Trends in Surface-Water Quality in Connecticut, 1969-88

By Elaine C. Todd Trench

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
mile (mi)	1.609	kilometer
square mile (mi^2)	2.590	square kilometer
cubic foot per second (ft^3/s)	0.02832	cubic meter per second
ton (short)	0.9072	megagram
pound (lb)	0.4536	kilogram

Sea level--In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)- a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called "Sea Level Datum of 1929."

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ABSTRACT

Surface-water-quality data from selected monitoring stations in Connecticut were analyzed for trend, using the Seasonal Kendall test, for water years 1969-88, 1975-88, and 1981-88. The number of constituents and stations evaluated varied with the different time periods. The 39 monitoring stations included 26 freshwater streams with associated discharge data, 7 tidally affected streams, 4 harbor stations, and 2 surface impoundments. Flow-adjustment procedures were used where possible to minimize the effects of streamflow variability on trend results.

The drainage area of the monitoring stations includes approximately 5,000 mi^2 covering the State of Connecticut and about 11,000 mi^2 in upstream drainage areas outside of the State. Drainage basin size for the freshwater streams ranges from 4.1 mi^2 to 9,660 mi^2. Land uses in the drainage basins range from undeveloped forested areas to highly urbanized metropolitan areas. During the period covered by the trend study, the State's population has grown, suburban development has increased, agricultural land use has decreased, and wastewater-treatment practices have improved.

Increases in specific conductance and in the concentrations of calcium, magnesium, chloride, sulfate, dissolved solids, and total solids were geographically widespread and numerous during water years 1975-88 and indicate a general increase statewide in dissolved constituents in streamflow, both in urbanized and less developed areas. The effects of increasing urbanization, including municipal and industrial wastewater, septic system leachate, nonpoint runoff, and atmospheric deposition of contaminants, are possible causes for these increases.

Decreases in turbidity and in the concentrations of total phosphorus, total organic carbon, and fecal coliform bacteria were geographically widespread and numerous during 1975-88. This general decrease in suspended material and bacteria may be attributable to basic improvements in the treatment of municipal and industrial wastewater during the period of record. Decreasing concentrations of total phosphorus may also be related to decreases in agricultural land use and to a decline in the use of detergents containing phosphorus. Detected decreases in total organic carbon and turbidity may have been caused, in part, by changes in sampling or analytical methods.

Increases in total nitrogen, total organic nitrogen, and total nitrite-plus-nitrate were geographically widespread and numerous during 1975-88 and appear to indicate effects from both point sources in urbanized basins and nonpoint sources in less developed basins. The number of stations with increasing concentrations of nitrogen constituents was much smaller during 1981-88 than during 1975-88. Decreases in total ammonia nitrogen were detected at 11 stations during 1981-88. Decreases in total ammonia, sometimes paired with increases in total nitrite-plus-nitrate, may result from improvements in wastewater treatment.

Increases in the concentration of dissolved oxygen, or dissolved oxygen as a percent of saturation, were geographically widespread and numerous during 1969-88 and 1975-88. Increases were less common during 1981-88. Increases in dissolved oxygen in urbanized basins may be related to major improvements in wastewater treatment during the 1970's and 1980's. The magnitude of the trends detected during 1969-88 may have been affected in part by a change, around 1974, in the model of the instrument used to measure dissolved oxygen in the field.

Statewide increases in pH were detected during 1969-88, 1975-88, and 1981-88, in both urbanized and less developed basins. The widespread increases in pH were unexpected, given the relatively acidic quality of precipitation in the region during the study period. Only two decreases in pH were detected, both in relatively undeveloped basins. Increases in pH in urbanized areas may be related to decreasing concentrations of ammonia

and to requirements for neutralization of municipal and industrial wastewater. In streams with high nutrient concentrations, photosynthetic activity may result in high daytime concentrations of dissolved oxygen and high pH.

Concentrations of trace metals generally decreased during 1975-88 and 1981-88. Decreases in the concentrations of dissolved iron and dissolved manganese were common during 1975-88. Decreases in the concentrations of dissolved iron, total copper, total nickel, dissolved nickel, and total zinc were common during 1981-88. These decreases may be related to declining industrial activity in Connecticut, coupled with improved industrial wastewater treatment practices. Trends in trace metals at stations draining urbanized basins, where trace metal concentrations are typically above the detection limit, are considered to be reasonably representative of environmental conditions. By contrast, downward trends at stations draining less developed areas, where concentrations are typically very low, are more likely to have been affected by method changes that reduce the potential for sample contamination during collection and processing. Sediments in some streams continue to be a source of trace metals from past industrial activity.

For constituents with trends at many stations, most trends (1) were typically in the same direction, (2) were found throughout large parts of the State, and (3) were not confined to particular drainage basins. Increases in dissolved and suspended constituent concentrations in some drainage basins may have been affected by downward trends in streamflow during 1975-88; however, upward constituent trends in basins with no trend in streamflow indicate that other widespread environmental changes are causing the most prevalent trends in Connecticut stream quality.

Major improvements in water quality have taken place on streams in Connecticut, as measured by decreasing concentrations in total phosphorus, total organic carbon, fecal coliform and fecal streptococcal bacteria, total ammonia, and trace metals, and increasing concentrations of dissolved oxygen. Notable improvements in the larger river basins and in highly urbanized basins are likely to be related to improvements in wastewater treatment. Continuing adverse changes in some constituents were detected, however, in streams that receive major point discharges, particularly in medium-sized and smaller drainage basins. Increases in both dissolved and suspended constituents, indicating deterioration in water quality, have been detected in small, sparsely developed drainage basins that previously were considered to represent water quality that is relatively unaffected by human activities. These changes, and the geographically widespread pattern of trends in several constituents, may indicate increasing contamination from a variety of nonpoint sources.

INTRODUCTION

Water quality is constantly changing in response to changes in physical, chemical, and biological conditions. Changes may occur hourly, daily, seasonally, or over a period of years. Variations in water quality may be cyclic, with a regular return to some typical condition, or there may be a direction, or trend, in the change.

A trend in water quality is a change over time in the chemical, physical, or biological characteristics of water. Information on trends in surface-water quality can be used to evaluate whether water quality has improved or deteriorated. Water managers and planners use trend information to evaluate the effectiveness of public expenditures for water-quality improvement, to assess the status of achieving established water-quality goals, and to plan necessary remedial or preventive actions. Information on trends in water quality can be used to assess environmental conditions and changes.

Until recently, however, the assessment of trends in water quality has been hampered by the lack of consistent, long-term, geographically widespread water-quality data, and by the lack of appropriate statistical techniques for dealing with trend detection problems commonly presented by water-quality data. These two problems have been largely resolved as State and Federal monitoring networks have expanded and accrued sufficient records for trend analysis, and as statistical techniques have been developed to address the particular characteristics of water-quality data (Hirsch and others, 1982; Smith and others, 1982).

The U.S. Geological Survey (USGS) has collected data on surface-water quality in Connecticut since 1953 (U.S. Geological Survey, 1957,

p. 30). The number and distribution of monitoring stations, the frequency of monitoring, and the constituents and properties monitored have changed with the changing needs of State and Federal programs, with advances in analytical technology, and with improved understanding of the dynamics of water quality in freshwater systems.

During the 1950's and most of the 1960's, common constituents and properties of surface water in Connecticut were monitored intermittently at a few locations. Monitoring activities expanded substantially following the passage of Connecticut's Clean Water Act in 1967 and the Federal Water Pollution Control Act Amendments of 1972. In water year 1969, the surface-water monitoring network consisted of 16 stations sampled for approximately 25 common physical, chemical, and biological properties and constituents (U.S. Geological Survey, 1970). A cooperative effort between the USGS and the Connecticut Department of Environmental Protection (DEP) was initiated in 1973 to provide continuous long-term monitoring of streams and rivers in Connecticut. By the end of water year 1974, the network consisted of 49 stations, including 43 stations on streams, 2 on impoundments, and 4 in harbors or estuaries. As many as 50 water-quality characteristics were monitored regularly, including physical properties, common chemical constituents, nutrients, and biological measures; additional constituents monitored less frequently included trace metals, pesticides, and other organic chemicals (U.S. Geological Survey, 1975).

Human use of land and water resources in Connecticut has changed considerably during the 1970's and 1980's. Total population has increased, and the distribution of population has changed as well, with extensive suburban development in formerly rural and agricultural areas. Although there are more people, waste-disposal practices have improved substantially during this period. The use of land for agricultural purposes has declined. Manufacturing, including the metal industries, has declined, and industrial wastewater-treatment practices have improved. These changes provide a complex background to the trends in water quality presented in this report. The detection of trends in water quality constitutes a first step in understanding how these complex factors may have affected water quality in Connecticut.

Purpose and Scope

The purpose of this report is to summarize major trends in the quality of surface water in Connecticut during water years 1969-88. The report describes the procedure for selection and preparation of data used in the trend analysis, describes the statistical techniques used to perform the trend analysis, and presents an evaluation of the major trends in surface-water quality for selected periods of record.

A thorough interpretation of how these trends relate to hydrogeology, land use, population distribution, and pollution sources is beyond the scope of this report. However, some supporting information is presented to provide perspective on the detected trends, propose some preliminary interpretations, and point toward possibilities for further analysis.

This report covers the drainage areas for a network of 39 surface-water-quality stations located throughout Connecticut. The 39 stations selected for the trend analysis have at least 5 years of record for the selected constituents—the minimum period required to use the trend programs. All 39 stations were part of the surface-water-quality network sampled by the USGS during the period of the study. Five of the 39 stations were part of the National Stream Quality Accounting Network (NASQAN), and 1 station was part of the Collection of Basic Records Network (CBR) for water quality.

Water-quality records stored in the Survey's National Water Information System (NWIS) were analyzed for trends in selected chemical constituents, physical properties, and bacterial constituents for selected periods of record during water years 1969-88. Water-quality records from eight long-term stations were analyzed for water years 1969-88. Records were analyzed from 32 to 35 stations for water years 1975-88; this represents the longest period of record for the maximum number of stations and constituents. Water-quality records, including data on trace metals, were analyzed from 38 stations for water years 1981-88.

Previous Investigations

National trends in stream quality have been reported in several USGS studies. Steele and others (1974) used nonparametric statistical testing procedures to assess trends at 88 stations in the NASQAN. Trends in specific conductance, used as an index of overall chemical quality conditions, were analyzed for variable periods of record ending in water year 1972 (Steele and others, 1974, p. 13). Smith and others (1982) analyzed trends in total phosphorus at more than 300 NASQAN stations for periods of record ranging from 5 to 8 years. Trends in major constituents and properties, nutrients, bacteria, and trace metals were analyzed and interpreted by Smith and Alexander (1983) for water years 1975-81. Samples were collected from 313 NASQAN stations and 51 USGS Hydrologic Bench-Mark stations. Trends in dissolved solids, suspended sediment, total phosphorus, and inorganic nitrogen were presented and interpreted by Smith and Alexander (1985, p. 66-73) for 298 NASQAN stations for water years 1975-81.

Another national USGS study analyzed data from 388 monitoring stations for trends in 15 common constituents and 9 trace elements during water years 1974-81 (Smith and others, 1987a). The monitoring network included 294 NASQAN stations operated by the USGS and 94 National Water Quality Surveillance System (NWQSS) stations operated by the U.S. Environmental Protection Agency. The detected trends showed both improvement and deterioration in water quality. For example, widespread declines in fecal bacteria concentrations constitute an improvement, whereas increases in nitrate concentrations indicate deterioration (Smith and others, 1987a, p. 21). The study also tested for statistical associations between the observed trends and related data describing population, land use, and known pollution sources in the drainage basins of the water-quality stations (Smith and others, 1987a, p. 5, 21-22). The study found evidence that the detected trends reflect the effects of atmospheric deposition, fertilizer use, cropland erosion, road salt use, changes in surface coal production, and improved treatment of point-source effluents (Smith and others, 1987a, p. 21-22). As a result of the national trend study, the USGS initiated statewide trend studies in Texas, New Jersey, Arkansas, and Connecticut to examine regional and local trends in surface-water quality in more detail.

In Texas, data for approximately 40 water-quality properties and constituents from 117 monitoring stations were analyzed for trend by Schertz (1990) for water years 1975-86. Data for a smaller number of constituents and stations were analyzed for trend during water years 1969-86. Trend patterns indicated improvement in water quality in some areas of the State and degradation in other areas.

In New Jersey, data for 86 monitoring stations were analyzed for trend by Hay and Campbell (1990) for water years 1980-86. Data from 67 stations were analyzed for water years 1976-86. The study not only detected geographically widespread increases in specific conductance and in the concentrations of major cations and fecal streptococcal bacteria, indicating deterioration of water quality, but also detected increases in the concentration of dissolved oxygen and decreases in the concentrations of trace metals, total organic carbon, and total organic nitrogen, indicating improvement (Hay and Campbell, 1990, p. 1, 40). Trends in selected water-quality constituents are being analyzed for statistical association with drainage-basin characteristics (Robinson and others, in press).

In Arkansas, data for approximately 40 water-quality properties and constituents at 120 monitoring stations were analyzed for trend by Petersen (1992) for several time periods during water years 1975-89. Notable statewide trends included decreases in biochemical oxygen demand and in the concentrations of total suspended solids, fecal coliform bacteria, dissolved chloride, and total ammonia. Various regions of the state had downward trends in turbidity and in the concentration of dissolved oxygen, and upward trends in total hardness and in the concentrations of dissolved sulfate, total phosphorus, and total orthophosphate.

Water-quality data used in the trend analysis for Connecticut have been previously published in the annual data-report series of the U.S. Geological Survey entitled "Water Resources Data--Connecticut," for water years 1969-88. Healy and others (1994) provide summary statistics for water-quality conditions at 47 surface-water-quality stations in Connecticut for water years 1973-85. Connecticut's water-quality conditions and problems are described by the Connecticut Department of Environmental Protection, Bureau of Water Management (1988, 1990, 1992). A national USGS summary of stream-water-quality conditions and trends in all 50 states included trend analysis for 7 properties and constituents at 10 monitoring stations in Connecticut for varying periods of record during water years 1970-89 (Paulson and others, 1993, p. 207-214). The 10 stations and 6 of the 7 properties and constituents are included in the present study.

Acknowledgments

The U.S. Geological Survey and the State of Connecticut have had cooperative agreements for the collection of water-quality records since 1952. Most of the water-quality data used for the trend analyses in this report were collected in cooperation with the Connecticut Department of Environmental Protection. Many U.S. Geological Survey employees provided assistance during this study. In particular, Denis F. Healy and Jonathan Morrison provided valuable information on specific water-quality conditions and sampling history in Connecticut. Lawrence A. Weiss provided helpful assistance in the early stages of the project. Dane J. Ohe and Terry L. Schertz provided support for use of the ESTREND computer program. Richard B. Alexander provided valuable technical perspectives on several issues. Robert M. Lent and Marc J. Zimmerman provided valuable technical insights in reviewing the report. Barbara A. Korzendorfer provided valuable assistance in editorial review and report production.

DESCRIPTION OF THE STUDY AREA

Connecticut is a coastal state in southern New England with a land area of 5,009 mi^2. Streams sampled by the water-quality network in Connecticut drain most of Connecticut as well as parts of New York, Massachusetts, Vermont, New Hampshire, and Rhode Island, and a small part of Quebec Province in Canada (fig. 1). More detailed information on drainage areas outside Connecticut can be found in Fenneman (1938), Denny (1982), U.S. Geological Survey (1984, 1985), Moody and others (1986, 1988), and Carr and others (1990).

Physiography, Geology, and Climate

The State consists primarily of eastern and western upland areas that are separated by a central lowland and bordered by a coastal lowland (fig. 2). Altitudes in the eastern uplands are as high as 1,000 ft above sea level; altitudes in some parts of the western uplands exceed 2,000 ft, and slopes are steeper than in the eastern uplands (Hunter and Meade, 1983, p. 11). The central lowland, often referred to as the central valley, is a north-south strip of land approximately 20 mi wide that extends approximately 95 mi from Long Island Sound through Connecticut and into central Massachusetts. The coastal lowland is approximately 6 to 16 mi wide in Connecticut and is lower in altitude and also smoother in its relief than the adjacent uplands. Upstream areas outside Connecticut are generally hilly or mountainous, with the exception of the central lowland in Massachusetts.

The geologic history and bedrock geology of Connecticut have been described by Rodgers (1980, 1985). The eastern and western uplands and coastal lowland are generally underlain by metamorphic and igneous bedrock, sometimes collectively termed crystalline rock (fig. 3). Most of these crystalline rocks are composed of relatively insoluble silicate minerals. However, an area along the western border and in the northwestern corner of the State includes a marble belt composed of soluble carbonate minerals.

Interbedded sedimentary and igneous rocks that are considerably younger than the crystalline rocks of eastern and western Connecticut underlie an area that corresponds closely to the central lowland (figs. 2, 3). These arkosic, or feldspar-rich, sedimentary rocks of the central lowland are more easily eroded and more susceptible to chemical weathering than either the igneous rocks of the central lowland or the crystalline rocks of the eastern and western uplands. The resistant igneous rocks form prominent north-south ridges in the otherwise flat topography of the central lowland.

Unconsolidated glacial deposits of varying thickness blanket the bedrock in most of New England, including Connecticut. Till, an unsorted, heterogeneous sediment deposited directly by glaciers, is the most widely distributed glacial deposit. Till covers most hills and hillsides in upland areas

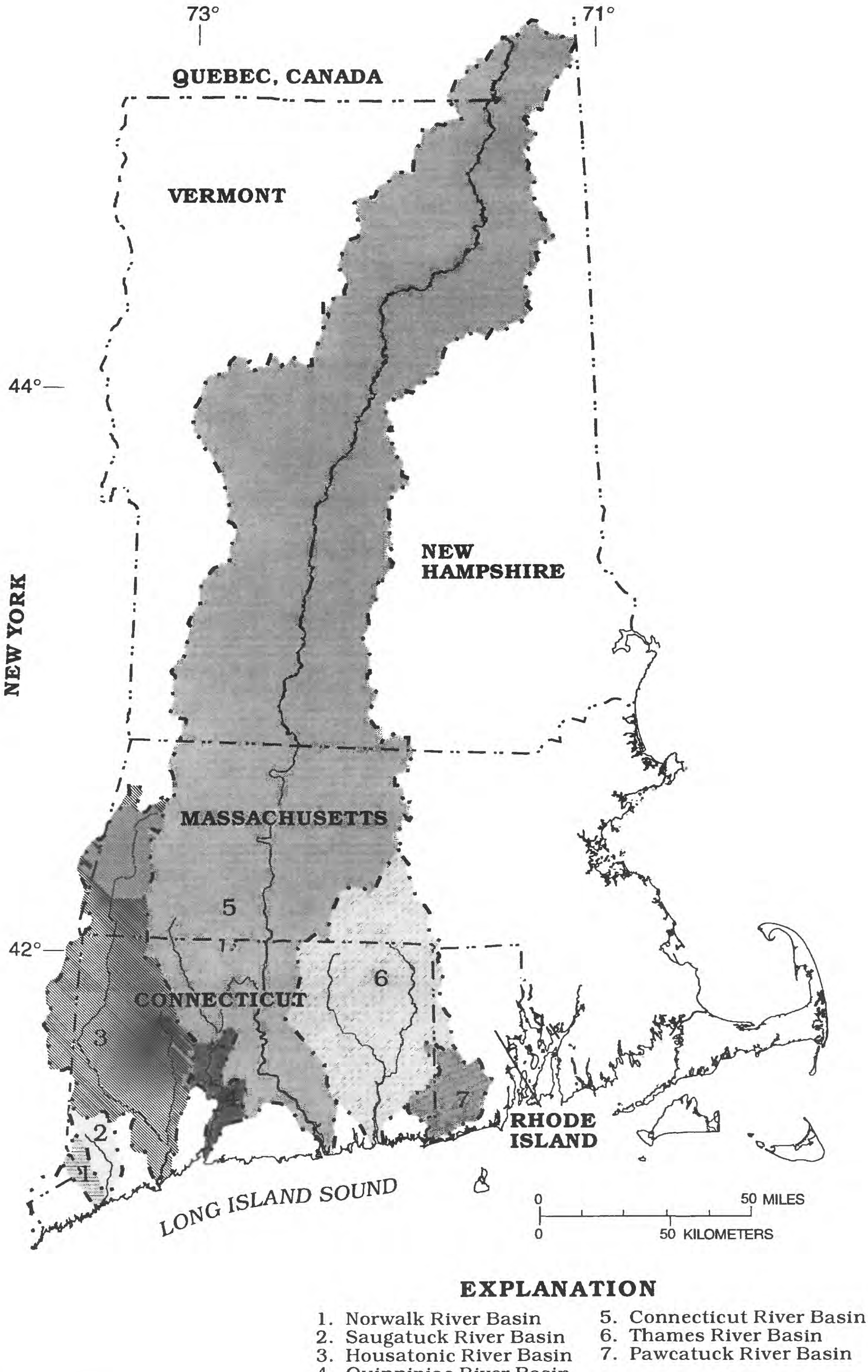


Figure 1. Major drainage basins for streams in Connecticut.

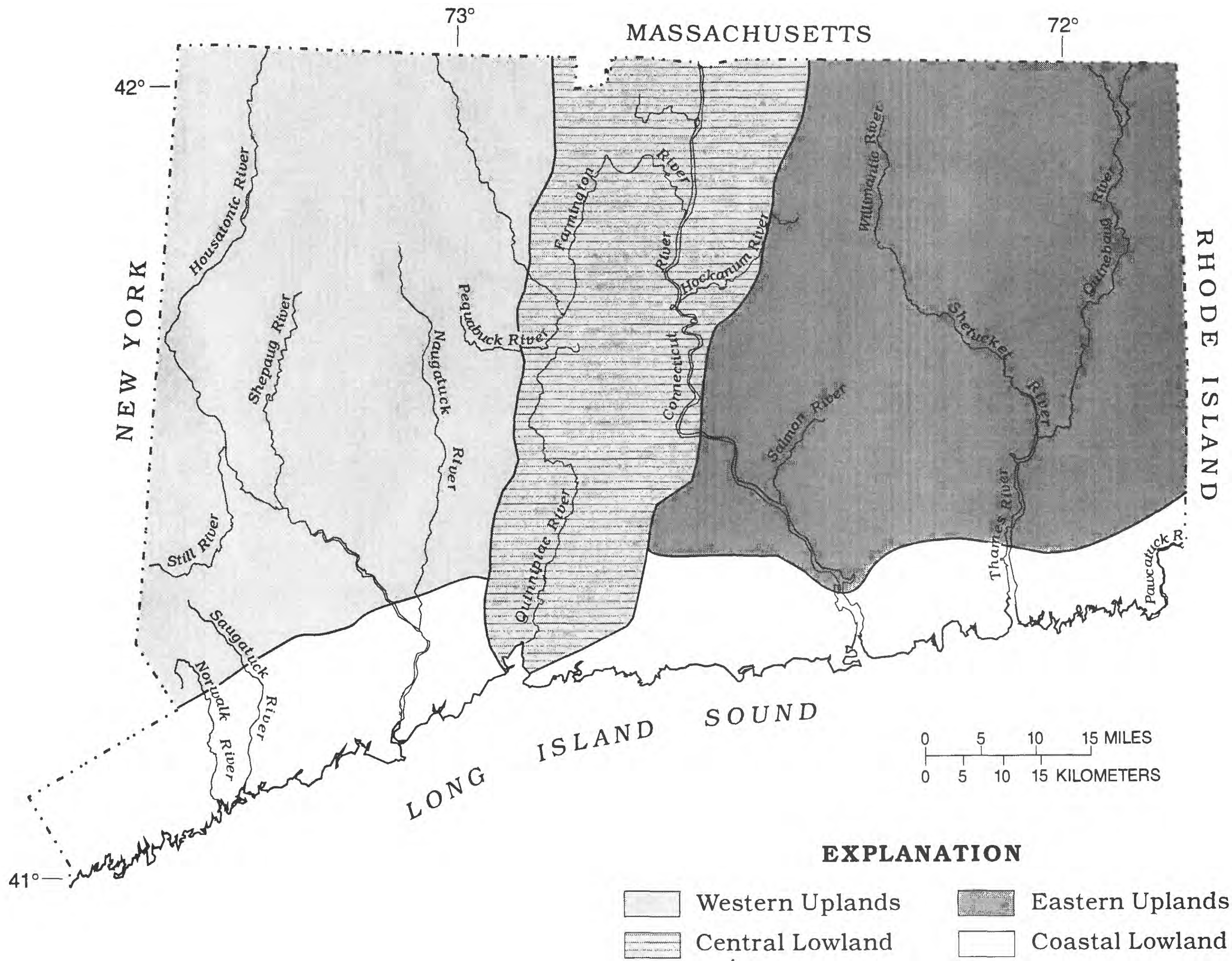


Figure 2. Physiographic subdivisions of Connecticut.

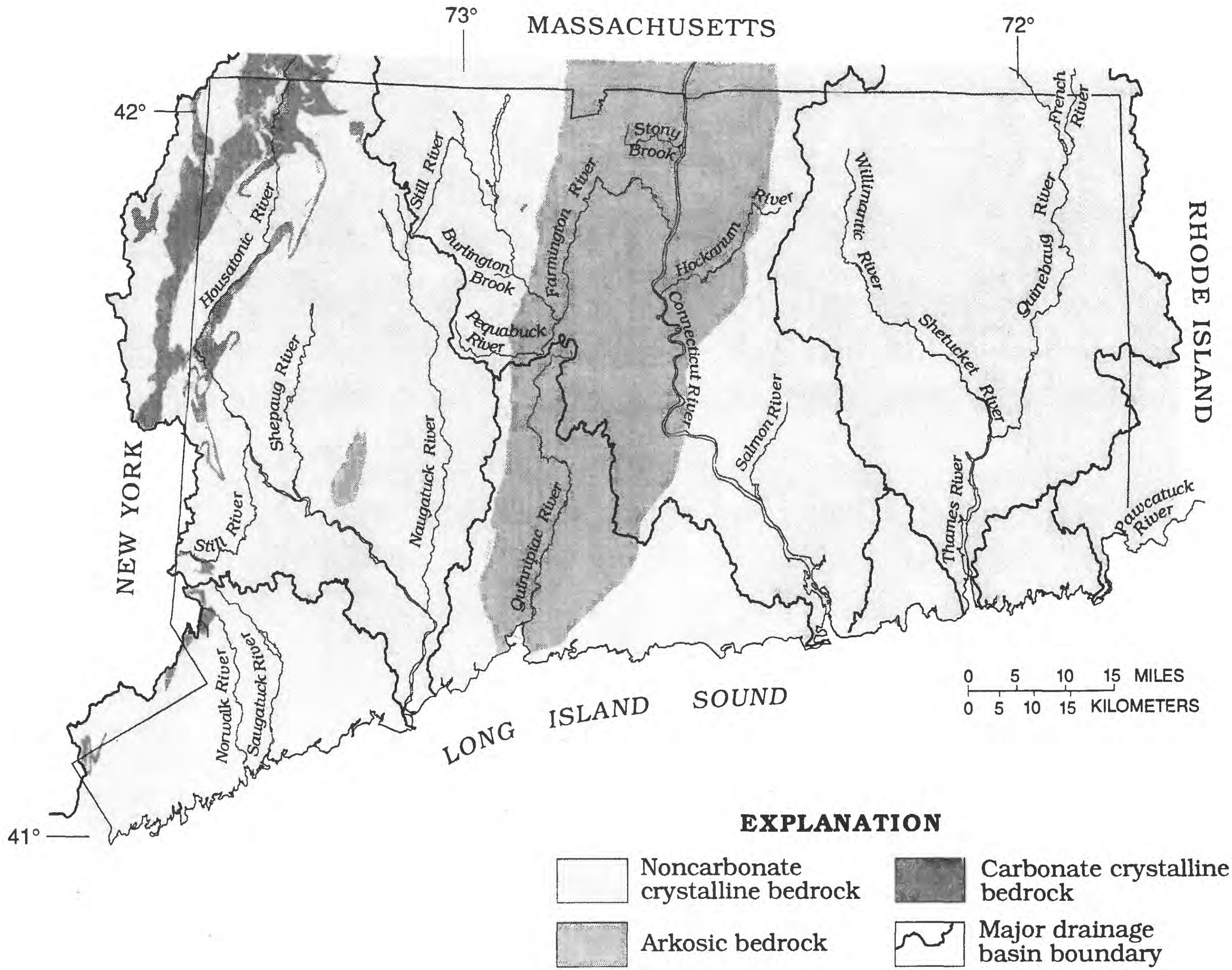


Figure 3. Generalized bedrock geology, major drainage basin boundaries, and selected streams in Connecticut.

of Connecticut, except where bedrock is exposed at the land surface. Stratified drift, a sediment that has been sorted into layers of similar grain size by glacial meltwater, forms deposits of variable width and thickness along many stream valleys. Fine-grained stratified drift, deposited in large glacial lakes that once occupied the central lowland, forms extensive, topographically flat areas. Soils developed in the stratified-drift deposits of the central lowland constitute some of the State's prime agricultural land.

The climate in Connecticut is generally temperate and humid, and precipitation is typically distributed evenly throughout the year. Median annual precipitation in Connecticut for calendar years 1951-80 ranged from about 42 in. along the southwestern coast to 53 in. in the northwestern corner of the State (Hunter and Meade, 1983, table 3, p. 8). The western uplands, eastern uplands, and high ridges within the central lowland all have greater median annual precipitation than the central lowland (Hunter and Meade, 1983, map 2, p. 12; map 3, p. 14). The eastern part of the coastal lowland, open to the Atlantic Ocean, has higher median annual precipitation than the western part of the coastal lowland, where median annual precipitation is lowest in the State.

Streamflow in Connecticut varies considerably throughout the year, in response to precipitation and snowmelt conditions. High-flow conditions generally occur in the spring, and low-flow conditions generally occur in late summer or early fall; however, major flooding can take place at any time of year. Streamflow also changes from year to year in response to varying climatic conditions.

Rivers, Reservoirs, and Harbors

Drainage areas for streams in Connecticut encompass most of Connecticut and large areas of north-central New England (fig. 1). Major streams generally flow from north to south into Long Island Sound.

Water-quality data from 39 monitoring stations in Connecticut have been analyzed for trends (fig. 4). The stations include 33 stream sites, 2 impoundments, and 4 harbor or estuary sites, and periods of record range from water years 1966-88 to 1981-88. The map location number, station number, name and location, drainage area, period of record, and approximate sampling frequency for each station are provided in table 1.

Locations of selected streams relative to major geologic regions of Connecticut are shown in figure 3. Of particular relevance to water quality are the locations of streams and their drainage areas relative to the arkosic sedimentary bedrock of the central lowland and the carbonate bedrock of northwestern Connecticut (fig. 3). Both of these rock groups are more susceptible to chemical weathering than the crystalline silicate rocks that predominate throughout most of the State and drainage areas outside the State.

The Connecticut, Thames, and Housatonic Rivers are the largest rivers in Connecticut. The Connecticut River is the largest stream in New England with a drainage area of 11,263 mi^2 that extends from Quebec to Long Island Sound. Approximately 13 percent of the drainage area is in Connecticut. Sixty-six mi of the main stem are in Connecticut; of this distance, 55 mi are affected by the tides in Long Island Sound. The flow of the Connecticut River is regulated by hydroelectric dams, by diversions for public water supply, and by several lakes and reservoirs before the river enters Connecticut. In Connecticut, public-supply reservoirs and flood-control reservoirs are located on some tributaries. The Farmington River, the largest tributary of the Connecticut River in Connecticut, has a drainage area of 601 mi^2, with 497 mi^2 in Connecticut. Streamflow on the Farmington River is regulated by reservoirs, hydroelectric power stations, and diversions for public supply (Healy and others, 1994, p. 18).

Monitoring stations on the main stem of the Connecticut River include Thompsonville, Hartford, Middletown, Middle Haddam, and East Haddam (locations 8, 16, 18, 19, and 21 in fig. 4, table 1). Flow at Thompsonville is not affected by tides. Stream stage at Hartford is affected by tides, and tidal effects increase downstream from this point. Upstream flow takes place at Middletown, Middle Haddam, and East Haddam during the majority of tidal cycles.

The drainage area of the Thames River and its tributaries is 1,478 mi^2, of which 1,153 mi^2 are in eastern Connecticut. Headwaters of the Thames are in northeastern Connecticut and adjacent parts of Massachusetts and Rhode Island. The Thames River forms at the confluence of the Shetucket and Yantic Rivers in southeastern Connecticut. The Shetucket, Quinebaug, and Yantic Rivers are the major tributaries to the Thames. Streamflow in the basin is regulated by mills, flood-control reservoirs, and diversions for public supply.

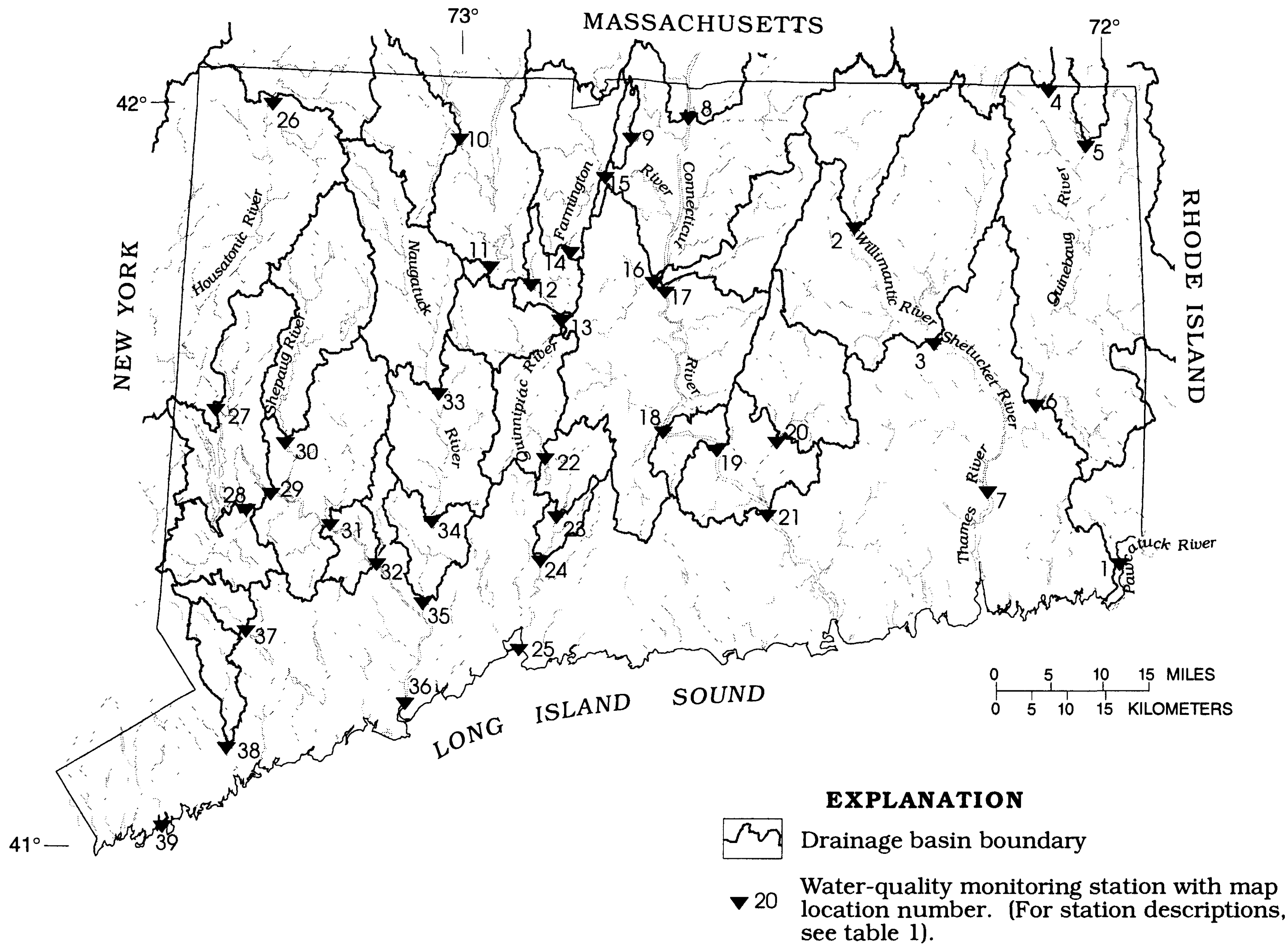


Figure 4. Drainage basin boundaries, selected streams, and locations of surface-water-quality monitoring stations in Connecticut.

Table 1. Connecticut water-quality monitoring stations used in trend analysis

[**, tidal saline; *, tidal nonsaline; M, monthly; BM, bimonthly; Q, quarterly]

Map location number (see fig. 4)	Station number	Station name and location	Hydrologic unit code	Drainage area (square miles)	Latitude	Longitude	Period of record (water years)	Sampling frequency
1	01118500	Pawcatuck River at Westerly, R.I.	01090005	295	41°23'01"	71°50'01"	1976-88	M
2	01119375	Willimantic River at Merrow, Conn.	01100002	94.0	41°50'07"	72°18'38"	1974-88	M
3	01122610	Shetucket River at South Windham, Conn.	01100002	408	41°40'56"	72°09'59"	1974-88	M
4	01124000	Quinebaug River at Quinebaug, Conn.	01100001	155	42°01'20"	71°57'22"	1981-88	M
5	01125150	French River at Mechanicsville, Conn.	01100001	107	41°56'51"	71°53'23"	1974-88	M
6	01127000	Quinebaug River at Jewett City, Conn.	01100001	713	41°35'52"	71°59'05"	1968-88	M
7	01127701	Thames River near Mohegan, Conn.**	01100003	1,382	41°28'54"	72°04'32"	1974-88	BM
8	01184000	Connecticut River at Thompsonville, Conn.	01080205	9,660	41°59'14"	72°36'21"	1966-88	M
9	01184100	Stony Brook near West Suffield, Conn.	01080205	10.4	41°57'38"	72°42'39"	1981-88	BM
10	01186800	Still River at Riverton, Conn.	01080207	86.2	41°57'34"	73°01'12"	1974-88	M
11	01188000	Burlington Brook near Burlington, Conn.	01080207	4.10	41°47'10"	72°57'55"	1968-88	Q
12	01188085	Farmington River, at Route 4, at Unionville, Conn.	01080207	374	41°45'52"	72°53'47"	1974-88	M
13	01189030	Pequabuck River at Farmington, Conn.	01080207	57.2	41°43'00"	72°50'25"	1974-88	M
14	01189120	Farmington River at Avon, Conn.	01080207	465	41°48'24"	72°49'23"	1974-88	Q
15	01189995	Farmington River at Tariffville, Conn.	01080207	577	41°54'30"	72°45'40"	1971-88	M
16	01190070	Connecticut River at Hartford, Conn.*	01080205	10,487	41°46'00"	72°40'04"	1977-88	M
17	01192516	Hockanum River at East Hartford, Conn.*	01080205	76.1	41°45'22"	72°39'08"	1974-88	M
18	01192911	Connecticut River at Middletown, Conn.*	01080205	10,869	41°34'00"	72°38'53"	1974-88	M
19	01193050	Connecticut River at Middle Haddam, Conn.*	01080205	10,897	41°32'30"	72°33'13"	1967-88	M
20	01193500	Salmon River near East Hampton, Conn.	01080205	100	41°33'08"	72°26'59"	1968-88	M

Table 1. Connecticut water-quality monitoring stations used in trend analysis--Continued

[**, tidal saline; *, tidal nonsaline; M, monthly; BM, bimonthly; Q, quarterly]

Map location number (see fig. 4)	Station number	Station name and location	Hydrologic unit code	Drainage area (square miles)	Latitude	Longitude	Period of record (water years)	Sampling frequency
21	01193750	Connecticut River at East Haddam, Conn.*	01080205	11,092	41°27'05"	72°27'55"	1974-88	M
22	01196222	Quinnipiac River near Meriden, Conn.	01100004	69.6	41°31'45"	72°51'50"	1974-88	M
23	01196500	Quinnipiac River at Wallingford, Conn.	01100004	115	41°26'58"	72°50'29"	1968-88	M
24	01196530	Quinnipiac River at North Haven, Conn.*	01100004	128	41°23'24"	72°52'19"	1974-88	M
25	01196656	New Haven Harbor near New Haven, Conn.**	01100007	241	41°16'11"	72°54'44"	1974-88	Q
26	01198550	Housatonic River near Canaan, Conn.	01100005	586	42°00'17"	73°21'27"	1974-83	M
27	01200600	Housatonic River near New Milford, Conn.	01100005	1,022	41°35'35"	73°27'00"	1974-88	M
28	01201485	Still River at Brookfield Center, Conn.	01100005	60.6	41°27'23"	73°23'47"	1974-88	M
29	01201700	Lake Lillinonah near Brookfield Center, Conn.	01100005	1,214	41°28'47"	73°21'04"	1974-88	BM
30	01203000	Shepaug River near Roxbury, Conn.	01100005	132	41°32'59"	73°19'49"	1974-88	M
31	01204510	Lake Zoar at Riverside, Conn.	01100005	1,511	41°26'21"	73°14'53"	1974-88	BM
32	01205500	Housatonic River at Stevenson, Conn.	01100005	1,544	41°23'02"	73°10'05"	1968-88	M
33	01208049	Naugatuck River near Waterville, Conn.	01100005	136	41°36'55"	73°03'30"	1981-88	M
34	01208500	Naugatuck River at Beacon Falls, Conn.	01100005	260	41°26'32"	73°03'47"	1974-88	M
35	01208736	Naugatuck River at Ansonia, Conn.*	01100005	309	41°19'50"	73°04'47"	1974-88	M
36	01208828	Housatonic River at Stratford, Conn.**	01100005	1,941	41°12'01"	73°06'39"	1974-88	Q
37	01208990	Saugatuck River near Redding, Conn.	01100006	21.0	41°17'40"	73°23'44"	1968-88	M
38	01209710	Norwalk River at Winnipauk, Conn.	01100007	33.0	41°08'07"	73°25'36"	1981-88	M
39	01209910	Stamford Harbor at Stamford, Conn.**	01100007	40.3	41°01'47"	73°32'17"	1974-88	Q

The Housatonic River and its tributaries drain an area of 1,946 mi^2 in western Connecticut and adjacent areas of Massachusetts and New York. Sixty-four percent, or 1,245 mi^2, of the drainage area is in Connecticut. The main stem of the Housatonic originates in western Massachusetts and flows 159 mi to Long Island Sound. Of this length, 94 mi are in Connecticut. The Shepaug and Naugatuck Rivers are the largest tributaries to the Housatonic. Tides in Long Island Sound affect 13 mi of the Housatonic River and about 1.5 mi of the Naugatuck River. The main stem of the Housatonic River is highly regulated by hydroelectric storage reservoirs. Water-quality monitoring stations are located at two of these reservoirs—Lake Lillinonah and Lake Zoar (locations 29 and 31, fig. 4). Flood-control reservoirs are located in the Naugatuck basin (Healy and others, 1994, p. 133), and streamflow on the Shepaug River is affected by diversions from the basin for public water supply.

The Quinnipiac River, with a drainage area of 166 mi^2, is located in south-central Connecticut. The river is 39 mi long, and a 9-mi reach is affected by tides in Long Island Sound. Stream stage and flow direction at the monitoring station at North Haven (location 24, fig. 4) are affected by tides. Streamflow on the Quinnipiac River is regulated by mills, public-supply reservoirs, and diversions to and from the basin for public water supply (Healy and others, 1994, p. 72). Approximately 85 percent of the Quinnipiac River Basin is in the central lowland.

In addition to these major drainage basins, the water quality of three small coastal basins is monitored. The Pawcatuck River Basin has a drainage area of 304 mi^2, of which approximately 61 mi^2 are in southeastern Connecticut and 243 mi^2 are in southwestern Rhode Island. There are numerous dams on the Pawcatuck and its tributaries. The Saugatuck and Norwalk Rivers drain areas of 93.2 mi^2 and 64.2 mi^2, respectively, in southwestern Connecticut. Reservoirs for public water supply are located in both of these drainage basins.

Monitored estuarine and harbor areas include the Thames River near Mohegan, New Haven Harbor, the Housatonic River at Stratford, and Stamford Harbor (locations 7, 25, 36, and 39, fig. 4). Water at the New Haven Harbor and Stamford Harbor stations is mixed saltwater and freshwater. The Thames River is tidal along its 16-mi length from the confluence of the Shetucket and Yantic Rivers to Long Island Sound. On most occasions, saltwater extends upstream underneath the freshwater flow, from the mouth of the river to an area upstream from the monitoring station. Water-quality samples are collected from both the saltwater wedge and the mixed waters above the wedge. Data from the mixed waters above the saltwater wedge at the Thames River station were used for the trend analyses in this study. At the Housatonic River at Stratford, some mixing of saltwater and freshwater occurs, and at times a saltwater wedge has been detected at this station.

Population and Land Use

Connecticut ranked fourth of the 50 states in population density in 1985. The population of Connecticut grew by 64 percent between 1950 and 1990 (table 2). The period of this trend study coincides with a period of population growth, changes in the geographic distribution of population, land use change, and intensive water-pollution control activity.

A map of areas served by public water supplies or public sewers (fig. 5) shows the approximate extent of urbanized land in Connecticut in the mid-1980's. Areas served by either public water supplies or public sewers are considered to be urbanized. Areas served by neither public water supplies nor public sewers are considered sparsely developed or undeveloped.

Table 2. Population in Connecticut, 1950-90

[Source: Connecticut Secretary of State, 1982, p. 591; U.S. Department of Commerce, 1991]

Year	Population	Increase	Percentage increase
1950	2,007,280		
1960	2,535,234	527,954	26
1970	3,032,217	496,983	20
1980	3,107,576	75,359	2.5
1990	3,287,116	179,540	5.8

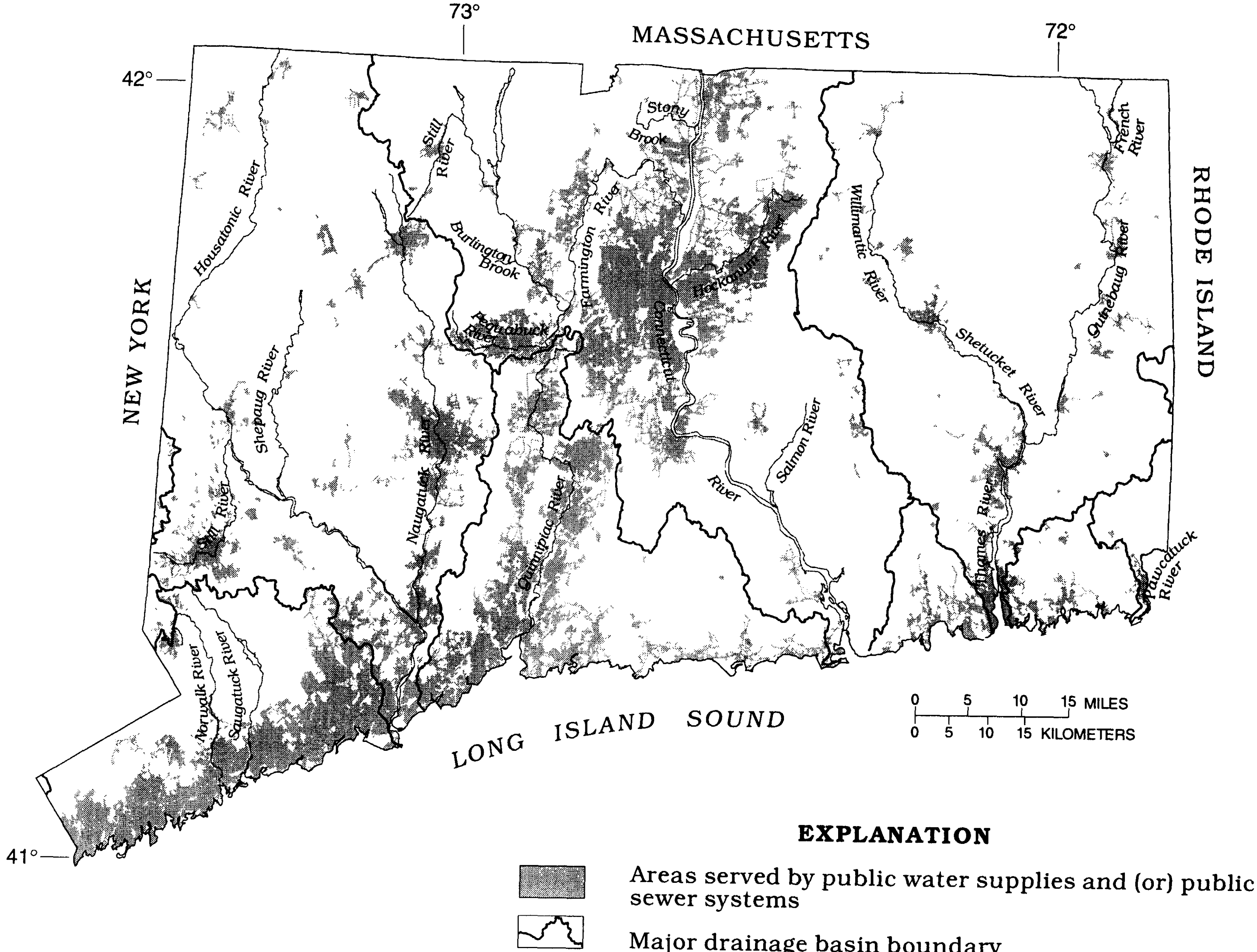


Figure 5. Distribution of urbanized land in Connecticut. (Data from Connecticut Department of Environmental Protection, unpublished files.)

The most highly urbanized areas are the central lowland and the southwestern coastal lowland (compare figs. 2 and 5). Other urbanized areas include the Naugatuck River valley, the Thames River estuary and nearby coastal areas, and the Danbury area along the Still River near the western border of the State.

In the early-to-mid-1970's, the greatest concentration of agricultural land in Connecticut was in the central lowland (excluding the cities of Hartford, New Britain, and New Haven and their immediate environs) (U.S. Geological Survey, 1979c; Healy and others, 1994, fig. 7). The second largest concentration of agricultural land was in the central and northwestern parts of the Housatonic River Basin. Considerable tracts of agricultural land were also located in the Yantic, Shetucket, and Quinebaug drainage basins. Few agricultural areas were located in the coastal lowlands or in southwestern Connecticut south of the Housatonic basin. Since the mid-1970's, large areas of agricultural land have been converted to suburban development, particularly in the central lowland. The eastern and western uplands have also experienced suburban development, but have retained more of their former rural and agricultural character.

Despite Connecticut's high population density, much of the State is forested. In 1980, forest land covered 60 percent of the State, followed by developed land (16 percent), farm land (16 percent), and other land uses (8 percent) (Lewis and Harmon, 1986, fig. 2.8, p. 27). The relative percentages of urbanized land and undeveloped or sparsely developed land vary considerably in different parts of the State (fig. 5).

Water Quality

Differences in stream-water quality in Connecticut can be related to major bedrock types and the glacial deposits derived from them. The major bedrock types and physiographic areas of Connecticut are (figs. 2 and 3):

(1) noncarbonate crystalline bedrock of the eastern uplands and parts of the western uplands;
(2) carbonate crystalline bedrock in parts of the western uplands; and
(3) arkosic sedimentary bedrock of the central lowland.

General areal appraisals of water quality in Connecticut show that streams draining areas underlain by noncarbonate crystalline bedrock have lower concentrations of dissolved solids than streams draining areas underlain by carbonate crystalline or sedimentary bedrock (Randall and others, 1966, table 18; Cervione and others, 1972, table 15; Mazzaferro and others, 1979, table 12; Ryder and others, 1981, table 15; Handman and others, 1986, table 21). Median concentrations of dissolved solids in streams from areas underlain by carbonate crystalline bedrock or sedimentary bedrock often exceed 100 mg/L, whereas median concentrations in streams from noncarbonate crystalline areas are typically less than 100 mg/L. Concentrations of calcium, magnesium, and bicarbonate are typically higher in streams draining areas underlain by sedimentary and carbonate crystalline bedrock than in streams draining areas underlain by noncarbonate crystalline bedrock. Concentrations of sulfate are typically higher in streams draining areas underlain by sedimentary bedrock than in streams from noncarbonate crystalline areas.

In areas underlain by noncarbonate crystalline bedrock, streamwater is typically soft and slightly acidic. In areas underlain by sedimentary bedrock, hardness of streamwater ranges from soft to very hard, with values commonly in the moderately hard range. The pH in these areas ranges from slightly acidic to slightly alkaline. In areas underlain by carbonate crystalline bedrock, streamwater is typically slightly alkaline, with hardness ranging from soft to very hard.

Human activity affects the quality of surface water throughout Connecticut, even in relatively undeveloped areas. Factors that affect water quality include air quality and the quality of precipitation; municipal and industrial waste disposal; urban nonpoint runoff, including road salt; fertilizers, chemicals, and sediment from agricultural land; land development and construction activities; water diversions; and stream regulation.

In the early 1970's, the major focus of water-pollution control efforts was to achieve consistent treatment levels for untreated or inadequately treated municipal and industrial wastewater (Connecticut Department of Environmental Protection, 1990, p. 5). Although these severe contamination problems have been addressed, complex water-quality problems remain.

The DEP periodically assesses the water quality and pollution sources of major rivers and streams in the State (table 3). In 1990, the major problems on the State's larger rivers, as well as the priority issues to address, were municipal-wastewater discharges, industrial-wastewater discharges, and municipal combined-sewer overflows (Connecticut Department of Environmental Protection, 1990, p. 4, 12). The DEP noted that the impact of nonpoint sources of pollution may be substantial on the several thousand miles of smaller streams that were not assessed.

Table 3. Major pollution sources for rivers and streams in Connecticut monitored by the U.S. Geological Survey

[Rivers for which no major pollution sources are listed may have moderate to minor or threatening pollution sources within their drainage areas. Source: Connecticut Department of Environmental Protection, 1990, Appendix A, p. 83-85, 93]

River	Major pollution sources
Pawcatuck River	no major pollution source
Willimantic River	no major pollution source
French River	municipal point sources; urban runoff; in-place contaminants
Quinebaug River	municipal point sources
Shetucket River	combined sewer overflows; on-site domestic septic systems
Connecticut River	combined sewer overflows
Stony Brook	on-site domestic septic systems
Farmington River	no major pollution source
Still River (Farmington Basin)	no major pollution source
Pequabuck River	municipal point sources
Hockanum River	municipal point sources
Salmon River	no major pollution source
Quinnipiac River	industrial point sources
Housatonic River	municipal point sources; in-place contaminants
Still River (Housatonic Basin)	municipal point sources
Shepaug River	no major pollution source
Naugatuck River	industrial point sources; municipal point sources; combined sewer overflows
Saugatuck River	no major pollution source
Norwalk River	no major pollution source

METHODS FOR DETECTING TRENDS IN WATER QUALITY

Major issues in choosing appropriate trend detection procedures for water-quality data have been discussed and summarized by Hirsch and others (1991). Procedures for the detection of trends in water-quality data have been developed and described by Schertz (1990) and Schertz and others (1991). These procedures for data analysis have been grouped into a system of information files and programs, collectively called the ESTREND program (Schertz and others, 1991). The ESTREND program has been used for trend analysis in this study.

Procedures for the selection and preparation of data for trend analysis and the statistical techniques used by the ESTREND program have been described by Schertz (1990, p. 4-20). Parts of the sections on "Selection and Preparation of Data" and "Statistical Techniques" are reproduced in this report for the convenience of the reader.

Field and laboratory methods used to collect and analyze water samples from stations used in the Connecticut trend study are described by Guy and Norman (1970), Goerlitz and Brown (1972), Greeson and others (1977), Skougstad and others (1979), Friedman and Erdmann (1982), Wershaw and others (1987), Edwards and Glysson (1988), and Fishman and Friedman (1989).

Characteristics of Water-Quality Data

The following characteristics of water-quality data complicate detection of trends (Hirsch and others, 1982):

• Non-normal distribution—The distribution of data values is not normal (bell-shaped), thereby limiting the use of parametric statistical procedures that assume normality.

• Seasonal variability—The concentrations of many water-quality constituents vary in a predictable way depending on the season of the year.

• Variability related to discharge—Concentrations of many constituents are related to stream discharge. The relation can be complex, depending on whether the major source of the constituent is natural ground-water inflow, point-source loadings, runoff during high flows, or some combination of sources. Trends in stream discharge can cause a trend in concentration that is actually the result of discharge history rather than the result of a change in the process that supplies the constituent to the river (Hirsch and others, 1982, p. 120).

• Censored data—Values below the analytical detection limit are commonly reported for a number of constituents. Censored values bias the results of conventional parametric tests for trend (Schertz and others, 1991, p. 2).

• Multiple detection limits—Some constituents have more than one reporting or detection limit in the historical record because laboratory analytical methods have changed.

• Missing values—Records are often incomplete.

• Outliers—The data may be strongly positively skewed by a few extreme values.

• Serial correlation—Data values in a water-quality time series may be affected by previous hydrologic conditions. That is, each value is not independent.

Many of these characteristics present problems in the use of conventional parametric statistical procedures. The Seasonal Kendall test for trend, a nonparametric test, has been investigated and developed for use with water-quality data (Hirsch and others, 1982; Smith and others, 1982, p. 5-6, 31). The Seasonal Kendall test and associated procedures are not adversely affected by non-normal data distributions, large seasonal variability, values below the detection limit, missing values, or outliers. Associated flow-adjustment procedures account for concentration variability related to discharge by defining a relation between concentration and discharge; flow-adjusted concentrations can then be tested for trend with the Seasonal Kendall test (Hirsch and others, 1982, p. 107). Flow-adjustment procedures have been described by Smith and others (1982), Hirsch and others (1982), and Smith and Alexander (1983).

Selection and Preparation of Data

Station Selection

Water-quality records are available for 53 stations in Connecticut for water years 1969-88. There is considerable variability among these stations in the length of the water-quality record, the beginning or ending dates of the record, and the constituents monitored. Trend analyses must be based on the same time period so that results can be compared among stations or among constituents; therefore, parts of the water-quality record for some stations were not included in the trend analysis.

Three periods of record were chosen to maximize the combination of years of record, number and geographic distribution of stations, and number of constituents for trend analysis.The criteria used to determine which stations to include in the trend analysis for the selected period of record for a particular constituent were as follows (modified from Schertz, 1990, p. 6):

(1) The period of record had to be at least 5 years.

(2) At least 20 percent of the concentrations had to be greater than the analytical detection limit.

(3) At least 40 percent of the values had to be within the beginning one-fifth and ending one-fifth of the selected period.

On the basis of these criteria, 39 stations were chosen for trend analysis (table 1; fig. 4). Water years 1969-88 include 20 years of record for 11 common constituents at 8 stations. The period 1975-88 includes 14 years of record for 32 stations, with data for 23 physical properties and common constituents, including nutrients and bacteria. Three additional stations that do not have records for the full 1975-88 period are included in the analysis for selected constituents, for a total of 35 stations. The period 1981-88 includes 8 years of record for 38 stations, with data for 29 properties and constituents, including several trace metals.

Constituent Selection and Data Screening

The properties and constituents selected for trend analysis represent the major categories of data emphasized in the long-term surface-water-quality program in Connecticut: physical properties, major inorganic chemical constituents and related properties, nutrients and related constituents, trace metals, bacteria, and suspended sediment (table 4). Some constituents are not included because of significant changes in sample collection or analytical methods, limited geographic distribution, or insufficient numbers of data values.

Trend detection procedures for censored constituents were used for any constituent where more than 5 percent of all data values were censored (table 5). In a few instances, procedures for censored constituents were used where the overall percentage of censored data was less than 5 percent, but several key stations had substantially higher percentages of censored data. Frequencies of concentrations below detection limits are shown in table 5 for censored constituents. The ESTREND program considers all zero values as censored data values for constituents with other censored values.

In some cases, where changes in sampling methods or laboratory analytical techniques affected the validity of trend analysis for a selected period of record, comparability of data for trend analysis was achieved either through choice of an appropriate analytical detection limit, in the case of censored constituents, or through choice of a time period that minimized inconsistencies in data. For example, a new laboratory analytical method for dissolved sulfate used after 1982 was subsequently found to be inaccurate for certain types of water samples. Consequently, trend analysis periods for dissolved sulfate end in water year 1982.

Table 4. Water-quality constituents and properties selected for trend analysis in Connecticut

[The term "dissolved ammonia" refers to analysis on a filtered sample, whereas the term "total ammonia" refers to analysis on a whole water sample. The term "total solids" refers to the residue on evaporation at 105°C, and the term "dissolved solids" refers to residue on evaporation at 180°C. NWIS, National Water Information System; µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; mL, milliliters;%, percent; °, degrees; (C), censored constituent; NTU, nephelometric turbidity units]

Water-quality constituent or property	Units	NWIS parameter code
PHYSICAL PROPERTIES		
Specific conductance	µS/cm	00095
Turbidity	NTU	00076
MAJOR CHEMICAL CONSTITUENTS AND RELATED PROPERTIES		
Oxygen, dissolved	mg/L	00300
Oxygen, dissolved	% of saturation	00301
pH	standard units	00400
Calcium, dissolved	mg/L	00915
Magnesium, dissolved	mg/L	00925
Chloride, dissolved	mg/L	00940
Sulfate, dissolved	mg/L	00945
Silica, dissolved	mg/L	00955
Solids, residue on evaporation at 105°C, total	mg/L	00500
Solids, residue on evaporation at 180°C, dissolved	mg/L	70300
NITROGEN, PHOSPHORUS, AND CARBON		
Nitrogen, total	mg/L	00600
Nitrogen, organic, total, as N	mg/L	00605
Nitrogen, nitrite-plus-nitrate, total, as N	mg/L	00630
Nitrogen, ammonia, dissolved, as N (C)	mg/L	00608
Nitrogen, ammonia, total, as N (C)	mg/L	00610
Nitrogen, nitrite, total, as N (C)	mg/L	00615
Phosphorus, total	mg/L	00665
Carbon, organic, total	mg/L	00680
TRACE METALS		
Iron, dissolved	µg/L	01046
Iron, total	µg/L	01045
Manganese, dissolved (C)	µg/L	01056
Copper, total	µg/L	01042
Nickel, dissolved (C)	µg/L	01065
Nickel, total (C)	µg/L	01067
Zinc, total (C)	µg/L	01092
BACTERIA		
Fecal coliform	colonies/100 mL	31616
Fecal streptococcal	colonies/100 mL	31673
SEDIMENT		
Sediment, suspended	mg/L	80154

Table 5. Frequency of concentrations below detection limits for selected water-quality constituents in Connecticut for the 1969-88 water years

[For censored constituents, historical values of 0.0 are considered to be data below a detection limit. *, the detection limit chosen for trend analysis; mg/L, milligrams per liter; µg/L, micrograms per liter]

Water-quality constituent	Total number of observations	Detection limit	Date range	Number of occurrences	Percent of total
Nitrogen, ammonia, dissolved (mg/L)	2,241	0.0	1979-80	4	0.18
		0.01*	1975-88	86	3.84
Nitrogen, ammonia, total (mg/L)	3,822	0.0	1979-80	24	.63
		0.01*	1977-88	142	3.72
		0.04	1985	1	.03
		5.00	1985	1	.03
Nitrogen, nitrite, total (mg/L)	3,333	0.0	1979-80	44	1.32
		0.01*	1973-88	973	29.19
		0.03	1986	1	.03
		0.04	1982	1	.03
		0.06	1985	1	.03
Manganese, dissolved (µg/L)	3,065	0.0	1969-80	32	1.04
		1.00	1981-88	8	.26
		10.00*	1972-85	277	9.04
Nickel, dissolved (µg/L)	3,039	0.0	1980-81	45	1.48
		1.00*	1980-88	459	15.10
		2.00	1973	1	.03
		3.00	1972-87	3	.10
		10.00	1987	3	.10
Nickel, total (µg/L)	1,184	0.0	1980	1	.08
		1.00*	1980-88	50	4.22
Zinc, total (µg/L)	1,208	10.00*	1982-88	89	7.37

Season Definition and Selection

The values of water-quality constituents and properties often vary seasonally. The Seasonal Kendall test minimizes the effect that seasonal variability in the data has on trend detection, because only data values from the same season within a period of record are compared.

Water-quality data collected at a regular sampling frequency, such as monthly, throughout the period of record have a uniform number of values available for comparison between years in the trend test (Schertz, 1990, p. 9). When sampling frequency has varied during the period of record, comparisons between years become more complex. Sampling frequency at the 39 stations used in the trend study generally ranged from quarterly to monthly. However, during the 8 to 20 years of record, data at some stations may have been collected at other frequencies. Such changes in sampling frequency were caused by changes in network design, availability of funding, or Federal and State sampling priorities.

Schertz (1990, p. 9, 12) has described how the ESTREND program, and user choices within the program, compensate for these variations in the number of data values available for each year:

> "To compensate for variation in the data density, a fixed number of data values [is] selected from each year that data were collected. The fixed number of values used for each station [is] usually selected

to reflect the year(s) with the smallest sampling frequency. The values [are] selected to evenly represent the whole year by establishing "seasons."

A season, for the purposes of this study, is defined as a period of a year from which a single value will be selected to compare to values from the same season or period from other years."

To illustrate how seasons are established and how a seasonal definition is selected, an example is given for a hypothetical sampling site. A constituent is sampled for a 20-year period. For the first 5 years the sampling frequency is once every 3 months (quarterly), for the next 10 years sampling is once every two months (bimonthly), and for the last 5 years sampling is once a month. Each sampling frequency has a different seasonal definition in the ESTREND program. If the bimonthly season were selected for use in the trend analysis in this example, there would be a disproportionate number of samples from the latter 15 years of the record. In order to maintain uniform comparisons among years, and to select a set of values that is representative of the 20 years, a quarterly seasonal definition (that is, the lowest sampling frequency) should be adopted to analyze the data for trend.

In the Connecticut trend study, there were 2, 3, 4, 6, or 12 possible seasons per year. The months included in each seasonal definition are:

Number of seasons per year	Months included
2	April - September; October - March
3	March - June; July - October; November - February
4	January - March; April - June; July - September; October - December
6	January - February; March - April; May - June; July - August; September - October; November - December
12	January; February; March; April; May; June; July; August; September; October; November; December

Restricting the maximum number of seasons to 12 tends to eliminate problems of serial dependence among values (Hirsch and Slack, 1984).

The ESTREND program contains an automated procedure to assist the user in determining the best seasonal choice for each constituent for each station (Schertz and others, 1991, p. 17-18). The program combines the suggested season definition for the beginning 20 percent and ending 20 percent of the record and compares it to the middle 60 percent of the record. The selection procedure emphasizes the beginning and ending parts of the water-quality record; this ensures that the data adequately span the period of interest. Also, data gaps in the middle years of the record have less effect on the performance of the statistical procedures than gaps at the beginning or end of the record (Schertz and others, 1991, p. 17-18). Where multiple data values within a season are present, the value that is closest to the midpoint of the season and is also paired with discharge (where applicable) is selected by the program to represent the season (Schertz, 1990, p. 12).

