Selected Field Parameters from Streams and Preliminary Analytical Data from Water and Macroinvertebrate Samples, Central Colorado Assessment Project, Environmental Assessment Task, 2004 and 2005

By David L. Fey, Stanley E. Church, Travis S. Schmidt, Richard B. Wanty, Philip L. Verplanck, Paul J. Lamothe, Monique Adams, and Michael W. Anthony

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Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
Length		
foot (ft)	0.3048	meter (m)
Volume		
gallon (gal)	3.785	liter (L)
cubic foot (ft^3)	28.32	liter (L)
Flow rate		
cubic foot per second (ft^3/s)	28.32	liter per second (L/s)
gallon per minute (gal/min)	0.06309	liter per second (L/s)
Mass		
ounce avoirdupois (oz)	28.35	gram (g)
pound avoirdupois (lb)	0.4536	kilogram (kg)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:
°F=(1.8×°C)+32
Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:
°C=(°F-32)/1.8
Altitude, as used in this report, refers to distance above the vertical datum.
Specific conductance is given in microsiemens per centimeter at 25 degrees Celsius (µS/cm at 25°C).
Concentrations of chemical constituents in water are given either in milligrams per liter (mg/L) or micrograms per liter (µg/L).

SI to Inch/Pound

Multiply	By	To obtain
Length		
meter (m)	3.281	foot (ft)
Volume		
liter (L)	0.2642	gallon (gal)
liter (L)	0.03531	cubic foot (ft^3)
Flow rate		
liter per second (L/s)	0.03531	cubic foot per second (ft^3/s)
liter per second (L/s)	15.85	gallon per minute (gal/min)
Mass		
gram (g)	0.03527	ounce avoirdupois (oz)
kilogram (kg)	2.205	pound avoirdupois (lb)

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Abstract

The U.S. Geological Survey (USGS) Central Colorado Assessment Project (CCAP) began in October 2003 and is planned to last through September 2008. One major goal of this project is to compare the relationships between surface-water chemistry and aquatic fauna in mined and unmined areas. To accomplish this goal, we are conducting a State-scale reconnaissance sampling program, in which we are collecting water and macroinvertebrate samples. Selected results from the first two years of project analyses are reported here. We plan to develop statistical models and use geographic information system (GIS) technology to quantify the relationships between ecological indicators of metal contamination in Rocky Mountain streams and water quality, landscape and land-use characteristics (for example, mine density, geology, geomorphology, vegetation, topography). Our research will test the hypothesis that physicochemical variables and ecological responses to metal concentrations in stream water in Rocky Mountain streams are ultimately determined largely by historical land uses.

Introduction

Ecological processes in streams may be measured at spatial scales ranging from individual substrate particles to entire landscapes. Whereas ecologists generally acknowledge the importance of landscape and land-use characteristics (for example, geology, topography, and vegetation) on the structure and function of ecosystems, the traditional research focus in stream ecology has been on small-scale studies conducted within a single watershed. To quantify the influence of landscape characteristics on ecological responses to historical mining, an understanding of the complex interplay among hydrological, geomorphologic, and habitat characteristics within a large geographic region is required. Although numerous studies have reported variation in effects of dissolved metals in water and sediment among watersheds affected by historical mining (for example, Church and others, 1993, 1994, 1995, 1997, 2000, 2004, 2006; Buxton and others, 1997; Farag and others, in press; Finger and others, 2004; Besser and others, 2006; and Kimball and others, 2002, 2004, 2006), there have been no attempts to identify landscape characteristics responsible for this variation or to quantify their effects on benthic communities.

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Project Goals and Objectives

The overall objective of the study is to provide the U.S. Department of Agriculture (USDA) Forest Service and other land-management agencies and government entities with geologic, energy, mineral resource, and hazards information to update their ten-year forest-management plans. As a part of this research, we are conducting studies of selected watersheds affected by historical mining to evaluate the environmental effects of past resource development. One of the project goals is to determine the geochemical baseline concentrations in both water and sediment from unimpaired watersheds, watersheds containing hydrothermally altered but unmined rock, and watersheds containing hydrothermally altered rock in which there has been historical mining activity. We will compare baselines observed in watersheds draining the major geologic units found throughout the Colorado Mineral Belt (CMB) with baselines observed in parallel studies of watersheds outside the CMB with similar geologic characteristics .

One product of this project will be a geochemical map of central Colorado showing (1) streams unimpaired as well as those detrimentally affected by metals and acidification, (2) stream rankings in the watersheds in terms of their overall impact on the environment, and (3) the likelihood of cost-effective restoration of affected streams based upon the evaluation of the effects of historical mining locally in the watershed. This report presents the results of analyses of water and macroinvertebrate samples collected in the first two years (2004 and 2005) of the study.

Scope of Study

The USGS is in year three of a five-year study of central Colorado. The area of study includes all of Arapahoe, Roosevelt, Pike, and San Isabel National Forests, portions of the White River and Rio Grande National Forests, and other public lands that are included within the area of these forests (that is, Bureau of Land Management (BLM) and National Wildlife Refuge (NWR) land). The project is known as the Central Colorado Assessment Project CCAP (*http://minerals.cr.usgs.gov/projects/colorado_assessment*). Sites where sampling was completed in 2004 and 2005 are shown in figure 1.

Acknowledgments

The following people assisted us in the collection of samples in the field or in the preparation of samples in the laboratory: Luke McEachron, Adam Thompson, Alicia Louie, Caitlin Balch-Burnett, Dan Scott, David Schnake, David Shaffer, Jamie Brennan, Jamie Thayer, Joe Connery, Mike Hill, Pete Cadmus, Sage Betts, Sarah Russell, Sigrid Gustafson, Therese Tepe, and Will Clements. Katharine Mitchell prepared the digestions of the macroinvertebrate samples and assisted in their identification.

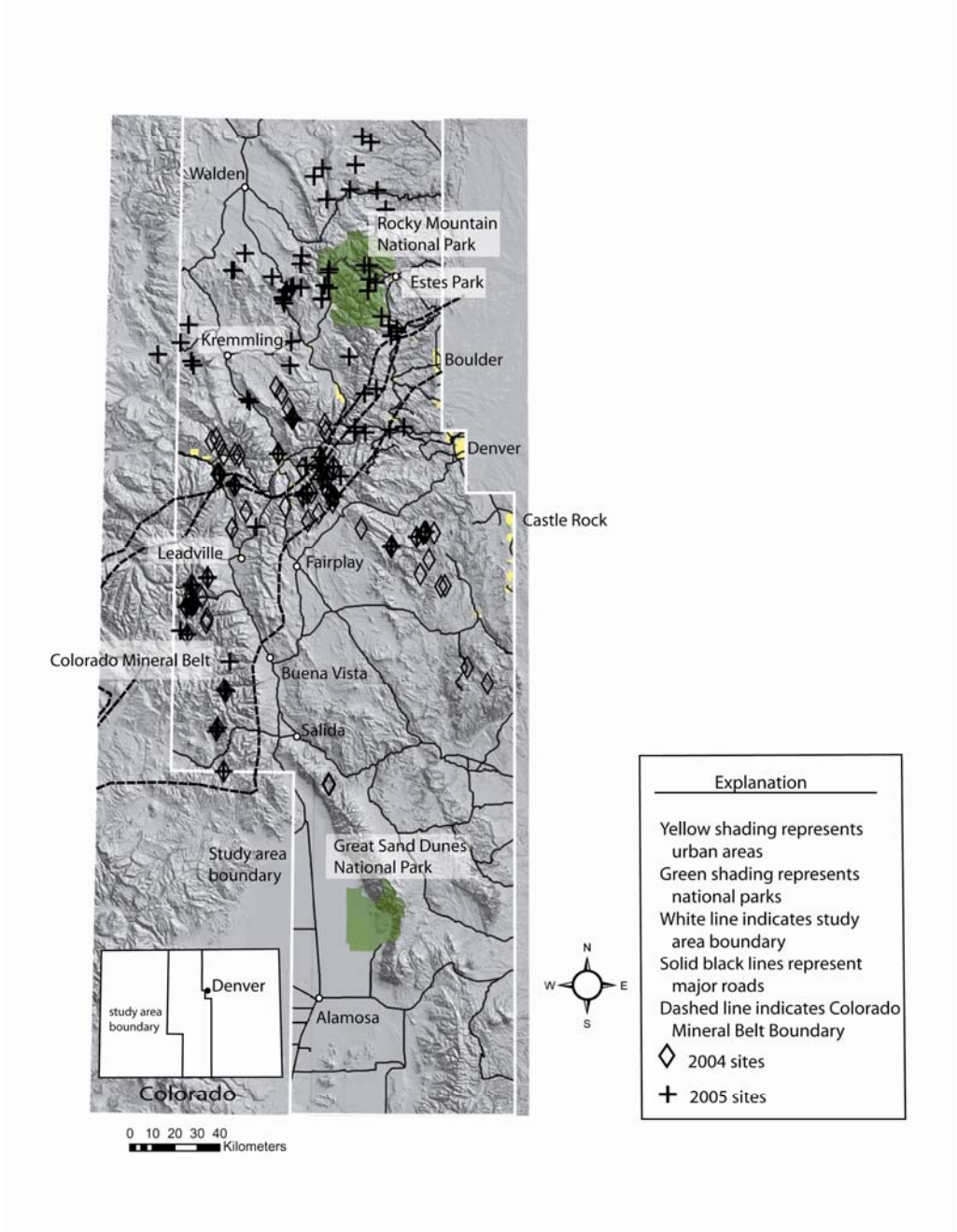

Figure 1. Map showing CCAP study area location, boundary, and sampling sites used for collections in 2004 and in 2005. The Colorado Mineral Belt runs diagonally through the study area (shown in broken line, location uncertain on west side).

Methods

Sampling Strategy

Sampling was conducted within and surrounding the eastern half of the Colorado Mineral Belt. Bedrock geologic mapping provided by other USGS personnel on the CCAP have been used to determine suitable areas for examining water quality from unimpaired stream reaches to establish geochemical baselines. Mapping of hydrothermal alteration, based on remote sensing data obtained from Airborne Visible/InfraRed Imaging Spectrometer (AVIRIS; *http://aviris.jpl.nasa.gov/html/aviris.task.html*) and Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER; http://asterweb.jpl.nasa.gov) data, was used to identify watersheds in which altered bedrock is present but mineral production was minimal. We also accessed the USGS Mineral Resources Data System (MRDS), which catalogs historical mining activity and production in the study area. (The current MRDS (http://tin.er.usgs.gov/mrds/) includes the former MAS (Mineral Availability System) and MILS (Mineral Industry Locator System)). Water quality and sediment geochemistry will be used to characterize watersheds with naturally high metal background concentrations. Areas that contain hydrothermal alteration will be visited by economic geologists and geochemists on other CCAP tasks to determine the type and extent of hydrothermal alteration. In areas where historical mining has occurred, previous work by economic geologists will be used to evaluate the extent of workings, type of mineralization, and extent of impacted areas. These data will be used to determine geochemical baseline conditions allowing the land management agencies to determine what the premining fish productivity of the stream might have been in impacted stream reaches.

Geographic information systems (GIS) were used to target sites based on geology, topography, and dominant land use and vegetation. ArcGIS 8.3 and ArcHydro 1.2 were used for all GIS modeling and for development of reach- and basin-level habitat parameters. Targeting watersheds on the basis of GIS information will ensure that a diverse regime of stream water chemistries and habitats are sampled. Sampling occurred during base flow from July through September in the summers of 2004 and 2005. Approximately half of these watersheds were also sampled for macroinvertebrates.

We used geologic maps at the 1:250,000 scale, which include predominate geology, mineral district and deposit locations, and new remote sensing AVIRIS and ASTER data descriptive of mineralized and hydrothermally altered rocks to help plan our sampling strategy. Small basins predominantly underlain by a singular geologic unit were targeted and categorized. Categories include basins that are mineralized or not mineralized, and then historically mined, actively mined, or unmined. The Colorado Vegetation Model (30 x 30 m resolution (Theobald and others 2003) was used to determine dominant vegetation type and to test previous results that suggest that this variable is a good predictor of dissolved organic matter (DOM) concentration (Prusha and others, 2004). Topographic parameters were developed from the Digital Elevation Models, with 30 x 30 m resolution, for hydrologic modeling and to provide data on basin- and reach- scale habitat.

Physiographic Parameters

Stream discharge was measured at each sample site using USGS protocols across the stream channel at 15–25 stations depending upon stream width (Rantz and others, 1982a). Discharge (L/s) was calculated using the continuity equation (Rantz and others, 1982b). To complete an estimate of local habitat, wetted perimeter (the linear measure of how much stream bottom is contacted by

water at the discharge sampling point), stream power and resistance were calculated and densiometer readings of canopy cover were collected from each point where a Hess sample was collected.

