Prepared in cooperation with the National Park Service, Voyageurs National Park, Minnesota

Impact of Wildfire on Levels of Mercury in Forested Watershed Systems—Voyageurs National Park, Minnesota

Scientific Investigations Report 2009–5151

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On the cover. Photograph of soil sample site along the shoreline of Shoepack Lake; sampling was done in August 2004, following a wildfire in Section 33, Voyageurs National Park, Minnesota.

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Preface

Mercury (Hg) cycling in forest soils is strongly influenced by forest disturbance, especially forest fires. Soil, lake water, and age-1 yellow perch were collected from lakes and surrounding watersheds in Voyageurs National Park, MN, to study the effect of fire on mercury. Samples were collected within the footprint of the Section 33 wildfire, which burned over 4.047 km² in the Shoepack Lake watershed in 2004, and from lakes and catchments in nearby unburned areas of the Park. Analyses of O- and A-horizon soils from the Shoepack Lake fire area show losses relative to adjacent unburned areas of (1) ~0.22 mg Hg/m² in high-fire severity burned areas because of complete combustion of the O horizon, and (2) ~0.6 to 0.9 mg Hg/m² from the A horizon in these same areas. The soil survey was conducted 2 weeks after the fire and prior to any significant rainfall and indicates that these mercury losses were an immediate and direct consequence of combustion and volatilization of mercury from the soil. Soil samples from the same sites collected in 2005 and 2006 showed no significant changes in mercury concentrations in either O- or A-horizon soils. Water-column data were collected three times a year (spring, mid-summer, and late summer) from 2000 through 2006 from four Voyageurs lakes, including Shoepack Lake and three nonburn control lakes. Over this short time period, there were significant ($p < 0.05$, where p = probability) decreases in aqueous methylmercury concentrations in three of the four lakes, but among the lakes there were no discernible patterns in lake-water chemistry that could be attributed to burned watershed vs. unburned watershed factors. There was not a significant difference in concentrations of total mercury in yellow perch from Shoepack Lake in 2005 and 2006 (post-fire) relative to that measured during 2000 and 2001 (pre-fire). There also was no detectable difference in the growth of age-1 yellow perch in Shoepack Lake between 2005 and 2006. The lack of change in methylmercury concentrations in yellow perch from Shoepack Lake before and after the fire indicates a lack of effect of fire on the bioavailability of methylmercury in the lake. There also was no apparent increase in nutrients following the fire that would have affected perch growth rate. Taken together, data for soil, lake water, and age-1 yellow perch show that mobilization of a significant quantity of mercury from soils resulting from the Section 33 wildfire had no effect on mercury levels in either lake waters or age-1 yellow perch in adjacent Shoepack Lake.

Acknowledgments

This study was conducted in cooperation with the National Park Service (NPS) in Voyageurs National Park, MN. Funding was provided by the National Park Service, the U.S. Geological Survey (USGS) Mineral Resources Program, the USGS Minnesota Water Science Center, and the University of Wisconsin-La Crosse Wisconsin (UW-LX). Cooperation and support from Jim Schaberl, Chris Holbeck, and Steve Windels (NPS) is greatly appreciated. Field support for soil sampling was provided by Connie Dicken and John Horton (USGS). Sean Bailey, Matthew Brantner, Leland Grimm (NPS), Peter Liska, Kevin Miller, and Jake Ogorek (UW-LX) assisted in the field during collection of age-1 yellow perch. Sean Bailey, Rebecca Curland, and Ryan Legler (UW-LX) assisted in the laboratory analysis of mercury in the yellow perch. Greg Melhus, Wally Larson, and Larry Kallemeyn (USGS), and Joan Elias (NPS) assisted with water sampling.

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Conversion Factors and Datums

Multiply	By	To obtain
Length		
centimeter (cm)	0.3937	inch (in.)
millimeter (mm)	0.03937	inch (in.)
meter (m)	3.281	foot (ft)
meter (m)	1.094	yard (yd)
Area		
square meter (m ²)	0.0002471	acre
square kilometer (km ²)	247.1	acre
square meter (m ²)	10.76	square foot (ft ²)
Volume		
liter (L)	33.82	ounce, fluid (fl. oz)
liter (L)	2.113	pint (pt)
liter (L)	1.057	quart (qt)
liter (L)	0.2642	gallon (gal)
cubic centimeter (cm ³)	0.06102	cubic inch (in ³)
liter (L)	61.02	cubic inch (in ³)
Mass		
gram (g)	0.03527	ounce, avoirdupois (oz)
kilogram (kg)	2.205	pound avoirdupois (lb)
nanogram (ng)	0.000000000353	ounce, avoirdupois (oz)
Density		
kilogram per cubic meter (kg/m ³)	0.06242	pound per cubic foot (lb/ft ³)

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$^{\circ}\text{F}=(1.8\times^{\circ}\text{C})+32$$

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:

$$^{\circ}\text{C}=(^{\circ}\text{F}-32)/1.8$$

Concentrations of chemical constituents in soils are given either in parts per million (ppm) or weight percent (wt. %). Calculated areal burdens are given as milligrams per meter squared (mg/m²) or grams per meter squared (g/m²). Concentrations of chemical constituents in water are given in milligrams per liter (mg/L), micrograms per liter (µg/L), or nanograms per liter (ng/L). Concentrations of mercury in age-one yellow perch are given in nanograms per gram (ng/g).

Impact of Wildfire on Levels of Mercury in Forested Watershed Systems—Voyageurs National Park, Minnesota

By Laurel G. Woodruff,¹ Mark B. Sandheinrich,² Mark E. Brigham,¹ and William F. Cannon¹

Introduction

Atmospheric deposition of mercury to remote lakes in mid-continental and eastern North America has increased approximately threefold since the mid-1800s (Swain and others, 1992; Fitzgerald and others, 1998; Engstrom and others,

2007). As a result, concerns for human and wildlife health related to mercury contamination have become widespread. Despite an apparent recent decline in atmospheric deposition of mercury in many areas of the Upper Midwest (Engstrom and Swain, 1997; Engstrom and others, 2007), lakes in which fish contain levels of mercury deemed unacceptable for human consumption and possibly unacceptable for fish-consuming wildlife are being detected with increasing frequency. In northern Minnesota, Voyageurs National Park (VNP) (fig. 1) protects a series of southern boreal lakes and wetlands situated on bedrock of the Precambrian Canadian Shield. Mercury

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Figure 1. Location map of Voyageurs National Park, Minnesota.

contamination has become a significant resource issue within VNP as high concentrations of mercury in loons, bald eagle eaglets, grebes, northern pike, and other species of wildlife and fish have been found. The two most mercury-contaminated lakes in Minnesota, measured as methylmercury in northern pike (*Esox lucius*), are in VNP.

Recent multidisciplinary U.S. Geological Survey (USGS) research demonstrated that the bulk of the mercury in lake waters, soils, and fish in VNP results from atmospheric deposition (Wiener and others, 2006). The study by Wiener and others (2006) showed that the spatial distribution of mercury in watershed soils, lake waters, and age-1 yellow perch (*Perca flavescens*) within the Park was highly variable. The majority of factors correlated for this earlier study suggested that mercury concentrations in lake waters and age-1 yellow perch reflected the influence of ecosystem processes that affected within-lake microbial production and abundance of methylmercury (Wiener and others, 2006), while the distribution of mercury in watershed soils seemed to be partially dependent on forest disturbance, especially the historic forest fire pattern (Woodruff and Cannon, 2002).

Forest fire has an essential role in the forest ecosystems of VNP (Heinselman, 1996). Because resource and land managers need to integrate both natural wildfire and prescribed fire in management plans, the potential influence of fire on an element as sensitive to the environment as mercury becomes a critical part of their decisionmaking. A number of recent studies have shown that while fire does have a significant impact on mercury at the landscape level, the observed effects of fire on aquatic environments are highly variable and unpredictable (Caldwell and others, 2000; Garcia and Carrigan, 2000; Kelly and others, 2006; Nelson and others, 2007). Caldwell and others (2000) described an increase in methylmercury in reservoir sediments resulting from mobilization and transport of charred vegetative matter following a fire in New Mexico. Krabbenhoft and Fink (2000) attributed increases in total mercury concentrations in young-of-the-year fish in the Florida Everglades to release of mercury resulting from peat oxidation following fires. A fivefold increase in whole-body mercury accumulation by rainbow trout (*Oncorhynchus mykiss*) following a fire in Alberta, Canada, apparently resulted from increased nutrient concentrations that enhanced productivity and restructured the food web of a lake within the fire's burn footprint (Kelly and others, 2006).

For this study, we determined the short-term effects of forest fire on mercury concentrations in terrestrial and aquatic environments in VNP by comparing and contrasting mercury concentrations in forest soils, lake waters, and age-1 yellow perch for a burned watershed and an adjacent lake, with similar samples from watersheds and lakes with no fire activity (control watersheds and lakes). The concentration of total mercury in whole, 1-year-old yellow perch serves as a good biological indicator for monitoring trends in methylmercury concentrations in food webs of lakes in North America (Wiener and others, 2007). With a limited gape, age-1 yellow perch that hatched the previous year and resided in a lake for 1 year

feed largely on zooplankton and small benthic invertebrates. Thus, age-1 yellow perch provide a baseline for methylmercury concentrations for individual lakes that can be compared across spatial areas.

The nine appendixes that accompany this report contain the complete datasets for soils, lake waters, and age-1 yellow perch collected for this study. This report uses data from these three media to provide a framework for evaluating short-term effects of fire on mercury in forested soils and possible effects of the mobilization of mercury from soils on lake water quality and aquatic health.

Study Design

From 2004 to 2006, the USGS and University of Wisconsin-LaCrosse (UW-LX), in cooperation with the National Park Service (NPS), collected soils, lake waters, and age-1 yellow perch from Shoepack Lake and its adjacent watershed (fig. 1), within an area that burned in a natural wildfire in August 2004. The objectives of this study were to determine the effects of the 2004 wildfire on mercury concentrations in burned watershed soils, in lake waters, and in age-1 yellow perch in Shoepack Lake. These same three sets of sample media were also collected from lakes and watersheds far removed from the 2004 fire area (Peary Lake, Brown Lake, and Ryan Lake) (fig. 1) to act as unburned controls.

An initial study requested by the NPS was designed around a proposed 2004 prescribed fire scheduled for an area that encompassed much of the Ryan Lake watershed in VNP. The unburned control lakes and watersheds for the original study design were nearby Brown Lake and Peary Lake, located west of the proposed prescribed fire area. In 2003, lake waters and age-1 yellow perch were collected from these three lakes as preburn baseline samples. Soils were collected only from the Brown Lake and Ryan Lake watersheds.

An indefinite postponement of the Ryan Lake prescribed fire and the outbreak of a lightning-ignited wildfire in July 2004 in the interior of the Kabetogama Peninsula, a remote part of VNP, shifted the geographic focus of the study. By August 2004, when the wildfire (by then known as the Section 33 fire) was extinguished by rain, it had burned more than 4,047 km², including nearly 80% of the shoreline of Shoepack Lake (fig. 2). The shift of this research from a study designed around prescribed fire to a study centered on a wildfire provided an opportunity to examine intensified fire effects. The timing of prescribed fire is largely controlled by soil-moisture levels and weather conditions, in part to ensure that fire severity, defined as the impact of the heat pulse to the basal surface, is generally low. In contrast, wildfires usually take off under uncontrolled conditions of abundant, dry fuel loads and windy, dry weather, with resulting high variability in fire severity influenced by local conditions.

Lake waters and age-1 yellow perch had been collected in the 2004 field season from Ryan Lake, Brown Lake, and Peary

Figure 2. Location map showing perimeter of Section 33 wildfire footprint (August 11, 2004) and 10 soil sample sites. (See table 4.)

Lake. After the Section 33 fire, lake waters from Shoepack Lake were collected in August and September 2004. Soils were collected from the Shoepack Lake watershed in August 2004, 2 weeks after the Section 33 fire had burned out. In 2005 and 2006, lake waters and age-1 yellow perch were collected from Shoepack Lake, Ryan Lake, Brown Lake, and Peary Lake. Soils were collected from the Shoepack Lake watershed in 2005 and 2006 and from the Ryan Lake and Brown Lake watersheds in 2006. In all cases, soils were collected in close proximity, usually within 1 to 2 meters, to the original sample sites that had been marked with metal stakes in the first year of collecting. For clarity, the complete sampling schedule for all three media described above is summarized in table 1.

Methods

Soils

To obtain equivalents to preburn "control" sites within the Section 33 wildfire footprint, the irregular burn pattern of the fire was exploited. Within the footprint of the fire, soil samples were collected along gradients of fire severity, here defined as the effect of the fire to the forest floor. Ten sampling areas were selected near the shoreline of Shoepack Lake in burned areas (fig. 2). Within each area, three sites that had similar topography and vegetation but varying fire severity (unburned, low-moderate severity, and high severity) were selected. Criteria defining low-moderate and high-severity sites were based on field observations of the extent of combustion of forest-floor organic soils. Photographs of site 4 in figure 3 are examples of the visual and physical criteria used in the field for site-severity classification. Unburned sites were largely untouched by fire, although in some cases the forest canopy nearby was scorched (fig. 3A). The forest floor was unburned and covered with living vegetation (fig. 3B). Low-moderate-severity sites had some tree mortality (fig. 3C) and incomplete combustion and charring of the organic soils at the forest floor with little or no exposure of mineral soil (fig. 3D). At high-severity sites, all trees in the area were killed, and downed, woody debris was heavily burned (fig. 3E). There was complete combustion of organic soil as well as widespread exposure of mineral soil (fig. 3F).

At each severity sample site, up to three soil samples were collected at all sites. These samples are (1) surficial organic soil (referred to here as the O horizon), not including living plants, fresh litter, or woody debris; (2) topmost mineral soil, typically intermixed with organic material (A horizon); and (3) the top of the illuviated soil (topmost B horizon). All samples were collected volumetrically. In addition, C-horizon soils were collected from six of the Section 33 wildfire sites.

Table 1. Timetable for collection of various sample media in Voyageurs National Park, Minn.

Media sampling schedule	2003 Planned Ryan Lake prescribed burn	2004 Section 33 wildfire	2005 Section 33 wildfire	2006 Section 33 wildfire
Watershed soils	Ryan Lake Brown Lake	Shoepack Lake	Shoepack Lake	Shoepack Lake Ryan Lake Brown Lake
Lake waters	Ryan Lake Brown Lake Peary Lake	Ryan Lake Brown Lake Peary Lake Shoepack Lake	Ryan Lake Brown Lake Peary Lake Shoepack Lake	Ryan Lake Brown Lake Peary Lake Shoepack Lake
Age-1 yellow perch	Ryan Lake Brown Lake Peary Lake	Ryan Lake Brown Lake Peary Lake	Ryan Lake Brown Lake Peary Lake Shoepack Lake	Ryan Lake Brown Lake Peary Lake Shoepack Lake

A

D

B

E

C

F

Figure 3. Photographs of soil sample areas and collection sites characterized by fire severity. A and B, site 4-1, unburned; C and D, site 4-2, low-moderate severity with charring of forest floor but no exposure of mineral soil; E and F, site 4-3, high severity with complete combustion of O horizon and exposure of mineral soil.

Soil samples were stored in cloth bags (organic soils) or plastic bags (mineral soils) and air dried prior to analysis. Dried soils were sieved to <2 mm. Soil that passed through the sieve was further ground to <150 μm prior to analyses. O-horizon soils were split, with one portion ashed at 500°C for 13 hours. Analytical methods used, including the precision, accuracy, and measurement range for each element in each analytical method, are described in detail in Taggart (2002) and briefly described here. Forty-two major, minor, and trace elements were measured in mineral and ashed soils by a combined method utilizing inductively coupled plasma-atomic emission spectrometry and inductively coupled plasma-mass spectrometry. Selenium was measured on mineral and unashed organic soils using atomic absorption spectrophotometry. Total mercury was determined for mineral and unashed organic soils using a cold vapor technique. Total carbon in mineral soils was determined using an automated carbon analyzer. Percent carbon for the O horizon was calculated as $100 - \% \text{ ash}$. Samples were submitted to the USGS contract laboratory with a full set of reference standards. Splits of the sieved samples were submitted as blind duplicates at a rate of 1 in 10. A relative percent difference between blind duplicates of less than 25% was deemed acceptable, as was always the case for mercury and carbon data for this study. Duplicate soil analyses are included in the complete tables in this report's appendixes.

To obtain the mass of the O horizon, a fixed area was laid out and all decomposed organic-rich material within the area was collected down to the top of the mineral soil. This material was weighed in the field and again after complete air drying to a constant weight. The mass of the O horizon was calculated as the weight of the dry soil—collected material per unit area. For the A horizon, a fixed area was excavated down to the base of the horizon and all soil was removed. The volume of the excavation was determined by lining the cavity with a plastic bag and filling it with pinto beans to the original ground level. The beans were then weighed, with three replications. The volume of the cavity was later calculated using a formula established in the laboratory that related the weight of the pinto beans to a fixed volume. For the B horizon, 10 short plugs were collected with a small hand metal sampler of known volume. All mineral soil samples were weighed in the field and reweighed following air drying to a constant weight. Mineral soils were hand sieved to <2 mm with all soil passing through the sieve reweighed to obtain the total weight of the <2-mm fraction. The density of the <2-mm fraction (g/cm^3) was calculated from the weight of the sieved fraction and the calculated volume of the original cavity (A horizon) or metal sampler (B horizon). For A-horizon soils, this density was converted to areal burdens (mass per area; for example, g/m^2 or mg/m^2) by dividing by the average depth of the sample cavity.

Soils were categorized by watershed, horizon, fire severity, and year collected. Relationships among geochemical data were analyzed by analysis of variance (ANOVA) methods with Tukey post hoc tests to determine significant varia-

tions between means (ANOVA, SYSTAT 11 software, Systat Software, Inc., San Jose, Calif.).

Lake Waters

Lake-water samples were collected from Shoepack Lake and three control lakes (Ryan, Brown, and Peary), both pre-fire and post-fire (table 1). Pre-fire water-chemistry data were also available for these and other VNP lakes from an earlier study in the Park (Goldstein and others, 2003). For this study, Ryan, Brown, and Peary Lakes were routinely sampled during 2003, 2004, and 2005. Shoepack Lake was added to the yearly lake-water-sampling schedule in 2004 after the Section 33 fire in the Shoepack Lake catchment and the postponement of prescribed fire in the Ryan catchment. For all lakes, waters typically were sampled in May (a few weeks after ice-out), July, and again in late summer (mid-August to mid-September). In addition, the NPS collected two rounds of samples in 2006 as part of their routine monitoring of VNP lakes. During the NPS sampling, water samples for mercury analysis were collected by protocols used in this study and analyzed by the USGS.

Epilimnetic water from each lake was dip sampled just below the lake surface (approximately 5 cm), near the approximate centroid of the lake surface. Sampling was conducted using trace-metal-clean protocols that have been demonstrated to not contaminate samples. Total mercury, methylmercury, elemental mercury, and total organic carbon were analyzed at the USGS Wisconsin Mercury Research Laboratory in Middleton, WI. Total mercury concentrations were determined using USEPA method 1631 (U.S. Environmental Protection Agency, 2002) as modified by Olson and DeWild (1999). Methylmercury concentrations were determined using methods described in DeWild and others (2002). Total mercury values were required to be accurate to within 10 percent of the "true" concentration when concentrations exceeded 0.4 ng/L, 10 times the method detection limit (MDL), and methylmercury values were required to be accurate to within 10 percent of the "true" concentration when concentrations exceeded 0.2 ng/L (as mercury), approximately 10 times the MDL of 0.025 ng/L. Total organic carbon concentrations were determined using a carbon analyzer using Standard Method 5301D (American Public Health Association and others, 1998). Major ions were analyzed at the USGS National Water Quality Laboratory in Lakewood, CO, using methods of Fishman and Friedman (1989). The laboratory maintains quality objectives through the use of standard reference water samples that constitute a minimum of 10 percent of the analyses and have published acceptance ranges that must be met.

For Shoepack Lake, pre-fire and post-fire conditions were compared using the t-test (PROC TTEST, SAS 9.13 software, SAS Institute, Cary, NC). Time trends for all lakes were tested by regression of log-transformed concentrations vs. time, in years. Because some concentration data were censored (reported as less than the method detection limit), maximum likelihood regression was used (PROC LIFEREG, SAS 9.13)

to properly account for censoring. The log transformation removed moderate heteroscedasticity in the data.

Age-1 Yellow Perch

One-year-old yellow perch were sampled shortly after ice-out in May 2003, 2004, 2005, and 2006 from Brown Lake, Peary Lake, and Ryan Lake, and in May 2005 and 2006 from Shoepack Lake (table 1). Fish were collected with seines and a small electroshocker fished in littoral habitat. Each fish was measured [total length (TL) to 1 mm], weighed (to 0.01 g), and stored at -30°C in a labeled plastic bag until lyophilized at -85°C to a constant dry weight. The age of each fish was determined by examination of three or more scales taken from the area of insertion of the left pectoral fin (DeVries and Frie, 1996). Freeze-dried tissue was homogenized in a stainless-steel blender. We digested 0.10-g subsamples with a modification of USEPA method 1631 (U.S. Environmental Protection Agency, 2001). Subsamples were digested for 3 hours at 95°C in a solution of sulfuric acid and nitric acid, followed by digestion with bromine monochloride (BrCl) at 40°C for 8 hours. Each digestate was analyzed by flow injection cold-vapor atomic fluorescence spectroscopy with a Leeman Labs Hydra AF Gold Plus Mercury Analyzer.

Method precision (relative standard deviation) from triplicate analyses of homogenized fish averaged 6.4% (table 2). Mean recovery of mercury from fish samples spiked before

digestion was 94.5%. Mean measured concentrations of total mercury in three standard reference materials were within or very near the certified ranges, which ranged from 57.4–64.6 to 724–872 ng/g dry weight (table 3). The accuracy of mercury determinations for each batch of fish samples was verified by the concomitant analyses of (1) certified reference materials from the U.S. National Institute of Standards and Technology (NIST) and the National Research Council of Canada (NRCC), (2) triplicate subsamples of homogenized fish, (3) spiked (before digestion) subsamples of homogenized fish, and (4) blanks and standards taken through the digestion procedures. Concentrations of total mercury in all fish samples exceeded our estimated method detection limit of 1.70 ng/g dry weight.

In order to determine if mercury concentrations and growth of yellow perch from Shoepack Lake had changed as results of the fire in 2004, we used analysis of variance with a “beyond Before-After-Control-Impact (BACI)” design (Underwood, 1992; 1994). This design required data on yellow perch from Shoepack Lake and control lakes (Brown, Peary, and Ryan) prior to 2005. Data on TL and mercury concentrations in age-1 yellow perch were obtained from all four lakes in 2000 and 2001 in conjunction with another project within VNP (Wiener and others, 2006). Therefore, we used data on yellow perch collected in 2000 and 2001 (before the fire) and in 2005 and 2006 (after the fire) for the analysis of variance.

Table 2. Summary results of quality-assurance analyses during determination of total mercury in samples of yellow perch sampled in 2003–2006 from Brown, Peary, Ryan, and Shoepack Lakes in Voyageurs National Park, Minn.

Material analyzed	Performance measure	Our results
Standard reference materials	Measured concentrations within the certified range	51 of 66
Fish tissue spiked before digestion	Percent recovery: mean range	94.5% 74.6%–117%
Triplicate subsamples of fish	Method precision (coefficient of variation): mean range	6.1% 0.1%–17.7%
NIST mussel tissue	Method detection limit (ng/g dry weight)	1.55–1.70 ng/g

Table 3. Analytical results for total mercury in reference materials from the U.S. National Institute of Standards and Technology and the National Research Council of Canada.

[Reference materials were analyzed with samples of yellow perch from 2003 through 2006 in Brown, Peary, Ryan, and Shoepack Lakes, Voyageurs National Park, Minn. Ng/g, nanograms per gram]

Reference material	Certified concentration range (ng/g dry weight)	Our results		
		<i>n</i>	Mean concentration (ng/g dry weight)	95% confidence interval
NIST mussel tissue	57.4–64.6	27	61.1	58.5–63.7
NRCC lobster hepatopancreas (TORT–2)	210–330	27	256.4	247–265.8
NRCC dogfish muscle (DORM–1)	724–872	12	816.1	776.9–855.3

Results and Discussion

Soils

Complete datasets for all soils collected from the Shoe-pack Lake watershed within the Section 33 wildfire footprint and from the Ryan Lake and Brown Lake watersheds are reported in appendixes 1 through 7. Data are given in weight percent (wt. %) or parts per million (ppm). All three study lakes are underlain by Precambrian bedrock consisting of fine- to medium-grained biotite schist, often cut by pegmatite dikes (Day and others, 1990). Soils in the study areas are typically sandy loams developed on thin glacial deposits largely derived from material similar in composition to underlying metamorphic rocks (Erickson, 1981). A soil pit from the Ryan Lake watershed in VNP is shown in figure 4. A typical soil profile in VNP has an O horizon of decomposing organic material overlying an A horizon, a dark brown to black mineral soil with some organic matter accumulation. Some soils in VNP have very thin or no A horizon and an O horizon may sit directly on an E horizon, a pale gray mineral soil leached of many

mineral and organic constituents. The B-horizon subsoil often is reddish because of subsurface accumulation of clays or iron, while the C horizon is little-weathered soil parent material.

The chemistry of B- and C-horizon soils collected from the three study watersheds plot along consistent trends expected for soils derived from similar parent mineralogy, principally plagioclase, quartz, and micas. There were no significant differences in soil parent chemistry noted among the three watersheds. C-horizon soils from the Shoe-pack Lake watershed have mercury concentrations that range from <0.02 ppm Hg (the lower method detection limit) to 0.03 ppm Hg, notably lower than the average concentrations of mercury in unburned O-horizon (0.14 ppm Hg) and A-horizon soils (0.15 ppm Hg). This supports the conclusion of Wiener and others (2006) that geologic sources of mercury in VNP soils are apparently insignificant.

Preburn Soil Chemistry

Mercury in soils is typically bound to organic carbon. Because soils from the Ryan Lake and Brown Lake watersheds had no statistically significant differences in soil

Figure 4. Soil pit from the Ryan Lake watershed in Voyageurs National Park showing different soil horizons.

chemistry between samples collected in 2003 and samples collected in 2006, data from both years were combined for comparisons. The distributions of mercury and carbon in A and B horizons for soils from the two control watersheds and for unburned sites in the Section 33 fire area are shown in figures 5*A* and 5*B*. A-horizon soils typically have much higher mercury concentrations than B-horizon soils. A- and B-horizon soils also have the good correlation of mercury with carbon observed for many forest soils (Grigal, 2002) (fig. 5*C*).

ANOVA tests showed no significant differences for concentrations of mercury, or any other elements, between soils from equivalent horizons in unburned Shoepack Lake watershed sites and control sites from the Ryan Lake and Brown Lake watersheds, suggesting that the unburned sites at Shoepack Lake can be used as "pre-fire" control sites for the fire-severity comparisons that follow.

Concentrations and the areal burdens of mercury in the three soil horizons collected from 10 unburned sites from

A

C

B

Figure 5. Box plots of *A*, mercury, and *B*, carbon concentrations in A- and B-horizon soils from Brown Lake and Ryan Lake watersheds collected in 2003 and 2006 and from the unburned sites from the Shoepack Lake watershed collected in 2004. *C*, The relationship between mercury and carbon in both horizons. Number in parentheses is number of samples used for each plot.

Shoepack Lake are shown as box plots in figure 6. Although organic O-horizon soils typically have high concentrations of mercury, predominantly mineral soils will contain the larger masses of mercury because of their higher densities. Therefore, while an O horizon is more combustible than underlying mineral soils and so represents a major source of mercury potentially mobilized by fire, A-horizon soils, if sufficiently heated, could be a more significant mercury source.

Soil Chemistry along Gradients of Fire Severity in 2004

Concentrations and calculated areal burdens for carbon and mercury in both O- and A-horizon soils collected from similar fire-severity gradients in 2004 from the Section 33 fire footprint are given in figure 7. By our severity classification, all O-horizon soils were totally combusted at high-severity sites and all contained mercury was released. The fire's impact on mercury contained in A-horizon soils is variable among the sampled areas (table 4). Two sites (sites 1 and 5) show little effect of fire on mercury in mineral soils, but data from the other eight sites indicate significant mercury mobilization from high-severity sites and possibly slight losses from low-moderate-severity sites. A plot of mercury vs. carbon in A-horizon soils shows that both elements were mobilized at high-severity sites (fig. 8). ANOVA testing of A-horizon soils across the fire-severity gradient indicates that concentrations and areal burdens of mercury and carbon are statistically significantly lower in high-severity sites compared to both low-moderate-severity and unburned sites. However, the differences in mercury and carbon between low-moderate-severity sites and unburned sites are not statistically significant.

Table 4. Mercury concentrations in A-horizon soils at 10 sites sampled in 2004 within Section 33 wildfire areas. Soils were collected across gradients of fire severity.

[Descriptions of fire severity criteria are given in the text. ppm Hg, parts per million mercury]

Section 33 sample area	Fire severity		
	Unburned (ppm Hg)	Low-moderate (ppm Hg)	High (ppm Hg)
Site 1	0.03	0.05	0.03
Site 2	0.03	0.16	0.23
Site 3	0.04	0.01	0.15
Site 4	0.03	0.19	0.26
Site 5	0.04	0.04	0.06
Site 6	0.01	0.09	0.18
Site 7	0.01	0.19	0.14
Site 8	0.08	0.04	0.12
Site 9	0.02	0.11	0.14
Site 10	0.01	0.11	0.15

A

B

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Figure 6. Box plots of *A*, concentrations, and *B*, calculated areal burden (mass per unit area) for mercury in O-, A-, and B-horizon soils from unburned sites within the Section 33 wildfire footprint in the Shoepack Lake watershed. Number in parentheses is number of samples used for each plot.

A

B

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Figure 7. Box plots of calculated areal burdens for carbon and mercury in O- and A-horizon soils from sample sites within the Section 33 wildfire footprint in the Shoepack Lake watershed collected across gradients of fire severity. Number in parentheses is number of samples used for each plot.

C

D

The mobilization of mercury from mineral soils observed for the Section 33 wildfire high-severity sites is an important observation on the fate of mercury during wildfire. While mineral soils are the largest pool of mercury sequestered in soils (Grigal, 2002), few studies have quantified mercury emissions from mineral soils following fire (Engle and others, 2005; Biswas and others, 2007). Results from this study show that the Section 33 wildfire created conditions of sufficient intensity and duration to release some fraction of sequestered mercury and carbon in uppermost mineral soils.

Figure 8. Plot of mercury versus carbon for A-horizon soils collected in 2004 across fire-severity gradients in Section 33 wildfire footprint in Shoepack Lake watershed.

Median values for areal burdens of mercury and carbon in O-horizon and A-horizon soils collected in 2004 are given in table 5. If the unburned sites from the Shoepack Lake watershed are representative of average mercury concentrations of the forest soils prior to the ignition of the Section 33 wildfire, these data suggest that at sites where all the organic forest floor material was combusted, exposing mineral soils (equivalent to high-severity sites), approximately 0.21 mg Hg/m² was potentially liberated from combusted organic material during the fire. For A-horizon soils, the difference between unburned and high-severity sites suggests potential mobilization of about 0.89 mg Hg/m². Based on these values, total mercury mobilization from soils within areas of high-severity fire in the Section 33 wildfire was about 1.1 mg Hg/m². This is similar to mercury emissions of 0.26 to 0.86 mg Hg/m² estimated by Turetsky and others (2006) for fire events in upland forests, but less than their estimates of 2 to 7 mg Hg/m² for fire events in boreal forest regions.

Fire severity was the primary control on mercury mobilization from the Section 33 wildfire, similar to findings from other studies (for example, Harden and others, 2004; Amirbahman and others, 2004; Kelly and others, 2006). Fire severity maps based on satellite imagery were constructed for the Section 33 fire by the USGS and the NPS. These maps show that approximately 4.047 km² were burned in the fire; vegetation mapping suggests that the landscapes within the burn perimeter could be characterized as about half upland and half wetland areas. On the basis of satellite imagery, it is estimated that about 75% of the upland areas and none of the wetland areas could be classified as high severity, giving a total of about 1.52 km² burned in high-severity settings (S. Weyenbery, NPS, personal communication, 2007). Using our calculation of mercury losses from high-severity burned soils of about 1.1 mg Hg/m², we estimate that a total of ~1.6 km of mercury were potentially mobilized from soils within the Section 33 wildfire footprint.

Table 5. Median areal burdens for mercury and carbon in O-horizon and A-horizon soils collected in 2004 within Section 33 wildfire areas.

[Soils were collected across gradients of fire severity. Descriptions of fire-severity criteria are given in text. g/m², grams per square meter; mg/m², micrograms per square meter]

Areal burdens and fire severity	Soil horizon	
	O horizon	A horizon
Mercury (mg/m ²):		
High	0.00	0.13
Low-moderate	0.22	0.77
Unburned	0.21	1.02
Carbon (g/m ²):		
High	0	420
Low-moderate	1,131	1,013
Unburned	1,374	1,180

Soil Chemistry from 2004 to 2006

Soils were collected in successive years from areas as close as possible to the original sample sites, always within 1 to 2 m of the stake marking the 2004 site. Typical site regeneration at high-severity sites over the 2-year timeframe of the study is shown in figure 9. In May 2005, 9 months following the fire, severe sites often had a mat of liverwort growing on exposed mineral soil. By May 2006, liverwort had often disappeared, replaced by mosses and grasses. Variations with time for all three severity classifications for mercury and carbon are given in figure 10. ANOVA testing found no significant trends for mercury or carbon for soils from the same horizon collected in close proximity to one another with the same fire severity classification over the different years. It was noted in the field that there was a decrease in the quantity of O-horizon soils collected within a fixed area for sites classified as low-moderate severity. In 2004, O-horizon samples were collected from all 10 sites. In 2005, O-horizon samples were collected from eight sites, but by 2006 only two of the sites still had sufficient quantities of organic material to collect (fig. 10). The cause of this depletion in O horizon is not known.

Lake Waters

This section reports on methylmercury in unfiltered water and related concentrations of total mercury in unfiltered water, and total organic carbon. Complete water-quality data are reported in appendix 8. Concentrations of mercury and methylmercury are given in units of nanograms per liter (ng/L), equivalent to parts per trillion.

Aqueous concentrations of methylmercury are a key indicator of exposure of aquatic food webs to methylmercury, and thus aqueous methylmercury is a key species of interest in studies of mercury in natural waters. Because water-column data were compiled from several sampling efforts extending

Figure 9. Photographs showing vegetation regeneration from high-severity soil site 6-3 following the Section 33 wildfire. *A*, August 2004, 2 weeks following the fire; *B*, May 2005, 9 months after the fire; *C*, May 2006, 17 months after the fire.

both before (2000–2002) and after (2006) the planned study, and also because of the unplanned Section 33 wildfire replacing the originally planned Ryan Lake prescribed fire, there are some year-to-year variations in sampling regime (table 3). Because of these variations and the relatively short duration of data collection, statistical analyses should be interpreted with due caution.

Shoepack Lake Waters—Comparison of Pre-Fire and Post-Fire Conditions

The distribution of methylmercury concentrations was somewhat lower in Shoepack Lake in the post-fire period (2004–2006) than in the pre-fire period (2000–2003). This difference was significant (two-tailed *t*-test; $p=0.03$). The mean difference was 0.0816 ng/L, which is 28 percent of the mean pre-fire methylmercury concentration of 0.283 ng/L. For reasons discussed earlier, readers are cautioned to not attach too much weight to statistical summaries of this small data-set. However, methylmercury appears to have significantly decreased in Shoepack lake waters rather than increased, relative to pre-fire conditions, and the lack of a sharp increase in aqueous methylmercury shortly following a significant wildfire is an important finding for natural resource managers. Aqueous total mercury and total organic carbon concentrations in Shoepack Lake were not significantly different post-fire compared to pre-fire.

Shoepack Lake Waters Compared to Control Lakes

The suggestion of a step decrease in aqueous methylmercury concentrations in Shoepack Lake should be viewed in the context of the three control lakes—Ryan, Brown, and Peary Lakes. Three of the four sampled lakes, including Shoepack Lake, had downward trends in aqueous methylmercury concentrations over the period from 2000–2006 (fig. 11). When data for all four lakes were combined, the trend in aqueous methylmercury is still significant ($p=0.008$). Given that two of the three control lakes (Ryan and Peary) had downward trends, similar to Shoepack Lake, the downward trend in Shoepack Lake cannot be attributed to the fire in that lake's catchment. It is more likely that lakes in the Park were responding to another factor or set of factors, such as decreased atmospheric mercury inputs or changes in regional precipitation patterns, which could affect both mercury methylation rates and inputs from connected wetlands to lakes.

Age-1 Yellow Perch

A total of 384 yellow perch from the four study lakes collected in 2003, 2004, 2005, and 2006 were analyzed (table 3). The sample size for individual lakes ranged from 11 to 47 fish (median, 30). Data are reported in appendix 9 as whole-body concentrations (wet weight) of total mercury in nanograms/gram (ng/g), or parts per billion. The annual mean TL and mass of age-1 yellow perch were generally consistent within each lake (table 6). Annually, the mean TL and mass of fish were generally least from Brown Lake (50–55 mm TL, 1.08–1.47 g) and greatest from Shoepack Lake (60–67 mm TL, 1.68–2.40 g).

Total mercury concentrations in the yellow perch varied markedly within and among lakes during the 4 years of the

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(n) Sample population size

Figure 10. Box plots of calculated loads for carbon and mercury in *A* and *B*, O-horizon, and *C* and *D*, A-horizon soils from sample sites within the Section 33 wildfire footprint in the Shoepack Lake watershed collected over the length of this study. The individual data points for O-horizon low-moderate sites in 2006 are plotted as filled blue squares. Number in parentheses is number of samples used for each plot.