In the Connecticut trend study, the season definition recommended for the beginning and ending parts of the record was used to define seasons for each station and constituent. The sampling frequency for a constituent may vary from station to station, and consequently the season definition for a constituent may vary from station to station.

Statistical Techniques

Flow Adjustment

The importance of streamflow variability as a source of variability in water-quality data is described by Schertz (1990, p. 12, 15):

"The stream discharge at the time a sample is taken can affect water-quality-constituent concentrations. Concentrations of many dissolved water-quality constituents, such as dissolved solids, generally decrease as discharge increases because of dilution. Concentrations of suspended constituents, such as suspended sediments, generally increase as discharge increases because of the transport of particulates by runoff. A large part of the variance of constituent concentrations, therefore, may be a result of the variation in the associated discharges. The removal of streamflow as a source of variance from the data makes trend-testing techniques more powerful (greater probability of detecting a trend if one exists) and prevents the identification of trends when they are only an artifact of trends in the associated discharges (J.K. Crawford and R.M. Hirsch, U.S. Geological Survey, written commun., 1985)."

The ESTREND program removes the effects of discharge on constituent concentrations by computing a time series of flow-adjusted concentrations (FAC) and testing this time series for trend.

> "The FAC, in statistical terms, is a residual and is defined as the actual constituent concentration minus the predicted concentration. The predicted concentration [is] computed from an equation describing the discharge-constituent relation." (Schertz, 1990, p. 15).

The relation between discharge and concentration is expressed as a flow-adjustment equation (fig. 6). Schertz (1990, p. 15-16) and Schertz and others (1991, p. 22-24) have described the forms of flow-adjustment equations, their use in the ESTREND program, and the procedure for selecting a particular form of the equation for each constituent at each station.

Schertz (1990, p. 16) notes that, "Ideally, the best flow-concentration model would be selected by examining the actual concentrations, the predicted concentrations from each model, and the residuals from each model." However, it is not practical to conduct this type of examination for the number of constituents, stations, and time periods involved. Consequently, the flow-adjustment procedure in the ESTREND program is automated "to select the model with residuals that [are] the least correlated to flow based on a Spearman's Rho correlation coefficient" (Schertz, 1990, p. 16). In other words, by selecting the model where the residuals are least correlated to flow, the program selects the model that removes the largest amount of flow-related variability from the concentrations.

The automated flow-adjustment procedure, using 1 of 11 models, was applied to many constituents in the Connecticut trend study, including conservative constituents such as the major ions (figs 6a, 6b). An additional flow-adjustment model was used for constituents with non-conservative transport, including turbidity, nitrogen constituents, total phosphorus, total organic carbon, fecal bacteria, trace metals, and suspended sediment (figs. 6c, 6d) (Schertz and others, 1991, p. 23).

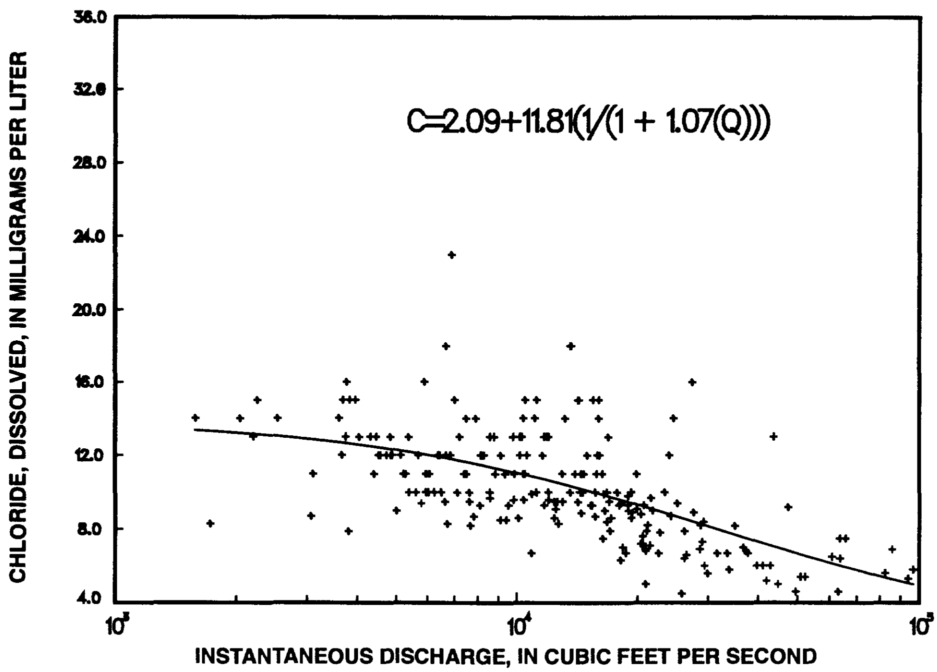


Figure 6a. Relation between chloride concentration (C) and discharge (Q), Connecticut River at Thompsonville, 1969-88.

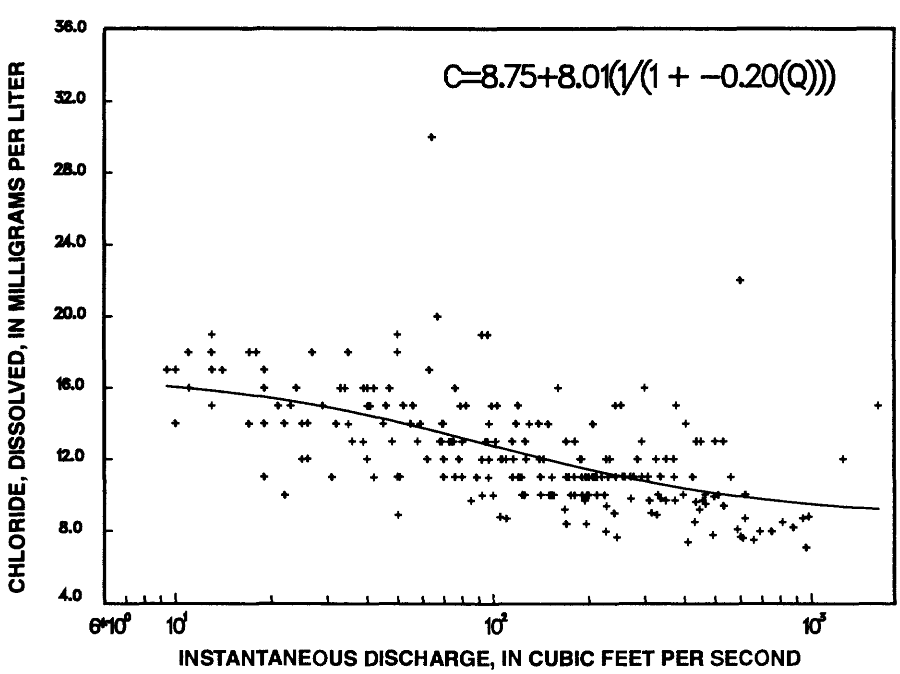


Figure 6b. Relation between chloride concentration (C) and discharge (Q), Salmon River near East Hampton, 1969-88.

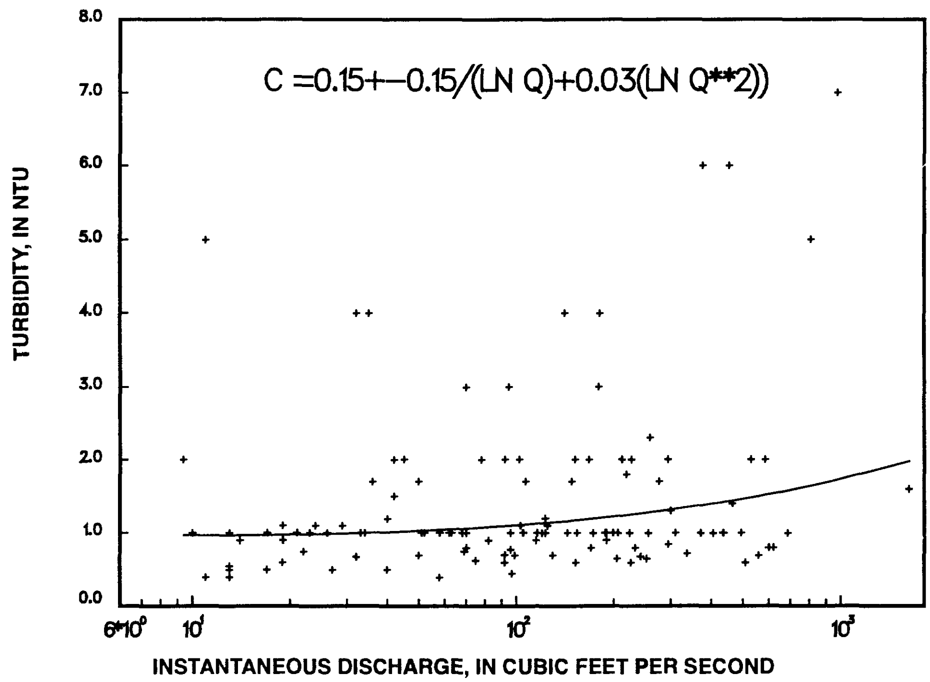


Figure 6c. Relation between turbidity (C) and discharge (Q), Salmon River near East Hampton, 1978-88.

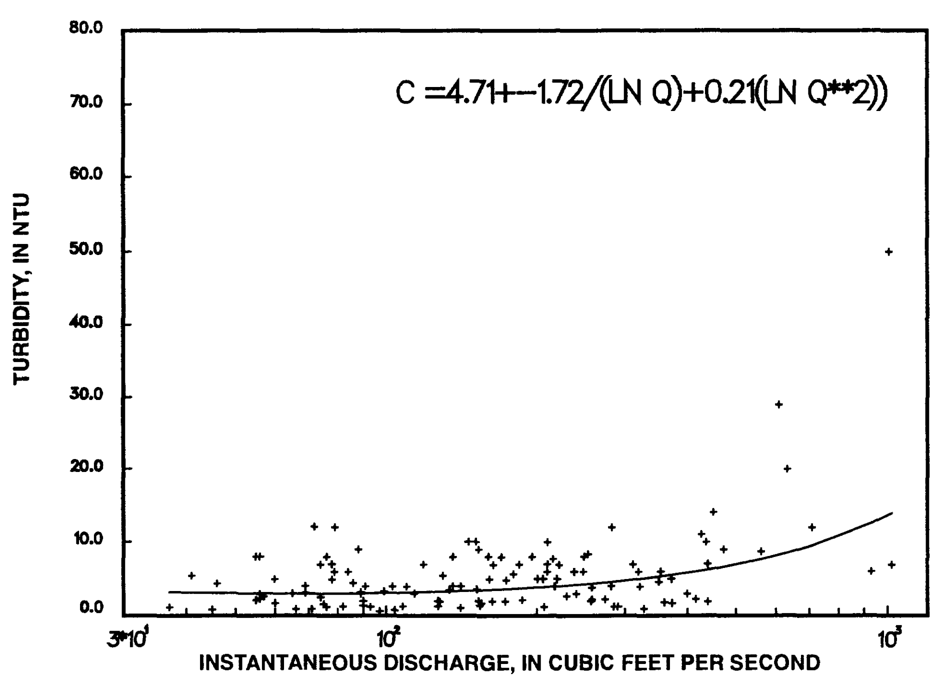


Figure 6d. Relation between turbidity (C) and discharge (Q), Quinnipiac River at Wallingford, 1978-88.

Trend Analysis of Uncensored Constituents

Seasonal Kendall test

The statistical test used by the ESTREND program to detect trends in uncensored constituents is the Seasonal Kendall test (Hirsch and others, 1982; Smith and others, 1982, p. 5-6). This test is a distribution-free or nonparametric test; that is, it ignores the magnitudes of the data in favor of the relative values or ranks of the data. The Seasonal Kendall test is based on the nonparametric Kendall's Tau test (Kendall and Gibbons, 1990). Smith and others (1982, p. 5) describe the Kendall's Tau test as follows:

> "In this test, all possible pairs of data values are compared; if the later value (in time) is higher, a plus is scored; if the later value is lower, a minus is scored... In the absence of a trend, the number of pluses should be about the same as the number of minuses. If, however, there are many more pluses than minuses, the values later in the series are more frequently higher than those earlier in the series, and so an uptrend is likely. Similarly, if there are many more minuses than pluses, a downtrend is likely."

The Seasonal Kendall test removes the effects of seasonal variability in water-quality data by restricting comparisons between pairs of data values to those values that are from the same season. For example, if a seasonal definition of 12 seasons per year is selected for a particular constituent and station, values for the month of May are compared only to all other May values in the period of record; January values are compared to all other January values, and so on. This process is repeated for all seasons in the seasonal definition selected for a particular constituent and station. The total number of pluses and minuses from all the seasonal comparisons is used to determine whether a trend exists, and to determine the direction of the trend if a trend is detected.

"Trend" in this study is defined as a one-directional change over time. A trend is considered to be statistically significant if the attained significance level of the trend test for a constituent is less than or equal to 0.10. The attained significance level, or p-value, is the probability that a detected trend resulted from a chance arrangement of the data rather than from an actual change in concentration. The smaller the p-value, the more significant is the detected trend.

The magnitude of the trend is estimated by the Seasonal Kendall Slope Estimator, described by Smith and others (1982, p. 6). In this procedure, for each pair of data values, the difference between the pair of data values is divided by the number of years separating the data points. These slopes, expressed as change in constituent concentration units per year, are ranked, and the median value is chosen to indicate the magnitude of the trend. Although a linear function is chosen to represent trend magnitude, the relation between data values and time may not be linear. Example scatterplots of concentration as a function of time are shown in figure 7. Smoothing lines are superimposed on the plots to depict patterns in the data values throughout the selected period. Use of the smoothing technique, called LOWESS (Locally Weighted Scatterplot Smoothing; Cleveland, 1979), provides information about short-term changes in water quality (Schertz and others, 1991, p. 7). Although the calculated trend slope can indicate the general relation between values near the beginning of record and values near the end of the record, this slope does not represent all the data variation within the selected period of record.

A few censored data values are sometimes present in the record for a constituent that is considered uncensored. When censored values are encountered among data values for constituents treated as uncensored, the ESTREND program uses one-half of the censoring level as the data value.

Selection of the best trend result

The Seasonal Kendall test for trend is applied to a time series of measured concentrations and to a time series of flow-adjusted concentrations, where possible, for each uncensored constituent. The ESTREND program selects a "best trend result" for an uncensored constituent on the basis of information from the trend tests on unadjusted and flow-adjusted concentrations and from analysis of the relation between concentration and flow.

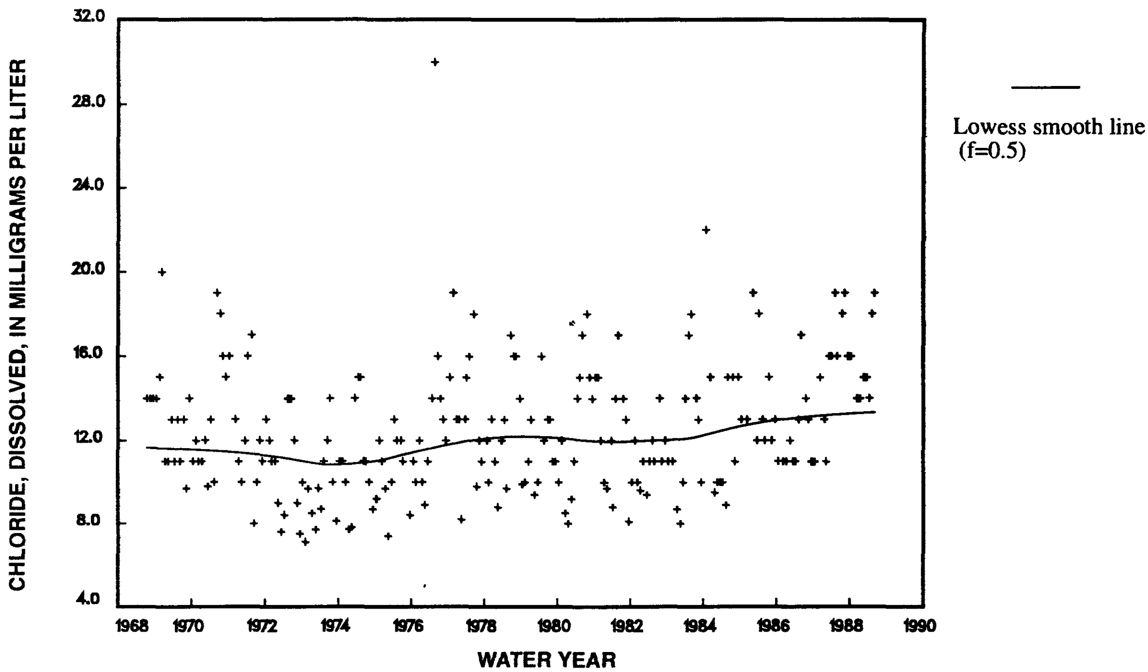


Figure 7a. Variations in chloride concentrations over time, Salmon River near East Hampton, 1969-88.

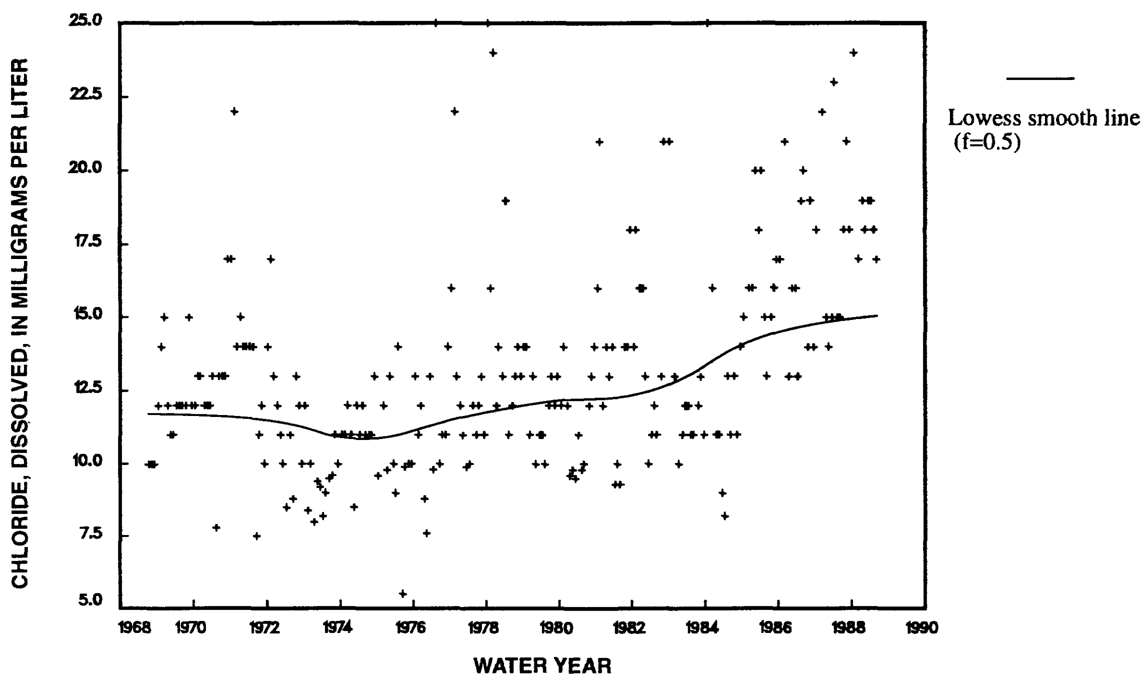


Figure 7b. Variations in chloride concentrations over time, Saugatuck River near Redding, 1969-88.

The selection process is based on the criteria described and summarized in table 6. If there is no significant correlation of concentration with discharge (category 1, table 6), then the best trend result is in unadjusted concentrations. If concentration is significantly correlated to discharge, and the flow adjustment procedure successfully removes flow-related variability (category 2), then the best trend result is in flow-adjusted concentrations. If concentration is significantly correlated to discharge, but after flow adjustment the residuals are still correlated to discharge, indicating that flow-related variability has not been removed completely (category 3), then the best trend result is in unadjusted concentrations. If concentration is significantly correlated to discharge, but none of the attempted flow-adjustment models are statistically significant (category 4), then the best trend is in unadjusted concentrations.

Trend results shown in maps

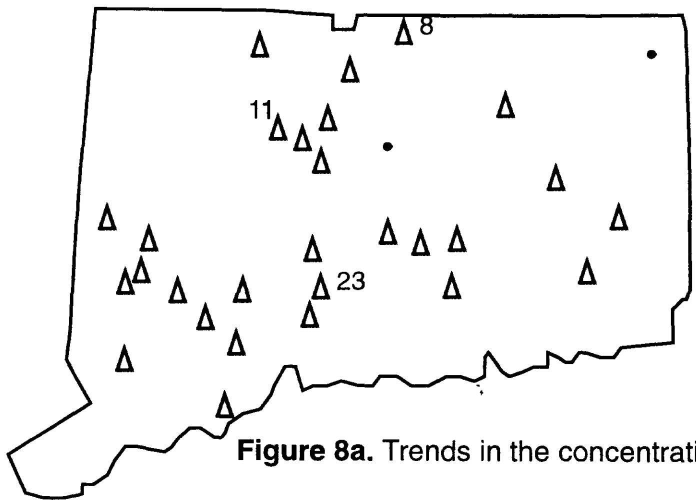
All trends shown on maps generated by the ESTREND program are statistically significant. Stations with sufficient data for trend analysis, but without statistically significant trends, are shown as dots on trend maps. Stations with insufficient data for trend analysis are not shown. There are three different types of maps, and the meaning of the trend results shown on each type of map is distinct (fig. 8a, b, and c).

Maps of trends in concentration show significant trends in concentration, without flow adjustments at any of the stations (fig. 8a). On these maps, a trend in concentration may be affected by the relation between constituent concentration and stream discharge, and may thus represent a change in discharge rather than a change in the factors supplying the constituent to the stream.

Table 6. Criteria for selecting the best trend result for uncensored constituents

[Selected level of significance is 0.10. Trend codes: blank, best trend is trend in unadjusted concentrations; F, best trend is trend in flow-adjusted concentrations; **, best trend is trend in unadjusted concentrations because the flow-adjustment was unsuccessful; --, not applicable. Source: Schertz, 1990, table 4]

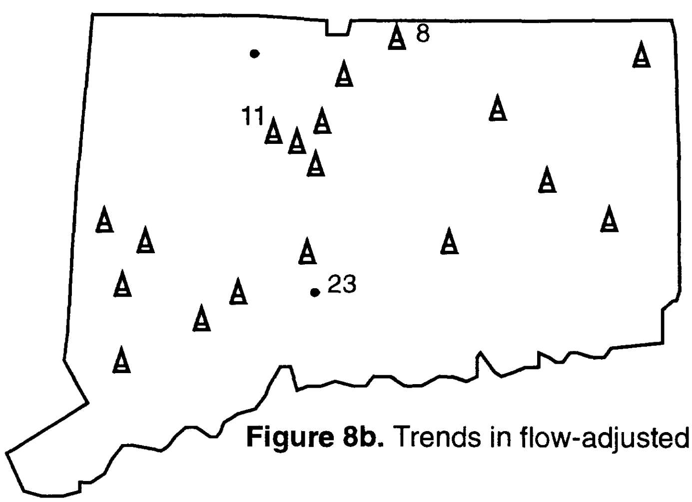
Category	Trend code shown in appendixes 1, 2, and 3	Significant correlation of concentration to discharge	Significant correlation of flow-adjusted concentration to discharge	Significant flow-adjustment model	Best trend result
1	blank	No	--	--	Unadjusted concentrations
2	F	Yes	No	Yes	Flow-adjusted concentrations
3	**	Yes	Yes	--	Unadjusted concentrations
4	**	Yes	--	No	Unadjusted concentrations



EXPLANATION

- Δ Upward trend (concentration)
- ∇ Downward trend (concentration)
- • No significant trend
- 23 Map location number

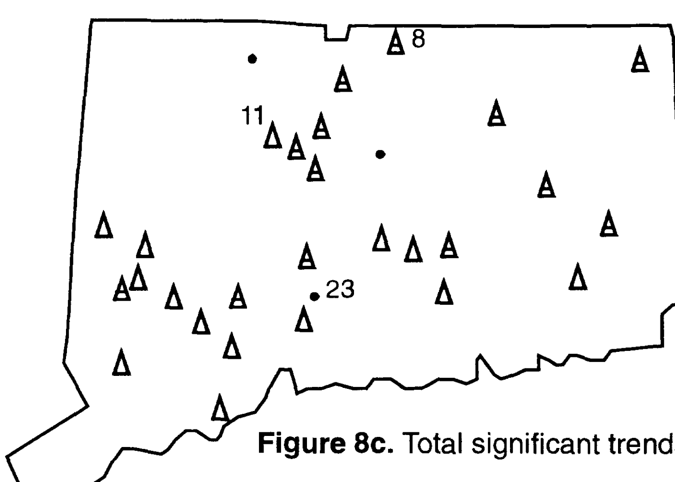
Figure 8a. Trends in the concentration of total nitrogen, 1975-88.



EXPLANATION

- Δ Upward trend (flow-adjusted)
- ∇ Downward trend (flow-adjusted)
- • No significant trend
- 23 Map location number

Figure 8b. Trends in flow-adjusted concentration of total nitrogen, 1975-88.



EXPLANATION

- Δ Upward trend (concentration)
- ∇ Downward trend (concentration)
- Δ Upward trend (flow-adjusted)
- ∇ Downward trend (flow-adjusted)
- • No significant trend
- 23 Map location number

Figure 8c. Total significant trends in total nitrogen, 1975-88.

Wherever possible, constituent concentrations are flow adjusted to remove the effects of discharge on concentration. The flow-adjusted concentrations are then tested for trend. Maps of trends in flow-adjusted concentration show only those stations where flow data are available to perform flow adjustment (fig. 8b). Stations where flow adjustment is not possible, including harbors, other tidally affected stations, and lakes, are not shown. All stations with significant flow-adjusted trends are shown, even if the flow-adjusted trend for a station is not the best trend according to the criteria shown in table 6.

Maps of total significant trends are a composite of concentration trends and flow-adjusted trends (fig. 8c). Flow-adjusted trend results are shown for stations where the concentration-discharge relation is significant, and the flow adjustment is successful. Results for harbors, other tidally affected stations, and lakes always represent concentration trends. Results for some stations with flow data may also represent concentration trends if the concentration-discharge relation is not significant or the flow-adjustment procedure is not successful (table 6). Most of the maps shown in this report are maps of total significant trends.

The following example, using trends in total nitrogen, illustrates the differences in the three types of maps. Burlington Brook (location 11) has an upward trend in total nitrogen concentrations (fig. 8a) and in flow-adjusted concentrations of total nitrogen (fig. 8b). However, the correlation between total nitrogen concentration and discharge is not significant at this station, and so the concentration trend is considered the best trend result and is shown on the map of total significant trends (fig. 8c). The Connecticut River at Thompsonville (location 8) also has an upward trend in total nitrogen concentrations (fig. 8a) and in flow-adjusted concentrations of total nitrogen (fig. 8b). The correlation between total nitrogen concentration and discharge is statistically significant, and flow adjustment is successful; consequently, the flow-adjusted trend is considered the best trend result (fig. 8c). The Quinnipiac River at Wallingford (location 23) has an upward trend in concentrations of total nitrogen (fig. 8a) and no trend in flow-adjusted concentrations of total nitrogen (fig. 8b). Because the correlation between total nitrogen concentration and discharge is statistically significant, and flow adjustment is successful, the flow-adjusted result is considered the best trend result, and the station is shown as having no trend in total nitrogen (fig. 8c).

Trend Analysis of Censored Constituents

Methods for censored constituents were used when more than 5 percent of the data for a constituent were censored. The Seasonal Kendall test can be used to detect trends in data where either single or multiple detection limits are present. Where multiple detection limits are present in the period of record, the Seasonal Kendall test uses the highest detection limit and considers all detected or censored values less than that level as equal (Schertz, 1990, p. 20). However, application of the highest detection limit to a water-quality record can result in a substantial loss of discrete data values for a constituent (Schertz, 1990, p. 20). For this reason, the ESTREND program allows the user to choose a detection limit lower than the highest detection limit. A lower detection limit might be chosen, for example, when the higher detection limit represented only a very small number of censored data values, and when use of the higher limit would result in the loss of many uncensored data values.

The ESTREND program provides a maximum likelihood estimation (MLE) procedure within the parametric Tobit test, as an alternative to the Seasonal Kendall test, for records that are highly censored by one or more reporting limits (Cohen, 1976; Cohn, 1988; Schertz and others, 1991, p. 28, 30):

> The maximum-likelihood method, a parametric (distribution-dependent) procedure recently adapted for trend detection in water-quality constituents, was chosen to best resolve the problems presented by multiple detection limits. The method employs a likelihood function to estimate the parameters of a regression between the concentrations and time. The concentrations are assumed to have a log-normal distribution (Schertz, 1990, p. 20).

Flow adjustment is not feasible for censored constituents. Consequently, all trends for censored constituents in the tables and maps of this report represent concentration trends. Additional information on procedures and criteria for trend analysis of censored data is presented by Schertz and others (1991, p. 27-32).

Summary Statistics

The ESTREND program calculates summary statistics for each constituent at each station for a selected period of record (Schertz, 1990, p. 20; Schertz and others, 1991, p. 26, 31-32). The mean, 25th percentile, 50th percentile (median), and 75th percentile of data values for each constituent at each station are shown for water years 1969-88, 1975-88, and 1981-88 in appendixes 1, 2, and 3, respectively (at back of report). The percentile columns in these tables show values for which 25, 50, and 75 percent of all the data values are less than or equal to the numbers shown. These descriptive statistics summarize information about the distribution of data values in the selected period of record for each constituent at each station. Summary statistics are based on all water-quality values for the selected period of record (Schertz and others, 1991, p. 26).

Some of the summary statistics provided for censored constituents are based on estimated data because values below a detection limit are present in the record. The ESTREND program incorporates a log-probability regression technique for multiply-censored data (Helsel and Cohn, 1988) to estimate or predict the censored data values (Schertz, 1990, p. 20). Summary statistics are then determined from the water-quality record, with estimated values used in place of censored values (Schertz and others, 1991, p. 31). In the summary statistics (appendixes 1, 2, and 3), the "e" denotes statistics based on estimated data.

WATER QUALITY AND STREAM DISCHARGE

Variations in stream discharge affect the variation of many water-quality properties and constituents. Concentration-discharge relations and trends in stream discharge form an important background for interpreting trends in water quality. Discharge values were available for 26 stations. Discharge measurements were not made for the 7 tidally affected stream stations, 4 harbor stations, and 2 lake stations (table 1).

Concentration as a Function of Discharge

Many constituents and properties evaluated show consistent relations between concentration and discharge in many drainage basins. Conditions at specific monitoring stations may vary from the general relations discussed here.

Concentrations of major ions, including calcium, magnesium, chloride, and sulfate, and values of the closely related property, specific conductance, typically decrease with increasing stream discharge (figs. 6a, 6b, 9a, and 9b). This relation is attributed to dilution effects at higher streamflows. In some cases, it appears that the slope of the regression line is steeper for basins with major point source discharges, such as the Quinnipiac River at Wallingford (fig. 9b; location 23, fig. 4) than for relatively undeveloped basins, such as the Salmon River (fig. 9a; location 20, fig. 4). This suggests that dilution effects are more pronounced in streams where the quality of water at low flow is dominated by point discharges. Concentrations at low flows are also affected by the timing of wastewater releases.

Concentrations of suspended constituents often increase with increasing stream discharge because heavy rainfall or snowmelt washes materials into streams from forests, agricultural areas, urban areas, paved surfaces, and disturbed land. Values of turbidity (figs. 6c and 6d) typically increase with increasing discharge. However, the relation between concentration and discharge for some suspended constituents, including total nitrogen and total phosphorus, varies at stations that integrate different land-use characteristics. For example, at several stations on streams that receive major point discharges, concentrations of total nitrogen and total phosphorus decrease with increasing stream discharge (fig. 9c). This indicates that the point sources may contribute the bulk of the total nitrogen and total phosphorus in these basins, with dilution effects apparent at higher flows. By contrast, at stations in relatively undeveloped basins, total nitrogen and total phosphorus concentrations increase slightly at higher streamflows, suggesting that nonpoint sources contribute most of these constituents (fig. 9d).

The concentration of dissolved oxygen typically increases with increasing discharge (figs. 9e and 9f). This relation is apparent in the data from the Shepaug River (fig. 9f), which drains a relatively undeveloped area (location 30, fig. 4), as well as in the data from the Shetucket River (fig. 9e), which drains a large basin with major point-source discharges (location 3, fig. 4). The relation between concentration and discharge may reflect increased turbulence and stream aeration at higher discharges on some streams. The relation may also reflect the effects of warm stream temperatures at low flows and cool stream temperatures at high flows.

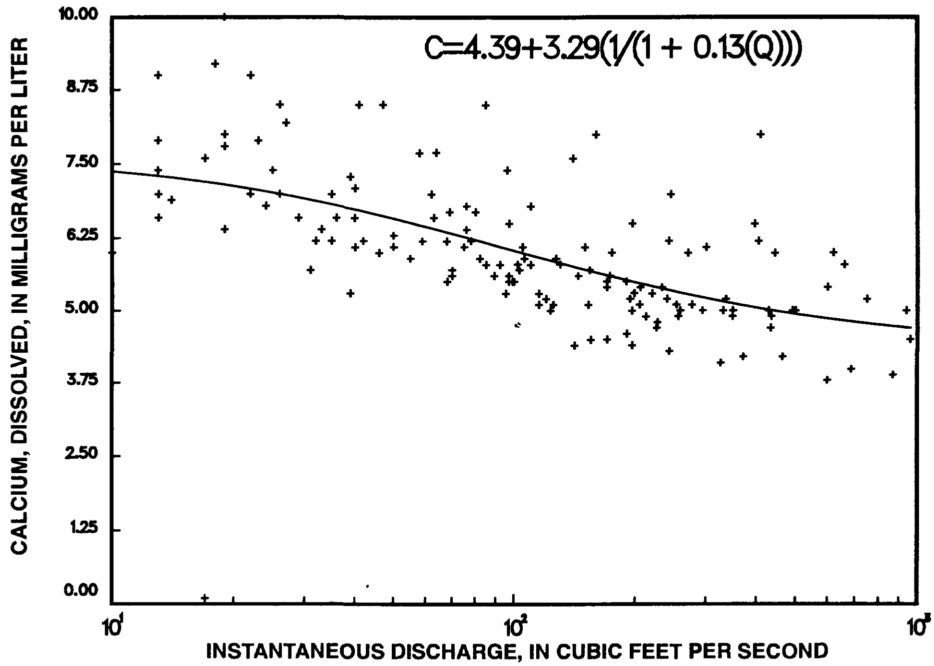


Figure 9a. Relation between calcium concentration (C) and discharge (Q), Salmon River near East Hampton, 1969-88.

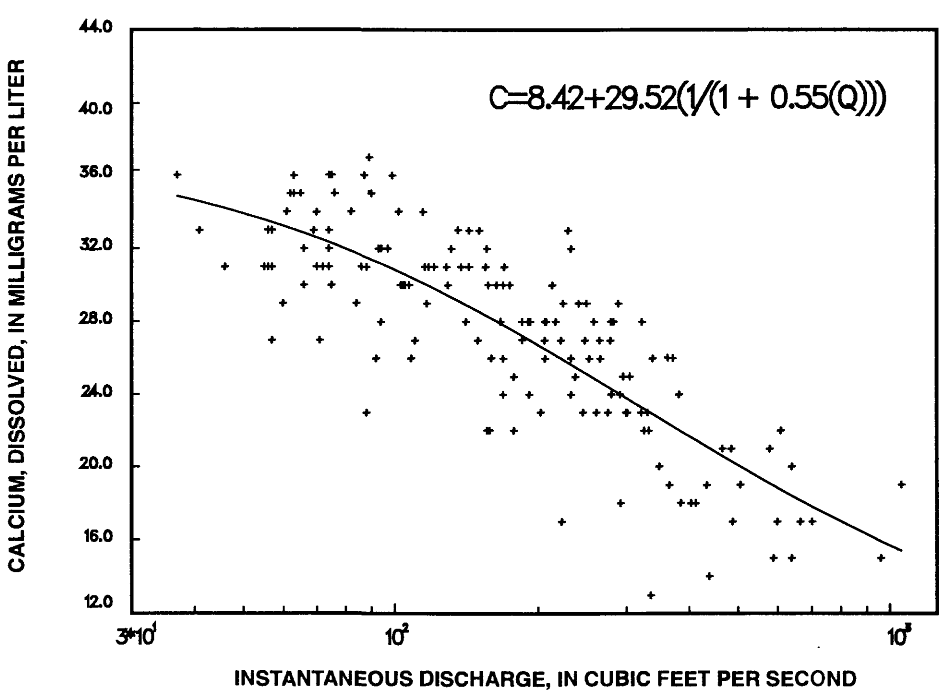


Figure 9b. Relation between calcium concentration (C) and discharge (Q), Quinnipiac River at Wallingford, 1969-88.

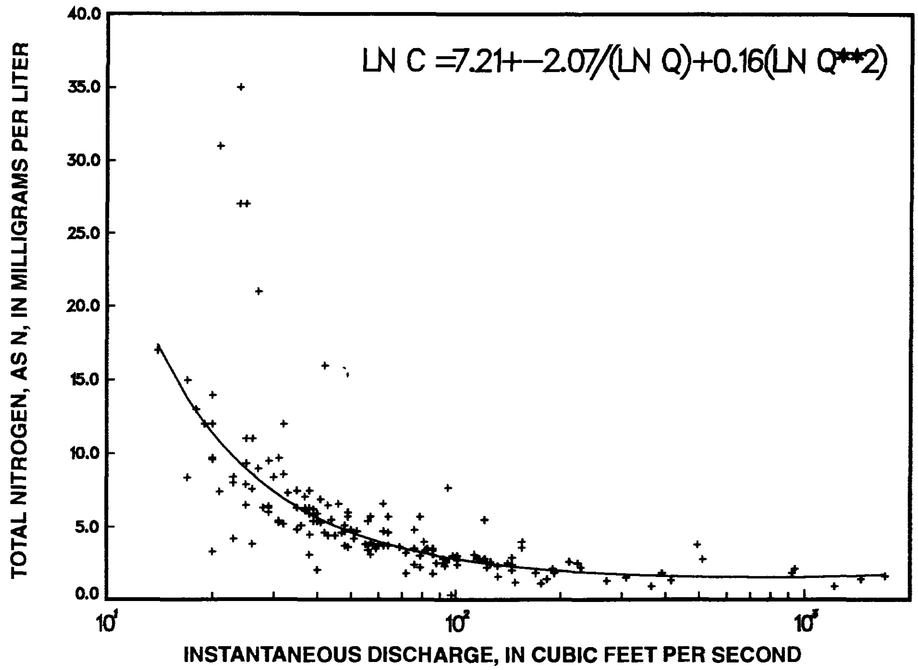


Figure 9c. Relation between total nitrogen concentration (C) and discharge (Q), Pequabuck River at Farmington, 1975-88.

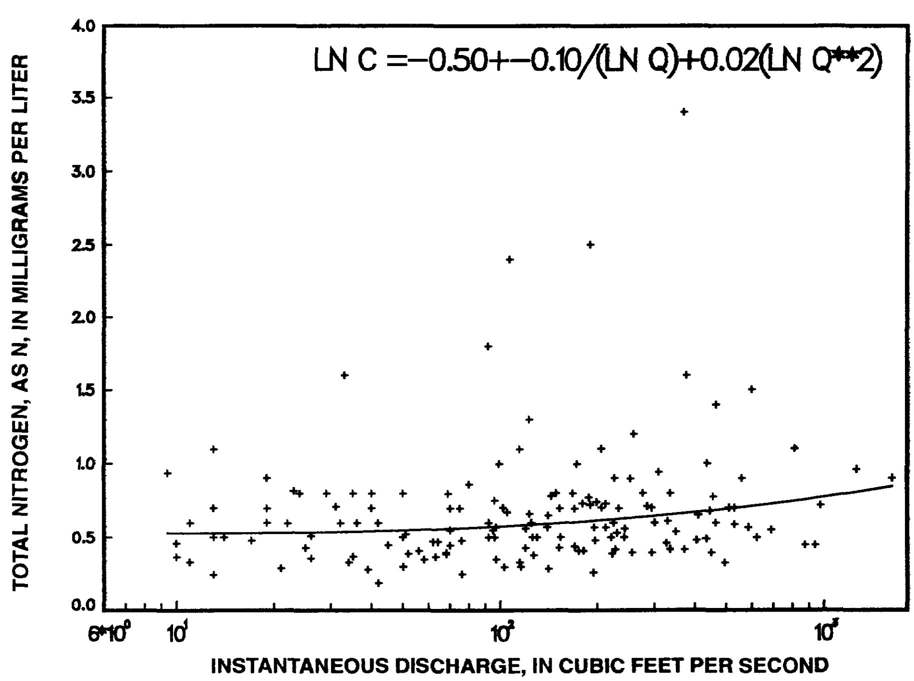


Figure 9d. Relation between total nitrogen concentration (C) and discharge (Q), Salmon River near East Hampton, 1975-88.

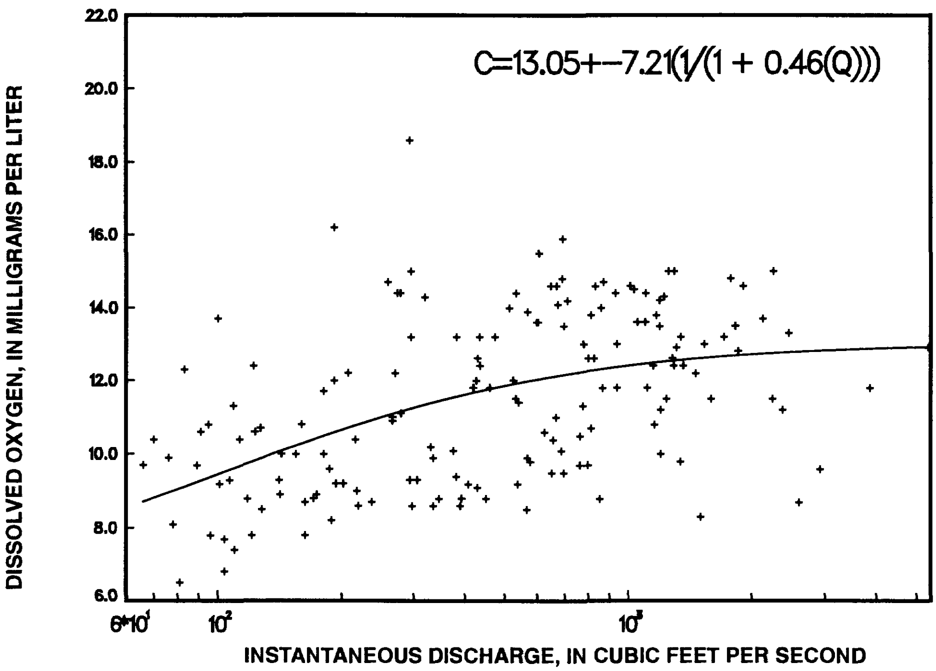


Figure 9e. Relation between dissolved oxygen concentration (C) and discharge (Q), Shetucket River at South Windham, 1975-88.

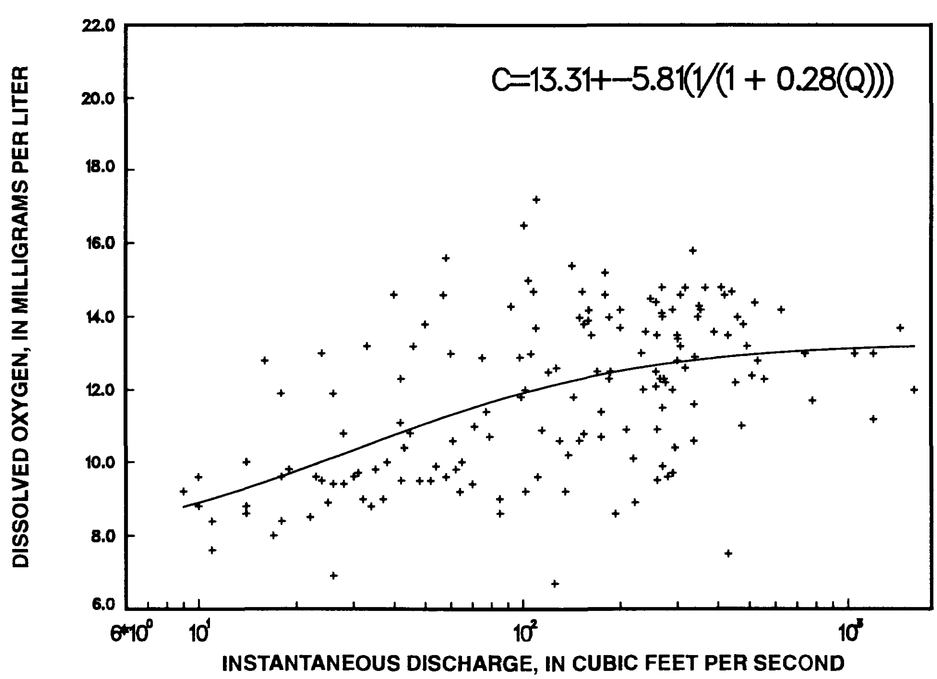


Figure 9f. Relation between dissolved oxygen concentration (C) and discharge (Q), Shepaug River near Roxbury, 1975-88.

Trends in Stream Discharge

Trends in instantaneous stream discharge were generally downward during the period of the trend study (table 7). During 1969-88, two of seven stations with discharge data had downward trends in streamflow. During 1975-88, 12 of 20 stations with discharge data had downward trends in streamflow. Downward trends in streamflow were more prevalent in central and southwestern parts of the State (fig. 10).

Plots of discharge as a function of time are shown in figure 11 for the Farmington River at Tariffville (location 15, fig. 4), the Salmon River (location 20, fig. 4), and the Naugatuck River at Beacon Falls (location 34, fig. 4). The smoothing lines in plots of discharge as a function of time reflect variations in annual precipitation during the same period (fig. 12). Smoothing lines dip during a period of below-median precipitation in 1980-81 and rise during a period of above-median precipitation in 1983. Records of annual precipitation for several locations in Connecticut (National Oceanic and Atmospheric Administration, 1970-89) show that years of below-median annual precipitation were more frequent in the 1980's than during the mid-to-late 1970's, indicating that the downward trends in streamflow are caused, in part, by climatic variations. Diversions are also a possible cause of trends in streamflow.

Table 7. Summary of trends in instantaneous discharge for stations in Connecticut for water years 1969-88, 1975-88, and 1981-88.

[--, not applicable]

		Trends in instantaneous discharge			
		Increases		Decreases	
Period of record	Number of stations	Number of stations	Median slope (percent/year)	Number of stations	Median slope (percent/year)
1969-88	7	0	--	2	-1.04
1975-88	20	0	--	12	-1.86
1981-88	25	0	--	1	-3.41

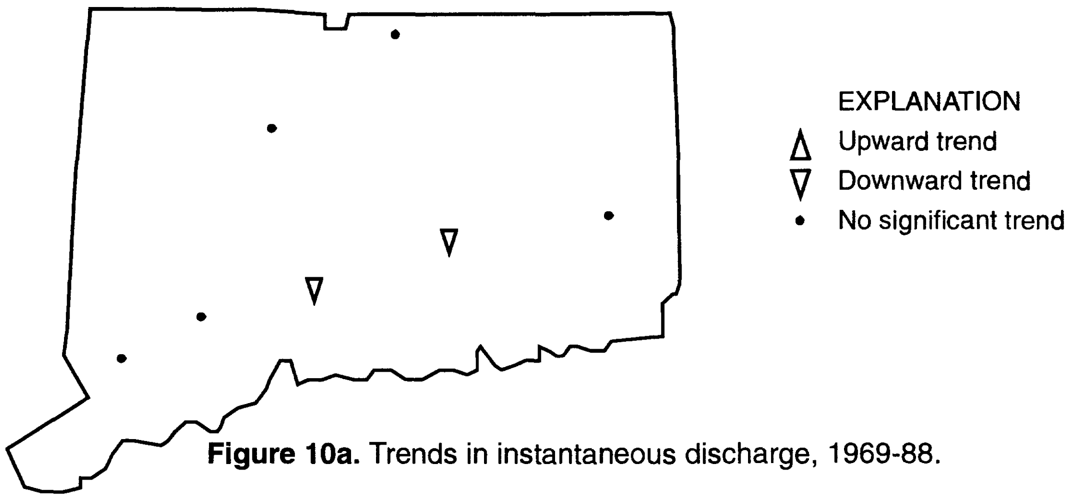


Figure 10a. Trends in instantaneous discharge, 1969-88.

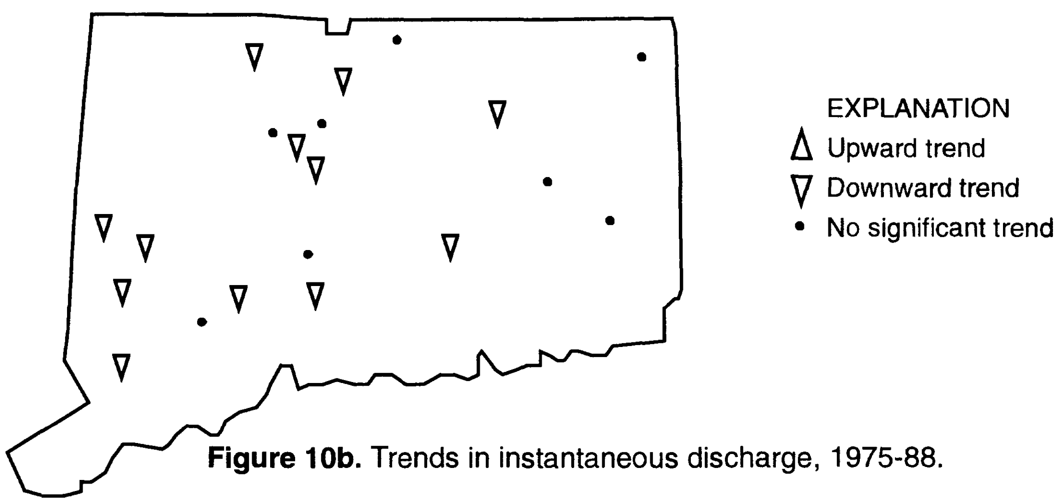


Figure 10b. Trends in instantaneous discharge, 1975-88.

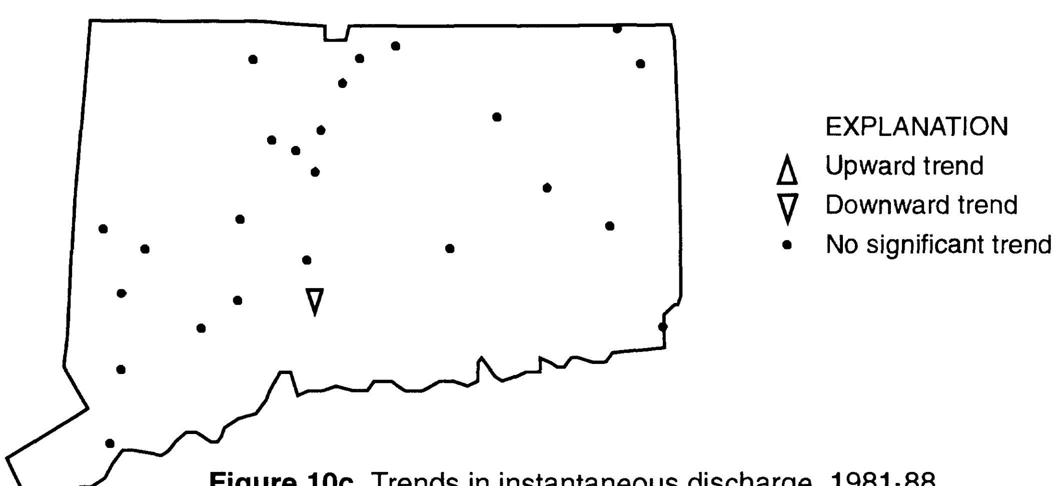


Figure 10c. Trends in instantaneous discharge, 1981-88.

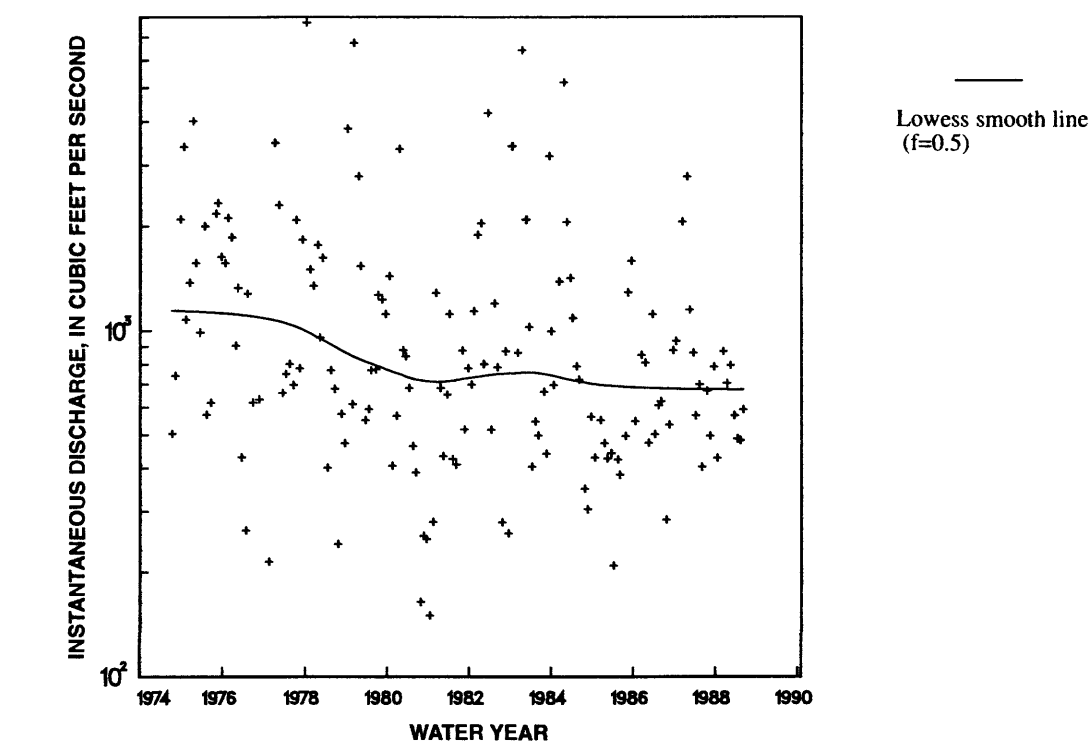


Figure 11a. Variations in discharge over time, Farmington River at Tariffville, 1975-88.

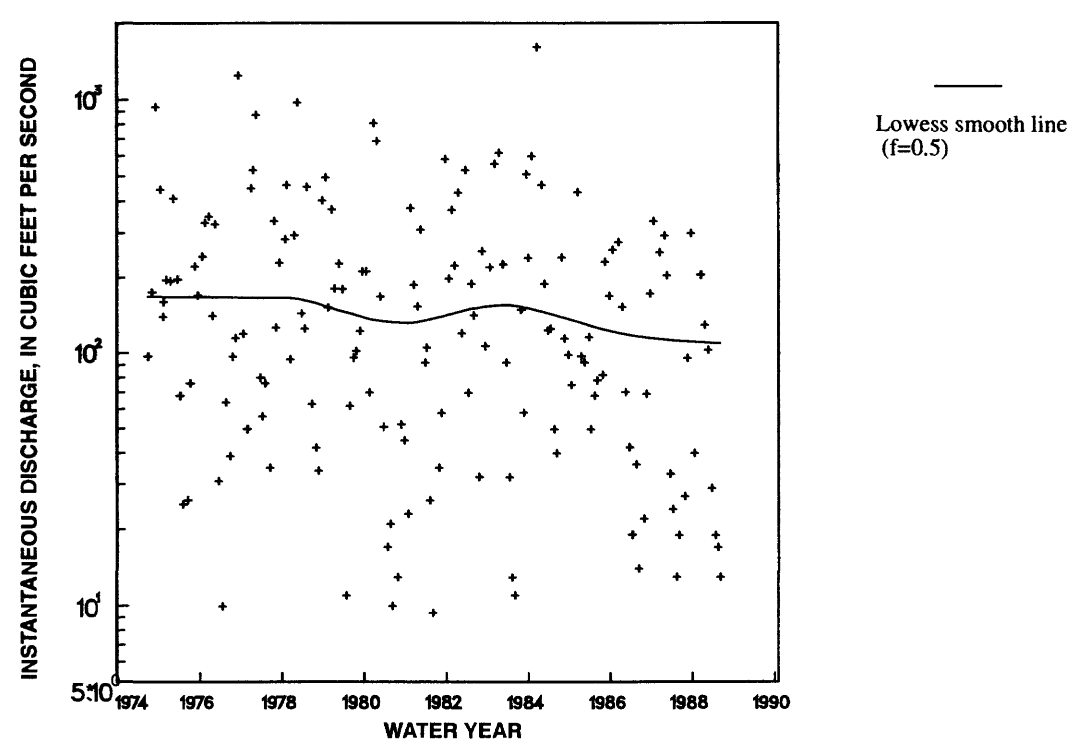


Figure 11b. Variations in discharge over time, Salmon River near East Hampton, 1975-88.

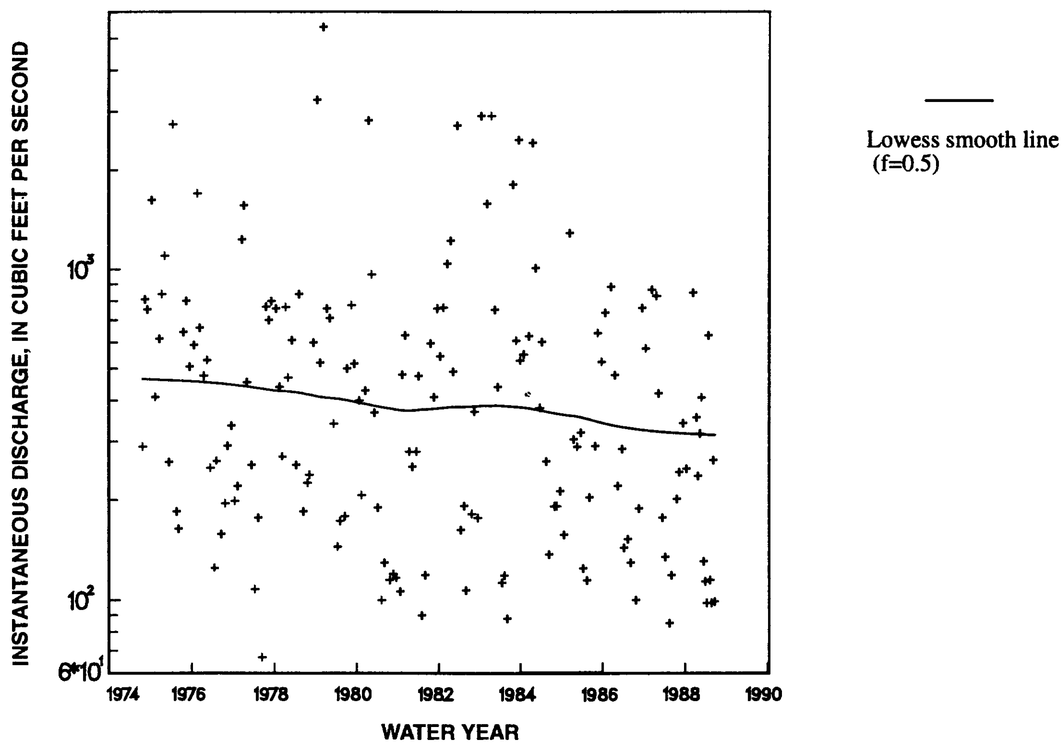


Figure 11c. Variations in discharge over time, Naugatuck River at Beacon Falls, 1975-88.

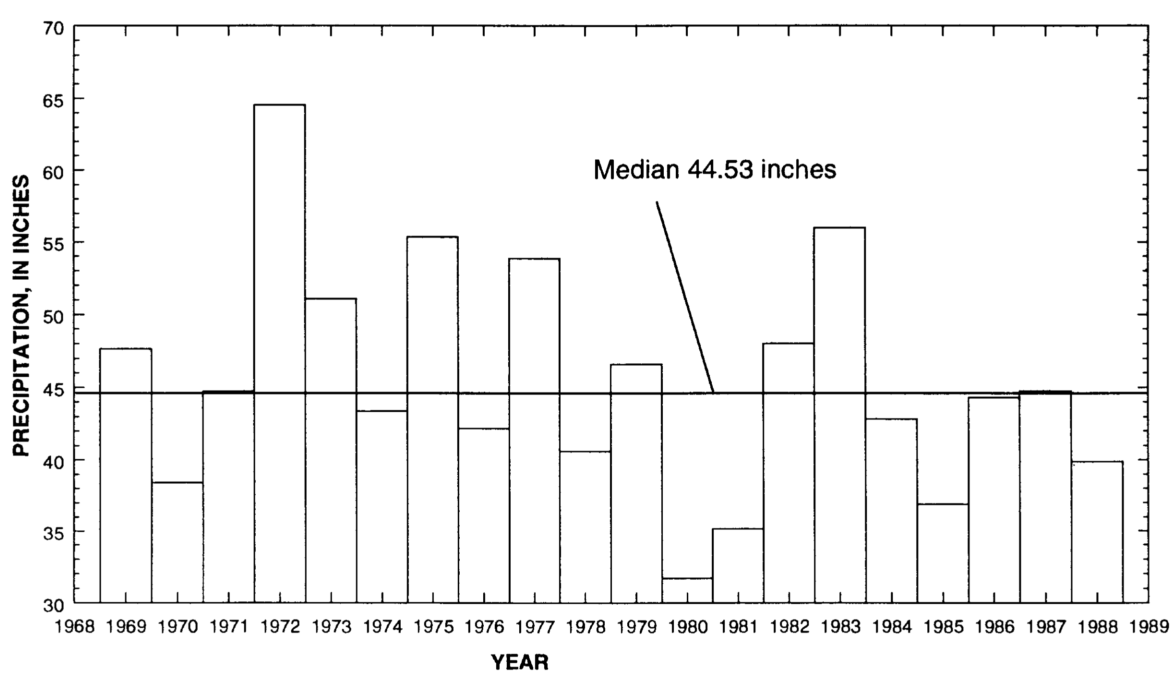


Figure 12. Precipitation at Hartford Weather Station Office, Airport, 1969-88.

TRENDS IN SURFACE-WATER QUALITY, 1969-88

Trend results are reported for three periods of record: (1) the 1969-88 water years, (2) the 1975-88 water years, and (3) the 1981-88 water years. The 1969-88 period provides data for eight long-term stations. The 1975-88 period provides the longest period of record for the largest number of stations and constituents. The 1981-88 period has the largest number of constituents and stations, and includes data for trace metals.

Statistically significant water-quality trends for the 1969-88 water years are summarized for 8 stations and 11 constituents (table 8). Significant water-quality trends for the 1975-88 water years are summarized for 35 stations and 23 constituents (table 9). Significant water-quality trends for the 1981-88 water years are summarized for 38 stations and 29 constituents (table 10). Significant trends summarized in these three tables are based on best trend results, and trend counts include both flow-adjusted and unadjusted trends.

Some of the significant trends represent very small changes in water quality. These changes may not be environmentally important. The importance of any significant trend needs to be evaluated in terms of the nature of the property or constituent, its effects on human health, aquatic life, and various municipal, industrial, or recreational water uses, and the magnitude of the change relative to water-quality standards. Relatively small changes in water quality may be important if they are geographically widespread or if they represent small but persistent environmental changes.

Details of the trend results for each station for each of the three periods are shown in appendixes 1, 2, and 3 (at back of report). These results include all trend tests, whether or not the trend was statistically significant. The attained significance level, or p-value, in these tables indicates the statistical significance of the trend.

A detailed comparison of water-quality trends in Connecticut with trends in other states is beyond the scope of this report. In the following sections, some similarities with trends detected in other states are noted.

