104	.327	.044	.678
01377000	Hackensack River at Rivervale, N.J.	1941/10/1	1956/9/30	-.275	.188	-.297	.155	-.231	.274
01377500	Pascack Brook at Westwood, N.J.	1934/10/1	2001/9/30	.210	.013	.269	.001	.325	.000
01378500	Hackensack River at New Milford, N.J.	1921/10/1	2001/9/30	.131	.033	.135	.042	.120	.106
01379000	Passaic River near Millington, N.J.	1903/10/1	2001/9/30	.034	.654	.025	.744	.041	.588
01379000	Passaic River near Millington, N.J.	1903/10/1	1979/9/30	-.168	.060	-.194	.030	-.127	.158
01379000	Passaic River near Millington, N.J.	1979/10/1	2001/9/30	-.105	.524	-.123	.450	-.105	.525
01379500	Passaic River near Chatham, N.J.	1903/10/1	2001/9/30	.463	.000	.423	.000	.330	.000
01379700	Rockaway River at Berkshire Valley, N.J.	1984/10/1	1996/9/30	-.378	.152	-.422	.107	-.333	.210
01379773	Green Pond Brook at Picatinny Arsenal, N.J.	1982/10/1	2000/9/30	-.346	.057	-.382	.036	-.382	.036
01379780	Green Pd Bk B Picatinny Lk at Picatinny Arsenal, N.J.	1984/10/1	2001/9/30	.025	.928	-.150	.444	-.300	.115
01379790	Green Pond Brook at Wharton, N.J.	1982/10/1	2001/9/30	-.405	.021	-.399	.023	-.359	.041
01380000	Beaver Bk at outlet of Splitrock Res, N.J.	1925/10/1	1989/9/30	.366	.004	.406	.001	.370	.004
01380500	Rockaway River above Reservoir at Boonton, N.J.	1937/10/1	2001/9/30	-.026	.767	-.025	.780	.013	.887
01381000	Rockaway River below Reservoir at Boonton, N.J.	1925/10/1	2001/9/30	.437	.000	.451	.000	.310	.000
01381500	Whippany River at Morristown, N.J.	1921/10/1	2001/9/30	.350	.000	.329	.000	.284	.000
01381900	Passaic River at Pine Brook, N.J.	1979/10/1	2001/9/30	.090	.586	.119	.468	.029	.880
01382500	Pequannock R at Macopin Intake Dam, N.J.	1922/10/1	1961/9/30	.053	.101	.053	.101	.081	.265
01382500	Pequannock R at Macopin Intake Dam, N.J.	1961/10/1	2001/9/30	.387	.001	.328	.005	.289	.015
01383500	Wanaque River at Awosting, N.J.	1918/10/1	2001/9/30	-.107	.158	-.053	.486	-.012	.874
01384000	Wanaque River at Monks, N.J.	1934/10/1	1985/9/30	-.285	.004	-.233	.017	-.216	.028
01384500	Ringwood Creek near Wanaque, N.J.	1934/10/1	2001/9/30	-.042	.648	-.041	.658	-.043	.639
01385000	Cupsaw Brook near Wanaque, N.J.	1934/10/1	1958/9/30	-.545	.000	-.589	.000	-.415	.006
01386000	West Brook near Wanaque, N.J.	1934/10/1	1978/9/30	.012	.916	-.060	.579	-.028	.802
01386500	Blue Mine Brook near Wanaque, N.J.	1934/10/1	1958/9/30	-.352	.005	-.340	.014	-.316	.036

Table 3-1. Results of trend tests on annual *n*-day low flow at 138 streamflow-gaging stations in New Jersey, New York, and Pennsylvania.—Continued[Bold **blue** indicates a significant upward trend and bold **red** indicates a significant downward trend; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		1-day low flow		7-day low flow		30-day low flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01387000	Wanaque R at Wanaque, N.J.	1911/10/1	1928/9/30	-0.022	1.000	0.244	0.371	0.156	0.592
01387000	Wanaque R at Wanaque, N.J.	1928/10/1	2001/9/30	.056	.486	.070	.383	.073	.368
01387400	Ramapo River at Ramapo, N.Y.	1978/10/1	2001/9/30	.132	.433	.116	.495	.095	.581
01387420	Ramapo River at Suffern, N.Y.	1978/10/1	2001/9/30	-.053	.769	-.089	.603	-.011	.974
01387450	Mahwah River near Suffern, N.Y.	1958/10/1	1995/9/30	-.079	.504	-.078	.513	-.016	.902
01387500	Ramapo River near Mahwah, N.J.	1903/10/1	2001/9/30	-.073	.336	-.141	.064	-.104	.174
01388000	Ramapo River at Pompton Lakes, N.J.	1921/10/1	2001/9/30	.142	.065	-.064	.409	-.065	.400
01388500	Pompton River at Pompton Plains, N.J.	1903/10/1	2001/9/30	-.167	.061	-.176	.047	-.151	.089
01389500	Passaic River at Little Falls, N.J.	1896/10/1	1927/9/30	-.148	.268	-.522	.000	-.369	.005
01389500	Passaic River at Little Falls, N.J.	1927/10/1	2001/9/30	.166	.039	.094	.243	.066	.410
01390500	Saddle River at Ridgewood, N.J.	1954/10/1	2001/9/30	-.215	.046	-.233	.030	-.175	.104
01391000	Hohokus Brook at Ho-Ho-kus, N.J.	1954/10/1	1996/9/30	.611	.000	.632	.000	.537	.000
01391500	Saddle River at Lodi, N.J.	1923/10/1	1966/9/30	.166	.123	.121	.264	.041	.713
01391500	Saddle River at Lodi, N.J.	1965/10/1	2001/9/30	-.003	.989	.000	1.000	-.035	.776
01391500	Saddle River at Lodi, N.J.	1923/10/1	2001/9/30	.156	.045	.139	.074	.129	.097
01392000	Weasel Bk at Clifton, N.J.	1936/10/1	1950/9/30	-.051	.846	.090	.714	.000	1.000
01392000	Weasel Bk at Clifton, N.J.	1951/10/1	1962/9/30	.489	.059	.467	.074	.511	.049
01392210	Third River at Passaic, N.J.	1976/10/1	1997/9/30	.070	.699	-.006	1.000	-.099	.576
01392500	Second River at Belleville, N.J.	1936/10/1	1964/9/30	-.009	.965	-.006	.982	.077	.597
01393450	Elizabeth River at Ursino Lake at Elizabeth, N.J.	1951/10/1	2001/9/30	.054	.587	-.304	.002	-.270	.006
01394000	WB Rahway River at Millburn, N.J.	1940/10/1	1950/9/30	-.139	.670	-.278	.348	-.333	.251
01394500	Rahway River near Springfield, N.J.	1938/10/1	2001/9/30	.371	.000	.399	.000	.361	.000
01395000	Rahway River at Rahway, N.J.	1921/10/1	2001/9/30	-.277	.000	-.204	.008	-.025	.751
01396000	Robinsons Branch at Rahway, N.J.	1939/10/1	1999/9/30	.143	.116	.165	.073	.356	.000
01396500	South Branch Raritan River near High Bridge, N.J.	1918/10/1	2001/9/30	.098	.194	.021	.782	.025	.740
01396580	Spruce Run at Glen Gardner, N.J.	1977/10/1	2001/9/30	-.088	.623	-.076	.674	-.146	.401
01396660	Mulhockaway Creek at Van Syckel, N.J.	1976/10/1	2001/9/30	-.016	.937	-.075	.635	-.130	.398
01396800	Spruce Run at Clinton, N.J.	1963/10/1	2001/9/30	.032	.794	-.090	.440	-.087	.456
01397000	South Branch Raritan River at Stanton, N.J.	1903/10/1	1963/9/30	.014	.899	-.095	.363	-.105	.314