Figure 11. Plot illustrating data and least square regression trendlines in methylmercury concentrations in unfiltered lake waters from the four study lakes. Data points circled have values lower than the method detection limit of 0.04 nanograms per liter.

study (table 6 and fig. 12). For example, mean mercury concentrations in yellow perch from Peary Lake varied more than fourfold from 2004 (31 ng/g) to 2006 (137 ng/g). Mean mercury concentrations were least in yellow perch collected from Peary Lake in 2004 (31 ng/g) and greatest in yellow perch collected from Ryan Lake in 2003 and 2004 (180 ng/g).

While there was a significant variation in mercury concentrations for age-1 yellow perch among the control lakes after the fire (table 7, $p < 0.0001$), there was not a significant difference in concentrations of total mercury in yellow perch from Shoepack Lake in 2005 and 2006 (after fire) relative to that measured during 2000 and 2001 (before fire; table 7, $p > 0.57$). The effect of fire on concentrations of mercury in aquatic biota is primarily dependent upon the characteristics of the watershed (Allen and others, 2005) and trophic structure of the aquatic ecosystem (Kelly and others, 2006). For example, Garcia and Carignan (2005) examined the relation between mercury concentrations in fish from 38 drainage lakes with clear-cut, burnt, or undisturbed watersheds. Highest mercury concentrations were found in fish from lakes in partially burnt watersheds. However, relative to control lakes in undisturbed catchments, there was no significant enhancement of mercury in fish from lakes within completely burnt watersheds. Similarly, no effects of forest fire on methylmercury concentrations in zooplankton and fish were observed in boreal lakes (Garcia

and Carignan, 1999, 2000). Conversely, Kelly and others (2006) found that mercury bioaccumulation in fish increased after fire as a result of an increase in nutrient concentrations that increased productivity and restructured the food web.

Although methylmercury bioavailability may increase after fire, a concomitant increase in nutrient flux to a lake may result in an increased productivity that results in a reduction in methylmercury in fish via biodilution or growth dilution (Allen and others, 2005). There was not a detectable difference in the growth of age-1 yellow perch in Shoepack Lake between years (table 7, $p > 0.31$); hence, the data suggest that the lack of change in methylmercury concentrations in yellow perch from Shoepack Lake was the result of a lack of effect of fire on the bioavailability of methylmercury in the lake rather than growth dilution.

Summary and Conclusions

Analyses of soils for this study confirm that in VNP, mercury is deposited across the landscape by atmospheric deposition. Thus, variations in the distribution of mercury in soils across the Park are the result of differences in mercury delivery to the forest floor and processes that can affect mercury cycling in soils and not of differences in soil parent

Table 6. Characteristics of age-1 yellow perch sampled from Brown, Peary, Ryan, and Shoepack Lakes in Voyageurs National Park in May 2003–2006.

[Perch sampled in May for each of the years from 2000 through 2006; Shoepack Lake was not sampled in 2003 and 2004. g, grams; Hg, mercury; Max, maximum value; Min, minimum value; mm, millimeters; NA, not available; *n*, sample size (the number of fish); ng/g, nanograms per gram; SE, standard error of the mean]

Year	Statistic	Brown Lake			Peary Lake			Ryan Lake			Shoepack Lake		
		Total length (mm)	Wet weight (g)	Total Hg (ng/g wet weight)	Total length (mm)	Wet weight (g)	Total Hg (ng/g wet weight)	Total length (mm)	Wet weight (g)	Total Hg (ng/g wet weight)	Total length (mm)	Wet weight (g)	Total Hg (ng/g wet weight)
2000	Mean	48	1.07	97	64	2.20	94	47	0.91	178	51	1.13	158
	SE	0.42	0.02	2.0	3.1	0.32	2.8	0.37	0.02	3.7	0.92	0.07	6.2
	Min	44	0.84	79	57	1.64	86	43	0.63	143	42	0.64	88
	Max	54	1.46	125	79	3.71	106	51	1.14	223	63	2.14	235
	<i>n</i>	29	29	29	6	6	6	29	29	29	29	29	29
2001	Mean	51	1.11	59	47	0.88	67	62	2.20	177	53	1.30	119
	SE	0.34	0.02	1.5	1.4	0.07	5.6	0.59	0.07	7.0	1.0	0.08	9.2
	Min	48	0.96	46	40	0.56	50	58	1.73	135	50	1.15	85
	Max	54	1.30	76	57	1.35	111	66	2.87	247	56	1.59	142
	<i>n</i>	20	20	20	10	10	10	19	19	19	5	5	5
2003	Mean	55	1.47	88	51	1.26	64	54	1.37	180	NA	NA	NA
	SE	0.46	0.36	1.7	0.84	0.68	1.7	1.2	0.12	13.0			
	Min	49	1.09	71	45	0.77	47	47	0.73	29			
	Max	63	2.12	115	64	2.38	79	74	3.81	297			
	<i>n</i>	47	47	47	30	30	30	29	29	29			
2004	Mean	50	1.08	57	58	1.83	31	66	2.37	180	NA	NA	NA
	SE	0.48	0.03	1.6	0.28	0.04	0.65	0.71	0.06	4.71			
	Min	43	0.75	42	56	1.49	25	60	1.71	140			
	Max	55	1.41	81	60	2.22	35	79	3.48	258			
	<i>n</i>	30	30	30	23	23	23	29	29	29			
2005	Mean	53	1.34	73	55	1.35	92	50	1.09	89	60	1.68	111
	SE	0.67	0.05	1.8	0.61	0.05	14	1.4	0.09	14.3	0.49	0.05	6.68
	Min	46	0.91	57	51	1.08	35	43	0.73	35	55	1.16	47
	Max	30	2.04	105	58	1.65	167	64	2.06	174	64	2.09	159
	<i>n</i>	39	39	39	14	14	14	14	14	14	28	28	28
2006	Mean	53	1.24	138	57	1.71	137	57	1.72	160	67	2.40	127
	SE	0.48	0.04	3.4	0.91	0.09	3.47	0.56	0.05	5.1	0.89	0.13	5.58
	Min	49	0.91	98	49	0.99	101	51	1.25	97	60	4.52	97
	Max	60	1.88	175	73	3.31	177	63	2.33	221	70	2.97	168
	<i>n</i>	30	30	30	30	30	30	30	30	30	11	11	11

Table 7. Analysis of variance used to test for differences in mercury concentrations and total length of age-1 yellow perch for the three control lakes and Shoepack Lake before and after the Section 33 wildfire of 2004.

[The effect of the wildfire (Impact) was tested by first determining if the Time(After fire) × Control interactions were significant and then determining if the Time(After fire) × Impact interactions were significant. df, degrees of freedom; MS, mean square; F, distribution of two ratios; and P, probability value; error term, denominator for the calculation of the F statistic. See Underwood (1992) for detailed explanation]

Source of variation	df	Differences in mercury concentrations			Differences in total length		
		MS	F	P	MS	F	P
Time(After fire) × Among locations	3	5,789	—	—	141	—	—
Time(After fire) × Impact versus controls	1	4,457	0.654 ¹	0.57	277	3.59 ¹	0.31
Time(After fire) × Among controls	2	6,815	9.906 ²	<0.0001	77	6.36 ²	0.002

¹The denominator for the F ratio was the mean square of Time(After) × Among controls.

²The denominator for the F ratio was the mean square of the residual.

A

B

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Figure 12. Box plots of total mercury concentrations in age-1 yellow perch from *A*, *B*, and *C*, the three control lakes—Brown, Peary, and Ryan—and *D*, fire-impacted Lake Shoepack. The mean is represented by the dotted line within the box, and individual outlying points are shown as solid circles.

chemistry. Comparison of soil chemistry between unburned sites selected within the Section 33 fire footprint and unburned control lakes confirms that site-to-site comparisons of soil chemistry across gradients of burn severity provide reliable data on the fate of mercury sequestered with organic carbon during fire. Mercury is mobilized from O-horizon soils by

C

D

combustion of the forest floor, and also from A-horizon soils if the temperature and duration of fire results in high-fire-severity impacts to the forest floor. At high-severity sites in the Section 33 wildfire, ~ 0.22 mg Hg/m² was mobilized by complete combustion of the O horizon, and ~ 0.6 to 0.9 mg Hg/m² from the A horizon in these same areas. Mineral soils at low-moderate-severity sites show little significant changes in mercury values, although some mercury certainly is released by the partial combustion of organic soils.

Analyses of lake waters showed that despite the mobilization of significant quantities of mercury from watershed soils, aqueous total mercury and total organic carbon concentration in waters from Shoepack Lake were not significantly different from pre-fire concentrations. This lack of notable changes in lake-water chemistry following fire suggests that, in watersheds with relatively subdued topography, there may not be significant input of material from the burned landscape into lake waters. An overall downward trend in methylmercury concentrations in lake waters in three of the four lakes in

VNP sampled in this study may be an indication of changes in regional mercury trends.

No changes in methylmercury for age-1 yellow perch, which provide a good baseline for a lake's aquatic food web, were found for perch in Shoepack Lake following the Section 33 wildfire. Statistical analyses indicate that this lack of change in methylmercury concentrations was the result of a lack of effect of fire on the bioavailability of methylmercury in the lake rather than on growth dilution.

In the timeframe of this study, we conclude that fire can mobilize large quantities of the mercury that have accumulated in forest soils over time. However, in forested watersheds with relatively subdued topography, similar to those in VNP, the bulk of this mercury apparently does not make its way into either a burned watershed's lake or aquatic food web.

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Field no.	Year collected	Latitude	Longitude	Watershed	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs ⁺ (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)	Li (ppm)
V-03-01A	2003	48.51360	-92.70532	Ryan Lake	4.30	1.03	1.85	1.00	0.42	0.96	0.07	0.18	<1	7	578	1.0	0.35	0.5	40.0	12.2	32	3.08	14.7	10.4	0.15	0.05	20.2	18
V-03-02A	2003	48.52164	-92.70490	Ryan Lake	2.14	0.76	1.00	0.43	0.25	0.26	0.12	0.08	<1	3	345	1.1	0.12	0.4	99.4	25.8	19	1.99	17.8	4.8	0.15	0.02	43.7	10
V-03-03A	2003	48.52124	-92.70567	Ryan Lake	3.58	0.81	0.99	0.96	0.26	1.00	0.07	0.13	<1	3	368	0.8	0.14	0.1	41.4	8.8	22	1.97	15.2	7.9	0.12	0.03	24.2	8
V-03-04A	2003	48.51987	-92.70518	Ryan Lake	3.78	0.63	2.13	0.74	0.33	0.62	0.08	0.16	<1	6	414	1.1	0.28	0.3	58.3	37.3	37	2.30	41.4	9.3	0.17	0.04	27.7	14
V-03-05A	2003	48.51889	-92.70403	Ryan Lake	3.24	1.31	1.17	0.92	0.29	0.80	0.08	0.14	<1	5	524	0.7	0.30	0.6	19.1	7.5	22	1.86	10.4	7.4	0.18	0.04	10.3	9
V-03-05A dup	2003	48.51889	-92.70403	Ryan Lake	3.18	1.28	1.12	0.92	0.29	0.77	0.08	0.14	<1	5	508	0.7	0.30	0.6	19.8	7.4	24	2.03	11.3	7.3	0.17	0.03	10.7	9
V-03-06A	2003	48.51519	-92.70383	Ryan Lake	3.43	1.07	1.75	0.70	0.35	0.57	0.09	0.16	<1	7	554	0.7	0.31	0.9	22.2	9.3	37	3.50	16.4	8.3	0.21	0.03	11.7	16
V-03-07A	2003	48.51681	-92.70174	Ryan Lake	3.14	1.32	1.80	0.59	0.37	0.65	0.09	0.14	<1	6	359	0.7	0.23	0.5	15.5	8.6	77	2.90	32.5	7.3	0.18	0.03	8.5	12
V-03-08A	2003	48.51711	-92.70057	Ryan Lake	2.06	0.58	0.83	0.47	0.18	0.48	0.09	0.08	<1	4	334	0.4	0.19	0.2	11.8	4.8	17	0.86	8.6	4.3	0.20	<0.02	6.9	5
V-03-09A	2003	48.51831	-92.70119	Ryan Lake	3.19	1.37	1.31	0.80	0.33	0.74	0.08	0.14	<1	4	707	0.7	0.24	0.9	18.0	7.5	25	1.91	9.1	7.1	0.17	0.03	9.3	10
V-03-10A	2003	48.51792	-92.69938	Ryan Lake	2.77	0.87	0.79	0.74	0.24	0.74	0.08	0.10	<1	4	427	0.6	0.20	0.3	15.1	9.2	16	1.09	9.4	5.8	0.19	0.02	8.4	6
V-03-11A	2003	48.51568	-92.70500	Ryan Lake	3.51	0.96	1.13	0.98	0.27	0.96	0.06	0.13	<1	3	476	0.7	0.18	0.3	17.3	7.4	22	1.79	10.1	7.8	0.12	0.02	9.4	9
V-03-11A dup	2003	48.51568	-92.70500	Ryan Lake	3.59	0.99	1.17	1.04	0.29	0.97	0.06	0.14	<1	4	499	0.8	0.20	0.3	18.1	8.2	25	1.59	12.1	8.2	0.12	0.03	9.8	10
V-03-12A	2003	48.51580	-92.70547	Ryan Lake	5.40	1.00	1.70	1.30	0.43	1.58	0.03	0.20	<1	3	408	1.0	0.22	<0.1	17.4	6.6	43	1.43	12.0	11.5	0.06	0.03	9.6	17
V-03-13A	2003	48.51373	-92.70505	Ryan Lake	3.68	0.94	1.65	0.85	0.39	0.92	0.07	0.17	<1	6	377	0.8	0.26	0.2	17.6	7.0	35	2.63	10.0	8.9	0.15	0.03	9.1	14
V-03-14A	2003	48.51351	-92.70242	Ryan Lake	3.65	1.19	1.13	1.05	0.32	1.03	0.07	0.14	<1	3	536	0.8	0.24	0.5	21.9	15.6	24	1.51	12.9	7.9	0.11	0.03	13.1	8
V-03-15A	2003	48.51373	-92.78778	Brown Lake	4.88	1.34	1.18	1.51	0.33	1.64	0.05	0.13	<1	3	544	0.9	0.23	0.4	17.6	7.3	25	2.18	13.0	9.8	0.08	0.03	9.0	11
V-03-16A	2003	48.51392	-92.78711	Brown Lake	3.77	1.08	1.62	1.06	0.39	0.81	0.08	0.17	<1	6	589	0.8	0.35	0.5	23.6	14.5	32	2.52	15.2	9.6	0.14	0.04	13.2	16
V-03-17A	2003	48.51284	-92.78577	Brown Lake	4.45	0.76	2.04	1.00	0.43	0.76	0.09	0.23	<1	4	572	1.4	0.32	0.4	71.5	54.7	43	3.61	29.7	11.0	0.13	0.04	29.3	23
V-03-18A	2003	48.51218	-92.78512	Brown Lake	3.44	1.02	1.70	0.59	0.42	0.76	0.10	0.17	<1	4	487	0.9	0.31	0.9	18.6	12.3	46	3.67	25.5	8.5	0.12	0.03	10.2	16
V-06-01A	2006	48.51472	-92.70396	Ryan Lake	4.23	0.79	1.78	0.72	0.31	0.84	0.05	0.19	<1	7	411	1.2	0.24	0.5	21.9	7.6	37	<5	16.4	10.2	0.17	0.03	12.1	14
V-06-02A	2006	48.51580	-92.70547	Ryan Lake	3.18	0.78	1.01	0.76	0.25	0.77	0.06	0.12	<1	5	322	0.8	0.19	0.3	17.2	4.6	24	<5	12.5	7.6	0.20	0.02	9.9	7
V-06-03A	2006	48.51574	-92.70515	Ryan Lake	5.10	0.97	2.02	1.01	0.43	1.26	0.04	0.24	<1	5	444	1.1	0.25	0.4	26.1	13.2	48	<5	21.7	13.6	0.08	0.03	14.5	16
V-06-04A	2006	48.51947	-92.70412	Ryan Lake	3.31	1.35	1.06	0.97	0.33	0.81	0.09	0.12	<1	6	396	0.8	0.16	0.6	14.4	5.6	25	<5	8.6	7.6	0.14	0.03	7.8	8
V-06-05A	2006	48.52139	-92.70499	Ryan Lake	4.86	0.77	2.13	1.13	0.47	0.80	0.07	0.19	<1	7	524	1.6	0.18	0.4	80.2	57.7	46	<5	25.5	11.7	0.10	0.04	26.2	22
V-06-06A	2006	48.52126	-92.70521	Ryan Lake	4.47	0.96	0.79	1.33	0.23	1.40	0.04	0.12	<1	3	429	0.9	0.07	0.2	20.6	4.6	21	<5	13.4	9.8	0.07	0.02	11.7	5
V-06-07A	2006	48.52016	-92.70523	Ryan Lake	4.82	1.00	1.54	1.27	0.37	1.20	0.05	0.16	<1	6	465	0.9	0.12	0.2	17.1	13.5	34	<5	12.9	11.3	0.13	0.02	9.8	11
V-06-08A	2006	48.51816	-92.70107	Ryan Lake	4.88	1.32	1.71	1.28	0.41	1.30	0.05	0.20	<1	4	604	0.9	0.14	0.5	17.6	7.7	43	<5	9.3	11.8	0.09	0.03	9.8	12
V-06-09A	2006	48.51760	-92.70024	Ryan Lake	2.71	0.76	0.77	0.68	0.23	0.73	0.07	0.10	<1	3	362	0.7	0.09	0.4	12.8	5.4	22	<5	9.3	6.2	0.15	0.02	7.7	4
V-06-10A	2006	48.51627	-92.70162	Ryan Lake	3.36	1.57	1.41	0.66	0.41	0.75	0.10	0.15	<1	5	432	0.7	0.20	0.7	15.3	10.7	41	<5	10.2	8.1	0.16	0.03	8.7	11
V-06-11A	2006	48.51359	-92.70248	Ryan Lake	3.55	1.18	0.92	1.11	0.30	0.99	0.07	0.12	<1	2	454	0.8	0.08	0.5	14.3	10.4	28	<5	9.5	8.0	0.09	0.02	8.6	6
V-06-12A	2006	48.71781	-92.69928	Ryan Lake	2.72	0.78	0.71	0.75	0.22	0.69	0.09	0.10	<1	4	382	0.6	0.08	0.3	13.4	6.4	22	<5	10.8	6.4	0.15	0.02	7.6	6
V-06-13A	2006	48.51214	-92.78509	Brown Lake	4.94	1.32	2.38	0.75	0.61	1.25	0.06	0.24	<1	5	483	1.1	0.19	1.0	17.2	14.6	72	<5	22.2	12.7	0.07	0.03	9.8	22
V-06-14A	2006	48.51289	-92.78571	Brown Lake	4.56	0.71	1.84	0.92	0.41	0.63	0.10	0.18	<1	5	474	1.9	0.22	0.4	114.0	87.6	45	<5	42.9	9.3	0.13	0.04	68.5	20
V-06-15A	2006	48.51385	-92.78703	Brown Lake	5.44	1.17	1.20	1.71	0.38	1.87	0.03	0.14	<1	3	458	1.1	0.10	0.2	16.1	7.3	32	<5	4.3	12.1	0.04	0.02	8.7	12
V-06-15A dup	2006	48.51383	-92.78757	Brown Lake	5.49	1.20	1.15	1.72	0.37	1.88	0.03	0.14	<1	3	459	1.3	0.09	0.2	17.9	8.5	36	<5	5.1	11.7	0.04	0.02	9.7	12
V-06-16A	2006	48.51383	-92.78757	Brown Lake	4.10	1.39	1.47	1.20	0.42	0.96	0.06	0.16	<1	4	572	1.1	0.24	0.8	22.0	11.8	35	<5	15.7	9.4	0.10	0.03	11.9	14

*Because of analytical laboratory issues, Cs detection limits in 2003 were 0.05 ppm and 5 ppm in 2006.

Field no.	Year collected	Latitude	Longitude	Watershed	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)	Total C (wt. %)
V-03-01A	2003	48.51360	-92.70532	Ryan Lake	2,900	0.93	5.7	26.6	900	66.3	72.8	0.65	6.1	1.6	168	<0.1	4.1	0.4	1.2	48	0.8	9.5	121	0.6	17.70
V-03-02A	2003	48.52164	-92.70490	Ryan Lake	2,400	0.60	2.6	26.8	1,140	21.8	38.6	0.42	4.8	0.5	93	<0.1	4.5	0.2	1.6	26	0.4	13.7	53	0.6	33.10
V-03-03A	2003	48.52124	-92.70567	Ryan Lake	333	0.54	3.9	12.8	620	28.6	59.3	0.49	4.7	1.1	159	<0.1	3.0	0.2	1.6	31	0.4	8.7	32	0.4	20.20
V-03-04A	2003	48.51987	-92.70518	Ryan Lake	1,950	1.17	5.1	22.1	1,040	41.9	64.4	0.50	5.5	1.5	116	<0.1	6.6	0.3	2.3	53	0.5	8.1	74	0.9	20.80
V-03-05A	2003	48.51889	-92.70403	Ryan Lake	2,620	0.65	4.3	12.6	750	61.3	65.7	0.65	4.2	1.4	151	<0.1	3.2	0.3	0.9	34	0.5	5.1	109	0.5	22.50
V-03-05A dup	2003	48.51889	-92.70403	Ryan Lake	2,560	0.74	4.2	13.4	740	59.3	64.0	0.67	4.3	1.5	148	<0.1	3.3	0.3	0.9	33	0.4	5.2	111	0.6	23.00
V-03-06A	2003	48.51519	-92.70383	Ryan Lake	3,690	0.99	4.6	22.8	790	58.1	60.5	0.65	4.8	1.4	125	<0.1	3.7	0.3	1.0	48	0.7	5.3	176	0.9	24.80
V-03-07A	2003	48.51681	-92.70174	Ryan Lake	1,970	15.30	4.2	30.1	630	49.2	48.9	0.72	3.9	2.2	131	<0.1	3.0	0.3	0.8	41	1.3	3.9	159	0.8	28.20
V-03-08A	2003	48.51711	-92.70057	Ryan Lake	184	0.55	2.3	12.7	560	30.3	24.3	0.44	2.7	0.9	99	<0.1	2.1	0.2	0.6	23	0.3	3.0	33	0.7	34.20
V-03-09A	2003	48.51831	-92.70119	Ryan Lake	2,740	0.53	4.0	14.7	720	46.0	54.3	0.48	4.2	1.1	166	<0.1	3.1	0.3	0.8	37	0.4	4.6	220	0.7	23.30
V-03-10A	2003	48.51792	-92.69938	Ryan Lake	1,130	0.55	2.9	8.8	650	42.0	39.9	0.54	3.4	0.9	135	<0.1	2.7	0.2	0.7	26	0.4	3.8	57	0.5	25.90
V-03-11A	2003	48.51568	-92.70500	Ryan Lake	1,490	0.51	3.8	13.3	580	38.0	56.0	0.42	4.3	0.9	152	<0.1	3.0	0.2	0.8	35	0.3	4.4	61	0.4	18.90
V-03-11A dup	2003	48.51568	-92.70500	Ryan Lake	1,610	0.59	4.1	15.6	640	42.0	60.6	0.46	4.6	1.2	155	<0.1	3.2	0.3	0.8	37	0.4	4.7	66	0.4	19.90
V-03-12A	2003	48.51580	-92.70547	Ryan Lake	232	0.62	5.2	21.3	200	35.7	58.5	0.35	5.7	1.1	211	<0.1	3.1	0.3	1.0	54	0.4	5.6	46	0.3	7.58
V-03-13A	2003	48.51373	-92.70505	Ryan Lake	821	0.69	4.8	19.1	600	44.6	57.4	0.50	5.1	1.5	146	<0.1	3.1	0.3	0.9	49	0.5	4.9	76	0.5	21.00
V-03-14A	2003	48.51351	-92.70242	Ryan Lake	2,270	0.53	4.2	13.0	580	47.4	66.9	0.47	4.6	1.1	188	<0.1	3.1	0.4	0.9	34	0.4	5.3	70	0.4	19.40
V-03-15A	2003	48.51373	-92.78778	Brown Lake	2,260	0.47	3.9	14.8	580	39.2	93.9	0.63	4.2	1.0	231	<0.1	2.6	0.2	0.8	32	0.3	5.1	40	0.3	12.10
V-03-16A	2003	48.51392	-92.78711	Brown Lake	3,150	1.05	5.1	23.3	960	57.2	69.1	0.66	5.0	1.7	148	<0.1	4.0	0.2	1.2	46	0.6	6.0	90	0.7	20.60
V-03-17A	2003	48.51284	-92.78577	Brown Lake	3,120	1.49	7.4	37.4	1,630	48.1	69.0	0.65	7.0	1.7	135	<0.1	5.6	0.5	2.9	58	0.7	10.0	105	1.0	16.60
V-03-18A	2003	48.51218	-92.78512	Brown Lake	1,290	0.80	4.6	31.4	1,320	43.8	44.6	0.55	4.9	1.4	152	<0.1	3.5	0.2	1.0	46	0.6	5.1	207	0.5	23.60
V-06-01A	2006	48.51472	-92.70396	Ryan Lake	916	1.57	4.6	18.9	700	44.8	42.5	0.56	5.1	0.9	145	<0.1	4.0	0.3	1.2	54	0.6	5.8	65	0.6	19.00
V-06-02A	2006	48.51580	-92.70547	Ryan Lake	177	0.63	3.0	12.8	430	44.7	36.1	0.53	3.9	0.5	130	<0.1	2.7	0.2	0.9	33	0.3	4.6	28	0.6	22.80
V-06-03A	2006	48.51574	-92.70515	Ryan Lake	978	0.98	5.5	18.2	520	47.9	63.8	0.46	6.0	1.2	190	<0.1	4.6	0.4	1.5	63	0.7	6.4	75	0.5	11.30
V-06-04A	2006	48.51947	-92.70412	Ryan Lake	2,320	0.59	3.4	10.7	730	47.1	59.9	0.46	4.0	1.2	147	<0.1	2.6	0.4	0.8	32	0.4	4.7	94	0.6	20.90
V-06-05A	2006	48.52139	-92.70499	Ryan Lake	6,570	1.54	5.2	25.8	890	33.5	69.4	0.46	8.1	1.2	141	<0.1	8.6	0.6	2.3	63	0.5	9.9	62	1.0	13.70
V-06-06A	2006	48.52126	-92.70521	Ryan Lake	319	0.43	3.1	9.0	410	25.0	58.8	0.32	4.3	0.9	195	<0.1	2.9	0.4	1.1	26	14.5	6.7	27	0.3	11.70
V-06-07A	2006	48.52016	-92.70523	Ryan Lake	1,220	0.69	3.9	15.4	650	29.9	74.5	0.42	5.5	1.1	174	<0.1	3.5	0.4	1.1	45	0.6	5.1	56	0.5	14.80
V-06-08A	2006	48.51816	-92.70107	Ryan Lake	1,070	1.18	4.7	14.8	620	35.5	62.4	0.34	5.6	1.2	215	<0.1	3.5	0.4	1.0	50	0.5	6.1	102	0.3	13.30
V-06-09A	2006	48.51760	-92.70024	Ryan Lake	206	0.49	2.5	8.5	570	31.1	32.3	0.30	3.4	0.8	126	<0.1	2.2	0.3	0.7	26	0.4	3.9	31	0.6	25.70
V-06-10A	2006	48.51627	-92.70162	Ryan Lake	2,310	0.74	3.4	16.2	740	49.4	60.0	0.55	3.9	1.3	151	<0.1	2.7	0.4	0.9	39	0.5	4.4	107	0.8	24.30
V-06-11A	2006	48.51359	-92.70248	Ryan Lake	1,470	0.52	3.2	8.9	670	34.5	64.8	0.35	4.0	0.9	170	<0.1	3.0	0.4	0.8	30	0.4	5.6	62	0.4	17.70
V-06-12A	2006	48.71781	-92.69928	Ryan Lake	366	0.66	2.8	7.6	660	32.3	36.9	0.41	3.5	0.9	121	<0.1	2.4	0.2	0.7	26	0.3	4.0	31	0.6	26.20
V-06-13A	2006	48.51214	-92.78509	Brown Lake	1,070	0.85	5.2	30.3	1,300	32.6	49.3	0.32	6.8	1.3	206	<0.1	4.0	0.3	1.4	63	0.6	6.1	192	0.4	13.40
V-06-14A	2006	48.51289	-92.78571	Brown Lake	2,950	1.82	4.9	39.6	2,030	35.2	56.8	0.51	6.4	1.3	115	<0.1	5.9	0.8	4.6	50	0.6	17.8	79	1.4	18.00
V-06-15A	2006	48.51385	-92.78703	Brown Lake	1,100	0.39	3.6	10.9	430	28.2	83.2	0.18	4.7	0.9	238	<0.1	3.2	0.4	1.0	34	0.3	5.4	29	0.2	6.67
V-06-15A dup	2006	48.51383	-92.78757	Brown Lake	1,060	0.51	4.8	13.6	430	27.7	84.2	0.20	4.6	0.8	241	<0.1	3.7	0.4	0.9	33	0.3	5.5	29	0.2	6.91
V-06-16A	2006	48.51383	-92.78757	Brown Lake	2,500	0.86	4.3	22.2	820	43.8	70.8	0.35	4.7	1.3	171	<0.1	4.1	0.4	1.2	40	0.4	6.6	88	0.6	17.40

Field no.	Year collected	Latitude	Longitude	Watershed	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs* (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)	Li (ppm)
V-03-01B	2003	48.51360	-92.70532	Ryan Lake	5.75	1.05	2.32	1.31	0.52	1.43	0.03	0.24	<1	4	558	1.1	0.22	0.2	32.5	12.5	45	2.54	15.5	13.0	0.07	0.03	16.4	25
V-03-02B	2003	48.52164	-92.70490	Ryan Lake	5.49	0.65	2.82	1.27	0.52	0.90	0.05	0.24	<1	5	552	1.4	0.23	0.2	72.0	43.7	56	4.30	28.0	12.1	0.08	0.04	30.4	32
V-03-03B	2003	48.52124	-92.70567	Ryan Lake	5.54	1.10	1.03	1.66	0.31	1.89	0.02	0.17	<1	1	462	1.0	0.14	<0.1	27.8	4.3	27	1.76	10.6	11.5	0.03	0.02	16.0	8
V-03-04B	2003	48.51987	-92.70518	Ryan Lake	6.19	1.02	2.19	1.53	0.48	1.61	0.02	0.22	<1	3	508	1.4	0.21	<0.1	32.4	12.0	52	2.89	27.7	14.3	0.05	0.03	16.7	20
V-03-05B	2003	48.51889	-92.70403	Ryan Lake	5.53	1.15	1.55	1.63	0.40	1.70	0.02	0.24	<1	3	544	1.0	0.17	0.1	21.9	6.1	37	1.72	14.4	13.1	0.03	0.02	11.3	14
V-03-06B	2003	48.51519	-92.70383	Ryan Lake	6.12	0.74	3.34	1.01	0.53	1.09	0.04	0.30	<1	7	556	1.3	0.31	0.2	33.6	12.1	80	4.20	26.6	15.6	0.10	0.04	17.9	35
V-03-07B	2003	48.51681	-92.70174	Ryan Lake	6.56	1.06	3.07	0.93	0.63	1.50	0.02	0.30	<1	5	418	1.2	0.24	0.1	21.1	10.3	87	3.48	20.5	15.1	0.06	0.04	11.4	26
V-03-08B	2003	48.51711	-92.70057	Ryan Lake	5.62	1.14	2.33	1.29	0.46	1.77	0.02	0.22	<1	3	433	1.0	0.16	<0.1	13.7	6.5	55	1.04	19.5	13.0	0.05	0.02	7.6	11
V-03-09B	2003	48.51831	-92.70119	Ryan Lake	6.23	1.16	2.70	1.31	0.58	1.51	0.02	0.29	<1	4	573	1.2	0.20	0.2	23.9	9.6	57	4.65	12.0	14.4	0.05	0.03	12.7	24
V-03-09B dup	2003	48.51831	-92.70119	Ryan Lake	6.17	1.15	2.62	1.35	0.60	1.47	0.02	0.28	<1	4	573	1.2	0.21	0.2	20.4	9.4	56	2.54	12.5	14.8	0.05	0.04	11.1	24
V-03-10B	2003	48.51792	-92.69938	Ryan Lake	6.03	1.26	1.06	1.72	0.34	2.18	0.01	0.18	<1	2	536	1.1	0.10	<0.1	15.3	4.1	31	0.89	6.0	13.1	0.03	0.02	8.1	9
V-03-11B	2003	48.51568	-92.70500	Ryan Lake	5.61	1.13	1.67	1.64	0.38	1.77	0.02	0.21	2	4	515	1.0	0.16	<0.1	17.4	6.5	35	2.33	10.2	12.1	0.04	0.03	9.2	14
V-03-12B	2003	48.51580	-92.70547	Ryan Lake	6.44	1.14	2.19	1.60	0.53	1.92	0.01	0.23	<1	2	455	1.2	0.17	<0.1	18.6	8.3	53	2.84	13.8	14.8	0.04	0.03	10.2	26
V-03-13B	2003	48.51373	-92.70505	Ryan Lake	6.06	1.19	2.67	1.30	0.58	1.60	0.03	0.27	<1	5	474	1.0	0.23	0.2	21.0	9.4	53	2.99	13.2	13.6	0.06	0.03	10.3	26
V-03-14B	2003	48.51351	-92.70242	Ryan Lake	5.85	1.28	1.67	1.81	0.48	1.96	0.01	0.21	<1	2	506	1.1	0.11	<0.1	16.0	9.5	40	2.19	6.1	13.1	0.02	0.02	8.4	15
V-03-14B dup	2003	48.51351	-92.70242	Ryan Lake	5.95	1.32	1.65	1.85	0.49	1.99	0.01	0.21	<1	2	541	1.1	0.14	0.1	15.4	8.9	39	1.77	6.9	12.9	0.02	0.03	8.8	15
V-03-15B	2003	48.51373	-92.78778	Brown Lake	6.15	1.14	1.37	1.91	0.41	2.20	0.01	0.16	<1	2	518	1.3	0.16	<0.1	17.6	7.4	36	2.19	5.4	13.0	0.03	<0.02	9.1	15
V-03-16B	2003	48.51392	-92.78711	Brown Lake	5.91	0.79	2.59	1.64	0.54	1.38	0.02	0.27	<1	4	572	1.3	0.28	0.1	35.2	16.3	52	3.17	19.7	15.7	0.05	0.03	18.5	30
V-03-17B	2003	48.51284	-92.78577	Brown Lake	6.46	0.76	3.00	1.29	0.58	1.17	0.04	0.31	<1	4	607	1.8	0.34	0.2	65.9	65.7	69	4.84	40.3	15.2	0.07	0.04	28.2	37
V-03-18B	2003	48.51218	-92.78512	Brown Lake	6.56	1.01	3.38	0.84	0.69	1.61	0.03	0.33	<1	4	477	1.4	0.26	0.2	21.7	14.6	97	3.75	26.2	16.6	0.04	0.04	11.6	36
V-06-01B	2006	48.51472	-92.70396	Ryan Lake	6.74	0.89	3.82	0.97	0.55	1.23	0.03	0.30	<1	6	424	1.5	0.23	0.2	24.9	13.0	81	<5	29.6	18.0	0.08	0.04	13.6	38
V-06-02B	2006	48.51580	-92.70547	Ryan Lake	6.48	1.13	2.32	1.60	0.54	1.89	0.01	0.22	<1	6	425	1.3	0.09	<0.1	18.3	8.8	62	<5	13.8	15.9	0.03	0.03	10.1	25
V-06-03B	2006	48.51574	-92.70515	Ryan Lake	6.67	1.05	3.23	1.13	0.63	1.75	0.02	0.29	<1	4	410	1.5	0.22	0.1	28.0	12.3	74	<5	19.6	17.2	0.04	0.03	14.9	30
V-06-04B	2006	48.51947	-92.70412	Ryan Lake	5.89	1.12	2.19	1.67	0.52	1.61	0.01	0.23	<1	4	483	1.4	0.08	<0.1	18.4	8.4	50	<5	9.1	14.1	0.03	0.03	10.1	21
V-06-05B	2006	48.52139	-92.70499	Ryan Lake	6.75	0.88	3.08	1.95	0.66	1.39	0.02	0.26	<1	7	641	1.4	0.15	0.1	56.1	47.8	75	6	18.5	14.3	0.03	0.04	20.1	40
V-06-06B	2006	48.52126	-92.70521	Ryan Lake	6.07	1.20	0.87	2.17	0.26	2.33	<0.01	0.14	<1	1	485	1.4	0.02	<0.1	17.7	2.6	26	<5	3.8	12.4	0.01	<0.02	8.8	5
V-06-07B	2006	48.52016	-92.70523	Ryan Lake	8.06	1.28	3.25	2.08	0.63	2.03	0.02	0.26	<1	5	576	1.9	0.14	0.2	32.6	27.8	69	5	19.4	19.0	0.04	0.04	16.0	28
V-06-08B	2006	48.51816	-92.70107	Ryan Lake	7.07	1.33	2.85	1.68	0.63	1.89	0.02	0.27	<1	3	507	1.3	0.10	0.1	21.3	9.0	57	<5	9.3	15.7	0.03	0.03	10.1	24
V-06-09B	2006	48.51760	-92.70024	Ryan Lake	7.12	1.73	2.25	1.78	0.58	2.35	0.01	0.28	<1	19	481	1.2	0.10	0.1	17.8	7.1	51	<5	10.1	16.4	0.03	0.04	8.9	9
V-06-10B	2006	48.51627	-92.70162	Ryan Lake	7.61	1.34	3.47	1.04	0.78	1.94	0.01	0.34	<1	5	429	1.8	0.18	0.1	24.1	13.5	90	<5	15.2	18.1	0.03	0.04	12.2	28
V-06-11B	2006	48.51359	-92.70248	Ryan Lake	6.93	1.70	1.97	2.18	0.59	2.18	0.01	0.23	<1	3	540	1.3	0.05	<0.1	20.4	7.6	45	<5	6.4	14.9	0.01	0.02	10.4	12
V-06-12B	2006	48.71781	-92.69928	Ryan Lake	7.57	1.47	1.90	2.12	0.54	2.34	0.02	0.26	<1	4	580	1.3	0.05	0.1	28.2	8.5	45	5	9.9	18.3	0.02	0.03	14.0	17
V-06-13B	2006	48.51214	-92.78509	Brown Lake	8.24	1.32	4.38	1.05	1.08	2.03	0.02	0.38	<1	5	477	1.5	0.19	0.2	29.1	19.0	129	6	26.0	20.6	0.02	0.04	14.4	47
V-06-14B	2006	48.51289	-92.78571	Brown Lake	7.90	0.97	3.62	1.54	0.78	1.37	0.04	0.32	<1	5	584	1.9	0.23	0.2	79.1	69.0	85	7	53.6	16.9	0.07	0.06	34.8	43
V-06-15B	2006	48.51385	-92.78703	Brown Lake	6.48	1.12	2.49	1.84	0.64	1.74	0.02	0.23	<1	5	537	1.4	0.32	0.2	27.8	11.2	64	<5	13.3	14.4	0.04	0.03	14.0	27
V-06-15B dup	2006	48.51385	-92.78703	Brown Lake	6.66	1.14	2.55	1.91	0.66	1.80	0.02	0.23	<1	5	556	1.8	0.19	0.2	27.9	12.3	54	<5	12.8	16.5	0.04	0.04	14.0	28
V-06-16B	2006	48.51383	-92.78757	Brown Lake	7.99	1.47	1.95	2.47	0.60	2.68	0.01	0.20	<1	3	533	2.1	0.20	<0.1	23.7	8.8	46	5	5.4	17.5	0.01	0.03	12.1	20

*Because of analytical laboratory issues, Cs detection limits in 2003 were 0.05 ppm and 5 ppm in 2006.

