GEOCHEMICAL DATA ON CONCENTRATIONS OF INORGANIC CONSTITUENTS AND POLYCHLORINATED BIPHENYL CONGENERS IN STREAMBED SEDIMENTS IN TRIBUTARIES TO LAKE CHAMPLAIN IN NEW YORK, VERMONT, AND QUEBEC, 1992

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CONVERSION FACTORS AND ABBREVIATED WATER-QUALITY UNITS

Multiply	By	To obtain
inch (in.)	25.4	millimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
square mile (mi^2)	2.590	square kilometer
gallon (gal)	3.785	liter

Additional Conversions

In this report certain units of measurement, by convention, use the metric system and include the following:

Multiply	By	To obtain
centimeter (cm)	0.3937	inch
millimeter (mm)	0.03937	inch
micrometer (µm)	0.00003937	inch
kilogram (kg)	2.205	pound, avoirdupois
gram (g)	0.03527	ounce, avoirdupois

In this report, the volume of chemical compounds or water is expressed in liters (L), milliliters (mL), and microliters (µL). Weight of chemical compounds is expressed in grams (g) and nanograms (ng). Concentrations of polychlorinated biphenyl congeners in sediment are in micrograms per gram (µg/g). Concentrations of inorganic constituents are in micrograms per gram (µg/g) or in weight percent. The sampling rate for the gas-liquid chromatograph is measured in hertz (Hz) or one cycle per second.

Water temperature in degrees Celsius (°C) can be converted to degrees Fahrenheit (°F) by use of the following equation:

$$°F = 1.8\,(°C) + 32$$

Geochemical Data on Concentrations of Inorganic Constituents and Polychlorinated Biphenyl Congeners in Streambed Sediments in Tributaries to Lake Champlain in New York, Vermont, and Quebec, 1992

By John A. Colman *and* Stewart F. Clark

Abstract

Geochemical data are presented from a survey of 42 inorganic constituents, polychlorinated biphenyl congeners, and organic carbon in streambed sediments of tributaries to Lake Champlain. The survey was completed during the summer of 1992. The project was concerned with quantification of inputs of toxic constituents to Lake Champlain, such as polychlorinated biphenyl compounds (PCB's) and trace metals including mercury, from one potential source, the tributary streams. Sediment samples for both organic and inorganic analyses were taken from each of the 34 major tributary streams and from 39 minor tributary streams. The 34 major tributary streams drain 97 percent of the basin area. The additional 39 minor tributary streams were selected and sampled for inorganic (usually) or organic analysis to provide a more complete, areal coverage along the coastline of the lake. Tributary-stream-sampling sites were chosen close enough to the lake to capture as much upstream cultural influence as possible but with consideration of contamination by lake waters during periods of high lake level. The bed sediment of Lake Champlain was sampled for PCB analysis in 16 separate sites adjacent to the mouths of major tributaries but in water deep enough to be dominated by sediments in contact with lake water. The survey of streambed sediment was initiated to screen the many tributaries for potential input of low-solubility, toxic materials to the Lake. After screening, subsequent investigation could assess loads from a smaller number of tributaries that were found to contain significant concentrations of toxic constituents in the bed sediment. In the case of PCB's, the congener pattern could be compared among tributaries to distinguish types of sources.

INTRODUCTION

The geochemical investigation of streambed sediments of tributaries of Lake Champlain was initiated to support the agenda of the Lake Champlain Special Designation Act of 1991. The Act authorized a Management Conference Committee to convene to address lake management activities, among which were assessment of sources and cycling of toxic constituents in the lake. The investigation was concerned with quantification of inputs to Lake Champlain of toxic constituents, such as polychlorinated biphenyl compounds (PCB's) and trace metals, from one potential source, the tributary streams. PCB's and mercury are distinguished from other toxic materials measured in that some of their concentrations in fish flesh have exceeded the U.S. Food and Drug Administration advisory levels for safe consumption. An investigation of the sources of PCB's and mercury addresses the specific problem of toxic compounds in fish, as well as contributes to the general knowledge of the cycling of low solubility compounds of which these materials are examples.

External input rates and in-lake processing of toxic substances determine their ultimate impact in lakes. Measurement of toxic substance loads from potential sources is necessary for informed management of toxic substances. Depending on the relative magnitudes of the atmospheric, tributary, and direct-discharge sources, it may be possible to reduce inputs by diversion, treatment, dredging, or other means.

The relative importance of the tributary load to Lake Champlain cannot be determined without comparing measurements from other sources. In other lakes, the ratio of atmospheric to non-atmospheric inputs depends on the presence of point sources, the ratio of drainage basin to lake area, and for trace metals, the ratio depends on the presence of natural sources (Swackhamer and Armstrong, 1987). For the Lake Champlain Basin there are various point sources from industry and publicly owned treatment plants. PCB's and trace metals persist in the environment; therefore, releases before the current (1994) accounting of point-source releases must also be considered. Natural sources of trace elements are in metal-sulfide deposits in the basin (Slack and Schruben, 1990). The atmosphere could be a significant source of toxic materials, particularly mercury, because atmospheric sources alone can cause mercury contamination of fish in oligotrophic lakes with low pH (Sorensen and others, 1990; Swain and Helwig, 1989). Although Lake Champlain is not oligotrophic and has bicarbonate buffering, atmospheric loading of mercury must be considered.

The narrow Champlain Valley has a large number of small tributaries that flow into the Lake from Vermont, New York, and Quebec (fig. 1, at back of report). The large number of tributaries make the measurement of their input load much more difficult than if one large river dominated. Because monitoring all of the tributaries is expensive, some screening is necessary to select which tributaries are most important in delivering substantial contaminant loads.

Streams may be efficiently surveyed for low-solubility materials, such as trace elements and PCB's, by analysis of their bed material. Low-solubility substances partition to the solid phase so that concentrations of low-solubility materials in the bed material are many times larger than the concentrations of low-solubility materials in the water (Chao, 1984). The bed material also integrates the water-column concentrations, so that concentrations of toxic materials in sediment reflect concentrations in the water column that have occurred throughout the year. An efficient design for evaluating tributary loads of low-solubility substances would include an initial screening of tributaries through bed-sediment sampling. Subsequently, loads could be determined by water-column measurements made in tributaries chosen according to load potential as measured by their concentrations of sediment constituents.

For the PCB's, it may be possible to determine the number of sources or types of sources, as well as relative magnitude of the sources by surveying the streambed sediments. PCB's were produced by chlorinating the biphenyl compound and collecting the various distillation fractions to obtain the final chlorinated biphenyl mixtures. The primary producer of PCB mixtures used in the United States marketed nine different PCB mixtures under the Aroclor[1] trademark with levels of chlorination ranging from about 21 to 68 percent (Alford-Stevens, 1986). Each Aroclor mixture contained a characteristic mixture of PCB congeners. By comparing the congener pattern among samples, it may be possible to determine whether one or more sources of PCB are present in the tributaries. By comparing congener patterns in the lake sediments with those of tributaries, it may be possible to connect lake concentrations with tributary sources.

Purpose and Scope

The purpose of this report is to present geochemical data on inorganic constituents, organic carbon, and PCB congeners in the bed sediments of tributaries to Lake Champlain. The inorganic and carbon constituent data are listed as concentrations in the report tables. These data can be located in the tables by map site number, latitude and longitude, or by a remark code that indicates the purpose for collecting the sample. The PCB congeners are presented in histograms that show the congener concentration pattern of each sample. The scope of the report includes a presentation of the investigative design, methods, quality-assurance data, summary statistics, and results for the individual samples.

Description of the Study Area

Hydrologic Setting

The Lake Champlain drainage basin covers 8,277 mi^2 in northwestern Vermont, northeastern New York, and southern Quebec. Long, narrow, north-south trending Lake Champlain is 110 mi long, up to 12 mi wide, and locally as much as 400 ft deep (Meyer and Gruendling, 1979). Approximately two-thirds of its drainage basin is east of the Lake and one-third is west of the Lake.

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[1] Use of trade names in this report is for identification purposes only and does not constitute endorsement by the U.S. Geological Survey.

Henson and Gruendling (1977) tabulated 296 tributaries to Lake Champlain. Ten streams drain 80 percent of the Champlain basin, and the 24 largest streams drain 95 percent of the basin. Only 34 streams have a drainage area greater than 10 mi^2. Roughly 70 percent of the discharge to Lake Champlain comes from the eastern two-thirds of the basin. Thirty percent of the discharge comes from the western third of the basin (Hunt and others, 1972).

The water level of Lake Champlain is unregulated. Discharge from the Lake flows northward down the Richelieu River where a bedrock ridge controls the minimum lake-water level. Maximum water levels of Lake Champlain during the USGS record were approached in 1903 with a water level of 101.80 ft and in 1993 with a water level of 101.88 ft. Minimum water level of 92.17 ft was observed in 1941. The mean water level of Lake Champlain is 95 ft.

Geologic Setting

Five physiographic provinces are found in the basin. These provinces include the Adirondack Mountains to the west, the Green Mountains, and the Taconic Mountains to the east and south, the Vermont Valley, and the Champlain-St. Lawrence lowlands. The relief of these provincial regions ranges from low to moderate. Bedrock geology in each province is distinct.

The Adirondacks are underlain by coarse grained, metamorphic rocks that have been strongly altered from the form of their parent materials into their present condition. These rocks are now metagabbro, anorthosite, amphibolite, quartzite, marble, and other gneisses. In the Green Mountains, metamorphism of oceanic sediments produced phyllites, schists, and greenstones. The Taconic Mountains are composed of shales, slates, phyllites, and quartzites, which overlie limestones and sandstones of the Vermont Valley. Unmetamorphosed to weakly metamorphosed sedimentary limestones, dolomites, shales, and sandstones extend northward from the Vermont Valley through the Champlain Valley-St. Lawrence Lowland.

Bedrock variations define the physiographic provinces of the Lake Champlain Basin but unconsolidated stratified deposits cover much of the bedrock near Lake Champlain. These materials formed as shoreline, lake bottom, and ice-contact deposits during retreat of the continental ice sheet. Features associated with a freshwater glacial lake are overlain at lower altitudes by deposits from a saltwater sea connected to the Atlantic Ocean (Chapman, 1937, Wagner, 1972). These deposits locally influence the composition and texture of the sediments taken from the mouths of streams.

Four general geologic settings can be defined by conditions found at the mouths of streams entering Lake Champlain. These settings produce samples dominated by (1) Adirondack bedrock (mafic gneisses), (2) Champlain Valley bedrock (carbonates and sandstones), (3) unconsolidated silts and clays from the floor of glacial Lake Vermont or the floor of the Champlain Sea, and (4) samples dominated by fine to coarse grained sand and gravel deposited at the shoreline of glacial Lake Vermont.

Acknowledgments

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METHODS

Survey Design

The survey of streambed sediment was initiated to screen the many tributaries for potential input of low-solubility toxic materials to Lake Champlain. After screening, subsequent investigation could assess loads from a smaller number of tributaries that were found to contain significant concentrations of toxic materials in the bed sediment. In the case of PCB's, the congener pattern could be compared among tributaries to distinguish the number and types of sources.

In order to intercept as many sources in a given tributary as possible, sampling sites were selected at the most downstream access point. However, contamination of stream sediments during times of high lake levels by materials of lake, rather than stream, origin was also considered in choosing sampling locations. Sampling sites were chosen at an altitude above 102 ft, except in low-gradient streams where the 102-ft level was more than 1 mi from the lake shore. The low-gradient reaches below the sampling sites often were associated with wetlands and were consequently in undeveloped areas. In the Saranac River, which flows through the city of Plattsburg just before the river enters the lake, an extra downstream sample was taken below the 102-ft level. Sites were selected upstream of highway, railroad, or power-line crossing of streams in order to avoid the local characteristics of these influences.

Locations of all sampling sites with associated site numbers are shown in figure 1. Sites where metals were sampled are indicated with upward-pointing triangles, sites where PCB's were sampled with downward pointing triangles, and sites where both kinds of samples were taken are indicated with stars. Site number, name, latitude and longitude, and sample type of each site are given in table 1 (at back of report). Sediment samples were taken from each of the 34 major tributary streams, which drain 97 percent of the basin area and 39 minor tributary streams. Samples from the 34 major tributary streams were analyzed for organic and inorganic constituents. The additional 39 minor tributary stream sediments were selected and analyzed for inorganic (usually) or organic analysis to provide a more complete, areal coverage along the coastline of the lake. The bed sediment of Lake Champlain was sampled for PCB analysis in 16 separate sites adjacent to the mouths of major tributaries but in water deep enough to be dominated by sediments in contact with lake water.

At 10 inorganic and 17 organic sites, duplicate samples were collected by resampling the bed materials. One of each of the replicate inorganic pairs was split so that three samples would be submitted for analysis. For the inorganic analysis, the three samples were each split into between-site, sampling, and analytical components, after Ray (1982), to partition total variance associated with sample concentrations. Eight organic samples were split for analysis. For the organic analysis, congener patterns were compared visually to determine if the sample patterns were diagnostic.

The analysis of variance serves as a quality-assurance procedure. The presence of all or most of the variance between sites, rather than at a site, indicates the precision of the data. A second quality-assurance procedure used included standard-reference materials in the samples submitted to the laboratory. The inorganic standards used were a reference shale sample (SDO-1) and a marine mud (MAG-1) obtained from the USGS. The organic standard used was a marine sediment (HS-2) obtained from the Marine Analytical Chemistry Standards Program of the National Research Council, Canada.

Field Methods

Sites that could be reached by wading were approached from the downstream direction and sampled while wading upstream. Sandy, aerobic sediments, less than 2-mm in diameter that were not exposed by low water, were collected for the inorganic- and organic-constituent analyses. A stainless-steel scoop with a 3-ft-long stainless-steel handle was used to scrape the surface of sandy point-bar deposits. Care was taken to minimize loss of fine material to the stream water as the sampler was moved to the surface. Sites too deep to wade or that had difficult access were sampled from a canoe with a small stainless-steel Ekman dredge. A collected sample was deposited on a stainless-steel 2-mm mesh sieve. The sample was worked through the sieve with a stainless-steel mixing spoon into a shallow stainless-steel pan. Additional composite scoops were sieved as necessary until a 1-L microporous Tyvek bag could be filled with sediment. Surplus material was not gathered, so that the entire size fraction equal to or less than 2 mm was poured into the bag. The bag was then suspended from a rack and allowed to drip and air dry. After drying, samples for inorganic analysis were sent to the USGS laboratory in Denver, Colo. for further processing and chemical analysis.

A separate collection of sediment was made for analysis of organic constituents. Material collected for analysis of organics from tributary streams was processed in the same manner as material collected for trace-metal analysis but with a smaller volume (300 mL) of material. Sieved material for analysis of organics was transferred to a pre-baked, clean 500-mL glass jar with a Teflon-lined lid and held on ice. Excess water was decanted when the sediment had settled. The sediment was then frozen in the jar.

Lake-bed sediments were sampled from the University of Vermont's research vessel, *Melosira*. A large steel Ekman dredge retrieved, landed, and released intact well layered slabs of lake-bed sediment into a stainless-steel pan. The upper layer was scooped with a stainless-steel spoon directly into pre-baked glass sample jars without sieving. Samples for organic-constituent measurements were sent to the State University of New York at Syracuse for analysis.

Sample equipment was cleaned at each site with Liqinox detergent and rinsed thoroughly with river water. Equipment was cleaned after sampling and transported clean in plastic bags to the next site. Before sampling, equipment was rinsed again in river water.

At each stream site, pH and specific conductance were measured following sediment collection. The measurements were made according to standard USGS procedures (Fishman and Friedman, 1989).

Chemical Analysis

Inorganic Constituents

Upon receipt of the samples at the USGS laboratory in Denver, the dried stream samples were processed through a jaw crusher. The samples were then placed in a ceramic "juicer" (a commercial mechanical soil grinder) for further disaggregation with minimal particle disintegration. About 25 percent of the sample was separated out and archived. The remainder of the sample was dry sieved through a 63-μm mesh stainless-steel sieve to separate the fine fraction for analysis.

Three techniques were used for the digestion of the resulting fine fraction—partial digestion for subsequent mercury analysis, partial digestion for subsequent 10-element analysis, and total digestion for subsequent analysis of 42 elements (Arbogast, 1990). The partial-digestion techniques were used because of the lower detection limits that are possible when the mineral-grain matrix is not dissolved. The partial digestion for mercury was by nitric acid and sodium dichromate in a closed Teflon vessel. The partial digestion for the 10-element analysis was with hydrochloric acid and hydrogen peroxide to solubilize metals that were not tightly bound in the silicate lattice of the sediments before analysis (Arbogast 1990). The total-digestion technique for the 42-element analysis used a mixture of hydrochloric, nitric, perchloric, and hydrofluoric acids.

All analyses were done by use of inductively coupled plasma-atomic emission spectrometry (ICP-AES) except for the mercury analysis, which was by cold vapor-atomic absorption spectrophotometry. Methods used are further described in Arbogast (1990). Minimum reporting levels vary by method and element and are listed in table 2 (at back of report).

Organic Constituents

Analysis of PCB congeners was done at the State University of New York at Syracuse. Upon receipt at the laboratory, sample names and date of arrival were recorded and samples were stored in the dark at 4°C. Each sample was prepared for analysis by drawing off supernatant water in the sample container, stirring the sediment to homogenize it, and placing the sediment on a 14.5-cm diameter watch glass in a fume hood to air dry (48-72 hours). The visual appearance of the sample (sandy, clayey, coarse, fine, organic matter) was recorded. After drying, the sample was divided into four quarters and each quarter was placed in a polyethylene Whirl-Pak bag. One quarter was sent to the USGS laboratory in Denver for organic carbon analysis and the others were stored at 4°C.

The organic-carbon analysis was determined at the USGS Denver laboratory by difference between measurements of total carbon and inorganic carbon. The total carbon was measured by detection of carbon dioxide after combustion and inorganic carbon was measured by coulometric titration after acidification (Arbogast, 1990).

The PCB congeners were determined by gas-liquid chromatography (GC). There is no standard USGS method for this analysis so the steps used for this report are described in the following paragraphs.

Approximately 10 g of sediment for extraction by solvent was weighed in a glass-soxhlet thimble. Distilled water was added until the sediment appeared damp (turned dark). A 100–μL aliquot of toluene containing 52 ng 2,2',6,6'-tetrachlorobiphenyl, 40 ng 3,3',5,5'-tetrachlorobiphenyl, 54 ng pentachlorobenzene, and 0.37 μg of hexabromobiphenyl were added to the sediment, and the sample was extracted with 10 percent (volume basis) acetone in hexane in a soxhlet extractor for 24 hours. The refluxing solvent contained copper turnings to remove elemental sulfur during the extraction process. The copper was precleaned by sequential rinsing with 50 percent hydrochloric acid, distilled water, acetone, and hexane. A method blank (empty soxhlet thimble) was carried through with each batch of samples processed. After cooling, the extract was transferred to a Kuderna-Danish concentrator and evaporated to approximately 2 mL on a steam bath.

The concentrated extract was placed on a column of 1 g 60-100 mesh florisil with approximately 15 g sodium sulfate on top in a Pasteur pipet and eluted with 15 mL hexane. Internal standard (67 ng octachlorostyrene and 315 ng decachlorobiphenyl in 10 µL toluene) and 2 mL isooctane were added to the sample and it was evaporated to 2 mL by bubbling a stream of charcoal-filtered air through it. Next, 5 mL concentrated sulfuric acid was added to the extract, and it was mixed with a vortex mixer for 1 minute. After standing for 1 minute, the solvent layer was transferred to an autoinjector vial with a Pasteur pipet. The acid layer was rinsed with 1 mL hexane and the hexane was transferred to the same vial.

Samples were analyzed with a GC equipped with an autoinjector, splitless capillary inlet, 30 m x 0.25 µm SE-54 fused silica capillary column and ^{63}Ni electron capture detector (ECD). Digitized output (sampling rate of 2.5 Hz) from the GC was sent through a RS-232 serial port to a microcomputer running a BASIC program to collect the data and store it in a disk file using the sample name as the file name.

At the beginning of each batch of samples analyzed on the GC, five standards containing approximately 0.2, 0.4, 0.6, 0.8 and 1 parts per million (ppm) each of Aroclor 1242 and 1260 and the internal standards were analyzed. A standard containing approximately 1 ppm of each Aroclor (1242 and 1260) was run after every five samples. Identities and quantities of congeners in the standards were established on the basis of the work of Schulz and others (1989). Response factors relative to the internal standards were determined from the first five standards and averaged. The average and standard deviation of the retention time of each congener was determined from the first five standards. Congeners were identified by use of retention-time windows bounded by plus and minus three standard deviations of the mean retention time. Congeners were quantified by use of peak heights relative to the internal standard-peak height and the relative-response factors. Peak height, retention time, identification, and quantification were all determined by use of Labtech Chrom version 2 to process the raw GC data.

In the United States, PCB's were used primarily as Aroclors each of which contained a characteristic mixture of congeners. PCB patterns found in the environment generally reflect a mixture of different Aroclors with some modification as a result of weathering. Therefore, the presence of a pattern of peaks similar to an Aroclor or mixture of Aroclors indicates the presence of PCB's. Analytical results were screened to determine if the major congeners in each Aroclor (congeners 31 and 28 for 1242; 66 and 95 for 1248; 77 and 110 for 1254 and 180 for 1260) were present in the samples. Samples with no peaks corresponding to any of these congeners present at levels that would correspond to 0.01 ppm of the Aroclor in the sample were recorded as samples with no detected PCB's.

SUMMARY STATISTICS AND GEOCHEMICAL DATA

Inorganic Constituents

Results of the standard reference-material analyses and corresponding standard concentrations are presented in table 3 (in back of report). Most standard concentrations given represent results from five or more laboratories and three or more independent methods in statistical agreement. Element standard concentrations not represented by well established independent methods are indicated with footnotes. Of the 30 elements quantified in the standards, only two comparisons between reference material and analysis were outside the 2 standard-deviation-unit range. These were the comparison of barium in the SDO-1 sample and of copper in the MAG-1 sample.

Percent variance of ranked data at each level of the analysis of variance design is presented in table 4 (in back of report). Variation introduced by the analytical method and sample splitting as a percentage of total variance is shown in the column under "Sample split." Variation introduced by the stream-sampling procedure is shown in the column under "Within site," and variation found among sites is shown in the column under "Between site." Elements for which virtually all of the results were below detection are not included in the table.

Summary statistics of the inorganic-analysis results were computed on the environmental samples, one sample from each site. Percentile data and maximum and minimum results are presented in table 5 (in back of report). A percentile value has at most the given percent of observations less than the value and 100 minus the given percent of observations greater than the value.

Concentrations for all elements by sample site number are shown in table 6 (in back of report). The site numbers refer to figure 1, where sampling sites are shown. Map numbers are consecutive, sorted in order of decreasing latitude. Each sample in table 6 is listed with a "Design remark" that refers to the intended use of the sample in the survey design.

Organic Constituents

Not all of the PCB congeners can be separated with the chromatographic conditions used in this study. Although most of the congeners are uniquely determined by retention time, it is possible for as many as three congeners to elute from the column at the same time. Information on the degree to which congeners are resolved is given in table 7 (in back of report) where the congeners and their International Union of Practical and Applied Chemistry (IUPAC) congener numbers are listed in order of their retention time in the GC. Each PCB peak that can be resolved is assigned a sequential domain number so that congeners in table 7 that coelute have the same domain number.

Results of the standard reference-material analyses and corresponding certified concentrations are presented in table 8 (in back of report). Only 2 of 10 congeners that were certified in the standard were uniquely defined by a domain. Results are from two samples of the reference material analyzed as blind samples by the laboratory. Although the sample size is too small to be conclusive regarding the accuracy of the analysis, results in general agree with the standard.

Data on sampling design for organic sample sites is given in table 9 (in back of report). The site numbers refer to figure 1. Results of the analyses of carbonate, organic, and total carbon are also included in table 9. These samples were splits of those analyzed for PCB's.

Results of the PCB congener-sample analyses are given in table 9 and figure 2 (in back of report). Not all of the samples had measurable concentrations of PCB's in them. Those samples that did not meet the concentration criterion described in the methods section have "no" in the last column of table 9 indicating that PCB's were not detected. Those samples that did meet the concentration criterion for detection are indicated by "yes" in the last column.

In some cases, one replicate from a site was classified as showing a PCB congener pattern, whereas another replicate from the same site was classified as not showing a PCB congener pattern. Variation in samples at a site and analytical variation can cause this difference in classification when the amount of PCB's in the sample is small. The pattern of congeners for samples with detections is given in figure 2. The results are in histogram, rather than table form, to emphasize the pattern of PCB congener occurrence among samples. The response axes of the histograms are given in terms of concentration. The nominal concentration units of the figure would correspond to actual concentration in micrograms per gram dry-weight basis if the height of the peak were caused only by PCB congeners. However, this is not necessarily the case since non-PCB compounds can be registered at the ECD. The sample treatment and clean up, and the ECD that was used, are selective for PCB compounds. However, other non-PCB compounds, not removed from the sample extract by the cleanup steps, may respond in the ECD and interfere with the PCB analysis. The interference produces either false identifications or concentrations that are biased high because of the interfering compound's response contribution. As discussed in the section "Methods," a pattern of peaks indicate the presence of PCB's, but for any one peak, only tentative identification is possible. The histograms in figure 2 are arranged in order of sample-site number. With the site number on each histogram is the design remark code from table 9 indicating duplicate and split samples.

Congener patterns of the principal PCB Aroclor mixtures that were used in the United States are given in figure 3. A comparison between patterns of the Aroclor and the environmental samples can be done to determine how much the environmental samples differ from the original patterns.

SUMMARY

This report does not include an interpretation of the large data set presented in the report tables. However, the tables contain numerous data on the distribution and presence of organic and inorganic constituents in the Lake Champlain tributaries.