Table 3-1. Results of trend tests on annual *n*-day low flow at 138 streamflow-gaging stations in New Jersey, New York, and Pennsylvania.—Continued[Bold **blue** indicates a significant upward trend and bold **red** indicates a significant downward trend; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		1-day low flow		7-day low flow		30-day low flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01397000	SB Raritan River at Stanton, N.J.	1963/10/1	2001/9/30	0.107	0.359	0.012	0.927	0.026	0.834
01397500	Walnut Brook near Flemington, N.J.	1935/10/1	1961/9/30	-1.110	.407	-.037	.812	-.050	.743
01398000	Neshanic River at Reaville, N.J.	1930/10/1	2001/9/30	-.063	.444	-.076	.356	.043	.598
01398045	Back Brook Tributary near Ringoes, N.J.	1976/10/1	1988/9/30	-.222	.410	-.067	.855	-.067	.858
01398107	Holland Brook at Readington, N.J.	1977/10/1	1996/9/30	.000	1.000	.051	.805	.074	.711
01398500	NB Raritan River near Far Hills, N.J.	1921/10/1	2001/9/30	-.038	.628	-.052	.507	-.028	.720
01399190	Lamington (Black) River at Succasunna, N.J.	1976/10/1	1987/9/30	.000	1.000	-.067	.858	.156	.592
01399200	Lamington (Black) R near Ironia, N.J.	1940/10/1	1987/9/30	-.182	.482	-.127	.640	-.018	1.000
01399500	Lamington (Black) River near Pottersville, N.J.	1921/10/1	2001/9/30	-.011	.892	-.038	.620	-.018	.822
01399510	Upper Cold Brook near Pottersville, N.J.	1972/10/1	1997/9/30	.308	.042	.245	.107	.162	.291
01399525	Axle Brook near Pottersville, N.J.	1977/10/1	1989/9/30	.200	.454	.222	.414	.133	.653
01399670	SB Rockaway Creek at Whitehouse Station, N.J.	1976/10/1	2001/9/30	-.301	.041	-.351	.017	-.239	.107
01400000	North Branch Raritan River near Raritan, N.J.	1923/10/1	2001/9/30	.182	.019	.104	.181	.139	.073
01400300	Peters Brook near Raritan, N.J.	1977/10/1	1996/9/30	.132	.482	.147	.434	.000	1.000
01400350	Mac's Brook at Somerville, N.J.	1981/10/1	1996/9/30	.372	.084	.346	.112	.385	.077
01400500	Raritan River at Manville, N.J.	1903/10/1	1963/9/30	-.195	.064	-.218	.038	-.152	.148
01400500	Raritan River at Manville, N.J.	1963/10/1	2001/9/30	.312	.007	.257	.026	.189	.102
01400730	Millstone River at Plainsboro, N.J.	1963/10/1	1990/9/30	.000	1.000	.061	.837	.182	.451
01401000	Stony Brook at Princeton, N.J.	1953/10/1	2001/9/30	.262	.010	.256	.011	.191	.059
01401650	Pike Run at Belle Mead, N.J.	1979/10/1	2001/9/30	-.232	.156	-.232	.161	-.189	.256
01402000	Millstone River at Blackwells Mills, N.J.	1921/10/1	2001/9/30	.065	.402	-.014	.862	-.018	.819
01402600	Royce Brook Tributary near Belle Mead, N.J.	1966/10/1	1996/9/30	.340	.015	.534	.000	.375	.013
01403060	Raritan River below Calco Dam at Bound Brook, N.J.	1902/10/1	1963/9/30	-.506	.001	-.542	.000	-.478	.002
01403060	Raritan River below Calco Dam at Bound Brook, N.J.	1963/10/1	2001/9/30	.119	.307	.048	.685	.039	.744
01403150	West Branch Middle Brook near Martinsville, N.J.	1978/10/1	2001/9/30	.238	.135	.238	.139	.229	.156
01403400	Green Brook at Seeley Mills, N.J.	1978/10/1	2001/9/30	.033	.856	.043	.809	.010	.976
01403500	Green Brook at Plainfield, N.J.	1938/10/1	1985/9/30	.059	.570	.055	.604	.162	.120
01403535	East Branch Stony Brook at Best Lake at Watchung, N.J.	1979/10/1	2001/9/30	.018	.944	-.064	.726	-.170	.327
01403540	Stony Brook at Watchung, N.J.	1974/10/1	2001/9/30	.049	.741	.052	.724	-.058	.692