Field no.	Year collected	Latitude	Longitude	Watershed	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)	Total C (wt. %)
V-03-01B	2003	48.51360	-92.70532	Ryan Lake	1,700	0.71	6.4	29.3	800	28.0	72.2	0.36	6.8	1.2	204	<0.1	5.0	0.4	1.3	62	0.6	7.4	113	0.4	5.73
V-03-02B	2003	48.52164	-92.70490	Ryan Lake	2,380	1.43	6.8	29.7	670	29.4	87.7	0.40	8.0	1.4	149	<0.1	11.8	0.6	2.3	82	0.6	9.3	60	0.7	8.22
V-03-03B	2003	48.52124	-92.70567	Ryan Lake	206	0.33	6.1	10.6	190	18.8	88.4	0.20	5.4	0.8	244	<0.1	5.0	0.5	2.1	34	0.4	8.3	25	<0.2	3.97
V-03-04B	2003	48.51987	-92.70518	Ryan Lake	386	0.84	6.3	22.6	420	20.5	90.7	0.25	7.0	1.2	223	<0.1	6.8	0.5	1.8	63	0.6	6.8	45	0.3	8.50
V-03-05B	2003	48.51889	-92.70403	Ryan Lake	439	0.55	6.4	13.8	280	16.1	83.5	0.26	6.1	1.1	240	<0.1	3.9	0.4	1.0	53	0.5	6.0	47	<0.2	3.01
V-03-06B	2003	48.51519	-92.70383	Ryan Lake	876	1.67	8.1	37.8	650	29.8	65.4	0.52	7.5	1.6	174	<0.1	6.0	0.4	1.7	94	1.0	6.6	135	0.6	7.45
V-03-07B	2003	48.51681	-92.70174	Ryan Lake	457	1.21	7.4	38.4	420	24.7	56.0	0.41	7.0	1.4	231	<0.1	5.0	0.3	1.3	85	1.3	6.5	77	0.4	5.25
V-03-08B	2003	48.51711	-92.70057	Ryan Lake	252	0.98	5.8	17.8	170	18.7	58.8	0.23	6.4	0.9	254	<0.1	4.2	0.3	1.0	71	0.4	5.4	34	0.4	5.41
V-03-09B	2003	48.51831	-92.70119	Ryan Lake	749	0.92	7.5	28.8	530	22.5	70.1	0.42	7.3	1.3	242	<0.1	5.2	0.3	1.2	80	0.6	6.9	110	0.3	4.06
V-03-09B dup	2003	48.51831	-92.70119	Ryan Lake	740	0.92	7.4	28.1	520	22.5	71.3	0.34	7.3	1.4	236	<0.1	5.2	0.4	1.1	78	0.7	5.9	108	0.3	4.05
V-03-10B	2003	48.51792	-92.69938	Ryan Lake	250	0.46	5.2	14.0	150	17.2	81.1	0.17	6.0	0.7	281	<0.1	7.7	0.4	0.9	41	0.4	5.0	27	<0.2	2.92
V-03-11B	2003	48.51568	-92.70500	Ryan Lake	451	0.54	5.4	21.2	290	22.5	85.3	0.28	6.0	0.9	235	<0.1	3.8	0.4	1.0	51	0.4	5.8	40	0.2	5.02
V-03-12B	2003	48.51580	-92.70547	Ryan Lake	260	0.70	6.2	28.6	110	22.4	80.6	0.22	6.9	1.1	244	<0.1	3.8	0.4	1.1	67	0.5	5.7	50	0.2	1.91
V-03-13B	2003	48.51373	-92.70505	Ryan Lake	623	0.80	6.7	28.7	360	28.7	70.6	0.38	7.1	1.7	236	<0.1	4.1	0.4	1.1	75	0.5	6.9	75	0.3	6.76
V-03-14B	2003	48.51351	-92.70242	Ryan Lake	621	0.49	5.6	16.4	180	18.4	92.8	0.20	6.5	1.0	252	<0.1	3.3	0.4	1.0	52	0.3	5.8	39	<0.2	2.03
V-03-14B dup	2003	48.51351	-92.70242	Ryan Lake	622	0.54	5.7	17.0	190	19.4	94.6	0.24	6.7	1.1	259	<0.1	3.3	0.4	0.9	52	2.1	5.9	39	<0.2	2.04
V-03-15B	2003	48.51373	-92.78778	Brown Lake	909	0.35	4.9	15.8	290	17.9	104.0	0.18	5.4	0.9	273	<0.1	6.3	0.4	0.9	39	0.4	5.5	51	<0.2	1.62
V-03-16B	2003	48.51392	-92.78711	Brown Lake	984	0.87	7.6	26.8	1,510	20.1	89.2	0.33	7.1	1.6	186	<0.1	5.7	0.5	1.5	72	0.7	6.8	128	0.5	5.20
V-03-17B	2003	48.51284	-92.78577	Brown Lake	2,560	1.67	8.9	54.1	1,560	30.4	92.6	0.42	8.6	2.2	171	<0.1	7.7	0.8	3.3	84	0.9	11.2	140	1.0	4.87
V-03-18B	2003	48.51218	-92.78512	Brown Lake	586	0.97	8.1	39.7	1,080	24.4	53.7	0.37	8.1	1.6	233	<0.1	5.0	0.3	1.5	90	0.8	6.9	204	0.4	5.22
V-06-01B	2006	48.51472	-92.70396	Ryan Lake	520	3.31	7.5	38.1	550	23.2	53.5	0.40	7.8	1.6	179	<0.1	5.5	0.4	1.6	103	0.8	6.1	86	0.7	5.32
V-06-02B	2006	48.51580	-92.70547	Ryan Lake	252	1.03	4.9	29.2	150	20.5	73.3	0.18	6.9	1.1	234	<0.1	8.4	0.4	1.2	70	0.3	5.8	39	<0.2	2.37
V-06-03B	2006	48.51574	-92.70515	Ryan Lake	547	1.53	6.8	28.3	470	30.4	65.8	0.24	7.5	1.4	236	<0.1	5.3	0.4	1.5	93	0.6	6.3	91	0.3	2.80
V-06-04B	2006	48.51947	-92.70412	Ryan Lake	468	0.76	5.6	16.7	540	16.0	79.8	0.22	6.2	1.1	217	<0.1	3.9	0.4	1.1	65	0.4	5.6	63	0.3	2.73
V-06-05B	2006	48.52139	-92.70499	Ryan Lake	3,470	1.84	6.9	29.6	440	25.1	99.3	0.32	7.9	1.4	200	<0.1	12.5	0.7	2.3	98	0.6	7.8	64	0.6	2.28
V-06-06B	2006	48.52126	-92.70521	Ryan Lake	229	0.27	3.3	5.7	110	17.0	88.3	0.11	4.4	0.6	266	<0.1	4.5	0.5	1.1	28	0.2	5.8	19	<0.2	1.23
V-06-07B	2006	48.52016	-92.70523	Ryan Lake	922	1.21	6.8	27.0	500	23.2	107.0	0.24	8.6	1.4	261	<0.1	8.1	0.6	2.2	82	0.5	8.3	54	0.4	3.39
V-06-08B	2006	48.51816	-92.70107	Ryan Lake	380	1.05	6.2	24.3	530	21.1	77.8	0.25	7.1	1.2	262	<0.1	5.0	0.4	1.3	79	0.5	6.6	78	<0.2	2.95
V-06-09B	2006	48.51760	-92.70024	Ryan Lake	357	1.18	5.6	17.2	180	24.0	75.6	0.39	8.1	1.2	317	<0.1	5.0	0.5	1.4	75	0.4	8.1	39	<0.2	3.07
V-06-10B	2006	48.51627	-92.70162	Ryan Lake	497	1.43	6.9	35.9	430	34.2	57.4	0.43	7.5	1.7	283	<0.1	5.9	0.3	1.6	95	0.7	6.6	91	0.2	2.97
V-06-11B	2006	48.51359	-92.70248	Ryan Lake	461	0.83	4.9	19.0	200	23.4	105.0	0.19	7.1	1.1	282	<0.1	4.6	0.5	1.2	57	0.3	7.5	35	<0.2	1.97
V-06-12B	2006	48.71781	-92.69928	Ryan Lake	383	1.02	6.4	16.4	240	24.3	106.0	0.25	8.3	1.3	297	<0.1	6.4	0.5	1.6	64	0.3	8.7	36	<0.2	3.17
V-06-13B	2006	48.51214	-92.78509	Brown Lake	551	1.43	8.2	45.7	1,070	21.8	59.6	0.34	10.6	1.6	283	<0.1	7.9	0.4	2.2	113	0.8	8.8	212	0.3	2.61
V-06-14B	2006	48.51289	-92.78571	Brown Lake	1,710	2.42	7.7	78.8	1,870	24.1	89.3	0.35	10.4	1.6	191	<0.1	10.7	0.7	4.8	94	0.7	15.3	146	1.0	4.39
V-06-15B	2006	48.51385	-92.78703	Brown Lake	763	0.94	6.2	30.5	970	21.4	86.8	0.31	6.7	1.3	224	<0.1	5.4	0.5	1.6	63	0.6	7.8	113	0.3	4.76
V-06-15B dup	2006	48.51385	-92.78703	Brown Lake	793	0.80	7.0	26.6	1,030	22.6	92.5	0.27	7.6	1.3	235	<0.1	6.0	0.5	1.7	65	6.5	9.0	109	0.3	5.08
V-06-16B	2006	48.51383	-92.78757	Brown Lake	511	0.47	16.9	17.0	360	22.0	120.0	0.17	7.1	1.1	322	<0.1	7.5	0.6	5.0	48	0.6	19.6	47	<0.2	1.25

Field no.	Year collected	Latitude	Longitude	Watershed	Ash (%)	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs* (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)
V-03-01O	2003	48.51360	-92.70532	Ryan Lake	25.15	5.69	4.50	2.88	1.61	0.87	1.16	0.28	0.26	<1	9	1,460	2.0	0.69	3.2	109.0	25.5	43	6.66	41.3	16.9	0.15	0.1	47.8
V-03-01O dup	2003	48.51360	-92.70532	Ryan Lake	20.60	3.56	11.10	1.60	1.47	1.46	0.40	0.78	0.12	<1	4	2,380	5.4	0.30	5.9	408.0	58.6	23	5.77	114.0	8.7	0.08	0.1	191.0
V-03-02O	2003	48.52164	-92.70490	Ryan Lake	11.05	4.60	5.33	1.46	1.74	0.74	1.25	0.28	0.17	<1	4	1,210	1.7	0.30	1.7	109.0	30.8	33	3.92	43.0	11.1	0.09	0.0	59.8
V-03-03O	2003	48.52124	-92.70567	Ryan Lake	17.72	5.21	6.58	3.51	1.80	0.99	0.69	0.63	0.21	<1	10	1,370	2.5	0.60	3.4	208.0	132.0	57	6.95	77.3	13.4	0.12	0.1	93.7
V-03-04O	2003	48.51987	-92.70518	Ryan Lake	10.00	3.85	12.20	2.21	2.16	1.37	0.62	0.73	0.17	<1	7	1,170	1.0	0.62	4.8	30.9	13.4	32	5.66	61.1	9.4	0.12	0.1	15.4
V-03-05O	2003	48.51889	-92.70403	Ryan Lake	9.50	5.34	7.39	3.14	1.75	0.99	0.87	0.51	0.26	<1	10	1,660	1.5	0.69	7.2	42.2	20.7	53	9.68	54.4	15.4	0.16	0.1	22.2
V-03-06O	2003	48.51324	-92.70163	Ryan Lake	16.30	5.56	6.84	3.00	1.60	1.10	1.18	0.37	0.27	<1	7	839	1.2	0.46	2.8	30.8	18.4	66	6.61	39.4	15.1	0.14	0.1	16.7
V-03-07O	2003	48.51681	-92.70174	Ryan Lake	18.70	2.61	13.90	1.52	1.92	2.22	0.55	1.08	0.11	<1	3	1,640	1.0	0.31	7.4	27.6	49.4	34	9.09	102.0	6.6	0.09	0.0	15.1
V-03-08O	2003	48.51711	-92.70057	Ryan Lake	6.30	4.48	9.98	2.38	1.87	1.10	0.98	0.56	0.20	<1	6	2,620	1.1	0.56	7.3	30.7	17.6	32	9.03	53.5	12.3	0.15	0.1	16.0
V-03-09O	2003	48.51831	-92.70119	Ryan Lake	14.80	3.20	11.10	1.39	1.80	1.77	0.77	0.76	0.14	<1	5	1,720	1.0	0.41	5.8	28.0	41.2	22	5.05	80.7	8.9	0.10	0.0	15.5
V-03-10O	2003	48.51792	-92.69938	Ryan Lake	11.60	4.75	6.77	1.75	2.14	1.05	1.39	0.35	0.18	<1	4	1,730	1.1	0.31	5.1	24.4	18.5	53	3.75	44.4	12.3	0.10	0.0	12.8
V-03-11O	2003	48.51568	-92.70500	Ryan Lake	17.75	5.48	4.80	2.88	1.70	0.86	1.22	0.65	0.23	<1	8	1,200	1.6	0.61	2.2	59.4	23.0	39	8.18	49.4	14.5	0.22	0.1	33.5
V-03-12O	2003	48.51580	-92.70547	Ryan Lake	13.65	5.66	3.54	2.97	1.81	0.78	1.31	0.31	0.26	<1	8	813	1.2	0.59	1.9	32.9	14.5	39	7.70	30.9	15.8	0.19	0.1	16.6
V-03-13O	2003	48.51373	-92.70205	Ryan Lake	19.70	4.12	8.09	1.60	1.74	1.07	1.14	0.40	0.18	<1	5	1,580	1.2	0.42	4.5	39.6	35.9	23	4.92	49.6	11.2	0.09	0.1	22.5
V-03-14O	2003	48.51351	-92.70242	Ryan Lake	16.55	4.69	6.98	1.76	2.12	0.98	1.29	0.41	0.15	<1	4	1,400	1.1	0.42	2.8	32.7	12.3	26	4.32	35.7	11.6	0.13	0.1	18.3
V-03-15O	2003	48.51373	-92.78778	Brown Lake	21.10	4.92	7.76	2.67	2.01	1.19	0.98	0.53	0.21	<1	6	1,220	1.2	0.51	3.1	34.4	15.5	49	5.25	48.1	13.7	0.12	0.1	17.6
V-03-16O	2003	48.51392	-92.78711	Brown Lake	16.05	4.16	10.70	2.10	1.84	1.60	0.65	0.74	0.18	<1	3	2,840	1.6	0.41	4.8	117.0	43.0	34	5.06	95.6	10.8	0.09	0.0	54.6
V-03-16O dup	2003	48.51392	-92.78711	Brown Lake	17.95	2.34	15.60	1.49	1.58	2.03	0.44	0.88	0.11	1	4	2,620	0.8	0.27	9.4	23.5	18.2	25	5.99	120.0	6.5	0.11	0.0	13.2
V-03-17O	2003	48.51284	-92.78577	Brown Lake	13.60	5.34	7.17	2.64	2.03	1.12	1.14	0.47	0.23	<1	5	1,140	1.3	0.42	2.4	32.6	16.1	36	5.36	43.6	15.1	0.11	0.1	16.2
V-03-18O	2003	48.51218	-92.78512	Brown Lake	11.40	5.71	5.05	2.81	1.68	0.88	1.20	0.34	0.25	<1	8	1,440	1.7	0.56	3.3	93.9	21.9	38	5.33	42.1	15.4	0.16	0.1	41.9
V-06-1 O	2006	48.51472	-92.70396	Ryan Lake	19.80	5.57	4.54	2.78	1.64	0.81	1.17	0.54	0.28	<1	8	1,080	1.3	0.68	2.7	44.8	18.0	48	12.00	44.1	18.1	0.17	0.1	22.8
V-06-2 O	2006	48.51580	-92.70547	Ryan Lake	12.50	5.87	6.32	2.62	1.74	1.01	1.18	0.89	0.19	<1	7	1,230	1.4	0.49	2.6	58.7	21.7	35	6.00	65.2	12.3	0.19	0.0	29.7
V-06-3 O	2006	48.51574	-92.70515	Ryan Lake	18.00	5.51	5.70	2.31	1.40	0.88	1.34	0.40	0.24	<1	5	1,290	1.1	0.46	2.2	33.3	18.3	40	<5	44.2	15.3	0.10	0.0	17.1
V-06-4 O	2006	48.51947	-92.70412	Ryan Lake	11.70	4.62	10.80	2.11	2.00	1.49	0.88	0.94	0.17	<1	3	889	0.9	0.37	5.1	25.7	13.0	31	<5	64.4	10.9	0.10	0.0	13.1
V-06-5 O	2006	48.52139	-92.70499	Ryan Lake	9.50	2.43	11.70	1.13	1.40	1.59	0.37	1.03	0.08	<1	2	1,740	3.5	0.25	5.4	195.0	53.6	16	<5	86.5	6.7	0.07	0.0	92.0
V-06-6 O	2006	48.52126	-92.70521	Ryan Lake	24.30	4.64	4.12	1.11	1.78	0.60	1.72	0.27	0.15	2	2	856	1.1	0.25	1.4	19.8	7.4	28	<5	26.7	12.3	0.09	0.0	10.9
V-06-7 O	2006	48.52016	-92.70523	Ryan Lake	27.30	6.22	3.08	2.14	1.75	0.62	1.52	0.28	0.20	<1	6	609	1.1	0.34	1.6	25.0	19.9	36	<5	26.8	15.8	0.10	0.0	13.4
V-06-8 O	2006	48.51816	-92.70107	Ryan Lake	27.30	4.97	3.89	2.29	1.49	0.69	1.51	0.31	0.22	<1	5	1,150	1.1	0.41	2.3	26.7	13.4	32	<5	26.8	14.2	0.14	0.0	13.7
V-06-9 O	2006	48.51760	-92.70024	Ryan Lake	6.30	1.72	13.50	1.11	1.81	2.28	0.39	1.49	0.07	<1	3	1,300	0.9	0.22	6.9	21.3	58.1	21	6	114.0	5.2	0.08	<0.02	12.6
V-06-10 O	2006	48.51627	-92.70162	Ryan Lake	13.50	5.51	9.05	2.62	1.62	1.59	1.12	0.64	0.23	<1	6	748	1.1	0.34	4.6	24.5	19.1	57	<5	56.8	14.1	0.09	0.0	13.1
V-06-11 O	2006	48.51359	-92.70248	Ryan Lake	13.30	3.71	11.40	1.32	1.54	1.23	0.71	0.75	0.13	<1	3	1,350	0.8	0.30	7.0	20.9	31.8	24	<5	67.1	8.6	0.08	0.0	12.3
V-06-12 O	2006	48.51781	-92.69928	Ryan Lake	12.30	3.59	10.50	1.21	1.77	1.70	0.83	0.89	0.14	<1	2	1,310	1.0	0.31	5.3	22.8	36.5	24	<5	74.5	9.4	0.08	0.0	12.7
V-06-13 O	2006	48.51214	-92.78509	Brown Lake	21.50	6.43	6.32	2.94	1.29	1.22	1.59	0.33	0.27	<1	4	1,240	1.2	0.46	4.5	28.9	27.1	65	<5	47.5	15.8	0.10	0.0	15.3
V-06-14 O	2006	48.51289	-92.78571	Brown Lake	13.00	5.29	9.64	2.26	1.74	1.56	0.79	0.85	0.20	<1	4	2,570	1.8	0.29	3.4	119.0	31.1	42	<5	95.3	11.6	0.08	0.0	66.5
V-06-15 O	2006	48.51385	-92.78703	Brown Lake	13.00	5.08	10.70	2.42	1.79	1.42	0.69	1.02	0.17	<1	6	1,390	1.0	0.47	4.1	28.5	13.6	37	<5	60.2	12.0	0.10	0.0	14.5
V-06-15 O dup	2006	48.51383	-92.78757	Brown Lake	12.30	4.10	9.88	2.19	1.88	1.38	0.82	0.95	0.17	<1	5	1,310	1.1	0.45	3.7	29.1	12.9	36	<5	56.5	11.9	0.11	0.0	14.7
V-06-16 O	2006	48.51383	-92.78757	Brown Lake	10.30	3.85	12.10	1.83	1.97	1.67	0.68	1.08	0.13	<1	5	1,150	0.8	0.39	4.8	27.9	15.2	26	<5	57.5	9.1	0.12	0.0	14.7

*Because of analytical laboratory issues, Cs detection limits in 2003 were 0.05 ppm and 5 ppm in 2006.

Field no.	Year collected	Latitude	Longitude	Watershed	Ash (%)	Li (ppm)	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Ti (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)
V-03-01O	2003	48.51360	-92.70532	Ryan Lake	25.15	26	7,270	2.29	8.9	62.8	4,620	107.0	122.0	1.4	9.0	3.4	348	0.1	7.1	0.8	2.2	75	1.1	23.4	436	0.4
V-03-01O dup	2003	48.51360	-92.70532	Ryan Lake	20.60	16	9,670	1.89	4.1	140.0	10,235	46.9	116.0	1.33	8.5	1.6	859	<0.1	6.5	0.6	3.6	43	0.6	69.3	673	0.3
V-03-02O	2003	48.52164	-92.70490	Ryan Lake	11.05	12	4,450	1.44	4.5	32.0	4,840	67.0	98.1	0.98	6.2	2.7	445	<0.1	4.1	0.7	2.7	47	0.6	22.7	210	0.2
V-03-03O	2003	48.52124	-92.70567	Ryan Lake	17.72	20	16,141	3.28	7.1	81.3	8,700	109.0	179.0	1.66	9.4	3.1	433	0.1	10.0	1.4	4.8	73	1.0	32.0	420	0.4
V-03-04O	2003	48.51987	-92.70518	Ryan Lake	10.00	17	13,913	2.32	7.7	38.7	9,320	134.0	136.0	1.41	5.2	3.0	409	0.1	5.3	1.2	5.0	53	1.0	10.4	916	0.3
V-03-05O	2003	48.51889	-92.70403	Ryan Lake	9.50	29	15,144	2.74	8.0	57.1	6,130	128.0	162.0	1.52	7.8	3.2	371	0.1	6.9	1.4	2.0	87	1.1	11.2	929	0.4
V-03-06O	2003	48.51324	-92.70163	Ryan Lake	16.30	25	6,280	2.24	7.7	52.3	4,720	73.9	132.0	1.05	6.8	2.7	331	<0.1	5.6	0.8	1.5	80	0.9	8.0	443	0.5
V-03-07O	2003	48.51681	-92.70174	Ryan Lake	18.70	10	13,308	1.78	3.3	39.2	12,022	53.9	106.0	1	4.0	1.9	666	<0.1	2.7	1.0	0.9	39	0.6	7.3	968	0.2
V-03-08O	2003	48.51711	-92.70057	Ryan Lake	6.30	18	11,235	2.32	6.3	37.7	6,640	115.0	176.0	1.34	6.3	2.8	597	0.1	5.0	0.8	1.5	64	0.8	9.6	1,350	0.5
V-03-09O	2003	48.51831	-92.70119	Ryan Lake	14.80	12	9,090	2.07	4.3	28.4	8,190	82.0	115.0	1.16	5.1	2.3	650	<0.1	3.6	0.6	1.1	46	0.7	7.9	984	0.2
V-03-10O	2003	48.51792	-92.69938	Ryan Lake	11.60	14	10,569	1.63	5.5	37.4	4,600	58.6	128.0	0.89	5.3	2.0	458	<0.1	5.1	0.6	1.2	52	0.6	7.0	799	0.3
V-03-11O	2003	48.51568	-92.70500	Ryan Lake	17.75	21	2,430	2.25	6.9	54.6	5,200	118.0	94.8	1.58	7.7	3.2	370	<0.1	6.1	0.8	1.9	77	0.9	15.4	282	0.6
V-03-12O	2003	48.51580	-92.70547	Ryan Lake	13.65	22	4,250	1.96	7.7	40.3	3,710	108.0	140.0	1.41	7.9	3.4	255	<0.1	5.6	0.9	1.7	81	0.9	10.7	303	0.5
V-03-13O	2003	48.51373	-92.70205	Ryan Lake	19.70	13	7,770	1.54	5.6	27.9	4,900	77.1	138.0	1.06	6.2	2.4	617	<0.1	4.1	0.6	1.4	50	0.6	11.3	579	0.3
V-03-14O	2003	48.51351	-92.70242	Ryan Lake	16.55	16	7,450	1.74	5.0	31.4	4,760	84.8	147.0	0.93	5.3	2.1	437	<0.1	4.2	0.7	1.2	45	0.6	8.3	266	0.4
V-03-15O	2003	48.51373	-92.78778	Brown Lake	21.10	25	9,650	2.56	6.5	43.3	7,610	75.9	108.0	1.03	6.6	2.6	357	<0.1	5.2	0.8	1.6	68	0.9	8.9	561	0.4
V-03-16O	2003	48.51392	-92.78711	Brown Lake	16.05	24	9,670	2.94	5.4	111.0	11,067	67.2	87.3	1.26	6.9	2.2	722	<0.1	6.0	0.7	3.1	61	0.8	20.3	897	0.4
V-03-16O dup	2003	48.51392	-92.78711	Brown Lake	17.95	12	10,392	2.58	3.6	44.7	20,240	48.5	82.4	0.83	3.6	1.6	777	<0.1	3.5	0.4	1.0	39	0.5	6.3	1,620	0.2
V-03-17O	2003	48.51284	-92.78577	Brown Lake	13.60	27	8,040	1.95	7.2	38.5	6,690	52.9	108.0	0.77	7.1	2.2	346	<0.1	6.2	0.5	1.7	70	0.9	8.7	517	0.3
V-03-18O	2003	48.51218	-92.78512	Brown Lake	11.40	25	6,830	1.94	8.0	61.4	4,830	102.0	128.0	1.28	8.2	2.8	358	<0.1	6.7	0.9	1.9	73	1.0	20.1	454	0.4
V-06-1 O	2006	48.51472	-92.70396	Ryan Lake	19.80	25	9,150	3.47	10.1	36.7	5,040	90.1	134.0	1.58	7.2	55.8	276	0.1	6.7	1.0	2.1	86	1.6	10.6	302	0.4
V-06-2 O	2006	48.51580	-92.70547	Ryan Lake	12.50	20	4,640	2.00	6.3	51.2	6,880	82.8	92.2	1.43	7.7	34.3	377	<0.1	37.6	0.8	2.0	64	0.9	15.4	284	0.3
V-06-3 O	2006	48.51574	-92.70515	Ryan Lake	18.00	19	11,301	1.95	7.7	32.3	3,830	66.7	88.1	0.76	6.3	12.2	400	<0.1	4.8	0.6	1.5	64	0.9	8.3	215	<0.2
V-06-4 O	2006	48.51947	-92.70412	Ryan Lake	11.70	17	12,813	2.20	5.6	33.8	9,880	58.7	114.0	1.26	6.5	16.8	355	<0.1	3.5	1.0	1.1	53	0.8	7.5	692	0.2
V-06-5 O	2006	48.52139	-92.70499	Ryan Lake	9.50	10	8,970	1.63	3.8	98.7	10,962	34.6	89.0	0.97	5.3	6.8	810	<0.1	3.7	0.4	1.8	26	0.5	40.5	620	<0.2
V-06-6 O	2006	48.52126	-92.70521	Ryan Lake	24.30	8	5,010	1.08	4.2	14.4	3,060	29.5	82.2	0.46	5.5	1.5	323	<0.1	2.7	0.6	1.0	37	0.5	6.5	167	<0.2
V-06-7 O	2006	48.52016	-92.70523	Ryan Lake	27.30	16	4,960	1.50	6.6	29.0	3,440	43.0	114.0	0.68	6.5	2.3	221	<0.1	4.2	0.8	1.3	60	0.7	7.0	175	0.3
V-06-8 O	2006	48.51816	-92.70107	Ryan Lake	27.30	17	4,590	1.57	6.7	26.8	2,870	60.6	87.9	0.75	7.0	2.4	339	<0.1	4.2	0.4	1.2	63	0.7	7.9	333	0.3
V-06-9 O	2006	48.51760	-92.70024	Ryan Lake	6.30	7	12,968	1.77	2.4	35.2	13,409	27.4	94.7	0.82	0.3	1.8	603	<0.1	1.8	0.8	0.6	22	0.5	6.3	894	<0.2
V-06-10 O	2006	48.51627	-92.70162	Ryan Lake	13.50	21	6,850	2.22	6.7	44.1	8,240	42.7	103.0	0.79	6.1	2.2	362	<0.1	3.8	0.9	1.3	66	0.9	7.0	504	0.3
V-06-11 O	2006	48.51359	-92.70248	Ryan Lake	13.30	9	8,920	1.73	4.8	20.8	9,080	43.6	90.2	0.79	4.5	2.5	720	<0.1	2.8	0.4	0.9	32	0.5	6.3	689	<0.2
V-06-12 O	2006	48.51781	-92.69928	Ryan Lake	12.30	10	7,550	1.87	4.6	21.6	9,040	43.3	98.4	0.82	4.6	1.9	591	<0.1	3.0	0.5	1.0	36	0.6	7.3	749	<0.2
V-06-13 O	2006	48.51214	-92.78509	Brown Lake	21.50	29	5,680	2.54	7.7	49.8	4,580	63.0	79.0	0.81	7.9	2.7	450	<0.1	4.9	0.6	1.6	77	0.9	8.7	661	0.2
V-06-14 O	2006	48.51289	-92.78571	Brown Lake	13.00	26	8,010	2.86	6.1	112.0	11,285	33.9	76.3	0.85	7.5	2.2	688	<0.1	4.8	0.6	2.9	58	0.7	24.3	690	0.2
V-06-15 O	2006	48.51385	-92.78703	Brown Lake	13.00	19	15,367	3.12	6.3	50.0	11,566	69.4	99.4	1.27	6.3	2.8	396	<0.1	4.4	0.8	1.4	53	1.0	9.5	757	0.3
V-06-15 O dup	2006	48.51383	-92.78757	Brown Lake	12.30	20	14,745	2.62	5.9	45.6	10,644	66.6	95.9	2.74	5.8	2.9	383	<0.1	4.6	0.8	1.4	54	0.9	9.1	714	0.3
V-06-16 O	2006	48.51383	-92.78757	Brown Lake	10.30	14	12,248	2.39	4.7	35.9	10,736	68.2	104.0	1.08	4.9	2.4	540	<0.1	3.4	0.7	1.2	43	0.7	8.1	392	0.2