Table 8. Statewide summary of water-quality data and significant trends for selected stations in Connecticut, water years 1969-88

[Trends for sulfate are for 1969-82. Median values in this table reflect rounding of percentile values for individual stations. Percentiles for censored constituents include estimated values. Trend slope is the percent change of mean concentration. Trend slopes are not reported for censored constituents. Trends summarized have an attained significance level of $\leq$0.10. See appendix 1 for trend results for individual stations. µs/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; %, percent; (C), censored constituent; --, not applicable; NR, not reported; e, parameter is estimated for censored constituent with a log-regression procedure]

Water quality constituent or property	Number of stations	Median concentration percentiles for all stations			Total significant trends: Increases		Total significant trends: Decreases		No trend
		25th	50th (median)	75th	Number of stations	Median slope (%/year)	Number of stations	Median slope (%/year)	
PHYSICAL PROPERTIES									
Specific conductance (µS/cm)	8	103	120	140	2	0.76	1	-0.53	5
MAJOR CHEMICAL CONSTITUENTS AND RELATED PROPERTIES									
Oxygen, dissolved (mg/L)	8	8.6	10.0	12.2	8	1.04	0	--	0
Oxygen, dissolved (% of saturation)	8	84	94	100	8	.92	0	--	0
pH (standard units)	8	6.8	7.1	7.4	5	.14	1	-0.24	2
Calcium, dissolved (mg/L)	8	10	12	14	2	.36	0	--	6
Magnesium, dissolved (mg/L)	8	1.6	1.8	2.0	6	.76	0	--	2
Chloride, dissolved (mg/L)	8	10	12	14	6	.74	0	--	2
Sulfate, dissolved, as SO_4 (mg/L)	8	11	12	14	0	--	7	-1.47	1
Silica, dissolved, as SiO_2 (mg/L)	4	5.8	7.0	8.1	0	--	0	--	4
TRACE METALS									
Iron, dissolved (µg/L)	2	80	120	180	0	--	2	-5.52	0
Manganese, dissolved (µg/L) (C)	7	e10	30	40	1	NR	4	NR	2

Table 9. Statewide summary of water-quality data and significant trends for selected stations in Connecticut, water years 1975-88

[Trends for turbidity and suspended sediment are for 1978-88; trends for sulfate are for 1975-82; trends for fecal streptococcal bacteria are for 1977-88. Median values in this table reflect rounding of percentile values for individual stations. Percentiles for censored constituents include estimated values. Trend slope is the percent change of mean concentration. Trend slopes are not reported for censored constituents. Trends summarized have an attained significance level of ≤0.10. See appendix 2 for trend results for individual stations.
µs/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; mL, milliliters; NTU, nephelometric turbidity units; (C), censored constituent; %, percent; °, degrees; --, not applicable; NR, not reported; e, parameter is estimated for censored constituent with a log-regression procedure]

Water quality constituent or property	Number of stations	Median concentration percentiles for all stations			Total significant trends				No trend
					Increases		Decreases		
		25th	50th (median)	75th	Number of stations	Median slope (%/year)	Number of stations	Median slope (%/year)	
PHYSICAL PROPERTIES									
Specific conductance (µS/cm)	32	171	200	222	19	1.15	0	--	13
Turbidity (NTU)	34	1.1	2.0	3.2	0	--	29	-8.06	5
MAJOR CHEMICAL CONSTITUENTS AND RELATED PROPERTIES									
Oxygen, dissolved (mg/L)	32	8.6	10.4	13.0	11	.56	1	-1.26	20
Oxygen, dissolved (% of saturation)	32	88	95	102	15	.71	2	-.78	15
pH (standard units)	32	6.9	7.1	7.3	23	.27	1	-.20	8
Calcium, dissolved (mg/L)	32	11	14	18	16	.84	0	--	16
Magnesium, dissolved (mg/L)	32	2.6	3.2	3.8	18	1.11	0	--	14
Chloride, dissolved (mg/L)	32	11	13	16	23	1.46	0	--	9
Sulfate, dissolved, as SO_4 (mg/L)	28	12	13	15	10	2.14	0	--	18
Silica, dissolved, as SiO_2 (mg/L)	32	4.6	5.6	6.6	0	--	7	-1.09	25
Solids, total, at 105°C (mg/L)	32	113	128	142	13	1.03	1	-.41	18
Solids, dissolved, at 180°C (mg/L)	32	104	119	133	17	.92	0	--	15
NITROGEN, PHOSPHORUS, AND CARBON									
Nitrogen, total, as N (mg/L)	30	0.9	1.0	1.3	27	2.49	0	--	3
Nitrogen, organic, total, as N (mg/L)	32	.28	.39	.60	23	3.72	1	-6.48	8
Nitrogen, nitrite-plus-nitrate, total, as N (mg/L)	32	.3	.4	.5	17	2.65	3	-1.53	12

Table 9. Statewide summary of water-quality data and significant trends for selected stations in Connecticut, water years 1975-88--Continued

[Trends for turbidity and suspended sediment are for 1978-88; trends for sulfate are for 1975-82; trends for fecal streptococcal bacteria are for 1977-88. Median values in this table reflect rounding of percentile values for individual stations. Percentiles for censored constituents include estimated values. Trend slope is the percent change of mean concentration. Trend slopes are not reported for censored constituents. Trends summarized have an attained significance level of ≤0.10. See appendix 2 for trend results for individual stations.
µs/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; mL, milliliters; NTU, nephelometric turbidity units; (C), censored constituent; %, percent; °, degrees; --, not applicable; NR, not reported; e, parameter is estimated for censored constituent with a log-regression procedure]

Water quality constituent or property	Number of stations	Median concentration percentiles for all stations			Total significant trends: Increases		Total significant trends: Decreases		No trend
		25th	50th (median)	75th	Number of stations	Median slope (%/year)	Number of stations	Median slope (%/year)	
NITROGEN, PHOSPHORUS, AND CARBON—Continued									
Nitrogen, ammonia, dissolved, as N (mg/L) (C)	5	0.05	0.08	0.14	2	NR	0	--	3
Phosphorus, total, as P (mg/L)	32	.08	.10	.13	0	--	23	-3.14	9
Carbon, organic, total, as C (mg/L)	32	3.7	4.6	6.0	0	--	30	-2.50	2
TRACE METALS									
Iron, dissolved (µg/L)	32	80	110	150	0	--	16	-4.90	16
Manganese, dissolved (µg/L) (C)	34	e20	30	40	1	NR	14	NR	19
BACTERIA									
Fecal coliform (colonies/100 mL)	27	100	420	990	2	6.66	8	-8.50	17
Fecal streptococcal (colonies/100 mL)	34	39	140	520	6	9.04	3	-14.92	25
SEDIMENT									
Sediment, suspended (mg/L)	5	5	9	14	1	5.09	0	--	4

Table 10. Statewide summary of water-quality data and significant trends for selected stations in Connecticut, water years 1981-88

[Median values in this table reflect rounding of percentile values for individual stations. Percentiles for censored constituents include estimated values. Trend slopes are not reported for censored constituents. Trend slope is the percent change of mean concentration. Trends summarized have an attained significance level of ≤0.10. See appendix 3 for trend results for individual stations.
µs/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; mL, milliliters; NTU, nephelometric turbidity units; (C), censored constituent; %, percent; °, degrees; --, not applicable; NR, not reported; e, parameter is estimated for censored constituent with a log-regression procedure]

Water quality constituent or property	Number of stations	Median concentration percentiles for all stations: 25th	50th (median)	75th	Total significant trends — Increases: Number of stations	Increases: Median slope (%/year)	Decreases: Number of stations	Decreases: Median slope (%/year)	No trend
PHYSICAL PROPERTIES									
Specific conductance (µS/cm)	38	158	185	222	19	1.55	1	-1.35	18
Turbidity (NTU)	38	1.0	1.7	3.0	0	--	22	-9.50	16
MAJOR CHEMICAL CONSTITUENTS AND RELATED PROPERTIES									
Oxygen, dissolved (mg/L)	38	8.6	10.6	12.9	5	1.46	1	-2.04	32
Oxygen, dissolved (% of saturation)	38	90	97	104	10	1.02	1	-.99	27
pH (standard units)	38	7.0	7.2	7.4	26	.69	0	--	12
Calcium, dissolved (mg/L)	38	12	14	16	8	1.63	1	-2.08	29
Magnesium, dissolved (mg/L)	38	2.8	3.2	3.8	13	1.63	0	--	25
Chloride, dissolved (mg/L)	38	13	15	18	25	3.06	0	--	13
Silica, dissolved, as SiO_2 (mg/L)	38	4.6	5.4	7.0	2	10.11	4	-1.83	32
Solids, total, at 105°C (mg/L)	38	104	122	144	5	1.64	3	-1.62	30
Solids, dissolved at 180°C (mg/L)	38	95	115	134	4	1.92	3	-2.12	31
NITROGEN, PHOSPHORUS, AND CARBON									
Nitrogen, total, as N (mg/L)	36	0.9	1.1	1.4	5	4.03	1	-1.59	30
Nitrogen, organic, total, as N (mg/L)	38	.30	.48	.70	6	7.58	0	--	32
Nitrogen, nitrite-plus-nitrate, total, as N (mg/L)	38	.3	.4	.5	6	3.94	1	-5.33	31
Nitrogen, ammonia, dissolved, as N (mg/L) (C)	5	.05	.09	.14	0	--	1	NR	4
Nitrogen, ammonia, total, as N (mg/L) (C)	38	.08	.14	.24	3	NR	11	NR	24

Table 10. Statewide summary of water-quality data and significant trends for selected stations in Connecticut, water years 1981-88--Continued

[Median values in this table reflect rounding of percentile values for individual stations. Percentiles for censored constituents include estimated values. Trend slopes are not reported for censored constituents. Trend slope is the percent change of mean concentration. Trends summarized have an attained significance level of ≤0.10. See appendix 3 for trend results for individual stations.
µs/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; mL, milliliters; NTU, nephelometric turbidity units; (C), censored constituent; %, percent; °, degrees; --, not applicable; NR, not reported; e, parameter is estimated for censored constituent with a log-regression procedure]

		Median concentration percentiles for all stations			Total significant trends				
					Increases		Decreases		
Water quality constituent or property	Number of stations	25th	50th (median)	75th	Number of stations	Median slope (%/year)	Number of stations	Median slope (%/year)	No trend
NITROGEN, PHOSPHORUS, AND CARBON—Continued									
Nitrogen, nitrite, total, as N (mg/L) (C)	36	e 0.01	e 0.01	e 0.03	0	--	1	NR	35
Phosphorus, total, as P (mg/L)	38	.06	.09	.12	1	2.85	24	-5.60	13
Carbon, organic, total, as C (mg/L)	38	3.6	4.3	5.1	7	3.02	1	-3.64	30
TRACE METALS									
Iron, dissolved (µg/L)	38	80	120	150	1	5.45	11	-5.57	26
Iron, total as Fe (µg/L)	15	350	440	600	0	--	4	-8.88	11
Manganese, dissolved (µg/L) (C)	37	29	36	44	1	NR	5	NR	31
Copper, total, as Cu (µg/L)	16	9	14	17	0	--	10	-9.38	6
Nickel, dissolved (µg/L) (C)	38	e1	2	3	1	NR	19	NR	18
Nickel, total, as Ni (µg/L) (C)	16	5	7	10	1	NR	7	NR	8
Zinc, total, as Zn (µg/L) (C)	16	e30	40	50	1	NR	14	NR	1
BACTERIA									
Fecal coliform (colonies/100 mL)	38	88	240	720	0	--	17	-17.58	21
Fecal streptococcal (colonies/100 mL)	38	44	200	880	0	--	28	-23.58	10
SEDIMENT									
Sediment, suspended (mg/L)	5	4	7	14	0	--	0	--	5

Physical Properties

Trends were analyzed for two physical properties, specific conductance and turbidity. Specific conductance, the ability of water to conduct an electric current, is caused by the presence of charged ions in solution. Thus, specific conductance is an indirect measure of the amount of dissolved matter in water. In general, the higher the concentration of ions, the greater the conductivity of the solution. Turbidity, a measure of the clarity or murkiness of water, is affected by suspended particles, dissolved matter, biological material, and color.

Increases in specific conductance were detected at 19 stations during 1975-88 (fig. 13b), with trends more prevalent in the western half of the State. No decreases were detected, and 13 station records showed no trend. Increases were detected at 19 stations during 1981-88, and a decrease was detected at 1 station (fig. 13c). The New Jersey trend study (Hay and Campbell, 1990) also detected geographically widespread increases in specific conductance during a similar time period.

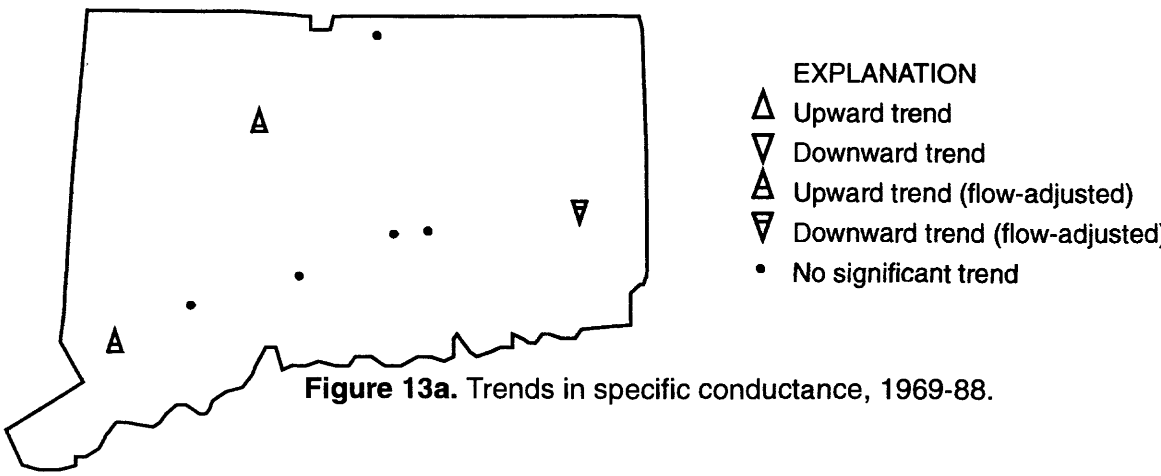


Figure 13a. Trends in specific conductance, 1969-88.

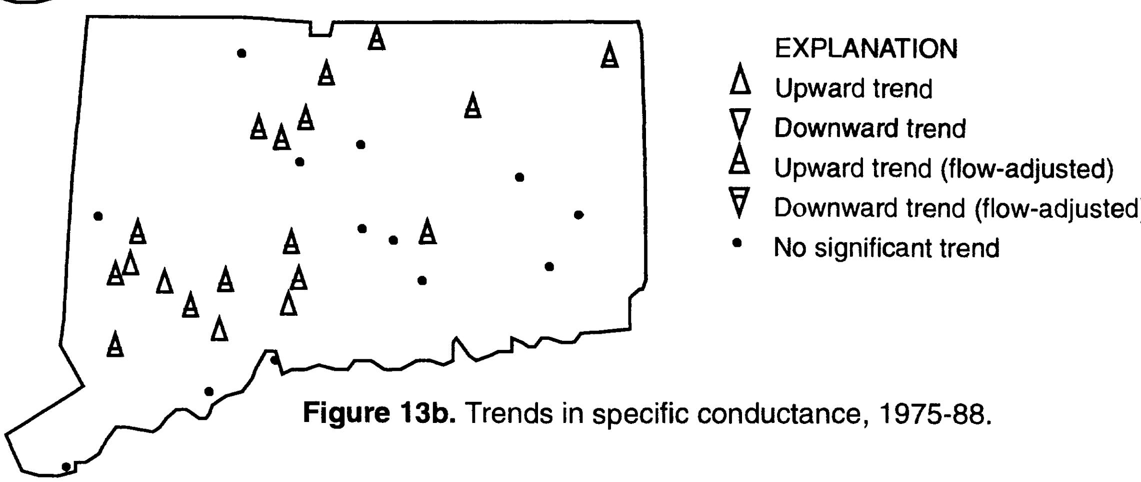


Figure 13b. Trends in specific conductance, 1975-88.

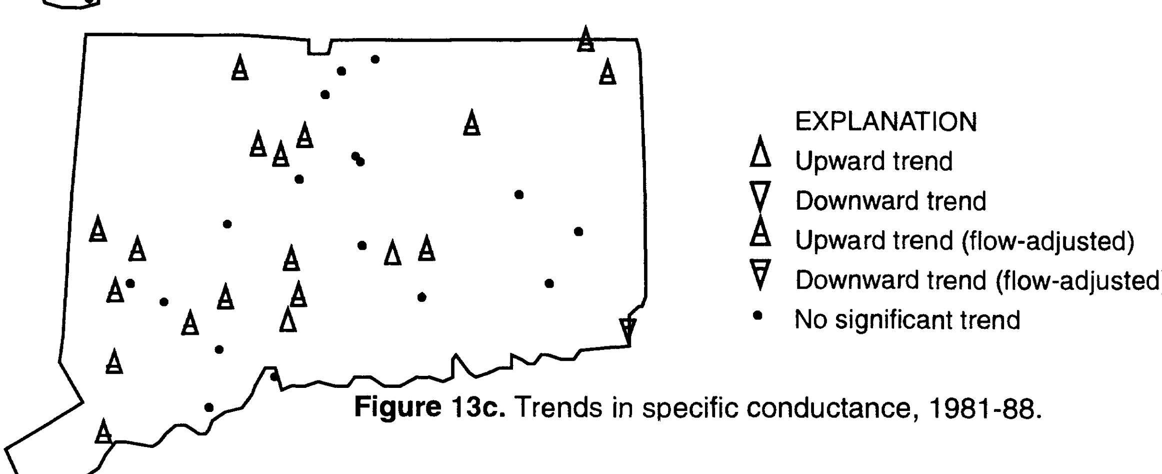


Figure 13c. Trends in specific conductance, 1981-88.

Decreases in turbidity were detected at 29 stations distributed throughout the State (fig. 14a) during 1978-88. No increases were detected, and 5 station records showed no trend. Decreases in turbidity were detected at 22 stations during 1981-88, and no increases were detected (fig. 14b). The Arkansas trend study (Petersen, 1992) also reported decreases in turbidity during a similar time period.

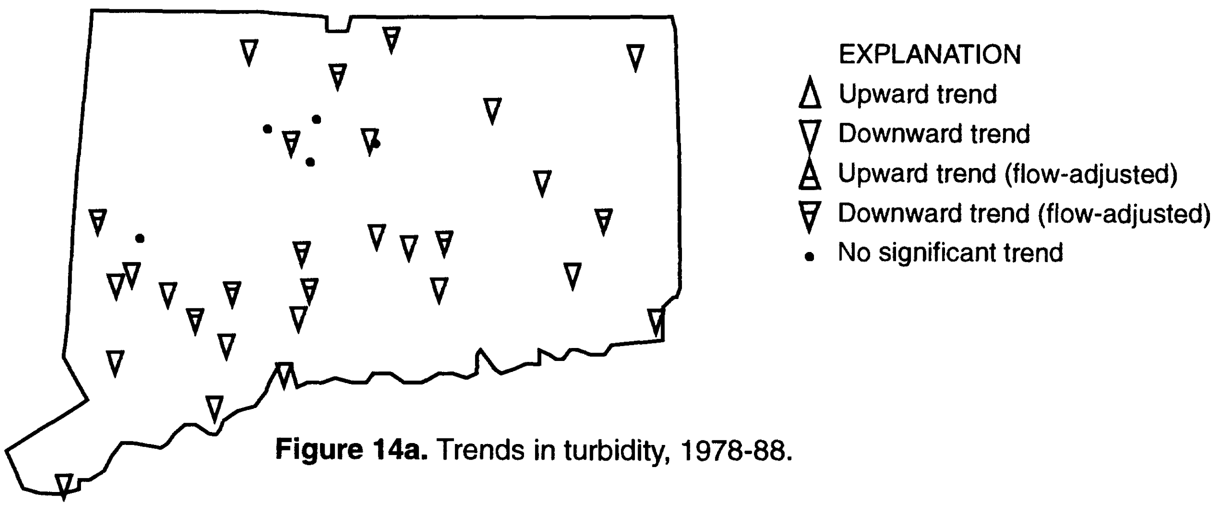


Figure 14a. Trends in turbidity, 1978-88.

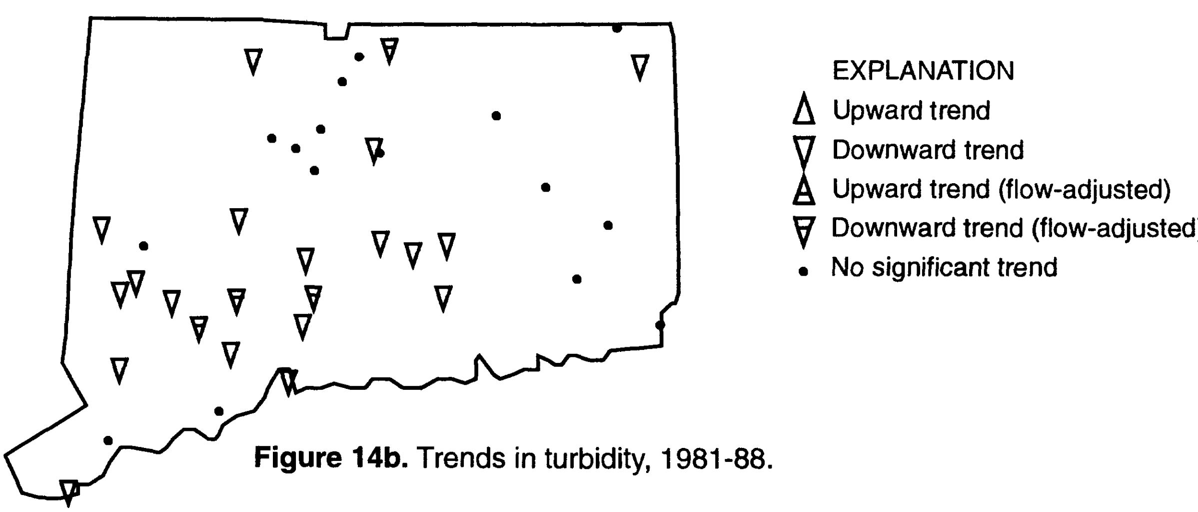


Figure 14b. Trends in turbidity, 1981-88.

Major Ions and Related Properties

Major ions and related properties analyzed for trend include dissolved solids, total solids, calcium, magnesium, chloride, sulfate, and silica. The concentrations of these constituents are affected by various natural processes and human activities. Calcium, magnesium, and silica are important components of common rock types in Connecticut. Chloride is present at low concentrations in uncontaminated freshwater in Connecticut. Disposal of domestic wastewater and application of salt to winter roads are two widespread human activities that add chloride to the environment. Sulfate occurs naturally at low concentrations in Connecticut streams. Concentrations of sulfate may be increased by municipal and industrial waste discharges and atmospheric deposition. Dissolved solids represents the measured concentration of dissolved material in water. Total solids represents the approximate sum of dissolved and suspended material in water. Dissolved and total solids concentrations are affected by natural rock weathering processes and by point and nonpoint contaminant sources.

Concentrations of several dissolved constituents increased in Connecticut during one or more of the three time periods. These results are similar to the New Jersey trend study (Hay and Campbell, 1990), which reported increases in calcium, magnesium, and chloride.

During 1975-88, increasing concentrations of dissolved solids were detected at 17 stations and increasing concentrations of total solids were detected at 13 stations. Trends were most prevalent in the west-central and southwestern parts of the State (figs. 15a and 16a). Data for about half of the stations showed no trend in either constituent.

Trends in the concentrations of dissolved solids and total solids were not widespread during 1981-88 (figs. 15b and 16b). Concentrations of dissolved solids increased at four stations and decreased at three stations. Concentrations of total solids increased at five stations and decreased at three stations. There were fewer increases in concentration and more decreases in concentration for both constituents during 1981-88 than during 1975-88.

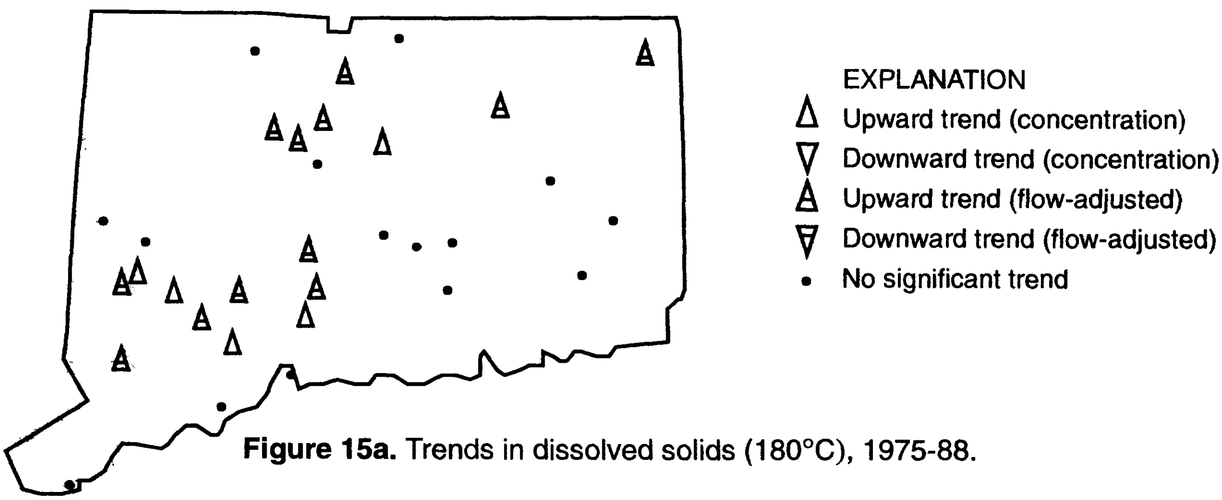


Figure 15a. Trends in dissolved solids (180°C), 1975-88.

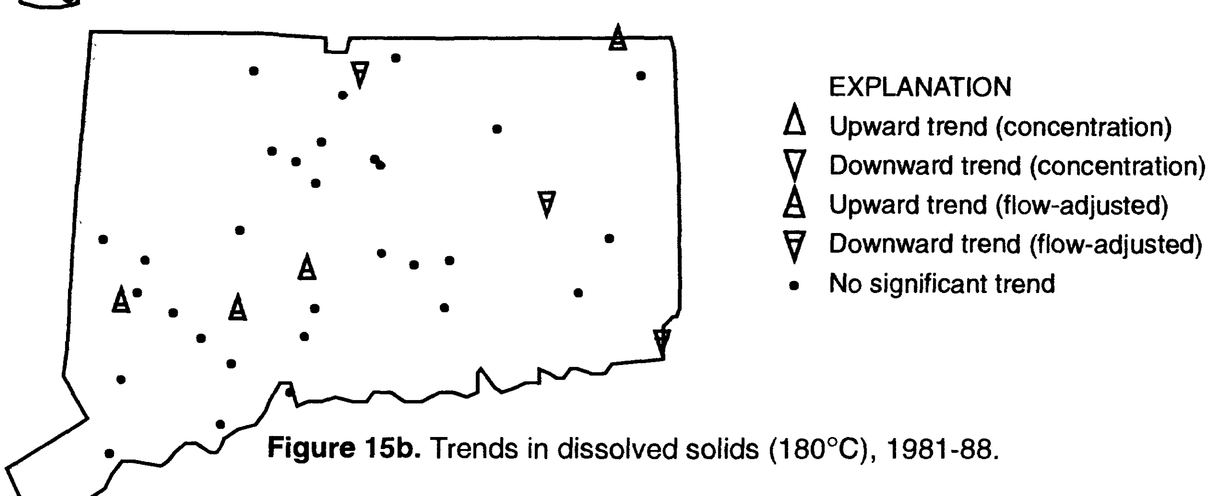


Figure 15b. Trends in dissolved solids (180°C), 1981-88.

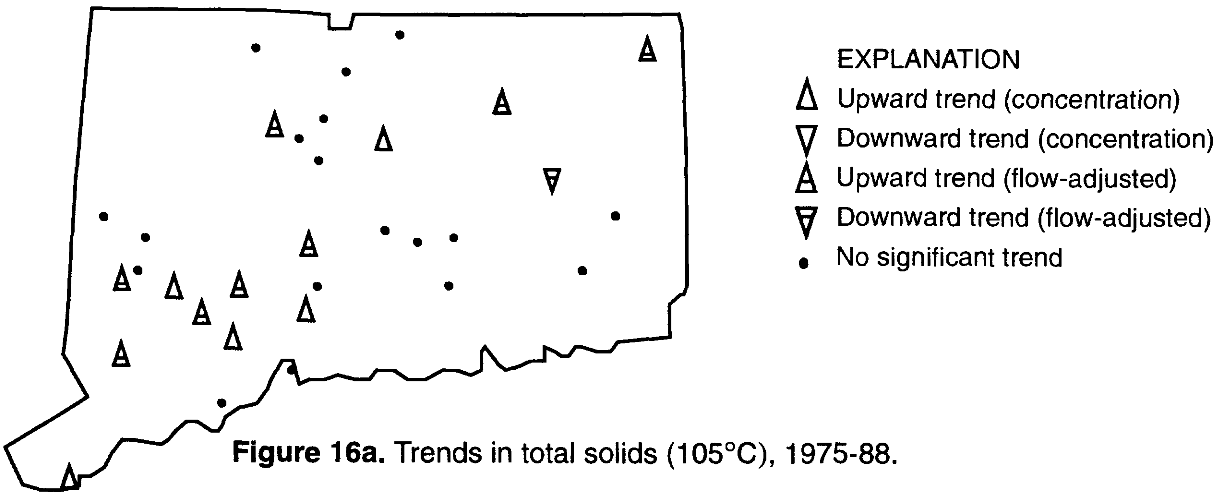


Figure 16a. Trends in total solids (105°C), 1975-88.

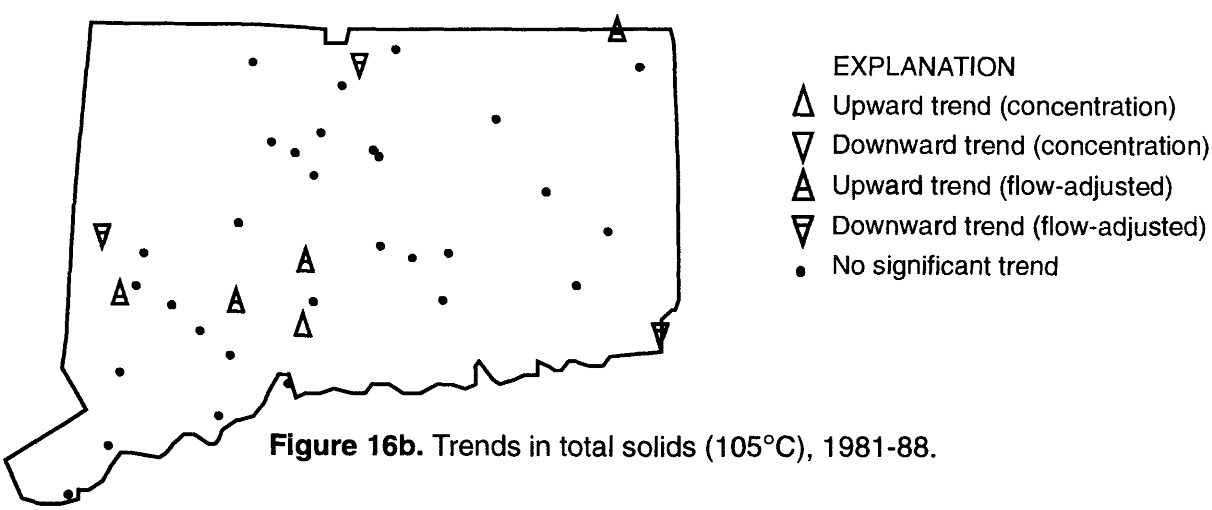


Figure 16b. Trends in total solids (105°C), 1981-88.

Concentrations of calcium increased at 2 of 8 stations during 1969-88, at 16 of 32 stations during 1975-88 and at 8 of 38 stations during 1981-88 (fig. 17). Increasing concentrations of magnesium were more numerous, with increases detected at 6 of 8 stations during 1969-88, 18 of 32 stations during 1975-88, and 13 of 38 stations during 1981-88 (fig. 18). No decreases in calcium or magnesium were detected during 1969-88 or 1975-88.

Numerous increases in concentration were detected for chloride during the three time periods evaluated for trend (fig. 19). Chloride concentrations increased at 6 of 8 stations during 1969-88, at 23 of 32 stations during 1975-88, and at 25 of 38 stations during 1981-88. No downward trends were detected during any of the three time periods. The geographic distribution of trends in chloride is similar to the pattern of trends in specific conductance for 1975-88. (Compare figs. 19b and 13b). Chloride was the major ion with the most numerous and geographically widespread trends in concentration during all three time periods.

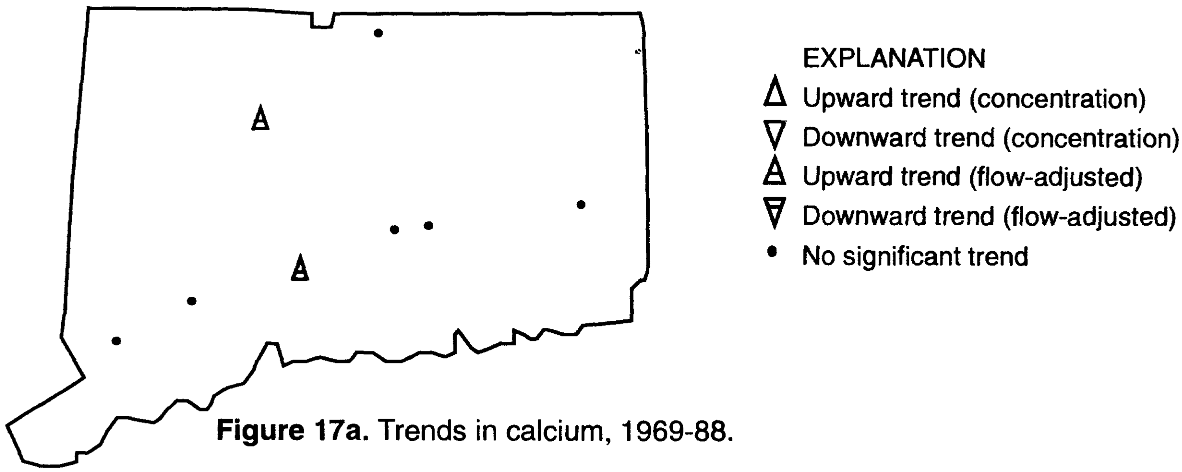


Figure 17a. Trends in calcium, 1969-88.

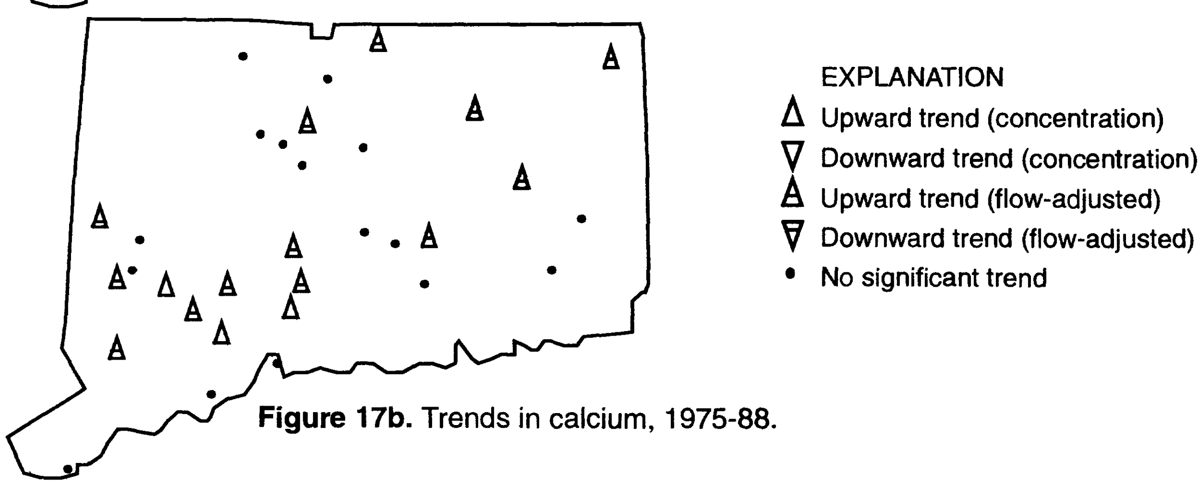


Figure 17b. Trends in calcium, 1975-88.

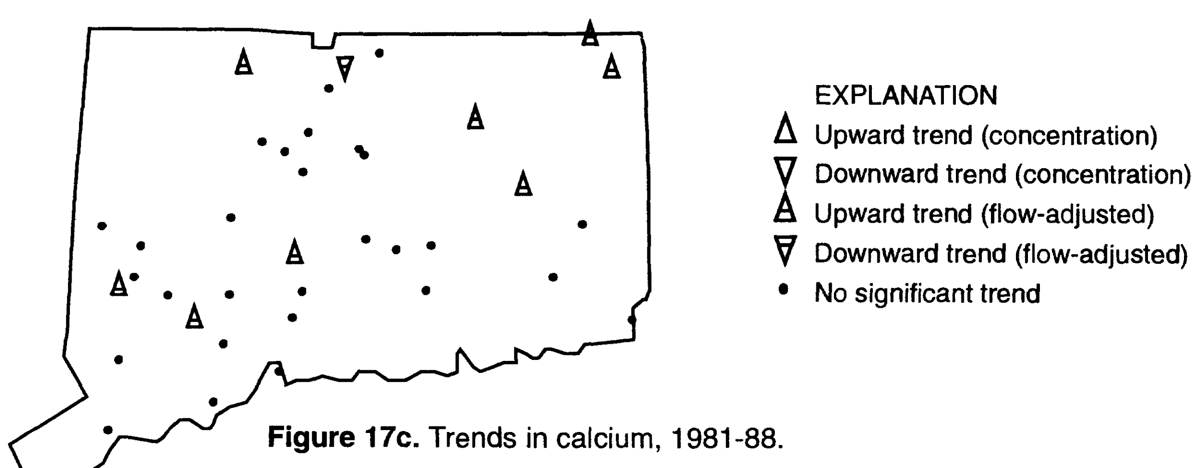


Figure 17c. Trends in calcium, 1981-88.

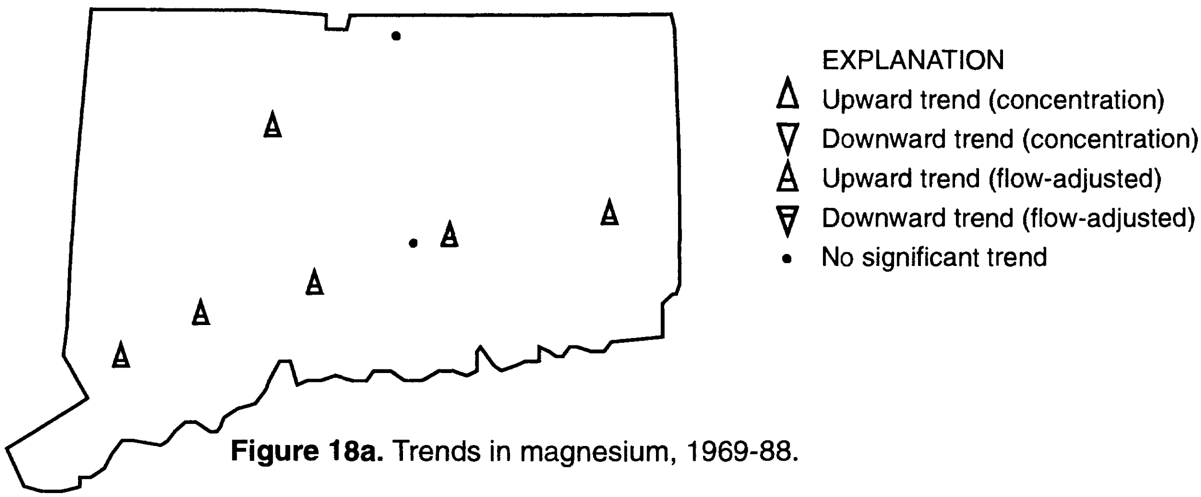


Figure 18a. Trends in magnesium, 1969-88.

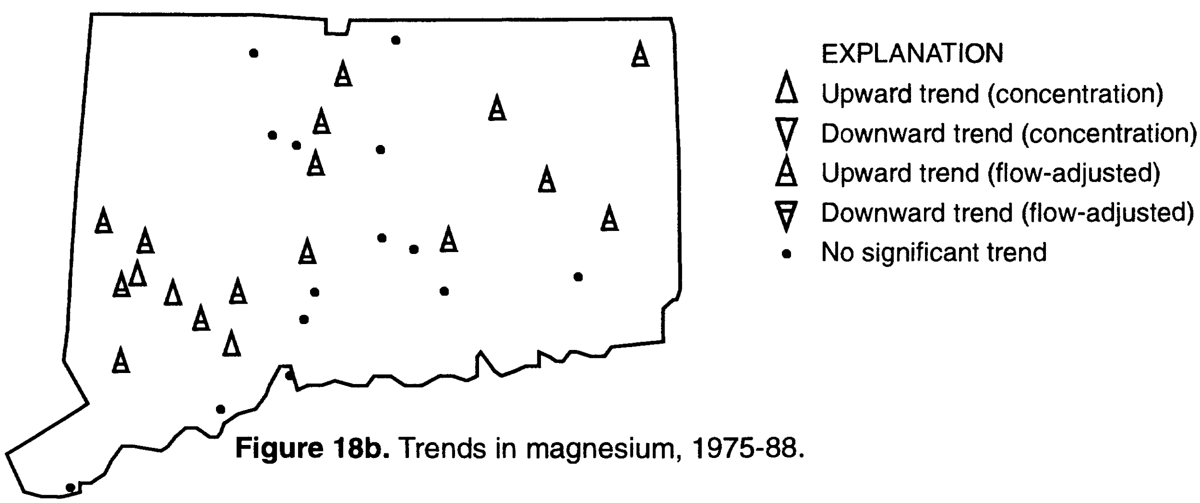


Figure 18b. Trends in magnesium, 1975-88.

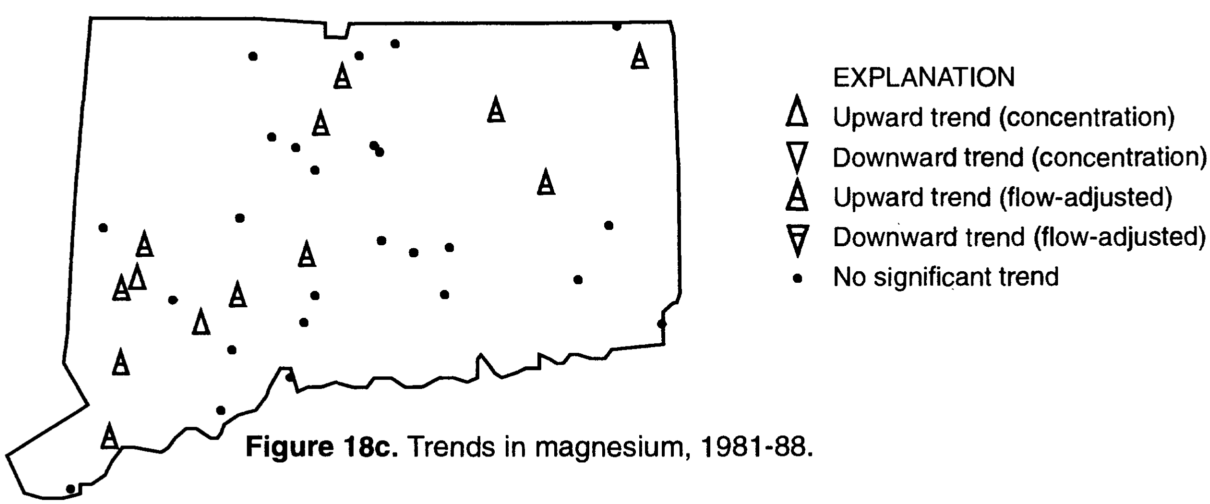


Figure 18c. Trends in magnesium, 1981-88.

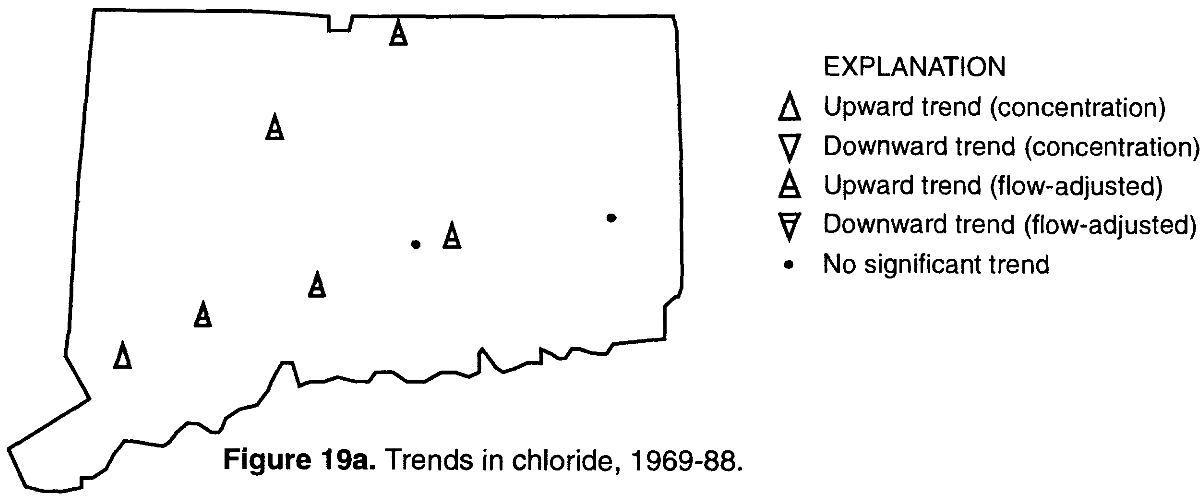


Figure 19a. Trends in chloride, 1969-88.

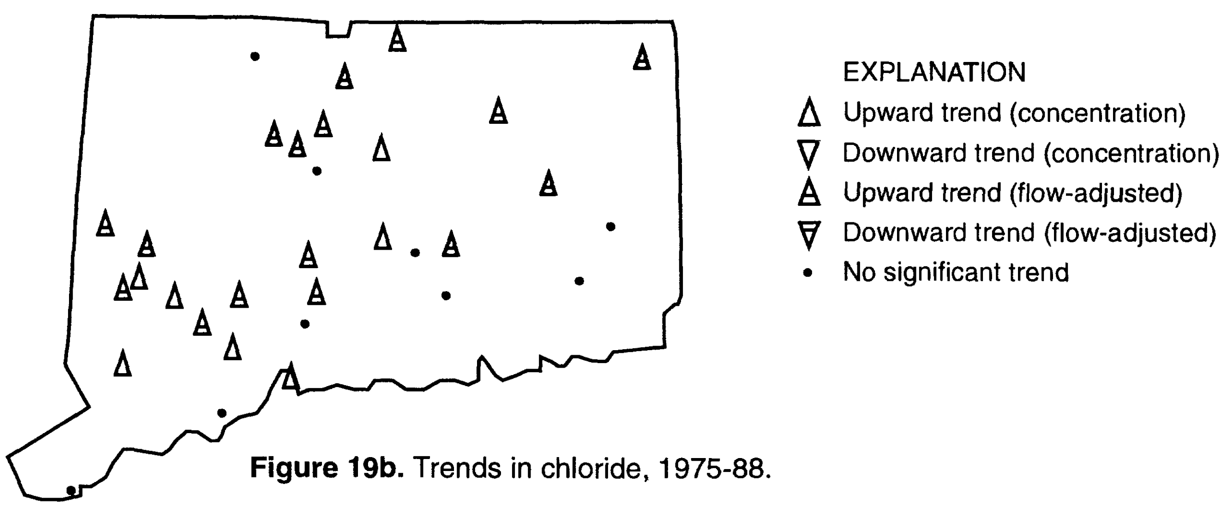


Figure 19b. Trends in chloride, 1975-88.

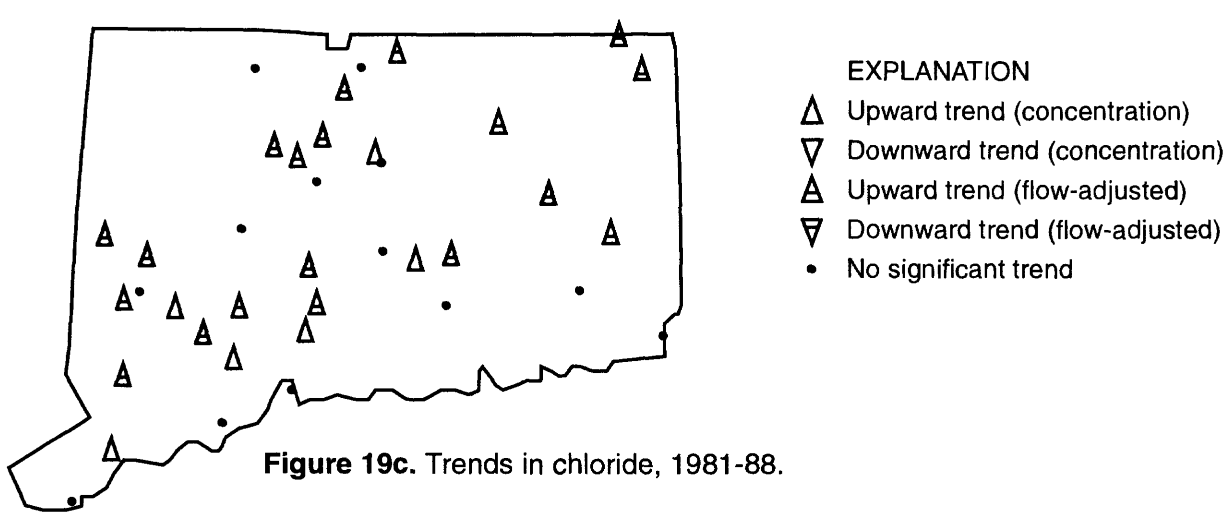


Figure 19c. Trends in chloride, 1981-88.

Sulfate data were analyzed for periods that ended in 1982 because the method of sulfate determination changed in 1983. Decreasing concentrations in sulfate were detected at 7 of 8 stations during 1969-82 and no increases were detected (fig. 20a). By contrast, increasing concentrations were detected at 10 of 28 stations during 1975-82 and no decreases were detected (fig. 20b). Only 2 of the 7 stations with decreasing concentrations for 1969-82 also had increasing concentrations for 1975-82. The shift from downward trends to no trends, or from downward trends to upward trends, indicates that the concentration decreases took place during the late 1960's and early 1970's rather than throughout the whole period of record.

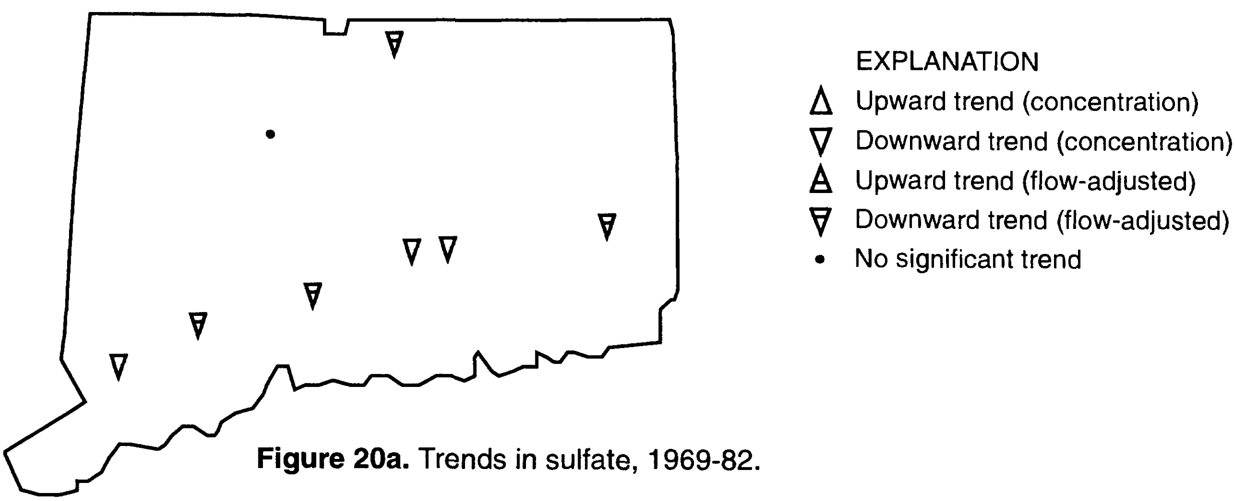


Figure 20a. Trends in sulfate, 1969-82.

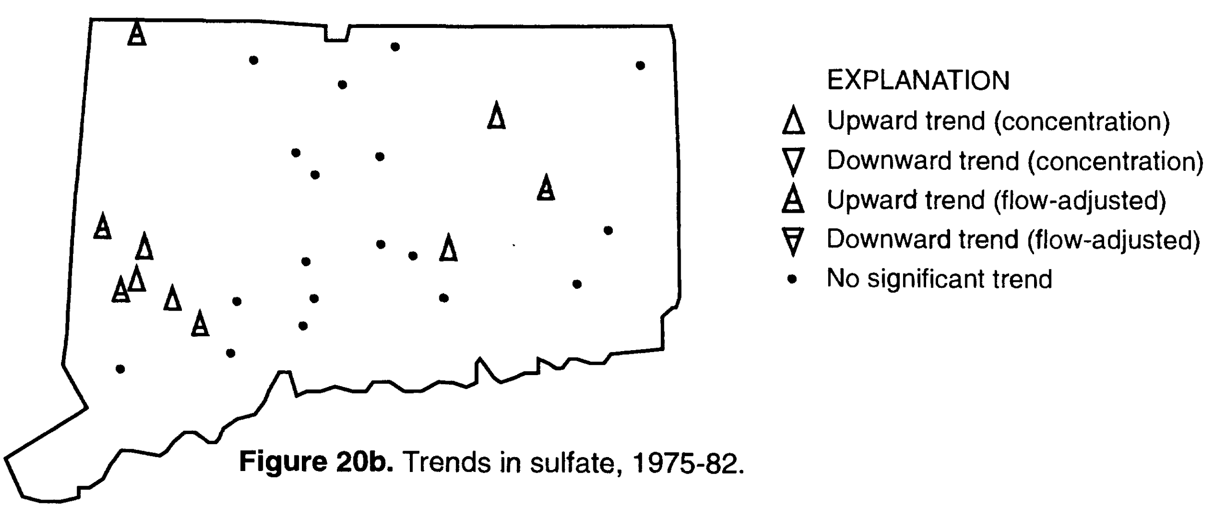


Figure 20b. Trends in sulfate, 1975-82.

Silica was the major chemical constituent with the fewest trends. No trends were detected during 1969-88. During 1975-88, 7 of 32 stations had downward trends in concentration and data for 25 stations showed no trend (fig. 21a). Concentrations of silica increased at two stations and decreased at four stations during 1981-88 (fig. 21b).

Upward trends in concentration substantially outnumbered downward trends for all major ions except silica during 1975-88 (figs. 17 to 20). These results agree with statewide trends in specific conductance and dissolved solids (figs. 13 and 15). Stations with increasing concentrations of calcium, magnesium, and chloride are distributed throughout the State and represent all major drainage basins. These sometimes small but widespread increases in the concentrations of several major ions may indicate the cumulative effects of a variety of human activities and land uses.

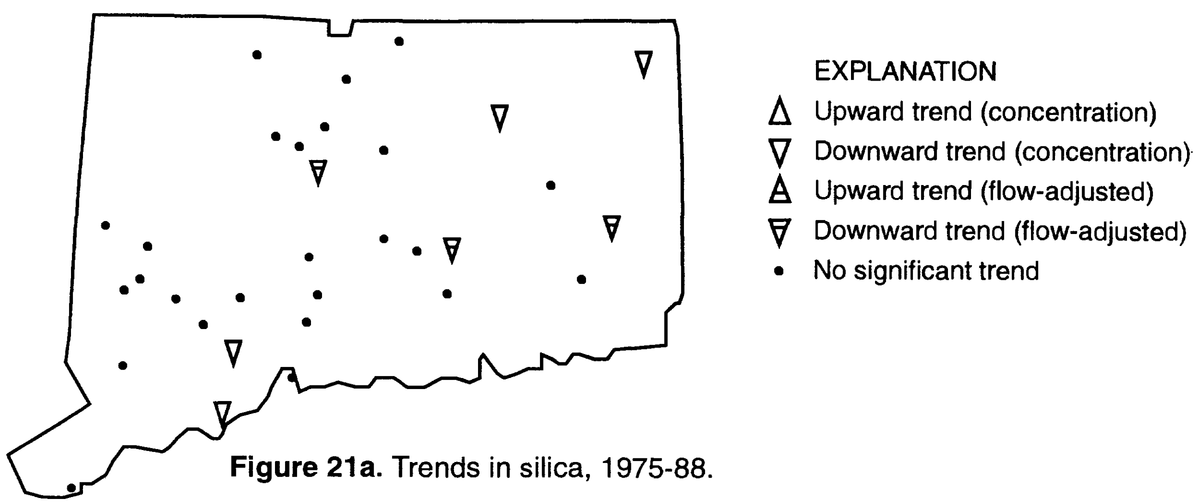


Figure 21a. Trends in silica, 1975-88.

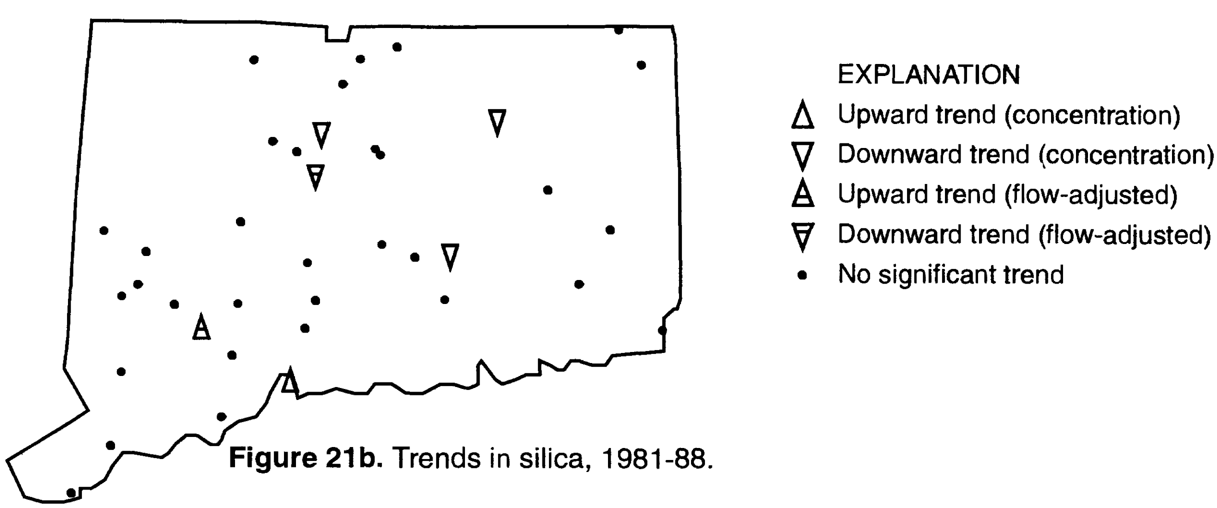


Figure 21b. Trends in silica, 1981-88.

Dissolved Oxygen

Dissolved oxygen is essential to the survival of higher forms of aquatic life (Hem, 1985, p. 155); thus, measures of dissolved oxygen are frequently used in evaluations of freshwater quality. Dissolved oxygen can be measured as a concentration in milligrams per liter or as a percent of saturation under given conditions. The latter measure is based on the saturation concentration of dissolved oxygen, which varies with temperature, atmospheric pressure, and, to some extent, the concentration of other materials in solution (Hem, 1985, p. 155). Cold water has a higher saturation concentration of dissolved oxygen than warm water, if other conditions are equal. The percent of saturation of dissolved oxygen is reported for the temperature of measurement, thus making measurements from different seasons comparable for purposes of water-quality assessment.

"The oxygen concentration in a surface-water body is a dynamic indicator of the balance between oxygen-consuming and oxygen-producing processes at the moment of sampling" (Hem, 1985, p. 155). Dissolved oxygen is consumed by the decomposition of suspended and dissolved material, and may be severely depleted in streams that receive substantial quantities of wastewater. Oxygen from the atmosphere is added to surface water by hydraulic processes such as turbulence. Oxygen is also produced by aquatic organisms during the process of photosynthesis, sometimes in concentrations that exceed equilibrium values (Hem, 1985, p. 155).

Daily fluctuations in the concentration of dissolved oxygen may be substantial in streams with a high level of daytime photosynthetic activity. Photosynthetic activity by organisms is related to nutrient availability, and thus it is possible for degraded streams to have high daytime concentrations of dissolved oxygen. However, plant respiration may result in low nighttime concentrations of dissolved oxygen. Because sampling at monitoring stations is conducted during daytime hours, it is possible that an upward trend in dissolved oxygen might not represent a consistent improvement in this constituent, in terms of requirements for aquatic life.

Concentrations of dissolved oxygen, and oxygen as a percent of saturation, increased at all eight stations during 1969-88 (figs. 22a and 23a). Concentrations of dissolved oxygen increased at 11 stations and decreased at 1 station during 1975-88 (fig. 22b). There were no significant trends at 20 stations. The percent saturation of dissolved oxygen increased at 15 stations and decreased at 2 stations during 1975-88, with no significant trends at 15 stations (fig. 23b). Increases in both measures were more prevalent in the south-central part of the State. The New Jersey trend study (Hay and Campbell, 1990) and the Texas trend study (Schertz, 1990) also reported numerous increases in dissolved oxygen during similar time periods.

The Still River at Brookfield Center (location 28, fig. 4) had a downward trend in dissolved oxygen concentration and percent of saturation during 1975-88. One other station, the Quinebaug River at Jewett City (location 6, fig. 4), had a downward trend in percent of saturation.

Concentrations of dissolved oxygen increased at five stations and decreased at one station during 1981-88. The percent of saturation of dissolved oxygen increased at 10 stations and decreased at 1 station. The two stations with decreases for this period are in the southwestern part of the State, as is the station with decreasing dissolved-oxygen concentrations during 1975-88. Increases in dissolved oxygen were less frequent during 1981-88 than during 1975-88.

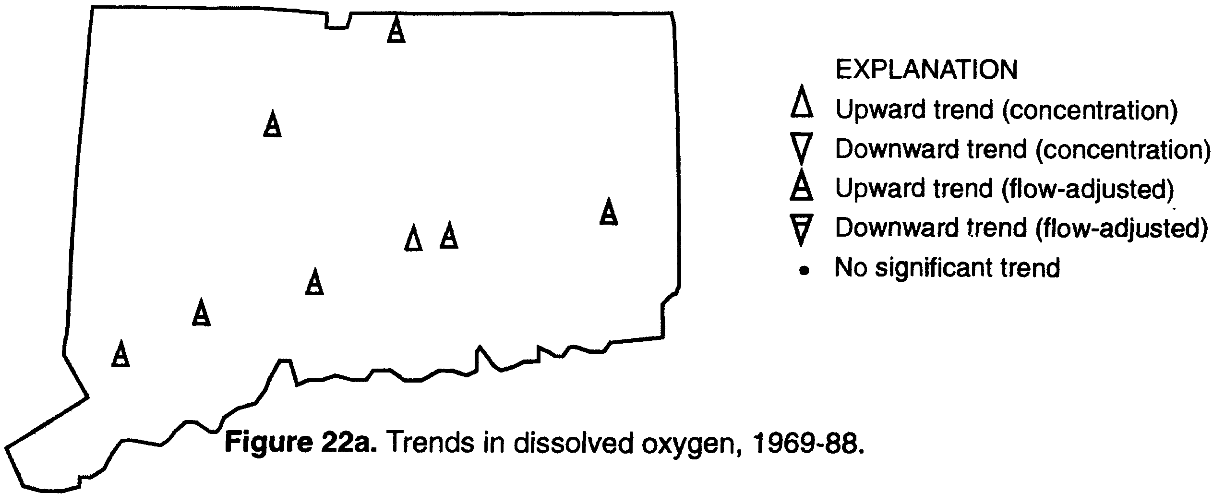


Figure 22a. Trends in dissolved oxygen, 1969-88.

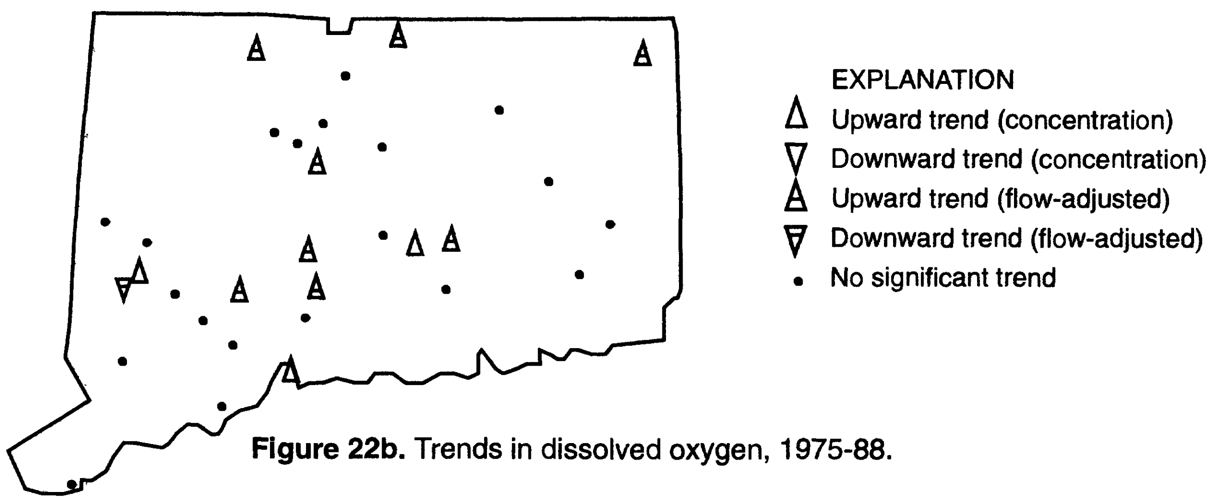


Figure 22b. Trends in dissolved oxygen, 1975-88.

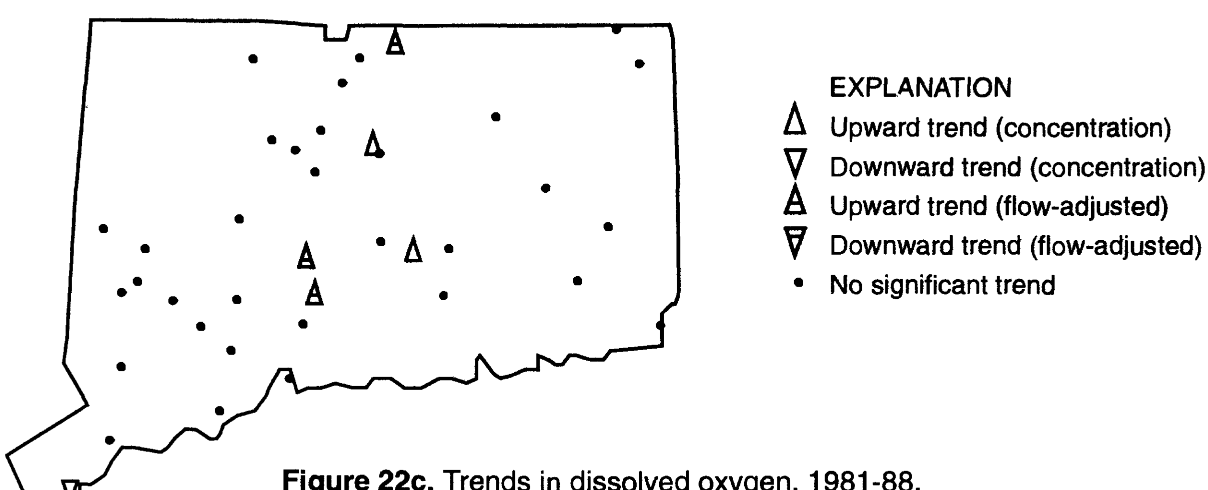


Figure 22c. Trends in dissolved oxygen, 1981-88.

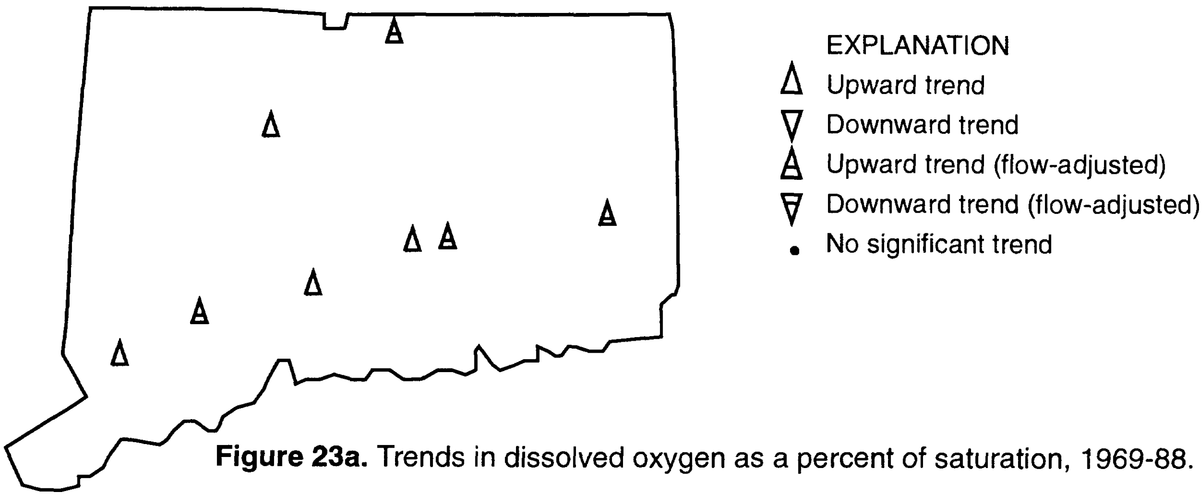


Figure 23a. Trends in dissolved oxygen as a percent of saturation, 1969-88.

