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Cost Effectiveness of the US Geological Survey's Stream-gaging Program in New York

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The following factors may be used to convert the inch-pound units of measurement in this report to metric (International System) units.

Multiply	by	To obtain
	Length	
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	2.590	sqaure kilometer (km^2)
	Volume	
cubic foot (ft^3)	0.02832	cubic meter (m^3)
	Flow	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)

COST EFFECTIVENESS OF THE U.S. GEOLOGICAL SURVEY'S STREAM-GAGING PROGRAM IN NEW YORK

By Stephen W. Wolcott, William B. Gannon, and William H. Johnston

Abstract

The U.S. Geological Survey conducted a 5-year nationwide analysis to define and document the most cost-effective means of obtaining streamflow data. This report describes the stream-gaging network in New York and documents the cost-effectiveness of its operation; it also identifies data uses and funding sources for the 174 continuous-record stream gages currently operated (1983). Those gages as well as 189 crest-stage, stage-only, and ground-water gages are operated with a budget of $1.068 million. One gaging station was identified as having insufficient reason for continuous operation and was converted to a crest-stage gage.

Current operation of the 363-station program requires a budget of $1.068 million per year. The average standard error of estimation of continuous streamflow data is 13.4 percent. Results indicate that this degree of accuracy could be maintained with a budget of approximately $1.006 million if the gaging resources were redistributed among the gages.

The average standard error for 174 stations was calculated for five hypothetical budgets. A minimum budget of $970,000 would be needed to operate the 363-gage program; a budget less than this does not permit proper servicing and maintenance of the gages and recorders. Under the restrictions of a minimum budget, the average standard error would be 16.0 percent. The maximum budget analyzed was $1.2 million, which would decrease the average standard error to 9.4 percent.

INTRODUCTION

The U.S. Geological Survey is the principal Federal agency responsible for collecting surface-water data nationwide. The data are collected in cooperation with State and local governments and with other Federal agencies. The Geological Survey is currently (1985) operating approximately 8,000 continuous-record gaging stations throughout the Nation, some of which have records since before the turn of this century.

Any long-term scientific activity such as the collection of surface-water data should be evaluated regularly because objectives, technology, or external constraints change continually. The previous systematic nationwide evaluation of the Survey's stream-gaging program was completed in 1970 (Benson and Carter, 1973). The current nationwide evaluation, which began in 1983, is to be done on a State-by-State basis over a 5-year period, with 20 percent of the program analyzed each year. The objective of this evaluation is to define the most cost-effective means of furnishing accurate streamflow information.

This report consists of four major sections. The first describes the Survey's stream-gaging program in New York and includes maps showing station locations. Table 1 lists the drainage area, period of record, and mean annual flows for all 174 stations.

The second section describes the principal uses of the data from continuous-record gaging stations, relates these uses to funding sources, and explains the three forms of data release--current, provisional, or annual publication. Table 2 lists this information for all continuous-record stations.

The third section describes alternative methods of furnishing streamflow data at reduced cost; it also identifies gaged sites from which data are no longer needed, are deficient, or do not meet data needs.

The fourth section describes the cost-effectiveness analysis, which involves the use of Kalman filtering and mathematical-programing techniques to identify data-collection and station-maintenance schedules that minimize the uncertainty (standard error) in the stream-discharge records for a series of hypothetical operating budgets. [Kalman-filtering techniques are used to compute uncertainty functions, which relate the standard error of computed streamflow records to the frequency of visits to each stream gage. The mathematical program (a steepest-descent-optimization technique) uses (1) the uncertainty functions, (2) information on practical stream-gaging routes, (3) other costs associated with stream gaging, and (4) the total network-operating budget, to identify for each station the visit frequency that minimizes the uncertainty in the streamflow data.] Results of this part of the analysis represent the combination of gaging routes and scheduling that meet the stated water-data needs at the least cost.

The standard errors of estimate given throughout the analysis are those that would result if daily discharges were computed by the methods described herein. No attempt was made to estimate standard errors for discharges that were computed by other means because they would differ from the errors given herein. The magnitude and direction of the differences would be a function of methods used to account for shifting controls and for estimating discharges during periods of missing record.

Each of the last three sections contains a summary statement. All tables are at the back of the report.

STREAM GAGING IN NEW YORK

Historical Stream-Gaging Program

Streamflows in New York have been gaged since gaging techniques were first developed in the early 19th century (Darmer, 1970). The first known daily streamflow records to be collected systematically in New York (and in the United States) consisted of measurements by John B. Jervis on Eaton and Madison Brooks in Madison County in 1835. During 1851-57, a few records of daily discharge were collected on Long Island streams, and, in 1868, New York City began a systematic record collection on Croton River at Old Croton Dam.

In 1860, the U.S. Army Corps of Engineers began to record daily flows of the Niagara and St. Lawrence Rivers.

The first current-meter measurements through ice were taken in the Catskill region by the Geological Survey. Before then, daily flow records were not obtained during periods of backwater from ice.

The growing demand for water power, navigation, and water supply in the 19th and early 20th centuries provided the impetus for the Geological Survey's early streamflow-record programs in New York. These early records were collected mostly on the larger rivers.

The Geological Survey's cooperative gaging-station program began in 1900 and grew steadily until 1968, after which the largest State cooperating agency decreased its contribution. The bar graph in figure 1 illustrates the number of continuous stream-gaging stations during 1890-1983.

Many gaging stations were added to the network in 1937-38 as a result of an increased cooperative program with the City of New York Board of Water Supply for water-supply studies in the Delaware River basin and the need for flood-control studies after the severe floods of 1935 and 1936 in the Susquehanna River basin.

Since about 1958, most new gaging stations have been established on medium-sized and small streams to help define hydrogeologic conditions for regional water-resources planning. Partial-record gaging-station programs also began at that time. (Partial-record gages are inexpensive gages that obtain data only on the highest or lowest flow.)

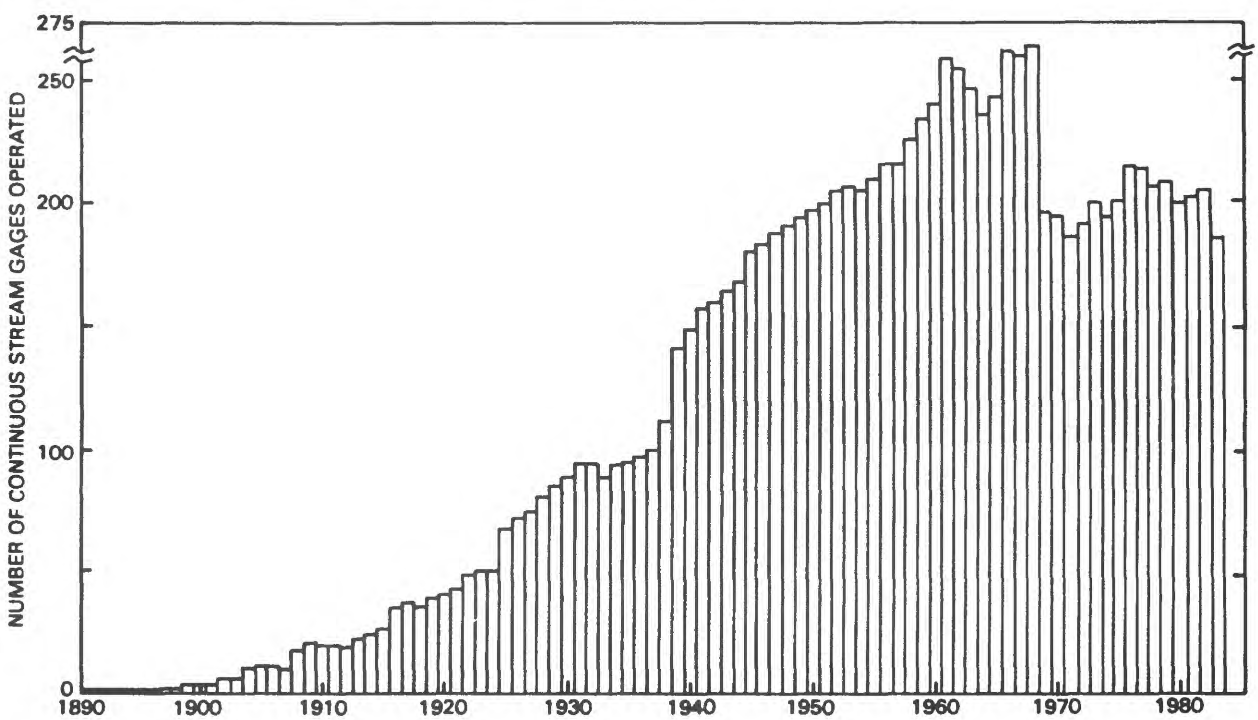


Figure 1.--Number of continuous stream gages operated by the U.S. Geological Survey in New York, 1890-1983.

The stream-gaging program has changed little in size since 1969. A few stations were discontinued when the cooperating agency no longer needed the data, and other stations have been established in response to a need for streamflow information on smaller streams.

Present Stream-Gaging Program

New York can be divided into eight major physiographic regions--the Central Lowland, the St. Lawrence Valley, the Adirondack Province, the Appalachian Plateaus, the Ridge and Valley Province, the New England Province, the Piedmont Province, and the Coastal Plain (Fenneman, 1938). The distribution of the 174 continuous-record stream gages operated by the Geological

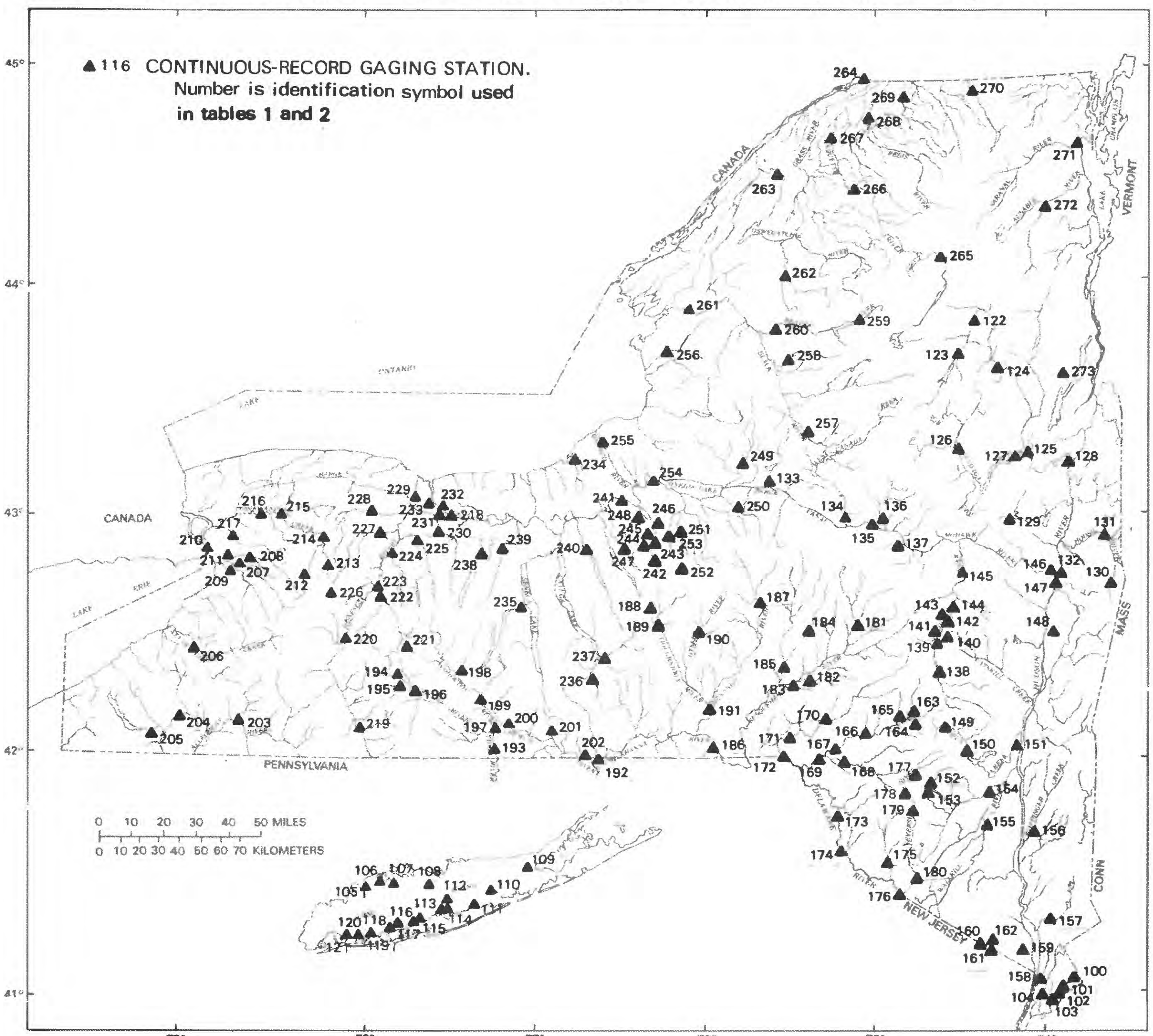


Figure 2.--Location of continuous-record gaging stations. (Station names are given in table 1.)

Survey in New York in 1983 is shown in figure 2; the locations of the eight physiographic regions are shown in figure 3. Comparison of figures 2 and 3 shows that the 174 gages are evenly distributed over the eight regions. The cost of operating these, in addition to 189 crest-stage, stage-only, and ground-water gages in fiscal year 1983, was $1.068 million.

Selected hydrologic data, including drainage area, period of record, and mean annual flow for the 174 active continuous-record streamflow gaging stations are given in table 1 (at end of report). Station-identification numbers used throughout this report are the U.S. Geological Survey's eight-digit downstream-order station number.

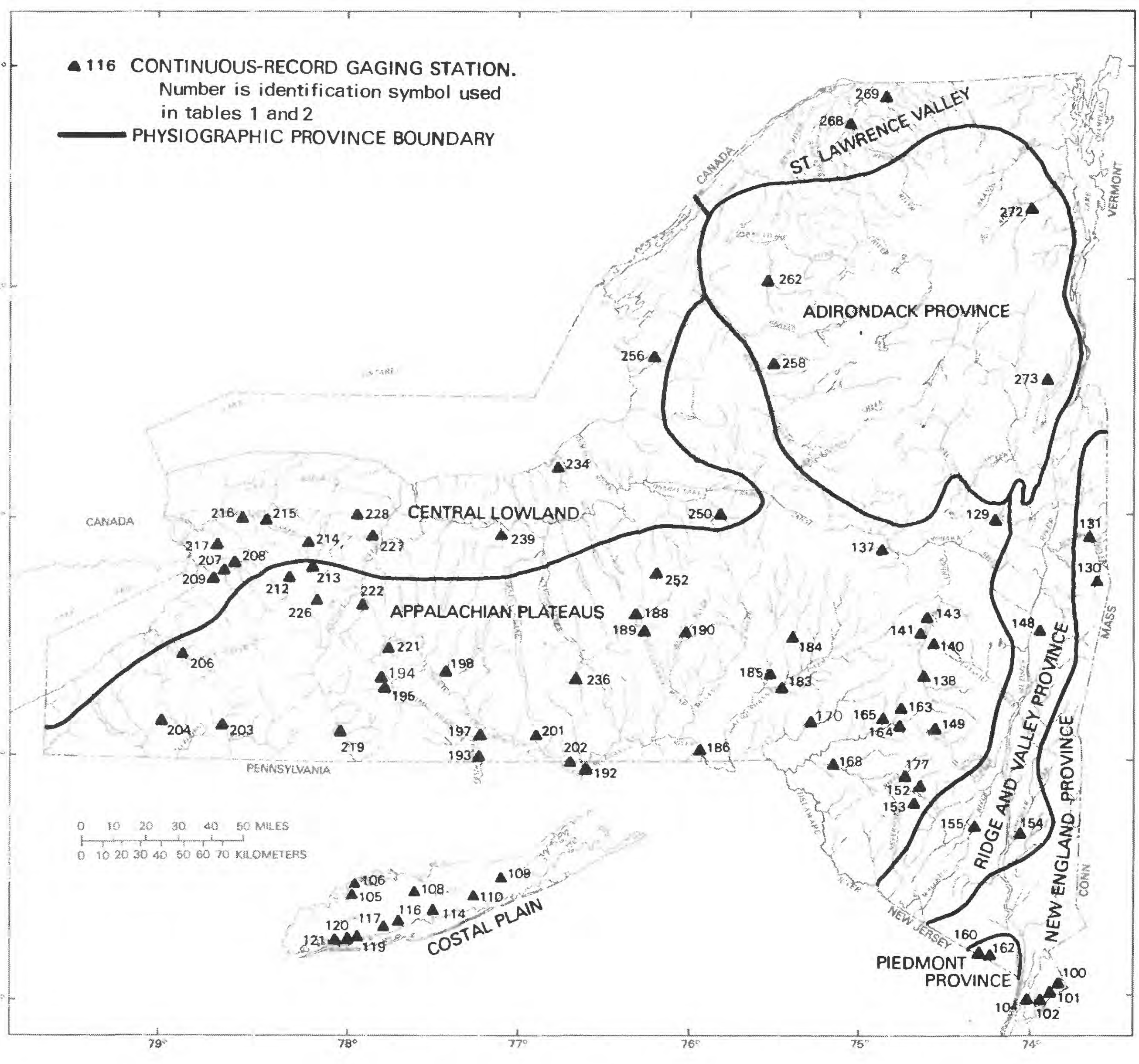


Figure 3.--Location of physiographic provinces and "regional hydrology" gaging stations described on p. 6.

USES, FUNDING, AND AVAILABILITY OF CONTINUOUS STREAMFLOW DATA

The relevance of a stream gage is defined by the uses that are made of the data it produces. The purposes for which data from each gage in the New York program are used were identified and confirmed by a survey of known data users. Results indicated the importance of each gage and identified gaging stations of lesser importance that may be considered for discontinuation or conversion to partial-record stations. The data uses reported in this survey were placed into nine categories, and the sources of funding and the frequency at which data are provided to the users were compiled for each station. Results are described below and summarized in table 2 (at end of report, p. 38).

Data-Use Categories

The categories described below were used to classify each of the 174 continuous-record stations in terms of known uses of streamflow data. The categories for each station are indicated in table 2.

"Regional hydrology" stations

Many studies require information on regional streamflow patterns. Gages that provide data to be used in defining the hydrology of a region must be set on reaches that are largely unaffected by manmade storage or diversion. Within this category, the effects of man on streamflow need not be small but must be related mainly to land use. Also, the basin may contain large amounts of manmade storage, provided that the outflow is uncontrolled. These stations are useful in developing regionally transferable information about the relationship between basin characteristics and streamflow.

Of the 174 New York stations, 83 were placed in the "Regional Hydrology" category. One of these has been designated as a "hydrologic benchmark" station by the Geological Survey, and 37 have been designated as benchmark stations by cooperating agencies. (Hydrologic benchmark stations have been established nationwide by the Geological Survey to serve as indicators of hydrologic conditions in watersheds that probably will continue to be relatively free of manmade alterations. This is explained further in Cobb and Biesecker [1971]. Stations designated "benchmark" by cooperating agencies are to be operated indefinitely to detect hydrologic trends in basins that are not influenced by man's activities.) The locations of stream gages in the regional hydrology category are shown in figure 3.

"Hydrologic systems" stations

Stations that can be used to define current hydrologic conditions within hydrologic systems, including regulated systems, are designated as "hydrologic systems" stations. This category includes stations that measure diversions and return flows and that are useful for defining the interaction of water systems. In New York, 161 stations were assigned to this category. Also included in this category are two State-designated benchmark stations because their records represent current and long-term conditions of regulated hydrologic systems. Also included are 14 Federal Energy Regulatory Commission (FERC) stations and 8 U.S. Geological Survey "hydrologic index" stations. The data collected at the FERC sites are used to monitor the compliance of control structures with downstream flow requirements determined by FERC. Also included in this category are two international gaging stations on the St. Lawrence and Niagara Rivers.

"Legal obligations" stations

Stations assigned to this category provide records of flows for the verification or enforcement of treaties, compacts, and decrees. Only stations that the U.S. Geological Survey is required to operate to satisfy a legal responsibility are included in this category. The New York program had no stations in this category in 1983.

"Planning and design" stations

Stations in this category provide data for use in the planning and design of a specific water project (for example, a dam, levee, floodwall, navigation system, water-supply diversion, hydroelectric powerplant, or waste-treatment facility) or group of hydraulic structures. Only stations that were installed for such purpose, whose purpose is still valid, were included in this category. The New York program had nine stations in this category in 1983.

"Project operation" stations

Stations in this category provide data that assist water managers in making decisions on matters such as reservoir releases, hydroelectric-power operations, or diversions. Data in this category are generally available to the users on an immediate basis. In 1983 the New York program had 93 stations in this category.

"Hydrologic forecasts" stations

Stations in this category provide information that can be used for flood forecasts for a specific river reach or for periodic (daily, weekly, monthly, or seasonal) flow-volume forecasts for a specific site or for a region. Data in this category are generally available to the forecasters on a rapid-reporting basis. (On large streams, data may be needed only every few days.) Stations in New York that are included in this category are those used for flood and water-supply forecasting and early flood-warning systems. The data are used by the U.S. National Weather Service as well as several State and county agencies to forecast floodflows at downstream sites. The New York program currently has 99 stations in this category.

"Water-quality-monitoring" stations

Gaging stations at which water quality or sediment transport is monitored regularly and from which streamflow records are used in conjunction with these data are designated as water-quality-monitoring sites. A total of 52 stations in New York were used for water-quality monitoring in 1983. One of these stations is a Geological Survey-designated benchmark station, and 12 are national stream-quality accounting network (NASQAN) stations. (Water samples from benchmark stations are used to indicate water-quality characteristics of streams that have been and probably will remain relatively free of manmade influence. NASQAN stations are part of a nationwide network designed to assess water-quality trends of significant streams. (See Ficke and Hawkinson, 1975.)

"Research" stations

Stations in this category are operated for a particular study and typically are operated for only a few years. The New York program had 12 stations in this category in 1983.

"Other" stations

This category includes stations that cannot be placed within the preceding categories. The New York program had no stations in this category in 1983.

Funding

The streamflow-data program is funded through four types of sources, described below. The sources of funding for each station are indicated in table 2 (at end of report, p. 38).

1. Federal program.--This source allocates U.S. Geological Survey funds directly to a project.

2. Other Federal Agencies program.--This source consists of funds that are transferred to the Geological Survey by other Federal agencies for specific studies.

3. Cooperative program.--This source consists of funds from one or more non-Federal cooperating agencies. These funds are matched by Geological Survey funds.

4. Other non-Federal programs.--This source consists of funds that are provided entirely by a non-Federal agency and are not matched by Geological Survey funds.

The funding described above pertains only to the collection of streamflow data. Funding for other activities, particularly collection of samples for water-quality analysis, may come from sources other than those described above. In 1983, 19 Federal and State agencies contributed funds to the New York stream-gaging program.

Availability of Data

Availability of data refers to the frequency at which streamflow data may be furnished to the user(s). Data can be furnished by (1) direct-access telemetry equipment, communication from satellite relay station, or ground observer, (2) by periodic release of provisional data, or (3) in published form in the Geological Survey's annual water-data report for each State. In the New York program, data from all continuous gaging stations are given in the annual report, data from 82 stations are available on an immediate basis, and provisional data from 37 stations are released on a periodic basis. The availability of data from each station is indicated in table 2.

Conclusions Pertaining to Data Uses

The data-use and funding information presented in table 2 indicate that two stations are currently operated to support short-term hydrologic studies. One of these, Hudson River at Waterford (01335754), is run as part of a study of PCB (polychlorinated biphenyl) transport in the upper Hudson River. The other, Irondequoit Creek near Pittsford (04232040), is operated as part of a project to study the flow and water-quality characteristics of the lower Irondequoit basin. These stations will be discontinued upon completion of the projects.

Many low-priority streamflow-gaging stations were discontinued between April 1, 1981 and March 31, 1983 for lack of funds and little need for the data. No additional stations are being considered for discontinuation at present (1985).

ALTERNATIVE METHODS OF DEVELOPING STREAMFLOW INFORMATION

The analysis of the stream-gaging program entailed an investigation of methods to provide daily streamflow information in place of operating continuous-flow gaging stations. The objective was to identify stations for which alternative methods, such as flow-routing or statistical procedures, would provide adequate daily mean streamflow information at lower cost.

No guidelines concerning the degree of accuracy needed for particular data uses are available; therefore, judgment is required in deciding whether the estimated daily flows are sufficiently accurate for the intended purpose. The required use of the data will influence a site's potential for alternative methods. For example, stations from which flood hydrographs are required on an immediate basis, such as those used for hydrologic forecasts and field studies, would not be candidates for the alternative methods; similarly, if the Geological Survey were legally obligated to operate a particular gaging station, the use of alternative methods would be precluded.

The primary candidates for other methods are stations on streams that have more than one station. The accuracy of the estimated streamflow at these sites may be suitable because of a high redundancy of flow information. Other candidates would be stations in watersheds similar to others in the same physiographic and climatic area.

All stations in the New York stream-gaging program were categorized as to their potential for alternative methods of developing streamflow information; results are described later in this section and given in a table on page 11.

Ideally, a proposed alternative method should (1) be computer oriented and easy to apply, (2) have an interface with the Geological Survey WATSTORE Daily Values File (Hutchinson, 1975), (3) be technically sound and generally acceptable to the hydrologic community, and (4) permit easy evaluation of the accuracy of the simulated streamflow records. Two methods--a flow-routing model and multiple-regression analysis--meet the above selection criteria. Only the multiple-regression analysis method, described below, was applied in this study, because testing of flow-routing models would have required additional time and funding.

Description of Regression Analysis

Simple- and multiple-regression techniques are frequently used to estimate daily flow records. Regression equations can be developed that relate daily flows (or their logarithms) at a single station to daily flows at a combination of upstream, downstream, and (or) tributary stations. Unlike the flow-routing method, the regression method is not limited to stations that are on the same stream. The variables in the regression analysis can be for stations from different watersheds or downstream and tributary watersheds.

The regression method shares many attributes with the flow-routing method--it is easy to apply, provides indices of accuracy, and is generally accepted as a valid method for estimation. The theory and assumptions of regression analysis are described in many textbooks, for example, Draper and Smith (1966) and Kleinbaum and Kupper (1978). The application of regression analysis to hydrologic stations is described and illustrated by Riggs (1973) and Thomas and Benson (1970). A brief description of regression analysis as it was applied in this study is given below.

The linear regression equation developed for estimating daily mean discharges in New York is:

$$y_i = B_o + \sum_{j=1}^{P} B_j x_j + e_i \qquad (1)$$

where: y_i = daily mean discharge at station i (dependent variable),
x_j = daily mean discharges at nearby stations (explanatory variables),
B_o, B_j = regression constant and coefficients, and
e_i = random error term.

The above equation was calibrated (B_o and B_j were estimated) from observed values of y_i and x_j. (These were retrieved from the WATSTORE Daily Values File.) The values of x_j may be discharges observed on the same day as discharges at station i or may be for previous or future days, depending on whether station j is upstream or downstream of station i. Once the equation was calibrated and verified, future values of y_i were estimated from observed values of x_j. The regression constant and coefficients (B_o and B_j) were tested to determine whether they are significantly different from zero. Only those station j's whose regression coefficient (B_j) was significantly different from zero were retained. The regression equation was calibrated for one period of time and verified for a different period to obtain a measure of the true predictive accuracy. Both the calibration and verification periods were representative of the normal range of flows at station i.

The equation was verified by (1) plotting the residuals e_i (difference between simulated and observed discharges) against the dependent variable and all explanatory variables in the equation, and (2) plotting the simulated and observed discharges through time on the same graph. These tests are intended to identify (1) whether the linear equation is appropriate or whether some transformation of the variables is needed, and (2) whether the equation has any bias, such as overestimating low flows. These tests might indicate, for example, that a logarithmic transformation is desirable, that a nonlinear regression equation is appropriate, or that the equation is biased in some way. In this study the tests indicated that a linear equation (eq. 1) with y_i and x_j in ft^3/s, was appropriate.

The use of a regression relationship to synthesize data for a discontinued station entails a reduction in the variance of the streamflow record relative to that which would be computed from an actual record of streamflow at the site. The reduction in variance, expressed as a fraction, is approximately equal to 1 minus the square of the correlation coefficient that results from the regression analysis.

Potential of Stations for Alternative Methods

All 174 stations plotted in figure 2 were reviewed to determine their potential for alternative methods of providing streamflow information. Only 15 stations were suitable; an analysis of the data uses for those stations (table 2) revealed that either the National Weather Service, Susquehanna River Basin Commission, nor the Corps of Engineers need immediate data from all 15 stations. Most of the sites are equipped with telemarks.

Results of Regression Analysis

A regression analysis was done for 6 of the 15 stations considered eligible for alternative methods (see table below) to illustrate the degree of accuracy attainable through alternative methods. Streamflow data for each station were plotted as the dependent variable against streamflow records from other stations (explanatory or independent variables) collected between October 1, 1979 and September 30, 1982 (the calibration period). "Best fit" linear regression equations were developed and used to provide a daily

Station name and number	Equation*	Percent of modeled days within indicated percentage of observed flow: within 5 percent	within 10 percent	greater than 25 percent
Schoharie Creek at Breakabeen (01350355)	$Q_{144} = 17.4 + 1.20\ Q_{142} + 0.82\ Q_{143}$	21	42	19
Hudson River at Green Island (01358000)	$Q_{147} = 282 + 0.98\ Q_{146} + 1.00\ Q_{132}$	39	58	7
East Branch Delaware River at Fishs Eddy (01421000)	$Q_{169} = 32.3 + 1.20\ Q_{167} + 1.11\ Q_{168}$	43	59	10
Delaware River at Callicoon (01427510)	$Q_{173} = -88.1 + 1.80\ Q_{169} + 1.00\ Q_{172}$	23	41	18
Chenango River near Chenango Forks (01512500)	$\log Q_{191} = 0.72 + 0.56 \log Q_{189} + 0.18 \log Q_{190} + 0.26 \log Q_{187}$	25	44	19
Tonawanda Creek near Alabama (04217500)	$\log Q_{215} = 0.25 + 0.94 \log Q_{214}$	20	45	17

* Q_{xxx} = Mean daily discharge at indicated station. Use index number (xxx) with table 3 to determine station name.

streamflow record for the 1979 water year (verification period), which was then compared to the observed streamflow record. The percent difference between the simulated and actual record for each day was calculated; results of the regression analysis for each site are summarized in the preceding table; the observed and simulated discharges for each of these stations are plotted in figure 4.