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Table 1. Location and sample-type data for sites sampled in the Lake Champlain Basin

Site number[1]	Stream name	Latitude	Longitude	Sample type
1	Pike River	45°04'40.3"	73°05'19.0"	inorganic, organic
2	Lake Bed near Pike River	45°03'32.8"	73°06'00.0"	organic
3	Lake Bed near Missisquoi River	45°01'18.7"	73°09'11.9"	organic
4	Rock River	44°59'46.9"	73°04'23.4"	inorganic, organic
5	Carman Brook	44°58'38.1"	73°05'01.8"	inorganic
6	Mud Creek	44°58'05.5"	73°16'10.5"	inorganic
7	Mud Creek	44°57'51.0"	73°16'12.8"	organic
8	Youngman Brook	44°57'22.7"	73°06'23.6"	inorganic
9	Great Chazy River	44°57'13.1"	73°25'03.8"	inorganic, organic
10	Corbeau Creek	44°56'27.2"	73°24'36.0"	inorganic
11	Missisquoi River	44°55'53.8"	73°07'37.7"	inorganic, organic
12	Lake Bed near Great Chazy River	44°55'30.0"	73°23'00.0"	organic
13	Little Chazy River	44°54'10.0"	73°24'52.9"	inorganic, organic
14	Stephens Brook	44°50'56.6"	73°07'08.0"	inorganic, organic
15	Stephens Brook	44°50'50.0"	73°05'52.0"	inorganic
16	Riley Brook	44°48'28.0"	73°24'03.0"	inorganic, organic
17	Lake Bed in St. Albans Bay	44°47'17.2"	73°09'24.1"	organic
18	Mill River	44°46'47.0"	73°08'39.2"	inorganic, organic
19	Dead Creek	44°45'31.4"	73°26'51.5"	inorganic, organic
20	Ray Brook	44°45'09.7"	73°27'48.6"	inorganic
21	Kennon Brook	44°44'12.5"	73°28'18.1"	inorganic
22	Dead Creek Marsh	44°43'21.5"	73°27'15.5"	organic
23	unnamed tributary	44°42'34.3"	73°26'58.2"	organic
24	Lake Bed in Cumberland Bay	44°42'31.7"	73°26'45.0"	organic
25	Lake Bed in Cumberland Bay	44°42'03.4"	73°25'19.0"	organic
26	Saranac River	44°41'57.6"	73°26'58.5"	inorganic, organic
27	Saranac River	44°41'27.8"	73°27'48.5"	organic
28	Saranac River	44°41'27.1"	73°27'45.7"	organic
29	Stone Bridge Brook	44°41'14.4"	73°11'22.6"	inorganic, organic
30	unnamed tributary	44°39'12.1"	73°26'41.0"	inorganic, organic
31	Trout Brook	44°39'11.3"	73°12'58.9"	inorganic
32	Salmon River	44°37'41.2"	73°26'55.0"	inorganic, organic
33	Silver Stream	44°37'14.0"	73°26'52.8"	inorganic
34	Lamoille River	44°36'52.9"	73°10'50.6"	inorganic, organic
35	Lake Bed in Malletts Bay	44°36'38.2"	73°15'02.9"	organic
36	Little Ausable River	44°34'58.2"	73°27'29.6"	inorganic, organic
37	Allen Brook	44°34'43.3"	73°09'28.6"	inorganic
38	Lake Bed in Malletts Bay	44°34'09.0"	73°12'35.9"	organic
39	Malletts Creek	44°34'00.9"	73°09'16.2"	inorganic, organic
40	Lake Bed near Ausable River	44°33'57.4"	73°24'45.7"	organic

Table 1. Location and sample-type data for sites sampled in the Lake Champlain Basin--Continued

Site number[1]	Stream name	Latitude	Longitude	Sample type
41	Indian Brook	44°33'33.8"	73°10'50.8"	inorganic, organic
42	Pond Brook	44°33'30.5"	73°09'52.9"	inorganic
43	Ausable River	44°33'19.5"	73°27'26.4"	inorganic, organic
44	Winooski River	44°32'20.7"	73°15'56.0"	inorganic, organic
45	Lake Bed near Winooski River	44°31'36.2"	73°18'22.5"	organic
46	Winooski River	44°29'20.2"	73°11'03.1"	inorganic, organic
47	Little Trout Brook	44°28'49.0"	73°25'06.7"	inorganic
48	Potash Brook	44°26'22.6"	73°13'10.7"	inorganic
49	unnamed tributary	44°25'37.2"	73°24'51.0"	inorganic, organic
50	Lake Bed in Shelburne Bay	44°24'31.6"	73°14'09.0"	organic
51	Munroe Brook	44°24'16.1"	73°13'03.0"	inorganic
52	Laplatte River	44°23'05.0"	73°13'26.8"	inorganic, organic
53	Bouquet River	44°22'10.8"	73°23'28.0"	inorganic, organic
54	Lake Bed near Bouquet River	44°21'27.5"	73°21'00.3"	organic
55	Holmes Creek	44°19'50.6"	73°16'34.5"	inorganic
56	Thorp Brook	44°16'27.2"	73°15'20.5"	inorganic
57	Lewis Creek	44°14'45.9"	73°14'44.5"	inorganic, organic
58	Lake Bed near Otter Creek	44°13'42.0"	73°19'54.5"	organic
59	Little Otter Creek	44°11'53.8"	73°14'46.2"	inorganic, organic
60	Lake Bed near Hoisington Brook	44°11'10.6"	73°24'46.2"	organic
61	Hoisington Brook	44°11'00.2"	73°26'05.2"	inorganic, organic
62	Otter Creek	44°09'27.0"	73°17'01.0"	inorganic, organic
63	Stacy Brook	44°08'33.6"	73°25'51.8"	inorganic
64	Mullen Brook	44°06'38.0"	73°27'04.0"	inorganic
65	unnamed tributary	44°06'06.0"	73°27'03.0"	inorganic
66	Mullen Brook	44°06'04.7"	73°27'00.0"	inorganic
67	Mill Brook	44°03'10.0"	73°27'22.6"	inorganic, organic
68	Mill Brook	44°02'58.0"	73°28'08.0"	inorganic
69	McKenzie Brook	44°02'08.3"	73°27'49.2"	inorganic
70	E. Branch Dead Creek	44°01'41.8"	73°19'15.6"	inorganic
71	West Branch Dead Creek	44°01'32.5"	73°20'53.6"	inorganic
72	Grove Brook	44°00'39.0"	73°27'24.9"	inorganic
73	Putnam Creek	43°57'21.2"	73°25'59.4"	inorganic, organic
74	Lake Bed near Putnam Creek	43°57'09.5"	73°24'27.5"	organic
75	Grant Brook	43°54'24.2"	73°25'25.7"	inorganic
76	Five Mile Creek	43°53'43.1"	73°24'17.1"	inorganic
77	unnamed tributary	43°51'00.0"	73°21'50.8"	inorganic
78	Ticonderoga Creek	43°50'49.3"	73°24'37.9"	inorganic, organic
79	Lake Bed near Lachutte	43°50'05.3"	73°23'19.6"	organic
80	East Creek	43°48'13.5"	73°20'16.2"	inorganic, organic

Table 1. Location and sample-type data for sites sampled in the Lake Champlain Basin–Continued

Site number[1]	Stream name	Latitude	Longitude	Sample type
81	Charter Brook	43°48'04.6"	73°23'42.8"	inorganic
82	South Brook	43°46'19.2"	73°23'21.0"	inorganic
83	Mill Brook	43°43'59.2"	73°23'35.7"	inorganic, organic
84	unnamed tributary	43°43'28.3"	73°21'52.5"	inorganic
85	unnamed tributary	43°40'04.6"	73°25'04.5"	inorganic
86	Horton Brook	43°38'55.9"	73°23'35.9"	inorganic
87	unnamed tributary	43°38'15.6"	73°26'23.1"	inorganic
88	Hubbardton River	43°37'37.5"	73°20'33.2"	inorganic
89	Poultney River	43°37'33.9"	73°20'35.5"	inorganic, organic
90	Coggman Creek	43°37'32.9"	73°22'16.8"	inorganic
91	Pine Lake Brook	43°37'07.1"	73°26'23.9"	inorganic
92	Pike Brook	43°33'02.4"	73°27'55.1"	inorganic
93	Mud Brook	43°32'42.5"	73°23'41.7"	inorganic
94	Greenland Brook	43°32'06.4"	73°30'22.5"	inorganic
95	Metawee River	43°31'46.6"	73°23'25.8"	inorganic, organic
96	Spectacle Brook	43°31'23.3"	73°30'35.6"	inorganic
97	Mount Hope Brook	43°31'19.8"	73°30'29.5"	inorganic, organic

[1] Location of site number shown in figure 1.

Table 2. Minimum reporting levels for the streambed sediments survey of the Lake Champlain Basin

[µg/g, micrograms per gram]

Element	Units	Minimum reporting level
Aluminum	percent	0.1
Antimony - partial	µg/g	.6
Arsenic	µg/g	10
Arsenic - partial	µg/g	.6
Barium	µg/g	1
Beryllium	µg/g	1
Bismuth	µg/g	10
Bismuth - partial	µg/g	.6
Cadmium	µg/g	2
Cadmium - partial	µg/g	.05
Calcium	percent	.05
Cerium	µg/g	4
Chromium	µg/g	1
Cobalt	µg/g	1
Copper	µg/g	1
Copper - partial	µg/g	.05
Europium	µg/g	2
Gallium	µg/g	4
Gold	µg/g	8
Gold - partial	µg/g	.1
Holmium	µg/g	4
Iron	percent	.05
Lanthanum	µg/g	2
Lead	µg/g	4
Lead - partial	µg/g	.6
Lithium	µg/g	2
Magnesium	percent	.005
Manganese	µg/g	4
Mercury - partial	µg/g	.02
Molybdenum	µg/g	2
Molybdenum - partial	µg/g	.09
Neodymium	µg/g	4
Nickel	µg/g	2
Niobium	µg/g	4
Phosphorus	percent	.005
Potassium	percent	.05
Scandium	µg/g	2
Silver	µg/g	2
Silver - partial	µg/g	.06
Sodium	percent	.005
Strontium	µg/g	2
Tantalum	µg/g	40
Thorium	µg/g	4
Tin	µg/g	5
Titanium	percent	.005
Uranium	µg/g	100
Vanadium	µg/g	2
Ytterbium	µg/g	1
Yttrium	µg/g	2
Zinc	µg/g	4
Zinc - partial	µg/g	.5

Table 3. Standard reference-material concentrations for inorganic-constituent analyses for tributaries to Lake Champlain

[percent, concentrations in weight percent, all other elements are in micrograms per gram (mg/g); values in parentheses are two standard deviations; SDO-1 had two laboratory results per sample; <, less than]

Elements	MAG-1			SDO-1			
	Standard results		Laboratory results	Standard results		Laboratory results	
Aluminum (percent)	8.70	--	8.5	6.50	(0.12)	6.4	6.5
Arsenic	--	--	--	68.5	(8.6)	68	67
Barium	493	(140)	470	397	(38.)	240	250
Calcium (percent)	1.07	--	1.1	.75	(.03)	.78	.78
Cerium	--	--	--	79.3	(7.8)	72	73
Chromium	121	(22)	120	66.4	(7.6)	67	68
Cobalt	17.6	(3.4)	22	46.8	(6.3)	48	48
Copper	48.8	(5.6)	30	[1]60.2	(9.6)	56	55
Europium	--	--	--	1.6	(.22)	<2	<2
Gallium	20.9	(4.1)	22	16.8	(1.8)	15	15
Iron (percent)	4.6	--	4.8	6.53	(.15)	6.4	6.5
Lanthanum	--	--	--	38.5	(4.4)	34	34
Lead	--	--	--	[1]27.9	(5.2)	24	25
Magnesium (percent)	1.79	--	1.7	.93	.023	.89	.90
Manganese	774	--	770	325	(40)	310	320
Mercury	--	--	--	[1].19	(.08)	.22	.22
Molybdenum	--	--	--	134	(21.)	150	150
Neodymium	--	--	--	36.6	(3.3)	32	34
Nickel	50.7	(9.0)	55	99.5	(9.9)	94	96
Niobium	--	--	--	11.4	(1.2)	9	8
Phosphorus (percent)	.14	--	.08	.048	(.003)	.05	.05
Potassium (percent)	2.99	--	2.9	2.78	(.05)	2.5	2.5
Scandium	18.3	(2.1)	17	13.2	(1.5)	13	13
Sodium (percent)	2.90	--	2.7	--	--	.29	.29
Strontium	158	(40.8)	150	75.1	(11)	77	77
Tantalum	--	--	--	[1]1.1	(.13)	<40	<40
Tin	--	--	--	[1]3.7	(1.2)	<5	<5
Uranium	--	--	--	48.8	(6.5)	<100	<100
Vanadium	132	(30.5)	130	160	(21.)	150	160
Zinc	--	--	--	64.1	(6.9)	57	59

[1]Values are less well established.

Table 4. Results, in percent, from one-way, nested analysis of variance of ranked sediment-constituent-concentration data for tributaries to Lake Champlain
[All values are in percent]

Elements	Sample split	Within site	Between site
Aluminum	4.4	0	95.6
Antimony - partial	.9	23.4	75.7
Arsenic - partial	9.5	15.9	74.6
Barium	3.3	.2	96.5
Beryllium	24.5	0	75.5
Bismuth - partial	0	73.6	26.4
Cadmium - partial	1.0	27.9	71.1
Calcium	.5	1.8	97.7
Cerium	5.7	0	94.3
Chromium	2.7	2.7	94.6
Cobalt	3.4	27.1	69.5
Copper	29.4	0	70.6
Copper - partial	8.7	.3	91.0
Gallium	7.4	1.2	91.4
Gold - partial	25.0	22.0	53.0
Iron	1.5	7.9	90.6
Lanthanum	5.0	1.1	93.9
Lead	2.8	1.7	95.5
Lead - partial	1.7	28.6	69.7
Lithium	.9	4.3	94.8
Magnesium	1.2	17.6	81.2
Manganese	1.4	4.7	93.9
Mercury	3.7	68.3	28.0
Molybdenum	.4	67.8	31.8
Molybdenum - partial	27.0	69.5	3.5
Neodymium	5.4	7.4	87.2
Nickel	.8	2.9	96.3
Niobium	48.7	0	51.3
Phosphorus	9.1	13.6	77.3
Potassium	3.0	1.5	95.5
Scandium	1.2	1.3	97.5
Silver - partial	5.4	31.1	63.5
Sodium	4.3	6.8	88.9
Strontium	1.0	3.2	95.8
Thorium	13.3	7.8	78.9
Tin	17.9	0	82.1
Titanium	4.4	10.9	84.7
Vanadium	1.5	14.8	83.7
Ytterbium	10.1	9.5	80.4
Yttrium	.9	2.9	96.2
Zinc	1.1	5.2	93.7
Zinc - partial	5.8	11.6	82.6

Table 5. Percentile distribution of element concentrations in 86 samples of fine-fraction streambed sediment for tributaries to Lake Champlain
[pct, percent; µg/g, micrograms per gram; <, less than reporting level given]

Element	Units of Concentration	Minimum	Maximum	Percent Distribution				
				10	25	50	75	90
Aluminum	pct	3.1	8.2	5.2	5.6	6.1	6.78	7.5
Antimony[1]	µg/g	<.6	4.2	<.6	<.6	<.6	<.6	.8
Arsenic	µg/g	<10	42	<10	<10	<10	<10	<10
Arsenic[1]	µg/g	<.6	45	1.4	2.2	3.4	4.8	7.1
Barium	µg/g	260	680	400	460	550	620	650
Beryllium	µg/g	<1	3	<1	<1	<1	2	2
Bismuth	µg/g	<10	<10	<10	<10	<10	<10	<10
Bismuth[1]	µg/g	<.6	1.1	<.6	<.6	<.6	<.6	<.6
Cadmium	µg/g	<2	3	<2	<2	<2	<2	<2
Cadmium[1]	µg/g	.08	2.4	.12	.16	.23	.35	.62
Calcium	pct	.6	7.9	1.0	1.4	2	3	4.3
Cerium	µg/g	26	510	54	64	80	92	110
Chromium	µg/g	40	190	52	62	73	88	110
Cobalt	µg/g	6	44	10	12	15	18	23
Copper	µg/g	5	51	8.3	11	16	23	28
Copper[1]	µg/g	4.0	47	8.4	12	18	24	30
Europium	µg/g	<2	3	<2	<2	<2	<2	<2
Gallium	µg/g	8	29	12	14	16	17	20
Gold	µg/g	<8	<8	<8	<8	<8	<8	<8
Gold[1]	µg/g	<.1	<.1	<.1	<.1	<.1	<.1	<.1
Holmium	µg/g	<4	5	<4	<4	<4	<4	<4
Iron	pct	2.1	9.4	2.8	3.4	3.7	4.3	4.6
Lanthanum	µg/g	13	290	26	30	38	43	48
Lead	µg/g	9	280	11	14	16	21	37
Lead[1]	µg/g	4.9	340	8.5	11	16	23	37
Lithium	µg/g	9	50	14	19	27	34	45
Magnesium	pct	.53	3	.79	.95	1.1	1.4	1.5
Manganese	µg/g	310	7,000	630	800	1,200	1,600	2,400
Mercury	µg/g	.03	3.7	.073	.11	.20	.34	.47
Molybdenum	µg/g	<2	4	<2	<2	<2	<2	<2
Molybdenum[1]	µg/g	.06	6.9	.51	.69	.94	1.7	2.9
Neodymium	µg/g	12	190	27	32	37	41	46
Nickel	µg/g	13	110	21	27	33	41	57
Niobium	µg/g	<4	19	7	9	10	12	12
Phosphorus	pct	.08	.34	.10	.11	.12	.14	.16
Potassium	pct	.87	3	1.5	1.7	2.1	2.3	2.5
Scandium	µg/g	5	15	7	9	11	12	14
Silver	µg/g	<2	12	<2	<2	<2	<2	<2
Silver[1]	µg/g	<.06	17	<.06	<.06	<.06	<.06	.11
Sodium	pct	.60	1.8	.92	1.1	1.3	1.5	1.6

Table 5. Percentile distribution of element concentrations in 86 samples of fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Element	Units of	Min-imum	Max-imum	Percent Distribution				
Strontium	µg/g	83	550	150	170	200	240	310
Tantalum	µg/g	<40	<40	<40	<40	<40	<40	<40
Thorium	µg/g	<4	30	5	6	7	8	10
Tin	µg/g	<5	220	<5	<5	<5	<5	5.7
Titanium	pct	.15	1.6	.41	.47	.54	.66	.75
Uranium	µg/g	<100	<100	<100	<100	<100	<100	<100
Vanadium	µg/g	41	110	51	61	73	84	100
Ytterbium	µg/g	1	16	2	2	3	3	4
Yttrium	µg/g	12	200	26	28	30	33	45
Zinc	µg/g	43	420	61	75	90	110	160
Zinc[1]	µg/g	25	360	50	73	84	120	160

[1] Partial digestion was used.

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain

[--, data not available or insufficient sample for analysis; <, less than reporting level given]

Site number[1]	Stream name	Latitude	Longitude	Design remarks[2]	Date	pH (standard units)	Specific conductance (microsiemens per centimeter)
1	Pike River	45°04'40.3"	73°05'19.0"	1	7-21-92	8.7	389
1	Pike River	45°04'40.3"	73°05'19.0"	2	7-21-92	8.7	389
1	Pike River	45°04'40.3"	73°05'19.0"	2	7-21-92	8.7	389
4	Rock River	44°59'46.9"	73°04'23.4"	1	7-02-92	7.3	363
4	Rock River	44°59'46.9"	73°04'23.4"	2	7-02-92	7.3	363
4	Rock River	44°59'46.9"	73°04'23.4"	2	7-02-92	7.3	363
5	Carman Brook	44°58'38.1"	73°05'01.8"	1	6-17-92	8.2	297
6	Mud Creek	44°58'05.5"	73°16'10.5"	1	7-22-92	7.0	434
8	Youngman Brook	44°57'22.7"	73°06'23.6"	3	10-15-92	--	--
8	Youngman Brook	44°57'22.7"	73°06'23.6"	1	6-17-92	7.7	149
9	Great Chazy River	44°57'13.1"	73°25'03.8"	2	7-22-92	7.2	198
9	Great Chazy River	44°57'13.1"	73°25'03.8"	1	7-22-92	7.2	198
9	Great Chazy River	44°57'13.1"	73°25'03.8"	2	7-22-92	7.2	198
10	Corbeau Creek	44°56'27.2"	73°24'36.0"	1	7-22-92	7.4	479
11	Missisquoi River	44°55'53.8"	73°07'36.0"	2	7-02-92	7.5	150
11	Missisquoi River	44°55'53.8"	73°07'36.0"	1	7-02-92	7.5	150
11	Missisquoi River	44°55'53.8"	73°07'36.0"	2	7-02-92	7.5	150
13	Little Chazy River	44°54'10.0"	73°24'52.9"	1	7-22-92	8.8	256
14	Stephens Brook	44°50'56.6"	73°07'08.0"	1	7-02-92	8.2	704
14	Stephens Brook	44°50'56.6"	73°07'08.0"	3	10-15-92	--	--
15	Stephens Brook	44°50'50.0"	73°05'52.0"	3	10-15-92	--	--
16	Riley Brook	44°48'28.0"	73°24'03.0"	1	7-23-92	7.2	649
18	Mill River	44°46'47.0"	73°08'39.2"	1	7-02-92	8.5	479
19	Dead Creek	44°45'31.4"	73°26'51.5"	1	7-23-92	7.3	417
20	Ray Brook	44°45'09.7"	73°27'48.6"	1	7-23-92	7.7	507
21	Kennon Brook	44°44'12.5"	73°28'18.1"	1	7-23-92	8.1	387
26	Saranac River	44°41'57.6"	73°26'58.5"	1	7-28-92	7.2	93
26	Saranac River	44°41'57.6"	73°26'58.5"	2	7-28-92	7.2	93
26	Saranac River	44°41'57.6"	73°26'58.5"	2	7-28-92	7.2	93
29	Stone Bridge Brook	44°41'14.4"	73°11'22.6"	1	7-06-92	7.6	278
30	unnamed tributary	44°39'12.1"	73°26'41.0"	1	7-29-92	7.4	530
31	Trout Brook	44°39'11.3"	73°11'58.9"	1	6-18-92	8.2	307
32	Salmon River	44°37'41.2"	73°26'55.0"	1	7-29-92	7.2	192
32	Salmon River	44°37'41.2"	73°26'55.0"	2	7-29-92	7.2	192
32	Salmon River	44°37'41.2"	73°26'55.0"	2	7-29-92	7.2	192
33	Silver Stream	44°37'14.0"	73°26'52.8"	1	7-23-92	7.6	568
34	Lamoille River	44°36'52.9"	73°10'50.6"	1	7-06-92	6.7	--
36	Little Ausable River	44°34'58.2"	73°27'29.6"	1	7-29-92	7.4	251
37	Allen Brook	44°34'43.3"	73°09'28.6"	1	6-18-92	8.1	517
39	Malletts Creek	44°34'00.9"	73°09'16.2"	1	7-06-92	8.0	313

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Stream name	Latitude	Longitude	Design remarks[2]	Date	pH (standard units)	Specific conductance (microsiemens per centimeter)
41	Indian Brook	44°33′33.8″	73°10′50.8″	1	7-06-92	7.6	493
42	Pond Brook	44°33′30.5″	73°09′52.9″	1	6-19-92	7.6	401
43	Ausable River	44°33′19.5″	73°27′26.4″	1	7-27-92	7.8	97
43	Ausable River	44°33′19.5″	73°27′26.4″	2	7-27-92	7.8	97
43	Ausable River	44°33′19.5″	73°27′26.4″	2	7-27-92	7.8	97
44	Winooski River	44°32′20.7″	73°15′56.0″	1	7-01-92	8.0	246
46	Winooski River	44°29′20.2″	73°11′03.1″	1	7-06-92	8.0	236
47	Little Trout Brook	44°28′49.0″	73°25′06.7″	1	7-27-92	8.2	369
48	Potash Brook	44°26′22.6″	73°13′10.7″	1	6-19-92	8.1	910
49	unnamed tributary	44°25′37.2″	73°24′51.0″	1	7-27-92	7.4	166
51	Munroe Brook	44°24′16.1″	73°13′03.0″	1	6-26-92	7.6	631
52	Laplatte River	44°23′05.0″	73°13′26.8″	1	7-07-92	7.7	446
53	Bouquet River	44°22′10.8″	73°23′28.0″	2	7-27-92	8.1	149
53	Bouquet River	44°22′10.8″	73°23′28.0″	1	7-27-92	8.1	149
53	Bouquet River	44°22′10.8″	73°23′28.0″	2	7-27-92	8.1	149
55	Holmes Creek	44°19′50.6″	73°16′34.5″	1	7-07-92	7.7	385
56	Thorp Brook	44°16′27.2″	73°15′20.5″	1	7-07-92	8.2	508
57	Lewis Creek	44°14′45.9″	73°14′44.5″	1	7-07-92	8.8	248
59	Little Otter Creek	44°11′53.8″	73°14′46.2″	1	7-07-92	8.7	346
61	Hoisington Brook	44°11′00.0″	73°26′06.7″	1	7-10-92	7.5	223
62	Otter Creek	44°09′27.0″	73°17′01.0″	1	7-08-92	8.5	230
63	Stacy Brook	44°08′33.6″	73°25′51.8″	1	7-10-92	7.6	180
64	Mullen Brook	44°06′38.0″	73°27′04.0″	3	10-21-92	--	--
65	unnamed tributary	44°06′06.0″	73°27′03.0″	3	10-21-92	--	--
66	Mullen Brook	44°06′04.7″	73°27′00.0″	1	7-09-92	7.6	155
66	Mullen Brook	44°06′04.7″	73°27′00.0″	3	10-21-92	--	--
67	Mill Brook	44°03′10.1″	73°27′22.6″	1	7-09-92	8.2	149
67	Mill Brook	44°03′10.1″	73°27′22.6″	3	10-21-92	--	--
68	Mill Brook	44°02′58.0″	73°28′08.0″	3	10-21-92	--	--
69	McKenzie Brook	44°02′08.3″	73°27′49.2″	1	7-10-92	8.6	281
70	E. Branch Dead Creek	44°01′41.8″	73°19′15.6″	1	7-08-92	8.4	885
71	W. Branch Dead Creek	44°01′32.5″	73°20′53.6″	1	7-08-92	9.3	816
72	Grove Brook	44°00′39.0″	73°27′24.9″	1	7-10-92	8.0	237
73	Putnam Creek	43°57′21.2″	73°25′59.4″	1	7-09-92	8.3	297
75	Grant Brook	43°54′24.2″	73°25′25.7″	1	7-23-92	8.2	490
76	Five Mile Creek	43°53′43.1″	73°24′17.1″	1	7-23-92	7.8	363
77	unnamed tributary	43°51′00.0″	73°21′50.8″	1	7-16-92	7.5	1095
78	Ticonderoga Creek	43°50′49.3″	73°24′37.9″	1	7-24-92	8.0	124
78	Ticonderoga Creek	43°50′49.3″	73°24′37.9″	2	7-24-92	8.0	124
78	Ticonderoga Creek	43°50′49.3″	73°24′37.9″	2	7-24-92	8.0	124
80	East Creek	43°48′13.5″	73°20′16.2″	1	7-16-92	7.7	513
81	Charter Brook	43°48′04.6″	73°23′42.8″	1	7-09-92	8.1	266
82	South Brook	43°46′19.2″	73°23′21.0″	1	7-09-92	7.6	469
83	Mill Brook	43°43′59.2″	73°23′35.7″	1	7-09-92	8.0	311
84	unnamed tributary	43°43′28.3″	73°21′52.5″	1	7-14-92	8.0	381

