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Richard A. Cahill
Gary L. Salmon
Illinois State Geological Survey
Institute of Natural Resource Sustainability
University of Illinois at Urbana-Champaign

James A. Slowikowski
Illinois State Water Survey
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LIST OF ABBREVIATIONS AND SYMBOLS

Ag	Silver
Al	Aluminum
Am	Americium
As	Arsenic
Au	Gold
B	Boron
Ba	Barium
Be	Beryllium
BHC	Benzene hexachloride
Bi	Bismuth
Br	Bromine
C	Centigrade
Ca	Calcium
Cd	Cadmium
Ce	Cerium
cm	centimeter
Co	Cobalt
Cr	Chromium
Cs	Cesium
Cu	Copper
CVAAS	Cold vapor atomic absorption spectroscopy
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
Dy	Dysprosium
EDX	Energy-dispersive x-ray fluorescence spectrometry
EPRI	Electric Power Research Institute
Eu	Europium
Fe	Iron
FMGP	Former manufactured gas plant
g	Gram
Ga	Gallium
GC-MS	Gas Chromatography / Mass Spectrometry
Ge	Germanium
GPS	Global Positioning System
GXR	Geochemical exploration reference materials
Hg	Mercury
HDPE	High Density Polyethylene
Hf	Hafnium
Hz	Hertz
ICP	Inductively Coupled Plasma Spectroscopy
ICP-MS	Inductively Coupled Plasma Spectroscopy / Mass Spectrometry
ID	Indentification
IEPA	Illinois Environmental Protection Agency
IDNR	Illinois Department of Natural Resources
In	Indium

ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey
K	Potassium
keV	kiloelectron volt
kg	Kilogram
kN	Kilonewton
La	Lanthanum
lb	Pound
Li	Lithium
Lu	Lutetium
m	Meter
mBq/g	Millibecquerel per gram (measure of radioactivity)
mCi	Millicurie (measure of radioactivity)
mL	Milliliter
mm	Millimeter
mm^2	Square Millimeter
mg	Milligram
Mg	Magnesium
Mn	Manganese
Mo	Molybdenum
n	Number of Samples
Na	Sodium
Nb	Niobium
Nd	Neodymium
Ni	Nickel
NIES-CRM	National Institute for Environmental Studies Certified Reference Material
NIST	National Institute of Standards and Technology
P	Phosphorous
PAH	Polycyclic aromatic hydrocarbons
Pb	Lead
PCB	Polychlorinated biphenyl mixtures
PEC	Probable effect concentration
QA/QC	Quality assurance/quality control
QEC	Quality Environmental Containers
Rb	Rubidium
Re	Rhenium
RM	River Mile
RTCM	Radio Technical Commission for Marine Services
S	Sulfur
Sb	Antimony
Sc	Scandium
Se	Selenium
Si	Silicon
Sm	Samarium
Sn	Tin
SOP	Standard Operating Procedure
SPEX	Trademark of a company that supplies products for spectroscopic analysis
Std. Dev.	Standard Deviation

Sr	Strontium
Ta	Tantalum
TACO	Tiered Approach to Corrective Action Objectives used by the IEPA
Tb	Terbium
Te	Tellurium
Th	Thorium
Ti	Titanium
Tl	Thallium
µ	micro-
U	Uranium
U.S. COE	United States Army Corp of Engineers
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geologic Survey
UTM	Universal Transverse Mercator projection
V	Vanadium
W	Tungsten
Y	Yttrium
Yb	Ytterbium
yr	Year
Zn	Zinc
Zr	Zirconium
^{137}Cs	Cesium-137

ABSTRACT

Systematic sub-sampling of sediment cores in sections of uniform thickness is necessary in order to evaluate historic changes in sediment quality, to determine the vertical extent of contamination, and to measure sedimentation rates. With these objectives in mind, fourteen sediment cores were collected during March 2002 using the Illinois State Water Survey vibracorer. Concentrations of metals and total organic carbon were measured using standard techniques. Concentrations of chlorinated pesticides, phenolic compounds, polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs) were measured by gas chromatography/mass spectrometry (GC-MS). The concentrations of chlorinated pesticides, phenolic compounds and polychlorinated biphenyls (PCBs) were below the method detection limit in all sediment samples analyzed. However, there was a wide range in concentrations of polycyclic aromatic hydrocarbons (PAHs) which were detected in all sediment samples. Also, a wide range of metal concentrations was noted in the sediments evaluated. Lower concentrations of metals were found in the upper 0.5 m of sediment but concentrations were elevated at depths ranging from 1.0 m to 1.5 m. Sedimentation rates were estimated using cesium-137 radiometric dating on 14 vibracores. Sedimentation rates range from < 0.1 to 1.9 cm/yr, with an average of 0.9 cm/yr. These rates are comparable to those reported in previous studies.

INTRODUCTION

Thick accumulations of sediment adversely impact the ecological resources, recreational opportunities and water quality of Illinois lakes and rivers. In many places these sediments are contaminated with metals and organic compounds mainly associated with land use and industrial practices that have occurred in the watershed. Removal of accumulated sediment has been proposed as a means of restoring habitat and recreational opportunities in backwater lakes associated with the Illinois River. Information about the composition of these sediments is needed to predict the impacts of dredging and will influence decisions on how dredged sediments can be reused.

The study objectives were to establish the spatial variability of metals and organic compounds in the sediments of backwater lakes associated with the Illinois River; to propose dredging depths; and to estimate long-term sedimentation rates using ^{137}Cs.

BACKGROUND

The Peoria Pool of the Illinois River is 73 miles long and is flanked by large backwater lakes on both sides of the river from south of Hennepin to the city of Peoria. In 1969, there were 32 identified backwater areas in the Peoria Pool that occupied 32,831 acres (Bellrose, et al., 1983). Using 1989 aerial photographs, 32 backwater occupied 30,325 acres during summer low water periods (U.S. COE, 2003a). Many of these lakes north of Chillicothe had not been sampled for sediment quality or sedimentation rates. None had been sampled at the depths to which dredging has been proposed. Only Peoria Lake itself had been characterized recently for a comprehensive list of organic contaminants (Cahill, 2001a).

The La Grange Pool of the Illinois River is 89 miles long. Many of the lakes in this pool have been separated from the river by levees. This area contains important wildlife refuges and conservation areas as well as the cities of Pekin, Havana, and Beardstown. The Spoon, Mackinaw, and Sangamon Rivers all carry heavy sediment loads and all join the Illinois River within this reach. In 1969, there were 52 identified backwater areas in the La Grange Pool that occupied 26,981 acres (Bellrose, et al., 1983). Using 1989 aerial photographs, only 46 identified backwater areas occupied 18,537 acres during summer low water periods (U.S. COE, 2007). The lakes along this section of river had not been sampled for sediment quality by the ISGS since 1977 (Cahill and Steele, 1986).

The Alton Pool of the Illinois River is 80 miles long and extends to the confluence of the Mississippi River below Grafton, Illinois. In 1969 there were 21 identified backwater areas in the Alton Pool that occupied 7,881 acres (Bellrose et al., 1983). Using 1989 aerial photographs, there were only 18 identified backwater areas that occupied 5,030 acres during summer low water periods (U.S. COE, 2007). Cores were collected in Meredosia Lake in 1975 and in Silver and Swan Lakes in 1983 (Cahill and Steele, 1986). Swan, Silver, Stump and Meredosia Lakes were sampled in 1994 (Demissie et al., 1996). Sedimentation rates, metals, and a limited number of organic compounds were determined.

The surface areas of the backwater lakes along the Illinois River have fluctuated significantly since the early 1900's. Increases in the backwater surface acreage are due to the combined effects of the Lake Michigan diversion, the construction of locks and dams, and levee building. The changes in surface area of the backwaters lakes that were sampled in this study are listed in Table 1. The 1903 and 1969 surface areas are estimates from Bellrose et al.(1983) and the 1989 estimates are from U.S. COE, 2007.

Table 1. Surface areas of backwater lakes associated with the Illinois River in 1903, 1969 and 1989.

Core ID*	**Location**	**Surface Area, acres**		
		1903	**1969**	**1989**
02-1	Senachwine	2,644	4,086	4,500
02-2	Sawmill	566	698	700
02-3	Billsbach	378	1,083	1,200
02-4	Weiss	151	328	250
02-5	Goose	343	1,068	800
02-6	Wightman	195	638	600
02-7	Meadow	124	679	500
02-8	Babb Slough	82	1,956	2,000
02-12	Quiver	403	277	155
02-13	Matanzas	316	479	400
02-14	Meredosia	1,043	1,484	1,600

*****Cores 02-09, 02-10, and 02-11 were from upper or lower Peoria Lake.

Peoria Lake is a flow-through lake on the main stem of the Illinois River that begins at the Peoria lock and dam. At river mile 166, the lake is divided into upper and lower Peoria Lake by a narrow section of the river. Because of its size, importance for navigation, water supply, recreation, and the proximity to the large urban industrial center of Peoria, it has been intensively studied (Demissie and Bhowmik, 1987). The changes in surface area, volume, and average depth of upper and lower Peoria Lakes are summarized in Table 2 (U.S. COE, 2003a). The surface area of the lake has not changed significantly since 1930, while the volume and average depth have decreased by approximately 50 percent from 1930 to 1999. Dredging is required to maintain the depth of the navigation channel at 3 m, and provide access to a number of the marinas.

Table 2. Year of survey, surface area, volume and average depth of upper and lower Peoria Lake (U.S. COE, 2001a).

Year of Survey	Surface Area (Acres)		Volume (Acre-Ft)		Average Depth (m)	
	Upper	Lower	Upper	Lower	Upper	Lower
1903	7,180	1,820	30,100	11,100	1.28	1.86
1930	13,490	2,600	75,200	23,400	1.70	2.74
1965	13,140	2,480	56,200	18,000	1.30	2.21
1976	13,360	2,490	45,500	15,500	1.04	1.90
1988	12,700	2,530	39,000	13,800	0.94	1.66
1996	12,070	2,480	32,300	11,000	0.82	1.35
1999	11,920	2,500	34,400	12,000	0.88	1.46

The sedimentation at the mouths of ten of the major tributaries to Peoria Lake has been reported (Bhowmik et al., 2001). Historical aerial photographs were used to determine the growth of the deltas into the lake. The rate of growth of deltas into the lake increased in the 1930s partially as a result of stream channelization (Bhowmik et al., 2001).