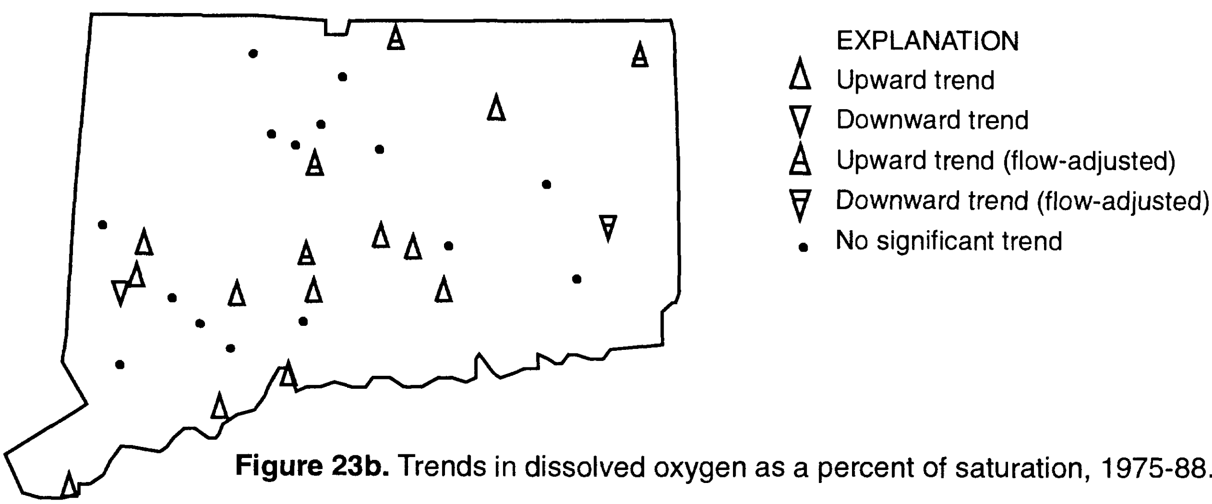


Figure 23b. Trends in dissolved oxygen as a percent of saturation, 1975-88.

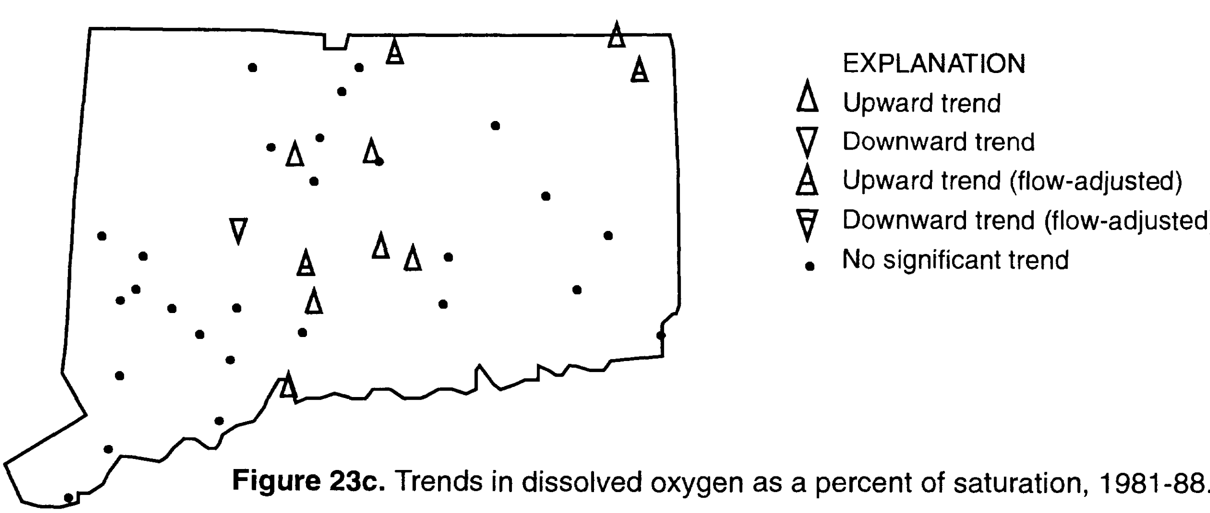


Figure 23c. Trends in dissolved oxygen as a percent of saturation, 1981-88.

pH

pH is a measure of the activity of hydrogen ions and is represented by the negative logarithm (base 10). "The hydrogen ion activity in an aqueous solution is controlled by interrelated chemical reactions that produce or consume hydrogen ions" (Hem, 1985, p. 61). pH is influenced by temperature; by the reaction of dissolved carbon dioxide with water; by reactions in which solid materials are dissolved, precipitated, or oxidized; and by the photosynthetic activity of aquatic organisms, which take up dissolved carbon dioxide during the day and release it at night.

Increases in pH were numerous during all three time periods. pH increased at 5 stations and decreased at 1 station during 1969-88; data for 2 stations showed no significant trend (fig. 24a). pH increased at 23 stations and decreased at 1 station during 1975-88 (fig. 24b); data for 8 stations showed no significant trend. Trends in pH were most prevalent in the central and western parts of the State during 1975-88. pH increased at 26 stations during 1981-88; there were no decreases and data for 12 stations showed no significant trend. Increases in pH were detected in all major drainage basins of the State. The Texas trend study also reported numerous increases in pH during a similar time period (Schertz, 1990).

Increases both in pH and in dissolved oxygen as a percent of saturation were detected at 13 stations for 1975-88. These constituents are both affected by photosynthetic activity in streams. Additional analyses, including the evaluation of sampling schedules relative to daily fluctuations in constituent concentrations, would be required to assess possible interrelations among nutrient availability, photosynthesis, dissolved oxygen concentrations, and pH.

The two stations with downward trends in pH were Burlington Brook (location 11, fig. 4) for 1969-88 and Salmon River (location 20, fig. 4) for 1975-88. Both drainage basins are sparsely developed, are underlain by noncarbonate crystalline bedrock, and have no major point discharges.

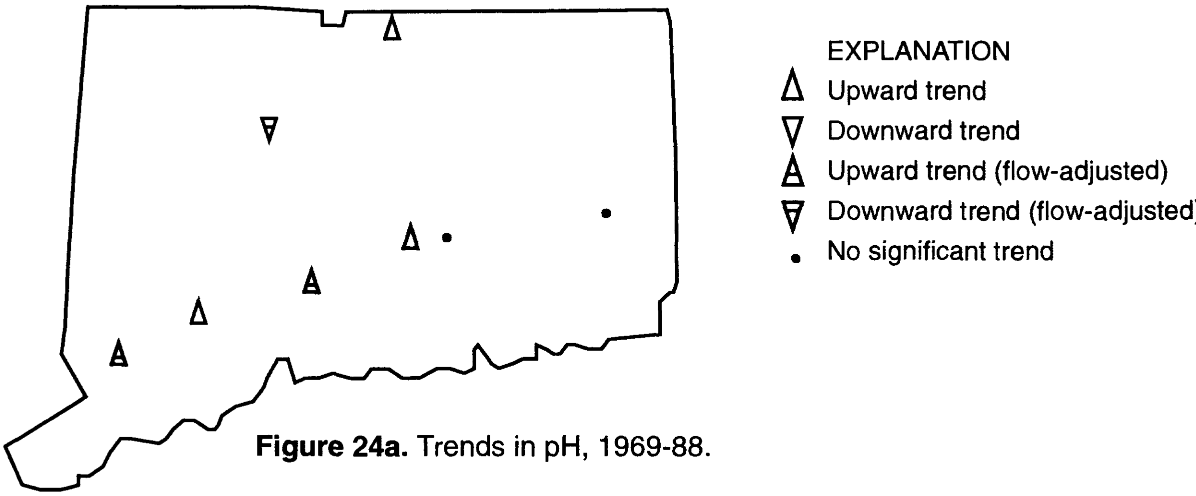


Figure 24a. Trends in pH, 1969-88.

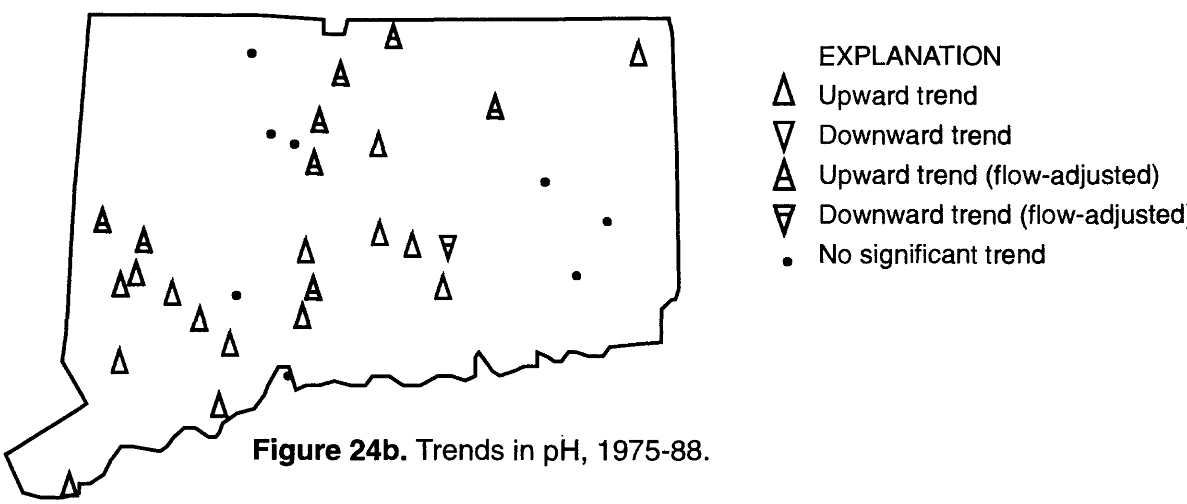


Figure 24b. Trends in pH, 1975-88.

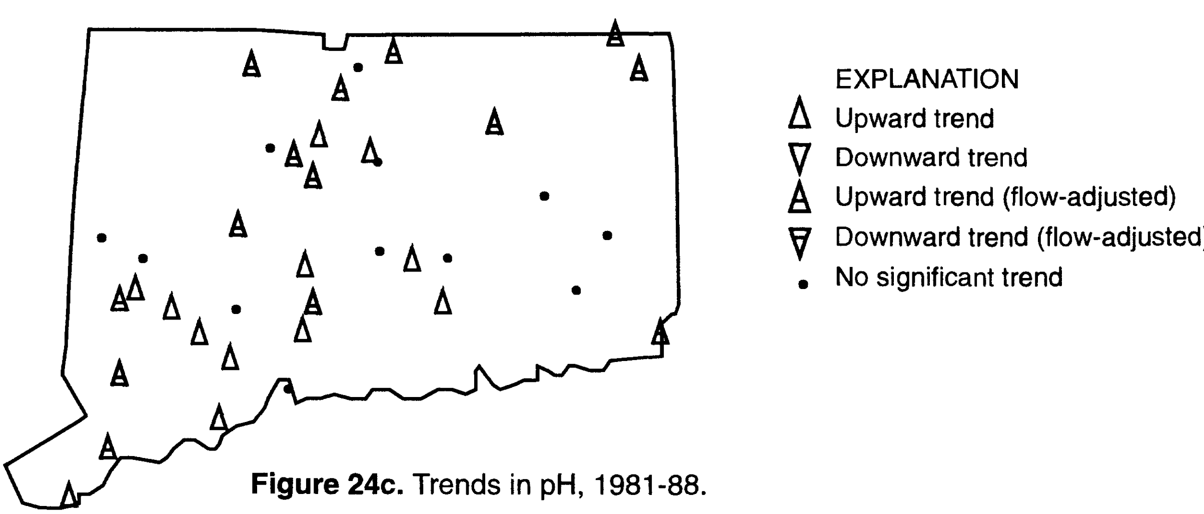


Figure 24c. Trends in pH, 1981-88.

Nitrogen, Phosphorus, and Carbon

Nitrogen, phosphorus, and carbon are important components of plants and animals. Waste matter produced by living organisms, and materials derived from their decomposition, are major sources of these elements in the freshwater systems of Connecticut. Natural organic material, domestic and industrial wastewater, agricultural and residential fertilizer, animal wastes, and combustion byproducts in the atmosphere contribute nitrogen, phosphorus, and carbon constituents to freshwater. Some nitrogen and phosphorus constituents are considered to be limiting nutrients that control the growth of plants and algae. Ammonia nitrogen, a common component of wastewater, is important because it is harmful to aquatic life.

Concentrations of total nitrogen, total organic nitrogen, total nitrite-plus-nitrate, dissolved ammonia nitrogen, total phosphorus, and total organic carbon were analyzed for trend during 1975-88 and 1981-88. Concentrations of total ammonia nitrogen and total nitrite were also analyzed for trend during 1981-88.

During 1975-88, concentrations of total nitrogen increased at 27 of 30 stations (fig. 25a); no stations showed decreasing concentrations. Concentrations of total organic nitrogen increased at 23 of 32 stations and decreased at 1 station (fig. 26a). Increasing concentrations of total nitrite-plus-nitrate were detected at 17 of 32 stations (fig. 27a). Three stations in the western part of the State had decreasing concentrations, and data for 12 stations showed no significant trend. Increases in these three constituents were detected in all the major drainage basins of the State. Increasing concentrations of total nitrogen were also reported by the Texas trend study (Schertz, 1990) for a similar time period.

Only five stations, all representing major drainage basins, had sufficient dissolved ammonia data for trend analysis during 1975-88 (fig. 28a). Two stations, the Connecticut River at Thompsonville (location 8, fig. 4) and the Quinebaug River at Jewett City (location 6, fig. 4), had upward trends in dissolved ammonia.

Stations with increasing concentrations of total nitrogen, total organic nitrogen, and total nitrite-plus-nitrate outnumbered stations with decreasing concentrations during 1981-88. However, the number of stations with increasing concentrations of these nitrogen constituents was much smaller for 1981-88 than for 1975-88 (figs. 25-27). Total ammonia nitrogen, with decreasing concentrations at 11 stations, was the only nitrogen constituent for which decreasing concentrations substantially outnumbered increases (fig. 29). Decreases in total ammonia were also reported in the Arkansas trend study (Petersen, 1992) for a similar time period.

Concentrations of nitrite nitrogen are typically very low in Connecticut streams that do not receive large amounts of organic wastes. Trend results for stations in the less developed areas of the state may not reflect environmental conditions because the very small number of data points above the detection limit may compromise the accurate detection of trends. By contrast, concentrations of nitrite in streams that receive substantial point discharges are often above the detection limit, and trend results are probably representative of environmental conditions. Only one trend in total nitrite was detected, a decrease in the sparsely developed Saugatuck River basin. This trend is not considered environmentally significant because of the limited amount of data above the detection limit.

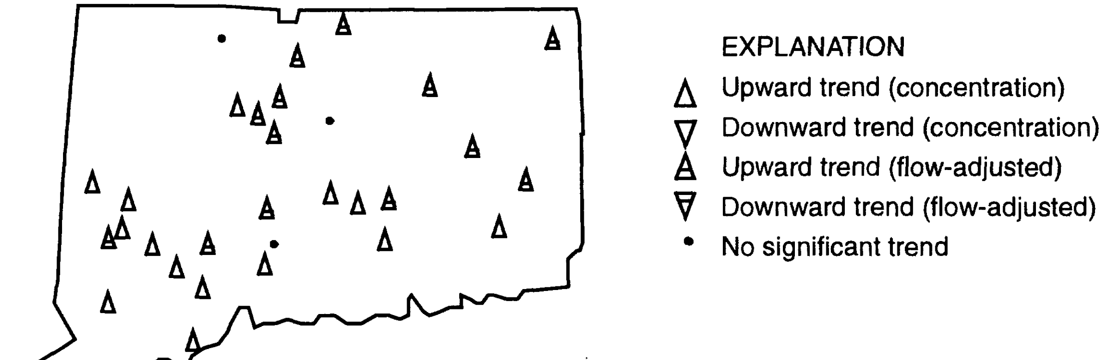


Figure 25a. Trends in total nitrogen, 1975-88.

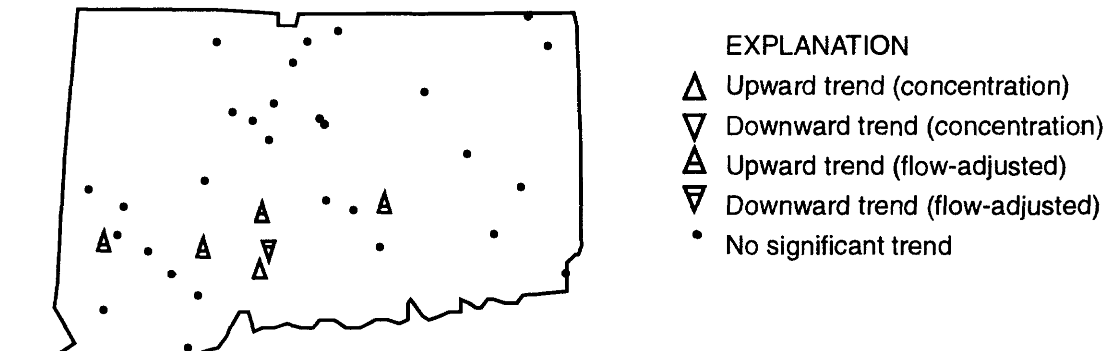


Figure 25b. Trends in total nitrogen, 1981-88.

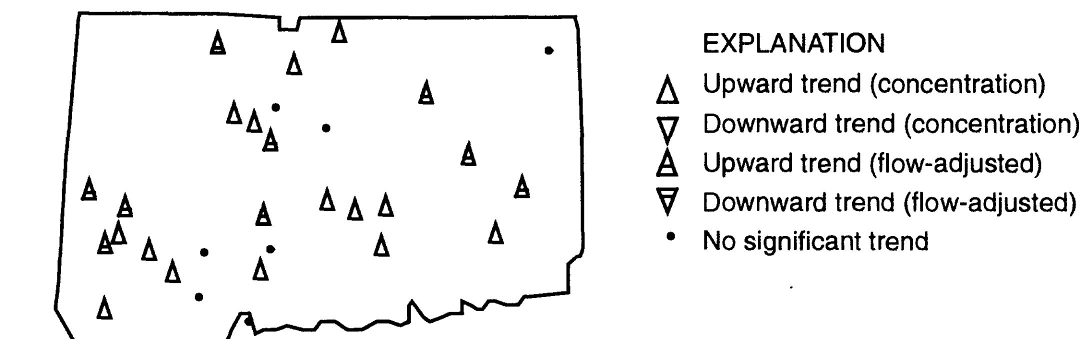


Figure 26a. Trends in total organic nitrogen, 1975-88.

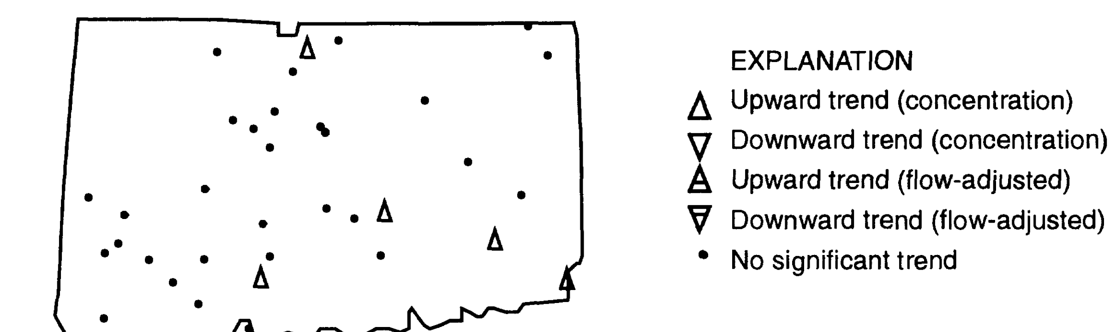


Figure 26b. Trends in total organic nitrogen, 1981-88.

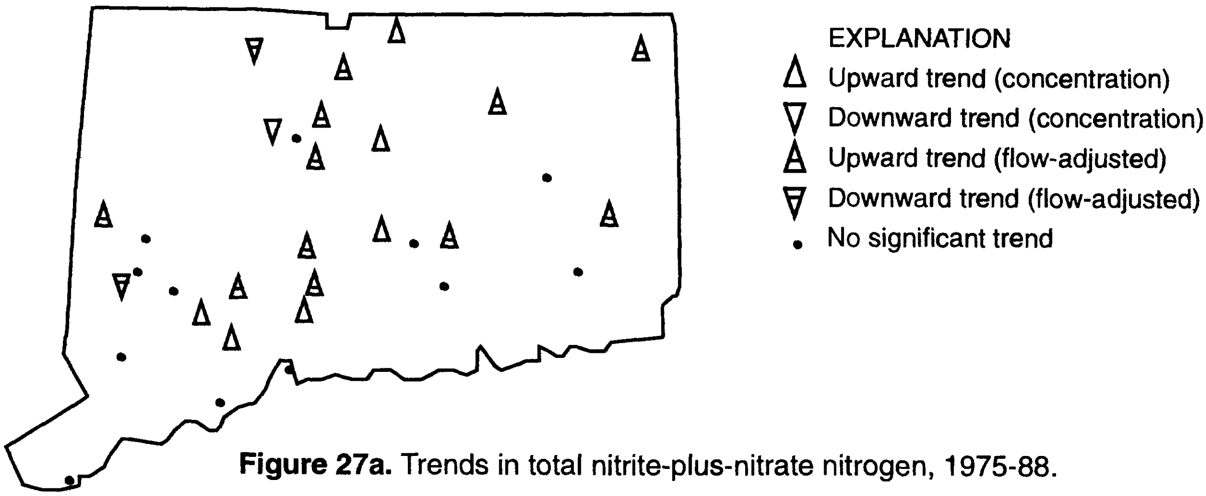


Figure 27a. Trends in total nitrite-plus-nitrate nitrogen, 1975-88.

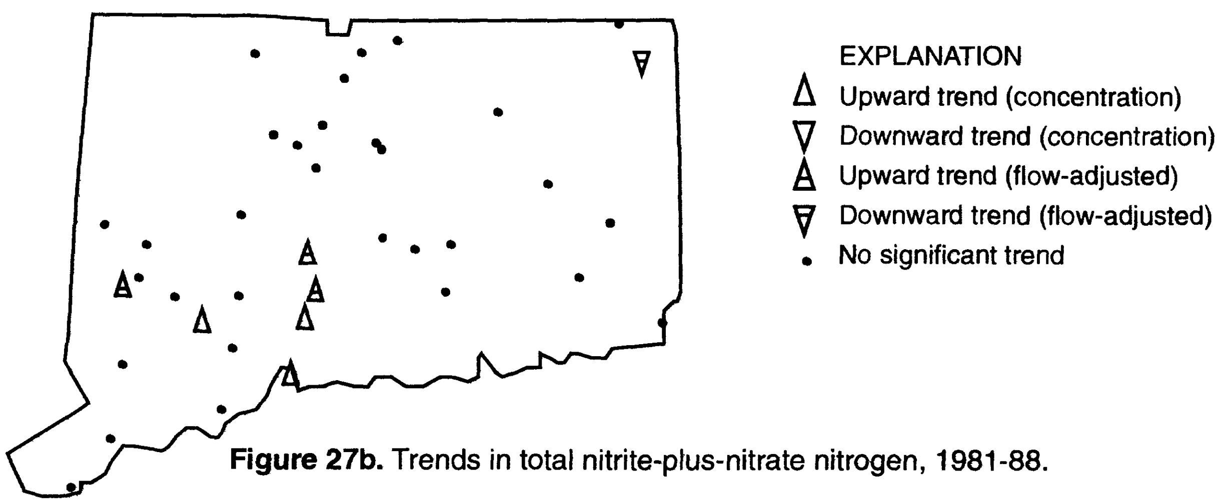


Figure 27b. Trends in total nitrite-plus-nitrate nitrogen, 1981-88.

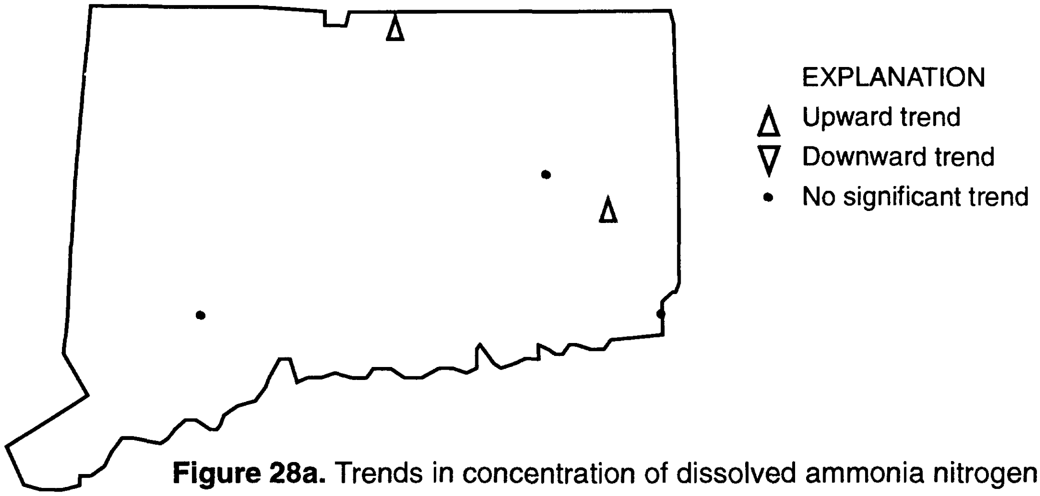


Figure 28a. Trends in concentration of dissolved ammonia nitrogen, 1975-88.

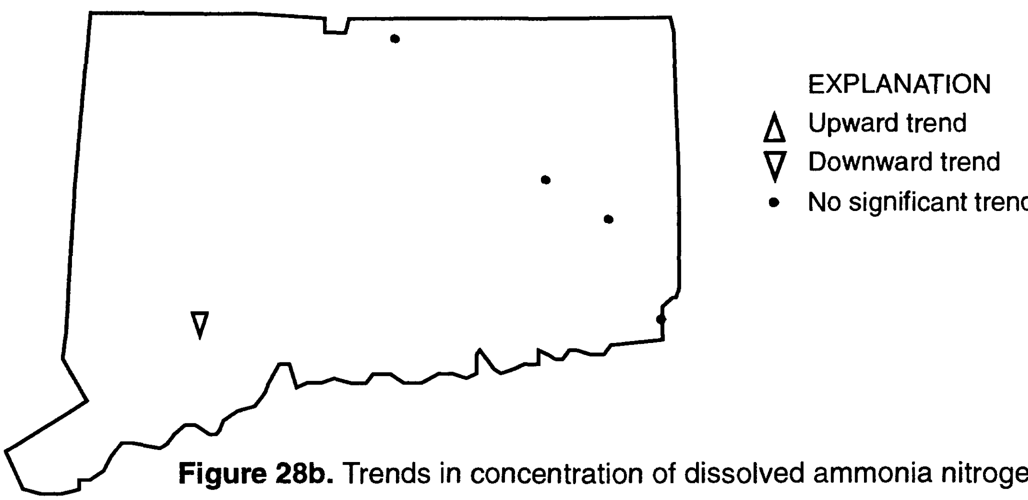


Figure 28b. Trends in concentration of dissolved ammonia nitrogen, 1981-88.

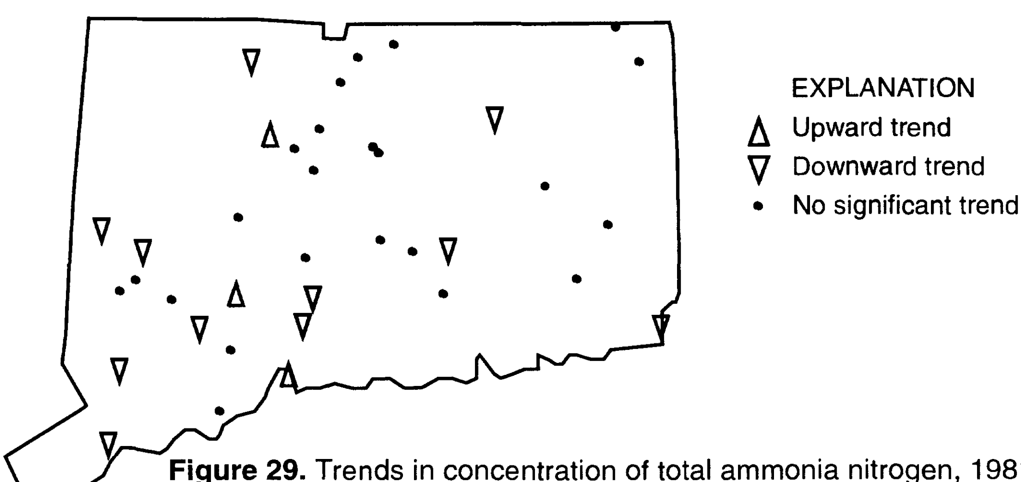


Figure 29. Trends in concentration of total ammonia nitrogen, 1981-88.

Decreasing concentrations of total phosphorus were detected at 23 of 32 stations during 1975-88 (fig. 30a). No stations had increases in phosphorus concentrations, and nine stations showed no significant trend. Stations with decreasing concentrations represent all the major drainage basins of the State, although most stations in the Farmington River Basin had no trend. Concentrations of total phosphorus decreased at 24 of 38 stations during 1981-88 (fig. 30b). Decreases in total phosphorus are consistent with numerous decreases detected nationally during 1982-89 (Smith and others, 1993).

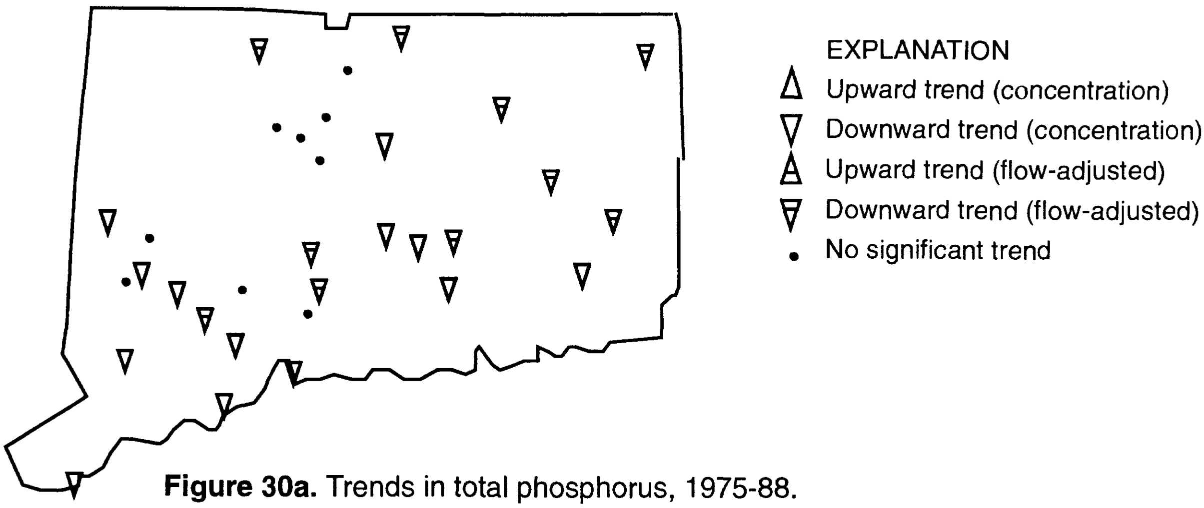


Figure 30a. Trends in total phosphorus, 1975-88.

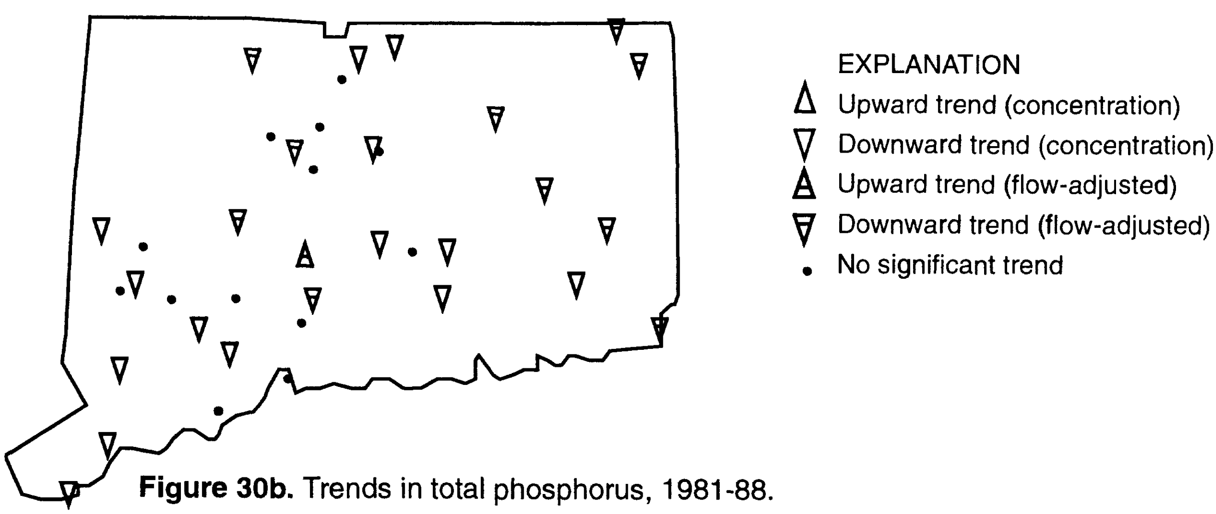


Figure 30b. Trends in total phosphorus, 1981-88.

Decreasing concentrations of total organic carbon were detected at 30 stations throughout the State during 1975-88 (fig. 31a). No increasing concentrations in total organic carbon were detected, and two stations had no significant trend. By contrast, increasing concentrations of total organic carbon were detected at seven stations during 1981-88, and only one decrease was detected (fig. 31b).

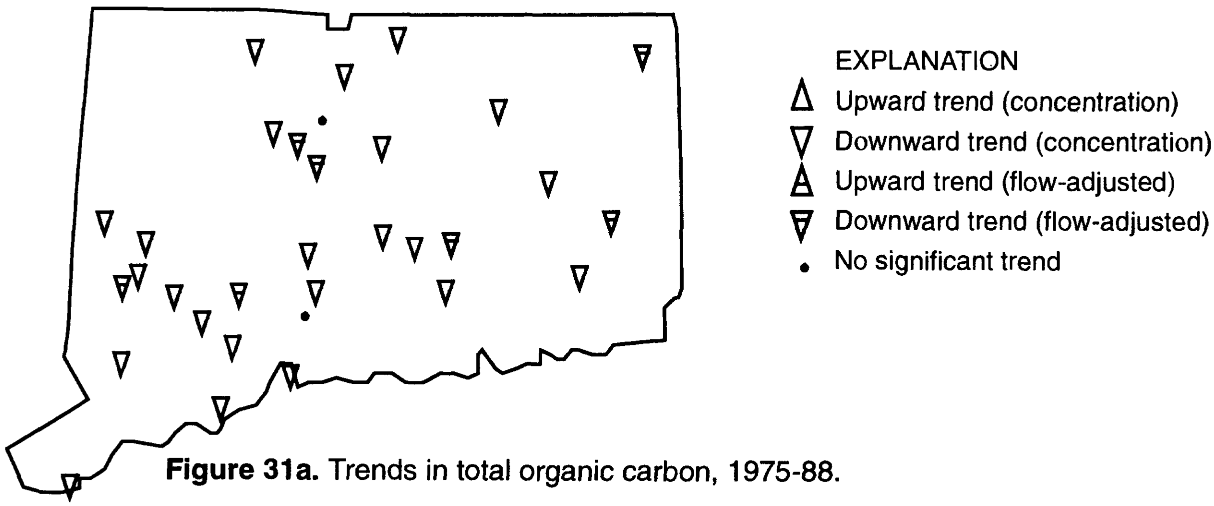


Figure 31a. Trends in total organic carbon, 1975-88.

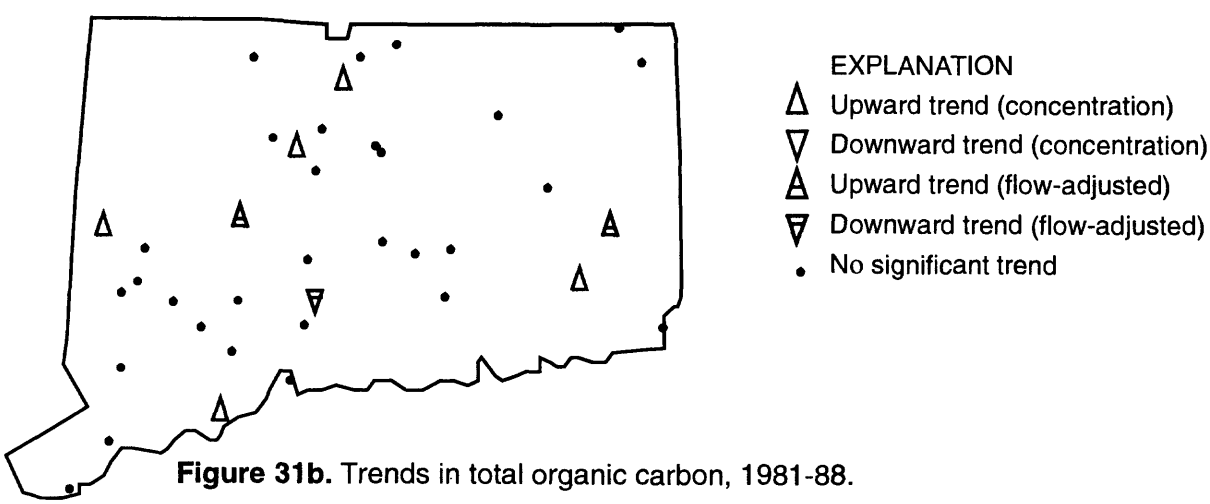


Figure 31b. Trends in total organic carbon, 1981-88.

Trace Metals

The term "trace constituent" is commonly used for substances that nearly always occur in concentrations of less than 1.0 mg/L (Hem, 1985, p. 129). Trace metals that were analyzed for trend in all three time periods include dissolved iron and dissolved manganese. Trace metals that were analyzed for trend during 1981-88 include dissolved iron, total iron, dissolved manganese, total copper, dissolved nickel, total nickel, and total zinc (table 10). Dissolved iron, total iron, and total copper were treated as uncensored constituents in the ESTREND analyses, and all other trace metals were treated as censored constituents. Trend results for censored constituents are not flow-adjusted.

Iron and manganese are common elements in the Earth's outer crust. Their concentrations in natural water are typically low because of the physical and chemical conditions affecting their solubility (Hem, 1985, p. 76-77). Municipal and industrial waste effluent are additional sources of iron and manganese. Copper, nickel, and zinc are less common than iron and manganese in the Earth's outer crust (Hem, 1985, table 1, p. 5-6). Use of these trace metals in various industrial applications has increased their concentrations in the environment (Hem, 1985, p. 138-142).

Concentrations of dissolved iron decreased at the only two stations with sufficient data for trend analysis during 1969-88. Both stations are on the Connecticut River, at Thompsonville and Middle Haddam (locations 8 and 19, fig. 4). Dissolved iron concentrations decreased at 16 of 32 stations during 1975-88 (fig. 32a). No stations had increasing concentrations of iron, and data for 16 stations showed no trend.

Dissolved manganese concentrations increased at one station during 1969-88 and decreased at four stations; data for two stations showed no trend (fig. 33a). Dissolved manganese concentrations decreased at 14 stations and increased at 1 station during 1975-88; data for 19 stations showed no trend (fig. 33b). Eight stations, all in the southern half of the State, had decreasing concentrations of both iron and manganese. Burlington Brook, the smallest drainage basin in the study (location 11, fig. 4), was the one station with an increasing concentration of manganese during both time periods.

Concentrations of most trace metals decreased at a substantial number of stations during 1981-88 (figs. 32 to 36). Few increases in trace metal concentrations were detected. Concentrations of dissolved nickel, total copper, and total zinc decreased at a majority of stations that had data sufficient for trend analysis (figs. 34a, 35, and 36). Decreasing concentrations of trace metals were also reported by the New Jersey trend study for a similar time period (Hay and Campbell, 1990).

A geographic pattern of distribution for trends in trace metals is uncertain because of the absence of stations with sufficient data for trend analysis in the northeastern and northwestern corners of the State. Decreasing concentrations of dissolved iron, dissolved nickel, and total zinc were detected in all major drainage basins of the State (figs. 32b, 34a, and 36).

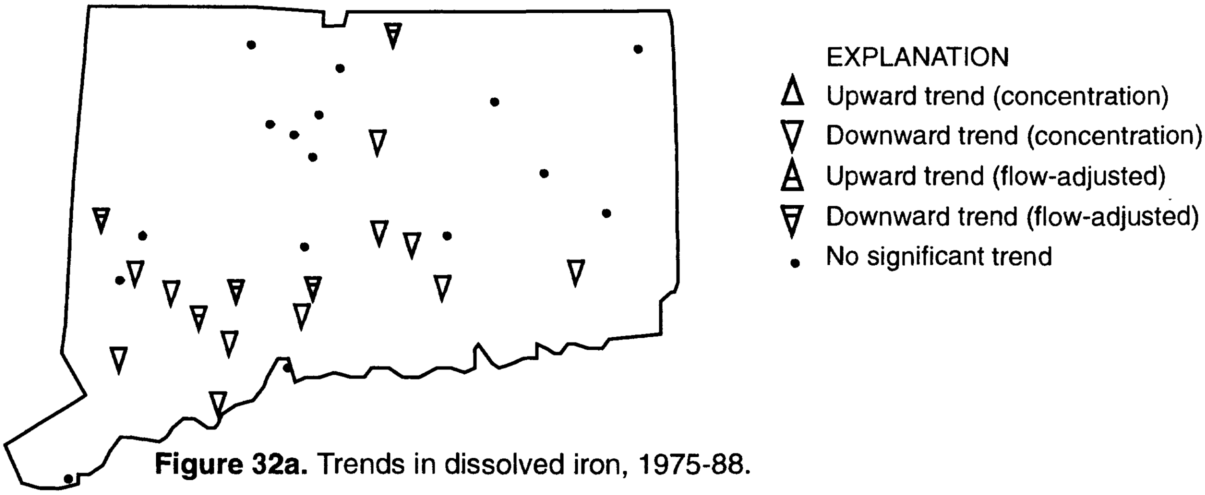


Figure 32a. Trends in dissolved iron, 1975-88.

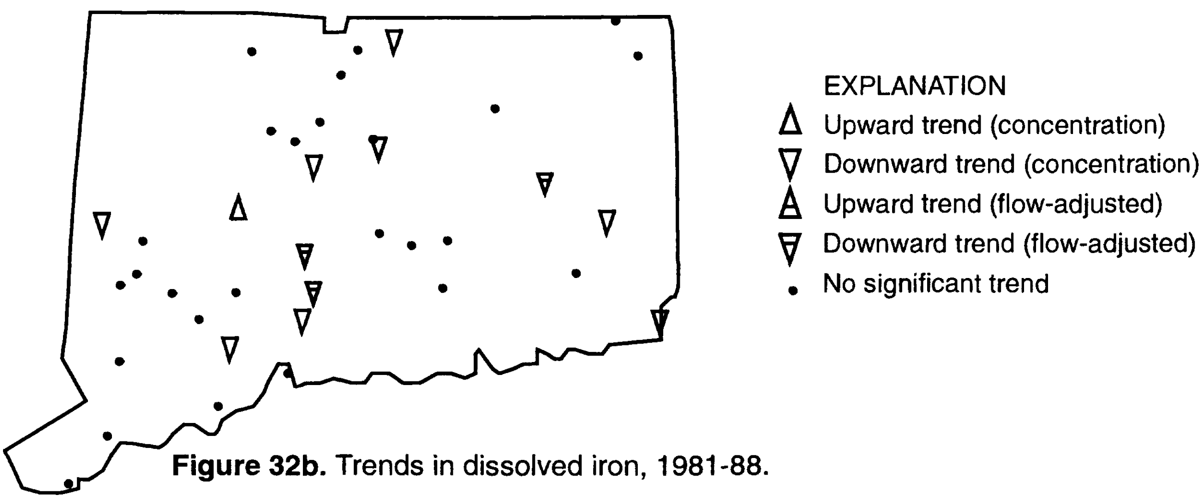


Figure 32b. Trends in dissolved iron, 1981-88.

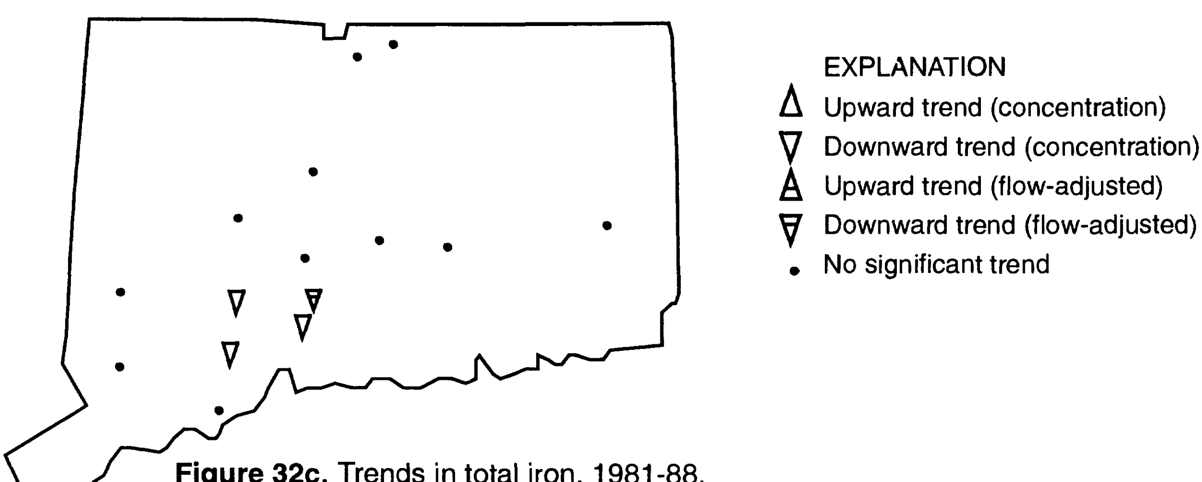


Figure 32c. Trends in total iron, 1981-88.

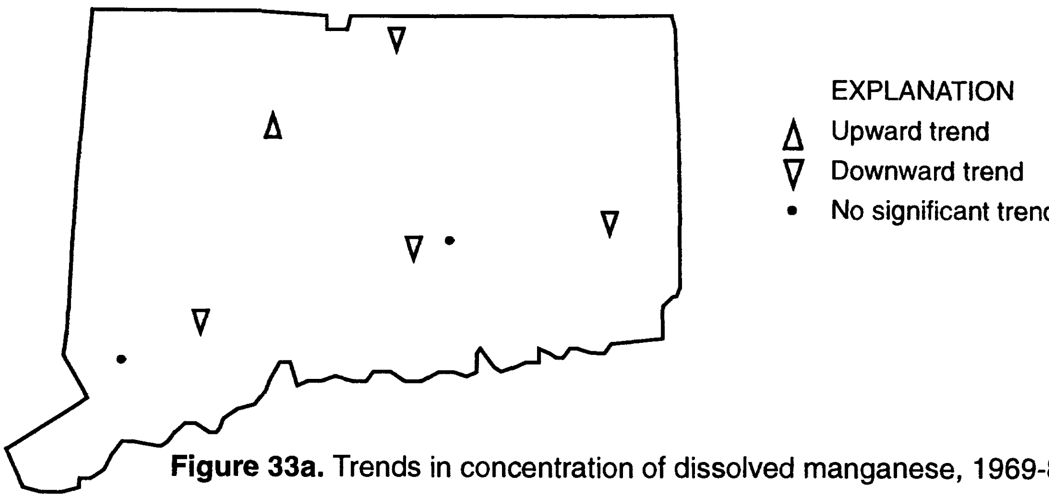


Figure 33a. Trends in concentration of dissolved manganese, 1969-88.

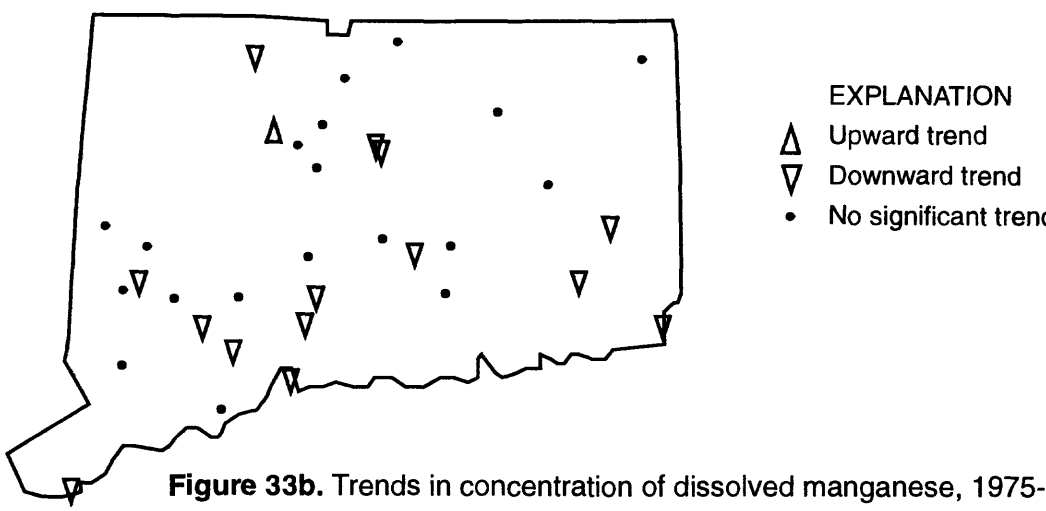


Figure 33b. Trends in concentration of dissolved manganese, 1975-88.

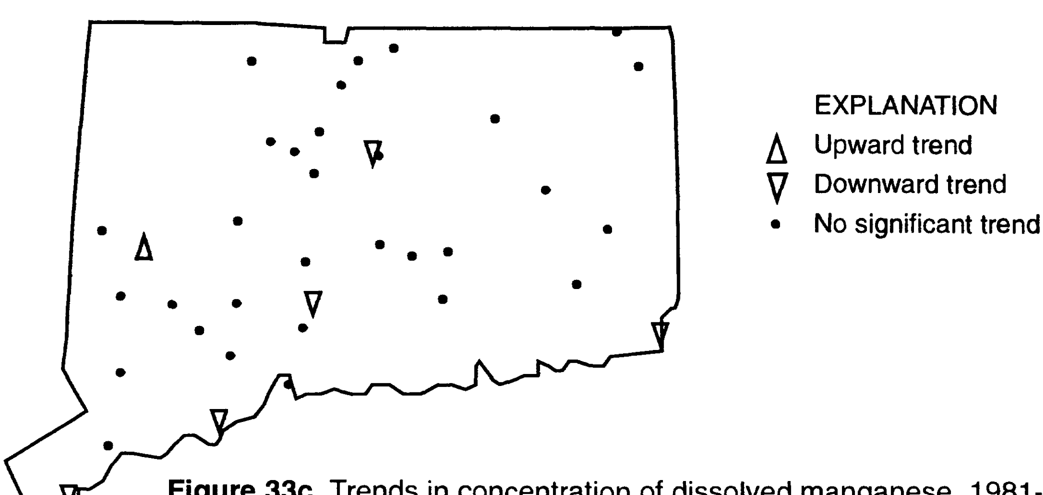


Figure 33c. Trends in concentration of dissolved manganese, 1981-88.

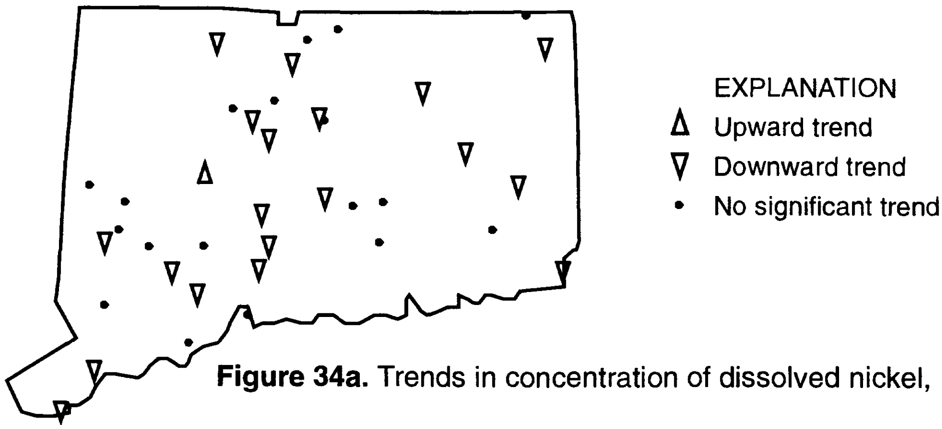


Figure 34a. Trends in concentration of dissolved nickel, 1981-88.

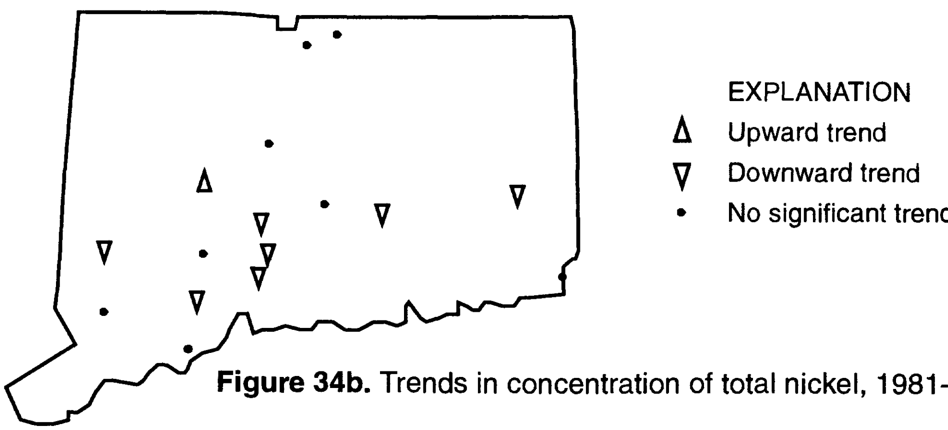


Figure 34b. Trends in concentration of total nickel, 1981-88.

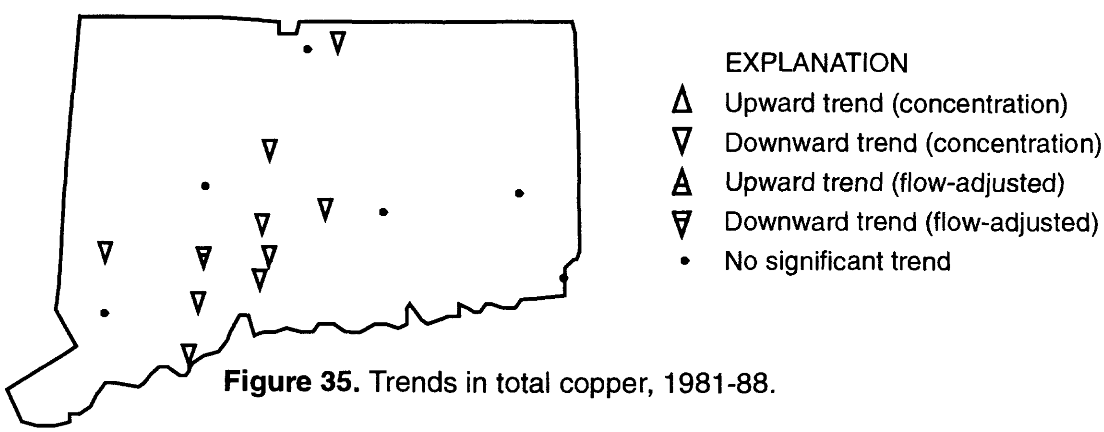


Figure 35. Trends in total copper, 1981-88.

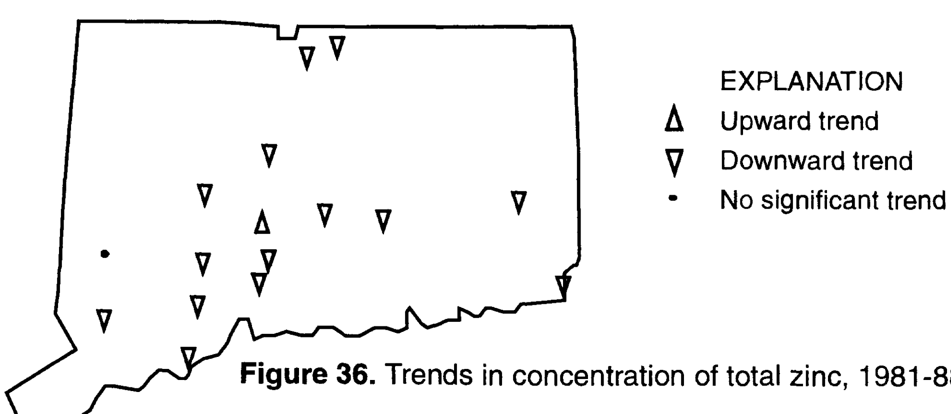


Figure 36. Trends in concentration of total zinc, 1981-88.

Bacteria

Fecal coliform and fecal streptococcal bacteria are found in the intestinal tracts of warm-blooded animals, including humans. Tests for both types of bacteria are used to assess the presence of fecal contamination in water. Bacterial contamination may be present in streams draining urban, suburban, or agricultural areas.

Concentrations of fecal coliform bacteria increased at two stations and decreased at eight stations during water years 1975-88 (fig. 37a). Most of the decreases were detected on the State's larger streams. Data for 17 stations showed no trend. Widespread decreases in fecal coliform bacteria were also reported by the Arkansas trend study during a similar time period (Petersen, 1992).

Concentrations of fecal streptococcal bacteria increased at six stations and decreased at three stations during water years 1977-88 (fig. 38a). Data for 25 stations showed no trend. Increases in both fecal coliform and fecal streptococcal bacteria were detected on the Saugatuck River (location 37, fig. 4), which drains a suburban and relatively undeveloped area with no point sources.

Concentrations of fecal coliform bacteria decreased at 17 stations during 1981-88, and data for 21 stations showed no trend (fig. 37b). Concentrations of fecal streptococcal bacteria decreased at 28 stations, and data for 10 stations showed no trend (fig. 38b). No increasing concentrations of either type of bacteria were detected. Concentrations of fecal coliform and fecal streptococcal bacteria decreased at stations in all major drainage basins of the State. Decreases in fecal coliform bacteria were most common in the Connecticut, Farmington, and Quinnipiac River Basins.

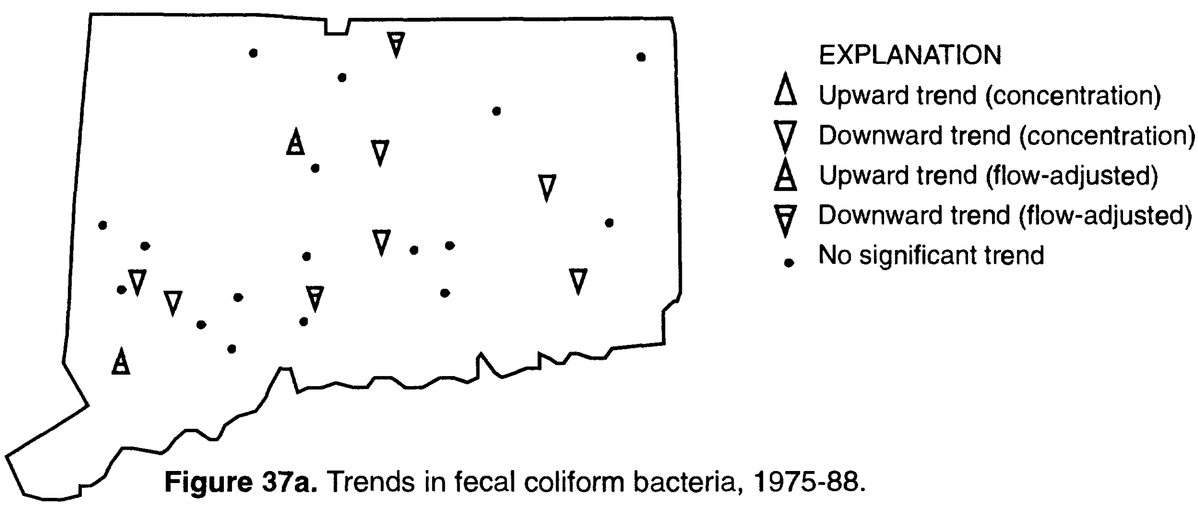


Figure 37a. Trends in fecal coliform bacteria, 1975-88.

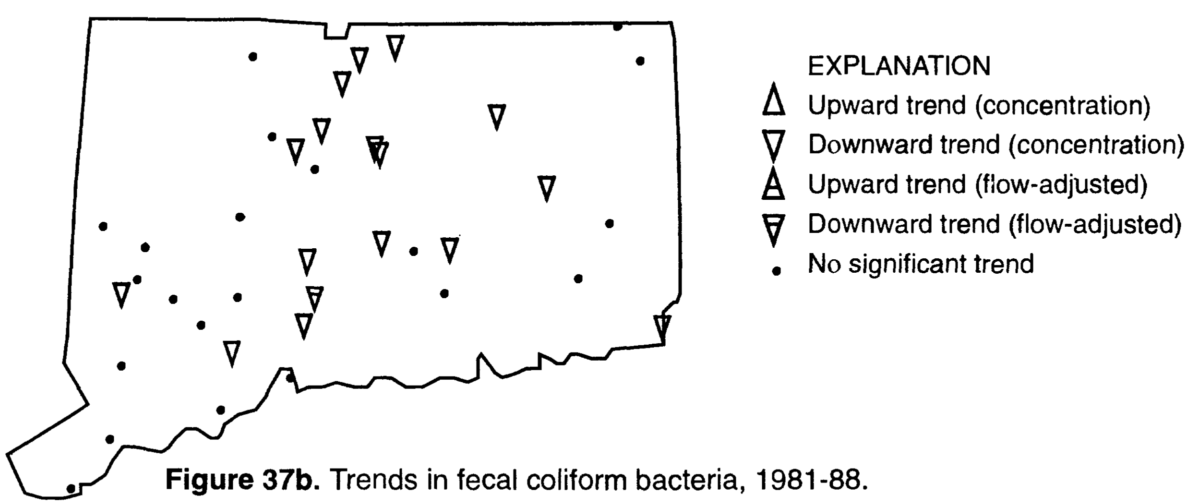


Figure 37b. Trends in fecal coliform bacteria, 1981-88.

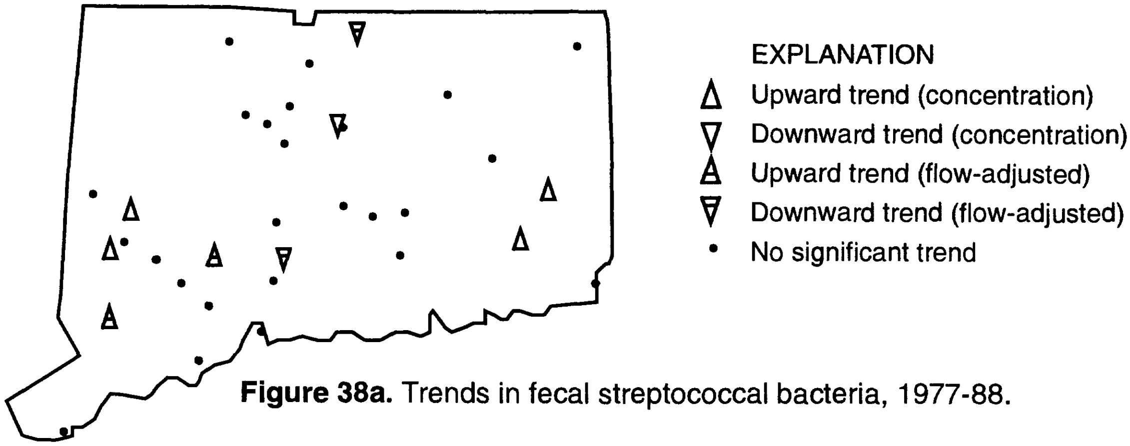


Figure 38a. Trends in fecal streptococcal bacteria, 1977-88.

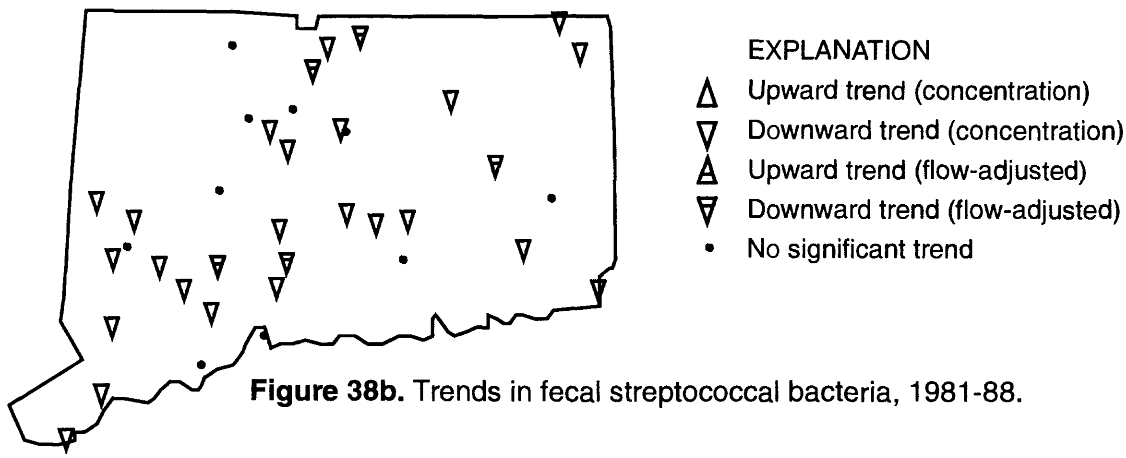


Figure 38b. Trends in fecal streptococcal bacteria, 1981-88.