*Because

Field no.	Year collected	Latitude	Longitude	Fire severity	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs* (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)	Li (ppm)
SP-04-1-1A	2004	48.49490	-92.88660	unburned	5.73	1.40	1.56	1.53	0.45	2.03	0.02	0.15	<1	2	447	1.3	0.16	0.1	18.2	5.0	33	1.72	8.0	13.40	0.03	<0.02	9.4	14
SP-04-1-2A	2004	48.49495	-92.88618	low/medium	4.94	1.29	1.25	1.32	0.39	1.69	0.04	0.12	<1	2	426	1.1	0.15	0.2	14.8	4.7	19	2.04	5.1	11.50	0.05	0.02	7.7	11
SP-04-1-3A	2004	48.49508	-92.88588	high	5.19	1.54	1.67	1.28	0.45	1.67	0.04	0.16	<1	3	486	1.1	0.19	0.3	15.9	5.9	35	2.84	8.3	12.60	0.03	0.02	8.5	14
SP-04-2-1A	2004	48.49599	-92.88988	unburned	2.98	1.31	1.05	0.86	0.32	0.76	0.10	0.10	<1	4	532	0.7	0.19	0.6	19.5	8.9	21	1.77	7.1	7.02	0.23	0.03	10.2	7
SP-04-2-2A	2004	48.49617	-92.88976	low/medium	4.23	1.37	1.24	1.20	0.34	1.31	0.05	0.14	<1	3	539	1.0	0.19	0.5	18.1	4.1	24	2.86	5.1	10.20	0.16	0.02	9.7	9
SP-04-2-2A dup	2004	48.49617	-92.88976	low/medium	4.44	1.33	1.29	1.27	0.35	1.42	0.06	0.14	<1	3	564	1.0	0.21	0.5	18.7	4.3	22	2.81	6.7	11.10	0.15	0.03	10.6	9
SP-04-2-3A	2004	48.49626	-92.88962	high	5.38	2.00	1.71	1.52	0.44	1.69	0.05	0.15	<1	7	783	1.5	0.35	0.6	23.3	5.8	34	3.27	10.8	13.30	0.03	0.04	12.2	12
SP-04-3-1A	2004	48.49990	-92.88320	high	5.43	1.31	1.34	1.45	0.39	1.99	0.02	0.13	<1	2	434	1.3	0.14	0.2	14.9	5.0	31	1.55	5.0	13.10	0.04	0.02	8.1	11
SP-04-3-2A	2004	48.49950	-92.88380	low/medium	5.65	1.03	2.05	1.41	0.41	1.49	0.02	0.24	<1	5	513	1.3	0.39	0.2	27.6	6.6	44	1.35	18.8	16.10	<0.02	0.04	14.8	14
SP-04-3-3A	2004	48.49950	-92.88430	unburned	2.79	0.94	1.01	0.71	0.24	0.74	0.12	0.10	<1	4	348	0.6	0.20	0.2	15.3	4.4	21	1.17	9.8	7.18	0.15	0.02	8.6	8
SP-04-4-1A	2004	48.49866	-92.89069	unburned	2.75	0.51	1.28	0.62	0.22	0.54	0.11	0.11	<1	5	272	0.7	0.24	0.3	16.5	4.3	24	0.98	8.6	7.54	0.26	0.03	9.0	9
SP-04-4-2A	2004	48.49850	-92.89060	low/medium	2.48	0.68	0.95	0.41	0.23	0.61	0.09	0.08	<1	3	185	0.7	0.20	0.4	14.2	2.2	23	3.10	6.1	6.19	0.19	0.02	7.7	6
SP-04-4-3A	2004	48.49830	-92.89090	high	5.61	1.72	1.70	1.68	0.42	1.87	0.05	0.15	<1	6	527	1.2	0.22	0.4	19.8	4.7	23	1.79	8.4	14.00	0.03	0.03	10.3	11
SP-04-5-1A	2004	48.50055	-92.88857	unburned	4.79	1.39	1.10	1.49	0.31	1.81	0.03	0.12	<1	2	426	1.1	0.09	0.1	12.2	3.2	17	1.52	3.0	11.30	0.06	<0.02	6.4	8
SP-04-5-2A	2004	48.50060	-92.88860	low/medium	5.39	1.31	1.27	1.60	0.32	2.05	0.02	0.13	<1	2	415	1.2	0.12	0.1	12.5	3.2	25	0.92	5.6	12.20	0.04	<0.02	6.6	8
SP-04-5-3A	2004	48.50060	-92.88840	high	4.72	2.23	1.50	1.41	0.40	1.56	0.07	0.13	<1	6	863	1.0	0.20	0.7	17.1	4.5	28	1.81	13.1	10.90	0.04	0.03	8.9	9
SP-04-6-1A	2004	48.50142	-92.88990	unburned	3.35	0.88	1.58	0.84	0.32	0.74	0.09	0.13	<1	5	557	1.0	0.35	0.6	19.5	6.3	29	4.12	10.3	9.78	0.18	0.03	10.5	12
SP-04-6-2A	2004	48.50170	-92.89010	low/medium	3.90	1.34	1.19	1.15	0.27	1.07	0.06	0.15	<1	4	547	1.0	0.26	0.2	19.0	2.8	23	2.19	7.9	11.40	0.09	0.02	10.6	8
SP-04-6-3A	2004	48.50180	-92.89100	high	5.05	1.90	1.35	1.50	0.31	1.63	0.05	0.16	<1	5	660	1.2	0.26	0.5	20.4	3.4	29	2.98	13.4	13.00	<0.02	0.03	11.2	8
SP-04-7-1A	2004	48.50540	-92.89810	unburned	3.24	0.61	0.93	0.88	0.24	0.84	0.07	0.12	<1	3	294	0.8	0.16	0.2	15.7	2.6	20	1.52	6.1	9.12	0.14	<0.02	8.9	5
SP-04-7-2A	2004	48.50501	-92.89789	low/medium	3.66	0.57	1.90	0.71	0.29	0.70	0.07	0.13	<1	5	322	1.2	0.28	0.2	23.5	13.8	33	3.05	11.5	9.04	0.19	0.03	13.0	15
SP-04-7-3A	2004	48.50480	-92.89560	high	5.32	1.59	1.39	1.37	0.35	1.87	0.03	0.12	<1	4	544	1.5	0.22	0.3	17.9	4.4	22	2.50	6.0	12.40	<0.02	0.03	9.6	10
SP-04-8-1A	2004	48.50166	-92.87214	unburned	3.76	1.09	1.49	0.75	0.47	1.01	0.06	0.12	<1	3	386	0.9	0.21	0.2	14.4	6.5	35	2.44	6.5	9.58	0.12	0.03	7.9	10
SP-04-8-2A	2004	48.50170	-92.87230	low/medium	5.12	0.79	2.04	1.31	0.48	1.09	0.03	0.23	<1	4	525	1.2	0.23	0.2	28.7	6.7	37	2.88	14.8	15.10	0.04	0.03	15.4	14
SP-04-8-3A	2004	48.50180	-92.87250	high	5.05	0.94	1.91	1.09	0.44	1.37	0.04	0.17	<1	4	361	1.2	0.23	0.2	20.1	5.6	35	2.49	12.6	13.20	0.08	0.03	11.0	15
SP-04-9-1A	2004	48.50080	-92.87210	unburned	3.01	1.16	0.80	0.94	0.28	0.87	0.08	0.09	<1	2	605	0.8	0.18	0.5	18.6	5.9	11	1.35	5.1	7.25	0.14	0.02	11.1	5
SP-04-9-1A dup	2004	48.50080	-92.87210	unburned	2.98	1.14	0.76	0.89	0.27	0.87	0.08	0.08	<1	2	588	0.7	0.17	0.5	18.0	5.8	17	1.70	4.4	7.10	0.13	0.02	10.5	5
SP-04-9-2A	2004	48.50097	-92.87247	low/medium	3.93	1.03	1.22	1.26	0.38	1.04	0.08	0.16	<1	3	586	1.0	0.24	0.4	25.0	12.4	27	2.30	7.1	10.20	0.11	0.03	13.7	8
SP-04-9-3A	2004	48.50130	-92.87270	high	5.27	1.78	1.90	1.27	0.47	1.54	0.05	0.17	<1	5	688	1.3	0.33	0.6	21.6	7.1	37	2.90	11.7	13.10	0.02	0.03	12.0	12
SP-04-10-1A	2004	48.50210	-92.88490	unburned	4.20	1.24	1.68	0.97	0.43	1.11	0.06	0.14	<1	5	768	1.0	0.23	0.7	21.2	6.7	35	2.72	9.4	11.30	0.15	0.03	10.5	13
SP-04-10-2A	2004	48.50192	-92.88459	low/medium	4.07	1.27	1.26	0.95	0.34	1.18	0.05	0.12	<1	4	503	0.9	0.27	0.5	19.2	4.3	27	2.07	6.6	9.70	0.11	0.03	10.5	9
SP-04-10-3A	2004	48.50180	-92.88450	high	4.84	1.47	1.21	1.31	0.27	1.66	0.02	0.14	<1	4	627	1.1	0.23	0.7	22.4	3.5	23	1.75	9.0	12.40	<0.02	0.04	11.9	7
SP-04-10-3A dup	2004	48.50180	-92.88450	high	4.87	1.51	1.25	1.46	0.28	1.66	0.03	0.15	<1	4	650	1.3	0.25	0.7	21.3	3.5	24	2.04	8.6	12.60	<0.02	0.03	11.4	7
SP-05-1-1A	2005	48.49490	-92.88660	unburned	3.68	1.26	0.86	1.03	0.25	1.29	0.06	0.10	<1	2	461	1.0	0.13	0.2	13.8	2.6	20	1.29	5.4	8.91	0.09	<0.02	7.6	6
SP-05-1-1A dup	2005	48.49490	-92.88660	unburned	3.84	1.21	0.78	1.01	0.25	1.35	0.05	0.08	<1	1	425	1.0	0.11	0.2	12.8	2.7	21	0.87	4.2	8.34	0.07	<0.02	7.1	5
SP-05-1-2A	2005	48.49495	-92.88618	low/medium	3.43	1.36	0.80	0.96	0.30	1.10	0.07	0.08	<1	2	466	1.5	0.14	0.4	15.0	3.4	18	1.84	6.3	7.66	0.09	<0.02	8.4	6
SP-05-1-3A	2005	48.49508	-92.88588	high	4.47	1.44	1.26	1.18	0.34	1.45	0.05	0.12	<1	2	575	1.1	0.17	0.4	16.3	5.0	28	2.29	6.9	10.60	0.07	0.02	8.5	10
SP-05-2-1A	2005	48.49599	-92.88988	unburned	3.57	1.08	1.25	1.04	0.35	0.92	0.08	0.12	<1	5	682	0.9	0.26	0.6	25.5	15.8	30	2.51	6.1	9.32	0.23	0.03	13.5	8
SP-05-2-2A	2005	48.49617	-92.88976	low/medium	3.93	1.34	1.30	1.08	0.31	1.16	0.05	0.12	<1	3	652	1.0	0.27	0.6	17.6	4.1	26	2.92	6.9	9.74	0.15	0.03	9.5	8
SP-05-2-3A	2005	48.49626	-92.88962	high	5.32	1.57	1.42	1.49	0.36	1.93	0.02	0.14	<1	4	622	1.4	0.21	0.4	17.2	4.3	36	1.78	7.0	13.00	<0.02	0.03	9.2	10
SP-05-3-1A	2005	48.49990	-92.88320	high	3.49	1.23	0.98	0.91	0.31	1.17	0.06	0.08	<1	2	347	0.8	0.11	0.3	13.2	3.3	23	1.34	4.5	7.76	0.09	<0.02	7.4	8
SP-05-3-2A	2005	48.49950	-92.88380	low/medium	4.06	0.94	1.62	0.92	0.31	1.02	0.04	0.14	<1	4	464	1.2	0.24	0.4	22.5	6.1	31	1.92	13.8	10.70	0.06	0.02	12.5	12
SP-05-3-3A	2005	48.49950	-92.88430	unburned	3.81	1.19	1.22	0.98	0.32	1.12	0.07	0.12	<1	4	413	0.8	0.18	0.2	16.2	4.1	28	1.71	9.8	9.09	0.09	<0.02	8.8	9

Field no.	Year collected	Latitude	Longitude	Fire severity	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs* (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)	Li (ppm)
SP-05-4-1A	2005	48.49866	-92.89069	unburned	1.16	0.44	0.56	0.30	0.13	0.18	0.13	0.05	<1	3	164	0.4	0.14	0.5	9.5	3.4	11	0.30	5.4	2.80	0.26	<0.02	5.6	3
SP-05-4-1A dup.	2005	48.49866	-92.89069	unburned	1.38	0.46	0.61	0.36	0.15	0.23	0.15	0.05	<1	4	188	0.6	0.16	0.5	11.3	3.8	12	0.49	6.9	3.43	0.26	<0.02	6.3	3
SP-05-4-2A	2005	48.49850	-92.89060	low/medium	2.22	0.41	0.84	0.49	0.17	0.45	0.06	0.08	<1	4	201	0.7	0.26	0.3	13.7	1.5	17	0.40	6.1	6.45	0.18	<0.02	7.4	5
SP-05-4-3A	2005	48.49830	-92.89090	high	4.90	1.89	1.48	1.50	0.36	1.67	0.03	0.13	<1	6	573	1.3	0.23	0.7	19.5	5.0	29	1.75	9.9	11.70	<0.02	0.03	9.9	9
SP-05-5-1A	2005	48.50055	-92.88857	unburned	3.96	1.27	1.19	1.10	0.34	1.33	0.06	0.09	<1	2	513	1.0	0.29	0.4	13.4	4.2	22	1.35	4.4	8.58	0.11	<0.02	6.8	9
SP-05-5-2A	2005	48.50060	-92.88860	low/medium	4.22	1.41	1.02	1.20	0.28	1.56	0.04	0.09	<1	2	477	1.0	0.12	0.2	11.8	3.2	22	1.58	3.4	9.64	0.08	<0.02	6.3	6
SP-05-5-3A	2005	48.50060	-92.88840	high	4.00	1.52	1.06	1.08	0.29	1.36	0.05	0.10	<1	4	666	1.1	0.21	0.6	16.6	3.4	24	1.73	6.8	9.48	0.11	0.03	8.9	6
SP-05-6-1A	2005	48.50142	-92.88990	unburned	3.86	0.89	1.66	0.93	0.37	0.91	0.07	0.14	<1	4	512	1.8	0.35	0.4	20.1	5.8	33	3.49	10.4	10.80	0.17	0.03	10.4	13
SP-05-6-2A	2005	48.50170	-92.89010	low/medium	2.48	1.61	1.02	0.59	0.22	0.46	0.05	0.08	<1	4	598	0.5	0.14	0.4	15.9	3.4	18	0.46	9.3	7.09	0.06	0.02	8.8	6
SP-05-6-3A	2005	48.50180	-92.89100	high	4.25	1.40	1.00	1.25	0.24	1.51	0.02	0.12	<1	3	511	1.0	0.17	0.3	15.3	2.6	22	0.69	7.4	11.00	<0.02	0.02	8.2	6
SP-05-7-1A	2005	48.50540	-92.89810	unburned	1.21	0.59	0.57	0.36	0.14	0.24	0.14	0.04	<1	4	229	0.4	0.11	0.2	9.1	1.6	13	0.84	5.9	2.90	0.38	<0.02	5.0	3
SP-05-7-2A	2005	48.50501	-92.89789	low/medium	2.49	0.49	1.33	0.51	0.20	0.35	0.10	0.07	<1	5	355	1.2	0.28	0.4	23.0	9.3	22	2.35	12.5	5.54	0.32	0.03	13.5	8
SP-05-7-3A	2005	48.50480	-92.89560	high	4.90	1.91	1.48	1.42	0.39	1.71	0.03	0.12	<1	3	556	1.2	0.24	0.3	20.1	5.0	31	2.53	8.6	11.60	0.02	0.03	10.9	10
SP-05-8-1A	2005	48.50166	-92.87214	unburned	3.04	0.87	1.15	0.78	0.30	0.84	0.08	0.09	<1	3	409	0.7	0.20	0.4	13.9	5.8	22	1.44	5.7	7.42	0.15	0.02	7.6	8
SP-05-8-2A	2005	48.50170	-92.87230	low/medium	4.01	0.48	1.55	0.84	0.37	0.61	0.05	0.15	<1	3	471	1.4	0.26	0.3	33.3	5.8	33	1.61	14.9	11.10	0.09	0.03	19.0	11
SP-05-8-3A	2005	48.50180	-92.87250	high	3.87	0.97	1.60	0.84	0.37	1.01	0.06	0.14	<1	4	320	1.1	0.22	0.5	15.5	5.0	33	1.72	10.6	10.20	0.10	0.03	9.5	12
SP-05-9-1A	2005	48.50080	-92.87210	unburned	3.35	1.44	0.91	1.04	0.35	1.10	0.09	0.09	<1	2	696	0.9	0.18	0.7	14.3	7.2	25	3.29	5.9	8.59	0.12	0.06	8.1	7
SP-05-9-2A	2005	48.50097	-92.87247	low/medium	2.56	1.32	0.94	0.77	0.35	0.64	0.11	0.10	<1	2	592	0.8	0.18	0.5	16.1	12.5	22	1.32	9.5	6.83	0.14	0.02	9.1	6
SP-05-9-3A	2005	48.50130	-92.87270	high	4.00	2.03	1.45	1.11	0.38	1.08	0.05	0.13	<1	4	940	1.0	0.32	1.2	21.5	9.8	32	3.04	15.4	10.70	0.05	0.04	11.7	10
SP-05-10-1A	2005	48.50210	-92.88490	unburned	4.78	1.44	1.98	0.90	0.48	1.42	0.06	0.17	<1	5	775	1.1	0.27	0.8	20.1	9.0	53	3.07	10.3	13.20	0.13	0.04	11.1	15
SP-05-10-2A	2005	48.50192	-92.88459	low/medium	3.88	1.04	1.16	1.04	0.31	1.22	0.05	0.11	<1	4	476	1.0	0.26	0.4	18.0	3.9	24	1.60	5.1	9.55	0.14	0.03	10.0	8
SP-05-10-3A	2005	48.50180	-92.88450	high	4.41	1.18	1.02	1.28	0.23	1.55	0.02	0.11	<1	3	557	1.2	0.26	0.5	16.7	2.7	21	0.68	7.1	10.70	0.02	0.02	9.1	5
SP-05-10-3A dup.	2005	48.50180	-92.88450	high	4.60	1.28	1.14	1.33	0.25	1.59	0.02	0.13	<1	3	585	1.1	0.21	0.5	18.9	3.4	26	1.42	8.8	11.40	<0.02	0.03	10.2	6
SP-06 1-1A	2006	48.49490	-92.88660	unburned	5.53	1.40	1.24	1.40	0.35	1.83	0.02	0.13	<1	4	492	0.9	0.11	0.3	12.9	4.7	32	<5	11.0	11.10	0.03	0.02	7.2	10
SP-06 1-2A	2006	48.49495	-92.88618	low/medium	4.79	1.43	1.12	1.25	0.38	1.54	0.05	0.12	<1	2	445	0.8	0.12	0.4	13.6	4.5	31	<5	10.8	9.50	0.04	<0.02	7.2	10
SP-06 1-3A	2006	48.49508	-92.88588	high	5.25	1.21	0.92	1.44	0.25	1.73	0.02	0.15	<1	3	461	1.0	0.07	0.2	14.9	3.1	25	<5	6.9	11.10	0.03	<0.02	8.6	6
SP-06 2-1A	2006	48.49599	-92.88988	unburned	3.42	1.13	1.15	0.92	0.31	0.78	0.10	0.14	<1	6	577	0.8	0.16	0.5	20.0	11.4	32	<5	12.5	8.09	0.20	0.03	11.2	8
SP-06 2-2A	2006	48.49617	-92.88976	low/medium	4.93	1.64	1.40	1.31	0.38	1.41	0.05	0.16	<1	5	803	1.1	0.24	0.9	20.8	6.9	34	<5	11.1	10.80	0.10	0.03	11.1	12
SP-06 2-3A	2006	48.49626	-92.88962	high	6.44	1.48	1.70	1.68	0.42	2.08	0.01	0.20	<1	7	547	1.2	0.16	0.3	17.5	5.5	44	<5	10.1	14.20	<0.02	0.02	9.9	13
SP-06 3-1A	2006	48.49990	-92.88320	high	5.31	1.41	1.23	1.37	0.36	1.77	0.03	0.14	<1	4	473	1.1	0.08	0.4	15.4	5.3	35	<5	9.1	11.00	0.04	<0.02	8.3	10
SP-06 3-2A	2006	48.49950	-92.88380	low/medium	4.72	0.95	1.40	1.01	0.29	1.15	0.04	0.18	<1	4	441	1.0	0.18	0.4	20.9	5.8	34	<5	14.9	11.50	0.05	0.02	11.8	10
SP-06 3-3A	2006	48.49950	-92.88430	unburned	4.42	1.28	1.19	1.12	0.28	1.24	0.06	0.17	<1	4	450	0.8	0.11	0.2	14.8	5.1	30	<5	12.5	10.80	0.07	0.02	8.3	9
SP-06 3-3A dup	2006	48.49950	-92.88430	unburned	4.26	1.27	1.17	1.23	0.28	1.37	0.06	0.16	<1	4	446	0.8	0.26	0.3	17.9	6.2	37	<5	15.5	10.80	0.07	0.03	9.7	10
SP-06 4-1A	2006	48.49866	-92.89069	unburned	4.62	1.05	1.43	1.15	0.39	1.21	0.07	0.17	<1	4	438	0.9	0.13	0.4	22.0	18.2	35	<5	11.6	11.10	0.11	0.03	12.4	10
SP-06 4-2A	2006	48.49850	-92.89060	low/medium	3.35	0.67	0.90	0.73	0.18	0.75	0.08	0.11	<1	6	239	1.2	0.26	0.5	17.4	2.7	19	<5	11.1	9.91	0.13	0.03	9.9	5
SP-06 4-3A	2006	48.49830	-92.89090	high	5.76	1.39	1.46	1.65	0.35	1.85	0.02	0.14	<1	5	448	1.2	0.08	0.5	15.1	5.3	33	<5	11.2	13.40	<0.02	0.02	8.0	9
SP-06 5-1A	2006	48.50055	-92.88857	unburned	4.10	1.36	1.13	1.23	0.30	1.35	0.07	0.11	<1	4	623	0.9	0.24	0.7	16.6	6.3	33	<5	6.9	9.05	0.13	0.03	8.3	11
SP-06 5-2A	2006	48.50060	-92.88860	low/medium	5.66	1.33	1.09	1.62	0.31	1.97	0.02	0.13	<1	3	430	1.1	<0.04	0.1	11.4	3.8	30	<5	5.9	12.50	0.03	<0.02	6.1	9
SP-06 5-3A	2006	48.50060	-92.88840	high	3.56	1.29	1.08	0.87	0.27	0.98	0.09	0.10	<1	7	497	1.0	0.15	0.5	13.1	4.4	25	<5	8.1	8.09	0.19	0.02	7.3	7
SP-06 6-1A	2006	48.50142	-92.88990	unburned	4.65	1.09	0.97	1.09	0.29	1.41	0.04	0.12	<1	5	403	1.2	0.12	0.3	13.6	4.6	29	<5	8.9	10.10	0.09	<0.02	7.7	7
SP-06 6-2A	2006	48.50170	-92.89010	low/medium	4.34	1.24	1.42	1.10	0.30	1.02	0.04	0.16	<1	7	649	1.1	0.28	0.8	19.9	6.7	32	<5	16.5	11.10	0.07	0.04	11.0	10
SP-06 6-3A	2006	48.50180	-92.89100	high	5.00	1.41	1.06	1.43	0.23	1.54	0.02	0.17	<1	5	542	1.1	0.13	0.4	16.5	3.1	27	<5	12.9	11.90	<0.02	0.03	9.2	7
SP-06 6-3A dup	2006	48.50180	-92.89100	high	4.93	1.41	1.00	1.43	0.22	1.56	0.02	0.15	<1	5	573	1.1	0.12	0.5	15.9	2.9	23	<5	14.4	11.60	<0.02	0.02	8.9	7

Field no.	Year collected	Latitude	Longitude	Fire severity	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs* (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)	Li (ppm)
SP-06 7-1A	2006	48.50540	-92.89810	unburned	2.50	0.40	1.01	0.57	0.18	0.44	0.12	0.09	<1	6	234	0.7	0.08	0.3	17.9	3.5	22	<5	9.5	5.99	0.24	0.02	10.8	5
SP-06 7-2A	2006	48.50501	-92.89789	low/medium	3.47	0.68	1.47	0.69	0.26	0.61	0.09	0.12	<1	9	359	1.4	0.21	0.4	23.5	11.8	29	<5	12.3	7.67	0.24	0.03	13.7	11
SP-06 7-3A	2006	48.50480	-92.89560	high	5.37	1.90	1.46	1.50	0.37	1.58	0.03	0.14	<1	6	594	1.3	0.20	0.6	20.0	6.3	30	<5	18.6	11.80	0.02	0.03	10.7	11
SP-06 8-1A	2006	48.50166	-92.87214	unburned	5.36	1.05	1.24	1.31	0.32	1.60	0.02	0.17	<1	5	499	1.1	0.19	0.4	18.2	8.5	30	<5	11.4	12.30	0.04	0.03	9.6	10
SP-06 8-2A	2006	48.50170	-92.87230	low/medium	4.38	0.63	1.74	1.00	0.37	0.70	0.07	0.19	<1	6	472	1.2	0.23	0.6	31.6	9.4	38	<5	22.8	11.10	0.09	0.04	18.6	11
SP-06 8-2A dup	2006	48.50170	-92.87230	low/medium	4.18	0.60	1.66	0.97	0.36	0.68	0.07	0.18	<1	7	457	1.5	0.23	0.6	32.8	9.2	36	<5	22.2	10.30	0.10	0.03	18.5	10
SP-06 8-3A	2006	48.50180	-92.87250	high	5.42	1.19	1.47	1.25	0.33	1.45	0.03	0.23	<1	6	465	1.2	0.21	0.3	21.8	3.7	36	<5	33.4	14.50	0.04	0.03	11.9	10
SP-06 9-1A	2006	48.50080	-92.87210	unburned	3.40	1.28	0.81	0.97	0.30	0.93	0.09	0.10	<1	4	654	0.9	0.12	0.7	16.2	7.7	22	<5	8.8	7.70	0.13	0.02	9.6	6
SP-06 9-2A	2006	48.50097	-92.87247	low/medium	3.43	1.16	1.04	0.88	0.32	0.81	0.10	0.12	<1	6	623	0.9	0.16	0.6	18.4	18.4	27	<5	14.1	7.99	0.15	0.03	10.2	7
SP-06 9-3A	2006	48.50130	-92.87270	high	4.81	1.20	1.34	1.15	0.31	1.33	0.03	0.17	<1	5	586	1.3	0.26	0.8	18.6	6.6	33	<5	13.0	11.80	0.05	0.03	10.2	10
SP-06 10-1A	2006	48.50210	-92.88490	unburned	4.97	1.59	1.83	1.18	0.50	1.22	0.07	0.18	<1	6	641	0.9	0.19	1.0	20.2	8.1	38	<5	11.8	11.60	0.13	0.03	10.7	17
SP-06 10-2A	2006	48.50192	-92.88459	low/medium	5.21	1.43	1.50	1.29	0.41	1.37	0.04	0.16	<1	7	610	1.2	0.22	0.9	20.6	7.7	35	<5	10.8	11.10	0.11	0.03	11.3	15
SP-06 10-3A	2006	48.50180	-92.88450	high	4.90	1.22	1.02	1.36	0.23	1.48	0.02	0.15	<1	5	555	1.2	0.15	0.8	17.0	3.3	24	<5	10.1	10.20	0.03	0.03	9.4	7

*Because of analytical laboratory issues, Cs detection limits in 2004 and 2005 were 0.05 ppm and 5 ppm in 2006.

Field no.	Year collected	Latitude	Longitude	Fire severity	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)	Total C (wt. %)
SP-04-1-1A	2004	48.49490	-92.88660	unburned	406	0.28	4.8	13.8	460	21.6	77.3	0.20	5.1	1.5	264	<0.1	4.4	0.3	1.1	42	0.4	5.8	34	0.2	3.98
SP-04-1-2A	2004	48.49495	-92.88618	low/medium	578	0.24	3.6	10.9	570	25.8	69.1	0.24	4.6	1.4	230	<0.1	2.6	0.2	0.9	31	0.3	4.6	37	0.3	8.48
SP-04-1-3A	2004	48.49508	-92.88588	high	727	0.58	4.5	15.5	790	33.1	77.5	0.36	5.0	1.8	246	<0.1	3.0	0.3	1.0	49	0.4	5.2	58	0.3	8.44
SP-04-2-1A	2004	48.49599	-92.88988	unburned	2960	0.59	3.3	8.6	900	52.2	50.0	0.61	4.0	1.5	171	<0.1	3.0	0.4	0.9	31	0.4	5.5	52	0.5	23.60
SP-04-2-2A	2004	48.49617	-92.88976	low/medium	1350	0.44	4.1	8.9	630	38.2	70.2	0.45	4.7	2.8	213	<0.1	3.3	0.4	1.0	34	0.7	6.2	61	0.4	13.30
SP-04-2-2A dup	2004	48.49617	-92.88976	low/medium	1370	0.47	4.2	10.2	630	39.5	76.2	0.49	4.8	1.2	222	<0.1	3.2	0.5	1.0	37	0.4	5.6	63	0.4	12.10
SP-04-2-3A	2004	48.49626	-92.88962	high	764	0.53	4.7	16.7	1,200	60.0	81.3	1.01	5.8	3.4	282	<0.1	3.9	0.6	1.3	47	0.7	7.4	64	0.8	5.52
SP-04-3-1A	2004	48.49990	-92.88320	high	388	0.25	3.7	12.0	330	24.4	73.1	0.21	5.0	1.4	243	<0.1	3.1	0.4	0.9	37	0.5	5.1	27	<0.2	4.65
SP-04-3-2A	2004	48.49950	-92.88380	low/medium	254	1.00	7.4	16.8	320	38.9	58.6	0.46	6.2	3.0	202	<0.1	5.0	0.4	6.3	75	0.7	6.7	50	0.4	3.69
SP-04-3-3A	2004	48.49950	-92.88430	unburned	411	0.69	3.3	12.3	620	40.1	35.6	0.60	3.3	2.3	128	<0.1	2.6	0.2	4.0	31	0.4	4.0	37	0.6	26.10
SP-04-4-1A	2004	48.49866	-92.89069	unburned	177	0.88	3.9	10.8	840	40.0	29.5	0.70	3.3	2.1	95	<0.1	2.8	0.2	1.1	37	0.5	3.9	41	0.5	27.80
SP-04-4-2A	2004	48.49850	-92.89060	low/medium	132	0.43	2.4	6.1	830	33.5	29.3	0.58	3.3	1.6	126	<0.1	2.9	0.2	3.5	23	0.4	4.0	35	0.5	31.40
SP-04-4-3A	2004	48.49830	-92.89090	high	465	0.58	4.3	14.1	740	38.3	77.5	0.55	5.3	3.0	250	<0.1	3.9	0.4	1.2	48	0.4	5.6	69	0.5	3.08
SP-04-5-1A	2004	48.50055	-92.88857	unburned	434	0.18	3.4	7.8	330	19.5	82.5	0.19	4.3	1.5	237	<0.1	2.3	0.3	0.8	29	0.3	4.5	31	<0.2	6.24
SP-04-5-2A	2004	48.50060	-92.88860	low/medium	286	0.22	3.3	8.5	250	20.2	70.2	0.19	4.6	1.2	251	<0.1	3.5	0.3	0.9	34	0.3	4.9	23	<0.2	4.45
SP-04-5-3A	2004	48.50060	-92.88840	high	1050	0.55	3.7	13.6	1,200	35.5	75.3	0.70	4.5	2.1	304	<0.1	2.9	0.4	1.0	41	0.5	6.5	103	0.6	7.51
SP-04-6-1A	2004	48.50142	-92.88990	unburned	3720	0.60	4.8	12.1	1,260	48.7	56.6	0.57	4.2	3.7	119	<0.1	3.6	0.4	1.4	43	0.7	5.1	121	0.5	20.80
SP-04-6-2A	2004	48.50170	-92.89010	low/medium	1170	0.71	5.2	7.9	870	36.8	55.2	0.53	4.4	2.2	174	<0.1	3.4	0.4	1.2	43	0.6	5.3	78	0.4	12.40
SP-04-6-3A	2004	48.50180	-92.89100	high	924	0.65	4.8	12.0	1,190	50.1	71.5	0.79	4.9	2.4	257	<0.1	3.5	0.5	1.2	45	0.6	5.6	109	0.7	4.70
SP-04-7-1A	2004	48.50540	-92.89810	unburned	103	0.60	4.0	7.1	560	21.4	44.2	0.36	3.9	2.3	123	<0.1	2.6	0.3	12.8	33	0.4	4.3	19	0.6	20.60
SP-04-7-2A	2004	48.50501	-92.89789	low/medium	245	0.78	4.6	15.5	860	35.4	44.6	0.59	4.6	2.7	106	<0.1	5.3	0.3	5.1	46	1.8	5.7	53	0.6	20.50
SP-04-7-3A	2004	48.50480	-92.89560	high	643	0.33	3.8	13.3	750	41.1	77.7	0.59	4.8	3.5	247	<0.1	3.1	0.5	1.0	36	0.4	5.8	40	0.4	6.11
SP-04-8-1A	2004	48.50166	-92.87214	unburned	1150	0.57	3.5	11.5	710	40.1	47.8	0.39	5.0	2.0	195	<0.1	3.0	0.2	1.0	38	0.4	5.2	64	0.4	16.00
SP-04-8-2A	2004	48.50170	-92.87230	low/medium	248	0.72	7.4	17.9	660	28.9	63.6	0.29	6.6	2.1	162	<0.1	4.6	0.4	5.1	70	0.7	6.2	47	0.4	5.98
SP-04-8-3A	2004	48.50180	-92.87250	high	211	0.90	5.1	17.2	540	23.4	53.0	0.33	5.6	2.3	190	<0.1	4.6	0.3	2.1	60	0.5	5.2	41	0.5	8.21
SP-04-9-1A	2004	48.50080	-92.87210	unburned	1570	0.58	3.3	6.1	780	46.7	63.1	0.47	3.4	2.3	181	<0.1	2.7	0.2	0.8	24	0.4	4.3	76	0.5	20.10
SP-04-9-1A dup	2004	48.50080	-92.87210	unburned	1490	0.53	3.0	6.4	770	43.4	60.6	0.41	3.2	2.6	180	<0.1	2.4	0.2	0.8	23	0.4	4.1	75	0.4	19.80
SP-04-9-2A	2004	48.50097	-92.87247	low/medium	1780	0.56	5.1	12.5	930	46.0	83.8	0.52	5.2	2.6	189	<0.1	3.7	0.4	1.2	41	0.7	6.0	48	0.5	14.70
SP-04-9-3A	2004	48.50130	-92.87270	high	1980	0.66	5.3	16.4	1,580	52.0	61.0	0.58	5.4	2.8	254	<0.1	5.2	0.4	1.3	53	0.7	5.9	139	0.5	8.68
SP-04-10-1A	2004	48.50210	-92.88490	unburned	4980	0.87	4.3	16.8	1,030	35.1	66.0	0.51	5.1	3.0	182	<0.1	3.8	0.4	1.1	46	0.7	6.0	131	0.6	12.40
SP-04-10-2A	2004	48.50192	-92.88459	low/medium	1120	0.60	3.7	11.9	480	51.5	60.8	0.51	4.6	1.8	186	<0.1	3.1	0.4	1.0	36	0.4	5.9	46	0.5	15.60
SP-04-10-3A	2004	48.50180	-92.88450	high	549	0.36	4.8	9.5	480	54.6	67.3	0.57	4.8	1.4	228	<0.1	3.5	0.5	1.2	37	0.4	6.6	68	0.5	5.40
SP-04-10-3A dup	2004	48.50180	-92.88450	high	588	0.36	4.8	10.7	520	54.5	71.8	0.60	4.8	1.5	233	<0.1	3.5	0.5	1.2	39	0.5	6.7	73	0.6	6.14
SP-05-1-1A	2005	48.49490	-92.88660	unburned	412	0.30	3.2	7.7	560	28.2	52.7	0.30	3.5	1.4	205	<0.1	2.3	0.3	0.8	26	0.5	4.1	38	0.3	16.30
SP-05-1-1A dup	2005	48.49490	-92.88660	unburned	342	0.28	2.8	9.0	470	26.6	50.9	0.24	3.2	1.2	208	<0.1	2.2	0.2	0.8	23	0.7	4.8	31	0.3	13.20
SP-05-1-2A	2005	48.49495	-92.88618	low/medium	993	0.43	2.9	8.1	710	33.5	56.5	0.31	3.2	1.9	188	<0.1	2.6	0.3	0.8	23	0.3	4.0	48	0.4	17.30
SP-05-1-3A	2005	48.49508	-92.88588	high	1390	0.48	4.0	12.7	740	31.4	70.9	0.29	4.2	0.9	218	<0.1	3.1	0.4	0.9	37	0.4	4.6	66	0.3	12.20
SP-05-2-1A	2005	48.49599	-92.88988	unburned	3450	0.81	4.3	12.5	860	51.9	63.9	0.65	4.8	1.3	173	<0.1	3.5	0.5	1.1	38	0.5	6.0	51	0.5	17.80
SP-05-2-2A	2005	48.49617	-92.88976	low/medium	1600	0.65	4.2	10.2	820	60.8	67.0	0.60	4.3	2.1	198	<0.1	3.4	0.3	1.0	36	1.0	5.3	79	0.4	17.00
SP-05-2-3A	2005	48.49626	-92.88962	high	553	0.47	4.0	17.8	760	35.5	74.3	0.48	4.8	2.4	260	<0.1	3.6	0.3	1.1	41	0.4	5.7	46	0.4	3.40
SP-05-3-1A	2005	48.49990	-92.88320	high	619	0.28	2.6	9.8	620	19.8	51.4	0.23	3.4	3.2	169	<0.1	2.3	0.1	0.8	25	0.3	3.9	37	0.4	17.00
SP-05-3-2A	2005	48.49950	-92.88380	low/medium	468	0.70	4.9	17.4	660	36.3	54.6	0.37	4.4	2.2	156	<0.1	3.7	0.2	7.0	45	0.5	5.8	62	0.7	16.30
SP-05-3-3A	2005	48.49950	-92.88430	unburned	378	0.51	4.0	14.6	440	27.3	55.0	0.28	4.1	2.6	173	<0.1	3.1	0.2	3.7	35	0.4	4.8	34	0.4	16.60