Between 1975 and 1983, Cahill and Steele (1986) collected 27 cores from 18 backwater lakes along the entire length of the Illinois River. They noted that the concentrations of zinc, lead, and cadmium were greater in sediments from the upstream lakes than in those from downstream lakes. The impact of the 1993 flood on sediment quality was determined in several backwater lakes of the lower Illinois River by Demissie, et al. (1996). In their study, ISGS and ISWS laboratories analyzed the sediment samples for various inorganic species and pesticides. Low levels of the pesticide Alachlor were detected in 14 of the 17 sediment samples tested.

In 1998, the ISGS and ISWS collected 14 sediment cores between river mile 199 in Senachwine Lake and river mile 164 in Peoria Lake (Cahill, 2001a). The cores averaged 0.5 meters in length. The sediment samples were analyzed for total recoverable concentrations of 20 metals by ICP and for mercury by CVAAS at Katalyst Analytical Technologies. In addition, the samples were analyzed by the ISGS for major, minor, and trace elements. The cores were not of sufficient length to determine complete ^{137}Cs records (sediments from the peak of atmospheric nuclear weapons tests fallout in 1963, or sediment deposited prior to 1954 at the start of significant fallout). The concentrations of metals, in general, were greater in the deeper, older sediments than in the shallower, younger sediments.

In order to assess sediment quality and determine the potential impacts of dredging, Cahill (2001a) collected 10 cores of sufficient length to extend below the proposed 2-meter depth of dredging in upper and lower Peoria Lakes between river mile 179 and 164. A portable vibracoring system that had collected cores up to 5-meters long in the Grand Calumet River was used (Cahill and Unger, 1993). The cores were collected in aluminum irrigation tubes that were 7.5 cm in diameter. The cores were first cut lengthwise using a modified circular saw. One half of the core was sub-sampled in 10 cm intervals for detailed metal analysis and ^{137}Cs dating at ISGS. The second half of the core was sub-sampled in composites ranging from 0.6 to 1 m in length. The 20 large composite samples were analyzed for a comprehensive list of organic parameters, metals and geotechnical parameters at Katalyst Analytical Technologies, and at ISGS for trace elements (Cahill, 2001a).

The concentrations of metals in the large composite samples of Peoria Lake sediments were found to be, in general, above background values for Illinois soils and in some cases, were in the elevated classification category as defined by the IEPA (Frost, 1995; IEPA, 1994; Mitzelfelt, J. D., 1996). Moreover, cadmium and nickel concentrations were above the consensus-based probable effect concentrations (MacDonald et al., 2000). The concentrations of some polycyclic aromatic hydrocarbon (PAH) compounds also exceeded the consensus-based probable effect concentrations in Peoria Lake sediments, but the results for PAH concentrations were inconsistent between laboratories. Pesticides, volatile organic compounds, semi-volatile organic compounds and chlorinated pesticides were also detected at low levels in a few samples.

FIELD PROCEDURES

Sampling Locations

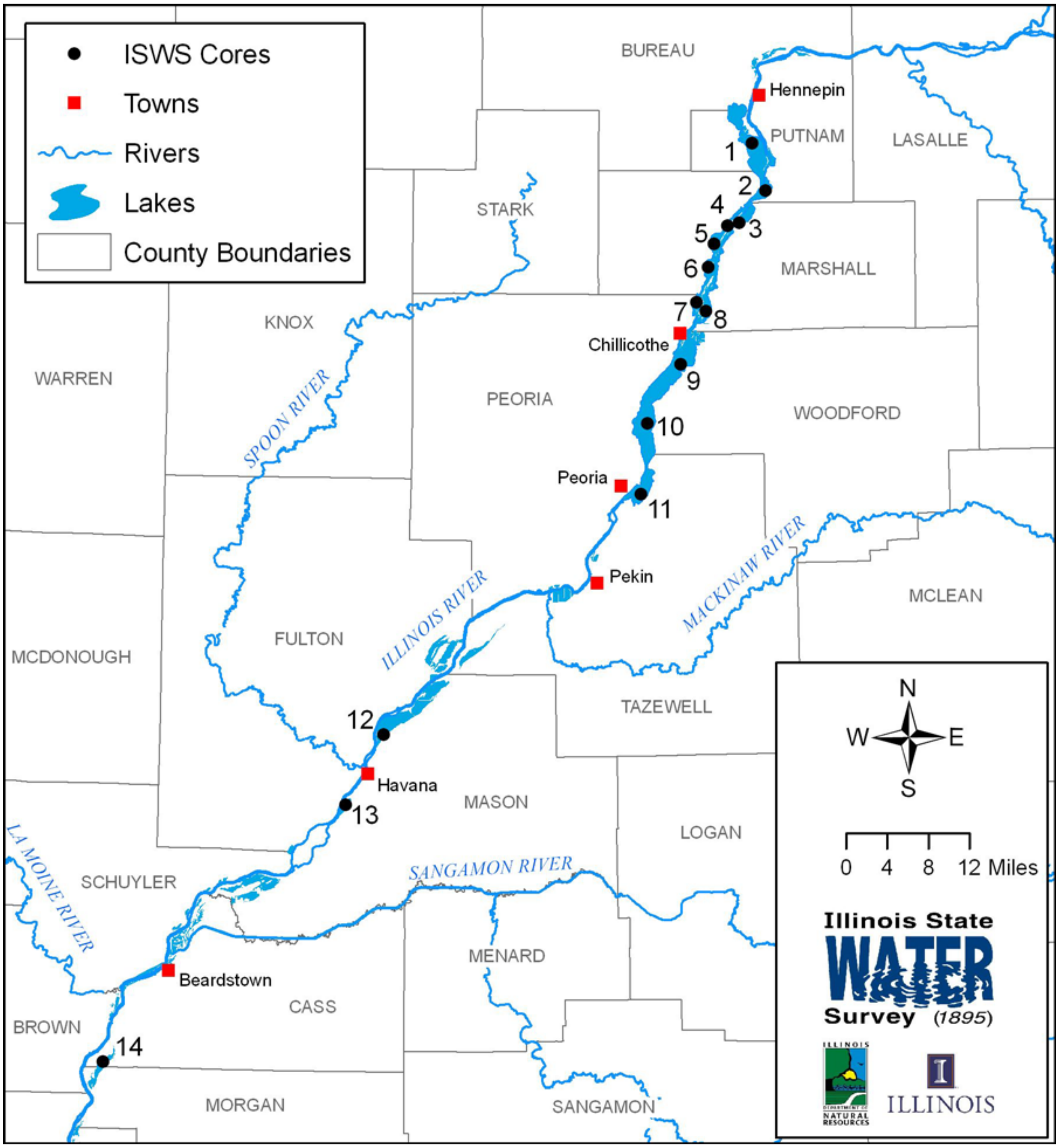
Coring locations were chosen based on the criteria that the lakes could be safely reached from the river, and the area was included in proposed restoration efforts. In addition, coring locations were chosen that were shown as deep water on the 1902-1904 U.S. COE Charts (Woermann, 1905). Eight cores were collected in backwater lakes in the Peoria Pool of the Illinois River. Two cores were collected in upper Peoria Lake and one in lower Peoria Lake. Two cores were collected from lakes in the La Grange Pool and one in the Alton Pool.

The core ID, name of lake, approximate river mile, UTM-16 coordinates, water depth and core length are listed in Table 3. The GPS coordinates are given using the Universal Transverse Mercator (UTM) projection. The GPS positions determined for this work were differentially corrected using Radio Technical Commission for Maritime Services (RTCM) correction signals broadcast by the U.S. Coast Guard from Rock Island, Illinois. The locations of the lakes sampled are shown in Figure 1.

Table 3. Core ID, name of lake, approximate river mile, latitude, longitude, water depth and core length of sediment vibracores collected from backwater lakes associated with the Illinois River March 13 - March 27, 2002.

Core ID	Location	RM	Latitude (^{o})	Longitude (^{o})	Water Depth (m)	Core Length (m)
02-1	Senachwine	199	N 41.18742	W 89.34994	2.67	2.18
02-2	Sawmill	197	N 41.12067	W 89.32486	2.29	2.64
02-3	Billsbach	194	N 41.07486	W 89.37517	2.06	2.34
02-4	Weiss	192	N 41.07111	W 89.39617	1.91	2.47
02-5	Goose	190	N 41.04564	W 89.42128	2.62	1.98
02-6	Wightman	187	N 41.01222	W 89.43306	2.13	2.06
02-7	Meadow	184	N 40.96269	W 89.45425	2.06	2.34
02-8	Babb Slough	184	N 40.94994	W 89.43736	2.21	1.88
02-9	Upper Peoria	178	N 40.87475	W 89.48403	2.54	2.39
02-10	Upper Peoria	171	N 40.79139	W 89.54561	2.74	2.31
02-11	Lower Peoria	164	N 40.69136	W 89.55828	2.90	2.51
02-12	Quiver	125	N 40.35000	W 90.03333	2.21	2.57
02-13	Matanzas	116	N 40.25014	W 90.10303	1.98	2.57
02-14	Meredosia	71	N 39.88378	W 90.54572	2.59	2.69

Figure 1. 2002 vibracore locations along the Illinois River used for sediment quality analyses and sedimentation rate estimates.



Sediment cores were collected using the ISWS vibracorer. The vibracorer was mounted on a pontoon boat that provided a safe, stable platform for the collection of cores up to 3 m in length. The vibracoring system employed by the ISWS is a model P-3c manufactured by Rossfelder Corporation of Ponway, California. The vibracoring unit is submersible, weighs 150 lb and is powered by a three phase, 240 volt 60 Hz generator. The vibracorer uses a steel core tube 10 cm in diameter, with HDPE liners. Sediment penetration is achieved through a method known as vibro-percussive, where the unit delivers 16-24 kN (1 kN= 225 lb) of force and a vibration frequency of 3,450 vibrations per minute to the core tube. Coring is made possible by both the percussive force of the corer and the sediment particles surrounding the drive tube being “liquefied” by the vibrational forces along the tube. The corer is lowered into the sediment until the cutter nose encounters sediments with sufficient cohesiveness to stabilize the drive tube. The unit is then engaged and coring proceeds until penetration ceases or the unit reaches the entire length of the drive tube. Penetration depths and recovery rates depend on factors such as the water content of the sediment, particle size, and compaction / density. Detailed descriptions of the procedure used for the collection of long sediment cores using the vibracore are included in the original SOP for this project (Cahill and Slowikowski, 2002).