Water Samples

Samples were collected using methods described in Wilde and others (1998) to meet the requirements of the biotic ligand model (HydroQual, 2003). Routine water quality parameters (temperature, conductivity, and pH) were measured in the field using methods described in Wilde and others (1998). All water samples processed in the laboratory were filtered through a 0.45-µm cellulose nitrate filter at the site and stored at 4°C until analyzed. Water samples for dissolved organic carbon (DOC) were filtered through a 0.70-µm glass-fiber filter, acidified with concentrated hydrochloric acid, and stored in baked amber glass bottles. A Shimadzu TOC-5000A total organic carbon analyzer was used to measure DOC. Dissolved trace-metal samples were acidified with distilled nitric acid to a pH of <2 and stored in polyethylene bottles. Samples for anions were collected and stored in polyethylene bottles. Major cation (Na^+, K^+, Mg^{2+}, and Ca^{2+}) concentrations were analyzed by inductively coupled plasma-atomic emission spectrometry (ICP-AES) (Briggs, 2002), whereas trace-metal concentrations (Cu, Cd, and Zn) were analyzed by inductively coupled plasma-mass spectrometry (ICP-MS) (Lamothe and others, 2002). Major anions (Cl^-, F^-, NO_3^-, SO_4^{2-}) were measured by ion chromatography at the analytical laboratories at the USGS Geological Discipline Laboratory, Denver, Colorado (Theodorakos and others, 2002). High concentrations of SO_4^{2-} (>25 mg/L) were determined using ICP-AES. Alkalinity was determined by titration (Theodorakos, 2002).

Biological Samples

Replicate benthic macroinvertebrate samples (*n*=5) were collected from each site using a 0.1-m^2 Hess sampler (350-µm mesh net) from shallow riffle areas (<0.5 m). The Hess sampler was placed on the stream bottom and the substrate was disturbed to a depth of approximately 10 cm. Materials retained in the collection net were sieved using a 350-µm mesh sieve in the field and organisms were preserved in 80 percent ethanol. In the laboratory, samples were sorted and organisms were identified to the lowest practical taxonomic level (genus or species for most taxa; subfamily for chironomids) (Merritt and Cummings, 1996; Ward and others, 2002).

To estimate concentrations of potentially toxic metals in the benthic macroinvertebrate community, speciments of *Arctopsyche grandis* (Trichoptera: Hydropsychidae), *Drunella* sp. (Ephemeroptera: Ephemerellidae), and *Rhithrogena* sp. (Ephemeroptera: Heptageniidae) were collected at each site. These three taxa are widely distributed aquatic insects in many Rocky Mountain streams. Ten individuals were collected from riffle habitats from each site by removing them from stream substrate by hand. Organisms were placed in 50-mL vials and stored in coolers for 24–48 hrs to allow for depuration to clear gut contents. In the laboratory, organisms were removed from the 50-mL vial, and placed into an acid-washed 15-mL vial containing 5 mL of 0.01 molar Ethylenediamminetetraacetic Acid (EDTA) solution for one minute, transferred to another acid washed 15-mL vial, dried to a constant weight at 50°C, cooled to room temperature, and weighed to the nearest 0.1 mg. Individual aquatic insects were digested in closed vessels in a 10:1 mixture of ultra pure HNO_3 and H_2O_2. These digested samples were analyzed using ICP-MS (Briggs and Meier, 2002) to determine metal content of the individual invertebrates.

Sampling and Results

Accomplishments

Field sampling was completed at 97 watershed sites in the summer of 2004 and at 100 sites in the summer of 2005. About 20 percent of the 2005 sites were resampled 2004 sites. These were resampled in order to evaluate annual variation between sites. We collected sediment, water, stream characteristics data, and discharge measurements at all the sites and our collaborators at Colorado State University collected macroinvertebrates at 93 sites. The mean values of the five replicate benthic samples were used to calculate benthic macroinvertebrate community metrics in the Invertebrate Data Analysis System (IDAS) version 3.9.5 (Cuffney, 2003), and statistical analysis was undertaken to evaluate the presence of metal-tolerant species in watersheds affected by historical mining activities. Analytical results have been completed for all samples from sites collected in 2004 and 2005. Selected results from analyses of 2004 water and macroinvertebrate are reported in tables 1b and 2, and in tables 3b and 4 for 2005 samples. Field parameters for 2004 sample sites are in table 1a and for 2005 sample sites are in table 3a.

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Table 1a. Discharge, wetted perimeter, elevation, temperature, pH, and specific conductance for 2004 sample sites. A blank space means parameter was not measured or calculated for that site.

Field number	Discharge (L/s)	Wetted Perimeter (m)	Elevation (m)	Temperature (^{o}C)	pH	Specific Conductance (µS/cm)
04CO101	305	13.3	3,210	10.9	6.50	27
04CO102	75	8.4	3,270	11.0	6.40	28
04CO103	144	7.3	3,270	8.9	7.14	65
04CO104	110	9.4	3,360	9.1	3.45	227
04CO105	127	4.9	3,330	11.0	6.80	63
04CO106	122	11.4	3,210	13.2	6.92	122
04CO107	260	10.8	3,320	8.9	6.62	153
04CO108	419	13.5	3,050	10.8	4.54	217
04CO109	202	10	3,220	8.9	6.99	112
04CO110	164	8.6	3,040	7.6	6.80	95
04CO111	234	11.4	3,160	7.8	6.72	113
04CO112	128	7.7	3,350	9.0	6.40	57
04CO113	269	11.6	2,740	8.5	6.70	65
04CO114	173	10.3	2,740	10.9	6.72	32
04CO115	234	13	2,450	11.5	8.40	275
04CO116	268	9.2	3,300	8.0	7.29	82
04CO117	266	15.2	3,300	9.0	6.89	47
04CO118	112	6.6	3,190	10.2	7.20	94
04CO119	176	7.3	3,380	7.9	7.18	135
04CO120	148	10.9	3,330	12.6	7.44	89
04CO121	97	8.1	3,330	12.7	4.66	195
04CO122	294	12.4	3,330	12.7	6.04	124
04CO123	485	16.9	3,060	9.8	6.73	92
04CO124	379	11	3,130	10.6	6.92	66
04CO125	48	5.8	2,330	9.8	8.53	259
04CO126	107	14	2,350	9.4	8.47	210
04CO127	75	6.3	2,680	9.6	8.62	551
04CO128	271	15.5	2,990	8.4	7.95	110
04CO129	436	16.5	2,940	9.6	8.32	135
04CO130	265	15.6	2,900	11.3	7.42	44
04CO131	114	8.4	2,990	11.3	7.13	33
04CO132	38	4.8	2,890	12.7	7.41	57
04CO133	424	14.2	3,040	9.3	6.95	32
04CO134	419	19.5	3,030	10.5	7.12	45
04CO136			3,000	7.4	7.50	55
04CO142	69	7.5	3,340	8.6	7.46	34
04CO150	83	10.3	2,750	10.8	6.72	34
04CO160	26		2,290	10.6	7.86	125
04CO161	166	11.3	2,420	7.6	7.10	39
04CO162	3.9		2,240	11.1	8.03	210
04CO163	5.9		2,270	13.6	7.36	76
04CO165	23	6.6	3,330	7.5	3.75	390

Table 1a. *Continued.* Discharge, wetted perimeter, elevation, temperature, pH, and specific conductance for 2004 sample sites. A blank space means parameter was not measured or calculated for that site.

Field number	Discharge (L/s)	Wetted Perimeter (m)	Elevation (m)	Temperature (^{o}C)	pH	Specific Conductance (µS/cm)
04CO166	55	16	3,330	9.3	5.59	174
04CO167	57	4.5	3,200	10.7	7.17	181
04CO168	74	6.6	3,260	12.5	4.44	349
04CO169	144	16.6	3,180	11.0	4.86	240
04CO170	11	3.6	3,180	8.2	2.85	2180
04CO171	196	23.1	3,170	5.4	3.70	443
04CO173	62	6.5	3,050	6.9	7.97	100
04CO174	155	25.4	3,200	10.0	7.02	116
04CO175	272	25.6	3,180	9.9	7.62	155
04CO176	180	12.4	3,120	8.1	7.98	94
04CO177	121	8.5	3,120	6.0	7.63	125
04CO205	391	28.1	2,730	8.5	7.60	38
04CO206	242	30.8	2,730	11.6	7.47	57
04CO207	191	15.5	2,700	8.0	7.74	73
04CO208	222	12.3	2,580	10.6	7.66	71
04CO209	0.5		2,530	11.0	7.33	88
04CO210	188	19.6	2,220	10.6	7.20	44
04CO211	902	32.3	2,350	11.7	7.12	36
04CO212	93	15.6	2,790	5.4	8.00	241
04CO213	73	5.4	2,760	6.1	7.93	210
04CO214	115	6.4	2,460	10.2	8.08	250
04CO215	423	17.5	2,440	15.8	7.17	49
04CO216	27	35.3	2,960	9.6	7.88	128
04CO217	42	8.5	2,960	9.4	7.80	148
04CO218	16		2,370	14.0	7.97	127
04CO219	33	14.3	2,410	13.8	8.21	200
04CO220	160	8.8	2,260	14.0	7.73	70
04CO221	118	15.5	2,820	11.5	7.64	41
04CO222	4.8	4.9	2,840	10.5	8.50	197
04CO223	36	9.4	2,810	9.3	8.18	91
04CO224	18	7.9	2,500	11.0	8.41	183
04CO225	84		2,540	11.0	8.37	103
04CO226	73	15.1	2,600	8.8	8.08	74
04CO227	36	9.1	3,270	6.0	7.87	81
04CO228	39	7.7	3,360	6.4	3.52	253
04CO229	47	7.4	2,850	8.4	7.29	80
04CO230	16	4.1	3,100	6.4	7.59	48
04CO232	6.2	3.7	3,340	6.8	7.55	82
04CO233	51	8.3	3,100	10.9	7.59	49
04CO234	33	7.2	3,000	5.4	3.49	513

Table 1a. *Continued.* Discharge, wetted perimeter, elevation, temperature, pH, and specific conductance for 2004 sample sites. A blank space means parameter was not measured or calculated for that site.

Field number	Discharge (L/s)	Wetted Perimeter (m)	Elevation (m)	Temperature (^{o}C)	pH	Specific Conductance (µS/cm)
04CO235	34	7.4	3,140	6.8	7.37	90
04CO236	2.5		3,120	6.3	7.62	71
04CO237	18	3.5	3,410	13.5	7.63	95
04CO238	17	7.5	3,410	13.5	7.65	95
04CO239	2	2.4	3,190	7.5	7.74	53
04CO240	69		3,090	10.2	7.12	52

Table 1b. Sodium, potassium, magnesium, calcium, cadmium, copper, zinc, sulfate, nitrate, alkalinity and dissolved organic carbon for filtered water samples from 2004 sample sites. A blank space means parameter was not measured for that site.