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USGS station number	Station name	Period of record		1-day low flow		7-day low flow		30-day low flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01405000	Lawrence Brook at Farrington Dam, N.J.	1926/10/1	1990/9/30	0.177	0.041	0.111	0.206	0.039	0.662
01405030	Lawrence Brook at Westons Mills, N.J.	1988/10/1	2001/9/30	-.222	.414	.156	.592	-.200	.474
01405300	Matchaponix Brook at Spotswood, N.J.	1956/10/1	1967/9/30	-.222	.419	-.200	.474	-.200	.474
01405400	Manalapan Brook at Spotswood, N.J.	1956/10/1	2001/9/30	.104	.326	-.025	.816	-.023	.832
01405500	South River at Old Bridge, N.J.	1938/10/1	1989/9/30	.066	.510	.063	.534	.115	.252
01407000	Matawan Creek at Matawan, N.J.	1931/10/1	1955/9/30	-.105	.317	-.095	.580	.137	.417
01407500	Swimming River near Red Bank, N.J.	1921/10/1	2001/9/30	-.489	.000	-.552	.000	-.513	.000
01407705	Shark River near Neptune City, N.J.	1966/10/1	2001/9/30	-.194	.109	-.159	.192	-.066	.594
01407760	Jumping Brook near Neptune City, N.J.	1966/10/1	2001/9/30	-.137	.259	-.169	.163	.020	.882
01408000	Manasquan River at Squankum, N.J.	1931/10/1	2001/9/30	.044	.597	.052	.527	.112	.176
01408029	Manasquan River near Allenwood, N.J.	1989/10/1	2001/9/30	-.311	.204	-.511	.047	-.511	.049
01408120	North Branch Metedeconk River near Lakewood, N.J.	1972/10/1	2001/9/30	-.246	.068	-.243	.072	-.116	.396
01408500	Toms River near Toms River, N.J.	1928/10/1	1966/9/30	-.005	.979	.000	1.000	.054	.647
01408500	Toms River near Toms River, N.J.	1966/10/1	2001/9/30	-.198	.103	-.191	.116	-.189	.120
01409000	Cedar Creek at Lanoka Harbor, N.J.	1931/10/1	1971/9/30	-.393	.006	-.260	.072	-.273	.059
01409095	Oyster Creek near Brookville, N.J.	1964/10/1	1985/9/30	-.111	.541	-.111	.544	-.118	.519
01409280	Westecunk Creek at Stafford Forge, N.J.	1973/10/1	1988/9/30	-.363	.079	-.121	.584	-.143	.511
01409400	Mullica River near Batsto, N.J.	1956/10/1	2001/9/30	-.085	.426	-.111	.300	-.092	.391
01409500	Batsto River at Batsto, N.J.	1927/10/1	2001/9/30	-.005	.950	-.131	.103	-.146	.071
01409810	West Branch Wading River near Jenkins, N.J.	1974/10/1	1997/9/30	-.086	.607	-.119	.468	-.014	.952
01410000	Oswego River at Harrisville, N.J.	1930/10/1	2001/9/30	.031	.711	-.057	.490	-.056	.494
01410150	East Branch Bass River near New Gretna, N.J.	1977/10/1	2001/9/30	.316	.037	.209	.170	.241	.113
01410500	Absecon Creek at Absecon, N.J.	1945/10/1	1985/9/30	.320	.005	.264	.022	.246	.033
01411000	Great Egg Harbor River at Folsom, N.J.	1924/10/1	2001/9/30	.000	1.000	-.016	.844	.008	.920
01411300	Tuckahoe River at Head of River, N.J.	1969/10/1	2001/9/30	.054	.682	.047	.721	.019	.892
01411456	Little Ease Run near Clayton, N.J.	1987/10/1	2001/9/30	-.269	.219	-.231	.300	-.308	.161
01411500	Maurice River at Norma, N.J.	1932/10/1	2001/9/30	.011	.899	-.058	.491	-.078	.352
01412000	Menantico Creek near Millville, N.J.	1930/10/1	1985/9/30	.305	.016	-.026	.852	-.166	.196
01412500	WB Cohansy River at Seeley, N.J.	1950/10/1	1967/9/30	-.352	.074	-.295	.138	-.352	.075