Suspended Sediment

Suspended sediment in freshwater streams is derived from natural rock weathering and soil erosion processes, from floods, and from land disturbed by human activities such as construction, agriculture, logging, and mining. Suspended sediment can harm aquatic organisms, fill reservoirs, and impair the quality of water for various uses. Suspended sediment concentrations are typically low in Connecticut under natural conditions because the heavily vegetated land cover limits soil erosion.

Only two stations, the Connecticut River at Thompsonville and the Housatonic River at Stevenson, had sufficient data for trend analysis for the complete period of water years 1975-88. Neither station had a trend in suspended sediment concentration. For water years 1978-88, five stations including these stations and the Pawcatuck River, the Shetucket River, and the Quinebaug River at Jewett City, had sufficient data for trend analysis. All five stations, which monitor major river basins, were part of the NASQAN program during the trend study. One station, the Quinebaug River at Jewett City, had an upward trend in suspended sediment concentration (fig. 39). Data from the other four stations showed no trend. None of the five stations had a trend in suspended sediment concentration during 1981-88.

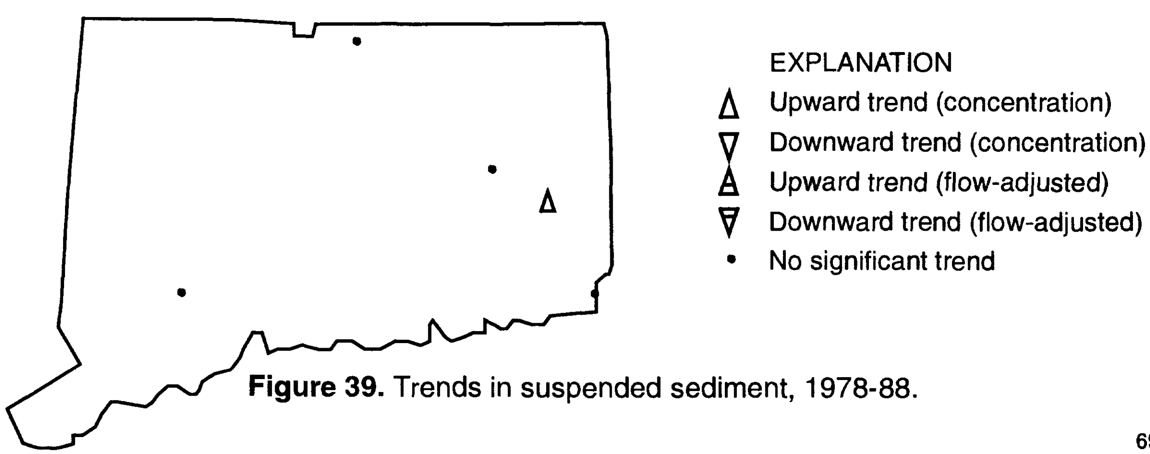


Figure 39. Trends in suspended sediment, 1978-88.

FACTORS THAT AFFECT TRENDS IN SURFACE-WATER QUALITY

Changes in sampling or analytical methods, trends in stream discharge, and human uses of land and water resources have affected the detected trends in surface-water quality in Connecticut. The relative magnitude of the effects of these factors is not known in most cases. Determining the importance of these factors for specific drainage basins and constituents is an area for further investigation.

Changes in Sampling or Analytical Methods

The period of record for the Connecticut trend study encompasses a period of improvement and increasing sophistication in sampling and analytical methods. The understanding of how choice of sampling location, equipment, and methods affect water-quality data has increased markedly during the period of record. Although the need for documenting any changes in these factors is clearly understood now, the importance of such changes was not always apparent in the earlier years of water-quality data collection. The possibility of the effects of such changes needs to be taken into account in evaluating the results of trend analysis. It is not always possible to document the nature, extent, and location of changes in sampling or methods. However, the period of the trend study does not include changes within the USGS to more rigorous water-quality sampling methods in the early 1990's, and records for most constituents and locations are considered to be reasonably consistent.

Plots of constituent concentration as a function of time sometimes show abrupt increases or decreases in concentration or data variability that may indicate changes in sampling techniques or analytical methods. Three constituents and properties in the Connecticut trend study that exhibit this pattern are dissolved oxygen, which increased about 1974, total organic carbon, which decreased around 1981-82, and turbidity, which decreased in the mid-1980's. Decreases in variance at some stations following these dates may be caused by a change in method. Also, the pattern is similar in both urbanized basins with major point discharges and relatively undeveloped basins with few or no point discharges (fig. 40). However, all of these trends are also consistent with improvements in wastewater treatment during the period of record, and these improvements may be largely responsible for the detected trends in basins that receive major point discharges. The noted decreases in variance could be consistent with improved wastewater treatment as well as with improved sampling or analytical methodology. In the case of dissolved oxygen, field equipment records indicate that a new model of instrument was acquired at about the time of the concentration increase, but that the method and general type of instrument remained the same (Jonathan Morrison, U.S. Geological Survey, oral commun., 1995).

The possible effects of laboratory measurement bias on trends in several major ions and nutrients have been evaluated for a national set of stream-quality data (Alexander and others, 1993). Decreases in total phosphorus and increases in calcium and magnesium detected in the Connecticut study may be related, in part, to trends in measurement bias. The extent of this effect is uncertain.

Historical changes in the processes of sampling and analysis may also have affected the detected concentrations of trace metals in Connecticut. Trace elements, by definition, are present naturally in very low concentrations. Consequently, concentrations of trace constituents may be quite sensitive to changes in sampling equipment and methods and to changes in analytical techniques. Evaluation of trace metal sampling procedures in the late 1980's has indicated that contamination of a water sample by additional trace metals can occur at several points during sampling and processing, thus leading to overestimates of environmental concentrations of dissolved trace metals. Different filtration techniques and materials can also affect reported dissolved trace metal concentrations (Horowitz and others, 1992). Where the dissolved concentration constitutes a large proportion of the total constituent concentration, contamination that affects the dissolved concentration can also have a substantial effect on the total concentration. For these reasons, trend analysis on dissolved and total trace metals has been limited to those constituents where contamination problems are believed to be minor relative to the actual environmental concentrations.

Trend results for total copper, dissolved nickel, total nickel, and total zinc are reported here with the cautionary note that trends at some stations may not represent environmental changes. In some of the less developed basins, such as the Pawcatuck, Salmon, and Saugatuck River basins, trace metal concentrations are very low, and decreasing concentrations of trace metals may result from changes in sampling techniques that reduce the potential for sample contamination during collection and processing. By contrast, contamination artifacts may be negligible relative to environmental concentrations of trace metals in samples from streams draining Connecticut's more heavily urbanized and industrialized areas.

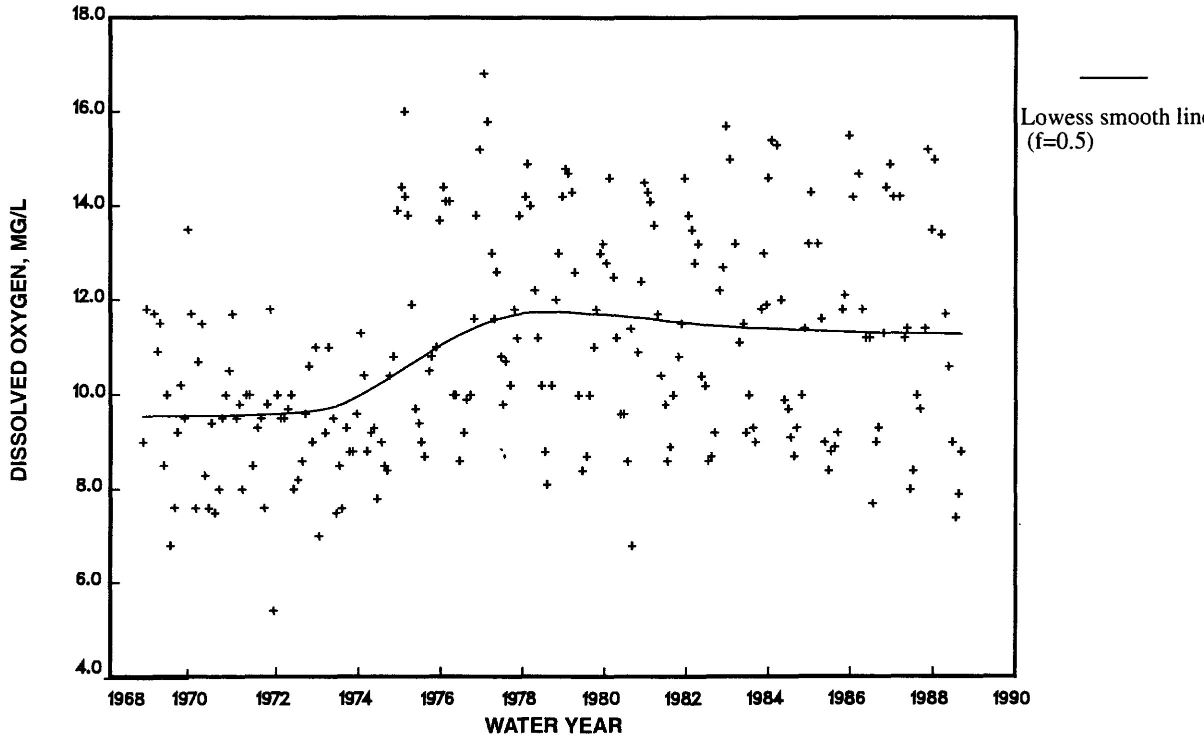


Figure 40a. Relation between dissolved oxygen concentration and time, Salmon River near East Hampton, 1969-88.

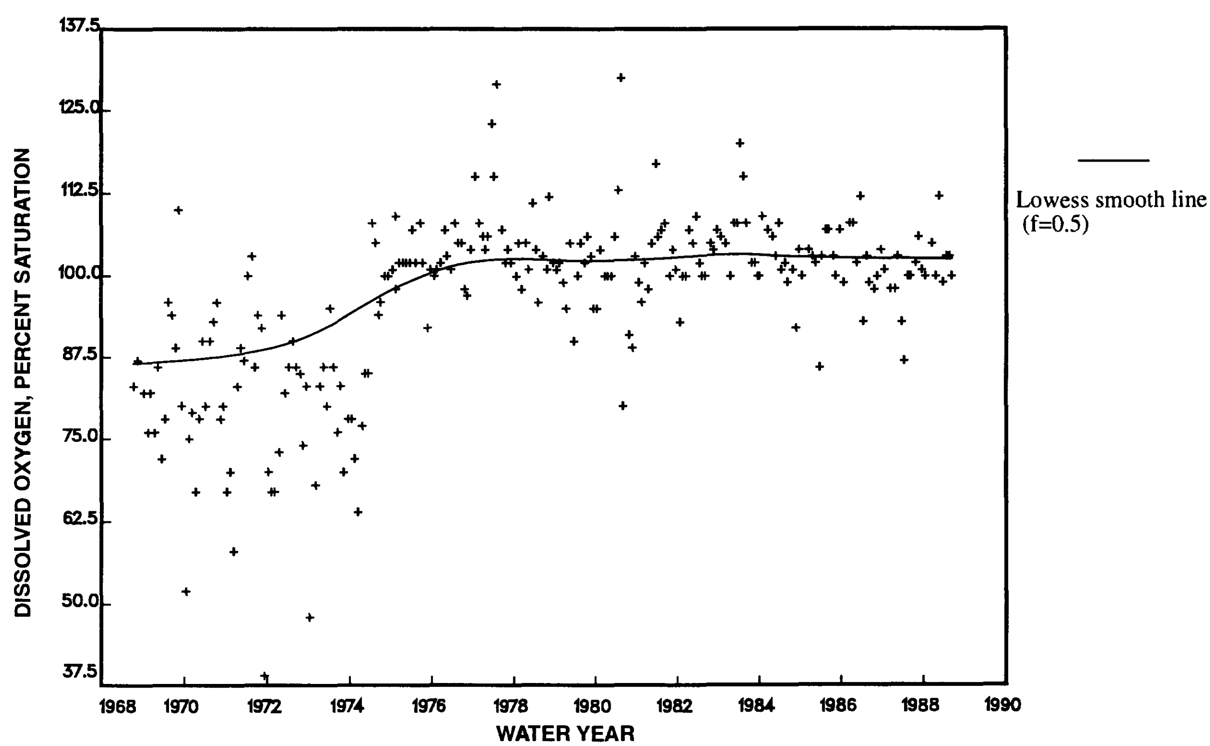


Figure 40b. Relation between dissolved oxygen (percent saturation) and time, Salmon River near East Hampton, 1969-88.

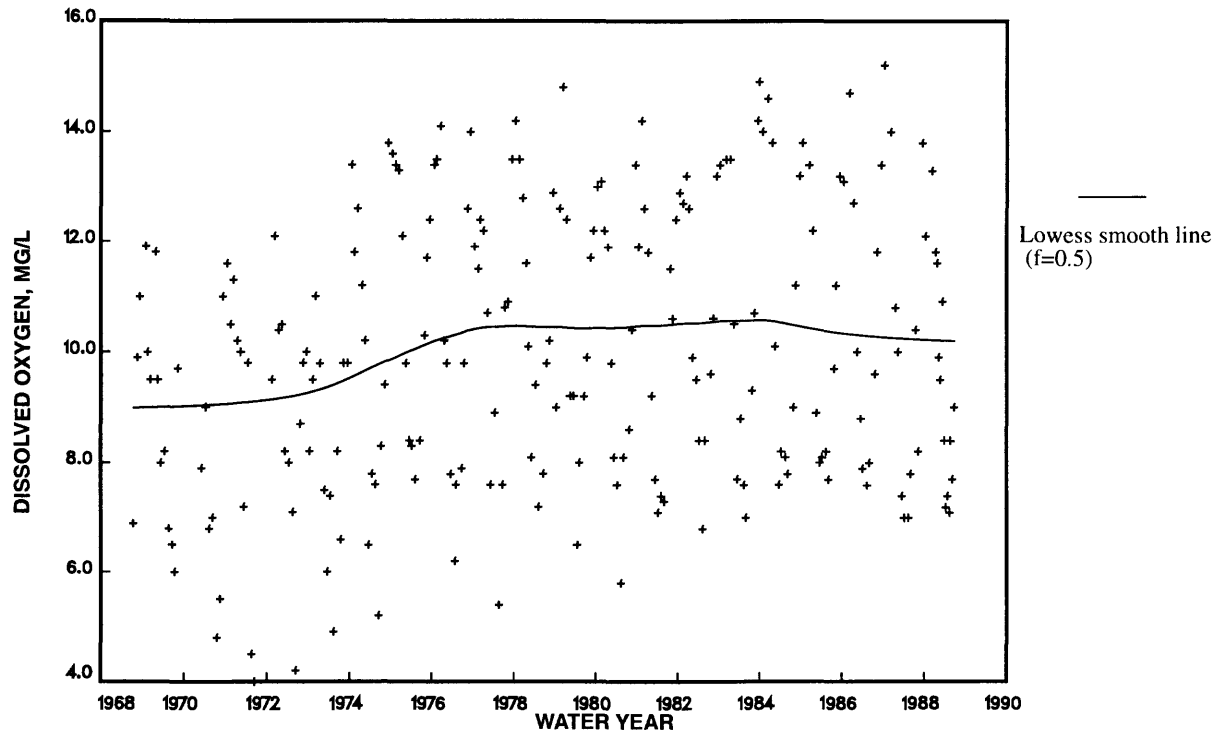


Figure 40c. Relation between dissolved oxygen concentration and time, Connecticut River at Thompsonville, 1969-88.

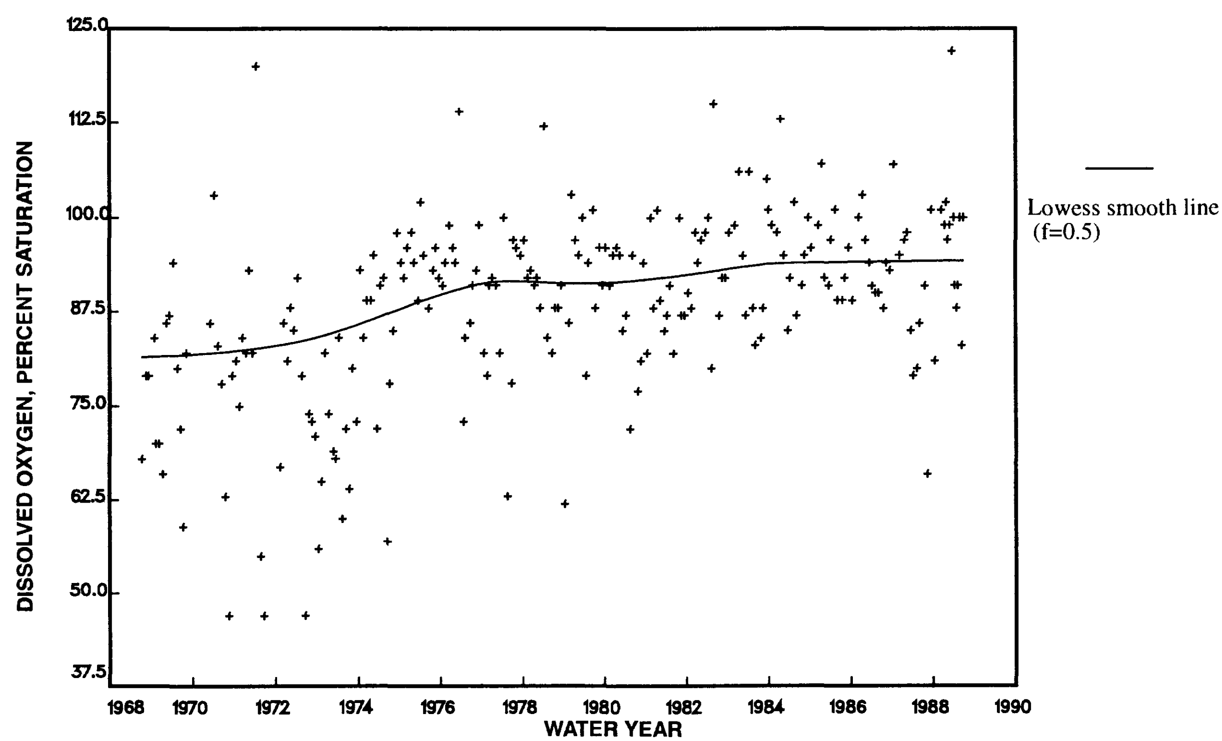


Figure 40d. Relation between dissolved oxygen (percent saturation) and time, Connecticut River at Thompsonville, 1969-88.

Trends in Stream Discharge

During 1975-88, 12 of 20 stations with discharge data had downward trends in streamflow (fig. 10b, table 7). Although trend results are flow-adjusted where possible, the presence of trends in streamflow complicates the interpretation of trends in constituent concentrations. Increases in specific conductance and in concentrations of calcium, magnesium, chloride, sulfate, and dissolved solids were all common during this period. The concentrations of these constituents tend to be high at low flows, and thus the overall trend results are consistent with the effects of a downward trend in streamflow. Likewise, downward trends in turbidity were numerous during this time period. Turbidity tends to be low at low flows, and this trend result is also consistent with a downward trend in streamflow.

The trends detected in these constituents are probably not solely caused by downward trends in streamflow, although that may be an important factor at some stations. Flow-adjusted trend results were compiled for selected constituents for the eight stations that did not have a trend in streamflow during 1975-88 (table 11). Specific conductance and concentrations of dissolved calcium and magnesium increased at six of the eight stations; concentrations of dissolved chloride increased at seven of the eight stations; and concentrations of dissolved solids increased at five of the eight stations. Turbidity decreased at four of the eight stations. The frequency and direction of constituent trends at stations with no trend in streamflow support the conclusion that these trends are caused by environmental effects other than decreasing streamflow. The geographic distribution of the eight stations indicates that these effects are generally statewide in their scope. Factors that may have caused these trends are discussed in the section entitled "Human Use of Land and Water Resources."

The detection of trends in streamflow and the recognition of strong relations between concentration and discharge for certain constituents are important factors in evaluating changing environmental conditions and planning for future water-quality management. Increasing or decreasing constituent concentrations may have significance for aquatic life, human health, or various water uses, whether these changes are driven by climatic variability or by changes in the sources contributing these constituents to streams.

Table 11. Summary of flow-adjusted trends in selected constituents for stations with no trend in instantaneous discharge, 1975-88

[+, upward trend; -, downward trend; •, no trend; x, constituent not correlated with flow; ND, no data for station]

Map location number	Station identification	Constituent or property						
		Specific conductance	Turbidity	Calcium	Magnesium	Chloride	Sulfate	Dissolved solids
3	01122610	•	x	+	+	+	+	•
5	01125151	+	x	+	+	+	•	+
6	01127000	•	-	•	+	•	•	•
8	01184000	+	-	+	•	+	•	•
11	01188000	+	•	•	•	+	ND	+
14	01189120	+	x	+	+	+	ND	+
22	01196222	+	-	+	+	+	•	+
32	01205500	+	-	+	+	+	+	+

Human Use of Land and Water Resources

Most human uses of land and water resources result in some effects on stream quality, whether these effects are obvious, such as the effluent from wastewater-treatment plants, or less apparent, such as leachate from septic systems that affects the quality of ground water discharging to streams. Factors that may affect current conditions and trends in stream quality in Connecticut include changes in the quality or quantity of municipal and industrial wastewater discharges; increased urbanization, including increased wastewater effluents in urban areas and increased nonpoint runoff in urban, suburban, and developing rural areas; changes in agricultural practices; and atmospheric deposition of contaminants. A full examination of these effects is beyond the scope of this report; however, some of the important trend results and their possible causes are discussed (table 12). Multiple factors are probably responsible for constituent trends that occur statewide in both urbanized and less developed basins.

The following discussion emphasizes the number of stations with trends in different constituents, but in some cases the magnitudes of the trends are also discussed. Ranking of the magnitude of a trend was usually based on the percentage change (of mean concentration) per year at each station, rather than the concentration change, in order to minimize differences between stations that have large concentration differences. Often the streams draining urbanized areas have large concentration changes per year that may represent very small percentage changes in constituent concentrations, whereas streams draining undeveloped areas may have very small changes in concentration that represent large percentage changes.

Changes in Wastewater Discharges

Changes in wastewater discharges may result in either improvement or deterioration in stream quality. Removal or reduction of certain constituents in waste sources, improvements in wastewater treatment, or reduction of total effluent loads discharged to streams are likely to result in water quality improvements. Increases in wastewater discharges are likely to cause deterioration in stream quality; such increases are discussed in the section entitled "Increased Urbanization."

The water quality of many streams in Connecticut has improved substantially since the passage of the State's Clean Water Act in 1967 and the Federal Water Pollution Control Act Amendments of 1972 (Connecticut Department of Environmental Protection, 1990, p. 5). Nitrogen constituents, phosphorus, organic carbon, and bacteria are all common components of wastewater. Achievements in the removal of suspended material under the State's water-quality management program, particularly along the major rivers of the State, are generally compatible with downward trends in total phosphorus, total organic carbon, turbidity, fecal coliform bacteria, and fecal streptococcal bacteria during 1975-88 or 1981-88 (table 12). The largest percentage decreases for fecal coliform bacteria during 1975-88 were on the Connecticut River at Thompsonville (location 8, fig. 4) and the Hockanum River (location 17, fig. 4), both in the urbanized central lowland of Connecticut. The largest percentage decreases for fecal streptococcal bacteria during 1977-88 were at stations on the Connecticut River at Thompsonville and Hartford (locations 8 and 16, fig. 4). Many of the largest percentage decreases in turbidity during 1978-88 were detected at stations on the Connecticut and Naugatuck Rivers. These rivers receive major point discharges, have been the focus of wastewater treatment improvements, and have had substantial room for improvement. In the case of total phosphorus, a decline in the manufacture and use of detergents containing phosphorus may also have contributed to reduced concentrations of phosphorus in wastewater discharges. Detected decreases in suspended materials in streams affected by point discharges are consistent with the improved health of aquatic communities reported by the State (Connecticut Department of Environmental Protection, 1992).

Some of the decreases in total phosphorus, total organic carbon, turbidity, and bacteria took place on streams draining basins without major point discharges, and additional causes for trends in less developed basins need to be identified. Also, several increases in organic carbon were detected during 1981-88, primarily on larger streams that receive point discharges. These increases point out the variability of water quality over time, and the complexity of factors affecting trends.

Table 12. Summary of the most prevalent trends in water quality in Connecticut, water years 1975-88 and 1981-88

Property or constituent	Direction	Areas	Possible environmental causes
		1975-88	
Specific conductance	Upward	Central lowland, western uplands	Point discharges, nonpoint runoff
Calcium	Upward	Southwestern, scattered statewide	Effects of urbanization
Magnesium	Upward	Statewide	Effects of urbanization
Chloride	Upward	Statewide	Point discharges, road salt in nonpoint runoff
Sulfate	Upward	Eastern and western uplands	Point discharges, atmospheric deposition
Total solids	Upward	Scattered statewide	Effects of urbanization
Dissolved solids	Upward	Primarily central lowland, western uplands	Effects of urbanization
Turbidity	Downward	Statewide	Wastewater treatment improvements
Total phosphorus	Downward	Statewide (except Farmington River Basin)	Wastewater treatment improvements, decline in agricultural land use, decline in use of detergents containing phosphorus
Total organic carbon	Downward	Statewide	Wastewater treatment improvements
Fecal coliform bacteria	Downward	Scattered statewide	Wastewater treatment improvements, improved agricultural management practices
Dissolved oxygen	Upward	Scattered statewide	Wastewater treatment improvements
pH	Upward	Statewide	Wastewater treatment improvements
Total nitrogen	Upward	Statewide	Point discharges, nonpoint runoff, atmospheric deposition
Total organic nitrogen	Upward	Statewide	Point discharges, nonpoint runoff
Total nitrite-plus-nitrate	Upward	Central lowland, scattered statewide	Point discharges, nonpoint runoff, atmospheric deposition
Dissolved iron	Downward	Western uplands, Central lowland, Connecticut River Basin (except Farmington River)	Declining metals industries, wastewater treatment improvements
Dissolved manganese	Downward	Scattered statewide	Declining metals industries, wastewater treatment improvements

Table 12. Summary of the most prevalent trends in water quality in Connecticut, water years 1975-88 and 1981-88--Continued

Property or constituent	Direction	Areas	Possible environmental causes
		1981-88	
Specific conductance	Upward	Statewide	Point discharges, nonpoint runoff
Magnesium	Upward	Scattered statewide (except Connecticut River)	Effects of urbanization
Chloride	Upward	Statewide	Point discharges, road salt in nonpoint runoff
Turbidity	Downward	Connecticut River Basin (except Farmington River), southwestern areas	Wastewater treatment improvements
Total phosphorus	Downward	Statewide	Wastewater treatment improvements, decline in agricultural land use, decline in use of detergents containing phosphorus
Fecal coliform bacteria	Downward	Central lowland, scattered statewide	Wastewater treatment improvements, improved agricultural management practices
Fecal streptococcal bacteria	Downward	Statewide	Wastewater treatment improvements, improved agricultural management practices
Dissolved oxygen (percent saturation)	Upward	Central lowland, Quinebaug River basin	Wastewater treatment improvements
pH	Upward	Statewide	Wastewater treatment improvements
Total ammonia nitrogen	Downward	Southwestern areas, scattered statewide	Wastewater treatment improvements
Dissolved iron	Downward	Scattered statewide	Declining metals industries, wastewater treatment improvements
Dissolved and total nickel	Downward	Statewide	Declining metals industries, wastewater treatment improvements
Total copper	Downward	Central lowland, southwestern areas	Declining metals industries, wastewater treatment improvements
Total zinc	Downward	Statewide	Declining metals industries, wastewater treatment improvements

Observed decreases in total ammonia and increases in total nitrite-plus-nitrate during 1981-88 are compatible with wastewater-treatment processes in which ammonia is converted to nitrite and eventually nitrate. Large percentage increases in the concentration of total nitrite-plus-nitrate and large decreases in total ammonia were detected at stations on the Quinnipiac River during water years 1981-88. These changes are consistent with reported improvements in municipal wastewater treatment in that drainage basin (Connecticut Department of Environmental Protection, 1988, p. 58).

Increases in pH have been detected statewide. In urbanized basins, these increases may be related to requirements for neutralization of wastewater from municipal and industrial sources. Neutralization of wastewater may have been a particularly important factor on streams such as the Naugatuck River that receive numerous industrial discharges (Connecticut Department of Environmental Management, 1988, p. 50). Increases in pH may also be related to improved wastewater treatment processes that convert ammonia to nitrate. As this conversion takes place, acidity actually increases and pH is lowered. However, the transfer of this conversion process from the stream environment to wastewater treatment plants may have caused increases in pH in some streams.

Increases in dissolved oxygen generally indicate improvement in water quality. Most of the increases during 1975-88 took place on streams draining urbanized areas with major wastewater discharges, although a few increases were in less developed areas. The increases in dissolved oxygen may indicate removal of oxygen-demanding materials from wastewater, but the causes may be more complex, as discussed in the section entitled "Dissolved Oxygen."

Interpretation of increases in the concentration of dissolved oxygen and dissolved oxygen as a percent of saturation illustrates the difficulty of distinguishing the effects of changes in sampling or analytical methods from the effects of environmental changes. The mid-1970's were a time of major improvements in wastewater-treatment plant design and operation, and increases in dissolved oxygen at some stations may be attributable, in large part, to these improvements. Detailed investigation of the sampling history and wastewater treatment history for individual drainage basins would be necessary to evaluate these results more fully. Possible effects of sampling changes on dissolved oxygen trends have been discussed in the section entitled "Changes in Sampling or Analytical Methods."

Decreases in the concentrations of dissolved and total trace metals indicate improvement in water quality. Industrial activity has declined in Connecticut during the 20th century and particularly since World War II (Lewis and Harmon, 1986, p. 125-133). Historically, industrial applications involving metals have been important in the Connecticut economy. Changes in the quantity of industrial waste discharges, as well as improved wastewater-treatment practices, may be factors that have contributed to the observed downward trends in trace metal concentrations. Particularly in heavily urbanized and industrialized basins, such as those of the Still (near Danbury), Naugatuck, and Quinnipiac Rivers, reported downward trends in trace metal concentrations are believed to indicate environmental changes brought about by a reduction in the total load of trace metals discharged to streams. Analyses of additional data on changing sources would be required to document this.

Sediments in streams continue to be a reservoir of trace metals derived from past industrial activity, despite improvements in industrial wastewater treatment. Analyses of bottom sediment data show that trace metals are present in the bed material of numerous Connecticut streams (Cervione and others, 1987, p. 226-229). Under changing hydrologic, physical, or chemical conditions, trace metals currently bound to sediments may dissolve and reenter the water, and bottom sediments bearing trace metals may be mobilized and transported as suspended sediment (Horowitz, 1991, p. 1).

Increased Urbanization

Increases in population and changes in the distribution of population during the period of the trend study have resulted in new and increased wastewater discharges in urbanized areas and increased nonpoint runoff in urban, suburban, and less developed areas. Increases in specific conductance and in the concentrations of several dissolved constituents (table 12) are consistent with the general effects of increased urbanization and land development. These increases are found statewide, including rural as well as urban and suburban areas. The largest percentage increases in specific conductance and dissolved chloride during 1981-88 were detected at stations on the Quinnipiac, Quinebaug, French, Connecticut, Naugatuck, and Saugatuck Rivers. With the exception of the Saugatuck, all these streams receive major point discharges.

Natural sources of chloride in freshwater streams of Connecticut are limited, and upward trends in chloride are believed to be caused by a variety of human activities and land uses, including wastewater discharges and nonpoint runoff that contains road deicing salts. The effect of wastewater on chloride concentrations may predominate during the low streamflow period of summer and early fall, whereas the effect of runoff containing road salt may predominate during winter and early spring. The predominant sources of chloride are likely to differ in urban and rural areas. Analysis of additional data on wastewater effluent, road salt use, and other factors would be necessary to evaluate the possible causes of trends in chloride statewide and at specific water-quality stations.

Increasing concentrations of nitrogen constituents represent both suspended and dissolved material. Statewide increases in nitrogen constituents during 1975-88 (table 12) may have been caused by point sources in urban areas and nonpoint sources in rural areas. The five largest percentage increases in total nitrogen were found at stations on the Saugatuck River, the Salmon River, Burlington Brook, the Quinnipiac River, and the Willimantic River at Merrow. The Quinnipiac River basin is urbanized; the other four streams have small, sparsely developed drainage basins with few or no point discharges. Trends at these four stations may indicate the increasing importance of nonpoint source contaminants in small, sparsely developed drainage basins. Significantly, the first three stations have historically been considered to represent water-quality conditions in relatively undeveloped areas of Connecticut. Although these three basins are still sparsely developed, population has increased during the period of the trend study.

Substantially more stations had increasing concentrations of nitrogen constituents during the 1975-88 period than during the 1981-88 period. At some stations, the major concentration increases took place earlier within the 1975-88 period, with concentrations becoming more stable during the latter part of the period. At other stations, there appears to have been a steady but subtle increase which was only detected during the longer period of record.

Increases in dissolved oxygen, although generally indicative of improving water quality, could be related to increasing concentrations of nitrogen constituents at some locations. Additional analyses would be necessary to determine whether the increases at any stations are related to daytime photosynthesis supported by high nutrient concentrations from wastewater discharges or nonpoint sources.

The only downward trends in dissolved oxygen, or dissolved oxygen as a percent of saturation, were detected at the Still River at Brookfield Center and the Quinebaug River at Jewett City during 1975-88, and at Stamford Harbor and the Naugatuck River near Waterville during 1981-88 (locations 28, 6, 39, and 33, fig. 4). The Naugatuck River, the Still River, and Stamford Harbor drain major urban areas. Improvements in wastewater treatment have been made; additional major improvements have been planned. Trends for several constituents at stations on the Still and Naugatuck Rivers illustrate the continuing water-quality problems of medium-sized and small streams that are dominated by major point discharges.

Changes in Agricultural Practices

Nitrogen and phosphorus are major components of fertilizer. Decreases in the concentration of total phosphorus during 1975-88 and 1981-88 may be related to decreased agricultural activity in some parts of the State. Decreases in fecal coliform and fecal streptococcal bacteria may be related to decreased agricultural activity or to improved agricultural management practices in rural areas. However, increases in nitrogen constituents in rural areas during 1975-88 could also be derived in part from agricultural sources, so there is no clear picture of the relationship of trends to agricultural activity. Parcels of agricultural land are typically small in Connecticut, and most monitored drainage basins encompass a mixture of forested, agricultural, and urban land, thus making it difficult to distinguish the effects of agricultural land on water quality.

Atmospheric Deposition of Contaminants

Connecticut is in the path of major storm systems that transport atmospheric contaminants from the urbanized and industrialized northeastern United States. Statewide increases in specific conductance and several dissolved constituents, including sulfate, may be partly related to the effects of atmospheric deposition. These increases are found in rural as well as urban and suburban areas. Increases in total nitrite-plus-nitrate in less developed areas of the state during 1975-88 may be related to atmospheric deposition of nitrate.

Numerous upward trends in pH during 1975-88 and 1981-88 indicate less acidic conditions in Connecticut streams. This result is of interest, given the relatively acidic quality of precipitation in the northeastern United States. The pH of 110 precipitation samples, collected at 3 precipitation-monitoring stations in Connecticut from October 1981 to December 1983, ranged from 3.7 to 5.4, with a median of 4.4 (Kulp and Hunter, 1987, table 3, p. 12). Additional unpublished data from the files of the U.S. Geological Survey indicate a median pH of 4.2 for 463 precipitation samples collected at the same three monitoring stations from October 1981 through September 1988 (K.P. Kulp, U.S. Geological Survey, written commun., 1990). Although precipitation tends to be slightly acidic under natural conditions, the average pH of precipitation in the northeastern United States has been more acidic than the natural range during the 1970's and 1980's (Kulp and Hunter, 1987, p. 1-2). By comparison, values of most pH measurements for Connecticut streams fall within the range of 6.5 to 9.0, and values between 7 and 8 are common (Cervione and others, 1991; Healy and others, 1994, p. 219). Trend results for pH at most stations suggest that factors other than precipitation chemistry have had a substantial effect on the pH of many streams.

The only decreases in pH were detected for Burlington Brook during 1969-88 and the Salmon River during 1975-88 (locations 11 and 20, fig. 4). Both of these streams drain relatively undeveloped areas underlain by noncarbonate crystalline bedrock. Possibly these streams are more likely than other streams in the state to reflect the effects of acidic precipitation because of their geologic setting, the location of their drainage basins near urbanized areas of central Connecticut, and the absence of other major pollution sources in their drainage basins. The relation between trends in precipitation chemistry and trends in stream chemistry in Connecticut is a subject for further investigation.

SUMMARY AND CONCLUSIONS

Trends in water quality were analyzed for 39 monitoring stations in Connecticut, including 33 streams sites, 2 impoundments, and 4 harbor or estuary sites. The combined drainage area for the monitoring network encompasses most of Connecticut and large areas of north-central New England. Drainage areas for individual water-quality stations range in size from 4.10 mi^2 to 11,092 mi^2.

Three periods of record were examined for trends in water quality. The longest period, water years 1969-88, includes data for 11 properties and constituents at 8 stations. The major period of record, 1975-88, includes data for 23 properties and constituents at 35 stations. The period 1981-88 includes data for 29 properties and constituents at 38 stations. The number of constituents with sufficient data for trend analysis varies at individual stations.

The Seasonal Kendall test, with associated flow-adjustment procedures, was used to remove the effects of seasonal variability and streamflow variability from water-quality data, making possible the accurate detection of water-quality trends. A computer program, ESTREND, that incorporates these statistical procedures was used for detection of trends.

Major Trends in Properties and Constituents

Increases in specific conductance and in the concentrations of several dissolved constituents were numerous during 1975-88 and 1981-88. Numerous increases in concentration were detected for magnesium and chloride during all three time periods. Chloride was the constituent with the most numerous and geographically widespread increases in concentration. Upward trends in calcium were numerous during 1975-88 but not in the other two time periods. Trends in calcium and silica were generally less numerous than for other dissolved constituents. Few trends in the concentration of silica were detected in any of the three time periods.

Sulfate was the only major dissolved constituent to show a notable difference in trend direction during different time periods. Decreasing concentrations were detected at 7 stations during 1969-82, whereas increasing concentrations were detected at 10 stations during 1975-82.

Increasing concentrations of dissolved solids and total solids were common during 1975-88. Data for the majority of stations showed no trend in the concentration of either constituent during 1981-88. Increasing concentrations slightly outnumbered decreasing concentrations for both constituents during 1981-88. For both constituents, there were fewer increases and more decreases during 1981-88 than during 1975-88.

Concentrations of dissolved oxygen and dissolved oxygen as a percent of saturation increased at all eight stations with records during 1969-88. Numerous increases in dissolved oxygen and dissolved oxygen as a percent of saturation were detected during 1975-88. Increases were less common during 1981-88.

pH increased at many stations during all three time periods. Few decreases in pH were detected. Increases in pH were detected in all major drainage basins of the State.

Increasing concentrations of total nitrogen, total organic nitrogen, and total nitrite plus nitrate were detected in all major drainage basins of the State during 1975-88. Concentrations of total nitrogen and total organic nitrogen increased at a substantial majority of stations, and concentrations of total nitrite-plus-nitrate increased at about half of the stations.

Six nitrogen constituents were analyzed for trend during 1981-88. For total nitrogen, total organic nitrogen, and total nitrite-plus-nitrate, stations with increasing concentrations outnumbered stations with decreasing concentrations. However, the number of stations with increasing concentrations of nitrogen constituents was much smaller for 1981-88 than for 1975-88, and most stations had no trend. Decreasing concentrations of total ammonia nitrogen outnumbered increasing concentrations during 1981-88.

Turbidity and concentrations of total phosphorus and total organic carbon decreased at a substantial majority of stations during 1975-88. No increases in total phosphorus, total organic carbon, or turbidity were detected during 1975-88. Decreases in turbidity and total phosphorus also were common during 1981-88. By contrast, increasing concentrations of total organic carbon were detected at a few stations during 1981-88, and only one decrease was detected.

Decreasing concentrations of dissolved iron and dissolved manganese were common during 1975-88. Additional trace metals analyzed for trend during 1981-88 include total iron, total copper, dissolved nickel, total nickel, and total zinc. Concentrations of most trace metals decreased at a substantial number of stations during 1981-88. Few increases in trace metal concentrations were detected. The geographic distribution of trends for several trace metals is uncertain because of the absence of stations with sufficient data for trend analysis in the northeastern and northwestern corners of the State.

Decreases in the concentration of fecal coliform bacteria were common during 1975-88 and 1981-88. Trends in fecal streptococcal bacteria were detected at about a quarter of all stations during 1977-88; increases outnumbered decreases during that period. Decreasing concentrations of fecal streptococcal bacteria were detected at a majority of stations during 1981-88.

Trends as Indicators of Water-Quality Conditions in Connecticut

Several trends detected during the study period indicate improvement in the physical, chemical, and bacteriological quality of surface water in Connecticut, particularly on major rivers that receive substantial point discharges. Widespread trends indicating improvement in water quality include decreases in the concentrations of total phosphorus and total organic carbon and decreases in turbidity. These changes indicate a reduction of suspended material, and possibly dissolved material as well, in surface water. Increases in the concentration of dissolved oxygen, and in dissolved oxygen as a percent of saturation, also indicate improvement in water quality. Fewer stations showed increases in dissolved oxygen in

1981-88 than in 1975-88, a possible indication that the major improvements had been achieved in the earlier part of the period of record. Detected decreases in total organic carbon and turbidity and increases in dissolved oxygen may have been caused, in part, by changes in sampling or analytical methods. Nevertheless, several lines of evidence, from trends in other constituents, from time periods that are unaffected by method changes, and from State reports of healthier aquatic communities, support the conclusion that notable decreases in suspended material and increases in dissolved oxygen have taken place during the period of the trend study in streams that receive point discharges.

Decreases in the concentrations of several trace metals indicate improvement in water quality. Trends in trace metals at stations draining urbanized basins are considered to be reasonably representative of environmental conditions, whereas trends at stations draining less developed areas are more likely to have been affected by method changes. Although decreasing concentrations of trace metals indicate improvement in water quality, sediments in some streams affected by past industrial activity continue to be a source of trace metals that could adversely affect surface-water quality in the future.

Trends in bacterial concentrations show some improvement in water quality, with numerous decreases during 1981-88. The largest percentage decreases for both fecal coliform and fecal streptococcal bacteria were detected on the Connecticut River during 1975-88 and 1977-88, respectively. For 1981-88, many of the largest percentage decreases for both types of bacteria were detected at stations on the Quinnipiac, Connecticut, Shetucket, Housatonic, and Naugatuck Rivers.

Numerous statewide increases in pH are of interest in light of the lower-than-normal pH values reported for precipitation in the northeastern United States during the 1970's and 1980's. Increases in pH in urbanized areas may be related to decreasing concentrations of ammonia and to requirements for neutralization of municipal and industrial wastewater. Decreases in pH were detected in two streams draining relatively undeveloped areas. The relation between trends in precipitation chemistry and trends in stream chemistry in Connecticut has not been investigated.

Increases both in pH and in dissolved oxygen as a percent of saturation were detected at several stations during 1975-88. Both constituents are affected by photosynthetic activity in streams, and additional investigation could assess possible interrelations among nutrient availability, photosynthesis, dissolved oxygen concentrations, and pH in Connecticut streams. In streams with high nutrient concentrations, dissolved oxygen concentrations and pH may fluctuate widely during a 24-hour period. Consequently, upward trends in dissolved oxygen and pH, based on daytime sampling, may not represent the full range of water-quality conditions in some streams.

Numerous increases in specific conductance and in the concentrations of calcium, magnesium, chloride, sulfate, dissolved solids, and total solids during 1975-88 indicate a slight but geographically widespread deterioration in surface water quality. These increases may indicate subtle changes in water quality caused by a variety of point and nonpoint sources.

Trends in nitrogen constituents indicate both deterioration and improvement in water quality. Increasing concentrations of total nitrogen, total organic nitrogen, and total nitrite-plus-nitrate during 1975-88 indicate deterioration in water quality, probably caused by both point and nonpoint sources. The persistence of upward trends at a few locations during 1981-88 indicates continued deterioration. Decreases in total ammonia during 1981-88 were paired with increases in total nitrite-plus-nitrate at some locations. Decreasing concentrations of ammonia, which is harmful to aquatic life, appear to reflect improvements in wastewater treatment in which ammonia is converted to nitrate. Thus, increases in total nitrite-plus-nitrate probably represent overall improvements in water quality at some urban locations.

Additional information on water-quality conditions may be obtained from examining the magnitude and environmental setting of the detected trends. Many of the largest percentage decreases in turbidity and in the concentrations of total phosphorus and fecal coliform bacteria were detected at stations on the larger rivers of the State, including the Connecticut, Housatonic, Shetucket, and Naugatuck. Many of the largest percentage increases in dissolved oxygen were detected on the Quinnipiac, Pequabuck, and Connecticut Rivers. These results suggest that improvements have taken place where major water-quality problems have been addressed, where conditions were historically poor, or where the dilution effects of large discharges may be important.

Continuing adverse changes were detected in streams that receive major wastewater discharges, particularly in medium-sized and smaller drainage basins. The largest percentage increases in specific conductance and dissolved chloride were found primarily in drainage basins of various sizes that receive major point discharges. Decreases in dissolved oxygen at stations on the Still (near Danbury) and Naugatuck Rivers, and large percentage increases in total nitrite-plus-nitrate on the Quinnipiac, French, Naugatuck, and Still Rivers, illustrate the continuing water-quality problems of streams that are dominated by major point discharges.

Four of the five largest percentage increases in total nitrogen during 1975-88 were detected in streams draining rural or relatively undeveloped areas. These results indicate the vulnerability of small streams to the increasing effects of nonpoint sources of contamination in suburban and rural areas.

For constituents with trends at many stations, most trends were typically in the same direction, were found throughout large parts of the State, and were not confined to particular drainage basins. Although constituent trends in some drainage basins may have been affected in part by trends in stream discharge, similar constituent trends in basins with no trend in discharge suggest that other widespread environmental factors are causing the most prevalent trends in Connecticut stream quality.

Trend analysis of 20 years of water-quality data in Connecticut represents a general look at a large resource of information. Factors causing the detected trends in particular drainage basins and at specific stations are subjects for further investigation. Specific constituents and drainage basins may be investigated to resolve questions related to the possible effects of changes in sampling or analytical methods. Further investigation also is needed to distinguish the effects of climatic factors from the effects of human use of land and water resources. Trend direction and magnitude may be related in a quantitative way to land use changes and wastewater treatment history. Concentration and trend relations among constituents at particular locations may yield insights of local or more general significance. Finally, analysis of the magnitude of the trends relative to water-quality standards and goals is necessary to determine which trends indicate a substantial change in water quality.

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APPENDIX 1

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Appendix 1. Statistical summary and trend results of selected water-quality data for the 1969-88 water years

[N, number of samples; P, P-value (or attained significance level);e, parameter is estimated for censored constituents with a log-probability regression procedure; --, insufficient data to calculate value; *****, value exceeds print field;
US/CM, microsiemens per centimeter; MG/L, milligrams per liter; %SAT, percent saturation; UG/L, micrograms per liter.
TREND CODES: blank, best trend is trend in unadjusted concentrations; F, best trend is trend in flow-adjusted concentrations;
**, best trend is trend in unadjusted concentrations because the flow-adjustment was unsuccessful.]

STATION NUMBER: 01127000 STATION NAME: QUINEBAUG RIVER AT JEWETT CITY, CT
LATITUDE: 413552 LONGITUDE: 715905 DRAINAGE AREA: 713.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	239	109.13	90	104	125	233	-0.58	-0.53	0.001	F
OXYGEN, DISS (MG/L)	236	10.70	8.9	10.3	12.4	230	0.11	1.03	0.000	F
OXYGEN, DISS (% SAT)	235	97.34	90	99	104	229	0.86	0.88	0.000	F
PH (STANDARD UNITS)	240	7.16	6.7	7.0	7.3	234	0.00	-0.06	0.550	F
CALCIUM, DISS (MG/L)	177	6.78	5.8	6.4	7.7	177	0.00	0.03	0.801	F
MAGNESIUM, DISS(MG/L)	175	1.52	1.3	1.5	1.7	175	0.01	0.72	0.000	F
CHLORIDE, DISS (MG/L)	232	12.92	11	12	14	232	-0.03	-0.24	0.160	F
SULFATE, DISS (MG/L)	157	11.78	10	12	13	157	-0.12	-1.02	0.000	F
IRON, DISS (UG/L)	98	229.29	150	210	270	0	--	--	--	
MANGANESE, DISS(UG/L)	100	e 37.53	20	30	40	100	-0.82	-2.18	0.002	

Appendix 1. Statistical summary and trend results of selected water-quality data for the 1969-88 water years

STATION NUMBER: 01184000 STATION NAME: CONNECTICUT RIVER AT THOMPSONVILLE, CT
LATITUDE: 415914 LONGITUDE: 723621 DRAINAGE AREA: 9,660.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	232	115.84	98	115	132	223	-0.27	-0.24	0.171	F
OXYGEN, DISS (MG/L)	231	9.97	8.0	9.8	12.1	223	0.08	0.85	0.000	F
OXYGEN, DISS (% SAT)	231	88.37	82	91	96	223	0.92	1.04	0.000	F
PH (STANDARD UNITS)	231	7.00	6.8	7.0	7.2	223	0.01	0.14	0.008	
CALCIUM, DISS (MG/L)	208	11.03	9.5	11	13	204	0.01	0.11	0.577	F
MAGNESIUM, DISS(MG/L)	207	1.69	1.5	1.7	1.9	203	0.00	0.07	0.551	F
CHLORIDE, DISS (MG/L)	227	10.25	8.3	10	12	220	0.04	0.35	0.043	F
SULFATE, DISS (MG/L)	161	11.43	10	11	13	154	-0.19	-1.65	0.000	F
SILICA, DISS (MG/L)	167	5.02	4.4	5.1	6.0	74	0.02	0.32	0.175	F
IRON, DISS (UG/L)	128	136.65	80	130	170	77	-7.12	-5.21	0.000	
MANGANESE, DISS(UG/L)	129	e 35.27	19	30	50	129	-1.00	-2.83	0.002	

Appendix 1. Statistical summary and trend results of selected water-quality data for the 1969-88 water years

STATION NUMBER: 01188000 STATION NAME: BURLINGTON BROOK NEAR BURLINGTON, CT
LATITUDE: 414710 LONGITUDE: 725755 DRAINAGE AREA: 4.1 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	176	78.49	65	77	89	80	0.88	1.12	0.000	F
OXYGEN, DISS (MG/L)	175	10.65	9.0	10.2	12.4	80	0.07	0.70	0.003	F
OXYGEN, DISS (% SAT)	175	92.09	83	97	101	80	0.83	0.90	0.000	
PH (STANDARD UNITS)	176	6.87	6.6	6.9	7.1	80	-0.02	-0.24	0.036	F
CALCIUM, DISS (MG/L)	119	4.24	3.5	4.0	5.0	72	0.02	0.46	0.039	F
MAGNESIUM, DISS(MG/L)	119	1.62	1.4	1.6	1.8	72	0.02	1.47	0.000	F
CHLORIDE, DISS (MG/L)	175	10.52	8.4	10	12	79	0.11	1.04	0.003	F
SULFATE, DISS (MG/L)	119	7.61	6.8	7.5	8.3	56	-0.01	-0.18	0.848	
SILICA, DISS (MG/L)	117	8.56	7.1	9.0	10	72	-0.03	-0.35	0.241	F
IRON, DISS (UG/L)	111	279.48	140	210	280	0	--	--	--	
MANGANESE, DISS(UG/L)	113	e 108.68	40	60	150	113	13.33	12.27	0.000	

Appendix 1. Statistical summary and trend results of selected water-quality data for the 1969-88 water years

STATION NUMBER: 01193050 STATION NAME: CONNECTICUT RIVER AT MIDDLE HADDAM, CT
LATITUDE: 413230 LONGITUDE: 723313 DRAINAGE AREA: 10,897.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	239	129.02	108	126	147	233	-0.43	-0.33	0.122	
OXYGEN, DISS (MG/L)	237	9.65	7.8	9.2	11.8	230	0.15	1.60	0.000	
OXYGEN, DISS (% SAT)	237	87.30	77	89	98	230	1.50	1.72	0.000	
PH (STANDARD UNITS)	238	7.10	6.8	7.1	7.3	232	0.01	0.13	0.029	
CALCIUM, DISS (MG/L)	174	12.30	11	12	14	174	0.00	0.00	0.427	
MAGNESIUM, DISS(MG/L)	172	1.98	1.6	2.0	2.2	172	0.00	0.00	0.588	
CHLORIDE, DISS (MG/L)	192	12.01	9.3	12	14	192	0.00	0.00	1.000	
SULFATE, DISS (MG/L)	127	13.59	12	13	15	56	-0.20	-1.47	0.009	
SILICA, DISS (MG/L)	143	4.95	4.3	5.1	6.2	80	0.02	0.49	0.122	
IRON, DISS (UG/L)	139	144.16	85	120	190	80	-8.39	-5.82	0.000	
MANGANESE, DISS(UG/L)	141	e 35.00	10	30	42	141	-0.39	-1.11	0.001	

Appendix 1. Statistical summary and trend results of selected water-quality data for the 1969-88 water years

STATION NUMBER: 01193500 STATION NAME: SALMON RIVER NEAR EAST HAMPTON, CT
LATITUDE: 413308 LONGITUDE: 722659 DRAINAGE AREA: 100.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	235	95.89	85	94	106	232	0.15	0.16	0.177	F
OXYGEN, DISS (MG/L)	234	10.94	9.2	10.5	12.7	231	0.12	1.10	0.000	F
OXYGEN, DISS (% SAT)	234	96.42	90	100	104	231	0.92	0.95	0.000	F
PH (STANDARD UNITS)	236	7.09	6.8	7.1	7.4	233	-0.01	-0.10	0.138	F
CALCIUM, DISS (MG/L)	148	6.00	5.1	5.9	6.7	147	-0.02	-0.28	0.109	F
MAGNESIUM, DISS(MG/L)	147	1.64	1.4	1.6	1.8	146	0.01	0.48	0.003	F
CHLORIDE, DISS (MG/L)	231	12.47	10	12	14	230	0.05	0.42	0.059	F
SULFATE, DISS (MG/L)	135	11.65	10	11	13	135	-0.10	-0.86	0.000	
IRON, DISS (UG/L)	96	183.36	90	140	220	0	--	--	--	
MANGANESE, DISS(UG/L)	98	e 20.40	e 10	12	30	98	0.00	0.00	0.757	

Appendix 1. Statistical summary and trend results of selected water-quality data for the 1969-88 water years

STATION NUMBER: 01196500 STATION NAME: QUINNIPIAC RIVER AT WALLINGFORD, CT
LATITUDE: 412658 LONGITUDE: 725029 DRAINAGE AREA: 115.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	240	291.57	247	292	330	234	0.32	0.11	0.476	F
OXYGEN, DISS (MG/L)	234	9.96	8.2	9.7	11.8	228	0.11	1.06	0.000	F
OXYGEN, DISS (% SAT)	235	90.85	84	91	99	229	0.77	0.85	0.000	
PH (STANDARD UNITS)	238	7.24	7.0	7.2	7.5	232	0.01	0.20	0.002	F
CALCIUM, DISS (MG/L)	155	27.35	24	28	31	155	0.07	0.26	0.074	F
MAGNESIUM, DISS(MG/L)	155	5.04	4.4	5.3	5.8	155	0.01	0.28	0.050	F
CHLORIDE, DISS (MG/L)	232	27.60	22	26	31	232	0.12	0.43	0.021	F
SULFATE, DISS (MG/L)	135	25.49	22	25	29	135	-0.32	-1.27	0.000	F
SILICA, DISS (MG/L)	121	10.14	8.8	10	12	75	0.02	0.22	0.478	F

APPENDIX 2

Appendix 1. Statistical summary and trend results of selected water-quality data for the 1969-88 water years

STATION NUMBER: 01205500 STATION NAME: HOUSATONIC RIVER AT STEVENSON, CT
LATITUDE: 412302 LONGITUDE: 731005 DRAINAGE AREA: 1,544.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	240	224.36	200	225	252	233	0.19	0.08	0.554	F
OXYGEN, DISS (MG/L)	239	9.56	7.4	9.5	11.9	232	0.13	1.32	0.000	F
OXYGEN, DISS (% SAT)	239	85.26	73	86	100	232	1.11	1.31	0.000	F
PH (STANDARD UNITS)	241	7.51	7.2	7.6	7.8	234	0.01	0.15	0.044	
CALCIUM, DISS (MG/L)	192	23.21	21	23	26	192	0.02	0.07	0.667	F
MAGNESIUM, DISS(MG/L)	193	8.20	7.2	8.3	9.3	193	0.07	0.91	0.000	F
CHLORIDE, DISS (MG/L)	232	12.78	10	13	15	232	0.17	1.35	0.000	F
SULFATE, DISS (MG/L)	165	15.25	13	15	17	165	-0.40	-2.60	0.000	F
IRON, DISS (UG/L)	102	64.72	20	40	70	0	--	--	--	
MANGANESE, DISS(UG/L)	103	e 31.42	e 10	10	30	103	-0.00	-0.00	0.003	

Appendix 1. Statistical summary and trend results of selected water-quality data for the 1969-88 water years

STATION NUMBER: 01208990 STATION NAME: SAUGATUCK RIVER NEAR REDDING, CT
LATITUDE: 411740 LONGITUDE: 732344 DRAINAGE AREA: 21.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	235	174.49	155	175	194	234	0.70	0.40	0.009	F
OXYGEN, DISS (MG/L)	232	10.81	9.2	10.5	12.5	231	0.11	0.98	0.000	F
OXYGEN, DISS (% SAT)	233	96.00	89	98	103	232	0.84	0.88	0.000	
PH (STANDARD UNITS)	234	7.46	7.2	7.5	7.7	233	0.01	0.14	0.070	F
CALCIUM, DISS (MG/L)	150	18.14	16	18	21	150	-0.02	-0.08	0.656	F
MAGNESIUM, DISS(MG/L)	150	5.44	4.8	5.3	6.1	150	0.04	0.80	0.000	F
CHLORIDE, DISS (MG/L)	232	13.23	11	12	15	232	0.26	1.98	0.000	
SULFATE, DISS (MG/L)	136	14.29	12	14	17	136	-0.34	-2.36	0.000	
IRON, DISS (UG/L)	97	130.85	79	110	150	0	--	--	--	
MANGANESE, DISS(UG/L)	98	e 20.46	e 10	13	20	98	0.00	0.00	0.608	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

[N, number of samples; P, P-value (or attained significance level);e, parameter is estimated for censored constituents with a log-probability regression procedure; --, insufficient data to calculate value; *****, value exceeds print field; US/CM, microsiemens per centimeter; MG/L, milligrams per liter; %SAT, percent saturation; UG/L, micrograms per liter.
TREND CODES: blank, best trend is trend in unadjusted concentrations; F, best trend is trend in flow-adjusted concentrations; **, best trend is trend in unadjusted concentrations because the flow-adjustment was unsuccessful.]