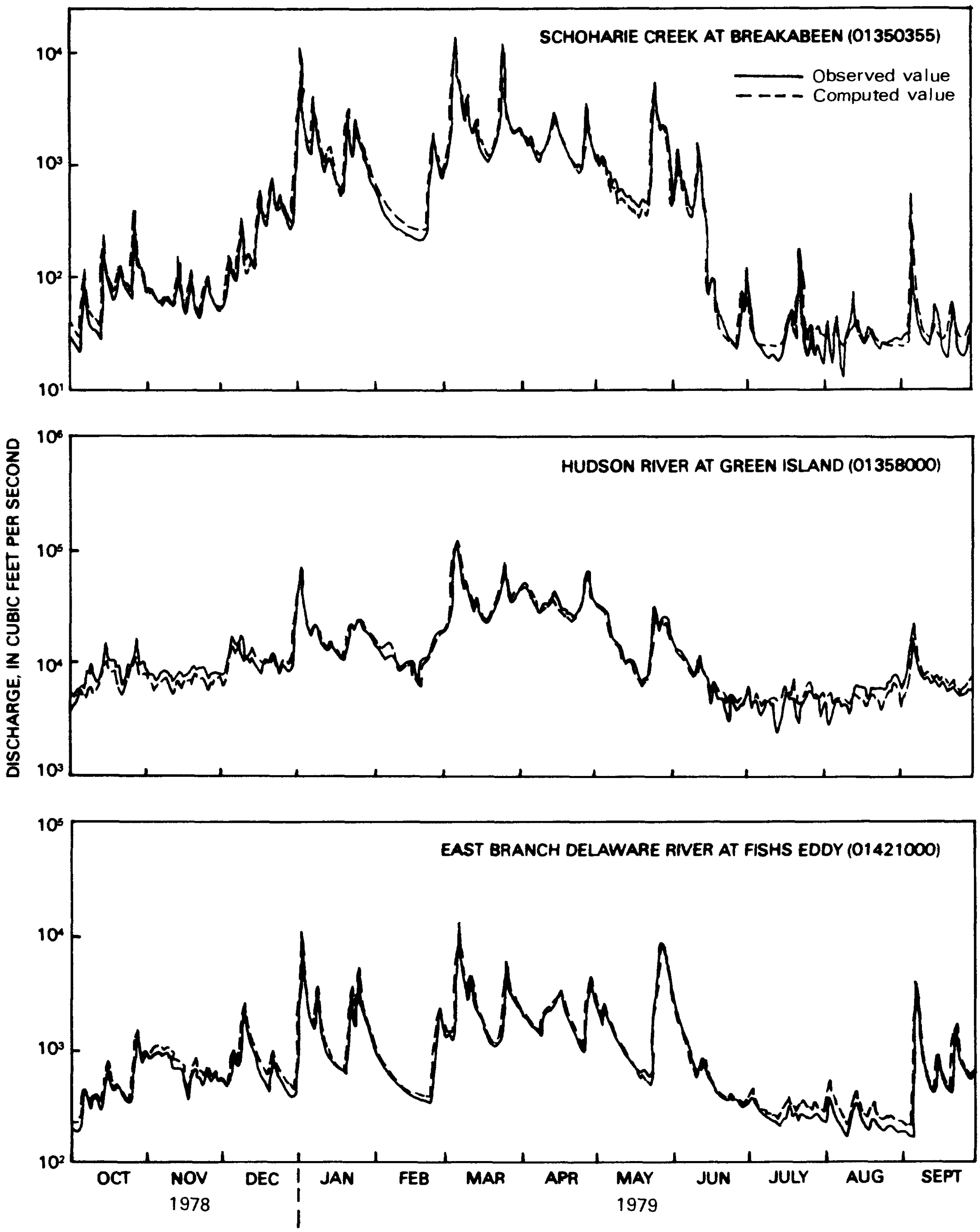
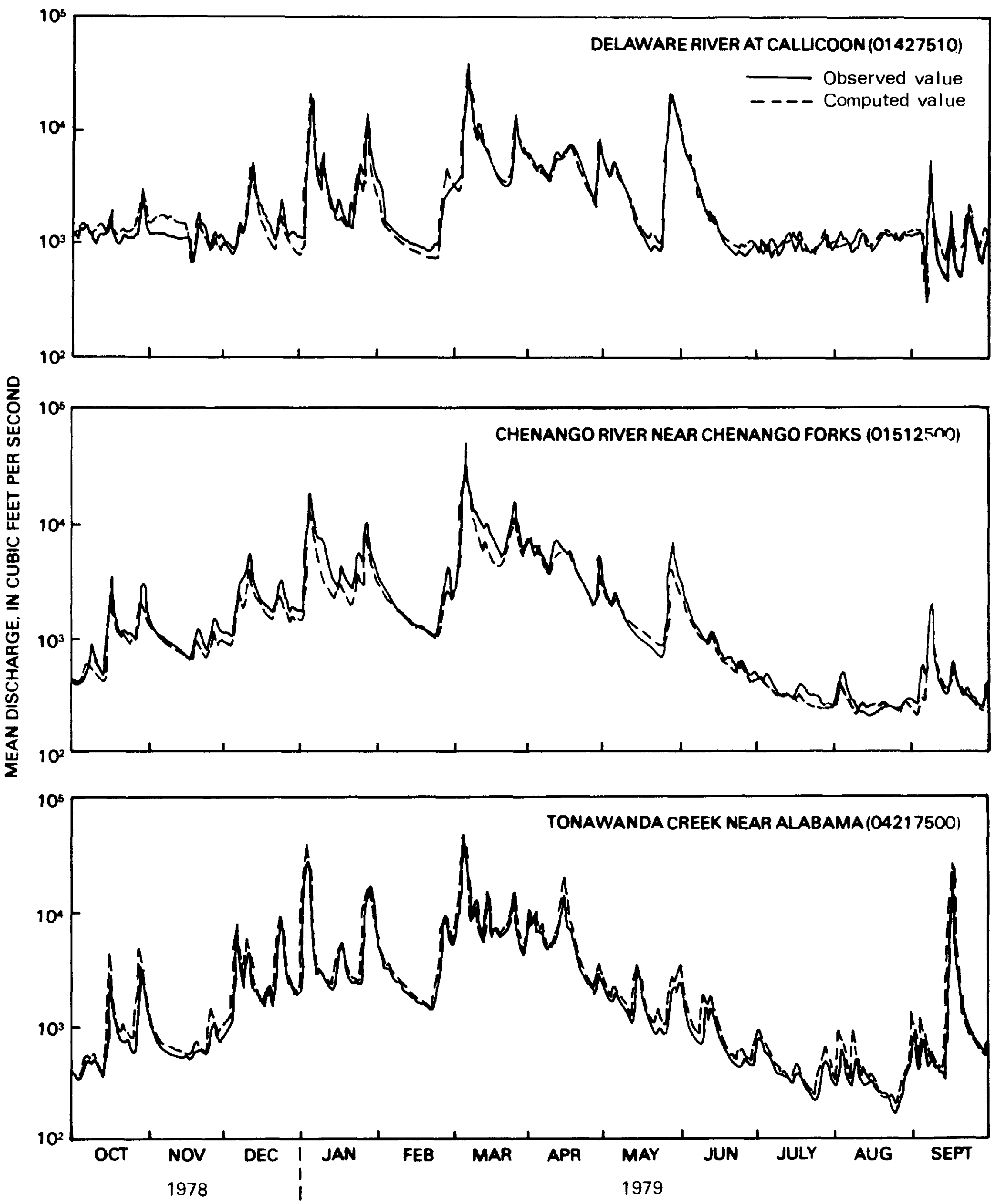


Figure 4.--Comparison of observed and simulated daily flow at six sites

Conclusions Pertaining to Alternative Methods of Data Generation

The simulated data obtained from the regression analysis were not sufficiently accurate for use in place of continuous-flow records. Most streamflow estimates provided by the regression method could not even be rated fair to poor by U.S. Geological Survey accuracy standards for daily discharge records. Therefore, all gaging stations will continue to be operated.



judged suitable for alternative methods of streamflow computation.

KALMAN FILTERING FOR COST-EFFECTIVE RESOURCE ALLOCATION (K-CERA)

A set of techniques called Kalman Filtering for Cost-Effective Resource Allocation (K-CERA) was developed in a Geological Survey study of the cost effectiveness of a network of stream gages operated to measure water consumption in the Lower Colorado River basin (Moss and Gilroy, 1980). Because that study entailed development of a water balance, the measure of the network's cost effectiveness was selected as the minimal sum of variances for the errors of the estimated annual mean discharges at each site in the network.

This measure of cost effectiveness would tend to allocate stream-gaging money to the larger, less stable streams where potential errors are greatest. Although such a tendency is appropriate for a network of stream gages used to determine the water balance within a basin, stream gages used for other purposes are not given equal consideration, which results in an increased allocation of money for gages on larger streams. Therefore, the K-CERA technique was expanded in the New York study to include as an optional measure of effectiveness the sum of the variances for the errors of estimation for annual mean discharge (in ft^3/s) or average instantaneous discharge (in percent). The use of percentage errors does not unduly weigh the streamflow data of large streams to the detriment of small streams. In addition, the instantaneous discharge is the variable from which all other streamflow data are derived. For these reasons, the New York study used the K-CERA techniques with the sum of the variances of the percent errors of the instantaneous discharges at all continuously gaged sites as the measure of the cost effectiveness of data collection.

The original version of K-CERA also did not account for error contributed by missing stage or other correlative data that are used to compute streamflow data. The probability of missing correlative data increases with the time between service visits to a stream gage. A procedure for compensating for the missing record has been developed and was incorporated into this study.

Brief descriptions of the mathematical program used to optimize cost effectiveness of the data-collection activity and of the application of Kalman filtering (Gelb, 1974) to the determination of the accuracy of a stream-gaging record are presented below. Additional information on the theory and applications of K-CERA are given in Moss and Gilroy (1980) and Gilroy and Moss (1981).

Mathematical Program

The program called "The Traveling Hydrographer" attempts to allocate among stream gages a predefined budget for the collection of streamflow data to maximize the cost effectiveness of field operation. (The measure of effectiveness is discussed above.) The set of decisions available to the manager includes the frequency of use (number of times per year) of each route that may be used to service the gage and measure discharge. The range for each route is from no use to daily use. (A route is defined as the path from the base of operation to each gage or set of gages and back by the least expensive travel method.) Associated with a route is an average cost of travel and average cost of servicing each gage visited along the way.

The first step in this part of the analysis is to define the set of practical routes. This frequently will contain the path to an individual gage and the return trip; here the needs for that gage can be considered as separate from those of the other gages.

The second step is to identify special requirements for visits to each gage for periodic maintenance, repair or servicing of recording equipment, or periodic sampling for water-quality analysis. Such requirements are considered essential in determining the minimum number of visits required for each gage.

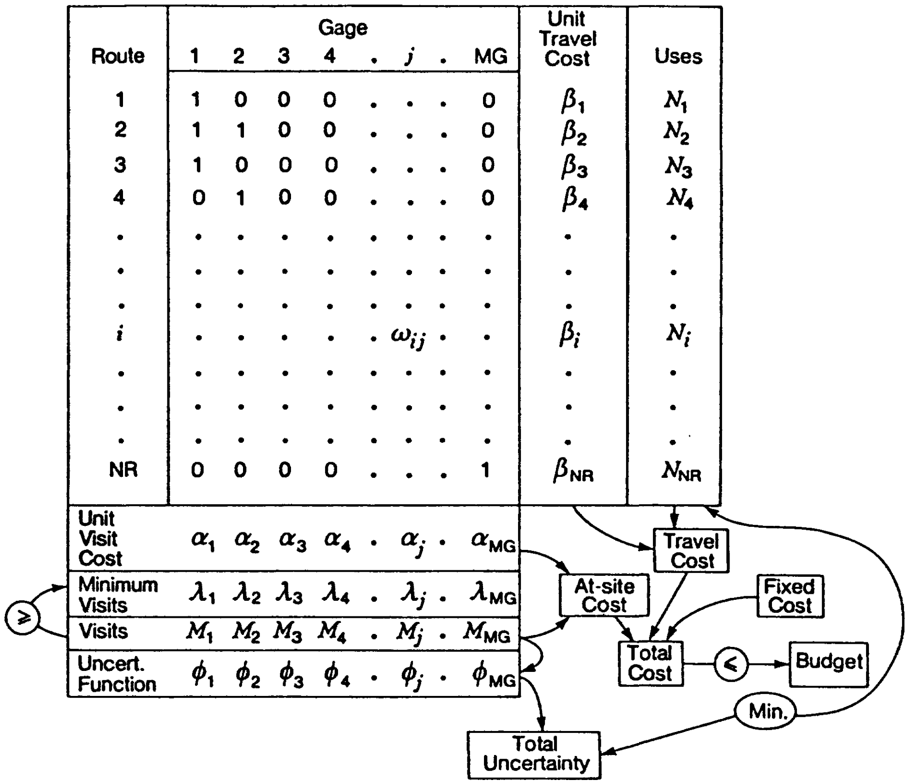
The final step is to use the above factors to calculate the number of times, N_i, that the i^{th} route for i + 1, 2, ..., NR (where NR is the number of practical routes) is used during a year such that (1) the budget for the network is not exceeded, (2) at least the minimum number of visits to each station is made, and (3) the total uncertainty (standard error) in the network data is minimized. This step is illustrated in figure 5, which includes the mathematical equation defining the total uncertainty and a flow chart of the problem. Each of the routes in figure 5B is represented by a row in the flow chart, and each of the stations is represented by a column. The zero-one matrix (W_{ij}) defines the routes in terms of the stations that it includes. For example, a value of 1 in row i and column j indicates that station j will be visited on route i; a value of 0 indicates that it will not. The unit travel cost, βi, is the per-trip cost of the hydrographer's traveltime, including per diem and operation, maintenance, and rental cost of vehicles. The sum of the products of βi and N_i for i = 1, 2, ..., NR is the total travel cost associated with the set of decisions $\underline{N} = (N_1, N_2, \cdots, N_{NR})$.

The unit-visit cost, αj, is defined as the average service and maintenance cost incurred on a visit to the station plus the average cost of making a discharge measurement. The set of minimum visits per stream gage is denoted by the row λj, j = 1, 2, ..., MG, where MG is the number of stream gages. In the row of integers Mj, j = 1, 2, ..., MG specifies the number of visits to each station. Mj is the sum of the products of W_{ij} and N_i for all i and must equal or exceed λj for all j if $\underline{N}$ is to be a feasible solution to the decision problem.

The total amount spent for the station visits is equal to the sum of the products of αj and Mj for all j. The number of visits to a station is assumed to have a negligible effect on the cost of record computation, documentation, and publication; these services are included as overhead in the fixed cost of operating the network. The total cost of operating the network equals the sum of the travel costs, the at-site costs, and the fixed cost, and must be less than or equal to the available budget.

The total uncertainty in the estimates of discharges at all stations (MG) is determined by summing the uncertainty functions, ϕ_j, evaluated at the value of M_j from the row above it, for j = 1, 2, ..., MG.

As pointed out in Moss and Gilroy (1980), the optimization technique used does not guarantee a true optimum solution. However, the locally optimum set of values for $\underline{N}$ obtained by this method specifies an efficient strategy for operating the network, which may be the true optimum strategy.



$$\text{Minimize } V = \sum_{j=1}^{MG'} \phi_j (M_j)$$

where: V ≡ total uncertainty in the network
$\underline{N}$ ≡ vector of annual number times each route was used
MG ≡ number of gages in the network
M_j ≡ annual number of visits in station j
ϕ_j ≡ function relating number of visits to uncertainty at station j

Such that

Budget $>$ T_c ≡ total cost of operating the network

$$T_c = F_c + \sum_{j=1}^{MG} a_j M_j + \mathrm{S}_{i=1}^{NR} b_i N_i$$

F_c ≡ fixed cost
α_j ≡ unit cost of visit to station j
NR ≡ number of practical routes chosen
β_i ≡ travel cost for route i
N_i ≡ annual number times route i is used (an element of $\underline{N}$)

and such that $M_j > \lambda_j$

λ_j ≡ minumum number of annual visits to station j

Figure 5.--Summary of the optimization procedure for routing hydrographer.
A. Flow chart (from Fontaine and others, 1984).
B. Mathematical equations (from Fontaine and others, 1984).

Uncertainty Functions

As noted earlier, uncertainty in streamflow records is defined in this study as the average relative variance of estimation of instantaneous discharges. The accuracy of a streamflow estimate depends on how that estimate was obtained. Three situations were considered in this study:

(1) Streamflow data are estimated from measured discharge and correlative data through a stage-vs-discharge relationship (rating curve).

(2) Streamflow data are reconstructed from secondary data from nearby stations,

(3) Neither primary nor secondary data are available.

The variances of the errors of the estimates of flow that would be used in each situation were weighted by the percentage of time that each situation is expected to occur. Thus, the average relative variance would be:

$$\overline{V} = \varepsilon_f V_f + \varepsilon_r V_r + \varepsilon_e V_e$$

with

$$1 = \varepsilon_f + \varepsilon_r + \varepsilon_e \qquad (2)$$

where: $\overline{V}$ = average relative variance of the errors of streamflow estimates,
ε_f = fraction of time that the primary recorders are functioning,
V_f = relative variance of the errors of flow estimates from primary recorders,
ε_r = fraction of time that secondary data are available to reconstruct streamflow records, given that the primary data are missing,
V_r = relative variance of the errors of estimation of flows reconstructed from secondary data,
ε_e = fraction of time that primary and secondary data are unavailable, and
V_e = relative error variance when primary and secondary data are unavailable.

The fraction of time that each source of error is relevant is a function of the frequency at which the recording equipment is serviced.

The time τ between the last service visit and failure of the recorder(s) at the primary site is assumed to have a negative-exponential probability distribution truncated at the next service time. The distribution's probability density function, f_τ, is expressed as

$$f_\tau = ke^{-k\tau}/(1-e^{-ks}) \qquad (3)$$

where: k = failure rate, in units of $(\text{day})^{-1}$,
e = base of natural logarithm, and
s = interval between visits to the site, in days.

It is assumed that if a recorder fails, it continues to malfunction until the next service visit. As a result,

$$\varepsilon_f = (1-e^{-ks})/(ks) \quad (4)$$

(Fontaine, 1983, eq. 21).

The fraction of time, ε_e, that no records from either the primary or secondary sites are available, can also be derived if the time between failures at both sites is independent and has a negative exponential distribution with the same rate constant. It then follows that

$$\varepsilon_e = 1 - [2(1-e^{-ks}) - 0.5(1-e^{-2ks})]/(ks) \quad (5)$$

(Fontaine, 1983, eqs. 23 and 25).

Finally, the fraction of time, ε_r, that records are reconstructed from data from a secondary site is determined by the equation

$$\varepsilon_r = 1 - \varepsilon_f - \varepsilon_e$$

$$= [(1-e^{-ks}) - 0.5(1-e^{-2ks})]/(ks) \quad (6)$$

The relative variance, V_f, of the error derived from primary record computation is determined by analyzing a time series of residuals that are the differences between the logarithms of measured discharge and the rating-curve discharge. The rating-curve discharge is calculated from a relationship between discharge and other correlative data, such as water-surface elevation at the gaging station. The measured discharge is the discharge calculated from field observations of depth, width, and velocity. For example, let $q_T(t)$ be the true instantaneous discharge at time t, and let $q_R(t)$ be the value that would be estimated from the rating curve. Then the instantaneous difference, x(t), between the logarithms of the true discharge and the rating-curve discharge is expressed as

$$x(t) = \log q_T(t) - \log q_R(t) = \log [q_T(t)/q_R(t)] \quad (7)$$

In computing estimates of streamflow, one may continually adjust the rating curve on the basis of periodic measurements of discharge. This adjustment process gives an improved estimate, $q_c(t)$ for discharge at time t. The difference between the variable $\hat{x}(t)$, which is defined as

$$\hat{x}(t) = \log q_c(t) - \log q_R(t) \quad (8)$$

and x(t) is the error in the streamflow record at time t. The variance of this difference over time is the desired estimate of V_f.

Because the true instantaneous discharge, $q_T(t)$, cannot be determined, neither x(t) nor the difference, $x(t) - \hat{x}(t)$, can be calculated. However, the statistical properties of $x(t) - \hat{x}(t)$, particularly its variance, can be inferred from the available discharge measurements. Let the observed residuals of measured discharge from the rating curve be z(t) so that

$$z(t) = x(t) + v(t) = \log q_m(t) - \log q_R(t) \quad (9)$$

where: v(t) = measurement error, and
$\log q_m(t)$ = log of measured discharge equal to $\log q_T(t)$ plus v(t).

In the Kalman-filter analysis, the z(t) time series was analyzed to obtain three site-specific terms for each uncertainty function. The Kalman filter used in this study assumes that the time residuals, x(t), arise from a continuous first-order Markovian process that has a Gaussian (normal) probability distribution with zero mean and variance (subsequently referred to as process variance) equal to p. The second term, β, is the reciprocal of the correlation time of the Markovian process that gives rise to x(t); the correlation between $x(t_1)$ and $x(t_2)$ is $\exp[-\beta | t_1-t_2 |]$. The third term, q, is the spectral density function of the "white noise" that drives the Gauss-Markov x-process. The terms p, β, and q are related by

$$\mathrm{Var}[x(t)] = p = q/(2\beta), \tag{10}$$

and the variance of the observed residuals z(t) is

$$\mathrm{Var}[z(t)] = p + r \tag{11}$$

where r is the variance of the measurement error v(t). The three terms, p, β, and r are computed from statistical properties of the z(t) time series and are needed to define this component of the uncertainty relationship. The Kalman filter uses these three terms to determine the average relative variance of the errors of estimation of discharges as a function of the number of discharge measurements per year (Moss and Gilroy, 1980).

If the recorder at the primary site fails, and if no concurrent data from other sites are available to reconstruct the missing record, at least two methods can be used to estimate discharges at the primary site. A recession curve could be applied for the time between recorder failure and reactivation, or the expected value of discharge for the period of missing data could be used as an estimate. In this study, the expected-value approach was used to estimate V_e, the relative error variance for periods lacking concurrent data from nearby stations. If the expected-value method is used to estimate discharge, it should be the expected value of discharge at the time of year of the missing record to reflect the seasonal character of the streamflow. The variance of streamflow, which also fluctuates seasonally, is an estimate of the error variance that results from using the expected value as an estimate. Thus, the coefficient of variation squared $(C_v)^2$ represents the required relative error variance, V_e. Because C_v varies seasonally and the times of failures cannot be anticipated, a seasonally averaged value of C_v is used:

$$\overline{C}_v = \left(\frac{1}{365} \sum_{i=1}^{365} \left[\frac{\sigma i}{\mu i} \right]^2 \right)^{1/2} \tag{12}$$

where: σi = standard deviation of daily discharges for the ith day of the year,
μi = expected value of discharge on the ith day of the year, and
$(\overline{C}_v)^2$ = used as an estimate of V_e.

The variance, V_r, of the relative error during periods of reconstructed streamflow records is calculated from the correlation between records from the primary site and records from gaged sites nearby. The correlation coefficient, ρc, between the streamflows with seasonal trends removed (detrended) at the site of interest and detrended streamflows at the other sites, is a measure of the soundness of their linear relationship. The fraction of the variance of streamflow at the primary site that is explained by data from the other sites is equal to ρ_c^2. Thus, the relative-error variance of flow estimates for the primary site obtained from secondary information will be

$$V_r = (1-\rho_c^2)\ \overline{C}_v^2 \qquad (13)$$

Because errors in streamflow estimates arise from three different sources and have widely varying precision, the resultant distribution of those errors may differ significantly from a normal or log-normal distribution. This lack of normality causes difficulty in interpretation of the resulting average estimation variance. Where primary and secondary data are unavailable, the relative-error variance, V_e, may be large. This could yield correspondingly large values of V in equation (2), even if the probability that primary and secondary information are unavailable, ε_e, is quite small.

A new variable, the equivalent Gaussian spread (EGS), is introduced here to assist in interpreting the results of the analyses. If it is assumed that the errors arising from the three situations represented in equation (2) are log-normally distributed, the value of EGS is determined by the probability statement that

$$\text{Probability}\ [e^{-EGS} \leq (q_c(t)/q_T(t)) \leq e^{+EGS}] = 0.683 \qquad (14)$$

Thus, if the residuals log $q_c(t)$ - log $q_T(t)$ were normally distributed, $(EGS)^2$ would be their variance. Here EGS is reported in percent because it is defined such that nearly two-thirds of the errors in instantaneous streamflow data will be within implied EGS percent of the reported values.

Application of K-CERA in New York

Continuous-record streamflow-gaging stations that had been in operation for at least 5 years before the 1983 water year were subjected to the K-CERA analysis; results are described below.

Of the 174 stations, 169 were included in this part of the study, which entailed use of Kalman-filtering and mathematical-programing techniques to identify schedules and routing for station visits that minimize the uncertainty in the streamflow records under the five operating budgets studied. The other five stations were included in the first phase of this study, which identified the principal uses of the data and related these uses to funding sources, but were omitted from this part because either (1) the records are supplied by other agencies, (2) the stations were established for short-term use for a specific project, or (3) the stations have been in operation for too short a time to have adequate records for the Kalman-filtering process.

Missing-record probability

As described earlier, the statistical characteristics of missing stage or other correlative data for computation of streamflow records can be defined by a single term, the value of k in the truncated negative exponential probability distribution of the time until failure of the equipment. In the representation of f_T, as given in equation 3, the average time to failure is 1/k. The value of 1/k will vary from site to site, depending upon the type of equipment at the site and upon its exposure to natural elements and vandalism. The value of 1/k can also be changed by advances in the technology of data collection and recording. To estimate 1/k for New York, a 10-year period of data collection (1974-83) in which little change in technology occurred and in which stream gages were visited monthly, was selected. The percentage of the time that each individual gage could be expected to be malfunctioning during this 10-year period is included in table 3 (at end of report). The yearly mean lost record during this period was 3.4 percent.

Cross-correlation coefficient and coefficient of variation

To compute the values of V_e and V_r of the needed uncertainty functions, daily streamflow records for each of the 169 stations were retrieved for the last 30 years (1954-83) (or for the part of the 30 years for which daily streamflow values are in WATSTORE) (Hutchinson, 1975). For each stream gage that had at least 3 complete water years of data, the coefficient of variation, C_v, was computed, and all feasible methods of comparing data from other stream gages with data from each individual stream gage were explored to determine the maximum correlation coefficient, ρ_c. For the one station that had fewer than 3 water years of data, values of C_v and ρ_c were estimated.

The c_v and ρ_c values for each station and the station(s) from which the highest cross-correlation coefficient was obtained are included in table 3.

Kalman-filter definition of variance

Calculation of the variance, V_f, for each of the 169 stream gages required three steps: (1) long-term rating analysis and computation of residuals of measured discharges from the long-term rating, (2) Kalman-filter analysis of residuals with respect to time to calculate the input parameters for determing the error variance, V_f, of the streamflow, and (3) computation of the error variance, V_f, as a function of the input parameters from the Kalman-filter analysis, the discharge-measurement-error variance, V_m, and the frequency of discharge measurement.

In the New York study, definition of long-term rating functions was complicated by the fact that several streams have both a summer open-water period and a winter backwater period, which makes defining a single rating function applicable for the entire year infeasible. Of the 169 stations included for analysis in this part of the study, 103 have differing winter and summer rating functions.

For 158 stations, rating functions with either one, two, or three logarithmic straight-line segments were developed for the open-water periods. For the remaining 11 open-water periods, rating curves were plotted by hand. The general form of the rating function for each segment was:

$$LQM = B1 + B3 [\log (GHT - B2)] \qquad (15)$$

where: LQM = log value of the measured discharge,
GHT = recorded gage height corresponding to the measured discharge,
B1 = log of discharge for a flow depth of 1 ft for a given segment,
B2 = gage height of zero flow for a given segment, and
B3 = slope of the rating curve for a given segment.

The rating functions were then used to compute residuals of the discharge measurements.

Three examples of rating functions based on one, two, and three segments for a typical open-water period in New York are given below. Data from each measurement are given in table 4 (at end of report).

(1) A one-segment rating function, used at Glen Cove Creek at Glen Cove (01302500), is given by the formula

$$LQM = 0.945 + 2.792\ [\log\ (GHT - 0.82)] \quad (16)$$

where: LQM = log discharge, in ft^3/s,
GHT = gage height, in feet.

The coefficient of determination, R^2, for the model is 0.998. The residuals of the measured discharges about the open-water rating curve (measured discharge minus rated discharge) for this site are given in table 4A (p. 48).

(2) A two-segment rating function, used at Canacadea Creek near Hornell (01523500), is given by the formulas

$$LQM = 1.907 + 2.688\ [\log\ (GHT - 0.465)] \quad \text{for } GHT \leq 2.58 \quad (17)$$

$$LQM = 2.860 + 1.344\ [\log\ (GHT - 1.690)] \quad \text{for } GHT > 2.58 \quad (18)$$

The coefficient of determination, R^2, for the model is 0.999. The residuals of the measured discharges about the open-water rating curve for this site are given in table 4B (p. 50).

(3) A three-segment rating function, used at Hudson River at Fort Edward (01327750), is given by the formulas

$$LQM = 3.177 + 1.517\ [\log\ (GHT - 19.587)] \quad \text{for } GHT < 22.89 \quad (19)$$

$$LQM = 4.137 + 0.416\ [\log\ (GHT - 22.505)] \quad \text{for } GHT \geq 22.89 \text{ and } \leq 25.68 \quad (20)$$

$$LQM = 3.124 + 1.511\ [\log\ (GHT - 19.249)] \quad \text{for } GHT > 25.68 \quad (21)$$

The coefficient of determination, R^2, for the model is 0.999. The residuals of the measured discharges about the open-water rating curve for this site are given in table 4C (p. 52).

Plots of time with respect to residuals determined from the rating functions for the open-water periods were adjusted to remove trends of increasing or decreasing residual values with time that resulted from identifiable physical changes in the channel configuration. An example of a plot of residuals with respect to time in which a decreasing trend is evident is shown in figure 6A. During the existence of this gage, the gravel and cobble channel was gradually scoured. This trend was removed as follows:

$$\text{RESIDUAL} = -\ 0.00039\ [\text{DAY} + 2.88511] \qquad (22)$$

where: RESIDUAL = log difference between the measured discharge and the predicted discharge from the rating function, and
DAY = total number of days since January 1, 1960.

The adjusted plot of residuals through time now becomes the difference between the actual residuals (measured discharge minus the predicted discharge from the rating function) and the predicted residuals determined by equation 22. A plot of the adjusted residuals with time is shown in figure 6B.

Rating functions for winter were developed but not used. The functions involved application of general linear equations to solve for the dependent variable, measured discharge as a function of (a) groupings of independent variables, (b) stage, and (c) climatological data. Most gages had an insufficient number of discharge measurements, generally two per year at most. For gages having sufficient data, the analysis of the time plot of residuals yielded extremely large variances. Therefore, alternative analyses (discussed later) were used for winter periods.

The time plot of residuals is used to compute sample estimates of q (spectral density function of "white noise") and β (reciprocal of the correlation time of the Markovian process), which are two of the three terms required to compute V_f (variance of errors of flow estimates from primary recorders), by applying a best-fit autocovariance function to the time plot of residuals. (Measurement variance, V_m, the third term, is determined from an assumed constant-percentage standard error.) In this study, all open-water measurements were assumed to have a measurement error of 5 percent.

As discussed earlier, q and β can be expressed as the process variance of the shifts from the rating curve and the 1-day autocorrelation coefficient of these shifts. A summary of the autocovariance analysis, expressed in terms of process variance and 1-day autocorrelation, is given in table 5. Two examples of the fit of the covariance functions are shown in figure 7.

As mentioned above, attempts were made to compute rating functions for the winter backwater periods and to proceed with an analysis similar to that for the open-water period. This type of analysis requires more discharge data than were available from most New York stations. An unsuccessful approach used in the Massachusetts study (Gadoury and others, 1983) was to assume that the variance for the winter period, V_{f_w}, could be approximated by

$$(1 - \rho_c{}^2) C_v{}^2 \qquad (23)$$

The resultant values for V_{f_w} were once again extremely large and seemed unreasonable; therefore, variances for the winter period were not evaluated in the New York study.

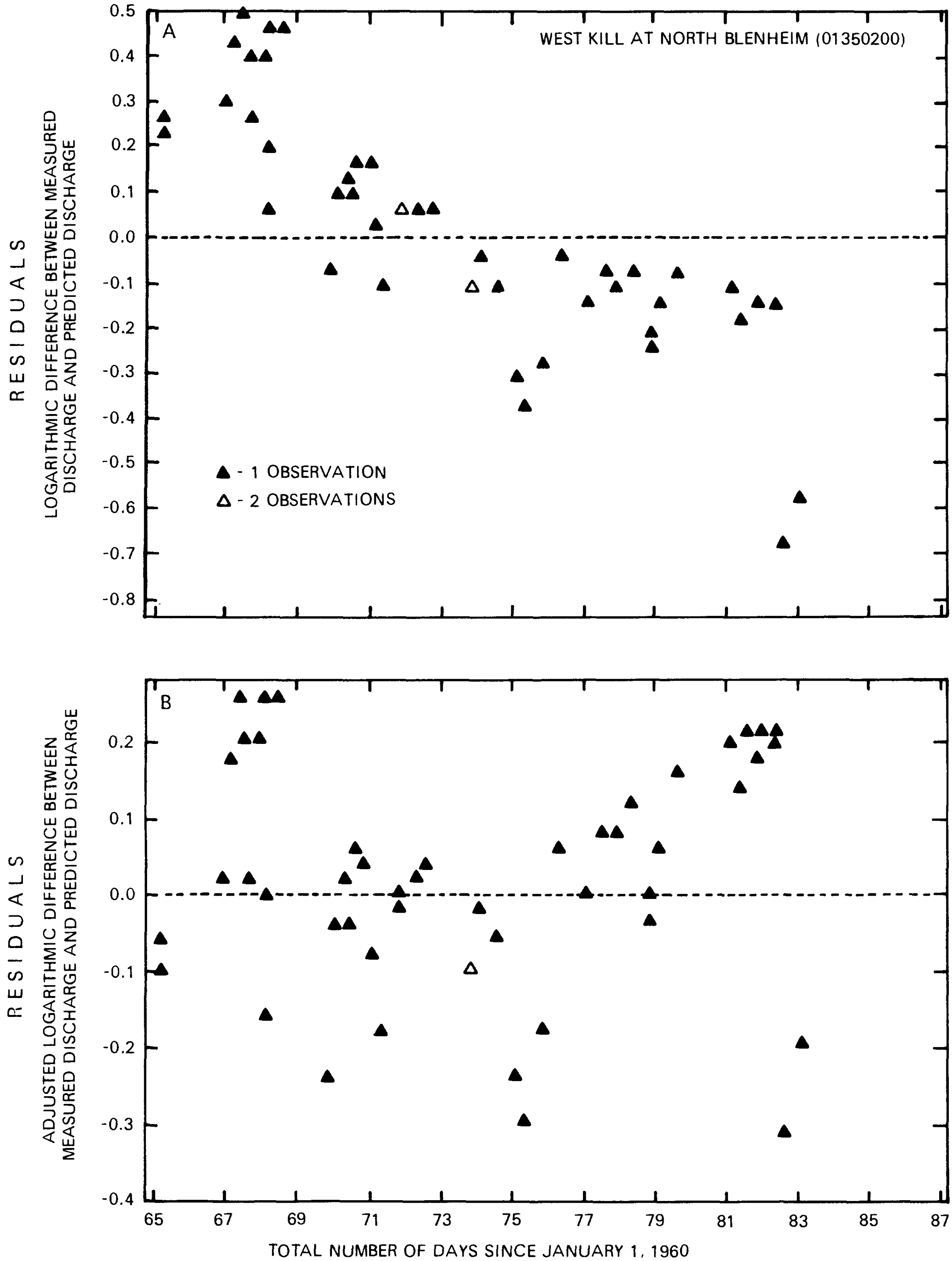


Figure 6.--Sample plot of residuals with respect to time, West Kill at North Blenheim (01350200). A. Unadjusted residual values. B. Adjusted residual values.