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USGS station number	Station name	Period of record		1-day low flow		7-day low flow		30-day low flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01412500	WB Cohansey River at Seeley, N.J.	1950/10/1	1967/9/30	-0.352	0.074	-0.295	0.138	-0.352	0.075
01412800	Cohansey River at Seeley, N.J.	1977/10/1	1988/9/30	-.556	.029	-.556	.032	-.467	.074
01434000	Delaware River at Port Jervis, N.Y.	1904/10/1	1954/9/30	.077	.443	.277	.005	.230	.020
01434000	Delaware River at Port Jervis, N.Y.	1954/10/1	2001/9/30	.221	.031	.228	.026	.186	.071
01437500	Neversink River at Godeffroy, N.Y.	1937/10/1	1954/9/30	.083	.685	-.050	.822	-.050	.822
01437500	Neversink River at Godeffroy, N.Y.	1954/10/1	2001/9/30	.146	.155	.080	.438	.014	.895
01438500	Delaware River at Montague, N.J.	1939/10/1	1954/9/30	-.011	1.000	-.143	.511	-.099	.661
01438500	Delaware River at Montague, N.J.	1954/10/1	2001/9/30	.168	.101	.190	.063	.164	.110
01440000	Flat Brook near Flat Brookville, N.J.	1923/10/1	2001/9/30	-.064	.415	-.086	.271	-.050	.526
01440200	Delaware River near Delaware Water Gap, Pa.	1963/10/1	1996/9/30	-.124	.344	-.163	.212	-.200	.125
01443500	Paulins Kill at Blair Stown, N.J.	1921/10/1	2001/9/30	.085	.273	.012	.878	.039	.622
01443900	Yards Creek near Blairstown, N.J.	1966/10/1	2001/9/30	.506	.000	.554	.000	.458	.000
01445000	Pequest River at Huntsville, N.J.	1939/10/1	1962/9/30	.035	.843	.013	.955	-.048	.778
01445500	Pequest River at Pequest, N.J.	1921/10/1	2001/9/30	.078	.313	.036	.638	.063	.416
01446000	Beaver Brook near Belvidere, N.J.	1922/10/1	1961/9/30	.011	.930	-.016	.900	-.024	.841
01446500	Delaware River at Belvidere, N.J.	1922/10/1	1954/9/30	-.090	.486	.019	.892	-.011	.946
01446500	Delaware River at Belvidere, N.J.	1954/10/1	2001/9/30	.118	.252	.091	.379	.127	.218
01453000	Lehigh River at Bethlehem, Pa.	1902/10/1	1990/9/30	.222	.003	.210	.006	.212	.005
01455200	Pohatcong Creek at New Village, N.J.	1959/10/1	1969/9/30	-.528	.059	-.333	.251	-.278	.348
01455500	Musconetcong R at out of Lake Hopatcong, N.J.	1927/10/1	1976/9/30	-.461	.000	-.359	.000	-.268	.009
01456000	Musconetcong R near Hackettstown, N.J.	1921/10/1	1974/9/30	.012	.909	-.045	.643	-.096	.322
01457000	Musconetcong River near Bloomsbury, N.J.	1903/10/1	2001/9/30	.144	.055	.061	.416	.065	.389
01457500	Delaware R at Riegelsville, N.J.	1905/10/1	1954/9/30	.321	.002	.353	.000	.288	.004
01457500	Delaware R at Riegelsville, N.J.	1954/10/1	1971/9/30	.208	.278	.233	.224	.200	.300
01460440	Delaware and Raritan Canal at Port Mercer, N.J.	1989/10/1	2001/9/30	-.800	.086	.022	1.000	.422	.107
01460500	Delaware and Raritan Canal at Kingston, N.J.	1946/10/1	1992/9/30	.080	.445	.128	.224	.197	.061
01463500	Delaware River at Trenton, N.J.	1912/10/1	1954/9/30	.139	.204	.185	.090	.120	.276
01463500	Delaware River at Trenton, N.J.	1954/10/1	2001/9/30	.128	.215	.071	.495	.074	.472
01464000	Assumpink Creek at Trenton, N.J.	1923/10/1	1954/9/30	.377	.004	.108	.412	.041	.762

Table 3-1. Results of trend tests on annual *n*-day low flow at 138 streamflow-gaging stations in New Jersey, New York, and Pennsylvania.—Continued[Bold **blue** indicates a significant upward trend and bold **red** indicates a significant downward trend; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		1-day low flow		7-day low flow		30-day low flow	
		Begin	End	Kendal Tau	<i>p</i> -value	Kendal Tau	<i>p</i> -value	Kendal Tau	<i>p</i> -value
01464000	Assumpink Creek at Trenton, N.J.	1954/10/1	2001/9/30	0.137	0.181	0.101	0.325	0.113	0.272
01464500	Crosswicks Creek at Extonville, N.J.	1939/10/1	2001/9/30	-.047	.605	-.090	.321	-.028	.758
01465850	SB Rancocas C at Vincentown, N.J.	1960/10/1	2001/9/30	.132	.546	.077	.742	.099	.661
01466000	MB Mt Misery Bk in Lebanon State Forest, N.J.	1952/10/1	1977/9/30	.061	.805	.197	.387	.227	.336
01466500	McDonalds Branch in Lebanon State Forest, N.J.	1953/10/1	2001/9/30	-.260	.010	-.274	.007	-.246	.015
01467000	North Branch Rancocas Creek at Pemberton, N.J.	1921/10/1	2001/9/30	.137	.074	.046	.553	.001	.990
01467081	South Branch Pennsauken Creek at Cherry Hill, N.J.	1967/10/1	2001/9/30	-.217	.089	-.204	.110	-.067	.610
01467150	Cooper River at Haddonfield, N.J.	1963/10/1	1987/9/30	.593	.000	.542	.000	.383	.011
01467150	Cooper River at Haddonfield, N.J.	1987/10/1	2001/9/30	-.269	.222	-.256	.246	-.282	.200
01474500	Schuylkill River at Philadelphia, Pa.	1931/10/1	1991/9/30	.287	.001	.236	.009	.228	.012
01475000	Mantua Creek at Pitman, N.J.	1939/10/1	1977/9/30	-.155	.195	-.153	.201	-.138	.250
01477120	Raccoon Creek near Swedesboro, N.J.	1965/10/1	2001/9/30	.020	.875	.039	.755	.032	.798
01482500	Salem River at Woodstown, N.J.	1939/10/1	1990/9/30	.064	.556	.074	.495	.043	.696
01483000	Alloway Creek at Alloway, N.J.	1952/10/1	1973/9/30	-.070	.683	-.099	.574	-.135	.441

Table 3-2. Results of trend tests on annual n-day high flow at 138 streamflow-gaging stations in New Jersey, New York, and Pennsylvania.