Field Number	Na mg/L	K mg/L	Mg mg/L	Ca mg/L	Cd µg/L	Cu µg/L	Zn µg/L	SO_4^- mg/L	NO_3^- mg/L	Alkalinity mg/L $CaCO_3$	DOC mg/L
04CO101	0.60	0.34	0.58	3.2	0.03	0.84	10	3.4	<0.08	9.1	1.5
04CO102	0.48	0.20	0.44	3.7	0.03	<0.5	8.2	2.4	0.17	11.3	1.1
04CO103	0.76	0.38	2.3	8.0	<0.02	<0.5	1.9	4.2	0.46	26.1	1.2
04CO104	1.9	0.67	4.6	8.7	0.92	14	220	60	<0.08	0.0	0.94
04CO105	0.54	0.38	1.5	8.8	<0.02	<0.5	1.4	5.8	<0.08	24.1	0.63
04CO106	1.0	0.80	2.7	17	0.37	0.74	140	24	<0.08	26.1	1.7
04CO107	1.0	0.54	4.5	15	0.77	1.3	160	40	0.90	4.8	0.51
04CO108	1.6	0.78	6.0	19	7.9	78	1940	75	0.60	0.12	0.47
04CO109	3.9	0.73	2.4	12	<0.02	<0.5	5.9	14	1.8	25.3	1.2
04CO110	1.1	0.91	3.0	12	0.04	0.51	9.8	11	0.60	33.8	0.83
04CO111	0.94	0.54	1.3	17	0.02	<0.5	2.4	21	0.60	29.8	0.68
04CO112	0.23	0.42	1.1	6.9	0.03	<0.5	6.1	11	0.50	17.5	0.66
04CO113	0.81	0.36	2.0	8.7	<0.02	<0.5	2.3	2.6	0.13	29.4	1.4
04CO114	0.55	0.32	0.81	4.0	<0.02	<0.5	1.0	0.66	0.19	14.2	1.5
04CO115	1.2	0.77	10	37	<0.02	<0.5	1.5	26	0.26	128	0.97
04CO116	0.75	0.90	2.2	9.8	<0.02	<0.5	0.8	7.6	1.0	30.4	0.65
04CO117	0.45	0.21	1.4	5.3	<0.02	<0.5	2.3	4.5	0.35	12	1.1
04CO118	1.5	0.61	2.2	13	<0.02	<0.5	1.2	7.6	<0.08	37	0.71
04CO119	0.72	0.30	3.9	15	1.7	7.0	328	35	0.60	15.70	0.46
04CO120	0.85	0.43	1.6	13	<0.02	0.5	3.6	12	<0.08	29.2	1.2
04CO121	1.1	0.49	2.5	18	0.40	137	42.8	70	0.27	0.0	0.51
04CO122	0.93	0.47	2.0	16	0.18	32	19	36	0.20	6.90	0.44
04CO123	1.0	0.32	1.1	13	1.6	1.1	490	19	<0.08	20.8	2.2
04CO124	1.2	0.69	1.0	9.3	<0.02	1.0	1.1	5.1	0.12	26	2.7
04CO125	2.6	0.70	16	29	<0.02	<0.5	1.2	28	<0.08	108	0.88
04CO126	0.88	0.98	9.7	28	<0.02	<0.5	1.0	7.0	0.27	103	0.74
04CO127	1.2	1.1	38	62	<0.02	<0.5	2.4	99	<0.08	192	1.0
04CO128	1.2	0.42	1.7	16	0.02	6.8	2.8	19	<0.08	29.3	1.3
04CO129	1.3	0.41	3.0	19	0.14	4.9	31	21	<0.08	41.8	1.2
04CO130	1.6	1.1	0.51	5.2	<0.02	<0.5	5.8	4.8	0.80	9.9	1.4
04CO131	1.5	0.58	0.34	3.1	<0.02	<0.5	2.8	2.9	1.0	7.4	1.6
04CO132	2.8	1.0	1.4	5.6	<0.02	0.78	1.5	6.0	<0.08	22.4	6.3
04CO133	2.1	0.36	0.69	3.0	<0.02	0.55	2.0	4.3	<0.08	10.9	7.8
04CO134	2.6	0.48	1.0	3.9	<0.02	0.64	3.4	3.7	<0.08	15.8	9.0
04CO136	2.2	0.50	0.52	7.6	<0.02	<0.5	<0.5	2.6	<0.08	21.4	
04CO142	1.2	0.71	1.8	5.4	<0.02	<0.5	<0.5	3.1	<0.08	17.3	
04CO150	1.4	0.28	1.1	3.6	<0.02	<0.5	1.6	2.0	<0.08	16.3	2.3
04CO160	5.0	1.2	3.1	15	<0.02	<0.5	1.2	8.2	<0.08	43.6	1.6
04CO161	2.1	0.65	0.47	4.2	<0.02	<0.5	0.7	3.7	0.40	9.6	2.1
04CO162	7.4	1.4	5.7	25	<0.02	<0.5	0.8	10	<0.08	82.4	1.3
04CO163	4.4	0.68	1.6	8.9	<0.02	<0.5	2.9	6.0	<0.08	22.7	2.3

Table 1b. *Continued*. Sodium, potassium, magnesium, calcium, cadmium, copper, zinc, sulfate, nitrate, alkalinity and dissolved organic carbon for filtered water samples from 2004 sample sites. A blank space means parameter was not measured for that site.

Field Number	Na mg/L	K mg/L	Mg mg/L	Ca mg/L	Cd µg/L	Cu µg/L	Zn µg/L	SO_4^- mg/L	NO_3^- mg/L	Alkalinity mg/L $CaCO_3$	DOC mg/L
04CO169	1.5	0.80	6.2	25	0.56	424	115	100	0.70	0.0	0.41
04CO170	3.1	1.1	37	52	8.5	5570	992	1280	<0.08	0.0	0.96
04CO171	1.4	0.69	7.3	22	1.0	688	180	167	0.86	0.0	0.34
04CO173	0.94	0.63	2.5	14	<0.02	<0.5	0.60	9.2	0.90	35.2	0.48
04CO174	1.1	0.62	1.8	19	<0.02	<0.5	1.9	22	0.50	27.8	0.77
04CO175	1.6	0.80	1.6	24	0.13	1.4	14.6	49	0.57	18.2	0.76
04CO176	1.22	0.50	3.5	10	<0.02	<0.5	0.70	9.0	1.1	22.4	0.53
04CO177	1.1	0.84	5.2	16	<0.02	<0.5	0.80	11	1.5	48.0	0.47
04CO205	1.4	0.74	2.6	12	<0.02	<0.5	0.50	5.6	0.33	35.5	0.99
04CO206	1.7	0.87	2.1	9.0	<0.02	0.57	1.2	3.9	<0.08	28.5	2.2
04CO207	1.4	1.2	1.8	13	<0.02	<0.5	0.80	4.8	0.30	37.4	1.5
04CO208	1.6	1.3	1.9	14	<0.02	<0.5	1.6	5.7	<0.08	37.3	1.5
04CO209	9.2	1.2	3.0	12	<0.02	0.66	0.50	2.4	<0.08	51.3	5.6
04CO210	2.9	0.70	0.88	5.6	<0.02	<0.5	1.2	4.0	0.30	16.8	2.2
04CO211	2.6	0.73	0.83	5.2	<0.02	<0.5	0.80	3.8	0.31	13.7	4.2
04CO212	1.2	0.92	16	39	<0.02	<0.5	0.60	11	0.50	141	0.90
04CO213	1.6	0.77	7.6	45	<0.02	<0.5	0.90	5.3	0.32	124	1.1
04CO214	1.4	0.84	13.2	45	<0.02	<0.5	1.0	19	0.40	135	0.65
04CO215	0.82	0.40	1.5	7.6	<0.02	1.2	2.8	12	0.46	12.4	1.2
04CO216	1.3	0.93	9.0	23	<0.02	<0.5	1.5	12	<0.08	75.8	1.5
04CO217	1.4	0.90	9.0	23	<0.02	<0.5	0.60	12	<0.08	76.5	1.5
04CO218	5.8	3.3	2.5	21	<0.02	<0.5	1.1	17	9.5	37.4	2.6
04CO219	7.4	2.8	5.6	38	<0.02	<0.5	1.1	8.7	1.2	100	5.4
04CO220	3.8	1.4	1.4	11	<0.02	<0.5	2.3	7.6	1.9	23.8	3.0
04CO221	0.35	0.56	1.7	7.0	<0.02	<0.5	1.0	2.8	<0.08	21.1	2.2
04CO222	2.2	0.54	1.5	44	<0.02	<0.5	0.90	1.5	<0.08	121	3.9
04CO223	1.6	0.64	1.8	18	<0.02	<0.5	1.4	2.5	<0.08	53	1.4
04CO224	1.2	0.82	6.5	38	<0.02	<0.5	0.80	8.5	0.25	102	1.3
04CO225	0.80	0.56	3.8	20	<0.02	<0.5	1.2	3.6	0.34	58.8	0.84
04CO226	0.89	0.74	4.5	11	<0.02	<0.5	0.60	4.0	0.50	40.4	0.68
04CO227	0.87	0.52	2.6	14	<0.02	<0.5	2.8	13	0.61	32.2	1.5
04CO228	2.4	0.76	5.8	8.4	1.7	23	372	94	0.34	0.0	0.65
04CO229	1.8	0.79	3.0	13	<0.02	<0.5	2.4	4.6	<0.08	10.5	1.3
04CO230	1.4	0.67	2.1	6.6	<0.02	<0.5	0.80	3.1	0.50	25.7	0.81
04CO232	1.0	0.40	2.0	15	<0.02	<0.5	1.9	5.2	1.45	40.4	0.40
04CO233	1.9	0.52	1.5	8.8	<0.02	<0.5	1.5	8.5	<0.08	21.7	1.1
04CO234	4.3	2.0	7.8	9.8	1.0	208	152	199	0.20	0.0	0.62
04CO235	0.89	0.63	2.8	15	0.02	3.0	6.5	21	0.60	21.8	0.87
04CO236	0.69	0.89	2.5	12	<0.02	<0.5	3.0	7.2	0.90	32.9	0.58
04CO237	0.59	0.64	3.0	17	0.07	9.3	12.7	23	0.70	25.1	0.91

Table 1b. *Continued*. Sodium, potassium, magnesium, calcium, cadmium, copper, zinc, sulfate, nitrate, alkalinity and dissolved organic carbon for filtered water samples from 2004 sample sites. A blank space means parameter was not measured for that site.

Field Number	Na mg/L	K mg/L	Mg mg/L	Ca mg/L	Cd µg/L	Cu µg/L	Zn µg/L	SO_4^- mg/L	NO_3^- mg/L	Alkalinity mg/L $CaCO_3$	DOC mg/L
04CO238	0.55	0.57	2.8	16	0.07	9.4	13.1	22	0.70	25.1	0.97
04CO239	1.1	0.70	2.3	8.2	<0.02	<0.5	0.90	3.5	<0.08	29.5	0.77
04CO240	3.0	0.75	2.0	6.3	<0.02	0.57	<0.5	5.4	<0.08	23.2	

Table 2. Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2004 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
Blank	*0.0*	*0.2*	*0.02*	*0.45*	*0.1*	*0.8*	*45*
04CO101bug1	0.5	0.7	1,100	2,100	6.2	25	1,300
04CO101bug2	0.7	0.9	760	1,000	14	40	860
04CO101bug3	0.5	0.9	1,300	2,200	6.6	47	1,500
04CO101bug4	0.6	0.9	1,300	2,100	8.7	29	1,100
04CO101bug5	0.5	0.8	1,400	2,300	9.2	51	1,600
04CO101bug6	0.1	0.1	130	210	1.7	4.2	28
04CO101bug7	1.8	3.1	4,000	5,300	37	100	4,100
04CO101bug8	0.1	0.1	340	390	1.1	14	230
04CO101bug9	1.9	3.0	3,400	4,400	33	170	2,800
04CO102bug1	0.4	0.4	760	340	17	20	1,400
04CO102bug2	0.4	0.4	650	510	22	21	1,600
04CO102bug3	0.4	0.6	940	650	23	28	2,300
04CO102bug4	0.4	0.5	940	750	26	29	2,800
04CO102bug5	0.4	0.5	700	510	19	23	1,600
04CO102bug6	0.3	0.4	710	530	17	21	1,400
04CO102bug7	0.3	0.3	630	330	9.6	15	1,000
04CO103bug1	0.3	0.3	440	750	1.2	8.5	66
04CO103bug2	0.5	0.5	550	1,000	1.6	12	92
04CO103bug3	0.3	0.4	370	600	0.7	13	33
04CO103bug4	0.3	0.5	560	970	0.3	14	45
04CO103bug5	0.2	0.4	430	460	1.0	10	58
04CO103bug8	0.2	0.4	510	890	1.7	11	84
04CO105bug1	0.5	0.5	880	740	5.4	25	300
04CO105bug3	0.4	0.7	1,300	1,100	9.5	37	530
04CO105bug4	0.4	0.6	900	1,200	4.3	24	260
04CO105bug5	0.2	0.3	550	520	4.3	21	240
04CO105bug6	0.5	0.7	1,100	660	6.7	28	410
04CO105bug8	0.1	0.2	380	300	1.5	7.3	84
04CO105bug9	0.4	0.5	1,200	970	6.3	27	350
04CO107bug1	0.3	0.4	360	810	4.0	23	1,100
04CO107bug2	0.3	0.3	350	980	3.3	32	770
04CO107bug3	0.5	0.7	740	1,300	8.1	75	2,400
04CO107bug4	0.3	0.5	410	800	3.8	41	1,400
04CO109bug1	0.9	1.0	1,400	2,800	2.9	30	160
04CO109bug2	0.6	0.9	1,300	1,700	0.8	20	120
04CO109bug3	0.5	0.6	660	1,100	2.8	21	150
04CO109bug4	0.6	0.9	1,300	1,900	3.5	29	750

