A STATISTICAL SUMMARY OF DATA FROM THE U.S. GEOLOGICAL SURVEY'S NATIONAL WATER QUALITY NETWORKS

by Richard A. Smith and Richard B. Alexander

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ABSTRACT

The U.S. Geological Survey operates two nationwide networks to monitor water quality, the National Hydrologic Bench-Mark Network and the National Stream Quality Accounting Network (NASQAN). The Bench-Mark network is composed of 51 stations in small drainage basins which are as close as possible to their natural state, with no human influence and little likelihood of future development. Stations in the NASQAN program are located to monitor flow from accounting units (subregional drainage basins) which collectively encompass the entire land surface of the nation. Data collected at both networks include streamflow, concentrations of major inorganic constituents, nutrients, and trace metals.

The goals of the two water-quality sampling programs include the determination of mean constituent concentrations and transport rates as well as the analysis of long-term trends in those variables. This report presents a station-by-station statistical summary of data from the two networks for the period 1974 through 1981.

INTRODUCTION

The U.S. Geological Survey operates two large networks to monitor water quality in surface waters, the National Hydrologic Bench-Mark Network and the National Stream Quality Accounting Network (NASQAN). Both are nationwide programs for collection and analysis of similar constituents, but were designed with different objectives, as described briefly below. The purpose of this report is to present a station-by-station statistical summary of data collected over a 7-year period from the Bench-Mark and NASQAN networks. Included in the summary are data from stations in operation as of October 1976--a total of 51 Bench-Mark stations and 313 NASQAN stations. The period of summary begins October 1974 (except for 22 NASQAN stations established between that date and October 1976) and ends October 1981.

Hydrologic Bench-Mark stations are located in small drainage basins in a variety of climatic, hydrologic, geologic, and geographic settings. The basins are as close to the natural state as possible with little likelihood of future development within the basin. The need for a network of Bench-Mark stations was pointed out by Leopold (1962): "A recurring question of our times, and one that we anticipate will be increasingly vexing to posterity, is to know how much of the change in our environment is caused by man and how much is natural...changes must be measured relative to some standard base or datum."

Basin selection for the Bench-Mark program was based on the following criteria (Cobb and Biesecker, 1971):

1. No manmade storage, regulation, or diversion currently exists or is probable for many years.

2. Ground water within the basin will not be affected by pumping from wells.

3. Conditions are favorable for accurate measurement of streamflow, chemical and physical quality of water, ground-water conditions, and the various characteristics of weather, principally precipitation.

4. The probability is small of special natural changes due to such things as major activities of beavers, overgrazing or overbrowsing by game animals, or extensive fires.

As originally proposed by Langbein and Hoyt (1959, p.18) and Leopold (1962), the network was to have comprised 100 stations. It has been very difficult to find basins which meet the above criteria and at present, only 51 sites are included in the water-quality component of the Bench-Mark program. The sites are well distributed throughout the United States and represent most of the physiographic divisions described by Fenneman (1928). Natural environments are well represented by the network since elevations within the different basins range from 100 ft. (30 m) to over 14,000 ft. (4,300 m). Vegetation ranges from sparse desert growth to dense coniferous forests.

All of the basins monitored in the Bench-Mark network are relatively small. Thirty-nine of the 51 basins are less than 100 mi^2 (260 km^2) though only 4 are less than 10 mi^2 (26 km^2). The smallest basin, in New Jersey, is 2.31 mi^2

(5.98 km^2) whereas the largest, in Alaska, is 2,006 mi^2 (5,196 km^2). A complete description of the sites compiled by Cobb and Biesecker (1971) includes location, drainage area, physiographic area, climate, topography, rock type, vegetation, manmade influences, gage location, flow characteristics, water quality, ground-water information, and availability of data.

For the period of time summarized in this report (see above), samples were collected monthly at 34 sites, bimonthly at 13, and quarterly at 4 sites. Field measurements, including discharge, specific conductance, dissolved oxygen, temperature, pH, bacteria, suspended sediment, and common ions are run at every visit to the station. Two samples per year are collected for trace metals.

The National Stream Quality Accounting Network was established in 1972 to provide data of the type needed to determine large-scale, long-term trends in the physical, chemical, and biological characteristics of the Nation's surface waters. NASQAN stations are located predominantly on large rivers to measure both quantity and quality of water moving within and from a system of drainage basins called "accounting units."

The Water Resources Planning Act of 1965 (PL 89-80) established the Water Resources Council (WRC) to facilitate coordination of water-resource and land-resource activities. The WRC divided the United States into 21 regions and 220 subregions. The Geological Survey further subdivided the regions and subregions into approximately 350 accounting units. Operational guidelines for NASQAN specify that an attempt will be made to measure water discharge and quality for at least 90 percent of the surface water leaving an accounting unit (Ficke and Hawkinson, 1975). This means that almost all NASQAN stations are located at the downstream end of accounting units and for inland accounting units especially, stations are generally located on large rivers.

Meeting the 90 percent goal on inland accounting units is relatively easy. In coastal accounting units, however, the numerous small streams with parallel drainage present problems. To meet the goal of measuring quantity and quality of 90 percent of the water leaving the coastal unit, a very large number of stations would have to be estalished, some on very small streams. To avoid the prohibitive cost and personnel requirements, the measurement goal of the network has been reduced to 30-50 percent for coastal units.

For the period summarized in this report, NASQAN samples were collected on a monthly basis. Water-quality characteristics that are measured at NASQAN stations include field measurements of temperature, pH, specific conductance, dissolved oxygen, major inorganic ions, major nutrients, organic carbon, bacteria and phytoplankton counts, and suspended sediment. Additional samples are collected approximately quarterly for determination of trace elements.

Laboratory methods used in analyzing samples from both networks are described in detail in Skougstad, et. al. (1979). Data collected from the networks are available in machine readable format from the Survey's WATSTORE computer storage and retrieval system (Hutchison, and others, 1975). All data are also published in the series, "Water Resources Data for (state), Water Year (year)," an annual report prepared on a state-by-state basis.

STATISTICAL METHODS

Data Screening

An effort was made to eliminate obvious typographical or recording errors in the data base by discarding any negative values or values exceeding five standard deviations of the mean for the period of summary. For certain common constituents having highly skewed frequency distributions (nitrate-nitrite, ammonia, total organic carbon, phosphorus, suspended sediment, turbidity, fecal coliform, fecal streptococci, and phytoplankton), this criteria was applied to the logrithmic transformations of the data. Also, pH values exceeding 14 and temperature values exceeding 45° C were discarded.

Multiple concentration values sometimes appear in the records of national network stations during a single sampling period (e.g., month, quarter, etc.) due to the use of these stations in other water quality investigations. In order to maintain an even frequency of observation, only the first concentration-stream flow data pair for each sampling period was used in preparing the statistical summary. In cases where instantaneous streamflow values were unavailable, the first value of concentration occurring during a sampling period was selected.

Estimates of Mean Concentration and Mean Transport of Common Constituents

Mean concentration values for the period of summary are estimated as sample averages and are expressed as mg L^{-1} for all constituents except: pH (standard units), conductivity (umhos cm^{-1}), turbidity (JTU), fecal coliform (colonies 100 ml^{-1}), fecal streptococci (colonies 100 ml^{-1}), phytoplankton (cells ml^{-1}).

Transport rates are expressed as kg day^{-1} except for: fecal coliform (colonies day^{-1}), fecal streptococci (colonies day^{-1}), and phytoplankton (cells day^{-1}).

NASQAN and Bench-Mark sites are sampled at fixed-time intervals without consideration for the variability in streamflow. As a result, estimates of annual transport derived by averaging the sample measurements of transport (product of discharge and concentration) may not accurately represent the total amount of material carried by the stream during the course of a year. Extremely high flows, which may carry disproportionately large amounts of material, are frequently missed in the fixed-sampling schedule employed at NASQAN stations. In such cases, the integration of the transport-discharge relationship (rating curve) over the daily flow-frequency distribution may provide a more accurate estimate of mean transport.

A flow-frequency distribution was computed for each station by separating the distribution of daily flows into 34 classes (see Hutchinson, and others, 1975; see also Searcy, 1959). The flow classes were based on a logarithmic scale such that the class width becomes increasingly larger as the magnitude of flow increases. The midpoint of each class was supplied to the appropriate equation describing the relationship between flow and transport to produce 34 values of transport which were weighted by the probability of their respective classes and summed to obtain a mean rate of transport.

The relationship between transport and discharge was described in linear terms by performing a least squares regression on the log transformations of the monthly, bimonthly, or quarterly samples of transport and discharge. The regression equation can be expressed as

$$Y = a + bX + e$$

where $Y = \ln T$, $X = \ln Q$, $e \sim N(0,S^2)$, T is transport, Q is discharge, S is the regression standard error, and a and b are regression estimates of the intercept and slope, respectively.

Estimates of the conditional mean and variance of Y for each of the 34 values of Q were substituted into an equation which relates the expected value of lognormally distributed random variables to the mean and variance of the normally distributed logarithms (Aitchson and Brown, 1963; Heien, 1968) to determine estimates of transport for each flow class. Estimates of transport rate for each of the 34 classes were determined from the equation $E[T|Q] = \exp(a + b\ln Q + 1/2S^2)$ (Heien, 1968, p. 1034), where $E[T|Q]$ is the expected value of transport conditioned on discharge. The mean transport rate is then computed as the weighted sum of the 34 $E[T|Q]$ values.

In cases where the relationship between transport and discharge is weak, a simple average of the historical monthly, bimonthly, or quarterly records of transport may provide the most accurate estimate of the mean rate of transport. Mean transport rates computed as simple averages of the historical records and mean transport rates obtained through the flow-frequency integration technique described above were determined for all NASQAN and Bench-Mark sites having at least 16 pairs of concentration and discharge values and compared on the basis of their respective estimated standard error. The transport estimate having the lower standard error was selected for use in the tables. Estimated standard errors were calculated on the basis of estimated values of b, s, variance of X, and sample size under the assumption that transport and discharge are distributed bivariate lognormal (Gilroy, E. J., and Hirsch, R. M., written communication).

For those stations with incomplete records of daily flow (records beginning after 1975 or ending prior to 1981) a simple average of monthly, bimonthly, or quarterly values of transport was computed. Such cases are denoted in the tables with an "a." Estimates of the mean transport rate were not computed for constituents with fewer than 16 values of concentration and discharge. These cases are denoted in the tables by an "I.D." (insufficient data) symbol.

Trend Test

The Seasonal Kendall test for trend (Hirsch, et. al., 1982) was applied to the concentration and transport records of 22 common constituents and to the concentration records of 16 trace metals (see tables for complete list of chemical constituents). The Seasonal Kendall test is designed for the analysis of time trend in seasonally varying water-quality data from fixed, regularlysampled monitoring sites such as those included in the national networks. The procedure includes an estimate of the median rate of change in the constituent over the sampling period (trend slope) and a method for flow-adjusting the concentration values to remove much of the variation in water quality which is the result of variations in streamflow (see below). Trend is defined as monotonic change with time, occurring either as an abrupt or gradual change in water quality.