Sample number, sample location, water depth, cored depth below sediment surface, recovered core length, date, time the core was collected or capped, and comments on local conditions at the site were noted on log sheets. The sediment that remained in the core nose at the base of cores was saved in the field and stored in plastic bags. All cores were capped, sealed, and labeled in the field and then transported to the ISWS laboratories in Champaign, and stored in a walk-in cooler until they were processed at ISGS.

A sample representing approximately the upper 10 cm of sediment was collected at each location using an Eckman dredge. The sediments were removed from the dredge using a stainless steel spatula, and placed in pre-cleaned Quality Environmental Containers (QEC) bottles. The QEC glass bottles were 250 mL in volume with Teflon-lined polypropylene closures. The bottles were labeled in the field, then transported to the ISGS laboratories in Champaign.

LABORATORY PROCEDURES

Initial Processing of Sediment Samples

The surface sediments were removed from their glass collection containers and a written description was made. The samples were then air-dried in a Class 100 clean bench. After drying for approximately 48 hours, the samples were placed in pre-cleaned QEC 250 mL glass bottles. The sediment that remained in the core nose at the base of the core was removed from the plastic bags, and approximately 300 grams (wet weight) was air-dried and then placed in pre-cleaned QEC 250 mL glass bottles.

The core liners were partially cut lengthwise using a router to a depth that did not penetrate the sediment. The shavings from the core liner were removed and the liner was cut with a utility knife. The sediment core was then divided into two halves using a 0.2 cm diameter copolymer trimmer line. The cores were photographed on a copy stand using Ektachrome 64 Tungsten slide film at an exposure of 1/30 sec at an F-11setting using a 50 mm lens. The slides were then scanned and combined using Adobe Photoshop to produce a single color plate for each core, included with the appendices of this report. The plates contain the core ID and a tape measure to indicate the sediment depth. The description of the core includes texture and consistency, color, presence of shells or plant debris, and other changes in sediment characteristics with depth. Precise determination of sediment texture would require grain size analysis which was beyond the scope of this study.

Sub-Sampling of Sediment Cores

Systematic sub-sampling of sediment cores in sections of uniform thickness is necessary in order to evaluate historic changes in sediment quality, evaluate the vertical extent of contamination, and measure sedimentation rates (U.S. EPA, 2001). Gross compositing of sediment intervals (> 25cm) was found to often miss discrete layers of contaminated sediment (Cahill, Demissie, and Bogner, 1999; Cahill, 2001b).

The cores were divided into 10 cm long sections to the depth in the core where there was a clear change from silt-clay lake deposits to other materials. The remaining core was then divided into sections approximately 25 cm in length to the base of the core. Approximately 300 g of wet sediment from each interval was air-dried in a Class 100 clean bench. Air-dried weight loss was calculated for each core interval.

All of the air-dried sediment samples were first ground by hand in a ceramic mortar and pestle to pass a 1 mm sieve and assigned analytical numbers as part of ISGS internal QA/QC protocol. An analytical split of approximately 30 g of the air-dried and ground sediment was further ground using a SPEX ® 8505 alumina ceramic grinding container in a SPEX ® 8500 shatter box to pass a 60 mesh sieve prior to inorganic analysis and the determination of moisture loss at 110^{o} C. The samples were then stored into pre-cleaned QEC 60 mL HDPE bottles.

Analytical Procedures Used for Sediment Analysis

The number of intervals prepared from each sediment core and the number of samples tested by various analyses are listed in Table 4. The air-dried and moisture (110^{o} C) weight losses were measured for all samples. The concentrations of total carbon, inorganic carbon, organic carbon, and 12 elements by Energy-dispersive x-ray fluorescence spectrometry (EDX) were determined on all samples.

Table 4. Number of sediment intervals prepared from each location and the number of samples tested by various techniques.

Core ID	Location	n	ICP-MS*	GC-MS**	ICP***
02-1	Senachwine	17	11	6	17
02-2	Sawmill	24	14	7	
02-3	Billsbach	21	13	6	
02-4	Weiss	19	9	3	
02-5	Goose	16	10	6	
02-6	Wightman	18	10	6	
02-7	Meadow	18	11	5	
02-8	Babb Slough	14	7	2	
02-9	Peoria RM 178	14	6	3	
02-10	Peoria RM 171	17	9	6	
02-11	Peoria RM 164	23	10	7	
02-12	Quiver	18	6	2	20
02-13	Matanzas	21	9	5	
02-14	Meredosia	19	7	4	
	Total	259	132	68	37

n = number of sub samples prepared included the surface grab samples.
* Inorganics determined by ICP-MS at a contract laboratory. ** Organic compounds determined by GC-MS at ISGS. *** Inorganics determined by ICP at ISGS.

The details of the analytical procedures used for this project were included in the Quality Assurance Project Plan that was approved at the start of the project (Cahill and Slowikowski, 2002).

GC-MS analysis for organic compounds

Air-dried, ground sediment samples were extracted following modified U.S. EPA Method 3540c. Modifications included the extraction of samples in triplicate with three solvent systems and the addition of granular copper to the extraction flask to remove the sulfur that is often found in sediment samples. The three solvent systems utilized were acetone/hexane (1:1), methylene chloride/acetone (1:1) and toluene/methanol (10:1). Following this process two of the triplicate extracts were fractionated on a silica column to clean up the sample and reduce analytical interference. In general, analyses of sediments for organic contaminants followed U.S. EPA Method 8270c, with minor modifications. The GC-MS analyses were performed with a Hewlett Packard 5890-II+ GC coupled to a Hewlett Packard 5973 quadruple mass spectrometer. The procedure used three deuterated aromatic compounds as internal standards and three compounds as surrogate standards.

The following organic compounds were determined by classes: <u>Phenols</u>: phenol, 2-chlorophenol, 2-methylphenol, 3-methylphenol, 4-ethylphenol, 2-nitrophenol, 2,4-dimethylphenol, 2,4-dichlorophenol, 2,6-dichlorophenol, 4-chloro-3-methylphenol, 2,3,5-trichlorophenol, 2,4,6-trichlorophenol, 2,4,5-trichlorophenol, 2,3,4-trichlorophenol, 2,3,6-trichlorophenol, 2,4-dinitrophenol, 4-nitrophenol, 2,3,4,6-tetrachlorophenol, 2, 3, 5,6-tetrachlorophenol, 2,3,4,5-tetrachlorophenol, 2-methyl-4,6-dinitrophenol, 3,4,5-

trichlorophenol, and pentachlorophenol. Chlorinated Pesticides: a-BHC, g-BHC, b-BHC, d-BHC, 2-(1-methylpropyl)-4, 6-nitrophenol, heptachlor, aldrin, heptachlor epoxide, endosulfan I, 4,4'-DDE, dieldrin, endrin, endosulfan II, 4,4'-DDD, endrin aldehyde, 4,4'-DDT, endosulfan sulfate, methoxychlor, and endrin ketone. Polycyclic aromatic hydrocarbons (PAHs): naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, chrysene, benzo(a)anthracene, benzo(k)fluoranthene, benzo(b)fluoranthene, benzo(a)pyrene, indeno[1,2,3-cd]pyrene, dibenz(a-h)anthracene, and benzo(g,h,i)perylene. Polychlorinated biphenyl mixtures (PCB): Aroclor 1016, Aroclor 1221, Aroclor 1232, Aroclor 1242, Aroclor 1248, Aroclor 1254, Aroclor 1260 and Aroclor 1262.

ICP-MS analysis for inorganic elements

The concentrations of 52 inorganic elements were determined at Act Labs in Ancaster, Ontario, Canada (contract lab), which is accredited by the Canadian Association of Environmental Analytical Laboratories to meet the requirements of the International Standard Organization 17025. The sediment samples were digested in aqua regia at 90°C in a microprocessor controlled digestion box for 2 hours. The solution was diluted and analyzed by ICP-MS using a Perkin Elmer SCIEX ELAN 6100. The concentrations measured are not total since unaltered silicates and resistant minerals may not have been dissolved. The analytes were: Li, Be, B, Na, Mg, Al, K, Ca, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, As, Se, Rb, Sr, Y, Zr, Nb, Mo, Ag, Cd, In, Sn, Sb, Te, Cs, Ba, La, Ce, Nd, Sm, Eu, Tb, Yb, Lu, Hf, Ta, W, Re, Au, Tl, Pb, Bi, Th, and U.

ICP Analysis for inorganic elements

The concentrations of 30 inorganic elements were determined at ISGS. The sediment samples were analyzed according to U.S. EPA Method 6010B using a Thermo Jarrell-Ash Model ICAP 61e inductively coupled plasma spectrometer. Samples were prepared following U.S. EPA Method 3050B, which is not a total digestion technique for most samples but is nonetheless a very strong acid digestion that will dissolve almost all elements that could become "environmentally available." The elements determined were: Li, Be, B, Na, Mg, Al, Si, P, S, K, Ca, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Sr, Mo, Cd, Sb, Ba, Tl, and Pb.

Mercury analysis

The concentrations of mercury were determined at the contract lab and at ISGS. Both laboratories used cold vapor atomic absorption spectroscopy (CVAAS) to determine mercury concentrations according to U.S. EPA Method 245.5.

Carbon analysis

Sediment samples were analyzed for total and inorganic carbon by coulometric titration of carbon dioxide released from a sample by either combustion (for total carbon) or acid evolution (for inorganic carbon) at ISGS. Organic carbon was calculated as the difference between total carbon and inorganic carbon.