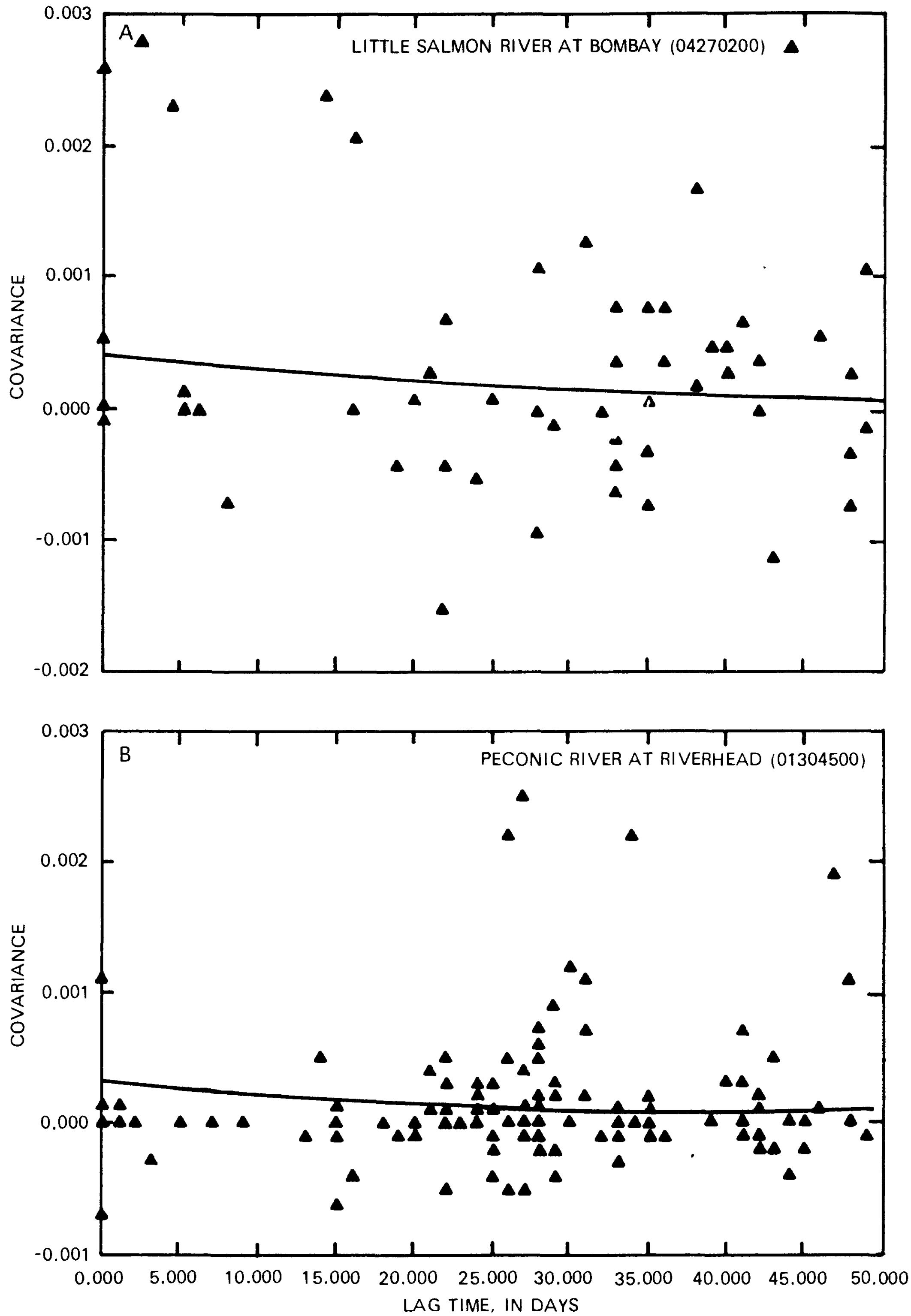
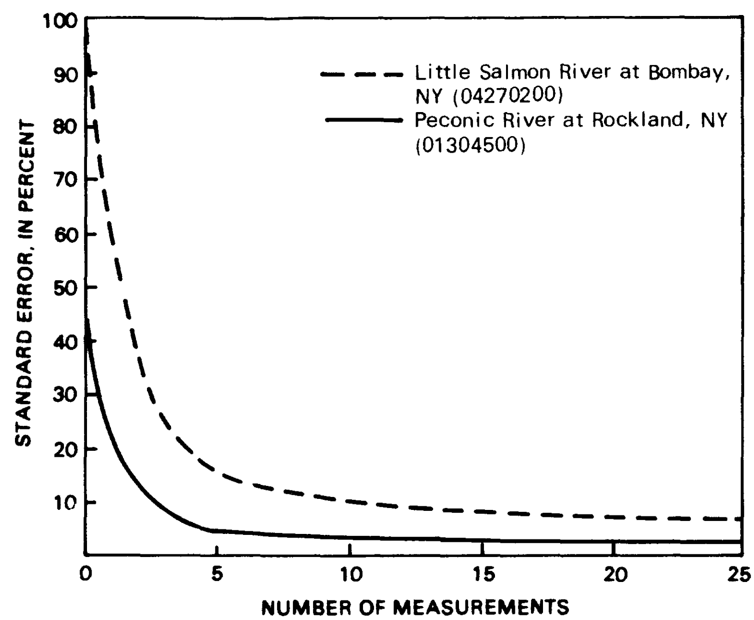


Figure 7.--Examples of autocovariance function for open-water period.
A. Little Salmon River at Bombay (04270200).
B. Peconic River at Riverhead (01304500).

The autocovariance values summarized in table 5 (p. 53), and data from the definition of missing-record probabilities in table 3 (p. 45) were used jointly to define uncertainty functions for each gaging station. The uncertainty functions give the relationship of total error variance to the number of visits and discharge measurements. The stations for which graphic fits of the autocovariance functions are shown (fig. 7) are represented in typical examples of uncertainty functions, which are plotted in figure 8 as standard error in relation to number of measurements. These functions are based on the assumption that a measurement was made during each visit to the station.

Figure 8.

Typical uncertainty function shown as a plot of standard error in relation to number of discharge measurements made.



Fixed cost, visit cost, and route cost

Fixed costs of operation were estimated for each station. Fixed costs include equipment rental, vehicle rental, batteries, miscellaneous supplies, data processing and storage, computer charges, maintenance, analysis, and supervision. Cost of analysis and supervision, especially analysis, forms a high percentage of the cost of each station and can differ widely among stations. These costs were calculated on a station-by-station basis from past records. Cost of supervision includes management and data review.

Visit cost consists of the hydrographer's pay for time actually spent servicing the equipment and making a discharge measurement. The cost varies from station to station and is a function of the difficulty and time required to make the measurement, the amount and complexity of equipment to be serviced, time spent walking from the vehicle to and from the gage structure and (or) the measuring sections, and time to complete documentation of the visit. Average visit costs in 1983 ranged from $20 to about $32.

Part of the visit cost represents the time needed to make a discharge measurement. A modification of the Traveling Hydrographer program permits a measurement-probability factor to be assigned, ranging from 0 (no measurement) to 1.0 (always measured). A factor was assigned to each station. In this study, 26 visits to a station per year was considered an appropriate maximum.

Route costs include vehicle costs associated with the number of miles driven to cover the route, the cost of the hydrographer's time in transit, and any expenses associated with the time needed to complete the trip. Route costs in 1983 ranged from $21 to visit stations near the Syosset (Long Island) office to $809 to visit stations in northern New York from the Albany office.

In the Maine study (Fontaine and others, 1984), separate summer and winter costs were developed for some stations; those costs were apportioned on the basis of the number of days in each season. This was not necessary in the New York study because the route and visit costs, which are the principal variables in the "Traveling Hydrographer" program, are similar in both seasons.

Although the variances for stations with winter periods were not evaluated, a fixed number of visits during the winter was used in the "Traveling Hydrographer" program. The number of visits was based on initial conditions used during the 1983 winter and adjusted if necessary.

A total of 286 routes to service 169 stations in New York were developed. The current allotment of stations among the Geological Survey's three New York offices (Syosset, Albany, and Ithaca) was maintained in this procedure. Many of these routes include visits to miscellaneous gages such as crest-stage gages, stage-only gages, observation wells, and sampling sites. These miscellaneous sites are referred to as "dummy stations" in the "Traveling Hydrographer" program. No statistics have been developed for these stations, but their costs are included in the route costs. The dummy stations are listed in table 6 (p. 56); the routes and stations visited on each are summarized in table 7 (p. 60).

Other routes were also tried; these entailed establishing a new field office at Springville in western New York, closing the present field office at Potsdam in northern New York, and transfering operation of 11 gages in southeastern New York from the Albany office to the Syosset office. Findings from the "Traveling Hydrographer" program based on all routes are discussed in the following section.

Results of the K-CERA Analysis

The "Traveling Hydrographer" program uses the uncertainty functions with the appropriate cost data and route definitions to compute the most cost-effective combinations of routes for operating the stream-gaging program for a given annual budget. The cost effectiveness is measured by the average standard error (uncertainty).

The "Traveling Hydrographer" program in this study was implemented after establishing a minimum number of visits to each stream gage per year. This minimum number is determined by the type of equipment used to record data. A minimum of at least four visits per year was established for all stations. This value was based on the life of the batteries used to drive recording equipment and capacity of the uptake spools on the digital recorders. At stations where the year was split into open-water and backwater periods, the actual number of visits during the 1983 water year was used for the backwater period.

Some routes also included visits for special purposes such as sampling for water-quality analyses. Some water-quality work in New York is done on routes not integrated in the stream-gaging network and, therefore, does not influence the minimum-visit requirements in this analysis. However, for those stations that require water-quality sampling, the minimum number of visits was adjusted to include the minimum of four visits (discussed above) and any additional visits required for sampling.

A maximum number of visits for each stream gage was also established. In this study, it was assumed that 26 visits would be a realistic upper limit.

For comparison purposes, the "Traveling Hydrographer" program was used to simulate the current routing for the 169-station stream-gaging program. Routes used in the 1983 water year to visit each stream gage and the 1983 annual budget ($1.068 million) were used as input for the program. The resulting average standard error per stream gage is 13.4 percent; it plotted as a point in figure 9 because only the current budget was analysed. The standard error for individual stream gages (see table 8, p. 75) ranges from 1.5 percent for Nissequogue River near Smithtown (01304000) to 79.7 percent for Croton River at New Croton Dam near Croton-on-Hudson (01375000).

Once the uncertainty for the current practice was established, test runs were made to determine the minimum uncertainty that can be obtained for a given budget while maintaining current office and field-office boundaries. The solid line in figure 9 was defined by several runs of the "Traveling Hydrographer" program with differing annual budgets. The average standard

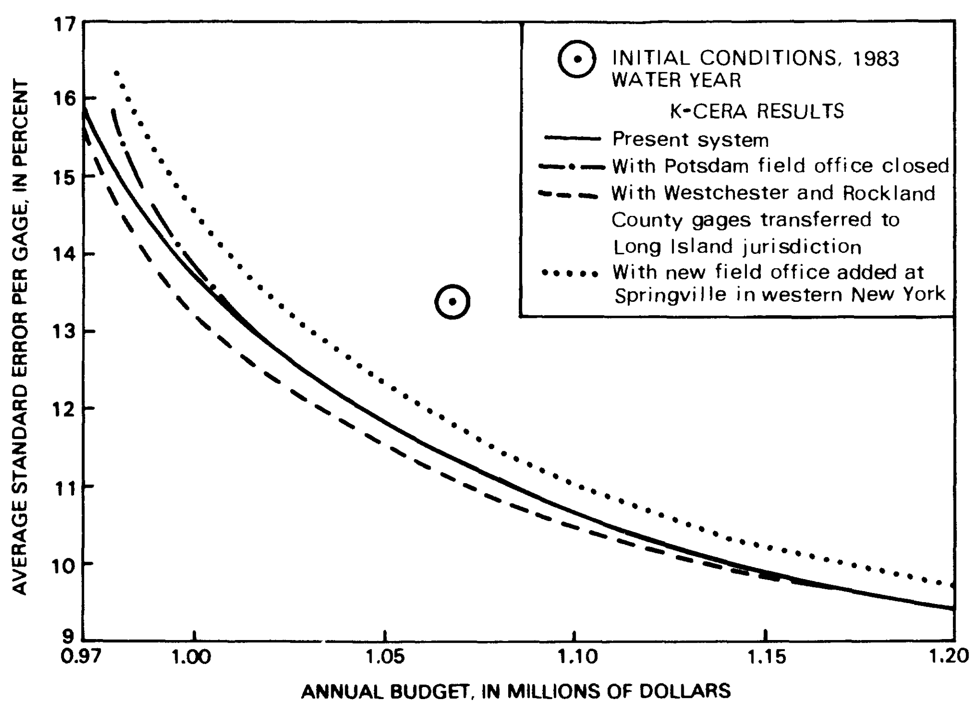


Figure 9.--Average standard error per stream gage in relation to annual budget.

error could be reduced from 13.4 to 11.4 percent by a more efficient selection of routes and visits at an annual budget of $1.068 million. Extremes for individual sites would be 1.9 percent for Oswego River at Lock 7, Oswego (04249000), and 66.4 for Croton River at New Croton Dam near Croton-on-Hudson (01375000). The same average standard error (13.4 percent) would be possible with a $1.006 million annual budget. The selection of routes and visits for this run of the "Traveling Hydrographer" program yields standard errors ranging from 2.4 percent for Nissequogue River near Smithtown (01304000) to 75.4 percent at Croton River at New Croton Dam near Croton-on-Hudson (01375000).

A minimum budget of $970,000 is required to operate the 169-station program; a budget less than this does not permit proper servicing and maintenance of the gages and recorders. Stations would have to be eliminated from the program if the budget were lowered below this minimum. At the minimum budget, the average standard error is 16.0 percent (fig. 9). The minimum standard error, again at Nissequogue River near Smitntown (01304000), would be 2.4 percent, and the maximum, again at Croton River at New Croton Dam near Croton-on-Hudson (013575000), would be 86.6 percent.

The maximum budget analyzed was $12 million, which resulted in an average standard error of 9.4 percent. The minimum standard error under this budget would be 1.6 percent for Nissequogue River near Smithtown (01304000), and the maximum would be 63.9 percent at Croton River at New Croton Dam near Croton-on-Hudson (01375000).

In addition to testing several combinations of routes within the boundaries of the present offices, the possibility of opening or closing field offices and transferring station jurisdiction among main offices was tried. If the standard error of estimate for the current practice (13.4 percent) were to be maintained and all offices remain unchanged, an annual budget of $1.006 million would be needed, which would constitute a saving of $62,000. Closing the Potsdam field office would require a slightly greater budget of $1.008 million, and, if a field office in Springville were opened, an even greater budget of $1.021 million would be needed. However, transferring the 11 stream gages in Westchester and Rockland counties from the Albany office to the Syosset office would decrease the required annual budget to about $996,000, which constitutes a saving of $10,000 from the routes studied within the current office boundaries. Results of these changes in terms of standard error are plotted in figure 9. The 11 gages in Westchester and Rockland counties considered for transfer to the Syosset (Long Island) office are listed below. (Locations are shown in fig. 2.)

01300000	Blind Brook at Rye
01300500	Beaver Swamp Brook at Mamaroneck
01301000	Mamaroneck River at Mamaroneck
01301500	Hutchinson River at Pelham
01302000	Bronx River at Bronxville
01375000	Croton River at New Croton Dam near Croton-on-Hudson
01376500	Saw Mill River at Yonkers
01376800	Hackensack River at West Nyack
01387400	Ramapo River at Ramapo
01387420	Ramapo River at Suffern
01387450	Mahwah River near Suffern

Any decision to change markedly the number of visits or the routing to a station should take into consideration the changes that may occur in both standard error and Equivalent Gaussian Spread (EGS). EGS is strongly influenced by the stability of the stage-discharge relationship; the lower the EGS percentage, the better and more stable the relationship. For example, the Hudson River gage at Hadley (01318500) has had basically the same rating since 1961; only two or three measurements are necessary each year to confirm the rating. The site has two independent recorders, the lost record is slight, and effect of ice is minimal. Under current procedures, this station has a standard error of 2.0 percent and an EGS of 1.4 percent for nine visits per year. The "Traveling Hydrographer" program shows that with 16 visits per year, the standard error could be reduced to 1.6 percent and the EGS to 1.2 percent. By contrast, Otsquago Creek at Fort Plain (01349000), with seven visits per open-water period, has a standard error of 24.7 percent and an EGS of 9.8 percent. The rating shifts constantly, and comparisons with other stations are poor. Here the "Traveling Hydrographer" program shows that if the number of visits were increased to 20, the standard error and EGS would be reduced to 14.5 percent and 5.7 percent, respectively. Thus, Otsquago Creek at Fort Plain should be given a higher priority than Hudson River at Hadley for increased station visits.

Conclusions from the K-CERA Analysis

Results of the K-CERA analysis give the following conclusions:

1. The routing and frequency of visits per station in the stream-gaging program could be altered to maintain the average standard error of estimate of 13.4 percent for the current practice with a budget of approximately $1.006 million. This would increase the accuracy of records at some sites and decrease it at others but would decrease the cost of the stream gaging program by $62,000.

2. If responsibility for the 11 gages in Westchester and Rockland Counties were transferred from the Albany office to the Syosset office, an additional $10,000 could be saved.

3. The amount of funding for individual stations with statisical accuracies that are not acceptable for the data uses could be renegotiated with the data users.

4. Relocation of field offices would not improve cost effectiveness of the stream-gaging program.

SUMMARY

During the 1983 water year, the 174 continuous-record stream gages and 189 crest stage, stage-only, and ground-water gages were operated in New York at an annual cost of $1.068 million. This program was funded from 19 separate sources, and the data from a single gage may be used for as many as five separate uses.

In an analysis of the uses that are made of the data, two stations were identified as having uses specific only to short-term studies; these stations probably will be deactivated at the end of the data-collection phase of the studies. The remaining 172 stations will be retained in the program for the foreseeable future.

Regression analyses indicate that discharge estimates derived through statistical methods are not accurate enough to be rated even as "fair to poor" by U.S. Geological Survey accuracy standards. Therefore, no benefit would result from discontinuing any of the 15 stations used in the regression analyses.

The current routing and visiting schedule for the 169 stations that were analyzed in this study requires a budget of $1.068 million per year. The current level of accuracy of the records (standard error of 13.4 percent) at these sites could be maintained with a $996,000 budget if the responsibility for 11 gages in Westchester and Rockland Counties were transferred from the Albany office to the Syosset office.

Studies similar to this one will be required in the future because the demands for streamflow information change with time, and gages are added and deleted.

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TABLES

Table 1.--Drainage area, period of record, and mean annual flow at gaging stations in New York.

[Mean annual flow based on period of record through 1981. Locations are shown in fig. 2.]

No. on map	Station no.	Station name	Drainage area (mi^2)	Period of record (water year)	Mean annual flow (ft^3/s)
100	01300000	Blind Brook at Rye	9.20	1944-	15.5
101	01300500	Beaver Swamp Brook at Mamaroneck	4.71	1944-	6.44
102	01301000	Mamaroneck River at Mamaroneck	23.4	1944-52, 1955-	34.6
103	01301500	Hutchinson River at Pelham	5.76	1944-	6.99
104	01302000	Bronx River at Bronxville	26.5	1944-	41.3
105	01302500	Glen Cove Creek at Glen Cove	11	1939-	7.18
106	01303000	Mill Neck Creek at Mill Neck	11.5	1937-	9.17
107	01303500	Cold Spring Brook at Cold Spring Harbor	7.3	1951-78, 1980-	2.61
108	01304000	Nissequogue River near Smithtown	27	1944-	41.6
109	01304500	Peconic River at Riverhead	75	1943-	36.6
110	01305000	Carmans River at Yaphank	71	1943-	23.9
111	01305500	Swan River at East Patchogue	8.8	1947-	12.6
112	01306440	Connetquot Brook at Central Islip	12	1980-	[1]--
113	01306460	Connetquot Brook near Central Islip	18	1978-	[1]--
114	01306500	Connetquot River near Oakdale	24	[2]1944-	38.6
115	01308000	Sampawams Creek at Babylon	23	[3]1945-	9.63
116	01308500	Carlls River at Babylon	35	1945-	26.6
117	01309500	Massapequa Creek at Massapequa	38	[4]1938-	11.4
118	01310000	Bellmore Creek at Bellmore	17	1938-	10.5
119	01310500	East Meadow Brook at Freeport	31	[5]1938-	14.8
120	01311000	Pines Brook at Malverne	10	[6]1938-	3.86
121	01311500	Valley Stream at Valley Stream	4.5	1955-	2.49
122	01312000	Hudson River near Newcomb	192	1926-	396
123	01315000	Indian River near Indian Lake	132	1913, [7]1916-	295
124	01315500	Hudson River at North Creek	792	1908-	1,556
125	01318500	Hudson River at Hadley	1 664	1922-	2,900
126	01321000	Sacandaga River near Hope	491	1912-	1,099
127	01325000	Sacandaga River at Stewarts Bridge near Hadley	1,055	1908-	2 138
128	01327750	Hudson River at Fort Edward	2.817	1977-	[1]--
129	01330500	Kayaderosseras Creek near West Milton	90.1	1928-	136
130	01333500	Little Hoosic River at Petersburg	56.1	1952-	93.8
131	01334500	Hoosic River near Eagle Bridge	510	1910-21 1923-	942
132	01335754	Hudson River near Waterford	4,620	1975-	[1]--
133	01336000	Mohawk River below Delta Dam near Rome	150	[7]1922-	377
134	01346000	West Canada Creek at Kast Bridge	556	1921-	1,316
135	01347000	Mohawk River near Little Falls	1,348	1928-	2,792
136	01348000	East Canada Creek at East Creek	291	1947-	680
137	01349000	Otsquago Creek at Fort Plain	59.2	1950-	85.1
138	01350000	Schoharie Creek at Prattsville	236	1904-	462
139	01350101	Schoharie Creek at Gilboa	314	1976-	[8]--
140	01350120	Platter Kill at Gilboa	11.1	1976-	17.1
141	01350140	Mine Kill near North Blenheim	16.3	1976-	27.1
142	01350180	Schoharie Creek at North Blenheim	359	1971-	512
143	01350200	West Kill at North Blenheim	44.6	1976-	91.1
144	01350355	Schoharie Creek at Breakabeen	443	1976-	648
145	01351500	Schoharie Creek at Burtonsville	883	1940-	1,004
146	01357500	Mohawk River at Cohoes	3.456	[7]1918-	[9]5,701

[1] Mean annual flow not published because of insufficient years of record.
[2] Monthly means estimated October 1974 to September 1975.
[3] Monthly means estimated December 1966 to November 1967.
[4] Monthly means estimated December 1959 to February 1961.
[5] Monthly means estimated November 1962 to December 1963.
[6] Monthly means estimated March to September 1970.
[7] Monthly mean discharges only for some periods.
[8] Mean annual flow not published because entire flow except leakage and spill diverted from basin.
[9] Mean annual based on the period 1926-81.

Table 1.--Drainage area, period of record, and mean annual flow at gaging stations in New York (continued).

[Mean annual flow based on period of record through 1981. Locations are shown in fig. 2.]

No. on map	Station no.	Station name	Drainage area (mi^2)	Period of record (water year)	Mean annual flow (ft^3/s)
147	01358000	Hudson River at Green Island	8,090	1947-	13,710
148	01359750	Moordener Kill at Castleton-on-Hudson	32.6	1958-	37.6
149	01362198	Esopus Creek at Shandaken	59.5	1964-	140
150	01362500	Esopus Creek at Coldbrook	192	[7]1915-	[10]--
151	01364500	Esopus Creek at Mount Marion	419	1971-	555
152	01365000	Rondout Creek near Lowes Corners	38.5	1938-	98.0
153	01365500	Chestnut Creek at Grahamsville	20.9	1939-	39.1
154	01367500	Rondout Creek at Rosendale	386	1927-	[11]--
155	01371500	Wallkill River at Gardiner	711	1925-	1,051
156	01372500	Wappinger Creek near Wappinger Falls	181	1929-	252
157	01375000	Croton R at New Croton Dam near Croton-on-Hudson	378	1934-	[12]--
158	01376500	Saw Mill River at Yonkers	25.6	1945-73, 1975-	32.4
159	01376800	Hackensack River at West Nyack	29.4	1960-	[13]--
160	01387400	Ramapo River at Ramapo	86.7	1980-	[1]--
161	01387420	Ramapo River at Suffern	93.0	1980-	[1]--
162	01387450	Mahwah River near Suffern	12.3	1959-	24.6
163	01413500	East Branch Delaware River at Margaretville	163	1938-	307
164	01414500	Mill Brook near Dunraven	25.2	1938-	56.1
165	01415000	Tremper Kill near Andes	33.0	1938-	59.8
166	01417000	East Branch Delaware River at Downsville	371	1942-	[14]--
167	01417500	East Branch Delaware River at Harvard	458	1935-67, 1978-	[14]--
168	01420500	Beaver Kill at Cooks Falls	241	1914-	559
169	01421000	East Branch Delaware River at Fishs Eddy	784	1913-	[14]--
170	01423000	West Branch Delaware River at Walton	332	1951-	588
171	01425000	West Branch Delaware River at Stilesville	456	1953-	[14]--
172	01426500	West Branch Delaware River at Hale Eddy	595	1913-	[14]--
173	01427510	Delaware River at Callicoon	1,820	1976-	[14]--
174	01428500	Delaware R above Lackawaxen R near Barryville	2 020	1941-	[14]--
175	01433500	Mongaup River near Mongaup	200	1940-	340
176	01434000	Delaware River at Port Jervis	3,070	1905-	[14]--
177	01435000	Neversink River near Claryville	66.6	1952-	190
178	01436000	Neversink River at Neversink	92.6	1942-	[14]--
179	01436500	Neversink River at Woodbourne	113	1938-72, 1978-	[14]--
180	01437500	Neversink River at Godeffroy	307	1910-13, 1938-	[14]--
181	01496500	Oaks Creek at Index	102	1931-32, 1938-	171
182	01500000	Ouleout Creek at East Sidney	103	1941-	173
183	01500500	Susquehanna River at Unadilla	982	1939-	1,579
184	01502000	Butternut Creek at Morris	59.7	1939-	100
185	01502500	Unadilla River at Rockdale	520	1931-33 1938-	842
186	01503000	Susquehanna River at Conklin	2,232	1914-	3,609
187	01505000	Chenango River at Sherburne	263	1939-	406
188	01508803	West Branch Tioughnioga River at Homer	71.5	1968 1973-	132

[1] Mean annual flow not published because of insufficient years of record.
[7] Monthly mean discharges for only some months.
[10] Mean annual flow not published because of large diversions from Schoharie Creek basin into Creek above station.
[11] Mean annual flow not published because of large diversion from Rondout Reservoir.
[12] Mean annual flow not published because of large diversion from New Croton Reservoir.
[13] Mean annual flow not published because of large diversion from gage pool.
[14] Mean annual flow not published because of diversions and changes in storage in upstream reservoirs.

Table 1.--Drainage area, period of record, and mean annual flow at gaging stations in New York (continued).

[Mean annual flow based on period of record through 1981. Locations are shown in fig. 2.]

No. on map	Station no.	Station name	Drainage area (mi²)	Period of record (water year)	Mean annual flow (ft³/s)
189	01509000	Tioughnioga River at Cortland	292	1939-	497
190	01510000	Otselic River at Cincinnatus	147	1939-64 1970-	271
191	01512500	Chenango River near Chenango Forks	1,483	1914-	2,421
192	01515000	Susquehanna River near Waverly	4,773	1938-	7,586
193	01520500	Tioga River at Lindley	771	1931-	801
194	01521500	Canisteo River at Arkport	30.6	1938-	35.3
195	01523500	Canacadea Creek near Hornell	57.9	1941-42, 1945-	64.2
196	01524500	Canisteo River below Canacadea Creek at Hornell	158	1943-	157
197	01526500	Tioga River near Erwins	1,377	1919-	1,373
198	01528000	Fivemile Creek near Kanona	66.8	1938-	75.8
199	01529500	Cohocton River near Campbell	470	1919-	448
200	01529950	Chemung River at Corning	2,006	1975-	2,241
201	01530500	Newtown Creek at Elmira	77.5	1939-	87.3
202	01531000	Chemung River at Chemung	2,506	1904-	[15]2,533
203	03011020	Allegheny River at Salamanca	1,608	1904-	2,784
204	03013000	Conewango Creek at Waterboro	290	1939-	528
205	03014500	Chadakoin River at Falconer	194	1935-	349
206	04213500	Cattaraugus Creek at Gowanda	436	1940-	737
207	04214500	Buffalo Creek at Gardenville	142	1939-	198
208	04215000	Cayuga Creek near Lancaster	96.4	1939-68, [16]1972-74, 1975-	129
209	04215500	Cazenovia Creek at Ebenezer	135	1941-	229
210	04216000	Niagara River at Buffalo	263 700	[17]1861-	204,000
211	04216200	Scajaquada Creek at Buffalo	15.4	1958-	35.5
212	04216418	Tonawanda Creek at Attica	76.9	1978-	[1]--
213	04216500	Little Tonawanda Creek at Linden	22.1	1913-68, 1978-	27.1
214	04217000	Tonawanda Creek at Batavia	171	1945-	209
215	04217500	Tonawanda Creek near Alabama	231	1956-	281
216	04218000	Tonawanda Creek at Rapids	349	1956-65, 1980-	359
217	04218518	Ellicott Creek below Williamsville	81.6	1973-	134
218	04219000	Erie (Barge) Canal at Lock 30, Macedon	--	1951-77, [18]1978-	[19]200
219	04221000	Genesee River at Wellsville	288	1956-58, 1973-	411
220	04223000	Genesee River at Portageville	984	1909-	1,251
221	04224775	Canaseraga Creek above Dansville	88.9	1975-	105
222	04227000	Canaseraga Creek at Shakers Crossing	335	1960-70, 1975-	289
223	04227500	Genesee River near Mount Morris	1,424	1909-13, 1916-	1,658
224	04228500	Genesee River at Avon	1,673	1956-	1,928
225	04229500	Honeoye Creek at Honeoye Falls	196	1946-70, 1973-	121
226	04230380	Oatka Creek at Warsaw	39.1	1965-	53.9
227	04230500	Oatka Creek at Garbutt	200	1946-	212
228	04231000	Black Creek at Churchville	130	1946-	114
229	04232000	Genesee River at Rochester	2 467	1905-18, 1921-	2,782

[1] Mean annual flow not published because of insufficient years of record.
[15] Mean annual flow based on the period 1905-13, 1914-81.
[16] Operated as a crest-stage gage.
[17] Monthly mean discharges only during the period 1861-1960.
[18] Daily discharges for navigation season only.
[19] Mean annual flow for the period 1951-77.