[Bold blue indicates a significant upward trend and bold red indicates a significant downward trend; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		1-day high flow		7-day high flow		30-day high flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01368000	Wallkill River near Unionville, N.Y.	1937/10/1	1981/9/30	-0.025	0.816	0.037	0.731	0.112	0.288
01369000	Pochuck Creek near Pine Island, N.Y.	1937/10/1	1978/9/30	.105	.345	.082	.463	.115	.300
01376280	Sparkill Creek at Sparkill, N.Y.	1959/10/1	1980/9/30	.071	.902	.071	.902	.000	1.000
01376800	Hackensack River at West Nyack, N.Y.	1959/10/1	2001/9/30	.039	.728	-.017	.884	-.102	.351
01377000	Hackensack River at Rivervale, N.J.	1941/10/1	1956/9/30	.200	.322	.238	.235	.162	.428
01377000	Hackensack River at Rivervale, N.J.	1956/10/1	2001/9/30	.203	.050	.061	.564	-.034	.747
01377500	Pascack Brook at Westwood, N.J.	1934/10/1	2001/9/30	-.004	.970	-.054	.520	-.070	.408
01378500	Hackensack River at New Milford, N.J.	1921/10/1	2001/9/30	.086	.260	-.074	.331	-.222	.004
01379000	Passaic River near Millington, N.J.	1903/10/1	2001/9/30	.152	.044	.152	.045	.027	.729
01379000	Passaic River near Millington, N.J.	1903/10/1	1979/9/30	.199	.026	.199	.026	.124	.165
01379000	Passaic River near Millington, N.J.	1979/10/1	2001/9/30	-.061	.714	.039	.822	-.152	.338
01379500	Passaic River near Chatham, N.J.	1903/10/1	2001/9/30	-.038	.641	-.015	.853	-.045	.583
01379700	Rockaway River at Berkshire Valley, N.J.	1984/10/1	1996/9/30	-.289	.283	-.067	.858	.022	1.000
01379773	Green Pond Brook at Picatinny Arsenal, N.J.	1982/10/1	2000/9/30	.000	1.000	.020	.940	-.072	.705
01379780	Green Pd Bk B1 Picatinny Lk at Picatinny Arsenal, N.J.	1984/10/1	2001/9/30	.096	.621	.051	.805	.140	.458
01379790	Green Pond Brook at Wharton, N.J.	1982/10/1	2001/9/30	-.064	.726	-.070	.700	-.064	.726
01380000	Beaver Bk at outlet of Splitrock Res, N.J.	1925/10/1	1989/9/30	.201	.104	.117	.344	.066	.598
01380500	Rockaway River above Reservoir at Boonton, N.J.	1937/10/1	2001/9/30	.202	.018	.143	.096	.100	.244
01381000	Rockaway River below Reservoir at Boonton, N.J.	1925/10/1	2001/9/30	.340	.000	.283	.000	.199	.011
01381500	Whippany River at Morristown, N.J.	1921/10/1	2001/9/30	.232	.002	.188	.014	.169	.027
01381900	Passaic River at Pine Brook, N.J.	1979/10/1	2001/9/30	-.013	.955	-.017	.933	-.065	.693
01382500	Pequannock R at Macopin Intake Dam, N.J.	1922/10/1	1961/9/30	.173	.124	.177	.116	.128	.255
01382500	Pequannock R at Macopin Intake Dam, N.J.	1961/10/1	2001/9/30	.206	.075	.201	.082	.243	.035
01383500	Wanaque River at Awosting, N.J.	1918/10/1	2001/9/30	.258	.001	.228	.002	.111	.141
01384000	Wanaque River at Monks, N.J.	1934/10/1	1985/9/30	.131	.183	.203	.038	.153	.120
01384500	Ringwood Creek near Wanaque, N.J.	1934/10/1	2001/9/30	-.009	.924	.093	.296	.085	.339
01385000	Cupsaw Bk near Wanaque, N.J.	1934/10/1	1958/9/30	.167	.264	.239	.107	.130	.385
01386000	West Brook near Wanaque, N.J.	1934/10/1	1978/9/30	-.039	.716	.104	.327	.125	.237
01386500	Blue Mine Brook near Wanaque, N.J.	1934/10/1	1958/9/30	.091	.551	.304	.040	.210	.157