EDX analysis for inorganic elements

The concentrations of 12 inorganic elements were determined by energy dispersive X-ray fluorescence spectrometry at ISGS. The X-ray activity was determined by counting the X-ray emission of an air-dried sample using a lithium-drifted, 30 mm^2 silicon crystal detector. The sample was caused to fluoresce in the X-ray region by bombarding the sample with X-rays from a 300 mCi ^{241}Am radioactive source using Dy and Mo secondary targets. The analytes were: Zn, Br, Rb, Sr, Ag, Cd, In, Sn, Sb, Ba, La, and Ce.

^{137}Cs Sedimentation Rate

The ^{137}Cs activity of each core was determined by counting the gamma activity of 10 g of dried sediment with approximately 40-percent efficient Ge (Li) detectors for a minimum of 24 hours. The 662 keV photon activities in sediment samples were compared to the activity of National Institute of Standards & Technology (NIST) Standard Reference Material 4350B. Plots of the ^{137}Cs activity (mBq/g) versus depth in the core were used to select the position in the sedimentation record when fallout from the testing of nuclear weapons in the atmosphere began to be deposited in significant quantities (1952) or the peak time of fallout from nuclear weapons testing (1963). Sedimentation rates were calculated with either of these dates as a marker. All of the sedimentation rates obtained by this technique were based on the assumption of a constant rate of sedimentation over the time interval of interest (39 or 48 years) and limited reworking of sediments once they were deposited.

QUALITY ASSURANCE/QUALITY CONTROL

Six reference materials were analyzed at ISGS for total carbon, inorganic carbon, and organic carbon. The results are included in Appendix 1. Twenty-four replicate samples were prepared for organic analysis by GC-MS. Also included were internal standards Acenaphthene-d_{10}, Chrysene-d_{12}, and Phenanthrene-d_{10}**.** The results are included in Appendix 3. The concentrations of PAH compounds determined in NIST standard reference material 1944 by GC-MS at ISGS are summarized in Table 5. The accuracy of the results relative to certified concentrations is good (May and Gill, 1999).

Table 5. Concentrations of PAHs compounds determined in National Institute of Standards and Technology Standard Reference Material 1944 by GC-MS at ISGS. All values in mg/kg.

PAHs Compounds	Certified Concentrations*	This Study
Naphthalene	1.65 ± 0.31	1.82
Acenaphthylene	* *	1.30
Acenaphthene	* *	<0.05
Fluorene	* *	<0.05
Phenanthrene	5.27± 0.22	5.53
Anthracene	1.77 ± 0.33	1.84
Fluoranthene	8.92 ± 0.32	8.51
Pyrene	9.70 ± 0.42	10.02
Chrysene	4.86 ± 0.10	4.71
Benzo(a) anthracene	4.72 ± 0.11	4.67
Benzo(k)-fluoranthene	2.30 ± 0.20	2.21
Benzo(b)fluoranthene	3.87 ± 0.42	3.49
Benzo(a)pyrene	4.30 ± 0.13	4.17
Indeno(1,2,3-c, d)pyrene	2.78 ± 0.10	2.63
Dibenz(a, h)anthracene	0.424 ± 0.069	0.41
Benzo(g, h, i) perylene	2.84 ± 0.10	2.74

*May and Gill, 1999
* * No values listed

The materials that were analyzed by the contract lab for QA/QC are summarized in Table 6. Eight replicate samples were also analyzed by the contract lab. These results are included in Appendix 5. Two reference materials and 4 replicate samples were analyzed at ISGS by ICP, the results of which are included in Appendix 6. Six reference samples were analyzed at the ISGS by EDX. and the results are included in Appendix 7.

Table 6. Materials, description, and the number of times tested for concentration of inorganic elements by the contract lab.

Material	Description	Number of Times Tested
NIST 8704	Buffalo River Sediment	4
NIST 2709	San Joaquin Soil	3
NIST 2711	Montana Soil – Moderately Elevated	2
NIES-CRM-02	Pond Sediment	2
ISGS Sec Ref.	Peoria Lake Sediment	1
ISGS Sec Ref.	Grand Calumet Sediment	1
Contract Lab Control Materials		
USGS GXR 1	Jasperoid, Utah	2
USGS GXR 2	Soil (B zone), Utah Soil	3
USGS GXR 4	Porphyry Copper Mill Heads, Utah	3
USGS GXR 6	Soil (B zone) North Carolina	3
SO-2	Canadian Soil (Mercury Only)	3

Summary of Contract Lab Results for NIST Standard Reference Materials

The concentrations of 8 metals determined in 3 NIST standard reference materials by the contract lab are summarized in Table 7. The accuracy of the results relative to certified total concentrations was good. The digestion procedure used was able to extract most of the Ni, Cu, Zn, As, Cd and Pb from the reference materials since the concentrations were near the certified total concentrations provided by NIST. In contrast, the concentrations of Cr were much lower then the certified total concentrations of NIST, but agreed with the noncertified leachable concentrations of NIST (Gill, 1993a, b).

Summary of ISGS Results for NIST Standard Reference Material 1944 by EDX

The concentrations of 12 metals determined in NIST standard reference material 1944 by ISGS by EDX are summarized in Table 8. The accuracy of the results relative to certified total concentrations was good.

Table 7. Concentrations of Cr, Ni, Cu, Zn, As, Cd, Hg, and Pb determined in three National Institute of Standards and Technology Standard Reference Materials by the contract lab. All values in mg/kg unless noted otherwise.

	Cr	Ni	Cu	Zn	As	Cd	Hg (µg/kg)	Pb
NIST 8704	72	39	87	378	11.8	2.9	1,096	141.4
	71	39	85	379	13.7	2.8	993	141.8
	76	41	87	366	14.3	2.9	895	146.8
	71	38	83	367	15.3	2.9	956	134.5
Mean	73	39	86	373	13.8	2.9	985	141.1
Standard Deviation	2.4	1.4	1.5	7	1.5	0.04	84	5.0
% Relative Std Deviation	3%	3%	2%	2%	11%	1%	9%	4%
*Total Certified Data	121.9	42.9		408	*(17)*	2.94		150
% Difference	-40%	-9%		-9%	-19%	-2%		-6%
NIST 2709	68.4	73.7	29.7	94	17.0	0.3	1,312	11.9
	79.7	87.5	32.4	97	16.4	0.3	1,278	13.7
	59.5	68.4	27.2	80	15.6	0.3	1,372	11.7
Mean	69.2	76.5	29.8	90	16.3	0.3	1,321	12.4
Standard Deviation	10.10	9.82	2.60	9	0.7	0.04	48	1.11
% Relative Std Deviation	15%	13%	9%	10%	4%	14%	4%	9%
*Total Certified Data	130	88	34.6	106	17.7	0.38	1,400	18.9
**Non Certified Leach Data	*(79)*	*(78)*	*(32)*	*(100)*	*(<20)*	*(<1)*		*(13)*
% Difference (Total)	-47%	-13%	-14%	-15%	-8%	-18%	-6%	-34%
% Difference (Leach)	-12%	-2%	-7%	-10%				-4%
NIST 2711	22.9	17.6	111	325	95.3	37.6	6,430	1,110
	24.3	19.0	109	320	103.2	40.1	6,447	1,100
Mean	23.6	18.3	110	323	99.3	38.8	6,439	1,105
*Total Certified Data	47	20.6	114	350	105.0	41.70	6,250	1,162
**Non Certified Leach Data	*(20)*	*(16)*	*(100)*	*(310)*	*(90)*	*(40)*		*(1,100)*
% Difference (Total)	-50%	-11%	-3%	-8%	-5%	-7%	3%	-5%
% Difference (Leach)	18%	14%	10%	4%	10%	-3%		0.5%

* Certificate of Analysis, National Institute of Standards & Technology (Gill, 1993a,b; May and Gill, 2000)
** Noncertified Informative Value in (*Italics)* (Gill, 1993a,b)

Table 8. Concentrations of Zn, Br, Rb, Sr, Ag, Cd, In, Sn, Sb, Ba, La, and Ce determined in National Institute of Standards and Technology Standard Reference Materials 1944 determined by Energy Dispersive X-ray at ISGS.

	Mean*	Std. Dev	Certified (Informative)**	% Difference
Zn	612	132	656 ± 74	-7 %
Br	45	11	(86 ± 10)	-47 %
Rb	77	3	(75 ± 2)	3%
Sr	131	7		
Ag	6	1	(6 ± 1.7)	-22%
Cd	7	1	8.8 ± 1.4	-15%
In	2	1		
Sn	40	2	(42 ± 6)	-5%
Sb	8	2	(5)	51%
Ba	490	27		
La	47	4	(39)	20%
Ce	76	6	(65)	17%

* Mean and standard deviations of 11 determinations
** (May and Gill, 1999)

RESULTS AND DISCUSSION

Core Descriptions

Senachwine Lake

The upper 50 cm was soft and fluid. The 50-108 cm interval was silt-clay with some plant debris and a few shell fragments. The 108-120 cm interval had soil texture, and was somewhat peaty with plant debris present. The 120-165 cm interval was lighter in color, contained plant debris, and abundant shell layers. The 165-218 cm interval was dense clay that was light grey in color with root fragments and shells present.

Sawmill Lake

The 0-200 cm interval was silt clay with shell layers present below 130 cm. The 200-265 cm interval had soil texture, was peaty, with abundant shell fragments throughout.

Billsbach Lake

The 0-162 cm interval was silt clay with scattered shell fragments and some plant debris present. There was a shell layer at 106 cm. The 162-210 cm interval had soil texture and was peaty. The 210-235 cm interval was dense clay that was grey in color with scattered root fragments present.

Weiss Lake

The 0-60 cm interval was silt clay with some plant debris. The 60-80 cm interval had a peaty texture, large wood fragments and roots. The 80-155 cm interval was dense clay, light gray in color. The 155–248 cm interval was silt–clay and fine sand, with iron-manganese stains, and root fragments at the base.

Goose Lake
The 0-107 cm interval was silt clay with a few shells present. The 107-145 cm interval had soil texture, plant debris and roots. The 145-198 cm interval was dense gray clay with several thin, fine sand layers present.

Wightman Lake
The 0-140 cm interval was silt clay, with scattered shells, fingernail clam shell layers and some plant debris. The 140-160 cm interval had soil texture and plant debris. The 160-210 cm interval was dense clay with plant debris and a few shells present at the base.