Table 1.--Drainage area, period of record, and mean annual flow at gaging stations in New York (continued).

[Mean annual flow based on period of record through 1981. Locations are shown in fig 2.]

No. on map	Station no.	Station name	Drainage area (mi^2)	Period of record (water year)	Mean annual flow (ft^3/s)
230	04232040	Irondequoit Creek near Pittsford	44.4	[16]1962-72 1980-	[1]--
231	04232046	Thomas Creek at Fairport	[20]28.5	1981-	[1]--
232	04232047	Irondequoit Creek at Linden Ave, East Rochester	[21]101	1974-	99.4
233	04232050	Allen Creek near Rochester	[22]30.1	1961-	33.4
234	04232100	Sterling Creek at Sterling	44.4	1958-	66.9
235	04232482	Keuka Lake Outlet at Dresden	207	1966-	204
236	04233000	Cayuga Inlet near Ithaca	35.2	1938-	38.5
237	04234000	Fall Creek near Ithaca	126	1926-	185
238	04235000	Canandaigua Outlet at Chapin	195	1941-	154
239	04235250	Flint Creek at Phelps	102	1960-	90.7
240	04235500	Owasco Outlet near Auburn	206	1914-	289
241	04237500	Seneca River at Baldwinsville	3,138	1951-	3,459
242	04239000	Onondaga Creek at Dorwin Avenue Syracuse	88 5	1952-	125
243	04240010	Onondaga Creek at Spencer Street, Syracuse	110	1971-	205
244	04240100	Harbor Brook at Syracuse	10.0	1960-	9.08
245	04240105	Harbor Brook at Hiawatha Boulevard, Syracuse	11.3	1971-	15.9
246	04240120	Ley Creek at Park Street, Syracuse	29.9	1974-	46.1
247	04240180	Ninemile Creek near Marietta	45.1	1965-	40.6
248	04240300	Ninemile Creek at Lakeland	115	1972-73, 1976-	238
249	04242500	East Branch Fish Creek at Taberg	188	1924-	543
250	04243500	Oneida Creek at Oneida	113	1950-	165
251	04245000	Limestone Creek at Fayetteville	85.5	1941-	142
252	04245200	Butternut Creek near Jamesville	32.2	1959-	50.1
253	04245236	Meadow Brook at Hurlburt Road, Syracuse	2.90	[16]1971-78, 1979-	[1]--
254	04246500	Oneida River at Caughdenoy	1,382	1903-12, 1948-	2,559
255	04249000	Oswego River at Lock 7, Oswego	5,100	1901-06, 1934-	[23]6 696
256	04250750	Sandy Creek near Adams	128	1958-	272
257	04252500	Black River near Boonville	304	1912-	699
258	04256000	Independence River at Donnattsburg	88.7	1943-	192
259	04257000	Beaver R below Stillwater Dam nr Beaver River	171	1909-	379
260	04258000	Beaver River at Croghan	291	1931-	594
261	04260500	Black River at Watertown	1,874	1921-	4,010
262	04262500	West Branch Oswegatchie River near Harrisville	244	1917-	513
263	04263000	Oswegatchie River near Heuvelton	965	1917-	1,720
264	04264331	St. Lawrence R at Cornwall, Ontario nr Massena	298,800	1861-	242 800
265	04266500	Raquette River at Piercefield	721	1909-	1,293
266	04267500	Raquette River at South Colton	937	1954-	1,755
267	04268000	Raquette River at Raymondville	1,125	1945-	2,043
268	04269000	St. Regis River at Brasher Center	612	1911-	1,044
269	04270200	Little Salmon River at Bombay	92.2	1959-	118
270	04270510	Chateaugay River below Chateaugay	151	1967-	249
271	04273500	Saranac River at Plattsburgh	608	1903-30, 1944-	833
272	04275000	East Branch Ausable River at Au Sable Forks	198	1925-	310
273	04278300	Northwest Bay Brook near Bolton Landing	23.4	1966-68, 1972-	37.0

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[1] Mean annual flow not published because of insufficient years of record.
[16] Operated as a crest-stage gage.
[20] Channel and drainage area have been altered by Barge Canal, 0.86 mi^2 is noncontributing.
[21] Natural drainage area affected by Barge Canal, 4.95 mi^2 is noncontributing.
[22] Stream crosses Barge Canal, 3.55 mi^2 is noncontributing.
[23] Mean annual flow based on 1934-81.

Table 2.--Gaging stations and their data use, source of funding, and data availability.

[Explanation of numbers is on p. 41. Locations are shown in fig. 2.]

No. on map	USGS station no.	Data use[1] a	b	c	d	e	f	d	h	i	Sources of funding[2] a	b	c	d	Data availability[3]
100	01300000	1	2	--	--	2	2	--	--	--	--	--	3	--	A
101	01300500	4	5	--	--	--	5	--	--	--	--	--	3	--	A
102	01301000	4	5	--	--	--	5	--	--	--	--	--	3	--	A
103	01301500	--	5	--	--	--	5	--	--	--	--	--	3	--	A
104	01302000	4	5	--	--	--	5	--	--	--	--	--	3	--	A
105	01302500	4	6	--	--	--	--	6	--	--	--	--	7	--	A
106	01303000	4	6	--	--	--	--	6	--	--	--	--	7	--	A
107	01303500	--	6	--	--	--	--	--	--	--	--	--	7	--	A
108	01304000	4	8	--	--	--	--	9	--	--	--	--	10	--	A
109	01304500	4	8	--	--	--	--	8	--	--	--	--	10	--	A
110	01305000	4	8	--	--	--	--	9	--	--	--	--	10	--	A
111	01305500	--	8	--	--	--	--	8	--	--	--	--	10	--	A
112	01306440	--	8	--	--	--	--	--	11	--	--	--	10	--	A
113	01306460	--	8	--	--	--	--	--	11	--	--	--	10	--	A
114	01306500	4	8	--	--	--	--	8	11	--	--	--	10	--	A
115	01308000	--	8	--	--	--	--	8	--	--	--	--	10	--	A
116	01308500	4	8	--	--	--	--	8	--	--	--	--	10	--	A
117	01309500	4	6	--	--	--	--	6	--	--	--	--	7	--	A
118	01310000	--	6	--	--	--	--	6	--	--	--	--	7	--	A
119	01310500	4	6	--	--	--	--	6	--	--	--	--	7	--	A
120	01311000	4	6	--	--	--	--	6	--	--	--	--	7	--	A
121	01311500	4	6	--	--	--	--	--	--	--	--	--	7	--	A
122	01312000	--	12	--	--	--	13	--	--	--	*	--	--	--	A
123	01315000	--	14	--	--	15	16	--	--	--	--	--	17	--	A
124	01315500	--	18	--	--	18	18	--	--	--	--	--	17	--	AT
125	01318500	--	19	--	--	19	19	19	--	--	--	--	17,20	--	ATP
126	01321000	--	21	--	--	21	--	--	22	--	--	--	17	--	AT
127	01325000	--	23	--	--	24	16	25	--	--	--	--	--	26	A
128	01327750	--	27	--	28	27	--	27	--	--	--	--	20	--	AT
129	01330500	4	29	--	--	--	16	--	--	--	--	--	20	--	A
130	01333500	4	--	--	--	--	--	--	--	--	*	--	20	--	A
131	01334500	30	31	--	28	32	31	--	--	--	--	--	20	--	ATP
132	01335770	--	--	--	--	--	--	33	33	--	--	--	20	--	A
133	01336000	--	29	--	28	34	35	--	--	--	--	--	20	--	A
134	01346000	--	29	--	28	32	35	--	--	--	--	--	20	--	A
135	01347000	--	29	--	--	32	13	36	37	--	--	38	--	--	ATP
136	01348000	--	29	--	28	32	16	--	37	--	--	--	20	--	A
137	01349000	30	29	--	--	--	16	--	--	--	--	--	20	--	AT
138	01350000	30	39	--	--	40	13	--	--	--	--	--	20,41	--	ATP
139	01350101	--	42	--	--	43	13	--	--	--	--	--	--	44	AT
140	01350120	4	42	--	--	43	--	--	--	--	--	--	--	44	AT
141	01350140	4	42	--	--	43	--	--	--	--	--	--	--	44	AT
142	01350180	--	42	--	--	43	--	--	--	--	--	--	--	44	AT
143	01350200	4	--	--	45	--	--	--	--	--	--	--	44	--	A
144	01350355	--	--	--	45	--	--	--	--	--	--	--	44	--	A
145	01351500	--	--	--	--	--	46	--	--	--	--	--	20	--	AT
146	01357500	--	47	--	--	48	49	--	--	--	--	--	20	26	AP
147	01358000	--	50	--	--	48	13	51	--	--	--	--	20	26	AT
148	01359750	4	12	--	--	--	--	--	--	--	--	--	20	--	A
149	01362198	52	53	--	--	40	--	54	--	--	*	--	20	--	AT
150	01362500	--	55	--	--	56	16	57	--	--	--	--	41	--	AT
151	01364500	--	58	--	--	--	--	--	--	--	--	--	59	--	A
152	01365000	4	60	--	--	--	--	--	--	--	--	--	--	41	A
153	01365500	4	60	--	--	--	--	--	--	--	--	--	--	41	A
154	01367500	--	61	--	63	63	46	--	--	--	--	38	20	--	AT
155	01371500	30	62	--	63	63	46	--	--	--	--	38	--	--	ATP
156	01372500	30	64	--	--	--	46	--	--	--	--	--	20	--	ATP
157	01375000	--	--	--	--	65	16	--	--	--	--	--	41	--	A

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Table 2.--Gaging stations and their data use, source of funding, and data availability (continued).

[Explanation of numbers is on p. 41. Locations are shown in fig. 2.]

No. on map	USGS station no.	Data use[1]									Sources of funding[2]				Data availability[3]
		a	b	c	d	e	f	d	h	i	a	b	c	d	
158	01376500	--	5	--	--	--	5	--	--	--	--	--	3	--	A
159	01376800	--	58	--	--	66	--	--	--	--	--	--	67	--	A
160	01387400	4	29	--	--	68	--	--	--	--	--	--	--	20	A
161	01387420	--	--	--	--	69	--	--	--	--	--	--	--	20	A
162	01387450	4	58	--	--	--	--	--	--	--	--	--	20	--	A
163	01413500	70	71	--	--	72	73	--	--	--	--	--	41	--	AT
164	01414500	70	71	--	--	72	73	--	--	--	--	--	--	41	A
165	01415000	70	71	--	--	72	73	--	--	--	--	--	--	41	A
166	01417000	--	71	--	--	74	75	--	--	--	--	--	41	--	AT
167	01417500	--	76	--	--	77	78	36	--	--	--	--	20	--	AT
168	01420500	70	80	--	--	72	75	--	--	--	--	--	41	--	ATP
169	01421000	--	79	--	--	81	75	82	--	--	--	--	41	--	AT
170	01423000	70	83	--	--	72	73	--	22	--	--	--	41	--	A
171	01425000	--	83	--	--	84	75	57	--	--	--	--	41	--	A
172	01426500	--	85	--	--	85	78	57	--	--	--	--	20,41	--	AT
173	01427510	--	79	--	--	77	75	57	--	--	--	--	20,41	--	AT
174	01428500	--	71	--	--	77	75	57	--	--	--	--	41	--	AT
175	01433500	--	--	--	--	77	--	--	--	--	--	--	20	--	A
176	01434000	--	76	--	--	77	75	36	--	--	*	--	20	--	AT
177	01435000	70	71	--	--	72	--	--	--	--	--	--	41	--	A
178	01436000	--	71	--	--	81	75	--	--	--	--	--	41	--	A
179	01436500	--	76	--	--	77	75	36	--	--	--	--	20	--	AT
180	01437500	--	71	--	--	77	75	--	--	--	--	--	41	--	A
181	01496500	--	86	--	--	87	--	--	--	--	--	--	20	--	A
182	01500000	--	88	--	--	89,90	13	--	--	--	--	91	20	--	AT
183	01500500	92	93	--	--	90	94	--	--	--	--	91	20	--	AT
184	01502000	4	95	--	--	90	--	--	--	--	--	91	20	--	A
185	01502500	4	93	--	--	90	94	--	--	--	--	91	20	--	AT
186	01503000	30	93	--	--	90	94	--	--	--	*	91	20	--	ATP
187	01505000	--	96	--	--	90	94	--	--	--	--	91	20	--	AT
188	01508803	4	88	--	--	--	97	--	--	--	--	--	98	--	AT
189	01509000	4	96	--	--	90	99	--	--	--	--	91	20	--	AT
190	01510000	4	93	--	--	--	100	--	--	--	--	91	20	--	AT
191	01512500	--	96	--	--	90	94	--	--	--	--	91	20	--	AT
192	01515000	30	96	--	--	90	101	--	--	--	--	91	20	--	AT
193	01520500	102	96	--	--	90	103	--	--	--	--	91	20	--	AT
194	01521500	104	88	--	--	89	16	--	--	--	--	91	--	--	AT
195	01523500	105	88	--	--	89	--	--	--	--	--	91	--	--	A
196	01524500	--	96	--	--	--	106	--	--	--	--	91	20	--	AT
197	01526500	30	96	--	--	90	100	--	--	--	--	91	20	--	AT
198	01528000	30	86	--	--	107	--	--	--	--	--	--	20	--	A
199	01529500	--	96	--	--	90	103	--	--	--	--	91	20	--	AT
200	01529950	--	108	--	--	90	109	--	--	--	--	91	--	--	AT
201	01530500	4	96	--	--	90	110	--	--	--	--	91	20	--	AT
202	01531000	30	93	--	--	90	94	--	--	--	--	91	20	--	ATP
203	03011020	4	29	--	--	--	101	--	--	--	--	111	--	--	ATP
204	03013000	4	112	--	--	--	13	--	--	--	--	111	--	--	AP
205	03014500	--	113	--	--	114	115	116	--	--	--	--	20,117	--	ATP
206	04213500	118	29	--	--	--	13	9	--	--	--	119	20	--	AT
207	04214500	120	29	--	--	--	13	--	--	--	--	119	20	--	ATP
208	04215000	118	29	--	--	--	13	--	--	--	--	119	20	--	ATP
209	04215500	118	29	--	--	--	46	--	--	--	--	119	20	--	ATP
210	04216000	--	121	--	--	--	--	--	--	--	--	--	20	--	A
211	04216200	--	122	--	--	--	--	--	--	--	--	119	--	--	AP
212	04216418	123	58	--	--	--	--	--	--	--	--	119	--	--	A
213	04216500	123	58	--	--	--	--	--	--	--	--	119	--	--	A
214	04217000	123	29	--	--	--	--	9	--	--	--	119	--	--	ATP
215	04217500	120	122	--	--	--	13	--	--	--	--	119	20	--	A
216	04218000	118	124	--	--	--	13	--	--	--	--	119	--	--	A

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Table 2.--Gaging stations and their data use, source of funding, and data availability (continued).

[Explanation of numbers is on p. 41. Locations are shown in fig. 2.]

No. on map	USGS station no.	Data use[1] a	b	c	d	e	f	d	h	i	Sources of funding[2] a	b	c	d	Data availability[3]
217	04218518	123	58	--	--	--	16	--	--	--	--	119	--	--	AT
218	04219000	--	125	--	--	--	--	--	--	--	--	--	20	--	A
219	04221000	30	12	--	--	--	46	--	--	--	--	--	20	--	ATP
220	04223000	--	29	--	--	126	101	--	--	--	--	119	20	--	ATP
221	04224775	4	58	--	--	127	128	--	--	--	--	119	--	--	ATP
222	04227000	4	29	--	--	127	101	--	--	--	--	119	20	--	ATP
223	04227500	--	29	--	--	127	129	--	--	--	--	119	20	--	ATP
224	04228500	--	58	--	--	127	129	--	--	--	--	119	--	--	ATP
225	04229500	--	58	--	--	127	101	--	--	--	--	119	--	--	ATP
226	04230380	4	124	--	--	127	101	--	--	--	--	119	--	--	ATP
227	04230500	4	58	--	--	127	101	--	--	--	--	119	--	--	ATP
228	04231000	30	29	--	--	127	101	--	--	--	--	119	--	--	ATP
229	04232000	--	12	--	--	--	13	36	--	--	--	--	20	--	ATP
230	04232040	--	--	--	--	--	--	--	130	--	--	--	131	--	A
231	04232046	--	--	--	--	--	--	--	130	--	--	--	131	--	A
232	04232047	--	132	--	--	--	--	--	130	--	--	--	131	--	AP
233	04232050	--	132	--	--	--	--	--	130	--	--	--	131	--	AP
234	04232100	4	12	--	--	--	--	--	--	--	--	--	20	--	A
235	04232482	--	133	--	--	134	46	36	--	--	--	--	20	--	AT
236	04233000	30	135	--	--	--	136	--	--	--	--	--	20	--	A
237	04234000	--	138	--	--	137	16	--	--	--	--	--	--	139	ATP
238	04235000	--	140	--	--	34	16	36	--	--	--	--	20	--	AT
239	04235250	4	141	--	--	--	--	--	--	--	--	--	20	--	A
240	04235500	--	133	--	--	142	--	36	--	--	--	--	143	--	AP
241	04237500	--	144	--	--	145	--	--	--	--	--	--	20	--	AT
242	04239000	--	146	--	--	--	--	147	--	--	--	--	148	--	A
243	04240010	--	146	--	--	--	--	147	--	--	--	--	148	--	A
244	04240100	--	146	--	--	149	150	147	--	--	--	--	148	--	AT
245	04240105	--	146	--	--	--	--	147	--	--	--	--	148	--	A
246	04240120	--	146	--	--	--	--	147	--	--	--	--	148	--	A
247	04240180	--	146	--	--	--	--	147	--	--	--	--	151	--	A
248	04240300	--	146	--	--	--	--	147	--	--	--	--	148	--	A
249	04242500	--	12	--	--	--	--	--	--	--	--	--	20	--	A
250	04243500	30	12	--	--	--	16	--	--	--	--	--	20	--	ATP
251	04245000	--	152	--	--	153	16	--	--	--	--	119	20	--	AT
252	04245200	4	140	--	--	--	--	--	--	--	*	--	20	--	A
253	04245236	--	146	--	--	--	150	--	--	--	--	--	148	--	AT
254	04246500	--	140	--	--	154	16	--	--	--	--	--	20	--	AT
255	04249000	--	155	--	--	--	16	9	--	--	--	--	20	--	AT
256	04250750	30	--	--	--	--	--	9	--	--	--	--	20	--	A
257	04252500	--	156	--	--	24	157	--	--	--	--	--	17,20	--	ATP
258	04256000	4	12	--	--	--	16	--	--	--	--	--	20	--	A
259	04257000	--	--	--	--	15	158	25	--	--	--	--	17	--	AT
260	04258000	--	159	--	--	24	--	--	--	--	--	--	17	--	A
261	04260500	--	156	--	--	160	161	9	--	--	--	--	17,20	--	AT
262	04262500	30	162	--	--	32	16	--	--	--	--	--	20	--	ATP
263	04263000	--	12	--	--	32	--	9	--	--	--	--	20	--	A
264	04264331	--	163	--	--	--	--	9	--	--	--	--	20	--	A
265	04266500	--	164	--	--	166	--	--	--	--	--	--	--	26	A
266	04267500	--	165	--	--	48	--	--	--	--	--	--	--	26	A
267	04268000	--	12	--	--	48	--	9	--	--	--	--	20	--	A
268	04269000	4	--	--	--	--	--	9	--	--	*	--	--	--	A
269	04270200	30	12	--	--	--	--	--	--	--	--	--	20	--	A
270	04270510	--	167	--	--	--	--	--	--	--	--	--	20	--	A
271	04273500	--	168	--	--	169	--	--	--	--	--	--	20	--	A
272	04275000	170	171	--	--	172	16	--	--	--	--	--	20	--	ATP
273	04278300	4	14	--	--	--	--	173	--	--	*	--	--	--	A

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EXPLANATION TO TABLE 2

1. Defines long-term trend. Detention reservoir upstream; medium and low flow unregulated.
2. Used by National Weather Service, Corps of Engineers, and Consolidated Edison Company to define current hydrologic conditions and flood forecasting and by the Soil Conservation Service to monitor an upstream flood-detention reservoir.
3. Westchester County Department of Public Works.
4. Defines long-term trend.
5. Used by National Weather Service, Corps of Engineers, Westchester County, and Consolidated Edison Company to define current hydrologic conditions and for flood forecasting and water-supply forecasting.
6. Used by Nassau County to define current hydrologic conditions.
7. Nassau County Department of Public Works.
8. Used by Suffolk County to define current hydrologic conditions.
9. National stream-quality accounting network station.
10. Suffolk County Department of Health Services.
11. Data needed for Streamflow Distribution Study.
12. Used by NYS Department of Environmental Conservation to define current hydrologic conditions.
13. Used by National Weather Service for flood forecasting.
14. Used by Adirondack Park Agency to monitor hydrologic conditions.
15. Used by Hudson River-Black River Regulating District and Niagara Mohawk Power Corporation to monitor and plan reservoir releases.
16. Used by National Weather Service for water-supply forecasting.
17. Hudson River-Black River Regulating District.
18. Used by Hudson River-Black River Regulating District, NYS Department of Environmental Conservation, Niagara Mohawk Power Corporation, Adirondack Park Agency, and National Weather Service to define current hydrologic conditions and make operating decisions and for flood forecasting.
19. Used by Hudson River-Black River Regulating District, NYS Department of Environmental Conservation, Niagara Mohawk Power Corporation, Adirondack Park Agency, and National Weather Service to define current hydrologic conditions and make operating decisions and for flood forecasting and maintenance of water-quality standards and by the USGS as a hydrologic index station.
20. New York State Department of Environmental Conservation.
21. Used by Hudson River-Black River Regulating District and Adirondack Park Agency to define current hydrologic conditions and make operational decisions.
22. Used by National Weather Service to help develop county self-help flash-flood program.
23. Niagara Mohawk Power Corporation, FERC license 2047.
24. Used by Niagara Mohawk Power Corporation and Hudson River-Black River Regulating District to obtain support data for basin-management decisions and to document powerplant operations.
25. Used by Hudson River-Black River Regulating District for maintenance of water-quality standards.
26. Niagara Mohawk Power Corporation.
27. Used by NYS Department of Environmental Conservation to document current hydrologic conditions and make operating decisions for removing PCB's from the lower Hudson River.
28. Used by Niagara Mohawk Power Corporation for hydropower development.
29. Used by Corps of Engineers and NYS Department of Environmental Conservation to determine current hydrologic conditions.
30. Defines long-term trend. Also used by NYS Department of Environmental Conservation as a hydrologic benchmark station.
31. Used by NYS Department of Environmental Conservation and National Weather Service to define current hydrologic conditions and for flood forecasting.
32. Used by Niagara Mohawk Power Corporation for basin-management decisions.
33. Data needed for project no. NY046, "PCB Transport in the Upper Hudson River."
34. Used by NYS Department of Environmental Conservation to monitor reservoir operations.
35. Used by NYS Department of Environmental Conservation for flood forecasting and by the National Weather Service for water-supply forecasting.
36. Used by NYS Department of Environmental Conservation for maintenance of water-quality standards.
37. Used by National Weather Service for river-stage forecasting and routing studies.
38. Corps of Engineers - New York District.
39. Used by NYS Department of Environmental Conservation, NYC Department of Environmental Protection, and Power Authority of the State of New York (PASNY) to monitor current hydrologic conditions; PASNY FERC License 2685; and by the USGS as a hydrologic index station.
40. Used by NYC Department of Environmental Protection to operate New York City's water supply.
41. New York City Department of Environmental Protection.
42. Power Authority of the State of New York, FERC license 2685.
43. Used by Power Authority of the State of New York to operate the Blenheim-Gilboa Pumped Storage Project.
44. Power Authority of the State of New York.
45. Used by Power Authority of the State of New York as a planning tool for the Breakabeen Project.
46. Used by NYS Department of Environmental Conservation and National Weather Service for flood forecasting.
47. Used by NYS Department of Environmental Conservation, National Weather Service, Consolidated Edison Company to define current hydrologic conditions; Niagara Mohawk Power Corporation, FERC license 2539; and by the USGS as a hydrologic index station.
48. Used by Niagara Mohawk Power Corporation to monitor reservoir operations.

49. Used by NYS Department of Environmental Conservation, National Weather Service, and Consolidated Edison Company for flood forecasting.
50. Used by NYS Department of Environmental Conservation, Niagara Mohawk Power Corporation, New York State Electric and Gas Corporation, Consolidated Edison Company, and Corps of Engineers to monitor current hydrologic conditions; and Niagara Mohawk Power Corporation,FERC, license 13.
51. National stream-quality accounting network station and used by NYS Department of Environmental Conservation to monitor water-quality standards.
52. Federal benchmark station. Used by NYS Department of Environmental Conservation and NYC Department of Environmental Protection as a hydrologic benchmark station.
53. Used by NYS Department of Environmental Conservation and NYC Department of Environmental Protection for support data for basin-management decisions.
54. Federal benchmark station.
55. Used by NYS Department of Environmental Conservation, NYC Department of Environmental Protection, and Corps of Engineers to document current hydrologic conditions.
56. Used by NYC Department of Environmental Protection to document diversions and reservoir operations.
57. Used by NYC Department of Environmental Protection for maintenance of water-quality standards.
58. Used by Corps of Engineers to define current hydrologic conditions.
59. Ulster County Environmental Management Council.
60. Used by NYC Department of Environmental Protection and Corps of Engineers to define current hydrologic conditions.
61. Used by NYC Department of Environmental Protection and Corps of Engineers to define current hydrologic conditions; and Central Hudson Gas & Electric Corporation, FERC license 2951.
62. Used by NYC Department of Environmental Protection and Corps of Engineers to define current hydrologic conditions; and USGS as a hydrologic index station.
63. Used by Central Hudson Gas & Electric Corporation for feasibility study for potential hydroelectric site and for operation of hydroelectric plants.
64. Used by NYS Department of Environmental Conservation and Consolidated Edison Company to define current hydrologic conditions; and by USGS for hydrologic index station.
65. Used by NYS Department of Environmental Conseration and NYC Department of Environmental Protection to operate and document reservoir releases for New York City's water supply.
66. Used by NYS Department of Environmental Conservation and Village of Nyack to document DeForest Reservoir operation and Village water-supply withdrawals.
67. Village of Nyack Board of Water Commissioners.
68. Use by NYS Department of Environmental Conservation and Spring Valley Water Company for basin management decisions.
69. Use by NYS Department of Environmental Conservation and Spring Valley Water Company to document effect of ground-water withdrawals on streamflow.
70. Defines long-term trend. Delaware River Basin Commission uses as a hydrologic benchmark stations.
71. Used by NYC Department of Environmental Protection and Delaware River Basin Commission to define current hydrologic conditions.
72. Used by Delaware River Basin Commission to provide support data for basin-management decisions.
73. Used by Delaware River Basin Commission for flood forecasting.
74. Used by Delaware River Basin Commission and New York State Electric and Gas Corporation to document reservoir operations and for support data for basin-management decisions.
75. Used by Delaware River Basin Commission and National Weather Service for flood forecasting.
76. Used by NYS Department of Environmental Conservation and Delaware River Basin Commission to define current hydrologic conditions.
77. Used by NYS Department of Environmental Conservation and Delaware River Basin Commission to monitor reservoir operations and provide support data for basin msnagement decisions.
78. Used by NYS Department of Environmental Conservation, Delaware River Basin Commission, and National Weather Service for flood forecasting.
79. Used by NYS Department of Environmental Conservation, NYC Department of Environmental Protection, and Delaware River Basin Commission to define current hydrologic conditions.
80. Used by NYS Department of Environmental Conservation, Delaware River Basin Commission, and National Weather Service for flood forecasting; and USGS as a hydrologic index station.
81. Used by NYS Department of Environmental Conservation, NYC Department of Environmental Protection, and Delaware River Basin Commission to monitor reservoir operations and for support data for basin management decisions.
82. Used by NYC Department of Environmental Protection and NYS Department of Environmental Conservation for maintenance of water-quality standards.
83. Used by NYC Department of Environmental Protection, U.S. Soil Conservation Service, and Delaware River Basin Commission to define current hydrologic conditions.
84. Used by NYS Department of Environmental Conservation, U.S. Soil Conservation Service, and Delaware River Basin Commission to monitor reservoir operations and for support data for basin management decisions.
85. Used by NYS Department of Environmental Conservation, NYC Department of Environmental Projection, Delaware River Basin Commission, and New York State Electric and Gas Corporation to define current hydrologic conditions and monitor reservoir operations.

EXPLANATION TO TABLE 2 (continued)

86. Used by NYS Department of Environmental Conservation and Susquehanna River Basin Commission to define current hydrologic conditions.
87. Used by NYS Department of Environmental Conservation and Susquehanna River Basin Commission to monitor reservoir operations and for support data for basin management decisions.
88. Used by Susquehanna River Basin Commission to define current hydrologic conditions.
89. Used by Susquehanna River Basin Commission and Corps of Engineers to monitor reservoir operations and for data for basin management decisions.
90. Used by Susquehanna River Basin Commission as input to flow-routing model.
91. Corps of Engineers - Baltimore District.
92. Used by NYS Department of Environmental Conservation as a hydrologic benchmark station; to be operated indefinitely.
93. Used by NYS Department of Environmental Conservation, Susquehanna River Basin Commission, Corps of Engineers, and New York State Electric and Gas Corporation to define current hydrologic conditions.
94. Used by NYS Department of Environmental Conservation, Susquehanna River Basin Commission, Corps of Engineers, and National Weather Service for flood forecasting.
95. Used by Susquehanna River Basin Commission and Corps of Engineers to define current hydrologic conditions.
96. Used by NYS Department of Environmental Conservation, Susquehanna River Basin Commission, and Corps of Engineers to define current hydrologic conditions.
97. Used by Cortland County for self-help flood forecasting and warning program.
98. Cortland County Planning Department.
99. Used by NYS Department of Environmental Conservation, Corps of Engineers, and National Weather Service for flood forecasting and by Cortland County for self-help flood forecasting and warning program.
100. Used by NYS Department of Environmental Conservation, Corps of Engineers, and National Weather Service for flood forecasting.
101. Used by Corps of Engineers and National Weather Service for flood forecasting.
102. Defines long-term trend; floodflows affected by upstream detention reservoirs.
103. Used by NYS Department of Environmental Conservation, Corps of Engineers, and National Weather Service for flood forecasting and by Southern Tier Central Region Planning & Development Board for early flood-warning system.
104. Defines long-term trend; floodflows affected by storage in Arkport Reservoir.
105. Defines long-term trend, floodflows affected by storage in Almond Lake.
106. Used by Susquehanna River Basin Commission and National Weather Service for flood forecasting and by Southern Tier Central Region Planning & Development Board for an early flood-warning system.
107. Used by Susquehanna River Basin Commission to provide support data for basin-management decisions.
108. Used by Susquehanna River Basin Commission and Corps of Engineers to define current hydrologic conditions.
109. Used by Corps of Engineers and National Weather Service for flood forecasting and the Southern Tier Central Regional Planning & Development Board for early flood-warning system.
110. Used by NYS Department of Environmental Conservation and Susquehanna River Basin Commission for flood forecasting and by Southern Tier Central Planning and Development Board for early flood-warning system.
111. Corps of Engineers - Pittsburg District.
112. Used by U.S. Soil Conservation Service and National Weather Service to define current hydrologic conditions.
113. Used by NYS Department of Environmental Conservation and Chautauqua County to define current hydrologic conditions.
114. Used by NYS Department of Environmental Conservation, Chautauqua County, and National Weather Service to monitor reservoir operations.
115. Used by Chautauqua County and National Weather Service for flood forecasting.
116. Used by NYS Department of Environmental Conservation and Chautauqua County for maintenance of water-quality standards.
117. Chautauqua County - Department of Planning and Development.
118. Defines long-term trends. Corps of Engineers uses as a hydrologic benchmark station.
119. Corps of Engineers - Buffalo District.
120. Defines long-term trend. NYS Department of Environmental Conservation and Coprs of Engineers use as a hydrologic benchmark station.
121. Used by NYS Department of Environmental Conservation in relation to international agreement to monitor flow through Niagara River.
122. Used by NYS Department of Environmental Conservation, Corps of Engineers, and National Weather Service to define current hydrologic conditions.
123. Used by Corps of Engineers as a hydrologic benchmark station.
124. Used by Corps of Engineers and National Weather Service to define current hydrologic conditions.
125. Used by NYS Department of Environmental Conservation to document diversions and to fulfill international agreement.
126. Used by Corps of Engineers to document inflow to Mount Morris Lake.
127. Used by Corps of Engineers for support data for basin management decisions.
128. Used by Corps of Engineers for flood forecasting and by National Weather Service for water-supply forecasting.
129. Used by Corps of Engineers for flood forecasting.