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Stream name	Latitude	Longitude	Design remarks[2]	Date	pH (standard units)	Specific conductance (microsiemens per centimeter)
85	unnamed tributary	43°40′04.6″	73°25′04.5″	3	10-21-92	--	--
85	unnamed tributary	43° 40′04.6″	73°25′04.5″	1	7-24-92	7.6	371
86	Horton Brook	43°38′55.9″	73°23′35.9″	1	7-16-92	8.2	687
87	unnamed tributary	43°38′15.6″	73°26′23.1″	1	7-24-92	8.3	276
88	Hubbardton River	43°37′37.5″	73°20′33.2″	1	7-16-92	8.4	350
89	Poultney River	43°37′33.9″	73°20′35.5″	1	7-16-92	7.7	215
89	Poultney River	43°37′33.9″	73°20′35.5″	2	7-16-92	7.7	215
89	Poultney River	43°37′33.9″	73°20′35.5″	2	7-16-92	7.7	215
90	Coggman Creek	43°37′32.9″	73°22′16.8″	1	7-16-92	7.4	421
91	Pine Lake Brook	43°37′07.1″	73°26′23.9″	1	7-24-92	6.8	94
92	Pike Brook	43°33′02.4″	73°27′55.1″	1	7-17-92	7.5	83
93	Mud Brook	43°32′42.5″	73°23′41.7″	1	7-15-92	7.5	519
94	Greenland Brook	43°32′06.4″	73°30′22.5″	1	7-17-92	8.8	38
95	Metawee River	43°31′46.6″	73°23′25.8″	1	7-15-92	7.9	230
96	Spectacle Brook	43°31′23.3″	73°30′35.6″	1	7-17-92	7.0	53
97	Mount Hope Brook	43°31′19.8″	73°30′29.5″	1	7-17-92	8.2	86

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Aluminum (weight percent)	Antimony -partial (micro-grams per gram)	Arsenic (micro-grams per gram)	Arsenic - partial (micro-grams per gram)	Barium (micro-grams per gram)	Beryllium (micro-grams per gram)	Bismuth (micro-grams per gram)	Bismuth - partial (micro-grams per gram)
1	1	6.9	<0.6	<10	1.6	670	2	<10	<0.6
1	2	6.6	<.6	<10	1.3	650	<1	<10	<.6
1	2	6.7	<.6	<10	1.3	660	2	<10	<.6
4	1	7.5	<.6	<10	2.6	640	2	<10	<.6
4	2	7.4	<.6	<10	2.7	630	2	<10	<.6
4	2	7.7	<.6	<10	2.9	640	2	<10	<.6
5	1	5.7	<.6	<10	4.4	450	<1	<10	<.6
6	1	3.1	4.0	<10	2.2	260	<1	<10	<.6
8	3	5.6	--	19	--	480	<1	<10	--
8	1	5.6	4.2	15	19	490	<1	<10	<.6
9	2	5.8	<.6	<10	1.1	630	<1	<10	<.6
9	1	5.6	<.6	<10	.8	630	<1	<10	<.6
9	2	5.8	<.6	<10	1.0	640	<1	<10	<.6
10	1	5.4	<.6	<10	1.6	650	<1	<10	<.6
11	2	6.4	<.6	<10	2.0	490	<1	<10	<.6
11	1	6.3	<.6	<10	3.4	500	<1	<10	<.6
11	2	6.0	<.6	<10	2.7	470	<1	<10	<.6
13	1	5.3	<.6	<10	1.1	620	<1	<10	<.6
14	1	6.5	.9	<10	7.7	580	2	<10	1.1
14	3	6.5	--	<10	--	590	2	<10	--
15	3	6.8	--	12	--	580	2	<10	--
16	1	5.8	<.6	<10	<.6	650	<1	<10	<.6
18	1	6.3	<.6	<10	4.2	560	<1	<10	<.6
19	1	6.1	<.6	<10	1.5	620	<1	<10	<.6
20	1	5.5	<.6	<10	2.0	620	<1	<10	<.6
21	1	5.2	<.6	<10	4.5	680	<1	<10	<.6
26	1	4.9	1.2	<10	3.2	610	<1	<10	<.6
26	2	5.0	1.4	<10	3.5	590	<1	<10	<.6
26	2	4.8	1.6	<10	3.1	570	<1	<10	<.6
29	1	5.4	<.6	<10	4.7	400	<1	<10	<.6
30	1	5.6	<.6	<10	5.4	630	<1	<10	<.6
31	1	6.2	<.6	<10	7.3	450	<1	<10	<.6
32	1	4.8	<.6	<10	1.6	560	<1	<10	<.6
32	2	4.6	--	<10	--	560	<1	<10	--
32	2	4.5	--	<10	--	550	<1	<10	--
33	1	5.5	<.6	<10	2.7	570	<1	<10	<.6
34	1	7.3	<.6	17	18	590	2	<10	<.6
36	1	4.8	<.6	<10	2.3	560	<1	<10	<.6
37	1	6.1	<.6	<10	5.5	440	<1	<10	<.6
39	1	6.7	<.6	<10	4.4	550	2	<10	<.6
41	1	5.9	<.6	11	6.5	400	<1	<10	<.6
42	1	7.1	<.6	<10	8.2	540	2	<10	<.6
43	1	5.6	<.6	<10	2.0	490	<1	<10	<.6
43	2	5.7	--	<10	--	460	<1	<10	--

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Aluminum (weight percent)	Antimony -partial (micro-grams per gram)	Arsenic (micro-grams per gram)	Arsenic - partial (micro-grams per gram)	Barium (micro-grams per gram)	Beryllium (micro-grams per gram)	Bismuth (micro-grams per gram)	Bismuth - partial (micro-grams per gram)
43	2	5.3	--	<10	--	420	<1	<10	--
44	1	6.0	<.6	<10	4.8	380	2	<10	<.6
46	1	6.5	<.6	<10	5.8	440	2	<10	<.6
47	1	5.0	<.6	<10	<.6	590	<1	<10	<.6
48	1	5.9	<.6	<10	4.4	460	<1	<10	<.6
49	1	5.4	<.6	<10	.6	580	<1	<10	<.6
51	1	6.0	<.6	<10	3.6	540	<1	<10	<.6
52	1	6.4	<.6	<10	3.2	570	<1	<10	<.6
53	2	6.9	<.6	<10	1.0	430	<1	<10	<.6
53	1	7.0	<.6	<10	<.6	410	<1	<10	<.6
53	2	6.6	<.6	<10	1.7	410	<1	<10	<.6
55	1	8.2	.7	<10	3.8	670	2	<10	<.6
56	1	7.3	<.6	<10	4.2	620	2	<10	<.6
57	1	6.1	<.6	<10	4.3	430	<1	<10	<.6
59	1	6.5	.7	<10	3.9	560	2	<10	<.6
61	1	6.8	<.6	<10	1.6	480	<1	<10	<.6
62	1	6.6	<.6	<10	2.3	520	2	<10	<.6
63	1	7.1	<.6	<10	1.8	490	<1	<10	<.6
64	3	6.7	--	<10	--	330	<1	<10	--
65	3	6.9	--	<10	--	420	<1	<10	--
66	1	6.7	<.6	<10	3.1	410	<1	<10	<.6
66	3	6.4	--	<10	--	400	<1	<10	--
67	1	5.8	1.2	42	45	330	3	<10	<.6
67	3	5.8	--	38	--	350	3	<10	--
68	3	6.0	--	41	--	340	3	<10	--
69	1	5.6	<.6	<10	7.3	430	<1	<10	<.6
70	1	8.1	<.6	<10	4.4	640	2	<10	.7
71	1	7.8	<.6	<10	3.8	620	2	<10	<.6
72	1	5.2	<.6	<10	6.3	380	<1	<10	<.6
73	1	5.0	<.6	<10	3.3	470	<1	<10	<.6
75	1	6.4	<.6	<10	4.0	540	<1	<10	<.6
76	1	6.4	<.6	<10	3.8	550	<1	<10	<.6
77	1	7.3	<.6	<10	2.8	670	2	<10	<.6
78	1	6.1	1.2	<10	4.0	530	2	<10	<.6
78	2	6.0	1.5	<10	4.3	530	2	<10	<.6
78	2	6.0	1.6	<10	4.2	520	2	<10	<.6
80	1	6.8	<.6	<10	2.5	570	2	<10	<.6
81	1	7.6	<.6	<10	6.6	650	2	<10	<.6
82	1	8.1	<.6	<10	4.7	620	2	<10	<.6
83	1	6.1	<.6	<10	4.6	570	2	<10	<.6
84	1	6.5	<.6	<10	3.4	590	2	<10	<.6
85	3	5.1	--	<10	--	470	<1	<10	--
85	1	5.2	<.6	<10	1.4	460	<1	<10	<.6
86	1	7.6	<.6	<10	2.8	640	2	<10	<.6

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Aluminum (weight percent)	Antimony -partial (micro-grams per gram)	Arsenic (micro-grams per gram)	Arsenic - partial (micro-grams per gram)	Barium (micro-grams per gram)	Beryllium (micro-grams per gram)	Bismuth (micro-grams per gram)	Bismuth - partial (micro-grams per gram)
87	1	5.6	<0.6	<10	2.0	470	<1	<10	<0.6
88	1	6.6	<.6	<10	3.9	560	2	<10	<.6
89	1	5.5	<.6	<10	2.8	400	<1	<10	<.6
89	2	5.6	<.6	<10	1.8	420	<1	<10	<.6
89	2	5.6	<.6	<10	2.9	410	<1	<10	<.6
90	1	6.1	<.6	<10	2.9	460	<1	<10	<.6
91	1	5.5	<.6	<10	2.4	520	2	<10	<.6
92	1	6.2	<.6	<10	2.8	530	<1	<10	<.6
93	1	7.5	.7	<10	3.7	630	2	<10	<.6
94	1	5.7	<.6	<10	2.0	450	2	<10	<.6
95	1	6.8	<.6	<10	3.7	590	2	<10	<.6
96	1	5.6	<.6	<10	2.5	540	2	<10	<.6
97	1	5.6	<.6	<10	2.4	480	2	<10	<.6

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Cadmium (micro-grams per gram)	Cadmium -partial (micro-grams per gram)	Calcium (weight percent)	Cerium (micro-grams per gram)	Chromium (micro-grams per gram)	Cobalt (micro-grams per gram)	Copper (micro-grams per gram)	Copper - partial (micro-grams per gram)
1	1	<2	0.39	1.4	71	71	17	20	22
1	2	<2	.37	1.5	63	62	15	19	20
1	2	<2	.35	1.5	69	63	15	19	20
4	1	<2	.20	1.0	85	84	16	17	18
4	2	<2	.20	1.1	87	79	14	14	16
4	2	<2	.19	1.1	80	82	13	15	15
5	1	<2	.14	2.0	90	73	11	9	11
6	1	3	2.1	2.8	26	52	12	51	34
8	3	<2	--	1.5	92	160	19	15	--
8	1	<2	.27	1.5	94	110	20	14	18
9	2	<2	.31	1.5	59	50	11	14	14
9	1	<2	.27	1.5	55	46	10	11	11
9	2	<2	.29	1.5	62	51	11	14	14
10	1	<2	.35	4.4	61	65	11	14	15
11	2	<2	.21	1.3	92	99	13	12	13
11	1	<2	.27	1.2	88	89	15	14	15
11	2	<2	.22	1.3	90	93	13	11	13
13	1	<2	.17	4.3	61	54	11	11	12
14	1	<2	.37	1.6	77	75	16	28	30
14	3	<2	--	1.6	75	70	13	23	--
15	3	<2	--	1.8	64	130	18	33	--
16	1	<2	.12	2.2	54	44	8	6	5.8
18	1	<2	.27	2.5	82	84	15	18	20
19	1	<2	.24	1.4	65	54	11	15	15
20	1	<2	.13	3.0	75	60	10	9	10
21	1	<2	.23	2.9	58	70	12	11	8.3
26	1	<2	.44	2.4	64	100	10	29	28
26	2	<2	.51	2.4	67	91	10	41	40
26	2	<2	.55	2.3	68	92	12	42	42
29	1	<2	.12	1.2	87	67	11	9	9.7
30	1	<2	.69	1.4	110	64	13	18	18
31	1	<2	.10	1.2	95	73	14	12	13
32	1	<2	.08	2.1	71	62	6	5	4.0
32	2	<2	--	2.3	79	59	7	6	--
32	2	<2	--	2.2	72	63	8	19	--
33	1	<2	.21	4.6	69	60	13	11	12
34	1	<2	.35	.81	83	190	22	17	20
36	1	<2	.12	1.9	58	45	6	5	4.7
37	1	<2	.14	1.2	100	73	13	10	12
39	1	<2	.17	1.1	96	75	15	13	14
41	1	<2	.11	1.1	90	67	12	11	12
42	1	<2	.15	.95	98	80	19	15	16
43	1	<2	.40	2.5	53	140	14	11	11
43	2	<2	--	2.9	62	250	17	16	--
43	2	<2	--	2.9	58	230	18	23	--

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Cadmium (micro-grams per gram)	Cadmium -partial (micro-grams per gram)	Calcium (weight percent)	Cerium (micro-grams per gram)	Chromium (micro-grams per gram)	Cobalt (micro-grams per gram)	Copper (micro-grams per gram)	Copper - partial (micro-grams per gram)
44	1	<2	0.19	1.2	86	73	14	17	20
46	1	<2	.29	1.4	77	140	17	25	26
47	1	<2	.13	2.2	44	41	6	6	4.8
48	1	<2	.33	1.6	83	74	14	15	17
49	1	<2	.09	2.0	51	52	7	6	5.2
51	1	<2	.21	1.5	81	65	12	12	13
52	1	<2	.19	1.6	80	65	14	15	17
53	2	<2	.18	3.5	60	65	16	9	9.8
53	1	<2	.10	3.9	60	68	15	6	6.9
53	2	<2	.18	3.5	63	63	17	6	11
55	1	<2	.22	1.6	92	96	22	31	37
56	1	<2	.18	1.2	100	78	18	18	21
57	1	<2	.13	1.2	91	60	12	10	12
59	1	<2	.22	3.6	71	110	16	17	20
61	1	<2	.17	2.6	54	54	14	9	11
62	1	<2	.39	.96	80	59	14	16	19
63	1	<2	.18	2.5	62	67	19	14	14
64	3	<2	--	3.5	40	78	17	11	--
65	3	<2	--	2.7	53	53	17	13	--
66	1	<2	.30	3.0	60	84	18	16	17
66	3	<2	--	3.3	53	58	16	13	--
67	1	<2	.39	3.3	510	81	28	27	32
67	3	<2	--	3.3	400	50	24	44	--
68	3	<2	--	3.3	470	45	23	120	--
69	1	<2	.23	3.5	110	77	16	13	14
70	1	<2	.22	1.4	110	97	23	26	30
71	1	<2	.23	1.6	110	94	23	27	32
72	1	<2	.28	4.1	110	170	15	16	15
73	1	<2	.14	4.2	70	40	10	8	8.6
75	1	<2	.17	3.9	68	69	16	17	19
76	1	<2	.16	4.7	70	63	16	17	19
77	1	<2	.23	3.0	82	84	19	28	29
78	1	<2	.47	2.5	83	170	15	48	47
78	2	<2	.45	2.6	87	160	15	49	49
78	2	<2	.45	2.6	88	150	15	48	49
80	1	<2	.18	3.7	85	79	18	23	24
81	1	<2	.38	1.0	79	89	23	23	24
82	1	<2	.43	1.4	110	98	27	30	33
83	1	<2	.25	2.4	77	72	16	14	16
84	1	<2	.19	3.6	69	66	15	20	20
85	3	<2	--	6.3	52	51	12	18	--
85	1	<2	.18	7.9	51	52	8	13	13
86	1	<2	.32	1.6	92	91	21	25	27
87	1	<2	.39	4.6	67	74	10	16	16

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Cadmium (micro-grams per gram)	Cadmium -partial (micro-grams per gram)	Calcium (weight percent)	Cerium (micro-grams per gram)	Chromium (micro-grams per gram)	Cobalt (micro-grams per gram)	Copper (micro-grams per gram)	Copper - partial (micro-grams per gram)
88	1	<2	0.15	1.7	93	78	19	21	21
89	1	<2	.11	2.0	190	59	13	13	13
89	2	<2	.08	2.0	110	55	14	14	10
89	2	<2	.12	2.0	120	54	14	14	15
90	1	<2	.17	1.9	84	59	15	17	18
91	1	<2	1.3	2.3	76	81	17	18	19
92	1	<2	1.0	2.1	67	110	24	27	27
93	1	<2	.26	.84	100	81	22	25	26
94	1	<2	2.4	5.5	58	180	44	24	19
95	1	<2	.28	.60	74	63	15	25	26
96	1	<2	1.6	3.2	60	77	24	19	20
97	1	<2	.81	2.9	94	93	18	23	24

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Europium (micro-grams per gram)	Gallium (micro-grams per gram)	Gold (micro-grams per gram)	Gold -partial (micro-grams per gram)	Holmium (micro-grams per gram)	Iron (weight percent)	Lanthanum (micro-grams per gram)	Lead (micro-grams per gram)
1	1	<2	16	<8	<0.1	<4	3.6	35	19
1	2	<2	15	<8	<.1	<4	3.3	31	18
1	2	<2	15	<8	<.1	<4	3.3	32	20
4	1	<2	18	<8	<.1	<4	3.9	40	14
4	2	<2	17	<8	<.1	<4	3.6	41	15
4	2	<2	19	<8	<.1	<4	3.5	37	16
5	1	<2	13	<8	<.1	<4	3.9	43	11
6	1	<2	8	<8	<.1	<4	2.9	13	230
8	3	<2	19	<8	--	<4	5.5	49	320
8	1	<2	23	<8	<.1	<4	5.5	44	280
9	2	<2	13	<8	<.1	<4	2.5	28	22
9	1	<2	13	<8	<.1	<4	2.3	25	21
9	2	<2	14	<8	<.1	<4	2.5	29	23
10	1	<2	13	<8	<.1	<4	3.0	28	41
11	2	<2	16	<8	<.1	<4	4.1	45	16
11	1	<2	16	<8	<.1	<4	4.2	45	14
11	2	<2	15	<8	<.1	<4	4.1	44	12
13	1	<2	13	<8	<.1	<4	2.6	28	21
14	1	<2	17	<8	<.1	<4	3.7	36	46
14	3	<2	16	<8	--	<4	3.6	40	42
15	3	<2	19	<8	--	<4	4.2	35	53
16	1	<2	12	<8	<.1	<4	2.1	25	16
18	1	<2	18	<8	<.1	<4	3.7	38	13
19	1	<2	15	<8	<.1	<4	2.8	30	16
20	1	<2	13	<8	<.1	<4	2.9	34	16
21	1	<2	18	<8	<.1	<4	3.3	26	22
26	1	<2	12	<8	<.1	<4	3.8	29	100
26	2	<2	13	<8	<.1	<4	4.1	31	130
26	2	<2	13	<8	<.1	<4	4.1	31	100
29	1	<2	14	<8	<.1	<4	3.4	42	10
30	1	<2	16	<8	<.1	<4	4.7	41	36
31	1	<2	16	<8	<.1	<4	4.0	46	9
32	1	<2	11	<8	<.1	<4	3.1	31	12
32	2	<2	12	<8	--	<4	3.3	33	11
32	2	<2	11	<8	--	<4	3.3	31	11
33	1	<2	16	<8	<.1	<4	3.0	31	13
34	1	<2	22	<8	<.1	<4	4.6	42	25
36	1	<2	12	<8	<.1	<4	3.1	26	12
37	1	<2	16	<8	<.1	<4	4.0	49	11
39	1	<2	17	<8	<.1	<4	3.8	46	13
41	1	<2	15	<8	<.1	<4	3.7	43	14
42	1	<2	20	<8	<.1	<4	4.6	46	16
43	1	<2	15	<8	<.1	<4	4.5	23	19
43	2	<2	16	<8	--	<4	7.1	28	19
43	2	<2	15	<8	--	<4	7.7	27	18

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Europium (micro-grams per gram)	Gallium (micro-grams per gram)	Gold (micro-grams per gram)	Gold -partial (micro-grams per gram)	Holmium (micro-grams per gram)	Iron (weight percent)	Lanthanum (micro-grams per gram)	Lead (micro-grams per gram)
44	1	<2	16	<8	<0.1	<4	3.7	43	17
46	1	<2	17	<8	<.1	<4	4.4	40	23
47	1	<2	12	<8	<.1	<4	2.1	20	14
48	1	<2	16	<8	<.1	<4	3.7	38	21
49	1	<2	12	<8	<.1	<4	2.6	23	15
51	1	<2	15	<8	<.1	<4	3.4	36	17
52	1	<2	16	<8	<.1	<4	3.6	37	12
53	2	<2	17	<8	<.1	<4	5.4	29	11
53	1	<2	17	<8	<.1	<4	5.8	29	9
53	2	<2	17	<8	<.1	<4	5.4	31	11
55	1	<2	21	<8	<.1	<4	4.5	44	16
56	1	<2	19	<8	<.1	<4	3.8	45	14
57	1	<2	14	<8	<.1	<4	3.7	44	11
59	1	<2	17	<8	<.1	<4	3.6	34	12
61	1	<2	16	<8	<.1	<4	4.3	26	16
62	1	<2	17	<8	<.1	<4	3.6	41	17
63	1	<2	17	<8	<.1	<4	4.4	29	14
64	3	<2	16	<8	--	<4	4.3	25	13
65	3	<2	16	<8	--	<4	4.2	34	14
66	1	<2	16	<8	<.1	<4	4.3	32	11
66	3	<2	15	<8	--	<4	4.5	32	12
67	1	3	19	<8	<.1	5	9.4	290	19
67	3	3	17	<8	--	<4	8.2	250	25
68	3	3	18	<8	--	5	8.5	300	13
69	1	<2	15	<8	<.1	<4	4.8	52	21
70	1	<2	21	<8	<.1	<4	4.2	50	15
71	1	<2	20	<8	<.1	<4	4.4	46	18
72	1	<2	15	<8	<.1	<4	4.3	55	15
73	1	<2	14	<8	<.1	<4	4.5	34	10
75	1	<2	16	<8	<.1	<4	3.6	31	15
76	1	<2	15	<8	<.1	<4	3.5	33	14
77	1	<2	18	<8	<.1	<4	3.8	37	15
78	1	<2	14	<8	<.1	<4	4.0	43	77
78	2	<2	14	<8	<.1	<4	4.1	44	79
78	2	<2	15	<8	<.1	<4	4.2	44	79
80	1	<2	16	<8	<.1	<4	3.6	37	15
81	1	<2	29	<8	<.1	<4	4.6	39	17
82	1	<2	22	<8	<.1	<4	4.7	49	18
83	1	<2	16	<8	<.1	<4	3.3	35	14
84	1	<2	17	<8	<.1	<4	3.4	32	16
85	3	<2	14	<8	--	<4	4.4	31	14
85	1	<2	12	<8	<.1	<4	2.4	26	10
86	1	<2	20	<8	<.1	<4	4.6	41	21
87	1	<2	14	<8	<.1	<4	3.1	37	25

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Europium (micro-grams per gram)	Gallium (micro-grams per gram)	Gold (micro-grams per gram)	Gold -partial (micro-grams per gram)	Holmium (micro-grams per gram)	Iron (weight percent)	Lanthanum (micro-grams per gram)	Lead (micro-grams per gram)
88	1	<2	17	<8	<0.1	<4	3.8	41	18
89	1	<2	15	<8	<.1	<4	3.7	86	12
89	2	<2	15	<8	<.1	<4	3.5	52	13
89	2	<2	15	<8	<.1	<4	3.5	55	12
90	1	<2	17	<8	<.1	<4	4.0	39	15
91	1	<2	15	<8	<.1	<4	3.7	41	32
92	1	<2	16	<8	<.1	<4	4.3	32	37
93	1	<2	19	<8	<.1	<4	4.4	42	24
94	1	<2	16	<8	<.1	<4	3.6	26	33
95	1	<2	16	<8	<.1	<4	3.7	38	21
96	1	<2	13	<8	<.1	<4	2.9	29	25
97	1	<2	15	<8	<.1	<4	3.6	47	28