At least 24 values of concentration or transport for monthly and bimonthly sampled constituents and 16 for quarterly sampled constituents were required before the Seasonal Kendall test was performed. In conducting the trend test for the monthly sampled constituents, each month was defined as a "season." Six seasons (Dec.-Jan., Feb.-March...) were defined for bimonthly sampled constituents, four seasons (Dec.-Feb., March-May...) were defined for quarterly sampled constituents, and two seasons (Dec.-May, June-Nov.) were defined for biannually sampled constituents. Records having fewer than the required number of values are identified in the tables by an "I.D." symbol. The level of statistical significance of the test is reported in the tables as p, the probability of error in rejecting the null hypothesis, where the null hypothesis is that no monotonic trend exists in the data. Values of p less than 0.01 are denoted by an "H" (highly significant) and values of p less than 0.05 are denoted by an "S" (significant).

Slope Estimator

Trend slope is the estimated rate of change in a constituent (concentration or transport) and is expressed in units of percent of the mean per year. Trend slope estimates are reported for all constituents regardless of the significance level of the trend test.

Flow Adjusted Trend Test

Stream discharge is often related to the concentration of a water-quality constituent. Substances which are introduced to the stream as a component of the runoff, such as suspended sediment, may show a positive sloping relationship to flow, whereas certain chemical constituents which have a relatively constant source within the basin may become diluted with increasing flow and show a negative relationship to discharge. The relationship between concentration and discharge may even exhibit both positive and negative responses over a range of flows. Consequently, trends resulting from changes in the mechanisms affecting the rate of input of constituents to the stream may be difficult to identify because of the degree of influence exerted by variations in flow.

An adjustment for these flow-related effects was accomplished by estimating the relationship between concentration and discharge through a least squares regression, and then applying the Seasonal Kendall trend test to the regression residuals (differences between actual and estimated concentrations).

One of two general models were used to describe the relationship between concentration and discharge depending on the constituent to be tested. The first, a linear model, was applied to the following constituents: temperature, pH, alkalinity, sulfate, calcium, magnesium, sodium, potassium, chloride, silica, dissolved solids, specific conductivity, and dissolved oxygen. The linear model has the general form

$$C = a + b\ f(Q)$$

where C is the estimated concentration, Q is the instantaneous discharge, and f(Q) may have one of the following four specific functional forms:

$f(Q) = Q$	linear
$f(Q) = \ln Q$	log
$f(Q) = 1/(1+BQ)$	hyperbolic
$f(Q) = 1/Q$	inverse

These four functions and the method for selecting an appropriate B coefficient are described in Smith, et. al. (1982). Regressions were performed using each of the four functions and the one having the highest r-squared value (shown in the tables) was selected for use in the flow adjustment procedure and is shown in the tables as "lin," "log," "hyp," or "inv," respectively. The slope of the relationship between concentration and discharge is given in the tables as "+" (positive) or "-" (negative). The letter "H" or "S" appears next to each r-squared value that is statistically significant at the 0.01 or 0.05 level, respectively. The number of concentration-discharge pairs used in the regression is shown in the tables in the column headed "N."

The second model used to describe the relationship between concentration and discharge was a nonlinear or exponential model (denoted in the tables as "exp") of the form

$$C = b_o + b_1 \ln Q + b_2 (\ln Q)^2$$

where C is the estimated concentration, Q is the instantaneous discharge, and lnQ is the natural logarithm of discharge. Investigations of the statistical properties of the 22 common constituents at NASQAN sites (R. M. Hirsch, written communication) indicate that this model most appropriately describes the relationship between concentration and discharge for the following constituents: nitrate-nitrite, ammonia, total organic carbon, phosphorous, suspended sediment, turbidity, fecal coliform, fecal streptococci, and phytoplankton. The sign of the slope of the concentration-discharge relationship for the above constituents was determined at the median flow.

Summary Statistics for Trace Metals

Summary statistics for trace metals are presented in two sections in the tables, one for dissolved forms and the second for total recoverable forms. Trace metal concentrations are expressed as ug L^{-1}, and transport rates are expressed as kg day^{-1}.

The concentrations of trace metals at many NASQAN and Bench-Mark stations are often too low to be adequately detected by present analytical methods. The statistical uncertainty associated with these extremely low concentrations is usually considered to be unacceptably large, and as a result, these values are "flagged" in the record as being less than or equal to an acceptable detection limit. The measured concentration of a flagged value, therefore, is unknown but lies in the range from zero to the detection limit.

The analytical procedures for certain metal constituents have undergone improvements during the period of summary resulting in the use of lower detection limits during the latter portion of the record. Table 1 shows the detection limits that were applied to both dissolved and total recoverable metals during the period of summary. Only the highest of the detection limits used during the period of summary appear in the tables. The fraction of the concentration values in the record exceeding this higher detection limit is reported in the table in the column headed "frequency exceeded."

The median for the dissolved and total metal constituents is computed by assigning the value of the higher detection limit to values flagged in the record at either limit. If more than half the values are flagged, then the median is reported in the tables as less than or equal to the higher detection limit (<=D.L.).

Since flagged values in the record are associated with a range of possible values (from zero to the detection limit), minimum and maximum estimates of the mean concentration and transport rate are calculated and displayed separately in the tables. Minimum estimates assume a value of zero for concentrations reported as less than or equal to either of the laboratory detection limits, and maximum estimates assume that such flagged values are equal to the applicable detection limit. These maximum and minimum estimates of the mean should not be confused with the total range of concentrations occurring in the record.

At some stations, estimates of mean dissolved metal concentrations exceed the estimates of mean total metal concentrations. This may be accounted for by either missing values in the total or dissolved records, or by error in the analytical methods. In general, estimates of dissolved metal concentrations are considered more reliable. As a caution, a "*" appears in the tables next to the mean total concentrations that are less than the corresponding mean dissolved concentrations.

The Seasonal Kendall test for trend is nonparametric and involves comparisons between the relative values or ranks of the data. The test is therefore very appropriate for the analysis of time trends in the concentrations of trace metals since the presence of flagged values in the record present no special problem in making relative comparisons between concentration values. For the purpose of trend testing, flagged values were set equal to the highest laboratory detection limit used during the period of record and were then treated the same as unflagged data. The highest detection limit thus becomes a lower bound on the applicability of the trend test. Sixteen values (eight for Bench-Mark sites), including at least one unflagged value, were considered sufficient to run the trend test. In cases where no unflagged values occur in the record, the tables show "N.D." (not detected).

The direction of change is reported in the tables in the column labeled "slope." The rate of change, however, is not computed due to the presence of flagged values in the record.

For records having at least six pairs of concentration and discharge values, mean estimates of transport for the period of summary were obtained as follows:

1. The frequency distribution of daily flows was separated into three intervals such that each class included at least two concentration-discharge data pairs.

2. The estimated transport of each flow interval was calculated as the product of the average concentration and average daily flow of the interval. Summing transport over all flow intervals, after weighting for the probability of the interval, yields the mean transport rate. Minimum and maximum estimates of the mean transport rate were calculated by alternately assigning a value of zero, and the value of the detection limit, to flagged concentration values.

For stations with incomplete records of daily flows, the frequency distribution of instantaneous flows was used instead; such cases are denoted in the tables with an "a" before the transport rate. Estimates of the mean rate of transport were not calculated for records with fewer than six pairs of concentration and discharge values. These cases are denoted in the tables by an "I.D." symbol.

Table 1.

Detection limits (in units of ug L^{-1}) applicable during the period of summary for total recoverable and dissolved metals.

	Total	Dissolved
Aluminum	100	100
Arsenic	1	1
Barium	100	100
Boron	20	20
Cadmium	2, 20	2*
Chromium	2, 20	2, 20
Copper	2, 20	2, 20
Iron	10	10
Lead	2, 200	2*
Manganese	10	10
Mercury	0.1, 0.5	0.1, 0.5
Nickel	2, 200	2, 200
Silver	2, 20	2*
Zinc	2, 20	2, 20

*For dissolved cadmium, lead, and silver, only data based on the lower detection limits were used in this summary since fewer than one percent of the concentration values were analyzed using the higher detection limit.

Table 2. Station list by drainage basin.

Station No.	National Hydrologic Bench-Mark Stations
10542.00	WILD RIVER AT GILEAD, ME
13621.98	ESOPUS CREEK AT SHANDAKEN, NY
14665.00	MCDONALDS B IN LEBANON STATE FOREST, NJ
15456.00	YOUNG WOMANS CREEK NEAR RENOVO, PA.
20388.50	HOLIDAY CREEK NEAR ANDERSONVILLE, VA.
21353.00	SCAPE ORE SWAMP NEAR BISHOPVILLE, SC
21973.00	UPPER THREE RUNS NEAR NEW ELLENTON, SC
22126.00	FALLING CREEK NEAR JULIETTE, GA.
23271.00	SOPCHOPPY RIVER NR SOPCHOPPY, FLA.
24502.50	SIPSEY FORK NEAR GRAYSON, AL
24791.55	CYPRESS CREEK NR JANICE, MS.
32372.80	UPPER TWIN CREEK AT MCGAW, OH
32767.00	SOUTH HOGAN CREEK NEAR DILLSBORO, IND.
34600.00	CATALOOCHEE CREEK NEAR CATALOOCHEE, NC
36040.00	BUFFALO RIVER NEAR FLAT WOODS, TENN.
40010.00	WASHINGTON CREEK AT WINDIGO, MICH.
40637.00	POPPLE RIVER NEAR FENCE, WI
50649.00	BEAVER CREEK NR FINLEY, ND
51244.80	KAWISHIWI RIVER NEAR ELY, MN
53760.00	NORTH FORK WHITEWATER RIVER NEAR ELBA, MN
62882.00	BEAUVAIS CREEK NEAR ST. XAVIER, MT.
63325.15	BEAR DEN CREEK NR MANDAREE, ND
64090.00	CASTLE CR ABOVE DEERFIELD RES NEAR HILL CITY, SD
66238.00	ENCAMPMENT RIV AB HOG PARK CR NR ENCAMPMENT, WYO
67759.00	DISMAL RIVER NR THEDFORD, NEBR
68979.50	ELK CREEK NEAR DECATUR CITY, IOWA
70607.10	NORTH SYLAMORE CREEK NEAR FIFTY SIX, ARK.
70830.00	HALFMOON CREEK NEAR MALTA, CO.
73112.00	BLUE BEAVER CREEK NR CACHE, OK
73357.00	KIAMICHI RIVER NR BIG CEDAR, OK
73730.00	BIG CREEK AT POLLOCK, LA
81039.00	SOUTH FORK ROCKY CREEK NEAR BRIGGS, TEX.
83779.00	RIO MORA NEAR TERRERO, NM
84317.00	LIMPIA CREEK ABOVE FT DAVIS, TEX.
93529.00	VALLECITO CREEK NEAR BAYFIELD, CO.
94306.00	MOGOLLON CREEK NEAR CLIFF, NM
95083.00	WET BOTTOM CREEK NR CHILDS, ARIZ.
101722.00	RED BUTTE CREEK AT FT. DOUGLAS NR. SLC, UTAH
102449.50	STEPTOE C NR ELY, NV
102493.00	S TWIN R NR ROUND MOUNTAIN, NV
112645.00	MERCED R AT HAPPY ISLES BRIDGE NR YOSEMITE,CALIF
114755.60	ELDER CREEK NEAR BRANSCOMB, CALIF
114922.00	CRATER LAKE NEAR CRATER LAKE,OREG.
120393.00	NORTH FORK QUINAULT R NEAR AMANDA PARK, WASH.
124160.00	HAYDEN CK BELOW N FK, NR HAYDEN LAKE, IDAHO
124473.90	ANDREWS CREEK NEAR MAZAMA, WASH.
130183.00	CACHE CREEK NEAR JACKSON, WYO
131695.00	BIG JACKS CREEK NEAR BRUNEAU, ID
133315.00	MINAM RIVER AT MINAM,OREG.
152927.00	TALKEETNA RIVER NEAR TALKEETNA AK
167170.00	HONOLII STREAM NR PAPAIKOU HAWAII HI