EXPLANATION TO TABLE 2 (continued)

130. Data needed for project NY126; Flow and water-quality characteristics of the lower Irondequoit Basin-Phase I.
131. Irondequoit Bay Pure Water District.
132. Used by the Corps of Engineers to determine flow characteristics.
133. Used by NYS Department of Transportation to define current hydrologic conditions.
134. Used by NYS Department of Environmental Conservation, National Weather Service, and New York State Electric and Gas Corporation to monitor reservoir operations.
135. Used by NYS Department of Environmental Conservation, NYS Department of Transportation, and New York State Electric and Gas Corporation to define current hydrologic conditions.
136. Used by NYS Department of Environmental Conservation and National Weather Service for water supply and flood forecasting.
137. Used by Corps of Engineers to determine basin yield for storage analysis.
138. Cornell University, FERC License No. 2047.
139. Cornell University.
140. Used by NYS Department of Environmental Conservation and NYS Department of Transportation to define current hydrologic conditions.
141. Used by U.S. Soil Conservation Service to define current hydrologic conditions.
142. Used by NYS Department of Environmental Conservation, City of Auburn, and Niagara Mohawk Power Corporation to monitor reservoir operations.
143. City of Auburn.
144. Used by NYS Department of Environmental Conservation, NYS Department of Transportation, and National Weather Service to define current hydrologic conditions.
145. Used by NYS Department of Environmental Conservation and Niagara Mohawk Power Corporation to monitor reservoir operations.
146. Used by Ononadaga County to define current hydrologic conditions.
147. Used by Ononadaga County for maintenance of water-quality standards.
148. Ononadaga County Department of Drainage and Sanitation.
149. Used by Ononadaga County to monitor reservoir operation.
150. Used by Ononadaga County for flood forecasting.
151. Ononadaga County Water Authority.
152. Used by NYS Department of Environmental Conservation, NYS Department of Transportation, U.S. Soil Conservation Service, and Corps of Engineers to define current hydrologic conditions.
153. Used by U.S. Soil Conservation Service to provide support data for basin-management decisions.
154. Used by NYS Department of Environmental Conservation and Niagara Mohawk Power Corporation to provide support data for basin-management decisions.
155. Used by NYS Department of Environmental Conservation, NYS Department of Transportation, and Niagara Mohawk Power Corporation to define current hydrologic conditions. Used by NYS Department of Environmental Conservation as a hydrologic benchmark station regardless of heavy storage and regulation.
156. Used by NYS Department of Environmental Conservation and Hudson River - Black River Regulating District to define current hydrologic conditions.
157. Used by National Weather Service and Hudson River - Black River Regulating District for flood- and water-supply forecasting.
158. Used by Hudson River - Black River Regulating District for water-supply forecasting.
159. Used by Hudson River - Black River Regulating District to define current hydrologic conditions.
160. Used by NYS Department of Environmental Conservation, Hudson River - Black River Regulating District, and Niagara Mohawk Power Corporation to provide support data for basin management decisions.
161. Used by National Weather Service and Hudson River - Black River Regulating District for flood forecasting.
162. Used by USGS as a hydrologic index station.
163. Used by NYS Department of Environmental Conservation as a hydrologic benchmark station regardless of heavy storage and regulation.
164. Used by NYS Department of Environmental Conservation and Adirondack Park Agency to define current hydrologic conditions; and Niagara Mohawk Power Corporation, FERC License No. 2084.
165. Used by NYS Department of Environmental Conservation to define current hydrologic conditions; and Niagara Mohawk Power Corporation, FERC License NO. 2084.
166. Used by Niagara Mohawk Power Corporation and Adirondack Park Agency to monitor reservoir operations and for support data for basin management decisions.
167. Used by NYS Department of Environmental Conservation and New York State Electric and Gas Corporation to define current hydrologic conditions.
168. Used by NYS Department of Environmental Conservation to define current hydrologic conditions and New York State Electric and Gas Corporation to fulfill FERC License 2738 requirements.
169. Used by New York State Electric and Gas Corporation to monitor reservoir operations.
170. Defines long-term trend. Adirondack Park Agency uses as a hydrologic benchmark station.
171. Used by NYS Department of Environmental Conservation to define current hydrologic condition and New York State Electric and Gas Corporation to fulfill FERC license 2835 requirements; and by USGS as a hydrologic index station.
172. Used by Adirondack Park Agency and New York State Electric and Gas Corporation to document powerplant operations.
173. Used by Adirondack Park Agency for maintenance of water-quality standards.

Table 3.--Statistics of record reconstruction for streamflow sites.

Station number	Station name	Percentage of record missing	C_v*	P_c**	Source of reconstructed records (station no.)		
01300000	Blind Brook at Rye	0.01	1.6439	0.9629	01300500	01301000	01302000
01300500	Beaver Swamp Brook at Mamaroneck	0.09	1.5881	0.9529	01300000	01301000	01301500
01301000	Mamaroneck River at Mamaroneck	0.05	1.6901	0.9494	01300000	01300500	01302000
01301500	Hutchinson River at Pelham	0.06	1.5210	0.9284	01300000	01300500	01302000
01302000	Bronx River at Bronxville	0.01	1.2650	0.9508	01300000	01301500	01376500
01302500	Glen Cove Creek at Glen Cove	0.01	0.9739	0.8033	01303000	01301500	01305000
01303000	Mill Neck Creek at Mill Neck	0.01	0.4221	0.8898	01302500	01304000	01301000
01303500	Cold Spring Brook at Cold Spring Harbor	0.01	0.6445	0.7323	01303000	01304000	01310500
01304000	Nissequogue River near Smithtown	0.01	0.2560	0.9307	01308500	01306440	01305000
01304500	Peconic River at Riverhead	0.01	0.4346	0.8810	01305000	01305500	01306440
01305000	Carmans River at Yaphank	0.01	0.3016	0.9468	01304500	01304000	01306440
01305500	Swan River at East Patchogue	0.01	0.2463	0.8890	01305000	01306460	01308000
01306440	Connetquot Brook at Central Islip	0.03	0.6251	0.9053	01305000	01306499	01308000
01306460	Connetquot Brook near Central Islip	0.07	0.3209	0.9033	01305000	01305500	01306495
01306495	Connetquot River near Oakdale (supplement)	0.02	0.4486	0.8533	01306460	01306500	01306499
01306499	Connetquot River near Oakdale (base)	0.01	0.3220	0.8912	01306440	01306500	01306495
01308000	Sampawams Creek at Babylon	0.01	0.4818	0.8788	01306500	01308500	01309500
01308500	Carlls River at Babylon	0.01	0.4311	0.9034	01306500	01308000	01309500
01309500	Massapequa Creek at Massapequa	0.01	0.7405	0.9221	01308500	01310000	01310500
01309950	Bellmore Creek at Bellmore (base)	0.06	0.6429	0.8825	01308500	01310000	01311000
01309990	Bellmore Creek at Bellmore (supplement)	0.04	0.8757	0.8519	01310000	01309950	01311000
01310500	East Meadow Brook at Freeport	0.07	1.0123	0.9390	01308500	01309500	01311000
01311000	Pine Brook at Malverne	0.15	1.4947	0.8880	01302500	01310000	01311500
01311500	Valley Stream at Valley Stream	0.05	1.2980	0.8208	01310000	01309990	01311000
01312000	Hudson River near Newcomb	0.03	0.9605	0.9213	01315000	01315500	04278300
01315000	Indian River near Indian Lake	0.09	0.8368	0.4840	01315500	01321000	01325000
01315500	Hudson River at North Creek	0.07	0.7404	0.9564	01318500	01327750	
01318500	Hudson River at Hadley	0.01	0.7263	0.9675	01315500	01327750	
01321000	Sacandaga River at Hadley	0.01	1.0159	0.8641	01315000	01315500	01318500
01325000	Sacandaga River at Stewarts Bridge near Hadley	0.02	0.7576	0.6502	01321000	01318500	
01327750	Hudson River at Fort Edward	0.03	0.4809	0.8210	01325000	01318500	
01330500	Kayaderosseras Creek near West Milton	0.04	0.8837	0.8314	01321000	01349000	01333500
01333500	Little Hoosic River at Petersburg	0.04	1.2110	0.9286	01332500	01333000	01334500
01334500	Hoosic River near Eagle Bridge	0.01	1.0160	0.9372	01333500	01332500	
01336000	Mohawk River below Delta Dam, near Rome	0.01	0.6429	0.5454	01347000	01348000	01346000
01346000	West Canada Creek at Kast Bridge	0.02	0.6309	0.8759	01336000	01347000	
01347000	Mohawk River near Little Falls	0.04	0.6898	0.9335	01346000	01357500	
01348000	East Canada Creek at East Creek	0.04	1.0957	0.7521	01336000	01357500	
01349000	Otsquago Creek at Fort Plain	0.04	1.6378	0.7750	01350000	01357500	
01350000	Schoharie Creek at Prattsville	0.01	1.5733	0.8777	01413500	01349000	01423000
01350101	Schoharie Creek at Gilboa	0.04	1.5488	0.8346	01350000	01350180	01350355
01350120	Platter Kill at Gilboa	0.03	0.8147	0.8205	01350000	01350140	01350200
01350140	Mine Kill near North Blenheim	0.03	1.1185	0.9030	01350000	01350120	01350200
01350180	Schoharie Creek at North Blenheim	0.06	1.6585	0.8888	01350101	01350355	01351500
01350200	West Kill at North Blenheim	0.02	1.0602	0.9022	01362198	01350120	01350140
01350355	Schoharie Creek at Breakabeen	0.03	1.2124	0.8712	01350101	01350100	01351500
01351500	Schoharie Creek at Burtonsville	0.04	1.6983	0.8907	01350000	01350101	01350180
01357500	Mohawk River at Cohoes	0.02	0.8988	0.9352	01347000	01351500	01358000
01359750	Moodener Kill at Castleton-on-Hudson	0.03	1.1538	0.8304	01333500	01350000	01372500
01362198	Esopus Creek at Shandaken	0.02	1.1466	0.8736	01413500	01362500	01364500
01362500	Esopus Creek at Coldbrook	0.01	0.8499	0.7990	01362198	01350000	01350101
01364500	Esopus Creek at Mount Marion	0.04	1.2933	0.8197	01362198	01367500	
01365000	Rondout Creek near Lowes Corners	0.06	1.2187	0.9479	01435000	01365500	01362198
01365500	Chestnut Creek at Grahamsville	0.09	1.1650	0.8933	01435000	01365000	01413500
01367500	Rondout Creek at Rosendale	0.01	1.3539	0.9044	01371500	01372500	01365000

* Coefficient of variation.
** Correlation coefficient.

Table 3.--Statistics of record reconstruction for streamflow sites (continued).

Station number	Station name	Percentage of record missing	C_v*	P_c**	Source of reconstructed records (station no.)		
01371500	Wallkill River at Gardiner	0.01	1.3276	0.8923	01367500	01372500	
01372500	Wappinger Creek near Wappingers Falls	0.01	1.3518	0.8432	01371500	01367500	
01375000	Croton River at New Croton Dam near Croton-on-Hudson	0.06	2.2124	0.6213	01387420	01350101	01367500
01376500	Saw Mill River at Yonkers	0.01	1.3603	0.8964	01300500	01301000	01302000
01376800	Hackensack River at West Nyack	0.01	1.0960	0.5729	01387400	01387420	01387450
01387400	Ramapo River at Ramapo	0.03	0.9197	0.9807	01387450	01387420	01376800
01387420	Ramapo River at Suffern	0.07	0.9899	0.9808	01387450	01387400	01376800
01387450	Mahwah River near Suffern	0.01	1.3229	0.7323	01387400	01387420	01376800
01413500	East Branch Delaware River at Margaretville	0.01	1.2903	0.9512	01420500	01350000	01423000
01414500	Mill Brook near Dunraven	0.01	1.2272	0.9058	01413500	01415000	01423000
01415000	Tremper Kill near Andes	0.01	1.3306	0.9160	01413500	01414500	01423000
01417000	East Branch Delaware River at Downsville	0.01	1.9327	0.8976	01415000	01414500	01417500
01417500	East Branch Delaware River at Harvard	0.01	1.2090	0.9342	01417000	01421000	
01420500	Beaver Kill at Cooks Falls	0.01	1.1808	0.9244	01415000	01414500	01413500
01421000	East Branch Delaware River at Fishs Eddy	0.01	1.0565	0.8349	01417000	01417500	
01423000	West Branch Delaware River at Walton	0.01	1.2680	0.9235	01415000	01413500	01420500
01425000	West Branch Delaware River at Stilesville	0.01	1.2540	0.9633	01426500	01421000	
01426500	West Branch Delaware River at Hale Eddy	0.01	1.1009	0.9608	01425000	01427510	01421000
01427510	Delaware River at Callicoon	0.06	0.8248	0.8252	01426500	01428500	
01428500	Delaware R above Lackawaxen River near Barryville	0.02	1.0095	0.5655	01427510	01434000	
01433500	Mongaup River near Mongaup	0.01	0.9376	0.6425	01436500	01437500	
01434000	Delaware River at Port Jervis	0.01	0.9645	0.9651	01428500	01433500	01437500
01435000	Neversink River near Claryville	0.01	1.1899	0.9305	01365000	01365500	01436000
01436000	Neversink River at Neversink	0.01	2.1553	0.8929	01436500	01437500	
01436500	Neversink River at Woodbourne	0.04	1.3215	0.9319	01436000	01437500	
01437500	Neversink River at Godeffroy	0.01	0.9728	0.8412	01436000	01436500	01433500
01496500	Oaks Creek at Index	0.04	0.8459	0.8233	01502000	01502500	01505000
01500000	Ouleout Creek at East Sidney	0.04	1.3800	0.6630	01496500	01502000	
01500500	Susquehanna River at Unadilla	0.02	0.9660	0.9508	01503000	01502500	01496500
01502000	Butternut Creek at Morris	0.02	1.0512	0.9088	01502500	01496500	01505000
01502500	Unadilla River at Rockdale	0.02	0.9281	0.9588	01502000	01505000	01503000
01503000	Susquehanna River at Conklin	0.02	0.9988	0.9773	01500500	01515000	01512500
01505000	Chenango River at Sherburne	0.04	0.9352	0.9356	01510000	01509000	04245200
01508803	West Branch Tioughnioga River at Homer	0.07	0.7004	0.8572	01509000	04234000	04245200
01509000	Tioughnioga River at Cortland	0.02	0.8849	0.9410	01508803	01510000	04234000
01510000	Otselic River at Cincinnatus	0.04	1.0608	0.9378	01509000	04245200	01505000
01512500	Chenango River near Chenango Forks	0.04	0.9021	0.9393	01505000	01509000	01510000
01515000	Susquehanna River near Waverly	0.01	1.0271	0.9816	01531500	01531000	
01520500	Tioga River at Lindley	0.01	1.4431	0.9988	01526500	01518700	01524500
01521500	Canisteo River at Arkport	0.02	1.9154	0.8104	01528000	04216500	
01523500	Canacadea Creek near Hornell	0.02	1.5633	0.9426	01521500	01524500	04221000
01524500	Canisteo River at Hornell	0.04	1.4572	0.9670	01521500	01523500	
01526500	Tioga River near Erwins	0.04	1.4356	0.9984	01520500	01524500	
01528000	Fivemile Creek near Kanona	0.01	1.6187	0.9189	01529500		
01529500	Cohocton River near Campbell	0.01	1.2977	0.9352	01528000	01526500	
01529950	Chemung River at Corning	0.04	0.9658	0.8240	01531000	01529500	01526500
01530500	Newtown Creek at Elmira	0.03	1.2977	0.8888	04233000	01531000	01529950
01531000	Chemung River at Chemung	0.04	1.2632	0.9282	01515000	01529950	01531500
03011020	Allegheny River at Salamanca	0.06	1.1808	0.8701	04221000	03013000	04213500
03013000	Conewango Creek at Waterboro	0.02	1.1800	0.8339	03011020	04213500	
03014500	Chadakoin River at Falconer	0.02	1.0242	0.6888	03013000		
04213500	Cattaraugus Creek at Gowanda	0.03	1.1913	0.9027	03011020	04214500	04221000
04214500	Buffalo Creek at Gardenville	0.05	1.6054	0.9622	04213500	04215000	04215500
04215000	Cayuga Creek near Lancaster	0.06	1.6834	0.8976	04214500	04215500	
04215500	Cazenovia Creek at Ebenezer	0.02	1.4861	0.9585	04213500	04214500	04215000
04216200	Scajaquada Creek at Buffalo	0.01	1.2575	0.6455	04215500		
04216418	Tonawanda Creek at Attica	0.05	0.7920	0.7145	04217000	04216500	04230380
04216500	Little Tonawanda Creek at Linden	0.03	1.2796	0.8393	04230380	04217000	
04217000	Tonawanda Creek at Batavia	0.03	1.3469	0.9456	04217500	04216418	
04217500	Tonawanda Creek near Alabama	0.07	1.3764	0.9448	04217000	04218000	

Table 3.--Statistics of record reconstruction for streamflow sites (continued).

Station number	Station name	Percentage of record missing	C_v*	P_c**	Source of reconstructed records (station no.)		
04217750	Murder Creek near Akron	0.03	1.1798	0.7092	*New gage used values from 04218518		
04218000	Tonawanda Creek at Rapids	0.03	1.0020	0.7839	04217500		
04218518	Ellicott Creek below Williamsville	0.06	1.1798	0.7092	04218000	04214500	04216200
04219000	Erie Canal at Lock 30, Macedon	0.03	0.8457	0.0000			
04221000	Genesee River at Wellsville	0.04	1.0840	0.8461	04223000	03011020	01529500
04223000	Genesee River at Portageville	0.01	1.3498	0.9139	04221000	04213500	03011020
04224775	Canaseraga Creek above Dansville	0.03	0.9255	0.8028	01528000	01521500	04227000
04227000	Canaseraga Creek at Shakers Crossing	0.01	1.0349	0.8432	04224775	04230380	
04227500	Genesee River near Mount Morris	0.01	1.1390	0.9607	04228500	04223000	
04228500	Genesee River at Avon	0.01	1.0766	0.9753	04227500	04232000	
04229500	Honeoye Creek at Honeoye Falls	0.03	1.3677	0.8562	04231000	04230500	04235250
04230380	Oatka Creek at Warsaw	0.03	1.1252	0.8233	04230500	04216500	
04230500	Oatka Creek at Garbutt	0.01	0.9728	0.9196	04230380	04231000	04217000
04231000	Black Creek at Churchville	0.03	1.2091	0.8531	04230500	04217000	04228500
04232000	Genesee River at Rochester	0.01	0.8865	0.9578	04230500	04231000	
04232100	Sterling Creek at Sterling	0.01	1.1969	0.7584	04235250	04245200	04234000
04232482	Keuka Lake Outlet at Dresden	0.07	0.9725	0.6901	01528000	04235000	
04233000	Cayuga Inlet near Ithaca	0.02	1.1246	0.8844	04234000	01530500	
04234000	Fall Creek near Ithaca	0.01	1.0576	0.9007	04233000	01509000	
04235000	Canandaigua Outlet at Chapin	0.03	1.1188	0.6936	04232482	04352500	
04235250	Flint Creek at Phelps	0.03	1.3670	0.8404	04321000	04229500	
04235500	Owasco Outlet near Auburn	0.03	0.9772	0.5991	04245200	04239000	
04237500	Seneca River at Baldwinsville	0.03	0.7274	0.9304	04249000	04246500	
04239000	Onondaga Creek at Dorwin Avenue, Syracuse	0.03	1.1205	0.9301	04240010	04245200	
04240010	Onondaga Creek at Spencer Street, Syracuse	0.05	0.7617	0.9137	04239000	04245200	
04240100	Harbor Brook at Syracuse	0.05	0.9575	0.8231	04240105	04245200	04232100
04240105	Harbor Brook at Hiawatha Boulevard, Syracuse	0.05	0.9630	0.8523	04240100	04240300	04240120
04240120	Ley Creek at Park Street, Syracuse	0.05	1.0031	0.7720	04240105	04245200	04245236
04240180	Ninemile Creek near Marietta	0.01	1.2061	0.8148	04235200	04240300	
04240300	Ninemile Creek at Lakeland	0.05	0.6410	0.8535	04240180	04240105	04240010
04242500	East Branch Fish Creek at Taberg	0.04	1.0614	0.8674	04243500	04250750	04252500
04243500	Oneida Creek at Oneida	0.03	1.0526	0.8906	01500500	04245000	04242500
04245000	Limestone Creek at Fayetteville	0.01	1.0086	0.9368	04245200	04243500	01500500
04245200	Butternut Creek near Jamesville	0.01	1.0484	0.9203	04245000	04239000	01510000
04245236	Meadow Brook at Hurlburt Road, Syracuse	0.05	1.0022	0.6155	04235200	04240120	
04246500	Oneida River at Caughdenoy-Slope	0.03	0.7777	0.8955	04249000	04237500	
04246501	Oneida River at Caughdenoy-Gage 3	0.03	0.7777	0.8955	04249000	04237500	
04249000	Oswego River at Lock 7, Oswego	0.01	0.6796	0.9678	04237500	04246500	
04250750	Sandy Creek near Adams	0.01	1.3603	0.7022	04256000	04262500	04252500
04252500	Black River near Boonville	0.01	0.7689	0.8857	04256000	04260500	
04256000	Independence River at Donnattsburg	0.01	0.8803	0.8703	04252500	04258000	04262500
04258000	Beaver River at Croghan	0.01	0.4773	0.7809	04257000	04260500	
04260500	Black River at Watertown	0.01	0.6486	0.9158	04258000	04256000	04252500
04262500	West Branch Oswegatchie River near Harrisville	0.01	0.8468	0.9072	04252500	04263000	
04263000	Oswegatchie River near Heuvelton	0.03	0.7002	0.8918	04262500	04267500	
04266500	Raquette River at Piercefield	0.01	0.5783	0.7286	04268000	04257000	
04267500	Raquette River at South Colton	0.07	0.5048	0.8359	04266500	04268000	
04268000	Raquette River at Raymondville	0.04	0.4340	0.8761	04267500	04266500	
04269000	St. Regis at Brasher Center	0.09	0.7016	0.8578	04262500	04270200	04267500
04270200	Little Salmon River at Bombay	0.04	0.9771	0.7707	04262500	04269000	
04270510	Chateaugay River below Chateaugay	0.03	0.6046	0.6734	04269000	04270200	
04273500	Saranac River at Plattsburgh	0.01	0.5320	0.7611	04275000	04268000	
04275000	East Branch Ausable River at Au Sable Forks	0.04	1.0616	0.6843	04273500	04266500	
04278300	Northwest Bay Brook near Bolton Landing	0.06	1.2460	0.7466	01321000	01315500	

Table 4.--Examples of residual data from three different types of rating functions.

Observation no.	Measurement no.	Date	Measured discharge (ft3/s)	Residual (ft3/s)	Percent error
A. One-segment rating function for Glen Cove Creek at Glen Cove (01302500)					
1	457	10-13-72	3.64	-0.19	-5.0
2	459	11-13-72	3.76	-.22	-5.5
3	460	12- 1-72	11.30	-.56	-4.7
4	461	12- 7-72	10.00	.37	3.8
5	462	1-15-73	3.29	-0.13	-3.7
6	463	2- 9-73	5.27	-.37	-6.5
7	464	3- 1-73	6.24	.22	3.7
8	465	4-10-73	16.60	.45	2.7
9	466	5-10-73	6.96	.35	5.2
10	467	6-27-73	4.51	-.09	-1.9
11	468	7-11-73	7.54	.51	7.2
12	469	8-21-73	3.48	-.35	-9.2
13	470	9-19-73	6.43	-.39	-5.7
14	471	10-18-73	3.95	.26	6.9
15	472	11-15-73	4.41	.58	15.0
16	473	12-11-73	5.46	.70	14.6
17	474	1-21-74	12.90	1.32	11.5
18	475	2-12-74	4.06	.08	1.9
19	476	3-19-74	4.98	.22	4.5
20	477	4-16-74	6.16	.33	5.7
21	478	5-14-74	5.38	.62	12.9
22	479	6-17-74	4.66	.22	4.9
23	480	7-10-74	4.35	.37	9.2
24	481	8-26-74	4.68	.55	13.3
25	482	9- 5-74	8.71	1.68	23.8
26	483	9-23-74	4.46	-.14	-3.0
27	484	10- 7-74	3.82	-.16	-4.0
28	485	11-11-74	3.48	-.50	-12.5
29	486	11-13-74	4.51	-.09	-1.9
30	487	11-29-74	3.47	-.08	-2.3
31	488	12-11-74	6.26	.98	18.6
32	489	1- 7-75	16.00	1.60	11.1
33	490	2- 4-75	4.84	.71	17.1
34	491	3- 5-75	4.22	.24	6.0
35	492	4- 3-75	61.60	2.91	4.9
36	493	5-14-75	12.00	-.16	-1.3
37	494	6-18-75	5.07	.14	2.8
38	495	7-22-75	5.83	.37	6.8
39	496	8-13-75	4.68	.08	1.7
40	497	9-15-75	5.73	.63	12.2
41	498	10-15-75	4.76	.01	-0.0
42	499	11-14-75	12.60	-.18	-1.3
43	500	12-10-75	13.10	-.31	-2.3
44	501	1- 6-76	5.06	-0.40	-7.2
45	502	2-12-76	5.61	-.60	-9.6
46	503	3-11-76	11.40	-.76	-6.2
47	504	4- 8-76	5.06	-.58	-10.2
48	506	5-13-76	5.47	-.17	-3.0
49	507	6-10-76	5.20	.10	1.9
50	509	7-22-76	4.43	-.33	-7.0
51	510	8-30-76	5.37	-.09	-1.5
52	511	9-22-76	4.68	-.08	-1.7
53	512	10-15-76	4.58	-.18	-3.8
54	513	10-15-76	4.88	.12	2.4
55	514	11- 8-76	4.86	.26	5.6
56	515	12- 8-76	6.69	.28	4.3

Table 4.--Examples of residual data from three different types of rating functions (continued).

Observation no.	Measurement no.	Date	Measured discharge (ft3/s)	Residual (ft3/s)	Percent error
A. One-segment rating function for Glen Cove Creek at Glen Cove (01302500) (continued)					
57	516	1-26-77	5.18	0.25	5.0
58	517	2-10-77	4.73	.29	6.5
59	518	3-14-77	7.13	-.56	-7.2
60	519	4-26-77	4.94	-.16	-3.1
61	520	5-31-77	4.48	.20	4.5
62	521	7- 7-77	4.52	.08	1.8
63	522	8-18-77	4.45	-.48	-9.7
64	523	9- 8-77	4.74	-.19	-3.8
65	524	10- 5-77	7.87	.41	5.4
66	525	11- 9-77	19.30	1.27	7.0
67	526	12-14-77	17.70	.82	4.8
68	527	1-17-78	7.62	1.21	18.8
69	528	2-15-78	6.46	.44	7.3
70	529	3- 8-78	8.27	-.11	-1.3
71	530	4-14-78	6.05	.03	0.5
72	531	5-11-78	11.10	.11	1.0
73	532	6- 7-78	5.65	-1.17	-17.1
74	533	7- 6-78	9.17	-1.26	-12.0
75	534	8-10-78	8.67	1.85	27.1
76	535	8-16-78	5.58	-.44	-7.2
77	536	9-18-78	7.30	-1.08	-12.9
78	537	10-13-78	6.06	.60	11.0
79	538	10-30-78	8.78	-.34	-3.7
80	539	11-22-78	5.24	-.04	-.7
81	540	12-13-78	7.28	-.18	-2.4
82	542	3- 2-79	8.34	-0.28	-3.2
83	543	4- 3-79	14.20	-.20	-1.3
84	544	5- 8-79	10.30	.41	4.1
85	545	6- 6-79	11.50	.79	7.4
86	546	7-16-79	8.75	.13	1.4
87	547	8-14-79	10.90	-1.26	-10.3
88	548	9- 7-79	13.70	.92	7.2
89	549	10-12-79	10.00	.11	1.0
90	550	11- 8-79	7.90	-.01	-.1
91	551	12-10-79	7.64	.18	2.3
92	552	1- 8-80	3.97	-0.16	-3.8
93	553	2- 7-80	4.09	-.04	-.9
94	554	3- 4-80	4.52	.08	1.8
95	555	4- 2-80	9.93	.04	.3
96	556	5- 7-80	5.54	.26	4.9
97	557	6- 4-80	10.20	.04	.4
98	558	7-14-80	8.32	.40	5.1
99	559	8-18-80	7.88	-.27	-3.2
100	560	9-16-80	7.20	-.72	-9.0
101	561	10-16-80	7.92	.23	3.0
102	562	11-12-80	7.18	-.07	-.9
103	563	12- 4-80	7.52	.06	.7
104	564	1-12-81	6.98	-0.05	-0.7
105	565	2-11-81	4.43	.15	3.4
106	566	3- 9-81	4.48	.04	.9
107	567	4- 7-81	5.53	.07	1.3
108	568	5- 5-81	3.95	-.18	-4.3
109	569	6- 3-81	4.64	-.12	-2.6
110	570	7- 6-81	10.10	.47	4.8
111	571	8-11-81	5.41	-.23	-4.0

Table 4.--Examples of resiaual data from three different types of rating functions (continued).

Observation no.	Measurement no.	Date	Measured discharge (ft3/s)	Residual (ft3/s)	Percent error
A. One-segment rating function for Glen Cove Creek at Glen Cove (01302500) (continued)					
112	572	9-11-81	4.88	-.40	-7.5
113	573	10-20-81	4.26	-.18	-4.0
114	574	11-20-81	9.69	.06	.6
115	575	12-22-81	5.70	-.51	-8.2
116	576	2-10-82	4.50	-0.26	-5.5
117	577	3-10-82	4.73	.13	2.8
118	578	4-15-82	4.80	.04	.7
119	579	5-25-82	5.50	-.52	-8.5
120	580	6-29-82	3.95	-.49	-11.0
121	581	7-27-82	4.11	-.65	-13.7
122	582	8-17-82	4.11	-.65	-13.7
123	583	8-25-82	24.40	-4.61	-15.8
124	584	9- 9-82	3.96	-1.14	-22.3
B. Two-segment rating function for Canacadea Creek near Hornell (01523500)					
1	300	1- 7-70	26.30	-0.66	-2.4
2	301	2-10-70	82.30	-3.96	-4.5
3	302	4-14-70	192.00	-9.37	-4.6
4	303	5-12-70	10.40	-.51	-4.6
5	304	6- 9-70	9.63	-.09	-.9
6	305	7-14-70	15.20	.15	6.4
7	306	8-11-70	7.21	.56	8.4
8	307	9-15-70	28.60	-.59	-2.0
9	308	11-16-70	386.00	36.42	10.4
10	309	12 8-70	42.10	1.42	3.4
11	310	1-11-71	39.60	-2.51	-5.9
12	311	2-23-71	131.00	.69	.5
13	312	3-29-71	138.00	7.69	5.8
14	313	4-26-71	58.40	-1.51	-2.5
15	314	6- 1-71	16.20	-.38	-2.2
16	315	6-28-71	19.00	-.10	-.5
17	316	7-28-71	5.33	-.04	-.8
18	317	8-24-71	6.27	-1.32	-17.3
19	318	9-30-71	8.86	-2.05	-18.7
20	319	10-28-71	8.92	-1.99	-18.2
21	320	11-24-71	11.20	-2.36	-17.4
22	321	1- 3-72	47.70	-3.63	-7.0
23	322	1-25-72	161.00	-.74	-.4
24	323	5-30-72	233.00	11.78	5.3
25	324	6- 1-72	108.00	-.17	-.1
26	325	6-22-72	3140.00	.14	.0
27	326	6-27-72	244.00	-29.74	-10.8
28	327	6-30-72	843.00	.25	.0
29	328	7-10-72	127.00	2.46	1.9
30	329	8- 2-72	22.10	-1.71	-7.1
31	330	9- 8-72	15.20	-.59	-3.7
32	331	1-16-73	24.00	0.39	0.7
33	332	3-27-73	79.40	-2.41	-2.9
34	333	4-25-73	40.10	4.82	13.6
35	334	6- 5-73	41.80	-3.26	-7.2
36	335	7- 9-73	16.60	2.32	16.2
37	336	8-16-73	7.59	.01	.0
38	337	9-25-73	16.40	.61	3.8
39	338	10-18-73	10.80	-.11	-1.0
40	339	11-20-73	34.80	3.26	10.3

Table 4.--Examples of residual data from three different types of rating functions (continued).