STATION NUMBER: 01118500 STATION NAME: PAWCATUCK RIVER AT WESTERLY, RI
LATITUDE: 412301 LONGITUDE: 715001 DRAINAGE AREA: 295.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	158	99.31	80	94	109	0	--	--	--	
TURBIDITY (NTU)	127	1.28	1.0	1.0	1.5	126	-0.03	-2.27	0.018	**
OXYGEN, DISS (MG/L)	145	10.89	9.3	10.7	12.8	0	--	--	--	
OXYGEN, DISS (% SAT)	144	97.12	91	97	102	0	--	--	--	
PH (STANDARD UNITS)	146	6.66	6.3	6.7	6.9	0	--	--	--	
CALCIUM, DISS (MG/L)	110	4.31	3.5	4.1	5.1	0	--	--	--	
MAGNESIUM, DISS(MG/L)	110	1.34	1.1	1.3	1.5	0	--	--	--	
CHLORIDE, DISS (MG/L)	137	12.06	10	12	13	0	--	--	--	
SILICA, DISS (MG/L)	76	6.75	4.7	7.0	8.5	0	--	--	--	
SOLIDS, TOTAL (MG/L)	133	77.24	64	74	84	0	--	--	--	
SOLIDS, DISS (MG/L)	132	71.07	60	69	81	0	--	--	--	
NITROGEN, TOT (MG/L)	144	0.95	0.69	0.88	1.1	0	--	--	--	
N, ORGANIC, TOT(MG/L)	136	0.47	0.31	0.43	0.56	0	--	--	--	
N, N02+N03, TOT(MG/L)	145	0.40	0.3	0.4	0.5	0	--	--	--	
N, AMMONIA, DIS(MG/L)	71	e 0.08	0.02	0.03	0.06	71	0.00	2.83	0.110	
PHOSPHORUS, TOT(MG/L)	144	0.04	0.03	0.04	0.06	0	--	--	--	
CARBON, ORG,TOT(MG/L)	135	7.13	5.2	6.3	8.0	0	--	--	--	
IRON, DISS (UG/L)	51	280.39	180	250	310	0	--	--	--	
MANGANESE, DISS(UG/L)	51	e 35.88	23	30	50	51	-0.67	-1.86	0.072	
FECAL COL (COL/100ML)	107	154.83	22	60	130	0	--	--	--	
FEC STREP (COL/100ML)	141	639.35	25	83	300	140	-11.33	-1.77	0.637	
SEDIMENT, SUSP (MG/L)	65	13.55	4	9	14	41	0.44	3.23	0.386	**

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01119375 STATION NAME: WILLIMANTIC RIVER AT MERROW, CT
LATITUDE: 415007 LONGITUDE: 721838 DRAINAGE AREA: 94.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	162	87.40	66	81	102	162	1.61	1.84	0.000	F
TURBIDITY (NTU)	121	1.60	1.0	1.3	2.0	121	-0.06	-3.53	0.005	
OXYGEN, DISS (MG/L)	161	11.50	9.6	11.6	13.6	161	0.01	0.11	0.382	F
OXYGEN, DISS (% SAT)	161	101.17	97	100	106	161	0.25	0.25	0.065	
PH (STANDARD UNITS)	162	6.76	6.5	6.7	7.0	162	0.02	0.28	0.005	F
CALCIUM, DISS (MG/L)	103	4.71	3.6	4.3	5.5	103	0.06	1.24	0.001	F
MAGNESIUM, DISS(MG/L)	102	1.49	1.2	1.5	1.8	102	0.03	1.97	0.000	F
CHLORIDE, DISS (MG/L)	160	11.66	8.5	11	14	160	0.17	1.42	0.000	F
SULFATE, DISS (MG/L)	64	10.05	8.2	9.0	11	64	0.32	3.17	0.017	
SILICA, DISS (MG/L)	72	8.27	7.1	8.4	9.2	56	-0.04	-0.53	0.088	
SOLIDS, TOTAL (MG/L)	159	67.73	55	66	80	159	0.70	1.03	0.000	F
SOLIDS, DISS (MG/L)	160	60.86	48	59	71	160	0.61	1.00	0.000	F
NITROGEN, TOT (MG/L)	160	0.84	0.58	0.73	1.0	160	0.03	3.66	0.000	F
N, ORGANIC, TOT(MG/L)	152	0.41	0.22	0.35	0.48	152	0.02	4.75	0.000	F
N, NO2+NO3, TOT(MG/L)	161	0.36	0.2	0.3	0.5	161	0.01	3.83	0.000	F
PHOSPHORUS, TOT(MG/L)	162	0.04	0.03	0.04	0.06	162	-0.00	-4.66	0.000	F
CARBON, ORG,TOT(MG/L)	158	5.19	3.7	4.8	5.9	158	-0.12	-2.34	0.003	**
IRON, DISS (UG/L)	72	192.43	110	190	250	56	-2.50	-1.30	0.477	F
MANGANESE, DISS(UG/L)	72	e 24.68	20	20	30	72	0.00	0.00	0.244	
FECAL COL (COL/100ML)	123	565.14	120	240	480	123	-17.91	-3.17	0.275	
FEC STREP (COL/100ML)	137	834.01	40	110	410	137	15.62	1.87	0.678	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01122610 STATION NAME: SHETUCKET RIVER AT SOUTH WINDHAM, CT
LATITUDE: 414056 LONGITUDE: 720959 DRAINAGE AREA: 408.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	165	97.65	80	94	110	160	0.29	0.29	0.121	F
TURBIDITY (NTU)	121	1.71	1.0	1.3	2.0	121	-0.05	-3.15	0.004	
OXYGEN, DISS (MG/L)	164	11.48	9.5	11.4	13.5	159	-0.03	-0.24	0.246	F
OXYGEN, DISS (% SAT)	163	102.85	99	102	106	159	-0.10	-0.09	0.270	
PH (STANDARD UNITS)	165	6.98	6.8	7.0	7.2	161	0.01	0.10	0.382	F
CALCIUM, DISS (MG/L)	121	6.11	5.1	6.0	7.2	121	0.03	0.43	0.028	F
MAGNESIUM, DISS(MG/L)	121	1.68	1.4	1.6	1.9	121	0.02	1.07	0.000	F
CHLORIDE, DISS (MG/L)	162	10.86	9.0	10	12	162	0.10	0.94	0.001	F
SULFATE, DISS (MG/L)	75	11.86	9.8	11	13	75	0.36	3.05	0.000	F
SILICA, DISS (MG/L)	90	7.56	6.4	7.6	8.7	56	-0.05	-0.66	0.118	
SOLIDS, TOTAL (MG/L)	157	72.17	62	70	80	157	-0.29	-0.41	0.029	F
SOLIDS, DISS (MG/L)	157	64.31	55	61	74	157	-0.12	-0.18	0.518	F
NITROGEN, TOT (MG/L)	165	0.95	0.70	0.90	1.1	160	0.01	1.44	0.002	F
N, ORGANIC, TOT(MG/L)	163	0.45	0.23	0.38	0.54	158	0.01	3.06	0.009	F
N, NO2+NO3, TOT(MG/L)	167	0.41	0.3	0.4	0.5	162	0.00	-0.14	0.768	F
N, AMMONIA, DIS(MG/L)	105	e 0.11	0.07	0.10	0.14	105	0.00	1.35	0.407	
PHOSPHORUS, TOT(MG/L)	167	0.07	0.04	0.07	0.10	162	-0.00	-5.25	0.000	F
CARBON, ORG,TOT(MG/L)	159	4.99	3.6	4.6	5.9	159	-0.14	-2.72	0.000	
IRON, DISS (UG/L)	75	207.13	140	200	250	56	-2.08	-1.01	0.396	F
MANGANESE, DISS(UG/L)	75	e 26.97	20	23	30	75	-0.33	-1.24	0.122	
FECAL COL (COL/100ML)	123	1,326.59	110	340	1,100	123	-99.95	-7.53	0.011	
FEC STREP (COL/100ML)	137	894.42	49	210	800	137	3.61	0.40	0.917	F
SEDIMENT, SUSP (MG/L)	53	10.36	5	8	13	37	0.00	0.00	0.960	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01125150 STATION NAME: FRENCH RIVER AT MECHANICSVILLE, CT
LATITUDE: 415651 LONGITUDE: 715323 DRAINAGE AREA: 107.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	163	163.12	116	146	190	160	2.68	1.64	0.000	F
TURBIDITY (NTU)	121	1.85	1.1	1.8	2.0	121	-0.10	-5.59	0.000	
OXYGEN, DISS (MG/L)	162	10.68	8.5	10.8	13.3	159	0.04	0.40	0.100	F
OXYGEN, DISS (% SAT)	162	94.75	90	98	101	159	0.75	0.79	0.000	F
PH (STANDARD UNITS)	163	6.94	6.8	6.9	7.2	162	0.02	0.23	0.005	
CALCIUM, DISS (MG/L)	101	7.49	6.4	7.3	8.4	99	0.08	1.06	0.000	F
MAGNESIUM, DISS(MG/L)	101	1.40	1.1	1.3	1.5	99	0.02	1.39	0.000	F
CHLORIDE, DISS (MG/L)	162	18.80	15	18	23	160	0.46	2.43	0.000	F
SULFATE, DISS (MG/L)	63	18.31	12	14	21	63	0.27	1.49	0.219	F
SILICA, DISS (MG/L)	71	5.01	3.8	5.1	6.1	55	-0.05	-1.00	0.080	
SOLIDS, TOTAL (MG/L)	161	110.41	83	100	126	159	1.07	0.97	0.016	F
SOLIDS, DISS (MG/L)	159	101.19	76	91	117	157	0.93	0.92	0.014	F
NITROGEN, TOT (MG/L)	162	1.84	1.2	1.6	2.4	160	0.03	1.66	0.012	F
N, ORGANIC, TOT(MG/L)	157	0.72	0.42	0.63	0.86	155	0.00	0.49	0.543	F
N, NO2+NO3, TOT(MG/L)	162	0.88	0.5	0.7	1.2	160	0.03	3.67	0.000	F
PHOSPHORUS, TOT(MG/L)	162	0.23	0.11	0.18	0.29	160	-0.01	-2.83	0.010	F
CARBON, ORG,TOT(MG/L)	159	7.15	5.7	6.8	8.0	157	-0.15	-2.09	0.000	F
IRON, DISS (UG/L)	71	242.99	150	220	310	53	-2.30	-0.94	0.426	F
MANGANESE, DISS(UG/L)	71	e 37.19	30	34	44	71	0.00	0.00	0.649	
FECAL COL (COL/100ML)	123	1,391.82	88	220	740	120	9.95	0.71	0.960	F
FEC STREP (COL/100ML)	137	1,660.54	39	150	770	137	0.00	0.00	0.983	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01127000 STATION NAME: QUINEBAUG RIVER AT JEWETT CITY, CT
LATITUDE: 413552 LONGITUDE: 715905 DRAINAGE AREA: 713.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	167	107.04	89	103	120	161	0.14	0.13	0.729	F
TURBIDITY (NTU)	121	3.37	1.5	2.0	3.3	121	-0.09	-2.56	0.078	F
OXYGEN, DISS (MG/L)	166	11.34	9.4	11.3	13.3	160	-0.02	-0.19	0.387	F
OXYGEN, DISS (% SAT)	164	102.51	97	101	106	159	-0.23	-0.22	0.053	F
PH (STANDARD UNITS)	168	7.21	6.8	7.0	7.3	162	0.00	0.03	0.793	F
CALCIUM, DISS (MG/L)	131	6.76	5.7	6.5	7.7	131	0.02	0.31	0.146	F
MAGNESIUM, DISS(MG/L)	129	1.54	1.3	1.5	1.7	129	0.02	1.11	0.001	F
CHLORIDE, DISS (MG/L)	161	13.04	11	12	14	161	0.00	-0.04	0.830	F
SULFATE, DISS (MG/L)	85	11.55	10	11	13	85	0.00	0.02	0.967	F
SILICA, DISS (MG/L)	100	5.66	4.5	5.3	7.0	56	-0.07	-1.24	0.020	F
SOLIDS, TOTAL (MG/L)	157	80.80	68	78	91	157	0.13	0.16	0.646	F
SOLIDS, DISS (MG/L)	158	70.59	60	68	80	158	-0.08	-0.11	0.698	F
NITROGEN, TOT (MG/L)	156	1.14	0.89	1.1	1.4	155	0.03	2.28	0.000	F
N, ORGANIC, TOT(MG/L)	161	0.59	0.34	0.51	0.77	158	0.01	2.07	0.053	F
N, NO2+NO3, TOT(MG/L)	167	0.42	0.3	0.4	0.5	162	0.01	2.42	0.001	F
N, AMMONIA, DIS(MG/L)	103	e 0.11	0.04	0.08	0.14	103	0.01	5.44	0.020	
PHOSPHORUS, TOT(MG/L)	167	0.11	0.07	0.10	0.14	162	-0.00	-2.11	0.017	F
CARBON, ORG,TOT(MG/L)	156	6.69	4.6	5.9	7.6	156	-0.10	-1.45	0.094	F
IRON, DISS (UG/L)	73	201.64	140	200	250	55	-3.48	-1.73	0.119	
MANGANESE, DISS(UG/L)	73	e 29.36	20	30	40	73	-0.50	-1.70	0.010	
FECAL COL (COL/100ML)	123	991.95	140	420	900	123	64.09	6.46	0.146	
FEC STREP (COL/100ML)	137	1,075.28	130	290	1,100	137	97.25	9.04	0.032	
SEDIMENT, SUSP (MG/L)	66	13.45	7	11	15	42	0.68	5.09	0.095	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01127701 STATION NAME: THAMES RIVER NEAR MOHEGAN, CT
LATITUDE: 412854 LONGITUDE: 720432 DRAINAGE AREA: 1,382.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	130	7,291.12	3,880	5,350	8,780	85	100.00	1.37	0.109	
TURBIDITY (NTU)	90	1.80	1.0	1.9	2.0	63	-0.04	-2.25	0.062	
OXYGEN, DISS (MG/L)	129	10.80	8.8	10.9	13.0	85	0.02	0.14	0.613	
OXYGEN, DISS (% SAT)	129	97.64	90	95	100	85	0.25	0.26	0.171	
PH (STANDARD UNITS)	130	7.36	7.1	7.2	7.5	85	0.00	0.00	0.191	
CALCIUM, DISS (MG/L)	78	53.34	31	40	67	68	0.00	0.00	1.000	
MAGNESIUM, DISS(MG/L)	78	150.14	87	110	150	68	1.42	0.94	0.263	
CHLORIDE, DISS (MG/L)	128	2,242.93	1,100	1,700	2,600	84	25.00	1.11	0.193	
SULFATE, DISS (MG/L)	61	292.89	170	220	340	41	-10.00	-3.41	0.102	
SILICA, DISS (MG/L)	69	5.52	4.1	5.7	6.9	54	-0.04	-0.78	0.354	
SOLIDS, TOTAL (MG/L)	125	4,821.18	2,500	3,500	5,350	83	35.00	0.73	0.351	
SOLIDS, DISS (MG/L)	126	4,300.71	2,280	3,290	4,690	83	19.09	0.44	0.586	
NITROGEN, TOT (MG/L)	124	1.02	0.78	0.93	1.2	79	0.03	2.69	0.012	
N, ORGANIC, TOT(MG/L)	123	0.53	0.32	0.46	0.67	83	0.02	4.14	0.056	
N, N02+N03, TOT(MG/L)	130	0.36	0.2	0.4	0.5	85	0.00	0.71	0.426	
PHOSPHORUS, TOT(MG/L)	130	0.08	0.05	0.07	0.10	85	-0.00	-2.26	0.015	
CARBON, ORG,TOT(MG/L)	127	5.50	4.0	5.0	6.6	83	-0.12	-2.19	0.097	
IRON, DISS (UG/L)	67	108.73	80	100	140	52	-4.14	-3.81	0.012	
MANGANESE, DISS(UG/L)	69	e 33.13	20	30	40	69	-1.25	-3.77	0.000	
FECAL COL (COL/100ML)	92	1,314.95	270	740	1,200	66	-126.76	-9.64	0.071	
FEC STREP (COL/100ML)	105	833.49	21	80	400	71	75.44	9.05	0.086	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01184000 STATION NAME: CONNECTICUT RIVER AT THOMPSONVILLE, CT
LATITUDE: 415914 LONGITUDE: 723621 DRAINAGE AREA: 9,660.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	170	113.47	98	114	130	162	0.61	0.54	0.092	F
TURBIDITY (NTU)	121	2.92	1.3	2.0	3.0	121	-0.39	-13.44	0.000	F
OXYGEN, DISS (MG/L)	169	10.44	8.1	10.1	12.6	162	0.04	0.35	0.095	F
OXYGEN, DISS (% SAT)	169	92.47	88	93	98	162	0.33	0.36	0.011	F
PH (STANDARD UNITS)	169	7.03	6.8	7.0	7.2	161	0.02	0.23	0.001	F
CALCIUM, DISS (MG/L)	145	10.96	9.5	11	13	145	0.06	0.50	0.058	F
MAGNESIUM, DISS(MG/L)	144	1.68	1.5	1.7	1.9	144	0.01	0.34	0.136	F
CHLORIDE, DISS (MG/L)	161	10.26	8.4	10	12	161	0.11	1.05	0.001	F
SULFATE, DISS (MG/L)	94	10.54	9.3	11	12	94	0.04	0.38	0.485	F
SILICA, DISS (MG/L)	113	5.20	4.6	5.2	6.1	55	0.01	0.12	0.653	F
SOLIDS, TOTAL (MG/L)	156	82.81	75	83	91	156	-0.27	-0.33	0.269	F
SOLIDS, DISS (MG/L)	159	70.43	60	72	79	159	0.27	0.38	0.156	F
NITROGEN, TOT (MG/L)	165	0.91	0.70	0.89	1.0	160	0.02	1.78	0.000	F
N, ORGANIC, TOT(MG/L)	161	0.42	0.28	0.36	0.51	156	0.01	1.90	0.050	**
N, N02+N03, TOT(MG/L)	168	0.36	0.3	0.3	0.4	162	0.00	0.85	0.002	
N, AMMONIA, DIS(MG/L)	111	e 0.13	0.07	0.10	0.18	111	0.01	6.04	0.003	
PHOSPHORUS, TOT(MG/L)	168	0.08	0.05	0.06	0.09	162	-0.00	-3.32	0.000	F
CARBON, ORG,TOT(MG/L)	159	4.67	3.5	4.1	5.1	159	-0.11	-2.39	0.000	
IRON, DISS (UG/L)	75	104.28	75	100	130	56	-5.25	-5.04	0.000	F
MANGANESE, DISS(UG/L)	75	e 26.89	17	23	35	75	-0.14	-0.52	0.118	
FECAL COL (COL/100ML)	123	2,511.35	230	960	3,200	123	-717.84	-28.58	0.000	F
FEC STREP (COL/100ML)	136	1,468.07	100	280	1,200	136	-265.72	-18.10	0.000	F
SEDIMENT, SUSP (MG/L)	74	18.09	5	10	16	42	-0.82	-4.51	0.262	F

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01186800 STATION NAME: STILL RIVER AT RIVERTON, CT
LATITUDE: 415734 LONGITUDE: 730112 DRAINAGE AREA: 86.2 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/YEAR	PERCENT/YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	161	112.84	90	108	128	159	0.00	0.00	1.000	F
TURBIDITY (NTU)	121	1.99	1.0	1.5	2.3	121	-0.20	-10.21	0.000	
OXYGEN, DISS (MG/L)	162	11.64	9.6	11.6	13.8	160	0.04	0.36	0.052	F
OXYGEN, DISS (% SAT)	161	101.76	98	101	105	160	0.00	0.00	0.533	
PH (STANDARD UNITS)	162	7.16	6.9	7.1	7.4	160	0.00	0.04	0.560	F
CALCIUM, DISS (MG/L)	104	7.78	6.4	7.3	8.8	103	0.01	0.15	0.672	F
MAGNESIUM, DISS(MG/L)	104	2.45	2.0	2.3	2.8	103	0.01	0.52	0.102	F
CHLORIDE, DISS (MG/L)	160	14.09	10	13	16	159	0.07	0.47	0.353	F
SULFATE, DISS (MG/L)	64	9.63	7.9	9.1	11	64	0.04	0.41	0.567	F
SILICA, DISS (MG/L)	72	5.17	4.1	5.1	6.1	56	0.00	0.00	0.978	
SOLIDS, TOTAL (MG/L)	156	78.87	63	76	89	155	-0.14	-0.17	0.667	F
SOLIDS, DISS (MG/L)	159	71.04	58	67	80	158	-0.26	-0.37	0.175	F
NITROGEN, TOT (MG/L)	158	1.27	0.68	1.0	1.6	157	0.01	1.03	0.225	F
N, ORGANIC, TOT(MG/L)	159	0.46	0.24	0.36	0.53	158	0.02	3.31	0.012	F
N, NO2+NO3, TOT(MG/L)	162	0.53	0.2	0.3	0.6	161	-0.01	-1.53	0.028	F
PHOSPHORUS, TOT(MG/L)	162	0.14	0.06	0.10	0.20	161	-0.00	-3.43	0.000	F
CARBON, ORG,TOT(MG/L)	160	5.34	3.9	5.0	6.1	160	-0.12	-2.16	0.000	
IRON, DISS (UG/L)	72	162.31	110	150	200	55	-1.41	-0.87	0.466	F
MANGANESE, DISS(UG/L)	72	e 25.12	15	21	30	72	-0.58	-2.30	0.030	
FECAL COL (COL/100ML)	122	897.62	23	72	190	122	37.66	4.20	0.281	
FEC STREP (COL/100ML)	135	651.13	37	96	320	135	-17.37	-2.67	0.596	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01188000 STATION NAME: BURLINGTON BROOK NEAR BURLINGTON, CT
LATITUDE: 414710 LONGITUDE: 725755 DRAINAGE AREA: 4.1 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	104	80.03	65	81	92	56	1.13	1.41	0.000	F
TURBIDITY (NTU)	62	2.36	1.0	2.0	3.0	42	-0.07	-3.17	0.184	F
OXYGEN, DISS (MG/L)	104	11.49	10.0	11.1	13.2	56	-0.03	-0.24	0.239	F
OXYGEN, DISS (% SAT)	104	99.47	98	100	102	56	0.00	0.00	0.720	
PH (STANDARD UNITS)	103	6.76	6.5	6.8	7.0	56	0.01	0.16	0.311	F
CALCIUM, DISS (MG/L)	71	4.27	3.5	4.1	4.9	55	0.02	0.37	0.239	F
MAGNESIUM, DISS(MG/L)	71	1.71	1.4	1.7	2.0	55	0.01	0.54	0.312	F
CHLORIDE, DISS (MG/L)	103	10.89	8.5	11	13	55	0.25	2.32	0.000	F
SILICA, DISS (MG/L)	73	8.42	7.1	8.8	9.7	56	-0.03	-0.38	0.427	F
SOLIDS, TOTAL (MG/L)	100	63.03	52	59	71	54	0.60	0.95	0.031	F
SOLIDS, DISS (MG/L)	100	54.98	47	53	61	54	0.46	0.84	0.061	F
NITROGEN, TOT (MG/L)	97	0.54	0.33	0.42	0.60	28	0.02	4.22	0.052	
N, ORGANIC, TOT(MG/L)	102	0.29	0.11	0.21	0.34	55	0.03	8.78	0.001	
N, NO2+NO3, TOT(MG/L)	104	0.18	0.1	0.2	0.2	56	-0.00	-2.25	0.012	
PHOSPHORUS, TOT(MG/L)	104	0.03	0.01	0.02	0.03	56	0.00	0.00	0.954	
CARBON, ORG,TOT(MG/L)	104	4.97	2.8	4.3	6.2	56	-0.18	-3.61	0.025	
IRON, DISS (UG/L)	72	311.97	150	240	330	56	8.01	2.57	0.100	F
MANGANESE, DISS(UG/L)	72	e 138.91	50	80	200	72	18.09	13.02	0.000	
FEC STREP (COL/100ML)	79	535.13	8	33	160	48	0.00	0.00	0.836	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01188085 STATION NAME: FARMINGTON RIVER, AT ROUTE 4, AT UNIONVILLE, CT
LATITUDE: 414552 LONGITUDE: 725347 DRAINAGE AREA: 377.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	163	79.76	68	78	88	162	0.42	0.53	0.003	F
TURBIDITY (NTU)	121	1.30	0.7	1.0	1.3	121	-0.05	-4.03	0.016	F
OXYGEN, DISS (MG/L)	161	11.87	9.8	11.7	13.8	160	0.00	0.00	0.933	
OXYGEN, DISS (% SAT)	160	104.21	100	104	107	159	0.15	0.15	0.169	F
PH (STANDARD UNITS)	162	7.12	6.9	7.1	7.3	161	0.01	0.13	0.181	F
CALCIUM, DISS (MG/L)	102	5.48	4.7	5.6	6.2	71	0.02	0.31	0.378	F
MAGNESIUM, DISS(MG/L)	102	1.63	1.4	1.7	1.9	71	0.01	0.73	0.118	F
CHLORIDE, DISS (MG/L)	161	9.67	7.6	9.0	11	161	0.14	1.46	0.000	F
SULFATE, DISS (MG/L)	63	8.44	7.5	8.3	9.5	63	0.10	1.15	0.137	F
SILICA, DISS (MG/L)	72	4.81	4.4	4.8	5.4	56	0.00	0.00	0.638	
SOLIDS, TOTAL (MG/L)	155	58.50	52	58	64	155	0.22	0.37	0.264	F
SOLIDS, DISS (MG/L)	156	51.24	45	50	56	156	0.17	0.33	0.086	F
NITROGEN, TOT (MG/L)	147	0.64	0.41	0.57	0.75	147	0.02	3.54	0.000	F
N, ORGANIC, TOT(MG/L)	147	0.37	0.18	0.28	0.44	147	0.02	5.74	0.000	
N, NO2+NO3, TOT(MG/L)	161	0.22	0.2	0.2	0.3	161	0.00	0.02	0.974	F
PHOSPHORUS, TOT(MG/L)	160	0.05	0.03	0.03	0.05	160	0.00	-0.91	0.117	F
CARBON, ORG,TOT(MG/L)	160	4.34	3.2	4.0	5.0	160	-0.08	-1.87	0.001	F
IRON, DISS (UG/L)	72	111.33	80	110	130	56	0.00	0.00	1.000	
MANGANESE, DISS(UG/L)	72	e 21.73	11	20	27	72	0.00	0.00	0.688	
FECAL COL (COL/100ML)	123	396.65	60	140	500	123	33.62	8.48	0.023	F
FEC STREP (COL/100ML)	137	707.55	47	140	510	137	0.00	0.00	0.934	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01189030 STATION NAME: PEQUABUCK RIVER AT FARMINGTON, CT
LATITUDE: 414300 LONGITUDE: 725025 DRAINAGE AREA: 57.2 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	164	254.99	186	243	310	162	0.53	0.21	0.513	F
TURBIDITY (NTU)	121	3.73	2.0	3.3	4.7	121	-0.10	-2.60	0.152	
OXYGEN, DISS (MG/L)	163	5.94	3.4	5.8	8.6	161	0.07	1.16	0.031	F
OXYGEN, DISS (% SAT)	163	49.90	33	53	67	161	0.62	1.25	0.012	F
PH (STANDARD UNITS)	163	6.84	6.7	6.9	7.0	161	0.02	0.30	0.000	F
CALCIUM, DISS (MG/L)	103	15.58	13	16	19	103	0.02	0.14	0.610	F
MAGNESIUM, DISS(MG/L)	103	3.16	2.6	3.3	3.8	103	0.02	0.66	0.067	F
CHLORIDE, DISS (MG/L)	160	26.75	20	26	32	160	-0.05	-0.18	0.741	F
SULFATE, DISS (MG/L)	64	23.31	17	21	31	64	0.04	0.16	0.949	F
SILICA, DISS (MG/L)	72	9.98	8.4	10	12	56	-0.10	-0.97	0.013	F
SOLIDS, TOTAL (MG/L)	160	164.26	129	162	195	160	0.20	0.12	0.714	F
SOLIDS, DISS (MG/L)	160	145.31	111	143	175	160	0.06	0.04	0.894	F
NITROGEN, TOT (MG/L)	160	5.65	2.7	4.3	6.5	160	0.06	1.07	0.044	F
N, ORGANIC, TOT(MG/L)	161	1.60	0.50	0.76	1.2	161	0.03	1.88	0.092	F
N, NO2+NO3, TOT(MG/L)	161	1.04	0.8	0.9	1.2	161	0.03	2.65	0.000	F
PHOSPHORUS, TOT(MG/L)	160	1.24	0.54	1.00	1.7	160	-0.01	-0.87	0.334	F
CARBON, ORG,TOT(MG/L)	160	7.86	5.8	7.6	9.4	160	-0.16	-2.09	0.001	F
IRON, DISS (UG/L)	71	272.11	200	250	300	55	-1.84	-0.68	0.463	
MANGANESE, DISS(UG/L)	72	e 175.56	130	170	210	72	1.11	0.63	0.439	
FECAL COL (COL/100ML)	123	27,850.71	300	5,100	29,000	123	551.55	1.98	0.512	
FEC STREP (COL/100ML)	137	14,525.44	450	4,500	18,000	137	820.81	5.65	0.140	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01189120 STATION NAME: FARMINGTON RIVER AT AVON, CT
LATITUDE: 414824 LONGITUDE: 724923 DRAINAGE AREA: 465.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	76	112.55	91	107	129	55	1.30	1.15	0.002	F
TURBIDITY (NTU)	43	1.80	0.8	1.0	2.5	43	-0.07	-4.01	0.103	
OXYGEN, DISS (MG/L)	76	10.75	8.9	10.4	13.0	55	0.02	0.16	0.866	F
OXYGEN, DISS (% SAT)	76	93.13	89	94	98	55	0.16	0.17	0.653	F
PH (STANDARD UNITS)	75	6.84	6.7	6.9	7.0	55	0.02	0.27	0.072	F
CALCIUM, DISS (MG/L)	72	7.82	6.6	7.3	8.9	55	0.05	0.70	0.092	F
MAGNESIUM, DISS(MG/L)	72	1.91	1.6	1.9	2.2	55	0.03	1.34	0.004	F
CHLORIDE, DISS (MG/L)	75	12.58	9.8	11	14	55	0.16	1.28	0.018	F
SILICA, DISS (MG/L)	72	5.74	5.2	5.8	6.3	56	0.00	0.00	1.000	
SOLIDS, TOTAL (MG/L)	75	78.48	66	77	86	54	-0.03	-0.03	1.000	F
SOLIDS, DISS (MG/L)	75	69.32	59	65	77	55	0.49	0.70	0.082	F
NITROGEN, TOT (MG/L)	76	1.32	0.87	1.1	1.6	55	0.03	2.22	0.002	F
N, ORGANIC, TOT(MG/L)	75	0.45	0.24	0.35	0.55	56	0.02	3.85	0.147	
N, NO2+NO3, TOT(MG/L)	76	0.49	0.3	0.4	0.6	55	0.01	3.07	0.003	F
PHOSPHORUS, TOT(MG/L)	76	0.21	0.12	0.17	0.24	55	0.00	-0.06	1.000	F
CARBON, ORG,TOT(MG/L)	75	5.15	4.0	5.0	5.9	56	-0.04	-0.79	0.411	
IRON, DISS (UG/L)	72	140.71	110	140	160	56	-1.09	-0.78	0.455	
MANGANESE, DISS(UG/L)	72	e 51.32	32	50	62	72	0.44	0.85	0.128	
FEC STREP (COL/100ML)	50	1,375.97	78	390	1,300	47	-79.42	-5.77	0.571	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01189995 STATION NAME: FARMINGTON RIVER AT TARIFFVILLE, CT
LATITUDE: 415430 LONGITUDE: 724540 DRAINAGE AREA: 577.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	159	114.93	97	112	132	158	0.69	0.60	0.000	F
TURBIDITY (NTU)	120	1.95	1.0	1.3	2.0	120	-0.11	-5.45	0.008	F
OXYGEN, DISS (MG/L)	158	10.53	8.6	10.2	12.7	157	0.00	0.02	0.986	F
OXYGEN, DISS (% SAT)	158	93.09	88	94	98	157	-0.03	-0.03	0.851	F
PH (STANDARD UNITS)	158	6.91	6.7	6.9	7.1	85	0.01	0.12	0.072	F
CALCIUM, DISS (MG/L)	102	9.06	7.5	8.9	11	70	0.01	0.11	0.685	F
MAGNESIUM, DISS(MG/L)	103	2.00	1.7	2.0	2.3	103	0.01	0.66	0.039	F
CHLORIDE, DISS (MG/L)	156	11.94	9.8	12	14	156	0.18	1.50	0.000	F
SULFATE, DISS (MG/L)	64	11.20	9.7	11	12	64	0.09	0.84	0.279	F
SILICA, DISS (MG/L)	72	6.28	5.6	6.3	6.8	56	0.01	0.23	0.582	
SOLIDS, TOTAL (MG/L)	150	81.69	71	79	92	150	0.13	0.15	0.525	F
SOLIDS, DISS (MG/L)	155	71.21	61	68	79	155	0.33	0.47	0.050	F
NITROGEN, TOT (MG/L)	155	1.33	0.94	1.2	1.5	155	0.03	2.49	0.000	F
N, ORGANIC, TOT(MG/L)	150	0.47	0.24	0.36	0.48	150	0.02	4.42	0.000	
N, NO2+NO3, TOT(MG/L)	153	0.62	0.5	0.6	0.7	153	0.01	1.16	0.000	F
PHOSPHORUS, TOT(MG/L)	155	0.18	0.10	0.15	0.22	155	0.00	-0.40	0.456	F
CARBON, ORG,TOT(MG/L)	156	4.79	3.5	4.3	5.3	156	-0.15	-3.09	0.000	
IRON, DISS (UG/L)	72	141.64	110	130	170	56	-1.06	-0.75	0.289	
MANGANESE, DISS(UG/L)	72	e 47.76	30	40	59	72	0.50	1.05	0.423	
FECAL COL (COL/100ML)	123	1,309.72	92	520	1,200	123	0.00	0.00	0.961	
FEC STREP (COL/100ML)	133	1,440.86	65	310	1,300	133	15.15	1.05	0.863	F

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01190070 STATION NAME: CONNECTICUT RIVER AT HARTFORD, CT
LATITUDE: 414610 LONGITUDE: 724004 DRAINAGE AREA: 10,487.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	140	118.44	102	118	135	0	--	--	--	
TURBIDITY (NTU)	121	2.98	1.0	2.0	3.7	121	-0.36	-11.99	0.000	
OXYGEN, DISS (MG/L)	139	10.64	8.2	10.7	13.2	0	--	--	--	
OXYGEN, DISS (% SAT)	139	93.76	89	94	99	0	--	--	--	
PH (STANDARD UNITS)	140	7.06	6.9	7.1	7.2	0	--	--	--	
CALCIUM, DISS (MG/L)	80	11.53	10	11	13	0	--	--	--	
MAGNESIUM, DISS(MG/L)	80	1.76	1.6	1.8	2.0	0	--	--	--	
CHLORIDE, DISS (MG/L)	139	10.57	8.7	10	13	0	--	--	--	
SILICA, DISS (MG/L)	49	5.12	4.6	5.2	6.1	0	--	--	--	
SOLIDS, TOTAL (MG/L)	134	86.82	77	86	94	0	--	--	--	
SOLIDS, DISS (MG/L)	139	73.91	64	75	83	0	--	--	--	
NITROGEN, TOT (MG/L)	139	0.95	0.70	0.88	1.1	0	--	--	--	
N, ORGANIC, TOT(MG/L)	136	0.43	0.28	0.36	0.52	0	--	--	--	
N, NO2+NO3, TOT(MG/L)	139	0.39	0.3	0.4	0.5	0	--	--	--	
PHOSPHORUS, TOT(MG/L)	139	0.08	0.05	0.07	0.10	0	--	--	--	
CARBON, ORG,TOT(MG/L)	139	4.62	3.7	4.4	5.2	0	--	--	--	
IRON, DISS (UG/L)	49	102.35	69	95	110	0	--	--	--	
MANGANESE, DISS(UG/L)	49	e 21.09	10	19	28	49	-0.00	-0.00	0.066	
FEC STREP (COL/100ML)	136	2,828.99	110	580	2,200	136	-422.21	-14.92	0.000	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01192516 STATION NAME: HOCKANUM RIVER AT EAST HARTFORD, CT
LATITUDE: 414522 LONGITUDE: 723908 DRAINAGE AREA: 76.1 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	163	325.04	270	313	375	162	2.00	0.62	0.206	
TURBIDITY (NTU)	119	6.04	3.0	5.6	9.0	119	-0.21	-3.50	0.118	
OXYGEN, DISS (MG/L)	162	8.47	6.5	7.9	10.7	161	0.01	0.15	0.608	
OXYGEN, DISS (% SAT)	162	76.95	68	77	87	161	0.20	0.26	0.345	
PH (STANDARD UNITS)	163	6.99	6.8	7.0	7.2	162	0.03	0.41	0.000	
CALCIUM, DISS (MG/L)	102	21.75	19	22	25	102	0.14	0.66	0.156	
MAGNESIUM, DISS(MG/L)	102	3.94	3.6	4.0	4.5	102	0.01	0.20	0.623	
CHLORIDE, DISS (MG/L)	160	38.30	31	36	41	160	0.30	0.78	0.046	
SULFATE, DISS (MG/L)	63	31.51	26	32	36	63	0.00	0.00	0.948	
SILICA, DISS (MG/L)	71	10.37	9.1	10	12	55	0.00	0.00	0.775	
SOLIDS, TOTAL (MG/L)	155	217.41	189	218	246	155	1.75	0.80	0.016	
SOLIDS, DISS (MG/L)	160	186.67	163	184	212	160	1.00	0.54	0.080	
NITROGEN, TOT (MG/L)	160	7.08	4.8	6.1	8.0	160	0.07	0.92	0.174	
N, ORGANIC, TOT(MG/L)	160	1.85	0.70	1.0	1.7	160	-0.02	-1.27	0.357	
N, NO2+NO3, TOT(MG/L)	161	1.84	1.4	1.8	2.2	161	0.03	1.53	0.017	
PHOSPHORUS, TOT(MG/L)	160	1.05	0.70	0.97	1.3	160	-0.03	-2.79	0.000	
CARBON, ORG,TOT(MG/L)	157	8.71	6.1	7.7	9.8	157	-0.27	-3.14	0.000	
IRON, DISS (UG/L)	71	175.44	120	170	220	55	-9.48	-5.40	0.000	
MANGANESE, DISS(UG/L)	70	e 193.97	160	190	230	70	-4.55	-2.34	0.010	
FECAL COL (COL/100ML)	122	39,797.66	100	10,000	51,000	66	*******	-11.64	0.002	
FEC STREP (COL/100ML)	135	15,207.49	100	2,000	12,000	135	-434.74	-2.86	0.595	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01192911 STATION NAME: CONNECTICUT RIVER AT MIDDLETOWN, CT
LATITUDE: 413400 LONGITUDE: 723853 DRAINAGE AREA: 10,869.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	169	125.80	110	125	144	162	0.50	0.40	0.173	
TURBIDITY (NTU)	121	3.03	1.5	2.0	4.0	121	-0.32	-10.53	0.000	
OXYGEN, DISS (MG/L)	168	10.57	8.7	10.3	12.8	161	0.03	0.27	0.101	
OXYGEN, DISS (% SAT)	167	95.15	90	95	99	160	0.33	0.35	0.007	
PH (STANDARD UNITS)	169	7.17	6.9	7.1	7.3	162	0.01	0.16	0.042	
CALCIUM, DISS (MG/L)	102	12.24	11	12	13	71	0.01	0.04	0.222	
MAGNESIUM, DISS(MG/L)	101	1.90	1.6	1.9	2.2	71	0.00	0.20	0.403	
CHLORIDE, DISS (MG/L)	162	11.48	9.3	11	14	162	0.08	0.71	0.042	
SULFATE, DISS (MG/L)	64	12.04	11	12	13	64	0.00	0.00	0.506	
SILICA, DISS (MG/L)	72	5.20	4.6	5.3	6.2	56	0.00	0.00	0.912	
SOLIDS, TOTAL (MG/L)	157	90.61	81	90	98	157	-0.20	-0.22	0.381	
SOLIDS, DISS (MG/L)	161	77.70	69	78	87	161	0.13	0.16	0.619	
NITROGEN, TOT (MG/L)	168	1.11	0.86	1.0	1.3	162	0.02	2.02	0.000	
N, ORGANIC, TOT(MG/L)	167	0.48	0.27	0.39	0.60	161	0.01	2.72	0.006	
N, NO2+NO3, TOT(MG/L)	168	0.44	0.4	0.4	0.5	162	0.00	0.45	0.034	
PHOSPHORUS, TOT(MG/L)	167	0.11	0.07	0.10	0.13	162	-0.00	-2.62	0.000	
CARBON, ORG,TOT(MG/L)	161	4.99	3.7	4.6	5.5	161	-0.11	-2.28	0.000	
IRON, DISS (UG/L)	72	106.13	65	100	130	56	-4.22	-3.98	0.001	
MANGANESE, DISS(UG/L)	72	e 23.35	3.0	20	40	72	0.00	0.00	0.178	
FECAL COL (COL/100ML)	123	1,933.31	240	1,000	2,700	123	-76.06	-3.93	0.065	
FEC STREP (COL/100ML)	136	1,556.16	42	400	1,100	136	-10.04	-0.65	0.768	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01193050 STATION NAME: CONNECTICUT RIVER AT MIDDLE HADDAM, CT
LATITUDE: 413230 LONGITUDE: 723313 DRAINAGE AREA: 10,897.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	166	125.13	106	122	143	160	0.46	0.37	0.327	
TURBIDITY (NTU)	118	3.60	1.4	2.6	4.0	118	-0.45	-12.37	0.000	
OXYGEN, DISS (MG/L)	165	10.38	8.2	10.0	12.6	159	0.04	0.39	0.068	
OXYGEN, DISS (% SAT)	165	93.99	87	95	101	159	0.41	0.43	0.039	
PH (STANDARD UNITS)	167	7.13	6.9	7.1	7.3	161	0.02	0.25	0.006	
CALCIUM, DISS (MG/L)	103	12.21	11	12	14	103	0.00	0.00	0.708	
MAGNESIUM, DISS(MG/L)	101	1.96	1.6	2.0	2.2	71	0.00	0.00	0.977	
CHLORIDE, DISS (MG/L)	121	11.88	9.3	12	14	121	0.09	0.76	0.144	
SULFATE, DISS (MG/L)	56	12.43	11	12	14	56	0.00	0.00	0.507	
SILICA, DISS (MG/L)	72	5.14	4.5	5.3	6.4	56	-0.01	-0.22	0.762	
SOLIDS, TOTAL (MG/L)	119	92.71	83	92	101	119	-0.22	-0.24	0.452	
SOLIDS, DISS (MG/L)	122	77.96	69	80	88	122	0.00	0.00	0.961	
NITROGEN, TOT (MG/L)	128	1.13	0.90	1.0	1.3	122	0.02	1.49	0.027	
N, ORGANIC, TOT(MG/L)	125	0.49	0.28	0.38	0.61	119	0.02	3.72	0.010	
N, NO2+NO3, TOT(MG/L)	128	0.45	0.4	0.5	0.5	122	0.00	0.00	0.285	
PHOSPHORUS, TOT(MG/L)	126	0.10	0.08	0.09	0.13	120	-0.00	-3.40	0.000	
CARBON, ORG,TOT(MG/L)	120	5.04	3.6	4.6	5.7	75	-0.10	-1.91	0.066	
IRON, DISS (UG/L)	72	97.88	64	100	130	56	-5.48	-5.60	0.000	
MANGANESE, DISS(UG/L)	72	e 23.70	5.0	20	35	72	-0.04	-0.18	0.005	
FECAL COL (COL/100ML)	122	1,428.39	180	830	2,200	122	-60.78	-4.26	0.112	
FEC STREP (COL/100ML)	111	985.56	31	210	860	66	-38.83	-3.94	0.590	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01193500 STATION NAME: SALMON RIVER NEAR EAST HAMPTON, CT
LATITUDE: 413308 LONGITUDE: 722659 DRAINAGE AREA: 100.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	164	95.72	83	94	106	162	1.01	1.06	0.000	F
TURBIDITY (NTU)	120	1.43	0.8	1.0	1.7	120	-0.09	-6.62	0.000	F
OXYGEN, DISS (MG/L)	164	11.61	9.7	11.4	13.8	162	0.04	0.33	0.062	F
OXYGEN, DISS (% SAT)	164	102.85	100	102	106	162	0.00	0.00	0.655	
PH (STANDARD UNITS)	164	7.11	6.8	7.1	7.4	162	-0.01	-0.20	0.092	F
CALCIUM, DISS (MG/L)	102	5.88	5.1	5.8	6.6	102	0.05	0.83	0.013	F
MAGNESIUM, DISS(MG/L)	101	1.65	1.5	1.6	1.8	101	0.02	1.27	0.000	F
CHLORIDE, DISS (MG/L)	159	12.65	10	12	15	159	0.13	1.04	0.001	F
SULFATE, DISS (MG/L)	63	11.15	9.5	11	12	63	0.10	0.90	0.059	
SILICA, DISS (MG/L)	72	8.21	7.3	8.2	9.2	56	-0.09	-1.09	0.002	F
SOLIDS, TOTAL (MG/L)	154	69.95	61	69	79	154	-0.07	-0.10	0.713	F
SOLIDS, DISS (MG/L)	155	64.05	56	64	71	155	0.06	0.10	0.602	F
NITROGEN, TOT (MG/L)	155	0.67	0.45	0.60	0.78	155	0.03	4.35	0.000	F
N, ORGANIC, TOT(MG/L)	142	0.33	0.18	0.26	0.45	81	0.03	8.69	0.000	
N, NO2+NO3, TOT(MG/L)	162	0.26	0.2	0.2	0.3	162	0.00	1.67	0.012	F
PHOSPHORUS, TOT(MG/L)	162	0.03	0.01	0.01	0.03	162	-0.00	-0.90	0.077	F
CARBON, ORG,TOT(MG/L)	157	4.56	3.1	4.1	5.3	157	-0.09	-1.99	0.003	F
IRON, DISS (UG/L)	71	145.96	80	140	190	55	0.00	0.00	0.821	
MANGANESE, DISS(UG/L)	72	e 17.57	4.0	14	22	72	0.00	0.00	0.660	
FECAL COL (COL/100ML)	123	213.16	16	42	100	123	-4.80	-2.25	0.452	
FEC STREP (COL/100ML)	137	982.12	14	42	210	137	-33.43	-3.40	0.589	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01193750 STATION NAME: CONNECTICUT RIVER AT EAST HADDAM, CT
LATITUDE: 412705 LONGITUDE: 722755 DRAINAGE AREA: 11,092.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	142	123.57	106	124	138	85	0.04	0.03	0.809	
TURBIDITY (NTU)	92	3.83	1.8	3.0	5.0	64	-0.48	-12.64	0.000	
OXYGEN, DISS (MG/L)	141	10.18	8.1	9.6	12.7	85	0.03	0.30	0.538	
OXYGEN, DISS (% SAT)	140	91.84	85	92	99	85	0.48	0.52	0.082	
PH (STANDARD UNITS)	142	7.12	6.9	7.1	7.3	85	0.02	0.28	0.017	
CALCIUM, DISS (MG/L)	80	11.67	10	12	13	69	0.00	0.00	0.502	
MAGNESIUM, DISS(MG/L)	80	1.97	1.7	2.0	2.2	69	0.00	0.00	0.571	
CHLORIDE, DISS (MG/L)	132	11.91	9.3	11	14	85	0.10	0.80	0.162	
SULFATE, DISS (MG/L)	64	12.09	10	12	13	64	0.00	0.00	0.842	
SILICA, DISS (MG/L)	72	5.18	4.4	5.4	6.4	56	0.00	0.09	0.848	
SOLIDS, TOTAL (MG/L)	123	90.91	80	89	99	83	0.00	0.00	0.750	
SOLIDS, DISS (MG/L)	130	77.15	67	78	88	85	0.31	0.40	0.391	
NITROGEN, TOT (MG/L)	141	1.09	0.89	1.0	1.3	85	0.02	1.76	0.003	
N, ORGANIC, TOT(MG/L)	139	0.48	0.29	0.44	0.62	84	0.01	3.01	0.006	
N, NO2+NO3, TOT(MG/L)	141	0.44	0.4	0.4	0.5	85	0.00	0.00	0.563	
PHOSPHORUS, TOT(MG/L)	140	0.10	0.08	0.10	0.12	85	-0.00	-2.54	0.004	
CARBON, ORG,TOT(MG/L)	129	5.23	3.8	4.6	6.0	84	-0.15	-2.78	0.002	
IRON, DISS (UG/L)	72	99.26	57	91	130	56	-3.14	-3.16	0.002	
MANGANESE, DISS(UG/L)	72	e 21.77	2.0	20	34	72	0.00	0.00	0.108	
FECAL COL (COL/100ML)	93	1,110.80	57	420	990	66	-47.29	-4.26	0.325	
FEC STREP (COL/100ML)	106	706.75	16	140	480	71	-28.46	-4.03	0.407	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01196222 STATION NAME: QUINNIPIAC RIVER NEAR MERIDEN, CT
LATITUDE: 413145 LONGITUDE: 725150 DRAINAGE AREA: 69.6 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	162	261.01	210	260	310	157	4.26	1.63	0.000	F
TURBIDITY (NTU)	121	3.78	2.0	3.0	5.0	116	-0.24	-6.23	0.001	F
OXYGEN, DISS (MG/L)	160	8.97	6.8	8.6	11.9	155	0.13	1.44	0.000	F
OXYGEN, DISS (% SAT)	160	78.54	67	81	93	155	0.86	1.09	0.001	F
PH (STANDARD UNITS)	161	7.13	6.9	7.2	7.3	161	0.04	0.53	0.000	
CALCIUM, DISS (MG/L)	104	25.72	22	26	30	102	0.38	1.49	0.000	F
MAGNESIUM, DISS(MG/L)	104	4.10	3.7	4.1	4.6	102	0.05	1.22	0.000	F
CHLORIDE, DISS (MG/L)	159	23.21	19	22	27	154	0.51	2.19	0.000	F
SULFATE, DISS (MG/L)	64	21.27	18	21	24	64	-0.04	-0.18	0.849	F
SILICA, DISS (MG/L)	73	11.01	9.6	11	13	55	0.03	0.29	0.369	F
SOLIDS, TOTAL (MG/L)	159	173.52	148	171	200	155	2.01	1.16	0.000	F
SOLIDS, DISS (MG/L)	161	157.04	132	159	182	156	1.81	1.16	0.000	F
NITROGEN, TOT (MG/L)	162	3.09	2.0	2.8	3.8	157	0.09	2.83	0.000	F
N, ORGANIC, TOT(MG/L)	161	0.63	0.30	0.47	0.65	156	0.02	2.92	0.006	F
N, NO2+NO3, TOT(MG/L)	162	1.67	1.1	1.6	2.0	157	0.05	3.13	0.000	F
PHOSPHORUS, TOT(MG/L)	162	0.54	0.29	0.46	0.75	157	-0.01	-1.40	0.027	F
CARBON, ORG,TOT(MG/L)	159	5.23	3.7	4.9	6.1	159	-0.20	-3.84	0.000	
IRON, DISS (UG/L)	72	116.42	77	110	160	55	-1.49	-1.28	0.116	F
MANGANESE, DISS(UG/L)	72	e 124.53	90	120	160	72	0.00	0.00	0.869	
FECAL COL (COL/100ML)	123	10,169.91	150	650	4,700	123	-715.72	-7.04	0.146	
FEC STREP (COL/100ML)	137	4,160.31	110	600	3,500	137	-132.46	-3.18	0.480	**

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01196500 STATION NAME: QUINNIPIAC RIVER AT WALLINGFORD, CT
LATITUDE: 412658 LONGITUDE: 725029 DRAINAGE AREA: 115.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	168	293.30	247	293	332	162	1.68	0.57	0.039	F
TURBIDITY (NTU)	121	5.45	2.0	4.0	7.0	121	-0.49	-9.02	0.000	F
OXYGEN, DISS (MG/L)	165	10.26	8.5	10.0	12.4	159	0.12	1.16	0.000	F
OXYGEN, DISS (% SAT)	165	93.66	87	95	100	159	0.67	0.71	0.000	**
PH (STANDARD UNITS)	167	7.26	7.0	7.3	7.5	161	0.04	0.60	0.000	F
CALCIUM, DISS (MG/L)	103	27.56	23	28	31	71	0.23	0.84	0.010	F
MAGNESIUM, DISS(MG/L)	103	5.12	4.4	5.3	5.9	71	0.02	0.42	0.221	F
CHLORIDE, DISS (MG/L)	160	27.50	22	26	31	160	0.35	1.28	0.000	F
SULFATE, DISS (MG/L)	64	23.98	21	23	26	64	0.07	0.31	0.484	F
SILICA, DISS (MG/L)	72	10.30	9.0	11	12	56	-0.05	-0.45	0.311	F
SOLIDS, TOTAL (MG/L)	159	195.28	169	197	222	159	0.14	0.07	0.724	F
SOLIDS, DISS (MG/L)	162	174.38	150	177	199	162	0.69	0.40	0.026	F
NITROGEN, TOT (MG/L)	168	3.39	2.5	3.3	4.0	162	0.00	0.14	0.731	F
N, ORGANIC, TOT(MG/L)	167	0.66	0.40	0.60	0.80	161	0.00	-0.06	0.716	
N, NO2+NO3, TOT(MG/L)	168	1.94	1.3	1.7	2.5	162	0.08	4.33	0.000	F
PHOSPHORUS, TOT(MG/L)	168	0.51	0.30	0.47	0.68	162	-0.02	-3.31	0.000	F
CARBON, ORG,TOT(MG/L)	160	5.79	4.3	5.5	7.0	160	-0.27	-4.62	0.000	
IRON, DISS (UG/L)	72	108.60	55	95	150	56	-4.19	-3.86	0.067	F
MANGANESE, DISS(UG/L)	72	e 159.36	110	160	200	72	-4.81	-3.02	0.018	
FECAL COL (COL/100ML)	123	4,140.54	400	940	4,400	123	-237.76	-5.74	0.059	F
FEC STREP (COL/100ML)	137	3,818.80	120	580	3,200	137	-353.66	-9.26	0.044	F

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01196530 STATION NAME: QUINNIPIAC RIVER AT NORTH HAVEN, CT
LATITUDE: 412324 LONGITUDE: 725219 DRAINAGE AREA: 128.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	168	323.15	267	320	370	162	5.00	1.55	0.001	
TURBIDITY (NTU)	121	5.91	2.3	5.0	8.0	121	-0.60	-10.17	0.000	
OXYGEN, DISS (MG/L)	166	7.92	5.1	7.9	10.6	160	-0.02	-0.28	0.573	
OXYGEN, DISS (% SAT)	166	70.29	56	72	88	160	-0.17	-0.24	0.642	
PH (STANDARD UNITS)	167	7.13	6.9	7.2	7.3	161	0.02	0.35	0.000	
CALCIUM, DISS (MG/L)	104	29.21	25	30	34	104	0.33	1.14	0.031	
MAGNESIUM, DISS(MG/L)	104	5.53	4.7	5.6	6.4	104	0.03	0.60	0.355	
CHLORIDE, DISS (MG/L)	161	31.62	25	30	36	161	0.25	0.79	0.214	
SULFATE, DISS (MG/L)	64	27.98	24	27	31	64	-0.37	-1.31	0.155	
SILICA, DISS (MG/L)	72	10.28	9.2	11	12	56	0.03	0.26	0.252	
SOLIDS, TOTAL (MG/L)	161	219.02	188	214	252	161	1.35	0.62	0.083	
SOLIDS, DISS (MG/L)	153	194.52	159	197	225	84	2.82	1.45	0.030	
NITROGEN, TOT (MG/L)	167	6.51	4.2	5.7	7.6	161	0.26	3.98	0.000	
N, ORGANIC, TOT(MG/L)	164	3.08	1.7	2.5	3.7	158	0.22	7.12	0.000	
N, NO2+NO3, TOT(MG/L)	168	2.25	1.6	2.0	2.6	162	0.11	4.77	0.000	
PHOSPHORUS, TOT(MG/L)	168	0.62	0.42	0.55	0.80	162	0.00	-0.58	0.470	
CARBON, ORG,TOT(MG/L)	161	8.83	6.4	8.5	10	161	-0.04	-0.46	0.456	
IRON, DISS (UG/L)	72	106.29	60	90	130	56	-7.38	-6.94	0.000	
MANGANESE, DISS(UG/L)	72	e 176.10	120	180	220	72	-3.76	-2.14	0.088	
FECAL COL (COL/100ML)	123	8,195.99	600	3,100	12,000	123	-151.00	-1.84	0.577	
FEC STREP (COL/100ML)	136	4,728.23	230	1,400	5,700	136	-25.50	-0.54	0.834	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01196656 STATION NAME: NEW HAVEN HARBOR NEAR NEW HAVEN, CT
LATITUDE: 411611 LONGITUDE: 725444 DRAINAGE AREA: 241.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	72	36,343.05	34,500	37,900	40,700	55	75.00	0.21	0.554	
TURBIDITY (NTU)	43	3.12	1.6	2.5	4.0	43	-0.29	-9.43	0.007	
OXYGEN, DISS (MG/L)	72	9.46	7.7	9.6	11.3	55	0.10	1.06	0.091	
OXYGEN, DISS (% SAT)	72	94.03	84	95	103	55	1.60	1.70	0.007	
PH (STANDARD UNITS)	73	7.83	7.7	7.8	8.0	56	0.00	0.00	0.656	
CALCIUM, DISS (MG/L)	70	271.84	250	290	300	55	0.00	0.00	0.609	
MAGNESIUM, DISS(MG/L)	70	909.57	860	940	980	55	0.00	0.00	0.713	
CHLORIDE, DISS (MG/L)	70	13,798.14	13,000	14,000	15,000	54	111.11	0.81	0.002	
SILICA, DISS (MG/L)	69	1.30	0.6	1.2	2.0	53	0.01	0.96	0.613	
SOLIDS, TOTAL (MG/L)	73	29,393.15	27,100	29,400	31,000	56	105.56	0.36	0.217	
SOLIDS, DISS (MG/L)	71	27,160.56	26,000	27,600	28,500	54	25.00	0.09	0.708	
N, ORGANIC, TOT(MG/L)	72	0.41	0.21	0.39	0.59	55	0.01	1.29	0.673	
N, NO2+NO3, TOT(MG/L)	73	0.15	--	--	0.3	56	0.00	0.00	0.151	
PHOSPHORUS, TOT(MG/L)	73	0.16	0.12	0.15	0.18	56	-0.01	-3.28	0.000	
CARBON, ORG,TOT(MG/L)	72	4.39	2.6	3.6	5.3	55	-0.24	-5.43	0.003	
IRON, DISS (UG/L)	70	149.29	98	120	160	54	1.45	0.97	0.487	
MANGANESE, DISS(UG/L)	71	e 67.40	50	70	80	71	-1.43	-2.12	0.036	
FEC STREP (COL/100ML)	48	271.35	6	16	72	48	-31.97	-11.78	0.228	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01198550 STATION NAME: HOUSATONIC RIVER NEAR CANAAN, CT
LATITUDE: 420017 LONGITUDE: 732127 DRAINAGE AREA: 586.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	107	264.87	230	270	300	0	--	--	--	
TURBIDITY (NTU)	66	4.65	2.0	4.0	5.0	0	--	--	--	
OXYGEN, DISS (MG/L)	105	11.39	9.5	11.5	13.3	0	--	--	--	
OXYGEN, DISS (% SAT)	105	99.09	90	98	104	0	--	--	--	
PH (STANDARD UNITS)	107	7.58	7.3	7.6	7.8	0	--	--	--	
CALCIUM, DISS (MG/L)	51	27.65	26	28	31	0	--	--	--	
MAGNESIUM, DISS(MG/L)	51	9.71	8.5	9.6	11	0	--	--	--	
CHLORIDE, DISS (MG/L)	106	14.38	11	14	17	0	--	--	--	
SULFATE, DISS (MG/L)	64	14.53	12	14	17	64	0.27	1.89	0.013	F
SILICA, DISS (MG/L)	52	3.46	2.6	3.8	4.3	0	--	--	--	
SOLIDS, TOTAL (MG/L)	104	169.82	152	165	185	0	--	--	--	
SOLIDS, DISS (MG/L)	105	152.97	131	152	176	0	--	--	--	
NITROGEN, TOT (MG/L)	107	1.11	0.78	0.96	1.2	0	--	--	--	
N, ORGANIC, TOT(MG/L)	104	0.53	0.27	0.43	0.63	0	--	--	--	
N, NO2+NO3, TOT(MG/L)	107	0.48	0.3	0.4	0.6	0	--	--	--	
PHOSPHORUS, TOT(MG/L)	107	0.09	0.07	0.08	0.11	0	--	--	--	
CARBON, ORG,TOT(MG/L)	105	4.91	3.4	4.6	5.9	0	--	--	--	
IRON, DISS (UG/L)	51	71.82	50	62	90	0	--	--	--	
MANGANESE, DISS(UG/L)	51	e 31.74	20	30	41	0	--	--	--	
FECAL COL (COL/100ML)	68	348.53	66	140	360	0	--	--	--	
FEC STREP (COL/100ML)	82	1,689.27	31	120	720	0	--	--	--	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01200600 STATION NAME: HOUSATONIC RIVER NEAR NEW MILFORD, CT
LATITUDE: 413535 LONGITUDE: 732700 DRAINAGE AREA: 1,022.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	163	268.73	240	270	300	161	0.83	0.31	0.109	F
TURBIDITY (NTU)	120	3.87	1.3	2.0	4.0	119	-0.44	-11.42	0.000	F
OXYGEN, DISS (MG/L)	162	11.92	10.0	12.2	13.8	160	0.05	0.43	0.143	F
OXYGEN, DISS (% SAT)	162	105.90	100	104	113	160	0.34	0.32	0.152	F
PH (STANDARD UNITS)	163	8.04	7.8	8.1	8.4	161	0.02	0.23	0.008	F
CALCIUM, DISS (MG/L)	104	29.42	27	30	32	103	0.14	0.49	0.006	F
MAGNESIUM, DISS(MG/L)	104	11.03	9.8	11	12	103	0.04	0.37	0.061	F
CHLORIDE, DISS (MG/L)	162	13.54	11	13	16	161	0.33	2.46	0.000	F
SULFATE, DISS (MG/L)	64	14.09	12	14	16	64	0.33	2.36	0.001	F
SILICA, DISS (MG/L)	71	3.52	2.6	3.8	4.5	54	0.01	0.34	0.795	F
SOLIDS, TOTAL (MG/L)	156	171.90	153	171	186	155	0.47	0.27	0.130	F
SOLIDS, DISS (MG/L)	162	153.44	136	155	170	161	0.25	0.17	0.241	F
NITROGEN, TOT (MG/L)	152	1.00	0.73	0.86	1.1	152	0.02	2.07	0.000	
N, ORGANIC, TOT(MG/L)	145	0.53	0.27	0.41	0.67	82	0.02	3.20	0.008	F
N, NO2+NO3, TOT(MG/L)	162	0.41	0.3	0.4	0.5	161	0.01	2.58	0.000	F
PHOSPHORUS, TOT(MG/L)	162	0.06	0.03	0.05	0.07	162	-0.00	-3.65	0.000	
CARBON, ORG,TOT(MG/L)	160	4.80	3.3	4.3	5.8	160	-0.19	-3.98	0.000	
IRON, DISS (UG/L)	72	47.99	25	40	60	55	-2.31	-4.82	0.000	F
MANGANESE, DISS(UG/L)	72	e 12.04	3.0	9.0	20	72	0.00	0.00	0.261	
FECAL COL (COL/100ML)	122	363.03	13	40	110	120	-11.37	-3.13	0.185	F
FEC STREP (COL/100ML)	136	704.25	9	34	210	134	38.18	5.42	0.368	F

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01201485 STATION NAME: STILL RIVER AT BROOKFIELD CENTER, CT
LATITUDE: 412723 LONGITUDE: 732347 DRAINAGE AREA: 60.6 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	161	423.88	340	410	510	159	9.58	2.26	0.000	F
TURBIDITY (NTU)	120	4.35	2.0	3.1	5.0	120	-0.43	-9.91	0.000	
OXYGEN, DISS (MG/L)	162	9.00	6.0	9.3	11.8	160	-0.11	-1.26	0.006	F
OXYGEN, DISS (% SAT)	162	79.10	65	83	94	160	-1.07	-1.35	0.000	F
PH (STANDARD UNITS)	163	7.29	7.1	7.3	7.5	162	0.02	0.26	0.001	
CALCIUM, DISS (MG/L)	103	34.11	29	35	39	102	0.35	1.02	0.000	F
MAGNESIUM, DISS(MG/L)	104	11.45	9.8	12	13	103	0.13	1.18	0.000	F
CHLORIDE, DISS (MG/L)	160	42.38	27	38	54	159	1.84	4.35	0.000	F
SULFATE, DISS (MG/L)	64	30.38	23	28	37	64	1.51	4.96	0.000	F
SILICA, DISS (MG/L)	72	8.06	7.0	8.3	9.2	56	0.00	0.00	0.912	
SOLIDS, TOTAL (MG/L)	157	276.31	219	265	323	156	4.38	1.59	0.000	F
SOLIDS, DISS (MG/L)	161	245.82	193	239	288	160	4.84	1.97	0.000	F
NITROGEN, TOT (MG/L)	159	4.87	2.5	3.8	6.1	158	0.12	2.55	0.000	F
N, ORGANIC, TOT(MG/L)	157	1.26	0.44	0.70	1.0	156	0.02	1.58	0.070	F
N, NO2+NO3, TOT(MG/L)	162	1.41	0.9	1.1	1.7	161	-0.02	-1.23	0.039	F
PHOSPHORUS, TOT(MG/L)	161	0.56	0.30	0.43	0.64	160	0.00	0.83	0.405	F
CARBON, ORG,TOT(MG/L)	161	7.68	5.9	7.3	8.7	160	-0.15	-1.98	0.001	F
IRON, DISS (UG/L)	71	93.83	60	80	130	54	-0.67	-0.71	0.624	F
MANGANESE, DISS(UG/L)	72	e 124.57	85	120	160	72	2.61	2.10	0.124	
FECAL COL (COL/100ML)	122	3,468.25	99	250	650	122	189.94	5.48	0.221	
FEC STREP (COL/100ML)	136	1,349.36	49	150	540	136	217.53	16.12	0.000	**

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01201700 STATION NAME: LAKE LILLINONAH NEAR BROOKFIELD CENTER, CT
LATITUDE: 412847 LONGITUDE: 732104 DRAINAGE AREA: 1,214.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	131	231.31	208	238	260	85	2.00	0.86	0.014	
TURBIDITY (NTU)	91	2.94	1.1	2.0	4.0	64	-0.17	-5.83	0.004	
OXYGEN, DISS (MG/L)	130	10.96	9.2	11.2	13.1	85	0.09	0.86	0.099	
OXYGEN, DISS (% SAT)	130	100.38	87	98	107	85	1.00	1.00	0.014	
PH (STANDARD UNITS)	131	7.85	7.4	7.8	8.4	85	0.03	0.42	0.019	
CALCIUM, DISS (MG/L)	81	24.07	22	25	27	70	0.10	0.42	0.288	
MAGNESIUM, DISS(MG/L)	81	9.10	8.3	9.5	11	70	0.05	0.60	0.044	
CHLORIDE, DISS (MG/L)	130	13.44	11	13	16	84	0.42	3.10	0.000	
SULFATE, DISS (MG/L)	64	14.13	12	14	16	64	0.17	1.18	0.063	
SILICA, DISS (MG/L)	70	2.97	1.3	2.9	4.5	54	-0.01	-0.49	0.773	
SOLIDS, TOTAL (MG/L)	127	142.57	131	147	157	84	0.33	0.23	0.294	
SOLIDS, DISS (MG/L)	128	132.11	119	136	150	85	1.00	0.76	0.021	
NITROGEN, TOT (MG/L)	120	0.95	0.75	0.86	1.0	77	0.02	1.98	0.002	
N, ORGANIC, TOT(MG/L)	125	0.50	0.28	0.40	0.64	81	0.03	5.20	0.000	
N, NO2+NO3, TOT(MG/L)	130	0.33	0.2	0.3	0.5	85	0.00	0.00	0.548	
PHOSPHORUS, TOT(MG/L)	130	0.06	0.04	0.05	0.06	85	-0.00	-3.65	0.000	
CARBON, ORG,TOT(MG/L)	129	5.05	3.4	4.6	6.3	85	-0.12	-2.31	0.010	
IRON, DISS (UG/L)	72	39.06	16	35	50	56	-3.50	-8.97	0.000	
MANGANESE, DISS(UG/L)	72	e 10.15	e 10	2.0	20	72	-0.00	-0.00	0.083	
FECAL COL (COL/100ML)	93	32.81	2	7	21	66	-3.11	-9.47	0.048	
FEC STREP (COL/100ML)	105	110.81	1	6	27	71	0.00	0.00	0.488	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01203000 STATION NAME: SHEPAUG RIVER NEAR ROXBURY, CT
LATITUDE: 413259 LONGITUDE: 731949 DRAINAGE AREA: 132.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	163	114.62	101	113	128	161	0.44	0.38	0.046	F
TURBIDITY (NTU)	120	1.96	1.0	1.8	2.5	119	-0.05	-2.49	0.115	F
OXYGEN, DISS (MG/L)	163	11.84	9.8	12.1	13.7	161	0.01	0.07	0.656	F
OXYGEN, DISS (% SAT)	162	103.61	99	104	108	161	0.25	0.24	0.046	
PH (STANDARD UNITS)	163	7.48	7.1	7.4	7.8	161	0.02	0.23	0.020	F
CALCIUM, DISS (MG/L)	104	9.89	8.8	9.9	11	103	0.02	0.21	0.276	F
MAGNESIUM, DISS(MG/L)	104	3.75	3.4	3.8	4.2	103	0.02	0.54	0.023	F
CHLORIDE, DISS (MG/L)	162	9.29	7.6	9.4	11	161	0.13	1.38	0.000	F
SULFATE, DISS (MG/L)	64	10.37	9.0	10	11	64	0.25	2.41	0.001	
SILICA, DISS (MG/L)	72	3.96	2.7	4.1	5.2	55	0.05	1.37	0.178	F
SOLIDS, TOTAL (MG/L)	158	79.70	71	80	87	157	-0.02	-0.02	0.918	F
SOLIDS, DISS (MG/L)	158	70.34	62	70	79	157	0.11	0.16	0.338	F
NITROGEN, TOT (MG/L)	146	0.73	0.50	0.65	0.80	80	0.02	2.79	0.003	
N, ORGANIC, TOT(MG/L)	147	0.43	0.25	0.34	0.51	81	0.02	3.72	0.018	F
N, NO2+NO3, TOT(MG/L)	162	0.23	0.1	0.2	0.3	161	0.00	0.12	0.908	F
PHOSPHORUS, TOT(MG/L)	162	0.04	0.02	0.03	0.04	162	0.00	0.00	1.000	
CARBON, ORG,TOT(MG/L)	160	5.07	3.8	4.8	5.7	160	-0.13	-2.65	0.000	**
IRON, DISS (UG/L)	72	79.99	59	77	96	56	-0.56	-0.71	0.564	
MANGANESE, DISS(UG/L)	72	e 12.07	e 10	8.0	20	72	0.00	0.00	0.377	
FECAL COL (COL/100ML)	123	213.34	12	44	120	123	8.08	3.79	0.498	
FEC STREP (COL/100ML)	135	558.01	10	45	220	135	60.41	10.83	0.043	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01204510 STATION NAME: LAKE ZOAR AT RIVERSIDE, CT
LATITUDE: 412621 LONGITUDE: 731453 DRAINAGE AREA: 1,511.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	132	230.23	205	234	262	85	3.33	1.45	0.003	
TURBIDITY (NTU)	91	2.61	1.0	2.0	3.0	64	-0.24	-9.14	0.004	
OXYGEN, DISS (MG/L)	132	9.56	7.2	10.4	13.1	85	0.05	0.52	0.343	
OXYGEN, DISS (% SAT)	132	81.83	71	92	100	85	0.50	0.61	0.172	
PH (STANDARD UNITS)	132	7.44	7.1	7.4	7.7	85	0.03	0.45	0.001	
CALCIUM, DISS (MG/L)	80	24.20	22	25	27	69	0.15	0.64	0.067	
MAGNESIUM, DISS(MG/L)	80	8.83	7.7	8.8	10	69	0.10	1.13	0.031	
CHLORIDE, DISS (MG/L)	132	13.36	11	13	16	85	0.55	4.08	0.000	
SULFATE, DISS (MG/L)	64	13.95	12	13	16	64	0.27	1.92	0.034	
SILICA, DISS (MG/L)	71	3.76	2.5	3.8	4.9	55	-0.04	-1.06	0.555	
SOLIDS, TOTAL (MG/L)	131	143.73	126	145	160	85	1.55	1.08	0.002	
SOLIDS, DISS (MG/L)	127	131.54	115	134	148	85	1.45	1.10	0.008	
NITROGEN, TOT (MG/L)	129	0.99	0.77	0.90	1.1	83	0.03	2.97	0.000	
N, ORGANIC, TOT(MG/L)	129	0.41	0.25	0.34	0.50	83	0.02	4.40	0.004	
N, NO2+NO3, TOT(MG/L)	130	0.42	0.3	0.4	0.5	85	0.00	0.88	0.223	
PHOSPHORUS, TOT(MG/L)	131	0.06	0.04	0.05	0.07	85	-0.00	-1.67	0.050	
CARBON, ORG,TOT(MG/L)	131	4.89	3.4	4.3	5.9	85	-0.13	-2.62	0.017	
IRON, DISS (UG/L)	72	46.89	24	40	60	56	-3.44	-7.35	0.000	
MANGANESE, DISS(UG/L)	72	e 19.80	7.0	18	23	72	0.00	0.00	0.818	
FECAL COL (COL/100ML)	93	82.86	7	18	40	66	-5.35	-6.46	0.029	
FEC STREP (COL/100ML)	106	551.14	4	18	85	71	-32.45	-5.89	0.391	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01205500 STATION NAME: HOUSATONIC RIVER AT STEVENSON, CT
LATITUDE: 412302 LONGITUDE: 731005 DRAINAGE AREA: 1,544.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	167	223.80	197	225	252	161	1.98	0.88	0.001	F
TURBIDITY (NTU)	121	2.35	1.1	2.0	3.0	121	-0.23	-9.93	0.000	F
OXYGEN, DISS (MG/L)	168	10.05	7.8	10.3	13.0	162	0.02	0.18	0.534	F
OXYGEN, DISS (% SAT)	168	89.51	78	94	102	162	0.31	0.35	0.191	F
PH (STANDARD UNITS)	168	7.54	7.2	7.6	7.8	162	0.04	0.53	0.000	
CALCIUM, DISS (MG/L)	147	23.02	21	23	26	147	0.18	0.79	0.006	F
MAGNESIUM, DISS(MG/L)	147	8.34	7.3	8.4	9.5	147	0.08	1.01	0.003	F
CHLORIDE, DISS (MG/L)	160	13.16	11	13	16	160	0.37	2.85	0.000	F
SULFATE, DISS (MG/L)	93	13.66	12	13	15	93	0.21	1.54	0.005	F
SILICA, DISS (MG/L)	124	3.51	2.2	3.4	4.9	85	-0.01	-0.40	0.677	F
SOLIDS, TOTAL (MG/L)	154	139.35	121	140	155	154	0.83	0.59	0.013	F
SOLIDS, DISS (MG/L)	154	129.41	115	130	147	154	0.73	0.56	0.029	F
NITROGEN, TOT (MG/L)	161	1.01	0.73	0.90	1.1	157	0.03	2.88	0.000	
N, ORGANIC, TOT(MG/L)	158	0.48	0.27	0.39	0.56	154	0.03	5.89	0.000	
N, NO2+NO3, TOT(MG/L)	165	0.41	0.3	0.4	0.5	160	0.01	1.33	0.002	**
N, AMMONIA, DIS(MG/L)	119	e 0.11	0.05	0.08	0.13	119	0.00	-1.87	0.121	
PHOSPHORUS, TOT(MG/L)	166	0.05	0.03	0.04	0.05	161	-0.00	-3.15	0.000	F
CARBON, ORG,TOT(MG/L)	153	4.62	3.3	4.2	5.3	153	-0.15	-3.18	0.000	
IRON, DISS (UG/L)	77	37.81	19	30	60	56	-2.17	-5.73	0.001	F
MANGANESE, DISS(UG/L)	76	e 14.08	2.0	8.0	20	76	-0.00	-0.00	0.026	
FECAL COL (COL/100ML)	121	27.06	3	8	23	121	-0.61	-2.26	0.298	F
FEC STREP (COL/100ML)	137	179.41	2	11	42	137	-1.54	-0.86	0.884	F
SEDIMENT, SUSP (MG/L)	78	9.87	3	7	13	61	0.00	0.00	0.668	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01208500 STATION NAME: NAUGATUCK RIVER AT BEACON FALLS, CT
LATITUDE: 412632 LONGITUDE: 730347 DRAINAGE AREA: 260.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	169	294.33	195	256	370	162	4.08	1.39	0.000	F
TURBIDITY (NTU)	121	4.60	1.7	3.0	5.0	121	-0.63	-13.67	0.000	F
OXYGEN, DISS (MG/L)	168	11.09	9.3	11.2	13.0	161	0.06	0.57	0.003	F
OXYGEN, DISS (% SAT)	166	101.83	97	101	106	159	0.50	0.49	0.002	
PH (STANDARD UNITS)	168	7.15	6.9	7.1	7.4	161	0.01	0.16	0.133	F
CALCIUM, DISS (MG/L)	103	15.23	11	14	19	103	0.13	0.84	0.003	F
MAGNESIUM, DISS(MG/L)	104	3.09	2.6	3.0	3.7	104	0.03	1.11	0.001	F
CHLORIDE, DISS (MG/L)	161	42.08	27	39	53	161	1.27	3.03	0.000	F
SULFATE, DISS (MG/L)	64	27.82	20	25	33	64	0.22	0.80	0.143	F
SILICA, DISS (MG/L)	72	6.79	5.9	6.7	7.7	56	-0.03	-0.45	0.338	F
SOLIDS, TOTAL (MG/L)	159	184.29	127	166	234	159	2.30	1.25	0.000	F
SOLIDS, DISS (MG/L)	162	162.91	112	143	213	162	2.08	1.27	0.000	F
NITROGEN, TOT (MG/L)	164	4.25	2.2	3.4	5.7	160	0.11	2.50	0.000	F
N, ORGANIC, TOT(MG/L)	163	1.09	0.41	0.70	1.1	159	0.00	0.29	0.524	F
N, N02+N03, TOT(MG/L)	167	1.67	0.9	1.3	2.2	162	0.05	3.00	0.000	F
PHOSPHORUS, TOT(MG/L)	168	0.53	0.22	0.40	0.67	162	-0.01	-0.97	0.116	F
CARBON, ORG,TOT(MG/L)	160	6.71	4.8	6.3	8.2	160	-0.21	-3.09	0.000	F
IRON, DISS (UG/L)	72	195.94	130	180	230	56	-7.24	-3.70	0.002	F
MANGANESE, DISS(UG/L)	71	e 141.20	100	140	170	71	-0.83	-0.59	0.461	
FECAL COL (COL/100ML)	122	3,902.45	220	910	4,300	66	431.73	11.06	0.113	F
FEC STREP (COL/100ML)	136	2,655.88	69	610	2,100	136	205.63	7.74	0.044	F