Table 3-2. Results of trend tests on annual n-day high flow at 138 streamflow-gaging stations in New Jersey, New York, and Pennsylvania.—Continued[Bold **blue** indicates a significant upward trend and bold **red** indicates a significant downward trend; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		1-day high flow		7-day high flow		30-day high flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01387000	Wanaque R at Wanaque, N.J.	1911/10/1	1928/9/30	0.055	0.876	-0.127	0.640	-0.418	0.087
01387000	Wanaque R at Wanaque, N.J.	1928/10/1	2001/9/30	.043	.590	.065	.415	-.018	.823
01387400	Ramapo River at Ramapo, N.Y.	1978/10/1	2001/9/30	-.138	.398	.095	.566	-.152	.349
01387420	Ramapo River at Suffern, N.Y.	1978/10/1	2001/9/30	-.157	.334	-.095	.566	-.133	.415
01387450	Mahwah River near Suffern, N.Y.	1958/10/1	1995/9/30	.168	.147	.096	.410	.059	.619
01387500	Ramapo River near Mahwah, N.J.	1903/10/1	2001/9/30	.129	.087	.124	.100	.080	.290
01388000	Ramapo River at Pompton Lakes, N.J.	1921/10/1	2001/9/30	.054	.477	.081	.288	.041	.592
01388500	Pompton River at Pompton Plains, N.J.	1903/10/1	2001/9/30	.124	.155	.126	.150	.097	.269
01389500	Passaic River at Little Falls, N.J.	1896/10/1	1927/9/30	-.294	.023	-.264	.042	-.315	.015
01389500	Passaic River at Little Falls, N.J.	1927/10/1	2001/9/30	.085	.285	.090	.259	.024	.765
01390500	Saddle R at Ridgewood, N.J.	1954/10/1	2001/9/30	-.069	.517	-.064	.544	-.070	.511
01391000	Hohokus Brook at Ho-ho-kus, N.J.	1954/10/1	1996/9/30	-.031	.792	.063	.589	.105	.359
01391500	Saddle River at Lodi, N.J.	1923/10/1	1965/9/30	.174	.102	.058	.594	.017	.884
01391500	Saddle River at Lodi, N.J.	1965/10/1	2001/9/30	-.241	.040	-.184	.117	-.111	.347
01392000	Weasel Bk at Clifton, N.J.	1936/10/1	1950/9/30	-.244	.271	-.103	.669	-.051	.855
01392000	Weasel Bk at Clifton, N.J.	1951/10/1	1962/9/30	-.091	.755	-.091	.755	-.091	.755
01392210	Third River at Passaic, N.J.	1976/10/1	1997/9/30	-.168	.315	-.295	.074	-.232	.163
01392500	Second River at Belleville, N.J.	1936/10/1	1964/9/30	.060	.677	-.117	.404	-.134	.338
01393450	Elizabeth R at Ursino Lake at Elizabeth, N.J.	1921/10/1	1951/9/30	.101	.443	-.021	.887	-.053	.695
01393450	Elizabeth R at Ursino Lake at Elizabeth, N.J.	1951/10/1	2001/9/30	-.148	.132	-.106	.281	-.096	.332
01394000	WB Rahway River at Millburn, N.J.	1940/10/1	1950/9/30	-.156	.592	-.111	.721	-.111	.721
01394500	Rahway R near Springfield, N.J.	1938/10/1	2001/9/30	.182	.036	.163	.060	.156	.072
01395000	Rahway River at Rahway, N.J.	1921/10/1	2001/9/30	.240	.002	.192	.012	.114	.136
01396000	Robinsons Branch at Rahway, N.J.	1939/10/1	1999/9/30	.079	.390	.046	.620	.041	.655
01396500	South Branch Raritan River near High Bridge, N.J.	1918/10/1	2001/9/30	.154	.039	.122	.104	.089	.233
01396580	Spruce Run at Glen Gardner, N.J.	1977/10/1	2001/9/30	.006	1.000	-.170	.327	-.170	.327
01396660	Mulhockaway Creek at Van Syckel, N.J.	1976/10/1	2001/9/30	-.043	.785	-.018	.921	-.138	.359
01396800	Spruce Run at Clinton, N.J.	1963/10/1	2001/9/30	-.078	.497	-.030	.801	.084	.466
01397000	SB Raritan River at Stanton, N.J.	1903/10/1	1963/9/30	-.019	.862	.019	.854	.003	.985

Table 3-2. Results of trend tests on annual n-day high flow at 138 streamflow-gaging stations in New Jersey, New York, and Pennsylvania.—Continued

[Bold blue indicates a significant upward trend and bold red indicates a significant downward trend; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		1-day high flow		7-day high flow		30-day high flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01397000	SB Raritan River at Stanton, N.J.	1963/10/1	2001/9/30	-0.017	0.890	0.061	0.597	0.118	0.303
01397500	Walnut Brook near Flemington, N.J.	1935/10/1	1961/9/30	-.127	.387	-.013	.944	-.007	.981
01398000	Neshanic River at Reaville, N.J.	1930/10/1	2001/9/30	.159	.050	.185	.023	.118	.146
01398045	Back Brook Tributary near Ringoes, N.J.	1976/10/1	1988/9/30	.055	.876	-.018	1.000	-.127	.640
01398107	Holland Brook at Readington, N.J.	1977/10/1	1996/9/30	-.441	.015	-.294	.108	-.191	.303
01398500	NB Raritan River near Far Hills, N.J.	1921/10/1	2001/9/30	.101	.193	.090	.246	.025	.746
01399190	Lamington (Black) River at Succasunna, N.J.	1976/10/1	1987/9/30	.145	.582	.018	1.000	-.091	.755
01399200	Lamington (Black) R near Ironia, N.J.	1940/10/1	1987/9/30	-.242	.304	-.091	.732	-.061	.837
01399500	Lamington (Black) River near Pottersville, N.J.	1921/10/1	2001/9/30	.075	.327	.120	.116	.091	.233
01399510	Upper Cold Brook near Pottersville, N.J.	1972/10/1	1997/9/30	-.033	.842	-.080	.602	-.051	.747
01399525	Axle Brook near Pottersville, N.J.	1977/10/1	1989/9/30	.455	.062	-.491	.043	-.600	.013
01399670	South Branch Rockaway Creek at Whitehouse Station, N.J.	1976/10/1	2001/9/30	-.225	.130	-.225	.130	-.167	.264
01400000	North Branch Raritan River near Raritan, N.J.	1923/10/1	2001/9/30	.115	.139	.134	.083	.100	.196
01400300	Peters Brook near Raritan, N.J.	1977/10/1	1996/9/30	-.213	.248	-.324	.077	-.368	.044
01400350	Maes Brook at Somerville, N.J.	1981/10/1	1996/9/30	-.462	.032	-.436	.044	-.205	.360
01400500	Raritan River at Manville, N.J.	1903/10/1	1963/9/30	-.142	.171	.002	.992	-.046	.660
01400500	Raritan River at Manville, N.J.	1963/10/1	2001/9/30	-.166	.145	.010	.940	.055	.633
01400730	Millstone River at Plainsboro, N.J.	1963/10/1	1990/9/30	.385	.077	.436	.044	.487	.024
01401000	Stony Brook at Princeton, N.J.	1953/10/1	2001/9/30	.078	.439	.144	.152	.165	.100
01401500	Millstone River near Kingston, N.J.	1933/10/1	1949/9/30	.000	1.000	.100	.620	-.017	.964
01401650	Pike Run at Belle Mead, N.J.	1979/10/1	2001/9/30	.043	.809	.038	.833	.019	.928
01402000	Millstone River at Blackwells Mills, N.J.	1921/10/1	2001/9/30	.178	.020	.138	.071	.090	.240
01402600	Royce Brook Tributary near Belle Mead, N.J.	1966/10/1	1996/9/30	-.194	.205	-.174	.256	-.107	.492
01403060	Raritan River below Calco Dam at Bound Brook, N.J.	1902/10/1	1963/9/30	-.188	.206	.022	.901	.022	.901
01403060	Raritan River below Calco Dam at Bound Brook, N.J.	1963/10/1	2001/9/30	-.195	.087	-.070	.546	.007	.960
01403150	West Branch Middle Brook near Martins Ville, N.J.	1978/10/1	2001/9/30	.104	.516	.048	.778	-.100	.535
01403400	Green Brook at Seeley Mills, N.J.	1978/10/1	2001/9/30	-.108	.499	.004	1.000	-.022	.910
01403500	Green Brook at Plainfield, N.J.	1938/10/1	1985/9/30	.310	.002	.282	.006	.214	.037
01403535	EB Stony Brook at Best Lake at Watchung, N.J.	1979/10/1	2001/9/30	.163	.330	.179	.284	.095	.581