Observation no.	Measurement no.	Date	Measured discharge (ft3/s)	Residual (ft3/s)	Percent error
B. Two-segment rating function for Canacadea Creek near Hornell (01523500) (continued)					
41	340	2-20-74	29.50	3.62	13.9
42	341	3-21-74	99.70	4.09	4.2
43	342	3-24-74	98.90	-11.89	-10.7
44	343	7-11-74	13.50	.64	4.9
45	344	8-20-74	10.70	.40	3.8
46	345	10- 4-74	14.10	.54	3.9
47	346	11-19-74	15.10	.82	5.7
48	347	1- 6-75	18.70	1.30	7.4
49	348	3-10-75	70.40	1.06	1.5
50	349	4-21-75	58.60	-4.98	-7.8
51	350	6-13-75	77.70	2.29	3.0
52	351	7-11-75	17.60	1.02	6.1
53	352	8-15-75	13.40	.54	4.1
54	353	9-17-75	31.10	.75	2.4
55	354	10-23-75	46.80	.22	.4
56	355	11-13-75	57.00	-2.91	-4.8
57	356	2-12-76	158.00	2.89	1.8
58	357	4-15-76	55.90	1.24	2.2
59	358	6-10-76	22.30	-.52	-2.2
60	359	7-16-76	24.40	.54	2.4
61	360	8-12-76	25.70	-.18	-.7
62	361	9-17-76	10.20	.48	4.9
63	362	11-17-76	39.00	1.08	2.8
64	363	12-10-76	42.60	-2.46	-5.4
65	364	3- 8-77	50.00	-1.33	-2.5
66	365	4-13-77	25.80	-.08	-.3
67	366	5- 5-77	204.00	-5.17	-2.4
68	367	6- 9-77	14.30	12.87	.1
69	368	7-12-77	20.40	-.51	-2.4
70	369	8-30-77	138.00	-1.30	-.9
71	370	10-13-77	65.80	-1.58	-2.3
72	371	11- 9-77	93.80	-6.72	-6.6
73	372	3-29-78	265.00	14.00	5.5
74	373	4-25-78	55.50	2.52	4.7
75	374	6- 1-78	29.10	-.09	-.3
76	375	6-29-78	12.50	1.59	14.5
77	376	10- 4-78	37.00	-.92	-2.4
78	377	11- 7-78	10.80	-1.39	-11.4
79	378	12-14-78	34.70	-.58	-1.6
80	380	3-15-79	128.00	-8.26	-6.0
81	381	4-18-79	71.00	-2.35	-3.2
82	382	6-28-79	12.10	-.09	-.7
83	383	8- 1-79	40.10	3.51	9.6
84	384	9-26-79	16.90	1.11	7.0
85	385	11- 7-79	35.10	-1.49	-4.0
86	386	12-13-79	60.80	.89	1.4
87	387	1-18-80	31.60	-3.68	-10.4
88	388	3-27-80	78.00	2.59	3.4
89	389	5-20-80	11.00	.70	6.7
90	390	7-29-80	7.59	.48	6.7
91	392	10-28-80	61.50	1.59	2.6
92	393	12-18-80	29.30	1.24	4.4

Table 4.--Examples of residual data from three different types of rating functions (continued).

Observation no.	Measurement no.	Date	Measured discharge (ft3/s)	Residual (ft3/s)	Percent error
B. Two-segment rating function for Canacadea Creek near Hornell (01523500) (continued)					
93	395	3-12-81	35.90	0.62	1.7
94	396	4-27-81	13.60	.74	5.7
95	397	5-13-81	30.60	.25	.8
96	398	10-14-81	33.40	3.05	10.0
97	399	12-29-81	38.10	-1.19	-3.0
98	400	4-13-82	198.00	0.46	0.2
99	401	6- 8-82	465.00	27.58	6.3
100	402	7-21-82	42.70	3.41	8.6
101	403	8-18-82	10.90	.60	5.7
102	404	10- 6-82	10.40	-1.14	-9.8
C. Three-segment rating function for Hudson River at Fort Edward (01327750)					
1	5	4-21-75	11800	760	6.8
2	6	4-22-75	11400	756	7.1
3	7	8-24-75	1010	13	1.2
4	8	9-27-75	13800	-1366	-9.0
5	9	9-28-75	13200	113	.8
6	10	3-29-76	18100	-175	-.9
7	11	3-30-76	18900	1012	5.6
8	12	4- 3-76	36300	-2116	-5.5
9	13	7-29-76	3970	263	7.1
10	14	8-19-76	6070	351	6.1
11	15	10- 6-76	3570	48	1.3
12	16	3-15-77	22300	151	0.6
13	17	4-26-77	27400	-2005	-6.8
14	18	6- 9-77	3080	-24	-.7
15	19	6-23-77	1360	72	5.6
16	20	10-17-77	6280	-552	-8.0
17	21	3-31-78	5330	-282	-5.0
18	22	6- 8-78	3850	-235	-5.7
19	23	8-27-78	1120	-61	-5.1
20	24	8-27-78	1110	-29	-2.5
21	25	3-27-79	20400	509	2.5
22	26	4-19-79	13500	-404	-2.9
23	27	4-29-79	33300	-329	-.9
24	28	8-28-79	2880	-224	-7.2
25	29	10-31-79	3930	-546	-12.1
26	30	1-17-80	4560	-319	-6.5
27	31	4-10-80	21200	296	1.4
28	32	7- 7-80	3200	-81	-2.4
29	34	9- 1-80	942	-136	-12.5
30	35	10- 6-80	3790	-168	-4.2
31	36	3-18-81	4290	-623	-12.6
32	37	6- 1-81	3830	-159	-3.9
33	38	7- 5-81	997	59	6.2
34	39	7- 5-81	1030	92	9.7
35	40	7- 5-81	996	77	8.3
36	41	10- 5-81	6990	536	8.3
37	42	12-18-81	4960	149	3.0
38	43	4- 2-82	9330	23	0.2
39	44	5-17-82	5350	92	1.7
40	45	8-11-82	3870	-183	-4.5

Table 5.--Summary of the autocovariance analysis.

Station number	Station name	RHO*	Measurement variance (log 10)	Process variance (log 10)	Length of period (days)
01300000	Blind Brook at Rye	0.968	0.00047	0.00130	365
01300500	Beaver Swamp Brook at Mamaroneck	.950	.00047	.00093	365
01301000	Mamaroneck River at Mamaroneck	.973	.00047	.00290	365
01301500	Hutchinson River at Pelham	.959	.00047	.01592	365
01302000	Bronx River at Bronxville	.977	.00047	.00166	365
01302500	Glen Cove Creek at Glen Cove	0.975	0.00047	0.00074	365
01303000	Mill Neck Creek at Mill Neck	.943	.00047	.00010	365
01303500	Cold Spring Brook at Cold Spring Harbor	.942	.00047	.00010	365
01304000	Nissequogue River near Smithtown	.962	.00047	.00006	365
01304500	Peconic River at Riverhead	.965	.00047	.00030	365
01305000	Carmans River at Yaphank	0.959	0.00047	0.00013	365
01305500	Swan River at East Patchogue	.970	.00047	.00267	365
01306440	Connetquot Brook at Central Islip	.552	.00047	.00044	365
01306460	Connetquot Brook near Central Islip	.987	.00047	.00042	365
01306495	Connetquot River near Oakdale (supplement)	.971	.00047	.00040	365
01306499	Connetquot River near Oakdale (base)	0.990	0.00047	0.00177	365
01308000	Sampawams Creek at Babylon	.543	.00047	.00200	365
01308500	Carlls River at Babylon	.971	.00047	.00034	365
01309500	Massapequa Creek at Massapequa	.929	.00047	.00824	365
01309950	Bellmore Creek at Bellmore (base)	.975	.00047	.00177	365
01309990	Bellmore Creek at Bellmore (supplement)	0.972	0.00047	0.00121	365
01310500	East Meadow Brook at Freeport	.961	.00047	.00043	365
01311000	Pine Brook at Malverne	.956	.00047	.00299	365
01311500	Valley Stream at Valley Stream	.581	.00047	.00482	365
01312000	Hudson River near Newcomb	.965	.00047	.00397	365
01315000	Indian River near Indian Lake	0.934	0.00047	0.00047	365
01315500	Hudson River at North Creek	.982	.00047	.00029	320
01318500	Hudson River at Hadley	.942	.00047	.00006	365
01321000	Sacandaga River near Hope	.938	.00047	.00029	290
01325000	Sacandaga River at Stewarts Bridge near Hadley	.637	.00047	.00015	365
01327750	Hudson River at Fort Edward	0.673	0.00047	0.00020	365
01330500	Kayaderosseras Creek near West Milton	.966	.00047	.00043	290
01333500	Little Hoosic River at Petersburg	.982	.00047	.00094	305
01334500	Hoosic River near Eagle Bridge	.990	.00047	.00141	305
01336000	Mohawk River below Delta Dam, near Rome	.958	.00047	.00021	365
01346000	West Canada Creek at Kast Bridge	0.991	0.00047	0.00483	365
01347000	Mohawk River near Little Falls	.971	.00047	.00023	365
01348000	East Canada Creek at East Creek	.987	.00047	.00086	365
01349000	Otsquago Creek at Fort Plain	.991	.00047	.01128	290
01350000	Schoharie Creek at Prattsville	.961	.00047	.00107	290
01350101	Schoharie Creek at Gilboa	0.971	0.00047	0.08703	320
01350120	Platter Kill at Gilboa	.982	.00047	.00777	290
01350140	Mine Kill near North Blenheim	.994	.00047	.02180	290
01350180	Schoharie Creek at North Blenheim	.980	.00047	.01125	365
01350200	West Kill at North Blenheim	.987	.00047	.02007	275
01350355	Schoharie Creek at Breakabeen	0.975	0.00047	0.02127	320
01351500	Schoharie Creek at Burtonsville	.971	.00047	.00072	305
01357500	Mohawk River at Cohoes	.927	.00047	.00010	365
01359750	Moordener Kill at Castleton-on-Hudson	.980	.00047	.00257	290
01362198	Esopus Creek at Shandaken	.989	.00047	.08196	305
01362500	Esopus Creek at Coldbrook	0.996	0.00047	0.02040	305
01364500	Esopus Creek at Mount Marion	.946	.00047	.00007	320
01365000	Rondout Creek near Lowes Corners	.962	.00047	.02607	365
01365500	Chestnut Creek at Grahamsville	.989	.00047	.00378	305
01367500	Rondout Creek at Rosendale	.969	.00047	.00138	320

* 1-day autocorrelation coefficient.

Table 5.--Summary of the autocovariance analysis (continued).

Station number	Station name	RHO*	Measurement variance (log 10)	Process variance (log 10)	Length of period (days)
01371500	Wallkill River at Gardiner	0.977	0.00047	0.00121	290
01372500	Wappinger Creek near Wappingers Falls	.958	.00047	.00063	320
01375000	Croton R at New Croton Dam near Croton-on-Hudson	.778	.00047	.07565	365
01376500	Saw Mill River at Yonkers	.000	.00047	.00200	365
01376800	Hackensack River at West Nyack	.969	.00047	.00266	365
01387400	Ramapo River at Ramapo	0.544	0.00047	0.00067	365
01387420	Ramapo River at Suffern	.972	.00047	.00450	365
01387450	Mahwah River near Suffern	.977	.00047	.01786	365
01413500	East Branch Delaware River at Margaretville	.976	.00047	.00947	320
01414500	Mill Brook near Dunraven	.972	.00047	.00215	305
01415000	Tremper Kill near Andes	0.974	0.00047	0.00212	305
01417000	East Branch Delaware River at Downsville	.976	.00047	.00067	365
01417500	East Branch Delaware River at Harvard	.977	.00047	.00042	320
01420500	Beaver Kill at Cooks Falls	.940	.00047	.00016	305
01421000	East Branch Delaware River at Fishs Eddy	.957	.00047	.00288	305
01423000	West Branch Delaware River at Walton	0.978	0.00047	0.00011	305
01425000	West Branch Delaware River at Stilesville	.965	.00047	.00109	365
01426500	West Branch Delaware River at Hale Eddy	.972	.00047	.00033	320
01427510	Delaware River at Callicoon	.972	.00047	.00095	290
01428500	Delaware R above Lacakawaxen R near Barryville	.959	.00047	.00047	305
01433500	Mongaup River near Mongaup	0.989	0.00047	0.00073	365
01434000	Delaware River at Port Jervis	.938	.00047	.00024	365
01435000	Neversink River near Claryville	.990	.00047	.00545	305
01436000	Neversink River at Neversink	.946	.00047	.00516	365
01436500	Neversink River at Woodbourne	.963	.00047	.00048	290
01437500	Neversink River at Godeffroy	0.984	0.00047	0.00130	305
01496500	Oaks Creek at Index	.973	.00047	.00037	290
01500000	Ouleout Creek at East Sidney	.982	.00047	.00057	365
01500500	Susquehanna River at Unadilla	.984	.00047	.00015	305
01502000	Butternut Creek at Morris	.979	.00047	.00296	290
01502500	Unadilla River at Rockdale	0.965	0.00047	0.00068	305
01503000	Susquehanna River at Conklin	.977	.00047	.00038	290
01505000	Chenango River at Sherburne	.966	.00047	.00390	290
01508803	West Branch Tioughnioga River at Homer	.972	.00047	.00097	320
01509000	Tioughnioga River at Cortland	.959	.00047	.00226	305
01510000	Otselic River at Cincinnatus	0.985	0.00047	0.00359	290
01512500	Chenango River near Chenango Forks	.961	.00047	.00037	290
01515000	Susquehanna River near Waverly	.955	.00047	.00016	305
01520500	Tioga River at Lindley	.979	.00047	.00192	305
01521500	Canisteo River at Arkport	.982	.00047	.00205	305
01523500	Canacadea Creek near Hornell	0.984	0.00047	0.00018	305
01524500	Canisteo River at Hornell	.967	.00047	.00031	290
01526500	Tioga River near Erwins	.971	.00047	.00179	305
01528000	Fivemile Creek near Kanona	.973	.00047	.00710	290
01529500	Cohocton River near Campbell	.979	.00047	.00442	290
01529950	Chemung River at Corning	0.979	0.00047	0.00102	290
01530500	Newtown Creek at Elmira	.982	.00047	.00965	305
01531000	Chemung River at Chemung	.978	.00047	.00562	305
03011020	Allegheny River at Salamanca	.950	.00047	.00030	305
03013000	Conewango Creek at Waterboro	.987	.00047	.01494	335
03014500	Chadakoin River at Falconer	0.973	0.00047	0.00038	365
04213500	Cattaraugus Creek at Gowanda	.989	.00047	.00226	320
04214500	Buffalo Creek at Gardenville	.988	.00047	.00333	290
04215000	Cayuga Creek near Lancaster	.993	.00047	.00362	290
04215500	Cazenovia Creek at Ebenezer	.988	.00047	.00624	290

Table 5.--Summary of the autocovariance analysis (continued).

Station number	Station name	RHO*	Measurement variance (log 10)	Process variance (log 10)	Length of period (days)
04216200	Scajaquada Creek at Buffalo	0.976	0.00047	0.00129	365
04216418	Tonawanda Creek at Attica	.843	.00047	.00028	290
04216500	Little Tonawanda Creek at Linden	.944	.00047	.00102	290
04217000	Tonawanda Creek at Batavia	.978	.00047	.00023	320
04217500	Tonawanda Creek near Alabama	.975	.00047	.00122	290
04217750	Murder Creek near Akron	0.979	0.00047	0.00323	305
04218000	Tonawanda Creek at Rapids	.993	.00047	.00207	305
04218518	Ellicott Creek below Williamsville	.979	.00047	.00323	305
04219000	Erie Canal at Lock 30, Macedon	.958	.00047	.00030	245
04221000	Genesee River at Wellsville	.986	.00047	.00045	305
04223000	Genesee River at Portageville	0.992	0.00047	0.02399	290
04224775	Canaseraga Creek above Dansville	.987	.00047	.01023	290
04227000	Canaseraga Creek at Shakers Crossing	.984	.00047	.00110	305
04227500	Genesee River near Mount Morris	.982	.00047	.00086	305
04228500	Genesee River at Avon	.973	.00047	.00020	290
04229500	Honeoye Creek at Honeoye Falls	0.967	0.00047	0.00194	290
04230380	Oatka Creek at Warsaw	.992	.00047	.09023	290
04230500	Oatka Creek at Garbutt	.949	.00047	.00066	320
04231000	Black Creek at Churchville	.973	.00047	.00235	305
04232000	Genesee River at Rochester	.654	.00047	.00012	365
04232100	Sterling Creek at Sterling	0.963	0.00047	0.00171	290
04232482	Keuka Lake Outlet at Dresden	.979	.00047	.00459	365
04233000	Cayuga Inlet near Ithaca	.955	.00047	.00123	305
04234000	Fall Creek near Ithaca	.953	.00047	.00034	290
04235000	Canandaigua Outlet at Chapin	.996	.00047	.00141	320
04235250	Flint Creek at Phelps	0.982	0.00047	0.00765	290
04235500	Owasco Outlet near Auburn	.985	.00047	.00239	365
04237500	Seneca River at Baldwinsville	.984	.00047	.00110	365
04239000	Onondaga Creek at Dorwin Avenue, Syracuse	.981	.00047	.00082	335
04240010	Onondaga Creek at Spencer Street, Syracuse	.973	.00047	.00030	365
04240100	Harbor Brook at Syracuse	0.996	0.00047	0.02173	365
04240105	Harbor Brook at Hiawatha Boulevard, Syracuse	.997	.00007	.00035	365
04240120	Ley Creek at Park Street, Syracuse	.982	.00047	.00748	365
04240180	Ninemile Creek near Marietta	.979	.00047	.00726	335
04240300	Ninemile Creek at Lakeland	.655	.00007	.00045	365
04242500	East Branch Fish Creek at Taberg	0.974	0.00047	0.00064	290
04243500	Oneida Creek at Oneida	.979	.00047	.00217	290
04245000	Limestone Creek at Fayetteville	.987	.00047	.00432	335
04245200	Butternut Creek near Jamesville	.997	.00047	.02137	320
04245236	Meadow Brook at Hurlburt Road, Syracuse	.986	.00047	.03142	335
04246500	Oneida River at Caughdenoy-Slope	0.944	0.00047	0.00008	243
04246501	Oneida River at Caughdenoy-Gage 3	.989	.00047	.00034	122
04249000	Oswego River at Lock 7, Oswego	.972	.00047	.00008	365
04250750	Sandy Creek near Adams	.877	.00047	.00040	305
04252500	Black River near Boonville	.966	.00047	.00031	290
04256000	Independence River at Donnattsburg	0.976	0.00047	0.00047	275
04258000	Beaver River at Croghan	.970	.00047	.00013	365
04260500	Black River at Watertown	.987	.00047	.00032	365
04262500	West Branch Oswegatchie River near Harrisville	.596	.00047	.00030	320
04263000	Oswegatchie River near Heuvelton	.948	.00047	.00010	305
04266500	Raquette River at Piercefield	0.973	0.00047	0.00017	365
04267500	Raquette River at South Colton	.973	.00047	.00037	365
04268000	Raquette River at Raymondville	.962	.00047	.00037	275
04269000	St. Regis at Brasher Center	.930	.00047	.00021	260
04270200	Little Salmon River at Bombay	.972	.00047	.00042	245
04270510	Chateaugay River below Chateaugay	0.987	0.00047	0.00004	275
04273500	Saranac River at Plattsburgh	.618	.00047	.00010	365
04275000	East Branch Ausable River at Au Sable Forks	.955	.00047	.00026	275
04278300	Northwest Bay Brook near Bolton Landing	.986	.00047	.01840	275

Table 6.--Dummy stations used in the New York "Traveling Hydrographer" program.

Station number	Station name	Type of site
01199477	Stony Brook near Dover Plains	Crest-stage gage
01300800	Mamaroneck River at Winfield Avenue, Mamaroneck	Crest-stage gage
01314500	Indian Lake near Indian Lake	Stage only
01319800	West Branch Sacandaga River at Arietta	Crest-stage gage
01319950	Sand Lake Outlet near Piseco	Crest-stage gage
01323500	Sacandaga Lake at Conklinville	Stage only
01329154	Steele Brook at Shushan	Crest-stage gage
01329780	Sessions Brook at Porters Corners	Crest-stage gage
01329900	Glowegee Creek tributary at Mosherville	Crest-stage gage
01330880	Saratoga Lake tributary near Bemis Heights	Crest-stage gage
01331095	Hudson River at Stillwater	Discharge
01333367	Little Hoosic River at Cherry Plain	Crest-stage gage
01335754	Hudson River at Waterford	Discharge
01342730	Steele Creek at Ilion	Crest-stage gage
01343900	Hinckley Reservoir	Stage only
01346820	Mohawk River tributary at Indian Castle	Crest-stage gage
01347000	Mohawk River near Little Falls	Stream gage, service only
01347460	Spruce Lake tributary near Salisbury Center	Crest-stage gage
01348420	North Creek near Epharatah	Crest-stage gage
01349360	Van Wie Creek tributary near Randall	Crest-stage gage
01349850	Batavia Kill at Hendersonville	Crest-stage gage
01350100	Schoharie Reservoir at Gilboa	Stage only
01350900	Beaverdam Creek near Knox	Crest-stage gage
01354200	Sandsea Kill at Pattersonville	Crest-stage gage
01354300	Plotter Kill at Rynex Corners	Crest-stage gage
01355405	Indian Kill near Glenville Center	Crest-stage gage
01358000	Hudson River at Green Island	Discharge
01359133	Patroon Creek at Albany	Crest-stage gage
01359528	Normans Kill near Albany	Miscellaneous site
01361245	Tributary Taghkanic Creek tributary near Claryville	Crest-stage gage
01361453	Catskill Creek tributary at Franklinton	Crest-stage gage
01361900	Shingle Kill at Cairo	Crest-stage gage
01362100	Roeliff Jansen Kill near Hillsdale	Crest-stage gage
01362197	Bushnellsville Creek at Shandaken	Crest-stage gage
01363388	Dry Brook at West Shokan	Crest-stage gage
01373690	Woodbury Creek near Highland Mills	Crest-stage gage
01374130	Canopus Creek at Oscawona Corners	Crest-stage gage
01374250	Peekskill Hollow Creek at Tompkins Corners	Crest-stage gage
01376420	Saw Mill River at Elmsford	Crest-stage gage
01387410	Torne Brook at Ramapo	Crest-stage gage
01417185	Campbell Brook tributary near Downsville	Crest-stage gage
01427207	Delaware River at Lordville	Temperature gage
01432160	Delaware River at Barryville	Stage only
01432805	Delaware River at Pond Eddy	Temperature gage
01434008	East Branch Neversink River at Strouss Estate	Crest-stage gage
01434025	Biscuit Brook above Pigeon Brook at Frost Valley	Water quality
01434029	Biscuit Brook above Pigeon Brook	Water quality
01437345	Basher Kill tributary near Westbrookville	Crest-stage gage
01496370	Mink Creek at Richfield Springs	Crest-stage gage
01497805	Little Elk Creek near Westford	Crest-stage gage

Table 6.--Dummy stations used in the New York "Traveling Hydrographer" program (continued).

Station number	Station name	Type of site
01499500	East Sidney Lake at East Sidney	Stage only
01501015	Mill Brook at New Berlin	Crest-stage gage
01501140	Wharton Creek tributary near Edmeston	Crest-stage gage
01502701	Susquehanna River at Afton	Crest-stage gage
01502714	Ouaquaga Creek near Belden	Crest-stage gage
01503960	Electric Light Stream near Morrisville	Crest-stage gage
01503980	Chenango River at Eaton	Crest-stage gage
01505017	Cold Brook near North Norwich	Crest-stage gage
01508946	Otter Creek tributary at SH 222 near Cortland	Crest-stage gage
01510610	Merrill Creek tributary near Texas Valley	Crest-stage gage
01511000	Whitney Point Lake at Whitney Point	Stage only
01511500	Tioughnioga River at Itaska	Crest-stage gage
01513500	Susquehanna River at Vestal	Crest-stage gage
01513712	Nanticoke Creek tributary at Nanticoke	Crest-stage gage
01514000	Owego Creek near Owego	Crest-stage gage
01521000	Arkport Reservoir near Arkport	Stage only
01521596	Big Creek near Howard	Crest-stage gage
01523000	Almond Lake near Almond	Stage only
01525500	Canisteo River at West Cameron	Crest-stage gage
01527000	Cohocton River at Cohocton	Crest-stage gage
01530301	Cuthrie Run near Big Flats	Crest-stage gage
03010734	Ischua Creek tributary near Machias	Crest-stage gag
03010743	Johnson Creek near Franklinville	Crest-stage gage
03010800	Olean Creek near Olean	Crest-stage gage
03011000	Great Valley Creek near Salamanca	Crest-stage gage
03013800	Ball Creek at Stow	Crest-stage gage
03013946	Chautauqua Lake at Bemus Point	Stage only
04213399	Walnut Creek tributary near Forestville	Crest-stage gage
04213490	South Branch Cattaraugus Creek near Otto	Crest-stage gage
04214040	Delaware Creek near Angola	Crest-stage gage
04214410	Hunter Creek at Colgrave	Crest-stage gage
04216400	Tonawanda Creek near Johnsonburg	Crest-stage gage
04216875	Little Tonawanda Creek tributary near Batavia	Crest-stage gage
04217700	Murder Creek at Pembroke	Crest-stage gage
04219645	Fourmile Creek near Youngstown	Crest-stage gage
04219738	Eighteenmile Creek tributary near Lockport	Crest-stage gage
04219900	Johnson Creek near Lyndonville	Crest-stage gage
04219922	Oak Orchard Creek at Barrville Road near Elba	Crest-stage gage
04220245	West Creek near Hamlin	Crest-stage gage
04221769	Black Creek at Hyder Flats Road at Black Creek	Crest-stage gage
04222600	Wiscoy Creek at Bliss	Crest-stage gage
04224000	Mount Morris Lake near Mount Morris	Stage only
04224700	Sugar Creek near Ossian	Crest-stage gage
04224807	Stony Brook tributary at South Dansville	Crest-stage gage
04224900	Mill Creek at Patchinville	Crest-stage gage
04227980	Conesus Lake near Lakeville	Stage only
04228845	Honeoye Lake near Honeoye	Stage only
04230650	Genesee River at Ballantyne Bridge near Mortimer	Stage only
04231040	Hotel Creek at Griffin Road near Churchville	Crest-stage gage
04232000	Genesee River at Rochester	Stage only

Table 6.--Dummy stations used in the New York "Traveling Hydrographer" program (continued).

Station number	Station name	Type of site
04232052	Mill Creek tributary near Webster	Crest-stage gage
04232057	Bear Creek at Ontario	Crest-stage gage
04232071	Second Creek tributary at Alton	Crest-stage gage
04232087	Red Creek tributary No. 16 near Red Creek	Crest-stage gage
04232400	Seneca Lake at Watkins Glen	Stage only
04232450	Keuka Inlet (Keuka Lake) at Hammondsport	Stage only
04232460	Sugar Creek at Guyanoga	Crest-stage gage
04232630	Kendig Creek near MacDougall	Crest-stage gage
04233255	Cayuga Inlet at Ithaca	Crest-stage gage
04233258	Coy Glen Creek at mouth at Ithaca	Crest-stage gage
04233310	Sixmile Creek near Ithaca	Crest-stage gage
04233500	Cayuga Inlet (Cayuga Lake) at Ithaca	Stage only
04233676	Virgil Creek at Mill Street, Dryden	Crest-stage gage
04233700	Virgil Creek at Freeville	Crest-stage gage
04234020	Cayuga Lake tributary No. 8 near Jacksonville	Crest-stage gage
04234058	Yawger Creek tributary near Auburn	Crest-stage gage
04234138	Schaeffer Creek near Canandaigua	Crest-stage gage
04234200	Mud Creek at East Victor	Crest-stage gage
04234363	Marbletown Creek tributary near Newark	Crest-stage gage
04234500	Canandaigua Lake at Canandaigua	Stage only
04235255	Canandaigua Outlet tributary near Alloway	Crest-stage gage
04235276	Black Brook at Tyre	Crest-stage gage
04235396	Owasco Lake near Auburn	Stage only
04238500	Onondaga Reservoir near Nedrow	Stage only
04240495	Onondaga Lake at Liverpool	Stage only
04242795	Canada Creek tributary near Lee Center	Crest-stage gage
04245840	Scriba Creek near Constantia	Crest-stage gage
04249050	Catfish Creek near New Haven	Crest-stage gage
04249067	North Branch Grindstone Creek near Altmar	Crest-stage gage
04253715	Moss Lake tributary near Eagle Bay	Miscellaneous site
04256040	Mill Creek tributary near Lowville	Crest-stage gage
04256500	Stillwater Reservoir near Beaver River	Stage only
04257000	Beaver River below Stillwater Dam near Beaver River	Temporary stream gage
04258700	Deer River at Deer River	Crest-stage gage
04260575	Horse Creek tributary near Dexter	Crest-stage gage
04263445	Birch Creek at Pierces Corners	Crest-stage gage
04264050	St. Lawrence River near Waddington	Stage only
04264300	Brandy Brook near Waddington	Crest-stage gage
04264331	St. Lawrence River near Massena	NASQAN
04265100	Elm Creek near Hermon	Crest-stage gage
04267800	Trout Brook at Allen Corners	Crest-stage gage
04268200	Plum Brook at Grantville	Crest-stage gage
04268720	Hopkinton Brook at Hopkinton	Crest-stage gage
04268800	West Branch St. Regis River near Parishville	Crest-stage gage
04269050	Allen Brook near Brasher Falls	Crest-stage gage
04269100	Lawrence Brook near Moira	Crest-stage gage
04270100	West Branch Deer Creek at Fort Covington Center	Crest-stage gage
04270150	East Branch Deer Creek at Fort Covington Center	Crest-stage gage
04270162	East Branch Little Salmon River near Skerry	Crest-stage gage
04270700	Trout River at Trout River	Crest-stage gage

Table 6.--Dummy stations used in the New York "Traveling Hydrographer" program (continued).

Station number	Station name	Type of site
04273700	Salmon River at South Plattsburgh	Crest-stage gage
04274000	West Branch Ausable River near Lake Placid	Crest-stage gage
04278000	Lake George at Rogers Rock	Stage only
04295000	Richelieu River at Rouses Point	Water-quality site
A-636	Albany County at S.U.N.Y. at Albany	Ground-water well
A-637	Albany County in Guilderland	Ground-water well
BM-100	Broome County at Binghamton	Ground-water well
BM-121	Broome County at Johnson City	Ground-water well
CM-46	Chemung County near Horseheads	Ground-water well
CN-12	Chenango County near Bainbridge	Ground-water well
CT-121	Cattaraugus County near Red House	Ground-water well
CU-104	Chautauqua County near Poland Center	Ground-water well
CU-5	Chautauqua County near Panama	Ground-water well
D-492	Delaware County near Walton	Ground-water well
DU-321	Dutchess County near Hyde Park	Ground-water well
GS-2	Genesee County near Pavilion	Ground-water well
H-3	Hamilton County near Griffin	Ground-water well
M-178	Madison County at Valley Mills	Ground-water well
MT-1	Montgomery County, St. Johnsville	Ground-water well
NI-69	Niagara County at Niagara Falls	Ground-water well
NI-70	Niagara County near Ransomville	Ground-water well
O-104	Orange County near Chester	Ground-water well
OE-766	Oneida County near Hawkinsville	Ground-water well
OG-23	Otsego County near Hartwick	Ground-water well
OT-900	Ontario County near Manchester	Ground-water well
RE-700	Rensselaer County near Defreestville	Ground-water well
RE-702	Rensselaer County near Brookview	Ground-water well
RE-703	Rensselaer County at East Greenbush	Ground-water well
SA-1072	Saratoga County, Saratoga Battlefield	Ground-water well
SA-1100	Saratoga County at Clifton Park	Ground-water well
SA-529	Saratoga County, Saratoga Springs	Ground-water well
SB-472	Steuben County near Kanona	Ground-water well
SN-363	Schenectady County in Schenectady	Ground-water well
ST-40	St. Lawrence County near Brasher Falls	Ground-water well
U-405	Ulster County at Tillson	Ground-water well
W-264	Washington County in Salem	Ground-water well
W-533	Washington County in Salem	Ground-water well
WE-3	Westchester County near Yorktown Heights	Ground-water well
WO-4	Wyoming County near Gainesville	Ground-water well

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983.