Field no.	Year collected	Latitude	Longitude	Fire severity	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)	Total C (wt. %)
SP-05-4-1A	2005	48.49866	-92.89069	unburned	97	0.49	1.7	7.1	830	32.4	16.8	0.48	1.7	1.6	57	<0.1	1.6	<0.1	0.6	15	0.3	2.3	30	0.7	39.60
SP-05-4-1A dup.	2005	48.49866	-92.89069	unburned	96	0.59	1.9	7.8	910	35.2	19.6	0.74	2.0	3.4	65	<0.1	1.8	0.1	0.8	18	0.4	2.9	35	0.9	38.00
SP-05-4-2A	2005	48.49850	-92.89060	low/medium	116	0.65	3.2	5.7	640	29.1	22.8	0.43	3.0	1.6	71	<0.1	2.3	0.1	2.1	26	0.4	3.3	29	0.6	23.70
SP-05-4-3A	2005	48.49830	-92.89090	high	607	0.50	4.1	16.4	850	189.0	74.1	2.96	4.9	2.6	247	<0.1	3.7	0.3	1.1	41	0.4	5.8	84	0.6	6.69
SP-05-5-1A	2005	48.50055	-92.88857	unburned	1140	0.27	2.7	11.6	750	29.9	58.1	0.26	3.7	2.0	193	<0.1	2.7	0.2	0.9	28	0.3	4.2	64	0.4	15.60
SP-05-5-2A	2005	48.50060	-92.88860	low/medium	667	0.27	2.8	9.5	520	24.0	69.1	0.24	3.8	3.3	223	<0.1	2.4	0.2	0.8	26	0.3	4.5	48	0.3	10.90
SP-05-5-3A	2005	48.50060	-92.88840	high	672	0.51	3.5	11.2	650	41.5	64.2	0.56	4.1	1.6	231	<0.1	2.9	0.3	0.9	31	0.4	5.2	70	0.4	13.00
SP-05-6-1A	2005	48.50142	-92.88990	unburned	2570	0.67	5.0	14.0	1,110	42.5	58.0	0.61	4.8	4.0	135	<0.1	3.9	0.2	1.6	43	0.6	5.5	91	0.6	16.70
SP-05-6-2A	2005	48.50170	-92.89010	low/medium	3050	0.53	3.2	10.4	1,390	40.2	38.6	0.54	3.1	1.9	135	<0.1	2.7	0.2	1.0	28	0.5	3.9	108	0.7	24.40
SP-05-6-3A	2005	48.50180	-92.89100	high	524	0.38	3.7	9.7	660	31.3	61.9	0.45	4.0	4.4	211	<0.1	3.0	0.3	1.0	31	0.4	5.0	68	0.4	4.07
SP-05-7-1A	2005	48.50540	-92.89810	unburned	63	0.37	1.5	6.4	810	24.1	21.4	0.49	1.7	1.9	71	<0.1	1.5	0.1	7.1	15	0.3	2.3	35	0.5	38.20
SP-05-7-2A	2005	48.50501	-92.89789	low/medium	596	0.75	3.1	13.5	1,140	51.4	37.2	0.75	3.3	2.6	76	<0.1	3.1	0.2	7.1	29	0.5	5.2	83	0.8	30.70
SP-05-7-3A	2005	48.50480	-92.89560	high	844	0.37	4.1	14.7	2,060	45.5	82.7	0.57	4.7	2.3	239	<0.1	3.6	0.4	1.1	39	0.5	6.1	69	0.5	8.41
SP-05-8-1A	2005	48.50166	-92.87214	unburned	1100	0.62	3.0	8.7	970	43.3	49.7	0.43	3.2	1.8	142	<0.1	2.5	0.3	0.9	31	0.4	3.8	69	0.5	22.90
SP-05-8-2A	2005	48.50170	-92.87230	low/medium	160	0.67	5.4	15.9	1,150	37.3	59.5	0.39	5.6	3.3	108	<0.1	4.1	0.3	9.7	47	0.6	6.6	48	0.7	17.20
SP-05-8-3A	2005	48.50180	-92.87250	high	264	0.90	4.8	16.2	860	32.0	50.4	0.38	4.4	1.5	160	<0.1	3.1	0.3	1.6	47	0.6	4.4	62	0.8	17.00
SP-05-9-1A	2005	48.50080	-92.87210	unburned	2380	0.48	3.0	10.9	900	37.0	67.5	0.32	3.3	2.1	214	<0.1	2.1	0.3	0.8	27	0.3	3.8	133	0.3	18.10
SP-05-9-2A	2005	48.50097	-92.87247	low/medium	2130	0.57	3.4	11.3	1,020	41.4	58.0	0.45	3.5	1.9	172	<0.1	2.7	0.3	0.8	29	0.4	4.8	109	0.6	25.80
SP-05-9-3A	2005	48.50130	-92.87270	high	3580	0.64	4.7	17.1	1,770	65.6	68.3	0.61	4.4	4.0	231	<0.1	3.7	0.5	1.2	42	0.6	5.2	234	0.6	15.70
SP-05-10-1A	2005	48.50210	-92.88490	unburned	3930	1.06	5.1	23.3	1,130	42.7	67.0	0.55	5.5	4.5	216	<0.1	3.6	0.5	1.3	56	0.8	6.1	142	0.4	10.70
SP-05-10-2A	2005	48.50192	-92.88459	low/medium	713	0.62	3.7	9.8	500	47.4	61.5	0.54	4.3	2.0	173	<0.1	3.6	0.3	1.0	33	0.4	5.1	48	0.6	16.10
SP-05-10-3A	2005	48.50180	-92.88450	high	354	0.31	3.7	8.4	410	38.4	62.9	0.40	4.0	4.3	202	<0.1	2.8	0.4	1.1	31	0.4	5.1	48	0.6	9.78
SP-05-10-3A dup.	2005	48.50180	-92.88450	high	420	0.41	4.0	11.7	460	40.9	66.3	0.40	4.5	1.9	212	<0.1	2.9	0.3	1.1	32	0.4	5.7	51	0.5	9.88
SP-06 1-1A	2006	48.49490	-92.88660	unburned	533	0.34	3.3	15.2	520	27.5	77.2	0.27	4.2	1.0	254	<0.1	3.4	0.4	0.9	33	0.3	5.0	45	0.2	5.94
SP-06 1-2A	2006	48.49495	-92.88618	low/medium	864	0.36	2.9	16.9	690	23.2	71.8	0.19	4.0	0.8	226	<0.1	3.5	0.3	0.9	30	0.3	4.7	48	0.2	9.86
SP-06 1-3A	2006	48.49508	-92.88588	high	560	0.38	3.5	12.8	320	24.1	67.1	0.26	3.6	0.9	235	<0.1	2.8	0.4	1.0	30	0.4	4.8	29	<0.2	4.73
SP-06 2-1A	2006	48.49599	-92.88988	unburned	1160	0.75	3.9	14.8	1,080	42.5	50.4	0.65	4.5	1.6	161	<0.1	3.3	0.4	1.0	37	0.5	5.3	63	0.6	21.50
SP-06 2-2A	2006	48.49617	-92.88976	low/medium	2890	0.70	4.1	14.8	900	53.7	85.0	0.55	5.1	1.5	233	<0.1	3.8	0.6	1.1	39	0.5	6.7	104	0.4	12.10
SP-06 2-3A	2006	48.49626	-92.88962	high	340	0.46	4.5	19.4	530	26.2	75.8	0.45	5.7	1.6	274	<0.1	3.8	0.4	1.1	51	0.4	6.8	31	0.4	1.81
SP-06 3-1A	2006	48.49990	-92.88320	high	1070	0.46	3.4	14.0	590	25.9	78.5	0.25	4.6	0.9	235	<0.1	4.4	0.4	1.0	34	0.3	5.6	41	0.3	7.80
SP-06 3-2A	2006	48.49950	-92.88380	low/medium	387	0.77	4.7	17.2	460	35.0	52.7	0.36	4.7	1.3	174	<0.1	3.3	0.3	5.4	45	0.5	5.8	51	0.5	14.30
SP-06 3-3A	2006	48.49950	-92.88430	unburned	708	0.77	4.1	14.2	480	32.1	64.0	0.33	4.3	1.1	195	<0.1	2.8	0.4	3.7	40	0.4	5.2	48	0.4	12.70
SP-06 3-3A dup	2006	48.49950	-92.88430	unburned	641	0.92	4.3	15.0	420	35.7	69.1	0.40	3.9	1.1	179	<0.1	3.3	0.4	3.7	38	0.5	5.6	46	0.4	13.20
SP-06 4-1A	2006	48.49866	-92.89069	unburned	2290	1.07	4.2	11.9	770	33.9	63.5	0.41	5.7	1.3	190	<0.1	3.7	0.4	1.7	45	0.5	5.9	52	0.4	14.60
SP-06 4-2A	2006	48.49850	-92.89060	low/medium	260	0.91	4.3	7.5	1,060	34.2	36.8	0.53	4.5	1.8	107	<0.1	3.4	0.3	6.7	27	0.6	5.4	42	0.6	22.30
SP-06 4-3A	2006	48.49830	-92.89090	high	494	0.44	3.3	17.2	630	22.7	78.6	0.30	5.3	1.0	244	<0.1	5.0	0.4	1.0	38	0.3	5.2	53	0.5	4.82
SP-06 5-1A	2006	48.50055	-92.88857	unburned	1680	0.74	3.2	15.8	720	44.7	72.4	0.43	3.6	1.0	193	<0.1	3.3	0.4	0.9	29	0.4	5.3	86	0.4	15.20
SP-06 5-2A	2006	48.50060	-92.88860	low/medium	389	0.29	3.0	11.1	220	18.0	86.4	0.24	4.9	0.8	254	<0.1	3.3	0.4	0.8	30	0.2	5.1	23	<0.2	3.30
SP-06 5-3A	2006	48.50060	-92.88840	high	546	0.65	2.9	11.5	660	41.3	53.1	0.57	4.1	1.3	182	<0.1	2.4	0.4	0.8	31	0.3	4.7	50	0.6	22.30
SP-06 6-1A	2006	48.50142	-92.88990	unburned	1110	0.50	3.1	11.1	530	30.3	58.8	0.38	4.6	1.1	202	<0.1	2.7	0.4	0.9	30	2.1	5.1	46	0.3	11.40
SP-06 6-2A	2006	48.50170	-92.89010	low/medium	2800	0.88	4.5	15.0	1,200	50.5	70.8	0.57	5.4	1.7	187	<0.1	3.8	0.5	1.3	43	0.6	6.4	120	0.7	14.20
SP-06 6-3A	2006	48.50180	-92.89100	high	757	0.56	3.8	8.7	750	35.4	65.1	0.40	4.9	1.2	230	<0.1	3.2	0.4	1.1	34	0.4	5.7	65	0.4	5.77
SP-06 6-3A dup	2006	48.50180	-92.89100	high	805	0.50	3.7	9.6	820	35.1	63.3	0.48	4.3	1.3	230	<0.1	3.2	0.4	1.1	34	0.4	5.6	75	0.4	5.85

Field no.	Year collected	Latitude	Longitude	Fire severity	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)	Total C (wt. %)
SP-06 7-1A	2006	48.50540	-92.89810	unburned	99	0.80	2.6	9.4	1,170	22.4	32.3	0.41	3.8	0.9	77	<0.1	2.3	0.2	24.9	26	0.3	4.7	26	0.5	28.60
SP-06 7-2A	2006	48.50501	-92.89789	low/medium	527	0.90	3.3	16.8	1,100	33.0	45.2	0.75	5.0	1.3	108	<0.1	3.4	0.4	6.1	36	0.5	6.2	61	0.8	24.20
SP-06 7-3A	2006	48.50480	-92.89560	high	1350	0.48	3.7	17.3	1,560	51.3	80.3	0.56	5.6	1.5	240	<0.1	3.4	0.5	1.0	40	0.4	6.8	79	0.6	8.05
SP-06 8-1A	2006	48.50166	-92.87214	unburned	2770	0.65	3.9	13.3	470	27.7	61.1	0.36	5.0	1.1	226	<0.1	3.6	0.4	1.0	37	0.4	5.8	51	0.3	5.52
SP-06 8-2A	2006	48.50170	-92.87230	low/medium	227	1.05	5.0	21.1	1,420	39.8	53.5	0.51	6.8	1.5	125	<0.1	4.1	0.4	10.5	53	0.5	7.2	49	0.6	16.90
SP-06 8-2A dup	2006	48.50170	-92.87230	low/medium	219	1.03	5.0	19.5	1,420	38.4	53.1	0.53	6.1	1.5	120	<0.1	4.2	0.4	10.8	51	0.5	7.1	49	0.7	17.00
SP-06 8-3A	2006	48.50180	-92.87250	high	531	0.73	5.4	13.4	810	28.4	64.2	0.43	5.6	1.8	214	<0.1	3.9	0.4	1.8	47	0.5	6.6	53	0.3	5.85
SP-06 9-1A	2006	48.50080	-92.87210	unburned	1980	0.69	2.8	9.5	880	43.8	56.0	0.46	3.9	1.3	195	<0.1	2.7	0.3	0.8	26	0.3	4.5	99	0.4	18.10
SP-06 9-2A	2006	48.50097	-92.87247	low/medium	3230	0.75	3.2	14.6	960	40.9	54.7	0.58	4.5	1.2	172	<0.1	2.9	0.4	0.9	33	0.4	5.2	83	0.7	20.60
SP-06 9-3A	2006	48.50130	-92.87270	high	1660	0.63	4.6	14.0	760	44.9	63.5	0.44	5.3	1.5	209	<0.1	3.5	0.4	1.1	41	0.4	6.4	113	0.4	10.10
SP-06 10-1A	2006	48.50210	-92.88490	unburned	3860	0.86	4.3	16.6	1,110	42.0	64.6	0.50	5.9	1.2	203	<0.1	4.1	0.4	1.1	46	0.5	6.7	150	0.5	11.80
SP-06 10-2A	2006	48.50192	-92.88459	low/medium	2460	0.96	4.2	15.1	590	44.4	73.7	0.52	5.5	1.3	206	<0.1	3.8	0.5	1.2	43	0.5	6.5	67	0.5	11.40
SP-06 10-3A	2006	48.50180	-92.88450	high	639	0.47	3.6	9.7	380	42.8	61.8	0.42	4.4	1.3	207	<0.1	3.1	0.5	1.1	31	0.5	5.9	58	0.4	9.33

Field no.	Year collected	Latitude	Longitude	Fire severity	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs* (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)	Li (ppm)
SP-04-1-1B	2004	48.49490	-92.88660	unburned	6.13	1.20	1.84	1.54	0.47	2.10	0.01	0.19	<1	2	425	1.4	0.15	<0.1	15.6	8.7	47	2.24	6.9	13.4	0.02	0.02	8.3	23
SP-04-1-2B	2004	48.49495	-92.88618	low/medium	6.33	1.24	1.69	1.57	0.42	2.17	0.01	0.17	<1	2	421	1.3	0.17	<0.1	16.1	6.1	42	2.30	7.7	13.1	0.02	<0.02	8.4	20
SP-04-1-3B	2004	48.49508	-92.88588	high	6.27	1.23	1.85	1.49	0.42	2.01	0.02	0.21	<1	4	421	1.4	0.26	0.1	17.2	6.4	47	3.21	34.8	14.1	0.03	0.03	9.2	19
SP-04-2-1B	2004	48.49599	-92.88988	unburned	6.22	1.31	1.68	1.80	0.56	2.02	0.02	0.22	<1	3	525	1.2	0.13	<0.1	20.3	7.8	48	2.14	8.9	13.4	0.05	0.03	10.6	13
SP-04-2-2B	2004	48.49617	-92.88976	low/medium	6.00	1.27	1.64	1.62	0.41	2.01	0.02	0.20	<1	2	450	1.1	0.14	<0.1	17.5	5.0	38	1.58	6.2	13.5	0.03	0.02	9.5	16
SP-04-2-3B	2004	48.49626	-92.88962	high	6.17	1.22	1.47	1.69	0.35	2.22	0.01	0.18	<1	2	415	1.3	0.41	<0.1	15.8	4.2	33	1.61	5.7	13.7	<0.02	<0.02	8.4	14
SP-04-3-1B	2004	48.49990	-92.88320	high	6.30	1.27	1.50	1.65	0.40	2.26	0.01	0.16	<1	2	417	1.3	0.19	<0.1	15.4	5.0	35	1.52	5.8	12.3	0.02	<0.02	8.2	16
SP-04-3-2B	2004	48.49950	-92.88380	low/medium	6.15	0.99	2.26	1.41	0.42	1.60	0.02	0.27	<1	4	434	1.0	0.26	<0.1	26.3	6.4	49	1.44	17.3	15.0	0.03	0.03	14.4	18
SP-04-3-3B	2004	48.49950	-92.88430	low/ub	5.39	1.04	1.36	1.45	0.27	1.81	0.01	0.20	<1	3	386	1.0	0.17	<0.1	15.8	3.5	31	0.67	8.5	13.2	0.03	<0.02	8.6	10
SP-04-4-1B	2004	48.49866	-92.89069	unburned	5.69	0.83	1.96	1.49	0.45	1.36	0.02	0.25	<1	3	458	1.0	0.21	0.1	22.1	6.8	46	1.04	13.6	14.5	0.05	0.03	12.7	18
SP-04-4-1B dup	2004	48.49866	-92.89069	unburned	5.61	0.85	1.89	1.43	0.45	1.35	0.03	0.24	<1	3	452	1.0	0.23	0.1	22.4	6.3	44	2.39	15.5	14.2	0.04	0.03	12.5	17
SP-04-4-3B	2004	48.49830	-92.89090	high	6.19	1.18	1.65	1.71	0.41	2.02	0.02	0.18	<1	3	423	1.1	0.14	<0.1	15.7	5.4	37	2.79	7.8	13.2	0.03	0.02	8.3	16
SP-04-5-1B	2004	48.50055	-92.88857	unburned	6.17	1.28	1.42	1.83	0.38	2.24	0.01	0.16	<1	2	474	1.2	0.11	<0.1	13.6	4.4	29	3.24	5.4	12.8	0.03	<0.02	7.0	14
SP-04-5-2B	2004	48.50060	-92.88860	low/medium	6.10	1.28	1.32	1.73	0.32	2.30	0.01	0.15	<1	1	405	1.4	0.09	<0.1	14.1	4.0	26	2.05	5.3	12.0	<0.02	<0.02	7.4	11
SP-04-5-3B	2004	48.50060	-92.88840	high	6.04	1.31	1.33	1.58	0.35	2.22	0.02	0.17	<1	2	400	1.3	0.09	<0.1	13.7	4.2	31	3.74	4.6	12.5	<0.02	<0.02	7.3	12
SP-04-6-1B	2004	48.50142	-92.88990	unburned	6.18	0.97	2.62	1.26	0.46	1.41	0.03	0.24	<1	4	424	1.7	0.47	<0.1	21.8	6.8	54	5.67	24.2	14.6	0.07	0.03	11.8	28
SP-04-6-2B	2004	48.50170	-92.89010	low/medium	5.96	0.92	2.38	1.46	0.37	1.58	0.03	0.23	<1	4	420	1.1	0.35	<0.1	17.7	5.5	42	2.44	10.5	16.2	0.05	0.03	9.8	23
SP-04-6-3B	2004	48.50180	-92.89100	high	5.61	1.13	1.10	1.51	0.24	1.98	0.01	0.18	<1	2	418	1.2	0.13	<0.1	12.7	2.6	26	1.34	5.9	12.6	0.02	<0.02	6.8	8
SP-04-6-3B dup	2004	48.50180	-92.89100	high	5.51	1.11	1.09	1.48	0.25	1.96	0.01	0.18	<1	2	400	1.1	0.15	<0.1	15.2	2.8	26	1.72	6.0	12.5	0.02	<0.02	8.1	8
SP-04-7-1B	2004	48.50540	-92.89810	unburned	6.17	0.97	1.68	1.68	0.42	1.77	0.02	0.23	<1	3	445	1.2	0.23	<0.1	19.8	4.9	44	2.46	13.7	15.4	0.03	0.02	10.8	15
SP-04-7-2B	2004	48.50501	-92.89789	low/medium	6.85	0.75	3.83	1.14	0.48	1.26	0.04	0.24	<1	5	438	2.2	0.39	<0.1	24.2	28.5	67	6.62	31.3	14.8	0.08	0.04	13.4	55
SP-04-7-3B	2004	48.50480	-92.89560	high	6.15	1.27	1.23	1.72	0.31	2.38	0.01	0.13	<1	2	407	1.4	0.15	0.1	12.4	4.1	28	1.60	5.0	12.1	0.02	<0.02	6.4	11
SP-04-8-1B	2004	48.50166	-92.87214	unburned	5.93	1.16	1.83	1.33	0.45	1.83	0.02	0.20	<1	3	476	1.3	0.26	0.2	16.9	7.2	46	1.85	11.3	13.1	0.05	0.03	8.7	18
SP-04-8-2B	2004	48.50170	-92.87230	low/medium	6.60	0.91	2.44	1.68	0.63	1.45	0.02	0.29	<1	4	551	1.2	0.22	<0.1	28.8	9.0	62	3.07	17.0	16.4	0.03	0.04	15.0	24
SP-04-8-2B dup	2004	48.50170	-92.87230	low/medium	6.74	0.94	2.45	1.73	0.63	1.50	0.02	0.29	<1	4	565	1.0	0.22	<0.1	27.6	9.5	69	3.68	18.1	16.1	0.03	0.03	14.3	25
SP-04-8-3B	2004	48.50180	-92.87250	high	6.69	1.06	2.41	1.35	0.51	1.78	0.03	0.22	<1	4	396	1.5	0.23	<0.1	17.5	8.5	66	2.90	15.4	14.9	0.07	0.03	9.8	27
SP-04-9-1B	2004	48.50080	-92.87210	unburned	5.79	1.15	1.11	1.69	0.31	2.03	0.01	0.18	<1	2	472	1.1	0.13	<0.1	16.7	4.1	28	1.59	3.9	11.8	0.02	0.02	9.7	11
SP-04-9-2B	2004	48.50097	-92.87247	low/medium	6.09	1.12	1.68	1.83	0.49	1.80	0.02	0.26	<1	3	550	1.2	0.17	<0.1	25.1	7.4	47	2.00	6.8	13.8	0.03	0.03	13.9	16
SP-04-9-3B	2004	48.50130	-92.87270	high	6.87	1.21	2.57	1.28	0.63	1.95	0.02	0.22	<1	4	369	1.4	0.28	<0.1	17.3	8.1	63	2.76	13.1	14.7	0.04	0.03	9.8	31
SP-04-10-1B	2004	48.50210	-92.88490	unburned	6.42	1.30	2.37	1.41	0.51	1.85	0.02	0.24	<1	3	686	1.3	0.21	0.3	21.3	9.7	53	3.71	12.6	15.1	0.06	0.03	11.0	24
SP-04-10-2B	2004	48.50192	-92.88459	low/medium	6.50	1.26	1.85	1.62	0.47	2.17	0.02	0.21	<1	2	458	1.2	0.17	<0.1	15.8	6.0	43	2.52	6.6	14.0	0.03	0.02	8.4	20
SP-04-10-3B	2004	48.50180	-92.88450	high	5.70	1.19	1.25	1.60	0.34	2.04	0.01	0.19	1	2	448	1.2	0.11	<0.1	15.8	3.9	31	1.72	8.2	12.5	0.02	<0.02	8.5	11
SP-05-1-1B	2005	48.49490	-92.88660	unburned	5.06	1.05	0.71	1.51	0.21	2.03	<0.01	0.11	<1	1	417	1.4	0.06	0.2	14.7	2.0	10	0.81	1.6	11.5	<0.02	<0.02	8.0	5
SP-05-1-2B	2005	48.49495	-92.88618	low/medium	5.36	1.12	1.14	1.55	0.32	2.03	0.01	0.12	<1	2	417	1.5	0.13	<0.1	14.4	3.3	20	1.82	3.0	13.5	<0.02	<0.02	7.6	10
SP-05-1-3B	2005	48.49508	-92.88588	high	5.43	1.09	1.49	1.44	0.38	1.85	0.01	0.16	<1	2	451	1.3	0.14	<0.1	18.1	4.6	30	1.99	4.5	14.5	0.03	0.02	10.2	12
SP-05-2-1B	2005	48.49599	-92.88988	unburned	5.68	1.14	1.87	1.67	0.59	1.86	0.01	0.18	<1	2	523	1.3	0.12	<0.1	23.0	7.6	34	1.26	4.9	14.8	0.03	0.03	11.9	13
SP-05-2-2B	2005	48.49617	-92.88976	low/medium	5.37	1.20	1.05	1.53	0.31	2.07	0.01	0.14	<1	1	432	1.3	0.10	<0.1	25.3	2.9	16	0.78	3.8	13.3	0.03	<0.02	13.0	7
SP-05-2-3B	2005	48.49626	-92.88962	high	5.80	1.18	1.73	1.54	0.41	2.11	0.01	0.15	<1	2	396	1.3	0.15	<0.1	16.0	4.6	28	1.30	3.6	14.8	<0.02	<0.02	8.6	16
SP-05-2-3B dup	2005	48.49626	-92.88962	high	6.37	1.30	1.79	1.63	0.43	2.29	0.01	0.16	<1	2	409	1.4	0.17	<0.1	15.0	4.2	24	2.95	3.5	15.8	<0.02	<0.02	8.1	18
SP-05-3-1B	2005	48.49990	-92.88320	high	5.53	1.20	1.22	1.55	0.36	2.12	0.01	0.13	<1	1	412	1.4	0.12	<0.1	15.4	4.3	25	0.72	3.0	12.6	0.02	<0.02	7.8	10
SP-05-3-2B	2005	48.49950	-92.88380	low/medium	5.55	0.88	2.23	1.16	0.39	1.48	0.02	0.20	<1	3	399	1.3	0.15	0.1	21.3	4.6	28	1.93	11.5	14.6	0.05	0.02	11.7	18
SP-05-3-3B	2005	48.49950	-92.88430	unburned	5.24	0.97	1.67	1.45	0.36	1.65	0.02	0.20	<1	2	430	1.2	0.20	0.1	19.3	4.0	18	1.24	8.1	14.9	0.03	0.02	10.4	12
SP-05-4-1B	2005	48.49866	-92.89069	unburned	4.96	0.72	1.82	1.21	0.36	1.19	0.02	0.19	<1	3	417	1.1	0.21	0.1	25.5	4.8	13	1.60	12.9	14.8	0.05	0.03	13.9	14

Field no.	Year collected	Latitude	Longitude	Fire severity	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs* (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)	Li (ppm)
SP-05-4-1B dup	2005	48.49866	-92.89069	unburned	5.33	0.77	1.86	1.27	0.37	1.26	0.02	0.21	<1	3	433	1.2	0.22	0.1	24.7	5.0	22	1.67	15.7	15.3	0.04	0.03	13.5	15
SP-05-4-2B	2005	48.49850	-92.89060	low/medium	5.52	0.76	2.58	1.23	0.44	1.23	0.02	0.21	<1	4	378	1.4	0.66	0.1	23.6	3.8	17	3.05	14.5	18.1	0.05	0.03	12.8	23
SP-05-4-3B	2005	48.49830	-92.89090	high	5.47	1.10	1.43	1.55	0.37	1.93	0.01	0.14	<1	2	438	1.3	0.12	<0.1	14.7	4.4	19	1.13	4.6	13.5	<0.02	<0.02	7.9	11
SP-05-5-1B	2005	48.50055	-92.88857	unburned	3.71	0.75	0.89	0.89	0.23	1.22	<0.01	0.07	<1	2	284	0.7	0.10	0.1	9.2	2.6	6	0.32	3.0	8.4	0.03	<0.02	4.9	7
SP-05-5-2B	2005	48.50060	-92.88860	low/medium	5.54	1.16	1.28	1.58	0.35	2.16	<0.01	0.11	<1	1	406	1.3	0.12	<0.1	12.1	4.4	17	0.78	3.3	12.4	<0.02	<0.02	6.3	10
SP-05-5-3B	2005	48.50060	-92.88840	high	5.26	1.26	0.94	1.44	0.29	2.12	<0.01	0.11	<1	<1	411	1.3	0.08	<0.1	12.7	2.6	8	0.27	1.8	12.2	<0.02	<0.02	6.6	6
SP-05-6-1B	2005	48.50142	-92.88990	unburned	5.51	0.89	2.31	1.25	0.45	1.41	0.02	0.19	<1	3	435	1.5	0.35	0.1	20.8	5.6	29	3.34	12.7	15.3	0.07	0.03	11.0	22
SP-05-6-2B	2005	48.50170	-92.89010	low/medium	4.92	0.93	1.62	1.29	0.32	1.36	0.02	0.19	<1	3	423	1.1	0.32	0.1	20.6	3.3	15	1.14	7.8	14.5	0.05	0.03	11.0	12
SP-05-6-3B	2005	48.50180	-92.89100	high	5.54	1.10	1.32	1.52	0.30	2.02	<0.01	0.15	<1	2	402	1.2	0.13	<0.1	14.0	3.4	7	1.50	3.3	14.1	<0.02	<0.02	8.1	8
SP-05-7-1B	2005	48.50540	-92.89810	unburned	5.53	0.98	1.39	1.59	0.41	1.77	0.01	0.17	<1	2	409	1.1	0.19	<0.1	16.0	4.5	8	2.09	4.2	14.8	0.03	0.02	9.0	10
SP-05-7-2B	2005	48.50501	-92.89789	low/medium	6.83	0.69	4.17	1.07	0.47	1.14	0.04	0.20	<1	5	435	2.5	0.38	0.1	28.1	25.9	53	5.89	34.1	15.2	0.09	0.04	15.2	46
SP-05-7-3B	2005	48.50480	-92.89560	high	6.04	1.29	1.45	1.56	0.44	2.42	<0.01	0.12	<1	2	407	1.5	0.13	<0.1	14.2	7.0	30	1.19	5.2	13.4	<0.02	<0.02	7.5	14
SP-05-8-1B	2005	48.50166	-92.87214	unburned	6.06	1.08	2.26	1.39	0.57	1.86	0.02	0.18	<1	3	431	1.4	0.21	0.1	15.8	6.0	36	1.11	5.6	14.3	0.04	0.03	8.5	22
SP-05-8-2B	2005	48.50170	-92.87230	low/medium	6.54	0.77	2.73	1.46	0.69	1.22	0.02	0.26	<1	4	550	1.3	0.27	<0.1	27.6	8.4	57	2.88	20.9	18.8	0.03	0.04	15.4	28
SP-05-8-3B	2005	48.50180	-92.87250	high	6.26	1.04	2.53	1.22	0.57	1.67	0.02	0.20	<1	4	386	1.5	0.23	0.1	17.3	6.1	50	2.11	11.8	15.8	0.07	0.03	9.7	24
SP-05-9-1B	2005	48.50080	-92.87210	unburned	5.51	1.07	1.11	1.62	0.32	2.07	<0.01	0.12	<1	2	440	1.3	0.15	<0.1	13.3	4.5	13	1.90	2.7	13.6	<0.02	<0.02	7.2	9
SP-05-9-1B dup	2005	48.50080	-92.87210	unburned	5.42	1.05	1.05	1.59	0.31	2.04	<0.01	0.12	<1	2	431	1.3	0.12	<0.1	15.2	4.1	14	1.68	3.2	12.9	<0.02	<0.02	7.9	9
SP-05-9-2B	2005	48.50097	-92.87247	low/medium	6.06	1.16	1.70	1.87	0.53	1.83	0.01	0.21	<1	2	565	1.2	0.18	<0.1	20.3	5.5	28	2.00	5.0	15.1	0.02	0.03	10.9	13
SP-05-9-3B	2005	48.50130	-92.87270	high	5.66	1.11	1.27	1.44	0.34	1.88	<0.01	0.17	<1	2	454	1.3	0.22	0.1	16.6	3.3	21	1.96	4.4	14.1	0.02	0.02	9.0	11
SP-05-10-1B	2005	48.50210	-92.88490	unburned	6.37	1.28	2.61	1.39	0.66	1.94	0.01	0.21	<1	3	565	1.4	0.21	0.2	21.1	8.1	43	3.39	8.4	16.9	0.04	0.03	10.9	25
SP-05-10-2B	2005	48.50192	-92.88459	low/medium	5.99	1.17	1.55	1.61	0.46	2.17	<0.01	0.15	<1	2	452	1.4	0.14	<0.1	14.2	4.7	25	2.47	4.0	14.1	0.02	0.02	8.2	14
SP-05-10-3B	2005	48.50180	-92.88450	high	5.65	1.16	0.92	1.64	0.27	2.22	<0.01	0.14	<1	<1	451	1.3	0.11	<0.1	14.0	1.9	9	2.07	2.0	13.0	<0.02	<0.02	7.7	7
SP-06 1-1B	2006	48.49490	-92.88660	unburned	6.02	1.22	1.09	1.72	0.28	2.18	<0.01	0.16	<1	1	413	1.3	0.02	<0.1	17.2	4.6	21	<5	11.5	13.1	<0.02	<0.02	9.0	11
SP-06 1-2B	2006	48.49495	-92.88618	low/medium	6.36	1.27	1.53	1.73	0.44	2.22	0.01	0.15	<1	3	390	1.4	0.09	<0.1	16.5	6.8	32	<5	7.6	13.3	<0.02	<0.02	8.3	16
SP-06 1-3B	2006	48.49508	-92.88588	high	6.43	1.15	2.04	1.60	0.48	1.96	0.01	0.20	<1	3	388	1.3	0.11	<0.1	21.3	7.5	46	<5	7.6	14.5	0.02	0.02	11.3	19
SP-06 2-1B	2006	48.49599	-92.88988	unburned	6.61	1.27	2.08	1.97	0.64	1.91	0.01	0.26	<1	2	537	1.4	0.05	<0.1	25.2	12.2	38	<5	14.3	13.7	0.03	0.03	13.3	21
SP-06 2-2B	2006	48.49617	-92.88976	low/medium	6.35	1.31	1.68	1.82	0.45	2.16	0.01	0.20	<1	2	452	1.5	0.04	<0.1	15.7	6.7	30	<5	5.0	14.4	<0.02	0.02	8.6	18
SP-06 2-3B	2006	48.49626	-92.88962	high	6.79	1.31	2.20	1.69	0.54	2.21	0.01	0.19	<1	4	388	1.5	0.06	<0.1	15.1	9.7	39	<5	5.9	14.0	0.02	0.02	8.2	25
SP-06 3-1B	2006	48.49990	-92.88320	high	6.67	1.41	1.56	1.84	0.47	2.41	<0.01	0.17	<1	2	401	1.4	0.02	<0.1	17.2	8.1	27	<5	5.1	13.4	<0.02	<0.02	9.0	16
SP-06 3-2B	2006	48.49950	-92.88380	low/medium	6.02	0.99	2.18	1.29	0.39	1.66	0.01	0.26	<1	4	382	1.1	0.22	0.1	21.5	7.1	33	<5	12.4	15.4	0.03	0.02	12.2	19
SP-06 3-3B	2006	48.49950	-92.88430	unburned	6.16	1.07	2.40	1.53	0.43	1.80	0.01	0.25	<1	3	396	1.1	0.96	<0.1	19.2	7.0	36	<5	10.0	15.7	<0.02	0.02	11.1	21
SP-06 4-1B	2006	48.49866	-92.89069	unburned	6.10	1.08	2.09	1.66	0.51	1.82	0.02	0.23	<1	3	459	1.3	0.10	<0.1	23.5	25.4	36	<5	12.2	14.0	0.03	0.02	12.9	20
SP-06 4-1B dup	2006	48.49866	-92.89069	unburned	6.12	1.06	1.97	1.72	0.50	1.88	0.01	0.18	<1	4	448	1.4	0.07	<0.1	20.0	23.0	50	<5	7.8	14.0	0.03	0.02	10.9	19
SP-06 4-2B	2006	48.49850	-92.89060	low/medium	5.59	0.91	1.24	1.27	0.30	1.55	0.03	0.20	<1	4	274	1.7	0.35	0.2	22.8	3.4	35	6	12.0	15.3	0.05	0.03	13.5	12
SP-06 4-3B	2006	48.49830	-92.89090	high	6.27	1.19	1.56	1.84	0.39	2.08	<0.01	0.17	<1	1	416	1.4	0.02	<0.1	15.4	5.8	33	<5	4.6	13.1	<0.02	<0.02	8.5	16
SP-06 5-1B	2006	48.50055	-92.88857	unburned	5.63	1.24	1.26	1.70	0.34	2.06	0.01	0.14	<1	2	417	1.1	0.02	0.1	12.9	4.4	38	<5	3.7	11.9	0.03	<0.02	6.8	11
SP-06 5-2B	2006	48.50060	-92.88860	low/medium	6.01	1.21	1.25	1.87	0.31	2.21	<0.01	0.14	<1	<1	407	1.2	0.02	<0.1	11.0	3.9	29	<5	3.1	12.2	<0.02	<0.02	6.0	11
SP-06 5-3B	2006	48.50060	-92.88840	high	5.98	1.35	1.27	1.64	0.37	2.21	<0.01	0.16	<1	<1	391	1.2	0.02	<0.1	13.1	5.9	38	<5	2.7	13.0	<0.02	<0.02	7.2	11
SP-06 6-1B	2006	48.50142	-92.88990	unburned	6.23	1.19	1.83	1.60	0.45	2.13	0.01	0.18	<1	2	389	1.4	0.08	<0.1	14.3	9.7	41	<5	7.6	14.1	0.02	0.02	7.9	19
SP-06 6-2B	2006	48.50170	-92.89010	low/medium	6.21	1.10	2.04	1.60	0.42	1.84	0.02	0.21	<1	4	389	1.6	0.16	<0.1	18.8	10.7	48	<5	9.9	15.0	0.04	0.02	10.2	21
SP-06 6-2B dup	2006	48.50170	-92.89010	low/medium	5.86	1.02	2.00	1.54	0.40	1.73	0.02	0.20	<1	4	387	1.1	0.20	<0.1	16.2	5.9	43	<5	8.6	13.8	0.04	0.02	8.8	19
SP-06 6-3B	2006	48.50180	-92.89100	high	5.80	1.15	1.53	1.67	0.30	2.09	0.02	0.19	<1	3	391	0.9	0.21	<0.1	16.6	4.6	38	<5	6.6	14.6	0.02	0.02	8.7	12
SP-06 7-1B	2006	48.50540	-92.89810	unburned	6.23	0.95	1.99	1.77	0.49	1.68	0.02	0.23	<1	3	434	1.1	0.15	<0.1	18.5	9.2	35	<5	7.9	15.3	0.03	0.03	10.2	19

Field no.	Year collected	Latitude	Longitude	Fire severity	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs* (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)	Li (ppm)
SP-06 7-2B	2006	48.50501	-92.89789	low/medium	6.70	0.90	3.27	1.28	0.56	1.52	0.02	0.22	<1	4	380	1.9	0.25	<0.1	22.3	19.3	61	6	18.6	15.0	0.05	0.04	12.3	45
SP-06 7-3B	2006	48.50480	-92.89560	high	6.30	1.31	1.22	1.85	0.34	2.35	<0.01	0.14	<1	2	407	1.6	0.05	<0.1	13.6	7.1	32	<5	5.3	12.7	<0.02	<0.02	7.4	13
SP-06 8-1B	2006	48.50166	-92.87214	unburned	6.37	1.11	1.94	1.60	0.44	1.93	0.01	0.21	<1	3	436	1.3	0.12	0.2	17.5	7.1	47	<5	5.7	13.8	0.03	0.03	9.7	20
SP-06 8-2B	2006	48.50170	-92.87230	low/medium	6.02	0.95	2.24	1.77	0.60	1.43	0.01	0.28	<1	3	522	1.1	0.12	<0.1	27.2	9.4	58	<5	10.8	13.7	<0.02	0.03	15.1	23
SP-06 8-3B	2006	48.50180	-92.87250	high	6.24	0.96	2.30	1.50	0.47	1.60	0.02	0.22	<1	4	415	1.3	0.25	<0.1	25.5	5.1	46	<5	10.7	17.0	0.03	0.03	13.7	21
SP-06 8-3B dup	2006	48.50180	-92.87250	high	6.16	0.94	2.37	1.37	0.48	1.54	0.02	0.25	<1	3	410	1.2	0.22	0.1	24.6	5.0	46	<5	8.1	15.7	0.03	0.03	13.6	22
SP-06 9-1B	2006	48.50080	-92.87210	unburned	5.65	1.13	1.01	1.80	0.31	1.99	<0.01	0.17	<1	2	469	1.3	0.02	<0.1	18.7	3.6	29	<5	2.5	12.5	<0.02	<0.02	10.2	9
SP-06 9-2B	2006	48.50097	-92.87247	low/medium	6.48	1.20	1.80	1.93	0.55	1.95	0.01	0.21	<1	3	523	1.5	0.07	<0.1	20.0	7.6	54	<5	9.8	14.8	<0.02	0.03	11.1	15
SP-06 9-3B	2006	48.50130	-92.87270	high	6.02	1.05	1.84	1.50	0.41	1.76	0.01	0.21	<1	3	400	1.6	0.21	<0.1	19.6	4.7	38	<5	5.6	15.6	0.02	0.02	10.7	19
SP-06 10-1B	2006	48.50210	-92.88490	unburned	6.46	1.21	2.57	1.58	0.62	1.79	0.01	0.23	<1	3	488	1.4	0.12	0.1	17.5	8.6	58	<5	8.4	15.2	0.03	0.03	9.9	27
SP-06 10-2B	2006	48.50192	-92.88459	low/medium	6.28	1.23	1.75	1.74	0.48	2.01	0.01	0.19	<1	5	487	1.1	0.08	0.1	18.2	8.2	44	<5	4.8	13.6	0.04	0.03	9.6	20
SP-06 10-3B	2006	48.50180	-92.88450	high	5.77	1.22	1.27	1.78	0.37	2.16	<0.01	0.18	<1	3	439	1.4	0.02	<0.1	14.9	4.0	36	<5	2.7	13.7	<0.02	<0.02	8.2	12

*Because of analytical laboratory issues, Cs detection limits in 2004 and 2005 were 0.05 ppm and 5 ppm in 2006.