Table 3-2. Results of trend tests on annual n-day high flow at 138 streamflow-gaging stations in New Jersey, New York, and Pennsylvania.—Continued[Bold **blue** indicates a significant upward trend and bold **red** indicates a significant downward trend; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		1-day high flow		7-day high flow		30-day high flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01403540	Stony Brook at Watchung, N.J.	1974/10/1	2001/9/30	0.003	1.000	-0.068	0.632	-0.094	0.505
01405000	Lawrence Brook at Farrington Dam, N.J.	1926/10/1	1990/9/30	.076	.388	.032	.720	-.036	.684
01405030	Lawrence Bk at Westons Mills, N.J.	1988/10/1	2001/9/30	-.055	.876	.091	.755	-.018	1.000
01405300	Matchaponix Brook at Spotswood, N.J.	1956/10/1	1967/9/30	-.244	.371	-.333	.210	-.511	.049
01405400	Manalapan Brook at Spotswood, N.J.	1956/10/1	2001/9/30	.019	.863	-.055	.606	-.051	.635
01405500	South River at Old Bridge, N.J.	1938/10/1	1989/9/30	.060	.546	.054	.587	.146	.140
01407000	Matawan C at Matawan, N.J.	1931/10/1	1955/9/30	.195	.215	.030	.866	-.074	.652
01407500	Swimming River near Red Bank, N.J.	1921/10/1	2001/9/30	.157	.041	.074	.339	-.027	.728
01407705	Shark River near Neptune City, N.J.	1966/10/1	2001/9/30	.040	.744	.047	.701	.143	.233
01407760	Jumping Brook near Neptune City, N.J.	1966/10/1	2001/9/30	.044	.723	-.018	.887	.029	.820
01408000	Manasquan River at Squankum, N.J.	1931/10/1	2001/9/30	.084	.306	.042	.612	.053	.516
01408029	Manasquan River near Allenwood, N.J.	1989/10/1	2001/9/30	-.127	.640	-.091	.755	-.055	.876
01408120	North Branch Metedeconk River near Lakewood, N.J.	1972/10/1	2001/9/30	.054	.694	-.037	.793	-.064	.639
01408500	Toms River near Toms River, N.J.	1928/10/1	1966/9/30	.165	.148	.115	.315	.058	.615
01408500	Toms River near Toms River, N.J.	1966/10/1	2001/9/30	-.129	.280	-.190	.112	-.156	.191
01409000	Cedar Creek at Lanoka Harbor, N.J.	1931/10/1	1971/9/30	-.020	.900	-.137	.327	-.100	.478
01409095	Oyster Creek near Brookville, N.J.	1964/10/1	1985/9/30	.094	.600	.146	.401	.240	.162
01409280	Westecunk Creek at Stafford Forge, N.J.	1973/10/1	1988/9/30	-.229	.254	-.162	.428	-.124	.553
01409400	Mullica River near Batsto, N.J.	1956/10/1	2001/9/30	-.066	.537	-.053	.620	.008	.944
01409500	Batsto River at Batsto, N.J.	1927/10/1	2001/9/30	.016	.849	-.005	.951	-.019	.815
01409810	West Branch Wading River near Jenkins, N.J.	1974/10/1	1997/9/30	-.104	.516	-.056	.735	-.004	1.000
01410000	Oswego River at Harrisville, N.J.	1930/10/1	2001/9/30	.080	.326	.087	.288	.033	.691
01410150	East Branch Bass River near New Gretna, N.J.	1977/10/1	2001/9/30	.142	.355	.138	.369	.083	.597
01410500	Absecon Creek at Absecon, N.J.	1945/10/1	1985/9/30	.048	.678	-.075	.513	.018	.880
01411000	Great Egg Harbor River at Folsom, N.J.	1924/10/1	2001/9/30	.172	.028	.085	.282	.089	.258
01411300	Tuckahoe River at Head of River, N.J.	1969/10/1	2001/9/30	.151	.241	.088	.497	.037	.786
01411456	Little Ease Rn near Clayton, N.J.	1987/10/1	2001/9/30	-.051	.855	.077	.760	-.051	.855
01411500	Maurice River at Norma, N.J.	1932/10/1	2001/9/30	-.020	.808	-.064	.440	-.059	.478
01412000	Menantico Creek near Millville, N.J.	1930/10/1	1985/9/30	-.095	.448	-.163	.188	-.110	.377

Table 3-2. Results of trend tests on annual n-day high flow at 138 streamflow-gaging stations in New Jersey, New York, and Pennsylvania.—Continued