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Lead - partial (micrograms per gram)	Lithium (micrograms per gram)	Magnesium (weight percent)	Manganese (micrograms per gram)	Mercury (micrograms per gram)	Molybdenum (micrograms per gram)	Molybdenum -partial (micrograms per gram)	Neodymium (micrograms per gram)
1	1	17	34	1.1	610	0.16	<2	0.75	34
1	2	16	30	.96	560	.09	<2	.68	31
1	2	15	30	.98	570	.10	<2	.66	32
4	1	14	39	1.2	680	.08	<2	.47	36
4	2	13	36	1.1	560	.18	<2	.49	37
4	2	13	36	1.1	560	.19	<2	.49	35
5	1	8.9	21	.81	870	.32	<2	.59	41
6	1	210	20	.53	340	.48	4	2.0	12
8	3	--	25	.93	4,200	.30	<2	--	47
8	1	340	26	.95	6,800	.72	<2	2.4	43
9	2	18	18	.83	510	.19	<2	.59	29
9	1	15	15	.77	460	.17	<2	.61	26
9	2	18	18	.83	510	.16	<2	.59	30
10	1	43	19	1.9	1,200	.13	<2	1.3	31
11	2	12	28	.95	1,100	.45	<2	.44	43
11	1	13	29	.98	930	.22	<2	1.0	42
11	2	12	27	.93	1,100	.37	<2	1.6	43
13	1	18	15	1.2	1,600	.16	<2	.91	30
14	1	53	29	.93	1,200	.76	<2	1.1	37
14	3	--	27	.91	860	.79	<2	--	41
15	3	--	35	1.2	2,200	.53	<2	--	33
16	1	8.6	14	.64	520	.06	<2	.92	26
18	1	13	27	1.1	2,400	.28	<2	1.7	38
19	1	10	21	.81	310	.06	<2	1.2	30
20	1	9.6	14	1.0	800	.20	<2	1.3	35
21	1	13	15	1.2	4,900	.14	<2	1.6	27
25	1	98	15	1.2	1,500	.43	<2	2.3	28
25	2	110	17	1.2	1,800	.33	<2	2.1	32
25	2	120	16	1.2	1,800	.25	<2	2.2	31
29	1	7.9	23	.74	1,700	.17	<2	.50	40
30	1	32	18	.65	3,300	.06	<2	1.6	43
31	1	7.2	31	1.0	1,200	.38	<2	.25	42
32	1	4.9	9	.93	1,000	.07	<2	1.5	33
32	2	--	8	1.0	1,100	.19	<2	--	37
32	2	--	8	.97	1,100	.20	<2	--	35
33	1	11	20	1.4	2,200	.07	<2	1.1	32
34	1	28	42	1.2	3,000	.54	3	6.9	38
36	1	8.3	9	.83	990	.10	<2	.85	29
37	1	8.4	29	.89	950	.21	<2	.52	46
39	1	11	31	.99	1,400	.16	<2	.85	43
41	1	10	27	.78	1,400	.08	<2	.50	41
42	1	15	39	1.1	2,200	.36	<2	.60	42
43	1	18	11	.95	1,500	.29	<2	5.0	28
43	2	--	12	1.2	1,400	.33	8	--	34

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Lead - partial (micro-grams per gram)	Lithium (micro-grams per gram)	Magnesium (weight percent)	Manganese (micro-grams per gram)	Mercury (micro-grams per gram)	Molybdenum (micro-grams per gram)	Molybdenum -partial (micro-grams per gram)	Neodymium (micro-grams per gram)
43	2	--	12	1.2	1,400	0.28	7	--	34
44	1	14	32	.83	940	.17	<2	.60	40
46	1	23	39	1.1	1,300	.43	<2	5.1	37
47	1	8.1	10	.97	710	.08	<2	.06	21
48	1	22	26	.84	1,900	.16	<2	.96	35
49	1	8.5	10	.76	700	.03	<2	.13	25
51	1	15	23	.82	1,200	.20	<2	1.2	35
52	1	13	27	1.0	840	.25	<2	.81	36
53	2	13	15	1.4	1,200	.65	<2	.15	35
53	1	8.5	11	1.5	1,200	.05	<2	.59	37
53	2	14	14	1.4	1,200	.57	<2	1.4	37
55	1	18	45	1.5	1,000	.20	<2	.69	39
56	1	15	37	1.1	1,000	.12	<2	.95	43
57	1	11	31	.89	750	.21	<2	.97	43
59	1	14	32	1.4	1,400	.43	<2	2.6	33
61	1	17	18	1.0	1,400	.20	<2	.72	29
62	1	19	33	.97	1,100	.27	<2	.71	40
63	1	13	23	1.2	1,000	.26	<2	1.0	32
64	3	--	12	1.1	1,200	.35	<2	--	30
65	3	--	17	.98	1,000	.23	<2	--	38
66	1	16	22	1.3	1,000	3.7	<2	1.6	35
66	3	--	17	1.3	1,200	.27	<2	--	34
67	1	27	19	1.3	2,400	.76	<2	2.9	190
67	3	--	17	1.2	1,900	.34	<2	--	170
68	3	--	17	1.2	1,700	.37	<2	--	200
69	1	23	15	1.1	1,200	.32	<2	1.7	49
70	1	18	49	1.5	660	.08	<2	.63	46
71	1	20	45	1.5	760	.09	<2	.77	40
72	1	17	18	1.8	1,600	.36	3	5.6	51
73	1	9.2	14	1.3	1,200	.35	<2	.60	37
75	1	15	30	1.4	1,300	.13	<2	1.0	32
76	1	13	30	1.4	720	.09	<2	.64	33
77	1	17	46	1.4	730	.10	<2	.67	34
78	1	84	29	1.3	540	.38	<2	1.4	39
78	2	86	29	1.4	570	.43	<2	1.5	40
78	2	85	28	1.4	560	.45	<2	1.5	41
80	1	16	38	1.4	590	.12	<2	.82	37
81	1	21	50	1.2	7,000	.10	<2	.74	37
82	1	22	46	1.5	1,500	.14	<2	1.9	45
83	1	16	27	1.3	1,600	.36	<2	1.7	35
84	1	17	34	1.4	1,500	.11	<2	.82	31
85	3	--	23	1.5	2,000	.19	<2	--	31
85	1	11	21	1.5	720	.75	<2	.06	25
86	1	22	45	1.3	1,500	.25	<2	1.2	36

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Lead - partial (micrograms per gram)	Lithium (micrograms per gram)	Magnesium (weight percent)	Manganese (micrograms per gram)	Mercury (micrograms per gram)	Molybdenum (micrograms per gram)	Molybdenum -partial (micrograms per gram)	Neodymium (micrograms per gram)
87	1	23	25	2.1	990	0.21	<2	0.84	39
88	1	15	37	1.3	1,100	.17	<2	.87	40
89	1	9.0	31	1.3	1,800	.14	<2	.83	80
89	2	7.0	33	1.2	1,600	.18	<2	.58	50
89	2	9.9	32	1.2	1,600	.16	<2	.82	53
90	1	15	36	1.4	2,000	.17	<2	.71	38
91	1	33	28	.97	2,100	.31	<2	2.6	46
92	1	39	28	1.1	2,100	.41	<2	3.1	35
93	1	26	45	1.1	810	.09	<2	.69	39
94	1	31	22	3.0	3,000	.44	3	4.6	28
95	1	21	46	.97	730	.22	<2	.76	35
96	1	25	24	1.6	1,300	.15	<2	2.2	30
97	1	28	28	1.5	1,400	.30	<2	2.9	48

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Nickel (micro-grams per gram)	Niobium (micro-grams per gram)	Phosphorus (weight percent)	Potassium (weight percent)	Scandium (micro-grams per gram)	Silver (micro-grams per gram)	Silver -partial (micro-grams per gram)	Sodium (weight percent)
1	1	31	9	0.14	1.9	11	<2	0.07	1.7
1	2	28	10	.13	1.8	11	<2	.08	1.7
1	2	28	9	.13	1.8	11	<2	.10	1.8
4	1	40	10	.12	2.2	13	<2	<.06	1.5
4	2	37	11	.11	2.1	13	<2	<.06	1.7
4	2	36	11	.11	2.1	13	<2	.07	1.6
5	1	28	13	.16	1.4	11	<2	<.06	1.7
6	1	33	4	.15	.87	5	12	17	.60
8	3	73	12	.15	1.4	12	<2	--	1.6
8	1	56	16	.16	1.4	12	<2	<.06	1.5
9	2	19	8	.13	2.1	8	<2	<.06	1.6
9	1	17	8	.12	2.0	8	<2	<.06	1.6
9	2	19	8	.13	2.1	8	<2	.08	1.6
10	1	27	9	.18	2.3	8	<2	<.06	1.3
11	2	42	14	.13	1.6	13	<2	<.06	1.7
11	1	41	12	.13	1.6	13	<2	<.06	1.6
11	2	43	13	.13	1.5	13	<2	<.06	1.6
13	1	20	10	.15	2.0	8	<2	<.06	1.5
14	1	33	10	.15	2.1	11	<2	.55	1.5
14	3	29	12	.15	2.2	11	<2	--	1.6
15	3	60	9	.15	2.5	11	<2	--	1.3
16	1	18	9	.11	2.0	7	<2	<.06	1.8
18	1	40	11	.13	1.9	11	<2	<.06	1.5
19	1	23	7	.12	2.0	9	<2	<.06	1.5
20	1	24	12	.12	2.2	9	<2	<.06	1.5
21	1	32	7	.16	3.0	7	<2	<.06	.86
26	1	39	9	.13	2.3	7	<2	.21	1.1
26	2	34	10	.14	2.4	7	<2	.17	1.0
26	2	34	7	.14	2.3	7	<2	.25	1.0
29	1	27	12	.12	1.3	10	<2	<.06	1.6
30	1	26	11	.13	2.2	9	<2	<.06	1.4
31	1	35	11	.12	1.6	12	<2	<.06	1.6
32	1	23	11	.09	2.3	7	<2	<.06	1.3
32	2	22	13	.10	2.3	7	<2	--	1.2
32	2	24	4	.06	2.3	7	<2	--	1.2
33	1	26	9	.11	2.1	8	<2	<.06	1.3
34	1	110	9	.11	2.3	13	<2	<.06	1.3
36	1	16	10	.13	2.2	7	<2	<.06	1.3
37	1	32	12	.12	1.6	12	<2	<.06	1.6
39	1	32	12	.11	2.0	12	<2	<.06	1.5
41	1	28	12	.11	1.4	12	<2	<.06	1.6
42	1	35	12	.14	2.1	14	<2	<.06	1.4
43	1	63	9	.13	1.9	8	<2	.08	1.5
43	2	130	14	.13	1.8	9	<2	--	1.5

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Nickel (micro-grams per gram)	Niobium (micro-grams per gram)	Phosphorus (weight percent)	Potassium (weight percent)	Scandium (micro-grams per gram)	Silver (micro-grams per gram)	Silver -partial (micro-grams per gram)	Sodium (weight percent)
43	2	110	15	0.13	1.7	10	<2	--	1.4
44	1	32	8	.12	1.5	12	<2	.10	1.5
46	1	65	12	.11	1.7	13	<2	.11	1.4
47	1	15	9	.08	2.5	6	<2	<.06	1.2
48	1	33	13	.12	1.7	11	<2	<.06	1.5
49	1	20	11	.09	2.3	7	<2	<.06	1.4
51	1	29	12	.12	2.1	10	<2	<.06	1.5
52	1	32	10	.14	2.2	11	<2	<.06	1.4
53	2	28	15	.13	1.6	12	<2	<.06	1.6
53	1	26	17	.14	1.6	13	<2	<.06	1.7
53	2	28	13	.14	1.5	12	<2	<.06	1.6
55	1	50	10	.11	2.8	15	<2	<.06	1.1
56	1	40	10	.10	2.4	13	<2	<.06	1.3
57	1	29	11	.13	1.7	10	<2	<.06	1.6
59	1	57	11	.12	2.3	11	<2	<.06	1.1
61	1	22	13	.09	1.9	11	<2	<.06	1.6
62	1	27	10	.13	2.2	12	<2	.37	1.2
63	1	32	11	.11	1.9	12	<2	<.06	1.5
64	3	35	8	.14	1.2	10	<2	--	1.5
65	3	23	11	.12	1.5	11	<2	--	1.5
66	1	38	10	.13	1.6	11	<2	<.06	1.3
66	3	24	10	.13	1.5	11	<2	--	1.4
67	1	39	19	.34	1.2	15	<2	<.06	1.5
67	3	23	17	.31	1.3	13	<2	--	1.5
68	3	20	18	.35	1.3	14	<2	--	1.7
69	1	34	10	.15	1.6	11	<2	<.06	1.5
70	1	54	10	.12	2.5	15	<2	<.06	1.0
71	1	50	12	.12	2.6	14	<2	<.06	1.1
72	1	83	12	.17	1.7	9	<2	<.06	1.2
73	1	13	12	.13	1.7	9	<2	<.06	1.4
75	1	33	9	.11	2.1	11	<2	<.06	1.2
76	1	30	9	.11	2.1	11	<2	<.06	1.3
77	1	45	9	.11	2.4	13	<2	.09	.91
78	1	32	10	.13	1.9	10	<2	.40	1.2
78	2	34	10	.13	2.0	10	<2	.44	1.2
78	2	33	9	.13	1.9	10	<2	.45	1.2
80	1	40	9	.11	2.2	12	<2	<.06	1.1
81	1	45	9	.13	2.3	14	<2	<.06	.75
82	1	55	10	.10	2.5	15	<2	<.06	.88
83	1	35	9	.11	2.3	10	<2	<.06	1.0
84	1	33	7	.11	2.2	11	<2	<.06	1.2
85	3	24	6	.13	1.9	8	<2	--	1.1
85	1	22	8	.11	1.9	7	<2	<.06	1.1
86	1	42	11	.13	2.5	14	<2	<.06	.87

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Nickel (micrograms per gram)	Niobium (micrograms per gram)	Phosphorus (weight percent)	Potassium (weight percent)	Scandium (micrograms per gram)	Silver (micrograms per gram)	Silver -partial (micrograms per gram)	Sodium (weight percent)
87	1	33	8	0.14	2.1	10	<2	0.08	1.0
88	1	38	9	.09	2.3	11	<2	<.06	1.1
89	1	27	8	.12	1.7	10	<2	<.06	1.0
89	2	26	7	.11	1.7	10	<2	<.06	1.0
89	2	26	8	.11	1.7	10	<2	<.06	1.0
90	1	28	7	.12	2.0	11	<2	.07	.99
91	1	38	8	.18	2.0	14	<2	.07	.74
92	1	62	7	.16	2.1	12	<2	.10	1.0
93	1	40	9	.11	2.5	14	<2	<.06	.97
94	1	98	6	.14	1.6	9	<2	<.06	.94
95	1	32	5	.11	2.1	11	<2	.13	1.2
96	1	46	7	.12	2.0	9	<2	<.06	1.1
97	1	47	7	.15	1.9	11	<2	.07	1.2

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Strontium (micro-grams per gram)	Tantalum (micro-grams per gram)	Thorium (micro-grams per gram)	Tin (micro-grams per gram)	Titanium (weight percent)	Uranium (micro-grams per gram)	Vanadium (micro-grams per gram)	Ytterbium (micro-grams per gram)
1	1	240	<40	7	<5	0.50	<100	75	3
1	2	250	<40	6	<5	.48	<100	69	2
1	2	250	<40	5	<5	.48	<100	70	3
4	1	180	<40	7	<5	.46	<100	87	2
4	2	190	<40	7	<5	.51	<100	83	2
4	2	190	<40	8	<5	.49	<100	82	2
5	1	200	<40	6	<5	.75	<100	71	2
6	1	270	<40	<4	20	.15	<100	55	1
8	3	190	<40	9	8	.79	<100	90	3
8	1	190	<40	9	220	.94	<100	87	3
9	2	240	<40	6	<5	.42	<100	50	2
9	1	240	<40	<4	<5	.46	<100	47	2
9	2	240	<40	6	<5	.42	<100	50	3
10	1	260	<40	6	12	.47	<100	53	2
11	2	200	<40	8	<5	.77	<100	81	3
11	1	190	<40	8	<5	.75	<100	82	2
11	2	200	<40	7	<5	.76	<100	79	3
13	1	340	<40	5	<5	.53	<100	49	3
14	1	200	<40	7	<5	.53	<100	77	3
14	3	210	<40	10	<5	.49	<100	76	3
15	3	170	<40	8	<5	.38	<100	87	2
16	1	300	<40	<4	<5	.48	<100	41	3
18	1	240	<40	6	<5	.60	<100	80	2
19	1	240	<40	6	<5	.41	<100	55	3
20	1	280	<40	7	<5	.64	<100	57	3
21	1	210	<40	5	<5	.34	<100	51	3
26	1	190	<40	7	27	.49	<100	56	3
26	2	190	<40	7	31	.56	<100	60	3
26	2	190	<40	7	30	.54	<100	60	3
29	1	170	<40	8	<5	.67	<100	67	2
30	1	210	<40	8	<5	.58	<100	70	4
31	1	170	<40	8	<5	.62	<100	78	2
32	1	210	<40	9	<5	.67	<100	51	4
32	2	210	<40	10	<5	.80	<100	55	4
32	2	210	<40	8	<5	.66	<100	56	4
33	1	370	<40	6	<5	.47	<100	59	3
34	1	140	<40	7	6	.45	<100	89	2
36	1	200	<40	7	<5	.60	<100	47	3
37	1	170	<40	8	<5	.74	<100	78	3
39	1	170	<40	9	<5	.66	<100	79	2
41	1	160	<40	8	<5	.75	<100	73	3
42	1	150	<40	8	<5	.65	<100	90	2
43	1	220	<40	6	<5	.65	<100	53	3
43	2	220	<40	6	6	1.1	<100	73	4
43	2	210	<40	5	<5	1.2	<100	78	4

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Strontium (micro-grams per gram)	Tantalum (micro-grams per gram)	Thorium (micro-grams per gram)	Tin (micro-grams per gram)	Titanium (weight percent)	Uranium (micro-grams per gram)	Vanadium (micro-grams per gram)	Ytterbium (micro-grams per gram)
44	1	170	<40	8	<5	0.67	<100	77	3
46	1	170	<40	8	7	.74	<100	87	2
47	1	200	<40	<4	<5	.48	<100	42	2
48	1	170	<40	5	<5	.73	<100	73	3
49	1	230	<40	6	<5	.60	<100	51	3
51	1	200	<40	6	<5	.66	<100	69	3
52	1	200	<40	6	<5	.59	<100	73	3
53	2	260	<40	5	<5	1.3	<100	95	5
53	1	280	<40	5	<5	1.6	<100	100	5
53	2	260	<40	<4	<5	1.4	<100	94	4
55	1	220	<40	11	<5	.51	<100	110	3
56	1	210	<40	10	<5	.53	<100	87	3
57	1	150	<40	7	<5	.63	<100	64	3
59	1	290	<40	7	<5	.51	<100	83	3
61	1	250	<40	<4	<5	1.1	<100	80	4
62	1	120	<40	8	<5	.51	<100	72	2
63	1	240	<40	5	<5	.90	<100	83	3
64	3	280	<40	5	<5	.70	<100	77	3
65	3	260	<40	7	<5	.66	<100	77	3
66	1	240	<40	5	<5	.75	<100	82	3
66	3	270	<40	5	<5	.78	<100	85	3
67	1	200	<40	30	<5	1.2	<100	110	16
67	3	220	<40	25	<5	.84	<100	94	14
68	3	210	<40	29	<5	.88	<100	98	17
69	1	260	<40	8	<5	.87	<100	76	5
70	1	220	<40	11	<5	.48	<100	110	3
71	1	240	<40	10	<5	.59	<100	100	2
72	1	210	<40	7	<5	.65	<100	67	5
73	1	320	<40	7	<5	.74	<100	64	3
75	1	300	<40	7	<5	.51	<100	74	2
76	1	360	<40	6	<5	.50	<100	73	3
77	1	320	<40	8	<5	.43	<100	90	3
78	1	210	<40	6	7	.55	<100	72	4
78	2	200	<40	7	8	.59	<100	73	4
78	2	200	<40	8	12	.60	<100	73	4
80	1	330	<40	9	<5	.42	<100	84	2
81	1	150	<40	10	<5	.42	<100	99	2
82	1	170	<40	12	<5	.48	<100	110	3
83	1	190	<40	8	<5	.44	<100	67	3
84	1	300	<40	7	<5	.38	<100	72	2
85	3	440	<40	7	<5	.28	<100	54	2
85	1	550	<40	6	<5	.37	<100	51	2
86	1	170	<40	9	<5	.57	<100	100	3
87	1	220	<40	7	<5	.47	<100	65	3

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Strontium (micro-grams per gram)	Tantalum (micro-grams per gram)	Thorium (micro-grams per gram)	Tin (micro-grams per gram)	Titanium (weight percent)	Uranium (micro-grams per gram)	Vanadium (micro-grams per gram)	Ytterbium (micro-grams per gram)
88	1	150	<40	9	<5	0.49	<100	79	2
89	1	120	<40	16	<5	.59	<100	57	2
89	2	120	<40	10	<5	.47	<100	56	2
89	2	120	<40	10	<5	.49	<100	56	2
90	1	120	<40	8	<5	.46	<100	65	2
91	1	150	<40	7	<5	.59	<100	79	5
92	1	170	<40	6	<5	.65	<100	97	3
93	1	130	<40	10	<5	.45	<100	91	2
94	1	190	<40	<4	<5	.44	<100	73	2
95	1	83	<40	8	<5	.29	<100	70	2
96	1	200	<40	5	<5	.41	<100	60	2
97	1	190	<40	8	<5	.51	<100	69	4

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Yttrium (micro-grams per gram)	Zinc (micro-grams per gram)	Zinc -partial (micro-grams per gram)
1	1	29	110	120
1	2	29	110	110
1	2	29	110	100
4	1	25	100	100
4	2	26	92	90
4	2	26	92	74
5	1	29	89	82
6	1	12	400	320
8	3	28	120	--
8	1	32	130	120
9	2	29	89	87
9	1	28	76	74
9	2	29	90	90
10	1	28	110	110
11	2	33	87	61
11	1	30	91	84
11	2	30	83	77
13	1	29	79	77
14	1	30	140	140
14	3	27	130	--
15	3	23	180	--
16	1	27	53	48
18	1	29	88	86
19	1	29	120	130
20	1	32	71	66
21	1	27	99	77
26	1	31	160	140
26	2	33	190	160
26	2	32	180	190
29	1	27	59	53
30	1	47	160	140
31	1	29	67	57
32	1	36	43	25
32	2	39	40	--
32	2	35	44	--
33	1	28	79	80
34	1	28	110	110
36	1	33	47	29
37	1	31	75	67
39	1	30	77	74
41	1	31	66	61
42	1	30	110	100
43	1	39	100	80
43	2	46	110	--

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Yttrium (micro-grams per gram)	Zinc (micro-grams per gram)	Zinc -partial (micro-grams per gram)
43	2	47	110	--
44	1	31	79	77
46	1	29	100	98
47	1	23	43	29
48	1	30	140	140
49	1	27	45	29
51	1	30	82	77
52	1	30	77	78
53	2	50	89	53
53	1	55	75	35
53	2	49	86	61
55	1	29	110	120
56	1	31	84	91
57	1	31	68	67
59	1	27	76	81
61	1	41	76	61
62	1	27	100	110
63	1	39	85	72
64	3	32	92	--
65	3	34	80	--
66	1	37	87	77
66	3	34	81	--
67	1	200	140	120
67	3	150	130	--
68	3	180	110	--
69	1	60	100	87
70	1	32	100	110
71	1	29	100	110
72	1	60	94	87
73	1	37	56	48
75	1	28	81	83
76	1	30	75	72
77	1	28	92	95
78	1	42	170	180
78	2	44	170	170
78	2	45	160	170
80	1	29	81	86
81	1	30	140	140
82	1	35	110	120
83	1	29	74	76
84	1	27	81	82
85	3	23	69	--
85	1	24	65	54
86	1	29	110	110

Table 6. Inorganic-constituent concentrations in fine-fraction streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Design remarks[2]	Yttrium (micro-grams per gram)	Zinc (micro-grams per gram)	Zinc -partial (micro-grams per gram)
87	1	41	110	84
88	1	27	73	77
89	1	25	67	57
89	2	22	68	45
89	2	22	68	60
90	1	22	79	76
91	1	57	200	190
92	1	42	220	210
93	1	28	110	110
94	1	30	420	360
95	1	18	110	100
96	1	29	290	300
97	1	50	160	170

[1]Location of site number shown in figure 1.

[2] Remark code 1 means a normal sample used in calculation of summary statistics; 2 means same-day resampling of site used for nested ANOVA, resampled material was split at the laboratory so that two samples were analyzed; 3 means site was sampled during follow-up investigation in October 1992.