Field no.	Year collected	Latitude	Longitude	Fire severity	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)	Total C (wt. %)
SP-04-1-1B	2004	48.49490	-92.88660	unburned	312	0.55	5.5	23.1	410	17.0	78.4	0.17	5.9	1.0	254	<0.1	3.7	0.4	1.1	51	0.4	5.7	42	<0.2	1.32
SP-04-1-2B	2004	48.49495	-92.88618	low/medium	288	0.33	4.5	22.1	790	18.2	78.2	0.18	5.6	0.8	269	<0.1	3.5	0.4	1.0	42	0.4	5.4	46	<0.2	1.73
SP-04-1-3B	2004	48.49508	-92.88588	high	314	0.78	5.4	35.3	230	23.2	75.0	0.26	5.9	1.3	265	<0.1	3.4	0.4	1.0	55	0.5	5.7	46	<0.2	2.05
SP-04-2-1B	2004	48.49599	-92.88988	unburned	653	0.39	6.5	18.9	310	17.8	85.6	0.23	7.4	1.2	275	<0.1	4.8	0.4	1.3	51	0.5	6.9	39	<0.2	2.72
SP-04-2-2B	2004	48.49617	-92.88976	low/medium	293	0.34	5.1	14.7	510	17.9	86.1	0.19	6.1	0.8	266	<0.1	4.4	0.4	1.1	45	0.4	5.7	37	<0.2	2.49
SP-04-2-3B	2004	48.49626	-92.88962	high	265	0.32	4.4	13.1	230	16.0	77.1	0.16	5.6	0.8	263	<0.1	3.5	0.4	1.0	41	0.4	6.1	24	<0.2	1.26
SP-04-3-1B	2004	48.49990	-92.88320	high	285	0.28	4.0	15.0	290	16.1	83.4	0.14	5.2	0.7	270	<0.1	3.4	0.3	0.9	41	0.3	5.1	31	<0.2	1.50
SP-04-3-2B	2004	48.49950	-92.88380	low/medium	240	1.14	6.9	21.0	180	20.8	61.6	0.34	6.5	1.5	213	<0.1	5.8	0.3	4.5	76	0.6	7.4	47	0.4	2.60
SP-04-3-3B	2004	48.49950	-92.88430	low/ub	219	0.75	5.4	12.0	130	16.8	65.6	0.23	5.0	1.2	230	<0.1	3.3	0.3	1.7	49	0.6	5.0	24	<0.2	2.10
SP-04-4-1B	2004	48.49866	-92.89069	unburned	253	0.98	6.9	21.2	400	20.1	70.4	0.32	6.5	2.1	189	<0.1	4.2	0.3	1.3	66	0.6	5.8	51	<0.2	4.75
SP-04-4-1B dup	2004	48.49866	-92.89069	unburned	251	0.95	7.0	23.4	400	21.2	68.2	0.31	6.3	1.4	187	<0.1	4.3	0.3	1.3	65	0.6	6.0	65	0.3	4.93
SP-04-4-3B	2004	48.49830	-92.89090	high	245	0.45	5.0	17.7	180	17.0	82.8	0.18	5.6	0.9	252	<0.1	4.5	0.3	1.0	46	0.4	5.0	33	<0.2	1.60
SP-04-5-1B	2004	48.50055	-92.88857	unburned	255	0.33	3.8	13.8	180	18.0	100.0	0.15	5.3	0.8	299	<0.1	5.9	0.4	1.2	38	0.3	5.4	28	<0.2	1.73
SP-04-5-2B	2004	48.50060	-92.88860	low/medium	288	0.25	3.6	11.4	110	14.4	86.9	0.12	5.4	0.6	277	<0.1	3.7	0.3	0.8	35	0.2	5.4	21	<0.2	0.87
SP-04-5-3B	2004	48.50060	-92.88840	high	289	0.35	4.1	13.1	90	15.4	75.2	0.17	5.5	0.7	287	<0.1	3.9	0.3	1.0	41	0.3	5.6	25	<0.2	1.32
SP-04-6-1B	2004	48.50142	-92.88990	unburned	739	0.59	7.0	21.7	1,830	19.8	74.0	1.56	6.9	66.1	187	<0.1	5.1	0.3	2.3	66	0.7	6.0	82	0.4	5.75
SP-04-6-2B	2004	48.50170	-92.89010	low/medium	254	1.12	7.2	16.7	510	20.7	72.2	0.28	5.8	1.4	208	<0.1	4.4	0.4	2.0	69	0.7	6.2	38	0.4	3.24
SP-04-6-3B	2004	48.50180	-92.89100	high	229	0.39	4.4	9.0	260	16.0	70.3	0.17	4.5	0.8	251	<0.1	3.4	0.3	0.9	37	0.4	4.8	22	<0.2	1.60
SP-04-6-3B dup	2004	48.50180	-92.89100	high	245	0.42	4.5	8.6	270	16.7	70.0	0.18	4.6	1.0	247	<0.1	3.1	0.4	1.1	36	0.4	5.0	23	<0.2	1.80
SP-04-7-1B	2004	48.50540	-92.89810	unburned	210	0.78	6.8	18.4	210	17.9	76.7	0.22	6.3	1.5	219	<0.1	3.9	0.5	9.2	57	0.6	5.5	28	0.3	2.00
SP-04-7-2B	2004	48.50501	-92.89789	low/medium	494	1.25	7.5	32.7	950	19.7	77.9	0.34	7.0	1.5	159	<0.1	6.0	0.4	8.2	81	0.9	6.7	93	0.6	4.79
SP-04-7-3B	2004	48.50480	-92.89560	high	257	0.26	3.3	13.0	210	16.0	83.5	0.18	4.9	0.8	273	<0.1	3.3	0.3	0.8	32	0.3	5.1	29	<0.2	1.29
SP-04-8-1B	2004	48.50166	-92.87214	unburned	1,340	0.61	5.0	19.4	500	22.0	65.3	0.31	6.1	1.1	255	<0.1	3.8	0.3	1.0	51	0.4	6.0	64	0.2	3.28
SP-04-8-2B	2004	48.50170	-92.87230	low/medium	356	0.71	8.0	25.3	480	19.4	87.2	0.29	8.6	1.6	207	<0.1	6.7	0.5	3.9	85	0.7	6.5	50	0.3	2.34
SP-04-8-2B dup	2004	48.50170	-92.87230	low/medium	356	0.87	7.8	29.2	500	19.8	84.9	0.30	8.5	1.5	211	<0.1	5.0	0.6	3.8	85	0.8	6.2	53	0.3	2.37
SP-04-8-3B	2004	48.50180	-92.87250	high	257	1.23	6.1	28.7	500	18.1	64.5	0.30	7.1	1.0	235	<0.1	5.1	0.4	2.7	69	0.6	5.5	44	0.7	3.54
SP-04-9-1B	2004	48.50080	-92.87210	unburned	330	0.32	4.6	11.3	300	18.6	82.7	0.18	5.2	0.8	258	<0.1	3.4	0.3	0.9	35	0.4	5.3	30	<0.2	1.57
SP-04-9-2B	2004	48.50097	-92.87247	low/medium	424	0.47	6.6	19.2	430	18.2	94.8	0.23	7.3	1.1	252	<0.1	5.0	0.4	1.2	58	0.6	6.3	37	<0.2	1.94
SP-04-9-3B	2004	48.50130	-92.87270	high	336	0.71	5.6	28.6	960	20.1	66.3	0.25	7.1	0.9	254	<0.1	3.9	0.3	1.2	70	0.6	5.6	53	0.3	2.98
SP-04-10-1B	2004	48.50210	-92.88490	unburned	3,400	0.87	6.0	23.8	1,110	20.1	87.7	0.27	6.7	1.1	253	<0.1	4.5	0.5	1.3	61	0.6	6.7	141	0.3	2.82
SP-04-10-2B	2004	48.50192	-92.88459	low/medium	336	0.61	5.3	16.9	270	18.2	77.3	0.20	6.2	0.8	268	<0.1	3.0	0.4	1.0	53	0.4	5.6	49	0.2	1.73
SP-04-10-3B	2004	48.50180	-92.88450	high	241	0.57	4.8	12.4	130	17.3	75.2	0.23	5.2	1.0	256	<0.1	3.1	0.3	0.9	43	0.5	5.6	29	0.2	1.78
SP-05-1-1B	2005	48.49490	-92.88660	unburned	194	0.18	4.6	6.0	150	14.5	67.8	0.13	3.5	1.5	236	<0.1	3.3	0.3	1.1	24	0.3	5.5	13	0.2	1.49
SP-05-1-2B	2005	48.49495	-92.88618	low/medium	212	0.20	3.6	9.1	480	16.3	75.0	0.15	4.4	3.4	237	<0.1	2.7	0.3	0.9	32	0.3	4.7	25	<0.2	1.80
SP-05-1-3B	2005	48.49508	-92.88588	high	381	0.52	4.7	13.1	290	19.6	75.4	0.20	4.7	4.7	225	<0.1	3.1	0.4	1.0	48	0.4	5.5	32	<0.2	2.28
SP-05-2-1B	2005	48.49599	-92.88988	unburned	441	0.34	5.6	17.0	310	15.9	78.6	0.23	7.0	5.7	234	<0.1	4.0	0.4	1.2	60	0.6	6.3	37	<0.2	2.69
SP-05-2-2B	2005	48.49617	-92.88976	low/medium	245	0.20	3.9	8.1	220	16.6	71.4	0.17	4.7	2.3	245	<0.1	6.3	0.4	1.0	34	0.5	5.4	22	<0.2	2.85
SP-05-2-3B	2005	48.49626	-92.88962	high	250	0.32	4.5	13.4	310	16.3	72.2	0.16	5.2	2.2	238	<0.1	3.2	0.4	1.0	47	0.4	5.8	25	0.6	1.29
SP-05-2-3B dup	2005	48.49626	-92.88962	high	248	0.31	6.2	12.8	320	16.3	73.8	0.14	5.3	0.8	250	<0.1	3.7	0.4	1.1	49	0.4	5.5	24	<0.2	1.21
SP-05-3-1B	2005	48.49990	-92.88320	high	208	0.27	3.8	12.6	280	16.7	74.7	0.20	4.4	4.4	240	<0.1	3.0	0.4	0.9	33	0.4	5.9	28	0.4	2.86
SP-05-3-2B	2005	48.49950	-92.88380	low/medium	198	1.17	5.8	16.4	300	21.1	51.1	0.29	5.1	1.6	187	<0.1	3.7	0.3	6.1	70	0.5	6.6	35	0.6	5.50
SP-05-3-3B	2005	48.49950	-92.88430	unburned	195	0.93	5.4	12.2	210	18.4	62.4	0.36	4.9	3.6	198	<0.1	3.5	0.4	3.5	58	0.5	5.4	28	0.4	4.39
SP-05-4-1B	2005	48.49866	-92.89069	unburned	197	1.07	6.3	13.4	440	18.7	64.5	0.27	5.1	2.3	159	<0.1	4.3	0.4	1.5	59	0.6	5.8	43	0.3	4.68

Field no.	Year collected	Latitude	Longitude	Fire severity	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)	Total C (wt. %)
SP-05-4-1B dup	2005	48.49866	-92.89069	unburned	204	1.02	6.5	14.2	450	19.6	63.7	0.26	5.2	1.3	166	<0.1	4.4	0.4	1.6	62	0.6	5.8	44	0.3	4.52
SP-05-4-2B	2005	48.49850	-92.89060	low/medium	198	1.19	8.6	12.4	1,020	21.4	59.9	0.32	6.5	4.4	149	<0.1	4.8	0.4	5.9	72	1.0	6.3	50	0.3	4.52
SP-05-4-3B	2005	48.49830	-92.89090	high	208	0.34	4.1	16.1	160	15.3	73.5	0.16	4.6	0.9	225	<0.1	4.1	0.4	1.1	44	0.4	5.5	25	0.2	1.88
SP-05-5-1B	2005	48.50055	-92.88857	unburned	277	0.12	2.1	14.0	210	11.3	45.4	0.11	3.0	0.7	151	<0.1	12.7	0.2	0.6	22	0.2	3.3	19	<0.2	2.69
SP-05-5-2B	2005	48.50060	-92.88860	low/medium	220	0.37	3.4	14.8	160	14.2	77.6	0.12	4.6	1.0	241	<0.1	5.3	0.4	0.9	36	0.3	5.0	21	<0.2	2.02
SP-05-5-3B	2005	48.50060	-92.88840	high	206	0.19	3.1	8.5	120	13.7	67.0	0.14	4.2	1.5	254	<0.1	2.8	0.3	0.8	30	0.4	4.7	16	<0.2	1.62
SP-05-6-1B	2005	48.50142	-92.88990	unburned	487	0.60	6.9	17.4	1,690	18.9	67.9	0.27	5.8	3.1	167	<0.1	4.9	0.4	2.3	62	0.7	5.8	74	0.4	5.01
SP-05-6-2B	2005	48.50170	-92.89010	low/medium	453	0.81	6.8	10.6	520	22.6	62.4	0.30	4.9	1.8	176	<0.1	3.8	0.4	1.6	56	0.7	6.0	42	0.3	5.25
SP-05-6-3B	2005	48.50180	-92.89100	high	207	0.44	4.3	11.4	360	14.2	73.9	0.15	4.3	0.9	229	<0.1	2.8	0.4	0.9	42	0.4	4.8	19	<0.2	1.77
SP-05-7-1B	2005	48.50540	-92.89810	unburned	172	0.70	5.3	13.7	230	16.3	72.1	0.17	5.3	1.3	205	<0.1	3.3	0.4	8.1	49	0.5	4.9	22	<0.2	2.93
SP-05-7-2B	2005	48.50501	-92.89789	low/medium	420	1.44	7.4	35.6	1,120	18.9	71.2	0.32	5.9	1.7	136	<0.1	8.8	0.5	11.1	85	0.9	6.5	81	0.8	6.89
SP-05-7-3B	2005	48.50480	-92.89560	high	233	0.38	3.6	21.0	310	15.9	77.5	0.15	4.8	1.6	263	<0.1	2.8	0.4	0.9	37	0.4	4.8	24	<0.2	1.84
SP-05-8-1B	2005	48.50166	-92.87214	unburned	433	0.49	5.5	17.2	570	19.7	65.2	0.21	5.5	1.0	221	<0.1	3.4	0.4	1.2	60	0.5	5.1	61	0.2	3.28
SP-05-8-2B	2005	48.50170	-92.87230	low/medium	250	0.83	8.7	22.9	680	21.5	74.6	0.26	7.9	1.7	164	<0.1	5.1	0.5	4.5	91	0.7	6.2	57	0.3	2.96
SP-05-8-3B	2005	48.50180	-92.87250	high	222	1.12	6.2	21.4	560	16.9	57.4	0.30	6.5	1.1	208	<0.1	5.0	0.4	2.1	76	0.6	5.3	46	0.5	4.69
SP-05-9-1B	2005	48.50080	-92.87210	unburned	554	0.26	3.9	7.8	310	16.5	81.7	0.16	4.5	0.7	232	<0.1	2.4	0.4	0.9	33	0.3	4.5	28	<0.2	1.86
SP-05-9-1B dup	2005	48.50080	-92.87210	unburned	462	0.23	3.7	7.5	300	15.5	82.5	0.14	4.2	0.7	228	<0.1	2.4	0.4	0.8	32	0.3	4.6	27	<0.2	1.72
SP-05-9-2B	2005	48.50097	-92.87247	low/medium	393	0.36	6.3	13.6	470	18.8	96.1	0.22	6.6	1.3	242	<0.1	4.0	0.5	1.3	59	0.5	5.9	36	<0.2	2.56
SP-05-9-3B	2005	48.50130	-92.87270	high	325	0.36	5.0	8.9	440	18.4	72.1	0.20	4.7	1.0	227	<0.1	2.9	0.4	1.1	41	0.8	4.8	42	<0.2	2.56
SP-05-10-1B	2005	48.50210	-92.88490	unburned	1,530	0.60	6.0	19.5	890	17.3	82.7	0.23	7.3	1.2	244	<0.1	4.4	0.4	1.4	69	0.6	6.8	89	0.2	2.13
SP-05-10-2B	2005	48.50192	-92.88459	low/medium	297	0.39	4.3	11.8	250	15.6	79.2	0.17	5.3	0.7	243	<0.1	3.9	0.4	0.9	45	0.4	4.9	41	<0.2	1.90
SP-05-10-3B	2005	48.50180	-92.88450	high	182	0.28	3.8	5.8	90	13.8	72.9	0.15	4.1	0.7	244	<0.1	2.7	0.5	1.0	31	0.3	4.7	18	<0.2	2.14
SP-06 1-1B	2006	48.49490	-92.88660	unburned	272	0.41	3.6	9.3	210	14.4	78.6	0.11	4.7	0.7	266	<0.1	4.4	0.4	1.0	32	0.4	5.7	23	<0.2	1.33
SP-06 1-2B	2006	48.49495	-92.88618	low/medium	299	0.32	3.3	16.6	720	15.3	75.2	0.07	5.2	0.7	264	<0.1	3.4	0.4	1.0	38	0.3	5.6	27	<0.2	1.60
SP-06 1-3B	2006	48.49508	-92.88588	high	265	0.90	4.6	21.2	440	15.5	74.8	0.11	6.0	0.8	244	<0.1	3.8	0.4	1.1	59	0.4	5.8	31	0.2	1.54
SP-06 2-1B	2006	48.49599	-92.88988	unburned	615	0.55	5.7	21.2	380	16.1	86.3	0.15	7.9	2.0	254	<0.1	5.0	0.5	1.3	63	0.5	7.2	56	<0.2	2.22
SP-06 2-2B	2006	48.49617	-92.88976	low/medium	375	0.36	4.3	14.4	510	15.1	82.2	0.11	6.3	0.8	262	<0.1	3.7	0.4	1.1	46	0.4	6.5	33	<0.2	1.75
SP-06 2-3B	2006	48.49626	-92.88962	high	288	0.60	4.1	21.8	570	14.6	74.5	0.12	6.5	0.8	259	<0.1	4.2	0.4	1.0	55	0.4	6.1	31	<0.2	1.38
SP-06 3-1B	2006	48.49990	-92.88320	high	313	0.41	4.0	16.3	260	14.3	85.0	0.07	5.9	0.7	284	<0.1	3.5	0.4	1.0	43	0.3	6.2	23	<0.2	1.14
SP-06 3-2B	2006	48.49950	-92.88380	low/medium	247	1.41	5.3	17.1	260	17.9	54.2	0.22	5.9	1.3	211	<0.1	4.5	0.3	3.8	72	0.4	6.7	37	0.3	3.09
SP-06 3-3B	2006	48.49950	-92.88430	unburned	256	1.76	5.2	16.7	290	17.2	68.4	0.18	5.8	1.1	228	<0.1	4.9	0.4	3.8	72	0.4	6.4	30	0.3	2.11
SP-06 4-1B	2006	48.49866	-92.89069	unburned	1,260	1.29	5.2	17.0	360	20.0	78.6	0.17	6.3	1.3	233	<0.1	5.4	0.5	1.9	63	0.5	6.2	64	0.3	2.28
SP-06 4-1B dup	2006	48.49866	-92.89069	unburned	1,070	1.14	4.6	16.6	330	18.7	79.0	0.17	5.9	1.0	237	<0.1	4.0	0.5	1.6	59	0.3	5.1	38	0.3	2.08
SP-06 4-2B	2006	48.49850	-92.89060	low/medium	206	1.02	5.7	8.4	650	23.9	60.5	0.22	5.7	2.2	204	<0.1	5.0	0.4	6.2	43	0.7	6.2	34	0.4	5.35
SP-06 4-3B	2006	48.49830	-92.89090	high	242	0.40	3.6	14.6	170	14.6	78.5	0.07	5.2	0.6	248	<0.1	3.6	0.4	1.0	45	0.2	5.3	24	<0.2	1.38
SP-06 5-1B	2006	48.50055	-92.88857	unburned	400	0.41	3.3	10.5	330	16.4	78.0	0.07	4.7	0.5	244	<0.1	3.9	0.4	0.8	33	0.3	5.3	27	<0.2	2.26
SP-06 5-2B	2006	48.50060	-92.88860	low/medium	259	0.27	2.9	8.5	150	13.1	85.2	0.05	4.6	0.6	258	<0.1	2.8	0.4	0.8	33	0.2	5.1	17	<0.2	0.74
SP-06 5-3B	2006	48.50060	-92.88840	high	287	0.41	3.1	12.3	120	14.1	77.1	0.06	5.5	0.6	278	<0.1	3.0	0.4	0.9	38	0.2	5.6	19	<0.2	1.68
SP-06 6-1B	2006	48.50142	-92.88990	unburned	332	0.65	3.7	20.0	360	16.2	75.8	0.10	5.6	0.7	255	<0.1	3.5	0.4	1.0	51	0.4	5.4	31	<0.2	1.68
SP-06 6-2B	2006	48.50170	-92.89010	low/medium	279	0.98	4.9	22.5	620	16.6	74.8	0.16	5.9	1.0	228	<0.1	4.3	0.4	1.6	59	0.5	5.9	36	0.3	2.72
SP-06 6-2B dup	2006	48.50170	-92.89010	low/medium	284	0.75	4.8	15.2	590	19.8	71.6	0.19	5.6	1.1	214	<0.1	4.5	0.4	1.4	58	0.4	5.2	35	0.2	2.92
SP-06 6-3B	2006	48.50180	-92.89100	high	238	0.81	5.0	12.1	340	18.3	67.9	0.20	4.4	0.9	224	<0.1	3.3	0.5	1.1	46	0.5	5.6	26	0.2	2.20
SP-06 7-1B	2006	48.50540	-92.89810	unburned	263	1.03	5.2	16.8	330	16.6	77.6	0.12	6.3	1.1	205	<0.1	5.1	0.5	8.6	70	0.4	6.5	31	0.3	2.42

Field no.	Year collected	Latitude	Longitude	Fire severity	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)	Total C (wt. %)
SP-06 7-2B	2006	48.50501	-92.89789	low/medium	390	1.26	5.4	26.9	710	17.4	76.0	0.22	6.9	1.3	185	<0.1	5.1	0.4	5.3	77	1.4	6.1	81	0.5	3.29
SP-06 7-3B	2006	48.50480	-92.89560	high	278	0.36	3.3	12.3	290	15.3	84.2	0.09	4.8	0.6	273	<0.1	3.6	0.4	1.0	33	0.3	5.5	21	<0.2	1.26
SP-06 8-1B	2006	48.50166	-92.87214	unburned	887	0.48	4.7	15.3	580	15.9	70.2	0.14	5.6	1.0	244	<0.1	3.6	0.4	1.1	52	0.4	6.2	56	0.2	2.09
SP-06 8-2B	2006	48.50170	-92.87230	low/medium	366	0.88	6.3	19.3	460	18.6	74.8	0.18	7.6	1.2	196	<0.1	5.1	0.5	3.5	79	0.5	6.7	49	0.2	1.85
SP-06 8-3B	2006	48.50180	-92.87250	high	268	1.06	5.0	15.2	720	18.8	72.9	0.21	6.6	1.4	201	<0.1	5.2	0.4	2.6	68	0.3	6.0	55	0.3	2.79
SP-06 8-3B dup	2006	48.50180	-92.87250	high	267	0.89	5.0	14.7	730	18.2	65.3	0.20	6.1	1.3	199	<0.1	7.6	0.4	2.8	70	0.3	6.5	55	0.3	2.79
SP-06 9-1B	2006	48.50080	-92.87210	unburned	276	0.33	3.2	9.2	280	17.0	75.8	0.12	5.3	0.9	245	<0.1	3.7	0.4	1.0	33	0.2	5.9	27	<0.2	1.35
SP-06 9-2B	2006	48.50097	-92.87247	low/medium	410	0.50	5.0	18.4	490	16.7	91.5	0.14	7.6	1.2	254	<0.1	4.3	0.5	1.2	58	0.4	6.5	34	<0.2	1.76
SP-06 9-3B	2006	48.50130	-92.87270	high	266	0.70	4.6	13.1	750	16.5	75.5	0.19	5.7	1.1	226	<0.1	3.9	0.4	1.2	56	0.4	5.6	46	<0.2	2.00
SP-06 10-1B	2006	48.50210	-92.88490	unburned	856	0.64	5.3	19.9	1,020	18.4	71.9	0.18	7.3	1.0	228	<0.1	5.3	0.4	1.2	68	0.5	6.3	90	0.2	1.68
SP-06 10-2B	2006	48.50192	-92.88459	low/medium	926	0.78	4.4	14.6	340	20.9	80.7	0.25	6.0	0.9	249	<0.1	4.1	0.5	1.1	48	0.4	5.8	45	0.2	2.06
SP-06 10-3B	2006	48.50180	-92.88450	high	240	0.51	3.5	10.5	140	14.6	70.2	0.14	5.2	0.7	251	<0.1	3.7	0.4	1.0	44	0.2	5.2	23	<0.2	0.97

Field no.	Year collected	Latitude	Longitude	Fire severity	Ash %	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs* (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)
SP-04-1-1 O	2004	48.49490	-92.88660	unburned	69.35	5.72	2.65	1.71	1.69	0.56	2.01	0.07	0.17	<1	3	820	1.2	0.26	0.7	21.9	7.5	22	3.07	13.9	14.3	0.05	0.03	10.9
SP-04-1-2 O	2004	48.49495	-92.88618	low/medium	27.20	4.80	6.40	1.37	2.29	1.08	1.70	0.30	0.15	<1	2	1,440	1.0	0.26	3.0	19.4	8.2	17	4.20	31.7	12.0	0.07	0.02	10.1
SP-04-2-1 O	2004	48.49599	-92.88988	unburned	21.65	4.81	7.84	2.17	2.18	0.89	1.16	0.67	0.19	<1	8	2,220	1.3	0.68	4.3	39.1	21.0	35	9.57	37.6	12.3	0.22	0.06	19.7
SP-04-2-2 O	2004	48.49617	-92.88976	low/medium	39.90	5.47	4.58	2.24	1.67	0.63	1.46	0.31	0.21	<1	6	2,020	1.2	0.70	4.3	35.9	11.6	28	8.97	29.2	14.3	0.23	0.06	17.4
SP-04-3-2 O	2004	48.49950	-92.88380	low/medium	50.95	6.08	3.38	2.58	1.65	0.60	1.39	0.19	0.26	<1	6	1,260	1.6	0.55	2.1	45.1	19.9	57	6.85	34.1	16.5	0.05	0.05	24.5
SP-04-3-3 O	2004	48.49950	-92.88430	unburned	14.39	4.33	11.00	2.22	1.85	1.39	1.08	0.72	0.19	<1	6	1,850	0.9	0.46	2.4	31.5	13.8	34	10.00	71.8	11.6	0.11	0.04	17.4
SP-04-4-1 O	2004	48.49866	-92.89069	unburned	12.65	4.72	6.91	3.05	2.06	0.90	0.86	0.95	0.20	<1	10	1,810	1.3	0.73	3.6	43.1	20.5	34	7.96	56.2	12.5	0.32	0.07	22.9
SP-04-4-1 O dup.	2004	48.49866	-92.89069	unburned	44.30	6.15	2.43	2.6	1.49	0.59	1.58	0.20	0.25	<1	6	755	1.5	0.5	1.8	29.2	14.3	40	5.61	26.3	16.5	0.16	0.05	16.4
SP-04-4-2 O	2004	48.49850	-92.89060	low/medium	11.11	4.72	8.45	3.03	2.38	1.27	0.94	0.84	0.20	<1	10	1,690	1.5	0.96	3.0	40.8	9.1	34	15.00	78.8	12.2	0.15	0.08	21.6
SP-04-5-1 O	2004	48.50055	-92.88857	unburned	44.84	5.18	4.46	1.41	1.94	0.50	1.91	0.20	0.14	<1	2	1,000	1.1	0.21	1.1	17.4	5.6	16	3.55	15.0	12.8	0.12	0.02	8.7
SP-04-5-1 O dup.	2004	48.50055	-92.88857	unburned	70.17	5.79	2.69	1.7	1.77	0.55	2.04	0.10	0.17	<1	2	894	1.2	0.27	0.7	20.5	7.3	19	2.89	14.6	14.6	0.07	0.03	10.4
SP-04-5-2 O	2004	48.50060	-92.88860	low/medium	29.60	4.71	8.83	1.98	1.75	0.81	1.41	0.55	0.17	<1	5	2,120	1.2	0.41	3.4	27.3	9.3	27	7.31	40.2	11.6	0.14	0.03	14.1
SP-04-6-1 O	2004	48.50142	-92.88990	unburned	13.89	3.87	10.30	1.94	2.41	1.05	0.85	0.70	0.16	<1	5	2,370	0.9	0.60	7.3	25.7	9.7	31	11.40	59.5	10.8	0.12	0.05	12.9
SP-04-6-2 O	2004	48.50170	-92.89010	low/medium	47.84	4.66	6.20	2.45	1.73	0.64	0.91	0.31	0.21	<1	10	2,150	1.3	0.76	2.6	37.2	10.8	29	6.91	45.0	13.5	0.08	0.07	19.9
SP-04-7-1 O	2004	48.50540	-92.89810	unburned	9.28	3.54	8.69	2.58	2.27	1.05	0.60	1.32	0.15	<1	11	2,040	1.3	0.67	3.3	40.5	13.7	26	11.40	64.8	8.9	0.27	0.06	20.8
SP-04-7-2 O	2004	48.50501	-92.89789	low/medium	18.80	6.11	4.78	3.82	2.01	0.78	0.78	0.59	0.23	<1	14	1,980	2.9	1.02	3.1	86.1	33.1	41	11.50	47.7	13.8	0.29	0.10	41.5
SP-04-8-1 O	2004	48.50166	-92.87214	unburned	11.22	3.61	10.50	1.99	1.95	1.46	0.82	0.85	0.13	<1	5	2,930	1.2	0.47	5.0	42.9	25.7	42	13.40	73.1	8.6	0.15	0.03	21.7
SP-04-8-2 O	2004	48.50170	-92.87230	low/medium	24.15	5.22	3.55	2.43	1.97	0.85	0.98	0.38	0.23	<1	6	1,670	1.9	0.52	3.2	59.7	46.1	46	7.02	40.5	14.5	0.21	0.05	31.2
SP-04-8-3 O	2004	48.50180	-92.87250	high	43.60	6.34	2.62	2.61	1.61	0.62	1.59	0.21	0.25	<1	6	835	1.5	0.45	1.8	29.1	14.3	40	5.72	27.7	16.0	0.16	0.05	16.3
SP-04-9-1 O	2004	48.50080	-92.87210	unburned	14.45	3.03	12.30	1.45	2.46	2.07	0.79	0.90	0.12	<1	4	3,940	1.1	0.41	8.1	39.2	29.4	21	6.82	72.8	7.7	0.15	0.03	25.3
SP-04-9-2 O	2004	48.50097	-92.87247	low/medium	34.45	4.63	5.94	1.91	1.92	0.97	1.12	0.42	0.21	<1	5	2,200	1.5	0.57	3.6	40.3	48.5	30	9.20	49.5	13.2	0.14	0.05	22.4
SP-04-10-1 O	2004	48.50210	-92.88490	unburned	20.55	4.68	8.95	2.08	2.22	1.18	1.27	0.51	0.19	<1	6	2,480	1.1	0.45	6.0	27.6	11.1	31	6.39	56.6	12.5	0.11	0.04	13.8
SP-04-10-2 O	2004	48.50192	-92.88459	low/medium	41.60	5.83	4.30	2.02	1.61	0.66	1.84	0.21	0.23	<1	5	1,030	1.3	0.46	1.5	28.3	8.4	25	4.97	24.8	14.8	0.12	0.05	14.7
SP-05-1-1 O	2005	48.49490	-92.88660	unburned	38.40	5.24	4.01	1.11	2.03	0.47	1.91	0.14	0.14	<1	3	1,200	1.3	0.26	1.3	17.7	5.3	18	3.70	19.6	13.1	0.06	<0.02	9.0
SP-05-1-1 O dup.	2005	48.49490	-92.88660	unburned	22.80	5.34	4.87	1.47	1.85	0.65	2.06	0.21	0.11	<1	2	1,030	1.3	0.19	1.4	16.4	6.6	21	2.79	17.7	13.4	0.11	0.02	7.7
SP-05-1-2 O	2005	48.49495	-92.88618	low/medium	23.25	4.44	7.63	1.21	1.65	1.04	1.57	0.41	0.13	<1	2	1,820	1.2	0.31	4.6	18.6	7.8	30	5.00	37.8	10.7	0.10	0.03	9.5
SP-05-2-1 O	2005	48.49599	-92.88988	unburned	20.50	4.86	6.93	1.83	2.00	0.79	1.27	0.51	0.20	<1	6	2,010	1.3	0.56	3.1	33.1	23.2	39	7.77	30.7	12.6	0.16	0.05	16.7
SP-05-3-1 O	2005	48.49990	-92.88320	high	25.05	5.28	3.59	1.44	1.78	0.62	2.01	0.21	0.13	<1	2	675	1.4	0.30	1.1	15.7	7.2	29	3.17	22.7	13.0	0.04	<0.02	8.1
SP-05-3-2 O	2005	48.49950	-92.88380	low/medium	19.85	5.52	4.67	2.29	1.56	0.72	1.25	0.35	0.22	<1	5	1,280	1.7	0.56	2.6	42.2	16.9	36	7.04	42.4	15.4	0.06	0.05	23.1
SP-05-3-3 O	2005	48.49950	-92.88430	unburned	22.10	4.97	6.22	1.70	1.71	0.82	1.48	0.36	0.19	<1	4	1,170	1.2	0.33	1.1	24.2	9.7	28	5.24	33.3	13.7	0.08	0.03	12.7
SP-05-4-1 O	2005	48.49866	-92.89069	unburned	11.06	4.16	10.80	2.50	1.95	1.28	0.86	1.09	0.18	<1	7	1,970	1.2	0.64	4.1	36.2	14.1	31	10.80	68.5	10.8	0.19	0.06	19.3
SP-05-4-2 O	2005	48.49850	-92.89060	low/medium	23.10	5.56	4.64	3.18	1.62	0.78	1.16	0.41	0.27	<1	7	1,080	1.5	0.88	1.5	34.8	7.9	45	10.90	46.4	18.6	0.17	0.05	18.1
SP-05-5-1 O	2005	48.50055	-92.88857	unburned	32.25	5.69	3.83	1.61	1.86	0.59	2.17	0.15	0.13	<1	2	909	1.2	0.17	1.2	15.8	6.5	25	2.69	14.8	13.5	0.08	<0.02	7.4
SP-05-5-2 O	2005	48.50060	-92.88860	low/medium	22.10	4.73	10.30	2.00	1.74	0.80	1.37	0.57	0.16	<1	5	2,290	1.3	0.38	3.2	26.8	9.1	28	7.88	42.3	11.7	0.12	0.04	13.7
SP-05-5-3 O	2005	48.50060	-92.88840	high	42.90	5.45	6.26	2.16	1.71	0.61	1.60	0.25	0.19	<1	8	2,130	1.4	0.59	3.4	33.6	9.9	28	7.30	36.3	13.7	0.16	0.06	16.9
SP-05-6-1 O	2005	48.50142	-92.88990	unburned	16.45	4.93	8.24	2.04	1.81	0.94	1.09	0.58	0.18	<1	5	2,180	1.3	0.54	6.1	25.4	9.6	33	10.60	54.8	12.9	0.16	0.05	13.1
SP-05-7-1 O	2005	48.50540	-92.89810	unburned	7.89	2.46	15.40	1.77	2.60	1.69	0.47	1.41	0.10	<1	6	2,810	1.0	0.39	4.2	29.1	12.4	21	9.98	95.8	6.1	0.21	0.03	16.9
SP-05-7-2 O	2005	48.50501	-92.89789	low/medium	18.55	5.48	5.43	2.96	2.00	0.71	1.01	0.48	0.20	<1	8	2,010	2.0	0.70	4.0	44.5	35.2	36	11.10	54.0	14.0	0.23	0.07	23.2
SP-05-8-1 O	2005	48.50166	-92.87214	unburned	13.65	4.26	8.04	2.29	1.74	1.15	0.89	0.73	0.16	<1	6	2,350	1.4	0.56	5.5	32.9	29.1	31	11.10	54.4	10.8	0.20	0.05	17.4
SP-05-8-2 O	2005	48.50170	-92.87230	low/medium	17.80	5.25	4.38	3.15	1.42	0.84	0.70	0.54	0.20	<1	5	2,430	3.4	0.57	4.0	112.0	77.1	35	9.51	56.3	12.7	0.21	0.07	52.3
SP-05-8-3 O	2005	48.50180	-92.87250	high	23.35	4.90	7.16	2.49	1.37	0.95	1.02	0.50	0.20	<1	6	2,130	1.3	0.61	5.4	38.5	17.9	35	15.10	44.0	11.8	0.18	0.06	24.1
SP-05-8-3 O dup.	2005	48.50180	-92.87250	high	10.45	3.94	11.7	2.39	2.15	1.36	0.81	1.16	0.17	<1	7	2,030	1.3	0.6	4	33	14.5	31	10.9	73.5	10.5	0.18	0.06	17.4
SP-05-9-1 O	2005	48.50080	-92.87210	unburned	13.90	2.73	12.50	1.26	1.57	2.01	0.80	0.84	0.09	<1	3	3,900	0.9	0.25	7.3	31.7	23.0	18	5.20	77.9	6.8	0.11	0.02	20.3

Field no.	Year collected	Latitude	Longitude	Fire severity	Ash %	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs* (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)
SP-05-9-2 O	2005	48.50097	-92.87247	low/medium	24.40	4.29	9.13	1.82	1.64	1.10	1.02	0.55	0.19	<1	5	2,760	1.5	0.47	5.6	36.6	42.5	28	8.75	81.0	11.7	0.09	0.05	19.6
SP-05-10-1 O	2005	48.50210	-92.88490	unburned	28.35	5.33	6.04	2.26	1.64	0.95	1.44	0.30	0.23	<1	6	1,860	1.3	0.52	4.5	30.5	10.4	36	6.36	37.2	14.5	0.11	0.05	14.6
SP-05-10-2 O	2005	48.50192	-92.88459	low/medium	43.35	5.46	3.46	1.83	1.73	0.57	1.62	0.17	0.20	<1	5	1,130	1.3	0.56	1.7	27.5	8.0	27	4.56	20.2	14.0	0.13	0.05	14.0
SP-06 1-2 O	2006	48.49495	-92.88618	low/medium	32.70	5.49	5.30	1.32	1.71	0.92	1.76	0.30	0.14	<1	2	1,200	1.2	0.23	2.4	16.6	8.1	26	<5	31.3	12.6	0.05	<0.02	8.2
SP-06 2-1 O	2006	48.49599	-92.88988	unburned	13.70	4.37	7.39	1.97	1.68	0.93	0.88	0.82	0.17	<1	5	1,840	1.2	0.46	3.3	27.5	20.2	33	<5	42.4	11.1	0.15	0.04	14.3
SP-06 3-3 O	2006	48.49950	-92.88430	unburned	13.70	4.05	8.49	1.45	1.47	1.12	0.95	0.65	0.17	<1	4	1,230	0.9	0.32	1.6	22.0	10.6	32	<5	47.6	10.8	0.07	0.03	11.8
SP-06 4-1 O	2006	48.49866	-92.89069	unburned	49.30	4.65	5.34	1.60	1.60	0.95	1.09	0.49	0.20	<1	5	1,040	1.1	0.41	2.0	34.5	21.8	41	<5	35.6	13.5	0.10	0.03	18.9
SP-06 5-1 O	2006	48.50055	-92.88857	unburned	22.30	5.49	5.87	2.01	1.77	0.70	1.58	0.49	0.15	<1	5	1,690	1.1	0.40	3.0	25.0	8.8	32	<5	33.2	12.7	0.15	0.03	12.6
SP-06 5-1 O dup.	2006	48.50055	-92.88857	unburned	18.00	2.73	8.82	1.19	1.17	1.31	0.67	0.79	0.1	<1	2	2,720	0.9	0.29	5.3	26.3	21.2	25	<5	58.1	7.36	0.14	0.02	16.3
SP-06 5-2 O	2006	48.50060	-92.88860	low/medium	45.00	5.61	3.45	1.25	1.77	0.44	1.93	0.19	0.14	1	2	773	1.1	0.18	0.9	14.9	5.6	18	<5	12.1	12.9	0.10	<0.02	7.4
SP-06 5-3 O	2006	48.50060	-92.88840	high	36.70	6.09	4.49	2.65	1.66	0.68	1.79	0.32	0.20	<1	5	1,330	1.4	0.41	1.9	32.6	11.7	39	6.00	26.7	14.9	0.19	0.04	16.4
SP-06 6-1 O	2006	48.50142	-92.88990	unburned	26.50	5.82	4.75	1.50	1.63	0.80	1.39	0.45	0.21	5	6	1,280	1.2	0.55	2.7	28.5	12.1	34	6.00	37.6	14.2	0.13	0.04	14.5
SP-06 7-1 O	2006	48.50540	-92.89810	unburned	9.00	5.15	6.63	3.02	2.45	1.21	0.76	1.35	0.14	<1	8	1,690	2.3	0.55	4.7	79.4	28.5	29	11.00	76.2	10.5	0.18	0.06	43.1
SP-06 8-1 O	2006	48.50166	-92.87214	unburned	14.30	4.18	9.19	1.83	1.53	1.45	0.87	0.96	0.14	4	3	2,680	1.1	0.35	6.1	26.1	24.3	30	9.00	62.5	10.1	0.14	0.03	14.8
SP-06 9-1 O	2006	48.50080	-92.87210	unburned	22.00	5.41	6.54	2.14	2.02	0.74	1.59	0.54	0.16	<1	5	1,790	1.1	0.39	3.0	25.4	8.8	29	<5	34.8	13.0	0.13	0.04	12.7
SP-06 10-1 O	2006	48.50210	-92.88490	unburned	21.50	4.75	8.28	2.14	1.48	1.25	1.20	0.56	0.18	<1	4	1,770	1.0	0.36	5.8	23.0	9.3	36	6.00	53.6	12.6	0.11	0.03	11.8

*Because of analytical laboratory issues, Cs detection limits in 2004 and 2005 were 0.05 ppm and 5 ppm in 2006.