Meadow Lake
The 0-120 cm interval was silt clay, with some shells and plant debris present. The 120-140cm interval was peaty with plant debris. The 140-230 cm interval was dense clay with roots, plant debris and shell fragments present.

Babb Slough
The 0-30 cm interval was uniform silt clay with shells and plant fragments present. The 30-90 cm interval had soil texture, large wood fragments and plant debris present. The 90-190 cm interval was sand, with silt-clay layers, some gravel, roots and shells present.

Upper Peoria Lake near River Mile 178
The 0-30 cm interval was uniform silt clay. The 30-110 cm interval was sand with several dark silt-clay and shells layers observed. The 110-185 cm was dense clay with root fragments present. The 185-238 cm interval was fine sand with silt layers and plant debris present.

Upper Peoria Lake near River Mile 171
The 0 to 90 cm interval was silt clay with shell fragments and layers present. The 90 to 137 cm interval had soil texture, was somewhat peaty, and some sand was present. The 137 to 230 cm interval was fine sand with silt, shell fragments and pebbles with large mussel shells at the base.

Lower Peoria Lake near River Mile 164
The 0-70 cm interval was silt clay with a shell layer at 65 cm. The 70-190 cm interval had soil texture, roots and numerous shell fragments. The 140-190 cm interval was very peaty. The 190-251 cm interval was dense grey clay, with some shells and plant material present.

Quiver Lake
The 0- 68 cm interval was silt clay with shells present. The 68-100 cm interval was sand with dark stains and shells present. The 100-120 cm interval was a dense silt-clay with plant debris and roots. The 120-257 cm interval was fine sand and silt, with scattered shell fragments and gravel present. There was a large mussel shell at 240 cm.

Matanzas Lake
The 0-160 cm interval was silt clay with few shells present. The 160-257 cm interval was uniform, silt- clay with some sand and plant debris observed.

Meredosia Lake
The 0-120 cm interval was silt clay with dark bands and shell fragments. The 120-271 cm interval was silt- clay with sand. The color in this interval changed to grey, with iron manganese stains and large shells fragments present.

Air-Dried Loss, 110°C Loss, and Concentrations of Total Carbon, Inorganic Carbon, and Organic Carbon

The air-dried loss, moisture loss (110ºC), total carbon, inorganic carbon and organic carbon concentrations are given in Appendix 1. The median, mean, standard deviation, minimum, and maximum values for air-dried loss, 110°C moisture loss, and concentrations of total carbon, inorganic carbon and organic carbon are listed in Table 9. Plots of air-dried loss and the concentrations of inorganic carbon and organic carbon are presented in Appendix 2. Information on air-dried loss and organic carbon concentrations can be critical when planning dredging activities and potential reuse of the dredged materials (Machesky et al., 2005).

Table 9. Median, mean, standard deviation, minimum, and maximum values for air-dried loss, 110°C loss, and concentration of total carbon, inorganic carbon and organic carbon. Values are in per-cent.

	Median	Mean	Std. Dev.	Minimum	Maximum
Air-Dried Loss	50.6	44.9	14.7	14.7	71.4
110°C Loss	1.95	1.90	0.92	0.06	4.77
Total Carbon	3.87	4.00	2.33	0.52	16.18
Inorganic Carbon	0.99	1.09	0.71	0.05	4.00
Organic Carbon	2.62	2.91	2.35	0.16	13.84

Organic Results and Discussion

The concentrations of organic compounds that were determined for 68 sediment intervals by GC-MS at ISGS are listed in Appendix 3. The median, mean, standard deviation, minimum, maximum, detection limits and the number of samples above detection limit concentrations for organic compounds are listed in Table 10a and 10b. The concentrations of phenolic compounds, chlorinated pesticides and PCBs were below the method detection limit in all sediment samples tested. A wide range in concentrations of PAH compounds were detected in the sediment samples tested.

PAHs have many sources including the operation of motor vehicles, wood burning, coke ovens, and highway dust. PAHs are important because the following are suspected carcinogenic according to the U.S. Environmental Protection Agency:

benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a-h)anthracene, chrysene, and indeno[1,2,3-cd]pyrene. The source apportionments of PAHs have been discussed for the Great Lakes area (Bzdusek et al. 2004; Christensen and Zhang, 1993; Van Metre, Maher and Furlong, 2000; Li, Jang and Scheff, 2003; and Lima, Eglinton and Reddy, 2003). In the late 1800s, manufactured gas plants produced gas for lighting prior to the advent of electricity. A by-product of these former manufactured gas plants (FMGPs) was coal tar, which contains PAHs. Several hundred FMGPs were located in Illinois, including several adjacent to the Illinois River (Geiger and Kientop, 2004; Doyle and Hathaway, 2006).

Table 10a. Detection limit and number of samples above detection limit (n) in sediments by GC-MS at ISGS; values are in µg/kg on a dry-weight basis.

	n	Detection Limit
PHENOLS		
Phenol	0	2
2-Chlorophenol	0	3
2-Methylphenol	0	9
3-Methylphenol	0	9
4-Methylphenol	0	9
2-Nitrophenol	0	4
2,4-Dimethylphenol	0	3
2,4-Dichlorophenol	0	3
2,6-Dichlorophenol	0	3
4-Chloro-3-methylphenol	0	3
2,3,5-Trichlorophenol	0	7
2,4,6-Trichlorophenol	0	7
2,4,5-Trichlorophenol	0	7
2,3,4-Trichlorophenol	0	7
2,3,6-Trichlorophenol	0	7
2,4-Dinitrophenol	0	13
4-Nitrophenol	0	3
2,3,4,6-Tetrachlorophenol	0	3
2,3,5,6-Tetrachlorophenol	0	6
2,3,4,5-Tetrachlorophenol	0	6
2-Methyl-4,6-dinitrophenol	0	17
3,4,5-Trichlorophenol	0	7
Pentachlorophenol	0	13
CHLORINATED PESTICIDES		
α-BHC	0	3
γ-BHC	0	10
β-BHC	0	10
δ-BHC	0	9
2-(1-Methylpropyl)-4,6-nitrophenol	0	5
Heptachlor	0	3
Aldrin	0	4
Heptachlor Epoxide	0	80
Endosulfan I	0	80
4,4'-DDE	0	5
Dieldrin	0	4
Endrin	0	8
Endosulfan II	0	6
4,4'-DDD	0	20
Endrin Aldehyde	0	40
4,4'-DDT	0	20
Endosulfan Sulfate	0	70
Methoxychlor	0	9
Endrin Ketone	0	40

Table 10b. Median, mean, standard deviation, minimum, maximum, detection limit and number of samples above detection limit (n) in sediments by GC-MS at ISGS; values are in µg/kg on a dry-weight basis

	n	Detection Limit	Median	Mean	Std. Dev	Minimum	Maximum
PAHs							
Naphthalene	41	2	174	268	271	2	1,107
Acenaphthylene	60	4	253	309	289	6	1,193
Acenaphthene	39	2	108	127	111	10	534
Fluorene	54	2	176	216	174	2	733
Phenanthrene	67	5	372	503	415	46	1,825
Anthracene	67	2	265	406	385	32	1,803
Fluoranthene	67	2	600	769	769	3	3,942
Pyrene	67	2	689	863	872	15	4,478
Chrysene	68	6	541	799	901	12	5,119
Benzo(a)anthracene	68	2	634	932	909	10	4,009
Benzo(k)fluoranthene	68	2	480	854	980	19	4,364
Benzo(b)fluoranthene	68	1	564	792	749	10	2,873
Benzo(a)pyrene	68	2	515	802	815	7	3,097
Indeno[1,2,3-cd]pyrene	65	2	439	693	935	3	4,948
Dibenz(a-h)anthracene	67	3	355	495	535	5	2,496
Benzo(g,h,i)perylene	67	4	341	512	696	8	3,563
PCBs							
Aroclor 1016	0	31					
Aroclor 1221	0	31					
Aroclor 1232	0	35					
Aroclor 1242	0	39					
Aroclor 1248	0	36					
Aroclor 1254	0	37					
Aroclor 1260	0	32					
Aroclor 1262	0	35					

Distribution of PAH compounds in Illinois River sediments by depth and location

The distribution of five PAH compounds and total PAHs relative to location in the Illinois River are plotted in Figures 2-7. The concentrations of eight PAHs and total PAHs are plotted versus depth in core in Appendix 4. The wide range in PAH concentrations in the sediments from the Peoria Pool are apparent.

There are a wide range of sediment quality guidelines that have been proposed to assess compounds or elements of concern. These guidelines are intended to represent the degree of likelihood that a certain concentration will have an impact on sediment-dwelling organisms. Elevated concentrations of organic compounds and metals have been shown to negatively affect human health and to adversely impact the health of ecosystems. Consensus-based, probable effect concentration values (PECs) are included in the plots of the distribution of PAHs. PECs are intended to define the concentrations of sediment-associated contaminants above which adverse effects on sediment-dwelling organisms are likely to be observed (MacDonald et al., 2000).

The concentrations of PAH compounds did not exceed PECs in the intervals tested in Senachwine Lake, Weiss Lake, Babb Slough, upper Peoria Lake at river mile 178, Quiver Lake, Matanzas Lake or Meredosia Lake. Only three locations - lower Peoria Lake at river mile 164, Meadow Lake and Sawmill Lake - had more than ten concentrations of PAH compounds that exceeded PEC values.

Figure 2. Distribution of total PAHs in Illinois River sediments relative to distance from the junction with the Mississippi River. The dashed line is the PEC of 22,800 µg/kg for total PAHs (MacDonald et al., 2000).