Station No.	National Stream Quality Accounting Stations
10171.00	AROOSTOOK RIVER AT CARIBOU, ME
10210.50	ST. CROIX RIVER AT MILLTOWN, ME
10345.00	PENOBSCOT RIVER AT WEST ENFIELD, ME
10594.00	ANDROSCOGGIN RIVER AT BRUNSWICK, ME
10660.00	SACO RIVER AT CORNISH, ME
10965.50	MERRIMACK RIVER ABOVE LOWELL, MA
11035.00	CHARLES RIVER AT DOVER, MA
11550.50	CONNECTICUT RIVER AT WALPOLE, NH
11840.00	CONNECTICUT R AT THOMPSONVILLE, CT
12055.00	HOUSATONIC R AT STEVENSON, CT
13045.00	PECONIC RIVER AT RIVERHEAD NY
13580.00	HUDSON RIVER AT GREEN ISLAND NY
14041.00	RARITAN R NR SOUTH BOUND BROOK NJ
14085.00	TOMS R NR TOMS RIVER NJ
14635.00	DELAWARE R AT TRENTON NJ
14745.00	SCHUYLKILL RIVER AT PHILADELPHIA, PA.
14910.00	CHOPTANK R NR GREENSBORO, MD
15405.00	SUSQUEHANNA RIVER AT DANVILLE, PA.
15535.00	WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.
15705.00	SUSQUEHANNA RIVER AT HARRISBURG, PA.
16465.80	POTOMAC R AT CHAIN BRIDGE, AT WASH, DC
16730.00	PAMUNKEY RIVER NR HANOVER VA
20350.00	JAMES RIVER AT CARTERSVILLE, VA
20495.00	BLACKWATER R NR FRANKLIN, VA
20805.00	ROANOKE RIVER AT ROANOKE RAPIDS, N.C.
20835.00	TAR RIVER AT TARBORO, N. C.
20895.00	NEUSE RIVER AT KINSTON, N. C.
21057.69	CAPE FEAR R AT LOCK # 1 NR KELLY, NC
21290.00	PEE DEE R NR ROCKINGHAM, NC
21320.00	LYNCHES RIVER AT EFFINGHAM S. C.
21360.00	BLACK RIVER AT KINGSTREE, S.C.
21705.00	LAKES M-M DIV CANAL NR PINEVILLE S. C.
21750.00	EDISTO RIVER NR GIVHANS S.C.
21765.00	COOSAWHATCHIE RIVER NR HAMPTON S.C.
21985.00	SAVANNAH RIVER NEAR CLYO, GA
22025.00	OGEECHEE RIVER NEAR EDEN, GA.
22280.00	SATILLA RIVER AT ATKINSON, GA.
22310.00	ST MARYS RIVER NR MACCLENNY, FLA.
22444.50	ST. JOHNS RIVER AT PALATKA, FLA.
22480.00	SPRUCE CREEK NR SAMSULA, FLA.
22530.00	MAIN CANAL AT VERO BEACH, FLA.
22730.00	KISSIMMEE R AT S-65E NR OKEECHOBEE, FLA.
22790.00	WEST PALM BEACH CANAL AT WEST PALM BEACH FLA
22886.00	MIAMI CANAL AT NW36 ST, MIAMI,FL
22924.80	CALOOSAHATCHEE CANAL AT ORTONA LOCK NR LA BELLE
22967.50	PEACE RIVER AT ARCADIA, FLA.
23030.00	HILLSBOROUGH RIVER NR ZEPHYRHILLS, FLA.
23130.00	WITHLACOOCHEE RIVER NR HOLDER, FLA.
23205.00	SUWANNEE RIVER AT BRANFORD, FLA.
23290.00	OCHLOCKONEE RIVER NR HAVANA, FLA.
23580.00	APALACHICOLA RIVER AT CHATTAHOOCHEE FLA
23590.00	CHIPOLA RIVER NR ALTHA, FLA.

23665.00	CHOCTAWHATCHEE RIVER NR BRUCE, FLA.
23680.00	YELLOW RIVER AT MILLIGAN, FLA.
23755.00	ESCAMBIA RIVER NEAR CENTURY, FLA.
24200.00	ALABAMA RIVER NEAR MONTGOMERY AL
24295.00	ALABAMA RIVER AT CLAIBORNE AL
24490.00	TOMBIGBEE RIVER AT GAINESVILLE AL
24697.62	TOMBIGBEE R BL COFFEEVILLE L&D NR COFFEEVILLE AL
24790.20	PASCAGOULA RIVER NR BENNDALE, MS.
24895.00	PEARL RIVER NEAR BOGALUSA, LA.
24920.00	BOGUE CHITTO NEAR BUSH, LA.
30496.25	ALLEGHENY R AT NEW KENSINGTON, PA.
30850.00	MONONGAHELA RIVER AT BRADDOCK, PA.
31500.00	MUSKINGUM R AT MCCONNELSVILLE OH
32013.00	KANAWHA RIVER AT WINFIELD, W.VA.
32150.00	BIG SANDY R AT LOUISA, KY
32166.00	OHIO R AT GREENUP DAM NR GREENUP, KY
32345.00	SCIOTO R AT HIGBY OH
32455.00	L MIAMI R AT MILFORD OH
32540.00	LICKING RIVER AT BUTLER,KY.
32746.00	G MIAMI R AT NEW BALTIMORE OH
32765.00	WHITEWATER RIVER AT BROOKVILLE, IND
32772.00	OHIO R AT MARKLAND DAM NR WARSAW, KY
32905.00	KENTUCKY RIVER AT LOCK 2,AT LOCKPORT,KY.
33016.30	ROLLING FORK NR LEBANON JUNCTION,KY.
33032.80	OHIO R AT CANNELTON DAM, KY
33212.30	GREEN RIVER NR BEECH GROVE,KY.
33741.00	WHITE RIVER AT HAZLETON, IND.
33785.00	WABASH RIVER AT NEW HARMONY, IND.
34250.00	CUMBERLAND RIVER AT CARTHAGE, TENN.
34382.20	CUMBERLAND RIVER NEAR GRAND RIVERS, KY.
34705.00	FRENCH BROAD RIVER NEAR KNOXVILLE, TENN.
35430.05	TENNESSEE RIVER AT WATTS BAR DAM (TAILWATER), TN
35718.50	TENNESSEE RIVER AT SOUTH PITTSBURG, TENN.
35930.05	TENNESSEE RIVER AT PICKWICK LANDING DAM (LL), TN
36097.50	TENNESSEE RIVER AT HIGHWAY 60,NEAR PADUCAH,KY.
36125.00	OHIO RIVER AT DAM 53 NEAR GRAND CHAIN,ILL.
40145.00	BAPTISM RIVER NEAR BEAVER BAY, MN
40240.00	ST. LOUIS RIVER AT SCANLON, MN
40400.00	ONTONAGON R NR ROCKLAND, MICH
40455.00	TAHQUAMENON RIVER NR TAHQUAMENON PARADISE, MICH.
40455.80	ST MARYS RIVER ABOVE SAULT STE MARIE, MICH.
40570.04	MANISTIQUE RIVER ABOVE MANISTIQUE, MICH.
40590.00	ESCANABA RIVER AT CORNELL, MICH.
40595.00	FORD RIVER NR HYDE, MICH.
40850.00	FOX RIVER AT WRIGHTSTOWN, WI
40870.00	MILWAUKEE RIVER AT MILWAUKEE, WI
41086.90	KALAMAZOO RIVER AT SAUGATUCK, MICH.
41220.30	MUSKEGON R NR BRIDGETON, MICH.
41265.20	MANISTEE R AT MANISTEE, MICH.
41320.52	CHEBOYGAN R AT LINCOLN AVE AT CHEBOYGAN, MICH.
41420.00	RIFLE RIVER NEAR STERLING, MICH.
41570.00	SAGINAW RIVER AT SAGINAW, MICH.
41655.00	CLINTON RIVER AT MOUNT CLEMENS, MICH.
41657.00	DETROIT R AT DETROIT, MICH.

41935.00	MAUMEE R AT WATERVILLE OH
42080.00	CUYAHOGA R AT INDEPENDENCE OH
42196.40	NIAGARA RIVER (LAKE ONTARIO) AT FORT NIAGARA NY
42320.06	GENESEE RIVER(CHARLOTTE DOCKS)AT ROCHESTER NY
42490.00	OSWEGO RIVER AT LOCK 7 AT OSWEGO NY
42605.00	BLACK RIVER AT WATERTOWN, NY
42643.31	ST LAWRENCE R AT CORNWALL ONT NR MASSENA, NY
42690.00	ST REGIS RIVER AT BRASHER CENTER NY
42950.00	RICHELIEU R (L CHAMPLAIN) AT ROUSES POINT NY
51120.00	ROSEAU RIVER BELOW STATE DITCH 51 NR CARIBOU, MN
51240.00	SOURIS RIVER NR WESTHOPE, ND
51315.00	LITTLE FORK RIVER AT LITTLEFORK, MN
52670.00	MISSISSIPPI RIVER NEAR ROYALTON, MN
53300.00	MINNESOTA RIVER NEAR JORDAN, MN
53405.00	ST. CROIX RIVER AT ST. CROIX FALLS, WI
53695.00	CHIPPEWA RIVER AT DURAND, WI
53785.00	MISSISSIPPI RIVER AT WINONA, MN
54070.00	WISCONSIN RIVER AT MUSCODA, WI
54205.00	MISSISSIPPI RIVER AT CLINTON, IOWA
54465.00	ROCK RIVER NEAR JOSLIN, IL
54745.00	MISSISSIPPI RIVER AT KEOKUK, IOWA
54906.00	DES MOINES RIVER AT ST. FRANCISVILLE, MO.
55435.00	ILLINOIS RIVER AT MARSEILLES, IL
55875.50	MISSISSIPPI RIVER BELOW ALTON,ILL
55941.00	KASKASKIA RIVER NEAR VENEDY STATION, IL
55995.00	BIG MUDDY RIVER AT MURPHYSBORO, IL
60545.00	MISSOURI RIVER AT TOSTON, MT.
61095.00	MISSOURI RIVER AT VIRGELLE, MT.
61305.00	MUSSELSHELL RIVER AT MOSBY, MT.
61320.00	MISSOURI RIVER BELOW FORT PECK DAM, MT.
61745.00	MILK RIVER AT NASHUA MT
61855.00	MISSOURI RIVER NEAR CULBERTSON, MT.
62145.00	YELLOWSTONE RIVER AT BILLINGS MT
62947.00	BIGHORN RIVER AT BIGHORN, MT.
63085.00	TONGUE RIVER AT MILES CITY, MT.
63265.00	POWDER RIVER NEAR LOCATE, MT.
63295.00	YELLOWSTONE RIVER NEAR SIDNEY, MT.
63370.00	LITTLE MISSOURI RIVER NR WATFORD CITY, ND
63384.90	MISSOURI RIVER AT GARRISON DAM, ND
63405.00	KNIFE RIVER AT HAZEN, ND
63540.00	CANNONBALL RIVER AT BREIEN, ND
63578.00	GRAND R AT LITTLE EAGLE SD
64380.00	BELLE FOURCHE R NEAR ELM SPRINGS SD
64393.00	CHEYENNE R AT CHERRY CREEK SD
64400.00	MISSOURI R AT PIERRE SD
64520.00	WHITE R NEAR OACOMA SD
64530.00	MISSOURI R AT FORT RANDALL SD
64655.00	NIOBRARA RIVER NR. VERDEL, NEBR.
64785.00	JAMES R NEAR SCOTLAND SD
64855.00	BIG SIOUX R AT AKRON IA
64860.00	MISSOURI RIVER AT SIOUX CITY, IOWA
66860.00	NORTH PLATTE RIVER AT LISCO, NEBR.
67640.00	SOUTH PLATTE RIVER AT JULESBURG, CO.
67924.99	LOUP R POWER CA AT DIV NR GENOA, NEBR.