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01208736 STATION NAME: NAUGATUCK RIVER AT ANSONIA, CT
LATITUDE: 411950 LONGITUDE: 730447 DRAINAGE AREA: 309.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	162	269.42	195	250	350	161	6.20	2.30	0.000	
TURBIDITY (NTU)	119	4.14	1.5	2.9	5.0	119	-0.53	-12.93	0.000	
OXYGEN, DISS (MG/L)	162	10.82	9.0	10.8	13.1	161	-0.03	-0.29	0.305	
OXYGEN, DISS (% SAT)	162	98.55	94	100	105	161	-0.11	-0.11	0.370	
PH (STANDARD UNITS)	161	7.03	6.8	7.0	7.2	160	0.02	0.24	0.009	
CALCIUM, DISS (MG/L)	104	14.64	11	14	18	104	0.33	2.28	0.000	
MAGNESIUM, DISS(MG/L)	104	3.05	2.7	3.0	3.6	104	0.06	1.92	0.000	
CHLORIDE, DISS (MG/L)	161	37.94	25	35	50	161	1.50	3.95	0.000	
SULFATE, DISS (MG/L)	64	28.40	22	26	36	64	0.37	1.29	0.336	
SILICA, DISS (MG/L)	72	7.16	6.2	7.1	8.0	56	-0.09	-1.19	0.006	
SOLIDS, TOTAL (MG/L)	159	173.36	128	159	218	159	3.28	1.89	0.000	
SOLIDS, DISS (MG/L)	161	156.18	112	145	199	161	3.54	2.26	0.000	
NITROGEN, TOT (MG/L)	161	4.00	2.7	3.7	4.8	161	0.08	1.95	0.029	
N, ORGANIC, TOT(MG/L)	161	0.78	0.40	0.65	1.0	161	0.00	0.00	0.572	
N, NO2+NO3, TOT(MG/L)	161	2.02	1.0	1.7	2.7	161	0.07	3.42	0.001	
PHOSPHORUS, TOT(MG/L)	161	0.47	0.30	0.42	0.62	161	-0.01	-3.14	0.003	
CARBON, ORG,TOT(MG/L)	160	6.52	4.6	6.2	7.8	160	-0.19	-2.98	0.000	
IRON, DISS (UG/L)	72	176.43	120	160	210	56	-8.80	-4.99	0.001	
MANGANESE, DISS(UG/L)	72	e 187.58	100	140	190	72	-4.00	-2.13	0.069	
FECAL COL (COL/100ML)	123	13,976.27	130	980	8,000	123	268.97	1.92	0.663	
FEC STREP (COL/100ML)	136	8,573.66	150	680	3,200	136	805.55	9.40	0.231	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01208828 STATION NAME: HOUSATONIC RIVER AT STRATFORD, CT
LATITUDE: 411201 LONGITUDE: 730639 DRAINAGE AREA: 1,941.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	72	9,613.23	1,230	6,100	15,200	56	193.30	2.01	0.250	
TURBIDITY (NTU)	43	2.64	1.0	2.2	4.0	43	-0.25	-9.55	0.012	
OXYGEN, DISS (MG/L)	71	9.97	7.7	9.9	12.4	55	0.07	0.67	0.215	
OXYGEN, DISS (% SAT)	71	91.83	80	94	102	55	0.86	0.93	0.052	
PH (STANDARD UNITS)	71	7.61	7.4	7.7	7.7	56	0.01	0.19	0.093	
CALCIUM, DISS (MG/L)	72	84.33	25	68	110	56	1.94	2.30	0.188	
MAGNESIUM, DISS(MG/L)	71	216.80	29	150	340	56	2.82	1.30	0.476	
CHLORIDE, DISS (MG/L)	71	3,216.24	380	2,100	5,300	55	25.00	0.78	0.593	
SILICA, DISS (MG/L)	71	3.37	1.8	3.4	4.9	55	-0.12	-3.56	0.067	
SOLIDS, TOTAL (MG/L)	72	7,420.49	857	5,540	11,100	56	96.00	1.29	0.427	
SOLIDS, DISS (MG/L)	72	6,910.21	807	5,210	10,800	56	50.89	0.74	0.529	
NITROGEN, TOT (MG/L)	69	1.17	0.93	1.1	1.4	53	0.02	1.87	0.052	
N, ORGANIC, TOT(MG/L)	71	0.43	0.28	0.37	0.54	55	0.02	3.52	0.103	
N, NO2+NO3, TOT(MG/L)	72	0.50	0.4	0.5	0.6	56	0.01	1.54	0.196	
PHOSPHORUS, TOT(MG/L)	71	0.11	0.09	0.11	0.13	55	-0.00	-1.74	0.100	
CARBON, ORG,TOT(MG/L)	72	5.03	3.2	4.1	6.4	56	-0.11	-2.20	0.100	
IRON, DISS (UG/L)	72	63.96	33	50	80	56	-3.59	-5.61	0.047	
MANGANESE, DISS(UG/L)	72	e 49.62	40	50	60	72	-0.14	-0.27	0.159	
FEC STREP (COL/100ML)	48	230.32	26	80	250	48	-7.69	-3.34	0.270	

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01208990 STATION NAME: SAUGATUCK RIVER NEAR REDDING, CT
LATITUDE: 411740 LONGITUDE: 732344 DRAINAGE AREA: 21.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	162	174.19	155	175	192	162	2.33	1.34	0.000	F
TURBIDITY (NTU)	120	1.68	1.0	1.1	2.0	120	-0.12	-7.10	0.000	
OXYGEN, DISS (MG/L)	162	11.30	9.4	10.8	13.5	162	0.04	0.32	0.214	F
OXYGEN, DISS (% SAT)	162	100.01	97	100	104	162	0.00	0.00	0.468	
PH (STANDARD UNITS)	161	7.47	7.2	7.5	7.7	161	0.03	0.39	0.000	F
CALCIUM, DISS (MG/L)	104	18.11	16	18	20	104	0.11	0.61	0.010	F
MAGNESIUM, DISS(MG/L)	103	5.57	4.8	5.5	6.2	71	0.06	1.08	0.000	F
CHLORIDE, DISS (MG/L)	161	14.02	11	13	16	161	0.50	3.57	0.000	
SULFATE, DISS (MG/L)	64	12.95	10	12	15	64	0.17	1.29	0.240	**
SILICA, DISS (MG/L)	72	7.63	6.0	7.9	9.2	56	-0.03	-0.44	0.492	
SOLIDS, TOTAL (MG/L)	156	117.29	105	116	129	156	1.32	1.13	0.000	F
SOLIDS, DISS (MG/L)	160	108.73	97	108	119	160	1.14	1.04	0.000	F
NITROGEN, TOT (MG/L)	135	0.60	0.37	0.50	0.70	78	0.03	4.54	0.000	
N, ORGANIC, TOT(MG/L)	140	0.34	0.17	0.28	0.38	81	0.02	5.11	0.004	**
N, NO2+NO3, TOT(MG/L)	162	0.17	--	0.1	0.2	162	0.00	-0.58	0.556	F
PHOSPHORUS, TOT(MG/L)	162	0.03	0.01	0.02	0.03	162	-0.00	-0.00	0.083	
CARBON, ORG,TOT(MG/L)	160	5.21	3.8	4.7	6.1	160	-0.11	-2.11	0.001	**
IRON, DISS (UG/L)	72	121.83	80	110	150	56	-2.74	-2.25	0.058	
MANGANESE, DISS(UG/L)	71	e 16.94	e 10	13	20	71	0.00	0.00	0.521	
FECAL COL (COL/100ML)	123	113.22	12	34	92	123	5.48	4.84	0.059	F
FEC STREP (COL/100ML)	137	1,326.17	16	60	220	137	113.57	8.56	0.044	F

Appendix 2. Statistical summary and trend results of selected water-quality data for the 1975-88 water years

STATION NUMBER: 01209910 STATION NAME: STAMFORD HARBOR AT STAMFORD, CT
LATITUDE: 410147 LONGITUDE: 733217 DRAINAGE AREA: 40.3 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	70	36,067.14	33,900	37,000	39,000	55	-66.67	-0.18	0.736	
TURBIDITY (NTU)	43	2.23	1.1	2.0	3.0	43	-0.27	-12.28	0.000	
OXYGEN, DISS (MG/L)	73	9.65	7.9	9.9	11.6	56	0.06	0.66	0.337	
OXYGEN, DISS (% SAT)	73	96.36	85	97	109	56	1.40	1.45	0.037	
PH (STANDARD UNITS)	72	7.77	7.6	7.8	8.0	56	0.02	0.26	0.045	
CALCIUM, DISS (MG/L)	72	261.94	230	280	300	56	0.00	0.00	0.956	
MAGNESIUM, DISS(MG/L)	71	861.34	800	900	970	56	0.00	0.00	0.978	
CHLORIDE, DISS (MG/L)	70	13,498.57	13,000	14,000	15,000	54	90.91	0.67	0.132	
SILICA, DISS (MG/L)	72	1.62	0.8	1.5	2.3	56	-0.01	-0.44	0.659	
SOLIDS, TOTAL (MG/L)	70	29,199.86	26,900	28,700	31,200	54	179.17	0.61	0.069	
SOLIDS, DISS (MG/L)	72	26,023.61	25,000	26,800	28,200	55	50.00	0.19	0.383	
N, ORGANIC, TOT(MG/L)	71	0.44	0.17	0.41	0.61	54	-0.03	-6.48	0.078	
N, NO2+NO3, TOT(MG/L)	73	0.24	--	0.1	0.3	56	0.00	0.00	0.540	
PHOSPHORUS, TOT(MG/L)	72	0.23	0.12	0.19	0.32	55	-0.01	-5.89	0.007	
CARBON, ORG,TOT(MG/L)	71	4.33	2.7	3.8	4.9	56	-0.26	-6.06	0.000	
IRON, DISS (UG/L)	72	138.38	93	120	170	56	0.00	0.00	1.000	
MANGANESE, DISS(UG/L)	72	e 107.69	50	70	90	72	-1.67	-1.55	0.023	
FEC STREP (COL/100ML)	48	95.30	1	8	57	48	-7.06	-7.41	0.184	

APPENDIX 3

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

[N, number of samples; P, P-value (or attained significance level);e, parameter is estimated for censored constituents with a log-probability regression procedure; --, insufficient data to calculate value; *****, value exceeds print field;
US/CM, microsiemens per centimeter; MG/L, milligrams per liter; %SAT, percent saturation; UG/L, micrograms per liter.
TREND CODES: blank, best trend is trend in unadjusted concentrations; F, best trend is trend in flow-adjusted concentrations;
**, best trend is trend in unadjusted concentrations because the flow-adjustment was unsuccessful.]

STATION NUMBER: 01118500 STATION NAME: PAWCATUCK RIVER AT WESTERLY, RI
LATITUDE: 412301 LONGITUDE: 715001 DRAINAGE AREA: 295.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	99	103.78	86	97	114	95	-1.40	-1.35	0.009	F
TURBIDITY (NTU)	95	1.20	0.9	1.0	1.4	95	0.00	0.00	0.581	**
OXYGEN, DISS (MG/L)	96	10.91	8.9	10.8	12.8	95	0.04	0.34	0.385	F
OXYGEN, DISS (% SAT)	95	97.26	92	97	102	95	0.50	0.51	0.228	
PH (STANDARD UNITS)	97	6.72	6.4	6.7	7.0	95	0.05	0.76	0.007	F
CALCIUM, DISS (MG/L)	72	4.49	3.7	4.4	5.3	48	0.01	0.26	0.764	F
MAGNESIUM, DISS(MG/L)	72	1.35	1.2	1.3	1.5	48	0.01	0.60	0.483	F
CHLORIDE, DISS (MG/L)	90	11.82	10	12	13	89	0.02	0.16	0.850	F
SILICA, DISS (MG/L)	39	6.95	4.7	7.2	9.1	32	0.03	0.48	0.901	
SOLIDS, TOTAL (MG/L)	85	77.84	65	74	88	84	-1.26	-1.62	0.010	F
SOLIDS, DISS (MG/L)	85	73.18	60	71	83	84	-1.92	-2.63	0.004	F
NITROGEN, TOT (MG/L)	95	0.98	0.70	0.90	1.2	94	0.02	1.98	0.322	F
N, ORGANIC, TOT(MG/L)	88	0.50	0.31	0.47	0.63	88	0.01	2.41	0.099	
N, N02+N03, TOT(MG/L)	96	0.41	0.3	0.4	0.5	95	0.00	0.92	0.426	F
N, AMMONIA, DIS(MG/L)	35	e 0.07	0.03	0.05	0.07	35	0.00	0.00	0.895	
N, AMMONIA, TOT(MG/L)	92	e 0.05	0.03	0.05	0.07	92	-0.00	-4.93	0.048	
N, NITRITE, TOT(MG/L)	95	e 0.01	e 0.01	e 0.01	0.01	95	0.00	0.00	1.000	
PHOSPHORUS, TOT(MG/L)	96	0.04	0.02	0.04	0.06	95	-0.00	-3.31	0.043	F
CARBON, ORG,TOT(MG/L)	88	6.67	5.2	6.3	7.8	88	-0.02	-0.33	0.817	
IRON, DISS (UG/L)	35	276.00	180	240	280	32	-9.96	-3.61	0.068	
MANGANESE, DISS(UG/L)	35	e 34.31	25	30	44	35	-1.86	-5.41	0.003	
COPPER, TOTAL (UG/L)	20	6.20	3.0	5.0	6.8	13	-0.21	-3.45	0.907	
NICKEL, DISS (UG/L)	90	e 1.35	e 1.0	1.0	2.0	90	-0.00	-0.00	0.013	
NICKEL, TOTAL (UG/L)	19	e 2.81	1.0	2.0	3.0	19	-0.25	-8.90	0.289	
ZINC, TOTAL (UG/L)	20	e 35.47	10	30	40	20	-6.33	-17.85	0.017	
FECAL COL (COL/100ML)	93	167.92	21	60	140	93	-20.56	-12.25	0.012	
FEC STREP (COL/100ML)	93	809.76	28	84	400	93	-136.90	-16.91	0.089	
SEDIMENT, SUSP (MG/L)	34	11.47	4	10	14	24	0.00	0.00	1.000	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01119375 STATION NAME: WILLIMANTIC RIVER AT MERROW, CT
LATITUDE: 415007 LONGITUDE: 721838 DRAINAGE AREA: 94.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	90	94.80	74	91	111	90	1.93	2.04	0.000	F
TURBIDITY (NTU)	90	1.51	1.0	1.3	1.8	90	-0.04	-2.60	0.344	
OXYGEN, DISS (MG/L)	90	11.35	9.2	11.2	13.6	90	0.05	0.40	0.157	F
OXYGEN, DISS (% SAT)	90	101.57	97	101	106	90	0.33	0.33	0.327	
PH (STANDARD UNITS)	90	6.81	6.6	6.8	7.0	90	0.06	0.92	0.000	F
CALCIUM, DISS (MG/L)	63	5.09	3.7	4.8	5.8	32	0.10	1.90	0.055	F
MAGNESIUM, DISS(MG/L)	63	1.63	1.4	1.6	1.8	32	0.02	1.37	0.041	F
CHLORIDE, DISS (MG/L)	89	12.07	9.3	12	14	89	0.36	3.02	0.000	F
SILICA, DISS (MG/L)	32	8.14	6.4	8.7	9.4	32	-0.10	-1.23	0.052	
SOLIDS, TOTAL (MG/L)	87	71.26	58	70	83	87	0.07	0.10	0.725	F
SOLIDS, DISS (MG/L)	89	64.70	52	63	74	89	0.44	0.68	0.241	F
NITROGEN, TOT (MG/L)	88	0.97	0.70	0.90	1.2	88	0.01	0.52	0.759	F
N, ORGANIC, TOT(MG/L)	80	0.46	0.26	0.40	0.63	80	0.00	0.49	0.965	F
N, NO2+NO3, TOT(MG/L)	89	0.44	0.3	0.4	0.5	89	0.01	2.61	0.104	F
N, AMMONIA, TOT(MG/L)	90	e 0.08	0.03	0.05	0.09	90	-0.00	-4.43	0.057	
N, NITRITE, TOT(MG/L)	90	e 0.01	e 0.01	e 0.01	0.01	90	0.00	0.00	1.000	
PHOSPHORUS, TOT(MG/L)	90	0.04	0.03	0.03	0.05	90	-0.00	-7.88	0.000	F
CARBON, ORG,TOT(MG/L)	88	4.70	3.6	4.3	5.5	88	0.06	1.36	0.192	F
IRON, DISS (UG/L)	32	184.84	110	180	230	32	6.53	3.53	0.122	F
MANGANESE, DISS(UG/L)	32	e 23.36	18	21	29	32	0.00	0.00	0.900	
NICKEL, DISS (UG/L)	89	e 2.46	1.0	2.0	3.0	89	-0.00	-0.00	0.068	
FECAL COL (COL/100ML)	90	644.08	130	250	560	90	-121.96	-18.94	0.001	
FEC STREP (COL/100ML)	90	1,060.22	41	200	750	90	-315.62	-29.77	0.000	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01122610 STATION NAME: SHETUCKET RIVER AT SOUTH WINDHAM, CT
LATITUDE: 414056 LONGITUDE: 720959 DRAINAGE AREA: 408.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	95	99.38	82	96	110	90	-0.19	-0.19	0.766	F
TURBIDITY (NTU)	90	1.68	1.0	1.2	2.0	90	-0.05	-3.14	0.119	
OXYGEN, DISS (MG/L)	94	11.22	9.2	11.1	13.2	89	0.02	0.16	0.791	F
OXYGEN, DISS (% SAT)	94	102.91	99	103	107	89	0.00	0.00	0.848	
PH (STANDARD UNITS)	95	7.06	6.9	7.0	7.2	90	0.03	0.46	0.117	F
CALCIUM, DISS (MG/L)	69	6.24	5.2	6.1	7.3	46	0.04	0.70	0.048	F
MAGNESIUM, DISS(MG/L)	69	1.75	1.5	1.7	1.9	46	0.02	1.24	0.037	F
CHLORIDE, DISS (MG/L)	90	11.09	9.3	11	13	90	0.34	3.06	0.000	F
SILICA, DISS (MG/L)	39	7.46	5.9	7.4	8.9	32	-0.16	-2.12	0.106	
SOLIDS, TOTAL (MG/L)	85	71.31	62	69	79	48	-0.55	-0.77	0.229	F
SOLIDS, DISS (MG/L)	86	64.81	57	61	74	86	-0.70	-1.08	0.086	F
NITROGEN, TOT (MG/L)	93	1.01	0.80	1.0	1.2	88	0.00	0.23	0.729	F
N, ORGANIC, TOT(MG/L)	92	0.53	0.28	0.42	0.61	87	0.01	1.23	0.785	F
N, NO2+NO3, TOT(MG/L)	95	0.41	0.3	0.4	0.5	90	0.00	0.70	0.602	F
N, AMMONIA, DIS(MG/L)	45	e 0.12	0.08	0.11	0.14	45	0.00	-1.91	0.495	
N, AMMONIA, TOT(MG/L)	93	e 0.14	0.08	0.12	0.19	93	0.00	0.00	0.969	
N, NITRITE, TOT(MG/L)	89	e 0.02	e 0.01	0.01	0.03	89	0.00	0.00	0.928	
PHOSPHORUS, TOT(MG/L)	95	0.07	0.04	0.05	0.09	90	-0.00	-7.32	0.000	F
CARBON, ORG,TOT(MG/L)	88	4.39	3.4	4.3	5.2	88	0.00	0.00	0.727	**
IRON, DISS (UG/L)	35	218.71	160	200	260	32	-10.11	-4.62	0.041	F
MANGANESE, DISS(UG/L)	35	e 25.14	18	23	30	35	-0.42	-1.66	0.373	
NICKEL, DISS (UG/L)	90	e 1.64	e 1.0	1.0	2.0	90	-0.14	-8.70	0.004	
FECAL COL (COL/100ML)	90	1,513.62	110	410	1,600	90	-371.42	-24.54	0.000	
FEC STREP (COL/100ML)	90	892.50	68	280	930	90	-198.37	-22.23	0.000	F
SEDIMENT, SUSP (MG/L)	35	11.94	6	7	13	24	-0.35	-2.89	0.718	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01124000 STATION NAME: QUINEBAUG RIVER AT QUINEBAUG, CT
LATITUDE: 420120 LONGITUDE: 715722 DRAINAGE AREA: 155.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	128.35	108	125	146	90	3.19	2.48	0.000	F
TURBIDITY (NTU)	90	1.73	1.0	1.5	2.0	90	-0.04	-2.39	0.573	
OXYGEN, DISS (MG/L)	91	11.17	8.7	11.3	13.3	90	0.04	0.32	0.456	F
OXYGEN, DISS (% SAT)	91	100.71	98	101	104	90	1.00	0.99	0.004	
PH (STANDARD UNITS)	91	6.86	6.6	6.8	7.1	90	0.07	1.04	0.000	F
CALCIUM, DISS (MG/L)	63	6.30	5.5	6.2	7.1	31	0.12	1.92	0.094	F
MAGNESIUM; DISS(MG/L)	63	1.83	1.6	1.8	2.1	31	0.02	1.34	0.122	F
CHLORIDE, DISS (MG/L)	90	21.31	17	22	24	90	0.83	3.89	0.000	F
SILICA, DISS (MG/L)	32	5.41	3.9	5.3	7.4	31	-0.05	-0.92	0.747	
SOLIDS, TOTAL (MG/L)	90	87.46	78	85	99	90	0.84	0.97	0.025	F
SOLIDS, DISS (MG/L)	88	79.07	69	78	87	88	0.96	1.21	0.069	F
NITROGEN, TOT (MG/L)	87	1.23	0.80	1.0	1.4	87	0.00	0.05	1.000	F
N, ORGANIC, TOT(MG/L)	86	0.64	0.35	0.48	0.67	48	-0.01	-1.35	1.000	
N, NO2+NO3, TOT(MG/L)	90	0.40	0.2	0.3	0.5	90	0.00	0.37	0.941	F
N, AMMONIA, TOT(MG/L)	90	e 0.19	0.08	0.12	0.21	90	0.00	-1.06	0.653	
N, NITRITE, TOT(MG/L)	90	e 0.02	e 0.01	0.01	0.03	90	0.00	0.00	0.640	
PHOSPHORUS, TOT(MG/L)	90	0.20	0.07	0.16	0.27	90	-0.02	-9.00	0.000	F
CARBON, ORG,TOT(MG/L)	90	4.86	4.0	4.6	5.8	90	0.07	1.42	0.297	F
IRON, DISS (UG/L)	31	277.42	170	210	350	24	-9.87	-3.56	0.481	F
MANGANESE, DISS(UG/L)	32	e 39.69	34	40	47	32	-1.86	-4.68	0.118	
NICKEL, DISS (UG/L)	90	e 2.13	1.0	2.0	3.0	90	0.00	0.00	0.460	
FECAL COL (COL/100ML)	90	1,028.07	86	210	560	90	82.37	8.01	0.370	**
FEC STREP (COL/100ML)	90	3,824.29	37	160	960	90	-963.67	-25.20	0.057	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01125150 STATION NAME: FRENCH RIVER AT MECHANICSVILLE, CT
LATITUDE: 415651 LONGITUDE: 715323 DRAINAGE AREA: 107.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/YEAR	PERCENT/YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	169.43	130	153	200	88	4.06	2.40	0.008	F
TURBIDITY (NTU)	90	1.69	1.1	1.5	2.0	90	-0.11	-6.31	0.011	
OXYGEN, DISS (MG/L)	91	10.80	8.4	10.2	13.2	88	0.08	0.72	0.235	F
OXYGEN, DISS (% SAT)	91	97.33	92	99	104	88	0.87	0.89	0.018	F
PH (STANDARD UNITS)	91	6.98	6.8	7.0	7.2	88	0.05	0.77	0.001	F
CALCIUM, DISS (MG/L)	61	7.68	6.8	7.4	8.4	30	0.10	1.35	0.068	F
MAGNESIUM, DISS(MG/L)	61	1.46	1.2	1.4	1.5	30	0.02	1.63	0.078	F
CHLORIDE, DISS (MG/L)	90	19.83	15	19	23	88	1.12	5.65	0.000	F
SILICA, DISS (MG/L)	31	4.67	3.3	4.4	5.8	31	-0.04	-0.92	0.604	
SOLIDS, TOTAL (MG/L)	89	113.09	89	103	128	87	0.77	0.68	0.414	F
SOLIDS, DISS (MG/L)	88	104.31	81	95	119	86	1.68	1.61	0.228	F
NITROGEN, TOT (MG/L)	90	1.94	1.3	1.7	2.4	88	-0.02	-1.20	0.619	F
N, ORGANIC, TOT(MG/L)	85	0.71	0.42	0.63	0.81	32	0.04	5.61	0.122	F
N, NO2+NO3, TOT(MG/L)	90	1.00	0.5	0.8	1.3	88	-0.05	-5.33	0.008	F
N, AMMONIA, TOT(MG/L)	90	e 0.23	0.05	0.15	0.26	90	0.00	-0.73	0.472	
N, NITRITE, TOT(MG/L)	90	e 0.03	0.01	0.02	0.03	90	0.00	0.00	0.814	
PHOSPHORUS, TOT(MG/L)	90	0.22	0.10	0.19	0.28	88	-0.02	-10.65	0.000	F
CARBON, ORG,TOT(MG/L)	89	6.51	5.3	6.3	7.6	87	0.06	0.97	0.392	F
IRON, DISS (UG/L)	31	225.23	150	210	310	29	-8.74	-3.88	0.183	F
MANGANESE, DISS(UG/L)	31	e 38.29	29	36	44	31	0.67	1.74	0.475	
NICKEL, DISS (UG/L)	89	e 2.86	1.0	2.0	4.0	89	-0.29	-10.00	0.012	
FECAL COL (COL/100ML)	90	988.83	91	240	750	90	42.17	4.26	0.682	**
FEC STREP (COL/100ML)	90	2,250.89	57	260	1,900	90	-731.30	-32.49	0.000	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01127000 STATION NAME: QUINEBAUG RIVER AT JEWETT CITY, CT
LATITUDE: 413552 LONGITUDE: 715905 DRAINAGE AREA: 713.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	96	109.10	92	104	121	90	1.09	1.00	0.157	F
TURBIDITY (NTU)	90	3.39	1.4	2.0	3.2	90	0.02	0.70	0.941	F
OXYGEN, DISS (MG/L)	96	11.15	9.2	11.2	12.7	90	-0.07	-0.62	0.205	F
OXYGEN, DISS (% SAT)	95	103.18	97	101	109	89	-0.58	-0.57	0.185	F
PH (STANDARD UNITS)	96	7.33	6.8	7.0	7.3	90	-0.01	-0.12	0.602	F
CALCIUM, DISS (MG/L)	69	6.92	5.9	6.6	7.7	47	0.08	1.11	0.119	F
MAGNESIUM, DISS(MG/L)	69	1.61	1.4	1.6	1.8	47	0.01	0.74	0.467	F
CHLORIDE, DISS (MG/L)	90	12.89	11	12	14	90	0.29	2.28	0.011	F
SILICA, DISS (MG/L)	38	5.34	3.8	5.1	7.0	32	0.02	0.38	0.853	F
SOLIDS, TOTAL (MG/L)	87	82.34	71	80	92	87	0.25	0.30	0.668	F
SOLIDS, DISS (MG/L)	87	70.64	61	68	81	87	0.35	0.49	0.299	F
NITROGEN, TOT (MG/L)	84	1.23	0.96	1.2	1.4	83	0.03	2.13	0.109	F
N, ORGANIC, TOT(MG/L)	89	0.64	0.38	0.55	0.78	86	0.01	1.26	0.874	F
N, N02+N03, TOT(MG/L)	95	0.45	0.3	0.5	0.6	90	0.00	-0.03	0.941	F
N, AMMONIA, DIS(MG/L)	43	e 0.13	0.05	0.09	0.19	43	0.01	6.29	0.537	
N, AMMONIA, TOT(MG/L)	90	e 0.13	0.06	0.10	0.18	90	0.00	1.50	0.573	
N, NITRITE, TOT(MG/L)	89	e 0.01	e 0.01	0.01	0.02	89	0.00	0.00	1.000	
PHOSPHORUS, TOT(MG/L)	95	0.11	0.07	0.10	0.15	90	-0.01	-5.18	0.011	F
CARBON, ORG,TOT(MG/L)	86	6.03	4.6	5.6	6.9	86	0.27	4.55	0.001	F
IRON, DISS (UG/L)	33	193.33	150	200	240	31	-7.03	-3.64	0.031	
IRON, TOTAL (UG/L)	88	523.30	390	500	650	88	6.58	1.26	0.419	**
MANGANESE, DISS(UG/L)	33	e 26.09	16	25	40	33	0.00	0.00	0.893	
COPPER, TOTAL (UG/L)	84	7.73	5.0	6.0	8.8	84	-0.30	-3.90	0.216	
NICKEL, DISS (UG/L)	88	e 1.88	1.0	1.0	3.0	88	-0.25	-13.29	0.000	
NICKEL, TOTAL (UG/L)	87	e 3.75	2.0	3.0	5.0	87	-0.25	-6.67	0.045	
ZINC, TOTAL (UG/L)	85	e 22.32	10	20	30	85	-1.83	-8.21	0.002	
FECAL COL (COL/100ML)	90	1,171.03	180	500	1,100	90	-49.85	-4.26	0.601	
FEC STREP (COL/100ML)	90	1,339.23	150	430	1,500	90	-96.11	-7.18	0.191	
SEDIMENT, SUSP (MG/L)	35	15.66	8	12	17	16	0.93	5.93	0.537	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01127701 STATION NAME: THAMES RIVER NEAR MOHEGAN, CT
LATITUDE: 412854 LONGITUDE: 720432 DRAINAGE AREA: 1,382.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	60	7,724.17	4,030	5,160	8,800	49	-58.33	-0.76	0.845	
TURBIDITY (NTU)	59	1.72	1.0	1.7	2.0	48	-0.04	-2.27	0.306	
OXYGEN, DISS (MG/L)	60	10.91	9.2	10.9	13.0	49	0.04	0.34	0.589	
OXYGEN, DISS (% SAT)	60	99.75	91	96	105	49	0.92	0.92	0.114	
PH (STANDARD UNITS)	60	7.44	7.1	7.3	7.6	49	0.00	0.00	0.649	
CALCIUM, DISS (MG/L)	40	53.45	31	40	73	31	0.00	0.00	0.948	
MAGNESIUM, DISS(MG/L)	40	160.10	88	110	210	31	0.33	0.21	0.948	
CHLORIDE, DISS (MG/L)	58	2,452.76	1,100	1,600	2,700	48	30.00	1.22	0.477	
SILICA, DISS (MG/L)	31	5.48	3.6	5.0	7.0	31	-0.15	-2.74	0.137	
SOLIDS, TOTAL (MG/L)	55	5,111.62	2,470	3,460	5,530	47	15.00	0.29	0.876	
SOLIDS, DISS (MG/L)	56	4,540.75	2,270	3,240	5,020	47	30.00	0.66	0.678	
NITROGEN, TOT (MG/L)	54	1.11	0.79	1.0	1.3	16	0.06	5.09	0.376	
N, ORGANIC, TOT(MG/L)	58	0.58	0.32	0.49	0.72	47	0.06	10.44	0.012	
N, N02+N03, TOT(MG/L)	60	0.38	0.2	0.4	0.5	49	0.00	0.00	1.000	
N, AMMONIA, TOT(MG/L)	60	e 0.13	0.07	0.11	0.20	60	0.00	0.63	0.767	
N, NITRITE, TOT(MG/L)	60	e 0.01	e 0.01	0.01	0.02	60	0.00	0.00	0.907	
PHOSPHORUS, TOT(MG/L)	60	0.08	0.05	0.06	0.11	49	-0.00	-5.81	0.005	
CARBON, ORG,TOT(MG/L)	57	4.79	3.5	4.5	5.1	47	0.20	4.09	0.056	
IRON, DISS (UG/L)	30	98.33	70	100	120	30	-4.29	-4.36	0.167	
MANGANESE, DISS(UG/L)	31	e 27.45	20	30	30	31	-1.00	-3.64	0.154	
NICKEL, DISS (UG/L)	59	e 2.50	1.0	2.0	3.0	59	0.00	0.00	1.000	
FECAL COL (COL/100ML)	60	1,136.45	230	650	1,000	49	-119.65	-10.53	0.405	
FEC STREP (COL/100ML)	59	1,250.32	36	150	420	48	-132.39	-10.59	0.087	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01184000 STATION NAME: CONNECTICUT RIVER AT THOMPSONVILLE, CT
LATITUDE: 415914 LONGITUDE: 723621 DRAINAGE AREA: 9,660.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	98	115.51	102	115	130	90	0.52	0.45	0.576	F
TURBIDITY (NTU)	90	2.40	1.1	1.8	3.0	90	-0.24	-10.09	0.003	F
OXYGEN, DISS (MG/L)	97	10.42	8.1	10.0	12.8	90	0.09	0.87	0.062	F
OXYGEN, DISS (% SAT)	97	93.57	88	94	100	90	0.82	0.88	0.014	F
PH (STANDARD UNITS)	98	7.09	6.9	7.1	7.3	90	0.03	0.48	0.017	F
CALCIUM, DISS (MG/L)	75	11.31	9.8	11	13	75	-0.06	-0.49	0.287	F
MAGNESIUM, DISS(MG/L)	74	1.70	1.5	1.7	1.9	74	0.01	0.67	0.208	F
CHLORIDE, DISS (MG/L)	89	10.42	8.9	10	12	89	0.25	2.39	0.006	F
SILICA, DISS (MG/L)	43	5.22	4.6	5.3	6.0	31	0.06	1.15	0.26	
SOLIDS, TOTAL (MG/L)	86	81.53	74	83	89	86	-0.04	-0.05	1.000	F
SOLIDS, DISS (MG/L)	87	72.06	62	73	79	87	-0.16	-0.22	0.788	F
NITROGEN, TOT (MG/L)	93	0.98	0.80	0.93	1.1	88	0.01	0.54	0.672	F
N, ORGANIC, TOT(MG/L)	92	0.45	0.30	0.44	0.59	87	0.00	1.04	0.784	
N, NO2+NO3, TOT(MG/L)	96	0.37	0.3	0.4	0.4	90	0.00	-1.13	0.135	F
N, AMMONIA, DIS(MG/L)	52	e 0.15	0.07	0.11	0.17	52	0.02	10.24	0.127	
N, AMMONIA, TOT(MG/L)	93	e 0.16	0.08	0.12	0.24	93	0.00	0.00	0.906	
N, NITRITE, TOT(MG/L)	88	e 0.01	e 0.01	0.01	0.01	88	0.00	0.00	0.495	
PHOSPHORUS, TOT(MG/L)	96	0.07	0.04	0.06	0.09	90	-0.00	-4.45	0.052	**
CARBON, ORG,TOT(MG/L)	90	4.11	3.3	3.8	4.6	90	0.04	1.06	0.311	**
IRON, DISS (UG/L)	35	91.74	66	92	110	32	-4.55	-4.96	0.053	
IRON, TOTAL (UG/L)	90	538.44	280	340	500	90	-9.60	-1.78	0.101	F
MANGANESE, DISS(UG/L)	35	e 23.71	17	23	32	35	-0.50	-2.11	0.223	
COPPER, TOTAL (UG/L)	89	7.60	4.0	6.0	9.0	89	-0.41	-5.45	0.083	
NICKEL, DISS (UG/L)	89	e 3.08	1.0	3.0	4.0	89	0.00	0.00	0.279	
NICKEL, TOTAL (UG/L)	86	e 5.38	3.0	5.0	6.0	86	0.00	0.00	0.117	
ZINC, TOTAL (UG/L)	88	e 24.39	10	20	30	88	-4.00	-16.40	0.000	
FECAL COL (COL/100ML)	90	1,553.06	160	540	2,100	90	-582.40	-37.50	0.000	
FEC STREP (COL/100ML)	89	1,271.21	81	240	1,100	89	-441.51	-34.73	0.000	F
SEDIMENT, SUSP (MG/L)	41	17.32	4	7	16	31	-0.31	-1.82	0.366	F

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01184100 STATION NAME: STONY BROOK NEAR WEST SUFFIELD, CT
LATITUDE: 415738 LONGITUDE: 724239 DRAINAGE AREA: 10.4 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	60	283.48	240	290	344	49	-1.03	-0.36	0.807	F
TURBIDITY (NTU)	60	2.34	1.1	2.0	2.9	49	0.05	2.21	0.591	F
OXYGEN, DISS (MG/L)	60	9.68	7.1	9.8	12.3	49	0.10	1.01	0.353	F
OXYGEN, DISS (% SAT)	60	82.68	72	82	93	49	0.02	0.03	0.961	F
PH (STANDARD UNITS)	60	7.28	7.0	7.3	7.5	49	0.03	0.46	0.156	F
CALCIUM, DISS (MG/L)	41	30.39	26	31	37	32	-0.63	-2.08	0.073	F
MAGNESIUM, DISS(MG/L)	41	8.90	7.8	8.9	11	32	-0.07	-0.77	0.421	F
CHLORIDE, DISS (MG/L)	60	19.17	14	18	24	49	0.00	0.02	0.807	F
SILICA, DISS (MG/L)	32	9.45	7.4	10	11	32	0.00	0.00	1.000	
SOLIDS, TOTAL (MG/L)	59	195.49	160	200	225	48	-3.35	-1.71	0.004	F
SOLIDS, DISS (MG/L)	59	178.41	144	188	209	49	-3.78	-2.12	0.003	F
NITROGEN, TOT (MG/L)	59	1.40	1.1	1.4	1.6	49	0.05	3.25	0.213	
N, ORGANIC, TOT(MG/L)	58	0.60	0.38	0.57	0.78	49	0.04	7.14	0.087	
N, N02+N03, TOT(MG/L)	59	0.69	0.4	0.6	0.9	49	-0.01	-1.21	0.353	F
N, AMMONIA, TOT(MG/L)	59	e 0.11	0.04	0.07	0.11	59	0.00	0.00	0.882	
N, NITRITE, TOT(MG/L)	59	e 0.02	e 0.01	0.01	0.02	59	0.00	0.00	0.466	
PHOSPHORUS, TOT(MG/L)	58	0.10	0.05	0.08	0.11	48	-0.00	-3.36	0.014	
CARBON, ORG,TOT(MG/L)	59	6.44	4.5	5.9	7.2	48	0.00	-0.05	1.000	F
IRON, DISS (UG/L)	32	149.94	98	150	190	32	4.41	2.94	0.578	F
IRON, TOTAL (UG/L)	45	411.11	310	370	540	31	4.59	1.12	0.699	F
MANGANESE, DISS(UG/L)	32	e 80.69	47	65	88	32	4.25	5.27	0.173	
COPPER, TOTAL (UG/L)	47	3.63	2.0	3.0	5.0	32	0.00	0.00	0.899	
NICKEL, DISS (UG/L)	59	e 1.67	e 1.0	1.0	2.0	59	0.00	0.00	0.132	
NICKEL, TOTAL (UG/L)	47	e 3.04	1.0	2.0	3.0	47	0.00	0.00	0.403	
ZINC, TOTAL (UG/L)	45	e 16.60	10	20	20	45	-2.50	-15.06	0.003	
FECAL COL (COL/100ML)	60	2,365.13	44	240	1,100	49	-490.41	-20.73	0.013	
FEC STREP (COL/100ML)	59	14,278.83	120	520	3,900	49	*******	-34.38	0.006	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01186800 STATION NAME: STILL RIVER AT RIVERTON, CT
LATITUDE: 415734 LONGITUDE: 730112 DRAINAGE AREA: 86.2 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	90	120.20	98	114	130	88	1.18	0.98	0.069	F
TURBIDITY (NTU)	90	1.71	1.0	1.2	2.0	90	-0.16	-9.43	0.002	
OXYGEN, DISS (MG/L)	91	11.66	9.4	11.8	13.8	89	-0.10	-0.86	0.140	F
OXYGEN, DISS (% SAT)	91	102.88	98	101	106	90	0.00	0.00	0.820	**
PH (STANDARD UNITS)	91	7.20	6.9	7.2	7.5	89	0.03	0.41	0.089	F
CALCIUM, DISS (MG/L)	64	8.13	6.9	7.8	9.1	31	0.11	1.36	0.002	F
MAGNESIUM, DISS(MG/L)	64	2.63	2.2	2.5	3.0	31	0.01	0.53	0.439	F
CHLORIDE, DISS (MG/L)	89	15.06	11	14	17	88	0.21	1.40	0.173	F
SILICA, DISS (MG/L)	32	5.45	4.2	5.1	6.3	32	-0.05	-0.98	0.347	
SOLIDS, TOTAL (MG/L)	86	82.60	70	79	91	85	-0.55	-0.66	0.662	F
SOLIDS, DISS (MG/L)	89	74.42	62	69	82	88	-0.51	-0.68	0.289	F
NITROGEN, TOT (MG/L)	86	1.50	0.80	1.3	1.8	85	-0.02	-1.21	0.603	F
N, ORGANIC, TOT(MG/L)	87	0.56	0.29	0.45	0.73	87	0.01	2.41	0.458	
N, NO2+NO3, TOT(MG/L)	90	0.62	0.2	0.4	0.7	89	-0.02	-2.65	0.212	F
N, AMMONIA, TOT(MG/L)	90	e 0.32	0.10	0.20	0.44	90	-0.02	-5.21	0.022	
N, NITRITE, TOT(MG/L)	90	e 0.04	e 0.01	0.02	0.05	90	0.00	0.00	0.382	
PHOSPHORUS, TOT(MG/L)	90	0.16	0.06	0.12	0.20	89	-0.01	-6.86	0.005	F
CARBON, ORG,TOT(MG/L)	90	4.77	3.8	4.8	5.5	89	0.04	0.93	0.472	F
IRON, DISS (UG/L)	32	163.94	120	150	200	31	-4.25	-2.59	0.606	F
MANGANESE, DISS(UG/L)	32	e 20.84	14	20	25	32	0.00	0.00	0.850	
NICKEL, DISS (UG/L)	90	e 6.92	3.0	5.0	8.0	90	-1.00	-14.45	0.000	
FECAL COL (COL/100ML)	89	1,181.33	22	74	260	89	145.05	12.28	0.363	
FEC STREP (COL/100ML)	88	728.40	30	94	320	88	-64.80	-8.90	0.337	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01188000 STATION NAME: BURLINGTON BROOK NEAR BURLINGTON, CT
LATITUDE: 414710 LONGITUDE: 725755 DRAINAGE AREA: 4.1 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	32	86.72	79	89	92	32	0.85	0.98	0.095	F
TURBIDITY (NTU)	31	1.94	1.0	1.6	2.1	31	-0.02	-1.28	0.747	F
OXYGEN, DISS (MG/L)	32	11.17	9.3	10.6	13.1	32	-0.10	-0.90	0.291	**
OXYGEN, DISS (% SAT)	32	98.34	96	99	102	32	-0.33	-0.34	0.318	
PH (STANDARD UNITS)	32	6.79	6.6	6.8	7.0	32	0.05	0.74	0.234	
CALCIUM, DISS (MG/L)	31	4.50	3.7	4.5	5.1	31	0.03	0.69	0.246	F
MAGNESIUM, DISS(MG/L)	32	1.92	1.6	1.8	2.1	32	0.00	0.20	0.951	F
CHLORIDE, DISS (MG/L)	31	11.75	10	11	13	31	0.36	3.10	0.039	F
SILICA, DISS (MG/L)	32	8.56	6.8	8.8	9.7	32	0.05	0.61	0.353	F
SOLIDS, TOTAL (MG/L)	30	62.90	56	62	68	30	0.68	1.08	0.311	F
SOLIDS, DISS (MG/L)	30	56.60	52	56	60	30	0.10	0.18	0.839	F
NITROGEN, TOT (MG/L)	25	0.71	0.42	0.55	0.70	16	0.01	1.29	0.721	
N, ORGANIC, TOT(MG/L)	31	0.42	0.19	0.31	0.53	16	0.02	3.78	1.000	
N, NO2+NO3, TOT(MG/L)	32	0.14	--	0.1	0.2	32	0.00	0.00	1.000	
N, AMMONIA, TOT(MG/L)	32	e 0.09	0.04	0.06	0.07	32	0.00	4.90	0.088	
PHOSPHORUS, TOT(MG/L)	32	0.03	0.01	0.01	0.03	32	0.00	0.00	0.696	
CARBON, ORG,TOT(MG/L)	32	3.93	2.5	3.5	4.9	32	0.00	0.00	1.000	
IRON, DISS (UG/L)	32	376.63	210	270	560	32	-10.36	-2.75	0.620	F
MANGANESE, DISS(UG/L)	32	e 242.19	150	220	310	32	13.33	5.51	0.315	
NICKEL, DISS (UG/L)	32	e 1.65	e 1.0	1.0	2.0	32	0.00	0.00	0.945	
FECAL COL (COL/100ML)	32	54.27	3	25	75	32	2.07	3.82	0.491	
FEC STREP (COL/100ML)	32	345.81	9	24	120	32	-57.00	-16.48	0.152	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01188085 STATION NAME: FARMINGTON RIVER, AT ROUTE 4, AT UNIONVILLE, CT
LATITUDE: 414552 LONGITUDE: 725347 DRAINAGE AREA: 377.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	84.15	75	83	90	90	0.65	0.77	0.021	F
TURBIDITY (NTU)	90	1.25	0.6	1.0	1.3	90	-0.06	-5.00	0.112	
OXYGEN, DISS (MG/L)	91	11.87	9.6	11.8	13.8	90	0.00	0.00	1.000	
OXYGEN, DISS (% SAT)	91	104.88	101	105	108	90	0.25	0.24	0.081	
PH (STANDARD UNITS)	91	7.20	6.9	7.2	7.4	90	0.05	0.68	0.017	F
CALCIUM, DISS (MG/L)	62	5.65	4.9	5.8	6.4	32	0.04	0.62	0.421	F
MAGNESIUM, DISS(MG/L)	62	1.73	1.5	1.7	2.0	32	0.02	1.31	0.122	F
CHLORIDE, DISS (MG/L)	90	10.56	8.8	9.9	12	90	0.29	2.73	0.000	F
SILICA, DISS (MG/L)	32	4.87	4.4	4.8	5.5	32	-0.04	-0.82	0.184	
SOLIDS, TOTAL (MG/L)	84	59.73	54	59	64	84	0.01	0.02	0.967	F
SOLIDS, DISS (MG/L)	88	52.52	47	52	58	88	0.52	0.98	0.256	F
NITROGEN, TOT (MG/L)	75	0.75	0.50	0.64	0.90	47	-0.01	-1.43	0.604	F
N, ORGANIC, TOT(MG/L)	76	0.46	0.25	0.37	0.58	48	-0.01	-2.81	0.509	
N, NO2+NO3, TOT(MG/L)	89	0.23	0.2	0.2	0.3	89	0.00	-1.27	0.273	F
N, AMMONIA, TOT(MG/L)	89	e 0.06	0.03	0.04	0.07	89	0.00	0.00	0.907	
N, NITRITE, TOT(MG/L)	89	e 0.01	e 0.01	e 0.01	0.01	89	0.00	0.00	0.787	
PHOSPHORUS, TOT(MG/L)	89	0.06	0.03	0.04	0.05	89	-0.00	-4.93	0.002	F
CARBON, ORG,TOT(MG/L)	90	3.79	3.1	3.6	4.3	90	0.11	2.82	0.033	
IRON, DISS (UG/L)	32	109.56	89	110	120	32	0.86	0.79	0.754	
MANGANESE, DISS(UG/L)	32	e 19.75	12	17	24	32	-0.25	-1.27	0.404	
NICKEL, DISS (UG/L)	90	e 2.17	1.0	2.0	3.0	90	-0.00	-0.00	0.099	
FECAL COL (COL/100ML)	90	495.03	99	220	600	90	-43.13	-8.71	0.044	
FEC STREP (COL/100ML)	90	817.74	48	180	530	90	-84.59	-10.34	0.033	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01189030 STATION NAME: PEQUABUCK RIVER AT FARMINGTON, CT
LATITUDE: 414300 LONGITUDE: 725025 DRAINAGE AREA: 57.2 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	92	262.72	200	259	315	90	0.59	0.22	0.823	F
TURBIDITY (NTU)	90	3.56	1.8	3.2	4.3	90	-0.07	-1.87	0.680	
OXYGEN, DISS (MG/L)	92	5.97	3.4	5.7	8.6	90	0.07	1.13	0.412	F
OXYGEN, DISS (% SAT)	92	50.84	35	53	68	90	0.66	1.31	0.205	F
PH (STANDARD UNITS)	92	6.91	6.7	6.9	7.1	90	0.04	0.51	0.008	F
CALCIUM, DISS (MG/L)	63	16.05	14	17	19	32	-0.01	-0.08	0.951	F
MAGNESIUM, DISS(MG/L)	63	3.28	2.8	3.4	3.8	32	-0.01	-0.40	0.757	F
CHLORIDE, DISS (MG/L)	89	27.34	21	27	33	89	0.26	0.96	0.520	F
SILICA, DISS (MG/L)	32	10.03	8.4	10	12	32	-0.20	-1.95	0.022	F
SOLIDS, TOTAL (MG/L)	89	169.34	135	170	201	89	-0.33	-0.19	0.733	F
SOLIDS, DISS (MG/L)	88	149.13	120	151	180	88	-0.18	-0.12	1.000	F
NITROGEN, TOT (MG/L)	88	6.50	2.8	5.3	7.3	88	0.06	0.94	0.617	F
N, ORGANIC, TOT(MG/L)	89	2.14	0.60	1.0	1.5	89	-0.05	-2.21	0.256	F
N, NO2+NO3, TOT(MG/L)	90	1.17	0.9	1.0	1.4	90	0.03	2.62	0.263	F
N, AMMONIA, TOT(MG/L)	89	e 3.04	1.1	2.5	4.5	89	0.04	1.19	0.595	
N, NITRITE, TOT(MG/L)	89	e 0.08	0.05	0.08	0.10	89	0.00	0.00	0.969	
PHOSPHORUS, TOT(MG/L)	88	1.35	0.60	1.1	1.9	88	-0.02	-1.85	0.192	F
CARBON, ORG,TOT(MG/L)	89	7.28	5.5	7.0	8.9	89	0.10	1.43	0.472	F
IRON, DISS (UG/L)	31	285.81	200	250	320	31	-14.79	-5.18	0.038	
IRON, TOTAL (UG/L)	89	1,003.71	820	980	1,200	89	-3.16	-0.32	0.623	F
MANGANESE, DISS(UG/L)	32	e 194.06	130	180	220	32	2.50	1.29	0.449	
COPPER, TOTAL (UG/L)	87	32.47	24	29	38	48	-1.91	-5.88	0.022	
NICKEL, DISS (UG/L)	89	e 11.32	6.0	9.0	14	89	-0.50	-4.42	0.077	
NICKEL, TOTAL (UG/L)	88	e 14.59	9.0	12	19	88	-0.33	-2.28	0.200	
ZINC, TOTAL (UG/L)	86	e 78.72	50	70	100	86	-4.00	-5.08	0.013	
FECAL COL (COL/100ML)	90	31,585.63	300	10,000	50,000	90	*******	-4.36	0.311	
FEC STREP (COL/100ML)	90	17,541.89	550	5,800	20,000	90	*******	-13.24	0.040	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01189120 STATION NAME: FARMINGTON RIVER AT AVON, CT
LATITUDE: 414824 LONGITUDE: 724923 DRAINAGE AREA: 465.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	32	125.44	101	121	139	31	1.90	1.52	0.039	F
TURBIDITY (NTU)	32	1.61	0.8	1.0	2.4	32	-0.07	-4.45	0.350	
OXYGEN, DISS (MG/L)	32	10.46	8.5	10.3	12.7	32	0.00	0.00	0.900	
OXYGEN, DISS (% SAT)	32	91.91	89	93	99	31	0.22	0.23	0.796	F
PH (STANDARD UNITS)	32	6.87	6.6	6.9	7.1	32	0.05	0.73	0.078	
CALCIUM, DISS (MG/L)	32	8.61	7.5	8.6	9.8	31	0.14	1.60	0.366	F
MAGNESIUM, DISS(MG/L)	32	2.12	1.9	2.2	2.3	31	0.03	1.63	0.039	F
CHLORIDE, DISS (MG/L)	32	14.25	11	13	15	31	0.50	3.51	0.039	F
SILICA, DISS (MG/L)	32	5.85	5.1	5.9	6.4	32	-0.10	-1.71	0.091	
SOLIDS, TOTAL (MG/L)	31	83.26	68	82	91	30	0.60	0.72	0.350	F
SOLIDS, DISS (MG/L)	32	75.88	63	71	86	31	1.07	1.41	0.156	F
NITROGEN, TOT (MG/L)	32	1.61	1.0	1.5	2.0	31	0.02	1.14	0.519	F
N, ORGANIC, TOT(MG/L)	32	0.55	0.27	0.50	0.84	32	0.00	0.31	1.000	
N, N02+N03, TOT(MG/L)	32	0.61	0.4	0.6	0.7	31	0.01	2.12	0.366	F
N, AMMONIA, TOT(MG/L)	32	e 0.46	0.25	0.37	0.63	32	0.00	-0.55	1.000	
N, NITRITE, TOT(MG/L)	31	e 0.03	0.01	0.02	0.04	31	0.00	0.00	0.728	
PHOSPHORUS, TOT(MG/L)	32	0.26	0.16	0.21	0.29	31	0.00	0.41	1.000	F
CARBON, ORG,TOT(MG/L)	32	4.80	3.9	4.3	5.3	32	0.13	2.62	0.420	
IRON, DISS (UG/L)	32	137.22	110	130	160	32	0.00	0.00	0.753	
MANGANESE, DISS(UG/L)	32	e 58.28	42	53	70	32	-1.17	-2.00	0.576	
NICKEL, DISS (UG/L)	32	e 4.42	2.0	4.0	7.0	32	-0.50	-11.32	0.187	
FECAL COL (COL/100ML)	32	3,616.23	70	1,300	5,300	32	-753.52	-20.84	0.011	
FEC STREP (COL/100ML)	31	1,640.11	80	560	1,200	16	-91.15	-5.56	0.861	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01189995 STATION NAME: FARMINGTON RIVER AT TARIFFVILLE, CT
LATITUDE: 415430 LONGITUDE: 724540 DRAINAGE AREA: 577.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	121.86	107	119	135	90	0.43	0.36	0.297	F
TURBIDITY (NTU)	89	1.71	1.0	1.2	2.0	89	-0.04	-2.40	0.356	
OXYGEN, DISS (MG/L)	91	10.49	8.4	10.5	12.4	90	0.02	0.17	0.823	F
OXYGEN, DISS (% SAT)	91	93.11	87	93	99	90	0.14	0.15	0.602	F
PH (STANDARD UNITS)	91	6.96	6.8	6.9	7.2	90	0.04	0.57	0.006	F
CALCIUM, DISS (MG/L)	62	9.56	8.1	9.4	11	32	0.12	1.24	0.194	F
MAGNESIUM, DISS(MG/L)	63	2.09	1.9	2.1	2.3	32	0.04	1.68	0.011	F
CHLORIDE, DISS (MG/L)	89	12.77	11	13	14	89	0.37	2.89	0.001	F
SILICA, DISS (MG/L)	32	6.51	5.6	6.4	7.1	32	0.00	0.00	0.850	
SOLIDS, TOTAL (MG/L)	86	84.80	75	83	94	86	0.24	0.28	0.428	F
SOLIDS, DISS (MG/L)	89	75.03	65	73	86	89	0.65	0.87	0.192	F
NITROGEN, TOT (MG/L)	89	1.55	1.1	1.3	1.7	89	0.01	0.91	0.623	F
N, ORGANIC, TOT(MG/L)	86	0.58	0.29	0.40	0.64	86	0.01	1.27	0.750	
N, NO2+NO3, TOT(MG/L)	87	0.69	0.5	0.6	0.8	87	0.01	1.08	0.146	F
N, AMMONIA, TOT(MG/L)	89	e 0.30	0.14	0.24	0.37	89	0.00	-0.99	0.469	
N, NITRITE, TOT(MG/L)	88	e 0.02	0.01	0.02	0.03	88	0.00	0.00	0.800	
PHOSPHORUS, TOT(MG/L)	88	0.20	0.12	0.17	0.25	88	0.00	-1.92	0.249	F
CARBON, ORG,TOT(MG/L)	90	4.04	3.4	3.9	4.6	90	0.10	2.50	0.033	
IRON, DISS (UG/L)	32	135.88	120	140	150	32	0.00	0.00	0.794	
MANGANESE, DISS(UG/L)	32	e 55.59	40	54	66	32	-3.30	-5.94	0.191	
NICKEL, DISS (UG/L)	89	e 3.18	1.0	2.0	4.0	89	-0.33	-10.47	0.001	
FECAL COL (COL/100ML)	90	1,383.92	190	610	1,600	90	-165.92	-11.99	0.007	
FEC STREP (COL/100ML)	89	1,501.22	62	400	1,500	89	-339.94	-22.64	0.000	F