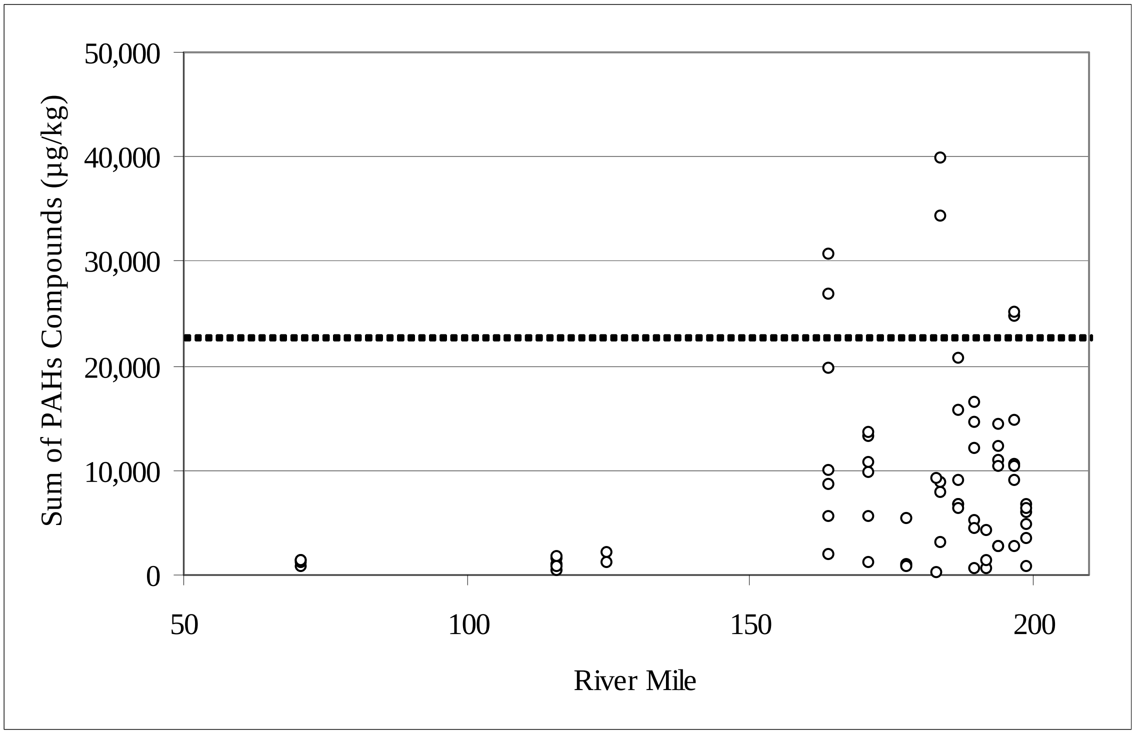


Figure 3. Distribution of anthracene in Illinois River sediments relative to distance from the junction with the Mississippi River. The dashed line is the PEC of 845 µg/kg for anthracene (MacDonald et al., 2000).

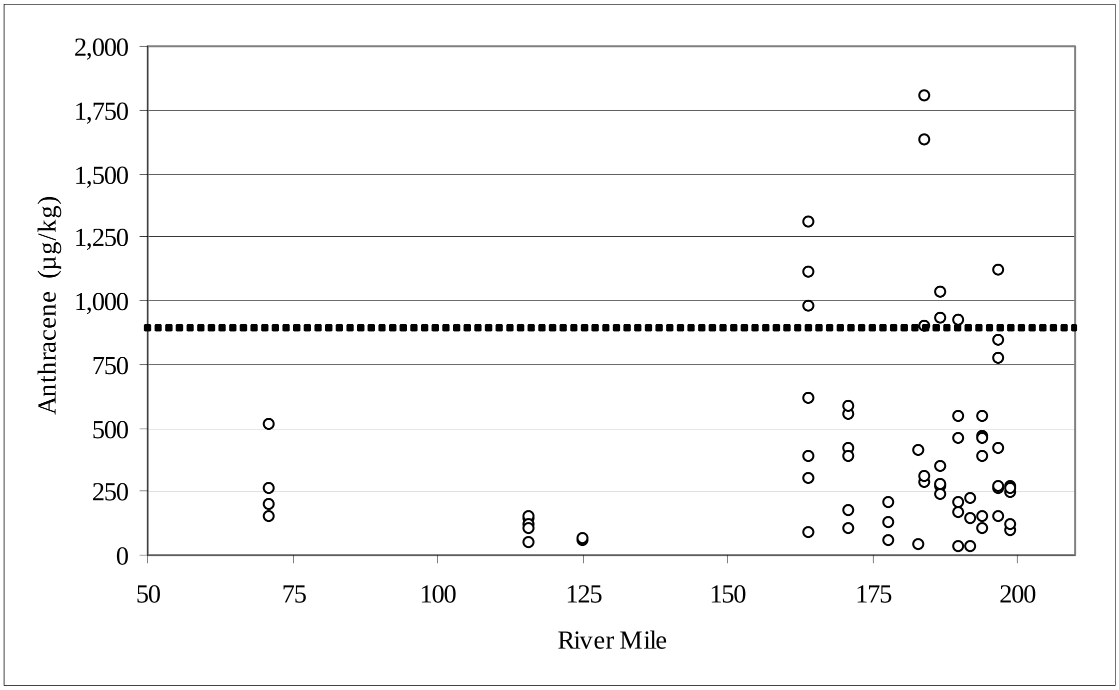


Figure 4. Distribution of pyrene in Illinois River sediments relative to distance from the junction with the Mississippi River. The dashed line is the PEC of 1,520 µg/kg for pyrene (MacDonald et al., 2000).

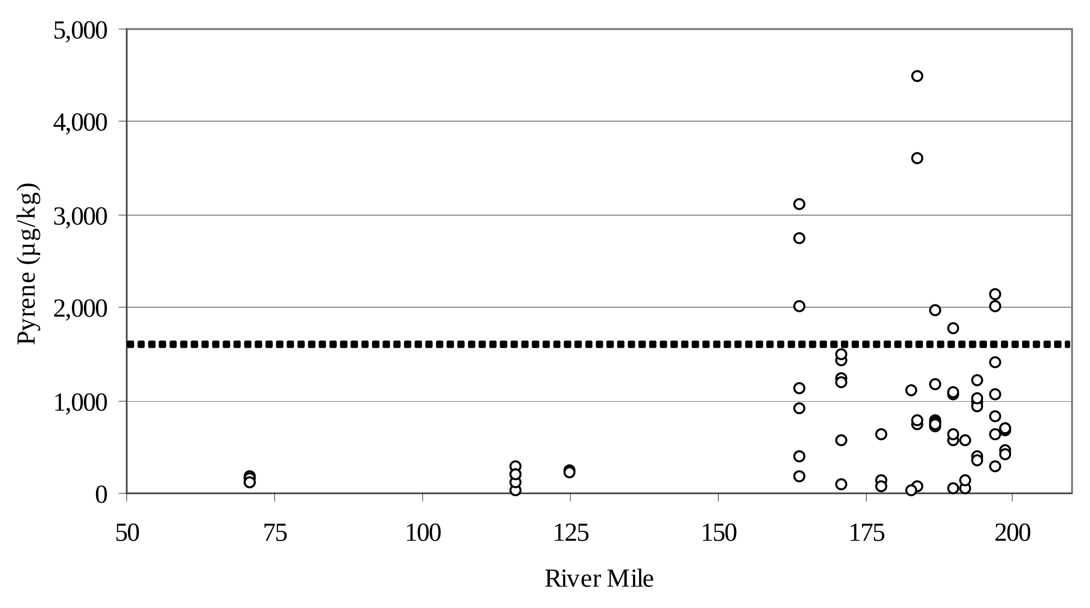


Figure 5. Distribution of chrysene in Illinois River sediments relative to distance from the junction with the Mississippi River. The dashed line is the PEC of 1,290 µg/kg for chrysene (MacDonald et al., 2000).

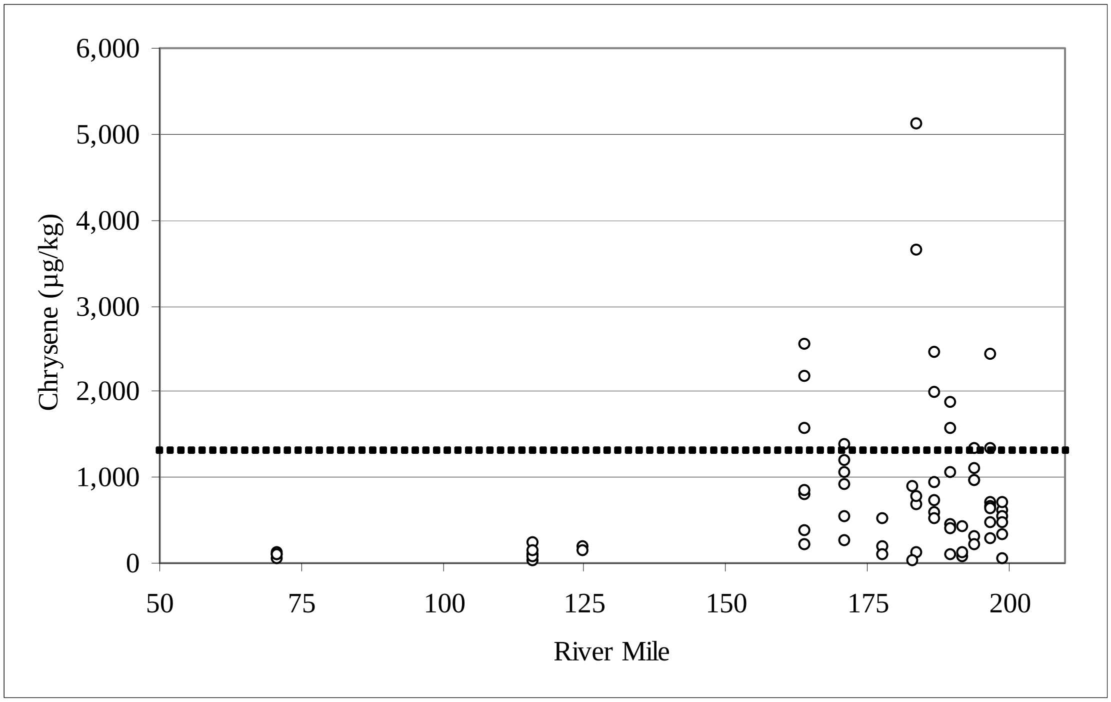


Figure 6. Distribution of benzo(a)anthracene in Illinois River sediments relative to distance from the junction with the Mississippi River. The dashed line is the PEC of 1,050 µg/kg for benzo(a)anthracene (MacDonald et al., 2000).