68055.00	PLATTE R AT LOUISVILLE NE
68180.00	MISSOURI RIVER AT ST. JOSEPH, MO.
68566.00	REPUBLICAN R AT CLAY CENTER, KS
68776.00	SMOKY HILL R AT ENTERPRISE, KS
68870.00	BIG BLUE R NR MANHATTAN, KS
68923.50	KANSAS R AT DESOTO, KS
69020.00	GRAND RIVER NEAR SUMNER MO
69265.10	OSAGE RIVER BELOW ST. THOMAS, MISSOURI
69345.00	MISSOURI RIVER AT HERMANN, MO
70220.00	MISSISSIPPI RIVER AT THEBES ILL
70260.00	OBION RIVER AT OBION, TENN.
70320.00	MISSISSIPPI RIVER AT MEMPHIS, TENN.
70478.00	ST. FRANCIS RIVER AT PARKIN, ARK.
70479.00	ST. FRANCIS BAY AT RIVERFRONT, ARK.
70778.00	WHITE RIVER AT CLARENDON, ARK.
71375.00	ARKANSAS R NR COOLIDGE, KS
71465.00	ARKANSAS R AT ARKANSAS CITY, KS
71579.50	CIMARRON RIVER NR BUFFALO, OK
71610.00	CIMARRON RIVER AT PERKINS, OK
71786.20	VERDIGRIS RIVER (NEWT GRAHAM L&D) NEAR INOLA, OK
71935.00	NEOSHO RIVER BLW FT GIBSON LAKE NR FT GIBSON, OK
72271.40	CANADIAN RIVER ABOVE NM-TX STATE LINE, NM
72280.00	CANADIAN R NR CANADIAN, TX
72315.00	CANADIAN RIVER AT CALVIN, OK
72340.00	BEAVER RIVER AT BEAVER, OK
72375.00	NORTH CANADIAN RIVER AT WOODWARD, OK
72450.00	CANADIAN RIVER NR WHITEFIELD, OK
72505.50	ARKANSAS R. AT DAM NO. 13, NR VAN BUREN, ARK.
72636.20	ARKANSAS R @ DAVID D TERRY L&D BL LITTLE ROCK AR
72654.50	MISSISSIPPI RIV NR ARKANSAS CITY, ARK.
72890.00	MISSISSIPPI RIVER AT VICKSBURG, MS.
72900.00	BIG BLACK RIVER NR BOVINA, MS.
72925.00	HOMOCHITTO RIVER AT ROSETTA, MS.
72979.10	PDTF RED RIVER NEAR WAYSIDE, TEX.
73050.00	NORTH FORK RED RIVER NR HEADRICK, OK
73085.00	RED RIVER NR BURKBURNETT, TX
73310.00	WASHITA RIVER NR DICKSON,OK
73316.00	RED RIVER AT DENISON DAM NR DENISON, TX
73555.00	RED R AT ALEXANDRIA
73620.00	OUACHITA RIVER AT CAMDEN, ARK
73676.40	OUACHITA RIVER AT COLUMBIA, LA.
73695.00	TENSAS RIVER AT TENDAL, LOUISIANA
73734.20	MISSISSIPPI RIVER NEAR ST. FRANCISVILLE, LA
73745.25	MISSISSIPPI RIVER AT BELLE CHASSE, LA.
73785.10	AMITE R AT 4H CAMP NR DENHAM SPRINGS
73816.00	LOWER ATCHAFALAYA RIVER AT MORGAN CITY, LA.
73857.00	BAYOU TECHE AT KEYSTONE LOCK, NR ST.MARTINVILLE
80159.00	CALCASIEU R NR LAKE CHARLES
80305.00	SABINE RIVER NR RULIFF, TEX.
80410.00	NECHES RIVER AT EVADALE, TEX.
80665.00	TRINITY R AT ROMAYOR, TEXAS
80680.00	WEST FORK SAN JACINTO RIVER NR CONROE, TX
80820.00	SALT FK BRAZOS R NR ASPERMONT, TX
80982.90	BRAZOS RIVER NR HIGHBANK, TEX.

81166.50	BRAZOS RIVER NEAR ROSHARON,TEX.(DISC)
81580.00	COLORADO RIVER AT AUSTIN, TEX.
81620.00	COLORADO RIVER AT WHARTON, TEX.
81765.00	GUADALUPE RIVER AT VICTORIA, TEX.
81885.00	SAN ANTONIO RIVER AT GOLIAD, TEX.
82100.00	NUECES RIVER NR. THREE RIVERS, TEX.
82124.00	LOS OLMOS CREEK NEAR FALFURRIAS, TEX.
82515.00	RIO GRANDE NEAR LOBATOS, CO.
83130.00	RIO GRANDE AT OTOWI BRIDGE, NM
83583.00	RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, NM
83772.00	RIO GRANDE AT FOSTER RANCH NR LANGTRY, TEXAS
84075.00	PECOS RIVER AT RED BLUFF, NM
84474.10	PECOS RIVER NEAR LANGTRY, TX
84590.00	RIO GRANDE AT LAREDO, TEX.
84750.00	RIO GRANDE NEAR BROWNSVILLE, TEXAS
84815.00	RIO TULAROSA NEAR BENT, NM
91525.00	GUNNISON RIVER NEAR GRAND JUNCTION, CO.
91635.30	COLORADO RIVER BELOW COLORADO-UTAH STATE LINE
91805.00	COLORADO RIVER NEAR CISCO UTAH
92345.00	GREEN RIVER NEAR GREENDALE, UTAH
92510.00	YAMPA RIVER NEAR MAYBELL, CO.
92600.00	LITTLE SNAKE RIVER NEAR LILY, CO.
93150.00	GREEN RIVER AT GREEN RIVER, UTAH
93680.00	SAN JUAN RIVER AT SHIPROCK, NM
93795.00	SAN JUAN RIVER NEAR BLUFF, UTAH
93800.00	COLORADO R AT LEES FERRY, AZ.
94012.00	LITTLE COLORADO R AT CAMERON ARIZ.
94215.00	COLORADO RIVER BLW HOOVER DAM,ARIZ-NEV
94241.90	COLORADO R AQV NR SAN JACINTO CA.
94266.00	BILL WILLIAMS R NR PLANET, ARIZ.
94294.90	COLORADO R AB IMPERIAL D ARIZ-CALIF
94665.00	GILA RIVER AT CALVA, ARIZ.
94735.00	SAN PEDRO R AT WINKELMAN, ARIZ.
94740.00	GILA R AT KELVIN ARIZ
94890.00	SANTA CRUZ RIVER NEAR LAVEEN, ARIZ.
95020.00	SALT R BL STEWART MOUNTAIN D ARIZ
95100.00	VERDE R BL BARTLETT D ARIZ
95180.00	GILA R AB DIVERSIONS AT GILLESPIE DAM AZ.
95207.00	GILA RIVER NEAR MOUTH, NEAR YUMA, ARIZ.
95220.00	COLORADO R AT NIB AB MORELOS DAM NR ANDRADE, CAL
101260.00	BEAR R NR CORINNE
101410.00	WEBER RIVER NR PLAIN CITY UTAH
101710.00	JORDAN RIVER @ 1700 SOUTH @ SALT LAKE CITY, UTAH
102240.00	SEVIER RIVER NEAR LYNNDYL, UTAH
102370.00	BEAVER RIV AT ADAMSVILLE, UTAH
102499.00	CHIATOVICH C NR DYER, NV
102549.70	NEW R AT INTERNAT BDY CALEXICO CA
102615.00	MOJAVE R AT LOWER NARROWS NR VICTORVILLE CA
102774.00	OWENS R BL TINEMAHA RE NR BIG PINE CA
103015.00	WALKER R NR WABUSKA, NV
103120.00	CARSON R NR FORT CHURCHILL, NV
103350.00	HUMBOLDT R NR RYE PATCH, NV
103517.00	TRUCKEE R NR NIXON, NV
103960.00	DONNER UND BLITZEN RIVER NR FRENCHGLEN,OREG.

110740.00	SANTA ANA RIVER BELOW PRADO DAM, CALIF.
111030.10	LA RIV A WILLOW ST BR A LONG BEACH
112500.00	FRIANT-KERN CANAL AT FRIANT CALIF
113035.00	SAN JOAQUIN RIVER NEAR VERNALIS CALIF
113255.00	MOKELUMNE RIVER AT WOODBRIDGE CALIF
114476.50	SACRAMENTO RIVER AT FREEPORT CALIF
114670.00	RUSSIAN RIVER NR GUERNEVILLE CALIF
115305.00	KLAMATH RIVER NEAR KLAMATH CALIF
120310.00	CHEHALIS RIVER AT PORTER, WASH.
120455.00	ELWHA RIVER AT MCDONALD BR NR PRT ANGELES, WASH.
122005.00	SKAGIT RIVER NEAR MOUNT VERNON, WASH.
123185.00	KOOTENAI RIVER NR COPELAND, ID
123550.00	FLATHEAD RIVER AT FLATHEAD, BRITISH COLUMBIA
123986.00	PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY
124005.20	COLUMBIA RIVER AT NORTHPORT, WASH.
124330.00	SPOKANE RIVER AT LONG LAKE, WASH.
125105.00	YAKIMA RIVER AT KIONA, WASH.
131545.00	SNAKE RIVER AT KING HILL IDAHO
132904.50	SNAKE RIVER AT HELLS CANYON DAM ID-OR LINE
133170.00	SALMON RIVER AT WHITEBIRD, IDAHO
133532.00	SNAKE RIVER AT BURBANK, WASH.
140480.00	JOHN DAY R AT MCDONALD FERRY,OREG.
141030.00	DESCHUTES RIVER AT MOODY, NEAR BIGGS OREG
141130.00	KLICKITAT RIVER NEAR PITT, WASH.
141289.10	COLUMBIA RIVER AT WARRENDALE,OREG.
142075.00	TUALATIN RIVER AT WEST LINN,OREG.
142117.20	WILLAMETTE RIVER AT PORTLAND,OREG.
143010.00	NEHALEM RIVER NEAR FOSS, OREG.
143210.00	UMPQUA RIVER NEAR ELKTON, OREG.
143723.00	ROGUE RIVER NEAR AGNESS,OREG.
150248.00	STIKINE R NR WRANGELL AK
152943.50	SUSITNA RIVER AT SUSITNA STATION AK
153040.00	KUSKOKWIM RIVER AT CROOKED CREEK AK
155654.47	YUKON RIVER AT PILOT STATION AK
157445.00	KOBUK R NR KIANA AK
158960.00	KUPARUK R NR DEADHORSE AK
160310.00	WAIMEA RIVER NR WAIMEA, KAUAI, HI
162130.00	WAIKELE STREAM AT WAIPAHU, OAHU, HI
162293.00	KALIHI STREAM AT KALIHI, OAHU, HI
164000.00	HALAWA STREAM NR HALAWA, MOLOKAI, HI
166180.00	KAHAKULOA STREAM NR HONOKOHAU, MAUI, HI
500381.00	RIO GRANDE DE MANATI AT HWY 2 NR MANATI, PR
500460.00	RIO DE LA PLATA AT TOA ALTA, PR
500920.00	RIO GRANDE DE PATILLAS NR PATILLAS
501440.00	RIO GRANDE DE ANASCO NR SAN SEBASTIAN, PR

Table 3. Station list by state.