Route number	Station identification number				
1	01496500	01500000	01500500	01502000	01502500
	01505000	01496370	01497805	01499500	01501015
	01501140	01502701	01502714	01503960	01503980
	01505017	CN-12	OG-23		
2	01508803	01509000	01510000	01508946	01510610
3	01512500	01511000	01511500		
4	01503000	01513500	01513712	BM-100	BM-121
5	04232100	04235250	04232071	04232087	04234058
	04234363	04235255	04235276		
6	04235000	04235500	04240180	04232630	04234020
	04234138	04234500	04235396		
7	01530500	01531000	CM-46		
8	01515000	04233000	01514000		
9	04234000	04233255	04233258	04233310	04233500
	04233676	04233700			
10	01521500	01523500	01524500	01528000	01529500
	04221000	04224775	04224807	01521000	01521596
	01523000	01525500	01527000	04221769	04224700
	04224900	04232450	SB-472		
11	04232482	04232400	04232460		
12	01520500	01526500	01529950	01530301	
13	03011020	03013000	03014500	04213500	03010734
	03010743	03010800	03011000	03013800	03013946
	04213399	04213490	CU-5	CU-104	CT-121
14	04214500	04215000	04215500	04216200	04217750
	04218000	04218518	04214040	04214410	04219645
	04219738	NI-69	NI-70		
15	04216418	04216500	04217000	04217500	04219000
	04223000	04227000	04227500	04228500	04229500
	04230380	04230500	04231000	04232000	04216400
	04216875	04217700	04219900	04219922	04220245
	04222600	04224000	04227980	04238500	04230650
	04231040	04232000	04232052	04232057	04234200
	GS-2	OT-900	WO-4		
16	04237500	04239000	04240010	04240100	04240105
	04240120	04240300	04242500	04243500	04245000
	04245200	04245236	04246500	04249000	04238500
	04240495	04245840	04249050	04249067	M-178
17	01496501	01500000	01500501	01502001	01502501
	01505001	01496370	01497805	01499500	01501015
	01501140	01502701	01502714	01503960	01503980
	01505017				
18	01496500	01500000	01500500	01502000	01502500
	01505000	01496370	01497805	01499500	01501015
	01501140	01502701	01502714	01503960	01503980
	01505017				
19	01496500	01500000	01500500	01502000	01502500
	01505000	01499500			

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
20	01508803	01509001	01510001	01508946	01510610
21	01508804	01509001	01510001	01508946	01510610
22	01508803	01509000	01510000		
23	01512501	01511000	01511500		
24	01512500	01511000			
25	01503001	01513500	01513712	BM-100	BM-121
26	01503000	BM-100	BM-121		
27	04232101	04235251	04232071	04232087	04234058
	04234363	04235255	04235276		
28	04232100	04235250			
29	04235001	04235500	04240181	04232630	04234020
	04234138	04234500	04235396		
30	04235000	04235500	04240180	04234500	04235396
31	01530501	01531001	CM-46		
32	01515001	04233001	01514000		
33	01515000	04233000			
34	04234001	04233255	04233258	04233310	04233500
	04233676	04233700			
35	04234000	04233500			
36	01521501	01523501	01524501	01528001	01529501
	04221001	04224776	04224807	01521000	01521596
	01523000	01525500	01527000	04221769	04224700
	04224900	04232450	SB-472		
37	01521500	01523500	01524500	01528000	01529500
	04221000	04224775	01521000	01523000	04232450
	SB-472				
38	04232482	04232400			
39	01520501	01526501	01529951	01530301	
40	01520500	01526500	01529950		
41	03011021	03013000	03014500	04213501	03010734
	03010743	03010800	03011000	03013800	03013946
	04213399	04213490	CU-104		
42	03011021	03013001	03014500	04213501	03010734
	03010743	03010800	03011000	03013800	03013946
	04213399	04213490	CU-104		
43	03011020	03013000	03014500	04213500	03010734
	03010743	03010800	03011000	03013800	03013946
	04213399	04213490	CU-104		
44	03011020	03013000	03014500	04213500	03013946
	CU-104				

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
45	04214501	04215001	04215501	04216200	04217751
	04218001	04218519	04214040	04214410	04219645
	04219738				
46	04214500	04215000	04215500	04216200	04217750
	04218000	04218518	04214040	04214410	04219645
	04219738				
47	04214500	04215000	04215500	04216200	04217750
	04218000	04218518			
48	04216418	04216500	04217000	04217500	04219001
	04223000	04227000	04227500	04228500	04229500
	04230380	04230500	04231000	04232000	04216400
	04216875	04217700	04219900	04219922	04220245
	04222600	04224000	04227980	04228845	04230650
	04231040	04232000	04232052	04232057	04234200
	GS-2				
49	04216419	04216501	04217000	04217501	04219001
	04223001	04227001	04227501	04228501	04229501
	04230381	04230500	04231001	04232000	04216400
	04216875	04217700	04219900	04219922	04220245
	04222600	04224000	04227980	04228845	04230650
	04231040	04232000	04232052	04232057	04234200
	GS-2				
50	04216419	04216501	04217001	04217501	04219001
	04223001	04227001	04227501	04228501	04229501
	04230381	04230501	04231001	04232000	04216400
	04216875	04217700	04219900	04219922	04220245
	04222600	04224000	04227980	04228845	04230650
	04231040	04232000	04232052	04232057	04234200
	GS-2				
51	04216418	04216500	04217000	04217500	04219000
	04223000	04227000	04227500	04228500	04229500
	04230380	04230500	04231000	04232000	04224000
	04227980	04228845	04230650	04232000	WO-4
52	04237500	04239000	04240010	04240100	04240105
	04240120	04240300	04242500	04243500	04245000
	04245200	04245236	04246501	04249000	04238500
	04240495	04245840	04249050	04249067	M-178
53	04237500	04239000	04240010	04240100	04240105
	04240120	04240300	04242501	04243501	04245000
	04245200	04245236	04246501	04249000	04238500
	04240495	04245840	04249050	04249067	M-178
54	04237500	04239001	04240010	04240100	04240105
	04240120	04240300	04242501	04243501	04245001
	04245201	04245237	04246501	04249000	04238500
	04240495	04245840	04249050	04249067	M-178
55	04237500	04239000	04240010	04240100	04240105
	04240120	04240300	04242500	04243500	04245000
	04245200	04245236	04246501	04249000	04238500
	04240495	M-178			
56	01500000				
57	01510000				

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
58	01521500				
59	04232482				
60	01530500	01531000			
61	04237500	04239000	04240010	04240100	04240105
	04240120	04240300	04242500	04243500	04245000
	04245200	04245236	04246500	04249000	
62	04235000	04235500	04240180		
63	04214500	04215000	04215500		
64	01521500	01523500	01524500	01528000	01529500
	04221000	04224775			
65	04216500	04217000	04217500	04223000	04227000
	04227500	04228500	04229500	04230380	04230500
	04231000				
66	03011020	03013000	03014500	04213500	
67	04216418	04216500	04217000	04217500	04219000
	04223000	04227000	04227500	04228500	04229500
	04230380	04230500	04231000	04232000	
68	04239000	04240100	04240105	04240120	04242500
	04243500	04245000	04245200	04245236	
69	01500000	01500500	01502000	01502500	
70	04237500	04239000	04240010	04240100	04240105
	04240120	04240300	04242500	04243500	04245000
	04245200	04245236	04246501	04249000	
71	04266500	04274000	04275000	04273700	04273500
	04295000	04270510			
72	04266500	04274000	04275001	04273700	04273500
	04295000	04270511			
73	04257000	04256500	04253715	OE-766	04252500
	04242795	01336000	04256000	04256040	04258700
74	04257000	04256500	04253715	OE-766	04252501
	04242795	01336000	04256001	04256040	04258700
75	01312000				
76	04250750	04260500	04260575	04263445	
77	04250751	04260500	04260575	04263445	
78	04262500	04258000			
79	04262501	04258000			
80	04265100	04263000	04264050	04264300	04267800
81	04265100	04263001	04264050	04264300	04267800
82	04268000				
83	04268001				

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
84	04267500	04268800	04268720		
85	04269000	04270200	04270100	04270150	04270700
	04270162	04269100	04269050	ST-40	
86	04269001	04270201	04270100	04270150	04270700
	04270162	04269100	04269050	ST-40	
87	04264331	04268200			
88	01413500	01414500	01415000	D-492	01423000
	01425000	01426500	01427207	01421000	01420500
	01417500	01417185	01417000		
89	01413501	01414501	01415001	D-492	01423001
	01425000	01426501	01427207	01421001	01420501
	01417501	01417185	01417000		
90	01361245	01362100	01199477	DU-321	01372500
	01374250	01374130	01375000	WE-3	01376420
	01300000	01300800	01300500	01301000	01301500
	01302000	01376500	01376800	01387420	01387450
	01387400	01387410	01373690	0-104	01371500
91	01361245	01362100	01199477	DU-321	01372501
	01374250	01374130	01375000	WE-3	01376420
	01300000	01300800	01300500	01301000	01301500
	01302000	01376500	01376800	01387420	01387450
	01387400	01387410	01373690	0-104	01371501
92	01365500	01365000	01436500	01436000	01435000
	01434025	01434008	01434029	01427510	01428500
	01432160	01432805	01433500	01434000	01437500
	01437345	U-405			
93	01365501	01365000	01436501	01436000	01435001
	01434025	01434008	01434029	01427511	01428501
	01432160	01432805	01433500	01434000	01437501
	01437345	U-405			
94	01361453	01350355	01350200	01350180	01350140
	01350120	01350101	01350100	01349850	01350000
	01362197	01362198	01362500	01363388	01367500
	01364500	01361900			
95	01361453	01350356	01350201	01350180	01350141
	01350121	01350102	01350100	01349850	01350001
	01362197	01362199	01362501	01363388	01367501
	01364501	01361900			
96	01329780	01318500	01325000	01323500	01343900
	04278300	04278000	01315500	01314500	01315000
	01319950	01321000	H-3	01319800	01348420
	01349360	MT-1	01349000	01348000	01347000
	01346820	01342730	01346000	01347460	
97	01329780	01318500	01325000	01323500	01343900
	04278301	04278000	01315501	01314500	01315000
	01319950	01321001	H-3	01319800	01348420
	01349360	MT-1	01349001	01348000	01347000
	01346820	01342730	01346000	01347460	

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
98	01335754	01357500	01358000	01359750	SA-1100
	RE-702	RE-703	RE-700	A-636	A-637
	01359133	01359528			
99	01335754	01357500	01358000	01359751	SA-1100
	RE-702	RE-703	RE-700	A-636	A-637
	01359133	01359528			
100	01350900	01351500	01354200	01354300	SN-363
	01355405				
101	01350900	01351501	01354200	01354300	SN-363
	01355405				
102	01331095	01330880	SA-1072	01327750	01329154
	W-264	W-533	SA-529		
103	01333367	01333500	01334500	01330500	01329900
104	01333367	01333501	01334501	01330501	01329900
105	01303500	01303000	01302500		
106	01309500	01309990	01309950		
107	01310500	01311000	01311500		
108	01304000	01305500			
109	01305000	01304500			
110	01306440	01306460	01306495		
111	01308000	01308500	01306499		
112	01347000				
113	04256500	04257000	04253715	OE-766	04252500
	04256000	04256040	04258700		
114	04256500	04257000	04253715	OE-766	04252501
	04256001	04256040	04258700		
115	04278300	04278000	01314500	01315000	01315500
	01318500	01325000	01323500		
116	04278301	04278000	01314500	01315000	01315501
	01318500	01325000	01323500		
117	01321000	H-3	01319950	01319800	01347460
	01342730	01343900	01346000	01347000	01346820
	01348000	MT-1	01349000	01349360	01348420
118	01321001	H-3	01319950	01319800	01347460
	01342730	01343900	01346000	01347000	01346820
	01348000	MT-1	01349001	01349360	01348420
119	01359750	RE-702	RE-703	01359528	01359133
	RE-700	01358000			
120	01359751	RE-702	RE-703	01359528	01359133
	RE-700	01358000			

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
121	SA-529	01329780	01330500	01329900	01355405
122	SA-529	01329780	01330501	01329900	01355405
123	01354200	SN-363	01354300	01351500	01350900
	A-637	A-636			
124	01354200	SN-363	01354300	01351501	01350900
	A-637	A-636			
125	01357500	SA-1100			
126	01327750	SA-1072	01330880	01331095	01335754
127	01333367	01333500	01334500	01329154	W-533
	W-264				
128	01333367	01333501	01334501	01329154	W-533
	W-264				
129	01361453	01350355	01350200	01350180	01350140
	01350120	01350101	01350100	01350000	01362197
	01362198	01349850	01361900		
130	01361453	01350356	01350201	01350180	01350141
	01350121	01350102	01350100	01350001	01362197
	01362199	01349850	01361900		
131	01362500	01365000	01434025	01434029	01434008
	01435000	01436500	01365500	01436000	01363388
132	01362501	01365000	01434025	01434029	01434008
	01435001	01436501	01365501	01436000	01363388
133	01361245	01362100	01199477	DU-321	01372500
	01374250	01374130	WE-3	01375000	01376420
	01300000	01300500	01301000	01300800	01301500
	01302000	01376500	01376800	01387450	01387420
	01387410	01387400	01373690	O-104	
134	01361245	01362100	01199477	DU-321	01372501
	01374250	01374130	WE-3	01375000	01376420
	01300000	01300500	01301000	01300800	01301500
	01302000	01376500	01376800	01387450	01387420
	01387410	01387400	01373690	O-104	
135	01364500	01367500	U-405	01371500	01434000
	01433500	01432805	01432160	01428500	01427510
	01437500	01437345			
136	01364501	01367501	U-405	01371501	01434000
	01433500	01432805	01432160	01428501	01427511
	01437501	01437345			
137	01361900	01349850	01362198	01362197	01413500
	01414500	01415000	01417185	01417000	01417500
	01420500	01421000	01427207	01426500	01425000
	01423000	D-492	01350000	01350100	01350101
	01350120	01350140	01350180	01350200	01361453
	01350355				
138	01361900	01349850	01362199	01362197	01413501
	01414501	01415001	01417185	01417000	01417501
	01420501	01421001	01427207	01426501	01425000
	01423001	D-492	01350001	01350100	01350102
	01350121	01350141	01350180	01350201	01361453
	01350356				

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number			
139	01361245	01362100	01199477	DU-321	01372500
	01374250	01374130	01373690	O-104	01437345
	01437500	01434000	01433500	01432805	01432160
	01428500	01427510	01436000	01434025	01435000
	01365000	01365500	01436500	01371500	01367500
	01363388	01362500	01364500		
140	01361245	01362100	01199477	DU-321	01372501
	01374250	01374130	01373690	O-104	01437345
	01437501	01434000	01433500	01432805	01432160
	01428501	01427511	01436000	01434025	01435001
	01365000	01365501	01436501	01371501	01367501
	01363388	01362501	01364501		
141	01361900	01362500	01363388	01362198	01362197
	01413500	01414500	01415000	01350000	01349850
	01350100	01350101	01350120	01350140	01350180
	01350200	01350355	01361453		
142	01361900	01362501	01363388	01362199	01362197
	01413501	01414501	01415001	01350001	01349850
	01350100	01350102	01350121	01350141	01350180
	01350201	01350356	01361453		
143	01362500	01363388	01362198	01362197	01434025
	01435000	01434008	01436000	01365000	01365500
	01436500				
144	01362501	01363388	01362199	01362197	01434025
	01435001	01434008	01436000	01365000	01365501
	01436501				
145	01361245	01362100	01199477	DU-321	01372500
	01374130	01374250	WE-3	01375000	01376420
	01300000	01300500	01301000	01300800	01301500
	01302000	01376500	01376800	01387450	01387420
	01387410	01387400	01373690	O-104	U-405
	01371500	01367500	01364500		
146	01361245	01362100	01199477	DU-321	01372501
	01374130	01374250	WE-3	01375000	01376420
	01300000	01300500	01301000	01300800	01301500
	01302000	01376500	01376800	01387450	01387420
	01387410	01387400	01373690	O-104	U-405
	01371501	01367501	01364501		
147	01437345	01437500	01434000	01432805	01433500
	01432160	01428500	01427510	01427207	01426500
	01425000	01423000	D-492	01417000	01417185
	01417500	01421000	01420500		
148	01437345	01437501	01434000	01432805	01433500
	01432160	01428501	01427511	01427207	01426501
	01425000	01423001	D-492	01417000	01417185
	01417501	01421001	01420501		
149	01361900	01349850	01413500	01414500	01415000
	01350000	01350100	01350120	01350101	01350200
	01350140	01350180	01350355	01361453	01351500
150	01361900	01349850	01413501	01414501	01415001
	01350001	01350100	01350121	01350102	01350201
	01350141	01350180	01350356	01361453	01351501

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
151	01361245	01362100	01199477	DU-321	01372500
	01374250	01374130	01376800	01387450	01387410
	01387400	01387420	01373690	01427510	01428500
	01432160	01432805	01433500	01434000	01437500
	01437345	O-104	01371500		
152	01361245	01362100	01199477	DU-321	01372501
	01374250	01374130	01376800	01387450	01387410
	01387400	01387420	01373690	01427511	01428501
	01432160	01432805	01433500	01434000	01437501
	01437345	O-104	01371501		
153	01423000	D-492	01425000	01427207	01426500
	01421000	01417500	01417000	01417185	01420500
	01434025	01434008	01435000	01436000	01365500
	01365000	01436500			
154	01423001	D-492	01425000	01427207	01426501
	01421001	01417501	01417000	01417185	01420501
	01434025	01434008	01435001	01436000	01365501
	01365000	01436501			
155	01329780	01318500	01325000	01323500	04278300
	04278000	01315500	01314500	01315000	01321000
	H-3	01319800	01348420	01349360	01349000
	01348000	01347000	01342730	01346000	01347460
156	01329780	01318500	01325000	01323500	04278301
	04278000	01315501	01314500	01315000	01321001
	H-3	01319800	01348420	01349360	01349001
	01348000	01347000	01342730	01346000	01347460
157	01361453	01350355	01350180	01350200	01350140
	01350120	01350101	01350100	01349850	01350000
	01414500	01415000	01413500	01362197	01362198
	01362500	01363388	01367500	01364500	01361900
158	01361453	01350356	01350180	01350201	01350141
	01350121	01350102	01350100	01349850	01350001
	01414501	01415001	01413501	01362197	01362199
	01362501	01363388	01367501	01364501	01361900
159	01361245	01362100	01199477	DU-321	01372500
	01374250	01374130	WE-3	01375000	01376420
	01300000	01301000	01300500	01300800	01301500
	01302000	01376500	01376800	01387450	01387410
	01387420	01387400	01373690	O-104	U-405
	01371500	01367500	01362500	01363388	01364500
160	01361245	01362100	01199477	DU-321	01372501
	01374250	01374130	WE-3	01375000	01376420
	01300000	01301000	01300500	01300800	01301500
	01302000	01376500	01376800	01387450	01387410
	01387420	01387400	01373690	O-104	U-405
	01371501	01367501	01362501	01363388	01364501
161	01329780	01318500	01325000	01323500	04278300
	04278000	01318500	01315000	01314500	01325000
	H-3	01319800	01348420	01349360	01349000
	01348000	01347000	01346820	01346000	01347460
	01350355	01350180	01350200	01361453	

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
162	01329780	01318500	01325000	01323500	04278301
	04278000	01318500	01315000	01314500	01325000
	H-3	01319800	01348420	01349360	01349001
	01348000	01347000	01346820	01346000	01347460
	01350356	01350180	01350201	01361453	
163	01350140	01350120	01350101	01350100	01349850
	01350000	01362198	01362197	01414500	01415000
	01413500	01434025	01434008	01435000	01436000
	01436500	01365500	01365000	01361900	
164	01350141	01350121	01350102	01350100	01349850
	01350001	01362199	01362197	01414501	01415001
	01413501	01434025	01434008	01435001	01436000
	01436501	01365501	01365000	01361900	
165	01423000	D-492	01425000	01426500	01427207
	01421000	01417500	01417000	01417185	01420500
	01427510	01428500	01432160	01432805	01433500
	01434000	01437500	01437345		
166	01423001	D-492	01425000	01426501	01427207
	01421001	01417501	01417000	01417185	01420501
	01427511	01428501	01432160	01432805	01433500
	01434000	01437501	01437345		
167	01365000	01365500	01434025	01434029	01434008
	01435000	01436000	01436500	01420500	01417500
	01421000	01427207	01426500	01425000	01423000
	D-492	01417185	01417000		
168	01365000	01365501	01434025	01434029	01434008
	01435001	01436000	01436501	01420501	01417501
	01421001	01427207	01426501	01425000	01423001
	D-492	01417185	01417000		
169	01361245	01362100	01199477	DU-321	01372500
	01374250	01374130	01373690	01387400	01387410
	01387420	01387450	01376800	O-104	01427510
	01428500	01432160	01432805	01433500	01434000
	01437500	01437345	01371500	U-405	01367500
	01364500				
170	01361245	01362100	01199477	DU-321	01372501
	01374250	01374130	01373690	01387400	01387410
	01387420	01387450	01376800	O-104	01427511
	01428501	01432160	01432805	01433500	01434000
	01437501	01437345	01371501	U-405	01367501
	01364501				
171	04270200				
172	04270201				
173	04256000				
174	04256001				
175	01330500	01357500			
176	01330501	01357500			
177	01334500	01333500	01359750		

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
178	01334501	01333501	01359751		
179	04278300				
180	04278301				
181	01349000	01348000	01351500		
182	01349001	01348000	01351501		
183	01364500	01367500	01365000	01365500	01436000
	01436500	01387400	01387450	01387420	01301500
	01301000	01300500	01300000	01375000	
184	01364501	01367501	01365000	01365501	01436000
	01436501	01387400	01387450	01387420	01301500
	01301000	01300500	01300000	01375000	
185	01350355	01350200	01350180	01350140	01350120
	01350101	01350000	01362198	01414500	01415000
	01417500	01427510	01428500		
186	01350356	01350201	01350180	01350141	01350121
	01350102	01350001	01362199	01414501	01415001
	01417501	01427511	01428501		
187	01309950	01309990	01309500	01308000	01308500
	01306499	01306495	01306460	01306440	01305500
	01305000	01304500	01304000	01303500	01303000
	01302500				
188	01304000	01305500			
189	01304000	01305000			
190	01304000	01304500			
191	01305000	01305500			
192	01306499	01306495			
193	01306499	01306495	01306460		
194	01309500	01308000	01308500		
195	01311000				
196	01311500				
197	01310500				
198	01309990				
199	04266500	04275000	04273500	04270510	
200	04266500	04275001	04273500	04270511	
201	04252500	04256000			
202	04252501	04256001			
203	04250750	04260500			
204	04250751	04260500			

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
205	04262500	04258000			
206	04262501	04258000			
207	04263000				
208	04263001				
209	04267500				
210	04269000	04270200			
211	04269001	04270201			
212	01413500	01414500	01415000	01423000	01425000
	01426500	01421000	01420500	01417500	01417000
213	01413501	01414501	01415001	01423001	01425000
	01426501	01421001	01420501	01417501	01417000
214	01372500	01375000	01300000	01300500	01301000
	01301500	01302000	01376500	01376800	01387420
	01387450	01387400	01371500		
215	01372501	01375000	01300000	01300500	01301000
	01301500	01302000	01376500	01376800	01387420
	01387450	01387400	01371501		
216	01365500	01365000	01436500	01436000	01435000
	01427510	01428500	01433500	01434000	01437500
217	01365501	01365000	01436501	01436000	01435001
	01427511	01428501	01433500	01434000	01437501
218	01350355	01350200	01350180	01350140	01350120
	01350101	01350000	01362198	01362500	01367500
	01364500				
219	01350356	01350201	01350180	01350141	01350121
	01350102	01350001	01362199	01362501	01367501
	01364501				
220	01318500	01325000	04278300	01315500	01315000
	01321000	01349000	01348000	01346000	
221	01318500	01325000	04278301	01315501	01315000
	01321001	01349001	01348000	01346000	
222	01357500	01359750			
223	01357500	01359751			
224	01351500				
225	01351501				
226	01327750				
227	01333500	01334500			
228	01333501	01334501			
229	04252500	04256000			

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
230	04252501	04256001			
231	04278300	01315000	01315500	01318500	01325000
232	04278301	01315000	01315501	01318500	01325000
233	01321000	01346000	01348000	01349000	
234	01321001	01346000	01348000	01349001	
235	01359750				
236	01359751				
237	01330500				
238	01330501				
239	01351500				
240	01351501				
241	01357500				
242	01327750				
243	01333500	01334500			
244	01333501	01334501			
245	01350355	01350200	01350180	01350140	01350120
	01350101	01350000	01362198		
246	01350356	01350201	01350180	01350141	01350121
	01350102	01350001	01362199		
247	01362500	01365000	01435000	01436500	01365500
	01436000				
248	01362501	01365000	01435001	01436501	01365501
	01436000				
249	01372500	01375000	01300000	01300500	01301000
	01301500	01302000	01376500	01376800	01387450
	01387420	01387400			
250	01372501	01375000	01300000	01300500	01301000
	01301500	01302000	01376500	01376800	01387450
	01387420	01387400			
251	01364500	01367500	01371500	01434000	01433500
	01428500	01427510	01437500		
252	01364501	01367501	01371501	01434000	01433500
	01428501	01427511	01437501		
253	01362198	01413500	01414500	01415000	01417000
	01417500	01420500	01421000	01426500	01425000
	01423000	01350000	01350101	01350120	01350140
	01350180	01350200	01350355		
254	01362199	01413501	01414501	01415001	01417000
	01417501	01420501	01421001	01426501	01425000
	01423001	01350001	01350102	01350121	01350141
	01350180	01350201	01350356		

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
255	01372500	01437500	01434000	01433500	01428500
	01427510	01436000	01435000	01365000	01365500
	01436500	01371500	01367500	01362500	01364500
256	01372501	01437501	01434000	01433500	01428501
	01427511	01436000	01435001	01365000	01365501
	01436501	01371501	01367501	01362501	01364501
257	01362500	01362198	01413500	01414500	01415000
	01350000	01350101	01350120	01350140	01350180
	01350200	01350355			
258	01362501	01362199	01413501	01414501	01415001
	01350001	01350102	01350121	01350141	01350180
	01350201	01350356			
259	01362500	01362198	01435000	01436000	01365000
	01365500	01436500			
260	01362501	01362199	01435001	01436000	01365000
	01365501	01436501			
261	01372500	01375000	01300000	01300500	01301000
	01301500	01302000	01376500	01376800	01387450
	01387420	01387400	01371500	01367500	01364500
262	01372501	01375000	01300000	01300500	01301000
	01301500	01302000	01376500	01376800	01387450
	01387420	01387400	01371501	01367501	01364501
263	01437500	01434000	01433500	01428500	01427510
	01426500	01425000	01423000	01417000	01417500
	01421000	01420500			
264	01437501	01434000	01433500	01428501	01427511
	01426501	01425000	01423001	01417000	01417501
	01421001	01420501			
265	01413500	01414500	01415000	01350000	01350120
	01350101	01350200	01350140	01350180	01350355
	01351500				
266	01413501	01414501	01415001	01350001	01350121
	01350102	01350201	01350141	01350180	01350356
	01351501				
267	01372500	01376800	01387450	01387400	01387420
	01427510	01428500	01433500	01434000	01437500
	01371500				
268	01372501	01376800	01387450	01387400	01387420
	01427511	01428501	01433500	01434000	01437501
	01371501				
269	01423000	01425000	01426500	01421000	01417500
	01417000	01420500	01435000	01436000	01365500
	01365000	01436500			
270	01423001	01425000	01426501	01421001	01417501
	01417000	01420501	01435001	01436000	01365501
	01365000	01436501			
271	01318500	01325000	04278300	01315500	01315000
	01321000	01349000	01348000	01347000	01346000

Table 7.--List of stations that may be visited on routes 1 through 286 in New York, 1983 (continued).

Route number	Station identification number				
272	01318500	01325000	04278301	01315501	01315000
	01321001	01349001	01348000	01347000	01346000
273	01350355	01350180	01350200	01350140	01350120
	01350101	01350000	01414500	01415000	01413500
	01362198	01362500	01367500	01364500	
274	01350356	01350180	01350201	01350141	01350121
	01350102	01350001	01414501	01415001	01413501
	01362199	01362501	01367501	01364501	
275	01372500	01375000	01300000	01301000	01300500
	01301500	01302000	01376500	01376800	01387450
	01387420	01387400	01371500	01367500	01362500
	01364500				
276	01372501	01375000	01300000	01301000	01300500
	01301500	01302000	01376500	01376800	01387450
	01387420	01387400	01371501	01367501	01362501
	01364501				
277	01318500	01325000	04278301	01318500	01315000
	01325000	01349001	01348000	01347000	01346000
	01350356	01350180	01350201		
278	01318500	01325000	04278300	01318500	01315000
	01325000	01349000	01348000	01347000	01346000
	01350355	01350180	01350200		
279	01350140	01350120	01350101	01350000	01362198
	01414500	01415000	01413500	01435000	01436000
	01436500	01365500	01365000		
280	01350141	01350121	01350102	01350001	01362199
	01414501	01415001	01413501	01435001	01436000
	01436501	01365501	01365000		
281	01423000	01425000	01426500	01421000	01417500
	01417000	01420500	01427510	01428500	01433500
	01434000	01437500			
282	01423001	01425000	01426501	01421001	01417501
	01417000	01420501	01427511	01428501	01433500
	01434000	01437501			
283	01365000	01365500	01435000	01436000	01436500
	01420500	01417500	01421000	01426500	01425000
	01423000	01417000			
284	01365000	01365501	01435001	01436000	01436501
	01420501	01417501	01421001	01426501	01425000
	01423001	01417000			
285	01372500	01387400	01387420	01387450	01376800
	01427510	01428500	01433500	01434000	01437500
	01371500	01367500	01364500		
286	01372501	01387400	01387420	01387450	01376800
	01427511	01428501	01433500	01434000	01437501
	01371501	01367501	01364501		

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis.

[a = standard error of instantaneous discharge, in percent
b = equivalent Gaussian spread (EGS)
c = number of visits to site per year]

Station no.		Annual network budget, in millions of 1983 dollars				
		Current operations 1.068	0.970	1.000	1.068	1.200
Average per station[1]		13.4	16.0	13.7	11.4	9.4
01300000	a	7.5	9.0	6.6	5.0	4.6
	b	[5.6]	[6.4]	[5.0]	[3.9]	[3.6]
	c	(9)	(6)	(12)	(22)	(26)
01300500	a	25.1	33.5	20.5	13.7	12.3
	b	[6.2]	[7.4]	[5.5]	[4.2]	[3.9]
	c	(9)	(6)	(12)	(22)	(26)
01301000	a	17.8	22.9	14.9	10.5	9.6
	b	[8.3]	[9.8]	[7.3]	[5.4]	[5.0]
	c	(9)	(6)	(12)	(22)	(26)
01301500	a	27.2	32.5	23.8	17.9	16.4
	b	[22.2]	[25.5]	[19.8]	[15.1]	[13.9]
	c	(9)	(6)	(12)	(22)	(26)
01302000	a	7.0	9.1	7.9	6.2	5.6
	b	[5.6]	[6.9]	[6.1]	[5.0]	[4.5]
	c	(9)	(5)	(7)	(12)	(15)
01302500	a	6.3	11.4	11.4	8.8	5.9
	b	[3.4]	[5.1]	[5.1]	[4.3]	[3.1]
	c	(12)	(4)	(4)	(7)	(16)
01303000	a	2.7	4.1	4.1	3.3	2.4
	b	[1.8]	[2.2]	[2.2]	[2.0]	[1.7]
	c	(12)	(4)	(4)	(7)	(16)
01303500	a	4.9	8.3	8.3	6.4	4.3
	b	[1.8]	[2.2]	[2.2]	[2.1]	[1.7]
	c	(12)	(4)	(4)	(7)	(16)
01304000	a	1.5	2.4	2.4	2.4	1.6
	b	[1.2]	[1.6]	[1.6]	[1.6]	[1.2]
	c	(12)	(4)	(4)	(4)	(10)
01304500	a	3.3	5.0	5.0	5.0	5.0
	b	[2.5]	[3.5]	[3.5]	[3.5]	[3.5]
	c	(12)	(4)	(4)	(4)	(4)
01305000	a	2.0	3.0	3.0	3.0	2.6
	b	[1.7]	[2.4]	[2.4]	[2.4]	[2.1]
	c	(12)	(4)	(4)	(4)	(6)
01305500	a	6.9	9.8	9.8	9.8	6.9
	b	[6.9]	[9.8]	[9.8]	[9.8]	[6.9]
	c	(12)	(4)	(4)	(4)	(12)
01306440	a	6.3	9.3	9.3	8.4	6.4
	b	[4.8]	[5.2]	[5.2]	[5.1]	[4.8]
	c	(12)	(4)	(4)	(5)	(11)

[1] Square root of seasonally averaged station variance.