Table 2. *Continued*. Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2004 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
04CO109bug5	0.6	0.8	1,300	2,000	1.4	22	130
04CO109bug6	0.3	0.7	990	1,400	1.8	18	520
04CO109bug7	0.6	0.8	1,100	1,400	1.9	25	540
04CO109bug8	0.7	0.7	680	1,000	1.7	23	120
04CO109bug9	0.5	0.9	1,300	2,100	4.3	25	920
04CO110bug1	0.4	0.4	720	390	20	48	1,400
04CO110bug2	0.3	0.5	1,100	780	16	31	1,100
04CO110bug3	0.3	0.7	1,600	1,000	26	40	1,700
04CO110bug4	0.3	0.6	1,600	600	25	33	1,700
04CO110bug5	0.5	0.7	1,200	580	38	46	2,500
04CO110bug6	0.5	0.7	1,200	600	41	72	2,800
04CO110bug7	0.7	0.8	2,000	840	44	57	2,800
04CO110bug8	0.6	0.6	1,200	520	24	46	1,800
04CO110bug9	0.6	0.5	1,100	640	24	35	1,600
04CO111bug1	0.1	0.1	300	250	1.7	6.7	130
04CO111bug2	0.4	0.6	910	550	12	23	700
04CO111bug3	0.5	0.7	1,600	1,100	23	42	1,500
04CO111bug4	0.3	0.4	810	600	12	25	830
04CO111bug5	0.5	0.7	1,400	1,000	9.3	30	580
04CO111bug6	0.5	0.5	770	610	7.3	27	430
04CO111bug7	0.5	0.8	1,500	940	13	39	760
04CO111bug8	0.4	0.8	1,700	850	10	28	650
04CO111bug9	0.3	0.4	820	670	5.9	23	380
04CO112bug1	0.4	0.5	740	1,100	12	19	510
04CO112bug2	0.3	0.4	600	900	8.2	11	390
04CO112bug3	0.2	0.3	460	690	4.5	11	250
04CO112bug4	0.3	0.5	630	990	11	21	500
04CO112bug6	0.3	0.4	510	780	7.3	17	300
04CO112bug8	0.4	0.6	1,000	1,800	14	25	600
04CO112bug9	0.3	0.5	630	1,300	14	20	620
04CO113bug1	0.4	0.9	790	370	0.6	15	180
04CO113bug2	0.6	1.0	840	350	0.7	13	160
04CO113bug3	0.4	0.7	1,500	1,000	7.7	34	440
04CO116bug7	0.7	0.9	1,300	2,100	1.6	16	110
04CO116bug8	0.5	0.9	1,100	1,600	2.4	19	130
04CO116bug9	0.4	0.7	650	1,000	1.9	20	120
04CO117bug1	0.3	0.4	830	680	1.9	15	93

Table 2. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2004 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
04CO117bug2	0.4	0.7	1,600	1,000	3.9	28	260
04CO117bug3	0.5	0.7	1,400	1,400	4.3	28	240
04CO117bug4	0.6	0.7	1,300	920	3.9	29	210
04CO117bug5	0.4	0.7	1,200	740	3.5	23	180
04CO117bug6	0.4	0.8	2,000	1,100	5.4	31	310
04CO117bug7	0.3	0.6	860	900	3.4	17	190
04CO117bug8	0.4	0.4	630	580	3.1	14	170
04CO117bug9	0.4	0.6	820	770	4.1	21	230
04CO118bug1	0.6	1.0	1,600	2,400	3.2	25	170
04CO118bug2	0.8	0.9	1,500	2,100	1.1	29	150
04CO118bug3	0.4	0.8	1,200	1,700	1.9	20	120
04CO118bug4	0.5	1.1	1,700	2,300	3.7	30	180
04CO118bug5	0.8	1.0	1,100	1,900	2.1	34	88
04CO118bug6	0.5	0.9	1,400	2,100	1.3	18	100
04CO118bug7	0.2	0.4	480	640	1.4	11	73
04CO118bug8	0.4	0.8	1,100	1,800	2.3	23	150
04CO118bug9	0.7	0.8	1,300	2,600	1.6	34	86
04CO119bug1	0.5	0.8	800	1,600	25	320	3,900
04CO119bug2	0.3	0.5	420	790	17	130	1,800
04CO119bug3	0.5	0.6	740	1,800	31	250	3,700
04CO119bug4	0.8	0.8	960	1,400	19	140	1,900
04CO119bug5	0.6	0.8	910	1,900	29	340	2,700
04CO119bug6	0.2	0.3	270	320	6.9	130	810
04CO119bug7	0.7	0.7	1,000	1,600	17	100	520
04CO119bug8	0.5	0.7	810	1,300	22	140	2,100
04CO119bug9	0.6	0.6	610	1,500	27	270	2,700
04CO120bug1	0.3	0.6	810	400	3.9	20	280
04CO120bug2	0.6	0.8	1,100	590	13	43	1,400
04CO120bug3	0.5	0.7	1,800	950	5.5	17	800
04CO120bug4	0.3	0.6	1,600	830	8.6	29	950
04CO120bug5	0.4	0.6	660	420	6.3	34	550
04CO120bug6	0.5	0.7	1,600	880	2.9	20	400
04CO120bug7	0.4	0.9	1,200	710	11	30	1,100
04CO120bug8	0.3	0.3	760	470	4.3	21	530
04CO120bug9	0.4	0.6	870	550	8.7	22	850
04CO123bug1	0.3	0.4	760	590	9.7	79	2,600
04CO123bug2	0.3	0.4	1,000	500	11	60	3,300
04CO123bug3	0.4	0.6	1,700	840	16	71	4,100
04CO123bug4	0.3	0.5	1,000	620	12	46	2,300

Table 2. *Continued*. Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2004 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
04CO123bug5	0.2	0.4	1,100	450	18	51	3,500
04CO123bug6	0.4	0.4	780	570	10	39	2,200
04CO123bug7	0.4	0.6	1,300	600	15	57	3,900
04CO123bug8	0.4	0.7	1,800	1,100	12	70	2,800
04CO123bug9	0.3	0.6	1,500	650	11	45	2,500
04CO124bug1	0.1	0.2	210	230	0.8	9.0	32
04CO124bug2	0.5	0.8	1,800	920	1.2	20	150
04CO124bug3	0.2	0.3	850	560	7.0	35	490
04CO124bug4	0.3	0.7	1,600	730	3.9	38	480
04CO124bug5	0.2	0.4	650	640	1.6	22	180
04CO124bug6	0.1	0.2	320	39	0.5	8.8	62
04CO124bug7	0.2	0.4	640	570	2.4	32	190
04CO124bug8	0.1	0.2	200	71	0.5	9.1	59
04CO124bug9	0.6	1.1	1,600	760	11	67	960
04CO125bug1	0.4	0.6	1,200	850	2.3	31	310
04CO125bug2	0.2	0.4	780	470	1.1	22	180
04CO125bug3	0.3	0.6	860	520	2.3	30	380
04CO125bug4	0.3	0.4	1,100	790	1.8	28	290
04CO125bug5	0.2	0.3	540	270	0.8	14	150
04CO125bug6	0.4	0.5	1,000	830	3.0	37	360
04CO125bug7	0.3	0.5	630	460	1.7	22	270
04CO125bug9	0.4	0.8	1,800	930	3.2	46	430
04CO126bug1	0.2	0.3	340	460	2.0	19	200
04CO126bug2	0.6	1.0	2,300	1,100	0.6	20	160
04CO126bug3	0.4	0.6	950	540	3.1	29	400
04CO126bug4	0.4	0.8	1,700	880	4.5	31	500
04CO126bug5	0.6	1.0	2,300	1,000	3.8	36	400
04CO126bug6	0.4	0.9	2,000	880	5.1	46	540
04CO126bug7	0.3	0.4	790	590	3.0	23	280
04CO126bug9	1.0	1.5	1,600	1,200	8.0	80	940
04CO128bug1	0.5	0.8	880	570	6.0	130	790
04CO128bug2	0.3	0.8	1,700	940	6.3	150	680
04CO128bug3	0.5	0.9	2,100	830	5.0	120	640
04CO128bug4	0.5	0.7	1,700	850	0.4	58	120
04CO128bug5	0.4	0.8	1,700	1,100	6.2	180	680
04CO128bug6	0.3	0.7	900	400	4.9	120	570
04CO128bug7	0.5	0.7	750	520	3.4	110	420

Table 2. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2004 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
04CO128bug8	0.5	0.7	1,500	800	0.8	48	160
04CO128bug9	0.5	0.9	1,900	1,000	7.4	160	820
04CO129bug1	0.3	0.7	1,800	720	7.5	83	1,700
04CO129bug2	0.5	0.9	1,800	890	5.5	65	970
04CO129bug3	0.5	0.5	1,300	1,400	10	77	1,500
04CO129bug4	0.3	0.8	1,900	920	9.7	92	2,200
04CO129bug5	0.4	0.9	2,000	880	6.7	52	1,600
04CO129bug6	0.2	0.4	1,600	1,100	8.0	80	1,800
04CO129bug7	0.4	0.7	1,100	520	13	87	2,600
04CO129bug8	0.4	0.9	1,900	810	9.2	77	1,800
04CO130bug1	0.4	0.9	760	310	0.2	17	170
04CO130bug2	0.5	1.1	840	380	0.2	16	190
04CO130bug3	0.6	1.3	1,000	450	0.5	19	260
04CO130bug4	0.3	0.8	650	280	0.1	12	150
04CO130bug5	0.4	0.8	680	270	0.1	17	150
04CO130bug6	0.3	0.4	350	140	0.0	3.1	55
04CO130bug7	0.4	0.9	730	290	0.1	14	150
04CO130bug8	0.4	0.9	770	290	0.1	14	150
04CO130bug9	0.5	0.9	890	380	0.1	11	180
04CO136bug1	0.0	0.3	450	620	0.5	8.6	23
04CO136bug2	0.1	0.2	130	130	0.3	4.0	5
04CO136bug3	0.2	0.4	470	560	0.4	7.4	20
04CO136bug5	0.1	0.2	260	290	0.3	2.9	9
04CO136bug6	0.2	0.3	250	320	0.5	5.7	21
04CO136bug7	0.2	0.3	400	510	0.3	6.1	25
04CO136bug8	0.1	0.2	380	420	0.5	6.2	15
04CO136bug9	0.2	0.3	420	450	0.3	5.8	10
04CO140bug1	0.4	0.9	790	350	0.3	15	130
04CO140bug2	0.4	0.9	900	270	0.8	16	150
04CO140bug3	0.4	1.1	900	180	0.3	9.6	110
04CO140bug4	0.5	1.0	910	310	1.7	20	160
04CO140bug5	0.6	1.0	1,000	290	0.7	15	160
04CO140bug6	0.6	1.2	1,100	320	1.0	17	150
04CO140bug7	0.4	0.8	820	280	0.6	12	110
04CO140bug8	0.5	1.0	1,000	400	3.0	25	180
04CO140bug9	0.6	1.2	1,000	360	3.3	29	200

Table 2. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2004 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
04CO142bug1	0.4	0.7	700	270	0.2	9.6	120
04CO142bug3	0.5	0.9	900	310	0.2	11	160
04CO142bug4	0.4	0.7	660	220	0.0	12	100
04CO142bug5	0.5	0.8	810	300	0.2	11	150
04CO142bug6	0.5	0.8	950	310	0.1	13	140
04CO142bug7	0.3	0.5	600	210	0.1	11	92
04CO142bug8	0.7	1.0	1,100	510	0.5	15	180
04CO142bug9	0.5	0.9	880	310	0.1	11	160
04CO161bug1	0.5	0.9	750	320	0.6	9.9	130
04CO161bug2	0.4	0.9	800	540	0.2	9.1	140
04CO161bug3	0.6	1.1	960	650	0.6	14	210
04CO161bug4	0.6	1.1	950	470	0.4	13	190
04CO161bug5	0.5	0.9	770	310	0.3	15	160
04CO161bug6	0.4	0.7	660	260	0.2	9.4	130
04CO161bug7	0.4	0.7	680	230	0.2	8.2	120
04CO161bug8	0.1	0.2	140	130	0.1	1.6	27
04CO161bug9	0.4	0.9	700	310	0.2	10	130
04CO174bug1	0.7	0.8	820	340	0.5	10	110
04CO174bug2	0.7	1.1	930	410	0.7	15	180
04CO174bug3	0.5	1.0	790	280	0.5	13	150
04CO174bug4	1.7	3.4	2,700	1,300	3.3	55	580
04CO174bug5	0.5	0.9	770	280	0.6	11	150
04CO174bug6	0.6	1.3	1,000	410	1.3	18	250
04CO174bug7	0.1	0.1	75	17	0.0	0.9	11
04CO174bug8	0.5	0.8	720	1,000	0.6	12	140
04CO174bug9	0.8	0.9	890	420	0.6	12	150
04CO175bug1	0.6	1.0	870	320	0.9	16	140
04CO175bug2	0.4	1.0	740	420	1.0	20	190
04CO175bug3	0.7	1.3	1,000	540	2.9	32	250
04CO175bug4	0.5	1.1	850	320	2.2	24	210
04CO175bug5	0.5	0.9	730	260	1.7	20	160
04CO175bug6	0.4	1.0	790	240	0.8	13	150
04CO175bug7	0.6	0.9	680	360	1.2	22	160
04CO175bug8	0.8	1.2	980	510	1.0	20	180
04CO176bug1	0.4	0.9	720	280	0.4	17	150
04CO176bug2	0.5	0.9	780	240	0.3	13	160
04CO176bug3	0.4	0.8	660	380	0.4	13	130
04CO176bug4	0.5	1.1	950	280	0.4	16	170
04CO176bug5	0.4	0.9	680	190	1.3	21	160