Field no.	Year collected	Latitude	Longitude	Fire severity	Ash %	Li (ppm)	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)
SP-04-1-1 O	2004	48.49490	-92.88660	unburned	69.35	16	1,620	0.87	5.0	21.2	1,390	41.0	96.7	0.40	6.2	1.5	333	<0.1	4.3	0.5	1.1	47	0.5	7.4	96	0.3
SP-04-1-2 O	2004	48.49495	-92.88618	low/medium	27.20	13	4,730	1.45	4.3	22.4	4,250	46.2	123.0	0.56	5.1	2.2	514	<0.1	3.0	0.3	0.9	39	0.5	6.3	341	0.3
SP-04-2-1 O	2004	48.49599	-92.88988	unburned	21.65	16	12,661	2.26	6.5	32.3	6,990	133.0	156.0	1.86	7.1	3.1	632	0.1	5.3	1.1	1.6	64	0.9	11.0	376	0.6
SP-04-2-2 O	2004	48.49617	-92.88976	low/medium	39.90	17	8,630	1.89	6.6	25.1	3,550	162.0	141.0	1.45	6.7	3.2	412	0.1	5.2	1.1	1.6	61	0.9	9.8	390	0.8
SP-04-3-2 O	2004	48.49950	-92.88380	low/medium	50.95	19	2,170	1.70	8.0	42.0	3,200	77.9	90.9	1.12	7.8	2.7	312	<0.1	5.4	0.6	11.0	78	1.0	12.1	323	0.9
SP-04-3-3 O	2004	48.49950	-92.88430	unburned	14.39	28	8,060	3.14	5.7	55.7	7,520	77.3	142.0	1.47	5.9	2.4	562	<0.1	4.5	0.7	7.1	63	0.9	8.2	412	0.5
SP-04-4-1 O	2004	48.49866	-92.89069	unburned	12.65	17	9,790	2.98	7.2	42.3	9,870	158.0	148.0	2.36	7.2	3.9	479	0.1	6.6	1.2	2.1	71	1.0	11.9	441	0.7
SP-04-4-1 O dup.	2004	48.49866	-92.89069	unburned	44.30	23	2,690	1.98	7.7	31.5	2,340	63	80	0.89	7.5	2.4	288	<0.1	6	0.5	3.1	73	0.7	8.6	206	0.7
SP-04-4-2 O	2004	48.49850	-92.89060	low/medium	11.11	15	5,420	3.33	7.3	40.4	11,274	166.0	140.0	3.65	7.3	5.3	368	<0.1	5.8	1.2	6.5	69	1.2	12.7	602	0.5
SP-04-5-1 O	2004	48.50055	-92.88857	unburned	44.84	11	2,530	0.78	4.2	16.4	2,320	30.5	111.0	0.47	5.2	1.2	393	<0.1	3.8	0.4	0.9	37	0.4	8.3	183	0.3
SP-04-5-1 O dup.	2004	48.50055	-92.88857	unburned	70.17	15	1,680	0.9	4.7	22.8	1,480	42	98.9	0.39	6	1.3	348	<0.1	3.7	0.4	1	49	0.4	7	93	0.4
SP-04-5-2 O	2004	48.50060	-92.88860	low/medium	29.60	15	7,620	1.65	5.3	30.1	6,240	60.2	133.0	1.03	5.6	1.9	609	<0.1	4.8	1.0	1.3	49	0.6	9.0	556	0.5
SP-04-6-1 O	2004	48.50142	-92.88990	unburned	13.89	17	21,329	2.28	5.7	27.9	10,623	75.2	154.0	1.42	5.0	2.5	491	<0.1	4.1	0.9	1.6	51	0.8	7.3	1,020	0.2
SP-04-6-2 O	2004	48.50170	-92.89010	low/medium	47.84	16	10,303	1.97	7.8	28.2	5,620	151.0	99.2	2.02	7.0	3.8	411	<0.1	5.9	1.1	2.0	69	1.0	9.8	519	1.1
SP-04-7-1 O	2004	48.50540	-92.89810	unburned	9.28	14	6,490	2.47	5.0	35.6	10,820	155.0	169.0	2.56	5.9	3.0	614	<0.1	4.7	1.7	19.5	59	0.9	11.7	558	0.4
SP-04-7-2 O	2004	48.50501	-92.89789	low/medium	18.80	21	6,060	3.11	8.4	59.0	8,240	206.0	129.0	3.24	9.9	5.3	391	0.1	7.5	1.7	12.6	80	1.3	21.3	383	0.8
SP-04-8-1 O	2004	48.50166	-92.87214	unburned	11.22	14	15,922	2.67	4.9	41.0	11,053	84.6	170.0	1.49	4.7	2.3	760	<0.1	7.0	0.9	1.5	48	0.8	9.4	933	0.5
SP-04-8-2 O	2004	48.50170	-92.87230	low/medium	24.15	17	4,180	2.34	5.9	38.7	6,540	85.1	131.0	1.51	8.7	3.1	396	<0.1	5.7	0.9	12.3	71	0.9	14.0	430	0.5
SP-04-8-3 O	2004	48.50180	-92.87250	high	43.60	24	3,010	2.00	7.3	32.2	2,440	60.7	84.7	0.84	7.3	2.1	304	<0.1	6.8	0.5	3.0	75	0.7	8.7	225	0.8
SP-04-9-1 O	2004	48.50080	-92.87210	unburned	14.45	11	15,307	3.26	3.7	29.0	13,350	71.2	214.0	1.10	4.2	2.2	1140	<0.1	3.0	0.6	1.1	36	0.6	7.3	1,290	0.5
SP-04-9-2 O	2004	48.50097	-92.87247	low/medium	34.45	15	9,270	1.78	6.7	32.5	6,200	112.0	170.0	1.46	7.0	3.5	598	<0.1	5.8	0.8	1.6	58	0.8	9.7	539	0.8
SP-04-10-1 O	2004	48.50210	-92.88490	unburned	20.55	19	10,837	2.35	5.7	33.6	6,910	68.4	157.0	1.20	5.8	2.4	497	<0.1	4.7	0.7	1.4	53	0.7	9.7	901	0.6
SP-04-10-2 O	2004	48.50192	-92.88459	low/medium	41.60	17	3,910	2.11	8.0	27.1	2,250	71.1	103.0	0.91	6.5	2.1	360	<0.1	5.9	0.6	1.5	58	0.8	8.5	134	0.6
SP-05-1-1 O	2005	48.49490	-92.88660	unburned	38.40	9	2,330	0.85	3.8	18.8	1,980	40.0	102.0	0.44	4.4	1.3	400	<0.1	3.4	0.6	1.0	32	0.4	6.8	178	0.4
SP-05-1-1 O dup.	2005	48.49490	-92.88660	unburned	22.80	15	3,060	0.82	3.6	22.6	3,380	24.2	85.9	0.31	4.6	1	392	<0.1	3.6	0.4	0.9	36	0.4	5.6	310	0.3
SP-05-1-2 O	2005	48.49495	-92.88618	low/medium	23.25	10	6,750	1.65	3.6	25.1	4,870	48.5	95.1	0.71	4.1	1.5	580	<0.1	2.9	0.5	1.0	33	0.4	5.9	521	0.4
SP-05-2-1 O	2005	48.49599	-92.88988	unburned	20.50	14	11,720	1.75	6.0	27.6	6,260	80.4	147.0	1.27	6.7	2.7	535	0.1	5.0	1.2	1.5	56	0.8	9.2	353	0.4
SP-05-3-1 O	2005	48.49990	-92.88320	high	25.05	12	3,790	1.25	3.6	21.8	3,180	27.4	93.3	0.43	4.8	1.1	292	<0.1	3.7	0.5	0.9	36	0.4	5.8	182	0.2
SP-05-3-2 O	2005	48.49950	-92.88380	low/medium	19.85	17	2,880	2.10	6.9	47.5	4,060	80.6	102.0	1.10	6.5	2.5	332	<0.1	5.4	0.9	12.7	66	0.8	11.3	341	0.4
SP-05-3-3 O	2005	48.49950	-92.88430	unburned	22.10	19	3,270	2.05	6.1	394.0	3,490	40.7	99.3	0.59	5.5	1.9	403	<0.1	4.3	0.6	6.5	54	0.7	7.5	220	0.4
SP-05-4-1 O	2005	48.49866	-92.89069	unburned	11.06	15	12,760	2.83	5.9	39.5	11,745	106.0	123.0	2.02	6.1	3.4	678	<0.1	5.2	1.1	2.2	59	1.0	10.1	648	0.4
SP-05-4-2 O	2005	48.49850	-92.89060	low/medium	23.10	26	4,210	2.42	9.8	31.4	5,500	77.9	102.0	1.29	8.0	3.4	266	<0.1	6.3	0.9	7.4	79	1.3	10.1	390	0.6
SP-05-5-1 O	2005	48.50055	-92.88857	unburned	32.25	14	2,710	0.71	3.6	22.5	2,610	24.4	90.7	0.28	5.3	1.0	360	<0.1	3.1	0.5	0.8	39	0.3	6.4	238	<0.2
SP-05-5-2 O	2005	48.50060	-92.88860	low/medium	22.10	16	7,550	1.45	5.7	32.0	6,390	64.3	134.0	0.97	5.5	2.1	662	<0.1	4.5	1.1	1.6	49	0.6	8.9	558	0.4
SP-05-5-3 O	2005	48.50060	-92.88840	high	42.90	15	4,870	1.63	6.1	28.8	3,590	112.0	139.0	1.39	6.4	2.8	543	0.1	6.3	0.9	1.5	56	0.7	10.0	413	0.6
SP-05-6-1 O	2005	48.50142	-92.88990	unburned	16.45	19	20,115	2.20	6.7	28.9	8,800	82.7	105.0	1.09	5.3	2.6	430	<0.1	4.0	1.0	1.9	54	0.8	9.0	930	0.4
SP-05-7-1 O	2005	48.50540	-92.89810	unburned	7.89	10	11,409	2.28	3.6	34.9	14,987	71.1	188.0	1.61	3.9	2.0	951	<0.1	3.6	1.5	11.7	39	0.7	9.0	911	0.4
SP-05-7-2 O	2005	48.50501	-92.89789	low/medium	18.55	21	9,940	2.48	7.3	43.6	6,720	127.0	135.0	2.05	7.3	3.8	374	<0.1	6.3	1.7	8.5	68	1.1	12.4	523	0.6
SP-05-8-1 O	2005	48.50166	-92.87214	unburned	13.65	15	14,593	2.63	5.5	35.9	8,820	122.0	160.0	1.55	5.9	3.0	594	0.1	4.6	0.8	1.9	56	0.8	9.7	796	0.7
SP-05-8-2 O	2005	48.50170	-92.87230	low/medium	17.80	18	6,640	3.06	7.1	57.2	8,900	132.0	131.0	2.00	10.3	3.7	466	<0.1	6.1	1.1	23.5	68	0.9	25.5	601	0.7
SP-05-8-3 O	2005	48.50180	-92.87250	high	23.35	17	9,670	2.54	6.0	31.4	5,240	105.0	111.0	1.52	6.1	2.9	576	<0.1	5.4	0.7	2.3	63	0.8	8.4	629	0.7
SP-05-8-3 O dup.	2005	48.50180	-92.87250	high	10.45	14	13,906	2.86	5.5	39.2	13,207	95.2	143	2.02	6	3.3	717	<0.1	5	1.2	2.1	57	0.9	10.4	713	0.4
SP-05-9-1 O	2005	48.50080	-92.87210	unburned	13.90	10	13,844	2.64	2.8	27.3	11,814	40.5	102.0	0.69	3.1	1.4	1140	<0.1	2.6	0.5	1.1	29	0.4	6.1	1,310	0.3

Field no.	Year collected	Latitude	Longitude	Fire severity	Ash %	Li (ppm)	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)
SP-05-9-2 O	2005	48.50097	-92.87247	low/medium	24.40	15	9,810	1.68	6.2	36.8	7,150	77.9	139.0	1.10	6.2	2.6	777	<0.1	5.0	0.8	2.3	56	0.7	9.3	1,060	0.5
SP-05-10-1 O	2005	48.50210	-92.88490	unburned	28.35	20	8,390	2.12	6.4	29.6	4,650	70.3	147.0	1.04	6.5	2.5	395	<0.1	5.6	0.6	1.7	61	0.7	9.1	610	0.5
SP-05-10-2 O	2005	48.50192	-92.88459	low/medium	43.35	15	3,750	1.88	5.9	25.1	1,840	81.7	102.0	1.00	6.1	2.6	309	<0.1	4.6	0.6	1.4	54	0.8	7.9	149	0.6
SP-06 1-2 O	2006	48.49495	-92.88618	low/medium	32.70	14	3,250	1.80	4.1	22.1	3,800	24.0	83.6	0.24	4.9	1.0	425	<0.1	2.8	0.4	0.8	37	0.6	5.4	313	<0.2
SP-06 2-1 O	2006	48.49599	-92.88988	unburned	13.70	14	10,029	2.19	6.1	26.0	9,900	74.2	89.9	1.23	6.5	2.9	506	<0.1	4.0	1.3	1.3	48	0.7	9.2	393	0.2
SP-06 3-3 O	2006	48.49950	-92.88430	unburned	13.70	14	4,310	2.33	5.2	33.9	6,680	40.3	97.9	0.61	5.3	2.0	472	<0.1	3.3	0.5	5.5	44	0.8	6.7	319	<0.2
SP-06 4-1 O	2006	48.49866	-92.89069	unburned	49.30	15	11,733	2.17	6.7	19.3	4,460	56.4	96.0	0.85	6.7	2.5	408	<0.1	5.1	0.6	2.4	53	0.8	8.6	286	<0.2
SP-06 5-1 O	2006	48.50055	-92.88857	unburned	22.30	15	6,030	1.54	4.7	27.7	5,670	62.0	111.0	0.81	5.8	2.2	453	<0.1	3.7	0.6	1.2	42	0.6	7.9	410	0.3
SP-06 5-1 O dup.	2006	48.50055	-92.88857	unburned	18.00	9	10,755	2.24	2.9	19.9	7,920	42.9	71.8	0.57	4.3	1.6	785	<0.1	2.6	0.4	0.8	27	2.7	5.9	754	0.3
SP-06 5-2 O	2006	48.50060	-92.88860	low/medium	45.00	10	1,890	0.84	4.1	13.7	1,840	25.5	91.5	0.21	4.9	1.2	318	<0.1	2.8	0.5	0.7	31	0.8	5.7	124	<0.2
SP-06 5-3 O	2006	48.50060	-92.88840	high	36.70	20	3,670	1.54	6.2	27.7	2,540	67.6	104.0	0.95	7.4	2.4	397	<0.1	3.9	0.9	1.2	60	0.8	9.1	224	0.4
SP-06 6-1 O	2006	48.50142	-92.88990	unburned	26.50	17	10,307	1.88	7.1	19.5	5,230	88.9	97.0	1.20	5.4	5.3	378	<0.1	4.6	0.8	1.5	57	0.9	8.2	368	0.3
SP-06 7-1 O	2006	48.50540	-92.89810	unburned	9.00	14	4,660	2.92	5.2	42.5	14,356	121.0	168.0	2.02	8.0	3.5	523	<0.1	4.2	1.7	76.6	54	0.9	25.0	396	0.3
SP-06 8-1 O	2006	48.50166	-92.87214	unburned	14.30	14	14,495	2.35	4.6	30.4	10,214	55.8	109.0	0.96	4.7	2.2	727	<0.1	3.2	0.7	1.4	41	0.7	7.7	764	0.3
SP-06 9-1 O	2006	48.50080	-92.87210	unburned	22.00	15	6,180	1.40	5.1	23.8	6,230	60.2	118.0	0.97	6.1	2.7	494	<0.1	3.8	0.7	1.2	45	1.2	8.1	434	0.2
SP-06 10-1 O	2006	48.50210	-92.88490	unburned	21.50	19	7,790	3.14	5.9	28.3	8,140	48.9	110.0	0.70	6.3	1.9	439	<0.1	3.5	0.6	1.1	49	0.7	8.0	709	0.3

Field no.	Year collected	Latitude	Longitude	Fire severity	Depth (cm)	Al (wt. %)	Ca (wt. %)	Fe (wt. %)	K (wt. %)	Mg (wt. %)	Na (wt. %)	S (wt. %)	Ti (wt. %)	Ag (ppm)	As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs (ppm)	Cu (ppm)	Ga (ppm)	Hg (ppm)	In (ppm)	La (ppm)	Li (ppm)
SP-1-1 C	2004	48.49490	-92.88660	unburned	61	6.61	1.36	1.71	1.74	0.50	2.28	<0.01	0.14	<1	2	423	1.5	0.12	<0.1	17.7	6.5	34	1.80	10.5	14.0	<0.02	<0.02	9.6	15
SP-2-2 C	2004	48.49617	-92.88976	low/medium	46	6.90	1.40	1.94	1.87	0.64	2.41	<0.01	0.14	<1	2	447	1.5	0.16	<0.1	21.8	7.9	41	1.56	12.0	14.5	<0.02	<0.02	11.2	18
SP-2-2 C dup	2004	48.49617	-92.88976	low/medium	46	6.79	1.39	1.94	1.78	0.61	2.36	<0.01	0.14	<1	2	436	1.6	0.16	<0.1	22.4	7.8	35	1.51	11.2	14.2	<0.02	0.02	11.4	17
SP-4-3 C	2004	48.49830	-92.89090	high	40	6.68	1.28	1.99	1.68	0.51	2.11	0.01	0.16	<1	2	429	1.3	0.13	<0.1	19.0	8.7	37	2.03	8.8	14.3	0.03	0.02	9.4	16
SP-5-3 C	2004	48.50060	-92.88840	high	50	6.87	1.43	2.05	1.79	0.58	2.35	0.01	0.17	<1	2	434	1.5	0.11	<0.1	14.4	7.2	45	1.88	7.7	14.4	<0.02	0.02	7.9	19
SP-7-3 C	2004	48.50480	-92.89560	high	45	6.37	1.32	1.58	1.68	0.42	2.32	0.01	0.15	<1	1	428	1.4	0.13	<0.1	15.8	5.8	53	1.65	5.4	14.0	<0.02	<0.02	8.4	16
SP-8-3 C	2004	48.50180	-92.87250	high	61	7.73	1.36	3.17	1.29	0.88	2.13	0.02	0.22	<1	2	346	1.7	0.28	<0.1	25.6	10.2	74	3.13	14.0	16.7	0.03	0.03	12.6	39

Field no.	Year collected	Latitude	Longitude	Fire severity	Depth (cm)	Mn (ppm)	Mo (ppm)	Nb (ppm)	Ni (ppm)	P (ppm)	Pb (ppm)	Rb (ppm)	Sb (ppm)	Sc (ppm)	Sn (ppm)	Sr (ppm)	Te (ppm)	Th (ppm)	Tl (ppm)	U (ppm)	V (ppm)	W (ppm)	Y (ppm)	Zn (ppm)	Se (ppm)	Total C (wt. %)
SP-1-1 C	2004	48.49490	-92.88660	unburned	61	241	0.21	3.7	19.5	260	15.5	68.5	0.10	5.6	0.9	275	<0.1	3.1	0.4	1.0	44	0.3	5.4	30	<0.2	0.41
SP-2-2 C	2004	48.49617	-92.88976	low/medium	46	303	0.26	3.9	24.4	360	16.5	82.3	0.09	6.1	2.2	271	<0.1	3.8	0.5	1.1	50	0.4	5.7	29	<0.2	0.45
SP-2-2 C dup	2004	48.49617	-92.88976	low/medium	46	301	0.20	4.0	23.0	340	16.3	75.4	0.09	6.1	1.9	269	<0.1	4.1	0.4	1.2	51	0.3	5.6	30	<0.2	0.42
SP-4-3 C	2004	48.49830	-92.89090	high	40	273	0.48	4.4	26.3	340	16.1	73.3	0.15	5.7	0.8	253	<0.1	4.4	0.4	1.4	52	0.5	5.6	42	0.4	0.92
SP-5-3 C	2004	48.50060	-92.88840	high	50	325	0.46	4.4	18.9	180	16.4	76.9	0.16	5.8	2.2	278	<0.1	3.0	0.4	0.9	51	0.3	5.0	35	<0.2	1.08
SP-7-3 C	2004	48.50480	-92.89560	high	45	276	0.52	4.3	17.1	360	16.1	82.1	0.15	5.3	0.8	265	<0.1	3.3	0.4	0.9	40	0.3	5.8	28	<0.2	1.18
SP-8-3 C	2004	48.50180	-92.87250	high	61	344	0.76	5.7	28.9	1,010	16.9	64.7	0.20	7.8	2.2	275	<0.1	5.1	0.4	2.7	78	0.7	6.1	54	0.4	1.65

Station no.	Lake	Collection Date			Sample no.	Sampling depth (m)	Secchi disc transparency (m)	Dissolved oxygen (mg/L)	pH [field]	pH [lab]	Specific conductance		Air temperature (°C)	Water temperature (°C)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Alkalinity (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)
											Field	Lab									
		Month	Day	Year							(µS/cm)	(µS/cm)									
483129092462001	Peary	5	8	2003	300338	0.05															
483109092422601	Ryan	5	8	2003	300339	0.05															
483059092474501	Brown	5	9	2003	300340	0.05															
483059092474501	Brown	5	19	2004	400181	0.05	3.0	11.4	6.9	7.0	22	26		12.9	2.10	0.852	0.60	1.08	6	8	0
483129092462001	Peary	5	19	2004	400171	0.05	2.3	11.8		7.1	26	30	18.5	13.1	2.48	1.060	0.71	1.14	10	8	0
483109092422601	Ryan	5	19	2004	400173	0.05	3.5	11.1	6.8	7.2	27	31	16.5	13.4	2.65	0.953	0.56	1.10	6	7	0
483059092474501	Brown	8	5	2004	400358	0.05	3.0	8.3	7.4	6.6	26	26	22.5	24.2	2.10	0.884	0.65	1.10	5	6	
483129092462001	Peary	8	5	2004	400357	0.05	2.5	8.5	7.3	6.4	32	31	24.0	26.7	2.65	1.160	0.61	1.17	10	12	0
483109092422601	Ryan	8	5	2004	400356	0.05	2.5	8.4	7.0	6.5	30	29		22.8	2.49	0.995	0.53	1.12	6	7	0
482951092531601	Shoepack	8	25	2004	400624	0.05															
482951092531601	Shoepack	9	22	2004	400613	0.05	1.5	8.6	6.4	7.1	29	35	13.5	16.8	2.68	1.150	0.85	1.23	4	5	0
483059092474501	Brown	9	23	2004	400588	0.05	2.5	9.2	7.0	7.0	23	27	21.5	17.2	2.08	0.853	0.62	1.06	6	8	0
483129092462001	Peary	9	23	2004	400607	0.05	2.7	8.9	6.9	6.9	28	32	18.0	16.9	2.56	1.150	0.57	1.17	10	12	0
483109092422601	Ryan	9	23	2004	400594	0.05	2.0	8.8	6.8	7.0	27	32	15.0	16.8	2.48	0.954	0.55	1.12	6	7	0
482951092531601	Shoepack	5	12	2005	500325	0.05		9.9	6.2	6.7	26	31		11.7	2.40	1.040	0.71	1.06	4	4	0
482951092531601	Shoepack	5	12	2005	500611	0.05															
483059092474501	Brown	5	13	2005	500322	0.05	2.4	10.1	6.6	6.8	23	25		10.9	1.96	0.877	0.60	0.98	6	7	0
483129092462001	Peary	5	13	2005	500323	0.05	2.0	10.4	6.8	7.0	27	28		11.1	2.50	1.110	0.64	1.07	8	10	0
483109092422601	Ryan	5	13	2005	500324	0.05	3.2	10.1	6.5	6.8	27	28		11.1	2.46	0.985	0.48	1.01	4	5	0
483059092474501	Brown	7	13	2005	500388	0.05	2.4	7.2	7.1		25			29.0							
483129092462001	Peary	7	13	2005	500389	0.05	2.1	7.2	7.3		29			28.7							
482951092531601	Shoepack	7	14	2005	500390	0.05	1.2	8.8	7.2		30			27.3							
483109092422601	Ryan	7	15	2005	500612	0.05															
483059092474501	Brown	9	14	2005	500528	0.05	2.0	8.5	6.9		27		15.0	19.1							
483129092462001	Peary	9	14	2005	500529	0.05	2.5	8.2	6.9		29		14.0	19.2							
483109092422601	Ryan	9	14	2005	500527	0.05	1.5	8.3	6.5		31		13.5	19.2							
483059092474501	Brown	5	16	2006	600190	0.05	3.0	10.1	6.5		19			13.8							
483129092462001	Peary	5	16	2006	600189	0.05	2.6	10.1	6.8		22			14.0							
483109092422601	Ryan	5	16	2006	600192	0.05	3.5	8.9	6.5		24			15.4							
482951092531601	Shoepack	5	17	2006	600191	0.05	1.2	9.9	6.0		20			13.9							
482951092531601	Shoepack	7	27	2006	600710	0.05															
483059092474501	Brown	7	28	2006	600712	0.05															
483129092462001	Peary	7	28	2006	600711	0.05															
483109092422601	Ryan	7	28	2006	600708	0.05															
482805092484101	Agnes	8	2	2006	600709	0.05															
482951092531601	Shoepack	9	15	2006	500526	0.05	1.5	7.9	6.1		27		18.0	18.5							

Station no.	Lake	Collection Date			Sample no.	Sampling depth (m)	Chloride (mg/L)	Fluoride (mg/L)	Silica (mg/L)	Sulfate (mg/L)	Ammonia + organic nitrogen		Ammonia (mg/L)	Nitrite + nitrate (mg/L as N)	Nitrite (mg/L as N)	Orthophosphate (mg/L as P)	Phosphorus		Organic carbon (mg/L)	Iron (µg/L)	Manganese (µg/L)	Mercury (ng/L)
		Month	Day	Year							Filtered (mg/L)	Unfiltered (mg/L)					Filtered (mg/L)	Unfiltered (mg/L)				
483129092462001	Peary	5	8	2003	300338	0.05																0.96
483109092422601	Ryan	5	8	2003	300339	0.05																2.38
483059092474501	Brown	5	9	2003	300340	0.05																1.34
483059092474501	Brown	5	19	2004	400181	0.05	0.24	<0.17	2.41	1.50	0.35	0.43	E0.02	0.09	<0.008	<0.02	E0.004	<0.004	7.6	141	3.4	1.97
483129092462001	Peary	5	19	2004	400171	0.05	0.28	<0.17	1.56	1.86	0.37	0.44	<0.04	<0.06	<0.008	<0.02	0.006	E0.004	7.7	81	0.9	1.72
483109092422601	Ryan	5	19	2004	400173	0.05	0.26	<0.17	2.61	3.33	0.50	0.50	0.10	<0.06	<0.008	<0.02	0.005	0.005	10.3	190	29.5	3.43
483059092474501	Brown	8	5	2004	400358	0.05	0.23	<0.17	1.06	1.95	0.38	0.46	<0.04	<0.06	<0.008	<0.02	<0.004	0.005	8.5	27	E0.4	1.21
483129092462001	Peary	8	5	2004	400357	0.05	0.25	<0.17	0.55	1.87	0.41	0.55	<0.04	<0.06	<0.008	<0.02	E0.004	0.015	8.6	42	0.9	1.11
483109092422601	Ryan	8	5	2004	400356	0.05	0.24	<0.17	1.69	3.52	0.40	0.48	<0.04	<0.06	<0.008	<0.02	E0.003	0.007	9.8	35	E0.6	2.40
482951092531601	Shoepack	8	25	2004	400624	0.05													15.0			2.46
482951092531601	Shoepack	9	22	2004	400613	0.05	0.28	0.17	1.35	2.94	0.59	0.71	<0.04	<0.06	<0.008	<0.02	0.008	0.026	14.8	291	10.9	2.78
483059092474501	Brown	9	23	2004	400588	0.05	0.20	<0.17	1.06	1.32	0.36	0.46	<0.04	<0.06	<0.008	<0.02	E0.002	0.010	8.3	47	1.5	1.59
483129092462001	Peary	9	23	2004	400607	0.05	0.22	<0.17	0.75	1.17	0.44	0.53	<0.04	<0.06	<0.008	<0.02	0.005	0.017	8.5	47	2.5	1.33
483109092422601	Ryan	9	23	2004	400594	0.05	0.23	<0.17	1.71	2.75	0.42	0.53	<0.04	<0.06	<0.008	<0.02	E0.003	0.012	10.4	26	1.7	2.49
482951092531601	Shoepack	5	12	2005	500325	0.05	0.34	0.10	3.31	3.46	0.52	0.66	<0.04	0.08	<0.008	<0.02	0.008	0.023	15.3	286	47.2	3.94
482951092531601	Shoepack	5	12	2005	500611	0.05													15.1			3.74
483059092474501	Brown	5	13	2005	500322	0.05	0.22	<0.10	2.98	1.66	0.38	0.50	<0.04	0.07	<0.008	<0.02	0.006	0.011	9.6	173	13.8	2.56
483129092462001	Peary	5	13	2005	500323	0.05	0.23	<0.10	2.17	1.58	0.37	0.49	<0.04	<0.06	<0.008	<0.02	0.006	0.024	9.3	145	0.7	2.01
483109092422601	Ryan	5	13	2005	500324	0.05	0.24	<0.10	3.58	3.28	0.48	0.57	0.08	E0.05	<0.008	<0.02	0.006	0.011	11.2	178	29.1	3.07
483059092474501	Brown	7	13	2005	500388	0.05													10.1			2.24
483129092462001	Peary	7	13	2005	500389	0.05													9.8			1.77
482951092531601	Shoepack	7	14	2005	500390	0.05													15.3			3.69
483109092422601	Ryan	7	15	2005	500612	0.05													12.0			2.35
483059092474501	Brown	9	14	2005	500528	0.05																2.04
483129092462001	Peary	9	14	2005	500529	0.05																1.09
483109092422601	Ryan	9	14	2005	500527	0.05																2.55
483059092474501	Brown	5	16	2006	600190	0.05													8.6			1.96
483129092462001	Peary	5	16	2006	600189	0.05																1.53
483109092422601	Ryan	5	16	2006	600192	0.05													6.5			3.02
482951092531601	Shoepack	5	17	2006	600191	0.05													14.7			3.58
482951092531601	Shoepack	7	27	2006	600710	0.05																2.07
483059092474501	Brown	7	28	2006	600712	0.05																1.58
483129092462001	Peary	7	28	2006	600711	0.05																0.86
483109092422601	Ryan	7	28	2006	600708	0.05																2.85
482805092484101	Agnes	8	2	2006	600709	0.05																3.05
482951092531601	Shoepack	9	15	2006	500526	0.05																2.24

Station no.	Lake	Collection Date			Sample no.	Sampling depth (m)	Methylmercury (ng/L)
		Month	Day	Year			
483129092462001	Peary	5	8	2003	300338	0.05	0.07
483109092422601	Ryan	5	8	2003	300339	0.05	0.12
483059092474501	Brown	5	9	2003	300340	0.05	0.06
483059092474501	Brown	5	19	2004	400181	0.05	<0.04
483129092462001	Peary	5	19	2004	400171	0.05	<0.04
483109092422601	Ryan	5	19	2004	400173	0.05	0.16
483059092474501	Brown	8	5	2004	400358	0.05	<0.04
483129092462001	Peary	8	5	2004	400357	0.05	0.07
483109092422601	Ryan	8	5	2004	400356	0.05	0.11
482951092531601	Shoepack	8	25	2004	400624	0.05	0.20
482951092531601	Shoepack	9	22	2004	400613	0.05	0.11
483059092474501	Brown	9	23	2004	400588	0.05	0.06
483129092462001	Peary	9	23	2004	400607	0.05	<0.04
483109092422601	Ryan	9	23	2004	400594	0.05	0.08
482951092531601	Shoepack	5	12	2005	500325	0.05	0.24
482951092531601	Shoepack	5	12	2005	500611	0.05	0.26
483059092474501	Brown	5	13	2005	500322	0.05	0.16
483129092462001	Peary	5	13	2005	500323	0.05	0.10
483109092422601	Ryan	5	13	2005	500324	0.05	0.19
483059092474501	Brown	7	13	2005	500388	0.05	0.17
483129092462001	Peary	7	13	2005	500389	0.05	0.07
482951092531601	Shoepack	7	14	2005	500390	0.05	0.20
483109092422601	Ryan	7	15	2005	500612	0.05	0.10
483059092474501	Brown	9	14	2005	500528	0.05	0.10
483129092462001	Peary	9	14	2005	500529	0.05	<0.04
483109092422601	Ryan	9	14	2005	500527	0.05	0.15
483059092474501	Brown	5	16	2006	600190	0.05	0.11
483129092462001	Peary	5	16	2006	600189	0.05	0.06
483109092422601	Ryan	5	16	2006	600192	0.05	0.11
482951092531601	Shoepack	5	17	2006	600191	0.05	0.18
482951092531601	Shoepack	7	27	2006	600710	0.05	0.26
483059092474501	Brown	7	28	2006	600712	0.05	0.11
483129092462001	Peary	7	28	2006	600711	0.05	0.06
483109092422601	Ryan	7	28	2006	600708	0.05	0.10
482805092484101	Agnes	8	2	2006	600709	0.05	0.26
482951092531601	Shoepack	9	15	2006	500526	0.05	0.16