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars				
		Current operations 1.068	0.970	1.000	1.068	1.200
01306460	a	4.9	6.2	6.2	6.2	4.3
	b	[2.2]	[2.7]	[2.7]	[2.7]	[1.9]
	c	(12)	(8)	(8)	(8)	(15)
01306495	a	4.5	5.4	5.4	5.4	3.9
	b	[2.8]	[3.2]	[3.2]	[3.2]	[2.4]
	c	(12)	(8)	(8)	(8)	(16)
01306499	a	4.1	6.5	6.5	6.6	4.5
	b	[3.9]	[6.3]	[6.3]	[6.3]	[4.2]
	c	(12)	(4)	(4)	(4)	(10)
01308000	a	10.3	11.0	11.0	11.0	10.4
	b	[10.1]	[10.5]	[10.5]	[10.5]	[10.2]
	c	(12)	(4)	(4)	(4)	(9)
01308500	a	3.1	4.8	4.8	4.8	3.5
	b	[2.5]	[3.6]	[3.6]	[3.6]	[2.8]
	c	(12)	(4)	(4)	(4)	(9)
01309500	a	16.5	18.1	16.5	14.0	12.7
	b	[16.4]	[17.9]	[16.4]	[13.9]	[12.6]
	c	(12)	(8)	(12)	(20)	(26)
01309950	a	9.1	16.2	11.2	7.6	6.7
	b	[5.6]	[8.9]	[6.7]	[4.7]	[4.2]
	c	(12)	(4)	(8)	(17)	(22)
01309990	a	10.8	15.5	11.8	9.0	7.3
	b	[4.8]	[6.4]	[5.2]	[4.2]	[3.4]
	c	(12)	(6)	(10)	(17)	(26)
01310500	a	12.3	16.1	10.3	9.9	7.6
	b	[3.4]	[4.1]	[3.0]	[2.9]	[2.4]
	c	(12)	(8)	(16)	(17)	(26)
01311000	a	30.3	27.6	21.8	19.3	19.3
	b	[9.9]	[9.1]	[7.4]	[6.7]	[6.7]
	c	(12)	(14)	(21)	(26)	(26)
01311500	a	23.3	26.8	21.4	19.9	18.9
	b	[16.5]	[17.1]	[16.1]	[15.7]	[15.4]
	c	(12)	(8)	(16)	(21)	(26)
01312000	a	12.4	17.2	14.6	11.3	7.9
	b	[10.2]	[13.1]	[11.7]	[9.4]	[6.7]
	c	(9)	(4)	(6)	(11)	(24)
01315000	a	17.2	22.8	22.8	18.2	13.5
	b	[4.4]	[5.1]	[5.1]	[4.5]	[3.7]
	c	(9)	(5)	(5)	(8)	(15)
01315500	a	8.4	15.3	15.3	9.3	5.8
	b	[2.4]	[3.7]	[3.7]	[2.6]	[1.9]
	c	(7)	(3)	(3)	(6)	(12)
01318500	a	2.0	2.6	2.6	2.1	1.6
	b	[1.4]	[1.6]	[1.6]	[1.5]	[1.2]
	c	(9)	(5)	(5)	(8)	(16)

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars: Current operations 1.068	0.970	1.000	1.068	1.200
01321000	a	5.3	7.5	7.5	6.7	5.7
	b	[3.2]	[3.7]	[3.7]	[3.6]	[3.3]
	c	(7)	(3)	(3)	(4)	(6)
01325000	a	6.7	8.7	8.7	7.0	5.3
	b	[2.8]	[2.9]	[2.9]	[2.8]	[2.7]
	c	(9)	(5)	(5)	(8)	(16)
01327750	a	4.8	6.4	6.4	6.4	5.2
	b	[3.2]	[3.4]	[3.4]	[3.4]	[3.3]
	c	(9)	(4)	(4)	(4)	(7)
01330500	a	10.4	13.9	12.3	10.4	7.1
	b	[3.4]	[4.2]	[3.9]	[3.4]	[2.5]
	c	(7)	(4)	(5)	(7)	(15)
01333500	a	10.8	15.0	11.8	10.0	6.6
	b	[4.1]	[5.2]	[4.4]	[3.9]	[2.7]
	c	(7)	(4)	(6)	(8)	(17)
01334500	a	5.0	6.5	5.4	4.7	3.2
	b	[3.7]	[4.8]	[4.0]	[3.5]	[2.5]
	c	(7)	(4)	(6)	(8)	(17)
01336000	a	5.0	7.2	7.2	7.2	6.5
	b	[2.5]	[3.0]	[3.0]	[3.0]	[2.8]
	c	(9)	(4)	(4)	(4)	(5)
01346000	a	7.5	10.0	10.0	9.1	7.5
	b	[6.2]	[8.3]	[8.3]	[7.6]	[6.2]
	c	(9)	(5)	(5)	(6)	(9)
01347000	a	12.2	12.2	8.0	8.0	5.0
	b	[3.9]	[3.9]	[3.4]	[3.4]	[2.7]
	c	(1)	(1)	(2)	(2)	(5)
01348000	a	10.3	11.8	9.0	7.5	6.5
	b	[3.3]	[3.6]	[2.9]	[2.4]	[2.1]
	c	(9)	(7)	(12)	(17)	(23)
01349000	a	24.7	29.4	21.7	17.3	14.5
	b	[9.8]	[11.8]	[8.6]	[6.8]	[5.7]
	c	(7)	(5)	(9)	(14)	(20)
01350000	a	9.1	9.7	7.1	5.8	5.6
	b	[5.4]	[5.7]	[4.5]	[3.7]	[3.7]
	c	(7)	(6)	(12)	(19)	(20)
01350101	a	49.7	52.8	39.2	31.3	30.5
	b	[48.1]	[51.2]	[37.6]	[29.8]	[29.0]
	c	(7)	(6)	(12)	(19)	(20)
01350120	a	13.8	14.8	10.6	8.5	8.3
	b	[11.0]	[11.8]	[8.5]	[6.8]	[6.6]
	c	(7)	(6)	(12)	(19)	(20)
01350140	a	13.7	14.9	10.4	8.3	8.1
	b	[10.7]	[11.7]	[8.1]	[6.6]	[6.4]
	c	(7)	(6)	(12)	(19)	(20)

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars				
		Current operations 1.068	0.970	1.000	1.068	1.200
01350180	a	30.0	27.7	20.4	16.9	15.7
	b	[14.4]	[15.2]	[11.4]	[9.5]	[8.8]
	c	(9)	(8)	(14)	(20)	(23)
01350200	a	15.5	16.7	11.9	9.7	9.2
	b	[14.5]	[15.6]	[11.1]	[9.0]	[8.6]
	c	(7)	(6)	(12)	(18)	(21)
01350355	a	23.8	25.4	18.7	15.4	14.6
	b	[21.8]	[23.2]	[17.1]	[14.0]	[13.3]
	c	(7)	(6)	(12)	(18)	(21)
01351500	a	12.1	14.3	10.6	8.9	8.0
	b	[4.5]	[5.0]	[4.1]	[3.6]	[3.3]
	c	(7)	(5)	(9)	(13)	(16)
01357500	a	3.2	3.2	3.2	3.2	3.2
	b	[2.2]	[2.2]	[2.2]	[2.2]	[2.2]
	c	(12)	(12)	(12)	(12)	(12)
01359750	a	10.2	18.3	13.1	11.4	7.6
	b	[5.7]	[9.3]	[7.1]	[6.3]	[4.3]
	c	(10)	(3)	(6)	(8)	(18)
01362198	a	29.3	31.6	22.3	17.7	17.2
	b	[28.6]	[30.9]	[21.6]	[17.0]	[16.5]
	c	(7)	(6)	(12)	(19)	(20)
01362500	a	9.8	14.9	12.9	11.6	7.3
	b	[8.5]	[13.1]	[11.3]	[10.1]	[6.3]
	c	(7)	(3)	(4)	(5)	(13)
01364500	a	15.7	21.2	14.6	11.4	9.3
	b	[1.6]	[1.9]	[1.6]	[1.3]	[1.2]
	c	(7)	(4)	(8)	(13)	(19)
01365000	a	29.0	33.9	27.8	22.0	17.9
	b	[27.1]	[30.9]	[26.1]	[20.9]	[17.0]
	c	(9)	(6)	(10)	(17)	(26)
01365500	a	20.7	29.2	19.1	13.3	11.3
	b	[7.0]	[9.8]	[6.5]	[4.6]	[6.2]
	c	(7)	(4)	(8)	(15)	(24)
01367500	a	8.3	10.5	7.9	6.3	5.3
	b	[5.9]	[7.0]	[5.7]	[4.7]	[4.0]
	c	(7)	(4)	(8)	(13)	(19)
01371500	a	7.2	10.5	8.4	7.2	5.9
	b	[4.8]	[6.4]	[5.4]	[4.8]	[4.0]
	c	(7)	(3)	(5)	(7)	(11)
01372500	a	9.0	11.6	9.6	7.3	6.5
	b	[4.4]	[5.0]	[4.6]	[3.8]	[3.5]
	c	(7)	(4)	(6)	(11)	(14)
01375000	a	79.7	86.8	75.4	66.4	63.9
	b	[70.2]	[73.8]	[67.7]	[61.5]	[59.4]
	c	(9)	(6)	(12)	(22)	(26)

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars: Current operations 1.068	0.970	1.000	1.068	1.200
01376500	a	12.2	13.6	12.7	11.7	11.5
	b	[10.5]	[10.6]	[10.5]	[10.4]	[10.4]
	c	(9)	(5)	(7)	(12)	(15)
01376800	a	12.2	15.7	13.7	10.8	9.7
	b	[7.9]	[9.5]	[8.6]	[7.1]	[6.4]
	c	(9)	(5)	(7)	(12)	(15)
01387400	a	7.5	8.7	6.9	6.2	6.0
	b	[6.0]	[6.2]	[5.9]	[5.7]	[5.7]
	c	(9)	(6)	(12)	(22)	(26)
01387420	a	14.4	18.5	12.0	8.5	7.7
	b	[10.3]	[12.1]	[9.1]	[6.8]	[6.3]
	c	(9)	(6)	(12)	(22)	(26)
01387450	a	20.1	23.8	17.6	13.1	12.1
	b	[18.0]	[21.2]	[15.8]	[11.8]	[10.8]
	c	(9)	(6)	(12)	(22)	(26)
01413500	a	14.4	19.2	17.6	14.4	10.6
	b	[14.0]	[18.4]	[17.0]	[14.0]	[10.3]
	c	(7)	(3)	(4)	(7)	(14)
01414500	a	8.6	12.0	10.8	8.7	6.4
	b	[7.0]	[9.1]	[8.4]	[7.0]	[5.3]
	c	(7)	(3)	(4)	(7)	(14)
01415000	a	8.6	12.0	10.8	8.6	6.3
	b	[6.8]	[8.8]	[8.2]	[6.8]	[5.1]
	c	(7)	(3)	(4)	(7)	(14)
01417000	a	9.0	12.0	12.0	11.0	7.8
	b	[3.6]	[4.5]	[4.5]	[4.2]	[3.2]
	c	(9)	(5)	(5)	(6)	(12)
01417500	a	5.6	8.6	8.6	7.4	4.7
	b	[3.0]	[3.9]	[3.9]	[3.6]	[2.6]
	c	(7)	(3)	(3)	(4)	(10)
01420500	a	4.9	7.2	7.2	6.3	4.1
	b	[2.4]	[2.7]	[2.7]	[2.7]	[2.2]
	c	(7)	(3)	(3)	(4)	(10)
01421000	a	10.6	13.7	13.7	12.7	9.3
	b	[9.3]	[11.2]	[11.2]	[10.7]	[8.3]
	c	(7)	(3)	(3)	(4)	(10)
01423000	a	5.1	8.0	8.0	6.9	4.3
	b	[1.5]	[1.9]	[1.9]	[1.8]	[1.3]
	c	(7)	(3)	(3)	(4)	(10)
01425000	a	6.2	7.7	7.7	7.2	5.5
	b	[5.3]	[6.2]	[6.2]	[6.0]	[4.8]
	c	(9)	(5)	(5)	(6)	(12)
01426500	a	4.1	6.1	6.1	5.3	3.5
	b	[2.8]	[3.6]	[3.6]	[3.3]	[2.5]
	c	(7)	(3)	(3)	(4)	(10)

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars				
		Current operations 1.068	0.970	1.000	1.068	1.200
01427510	a	11.8	18.2	18.2	15.7	9.8
	b	[4.8]	[6.7]	[6.7]	[6.0]	[4.2]
	c	(7)	(3)	(3)	(4)	(10)
01428500	a	8.0	11.7	11.7	10.3	6.8
	b	[3.7]	[4.5]	[4.5]	[4.3]	[3.3]
	c	(7)	(3)	(3)	(4)	(10)
01433500	a	7.3	9.8	9.8	8.9	6.4
	b	[2.8]	[3.5]	[3.5]	[3.3]	[2.4]
	c	(9)	(5)	(5)	(6)	(12)
01434000	a	2.9	3.2	3.2	3.1	2.7
	b	[2.9]	[3.2]	[3.2]	[3.1]	[2.7]
	c	(9)	(5)	(5)	(6)	(12)
01435000	a	7.0	10.2	10.2	8.2	5.2
	b	[7.0]	[10.2]	[10.2]	[8.2]	[5.2]
	c	(7)	(3)	(3)	(5)	(13)
01436000	a	14.8	16.7	14.3	11.8	9.8
	b	[13.0]	[14.2]	[12.6]	[10.6]	[8.9]
	c	(9)	(6)	(10)	(17)	(26)
01436500	a	10.3	14.3	9.6	6.8	5.9
	b	[3.7]	[4.4]	[3.5]	[2.7]	[3.4]
	c	(7)	(4)	(8)	(15)	(24)
01437500	a	6.8	9.9	9.9	8.8	5.7
	b	[4.4]	[6.1]	[6.1]	[5.5]	[3.8]
	c	(7)	(3)	(3)	(4)	(10)
01496500	a	7.6	12.3	10.7	8.7	5.7
	b	[3.0]	[4.1]	[3.8]	[3.3]	[2.4]
	c	(8)	(3)	(4)	(6)	(14)
01500000	a	20.2	26.1	22.6	18.4	12.7
	b	[3.1]	[3.9]	[3.5]	[2.9]	[2.0]
	c	(10)	(6)	(8)	(12)	(25)
01500500	a	4.2	7.4	6.2	5.0	3.0
	b	[1.5]	[2.2]	[2.0]	[1.7]	[1.2]
	c	(8)	(3)	(4)	(6)	(15)
01502000	a	9.1	14.2	12.5	10.4	6.7
	b	[6.9]	[10.0]	[9.1]	[7.8]	[5.2]
	c	(8)	(3)	(4)	(6)	(15)
01502500	a	5.6	8.4	7.4	6.3	4.3
	b	[4.4]	[5.6]	[5.3]	[4.8]	[3.5]
	c	(8)	(3)	(4)	(6)	(15)
01503000	a	3.4	6.3	6.3	6.3	5.4
	b	[2.5]	[3.8]	[3.8]	[3.8]	[3.5]
	c	(10)	(3)	(3)	(3)	(4)
01505000	a	11.4	17.2	15.2	12.9	8.8
	b	[9.6]	[13.2]	[12.2]	[10.7]	[7.6]
	c	(8)	(3)	(4)	(6)	(14)

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars				
		Current operations 1.068	0.970	1.000	1.068	1.200
01508803	a	10.8	14.8	13.4	10.8	7.3
	b	[4.7]	[6.1]	[5.6]	[4.7]	[3.3]
	c	(9)	(5)	(6)	(9)	(19)
01509000	a	8.8	11.0	10.3	8.8	6.5
	b	[8.1]	[9.7]	[9.2]	[8.1]	[6.0]
	c	(8)	(4)	(5)	(8)	(18)
01510000	a	9.8	14.3	12.6	9.8	6.4
	b	[6.6]	[9.1]	[8.2]	[6.6]	[4.5]
	c	(8)	(4)	(5)	(8)	(18)
01512500	a	5.7	9.5	9.5	8.2	6.6
	b	[3.2]	[4.2]	[4.2]	[3.9]	[3.5]
	c	(8)	(3)	(3)	(4)	(6)
01515000	a	2.9	4.2	4.2	3.5	2.7
	b	[2.4]	[2.8]	[2.8]	[2.7]	[2.3]
	c	(8)	(3)	(3)	(5)	(10)
01520500	a	5.8	8.6	7.7	6.5	4.8
	b	[5.6]	[7.8]	[7.2]	[6.3]	[4.7]
	c	(8)	(3)	(4)	(6)	(12)
01521500	a	14.8	21.0	18.8	14.8	10.5
	b	[5.5]	[7.3]	[6.7]	[5.5]	[4.0]
	c	(8)	(4)	(5)	(8)	(16)
01523500	a	6.5	9.5	8.4	6.5	4.5
	b	[1.8]	[2.4]	[2.2]	[1.8]	[1.4]
	c	(8)	(4)	(5)	(8)	(16)
01524500	a	9.5	15.3	13.1	9.5	6.2
	b	[2.9]	[3.7]	[3.4]	[2.9]	[2.2]
	c	(8)	(4)	(5)	(8)	(16)
01526500	a	7.5	13.5	11.2	8.8	6.0
	b	[6.2]	[8.2]	[7.7]	[6.8]	[5.3]
	c	(8)	(3)	(4)	(6)	(12)
01528000	a	13.0	17.1	15.7	13.0	9.5
	b	[11.6]	[14.9]	[13.9]	[11.6]	[8.5]
	c	(8)	(4)	(5)	(8)	(16)
01529500	a	9.2	12.3	11.2	9.2	6.7
	b	[8.2]	[10.8]	[10.0]	[8.2]	[6.0]
	c	(8)	(4)	(5)	(8)	(16)
01529950	a	10.3	17.0	14.7	11.9	8.4
	b	[4.2]	[6.2]	[5.6]	[4.7]	[3.5]
	c	(8)	(3)	(4)	(6)	(12)
01530500	a	15.5	17.8	17.8	12.7	9.2
	b	[11.8]	[13.5]	[13.5]	[9.7]	[7.0]
	c	(8)	(6)	(6)	(12)	(23)
01531000	a	13.0	15.0	15.0	10.7	7.7
	b	[9.9]	[11.2]	[11.2]	[8.2]	[6.0]
	c	(8)	(6)	(6)	(12)	(23)

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars				
		Current operations 1.068	0.970	1.000	1.068	1.200
03011020	a	14.7	21.8	21.8	14.7	9.8
	b	[3.3]	[4.1]	[4.1]	[3.3]	[2.5]
	c	(8)	(4)	(4)	(8)	(17)
03013000	a	15.0	19.8	19.8	15.0	10.6
	b	[12.3]	[16.3]	[16.3]	[12.3]	[8.6]
	c	(9)	(5)	(5)	(9)	(18)
03014500	a	9.5	12.1	12.1	9.5	7.0
	b	[3.5]	[4.0]	[4.0]	[3.4]	[2.8]
	c	(10)	(6)	(6)	(10)	(19)
04213500	a	10.6	15.5	15.5	10.6	7.1
	b	[4.8]	[6.7]	[6.7]	[4.8]	[3.4]
	c	(8)	(4)	(4)	(8)	(17)
04214500	a	13.4	18.3	14.6	11.6	7.6
	b	[5.9]	[7.5]	[6.3]	[5.2]	[3.7]
	c	(8)	(5)	(7)	(10)	(20)
04215000	a	18.8	24.8	20.3	16.6	11.3
	b	[4.8]	[6.2]	[5.2]	[4.3]	[3.0]
	c	(8)	(5)	(7)	(10)	(20)
04215500	a	9.5	12.1	10.2	8.5	6.0
	b	[7.6]	[9.5]	[8.1]	[6.8]	[4.9]
	c	(8)	(5)	(7)	(10)	(20)
04216200	a	9.8	11.6	10.4	9.0	6.7
	b	[4.8]	[5.5]	[5.0]	[4.5]	[3.4]
	c	(10)	(7)	(9)	(12)	(22)
04216418	a	10.5	13.0	12.0	9.5	7.3
	b	[3.8]	[4.0]	[3.9]	[3.7]	[3.4]
	c	(8)	(5)	(6)	(10)	(18)
04216500	a	11.9	14.8	13.6	10.7	8.2
	b	[6.0]	[6.7]	[6.4]	[5.6]	[4.6]
	c	(8)	(5)	(6)	(10)	(18)
04217000	a	8.9	11.4	10.3	7.9	5.8
	b	[2.1]	[2.4]	[2.3]	[1.9]	[1.5]
	c	(9)	(6)	(7)	(11)	(19)
04217500	a	13.3	17.9	15.9	11.6	8.2
	b	[5.0]	[6.2]	[5.7]	[4.6]	[3.4]
	c	(8)	(5)	(6)	(10)	(18)
04217750	a	15.2	19.0	16.2	13.6	9.7
	b	[7.4]	[9.1]	[7.8]	[6.7]	[4.8]
	c	(8)	(5)	(7)	(10)	(20)
04218000	a	10.7	13.6	11.5	9.6	6.7
	b	[3.7]	[4.6]	[3.9]	[3.3]	[2.3]
	c	(8)	(5)	(7)	(10)	(20)
04218518	a	21.7	27.4	23.2	19.4	13.7
	b	[7.7]	[9.7]	[8.2]	[6.9]	[4.9]
	c	(8)	(5)	(7)	(10)	(20)

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars: Current operations 1.068	0.970	1.000	1.068	1.200
04219000	a	11.1	10.0	9.2	7.4	5.7
	b	[3.8]	[3.7]	[3.6]	[3.3]	[2.8]
	c	(4)	(5)	(6)	(10)	(18)
04221000	a	9.9	14.3	12.7	9.9	6.9
	b	[2.5]	[3.4]	[3.1]	[2.5]	[1.8]
	c	(8)	(4)	(5)	(8)	(16)
04223000	a	12.8	16.1	14.7	11.4	8.5
	b	[11.9]	[15.0]	[13.8]	[10.6]	[7.9]
	c	(8)	(5)	(6)	(10)	(18)
04224775	a	13.5	18.8	16.9	13.5	9.6
	b	[10.2]	[14.2]	[12.8]	[10.2]	[7.2]
	c	(8)	(4)	(5)	(8)	(16)
04227000	a	6.9	8.5	7.9	6.2	4.7
	b	[4.2]	[5.1]	[4.8]	[3.8]	[3.0]
	c	(8)	(5)	(6)	(10)	(18)
04227500	a	4.8	6.0	5.5	4.3	3.3
	b	[3.6]	[4.3]	[4.0]	[3.3]	[2.5]
	c	(8)	(5)	(6)	(10)	(18)
04228500	a	3.0	3.7	3.4	2.7	2.0
	b	[2.0]	[2.4]	[2.3]	[1.9]	[1.5]
	c	(8)	(5)	(6)	(10)	(18)
04229500	a	13.1	16.5	15.1	11.8	8.8
	b	[6.7]	[8.0]	[7.5]	[6.2]	[4.7]
	c	(8)	(5)	(6)	(10)	(18)
04230380	a	25.2	31.9	29.1	22.5	16.7
	b	[23.4]	[30.0]	[27.2]	[20.7]	[15.2]
	c	(8)	(5)	(6)	(10)	(18)
04230500	a	5.2	5.9	5.6	4.8	3.9
	b	[4.4]	[4.9]	[4.7]	[4.2]	[3.4]
	c	(9)	(6)	(7)	(11)	(19)
04231000	a	12.4	15.6	14.3	11.1	8.3
	b	[7.0]	[8.4]	[7.9]	[6.4]	[4.9]
	c	(8)	(5)	(6)	(10)	(18)
04232000	a	3.3	3.6	3.4	3.1	2.9
	b	[2.6]	[2.6]	[2.6]	[2.5]	[2.5]
	c	(10)	(7)	(8)	(12)	(20)
04232100	a	10.0	12.1	11.2	9.0	6.4
	b	[6.7]	[7.7]	[7.3]	[6.2]	[4.6]
	c	(8)	(5)	(6)	(10)	(21)
04232482	a	21.0	25.0	22.1	17.2	13.0
	b	[9.1]	[11.0]	[9.6]	[7.4]	[5.6]
	c	(10)	(7)	(9)	(15)	(26)
04233000	a	8.8	13.3	13.3	10.7	8.0
	b	[6.0]	[7.6]	[7.6]	[6.8]	[5.6]
	c	(8)	(3)	(3)	(5)	(10)

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars				
		Current operations 1.068	0.970	1.000	1.068	1.200
04234000	a	4.8	7.1	7.1	7.1	5.4
	b	[3.1]	[3.9]	[3.9]	[3.9]	[3.4]
	c	(8)	(3)	(3)	(3)	(6)
04235000	a	12.7	17.1	14.4	11.0	7.9
	b	[2.3]	[3.1]	[2.6]	[2.0]	[1.5]
	c	(9)	(5)	(7)	(12)	(23)
04235250	a	15.4	19.4	17.8	13.8	9.6
	b	[10.3]	[12.7]	[11.8]	[9.2]	[6.4]
	c	(8)	(5)	(6)	(10)	(21)
04235500	a	14.6	18.8	16.3	12.9	9.5
	b	[5.5]	[7.0]	[6.1]	[4.8]	[3.6]
	c	(10)	(6)	(8)	(13)	(24)
04237500	a	7.7	7.7	7.7	7.7	7.2
	b	[6.6]	[6.6]	[6.6]	[6.6]	[6.3]
	c	(10)	(10)	(10)	(10)	(12)
04239000	a	8.4	8.4	8.4	6.9	5.0
	b	[3.8]	[3.8]	[3.8]	[3.2]	[2.4]
	c	(9)	(9)	(9)	(13)	(24)
04240010	a	8.3	8.3	8.3	8.3	7.5
	b	[2.6]	[2.6]	[2.6]	[2.6]	[2.4]
	c	(10)	(10)	(10)	(10)	(12)
04240100	a	16.3	16.3	16.3	13.7	10.2
	b	[8.6]	[8.6]	[8.6]	[7.2]	[5.3]
	c	(10)	(10)	(10)	(14)	(25)
04240105	a	12.9	12.9	12.9	10.7	7.9
	b	[1.2]	[1.2]	[1.2]	[1.0]	[0.8]
	c	(10)	(10)	(10)	(14)	(25)
04240120	a	19.0	19.0	19.0	16.1	12.0
	b	[10.6]	[10.6]	[10.6]	[8.9]	[6.6]
	c	(10)	(10)	(10)	(14)	(25)
04240180	a	12.7	16.4	14.2	11.1	8.1
	b	[10.7]	[13.6]	[11.9]	[9.3]	[6.8]
	c	(9)	(5)	(7)	(12)	(23)
04240300	a	9.7	9.7	9.7	9.7	9.0
	b	[5.1]	[5.1]	[5.1]	[5.1]	[5.0]
	c	(10)	(10)	(10)	(10)	(12)
04242500	a	11.8	11.9	11.9	9.6	6.8
	b	[3.7]	[3.7]	[3.7]	[3.1]	[2.3]
	c	(8)	(8)	(8)	(12)	(23)
04243500	a	10.1	10.1	10.1	8.3	6.0
	b	[6.0]	[6.0]	[6.0]	[5.0]	[3.7]
	c	(8)	(8)	(8)	(12)	(23)
04245000	a	7.9	7.9	7.9	6.7	5.0
	b	[7.0]	[7.0]	[7.0]	[5.9]	[4.4]
	c	(9)	(9)	(9)	(13)	(24)

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars				
		Current operations 1.068	0.970	1.000	1.068	1.200
04245200	a	8.1	8.1	8.1	6.8	5.1
	b	[6.9]	[6.9]	[6.9]	[5.8]	[4.4]
	c	(9)	(9)	(9)	(13)	(24)
04245236	a	26.0	26.0	26.0	21.7	16.0
	b	[20.1]	[20.0]	[20.1]	[16.4]	[11.9]
	c	(9)	(9)	(9)	(13)	(24)
04246500	a	7.1	7.1	7.1	7.1	6.1
	b	[2.0]	[2.0]	[2.0]	[2.0]	[1.9]
	c	(3)	(3)	(3)	(3)	(4)
04246501	a	2.7	2.7	2.7	2.7	2.5
	b	[1.4]	[1.4]	[1.4]	[1.4]	[1.3]
	c	(7)	(7)	(7)	(7)	(8)
04249000	a	1.9	1.9	1.9	1.9	1.8
	b	[1.6]	[1.6]	[1.6]	[1.6]	[1.5]
	c	(10)	(10)	(10)	(10)	(12)
04250750	a	11.4	16.9	16.9	13.3	10.3
	b	[4.3]	[4.6]	[4.6]	[4.4]	[4.2]
	c	(7)	(3)	(3)	(5)	(9)
04252500	a	4.3	6.1	6.1	6.1	5.4
	b	[2.8]	[3.5]	[3.5]	[3.5]	[3.3]
	c	(7)	(3)	(3)	(3)	(4)
04256000	a	5.3	7.8	7.8	7.8	5.7
	b	[3.0]	[4.0]	[4.0]	[4.0]	[3.2]
	c	(7)	(3)	(3)	(3)	(6)
04258000	a	2.6	2.6	2.6	2.6	2.6
	b	[1.6]	[1.6]	[1.6]	[1.6]	[1.6]
	c	(12)	(12)	(12)	(12)	(12)
04260500	a	3.5	4.6	4.6	3.9	3.1
	b	[2.0]	[2.5]	[2.5]	[2.2]	[1.8]
	c	(9)	(5)	(5)	(7)	(11)
04262500	a	4.8	4.8	4.8	4.8	4.8
	b	[3.9]	[3.9]	[3.9]	[3.9]	[3.9]
	c	(10)	(10)	(10)	(10)	(10)
04263000	a	5.6	8.9	8.9	8.9	6.1
	b	[1.9]	[2.3]	[2.3]	[2.3]	[2.0]
	c	(7)	(3)	(3)	(3)	(6)
04266500	a	3.5	4.6	4.6	3.9	3.1
	b	[1.9]	[2.3]	[2.3]	[2.1]	[1.7]
	c	(9)	(5)	(5)	(7)	(12)
04267500	a	5.9	8.8	8.8	7.8	5.3
	b	[2.9]	[3.9]	[3.9]	[3.6]	[2.7]
	c	(9)	(4)	(4)	(5)	(11)
04268000	a	4.9	7.3	7.3	6.4	4.9
	b	[3.2]	[4.1]	[4.1]	[3.8]	[3.2]
	c	(7)	(3)	(3)	(4)	(7)

Table 8.--Standard error of instantaneous discharge, equivalent Gaussian spread, and number of visits per year to gaging stations in New York, 1983, as computed through K-CERA analysis (continued).

Station no.		Annual network budget, in millions of 1983 dollars				
		Current operations 1.068	0.970	1.000	1.068	1.200
04269000	a	11.4	18.5	13.7	11.4	8.5
	b	[3.0]	[3.9]	[3.3]	[3.0]	[2.5]
	c	(7)	(3)	(5)	(7)	(12)
04270200	a	13.0	17.3	14.0	11.4	8.0
	b	[3.0]	[3.8]	[3.2]	[2.7]	[2.0]
	c	(7)	(4)	(6)	(9)	(18)
04270510	a	8.2	12.6	12.6	9.7	6.8
	b	[0.7]	[1.1]	[1.1]	[0.8]	[0.6]
	c	(7)	(3)	(3)	(5)	(10)
04273500	a	4.1	5.2	5.2	4.5	3.7
	b	[2.3]	[2.3]	[2.3]	[2.3]	[2.2]
	c	(9)	(5)	(5)	(7)	(12)
04275000	a	15.8	24.2	24.2	18.7	13.2
	b	[2.9]	[3.7]	[3.7]	[3.2]	[2.5]
	c	(7)	(3)	(3)	(5)	(10)
04278300	a	22.4	26.5	20.9	16.4	13.2
	b	[11.6]	[13.9]	[10.8]	[8.4]	[6.7]
	c	(7)	(5)	(8)	(13)	(20)