State	Station No.	National Hydrologic Bench-Mark Stations
ALABAMA	24502.50	SIPSEY FORK NEAR GRAYSON AL
ALASKA	152927.00	TALKEETNA RIVER NEAR TALKEETNA AK
ARIZONA	95083.00	WET BOTTOM CREEK NR CHILDS, ARIZ.
ARKANSAS	70607.10	NORTH SYLAMORE CREEK NEAR FIFTY SIX, ARK.
CALIFORNIA	114755.60	ELDER CREEK NEAR BRANSCOMB CALIF
CALIFORNIA	112645.00	MERCED R AT HAPPY ISLES BRIDGE NR YOSEMITE CALIF
COLORADO	70830.00	HALFMOON CREEK NEAR MALTA, CO.
COLORADO	93529.00	VALLECITO CREEK NEAR BAYFIELD, CO.
FLORIDA	23271.00	SOPCHOPPY RIVER NR SOPCHOPPY, FLA.
GEORGIA	22126.00	FALLING CREEK NEAR JULIETTE, GA.
HAWAII	167170.00	HONOLII STREAM NR PAPAIKOU, HAWAII, HI
IDAHO	131695.00	BIG JACKS CR NR BRUNEAU ID
IDAHO	124160.00	HAYDEN CK BELOW N FK, NR HAYDEN LAKE, IDAHO
INDIANA	32767.00	SOUTH HOGAN CREEK NEAR DILLSBORO, IND.
IOWA	68979.50	ELK CREEK NEAR DECATUR CITY, IOWA
LOUISIANA	73730.00	BIG CREEK AT POLLOCK, LA
MAINE	10542.00	WILD RIVER AT GILEAD, ME
MICHIGAN	40010.00	WASHINGTON CREEK AT WINDIGO, MICH.
MINNESOTA	51244.80	KAWISHIWI RIVER NEAR ELY, MN
MINNESOTA	53760.00	NORTH FORK WHITEWATER RIVER NEAR ELBA, MN
MISSISSIPPI	24791.55	CYPRESS CREEK NR JANICE, MS
MONTANA	62882.00	BEAUVAIS CREEK NEAR ST. XAVIER, MT.
NEBRASKA	67759.00	DISMAL RIVER NR THEDFORD NEBR
NEVADA	102493.00	S TWIN R NR ROUND MOUNTAIN, NV
NEVADA	102449.50	STEPTOE C NR ELY, NV
NEW JERSEY	14665.00	MCDONALDS B IN LEBANON STATE FOREST NJ
NEW MEXICO	94306.00	MOGOLLON CREEK NEAR CLIFF, NM
NEW MEXICO	83779.00	RIO MORA NEAR TERRERO, NM
NEW YORK	13621.98	ESOPUS CREEK AT SHANDAKEN, NY
NORTH CAROLINA	34600.00	CATALOOCHEE CREEK NEAR CATALOOCHEE N C
NORTH DAKOTA	63325.15	BEAR DEN CREEK NR MANDAREE, ND
NORTH DAKOTA	50649.00	BEAVER CREEK NR FINLEY, ND
OHIO	32372.80	UPPER TWIN C AT MCGAW OH
OKLAHOMA	73112.00	BLUE BEAVER CREEK NR CACHE, OK
OKLAHOMA	73357.00	KIAMICHI RIVER NR BIG CEDAR, OK
OREGON	114922.00	CRATER LAKE NEAR CRATER LAKE,OREG.
OREGON	133315.00	MINAM RIVER AT MINAM,OREG.
PENNSYLVANIA	15456.00	YOUNG WOMANS CREEK NEAR RENOVO, PA.
SOUTH CAROLINA	21353.00	SCAPE ORE SWAMP NEAR BISHOPVILLE,SC
SOUTH CAROLINA	21973.00	UPPER THREE RUNS NEAR NEW ELLENTON,
SOUTH DAKOTA	64090.00	CASTLE CR ABOVE DEERFIELD RES NEAR HILL CITY SD
TENNESSEE	36040.00	BUFFALO RIVER NEAR FLAT WOODS, TENN.
TEXAS	84317.00	LIMPIA CREEK ABOVE FT DAVIS, TEX.
TEXAS	81039.00	SOUTH FORK ROCKY CREEK NEAR BRIGGS, TEX.
UTAH	101722.00	RED BUTTE CREEK AT FT. DOUGLAS NR. SLC, UTAH
VIRGINIA	20388.50	HOLIDAY CREEK NEAR ANDERSONVILLE, VA.
WASHINGTON	124473.90	ANDREWS CREEK NEAR MAZAMA, WASH.
WASHINGTON	120393.00	NORTH FORK QUINAULT R NEAR AMANDA PARK, WASH.
WISCONSIN	40637.00	POPPLE RIVER NEAR FENCE, WI
WYOMING	130183.00	CACHE CREEK NEAR JACKSON, WYO.
WYOMING	66238.00	ENCAMPMENT RIV AB HOG PARK CR NR ENCAMPMENT WYO

State	Station No.	National Stream Quality Accounting Stations
ALABAMA	24295.00	ALABAMA RIVER AT CLAIBORNE AL
ALABAMA	24200.00	ALABAMA RIVER NEAR MONTGOMERY AL
ALABAMA	24490.00	TOMBIGBEE RIVER AT GAINESVILLE, AL
ALABAMA	24697.62	TOMBIGBEE RIVER BL COFFEEVILLE LOCK AND DAM, AL
ALASKA	157445.00	KOBUK R NR KIANA AK
ALASKA	158960.00	KUPARUK R NR DEADHORSE AK
ALASKA	153040.00	KUSKOKWIM RIVER AT CROOKED CREEK AK
ALASKA	150248.00	STIKINE R NR WRANGELL AK
ALASKA	152943.50	SUSITNA RIVER AT SUSITNA STATION AK
ALASKA	155654.47	YUKON RIVER AT PILOT STATION AK
ARIZONA	94665.00	GILA RIVER AT CALVA, ARIZ.
ARIZONA	94890.00	SANTA CRUZ RIVER NEAR LAVEEN, ARIZ.
ARIZONA	94266.00	BILL WILLIAMS R NR PLANET, ARIZ.
ARIZONA	93800.00	COLORADO R AT LEES FERRY, AZ.
ARIZONA	95220.00	COLORADO R AT NIB AB MORELOS DAM NR ANDRADE, CA.
ARIZONA	94215.00	COLORADO RIVER BLW HOOVER DAM,ARIZ-NEV
ARIZONA	95180.00	GILA R AB DIVERSIONS AT GILLESPIE DAM AZ.
ARIZONA	94740.00	GILA R AT KELVIN ARIZ
ARIZONA	95207.00	GILA RIVER NEAR MOUTH, NEAR YUMA, AZ.
ARIZONA	94012.00	LITTLE COLORADO R AT CAMERON ARIZ.
ARIZONA	95020.00	SALT R BL STEWART MOUNTAIN D ARIZ
ARIZONA	94735.00	SAN PEDRO R AT WINKELMAN, ARIZ.
ARIZONA	95100.00	VERDE R BL BARTLETT D ARIZ
ARKANSAS	72654.50	MISSISSIPPI RIV NR ARKANSAS CITY, ARK.
ARKANSAS	70778.00	WHITE RIVER AT CLARENDON, ARK.
ARKANSAS	72636.20	ARKANSAS R @ DAVID D TERRY L&D BL LITTLE ROCK AR
ARKANSAS	72505.50	ARKANSAS R. AT DAM NO. 13, NR VAN BUREN, ARK.
ARKANSAS	73620.00	OUACHITA RIVER AT CAMDEN, ARK
ARKANSAS	70479.00	ST. FRANCIS BAY AT RIVERFRONT, ARK.
ARKANSAS	70478.00	ST. FRANCIS RIVER AT PARKIN, ARK.
BRITISH COLUMB	123550.00	FLATHEAD RIVER AT FLATHEAD, BRITISH COLUMBIA
CALIFORNIA	94241.90	COLORADO R AQV NR SAN JACINTO CA.
CALIFORNIA	94294.90	COLORADO RIVER ABOVE IMPERIAL DAM, CA-AZ.
CALIFORNIA	112500.00	FRIANT-KERN CANAL AT FRIANT CALIF
CALIFORNIA	115305.00	KLAMATH RIVER NEAR KLAMATH CALIF
CALIFORNIA	111030.10	LA RIV A WILLOW ST BR A LONG BEACH
CALIFORNIA	102615.00	MOJAVE R AT LOWER NARROWS NR VICTORVILLE CA
CALIFORNIA	113255.00	MOKELUMNE RIVER AT WOODBRIDGE CALIF
CALIFORNIA	102549.70	NEW R AT INTERNAT BDY CALEXICO CA
CALIFORNIA	102774.00	OWENS R BL TINEMAHA RE NR BIG PINE CA
CALIFORNIA	114670.00	RUSSIAN RIVER NR GUERNEVILLE CALIF
CALIFORNIA	114476.50	SACRAMENTO RIVER AT FREEPORT CALIF
CALIFORNIA	113035.00	SAN JOAQUIN RIVER NEAR VERNALIS CALIF
CALIFORNIA	110740.00	SANTA ANA RIVER BELOW PRADO DAM, CALIF.
COLORADO	91525.00	GUNNISON RIVER NEAR GRAND JUNCTION, CO.
COLORADO	92600.00	LITTLE SNAKE RIVER NEAR LILY, CO.
COLORADO	82515.00	RIO GRANDE NEAR LOBATOS, CO.
COLORADO	67640.00	SOUTH PLATTE RIVER AT JULESBURG, CO.
COLORADO	92510.00	YAMPA RIVER NEAR MAYBELL, CO.
CONNECTICUT	11840.00	CONNECTICUT R AT THOMPSONVILLE, CT
CONNECTICUT	12055.00	HOUSATONIC R AT STEVENSON, CT