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USGS station number	Station name	Period of record		1-day high flow		7-day high flow		30-day high flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01412500	WB Cohansey River at Seeley, N.J.	1950/10/1	1967/9/30	-0.383	0.043	-0.367	0.053	-.250	0.192
01412800	Cohansey River at Seeley, N.J.	1977/10/1	1988/9/30	-.236	.350	-.236	.350	-.455	.062
01434000	Delaware River at Port Jervis, N.Y.	1904/10/1	1954/9/30	.017	.867	-.118	.232	-.193	.048
01434000	Delaware River at Port Jervis, N.Y.	1954/10/1	2001/9/30	-.094	.354	-.121	.233	-.036	.727
01437500	Neversink River at Godeffroy, N.Y.	1954/10/1	2001/9/30	.127	.212	.023	.826	.027	.797
01437500	Neversink River at Godeffroy, N.Y.	1937/10/1	1954/9/30	-.015	.967	.059	.773	.088	.650
01438500	Delaware River at Montague, N.J.	1954/10/1	2001/9/30	-.080	.430	-.114	.263	-.018	.869
01438500	Delaware River at Montague, N.J.	1939/10/1	1954/9/30	-.048	.843	-.029	.921	.029	.921
01440000	Flat Brook near Flat Brookville, N.J.	1923/10/1	2001/9/30	.103	.184	.099	.203	.102	.187
01440200	Delaware River near Delaware Water Gap, Pa.	1963/10/1	1996/9/30	.118	.359	.127	.320	.144	.260
01443500	Paulins Kill at Blairstown, N.J.	1921/10/1	2001/9/30	.033	.666	.082	.290	.064	.410
01443900	Yards Creek near Blairstown, N.J.	1966/10/1	2001/9/30	.061	.619	-.018	.890	.018	.890
01445000	Pequest River at Huntsville, N.J.	1939/10/1	1962/9/30	.138	.369	.162	.290	.099	.530
01445500	Pequest River at Pequest, N.J.	1921/10/1	2001/9/30	.384	.000	.217	.000	.139	.070
01446000	Beaver Brook near Belvidere, N.J.	1922/10/1	1961/9/30	-.059	.603	.077	.500	.066	.560
01446500	Delaware River at Belvidere, N.J.	1954/10/1	2001/9/30	-.032	.755	-.040	.700	.056	.582
01446500	Delaware River at Belvidere, N.J.	1922/10/1	1954/9/30	.117	.355	.113	.372	.048	.709
01453000	Lehigh River at Bethlehem, Pa.	1902/10/1	1990/9/30	.033	.660	.124	.100	.105	.160
01455200	Pohatcong Creek at New Village, N.J.	1959/10/1	1969/9/30	-.156	.592	-.244	.371	-.200	.474
01455500	Musconetcong R at out of Lake Hopatcong, N.J.	1927/10/1	1976/9/30	.032	.755	.001	1.000	.069	.500
01456000	Musconetcong R near Hackettstown N.J.,	1921/10/1	1974/9/30	.111	.249	.088	.360	.127	.190
01457000	Musconetcong River near Bloomsbury, N.J.	1903/10/1	2001/9/30	.186	.013	.170	.020	.131	.080
01457500	Delaware R at Riegelsville, N.J.	1954/10/1	1971/9/30	-.382	.036	-.382	.036	-.294	.108
01457500	Delaware R at Riegelsville, N.J.	1905/10/1	1954/9/30	.038	.709	-.043	.676	-.121	.230
01460440	Delaware and Raritan Canal at Port Mercer, N.J.	1989/10/1	2001/9/30	-.091	.753	.073	.815	.018	1.000
01460500	Delaware and Raritan Canal at Kingston, N.J.	1946/10/1	1992/9/30	.410	.000	.463	.000	.518	.000
01463500	Delaware River at Trenton, N.J.	1954/10/1	2001/9/30	-.075	.463	-.073	.474	.047	.647
01463500	Delaware River at Trenton, N.J.	1912/10/1	1954/9/30	.037	.737	-.031	.778	-.080	.461
01464000	Assumpink Creek at Trenton, N.J.	1954/10/1	2001/9/30	.056	.582	.086	.399	.136	.181

Table 3-2. Results of trend tests on annual n-day high flow at 138 streamflow-gaging stations in New Jersey, New York, and Pennsylvania.—Continued

[Bold blue indicates a significant upward trend and bold red indicates a significant downward trend; USGS, U.S. Geological Survey]

USGS station number	Station name	Period of record		1-day high flow		7-day high flow		30-day high flow	
		Begin	End	Kendal Tau	p-value	Kendal Tau	p-value	Kendal Tau	p-value
01464000	Assumpink Creek at Trenton, N.J.	1923/10/1	1954/9/30	-0.058	0.658	-0.019	0.892	-0.049	0.708
01464500	Crosswicks Creek at Extonville, N.J.	1939/10/1	2001/9/30	.180	.043	.138	.120	.153	.090
01465850	SB Rancocas C at Vincentown, N.J.	1960/10/1	2001/9/30	.317	.096	.250	.192	.100	.620
01466000	MB Mt Misery Bk in Lebanon State Forest, N.J.	1952/10/1	1977/9/30	-.218	.328	-.077	.760	-.051	.855
01466500	McDonalds Branch in Lebanon State Forest, N.J.	1953/10/1	2001/9/30	-.051	.612	-.026	.800	-.042	.680
01467000	North Branch Rancocas Creek at Pemberton, N.J.	1921/10/1	2001/9/30	.075	.325	.087	.250	.095	.210
01467081	South Branch Pennsauken Creek at Cherry Hill, N.J.	1967/10/1	2001/9/30	.042	.745	-.148	.230	-.087	.490
01467150	Cooper River at Haddonfield, N.J.	1987/10/1	2001/9/30	.099	.661	-.165	.443	.077	.743
01467150	Cooper River at Haddonfield, N.J.	1963/10/1	1987/9/30	.159	.286	.101	.503	.217	.143
01474500	Schuylkill River at Philadelphia, Pa.	1931/10/1	1991/9/30	.000	1.000	.010	.920	.052	.560
01475000	Mantua Creek at Pitman N.J.,	1939/10/1	1977/9/30	.240	.044	.232	.050	.171	.150
01477120	Raccoon Creek near Swedesboro, N.J.	1965/10/1	2001/9/30	.008	.955	-.069	.570	-.079	.510
01482500	Salem River at Woodstown, N.J.	1939/10/1	1990/9/30	.027	.812	.057	.600	.196	.070
01483000	Alloway Creek at Alloway, N.J.	1952/10/1	1973/9/30	.116	.496	.053	.770	.095	.580

For additional information, write to:

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