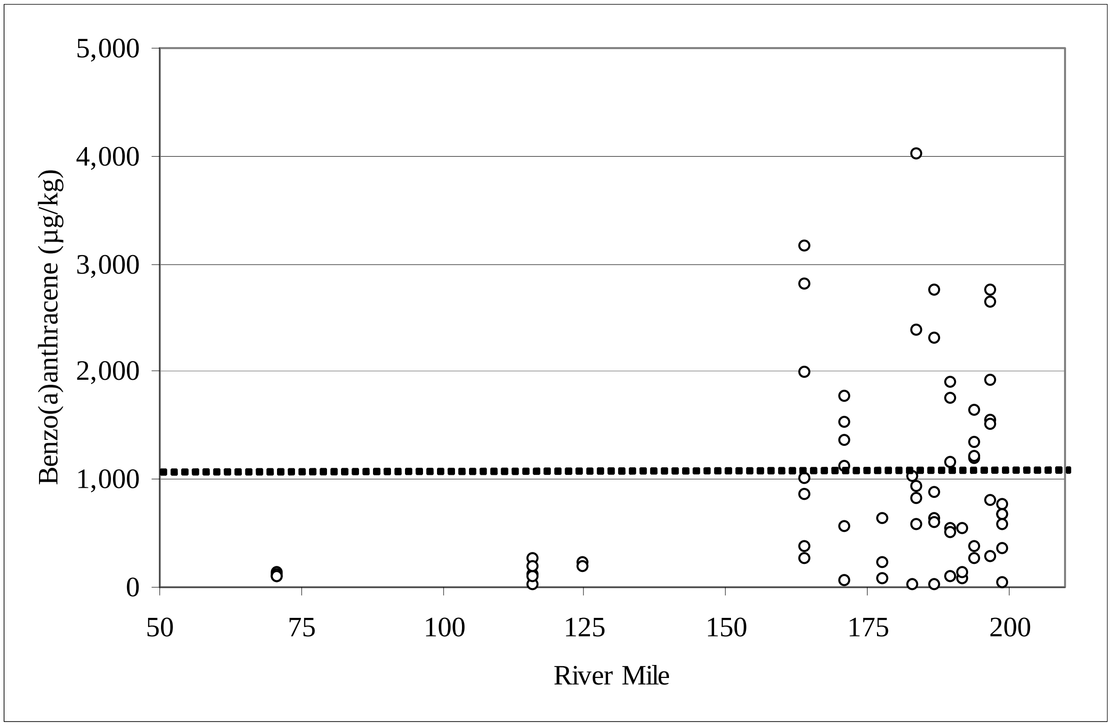
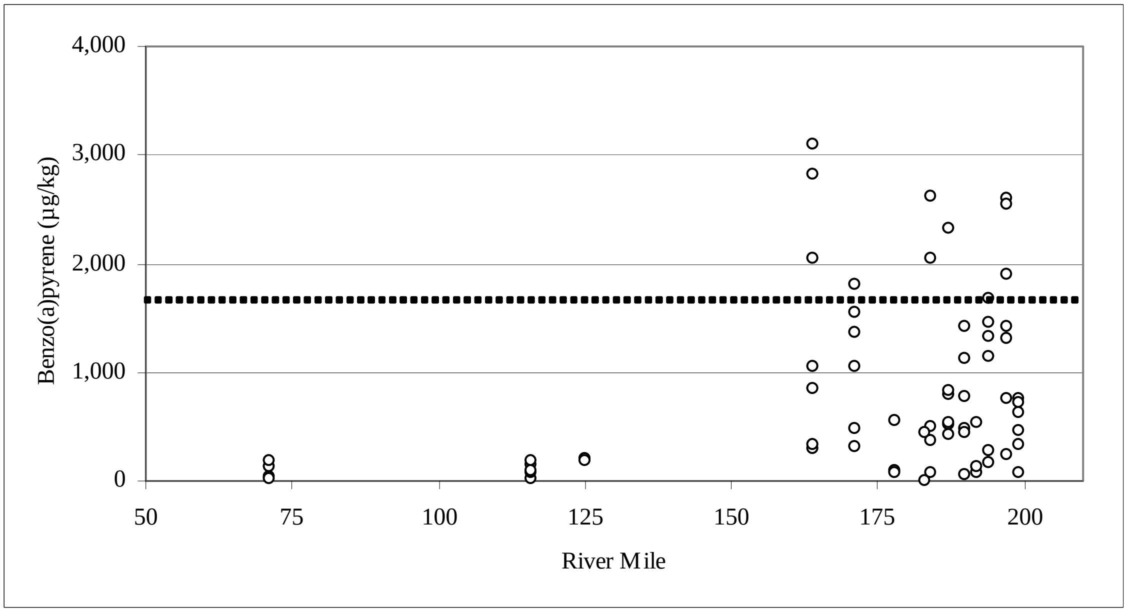


Figure 7. Distribution of benzo(a)pyrene in Illinois River sediments relative to distance from the junction with the Mississippi River. The dashed line is the PEC of 1,450 µg/kg for benzo(a)pyrene (MacDonald et al., 2000).



Comparison of PAH Concentration to Other Locations in Illinois

Concentrations of PAH compounds and metals were determined by the U.S. EPA in sediments from the Chicago River (Collier and Cieniawski, 2003), and by the ISGS and ISWS in sediment samples from the West Branch of the Grand Calumet River (Cahill et al. 1999). There are well-documented sources of PAH contamination in these areas from coke production and former gas manufacturing plants. The mean and range in concentrations of selected PAH compounds from these studies is listed in Table 11. The mean and maximum concentrations of PAH compounds in these urban rivers are much higher than those observed in this study. For example, the mean concentration of benzo(a)pyrene in this study is 802 µg/kg compared to 6,900 µg/kg in the Chicago River and 11, 371 µg/kg in the Grand Calumet River.

Table 11. Concentration of Selected PAH compounds in the Chicago and West Branch of the Grand Calumet Rivers in Illinois. All values in µg/kg on the dried basis unless noted otherwise.

	Chicago River *			**Grand Calumet River ****		
	Mean	**Minimum**	**Maximum**	**Mean**	**Minimum**	**Maximum**
Naphthalene	2,900	300	33,000	1,885	<2	10,079
Fluorene	3,900	400	45,000	7,362	3	24,990
Phenanthrene	14,800	1,500	140,000	23,319	<2	88,024
Anthracene	6,900	300	140,000	9,459	<2	36,732
Fluoranthene	14,200	4,000	67,000	9,433	16	51,330
Pyrene	16,700	3,300	75,000	31,653	26	109,291
Chrysene	9,100	1,900	42,000	18,173	19	52,459
Benzo(a)anthracene	6,900	1,700	27,000	13,862	201	36,661
Benzo(a)pyrene	6,900	1,500	30,000	11,371	25	33,987
Total PAHs	106,900	22,500	721,000	157,588	1,000	485,000

* 12 locations in the Chicago River from Collier and Cieniawski, 2003.

** Seven locations in the West branch of the Grand Calumet River in Illinois from Cahill, Demissie and Bogner, 1999.

The mean and range in concentrations of PAH compounds in Illinois surface soils are summarized in Table 12 (EPRI, 2003). The results are being used to establish risk-based objectives for soil remediation and to account for background concentrations as part of the Tiered Approach to Corrective Action Objectives (TACO; Illinois Compiled Statutes, 1997).

Table 12. Mean, minimum and maximum concentrations of PAH Compounds in Background Soils of Illinois (µg/kg) (EPRI, 2003).

	Mean	Minimum	Maximum
Naphthalene	13	0.01	2,850
Fluorene	5	0.01	682
Phenanthrene	73	0.5	8,100
Anthracene	12	0.05	1,370
Fluoranthene	114	0.02	12,400
Pyrene	97	2.1	9,060
Chrysene	75	0.07	5,540
Benzo(a)anthracene	58	2.0	4,170
Benzo(a)pyrene	53	0.1	5,210

The mean concentrations of PAHs in background soils are similar to the values observed in the lower portions of the cores analyzed in this study. The maximum background soil concentrations are higher than the maximums observed in this study for naphthalene, phenanthrene, fluoranthene, pyrene and benzo(a)pyrene.

Inorganic Elements Results and Discussion

The concentrations of inorganic elements that were determined in 132 sediment intervals by the contract lab are given in Appendix 5. The median, mean, standard deviation, minimum, maximum, detection limits and the numbers of samples above detection limit for inorganic elements are provided in Table 13.

Every sediment interval in the cores from Wightman Lake and Matanzas Lake was analyzed at ISGS. The results of these 37 sediment samples for inorganic elemental analysis by ICP and mercury by CVAAS are given in Appendix 6. Every sediment interval was analyzed at ISGS by EDX for 12 inorganic elements, and the results are given in Appendix 7. The median, mean, standard deviation, minimum, maximum, detection limits and the numbers of samples above detection limit are provided in Table 14.

Table 13. Median, mean, standard deviation, minimum, maximum, detection limit, and number of samples above detection limit in sediments by ICP-MS by contract lab. All values in mg/kg on a dry-weight basis unless noted otherwise.