Sample ID	Lake	Collection date			Total length (mm)	Fish wet weight (g)	Total mercury wet weight (ng/g)	Fish dry weight (g)	Total mercury dry weight (ng/g)	Age (years)
		Month	Day	Year						
br03yp019	Brown	5	12	2003	54	1.42	71	0.299	338	1
br03yp026	Brown	5	12	2003	58	1.56	77	0.331	361	1
br03yp011	Brown	5	12	2003	56	1.58	76	0.331	364	1
br03yp041	Brown	5	12	2003	50	1.13	72	0.221	367	1
br03yp027	Brown	5	12	2003	54	1.31	74	0.262	368	1
br03yp034	Brown	5	12	2003	54	1.36	80	0.293	369	1
br03yp021	Brown	5	12	2003	53	1.50	78	0.312	373	1
br03yp018	Brown	5	12	2003	55	1.46	76	0.296	375	1
br03yp013	Brown	5	12	2003	63	2.12	81	0.456	377	1
br03yp017	Brown	5	12	2003	57	1.58	78	0.320	385	1
br03yp015	Brown	5	12	2003	55	1.42	82	0.294	396	1
br03yp043	Brown	5	12	2003	49	1.15	81	0.236	397	1
br03yp012	Brown	5	12	2003	56	1.46	80	0.292	399	1
br03yp006	Brown	5	12	2003	59	1.95	88	0.430	401	1
br03yp044	Brown	5	12	2003	58	1.57	84	0.325	404	1
br03yp030	Brown	5	12	2003	57	1.69	89	0.371	406	1
br03yp025	Brown	5	12	2003	54	1.21	83	0.247	407	1
br03yp005	Brown	5	12	2003	53	1.27	81	0.249	411	1
br03yp004	Brown	5	12	2003	59	1.84	89	0.395	415	1
br03yp020	Brown	5	12	2003	58	1.85	77	0.342	417	1
br03yp022	Brown	5	12	2003	59	1.74	86	0.355	419	1
br03yp023	Brown	5	12	2003	53	1.32	83	0.257	425	1
br03yp039	Brown	5	12	2003	53	1.40	86	0.280	430	1
br03yp046	Brown	5	12	2003	58	1.85	90	0.381	436	1
br03yp042	Brown	5	12	2003	53	1.31	87	0.261	437	1
br03yp024	Brown	5	12	2003	52	1.24	82	0.231	438	1
br03yp014	Brown	5	12	2003	55	1.49	89	0.304	438	1
br03yp008	Brown	5	12	2003	54	1.33	90	0.270	444	1
br03yp016	Brown	5	12	2003	53	1.40	86	0.270	445	1
br03yp029	Brown	5	12	2003	57	1.79	96	0.385	445	1
br03yp007	Brown	5	12	2003	52	1.32	91	0.268	448	1
br03yp050	Brown	5	12	2003	49	1.16	94	0.242	452	1
br03yp035	Brown	5	12	2003	54	1.27	90	0.252	453	1
br03yp037	Brown	5	12	2003	52	1.14	83	0.207	456	1
br03yp009	Brown	5	12	2003	59	1.68	91	0.332	463	1
br03yp010	Brown	5	12	2003	50	1.09	89	0.205	473	1
br03yp051	Brown	5	12	2003	55	1.32	96	0.267	473	1
br03yp028	Brown	5	12	2003	54	1.37	104	0.289	493	1
br03yp045	Brown	5	12	2003	57	1.51	103	0.309	505	1
br03yp038	Brown	5	12	2003	54	1.48	104	0.298	515	1
br03yp036	Brown	5	12	2003	55	1.47	109	0.310	516	1
br03yp040	Brown	5	12	2003	54	1.17	101	0.226	525	1
br03yp031	Brown	5	12	2003	57	1.58	111	0.334	526	1
br03yp032	Brown	5	12	2003	49	1.17	111	0.244	530	1
br03yp047	Brown	5	12	2003	58	1.62	106	0.319	539	1
br03yp033	Brown	5	12	2003	62	2.02	115	0.427	543	1
br03yp049	Brown	5	12	2003	53	1.36	107	0.262	553	1
pe03yp029	Peary	5	8	2003	61	2.11	47	0.456	216	1
pe03yp023	Peary	5	8	2003	58	1.71	50	0.349	247	1
pe03yp016	Peary	5	8	2003	52	1.28	50	0.248	257	1
pe03yp026	Peary	5	8	2003	56	1.55	53	0.312	261	1
pe03yp019	Peary	5	8	2003	52	1.31	52	0.256	266	1
pe03yp004	Peary	5	8	2003	55	1.65	55	0.341	268	1
pe03yp021	Peary	5	8	2003	64	2.38	58	0.515	270	1
pe03yp006	Peary	5	8	2003	47	0.95	53	0.181	279	1
pe03yp001	Peary	5	8	2003	53	1.52	60	0.312	294	1
pe03yp002	Peary	5	8	2003	57	1.67	58	0.326	295	1
pe03yp020	Peary	5	8	2003	47	1.03	57	0.197	300	1
pe03yp025	Peary	5	8	2003	47	1.06	60	0.206	306	1
pe03yp007	Peary	5	8	2003	54	1.35	62	0.265	318	1
pe03yp010	Peary	5	8	2003	46	0.91	66	0.179	335	1
pe03yp011	Peary	5	8	2003	51	1.24	67	0.247	336	1
pe03yp030	Peary	5	8	2003	50	1.13	70	0.228	345	1
pe03yp022	Peary	5	8	2003	53	1.34	72	0.275	349	1
pe03yp009	Peary	5	8	2003	54	1.18	70	0.235	352	1
pe03yp013	Peary	5	8	2003	52	1.39	70	0.273	354	1
pe03yp003	Peary	5	8	2003	52	1.25	70	0.246	357	1
pe03yp024	Peary	5	8	2003	48	0.98	69	0.187	361	1
pe03yp014	Peary	5	8	2003	50	1.14	72	0.224	364	1
pe03yp005	Peary	5	8	2003	49	1.12	72	0.215	377	1
pe03yp008	Peary	5	8	2003	47	0.96	74	0.188	377	1
pe03yp015	Peary	5	8	2003	48	0.95	68	0.168	384	1
pe03yp018	Peary	5	8	2003	48	1.02	72	0.189	389	1
pe03yp012	Peary	5	8	2003	45	0.77	73	0.144	391	1
pe03yp027	Peary	5	8	2003	46	0.81	79	0.160	398	1
pe03yp017	Peary	5	8	2003	49	0.90	74	0.161	415	1

Sample ID	Lake	Collection date			Total length (mm)	Fish wet weight (g)	Total mercury wet weight (ng/g)	Fish dry weight (g)	Total mercury dry weight (ng/g)	Age (years)
		Month	Day	Year						
pe03yp028	Peary	5	8	2003	49	1.07	79	0.203	417	1
ry03yp023	Ryan	5	12	2003	57	1.36	59	0.266	301	1
ry03yp020	Ryan	5	12	2003	58	1.61	87	0.319	440	1
ry03yp005	Ryan	5	12	2003	54	1.37	100	0.247	555	1
ry03yp025	Ryan	5	12	2003	58	1.68	109	0.320	570	1
ry03yp017	Ryan	5	12	2003	53	1.20	105	0.220	572	1
ry03yp030	Ryan	5	12	2003	67	2.30	111	0.415	614	1
ry03yp010	Ryan	5	12	2003	63	2.04	126	0.409	627	1
ry03yp027	Ryan	5	12	2003	56	1.09	110	0.188	639	1
ry03yp029	Ryan	5	12	2003	60	1.87	126	0.351	669	1
ry03yp012	Ryan	5	12	2003	53	1.23	125	0.226	680	1
ry03yp001	Ryan	5	12	2003	74	3.81	144	0.773	709	1
ry03yp008	Ryan	5	12	2003	54	1.32	145	0.256	746	1
ry03yp003	Ryan	5	12	2003	53	1.09	143	0.208	748	1
ry03yp019	Ryan	5	12	2003	50	1.02	146	0.199	749	1
ry03yp016	Ryan	5	12	2003	50	1.04	189	0.191	1,028	1
ry03yp015	Ryan	5	12	2003	50	1.04	189	0.190	1,034	1
ry03yp021	Ryan	5	12	2003	52	1.27	227	0.253	1,138	1
ry03yp007	Ryan	5	12	2003	49	0.95	218	0.180	1,149	1
ry03yp018	Ryan	5	12	2003	50	1.03	217	0.194	1,151	1
ry03yp011	Ryan	5	12	2003	49	1.03	222	0.186	1,230	1
ry03yp013	Ryan	5	12	2003	50	0.96	165	0.127	1,245	1
ry03yp006	Ryan	5	12	2003	47	0.78	232	0.142	1,277	1
ry03yp002	Ryan	5	12	2003	63	2.08	266	0.411	1,347	1
ry03yp004	Ryan	5	12	2003	47	0.81	262	0.157	1,354	1
ry03yp022	Ryan	5	12	2003	48	0.87	253	0.153	1,440	1
ry03yp009	Ryan	5	12	2003	51	1.01	276	0.191	1,460	1
ry03yp026	Ryan	5	12	2003	47	0.73	285	0.142	1,468	1
ry03yp024	Ryan	5	12	2003	57	1.52	274	0.278	1,498	1
ry03yp014	Ryan	5	12	2003	57	1.50	297	0.282	1,579	1
br04yp021	Brown	5	18	2004	54	1.19	42	0.234	211	1
br04yp018	Brown	5	18	2004	48	1.00	45	0.205	221	1
br04yp020	Brown	5	18	2004	49	1.08	46	0.216	231	1
br04yp026	Brown	5	18	2004	51	1.16	48	0.238	233	1
br04yp004	Brown	5	18	2004	49	1.07	47	0.215	235	1
br04yp012	Brown	5	18	2004	50	1.26	53	0.275	245	1
br04yp008	Brown	5	18	2004	49	1.10	52	0.232	248	1
br04yp028	Brown	5	18	2004	53	1.19	49	0.233	253	1
br04yp017	Brown	5	18	2004	53	1.12	52	0.231	253	1
br04yp003	Brown	5	18	2004	48	1.00	52	0.204	256	1
br04yp027	Brown	5	18	2004	51	1.06	55	0.225	261	1
br04yp010	Brown	5	18	2004	50	1.13	54	0.227	267	1
br04yp016	Brown	5	18	2004	47	0.94	55	0.192	271	1
br04yp011	Brown	5	18	2004	47	0.93	54	0.183	274	1
br04yp005	Brown	5	18	2004	49	1.14	57	0.233	277	1
br04yp019	Brown	5	18	2004	47	0.91	56	0.180	281	1
br04yp002	Brown	5	18	2004	47	0.98	55	0.190	286	1
br04yp030	Brown	5	18	2004	50	1.27	58	0.254	288	1
br04yp006	Brown	5	18	2004	47	0.93	57	0.185	289	1
br04yp014	Brown	5	18	2004	47	0.94	61	0.193	296	1
br04yp013	Brown	5	18	2004	49	1.07	60	0.216	296	1
br04yp015	Brown	5	18	2004	49	1.03	60	0.207	297	1
br04yp024	Brown	5	18	2004	54	1.29	61	0.261	300	1
br04yp029	Brown	5	18	2004	52	1.23	60	0.244	301	1
br04yp023	Brown	5	18	2004	52	1.24	60	0.243	307	1
br04yp007	Brown	5	18	2004	43	0.75	65	0.155	315	1
br04yp009	Brown	5	18	2004	51	0.96	70	0.181	370	1
br04yp022	Brown	5	18	2004	50	1.07	81	0.225	385	1
br04yp025	Brown	5	18	2004	55	1.41	79	0.281	394	1
br04yp001	Brown	5	18	2004	49	0.82	69	0.141	401	1
pe04yp011	Peary	5	19	2004	59	1.93	26	0.419	121	1
pe04yp002	Peary	5	19	2004	60	2.06	25	0.428	122	1
pe04yp022	Peary	5	19	2004	59	1.96	25	0.397	123	1
pe04yp010	Peary	5	19	2004	58	1.70	29	0.366	137	1
pe04yp017	Peary	5	19	2004	59	1.83	28	0.369	141	1
pe04yp019	Peary	5	19	2004	60	2.09	31	0.454	144	1
pe04yp023	Peary	5	19	2004	60	2.02	31	0.432	145	1
pe04yp008	Peary	5	19	2004	60	2.00	31	0.422	146	1
pe04yp001	Peary	5	19	2004	56	1.49	28	0.283	146	1
pe04yp013	Peary	5	19	2004	57	1.87	32	0.404	149	1
pe04yp016	Peary	5	19	2004	57	1.67	30	0.339	149	1
pe04yp021	Peary	5	19	2004	58	1.89	33	0.408	154	1
pe04yp009	Peary	5	19	2004	60	2.03	34	0.440	156	1
pe04yp015	Peary	5	19	2004	60	2.22	34	0.473	158	1
pe04yp014	Peary	5	19	2004	57	1.73	35	0.379	159	1
pe04yp003	Peary	5	19	2004	57	1.56	32	0.306	161	1

Sample ID	Lake	Collection date			Total length (mm)	Fish wet weight (g)	Total mercury wet weight (ng/g)	Fish dry weight (g)	Total mercury dry weight (ng/g)	Age (years)
		Month	Day	Year						
pe04yp020	Peary	5	19	2004	58	1.68	33	0.343	162	1
pe04yp004	Peary	5	19	2004	56	1.72	33	0.345	165	1
pe04yp006	Peary	5	19	2004	58	1.89	34	0.389	165	1
pe04yp005	Peary	5	19	2004	57	1.64	34	0.333	165	1
pe04yp007	Peary	5	19	2004	59	1.84	35	0.387	168	1
pe04yp018	Peary	5	19	2004	57	1.54	34	0.304	172	1
pe04yp012	Peary	5	19	2004	58	1.71	35	0.349	173	1
ry04yp021	Ryan	5	18	2004	65	2.41	141	0.503	675	1
ry04yp026	Ryan	5	18	2004	68	2.49	140	0.509	683	1
ry04yp019	Ryan	5	18	2004	65	2.37	142	0.486	694	1
ry04yp028	Ryan	5	18	2004	65	2.40	155	0.519	716	1
ry04yp012	Ryan	5	18	2004	64	2.45	154	0.528	716	1
ry04yp006	Ryan	5	18	2004	64	2.14	159	0.456	745	1
ry04yp011	Ryan	5	18	2004	65	2.34	167	0.511	766	1
ry04yp018	Ryan	5	18	2004	65	2.34	175	0.521	784	1
ry04yp017	Ryan	5	18	2004	67	2.52	167	0.537	786	1
ry04yp027	Ryan	5	18	2004	68	2.55	166	0.537	788	1
ry04yp022	Ryan	5	18	2004	66	2.41	159	0.487	788	1
ry04yp016	Ryan	5	18	2004	63	2.21	169	0.474	789	1
ry04yp009	Ryan	5	18	2004	65	2.57	169	0.547	795	1
ry04yp007	Ryan	5	18	2004	67	2.49	167	0.518	803	1
ry04yp015	Ryan	5	18	2004	63	2.05	180	0.445	828	1
ry04yp023	Ryan	5	18	2004	65	2.21	189	0.467	893	1
ry04yp029	Ryan	5	18	2004	66	2.37	188	0.498	895	1
ry04yp010	Ryan	5	18	2004	63	2.09	184	0.429	899	1
ry04yp008	Ryan	5	18	2004	67	2.02	180	0.401	906	1
ry04yp003	Ryan	5	18	2004	63	2.09	191	0.441	906	1
ry04yp024	Ryan	5	18	2004	68	2.83	199	0.614	917	1
ry04yp025	Ryan	5	18	2004	65	2.36	202	0.516	926	1
ry04yp004	Ryan	5	18	2004	64	2.15	194	0.448	929	1
ry04yp020	Ryan	5	18	2004	67	2.62	198	0.549	944	1
ry04yp002	Ryan	5	18	2004	77	3.48	195	0.719	946	1
ry04yp005	Ryan	5	18	2004	65	2.45	206	0.507	993	1
ry04yp014	Ryan	5	18	2004	60	1.71	208	0.349	1,018	1
ry04yp013	Ryan	5	18	2004	63	2.06	211	0.416	1,045	1
ry04yp030	Ryan	5	18	2004	79	2.60	258	0.590	1,137	1
br05yp016	Brown	5	16	2005	60	1.81	57	0.388	264	1
br05yp010	Brown	5	16	2005	60	1.99	57	0.411	274	1
br05yp008	Brown	5	16	2005	50	1.13	59	0.244	275	1
br05yp035	Brown	5	16	2005	55	1.55	58	0.320	282	1
br05yp031	Brown	5	16	2005	46	0.91	57	0.169	305	1
br05yp009	Brown	5	16	2005	53	1.33	64	0.274	313	1
br05yp003	Brown	5	16	2005	49	1.01	65	0.209	313	1
br05yp018	Brown	5	16	2005	53	1.30	63	0.261	313	1
br05yp007	Brown	5	16	2005	55	1.40	65	0.288	317	1
br05yp015	Brown	5	16	2005	54	1.34	64	0.267	320	1
br05yp020	Brown	5	16	2005	60	2.04	70	0.444	321	1
br05yp030	Brown	5	16	2005	48	1.09	65	0.222	322	1
br05yp026	Brown	5	16	2005	52	1.23	64	0.245	324	1
br05yp032	Brown	5	16	2005	50	1.04	65	0.207	325	1
br05yp011	Brown	5	16	2005	50	1.04	61	0.194	326	1
br05yp033	Brown	5	16	2005	48	0.92	67	0.185	336	1
br05yp024	Brown	5	16	2005	52	1.12	66	0.215	345	1
br05yp040	Brown	5	16	2005	54	1.45	67	0.279	351	1
br05yp019	Brown	5	16	2005	55	1.28	74	0.267	356	1
br05yp014	Brown	5	16	2005	59	1.64	73	0.330	362	1
br05yp034	Brown	5	16	2005	48	1.00	67	0.184	363	1
br05yp005	Brown	5	16	2005	49	0.97	78	0.207	367	1
br05yp021	Brown	5	16	2005	58	1.69	77	0.354	370	1
br05yp036	Brown	5	16	2005	57	1.67	73	0.328	373	1
br05yp027	Brown	5	16	2005	58	1.66	76	0.338	373	1
br05yp022	Brown	5	16	2005	53	1.24	74	0.245	375	1
br05yp004	Brown	5	16	2005	49	1.02	79	0.212	379	1
br05yp013	Brown	5	16	2005	57	1.55	81	0.330	382	1
br05yp012	Brown	5	16	2005	56	1.45	84	0.316	388	1
br05yp029	Brown	5	16	2005	48	0.93	78	0.186	392	1
br05yp001	Brown	5	16	2005	60	1.83	74	0.342	394	1
br05yp037	Brown	5	16	2005	52	1.40	80	0.284	395	1
br05yp017	Brown	5	16	2005	57	1.58	91	0.353	409	1
br05yp039	Brown	5	16	2005	52	1.30	84	0.264	415	1
br05yp038	Brown	5	16	2005	49	0.97	83	0.189	427	1
br05yp002	Brown	5	16	2005	51	1.22	82	0.233	432	1
br05yp023	Brown	5	16	2005	48	0.94	88	0.179	464	1
br05yp028	Brown	5	16	2005	59	1.75	93	0.338	480	1
br05yp025	Brown	5	16	2005	56	1.47	105	0.315	491	1
pe05yp004	Peary	5	15	2005	51	1.16	35	0.248	166	1

Sample ID	Lake	Collection date			Total length (mm)	Fish wet weight (g)	Total mercury wet weight (ng/g)	Fish dry weight (g)	Total mercury dry weight (ng/g)	Age (years)
		Month	Day	Year						
pe05yp002	Peary	5	15	2005	57	1.61	37	0.356	170	1
pe05yp001	Peary	5	15	2005	55	1.47	36	0.312	170	1
pe05yp007	Peary	5	15	2005	58	1.65	42	0.364	191	1
pe05yp003	Peary	5	15	2005	52	1.14	44	0.240	210	1
pe05yp005	Peary	5	15	2005	57	1.48	46	0.313	217	1
pe05yp006	Peary	5	15	2005	52	1.08	46	0.227	220	1
pe05yp009	Peary	5	15	2005	54	1.26	127	0.266	599	1
pe05yp011	Peary	5	15	2005	53	1.15	120	0.228	606	1
pe05yp013	Peary	5	15	2005	58	1.58	132	0.326	642	1
pe05yp010	Peary	5	15	2005	56	1.48	140	0.317	654	1
pe05yp014	Peary	5	15	2005	55	1.29	150	0.256	753	1
pe05yp008	Peary	5	15	2005	56	1.37	168	0.296	775	1
pe05yp012	Peary	5	15	2005	54	1.22	162	0.246	803	1
ry05yp008	Ryan	5	16	2005	52	1.19	35	0.258	160	1
ry05yp009	Ryan	5	16	2005	51	1.14	36	0.232	175	1
ry05yp013	Ryan	5	16	2005	48	0.92	37	0.182	185	1
ry05yp010	Ryan	5	16	2005	50	0.99	37	0.188	197	1
ry05yp012	Ryan	5	16	2005	55	1.40	47	0.300	219	1
ry05yp014	Ryan	5	16	2005	43	0.73	42	0.134	229	1
ry05yp011	Ryan	5	16	2005	47	0.91	48	0.190	230	1
ry05yp001	Ryan	5	15	2005	64	2.06	96	0.441	446	1
ry05yp003	Ryan	5	16	2005	51	1.09	144	0.238	662	1
ry05yp002	Ryan	5	15	2005	43	0.77	112	0.127	678	1
ry05yp007	Ryan	5	16	2005	47	1.08	127	0.193	712	1
ry05yp005	Ryan	5	16	2005	49	0.95	150	0.198	720	1
ry05yp006	Ryan	5	16	2005	52	1.18	157	0.253	730	1
ry05yp004	Ryan	5	16	2005	48	0.89	174	0.185	836	1
sh05yp010	Shoepack	5	13	2005	60	1.88	50	0.350	269	1
sh05yp029	Shoepack	5	13	2005	55	1.30	50	0.239	269	1
sh05yp006	Shoepack	5	13	2005	55	1.24	49	0.196	308	1
sh05yp019	Shoepack	5	13	2005	57	1.43	47	0.218	311	1
sh05yp004	Shoepack	5	13	2005	66	2.49	60	0.458	325	2
sh05yp013	Shoepack	5	13	2005	57	1.45	65	0.246	382	1
sh05yp022	Shoepack	5	13	2005	62	1.87	69	0.326	399	1
sh05yp002	Shoepack	5	13	2005	75	3.34	84	0.631	442	2
sh05yp025	Shoepack	5	13	2005	61	2.09	88	0.375	492	1
sh05yp030	Shoepack	5	13	2005	59	1.69	95	0.279	573	1
sh05yp008	Shoepack	5	13	2005	61	2.03	112	0.371	614	1
sh05yp007	Shoepack	5	13	2005	59	1.31	97	0.205	617	1
sh05yp012	Shoepack	5	13	2005	57	1.53	111	0.268	631	1
sh05yp023	Shoepack	5	13	2005	58	1.46	103	0.237	636	1
sh05yp011	Shoepack	5	13	2005	62	1.73	113	0.308	637	1
sh05yp021	Shoepack	5	13	2005	61	1.73	116	0.313	641	1
sh05yp032	Shoepack	5	13	2005	56	1.16	121	0.218	642	1
sh05yp015	Shoepack	5	13	2005	65	2.00	116	0.338	685	2
sh05yp003	Shoepack	5	13	2005	62	1.89	139	0.359	729	1
sh05yp001	Shoepack	5	13	2005	64	1.96	135	0.362	730	1
sh05yp024	Shoepack	5	13	2005	61	1.80	121	0.290	748	1
sh05yp005	Shoepack	5	13	2005	62	1.69	130	0.288	760	1
sh05yp027	Shoepack	5	13	2005	60	1.74	135	0.303	774	1
sh05yp016	Shoepack	5	13	2005	60	1.64	132	0.280	775	1
sh05yp031	Shoepack	5	13	2005	64	2.04	140	0.358	801	1
sh05yp018	Shoepack	5	13	2005	63	2.00	152	0.357	853	1
sh05yp017	Shoepack	5	13	2005	60	1.71	150	0.288	891	1
sh05yp026	Shoepack	5	13	2005	63	1.98	151	0.335	893	1
sh05yp009	Shoepack	5	13	2005	63	1.79	149	0.294	904	1
sh05yp014	Shoepack	5	13	2005	60	1.22	145	0.193	918	1
sh05yp020	Shoepack	5	13	2005	61	1.69	159	0.283	950	1
br06yp017	Brown	5	15	2006	53	1.38	98	0.294	460	1
br06yp013	Brown	5	15	2006	54	1.32	103	0.249	544	1
br06yp018	Brown	5	15	2006	50	1.08	119	0.235	549	1
br06yp003	Brown	5	15	2006	60	1.88	124	0.413	564	1
br06yp020	Brown	5	15	2006	51	1.11	123	0.237	576	1
br06yp016	Brown	5	15	2006	53	1.24	123	0.260	589	1
br06yp012	Brown	5	15	2006	54	1.33	118	0.261	600	1
br06yp008	Brown	5	15	2006	53	1.20	132	0.260	609	1
br06yp014	Brown	5	15	2006	52	1.20	129	0.251	616	1
br06yp019	Brown	5	15	2006	49	1.05	136	0.230	619	1
br06yp010	Brown	5	15	2006	53	1.17	132	0.249	621	1
br06yp007	Brown	5	15	2006	50	1.12	123	0.222	623	1
br06yp001	Brown	5	15	2006	54	1.41	133	0.297	633	1
br06yp009	Brown	5	15	2006	54	1.30	122	0.245	648	1
br06yp006	Brown	5	15	2006	55	1.32	134	0.268	660	1
br06yp026	Brown	5	15	2006	51	1.09	144	0.236	663	1
br06yp021	Brown	5	15	2006	51	1.05	137	0.215	668	1
br06yp024	Brown	5	15	2006	55	1.30	149	0.289	670	1

Sample ID	Lake	Collection date			Total length (mm)	Fish wet weight (g)	Total mercury wet weight (ng/g)	Fish dry weight (g)	Total mercury dry weight (ng/g)	Age (years)
		Month	Day	Year						
br06yp027	Brown	5	15	2006	58	1.56	148	0.345	671	1
br06yp011	Brown	5	15	2006	57	1.56	134	0.309	674	1
br06yp030	Brown	5	15	2006	51	1.07	149	0.231	691	1
br06yp004	Brown	5	15	2006	51	1.05	135	0.205	693	1
br06yp015	Brown	5	15	2006	53	1.22	142	0.248	699	1
br06yp022	Brown	5	15	2006	52	1.13	150	0.240	707	1
br06yp025	Brown	5	15	2006	56	1.35	158	0.290	737	1
br06yp029	Brown	5	15	2006	55	1.19	165	0.253	776	1
br06yp023	Brown	5	15	2006	51	1.15	164	0.240	786	1
br06yp002	Brown	5	15	2006	57	1.42	158	0.285	787	1
br06yp005	Brown	5	15	2006	51	1.20	172	0.254	811	1
br06yp028	Brown	5	15	2006	50	0.91	175	0.196	812	1
pe06yp017	Peary	5	15	2006	53	1.38	101	0.304	460	1
pe06yp013	Peary	5	15	2006	59	1.72	115	0.362	544	1
pe06yp018	Peary	5	15	2006	57	1.62	120	0.354	549	1
pe06yp003	Peary	5	15	2006	73	3.31	113	0.665	564	1
pe06yp020	Peary	5	15	2006	55	1.65	126	0.361	576	1
pe06yp016	Peary	5	15	2006	57	0.99	105	0.177	589	1
pe06yp012	Peary	5	15	2006	57	1.65	128	0.353	600	1
pe06yp008	Peary	5	15	2006	56	1.71	139	0.391	609	1
pe06yp014	Peary	5	15	2006	64	2.28	130	0.481	616	1
pe06yp019	Peary	5	15	2006	52	1.37	121	0.267	619	1
pe06yp010	Peary	5	15	2006	53	1.29	141	0.292	621	1
pe06yp007	Peary	5	15	2006	51	1.19	142	0.271	623	1
pe06yp001	Peary	5	15	2006	60	1.80	132	0.375	633	1
pe06yp009	Peary	5	15	2006	60	1.86	128	0.368	648	1
pe06yp006	Peary	5	15	2006	51	1.05	116	0.184	660	1
pe06yp026	Peary	5	15	2006	54	1.36	120	0.245	663	1
pe06yp021	Peary	5	15	2006	58	1.78	148	0.394	668	1
pe06yp024	Peary	5	15	2006	58	1.80	142	0.381	670	1
pe06yp027	Peary	5	15	2006	55	1.51	143	0.322	671	1
pe06yp011	Peary	5	15	2006	55	1.52	149	0.337	674	1
pe06yp030	Peary	5	15	2006	58	1.90	151	0.414	691	1
pe06yp004	Peary	5	15	2006	63	2.49	136	0.488	693	1
pe06yp015	Peary	5	15	2006	64	2.18	142	0.443	699	1
pe06yp022	Peary	5	15	2006	59	1.81	156	0.398	707	1
pe06yp025	Peary	5	15	2006	60	1.97	157	0.420	737	1
pe06yp029	Peary	5	15	2006	50	1.29	159	0.264	776	1
pe06yp023	Peary	5	15	2006	62	2.44	162	0.504	786	1
pe06yp002	Peary	5	15	2006	59	1.97	161	0.404	787	1
pe06yp005	Peary	5	15	2006	55	1.48	177	0.324	811	1
pe06yp028	Peary	5	15	2006	49	1.03	165	0.209	812	1
ry06yp002	Ryan	5	16	2006	58	1.73	98	0.360	469	1
ry06yp016	Ryan	5	16	2006	61	2.33	107	0.485	516	1
ry06yp004	Ryan	5	16	2006	52	1.29	110	0.267	532	1
ry06yp026	Ryan	5	16	2006	57	1.72	128	0.380	580	1
ry06yp013	Ryan	5	16	2006	54	1.85	123	0.363	629	1
ry06yp003	Ryan	5	16	2006	54	1.46	138	0.307	657	1
ry06yp019	Ryan	5	16	2006	53	1.35	147	0.294	676	1
ry06yp009	Ryan	5	16	2006	56	1.58	150	0.348	680	1
ry06yp015	Ryan	5	16	2006	60	1.89	156	0.420	701	1
ry06yp011	Ryan	5	16	2006	63	2.13	153	0.455	718	1
ry06yp005	Ryan	5	16	2006	53	1.45	155	0.307	733	1
ry06yp022	Ryan	5	16	2006	59	2.12	156	0.440	751	1
ry06yp025	Ryan	5	16	2006	56	1.52	158	0.320	751	1
ry06yp001	Ryan	5	16	2006	59	2.13	159	0.448	757	1
ry06yp006	Ryan	5	16	2006	56	1.74	150	0.342	764	1
ry06yp017	Ryan	5	16	2006	54	1.51	152	0.299	769	1
ry06yp020	Ryan	5	16	2006	52	1.48	171	0.324	780	1
ry06yp027	Ryan	5	16	2006	56	1.47	171	0.313	805	1
ry06yp018	Ryan	5	16	2006	51	1.25	168	0.259	813	1
ry06yp024	Ryan	5	16	2006	58	1.89	180	0.408	834	1
ry06yp028	Ryan	5	16	2006	56	1.70	172	0.348	839	1
ry06yp014	Ryan	5	16	2006	59	1.89	181	0.405	843	1
ry06yp008	Ryan	5	16	2006	56	1.83	166	0.360	846	1
ry06yp012	Ryan	5	16	2006	59	1.94	184	0.420	851	1
ry06yp029	Ryan	5	16	2006	54	1.62	180	0.338	860	1
ry06yp021	Ryan	5	16	2006	55	1.50	186	0.320	871	1
ry06yp030	Ryan	5	16	2006	56	1.79	183	0.368	891	1
ry06yp007	Ryan	5	16	2006	63	2.07	204	0.439	962	1
ry06yp023	Ryan	5	16	2006	59	1.66	186	0.310	994	1
ry06yp010	Ryan	5	16	2006	56	1.72	221	0.318	1,196	1
sh06yp037	Shoepack	5	17	2006	85	6.33	59	1.367	275	3
sh06yp033	Shoepack	5	17	2006	89	6.26	79	1.418	347	3
sh06yp035	Shoepack	5	17	2006	87	6.29	82	1.366	378	3
sh06yp020	Shoepack	5	17	2006	71	3.10	82	0.642	396	2

Sample ID	Lake	Collection date			Total length (mm)	Fish wet weight (g)	Total mercury wet weight (ng/g)	Fish dry weight (g)	Total mercury dry weight (ng/g)	Age (years)
		Month	Day	Year						
sh06yp055	Shoepack	5	17	2006	67	2.36	89	0.457	459	2
sh06yp013	Shoepack	5	17	2006	71	3.33	95	0.645	488	2
sh06yp010	Shoepack	5	17	2006	70	2.83	101	0.575	498	1
sh06yp043	Shoepack	5	17	2006	89	6.45	108	1.397	499	3
sh06yp047	Shoepack	5	17	2006	83	4.52	103	0.909	511	3
sh06yp016	Shoepack	5	17	2006	71	3.53	112	0.767	516	2
sh06yp012	Shoepack	5	17	2006	65	2.02	97	0.378	519	1
sh06yp008	Shoepack	5	17	2006	75	3.91	104	0.758	536	2
sh06yp060	Shoepack	5	17	2006	76	3.87	116	0.816	550	2
sh06yp024	Shoepack	5	17	2006	70	2.88	104	0.540	554	2
sh06yp059	Shoepack	5	17	2006	74	3.45	131	0.753	601	2
sh06yp058	Shoepack	5	17	2006	75	3.74	133	0.812	614	scales missing
sh06yp040	Shoepack	5	17	2006	83	5.04	132	1.078	617	3
sh06yp011	Shoepack	5	17	2006	73	3.44	125	0.692	624	2
sh06yp004	Shoepack	5	17	2006	68	2.39	128	0.482	633	1
sh06yp017	Shoepack	5	17	2006	67	2.13	119	0.400	633	1
sh06yp030	Shoepack	5	17	2006	66	2.47	118	0.461	635	1
sh06yp025	Shoepack	5	17	2006	74	3.49	131	0.717	639	2
sh06yp056	Shoepack	5	17	2006	71	3.32	135	0.698	643	2
sh06yp052	Shoepack	5	17	2006	80	4.50	142	0.994	645	3
sh06yp029	Shoepack	5	17	2006	70	2.73	124	0.522	648	1
sh06yp021	Shoepack	5	17	2006	67	2.64	133	0.532	660	1
sh06yp032	Shoepack	5	17	2006	84	4.61	130	0.902	662	3
sh06yp002	Shoepack	5	17	2006	70	2.88	132	0.561	675	2
sh06yp019	Shoepack	5	17	2006	75	3.65	136	0.731	678	2
sh06yp027	Shoepack	5	17	2006	68	2.66	135	0.530	679	1
sh06yp001	Shoepack	5	17	2006	73	2.86	143	0.572	713	2
sh06yp057	Shoepack	5	17	2006	75	3.46	136	0.651	722	3
sh06yp038	Shoepack	5	17	2006	84	5.59	150	1.144	733	3
sh06yp006	Shoepack	5	17	2006	72	2.79	125	0.468	743	2
sh06yp007	Shoepack	5	17	2006	60	1.52	126	0.255	754	1
sh06yp009	Shoepack	5	17	2006	65	2.05	142	0.384	756	1
sh06yp054	Shoepack	5	17	2006	81	4.25	154	0.860	762	3
sh06yp018	Shoepack	5	17	2006	70	2.92	145	0.544	776	2
sh06yp023	Shoepack	5	17	2006	72	3.30	160	0.672	784	2
sh06yp005	Shoepack	5	17	2006	73	3.30	151	0.634	787	2
sh06yp049	Shoepack	5	17	2006	88	6.14	174	1.305	820	3
sh06yp003	Shoepack	5	17	2006	70	2.97	169	0.588	851	1
sh06yp026	Shoepack	5	17	2006	78	3.67	173	0.744	854	2
sh06yp041	Shoepack	5	17	2006	83	4.98	183	1.048	868	3
sh06yp036	Shoepack	5	17	2006	80	4.02	170	0.780	876	3
sh06yp028	Shoepack	5	17	2006	75	3.38	171	0.653	887	2
sh06yp014	Shoepack	5	17	2006	74	3.12	164	0.574	893	2
sh06yp053	Shoepack	5	17	2006	81	4.27	192	0.863	950	3
sh06yp022	Shoepack	5	17	2006	70	2.84	179	0.523	971	2
sh06yp051	Shoepack	5	17	2006	80	3.93	181	0.733	971	3
sh06yp031	Shoepack	5	17	2006	83	4.64	204	0.936	1,013	3
sh06yp039	Shoepack	5	17	2006	90	6.38	196	1.220	1,027	4
sh06yp045	Shoepack	5	17	2006	89	5.67	205	1.109	1,048	4
sh06yp046	Shoepack	5	17	2006	84	4.78	214	0.937	1,090	3
sh06yp042	Shoepack	5	17	2006	80	4.50	235	0.927	1,138	2
sh06yp034	Shoepack	5	17	2006	88	5.27	232	0.988	1,238	3
sh06yp050	Shoepack	5	17	2006	82	3.64	238	0.650	1,331	3
sh06yp048	Shoepack	5	17	2006	85	4.29	280	0.806	1,490	3