Table 7. Domain, International Union of Practical and Applied Chemistry (IUPAC) structure number, and name of polychlorinated biphenyl congeners in order of elution from the gas chromatograph

[IUPAC, International Union of Practical and Applied Chemistry]

Domain	IUPAC number	Congener name
1	10	2,6-Dichlorobiphenyl
1	4	2,2'-Dichlorobiphenyl
2	7	2,4-Dichlorobiphenyl
2	9	2,5-Dichlorobiphenyl
3	6	2,3'-Dichlorobiphenyl
4	8	2,4'-Dichlorobiphenyl
4	5	2,3-Dichlorobiphenyl
5	19	2,2',6-Trichlorobiphenyl
6	18	2,2',5-Trichlorobiphenyl
7	15	4,4'-Dichlorobiphenyl
7	17	2,2',4-Trichlorobiphenyl
8	24	2,3,6-Trichlorobiphenyl
8	27	2,3',6-Trichlorobiphenyl
9	16	2,2',3-Trichlorobiphenyl
9	32	2,4',6-Trichlorobiphenyl
10	26	2,3',5-Trichlorobiphenyl
11	25	2,3',4-Trichlorobiphenyl
12	31	2,4',5-Trichlorobiphenyl
12	28	2,4,4'-Trichlorobiphenyl
13	33	2',3,4-Trichlorobiphenyl
13	20	2,3,3'-Trichlorobiphenyl
13	53	2,2',5,6'-Tetrachlorobiphenyl
14	51	2,2',4,6'-Tetrachlorobiphenyl
14	22	2,3,4'-Trichlorobiphenyl
15	45	2,2',3,6-Tetrachlorobiphenyl
16	46	2,2',3,6'-Tetrachlorobiphenyl
17	52	2,2',5,5'-Tetrachlorobiphenyl
18	49	2,2',4,5'-Tetrachlorobiphenyl
19	47	2,2'4,4'-Tetrachlorobiphenyl
19	48	2,2',4,5-Tetrachlorobiphenyl
19	75	2,4,4',6-Tetrachlorobiphenyl
20	44	2,2',3,5'-Tetrachlorobiphenyl
21	59	2,3,3',6-Tetrachlorobiphenyl
21	42	2,2',3,4'-Tetrachlorobiphenyl
21	37	3,4,4'-Trichlorobiphenyl
22	41	2,2',3,4-Tetrachlorobiphenyl
22	64	2,3,4',6-Tetrachlorobiphenyl
23	40	2,2',3,3'-Tetrachlorobiphenyl
24	74	2,4,4',5-Tetrachlorobiphenyl
25	91	2,2',3,4',6-Pentachlorobiphenyl

Table 7. Domain, International Union of Practical and Applied Chemistry (IUPAC) structure number, and name of polychlorinated biphenyl congeners in order of elution from the gas chromatograph--Continued

Domain	IUPAC number	Congener name
26	60	2,3,4,4'-Tetrachlorobiphenyl
26	56	2,3,3',4'-Tetrachlorobiphenyl
26	92	2,2',3,5,5'-Pentachlorobiphenyl
27	84	2,2',3,3',6-Pentachlorobiphenyl
28	90	2,2',3,4',5-Pentachlorobiphenyl
28	101	2,2',4,5,5'-Pentachlorobiphenyl
29	99	2,2',4,4',5-Pentachlorobiphenyl
30	83	2,2',3,3',5-Pentachlorobiphenyl
31	97	2,2',3',4,5-Pentachlorobiphenyl
32	87	2,2',3,4,5'-Pentachlorobiphenyl
32	115	2,3,4,4',6-Pentachlorobiphenyl
33	85	2,2',3,4,4'-Pentachlorobiphenyl
34	136	2,2',3,3',6,6'-Hexachlorobiphenyl
35	77	3,3',4,4'-Tetrachlorobiphenyl
35	110	2,3,3',4',6-Pentachlorobiphenyl
36	82	2,2',3,3',4-Pentachlorobiphenyl
36	151	2,2',3,5,5',6-Hexachlorobiphenyl
37	135	2,2',3,3',5,6'-Hexachlorobiphenyl
38	123	2',3,4,4',5-Pentachlorobiphenyl
38	149	2,2',3,4',5',6-Hexachlorobiphenyl
38	118	2,3',4,4',5-Pentachlorobiphenyl
39	134	2,2',3,3',5,6-Hexachlorobiphenyl
40	114	2,3,4,4',5-Pentachlorobiphenyl
40	131	2,2',3,3',4,6-Hexachlorobiphenyl
40	122	2',3,3'4,5-Pentachlorobiphenyl
41	146	2,2',3,4',5,5'-Hexachlorobiphenyl
42	132	2,2',3,3',4,6'-Hexachlorobiphenyl
42	153	2,2',4,4',5,5'-Hexachlorobiphenyl
42	105	2,3,3',4,4'-Pentachlorobiphenyl
43	141	2,2',3,4,5,5'-Hexachlorobiphenyl
43	179	2,2',3,3',5,6,6'-Heptachlorobiphenyl
44	176	2,2',3,3',4,6,6'-Heptachlorobiphenyl
44	137	2,2',3,4,4',5-Hexachlorobiphenyl
45	138	2,2',3,4,4',5'-Hexachlorobiphenyl
45	160	2,3,3',4,5,6-Hexachlorobiphenyl
46	158	2,3,3',4,4',6-Hexachlorobiphenyl
47	129	2,2',3,3',4,5-Hexachlorobiphenyl
47	126	3,3',4,4',5-Pentachlorobiphenyl
47	178	2,2',3,3',5,5',6-Heptachlorobiphenyl
48	175	2,2',3,3',4,5',6-Heptachlorobiphenyl

Table 7. Domain, International Union of Practical and Applied Chemistry (IUPAC) structure number, and name of polychlorinated biphenyl congeners in order of elution from the gas chromatograph --Continued

Domain	IUPAC number	Congener name
49	187	2,2',3,4',5,5',6-Heptachlorobiphenyl
50	183	2,2',3,4,4',5',6-Heptachlorobiphenyl
51	128	2,2',3,3',4,4'-Hexachlorobiphenyl
52	185	2,2',3,4,5,5',6-Heptachlorobiphenyl
53	174	2,2',3,3',4,5,6'-Heptachlorobiphenyl
54	177	2,2',3,3',4',5,6-Heptachlorobiphenyl
55	202	2,2',3,3',5,5',6,6'-Octachlorobiphenyl
55	171	2,2',3,3',4,4',6-Heptachlorobiphenyl
55	156	2,3,3',4,4',5-Hexachlorobiphenyl
56	173	2,2',3,3',4,5,6-Heptachlorobiphenyl
56	157	2,3,3',4,4',5'-Hexachlorobiphenyl
56	201	2,2',3,3',4,5',6,6'-Octachlorobiphenyl
57	172	2,2',3,3',4,5,5'-Heptachlorobiphenyl
58	180	2,2',3,4,4',5,5'-Heptachlorobiphenyl
59	193	2,3,3',4',5,5',6-Heptachlorobiphenyl
60	200	2,2',3,3',4,5,6,6'-Octachlorobiphenyl
61	170	2,2',3,3',4,4',5-Heptachlorobiphenyl
61	190	2,3,3',4,4',5,6-Heptachlorobiphenyl
62	198	2,2',3,3',4,5,5',6-Octachlorobiphenyl
63	203	2,2',3,4,4',5,5',6-Octachlorobiphenyl
63	196	2,2',3,3',4,4',5',6-Octachlorobiphenyl
64	208	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl
64	195	2,2',3,3',4,4',5,6-Octachlorobiphenyl
65	194	2,2',3,3',4,4',5,5'-Octachlorobiphenyl
66	205	2,3,3',4,4',5,5',6-Octachlorobiphenyl

Table 8. Comparison of polychlorinated biphenyl congener standard-reference material HS-2 to analytical results

[All concentrations are in nanograms per gram; IUPAC, International Union of Practical and Applied Chemistry; values in parenthesis are 2 standard deviations]

IUPAC Structure number	Congener name	Standard concentration of reference material HS-2		Laboratory concentration	
				Sample1	Sample2
180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	3.70	(0.33)	5.5	5.5
194	2,2',3,3',4,4',5'5'-Octachlorobiphenyl	.61	(.07)	2.0	.8

Table 9. Carbonate, organic, and total carbon concentrations, and polychlorinated biphenyl compound detections in streambed sediment for tributaries to Lake Champlain

[--, data not available; <, less than reporting level given; PCB's, polychlorinated biphenyl congeners]

Site number[1]	Stream name	Design remarks[2]	Date	Specific conductance (microsiemens per centimeter)	pH (standard units	Carbonate carbon (percent)	Organic carbon (per cent)	Total carbon (percent)	PCB's detected[3]
1	Pike River	1	7-21-92	389	8.7	0.02	0.94	0.96	no
1	Pike River	2	7-21-92	389	8.7	.01	.89	.90	no
2	Lake Bed near Pike River	1	6-29-92	--	--	.02	2.87	2.89	yes
2	Lake Bed near Pike River	2	6-29-92	--	--	.03	2.87	2.90	yes
3	Lake Bed near Missisquoi River	1	6-29-92	--	--	.02	3.26	3.28	yes
3	Lake Bed near Missisquoi River	1	6-29-92	--	--	.02	3.26	3.28	no
3	Lake Bed near Missisquoi River	2	6-29-92	--	--	.07	3.06	3.13	yes
4	Rock River	1	7-02-92	363	7.3	.02	1.99	2.01	no
7	Mud Creek	1	7-22-92	434	7.0	.05	8.21	8.26	yes
9	Great Chazy River	1	7-22-92	198	7.2	.02	.65	.67	no
9	Great Chazy River	2	7-22-92	198	7.2	.03	.71	.74	no
11	Missisquoi River	1	7-02-92	150	7.5	<.01	.85	.85	no
12	Lake Bed near Great Chazy River	1	6-29-92	--	--	.14	.77	.91	no
13	Little Chazy River	1	7-22-92	256	8.8	.78	.41	1.19	no
14	Stephens Brook	1	7-02-92	704	8.2	.05	.70	.75	yes
16	Riley Brook	1	7-23-92	649	7.2	.63	1.22	1.85	no
17	Lake Bed in St. Albans Bay	1	6-23-92	--	--	.01	5.69	5.70	yes
18	Mill River	1	6-04-92	479	8.5	--	--	--	no
18	Mill River	2	6-04-92	479	8.5	--	--	--	no
19	Dead Creek	1	7-23-92	417	7.3	.06	3.95	4.01	yes
22	Dead Creek Marsh	1	7-28-92	450	7.4	.09	28.70	28.80	yes
23	unnamed tributary	1	8-11-92	--	--	.75	.25	1.00	yes
24	Lake Bed in Cumberland Bay	1	7-28-92	--	--	.06	8.98	9.04	yes
24	Lake Bed in Cumberland Bay	1	7-28-92	--	--	.06	8.98	9.04	yes
24	Lake Bed in Cumberland Bay	2	7-28-92	--	--	<.01	9.64	9.64	yes
25	Lake Bed in Cumberland Bay	1	6-23-92	--	--	.01	3.68	3.69	yes
26	Saranac River	1	7-28-92	93	7.2	.11	.88	.99	yes
26	Saranac River	2	7-28-92	93	7.2	.10	.96	1.06	yes
27	Saranac River	1	7-28-92	85	7.2	.04	.18	.22	no
28	Saranac River	1	7-28-92	85	7.2	.03	.26	.29	no
29	Stone Bridge Brook	1	7-06-92	278	7.6	<.01	.14	.14	no
30	unnamed tributary	1	7-29-92	530	7.4	.03	.23	.26	yes
32	Salmon River	1	7-29-92	192	7.2	.18	.13	.31	yes
32	Salmon River	2	7-29-92	192	7.2	.12	.09	.21	yes
32	Salmon River	2	7-29-92	192	7.2	.12	.09	.21	yes
34	Lamoille River	1	7-02-92	--	6.7	<.01	.14	.14	no
35	Lake Bed in Malletts Bay	1	6-23-92	--	--	.03	2.74	2.77	no
36	Little Ausable River	1	7-29-92	251	7.4	.10	1.24	1.34	no
38	Lake Bed in Malletts Bay	1	6-23-92	--	--	.02	3.90	3.92	yes
38	Lake Bed in Malletts Bay	1	6-23-92	--	--	.02	3.90	3.92	yes

Table 9. Carbonate, organic and total carbon concentrations, and polychlorinated biphenyl compound detections in streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Stream name	Design remarks[2]	Date	Specific conductance (microsiemens per centimeter)	pH (standard units)	Carbonate carbon (percent)	Organic carbon (per cent)	Total carbon (percent)	PCB's detected[3]
39	Malletts Creek	1	7-06-92	313	8.0	0.04	0.43	0.47	yes
39	Malletts Creek	1	7-06-92	313	8.0	.04	.43	.47	yes
40	Lake bed near Ausable River	1	6-24-92	--	--	.03	5.62	5.65	yes
41	Indian Brook	1	7-06-92	493	7.6	<.01	.27	.27	yes
43	Ausable River	1	7-27-92	97	7.8	<.01	.09	.09	no
43	Ausable River	2	7-27-92	97	7.8	.02	.27	.29	no
44	Winooski River	1	7-01-92	246	8.0	.05	1.74	1.79	yes
44	Winooski River	2	7-01-92	246	8.0	.03	.68	.71	yes
45	Lake Bed near Winooski River	1	6-23-92	--	--	.03	3.45	3.48	yes
46	Winooski River	1	7-06-92	236	8.0	.04	.82	.86	yes
46	Winooski River	1	7-06-92	236	8.0	.04	.82	.86	no
49	Highland Forge Outlet	1	7-27-92	166	7.4	.07	.16	.23	no
50	Lake Bed in Shelburne Bay	1	6-22-92	--	--	.05	3.49	3.54	no
52	Laplatte River	1	7-07-92	446	7.7	.14	.68	.82	yes
53	Bouquet River	1	7-27-92	149	8.1	.02	.13	.15	no
53	Bouquet River	2	7-27-92	149	8.1	.03	.99	1.02	no
54	Lake Bed near Bouquet River	1	6-22-92	--	--	.03	1.73	1.76	no
57	Lewis Creek	1	7-07-92	248	8.8	.19	.43	.62	no
58	Lake Bed near Otter Creek	1	6-22-92	--	--	.06	2.26	2.32	yes
59	Little Otter Creek	1	6-15-92	346	8.7	--	--	--	no
59	Little Otter Creek	2	6-15-92	346	8.7	--	--	--	no
60	Lake Bed near Hoisington River	1	6-22-92	--	--	<.01	2.62	2.62	yes
61	Hoisington Brook	1	7-10-92	223	7.5	.06	.87	.93	no
62	Otter Creek	1	7-08-92	230	8.5	.03	.70	.73	yes
67	Mill Brook	1	7-09-92	149	8.2	.09	.70	.79	no
73	Putnam Creek	1	7-09-92	297	8.3	.60	.82	1.42	no
74	Lake Bed near Putnam Creek	1	6-30-92	--	--	.07	2.51	2.58	no
74	Lake Bed near Putnam Creek	2	6-30-92	--	--	.07	2.50	2.57	yes
74	Lake Bed near Putnam Creek	2	6-30-92	--	--	.07	2.50	2.57	yes
78	Ticonderoga Creek	1	7-24-92	124	8.0	.34	8.01	8.35	yes
78	Ticonderoga Creek	2	7-24-92	124	8.0	.34	8.78	9.12	no
79	Lake Bed near Lachutte	1	6-30-92	--	--	.05	2.93	2.98	yes
79	Lake Bed near Lachutte	1	6-30-92	--	--	.05	2.93	2.98	yes
79	Lake Bed near Lachutte	2	6-30-92	--	--	.05	3.15	3.20	yes
80	East Creek	1	7-16-92	513	7.7	.96	1.41	2.37	no

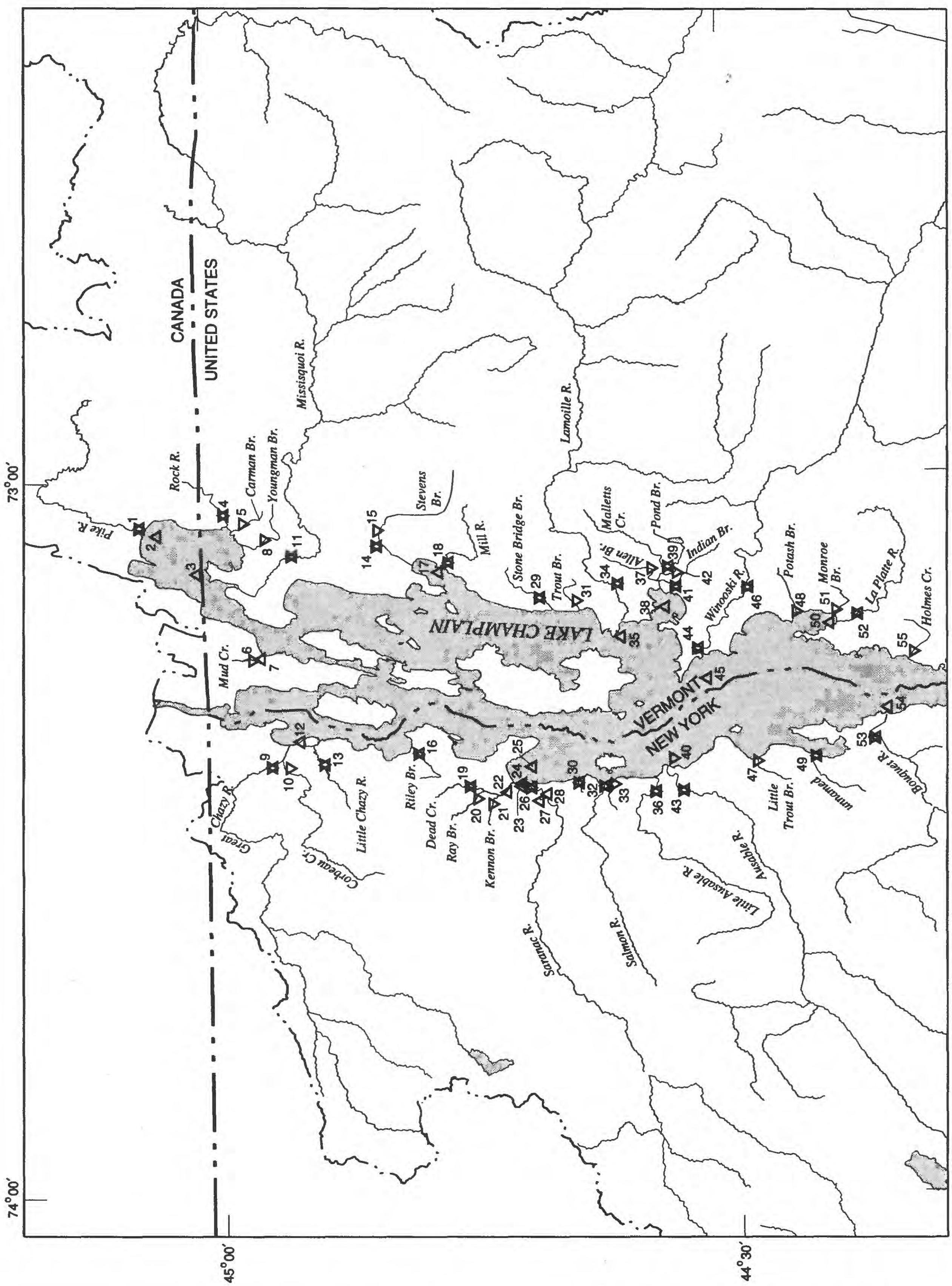
Table 9. Carbonate, organic and total carbon concentrations, and polychlorinated biphenyl compound detections in streambed sediment for tributaries to Lake Champlain--Continued

Site number[1]	Stream name	Design remarks[2]	Date	Specific conductance (microsiemens per centimeter)	pH (standard units)	Carbonate carbon (percent)	Organic carbon (per cent)	Total carbon (percent)	PCB's detected[3]
83	Mill Brook	1	7-09-92	311	8.0	0.54	0.86	1.40	no
89	Poultney River	1	7-16-92	215	7.7	.31	.19	.50	no
89	Poultney River	2	7-16-92	215	7.7	.20	.11	.31	no
95	Metawee River	1	7-15-92	230	7.9	.05	1.79	1.84	no
97	Mount Hope Brook	1	7-17-92	86	8.2	.13	.25	.38	no

[1] Location of site number shown in figure 1.

[2] Remark code 1 means a normal sample; 2 means same-day resampling of site; some samples were split at the laboratory and are indicated by a second sample with the same site number and remark code, either 1 or 2.

[3] No means PCB's were not detected according to the criterion given in the methods section; yes means PCB's were detected according to the criterion given in the methods section.


CANADA
UNITED STATES
LAKE CHAMPLAIN
VERMONT
NEW YORK
73°00′
74°00′
45°00′
44°30′
Pike R.
Rock R.
Carman Br.
Youngman Br.
Missisquoi R.
Stevens Br.
Mill R.
Lamoille R.
Stone Bridge Br.
Trout Br.
Mallets Cr.
Pond Br.
Allen Br.
Indian Br.
Winooski R.
Potash Br.
Monroe Br.
La Platte R.
Holmes Cr.
Mud Cr.
Chazy R.
Great Chazy R.
Corbeau Cr.
Little Chazy R.
Riley Br.
Dead Cr.
Ray Br.
Kennon Br.
Saranac R.
Salmon R.
Little Ausable R.
Ausable R.
Little Trout Br.
unnamed
Bouquet R.

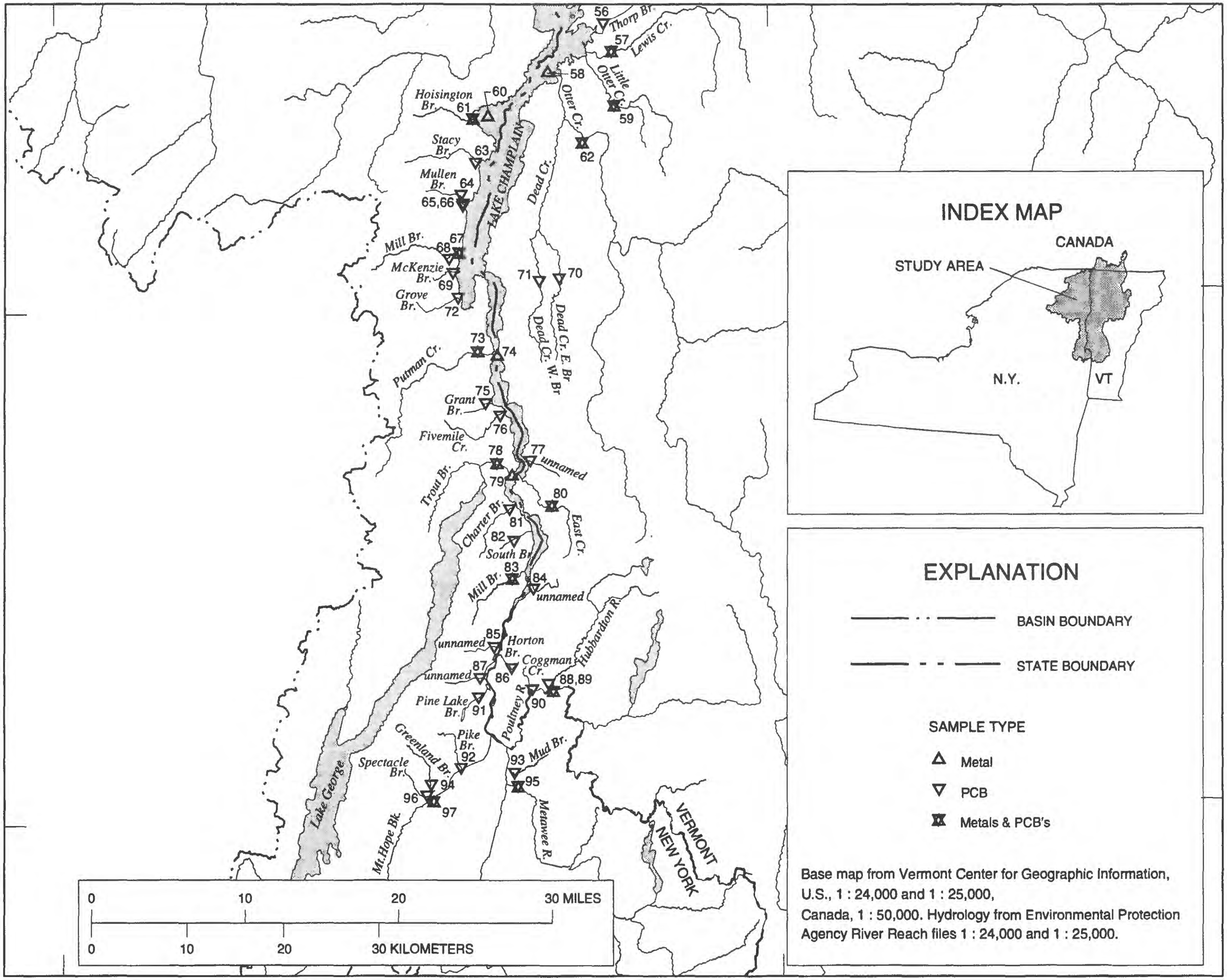


Figure 1. Sample-site locations in the Lake Champlain basin.