Table 2. *Continued*. Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2004 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
04CO176bug6	0.3	0.4	460	130	0.1	5.5	60
04CO176bug7	0.8	1.8	1,500	560	1.9	30	280
04CO176bug8	0.4	1.0	700	210	1.1	20	180
04CO177bug1	0.6	1.0	1,100	430	5.3	21	220
04CO177bug2	0.4	0.6	650	180	2.0	13	100
04CO177bug3	0.6	1.0	860	270	4.2	22	210
04CO177bug4	0.2	0.5	440	69	1.5	7.7	73
04CO177bug5	0.5	1.1	960	290	8.5	32	280
04CO177bug6	0.3	0.6	660	190	2.6	13	120
04CO177bug7	0.9	1.3	1,400	440	0.6	17	190
04CO177bug8	0.5	0.9	890	310	3.5	18	150
04CO177bug9	0.5	1.2	1,000	390	7.6	29	300
04CO210bug1	0.2	0.5	520	190	0.1	4.9	96
04CO210bug2	0.2	0.4	410	130	0.1	4.9	74
04CO210bug4	0.1	0.3	270	150	0.0	2.7	49
04CO210bug5	0.2	0.3	290	99	0.1	2.8	58
04CO210bug6	0.6	0.9	830	370	0.4	12	150
04CO210bug7	0.4	0.8	890	340	0.3	11	150
04CO210bug8	0.3	0.7	680	320	0.1	7.5	140
04CO210bug9	0.2	0.5	550	170	0.1	4.3	79
04CO212bug1	0.4	0.8	910	320	0.5	16	150
04CO212bug2	0.4	0.7	820	310	0.4	19	130
04CO212bug3	0.5	0.8	960	790	0.4	20	160
04CO212bug4	0.2	0.4	540	190	0.1	9.6	72
04CO212bug5	0.4	0.8	900	3,200	0.4	16	140
04CO212bug6	0.9	1.6	1,400	970	0.9	26	270
04CO212bug7	0.5	1.1	1,200	640	0.4	21	180
04CO212bug9	0.4	0.7	820	880	0.3	16	150
04CO213bug1	0.6	0.9	930	500	0.1	8.9	120
04CO213bug2	0.6	1.0	920	410	0.8	19	190
04CO213bug3	0.6	1.4	1,100	350	0.4	11	150
04CO213bug4	0.5	0.9	910	550	0.6	14	170
04CO213bug5	0.6	1.0	880	380	0.9	19	190
04CO213bug6	0.3	0.9	680	210	0.1	6.2	81
04CO213bug7	0.6	1.0	890	410	0.5	15	180
04CO213bug8	0.9	1.5	1,400	910	0.5	21	230
04CO213bug9	0.5	1.0	790	330	0.3	14	150
04CO216bug1	0.5	0.9	820	350	1.0	17	180

Table 2. *Continued*. Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations in 2004 invertebrate samples.

Sample No.	Na percent	K percent	Mg μg/g	Ca μg/g	Cd μg/g	Cu μg/g	Zn μg/g
04CO216bug2	0.5	1.0	880	360	0.5	14	160
04CO216bug3	0.4	0.7	660	230	0.2	9.9	120
04CO216bug4	0.6	1.1	950	420	0.9	18	210
04CO216bug5	0.5	0.9	820	580	0.5	16	170
04CO216bug6	0.6	1.0	920	420	0.7	17	180
04CO216bug7	0.6	1.2	950	450	1.0	18	190
04CO216bug8	0.1	0.3	260	110	0.1	4.1	43
04CO216bug9	0.5	1.0	900	320	0.9	17	180
04CO233bug1	0.3	0.6	560	230	0.4	7.1	130
04CO233bug2	0.3	0.8	860	410	0.5	10	170
04CO233bug3	0.5	0.9	880	330	0.2	13	190
04CO233bug4	0.4	0.9	780	290	1.1	13	260
04CO233bug5	0.4	0.8	1,000	530	0.9	10	210
04CO233bug6	0.3	0.7	680	250	0.4	8.3	170
04CO233bug7	0.3	0.7	630	250	0.4	9.0	150
04CO233bug8	0.3	0.5	490	160	0.4	6.4	120
04CO233bug9	0.3	0.7	710	280	0.2	8.0	190

Table 3a. Discharge, wetted perimeter, elevation, temperature, pH, and specific conductance for 2005 sample sites. A blank space means parameter was not measured or calculated for that site.

Field Number	Discharge (L/s)	Wetted Perimeter (m)	Elevation (m)	Temperature (^{o}C)	pH	Specific Conductance (µS/cm)
05CO101	5.3		2,450	10.6	6.56	187
05CO102	2.1		2,450	15.8	7.71	297
05CO103	37	3.3	2,740	17.8	7.76	77
05CO104	9.6	2.5	2,820	11.9	7.42	36
05CO105	9.2	1.6	2,600	17.0	7.72	137
05CO106	192	13.8	2,880	10.1	7.47	58
05CO107	143	4.4	2,910	9.5	7.57	85
05CO108	86	11.6	2,640	14.4	7.34	84
05CO109	2.8	1.4	2,600	18.4	7.10	143
05CO110	44	5.5	2,650	13.2	6.74	85
05CO111	24	40.5	2,400	12.7	7.39	129
05CO112	112	8.8	3,000	15.8	7.45	25
05CO113	213	7.8	2,610	4.7	7.00	27
05CO114	484	10.5	2,800	4.6	6.84	39
05CO115	338	10.6	2,880	8.6	7.02	27
05CO116	0.2		2,480	21	3.04	3,002
05CO117	0.9		2,270	24.1	6.14	710
05CO118	179	12.7	2,910	8.5	5.77	19
05CO119	511	14.5	2,910	8.0	6.36	40
05CO120	212	11	2,800	10.0	6.43	27
05CO121	60	4.2	2,560	11.6	6.11	43
05CO122	13	4.4	2,760	11.0	5.84	35
05CO123	22	5.3	2,800	13.2	6.38	98
05CO124	2.7	1.9	2,730	9.0	5.97	94
05CO125	9		2,710	8.5	5.05	77
05CO126	7.1	2.5	2,700	14.2	6.39	112
05CO127	100	10.4	2,690	16.9	6.43	92
05CO128	10	4.1	2,650	19.5	6.61	110
05CO129	36	4.7	2,630	15.1	6.93	68
05CO130	17	4	2,630	10.8	6.99	83
05CO131	41	6.5	2,930	7.2	6.69	140
05CO132	228	11.8	2,960	9.5	7.20	73
05CO133	387	11.8	2,860	10.7	7.24	75
05CO134	15	3.5	2,610	10.1	7.28	45
05CO135	26	5.7	2,520	13.5	7.58	38
05CO136	335	7.6	2,340	11.1	7.71	44
05CO137	68	7.6	2,800	5.4	5.70	37
05CO138	29	6.1	2,590	13.3	6.40	100
05CO139	17	5.6	2,590	16.1	6.70	102
05CO140	281	12.3	3,110	8.7	5.4	70
05CO141	289	19.1	3,060	11.5	6.1	108
05CO142	148	10.1	3,300	8.8	6.4	80

Table 3a. *Continued*. Discharge, wetted perimeter, elevation, temperature, pH, and specific conductance for 2005 sample sites. A blank space means parameter was not measured or calculated for that site.

Field Number	Discharge (L/s)	Wetted Perimeter (m)	Elevation (m)	Temperature (^{o}C)	pH	Specific Conductance (µS/cm)
05CO143	271	12.3	3,300	10.9	6.7	48
05CO144	87	7.3	3,330	9.4	4.2	235
05CO145	592	21.2	3,180	10.4	5.1	173
05CO146	580	19.8	3,120	7	6.2	80
05CO147	225	13.3	3,130	5.7	6.8	111
05CO148	119	8.8	2,770	8.9	8.0	243
05CO149	159	8.8	2,790	7.3	8.0	276
05CO150	212	15.4	2,450	11.1	8.2	287
05CO151	202	10.1	3,160	6	5.9	122
05CO152	243	10.9	3,040	8.6	6.6	94
05CO153	108	10.7	3,330	12.3	7.1	76
05CO154	109	12	3,360	10.1	3.5	245
05CO155	552	13.7	3,050	10.2	5.0	191
05CO156	101	10	3,220	9.5	6.1	139
05CO157	133	9.9	2,420	8.8	6.6	39
05CO158	230	16.1	2,230	11.2	6.6	56
05CO159	88	13	3,040	10.7	7.4	49
05CO160	76	6.3	3,030	11.2	7.5	40
05CO161	194	21	3,220	12.4	8.1	144
05CO162	198	16.3	3,270	12.7	6.9	98
05CO163	200	10	3,320	5.3	6.0	171
05CO164	735	33.1	3,000	9.3	5.6	189
05CO165	1128		2,830	10.4	5.7	153
05CO166	93	11.1	2,740	10	6.5	36
05CO167	316	23.8	2,730	13.1	6.5	63
05CO168	761	29	2,730	11.6	6.8	82
05CO201			3,030	10.3	7.59	49
05CO202	65	11	3,030	18.4	7.22	42
05CO203	398	33.7	2,990	16.4	7.42	64
05CO204	102	8	2,680	8.7	8.3	542
05CO205	355	22.1	2,990	9.6	7.8	100
05CO206	442	17.8	2,910	11.1	8.13	128
05CO207	51	13.9	3,140	0.7	6.89	107
05CO208	45	7.6	3,090	1.7	3.19	621
05CO209	95 (est.)	3.5	3,140	4.4	3.39	492
05CO210			2,650	7.3	6.63	31
05CO211	100	9.5	2,790	5.9	6.62	13
05CO212	190	19.7	2,800	5.9	6.51	13
05CO213	70 (est.)		2,550	6.7	6.56	28
05CO214	340 (est.)		2,550	8.8	6.55	17
05CO215	100 (est.)		2,640	7.2	6.7	27
05CO216	280 (est.)		2,650	11.5	6.65	20

Table 3a. *Continued*. Discharge, wetted perimeter, elevation, temperature, pH, and specific conductance for 2005 sample sites. A blank space means parameter was not measured or calculated for that site.

Field Number	Discharge (L/s)	Wetted Perimeter (m)	Elevation (m)	Temperature (^{o}C)	pH	Specific Conductance (µS/cm)
05CO218			2,660	6.5	6.83	24
05CO219	154	22.4	2,710	9.2	6.65	30
05CO220	2		2,560	11.3	6.6	168
05CO221	11 (est.)		2,300	9.3	7.39	88
05CO222	218	25.2	2,640	7.6	7.43	41
05CO223	18		2,700	8.9	6.75	70
05CO224	21	6.6	2,750	2.8	6.55	90
05CO225	71		2,750	2.8	6.91	41
05CO226	74	9.9	2,750	4.6	6.54	86
05CO227	67	9.1	2,680	6.4	7.02	25
05CO228	17	6.2	2,770	8.5	6.83	48
05CO229	11 (est.)		2,800	5.8	7.17	38
05CO230	20	12.7	3,080	10.4	7.1	38
05CO231	460	58.6	2,650	6.2	6.64	22
05CO232	<3		2,620	7.4	6.64	35
05CO233	<<3		2,570	7	7.04	46
05CO235	334	27.5	2,600	7.5	6.93	38
05CO236	69	10.4	2,870	6.1	6.96	75
05CO237	27	9	2,860	9.1	7.29	25

Table 3b. Sodium, potassium, magnesium, calcium, cadmium, copper, zinc, sulfate, nitrate, alkalinity and dissolved organic carbon for filtered water samples from 2005 sample sites. A blank space means parameter was not measured for that site.