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01190070 STATION NAME: CONNECTICUT RIVER AT HARTFORD, CT
LATITUDE: 414610 LONGITUDE: 724004 DRAINAGE AREA: 10,487.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	118.74	103	118	135	90	1.00	0.84	0.202	
TURBIDITY (NTU)	90	2.37	1.0	1.5	3.0	90	-0.16	-6.91	0.023	
OXYGEN, DISS (MG/L)	91	10.69	8.2	10.8	13.4	90	0.10	0.94	0.022	
OXYGEN, DISS (% SAT)	91	94.75	89	94	100	90	1.00	1.06	0.024	
PH (STANDARD UNITS)	91	7.12	6.9	7.1	7.3	90	0.03	0.47	0.022	
CALCIUM, DISS (MG/L)	63	11.68	10	11	13	32	0.00	0.00	0.848	
MAGNESIUM, DISS(MG/L)	63	1.77	1.6	1.8	2.0	32	0.01	0.47	0.407	
CHLORIDE, DISS (MG/L)	90	10.59	9.0	10	13	90	0.20	1.89	0.050	
SILICA, DISS (MG/L)	32	5.23	4.7	5.3	6.0	32	0.03	0.48	0.853	
SOLIDS, TOTAL (MG/L)	86	86.24	77	87	93	86	0.00	0.00	0.629	
SOLIDS, DISS (MG/L)	90	73.88	64	75	84	90	0.25	0.34	0.765	
NITROGEN, TOT (MG/L)	90	1.00	0.77	0.90	1.1	90	0.00	0.00	0.735	
N, ORGANIC, TOT(MG/L)	88	0.47	0.28	0.38	0.54	88	0.00	0.00	0.938	
N, NO2+NO3, TOT(MG/L)	90	0.40	0.3	0.4	0.5	90	0.00	0.00	0.783	
N, AMMONIA, TOT(MG/L)	90	e 0.13	0.07	0.11	0.15	90	0.00	0.00	0.496	
N, NITRITE, TOT(MG/L)	90	e 0.01	e 0.01	0.01	0.02	90	0.00	0.00	0.633	
PHOSPHORUS, TOT(MG/L)	90	0.07	0.05	0.06	0.09	90	-0.00	-5.59	0.043	
CARBON, ORG,TOT(MG/L)	90	4.21	3.5	4.1	4.8	90	0.07	1.77	0.153	
IRON, DISS (UG/L)	32	82.97	64	82	100	32	-0.97	-1.17	0.709	
MANGANESE, DISS(UG/L)	32	e 21.47	11	18	28	32	-1.00	-4.66	0.040	
NICKEL, DISS (UG/L)	90	e 2.21	1.0	2.0	3.0	90	-0.20	-9.04	0.007	
FECAL COL (COL/100ML)	90	1,880.01	340	1,200	2,800	90	-544.46	-28.96	0.000	
FEC STREP (COL/100ML)	89	3,430.54	93	540	3,100	89	*******	-35.32	0.000	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01192516 STATION NAME: HOCKANUM RIVER AT EAST HARTFORD, CT
LATITUDE: 414522 LONGITUDE: 723908 DRAINAGE AREA: 76.1 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	329.99	285	325	380	90	2.00	0.61	0.476	
TURBIDITY (NTU)	88	5.70	2.6	5.0	7.7	49	-0.10	-1.71	0.806	
OXYGEN, DISS (MG/L)	91	8.44	6.4	7.9	10.5	90	-0.04	-0.47	0.453	
OXYGEN, DISS (% SAT)	91	77.97	68	77	87	90	0.00	0.00	0.822	
PH (STANDARD UNITS)	91	7.11	6.9	7.1	7.3	90	0.01	0.20	0.106	
CALCIUM, DISS (MG/L)	63	22.19	19	23	25	32	-0.40	-1.80	0.380	
MAGNESIUM, DISS(MG/L)	63	3.99	3.6	4.0	4.4	32	-0.05	-1.25	0.379	
CHLORIDE, DISS (MG/L)	88	39.14	32	37	42	88	0.40	1.02	0.295	
SILICA, DISS (MG/L)	32	10.35	9.0	10	12	32	-0.17	-1.65	0.207	
SOLIDS, TOTAL (MG/L)	84	224.25	198	222	251	84	2.25	1.00	0.350	
SOLIDS, DISS (MG/L)	89	191.66	168	191	218	89	0.21	0.11	0.850	
NITROGEN, TOT (MG/L)	89	7.26	4.9	6.9	8.1	89	0.10	1.38	0.431	
N, ORGANIC, TOT(MG/L)	89	1.76	0.70	1.0	1.7	89	-0.04	-2.52	0.595	
N, NO2+NO3, TOT(MG/L)	90	1.91	1.5	1.9	2.3	90	0.00	0.00	0.678	
N, AMMONIA, TOT(MG/L)	90	e 3.55	2.3	3.4	4.4	90	0.10	2.82	0.124	
N, NITRITE, TOT(MG/L)	90	e 0.14	0.03	0.09	0.25	90	0.00	0.00	0.298	
PHOSPHORUS, TOT(MG/L)	88	0.97	0.66	0.95	1.2	88	-0.02	-2.13	0.182	
CARBON, ORG,TOT(MG/L)	87	7.41	5.7	7.4	8.5	87	0.06	0.87	0.697	
IRON, DISS (UG/L)	32	139.25	83	130	190	32	-7.76	-5.57	0.054	
MANGANESE, DISS(UG/L)	31	e 181.06	160	180	210	31	0.00	0.00	0.844	
NICKEL, DISS (UG/L)	90	e 5.77	3.0	5.0	7.0	90	0.00	0.00	0.700	
FECAL COL (COL/100ML)	89	26,668.44	80	6,000	38,000	89	*******	-12.15	0.030	
FEC STREP (COL/100ML)	88	19,960.94	93	3,400	15,000	49	*******	-15.71	0.105	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01192911 STATION NAME: CONNECTICUT RIVER AT MIDDLETOWN, CT
LATITUDE: 413400 LONGITUDE: 723853 DRAINAGE AREA: 10,869.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	97	126.78	111	125	144	90	1.67	1.31	0.133	
TURBIDITY (NTU)	90	2.55	1.2	2.0	2.8	90	-0.21	-8.25	0.024	
OXYGEN, DISS (MG/L)	97	10.59	8.7	10.3	12.8	90	0.03	0.31	0.432	
OXYGEN, DISS (% SAT)	97	96.60	90	95	100	90	0.50	0.52	0.069	
PH (STANDARD UNITS)	97	7.22	7.0	7.2	7.4	90	0.03	0.35	0.172	
CALCIUM, DISS (MG/L)	62	12.40	11	12	14	32	0.00	0.00	0.652	
MAGNESIUM, DISS(MG/L)	61	1.92	1.6	1.9	2.2	32	0.02	1.04	0.283	
CHLORIDE, DISS (MG/L)	90	11.58	9.6	11	14	90	0.17	1.44	0.105	
SILICA, DISS (MG/L)	32	5.22	4.5	5.3	6.1	32	0.05	0.96	0.575	
SOLIDS, TOTAL (MG/L)	87	89.86	80	90	97	87	-0.45	-0.50	0.639	
SOLIDS, DISS (MG/L)	89	78.30	70	78	87	89	0.33	0.43	0.761	
NITROGEN, TOT (MG/L)	96	1.18	0.90	1.1	1.4	90	0.01	0.51	0.306	
N, ORGANIC, TOT(MG/L)	95	0.53	0.29	0.43	0.69	89	0.01	1.70	0.494	
N, NO2+NO3, TOT(MG/L)	96	0.44	0.4	0.4	0.5	90	0.00	0.00	0.936	
N, AMMONIA, TOT(MG/L)	96	e 0.21	0.13	0.20	0.28	96	0.00	1.59	0.244	
N, NITRITE, TOT(MG/L)	90	e 0.02	e 0.01	0.01	0.02	90	0.00	0.00	0.435	
PHOSPHORUS, TOT(MG/L)	95	0.10	0.07	0.09	0.12	90	-0.00	-3.78	0.010	
CARBON, ORG,TOT(MG/L)	90	4.61	3.5	4.3	5.1	90	0.09	2.04	0.124	
IRON, DISS (UG/L)	32	82.22	58	82	110	32	-2.20	-2.68	0.352	
IRON, TOTAL (UG/L)	89	501.46	320	430	540	89	-9.18	-1.83	0.295	
MANGANESE, DISS(UG/L)	32	e 21.17	9.0	17	33	32	0.00	0.00	0.190	
COPPER, TOTAL (UG/L)	90	7.27	5.0	6.5	8.3	90	-0.40	-5.45	0.012	
NICKEL, DISS (UG/L)	88	e 2.70	1.0	2.0	4.0	88	-0.00	-0.00	0.080	
NICKEL, TOTAL (UG/L)	89	e 4.91	2.0	4.0	6.0	89	0.00	0.00	0.333	
ZINC, TOTAL (UG/L)	90	e 21.73	10	20	30	90	-3.33	-15.34	0.000	
FECAL COL (COL/100ML)	90	2,274.46	290	1,200	3,200	90	-399.77	-17.58	0.000	
FEC STREP (COL/100ML)	89	1,831.54	52	520	1,200	89	-307.63	-16.80	0.011	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01193050 STATION NAME: CONNECTICUT RIVER AT MIDDLE HADDAM, CT
LATITUDE: 413230 LONGITUDE: 723313 DRAINAGE AREA: 10,897.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/YEAR	PERCENT/YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	95	124.66	110	123	142	89	3.00	2.41	0.010	
TURBIDITY (NTU)	89	2.95	1.3	2.0	4.0	49	-0.39	-13.15	0.021	
OXYGEN, DISS (MG/L)	96	10.30	8.2	9.9	12.4	90	0.15	1.46	0.039	
OXYGEN, DISS (% SAT)	96	94.61	87	95	101	90	1.33	1.41	0.010	
PH (STANDARD UNITS)	96	7.20	7.0	7.2	7.4	90	0.05	0.69	0.000	
CALCIUM, DISS (MG/L)	63	12.34	11	12	14	32	0.14	1.16	0.339	
MAGNESIUM, DISS(MG/L)	63	1.96	1.7	2.0	2.2	32	0.04	2.13	0.146	
CHLORIDE, DISS (MG/L)	82	11.67	9.2	12	13	32	0.40	3.43	0.017	
SILICA, DISS (MG/L)	32	5.14	4.5	5.1	6.2	32	0.02	0.42	0.950	
SOLIDS, TOTAL (MG/L)	79	90.37	81	89	100	32	0.38	0.42	0.707	
SOLIDS, DISS (MG/L)	82	78.52	69	80	88	32	0.00	0.00	1.000	
NITROGEN, TOT (MG/L)	88	1.20	0.90	1.1	1.4	32	-0.04	-3.37	0.207	
N, ORGANIC, TOT(MG/L)	85	0.56	0.32	0.52	0.65	32	-0.02	-2.72	0.386	
N, N02+N03, TOT(MG/L)	88	0.46	0.4	0.5	0.5	32	-0.01	-1.24	0.137	
N, AMMONIA, TOT(MG/L)	88	e 0.20	0.12	0.18	0.27	88	-0.01	-3.41	0.457	
N, NITRITE, TOT(MG/L)	82	e 0.02	e 0.01	0.01	0.02	82	0.00	0.00	0.566	
PHOSPHORUS, TOT(MG/L)	88	0.09	0.06	0.09	0.11	32	0.00	-2.75	0.571	
CARBON, ORG,TOT(MG/L)	82	4.56	3.6	4.2	5.1	32	0.11	2.44	0.171	
IRON, DISS (UG/L)	32	75.53	50	83	100	32	-1.34	-1.77	0.420	
MANGANESE, DISS(UG/L)	32	e 18.50	9.0	17	30	32	0.00	0.00	0.718	
NICKEL, DISS (UG/L)	82	e 2.68	2.0	2.0	3.0	82	0.00	0.00	1.000	
FECAL COL (COL/100ML)	89	1,481.03	130	800	2,300	89	-60.10	-4.06	0.622	
FEC STREP (COL/100ML)	89	1,017.03	32	210	930	89	-171.50	-16.86	0.069	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01193500 STATION NAME: SALMON RIVER NEAR EAST HAMPTON, CT
LATITUDE: 413308 LONGITUDE: 722659 DRAINAGE AREA: 100.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	99.23	87	98	111	90	1.35	1.36	0.001	F
TURBIDITY (NTU)	90	1.20	0.7	1.0	1.2	90	-0.07	-5.90	0.001	
OXYGEN, DISS (MG/L)	91	11.47	9.3	11.4	13.5	90	0.06	0.50	0.371	F
OXYGEN, DISS (% SAT)	91	102.45	100	102	106	90	0.00	0.00	0.448	
PH (STANDARD UNITS)	91	7.09	6.8	7.1	7.3	90	0.03	0.38	0.218	F
CALCIUM, DISS (MG/L)	63	6.06	5.3	5.9	6.6	32	0.01	0.11	0.951	F
MAGNESIUM, DISS(MG/L)	63	1.73	1.6	1.7	1.9	32	0.01	0.60	0.240	F
CHLORIDE, DISS (MG/L)	89	13.20	11	13	15	89	0.32	2.39	0.000	F
SILICA, DISS (MG/L)	32	8.22	6.9	8.2	9.4	32	-0.21	-2.58	0.004	
SOLIDS, TOTAL (MG/L)	87	71.21	62	69	81	87	-0.26	-0.37	0.507	F
SOLIDS, DISS (MG/L)	86	65.34	57	64	75	86	-0.11	-0.16	0.502	F
NITROGEN, TOT (MG/L)	83	0.80	0.50	0.70	0.90	48	0.05	5.92	0.096	F
N, ORGANIC, TOT(MG/L)	70	0.42	0.23	0.36	0.55	70	0.03	8.03	0.010	
N, NO2+NO3, TOT(MG/L)	90	0.26	0.2	0.2	0.3	90	0.00	1.44	0.168	F
N, AMMONIA, TOT(MG/L)	90	e 0.06	0.01	0.02	0.05	90	-0.00	-4.07	0.032	
PHOSPHORUS, TOT(MG/L)	90	0.03	0.01	0.02	0.03	90	-0.00	-0.00	0.045	
CARBON, ORG,TOT(MG/L)	89	3.97	2.9	3.6	4.9	89	0.10	2.47	0.118	
IRON, DISS (UG/L)	32	151.97	76	140	200	32	7.00	4.60	0.386	
IRON, TOTAL (UG/L)	47	398.51	220	360	520	46	-7.94	-1.99	0.396	F
MANGANESE, DISS(UG/L)	32	e 19.13	8.0	14	22	32	-0.45	-2.35	0.250	
COPPER, TOTAL (UG/L)	46	3.74	2.0	3.0	5.0	46	-0.20	-5.29	0.253	
NICKEL, DISS (UG/L)	90	e 1.77	e 1.0	1.0	3.0	90	0.00	0.00	0.359	
NICKEL, TOTAL (UG/L)	48	e 3.24	1.0	3.0	4.0	48	-0.33	-10.27	0.010	
ZINC, TOTAL (UG/L)	47	e 20.65	e 10	20	30	47	-3.33	-16.14	0.002	
FECAL COL (COL/100ML)	90	251.53	17	44	110	90	-36.69	-14.59	0.004	
FEC STREP (COL/100ML)	90	1,289.94	20	49	230	90	-249.96	-19.38	0.025	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01193750 STATION NAME: CONNECTICUT RIVER AT EAST HADDAM, CT
LATITUDE: 412705 LONGITUDE: 722755 DRAINAGE AREA: 11,092.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	69	125.80	114	128	139	49	0.67	0.53	0.590	
TURBIDITY (NTU)	61	3.07	1.3	2.0	3.1	49	-0.26	-8.45	0.085	
OXYGEN, DISS (MG/L)	69	10.21	8.3	9.6	12.6	49	0.01	0.07	0.883	
OXYGEN, DISS (% SAT)	69	94.10	86	94	101	49	0.50	0.53	0.492	
PH (STANDARD UNITS)	69	7.19	7.0	7.2	7.4	49	0.05	0.69	0.001	
CALCIUM, DISS (MG/L)	40	11.92	11	12	14	32	0.00	0.00	0.794	
MAGNESIUM, DISS(MG/L)	40	1.96	1.8	2.0	2.2	32	0.03	1.49	0.378	
CHLORIDE, DISS (MG/L)	60	12.32	9.7	12	14	49	0.25	2.03	0.123	
SILICA, DISS (MG/L)	32	5.41	4.3	5.5	6.8	32	-0.05	-0.92	0.664	
SOLIDS, TOTAL (MG/L)	58	89.41	81	88	97	48	0.75	0.84	0.546	
SOLIDS, DISS (MG/L)	60	78.15	69	79	87	49	0.10	0.13	0.922	
NITROGEN, TOT (MG/L)	69	1.19	0.92	1.2	1.4	49	0.00	0.00	0.766	
N, ORGANIC, TOT(MG/L)	68	0.56	0.33	0.49	0.74	49	0.01	1.60	0.732	
N, N02+N03, TOT(MG/L)	69	0.46	0.4	0.5	0.5	49	0.00	0.00	1.000	
N, AMMONIA, TOT(MG/L)	69	e 0.18	0.11	0.17	0.24	69	0.00	0.00	0.961	
N, NITRITE, TOT(MG/L)	60	e 0.01	e 0.01	0.01	0.02	60	0.00	0.00	0.297	
PHOSPHORUS, TOT(MG/L)	69	0.10	0.07	0.09	0.11	49	-0.00	-3.48	0.036	
CARBON, ORG,TOT(MG/L)	60	4.43	3.6	4.1	4.8	49	0.05	1.16	0.431	
IRON, DISS (UG/L)	32	88.19	52	80	110	32	-2.17	-2.46	0.151	
MANGANESE, DISS(UG/L)	32	e 18.66	7.0	15	34	32	0.00	0.00	0.238	
NICKEL, DISS (UG/L)	60	e 2.62	1.0	2.0	3.0	60	0.00	0.00	0.450	
FECAL COL (COL/100ML)	60	1,363.49	41	450	1,200	49	-61.46	-4.51	0.522	
FEC STREP (COL/100ML)	59	870.88	17	170	500	48	-133.02	-15.27	0.206	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01196222 STATION NAME: QUINNIPIAC RIVER NEAR MERIDEN, CT
LATITUDE: 413145 LONGITUDE: 725150 DRAINAGE AREA: 69.6 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	90	272.66	214	269	322	87	8.57	3.14	0.000	F
TURBIDITY (NTU)	90	3.62	1.6	2.8	4.5	90	-0.23	-6.46	0.009	
OXYGEN, DISS (MG/L)	90	9.06	7.0	8.6	11.4	87	0.30	3.30	0.001	F
OXYGEN, DISS (% SAT)	90	80.36	70	82	93	87	2.40	2.99	0.000	F
PH (STANDARD UNITS)	90	7.23	7.1	7.2	7.4	90	0.07	0.92	0.000	**
CALCIUM, DISS (MG/L)	64	27.28	22	28	32	31	0.80	2.92	0.000	F
MAGNESIUM, DISS(MG/L)	64	4.24	3.7	4.3	4.8	31	0.11	2.49	0.001	F
CHLORIDE, DISS (MG/L)	89	25.45	21	25	29	86	1.22	4.80	0.000	F
SILICA, DISS (MG/L)	33	11.51	9.9	11	13	31	0.10	0.89	0.366	F
SOLIDS, TOTAL (MG/L)	87	180.29	150	180	205	85	3.87	2.14	0.000	F
SOLIDS, DISS (MG/L)	90	165.38	135	167	191	87	3.65	2.21	0.000	F
NITROGEN, TOT (MG/L)	90	3.47	2.2	3.1	4.2	87	0.14	4.03	0.001	F
N, ORGANIC, TOT(MG/L)	89	0.74	0.30	0.51	0.80	89	0.02	3.23	0.650	
N, N02+N03, TOT(MG/L)	90	1.86	1.1	1.6	2.4	87	0.16	8.69	0.000	F
N, AMMONIA, TOT(MG/L)	90	e 0.88	0.36	0.68	1.1	90	-0.02	-2.66	0.313	
N, NITRITE, TOT(MG/L)	89	e 0.05	0.02	0.04	0.07	89	0.00	0.00	0.614	
PHOSPHORUS, TOT(MG/L)	90	0.51	0.27	0.46	0.72	87	0.01	2.85	0.039	F
CARBON, ORG,TOT(MG/L)	89	4.52	3.5	4.2	5.1	89	-0.06	-1.40	0.382	
IRON, DISS (UG/L)	32	109.59	64	96	160	31	-9.92	-9.05	0.001	F
IRON, TOTAL (UG/L)	90	539.00	350	440	600	87	-9.73	-1.81	0.258	F
MANGANESE, DISS(UG/L)	32	e 129.25	79	140	170	32	0.00	0.00	1.000	
COPPER, TOTAL (UG/L)	90	11.74	7.0	10	13	90	-1.13	-9.61	0.000	
NICKEL, DISS (UG/L)	90	e 5.62	3.0	5.0	7.0	90	-0.33	-5.93	0.024	
NICKEL, TOTAL (UG/L)	90	e 8.13	5.0	7.0	10	90	-0.25	-3.08	0.100	
ZINC, TOTAL (UG/L)	89	e 57.08	40	50	70	89	1.83	3.21	0.078	
FECAL COL (COL/100ML)	90	13,046.96	180	1,000	6,000	90	*******	-25.71	0.001	
FEC STREP (COL/100ML)	90	5,704.48	120	850	5,400	90	*******	-31.87	0.000	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01196500 STATION NAME: QUINNIPIAC RIVER AT WALLINGFORD, CT
LATITUDE: 412658 LONGITUDE: 725029 DRAINAGE AREA: 115.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	96	303.19	254	301	338	90	3.20	1.06	0.025	F
TURBIDITY (NTU)	90	4.83	1.8	3.4	7.0	90	-0.52	-10.81	0.007	F
OXYGEN, DISS (MG/L)	95	10.31	8.5	10.4	12.2	89	0.29	2.81	0.000	F
OXYGEN, DISS (% SAT)	95	95.51	89	97	102	89	2.00	2.09	0.000	
PH (STANDARD UNITS)	96	7.39	7.2	7.4	7.6	90	0.07	0.99	0.000	F
CALCIUM, DISS (MG/L)	63	28.81	26	30	33	32	0.34	1.17	0.386	F
MAGNESIUM, DISS(MG/L)	63	5.29	4.6	5.5	6.0	32	0.05	1.04	0.421	F
CHLORIDE, DISS (MG/L)	89	29.35	25	28	32	89	0.92	3.12	0.000	F
SILICA, DISS (MG/L)	32	10.57	9.2	11	12	32	-0.18	-1.74	0.207	**
SOLIDS, TOTAL (MG/L)	88	200.93	175	206	225	88	0.75	0.37	0.591	F
SOLIDS, DISS (MG/L)	90	181.69	152	185	204	90	0.40	0.22	0.602	F
NITROGEN, TOT (MG/L)	96	3.62	2.6	3.4	4.4	90	-0.06	-1.59	0.044	F
N, ORGANIC, TOT(MG/L)	95	0.68	0.40	0.56	0.80	89	-0.01	-1.84	0.569	
N, NO2+NO3, TOT(MG/L)	96	2.31	1.5	2.2	2.9	90	0.13	5.77	0.000	F
N, AMMONIA, TOT(MG/L)	93	e 0.65	0.16	0.33	0.75	93	-0.09	-13.34	0.000	
N, NITRITE, TOT(MG/L)	89	e 0.08	0.04	0.06	0.10	89	0.00	0.00	0.281	
PHOSPHORUS, TOT(MG/L)	96	0.50	0.28	0.45	0.67	90	-0.01	-2.93	0.062	F
CARBON, ORG,TOT(MG/L)	89	4.86	3.8	4.6	5.7	89	-0.18	-3.64	0.014	F
IRON, DISS (UG/L)	32	98.41	39	85	140	32	-15.06	-15.30	0.000	F
IRON, TOTAL (UG/L)	88	789.55	510	700	930	88	-77.76	-9.85	0.000	F
MANGANESE, DISS(UG/L)	32	e 157.91	120	150	180	32	-15.00	-9.50	0.001	
COPPER, TOTAL (UG/L)	88	21.27	11	17	26	88	-3.74	-17.58	0.000	
NICKEL, DISS (UG/L)	89	e 7.36	4.0	6.0	10	89	-0.67	-9.06	0.001	
NICKEL, TOTAL (UG/L)	87	e 9.55	6.0	8.0	11	87	-1.00	-10.47	0.001	
ZINC, TOTAL (UG/L)	88	e 42.39	30	40	50	88	-2.86	-6.74	0.000	
FECAL COL (COL/100ML)	90	4,738.27	400	1,100	5,000	90	*******	-21.78	0.000	F
FEC STREP (COL/100ML)	90	4,155.96	130	600	3,000	90	*******	-32.14	0.000	F

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01196530 STATION NAME: QUINNIPIAC RIVER AT NORTH HAVEN, CT
LATITUDE: 412324 LONGITUDE: 725219 DRAINAGE AREA: 128.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	96	332.09	267	337	375	90	12.83	3.86	0.002	
TURBIDITY (NTU)	90	5.26	1.9	3.9	7.8	90	-0.57	-10.91	0.001	
OXYGEN, DISS (MG/L)	96	7.72	5.2	7.2	10.3	90	-0.02	-0.32	0.823	
OXYGEN, DISS (% SAT)	96	69.47	58	70	87	90	0.25	0.36	0.793	
PH (STANDARD UNITS)	96	7.20	7.0	7.2	7.4	90	0.05	0.69	0.000	
CALCIUM, DISS (MG/L)	64	29.66	25	31	34	32	0.20	0.66	0.661	
MAGNESIUM, DISS(MG/L)	64	5.53	4.7	5.8	6.4	32	0.05	0.90	0.492	
CHLORIDE, DISS (MG/L)	90	31.06	26	31	35	90	1.67	5.37	0.000	
SILICA, DISS (MG/L)	32	10.72	9.2	11	12	32	0.00	0.00	1.000	
SOLIDS, TOTAL (MG/L)	89	223.43	191	221	260	89	3.67	1.64	0.088	
SOLIDS, DISS (MG/L)	88	199.36	162	203	227	88	3.25	1.63	0.144	
NITROGEN, TOT (MG/L)	95	7.16	4.8	6.4	8.6	89	0.41	5.78	0.034	
N, ORGANIC, TOT(MG/L)	93	3.60	2.0	2.9	4.6	87	0.25	6.89	0.023	
N, NO2+NO3, TOT(MG/L)	96	2.54	1.7	2.4	3.1	90	0.21	8.32	0.000	
N, AMMONIA, TOT(MG/L)	96	e 1.23	0.56	0.73	1.4	96	-0.09	-7.74	0.000	
N, NITRITE, TOT(MG/L)	90	e 0.10	0.05	0.09	0.15	90	0.00	2.49	0.197	
PHOSPHORUS, TOT(MG/L)	96	0.61	0.40	0.54	0.77	90	0.00	0.00	1.000	
CARBON, ORG,TOT(MG/L)	90	8.65	6.4	8.3	10	90	0.00	0.00	1.000	
IRON, DISS (UG/L)	32	90.72	40	79	120	32	-14.20	-15.65	0.001	
IRON, TOTAL (UG/L)	86	881.98	550	760	1,000	47	-97.78	-11.09	0.000	
MANGANESE, DISS(UG/L)	32	e 168.09	120	160	220	32	-10.00	-5.95	0.236	
COPPER, TOTAL (UG/L)	88	24.08	13	19	28	88	-3.50	-14.52	0.000	
NICKEL, DISS (UG/L)	90	e 12.53	7.0	10	15	90	-1.00	-7.98	0.000	
NICKEL, TOTAL (UG/L)	87	e 17.57	10	13	21	87	-1.00	-5.69	0.014	
ZINC, TOTAL (UG/L)	88	e 44.67	30	40	50	88	-2.50	-5.60	0.005	
FECAL COL (COL/100ML)	90	9,275.40	750	5,600	13,000	90	*******	-14.54	0.001	
FEC STREP (COL/100ML)	90	5,643.88	620	2,100	7,000	90	*******	-25.99	0.000	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01196656 STATION NAME: NEW HAVEN HARBOR NEAR NEW HAVEN, CT
LATITUDE: 411611 LONGITUDE: 725444 DRAINAGE AREA: 241.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	32	37,471.88	35,200	38,200	41,900	32	-450.00	-1.20	0.420	
TURBIDITY (NTU)	32	2.78	1.3	2.2	3.8	32	-0.31	-11.00	0.062	
OXYGEN, DISS (MG/L)	32	9.77	8.4	10.0	11.3	32	0.09	0.94	0.664	
OXYGEN, DISS (% SAT)	32	98.00	89	97	112	32	2.54	2.59	0.030	
PH (STANDARD UNITS)	32	7.80	7.6	7.8	8.0	32	0.02	0.32	0.207	
CALCIUM, DISS (MG/L)	32	264.34	250	290	300	32	3.67	1.39	0.287	
MAGNESIUM, DISS(MG/L)	32	920.00	860	930	990	32	0.00	0.00	0.705	
CHLORIDE, DISS (MG/L)	30	14,516.67	14,000	15,000	16,000	30	0.00	0.00	0.422	
SILICA, DISS (MG/L)	31	1.22	0.8	1.2	1.7	16	0.16	12.85	0.011	
SOLIDS, TOTAL (MG/L)	32	30,159.38	28,200	29,500	31,900	32	-41.67	-0.14	0.803	
SOLIDS, DISS (MG/L)	32	27,603.13	26,600	27,600	28,500	32	-226.67	-0.82	0.107	
N, ORGANIC, TOT(MG/L)	31	0.40	0.20	0.42	0.58	31	0.05	11.35	0.156	
N, NO2+NO3, TOT(MG/L)	32	0.11	--	--	0.2	32	0.00	0.00	0.035	
N, AMMONIA, TOT(MG/L)	32	e 0.23	0.15	0.24	0.31	32	0.01	5.97	0.040	
N, NITRITE, TOT(MG/L)	32	e 0.02	0.01	0.01	0.03	32	0.00	0.00	0.340	
PHOSPHORUS, TOT(MG/L)	32	0.13	0.10	0.13	0.15	32	0.00	0.00	0.799	
CARBON, ORG,TOT(MG/L)	32	2.97	2.2	2.7	3.4	32	0.11	3.81	0.352	
IRON, DISS (UG/L)	32	167.97	100	120	170	32	-10.77	-6.41	0.148	
MANGANESE, DISS(UG/L)	32	e 63.75	50	60	70	32	-1.67	-2.61	0.249	
NICKEL, DISS (UG/L)	31	e 3.24	2.0	3.0	4.0	31	0.00	0.00	0.507	
FECAL COL (COL/100ML)	32	173.38	11	24	41	32	-30.10	-17.36	0.153	
FEC STREP (COL/100ML)	32	55.80	4	16	47	32	-7.25	-13.00	0.386	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01200600 STATION NAME: HOUSATONIC RIVER NEAR NEW MILFORD, CT
LATITUDE: 413535 LONGITUDE: 732700 DRAINAGE AREA: 1,022.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	275.90	254	276	305	89	2.16	0.78	0.011	F
TURBIDITY (NTU)	89	3.16	1.0	1.7	3.0	89	-0.35	-11.16	0.001	
OXYGEN, DISS (MG/L)	91	11.85	9.8	12.2	13.8	89	-0.02	-0.16	0.791	F
OXYGEN, DISS (% SAT)	91	106.75	100	105	116	90	0.00	0.00	1.000	
PH (STANDARD UNITS)	91	8.20	7.9	8.2	8.5	89	0.01	0.13	0.570	F
CALCIUM, DISS (MG/L)	64	30.55	28	31	33	32	0.20	0.67	0.240	F
MAGNESIUM, DISS(MG/L)	64	11.48	11	12	13	32	0.09	0.79	0.421	F
CHLORIDE, DISS (MG/L)	90	15.16	13	15	17	89	0.36	2.35	0.001	F
SILICA, DISS (MG/L)	31	3.35	1.9	3.5	4.6	31	0.07	2.24	0.698	
SOLIDS, TOTAL (MG/L)	84	177.71	162	176	190	83	-1.60	-0.90	0.075	F
SOLIDS, DISS (MG/L)	90	159.80	144	159	176	89	0.94	0.59	0.307	F
NITROGEN, TOT (MG/L)	80	1.09	0.76	0.96	1.2	47	0.01	1.37	0.532	
N, ORGANIC, TOT(MG/L)	74	0.59	0.29	0.52	0.76	47	0.02	3.24	0.468	**
N, NO2+NO3, TOT(MG/L)	90	0.43	0.3	0.4	0.5	89	0.01	2.29	0.185	F
N, AMMONIA, TOT(MG/L)	90	e 0.04	0.01	0.02	0.05	90	-0.00	-4.66	0.023	
N, NITRITE, TOT(MG/L)	90	e 0.01	e 0.01	e 0.01	0.01	90	0.00	0.00	0.405	
PHOSPHORUS, TOT(MG/L)	90	0.06	0.03	0.05	0.06	90	-0.00	-5.90	0.006	
CARBON, ORG,TOT(MG/L)	90	3.93	2.9	3.8	4.9	90	0.10	2.58	0.100	**
IRON, DISS (UG/L)	32	33.13	20	29	46	32	-3.12	-9.43	0.007	**
MANGANESE, DISS(UG/L)	32	e 9.66	4.0	10	13	32	0.00	0.00	0.211	
NICKEL, DISS (UG/L)	90	e 1.56	e 1.0	1.0	2.0	90	0.00	0.00	0.222	
FECAL COL (COL/100ML)	89	203.32	12	36	110	87	-8.36	-4.11	0.413	F
FEC STREP (COL/100ML)	89	788.74	11	60	290	89	-215.54	-27.33	0.012	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01201485 STATION NAME: STILL RIVER AT BROOKFIELD CENTER, CT
LATITUDE: 412723 LONGITUDE: 732347 DRAINAGE AREA: 60.6 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	473.67	386	462	565	89	10.81	2.28	0.000	F
TURBIDITY (NTU)	89	3.93	1.8	2.7	4.6	89	-0.47	-11.95	0.000	
OXYGEN, DISS (MG/L)	91	8.21	4.9	8.1	11.5	89	-0.09	-1.10	0.241	F
OXYGEN, DISS (% SAT)	91	72.18	53	73	90	89	-1.04	-1.44	0.121	F
PH (STANDARD UNITS)	91	7.36	7.2	7.3	7.5	89	0.05	0.68	0.000	F
CALCIUM, DISS (MG/L)	63	36.51	33	36	41	32	0.34	0.94	0.055	F
MAGNESIUM, DISS(MG/L)	64	12.31	11	13	14	32	0.22	1.75	0.000	F
CHLORIDE, DISS (MG/L)	89	51.39	37	49	61	88	2.01	3.90	0.000	F
SILICA, DISS (MG/L)	32	8.09	7.1	8.3	9.2	32	0.10	1.24	0.185	
SOLIDS, TOTAL (MG/L)	86	298.50	247	294	347	85	4.28	1.43	0.001	F
SOLIDS, DISS (MG/L)	89	269.15	221	264	318	88	4.94	1.84	0.002	F
NITROGEN, TOT (MG/L)	88	5.96	3.0	4.9	6.8	87	0.13	2.26	0.079	F
N, ORGANIC, TOT(MG/L)	86	1.71	0.50	0.80	1.2	85	0.00	0.00	1.000	F
N, NO2+NO3, TOT(MG/L)	90	1.34	0.9	1.1	1.6	89	0.03	2.10	0.054	F
N, AMMONIA, TOT(MG/L)	88	e 2.96	1.4	2.4	4.3	88	0.04	1.24	0.755	
N, NITRITE, TOT(MG/L)	89	e 0.14	0.03	0.08	0.23	89	0.00	1.80	0.218	
PHOSPHORUS, TOT(MG/L)	89	0.63	0.31	0.46	0.69	88	-0.01	-1.64	0.701	F
CARBON, ORG,TOT(MG/L)	90	7.20	5.7	7.3	8.0	89	0.02	0.33	0.970	F
IRON, DISS (UG/L)	32	93.50	54	67	120	32	-3.54	-3.78	0.263	
IRON, TOTAL (UG/L)	88	1,085.00	590	820	1,100	49	-24.18	-2.23	0.434	
MANGANESE, DISS(UG/L)	32	e 140.53	93	140	180	32	0.00	0.00	0.950	
COPPER, TOTAL (UG/L)	89	27.29	14	22	34	89	-2.00	-7.34	0.003	
NICKEL, DISS (UG/L)	88	e 12.45	5.0	9.0	16	88	-2.00	-16.07	0.000	
NICKEL, TOTAL (UG/L)	88	e 17.38	8.0	11	20	88	-2.00	-11.51	0.000	
ZINC, TOTAL (UG/L)	88	e 41.59	30	40	50	88	0.00	0.00	0.158	
FECAL COL (COL/100ML)	89	3,549.03	150	300	680	89	-336.69	-9.49	0.041	
FEC STREP (COL/100ML)	89	1,936.67	110	300	830	89	-353.12	-18.23	0.001	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01201700 STATION NAME: LAKE LILLINONAH NEAR BROOKFIELD CENTER, CT
LATITUDE: 412847 LONGITUDE: 732104 DRAINAGE AREA: 1,214.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	60	240.25	220	250	265	49	2.00	0.83	0.302	
TURBIDITY (NTU)	60	2.51	1.0	2.0	3.0	49	-0.20	-7.98	0.011	
OXYGEN, DISS (MG/L)	60	11.32	9.0	11.6	13.5	49	0.07	0.59	0.525	
OXYGEN, DISS (% SAT)	60	104.97	89	98	111	49	1.00	0.95	0.239	
PH (STANDARD UNITS)	60	7.96	7.5	7.9	8.5	49	0.06	0.78	0.027	
CALCIUM, DISS (MG/L)	41	24.43	22	25	29	32	0.25	1.02	0.109	
MAGNESIUM, DISS(MG/L)	41	9.29	8.3	10	11	32	0.16	1.70	0.067	
CHLORIDE, DISS (MG/L)	59	15.36	13	15	17	48	0.17	1.09	0.385	
SILICA, DISS (MG/L)	30	2.53	0.8	1.7	4.5	30	0.13	5.07	0.117	
SOLIDS, TOTAL (MG/L)	58	147.59	137	153	160	48	-0.50	-0.34	0.363	
SOLIDS, DISS (MG/L)	59	139.25	128	144	155	49	0.29	0.21	0.806	
NITROGEN, TOT (MG/L)	50	1.04	0.80	0.97	1.1	16	-0.01	-0.79	0.587	
N, ORGANIC, TOT(MG/L)	55	0.54	0.34	0.54	0.71	45	0.00	0.37	0.872	
N, NO2+NO3, TOT(MG/L)	60	0.34	0.1	0.3	0.5	49	0.00	0.00	0.609	
N, AMMONIA, TOT(MG/L)	60	e 0.09	0.04	0.07	0.11	60	0.00	0.00	0.690	
N, NITRITE, TOT(MG/L)	60	e 0.01	e 0.01	0.01	0.02	60	0.00	0.00	0.371	
PHOSPHORUS, TOT(MG/L)	60	0.05	0.03	0.04	0.05	49	-0.00	-9.14	0.000	
CARBON, ORG,TOT(MG/L)	60	4.07	3.1	4.0	4.7	49	0.00	0.00	0.961	
IRON, DISS (UG/L)	32	22.72	12	20	31	32	-0.71	-3.13	0.263	
MANGANESE, DISS(UG/L)	32	e 7.08	1.0	3.0	11	32	--	--	--	
NICKEL, DISS (UG/L)	60	e 1.79	e 1.0	1.0	2.0	60	0.00	0.00	0.177	
FECAL COL (COL/100ML)	60	21.12	2	7	16	49	-2.39	-11.34	0.235	
FEC STREP (COL/100ML)	59	66.56	2	7	25	48	-12.20	-18.32	0.110	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01203000 STATION NAME: SHEPAUG RIVER NEAR ROXBURY, CT
LATITUDE: 413259 LONGITUDE: 731949 DRAINAGE AREA: 132.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	116.21	105	118	129	89	1.80	1.55	0.000	F
TURBIDITY (NTU)	89	1.83	1.0	1.5	2.1	89	-0.05	-2.82	0.360	
OXYGEN, DISS (MG/L)	91	11.80	9.6	12.3	14.0	89	0.02	0.14	0.791	F
OXYGEN, DISS (% SAT)	90	104.99	100	105	111	89	-0.33	-0.32	0.423	
PH (STANDARD UNITS)	91	7.63	7.3	7.6	7.9	89	0.00	-0.05	0.910	F
CALCIUM, DISS (MG/L)	64	10.15	9.0	10	11	32	0.08	0.78	0.194	F
MAGNESIUM, DISS(MG/L)	64	3.89	3.6	3.9	4.3	32	0.06	1.55	0.019	F
CHLORIDE, DISS (MG/L)	90	9.79	8.6	9.8	11	89	0.23	2.31	0.002	F
SILICA, DISS (MG/L)	32	4.04	2.5	4.3	5.9	31	0.05	1.25	0.606	F
SOLIDS, TOTAL (MG/L)	89	81.30	73	82	88	88	-0.29	-0.35	0.398	F
SOLIDS, DISS (MG/L)	88	72.75	65	72	82	87	-0.03	-0.04	1.000	F
NITROGEN, TOT (MG/L)	74	0.85	0.60	0.80	0.97	44	0.01	0.77	0.535	
N, ORGANIC, TOT(MG/L)	75	0.52	0.29	0.45	0.66	46	0.02	3.54	0.335	**
N, NO2+NO3, TOT(MG/L)	90	0.23	0.1	0.2	0.4	89	-0.01	-4.98	0.185	F
N, AMMONIA, TOT(MG/L)	90	e 0.06	0.01	0.04	0.07	90	-0.00	-5.56	0.023	
N, NITRITE, TOT(MG/L)	90	e 0.01	e 0.01	e 0.01	0.01	90	0.00	0.00	0.447	
PHOSPHORUS, TOT(MG/L)	90	0.04	0.02	0.03	0.05	90	0.00	0.00	0.159	
CARBON, ORG,TOT(MG/L)	89	4.46	3.6	4.6	5.1	89	0.09	2.02	0.138	
IRON, DISS (UG/L)	32	73.41	55	70	93	32	1.83	2.50	0.495	
MANGANESE, DISS(UG/L)	32	e 12.03	7.0	8.0	18	32	0.00	0.00	0.079	
NICKEL, DISS (UG/L)	90	e 1.50	e 1.0	1.0	2.0	90	0.00	0.00	0.480	
FECAL COL (COL/100ML)	90	218.99	13	44	120	90	23.56	10.76	0.263	
FEC STREP (COL/100ML)	89	817.16	14	100	500	89	-160.25	-19.61	0.049	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01204510 STATION NAME: LAKE ZOAR AT RIVERSIDE, CT
LATITUDE: 412621 LONGITUDE: 731453 DRAINAGE AREA: 1,511.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	60	240.17	215	244	272	49	1.42	0.59	0.524	
TURBIDITY (NTU)	60	2.01	1.0	1.9	3.0	49	-0.17	-8.29	0.084	
OXYGEN, DISS (MG/L)	60	9.77	7.7	10.5	13.4	49	-0.02	-0.23	0.587	
OXYGEN, DISS (% SAT)	60	84.55	73	94	101	49	-0.27	-0.32	0.694	
PH (STANDARD UNITS)	60	7.58	7.3	7.6	7.8	49	0.06	0.76	0.003	
CALCIUM, DISS (MG/L)	40	24.85	22	26	28	32	0.07	0.29	0.706	
MAGNESIUM, DISS(MG/L)	40	9.13	8.1	9.4	10	32	0.07	0.77	0.445	
CHLORIDE, DISS (MG/L)	60	15.51	13	16	18	49	0.41	2.67	0.065	
SILICA, DISS (MG/L)	31	3.28	1.8	3.2	4.7	31	0.08	2.34	0.651	
SOLIDS, TOTAL (MG/L)	60	150.95	138	153	162	49	0.08	0.06	0.922	
SOLIDS, DISS (MG/L)	59	138.98	125	141	154	49	-0.20	-0.14	0.767	
NITROGEN, TOT (MG/L)	58	1.12	0.86	1.0	1.3	25	0.00	0.00	1.000	
N, ORGANIC, TOT(MG/L)	58	0.50	0.29	0.44	0.55	47	0.03	5.54	0.279	
N, NO2+NO3, TOT(MG/L)	60	0.44	0.3	0.4	0.6	49	0.00	0.00	0.612	
N, AMMONIA, TOT(MG/L)	60	e 0.17	0.09	0.13	0.20	60	-0.01	-4.35	0.302	
N, NITRITE, TOT(MG/L)	60	e 0.02	0.01	0.02	0.03	60	0.00	0.00	0.564	
PHOSPHORUS, TOT(MG/L)	60	0.06	0.04	0.05	0.07	49	0.00	0.00	0.338	
CARBON, ORG,TOT(MG/L)	60	4.12	3.0	3.6	4.4	49	0.09	2.18	0.201	
IRON, DISS (UG/L)	32	30.66	17	30	39	32	-0.96	-3.15	0.535	
MANGANESE, DISS(UG/L)	32	e 16.53	8.0	13	21	32	0.00	0.00	0.650	
NICKEL, DISS (UG/L)	59	e 1.66	e 1.0	1.0	2.0	59	0.00	0.00	0.570	
FECAL COL (COL/100ML)	60	101.05	6	18	43	49	-7.09	-7.02	0.154	
FEC STREP (COL/100ML)	59	512.61	8	28	110	48	-185.43	-36.17	0.002	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01205500 STATION NAME: HOUSATONIC RIVER AT STEVENSON, CT
LATITUDE: 412302 LONGITUDE: 731005 DRAINAGE AREA: 1,544.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	96	231.13	205	235	260	90	2.90	1.25	0.007	F
TURBIDITY (NTU)	90	2.06	1.0	1.6	2.3	90	-0.20	-9.58	0.003	F
OXYGEN, DISS (MG/L)	96	10.02	7.6	10.4	12.8	90	-0.01	-0.10	0.881	F
OXYGEN, DISS (% SAT)	96	90.84	79	95	102	90	0.50	0.55	0.410	
PH (STANDARD UNITS)	96	7.70	7.5	7.6	7.9	90	0.05	0.65	0.001	
CALCIUM, DISS (MG/L)	78	23.78	22	24	26	78	0.45	1.91	0.022	F
MAGNESIUM, DISS(MG/L)	78	8.68	7.9	8.8	9.5	78	0.15	1.73	0.010	**
CHLORIDE, DISS (MG/L)	89	14.65	13	15	17	89	0.30	2.03	0.002	F
SILICA, DISS (MG/L)	56	3.07	1.6	2.8	4.5	49	0.23	7.37	0.007	F
SOLIDS, TOTAL (MG/L)	84	144.56	131	146	158	84	0.36	0.25	0.743	F
SOLIDS, DISS (MG/L)	87	133.83	123	134	148	87	0.23	0.17	0.876	F
NITROGEN, TOT (MG/L)	90	1.14	0.80	1.0	1.3	49	0.01	1.28	0.730	
N, ORGANIC, TOT(MG/L)	87	0.59	0.35	0.47	0.75	83	-0.01	-2.43	0.213	
N, N02+N03, TOT(MG/L)	94	0.42	0.3	0.4	0.5	89	0.00	0.00	0.030	
N, AMMONIA, DIS(MG/L)	60	e 0.10	0.05	0.08	0.13	60	-0.01	-6.62	0.047	
N, AMMONIA, TOT(MG/L)	90	e 0.10	0.05	0.08	0.14	90	-0.01	-6.91	0.003	
N, NITRITE, TOT(MG/L)	88	e 0.02	e 0.01	0.01	0.02	88	0.00	0.00	0.633	
PHOSPHORUS, TOT(MG/L)	94	0.04	0.03	0.04	0.05	89	-0.00	-5.51	0.000	
CARBON, ORG,TOT(MG/L)	86	3.93	2.9	3.7	4.5	86	0.04	1.10	0.361	
IRON, DISS (UG/L)	35	20.81	9.0	20	30	32	0.35	1.67	0.665	F
MANGANESE, DISS(UG/L)	35	e 8.32	3.0	7.0	13	35	0.00	0.00	1.000	
NICKEL, DISS (UG/L)	90	e 1.69	e 1.0	1.0	2.0	90	-0.00	-0.00	0.044	
FECAL COL (COL/100ML)	88	24.78	3	8	20	88	-1.37	-5.52	0.249	F
FEC STREP (COL/100ML)	90	110.62	3	16	42	90	-20.74	-18.75	0.064	**
SEDIMENT, SUSP (MG/L)	50	10.26	3	7	12	45	-0.59	-5.77	0.343	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01208049 STATION NAME: NAUGATUCK RIVER NEAR WATERVILLE, CT
LATITUDE: 413655 LONGITUDE: 730330 DRAINAGE AREA: 136.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	91	206.18	148	188	245	90	1.29	0.63	0.502	F
TURBIDITY (NTU)	90	2.07	1.2	1.6	2.8	90	-0.13	-6.47	0.015	
OXYGEN, DISS (MG/L)	91	11.15	8.8	11.1	13.4	90	-0.07	-0.62	0.502	F
OXYGEN, DISS (% SAT)	91	101.01	96	100	106	90	-1.00	-0.99	0.061	
PH (STANDARD UNITS)	91	7.15	6.9	7.1	7.3	90	0.03	0.45	0.044	F
CALCIUM, DISS (MG/L)	63	11.79	8.9	11	14	32	-0.08	-0.67	0.757	F
MAGNESIUM, DISS(MG/L)	64	3.03	2.7	2.9	3.3	32	-0.02	-0.64	0.665	F
CHLORIDE, DISS (MG/L)	89	29.56	22	27	34	89	0.26	0.89	0.307	F
SILICA, DISS (MG/L)	31	5.20	4.1	5.2	6.3	31	-0.14	-2.69	0.272	
SOLIDS, TOTAL (MG/L)	86	133.40	97	124	153	86	-0.41	-0.31	0.692	F
SOLIDS, DISS (MG/L)	90	122.79	88	116	143	90	-0.52	-0.42	0.655	F
NITROGEN, TOT (MG/L)	90	2.74	1.7	2.4	3.4	90	0.01	0.31	0.737	F
N, ORGANIC, TOT(MG/L)	89	0.61	0.37	0.52	0.86	89	0.02	3.09	0.121	F
N, NO2+NO3, TOT(MG/L)	90	1.69	0.8	1.5	2.2	90	0.00	0.02	0.941	F
N, AMMONIA, TOT(MG/L)	90	e 0.44	0.22	0.32	0.52	90	0.01	1.35	0.313	
N, NITRITE, TOT(MG/L)	90	e 0.07	0.03	0.06	0.10	90	0.00	0.00	0.818	
PHOSPHORUS, TOT(MG/L)	90	0.20	0.09	0.18	0.25	90	-0.02	-7.53	0.003	F
CARBON, ORG,TOT(MG/L)	90	4.10	3.4	4.1	4.9	90	0.12	3.02	0.007	F
IRON, DISS (UG/L)	32	129.88	96	130	150	32	7.08	5.45	0.043	
IRON, TOTAL (UG/L)	90	494.89	330	420	560	90	3.51	0.71	0.709	F
MANGANESE, DISS(UG/L)	32	e 69.94	47	65	88	32	0.00	0.00	0.950	
COPPER, TOTAL (UG/L)	88	18.24	13	18	22	88	-0.18	-0.97	0.539	F
NICKEL, DISS (UG/L)	89	e 14.73	8.0	13	20	89	1.00	6.79	0.003	
NICKEL, TOTAL (UG/L)	90	e 18.63	10	15	24	90	1.00	5.37	0.013	
ZINC, TOTAL (UG/L)	87	e 40.02	30	40	50	87	-2.68	-6.69	0.000	
FECAL COL (COL/100ML)	90	499.92	16	82	660	90	48.10	9.62	0.297	F
FEC STREP (COL/100ML)	89	884.48	13	68	440	89	-78.56	-8.88	0.307	F

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01208500 STATION NAME: NAUGATUCK RIVER AT BEACON FALLS, CT
LATITUDE: 412632 LONGITUDE: 730347 DRAINAGE AREA: 260.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	97	328.78	210	290	409	90	7.75	2.36	0.000	F
TURBIDITY (NTU)	90	3.40	1.4	2.0	4.0	90	-0.44	-13.01	0.000	F
OXYGEN, DISS (MG/L)	97	11.10	9.2	10.9	13.0	90	0.06	0.52	0.263	F
OXYGEN, DISS (% SAT)	97	103.02	98	103	107	90	0.25	0.24	0.625	
PH (STANDARD UNITS)	97	7.25	7.0	7.3	7.4	90	0.00	0.06	0.655	F
CALCIUM, DISS (MG/L)	63	16.67	12	16	22	32	0.08	0.46	0.853	F
MAGNESIUM, DISS(MG/L)	64	3.29	2.8	3.2	3.9	32	0.03	1.05	0.055	F
CHLORIDE, DISS (MG/L)	90	48.82	32	46	65	90	2.40	4.91	0.000	F
SILICA, DISS (MG/L)	32	6.68	5.6	6.7	7.6	32	-0.06	-0.96	0.420	
SOLIDS, TOTAL (MG/L)	87	202.64	137	195	251	87	3.33	1.64	0.011	F
SOLIDS, DISS (MG/L)	90	180.83	119	167	241	90	3.63	2.01	0.011	F
NITROGEN, TOT (MG/L)	92	4.98	2.7	4.0	6.3	88	0.17	3.47	0.055	F
N, ORGANIC, TOT(MG/L)	91	1.34	0.50	0.76	1.2	87	-0.05	-3.92	0.458	**
N, NO2+NO3, TOT(MG/L)	95	1.95	1.1	1.7	2.7	90	0.01	0.27	0.881	F
N, AMMONIA, TOT(MG/L)	93	e 1.72	0.77	1.2	2.5	93	0.08	4.51	0.062	
N, NITRITE, TOT(MG/L)	89	e 0.11	0.04	0.06	0.15	89	0.00	0.00	0.354	
PHOSPHORUS, TOT(MG/L)	96	0.61	0.23	0.44	0.76	90	-0.01	-0.85	0.551	F
CARBON, ORG,TOT(MG/L)	90	6.02	4.4	5.8	7.3	90	-0.05	-0.82	0.602	F
IRON, DISS (UG/L)	32	178.38	110	150	190	32	-8.74	-4.90	0.135	**
IRON, TOTAL (UG/L)	90	960.44	490	620	830	90	-75.94	-7.91	0.000	
MANGANESE, DISS(UG/L)	31	e 130.48	90	110	160	31	-1.00	-0.77	0.695	
COPPER, TOTAL (UG/L)	87	62.61	36	51	80	87	-8.86	-14.15	0.000	F
NICKEL, DISS (UG/L)	90	e 27.14	14	21	33	90	-0.40	-1.47	0.348	
NICKEL, TOTAL (UG/L)	88	e 37.19	19	29	48	88	-0.50	-1.34	0.261	
ZINC, TOTAL (UG/L)	89	e 82.81	50	70	110	89	-7.50	-9.06	0.000	
FECAL COL (COL/100ML)	90	4,730.37	290	1,600	5,300	90	-252.88	-5.35	0.456	F
FEC STREP (COL/100ML)	89	3,327.88	88	860	3,500	89	-483.50	-14.53	0.021	F

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01208736 STATION NAME: NAUGATUCK RIVER AT ANSONIA, CT
LATITUDE: 411950 LONGITUDE: 730447 DRAINAGE AREA: 309.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	90	288.26	213	273	370	89	7.00	2.43	0.112	
TURBIDITY (NTU)	88	3.18	1.4	2.0	4.0	88	-0.43	-13.38	0.000	
OXYGEN, DISS (MG/L)	90	10.64	8.7	10.8	13.2	89	-0.06	-0.59	0.361	
OXYGEN, DISS (% SAT)	90	97.37	91	99	107	89	-0.63	-0.65	0.222	
PH (STANDARD UNITS)	90	7.11	6.9	7.1	7.3	89	0.03	0.48	0.029	
CALCIUM, DISS (MG/L)	64	15.76	12	15	20	32	-0.27	-1.69	0.575	
MAGNESIUM, DISS(MG/L)	64	3.20	2.8	3.1	3.7	32	0.04	1.15	0.451	
CHLORIDE, DISS (MG/L)	89	42.52	31	40	54	89	2.00	4.70	0.011	
SILICA, DISS (MG/L)	32	6.84	5.9	6.5	7.7	32	-0.12	-1.75	0.119	
SOLIDS, TOTAL (MG/L)	88	185.97	142	179	229	88	2.50	1.34	0.355	
SOLIDS, DISS (MG/L)	89	169.09	122	167	209	89	2.38	1.40	0.426	
NITROGEN, TOT (MG/L)	89	4.17	3.0	3.9	4.9	89	0.00	0.00	0.970	
N, ORGANIC, TOT(MG/L)	89	0.77	0.40	0.70	1.0	89	0.00	0.00	1.000	
N, NO2+NO3, TOT(MG/L)	89	2.17	1.1	2.0	3.1	89	0.05	2.27	0.268	
N, AMMONIA, TOT(MG/L)	89	e 1.24	0.49	1.0	1.8	89	-0.05	-3.75	0.119	
N, NITRITE, TOT(MG/L)	89	e 0.11	0.04	0.08	0.16	89	0.00	1.69	0.247	
PHOSPHORUS, TOT(MG/L)	89	0.42	0.25	0.37	0.58	89	-0.02	-5.60	0.025	
CARBON, ORG,TOT(MG/L)	89	5.72	4.3	5.5	6.8	89	-0.07	-1.24	0.362	
IRON, DISS (UG/L)	32	150.41	90	140	190	32	-12.24	-8.13	0.021	
IRON, TOTAL (UG/L)	90	830.78	450	560	740	90	-45.08	-5.43	0.001	
MANGANESE, DISS(UG/L)	32	e 132.22	92	120	170	32	-5.00	-3.78	0.664	
COPPER, TOTAL (UG/L)	87	84.89	44	64	85	87	-7.76	-9.14	0.000	
NICKEL, DISS (UG/L)	90	e 23.28	14	20	28	90	-1.00	-4.30	0.015	
NICKEL, TOTAL (UG/L)	87	e 31.13	20	28	36	87	-1.20	-3.86	0.029	
ZINC, TOTAL (UG/L)	86	e 90.93	60	80	110	86	-10.00	-11.00	0.000	
FECAL COL (COL/100ML)	90	18,068.83	220	1,700	11,000	90	*******	-13.67	0.012	
FEC STREP (COL/100ML)	89	12,449.63	210	1,200	5,500	89	*******	-24.51	0.001	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01208828 STATION NAME: HOUSATONIC RIVER AT STRATFORD, CT
LATITUDE: 411201 LONGITUDE: 730639 DRAINAGE AREA: 1,941.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	32	10,994.25	3,380	8,190	15,900	32	19.80	0.18	1.000	
TURBIDITY (NTU)	32	2.21	0.9	2.0	3.1	32	-0.06	-2.90	0.453	
OXYGEN, DISS (MG/L)	31	10.24	8.0	10.2	12.8	31	0.00	0.00	1.000	
OXYGEN, DISS (% SAT)	31	94.42	82	94	107	31	0.67	0.71	0.796	
PH (STANDARD UNITS)	32	7.66	7.4	7.7	7.8	32	0.04	0.48	0.095	
CALCIUM, DISS (MG/L)	32	92.94	40	81	120	32	0.00	0.00	0.950	
MAGNESIUM, DISS(MG/L)	32	244.38	74	200	360	32	-3.33	-1.36	0.620	
CHLORIDE, DISS (MG/L)	31	3,580.00	1,000	2,100	5,500	31	-25.00	-0.70	0.796	
SILICA, DISS (MG/L)	31	2.90	1.5	3.0	3.7	31	0.05	1.72	0.794	
SOLIDS, TOTAL (MG/L)	32	8,306.06	2,270	6,390	12,000	32	-127.50	-1.54	0.496	
SOLIDS, DISS (MG/L)	32	7,347.00	2,090	6,150	11,000	32	-63.67	-0.87	0.665	
NITROGEN, TOT (MG/L)	29	1.26	0.94	1.2	1.5	29	0.04	3.19	0.187	
N, ORGANIC, TOT(MG/L)	31	0.45	0.27	0.43	0.54	31	0.07	14.77	0.028	
N, N02+N03, TOT(MG/L)	32	0.52	0.3	0.5	0.7	32	0.00	0.55	0.901	
N, AMMONIA, TOT(MG/L)	32	e 0.26	0.14	0.25	0.30	32	0.00	-1.03	0.901	
N, NITRITE, TOT(MG/L)	32	e 0.03	0.02	0.02	0.03	32	0.00	0.00	0.666	
PHOSPHORUS, TOT(MG/L)	32	0.14	0.08	0.10	0.13	32	0.00	-1.84	0.572	
CARBON, ORG,TOT(MG/L)	32	3.89	3.0	3.4	4.3	32	0.18	4.50	0.072	
IRON, DISS (UG/L)	32	60.47	23	41	70	32	-4.00	-6.61	0.415	
IRON, TOTAL (UG/L)	32	393.75	250	350	480	32	-17.60	-4.47	0.133	
MANGANESE, DISS(UG/L)	32	e 45.59	40	50	60	32	-3.17	-6.95	0.086	
COPPER, TOTAL (UG/L)	32	22.25	13	20	31	32	-2.23	-10.03	0.034	
NICKEL, DISS (UG/L)	32	e 6.87	5.0	6.0	8.0	32	-0.50	-7.28	0.101	
NICKEL, TOTAL (UG/L)	32	e 8.64	5.0	8.0	12	32	-0.80	-9.26	0.192	
ZINC, TOTAL (UG/L)	31	e 39.35	30	40	50	31	-4.29	-10.89	0.002	
FECAL COL (COL/100ML)	32	460.56	76	130	410	32	-22.18	-4.82	0.535	
FEC STREP (COL/100ML)	32	272.27	25	51	300	32	-30.76	-11.30	0.194	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01208990 STATION NAME: SAUGATUCK RIVER NEAR REDDING, CT
LATITUDE: 411740 LONGITUDE: 732344 DRAINAGE AREA: 21.0 SQUARE MILES

WATER-QUALITY PROPERTY OR CONSTITUENT	DESCRIPTIVE STATISTICS: SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	BEST TREND RESULTS: N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	90	183.18	169	182	197	90	2.67	1.46	0.001	F
TURBIDITY (NTU)	89	1.36	0.8	1.0	1.5	89	-0.08	-6.13	0.013	
OXYGEN, DISS (MG/L)	90	11.21	9.0	10.8	13.5	90	0.07	0.63	0.233	F
OXYGEN, DISS (% SAT)	90	100.21	96	101	106	90	0.02	0.02	0.941	F
PH (STANDARD UNITS)	90	7.59	7.4	7.6	7.8	90	0.04	0.53	0.000	F
CALCIUM, DISS (MG/L)	64	18.73	16	19	21	32	-0.04	-0.21	0.757	F
MAGNESIUM, DISS(MG/L)	63	5.85	5.1	5.8	6.6	32	0.05	0.83	0.073	F
CHLORIDE, DISS (MG/L)	89	15.12	12	15	18	89	1.00	6.61	0.000	
SILICA, DISS (MG/L)	32	7.49	5.8	7.8	9.0	32	0.01	0.10	0.951	F
SOLIDS, TOTAL (MG/L)	87	122.68	111	121	135	87	0.26	0.21	0.697	F
SOLIDS, DISS (MG/L)	90	113.78	102	115	125	90	-0.03	-0.02	0.941	F
NITROGEN, TOT (MG/L)	63	0.78	0.47	0.63	0.80	42	0.00	0.00	0.857	
N, ORGANIC, TOT(MG/L)	68	0.44	0.26	0.36	0.55	45	-0.01	-1.38	0.827	
N, NO2+NO3, TOT(MG/L)	90	0.17	--	0.1	0.2	90	0.00	-1.65	0.433	F
N, AMMONIA, TOT(MG/L)	90	e 0.05	0.01	0.03	0.05	90	-0.01	-10.12	0.000	
N, NITRITE, TOT(MG/L)	90	e 0.01	e 0.01	e 0.01	e 0.01	90	-0.00	-0.00	0.078	
PHOSPHORUS, TOT(MG/L)	90	0.03	0.01	0.02	0.03	90	-0.00	-0.00	0.015	
CARBON, ORG,TOT(MG/L)	89	4.62	3.6	4.3	5.5	89	0.00	0.00	0.909	
IRON, DISS (UG/L)	32	111.63	79	110	140	32	-3.34	-2.99	0.495	
IRON, TOTAL (UG/L)	48	287.50	170	250	330	46	-11.27	-3.92	0.138	
MANGANESE, DISS(UG/L)	32	e 16.50	10	18	21	32	-0.73	-4.44	0.155	
COPPER, TOTAL (UG/L)	49	4.64	2.0	3.0	6.0	47	0.00	0.00	0.750	
NICKEL, DISS (UG/L)	89	e 1.51	e 1.0	1.0	2.0	89	0.00	0.00	0.273	
NICKEL, TOTAL (UG/L)	49	e 2.24	1.0	2.0	3.0	49	0.00	0.00	0.554	
ZINC, TOTAL (UG/L)	47	e 18.98	e 10	20	20	47	-2.25	-11.85	0.012	
FECAL COL (COL/100ML)	90	139.60	12	39	110	90	9.51	6.81	0.371	F
FEC STREP (COL/100ML)	90	1,936.72	21	88	320	90	-300.22	-15.50	0.062	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01209710 STATION NAME: NORWALK RIVER AT WINNIPAUK, CT
LATITUDE: 410807 LONGITUDE: 732536 DRAINAGE AREA: 33.0 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	95	265.51	243	270	290	90	5.02	1.89	0.004	F
TURBIDITY (NTU)	89	2.95	1.2	1.7	3.0	89	-0.13	-4.41	0.127	
OXYGEN, DISS (MG/L)	95	12.04	10.2	12.2	13.4	90	0.08	0.70	0.263	F
OXYGEN, DISS (% SAT)	95	111.59	102	108	118	90	0.27	0.24	0.766	F
PH (STANDARD UNITS)	95	7.80	7.5	7.8	8.1	90	0.07	0.93	0.000	F
CALCIUM, DISS (MG/L)	63	22.67	21	22	25	32	0.07	0.30	0.578	F
MAGNESIUM, DISS(MG/L)	63	6.78	6.2	6.9	7.5	32	0.18	2.66	0.008	F
CHLORIDE, DISS (MG/L)	90	33.88	29	34	40	90	0.93	2.76	0.010	F
SILICA, DISS (MG/L)	32	7.16	5.3	7.1	9.1	32	0.13	1.89	0.349	
SOLIDS, TOTAL (MG/L)	88	173.93	154	175	191	88	0.23	0.13	0.701	F
SOLIDS, DISS (MG/L)	88	158.47	145	159	168	88	0.07	0.05	0.878	F
NITROGEN, TOT (MG/L)	93	1.09	0.80	0.90	1.3	88	0.01	0.57	0.729	F
N, ORGANIC, TOT(MG/L)	86	0.50	0.33	0.43	0.57	48	0.01	1.84	0.802	
N, NO2+NO3, TOT(MG/L)	95	0.52	0.3	0.4	0.6	90	-0.01	-2.42	0.168	F
N, AMMONIA, TOT(MG/L)	94	e 0.05	0.02	0.04	0.07	94	-0.00	-6.34	0.081	
N, NITRITE, TOT(MG/L)	89	e 0.01	e 0.01	e 0.01	0.01	89	0.00	0.00	0.127	
PHOSPHORUS, TOT(MG/L)	95	0.07	0.04	0.05	0.08	90	-0.01	-8.07	0.003	
CARBON, ORG,TOT(MG/L)	88	4.10	3.1	3.8	4.8	88	0.10	2.33	0.357	F
IRON, DISS (UG/L)	32	113.88	80	110	160	32	-2.05	-1.80	0.421	F
MANGANESE, DISS(UG/L)	31	e 48.68	31	43	60	31	-0.33	-0.68	0.515	
NICKEL, DISS (UG/L)	90	e 2.33	1.0	2.0	4.0	90	-0.20	-8.58	0.022	
FECAL COL (COL/100ML)	90	1,385.67	92	200	700	90	-103.18	-7.45	0.156	
FEC STREP (COL/100ML)	90	1,570.97	90	330	1,000	90	-336.16	-21.40	0.017	

Appendix 3. Statistical summary and trend results of selected water-quality data for the 1981-88 water years

STATION NUMBER: 01209910 STATION NAME: STAMFORD HARBOR AT STAMFORD, CT
LATITUDE: 410147 LONGITUDE: 733217 DRAINAGE AREA: 40.3 SQUARE MILES

	DESCRIPTIVE STATISTICS					BEST TREND RESULTS				
WATER-QUALITY PROPERTY OR CONSTITUENT	SAMPLE SIZE	MEAN	25TH PERCENTILE	50TH PERCENTILE (MEDIAN)	75TH PERCENTILE	N	UNITS/ YEAR	PERCENT/ YEAR	P	TREND CODE
SPECIFIC COND (US/CM)	32	36,568.75	33,600	36,700	39,900	32	-66.67	-0.18	0.901	
TURBIDITY (NTU)	32	1.87	1.0	1.4	2.3	32	-0.24	-12.93	0.009	
OXYGEN, DISS (MG/L)	32	10.22	8.5	10.2	11.5	32	-0.21	-2.04	0.081	
OXYGEN, DISS (% SAT)	32	103.91	92	100	118	32	0.00	0.00	0.950	
PH (STANDARD UNITS)	32	7.82	7.6	7.8	8.0	32	0.07	0.85	0.008	
CALCIUM, DISS (MG/L)	32	255.31	210	280	290	32	8.00	3.13	0.104	
MAGNESIUM, DISS(MG/L)	32	866.56	810	870	990	32	2.00	0.23	0.803	
CHLORIDE, DISS (MG/L)	30	13,876.67	13,000	14,000	15,000	30	71.43	0.51	0.362	
SILICA, DISS (MG/L)	32	1.62	0.9	1.5	2.4	32	0.00	0.00	0.950	
SOLIDS, TOTAL (MG/L)	31	30,038.39	27,400	29,200	32,200	31	260.00	0.87	0.401	
SOLIDS, DISS (MG/L)	32	26,178.13	25,100	26,900	28,200	32	112.50	0.43	0.710	
N, ORGANIC, TOT(MG/L)	30	0.32	--	0.23	0.47	16	0.11	32.31	0.292	
N, NO2+NO3, TOT(MG/L)	32	0.22	--	0.1	0.3	32	0.00	0.00	0.646	
N, AMMONIA, TOT(MG/L)	32	e 0.42	0.18	0.28	0.49	32	0.00	-0.79	0.491	
N, NITRITE, TOT(MG/L)	32	e 0.03	0.01	0.02	0.04	32	0.00	0.00	0.166	
PHOSPHORUS, TOT(MG/L)	31	0.22	0.10	0.15	0.33	31	-0.04	-16.79	0.000	
CARBON, ORG,TOT(MG/L)	32	3.04	2.3	3.0	3.5	32	0.00	0.00	0.950	
IRON, DISS (UG/L)	32	134.00	100	120	160	32	-4.55	-3.39	0.411	
MANGANESE, DISS(UG/L)	32	e 68.88	50	60	70	32	-3.33	-4.84	0.048	
NICKEL, DISS (UG/L)	32	e 4.28	1.0	3.0	7.0	32	-1.00	-23.36	0.000	
FECAL COL (COL/100ML)	32	111.22	2	10	46	32	-18.64	-16.76	0.152	
FEC STREP (COL/100ML)	32	113.86	1	19	67	32	-46.95	-41.24	0.001	

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