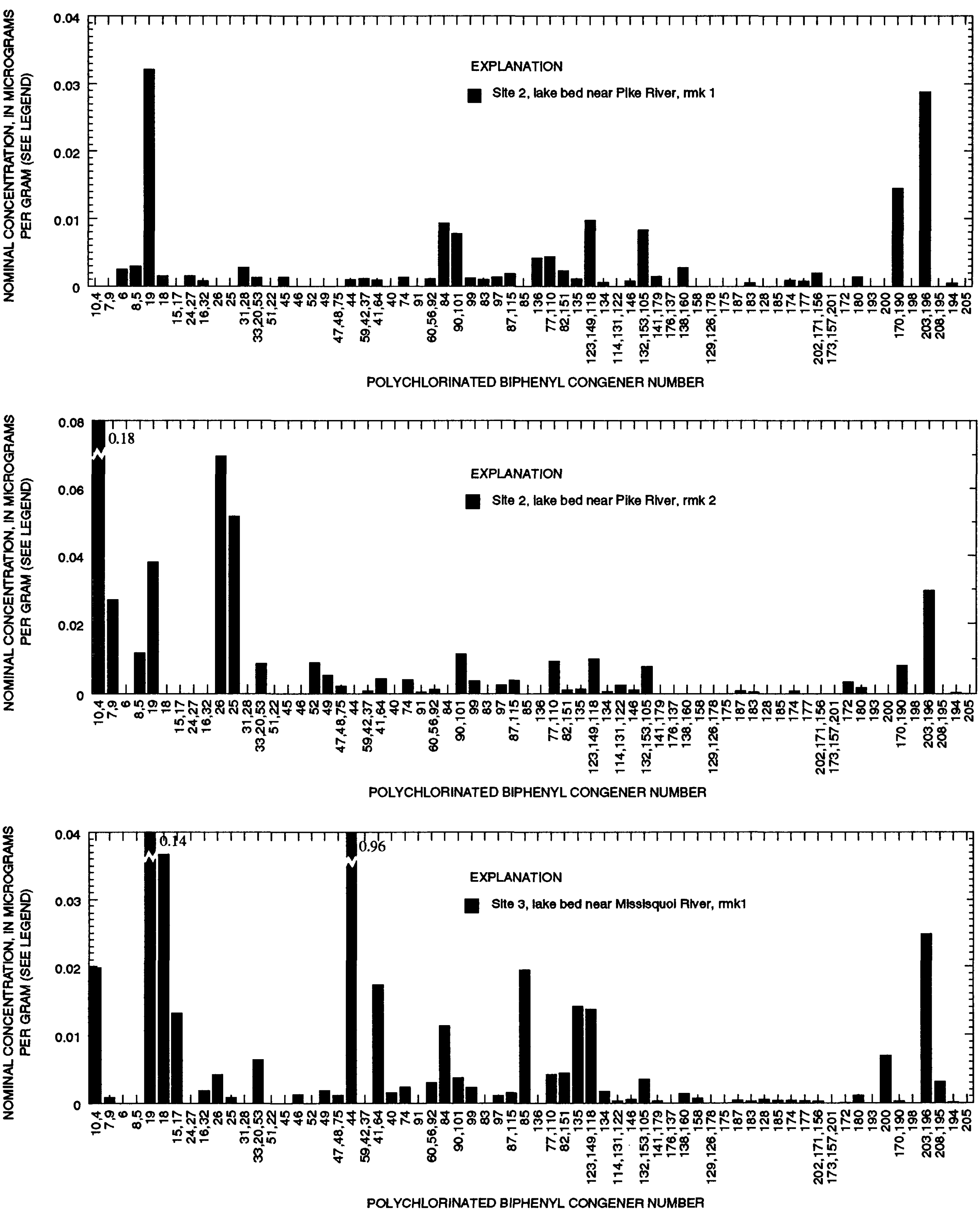
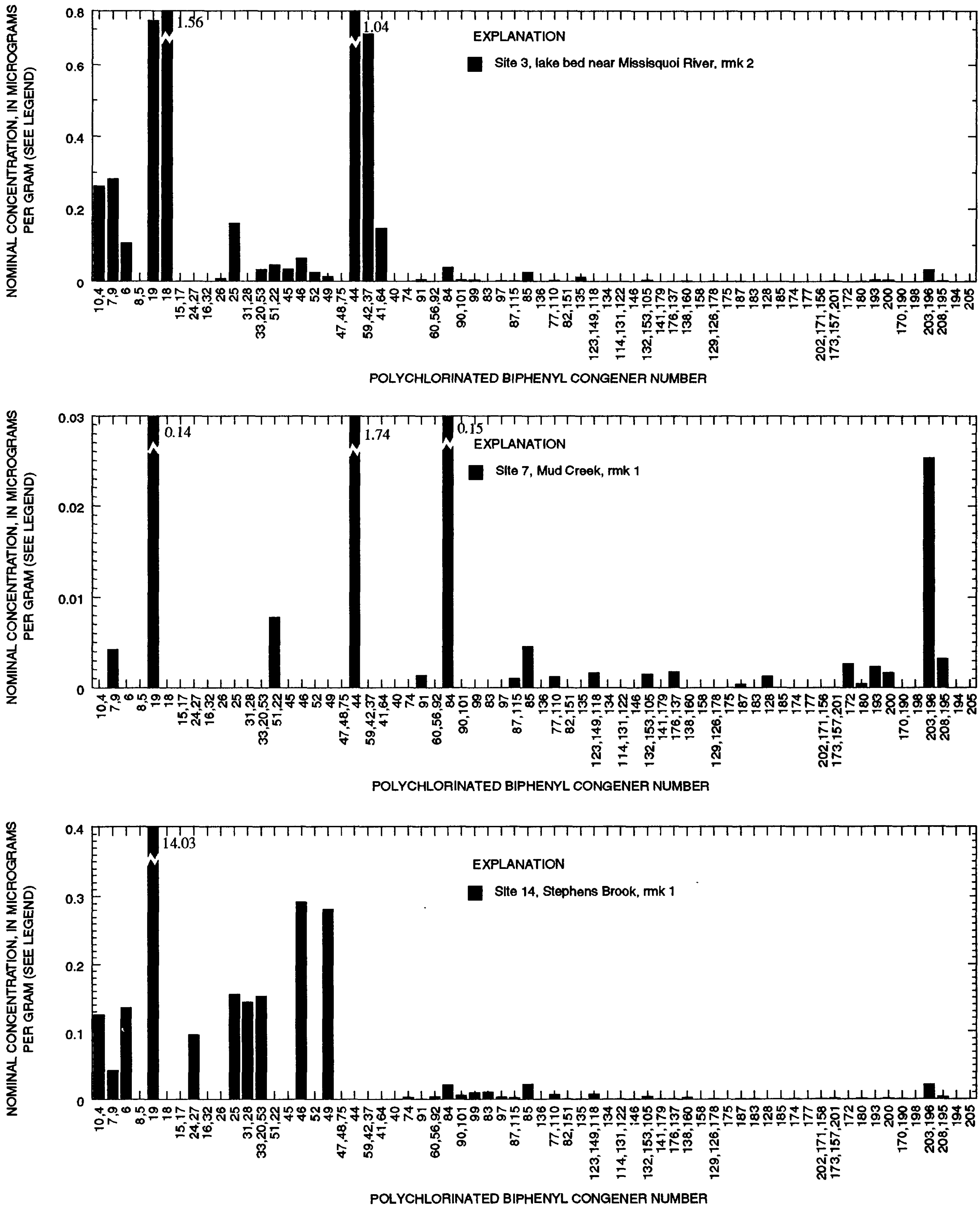


Figure 2. Histograms of polychlorinated biphenyl congeners (PCBs) from stream- and lake-bed samples of Lake Champlain. Site numbers are listed in figure 1 and site descriptions in table 1. Congener identifications are listed by International Union of Practical and Applied Chemistry number in table 7. Concentration units apply only if height of peak is caused by PCB congeners as described in text; rmk refers to Design remark in table 9.



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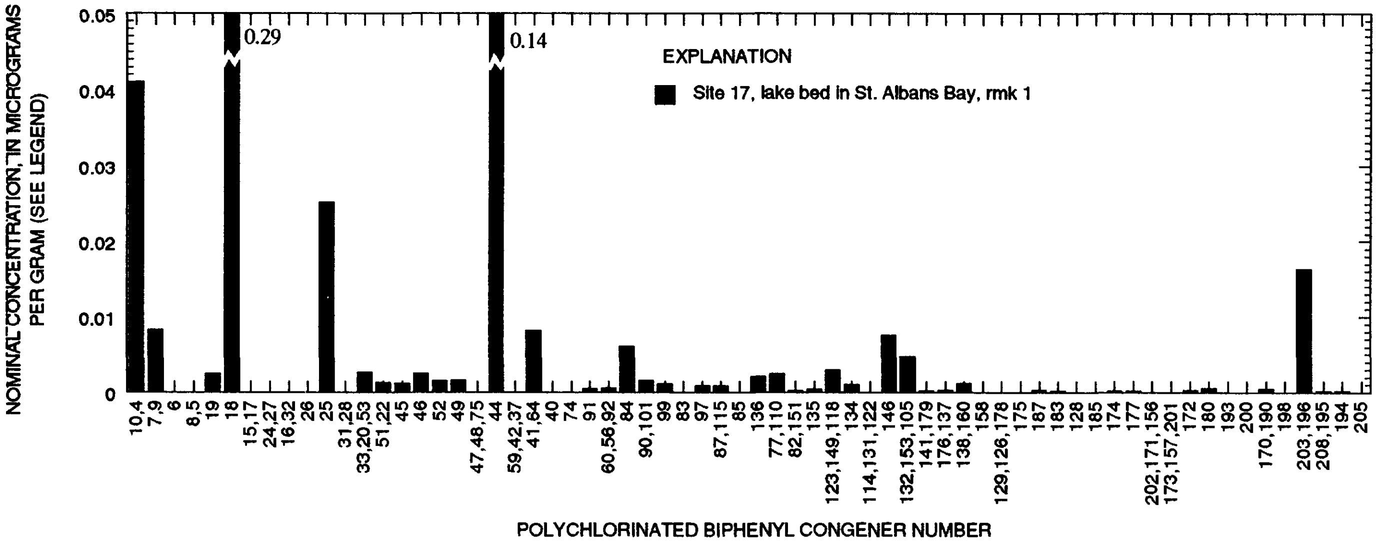
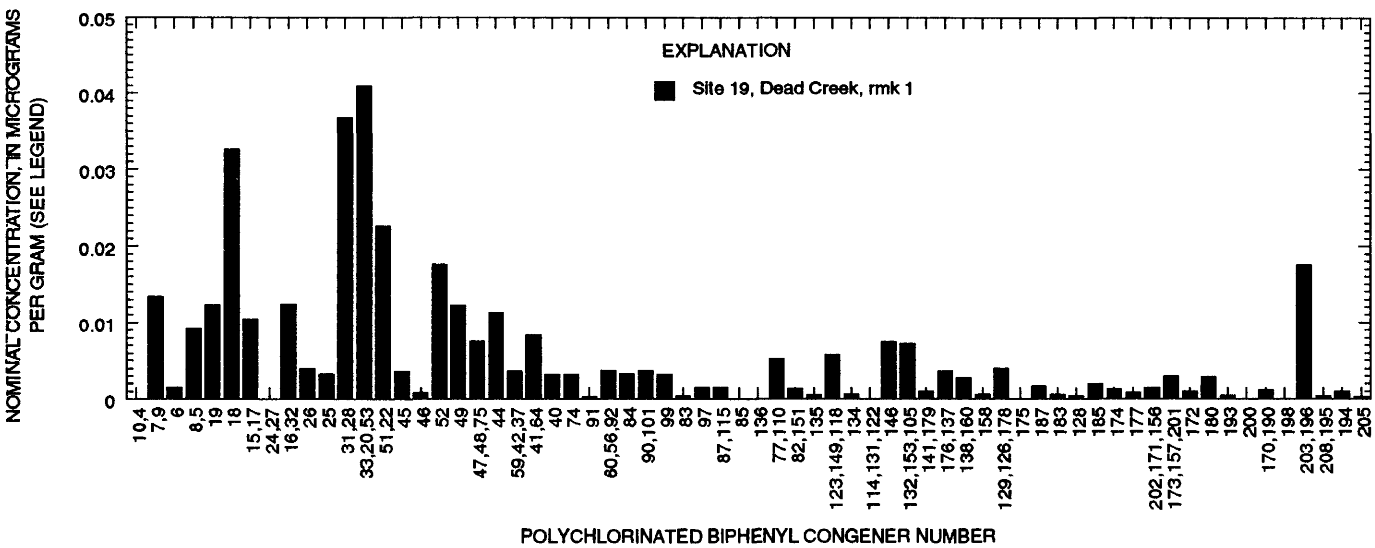




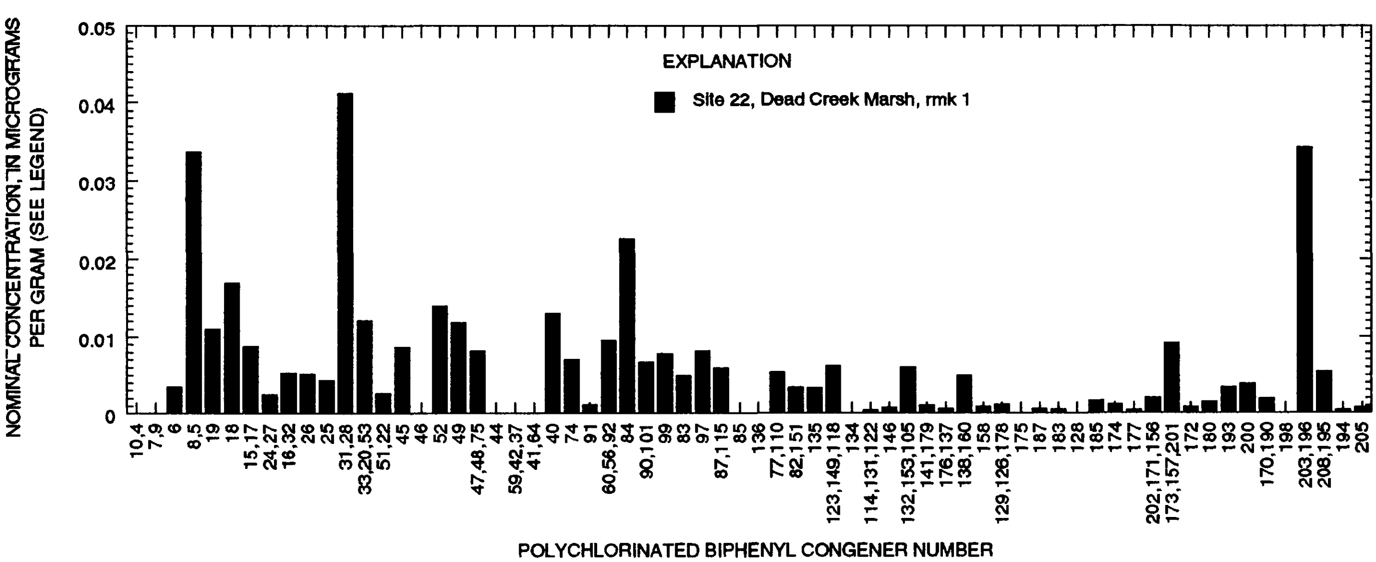
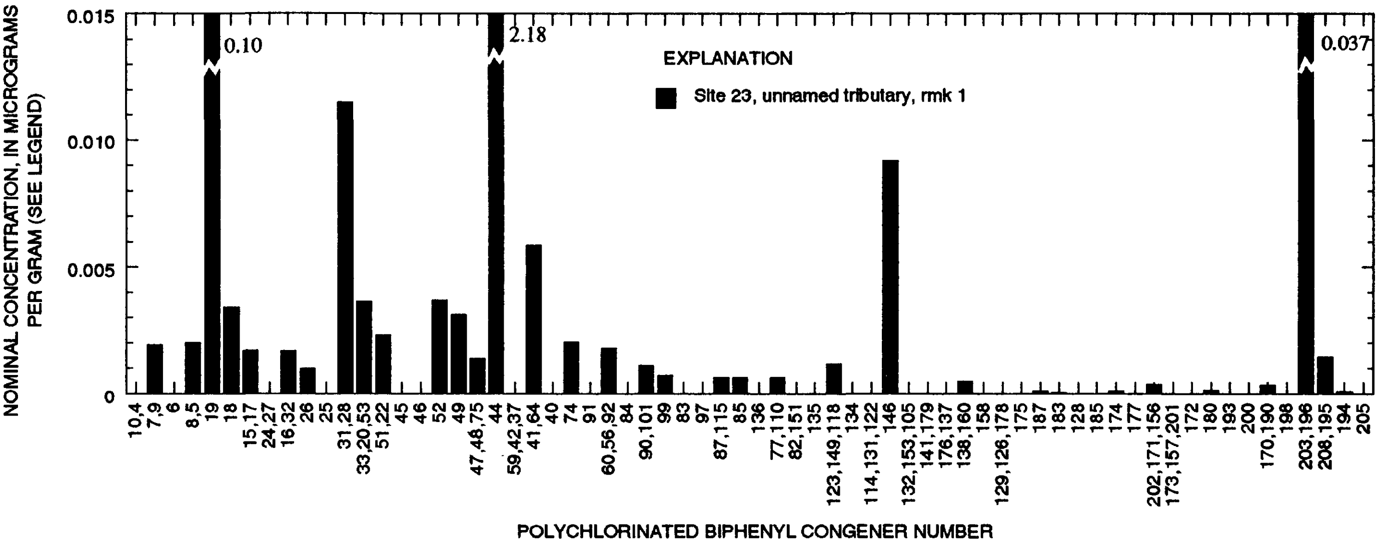
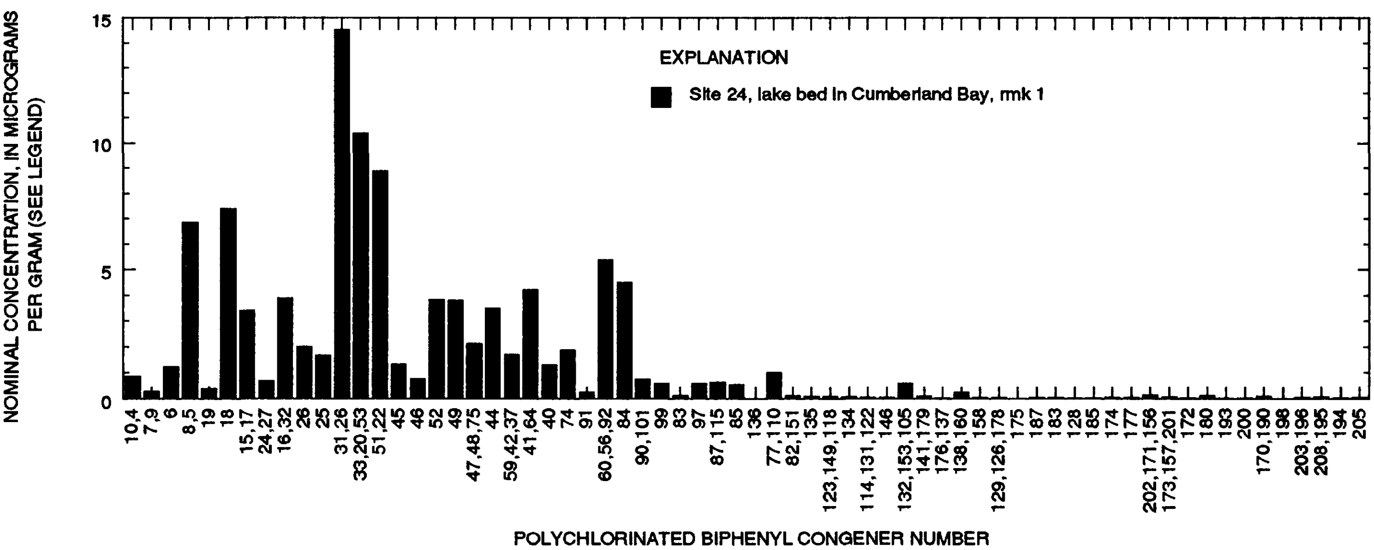


Figure 2. Histograms of polychlorinated biphenyl congeners (PCBs) from stream- and lake-bed samples of Lake Champlain. Site numbers are listed in figure 1 and site descriptions in table 1. Congener identifications are listed by International Union of Practical and Applied Chemistry number in table 7. Concentration units apply only if height of peak is caused by PCB congeners as described in text; rmk refers to Design remark in table 9.--Continued





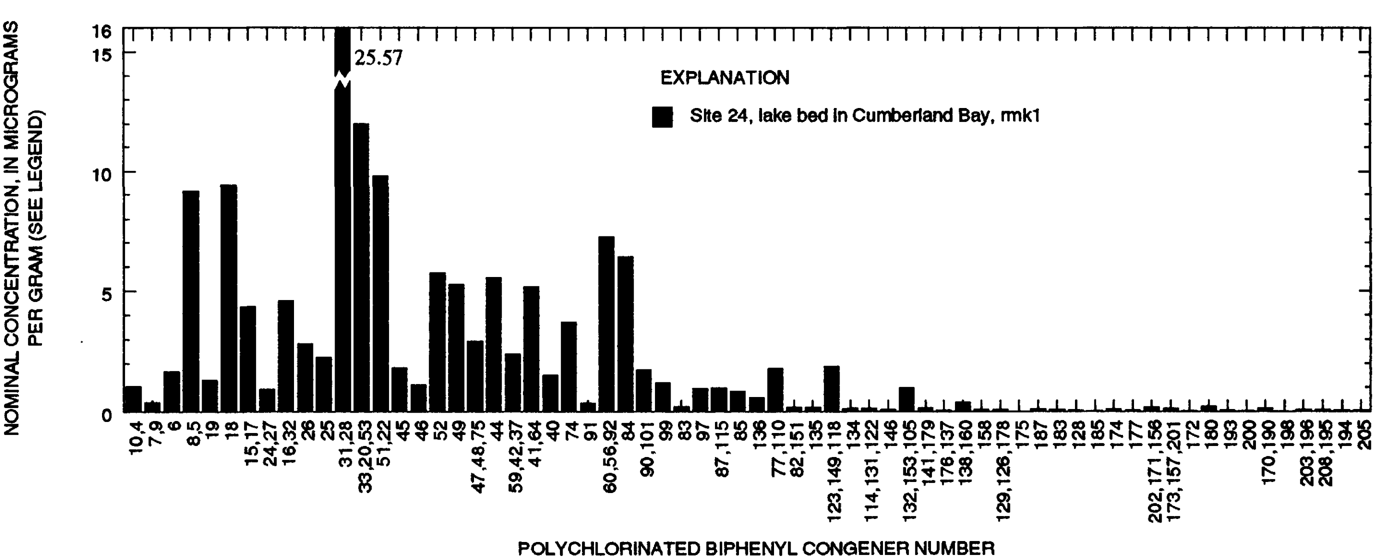


Figure 2. Histograms of polychlorinated biphenyl congeners (PCBs) from stream- and lake-bed samples of Lake Champlain. Site numbers are listed in figure 1 and site descriptions in table 1. Congener identifications are listed by International Union of Practical and Applied Chemistry number in table 7. Concentration units apply only if height of peak is caused by PCB congeners as described in text; rmk refers to Design remark in table 9.--Continued

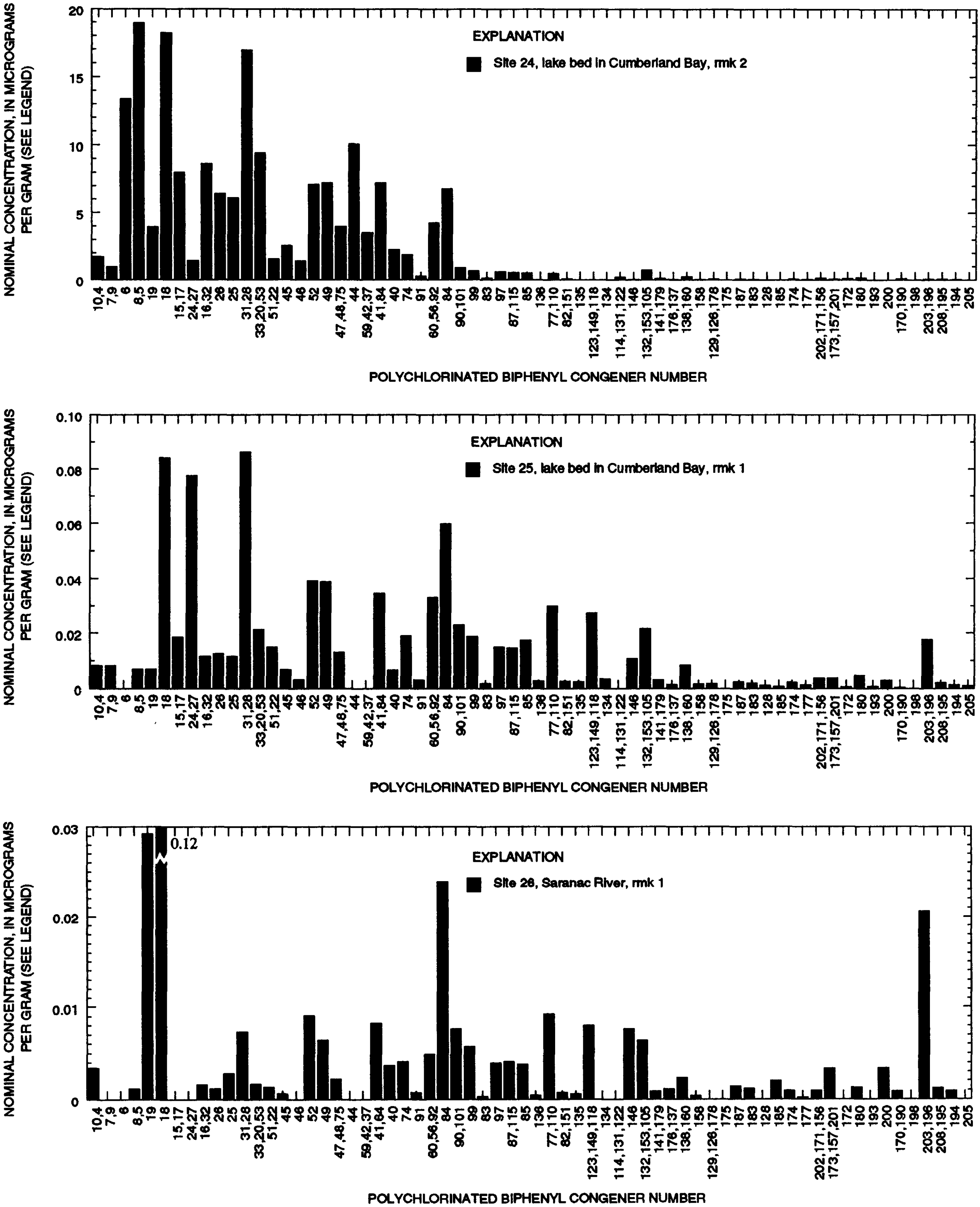
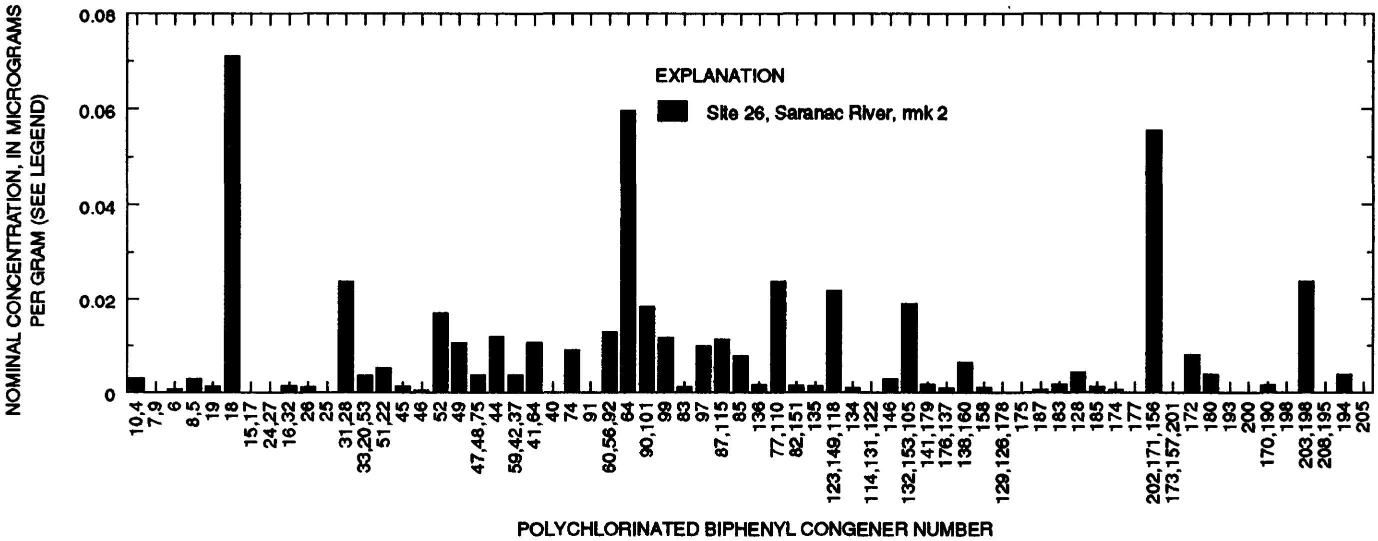
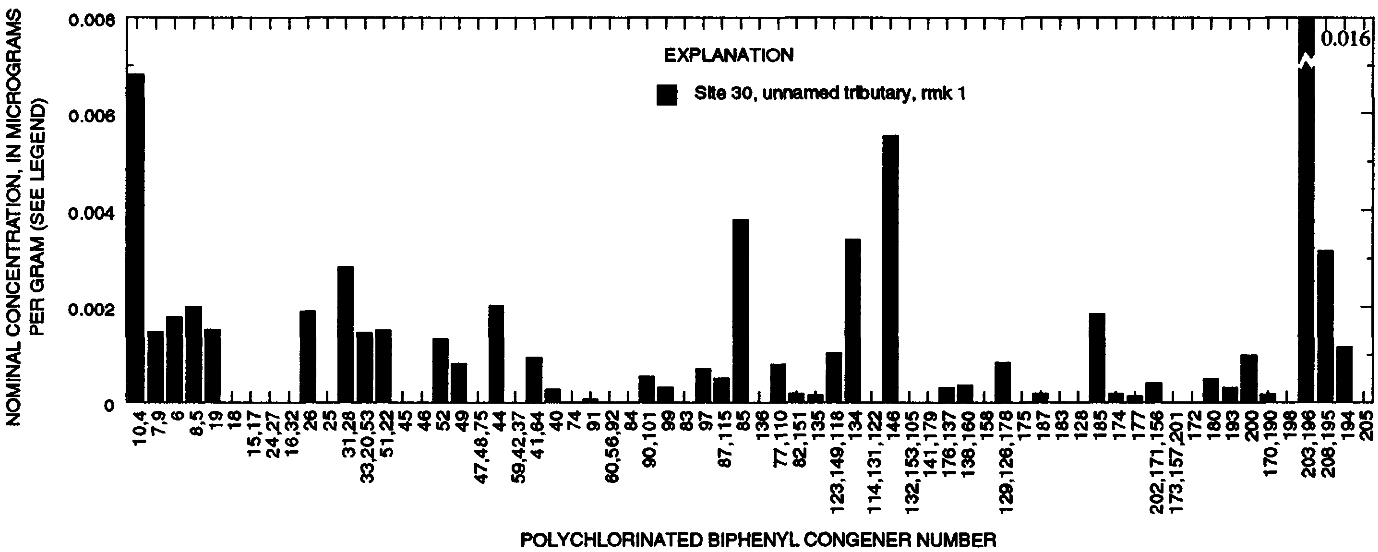