Field Number	Na mg/L	K mg/L	Mg mg/L	Ca mg/L	Cd µg/L	Cu µg/L	Zn µg/L	SO_4^- mg/L	NO_3^- mg/L	Alkalinity mg/L CaCo3	DOC mg/L
05CO-101	4.6	1.7	5.9	23	<0.02	<0.5	<0.5	15.4	<0.08	75.4	1.8
05CO-102	7.9	1.5	11	35	<0.02	0.54	0.7	26	<0.08	111	2.9
05CO-103	3.4	0.59	2.2	9.9	<0.02	<0.5	1.0	2.7	<0.08	35.9	5.1
05CO-104	2.3	0.5	0.84	4.2	<0.02	<0.5	2.0	2.1	<0.08	16.9	3.9
05CO-105	3.8	0.97	4.6	16	<0.02	<0.5	0.6	2.4	<0.08	63.6	3.8
05CO-106	1.8	1.8	1.6	6.4	<0.02	<0.5	0.7	2.5	<0.08	25.7	2.8
05CO-107	1.9	1.8	2.7	9.7	<0.02	<0.5	0.5	3.8	<0.08	36.4	2.5
05CO-108	2.8	1.9	2.0	8.9	0.02	0.74	18	3.5	0.20	36.7	5.8
05CO-109	4.4	1.0	4.9	16	<0.02	<0.5	1.6	1.8	0.20	69.3	5.5
05CO-110	3.6	0.6	1.5	11	<0.02	<0.5	2.4	5.0	<0.08	36.4	3.3
05CO-111	5.8	0.5	2.8	15	<0.02	<0.5	1.8	8.6	0.23	51.3	3.1
05CO-112	0.8	0.32	0.92	2.7	<0.02	0.58	1.8	2.0	0.30	11.4	2.3
05CO-113	1.2	0.4	0.67	2.8	<0.02	<0.5	3.0	3.0	0.60	10.6	1.5
05CO-114	1.3	0.41	1.4	3.8	0.06	<0.5	11	3.0	0.50	16.2	1.7
05CO-115	0.99	0.32	0.99	2.4	<0.02	<0.5	2.1	3.0	0.40	11.3	1.6
05CO-116	19	3.1	113	261	507	12300	107000	1920	5.4	0.0	2.2
05CO-117	26	8.0	21.9	68	1.4	11	263	273	<0.08	30.5	2.1
05CO-118	0.41	0.24	0.66	2.1	<0.02	<0.5	0.60	2.0	0.40	8.9	2.1
05CO-119	0.98	0.52	1.7	4.0	<0.02	<0.5	1.0	5.0	0.40	14.5	1.7
05CO-120	1.4	0.39	0.68	2.7	<0.02	<0.5	1.4	3.0	<0.08	10.7	2.0
05CO-121	2.2	0.81	1.1	4.4	<0.02	<0.5	1.3	2.4	<0.08	19.0	3.8
05CO-122	2.1	0.55	0.9	3.4	<0.02	<0.5	1.8	2.4	<0.08	15.1	3.1
05CO-123	3.7	0.38	2.7	12	<0.02	<0.5	0.9	5.0	<0.08	42.6	2.3
05CO-124	4.4	0.79	3.6	8.1	<0.02	<0.5	0.6	5.0	<0.08	40.8	3.3
05CO-125	4.4	0.58	3.1	5.8	<0.02	<0.5	0.8	4.0	<0.08	33.8	3.4
05CO-126	5.8	1.1	4.0	10	<0.02	<0.5	1.1	6.0	<0.08	48.5	3.6
05CO-127	2.9	0.67	1.9	12	<0.02	<0.5	3.2	14.7	<0.08	25.3	2.1
05CO-128	4.8	0.45	2.3	14	<0.02	<0.5	1.2	4.0	0.60	48.2	3.5
05CO-129	3.2	0.53	1.6	7.2	<0.02	<0.5	0.70	4.2	<0.08	29.2	2.5
05CO-130	3.8	0.57	1.8	9.4	<0.02	<0.5	<0.5	7.0	<0.08	32.3	3.4
05CO-131	1.6	0.58	2.9	19	<0.02	<0.5	1.9	18	0.30	34.5	4.0
05CO-132	0.84	0.55	2.4	9.1	0.02	0.5	1.6	6.4	0.50	26.4	8.1
05CO-133	1.3	0.54	1.9	9.6	0.05	0.69	7.2	14	0.70	15.8	
05CO-134	2.2	0.46	1.2	4.3	<0.02	<0.5	0.90	2.5	0.60	20.0	
05CO-135	1.9	0.53	0.93	4.1	<0.02	0.60	2.9	2.0	<0.08	17.7	4.4
05CO-136	2.6	0.58	1.2	4.0	<0.02	<0.5	0.90	2.7	<0.08	19.2	2.5
05CO-137	2.1	0.37	1.1	3.1	<0.02	<0.5	0.50	2.6	0.30	16.1	2.0
05CO-138	4.0	0.61	3.8	12	<0.02	0.74	1.4	3.0	<0.08	46.2	7.9
05CO-139	3.6	0.78	3.7	11	<0.02	0.82	1.2	4.0	0.20	44	6.2
05CO-140	1.5	0.56	1.2	10	<0.02	0.77	0.60	6.1	0.30	26.8	2.4
05CO-141	1.4	0.33	1.4	16	3.0	1.1	922	24	0.20	21.9	5.3

Table 3b. *Continued*. Sodium, potassium, magnesium, calcium, cadmium, copper, zinc, sulfate, nitrate, alkalinity and dissolved organic carbon for filtered water samples from 2005 sample sites. A blank space means parameter was not measured for that site.

Field Number	Na mg/L	K mg/L	Mg mg/L	Ca mg/L	Cd µg/L	Cu µg/L	Zn µg/L	SO_4^- mg/L	NO_3^- mg/L	Alkalinity mg/L CaCo3	DOC mg/L
05CO-142	0.80	0.85	2.4	11	<0.02	<0.5	0.60	7.0	0.80	30.7	1.3
05CO-143	0.99	0.32	1.6	6.4	<0.02	1.7	3.2	6.6	0.50	17.7	1.6
05CO-144	1.3	0.49	2.8	19	0.47	162	47.4	83	0.40	0.0	0.93
05CO-145	1.1	0.51	4.3	16	0.54	227	109	68	0.40	0.4	1.0
05CO-146	0.76	0.40	3.3	9.0	<0.02	<0.5	0.80	7.1	0.80	31.0	1.2
05CO-147	1.2	0.68	4.6	14	<0.02	<0.5	<0.5	7.0	15	44.1	1.1
05CO-148	1.5	0.70	6.7	37	<0.02	<0.5	1.9	5.0	0.25	118	1.8
05CO-149	1.2	0.87	15	34	<0.02	<0.5	<0.5	6.6	0.50	128	1.6
05CO-150	1.3	0.74	12.2	39	<0.02	<0.5	0.50	17	0.35	127	1.6
05CO-151	1.2	0.49	1.5	20	0.02	<0.5	2.2	19	0.50	0.0	1.5
05CO-152	1.3	0.87	3.2	12	0.04	0.52	8.8	11	0.70	31.9	1.5
05CO-153	0.82	0.38	1.9	10	<0.02	<0.5	0.90	2.0	0.20	27.8	2.1
05CO-154	2.1	0.48	5.0	7.8	1.0	18	270	67	0.20	0.0	1.2
05CO-155	1.7	0.71	5.4	19	6.7	76	1580	70	0.45	0.9	1.2
05CO-156	7.7	1.0	2.8	14	<0.02	0.57	4.0	14	2.8	28.8	1.7
05CO-157	2.3	0.61	0.5	4.1	<0.02	<0.5	0.90	3.5	0.40	10.6	2.2
05CO-158	2.9	0.81	0.91	6.4	<0.02	<0.5	1.0	4.3	0.40	15.9	3.4
05CO-159	3.1	0.77	1.2	4.6	<0.02	<0.5	0.50	3.6	<0.08	19.2	4.8
05CO-160	2.5	0.45	0.95	3.8	<0.02	<0.5	0.80	3.0	<0.08	15.6	5.1
05CO-161	1.3	0.57	3.1	19	0.64	5.8	94	45	0.40	7.1	1.5
05CO-162	1.2	0.3	3.1	13	0.04	0.61	8.6	12	0.70	29.6	1.7
05CO-163	1.2	0.62	5.6	18	1.0	0.89	251	58	11.7	6.3	1.3
05CO-164	2.1	0.73	5.3	20	4.6	43	1160	67	0.30	1.7	1.4
05CO-165	2.4	0.85	4.1	17	2.4	6.7	617	44	0.50	12.5	1.4
05CO-166	1.0	0.36	1.0	4.9	<0.02	<0.5	2.2	2.5	0.50	15.2	1.4
05CO-167	1.9	0.70	2.0	8.3	<0.02	<0.5	1.3	4.4	0.20	26.4	2.0
05CO-168	1.7	0.85	2.7	12	<0.02	<0.5	0.50	7.7	0.25	32.5	1.7
05CO-201	1.3	0.62	0.98	6.9	<0.02	<0.5	1.7	2.8	0.30	21.6	3.9
05CO-202	2.1	0.51	0.42	7.0	<0.02	<0.5	5.6	3.0	<0.08	20.8	2.3
05CO-203	1.0	0.37	0.60	11	<0.02	<0.5	1.8	6.3	0.33	25.2	2.2
05CO-204	1.6	1.1	37.3	60	<0.02	0.5	0.70	113	<0.08	183	2.2
05CO-205	1.5	0.56	1.7	16	0.02	6.7	2.8	16.7	0.20	28.5	2.1
05CO-206	1.5	0.50	2.9	18	0.24	4.5	49.9	19.3	<0.08	39.6	2.2
05CO-207	1.3	0.65	2.7	14	0.04	4.0	9.4	24	0.80	22.8	1.6
05CO-208	4.6	2.0	8.2	10	0.9	193	152	246	<0.08	0.0	1.2
05CO-209	2.3	1.6	8.8	16	4.5	102	767	196	1.0	0.0	1.2
05CO-210	1.7	0.35	0.75	3.1	0.02	<0.5	5.4	3.5	0.4	12.9	1.4
05CO-211	0.54	0.21	0.24	1.5	<0.02	<0.5	<0.5	2.5	1.4	4.9	1.3
05CO-212	0.55	0.15	0.23	1.5	<0.02	0.57	<0.5	2.5	1.0	4.9	2.0
05CO-213	2.2	0.33	0.79	2.5	<0.02	1.9	1.5	2.0	<0.08	14.1	3.6

Table 3b. *Continued*. Sodium, potassium, magnesium, calcium, cadmium, copper, zinc, sulfate, nitrate, alkalinity and dissolved organic carbon for filtered water samples from 2005 sample sites. A blank space means parameter was not measured for that site.

Field Number	Na mg/L	K mg/L	Mg mg/L	Ca mg/L	Cd µg/L	Cu µg/L	Zn µg/L	SO_4^- mg/L	NO_3^- mg/L	Alkalinity mg/L CaCo3	DOC mg/L
05CO-214	0.93	0.22	0.41	1.7	<0.02	0.74	0.60	3.0	0.8	6.6	2.2
05CO-215	1.3	0.39	0.87	2.5	<0.02	0.81	0.60	4.0	1.0	9.4	2.1
05CO-216	1.3	0.25	0.44	1.9	<0.02	0.56	0.70	2.7	0.60	7.9	3.0
05CO-217	<0.1	<0.1	<0.1	<0.1	<0.02	<0.5	<0.5	<1.6	<0.08	0.0	1.7
05CO-218	2.0	0.29	0.48	2.2	<0.02	<0.5	0.50	2.6	<0.08	11.2	1.5
05CO-219	1.9	0.50	0.86	2.9	<0.02	1.3	1.0	2.3	<0.08	14.5	3.2
05CO-220	6.6	1.5	5.4	20	<0.02	0.93	0.90	8.3	1.6	70	5.2
05CO-221	4.1	1.1	2.8	9.1	<0.02	0.5	<0.5	5.6	<0.08	37.6	2.4
05CO-222	1.0	0.60	0.89	5.4	<0.02	<0.5	<0.5	3.0	0.60	17.9	1.6
05CO-223	3.1	0.44	1.4	8.6	<0.02	<0.5	<0.5	5.6	<0.08	28.7	1.6
05CO-224	1.9	0.91	3.9	9.4	<0.02	0.68	<0.5	8.2	0.30	35.1	1.9
05CO-225	1.8	0.59	1.4	4.1	<0.02	0.56	<0.5	4.0	0.30	17.6	2.0
05CO-226	1.3	0.83	3.1	10	<0.02	<0.5	<0.5	9.8	0.60	31.8	1.7
05CO-227	1.8	0.32	0.57	2.2	<0.02	<0.5	<0.5	2.8	<0.08	10.8	2.2
05CO-228	2.6	0.72	1.3	5.1	<0.02	<0.5	0.50	2.8	<0.08	22.2	2.4
05CO-229	2.2	0.54	1.1	3.7	<0.02	<0.5	0.60	2.6	<0.08	18.3	1.7
05CO-230	1.4	0.39	1.5	4.0	<0.02	<0.5	0.90	2.4	0.25	18.1	2.4
05CO-231	1.1	0.25	0.48	2.4	<0.02	<0.5	0.50	3.0	0.60	9.1	3.0
05CO-232	2.6	0.39	0.72	3.3	<0.02	<0.5	<0.5	3.0	<0.08	14.7	3.0
05CO-233	2.5	0.57	1.2	5.0	<0.02	0.54	0.60	3.2	<0.08	20.8	3.8
05CO-234	<0.1	<0.1	<0.1	<0.1	<0.02	<0.5	0.60	<1.6	<0.08	1.8	4.7
05CO-235	0.94	0.32	0.7	4.9	<0.02	<0.5	<0.5	6.1	0.50	11	3.9
05CO-236	1.1	0.43	3.8	7.6	<0.02	<0.5	<0.5	9.5	0.80	25.7	2.1
05CO-237	0.61	0.25	0.94	3.0	<0.02	<0.5	0.50	2.4	0.40	11.9	2