FLORIDA	23580.00	APALACHICOLA RIVER AT CHATTAHOOCHEE FLA
FLORIDA	22924.80	CALOOSAHATCHEE CANAL AT ORTONA LOCK NR LA BELLE
FLORIDA	23590.00	CHIPOLA RIVER NR ALTHA, FLA.
FLORIDA	23665.00	CHOCTAWHATCHEE RIVER NR BRUCE, FLA.
FLORIDA	23755.00	ESCAMBIA RIVER NEAR CENTURY, FLA.
FLORIDA	23030.00	HILLSBOROUGH RIVER NR ZEPHYRHILLS, FLA.
FLORIDA	22730.00	KISSIMMEE R AT S-65E NR OKEECHOBEE, FLA.
FLORIDA	22530.00	MAIN CANAL AT VERO BEACH, FLA.
FLORIDA	22886.00	MIAMI CANAL AT NW36 ST, MIAMI,FL
FLORIDA	23290.00	OCHLOCKONEE RIVER NR HAVANA, FLA.
FLORIDA	22967.50	PEACE RIVER AT ARCADIA, FLA.
FLORIDA	22480.00	SPRUCE CREEK NR SAMSULA, FLA.
FLORIDA	22310.00	ST MARYS RIVER NR MACCLENNY, FLA.
FLORIDA	22444.50	ST. JOHNS RIVER AT PALATKA, FLA.
FLORIDA	23205.00	SUWANNEE RIVER AT BRANFORD, FLA.
FLORIDA	22790.00	WEST PALM BEACH CANAL AT WEST PALM BEACH FLA
FLORIDA	23130.00	WITHLACOOCHEE RIVER NR HOLDER, FLA.
FLORIDA	23680.00	YELLOW RIVER AT MILLIGAN, FLA.
GEORGIA	22025.00	OGEECHEE RIVER NEAR EDEN, GA.
GEORGIA	22280.00	SATILLA RIVER AT ATKINSON, GA.
GEORGIA	21985.00	SAVANNAH RIVER NEAR CLYO, GA
HAWAII	164000.00	HALAWA STREAM NR HALAWA, MOLOKAI, HI
HAWAII	166180.00	KAHAKULOA STREAM NR HONOKOHAU, MAUI, HI
HAWAII	162293.00	KALIHI STREAM AT KALIHI, OAHU, HI
HAWAII	162130.00	WAIKELE STREAM AT WAIPAHU, OAHU, HI
HAWAII	160310.00	WAIMEA RIVER NR WAIMEA, KAUAI, HI
IDAHO	123185.00	KOOTENAI RIVER NR COPELAND, ID
IDAHO	133170.00	SALMON RIVER AT WHITEBIRD, IDAHO
IDAHO	131545.00	SNAKE RIVER AT KING HILL,ID
ILLINOIS	55995.00	BIG MUDDY RIVER AT MURPHYSBORO, IL
ILLINOIS	55435.00	ILLINOIS RIVER AT MARSEILLES, IL
ILLINOIS	55941.00	KASKASKIA RIVER NEAR VENEDY STATION, IL
ILLINOIS	70220.00	MISSISSIPPI RIVER AT THEBES ILL
ILLINOIS	55875.50	MISSISSIPPI RIVER BELOW ALTON,ILL
ILLINOIS	36125.00	OHIO RIVER AT DAM 53 NEAR GRAND CHAIN,ILL.
ILLINOIS	54465.00	ROCK RIVER NEAR JOSLIN, IL
INDIANA	33785.00	WABASH RIVER AT NEW HARMONY, IND.
INDIANA	33741.00	WHITE RIVER AT HAZLETON, IND.
INDIANA	32765.00	WHITEWATER RIVER AT BROOKVILLE, IND
IOWA	64855.00	BIG SIOUX R AT AKRON IA
IOWA	54205.00	MISSISSIPPI RIVER AT CLINTON, IOWA
IOWA	54745.00	MISSISSIPPI RIVER AT KEOKUK, IOWA
IOWA	64860.00	MISSOURI RIVER AT SIOUX CITY, IOWA
KANSAS	71465.00	ARKANSAS R AT ARKANSAS CITY, KS
KANSAS	71375.00	ARKANSAS R NR COOLIDGE, KS
KANSAS	68870.00	BIG BLUE R NR MANHATTAN, KS
KANSAS	68923.50	KANSAS R AT DESOTO, KS
KANSAS	68566.00	REPUBLICAN R AT CLAY CENTER, KS
KANSAS	68776.00	SMOKY HILL R AT ENTERPRISE, KS
KENTUCKY	32150.00	BIG SANDY R AT LOUISA, KY
KENTUCKY	34382.20	CUMBERLAND RIVER NE4R GRAND RIVERS, KY.
KENTUCKY	33212.30	GREEN RIVER NR BEECH GROVE,KY.
KENTUCKY	32905.00	KENTUCKY RIVER AT LOCK 2,AT LOCKPORT,KY.
KENTUCKY	32540.00	LICKING RIVER AT BUTLER,KY.

KENTUCKY	33032.80	OHIO R AT CANNELTON DAM, KY
KENTUCKY	32166.00	OHIO R AT GREENUP DAM NR GREENUP, KY
KENTUCKY	32772.00	OHIO R AT MARKLAND DAM NR WARSAW, KY
KENTUCKY	33016.30	ROLLING FORK NR LEBANON JUNCTION,KY.
KENTUCKY	36097.50	TENNESSEE RIVER AT HIGHWAY 60,NEAR PADUCAH,KY.
LOUISIANA	24920.00	BOGUE CHITTO NEAR BUSH, LA.
LOUISIANA	73816.00	LOWER ATCHAFALAYA RIVER AT MORGAN CITY, LA.
LOUISIANA	24895.00	PEARL RIVER NEAR BOGALUSA, LA.
LOUISIANA	73785.10	AMITE R AT 4H CAMP NR DENHAM SPRINGS
LOUISIANA	73857.00	BAYOU TECHE AT KEYSTONE LOCK, NR ST.MARTINVILLE
LOUISIANA	80159.00	CALCASIEU R NR LAKE CHARLES
LOUISIANA	73745.25	MISSISSIPPI RIVER AT BELLE CHASSE, LA.
LOUISIANA	73734.20	MISSISSIPPI RIVER NEAR ST. FRANCISVILLE, LA
LOUISIANA	73676.40	OUACHITA RIVER AT COLUMBIA, LA.
LOUISIANA	73555.00	RED R AT ALEXANDRIA
LOUISIANA	73695.00	TENSAS RIVER AT TENDAL, LOUISIANA
MAINE	10594.00	ANDROSCOGGIN RIVER AT BRUNSWICK, ME
MAINE	10171.00	AROOSTOOK RIVER AT CARIBOU, ME
MAINE	10345.00	PENOBSCOT RIVER AT WEST ENFIELD, ME
MAINE	10660.00	SACO RIVER AT CORNISH, ME
MAINE	10210.50	ST. CROIX RIVER AT MILLTOWN, ME
MARYLAND	14910.00	CHOPTANK R NR GREENSBORO, MD
MASSACHUSETTS	11035.00	CHARLES RIVER AT DOVER, MA
MASSACHUSETTS	10965.50	MERRIMACK RIVER ABOVE LOWELL, MA
MICHIGAN	40595.00	FORD RIVER NR HYDE, MICH.
MICHIGAN	41320.52	CHEBOYGAN R AT LINCOLN AVE AT CHEBOYGAN, MICH.
MICHIGAN	41655.00	CLINTON RIVER AT MOUNT CLEMENS, MICH.
MICHIGAN	41657.00	DETROIT R AT DETROIT, MICH.
MICHIGAN	40590.00	ESCANABA RIVER AT CORNELL, MICH.
MICHIGAN	41086.90	KALAMAZOO RIVER AT SAUGATUCK, MICH.
MICHIGAN	41265.20	MANISTEE R AT MANISTEE, MICH.
MICHIGAN	40570.04	MANISTIQUE RIVER ABOVE MANISTIQUE, MICH.
MICHIGAN	41220.30	MUSKEGON R NR BRIDGETON, MICH.
MICHIGAN	40400.00	ONTONAGON R NR ROCKLAND, MICH
MICHIGAN	41420.00	RIFLE RIVER NEAR STERLING, MICH.
MICHIGAN	41570.00	SAGINAW RIVER AT SAGINAW, MICH.
MICHIGAN	40455.80	ST MARYS RIVER ABOVE SAULT STE MARIE, MICH.
MICHIGAN	40455.00	TAHQUAMENON RIVER NR TAHQUAMENON PARADISE, MICH.
MINNESOTA	40145.00	BAPTISM RIVER NEAR BEAVER BAY, MN
MINNESOTA	51315.00	LITTLE FORK RIVER AT LITTLEFORK, MN
MINNESOTA	53300.00	MINNESOTA RIVER NEAR JORDAN, MN
MINNESOTA	53785.00	MISSISSIPPI RIVER AT WINONA, MN
MINNESOTA	52670.00	MISSISSIPPI RIVER NEAR ROYALTON, MN
MINNESOTA	51120.00	ROSEAU RIVER BELOW STATE DITCH 51 NR CARIBOU, MN
MINNESOTA	40240.00	ST. LOUIS RIVER AT SCANLON, MN
MISSISSIPPI	72900.00	BIG BLACK RIVER NR BOVINA, MS
MISSISSIPPI	72925.00	HOMOCHITTO RIVER AT ROSETTA, MS
MISSISSIPPI	72890.00	MISSISSIPPI RIVER AT VICKSBURG, MS
MISSISSIPPI	24790.20	PASCAGOULA RIVER NR BENNDALE, MS
MISSOURI	54906.00	DES MOINES RIVER AT ST. FRANCISVILLE, MO.
MISSOURI	69020.00	GRAND RIVER NEAR SUMNER MO
MISSOURI	69345.00	MISSOURI RIVER AT HERMANN, MO
MISSOURI	68180.00	MISSOURI RIVER AT ST. JOSEPH, MO.
MISSOURI	69265.10	OSAGE RIVER BELOW ST. THOMAS, MISSOURI