Figure 2. Histograms of polychlorinated biphenyl congeners (PCBs) from stream- and lake-bed samples of Lake Champlain. Site numbers are listed in figure 1 and site descriptions in table 1. Congener identifications are listed by International Union of Practical and Applied Chemistry number in table 7. Concentration units apply only if height of peak is caused by PCB congeners as described in text; rmk refers to Design remark in table 9.--Continued





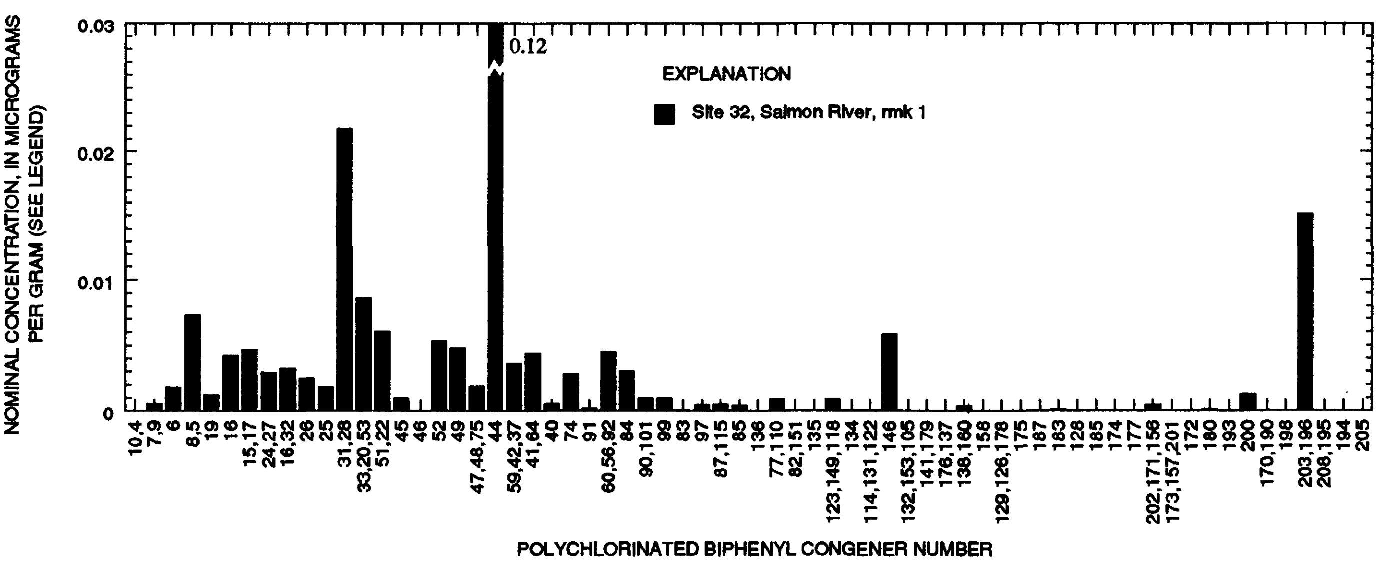
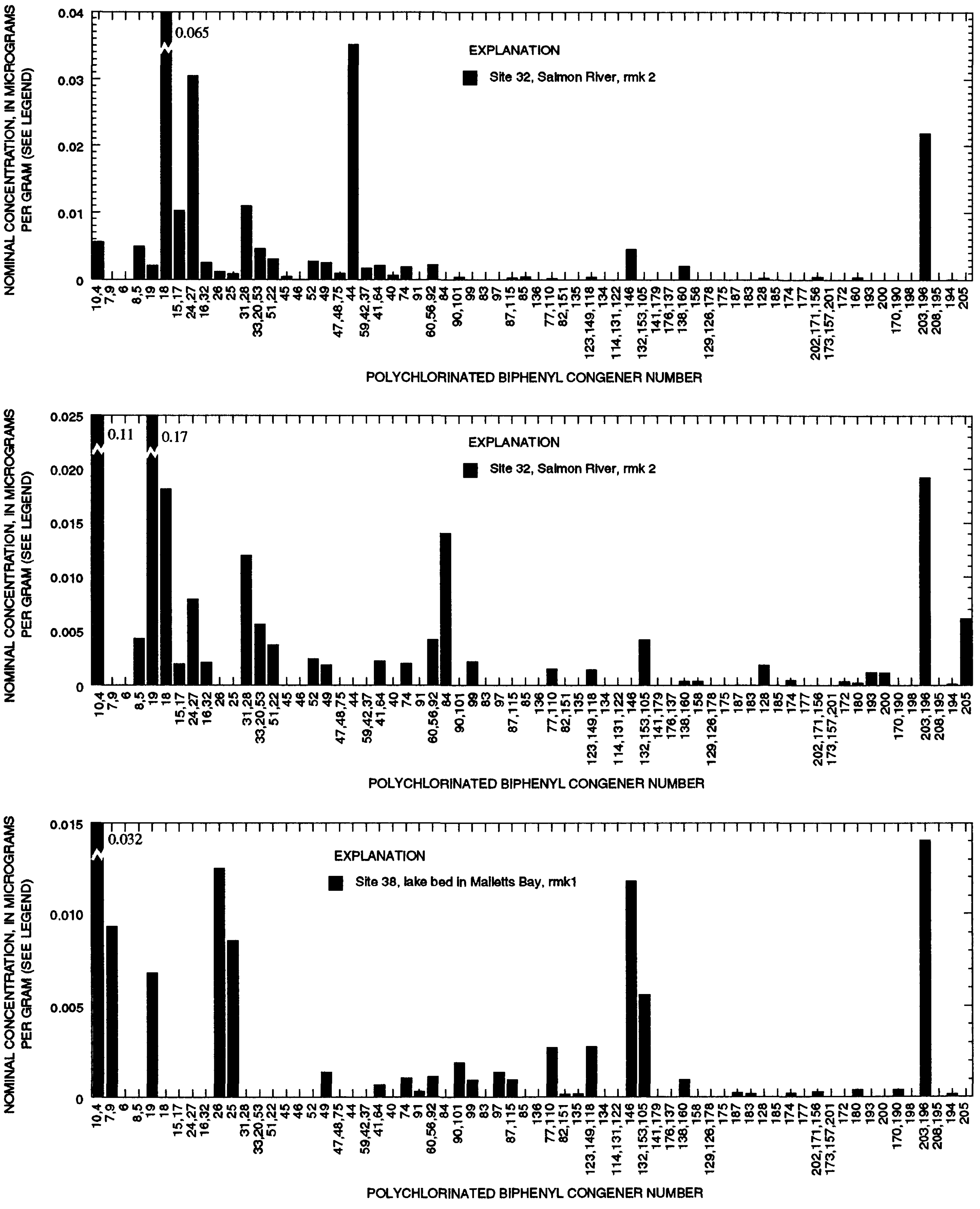


Figure 2. Histograms of polychlorinated biphenyl congeners (PCBs) from stream- and lake-bed samples of Lake Champlain. Site numbers are listed in figure 1 and site descriptions in table 1. Congener identifications are listed by International Union of Practical and Applied Chemistry number in table 7. Concentration units apply only if height of peak is caused by PCB congeners as described in text; rmk refers to Design remark in table 9.--Continued



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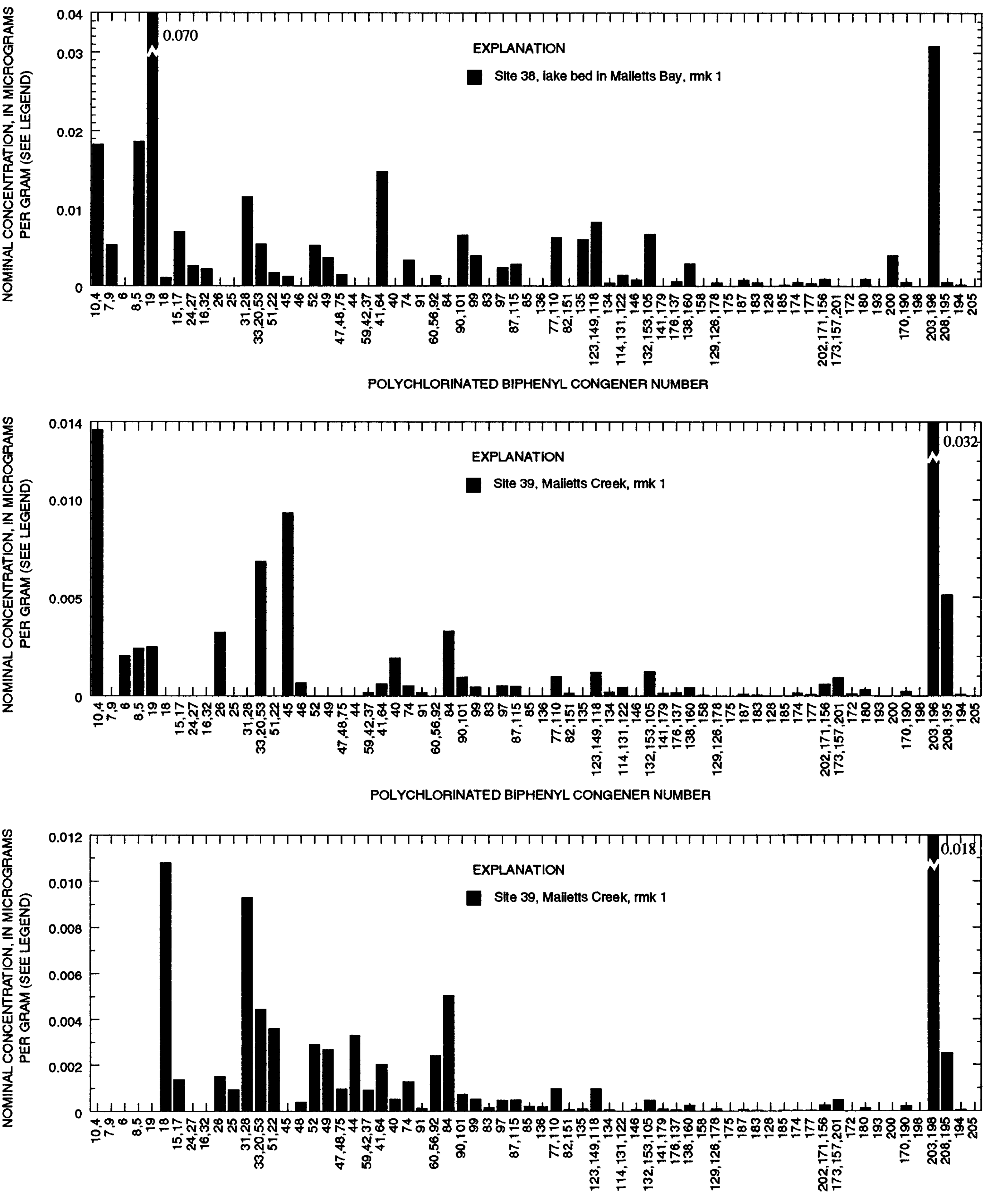

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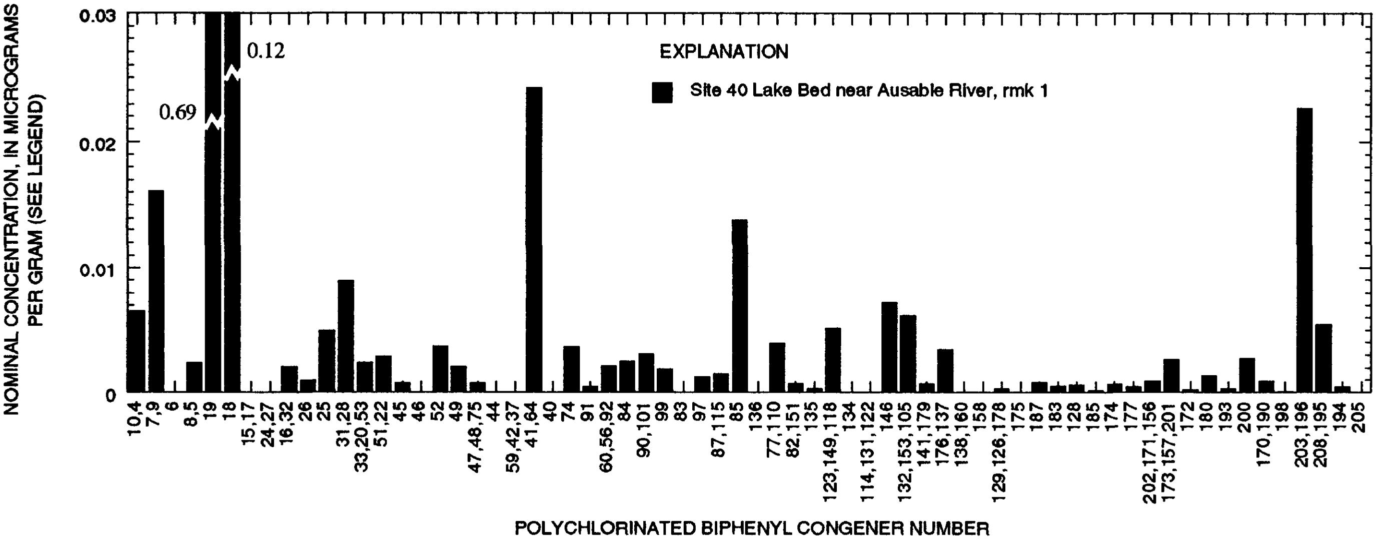

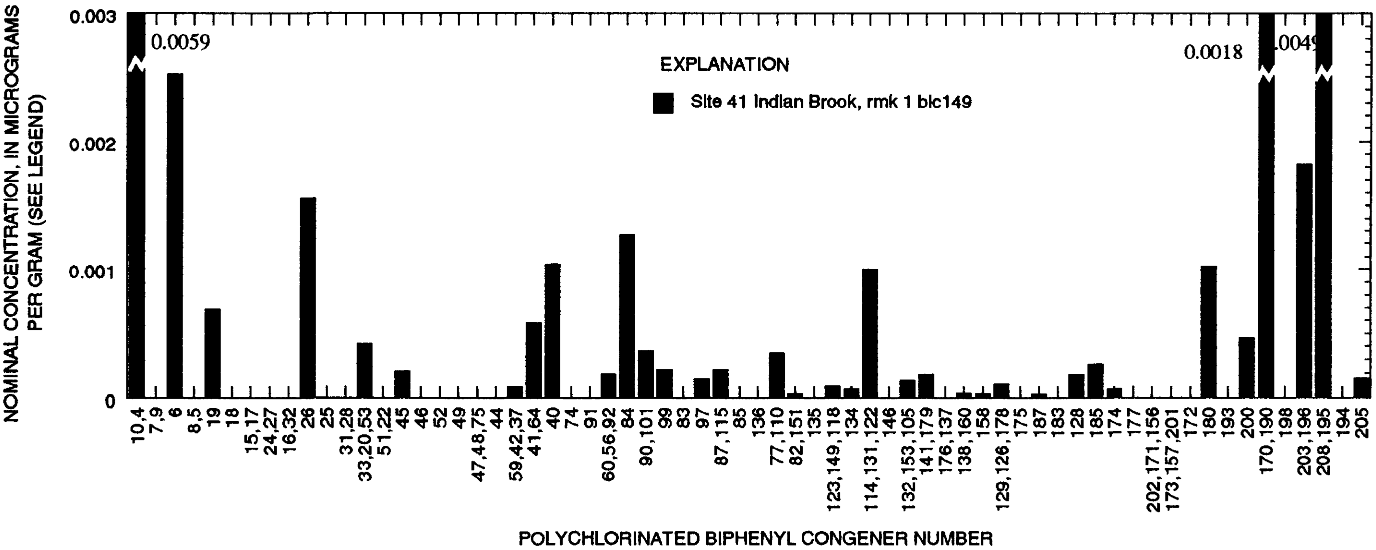

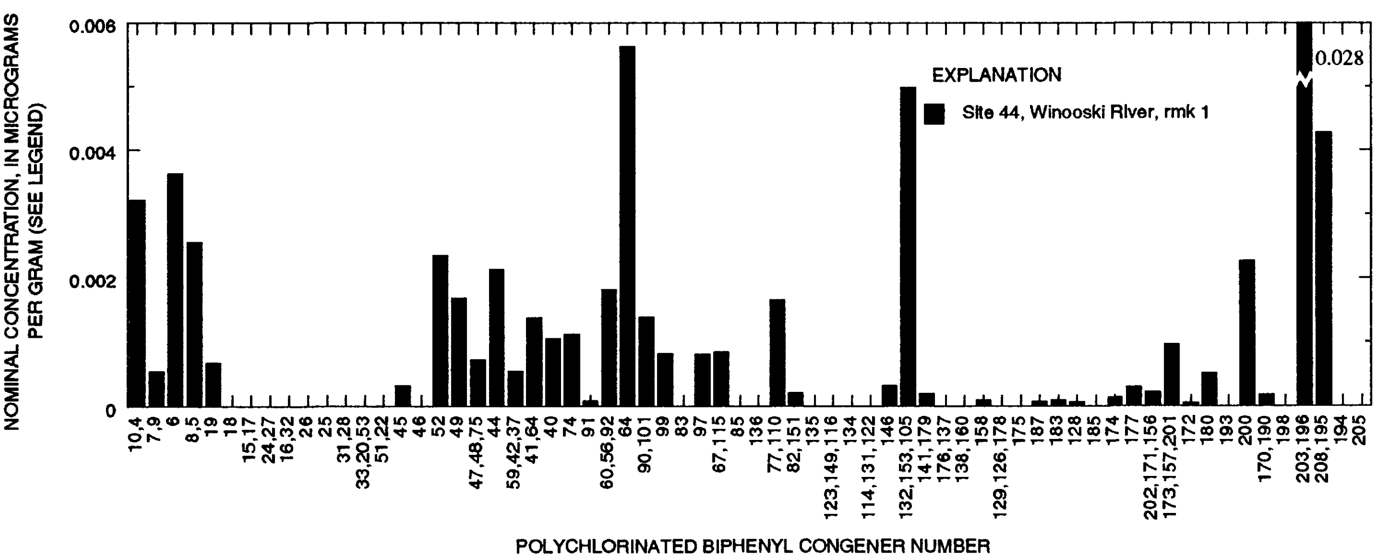

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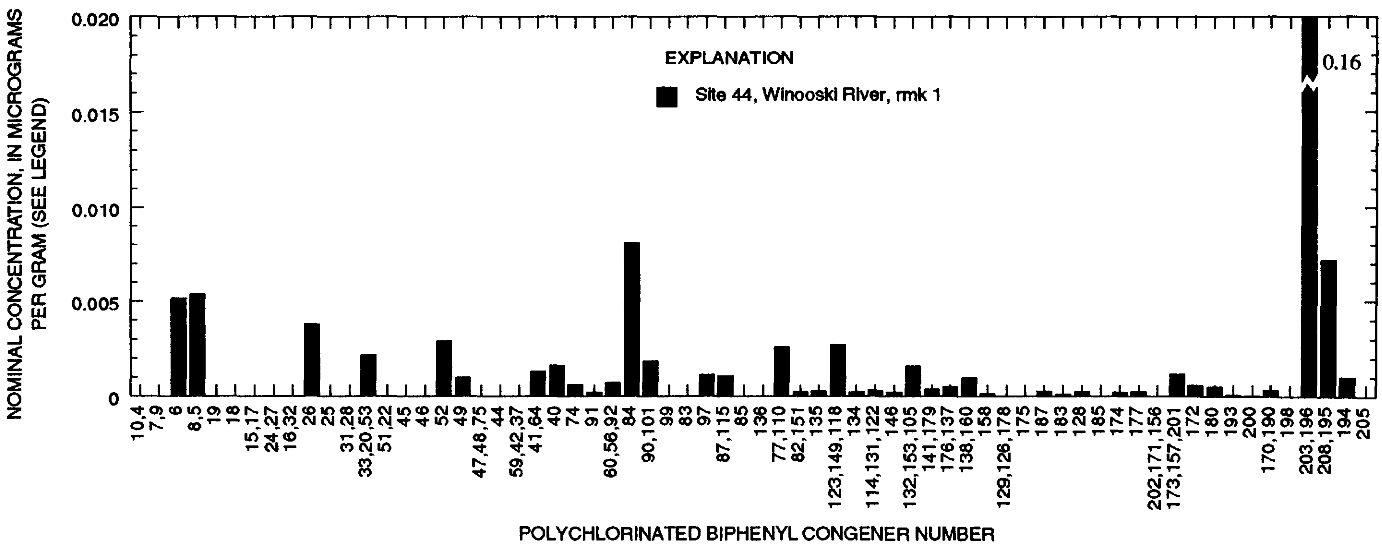
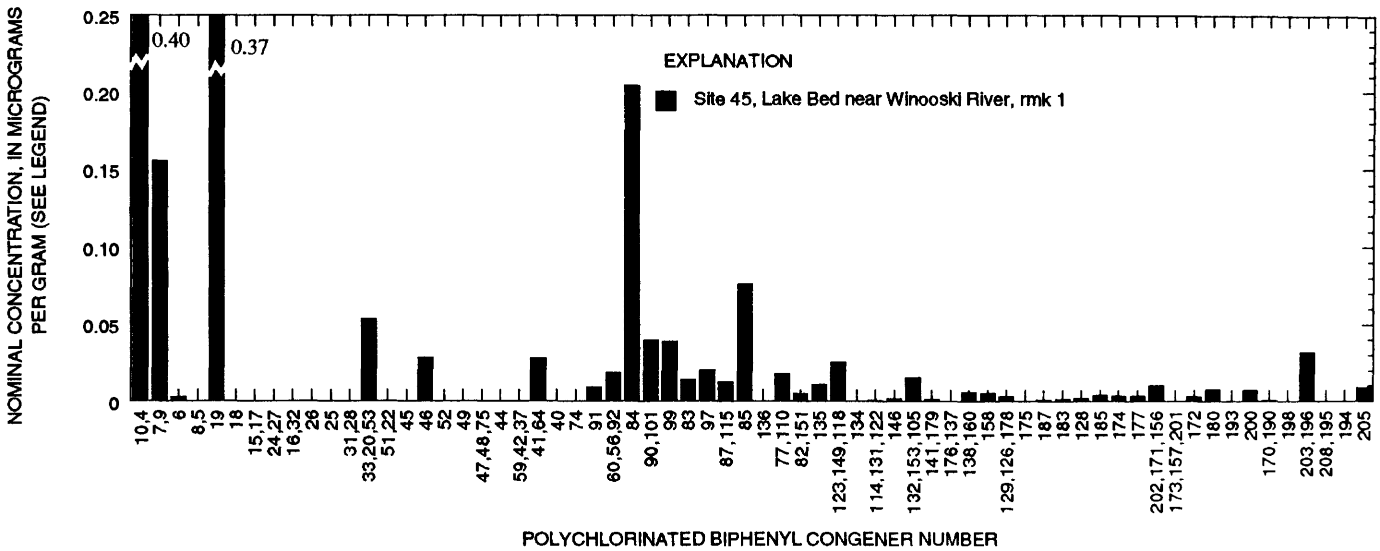