Table 4. Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2005 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
Blank	*0.0*	*0.2*	*0.02*	*0.45*	*0.1*	*0.8*	*45*
05CO103bug1	0.5	0.7	690	240	0.0	9.8	120
05CO103bug2	0.6	0.8	820	250	0.0	8.8	130
05CO103bug3	0.4	0.8	750	220	0.0	9.3	120
05CO103bug4	0.5	0.7	690	260	0.0	9.4	110
05CO103bug5	0.4	0.7	590	270	0.0	9.6	97
05CO103bug6	0.3	0.8	620	310	0.2	11	130
05CO103bug7	0.4	0.7	620	230	0.1	9.5	96
05CO103bug8	0.4	0.8	740	310	0.1	9.9	110
05CO103bug9	0.4	0.7	680	280	0.1	8.8	120
05CO106bug1	0.5	0.8	690	350	0.1	10	140
05CO106bug2	0.6	0.9	920	450	0.1	9.6	150
05CO106bug3	0.3	0.8	650	490	0.2	12	150
05CO106bug4	0.6	1.1	840	490	0.1	12	230
05CO106bug5	0.7	1.0	960	490	0.1	11	150
05CO106bug6	0.8	1.0	1,000	330	0.0	9.7	170
05CO106bug7	0.7	1.0	1,000	520	0.1	10	200
05CO106bug8	0.5	0.8	890	480	0.2	14	230
05CO107bug1	1.0	1.1	1,200	590	0.1	10	160
05CO107bug2	1.0	1.3	1,300	500	0.2	13	200
05CO107bug3	1.2	1.3	1,400	670	0.0	13	180
05CO107bug4	0.8	1.0	1,200	630	0.1	9.7	190
05CO107bug5	1.3	1.5	1,400	700	0.1	13	190
05CO107bug6	1.0	1.3	1,300	540	0.1	8.3	140
05CO107bug7	0.8	0.9	950	370	0.1	9.1	150
05CO107bug8	1.1	1.2	1,300	630	0.1	12	190
05CO107bug9	1.3	1.5	1,300	1,000	0.0	11	190
05CO112bug1	0.5	1.1	1,000	340	0.2	9.5	170
05CO112bug2	0.4	1.0	980	310	0.1	9.2	160
05CO112bug3	0.5	1.0	1,200	660	0.3	11	200
05CO112bug4	0.5	1.0	1,200	390	0.4	11	160
05CO112bug5	0.5	0.9	970	260	0.1	9.0	120
05CO112bug6	0.6	1.0	1,100	330	0.1	7.8	150
05CO112bug7	0.5	1.0	1,000	740	0.0	9.7	170
05CO112bug8	0.5	1.0	1,100	330	0.1	6.7	140
05CO112bug9	0.5	1.0	980	430	0.0	8.2	140
05CO115bug1	0.5	0.7	930	510	7.7	32	790
05CO115bug2	0.3	0.6	1,800	840	9.6	37	890
05CO115bug3	0.6	0.6	930	770	8.0	40	700

Table 4. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2005 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
05CO115bug4	0.4	0.7	1,400	840	6.6	33	580
05CO115bug5	0.5	0.6	1,600	710	6.7	26	650
05CO115bug6	0.5	0.6	1,300	730	7.9	29	620
05CO115bug7	0.4	0.7	1,600	790	9.4	36	730
05CO115bug8	0.5	0.7	1,100	600	7.8	37	800
05CO115bug9	0.3	0.5	900	530	6.6	380	510
05CO118bug1	0.4	0.7	790	460	4.4	20	240
05CO118bug2	0.4	0.7	1,500	880	4.8	21	250
05CO118bug3	0.5	0.8	1,200	660	4.4	19	250
05CO118bug4	0.6	0.7	750	530	3.1	18	210
05CO118bug5	0.5	0.8	1,100	600	4.7	27	280
05CO118bug6	0.4	0.8	2,000	950	4.0	19	220
05CO118bug7	0.6	0.9	2,000	1,200	6.7	23	390
05CO118bug8	0.3	0.7	1,000	570	4.5	23	250
05CO119bug1	0.4	0.7	1,300	930	9.1	27	400
05CO119bug2	0.4	0.7	1,400	850	9.6	28	410
05CO119bug3	0.3	0.6	730	420	9.5	20	410
05CO119bug4	0.6	0.9	1,600	850	10.0	26	390
05CO119bug5	0.3	0.5	780	430	6.2	23	310
05CO119bug6	0.4	0.7	1,000	500	9.6	22	460
05CO119bug7	0.4	0.7	1,000	480	7.4	31	400
05CO119bug8	0.4	0.6	710	510	7.2	27	380
05CO119bug9	0.5	0.7	970	830	5.5	26	320
05CO120bug1	0.7	0.7	1,300	1,300	2.6	27	290
05CO120bug2	0.3	0.4	850	600	3.8	17	370
05CO120bug3	0.4	0.5	1,600	930	3.8	24	470
05CO120bug4	0.4	0.7	960	570	4.9	29	510
05CO120bug5	0.5	0.7	970	560	4.1	28	390
05CO120bug6	0.3	0.6	1,600	960	3.4	25	430
05CO120bug7	0.3	0.5	1,400	970	4.7	29	510
05CO120bug8	0.4	0.6	1,400	830	3.7	20	370
05CO120bug9	0.6	0.7	1,200	1,400	3.8	25	330
05CO121bug1	0.6	0.7	1,500	700	2.4	13	330
05CO121bug2	0.7	0.7	1,500	1,000	0.4	0.0	120
05CO121bug3	0.7	0.6	640	550	0.4	0.0	59
05CO121bug4	0.4	0.5	830	910	2.9	29	460
05CO121bug5	0.6	0.7	640	500	1.5	0.0	200
05CO121bug6	0.7	0.7	630	540	0.8	0.0	140

Table 4. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2005 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
05CO121bug7	0.5	0.7	910	500	3.8	11	450
05CO121bug8	0.5	0.7	1,400	910	2.6	19	410
05CO121bug9	0.8	0.7	700	590	0.3	0.0	65
05CO122bug1	0.6	0.7	1,300	950	3.0	0.7	440
05CO122bug2	0.6	0.7	1,300	1,100	0.6	14	160
05CO122bug3	0.5	0.5	530	510	0.4	14	57
05CO122bug4	0.9	0.7	1,100	990	3.3	0.0	540
05CO122bug5	0.6	0.6	570	490	0.3	13	56
05CO122bug6	0.8	0.7	670	530	0.5	0.0	58
05CO122bug7	0.4	0.6	1,400	710	3.6	22	530
05CO122bug8	0.6	0.7	1,500	890	0.5	12	110
05CO122bug9	0.5	0.6	760	430	3.1	22	480
05CO123bug1	0.8	1.0	930	380	0.7	12	150
05CO123bug2	0.7	1.0	930	330	0.9	1.3	150
05CO123bug3	0.8	1.2	980	460	1.3	18	200
05CO123bug4	0.7	1.1	900	480	0.6	11	190
05CO123bug5	0.8	1.1	990	390	0.9	16	200
05CO123bug6	0.5	0.9	760	320	0.4	8.2	150
05CO123bug7	0.7	1.1	930	430	0.5	11	150
05CO123bug8	1.0	1.3	1,200	590	1.3	15	220
05CO123bug9	0.5	0.8	690	340	0.1	6.8	120
05CO127bug1	0.6	1.0	880	340	1.2	6.7	170
05CO127bug2	0.6	1.0	820	380	1.8	9.6	180
05CO127bug3	0.9	1.2	1,100	420	2.2	0.0	250
05CO127bug4	0.8	1.0	960	360	1.3	11	230
05CO127bug5	0.6	1.0	890	360	1.3	9.2	200
05CO127bug6	0.4	0.7	630	210	0.8	7.4	130
05CO127bug7	0.4	0.8	680	310	1.7	11	210
05CO127bug8	0.6	0.9	840	300	1.1	0.0	120
05CO127bug9	0.4	0.9	1,100	540	0.4	0.0	130
05CO129bug1	0.4	0.7	1,600	870	2.4	24	310
05CO129bug2	0.6	0.8	1,700	960	3.6	31	480
05CO129bug3	0.6	0.7	650	600	0.5	19	120
05CO129bug4	0.3	0.6	720	380	2.1	21	290
05CO129bug5	0.4	0.6	1,400	770	3.0	30	360
05CO129bug6	0.6	0.6	580	590	0.5	13	54
05CO129bug7	0.6	0.9	1,200	690	3.9	38	430
05CO129bug8	0.5	0.6	1,400	800	0.3	12	86

Table 4. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2005 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
05CO129bug9	0.5	0.6	690	560	2.4	27	320
05CO130bug1	0.5	0.7	820	500	5.2	40	660
05CO130bug2	0.7	0.7	1,400	840	0.4	14	110
05CO130bug3	0.6	0.7	1,400	780	0.7	15	130
05CO130bug4	0.3	0.6	1,400	540	3.4	22	460
05CO130bug5	0.8	0.7	720	540	0.3	18	53
05CO130bug6	0.6	0.8	960	1,100	3.4	41	470
05CO130bug7	0.5	0.7	1,600	710	1.7	24	260
05CO130bug8	0.3	0.7	1,300	700	4.7	34	540
05CO130bug9	0.5	0.7	1,600	910	0.4	15	93
05CO131bug1	0.4	0.7	1,700	1,200	5.8	22	450
05CO131bug2	0.5	0.8	1,300	870	10.0	36	1,100
05CO131bug3	0.4	0.6	1,200	520	9.5	25	1,200
05CO131bug4	0.4	0.7	1,100	670	13.0	26	1,300
05CO131bug5	0.8	0.8	1,200	910	6.4	38	720
05CO131bug6	0.4	0.7	1,800	920	10.0	27	1,300
05CO131bug7	0.6	0.8	1,600	1,100	5.2	17	440
05CO131bug8	0.3	0.6	1,700	860	8.5	25	1,200
05CO131bug9	0.5	0.7	1,000	550	11.0	29	1,200
05CO132bug1	0.5	0.6	1,600	870	7.4	26	670
05CO132bug2	0.6	0.7	1,600	830	4.0	25	310
05CO132bug3	0.5	0.6	1,300	920	9.4	34	770
05CO132bug4	0.5	0.7	1,600	980	8.7	26	650
05CO132bug5	0.6	0.7	1,600	850	1.2	14	130
05CO132bug6	0.4	0.7	1,600	880	5.5	25	520
05CO132bug7	0.5	0.7	1,800	950	5.8	27	500
05CO132bug8	0.7	0.6	1,500	6,300	4.0	30	550
05CO132bug9	0.4	0.7	1,500	970	7.2	31	650
05CO133bug2	0.6	0.7	710	540	7.4	18	510
05CO133bug3	0.6	0.7	1,600	890	14.0	16	1,300
05CO133bug4	0.5	0.7	1,400	890	1.1	13	150
05CO133bug5	0.4	0.7	1,400	850	22.0	19	1,500
05CO133bug6	0.4	0.7	1,800	830	15.0	13	1,000
05CO133bug7	0.7	0.7	1,100	640	15.0	39	1,300
05CO133bug8	0.0	0.0	0	0	0.0	0.0	0
05CO133bug9	0.4	0.6	950	600	21.0	22	1,700
05CO136bug2	0.6	1.1	820	380	0.2	13	140