MONTANA	62947.00	BIGHORN RIVER AT BIGHORN, MT.
MONTANA	61745.00	MILK RIVER AT NASHUA MT
MONTANA	60545.00	MISSOURI RIVER AT TOSTON, MT.
MONTANA	61095.00	MISSOURI RIVER AT VIRGELLE, MT.
MONTANA	61320.00	MISSOURI RIVER BELOW FORT PECK DAM, MT.
MONTANA	61855.00	MISSOURI RIVER NEAR CULBERTSON, MT.
MONTANA	61305.00	MUSSELSHELL RIVER AT MOSBY, MT.
MONTANA	63265.00	POWDER RIVER NEAR LOCATE, MT.
MONTANA	63085.00	TONGUE RIVER AT MILES CITY, MT.
MONTANA	62145.00	YELLOWSTONE RIVER AT BILLINGS MT
MONTANA	63295.00	YELLOWSTONE RIVER NEAR SIDNEY, MT.
NEBRASKA	67924.99	LOUP R POWER CA AT DIV NR GENOA, NEBR.
NEBRASKA	64655.00	NIOBRARA RIVER NR. VERDEL, NEBR.
NEBRASKA	66860.00	NORTH PLATTE RIVER AT LISCO, NEBR.
NEBRASKA	68055.00	PLATTE R AT LOUISVILLE NE
NEVADA	103120.00	CARSON R NR FORT CHURCHILL, NV
NEVADA	102499.00	CHIATOVICH C NR DYER, NV
NEVADA	103350.00	HUMBOLDT R NR RYE PATCH, NV
NEVADA	103517.00	TRUCKEE R NR NIXON, NV
NEVADA	103015.00	WALKER R NR WABUSKA, NV
NEW HAMPSHIRE	11550.50	CONNECTICUT RIVER AT WALPOLE, NH
NEW JERSEY	14635.00	DELAWARE R AT TRENTON NJ
NEW JERSEY	14041.00	RARITAN R NR SOUTH BOUND BROOK NJ
NEW JERSEY	14085.00	TOMS R NR TOMS RIVER NJ
NEW MEXICO	72271.40	CANADIAN RIVER ABOVE NM-TX STATE LINE, NM
NEW MEXICO	84075.00	PECOS RIVER AT RED BLUFF, NM
NEW MEXICO	83130.00	RIO GRANDE AT OTOWI BRIDGE, NM
NEW MEXICO	83583.00	RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, NM
NEW MEXICO	84815.00	RIO TULAROSA NEAR BENT, NM
NEW MEXICO	93680.00	SAN JUAN RIVER AT SHIPROCK, NM
NEW YORK	42605.00	BLACK RIVER AT WATERTOWN, NY
NEW YORK	42320.06	GENESEE RIVER(CHARLOTTE DOCKS)AT ROCHESTER NY
NEW YORK	13580.00	HUDSON RIVER AT GREEN ISLAND NY
NEW YORK	42196.40	NIAGARA RIVER (LAKE ONTARIO) AT FORT NIAGARA NY
NEW YORK	42490.00	OSWEGO RIVER AT LOCK 7 AT OSWEGO NY
NEW YORK	13045.00	PECONIC RIVER AT RIVERHEAD NY
NEW YORK	42950.00	RICHELIEU R (L CHAMPLAIN) AT ROUSES POINT NY
NEW YORK	42643.31	ST LAWRENCE R AT CORNWALL ONT NR MASSENA, NY
NEW YORK	42690.00	ST REGIS RIVER AT BRASHER CENTER NY
NORTH CAROLINA	21057.69	CAPE FEAR R AT LOCK # 1 NR KELLY, NC
NORTH CAROLINA	20895.00	NEUSE RIVER AT KINSTON, N. C.
NORTH CAROLINA	21290.00	PEE DEE R NR ROCKINGHAM, NC
NORTH CAROLINA	20805.00	ROANOKE RIVER AT ROANOKE RAPIDS, N.C.
NORTH CAROLINA	20835.00	TAR RIVER AT TARBORO, N. C.
NORTH DAKOTA	63540.00	CANNONBALL RIVER AT BREIEN, ND
NORTH DAKOTA	63405.00	KNIFE RIVER AT HAZEN, ND
NORTH DAKOTA	63370.00	LITTLE MISSOURI RIVER NR WATFORD CITY, ND
NORTH DAKOTA	63384.90	MISSOURI RIVER AT GARRISON DAM, ND
NORTH DAKOTA	51240.00	SOURIS RIVER NR WESTHOPE, ND
OHIO	42080.00	CUYAHOGA R AT INDEPENDENCE OH
OHIO	32746.00	G MIAMI R AT NEW BALTIMORE OH
OHIO	32455.00	L MIAMI R AT MILFORD OH
OHIO	41935.00	MAUMEE R AT WATERVILLE OH
OHIO	31500.00	MUSKINGUM R AT MCCONNELSVILLE OH

OHIO	32345.00	SCIOTO R AT HIGBY OH
OKLAHOMA	72340.00	BEAVER RIVER AT BEAVER, OK
OKLAHOMA	72315.00	CANADIAN RIVER AT CALVIN, OK
OKLAHOMA	72450.00	CANADIAN RIVER NR WHITEFIELD, OK
OKLAHOMA	71610.00	CIMARRON RIVER AT PERKINS, OK
OKLAHOMA	71579.50	CIMARRON RIVER NR BUFFALO, OK
OKLAHOMA	71935.00	NEOSHO RIVER BLW FT GIBSON LAKE NR FT GIBSON, OK
OKLAHOMA	72375.00	NORTH CANADIAN RIVER AT WOODWARD, OK
OKLAHOMA	73050.00	NORTH FORK RED RIVER NR HEADRICK, OK
OKLAHOMA	71786.20	VERDIGRIS RIVER (NEWT GRAHAM L&D) NEAR INOLA, OK
OKLAHOMA	73310.00	WASHITA RIVER NR DICKSON,OK
OREGON	141289.10	COLUMBIA RIVER AT WARRENDALE,OREG.
OREGON	141030.00	DESCHUTES RIVER AT MOODY, NEAR BIGGS OREG
OREGON	103960.00	DONNER UND BLITZEN RIVER NR FRENCHGLEN,OREG.
OREGON	140480.00	JOHN DAY R AT MCDONALD FERRY,OREG.
OREGON	143010.00	NEHALEM RIVER NEAR FOSS, OREG.
OREGON	143723.00	ROGUE RIVER NEAR AGNESS,OREG.
OREGON	132904.50	SNAKE RIVER AT HELLS CANYON DAM ID-OR LINE
OREGON	142075.00	TUALATIN RIVER AT WEST LINN,OREG.
OREGON	143210.00	UMPQUA RIVER NEAR ELKTON, OREG.
OREGON	142117.20	WILLAMETTE RIVER AT PORTLAND,OREG.
PENNSYLVANIA	30496.25	ALLEGHENY R AT NEW KENSINGTON, PA.
PENNSYLVANIA	30850.00	MONONGAHELA RIVER AT BRADDOCK, PA.
PENNSYLVANIA	14745.00	SCHUYLKILL RIVER AT PHILADELPHIA, PA.
PENNSYLVANIA	15405.00	SUSQUEHANNA RIVER AT DANVILLE, PA.
PENNSYLVANIA	15705.00	SUSQUEHANNA RIVER AT HARRISBURG, PA.
PENNSYLVANIA	15535.00	WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.
PUERTO RICO	500460.00	RIO DE LA PLATA AT TOA ALTA, PR
PUERTO RICO	501440.00	RIO GRANDE DE ANASCO NR SAN SEBASTIAN, PR
PUERTO RICO	500381.00	RIO GRANDE DE MANATI AT HWY 2 NR MANATI, PR
PUERTO RICO	500920.00	RIO GRANDE DE PATILLAS NR PATILLAS
SOUTH CAROLINA	21360.00	BLACK RIVER AT KINGSTREE, S.C.
SOUTH CAROLINA	21765.00	COOSAWHATCHIE RIVER NR HAMPTON S.C.
SOUTH CAROLINA	21750.00	EDISTO RIVER NR GIVHANS S.C.
SOUTH CAROLINA	21705.00	LAKES M-M DIV CANAL NR PINEVILLE S. C.
SOUTH CAROLINA	21320.00	LYNCHES RIVER AT EFFINGHAM S. C.
SOUTH DAKOTA	64380.00	BELLE FOURCHE R NEAR ELM SPRINGS SD
SOUTH DAKOTA	64393.00	CHEYENNE R AT CHERRY CREEK SD
SOUTH DAKOTA	63578.00	GRAND R AT LITTLE EAGLE SD
SOUTH DAKOTA	64785.00	JAMES R NEAR SCOTLAND SD
SOUTH DAKOTA	64530.00	MISSOURI R AT FORT RANDALL SD
SOUTH DAKOTA	64400.00	MISSOURI R AT PIERRE SD
SOUTH DAKOTA	64520.00	WHITE R NEAR OACOMA SD
TENNESSEE	34250.00	CUMBERLAND RIVER AT CARTHAGE, TENN.
TENNESSEE	34705.00	FRENCH BROAD RIVER NEAR KNOXVILLE, TENN.
TENNESSEE	70320.00	MISSISSIPPI RIVER AT MEMPHIS, TENN.
TENNESSEE	70260.00	OBION RIVER AT OBION, TENN.
TENNESSEE	35930.05	TENNESSEE RIVER AT PICKWICK LANDING DAM (LL), TN
TENNESSEE	35718.50	TENNESSEE RIVER AT SOUTH PITTSBURG, TENN.
TENNESSEE	35430.05	TENNESSEE RIVER AT WATTS BAR DAM (TAILWATER), TN
TEXAS	81166.50	BRAZOS RIVER NEAR ROSHARON,TEX.(DISC)
TEXAS	80982.90	BRAZOS RIVER NR HIGHBANK, TEX.
TEXAS	72280.00	CANADIAN R NR CANADIAN, TX
TEXAS	81580.00	COLORADO RIVER AT AUSTIN, TEX.

TEXAS	81620.00	COLORADO RIVER AT WHARTON, TEX.
TEXAS	81765.00	GUADALUPE RIVER AT VICTORIA, TEX.
TEXAS	82124.00	LOS OLMOS CREEK NEAR FALFURRIAS, TEX.
TEXAS	80410.00	NECHES RIVER AT EVADALE, TEX.
TEXAS	82100.00	NUECES RIVER NR. THREE RIVERS, TEX.
TEXAS	72979.10	PDTF RED RIVER NEAR WAYSIDE, TEX.
TEXAS	84474.10	PECOS RIVER NEAR LANGTRY, TX
TEXAS	73316.00	RED RIVER AT DENISON DAM NR DENISON, TX
TEXAS	73085.00	RED RIVER NR BURKBURNETT, TX
TEXAS	83772.00	RIO GRANDE AT FOSTER RANCH NR LANGTRY, TEXAS
TEXAS	84590.00	RIO GRANDE AT LAREDO, TEX.
TEXAS	84750.00	RIO GRANDE NEAR BROWNSVILLE, TEXAS
TEXAS	80305.00	SABINE RIVER NR RULIFF, TEX.
TEXAS	80820.00	SALT FK BRAZOS R NR ASPERMONT, TX
TEXAS	81885.00	SAN ANTONIO RIVER AT GOLIAD, TEX.
TEXAS	80665.00	TRINITY R AT ROMAYOR, TEXAS
TEXAS	80680.00	WEST FORK SAN JACINTO RIVER NR CONROE, TX
UTAH	101260.00	BEAR R NR CORINNE
UTAH	102370.00	BEAVER RIV AT ADAMSVILLE, UTAH
UTAH	91635.30	COLORADO RIVER BELOW COLORADO-UTAH STATE LINE
UTAH	91805.00	COLORADO RIVER NEAR CISCO UTAH
UTAH	93150.00	GREEN RIVER AT GREEN RIVER, UTAH
UTAH	92345.00	GREEN RIVER NEAR GREENDALE, UTAH
UTAH	101710.00	JORDAN RIVER @ 1700 SOUTH @ SALT LAKE CITY, UTAH
UTAH	93795.00	SAN JUAN RIVER NEAR BLUFF, UTAH
UTAH	102240.00	SEVIER RIVER NEAR LYNNDYL, UTAH
UTAH	101410.00	WEBER RIVER NR PLAIN CITY UTAH
VIRGINIA	16730.00	PAMUNKEY RIVER NR HANOVER VA
VIRGINIA	20495.00	BLACKWATER R NR FRANKLIN, VA
VIRGINIA	20350.00	JAMES RIVER AT CARTERSVILLE, VA
VIRGINIA	16465.80	POTOMAC R AT CHAIN BRIDGE, AT WASH, DC
WASHINGTON	120310.00	CHEHALIS RIVER AT PORTER, WASH.
WASHINGTON	124005.20	COLUMBIA RIVER AT NORTHPORT, WASH.
WASHINGTON	120455.00	ELWHA RIVER AT MCDONALD BR NR PRT ANGELES, WASH.
WASHINGTON	141130.00	KLICKITAT RIVER NEAR PITT, WASH.
WASHINGTON	123986.00	PEND OREILLE RIVER AT INTERNATIONAL BOUNDARY
WASHINGTON	122005.00	SKAGIT RIVER NEAR MOUNT VERNON, WASH.
WASHINGTON	133532.00	SNAKE RIVER AT BURBANK, WASH.
WASHINGTON	124330.00	SPOKANE RIVER AT LONG LAKE, WASH.
WASHINGTON	125105.00	YAKIMA RIVER AT KIONA, WASH.
WEST VIRGINIA	32013.00	KANAWHA RIVER AT WINFIELD, WV
WISCONSIN	53695.00	CHIPPEWA RIVER AT DURAND, WI
WISCONSIN	40850.00	FOX RIVER AT WRIGHTSTOWN, WI
WISCONSIN	40870.00	MILWAUKEE RIVER AT MILWAUKEE, WI
WISCONSIN	53405.00	ST. CROIX RIVER AT ST. CROIX FALLS, WI
WISCONSIN	54070.00	WISCONSIN RIVER AT MUSCODA, WI