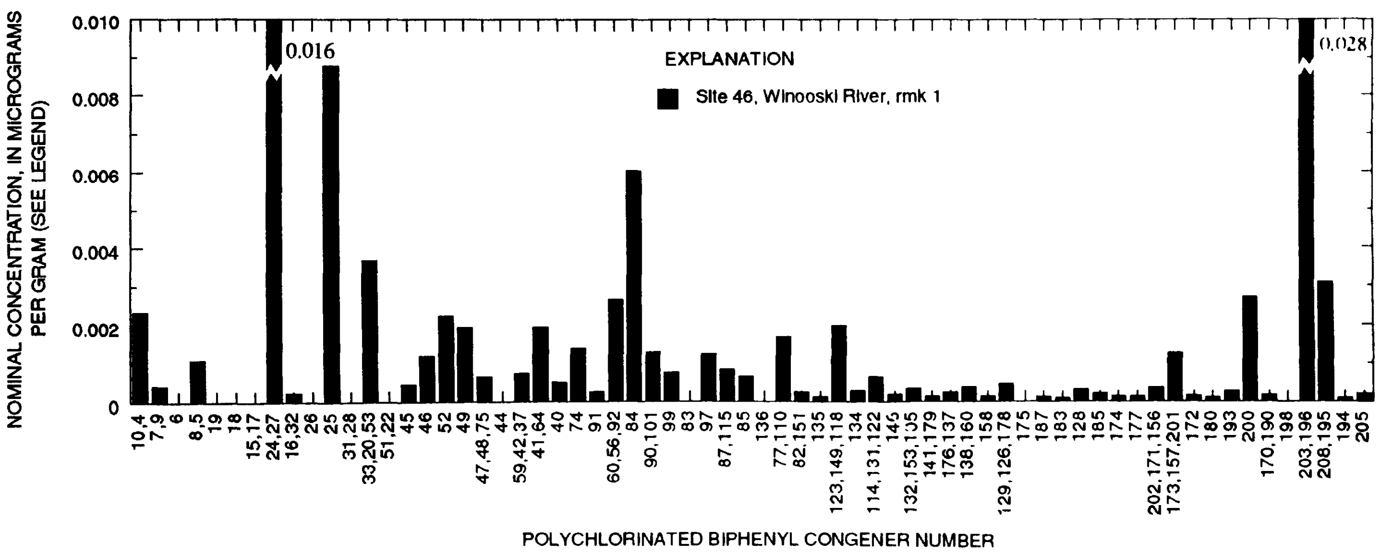
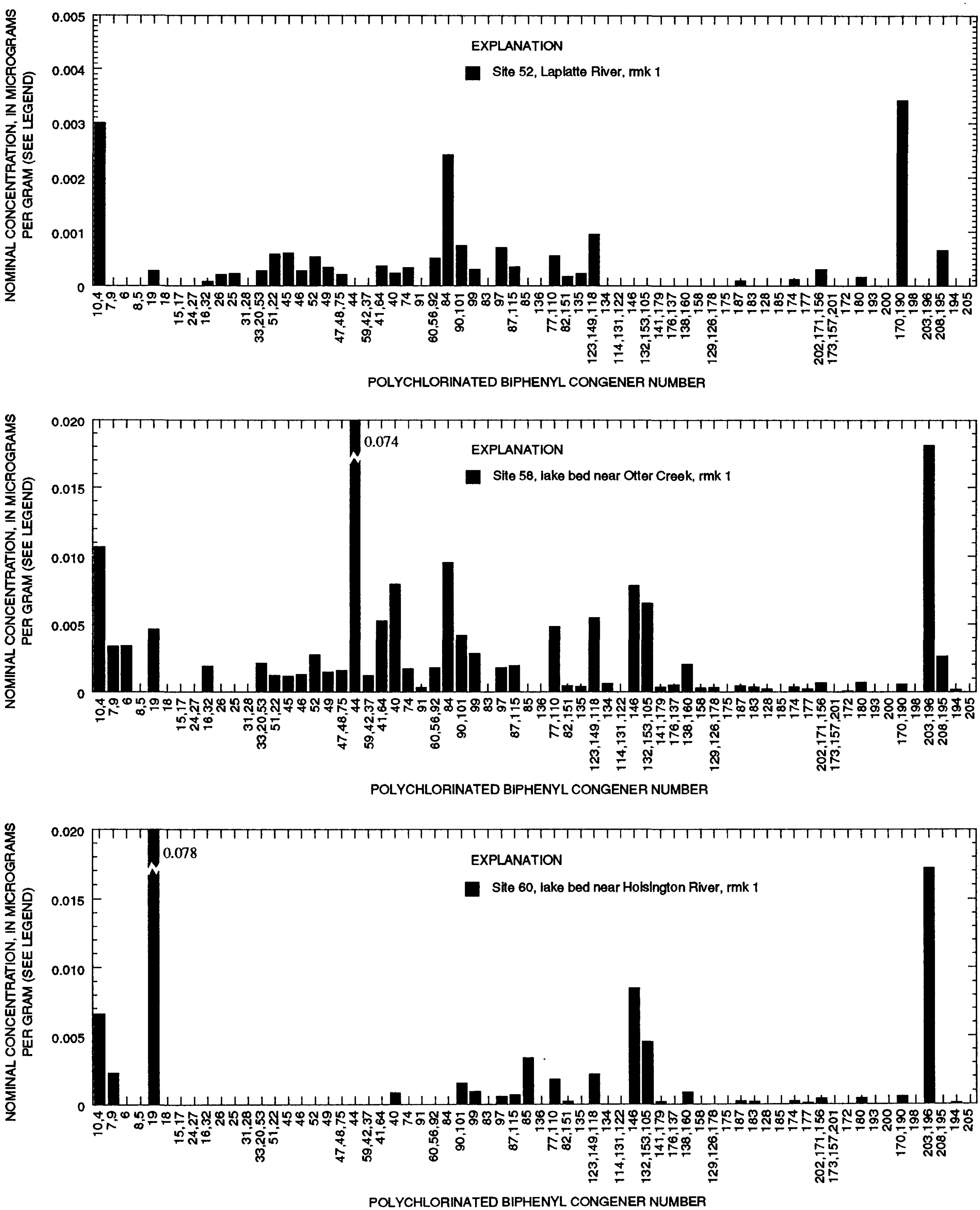


Figure 2. Histograms of polychlorinated biphenyl congeners (PCBs) from stream- and lake-bed samples of Lake Champlain. Site numbers are listed in figure 1 and site descriptions in table 1. Congener identifications are listed by International Union of Practical and Applied Chemistry number in table 7. Concentration units apply only if height of peak is caused by PCB congeners as described in text; rmk refers to Design remark in table 9.--Continued



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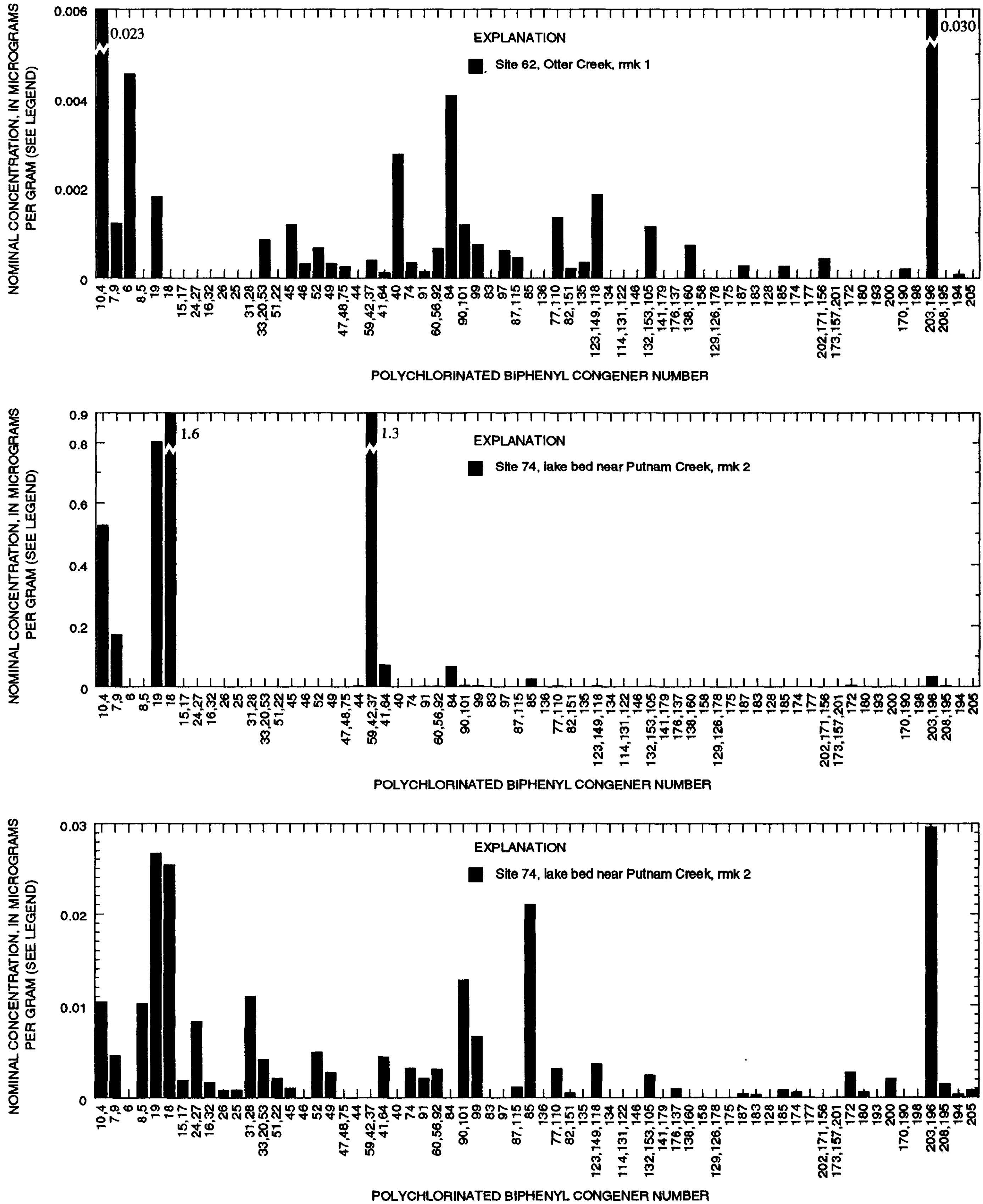

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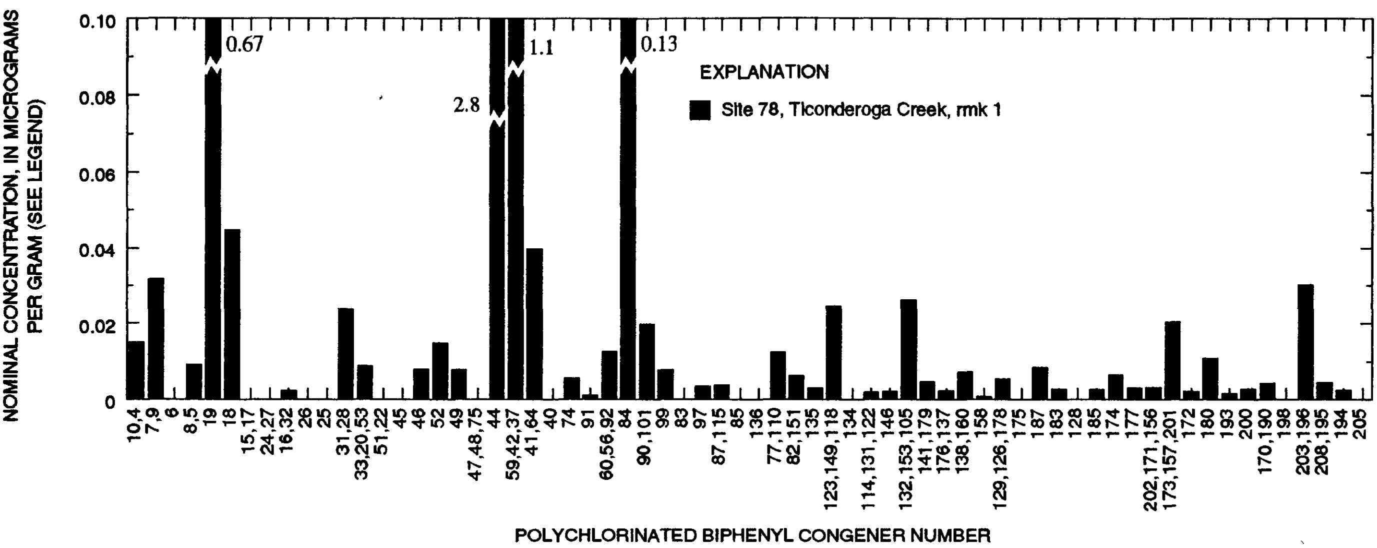

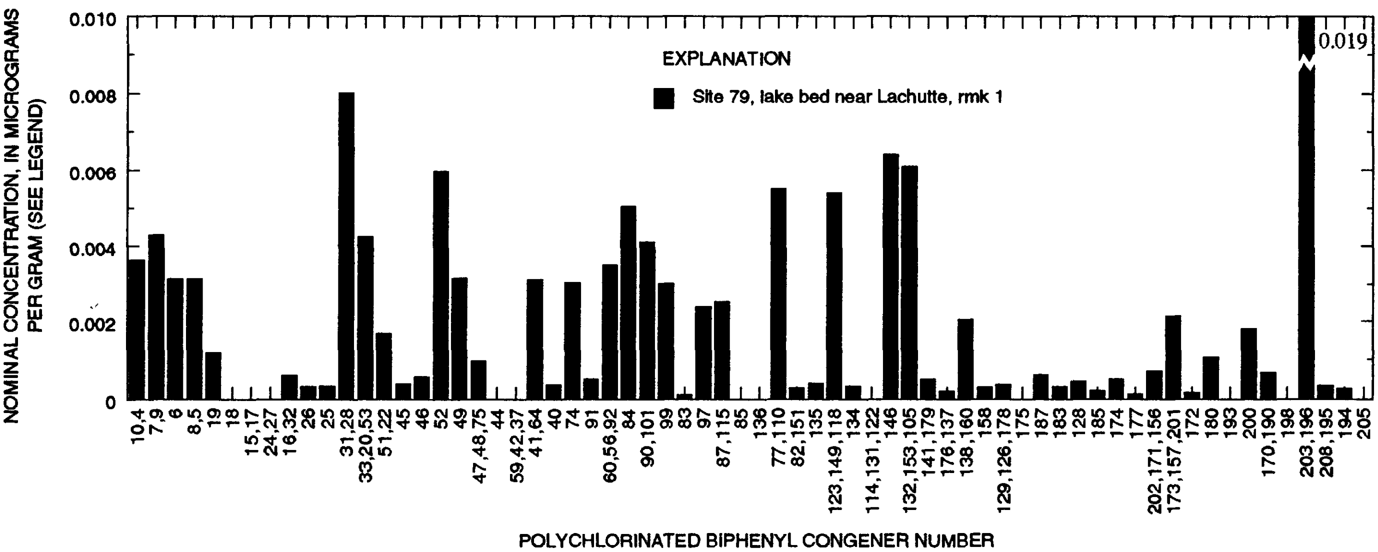

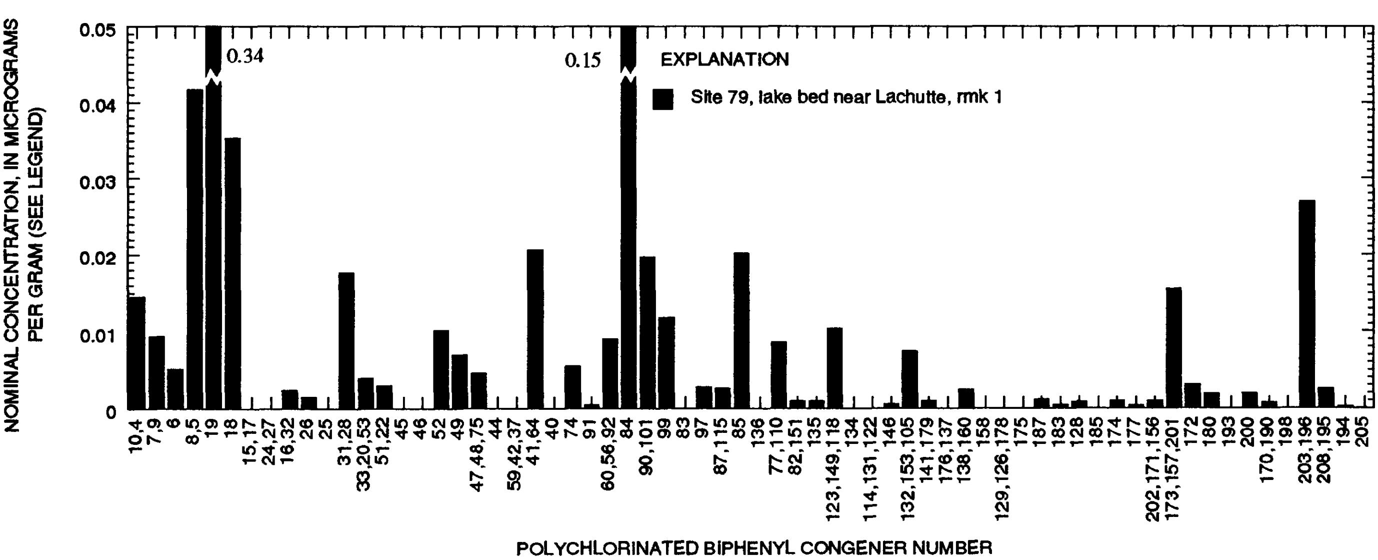

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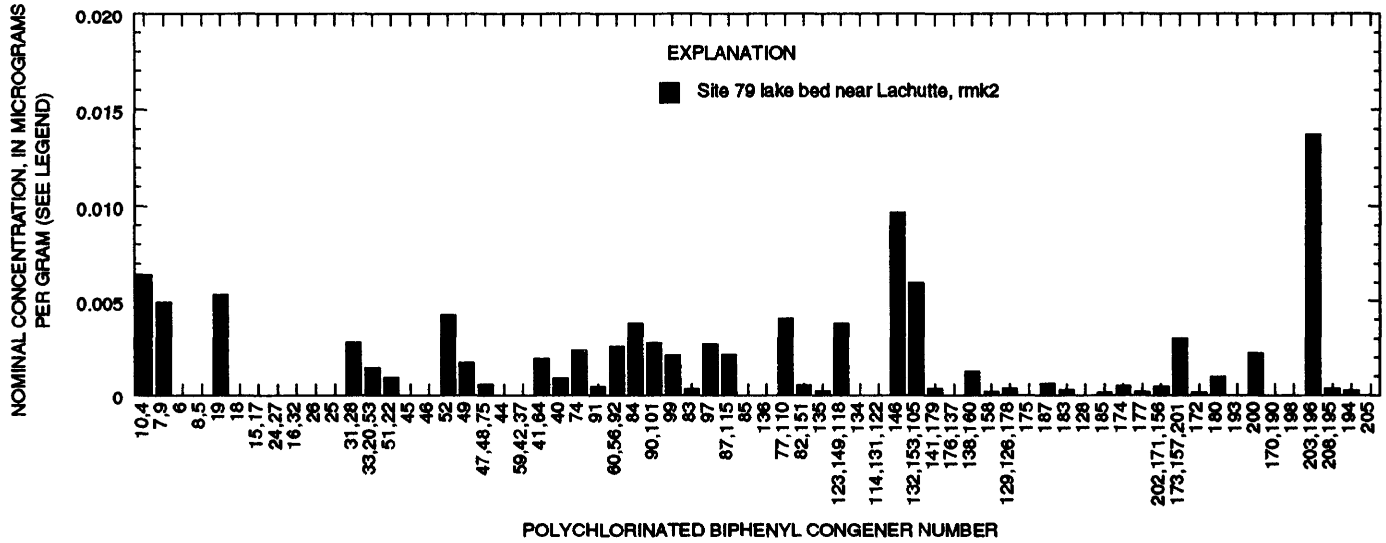

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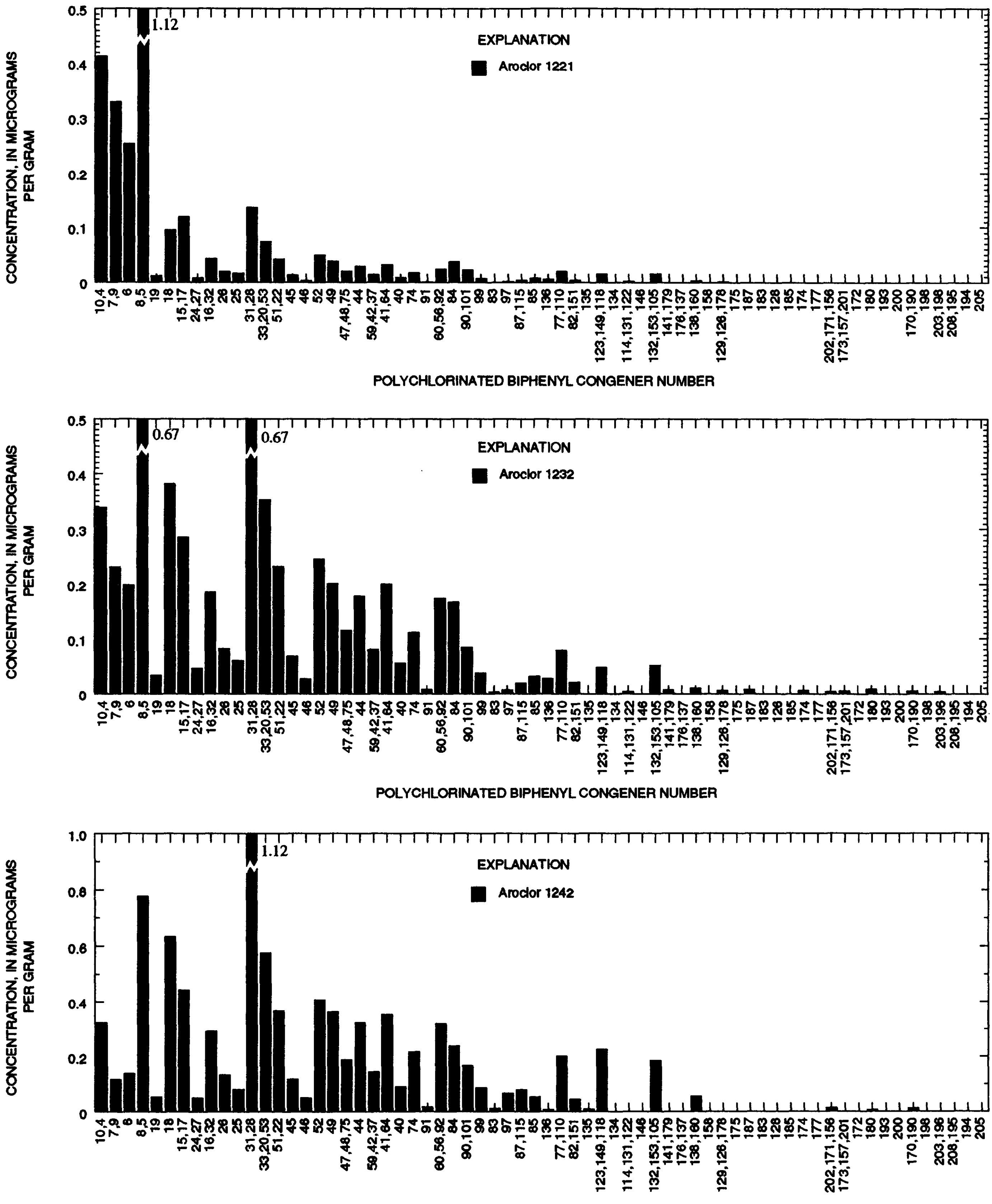

Figure 3. Histograms of polychlorinated biphenyl congeners in Aroclor mixtures. Congener identifications are by International Union of Practical and Applied Chemistry number, as listed in table 7.

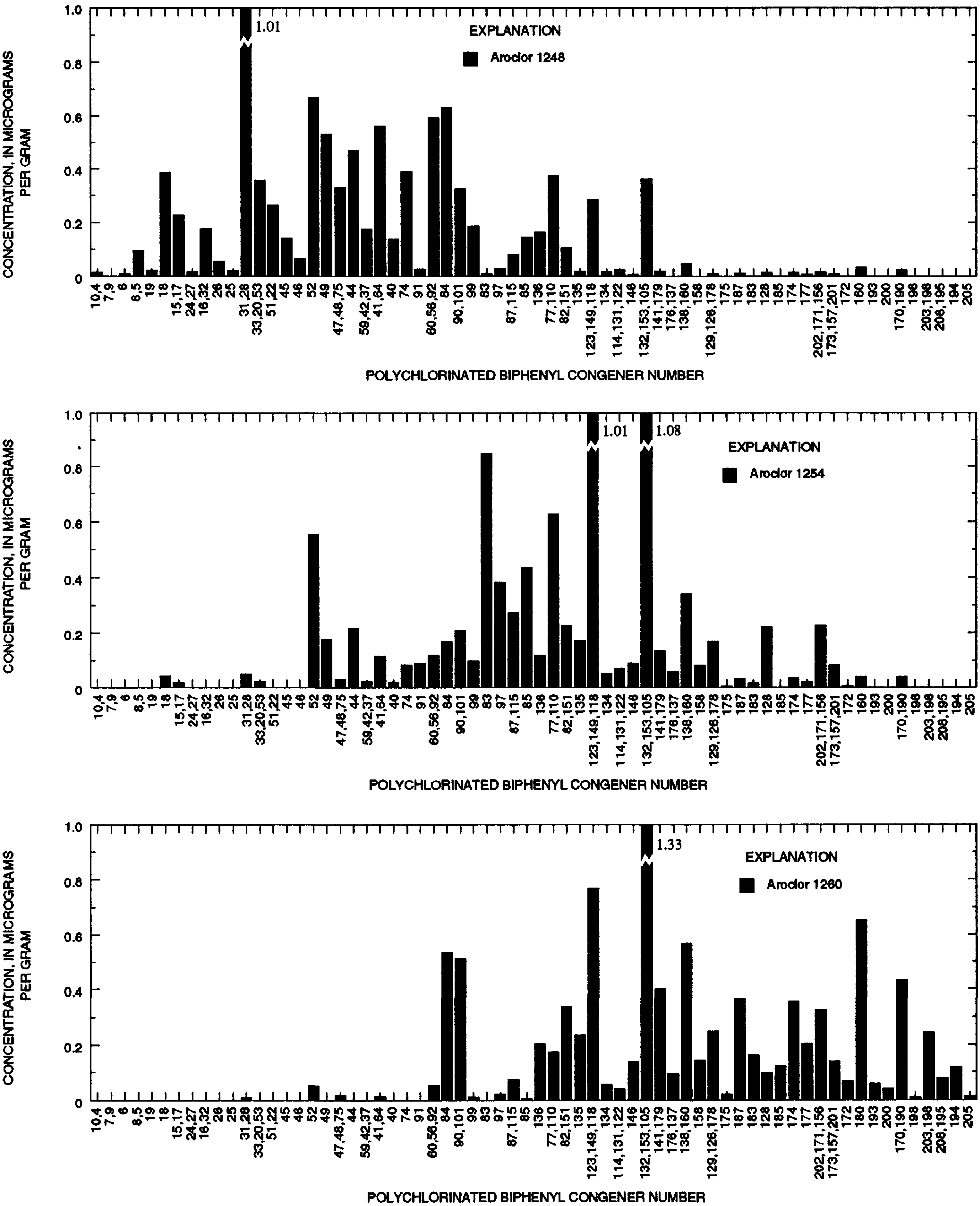

Figure 3. Histograms of polychlorinated biphenyl congeners in Aroclor mixtures. Congener identifications are by International Union of Practical and Applied Chemistry number, as listed in table 7.--Continued