Table 4. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2005 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
05CO136bug3	0.6	1.0	900	630	0.0	9.8	120
05CO136bug4	0.6	0.9	730	580	0.1	12	130
05CO136bug5	0.4	0.9	740	380	0.1	11	130
05CO136bug6	0.4	0.8	670	300	0.1	11	110
05CO136bug7	1.1	1.2	1,100	450	0.2	11	170
05CO137bug1	0.5	1.0	1,300	800	4.5	22	380
05CO137bug2	1.5	3.4	3,900	2,700	17.0	67	1,500
05CO137bug3	2.2	3.6	7,600	4,100	11.0	100	1,700
05CO137bug4	0.5	0.9	1,200	800	2.7	24	380
05CO137bug5	0.8	0.8	690	590	0.6	16	63
05CO138bug2	2.3	2.5	2,300	1,200	0.4	19	280
05CO138bug3	1.1	1.4	1,300	590	0.2	14	160
05CO138bug4	0.5	1.4	1,100	620	0.4	16	210
05CO138bug6	0.9	1.5	1,200	590	0.2	17	220
05CO138bug7	0.9	1.2	1,400	760	0.5	14	210
05CO140bug2	0.6	0.9	1,200	1,300	3.5	66	350
05CO140bug3	1.1	1.1	1,200	1,500	3.4	84	390
05CO140bug4	0.6	1.1	1,100	380	0.2	12	160
05CO140bug5	0.5	1.1	2,100	1,400	3.5	53	440
05CO140bug6	0.7	0.8	1,800	1,200	0.6	15	120
05CO140bug7	0.5	0.8	1,000	890	3.4	85	360
05CO140bug8	0.8	1.1	1,100	390	1.2	25	220
05CO143bug1	0.3	0.7	560	230	0.8	11	120
05CO143bug2	0.6	1.0	1,100	2,200	3.4	31	91
05CO143bug3	0.4	1.1	1,100	2,600	2.8	21	130
05CO143bug4	0.6	0.7	690	1,400	2.1	17	58
05CO143bug5	0.5	0.7	1,000	1,600	1.8	11	65
05CO143bug6	1.8	1.5	1,900	3,700	4.9	35	130
05CO143bug7	0.9	1.1	1,500	2,700	2.0	25	100
05CO143bug8	0.7	0.8	1,100	2,300	1.6	16	64
05CO143bug9	1.0	1.0	1,100	2,100	3.9	23	71
05CO152bug1	0.4	1.1	810	380	8.8	15	350
05CO152bug2	0.5	1.2	930	420	6.1	20	300
05CO152bug3	0.8	2.2	1,000	640	7.2	27	260
05CO153bug1	0.8	0.9	1,100	1,600	4.6	37	420

Table 4. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2005 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
05CO163bug1	0.6	1.1	940	390	0.9	51	280
05CO163bug2	0.6	1.2	1,100	420	1.8	48	380
05CO163bug3	0.7	1.1	870	1,000	1.7	68	270
05CO163bug4	1.0	1.2	1,000	500	1.7	77	360
05CO163bug5	0.8	1.3	920	500	3.1	120	420
05CO163bug6	0.6	1.0	850	350	1.3	48	230
05CO163bug7	0.8	1.1	980	340	1.8	62	480
05CO166bug2	0.6	0.9	1,200	1,300	2.7	26	270
05CO211bug1	0.9	1.0	1,000	640	0.3	12	180
05CO211bug2	0.3	0.6	490	200	0.1	8.4	89
05CO211bug3	0.4	0.7	810	1,100	0.2	9.6	150
05CO211bug4	0.5	0.8	620	270	0.4	11	130
05CO211bug5	0.4	0.8	600	290	0.3	9.2	140
05CO211bug6	0.4	0.9	640	390	0.2	7.0	100
05CO211bug7	0.3	0.6	450	280	0.1	8.8	92
05CO211bug8	0.4	0.8	670	340	0.8	14	150
05CO211bug9	0.4	0.8	690	350	0.4	12	140
05CO212bug1	1.0	0.9	900	910	3.7	27	150
05CO212bug2	0.9	0.9	790	640	2.5	19	85
05CO212bug3	0.7	0.8	1,500	900	0.7	17	110
05CO212bug4	0.6	0.7	720	700	1.0	21	84
05CO212bug5	0.6	0.3	570	540	1.2	10	81
05CO212bug6	0.3	0.5	450	240	0.3	18	110
05CO212bug7	0.5	0.9	750	340	0.2	9.3	140
05CO212bug8	0.3	0.5	450	230	0.2	13	110
05CO212bug9	0.4	0.9	650	380	0.3	8.6	120
05CO213bug1	0.5	0.7	2,000	1,400	0.9	25	360
05CO213bug2	0.4	0.8	2,100	1,000	0.5	22	370
05CO213bug3	1.1	1.1	1,200	780	0.2	23	110
05CO213bug4	1.0	0.9	1,000	690	1.0	23	230
05CO213bug5	0.5	1.0	2,000	1,300	1.3	26	460
05CO213bug6	0.8	0.9	780	700	0.0	13	90
05CO213bug7	0.5	0.7	1,800	1,200	0.0	14	110
05CO213bug8	0.4	0.7	1,400	1,300	0.4	20	320
05CO213bug9	0.8	1.1	2,500	1,500	0.0	17	140
05CO214bug1	0.6	1.2	890	540	0.6	14	180
05CO214bug2	0.5	1.0	880	550	0.9	15	150

Table 4. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2005 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
05CO214bug3	0.6	1.0	760	350	0.6	16	160
05CO214bug4	0.6	1.1	1,000	470	0.4	11	170
05CO214bug5	0.6	1.0	780	330	0.5	13	150
05CO214bug6	0.6	1.1	910	400	0.7	12	150
05CO214bug7	0.4	0.8	620	330	0.2	12	120
05CO214bug8	0.7	1.2	1,200	510	0.2	10	160
05CO214bug9	0.5	1.0	860	610	0.2	13	140
05CO215bug1	1.0	1.4	2,600	1,400	1.2	27	200
05CO215bug2	0.6	0.7	1,600	850	5.4	32	340
05CO215bug3	0.9	0.9	950	920	1.0	26	110
05CO215bug4	0.4	0.7	840	560	7.5	44	360
05CO215bug5	1.1	1.1	1,500	1,200	11.0	71	540
05CO215bug6	1.5	1.6	1,500	1,200	2.5	43	210
05CO215bug7	0.5	0.7	950	660	5.5	55	400
05CO215bug8	0.8	0.8	1,900	1,100	0.9	20	120
05CO216bug1	0.8	1.6	2,000	1,000	8.6	85	470
05CO216bug2	1.9	2.6	5,900	1,900	11.0	110	590
05CO216bug3	1.7	2.3	2,600	1,400	8.1	91	570
05CO216bug4	0.8	1.5	2,600	1,700	8.6	71	460
05CO216bug5	2.2	2.4	2,800	2,100	15.0	140	670
05CO216bug6	0.7	1.3	2,500	1,300	5.7	82	340
05CO216bug7	0.7	1.1	1,300	780	5.0	59	410
05CO216bug8	0.5	1.0	2,000	1,200	4.2	51	230
05CO216bug9	1.5	2.6	5,000	2,700	11.0	110	660
05CO219bug1	0.3	0.6	580	320	0.0	10	99
05CO219bug2	0.4	0.7	610	290	0.0	9.2	100
05CO219bug3	0.5	0.8	670	270	0.2	10	110
05CO219bug4	0.4	0.8	630	270	0.1	11	110
05CO219bug5	0.4	0.8	710	340	0.2	12	130
05CO219bug6	0.4	0.8	690	300	0.1	12	130
05CO219bug7	0.4	0.8	650	300	0.1	10	100
05CO219bug8	0.4	0.7	670	300	0.1	12	110
05CO219bug9	0.4	0.8	640	500	0.1	12	140
05CO222bug01	0.5	1.1	800	380	0.3	10	120
05CO222bug10	0.5	1.0	690	420	0.3	12	140
05CO222bug11	0.5	0.7	600	580	0.8	16	100
05CO222bug12	0.6	0.9	1,200	1,100	2.8	19	180
05CO222bug13	0.6	0.8	1,600	1,200	0.5	16	110

Table 4. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2005 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
05CO222bug14	0.6	0.7	1,500	980	0.1	10	93
05CO222bug15	0.6	0.8	660	800	0.4	16	62
05CO222bug17	0.6	0.8	1,200	1,900	1.1	24	120
05CO222bug18	0.5	0.9	1,000	1,500	1.4	31	120
05CO222bug19	0.9	0.9	1,100	2,000	1.3	33	120
05CO222bug02	0.7	1.2	1,100	430	0.4	15	150
05CO222bug03	0.4	0.8	590	280	0.4	13	120
05CO222bug04	0.7	1.3	1,000	420	0.6	17	190
05CO222bug05	0.4	0.9	710	370	0.2	10	120
05CO222bug06	0.7	1.2	1,000	500	0.5	15	150
05CO222bug07	0.5	0.9	630	330	0.3	31	140
05CO222bug08	0.6	1.1	820	340	0.3	9.9	140
05CO222bug09	0.7	1.1	970	460	0.5	12	160
05CO223bug1	0.4	0.6	840	510	3.2	24	300
05CO223bug2	0.8	0.6	690	720	0.2	16	69
05CO223bug3	0.7	0.8	760	820	4.5	32	400
05CO223bug4	0.6	0.6	1,500	950	0.6	13	95
05CO223bug5	0.6	0.6	660	670	0.6	16	71
05CO223bug6	0.6	0.6	1,500	920	0.5	11	89
05CO223bug7	0.3	0.3	1,600	950	0.4	13	90
05CO224bug1	0.4	1.1	1,000	740	2.9	38	260
05CO224bug2	0.5	1.1	1,100	950	1.9	25	130
05CO224bug3	0.7	0.8	1,700	1,100	0.6	17	110
05CO224bug4	0.7	0.7	1,500	780	0.8	26	130
05CO224bug5	0.8	1.0	880	780	1.8	33	220
05CO224bug6	0.5	0.7	920	1,100	0.8	32	97
05CO224bug7	0.5	0.6	590	590	1.2	26	140
05CO224bug8	1.0	1.3	2,500	1,600	1.6	55	240
05CO225bug1	1.3	1.0	1,900	1,500	6.8	92	380
05CO225bug2	0.9	1.2	1,700	1,700	6.0	78	300
05CO225bug3	1.2	1.5	3,000	1,700	2.9	31	250
05CO225bug4	0.7	0.7	1,500	1,000	0.4	13	90
05CO225bug5	1.2	1.2	1,200	1,300	2.6	42	220
05CO225bug6	4.0	3.5	4,600	5,500	19.0	180	1,400
05CO225bug7	0.9	0.9	1,100	770	3.6	69	270
05CO225bug8	1.8	1.6	2,300	1,700	5.0	110	320
05CO225bug9	1.8	3.0	3,500	3,100	8.9	160	540
05CO226bug01	0.3	1.1	1,000	340	0.2	9.4	150

Table 4. *Continued.* Sodium, potassium, magnesium, calcium, cadmium, copper, and zinc concentrations (dry weight) in 2005 invertebrate samples.

Sample No.	Na percent	K percent	Mg µg/g	Ca µg/g	Cd µg/g	Cu µg/g	Zn µg/g
05CO226bug10	0.8	0.8	1,500	1,100	0.2	19	90
05CO226bug11	1.2	1.7	1,700	1,300	3.3	51	270
05CO226bug02	0.6	1.0	1,000	380	0.3	11	140
05CO226bug03	0.9	1.3	1,200	610	0.6	13	190
05CO226bug04	0.6	1.2	1,100	500	0.5	13	190
05CO226bug05	0.7	1.3	1,400	700	0.5	11	190
05CO226bug06	0.5	1.1	1,000	530	0.5	15	150
05CO226bug07	0.7	1.1	1,100	980	2.5	52	200
05CO226bug08	0.6	0.8	1,500	1,100	0.3	16	95
05CO226bug09	1.1	1.1	1,200	1,200	0.6	25	110
05CO227bug1	0.7	1.2	1,100	540	0.2	11	180
05CO227bug2	0.5	0.9	830	320	0.1	9.8	120
05CO227bug3	0.7	1.0	1,000	380	0.2	8.8	140
05CO227bug4	0.7	1.1	990	430	0.2	8.6	160
05CO227bug5	0.9	1.2	1,100	660	0.2	10	150
05CO227bug6	0.6	1.3	1,000	460	0.2	8.9	150
05CO227bug7	0.3	0.7	660	300	0.1	10	120
05CO227bug8	0.5	0.9	740	310	0.1	9.4	110
05CO227bug9	0.5	1.0	910	340	0.1	8.6	140