SUMMARY TABLES BY STATION

Summary Tables for the Bench-Mark and NASQAN stations listed in Table 2 and Table 3 are available on request from the National Water Data Exchange, U.S. Geological Survey, Reston, Virginia, 22092, telephone (703) 860-6031. Tables are available through the mail or by wire to remote terminal. An example table for station no. 11035.00, Charles River at Dover, MA appears on the following page.

Statistical summary by station (example)

Station ID 11035.00 — Station Location: CHARLES RIVER AT DOVER, MA — Mean Discharge (cfs) 320 — Drainage Area (sq mi) 184

Period of summary 1974-1981

Common Quality Constituents (sampled monthly)	N	Concentration MEAN (mg/l)	Concentration STANDARD DEVIATION	Concentration TREND p	Concentration SLOPE (%/yr)	Flow Adjusted Concentration REGRESSION vs FLOW r squared	N	type/slope	Flow Adjusted TREND p	Flow Adjusted SLOPE (%/yr)	Transport MEAN (kg/day)	Transport TREND p	Transport SLOPE (%/yr)
Temperature (degrees C)	77	11.3	9.2	0.03S	2.0	0.23H	72	log -	0.73	-0.4			
Conductivity (um/cm)	77	186.5	35.6	0.59	0.9	0.47H	77	hyp -	0.26	-1.3			
Turbidity (JTU)	19	2.6	1.2	I.D.	I.D.	I.D.	19		I.D.	I.D.			
pH(std units;transport as H)	75	6.7	0.5	0.00H	-1.5	0.04	75	log -	0.00H	-1.9	0.38E-03	0.06	11.4
Alkalinity as CaCO3	47	20.1	6.5	0.00H	5.0	0.60H	47	hyp -	0.03S	4.0	0.13E+05	0.85	1.1
Sulfate as SO4	57	14.4	3.9	0.83	0.0	0.08S	57	lin -	0.83	0.3	0.10E+05	0.08	-8.2
Chloride	57	33.2	5.9	0.61	-0.0	0.36H	57	hyp -	0.14	-1.8	0.22E+05	0.08	-8.4
Silica	56	5.4	2.9	0.56	2.4	0.02	56	inv +	0.56	4.1	0.45E+04	0.77	-3.9
Calcium	57	10.7	2.3	0.82	0.0	0.61H	57	log -	0.08	-2.7	0.66E+04	0.03S	-9.9
Magnesium	57	2.6	0.6	0.13	1.9	0.52H	57	log -	0.94	0.4	0.16E+04	0.14	-10.0
Sodium	57	19.4	3.7	0.08	1.3	0.46H	57	log -	1.00	-0.1	0.13E+05	0.18	-7.2
Potassium	57	2.0	0.6	0.00H	4.9	0.28H	57	log -	0.14	3.3	0.13E+04	0.15	-9.6
Dissolved Solids	56	100.4	16.2	0.08	1.2	0.57H	56	hyp -	0.77	0.4	0.66E+05	0.15	-7.0
Suspended Sediment	47	22.2	27.4	0.00H	-43.6	0.16S	47	exp +	0.01S	-34.8	0.23E+05	0.00H	-69.6
Phosphorus, total as P	76	0.23	0.12	0.55	0.8	0.65H	76	exp -	0.65	-0.9	0.11E+03	0.03S	-7.4
Nitrate-Nitrite, total as N	73	0.45	0.30	0.08	4.9	0.20H	73	exp +	0.01S	9.4	0.51E+03	0.05	-7.6
Ammonia, total as N	46	0.19	0.31	0.11	14.4	0.10	46	exp -	0.35	9.7	0.98E+02	0.05	-25.6
Organic Carbon, total as C	34	9.5	5.4	0.44	-3.6	0.02	34	exp -	0.26	-4.3	0.68E+04	0.90	-3.8
Dissolved Oxygen	77	10.3	2.3	0.40	0.5	0.15H	77	log +	0.13	1.2	0.83E+04	0.19	-5.2
Fecal Coliform (col/100 ml)	19	95.0	127.0	I.D.	I.D.	I.D.	18		I.D.	I.D.	a0.32E+12c	I.D.	I.D.
Fecal Strep. (col/100 ml)	52	215.0	492.0	0.45	-20.1	0.00	51	exp -	0.34	-19.6	0.16E+13c	0.14	-41.6
Phytoplankton (cells/ml)	50	17649.0	25154.0	0.52	11.4	0.40H	50	exp -	1.00	2.0	0.80E+16c	0.63	3.6

Metals (total) (sampled quarterly)	N	Concentration DETECTION LIMIT value (ug/l)	DETECTION LIMIT frequency exceeded (%)	MEDIAN (ug/l)	RANGE OF MEAN min (ug/l)	RANGE OF MEAN max (ug/l)	TREND p	SLOPE direction	Transport N	RANGE OF MEAN min (kg/day)	RANGE OF MEAN max (kg/day)
Aluminum	0	100.0	0	I.D.	I.D.	I.D.	I.D.	I.D.	0	I.D.	I.D.
Arsenic	23	1.0	65	1.0	1.2	1.6	1.00	+	23	0.92E+00	0.12E+01
Barium	14	100.0	42	<=D.L.	50.0	107.1	I.D.	I.D.	14	0.41E+02	0.98E+02
Boron	0	20.0	0	I.D.	I.D.	I.D.	I.D.	I.D.	0	I.D.	I.D.
Cadmium	24	20.0	0	<=D.L.	1.4	14.1	N.D.	N.D.	24	0.30E+01	0.15E+02
Chromium	24	20.0	8	<=D.L.	3.3*	18.3	0.15	+	24	0.15E+01*	0.19E+02
Copper	24	20.0	0	<=D.L.	3.1	9.0	N.D.	N.D.	24	0.28E+01	0.60E+01
Iron	24	10.0	100	420.0	497.5	497.5	0.35	-	24	0.34E+03	0.34E+03
Lead	24	200.0	0	<=D.L.	10.5	35.5	N.D.	N.D.	24	0.75E+01*	0.55E+02
Manganese	24	10.0	100	50.0	64.6	64.6	0.92	-	24	0.41E+02	0.41E+02
Mercury	23	0.5	4	<=D.L.	0.0	0.4	0.24	-	23	0.30E-02	0.40E+00*
Nickel	8	200.0	0	<=D.L.	3.3	3.5*	I.D.	I.D.	8	0.10E+02	0.11E+02*
Silver	14	20.0	0	<=D.L.	0.0	20.0	I.D.	I.D.	14	0.00E+00	0.18E+02
Zinc	24	20.0	54	20.0	27.5	35.0	1.00	+	24	0.20E+02	0.29E+02

Metals (dissolved) (sampled quarterly)	N	Concentration DETECTION LIMIT value (ug/l)	DETECTION LIMIT frequency exceeded (%)	MEDIAN (ug/l)	RANGE OF MEAN min (ug/l)	RANGE OF MEAN max (ug/l)	TREND p	SLOPE direction	Transport N	RANGE OF MEAN min (kg/day)	RANGE OF MEAN max (kg/day)
Aluminum	0	100.0	0	I.D.	I.D.	I.D.	I.D.	I.D.	0	I.D.	I.D.
Arsenic	24	1.0	50	<=D.L.	0.7	1.2	0.91	-	24	0.65E+00	0.11E+01
Barium	14	100.0	14	<=D.L.	21.4	107.1	I.D.	I.D.	14	0.35E+02	0.92E+02
Boron	0	20.0	0	I.D.	I.D.	I.D.	I.D.	I.D.	0	I.D.	I.D.
Cadmium	24	2.0	29	<=D.L.	1.0	2.4	0.20	+	24	0.13E+01	0.24E+01
Chromium	24	20.0	4	<=D.L.	3.8	11.7	0.56	+	24	0.22E+01	0.63E+01
Copper	24	20.0	0	<=D.L.	2.2	8.2	N.D.	N.D.	24	0.17E+01	0.52E+01
Iron	24	10.0	100	220.0	249.2	249.2	0.26	-	24	0.16E+03	0.16E+03
Lead	24	2.0	75	5.0	9.6	10.0	0.26	-	24	0.13E+02	0.13E+02
Manganese	24	10.0	95	40.0	43.3	43.8	0.29	-	24	0.32E+02	0.33E+02
Mercury	24	0.5	0	<=D.L.	0.0	0.4	N.D.	N.D.	24	0.00E+00	0.45E+00
Nickel	8	200.0	0	<=D.L.	2.3	52.5	I.D.	I.D.	8	0.15E+01	0.89E+02
Silver	14	2.0	0	<=D.L.	0.0	2.0	I.D.	I.D.	14	0.00E+00	0.17E+01
Zinc	24	20.0	45	<=D.L.	12.1	22.9	0.34	+	24	0.52E+01	0.21E+02

Notes

Detection limits refer to the highest laboratory detection limits used during the period of record. Consequently, estimated mean metal concentrations may be lower than the stated detection limits.

'a' denotes transport rates estimated as averages of monthly or quarterly sample data. Otherwise, daily flow frequency distributions are used in the estimation of transport rates (see text).

'c' denotes transport rates expressed as colonies per day (bacteria) or cells per day (phytoplankton).

'*' denotes mean total metal concentrations estimated as less than the corresponding mean dissolved metal concentrations.

Abbreviations

N	Number of Samples	cfs	Cubic Feet per Second
min	Minimum	C	Celsius
max	Maximum	JTU	Jackson Turbidity Units
I.D.	Insufficient Data	col	Colonies
N.D.	Not Detected	lin	Linear
D.L.	Detection Limit	log	Log
p	Significance Level of Trend Test	hyp	Hyperbolic
H	Highly Significant (p less than 0.01)	inv	Inverse
S	Significant (p less than 0.05)	exp	Exponential

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