	Number	Detection Limit	Median	Mean	Std. Dev	Minimum	Maximum
Li	132	0.5	24.0	23.8	6.1	4.5	39.7
Be	132	0.1	1.1	1.1	0.3	0.2	1.7
B	132	1	12	12	5	1	23
Na	132	1	238	247	67	100	470
Mg (%)	132	0.01	1.02	1.04	0.29	0.47	2.23
Al (%)	132	0.01	2.27	2.24	0.65	0.33	3.92
K (%)	132	0.01	0.30	0.32	0.12	0.03	0.62
Ca (%)	132	0.01	2.59	2.63	1.24	0.42	10.34
V	132	0.1	40	41	11	10	72
Cr	132	0.5	50.7	56.4	26.2	7.0	122.9
Mn	132	1	566	602	210	123	1,300
Fe (%)	132	0.01	3.29	3.15	0.62	0.73	4.21
Co	132	0.1	11.8	11.5	1.9	2.5	14.8
Ni	132	0.1	38.3	42.6	15.7	7.7	97.9
Cu	132	0.1	48.0	55.1	33.5	6.4	211.0
Zn	132	0.1	296	273	152	19	690
Ga	132	0.02	6.7	6.6	1.8	1.1	11.0
Ge	4	0.1	0.1	0.1		0.1	0.1
As	132	0.1	10.6	12.4	9.2	0.3	45.2
Se	131	0.1	1.2	1.2	0.4	0.2	2.7
Rb	132	0.1	26.6	28.7	10.1	3.2	52.9
Sr	132	0.5	46.9	45.8	14.6	10.4	90.7
Y	132	0.1	13.6	13.4	2.8	3.8	20.3
Zr	132	0.1	4.3	4.3	1.7	0.6	12.7
Nb	132	0.1	0.7	0.6	0.2	0.1	0.9
Mo	132	0.01	1.49	1.32	0.52	0.17	2.33
Ag	106	0.05	1.0	1.0	0.7	0.1	3.4
Cd	132	0.1	2.4	3.4	2.8	0.2	11.5
In	126	0.02	0.04	0.04	0.01	0.02	0.07
Sn	131	0.05	1.99	2.34	2.07	0.06	9.70
Sb	132	0.02	0.42	0.46	0.31	0.06	1.42
Te	114	0.02	0.06	0.07	0.03	0.03	0.13
Cs	132	0.1	1.2	1.3	0.5	0.2	2.5
Ba	132	0.5	182	175	45	29	262
La	132	0.5	24.2	23.6	4.4	6.3	31.7
Ce	132	0.01	46.1	45.4	7.9	13.9	62.0
Nd	132	0.1	22.6	22.1	3.7	7.1	29.0
Sm	132	0.1	4.5	4.5	0.8	1.5	6.0
Eu	132	0.1	0.9	0.9	0.2	0.3	1.3
Tb	132	0.1	0.5	0.5	0.1	0.2	0.7
Yb	132	0.1	1.0	1.0	0.2	0.3	1.5
Lu	120	0.1	0.1	0.1	0.02	0.1	0.2
Hf	32	0.1	0.1	0.1	0.05	0.1	0.3
Ta	0	0.05					
W	0	0.2					
Re (µg/kg)	114	1	2	2	1	1	12
Au(µg/kg)	51	0.2	8.8	13.4	12.9	0.6	60.4
Hg (µg/kg)	132	5	270	420	457	19	2,265
Tl	132	0.02	0.40	0.38	0.12	0.05	0.59
Pb	132	0.01	58.1	61.5	42.5	3.7	209.2
Bi	132	0.02	0.46	0.50	0.31	0.04	1.64
Th	132	0.1	4.6	4.5	1.1	1.1	7.7
U	132	0.1	1.2	1.2	0.4	0.3	2.4

Table 14. Median, mean, standard deviation, minimum, maximum, detection limit and number of samples above detection limit in sediments by EDX at ISGS. All values in mg/kg on a dry-weight basis unless noted otherwise.

	Number	Detection Limit	Median	Mean	Std. Dev.	Minimum	Maximum
Zn	201	50	227	246	150	50	772
Br	244	0.5	3.9	3.6	1.5	0.5	7.7
Rb	259	20	107	101	25	24	142
Sr	259	50	106	107	14	71	143
Ag	250	0.5	2.1	2.2	1.0	0.5	6.6
Cd	252	0.5	2.3	3.1	2.3	0.5	11.4
In	90	0.5	0.9	1.0	0.5	0.5	3.4
Sn	258	0.5	6.0	7.1	3.9	0.9	23.2
Sb	216	0.5	1.9	2.0	1.0	0.5	4.9
Ba	259	100	544	522	79	269	673
La	259	10	39	38	8	10	54
Ce	259	10	62	59	12	10	82

Distribution of Trace Metals in Illinois River sediments by location and depth

The distributions of seven metals as a function of location in the Illinois River are plotted in Figures 8-14. The concentrations of these seven metals are plotted versus depth in core in Appendix 8. Included in these plots are results from Act Labs and ISGS.

Figure 8. Distribution of nickel in Illinois River Lake sediments as a function of distance from the junction with the Mississippi River. The dashed line is the PEC of 49 mg/kg for nickel (MacDonald et al., 2000).

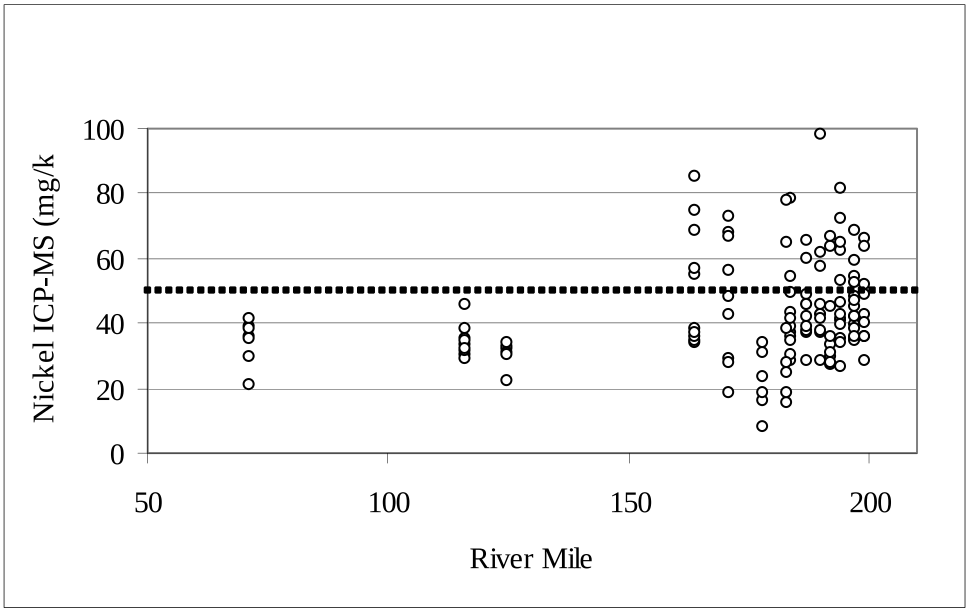


Figure 9. Distribution of copper in Illinois River Lake sediments as a function of distance from the junction with the Mississippi River. The dashed line is the PEC of 149 mg/kg for copper (MacDonald et al., 2000).

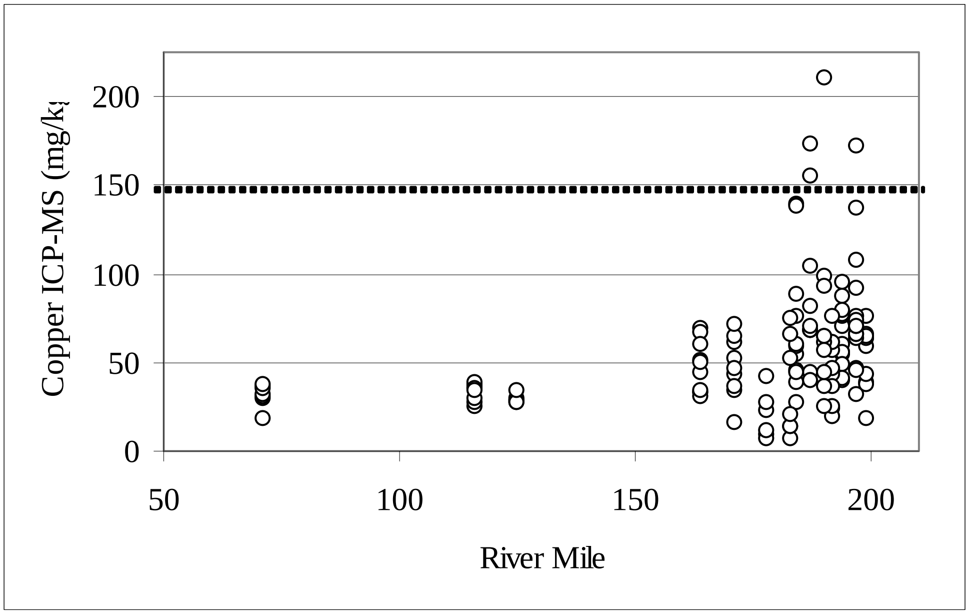


Figure 10. Distribution of zinc in Illinois River Lake sediments as a function of distance from the junction with the Mississippi River. The dashed line is the PEC of 459 mg/kg for zinc (MacDonald et al., 2000).

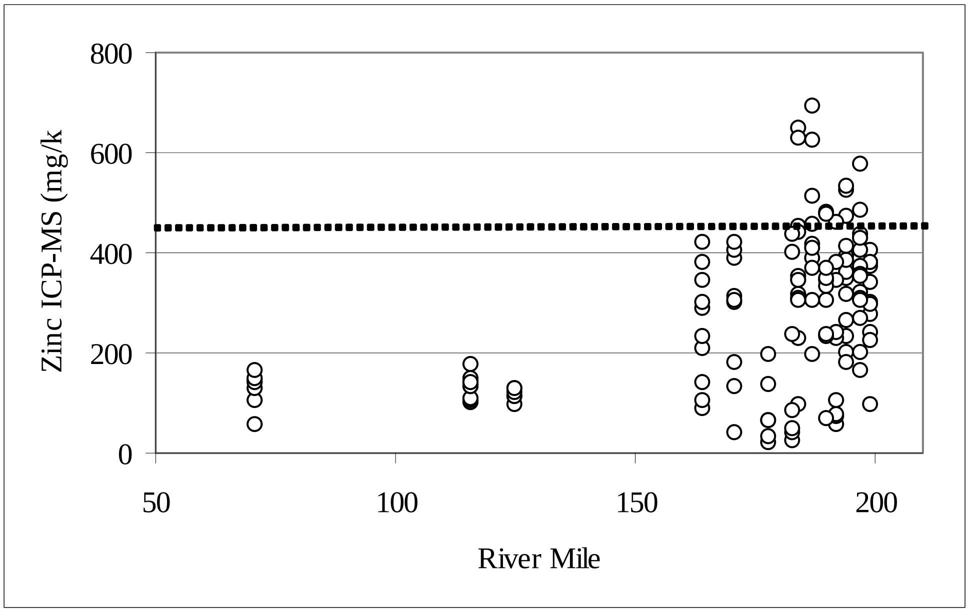


Figure 11. Distribution of arsenic in Illinois River Lake sediments as a function of distance from the junction with the Mississippi River. The dashed line is the PEC of 33 mg/kg for arsenic (MacDonald et al., 2000).

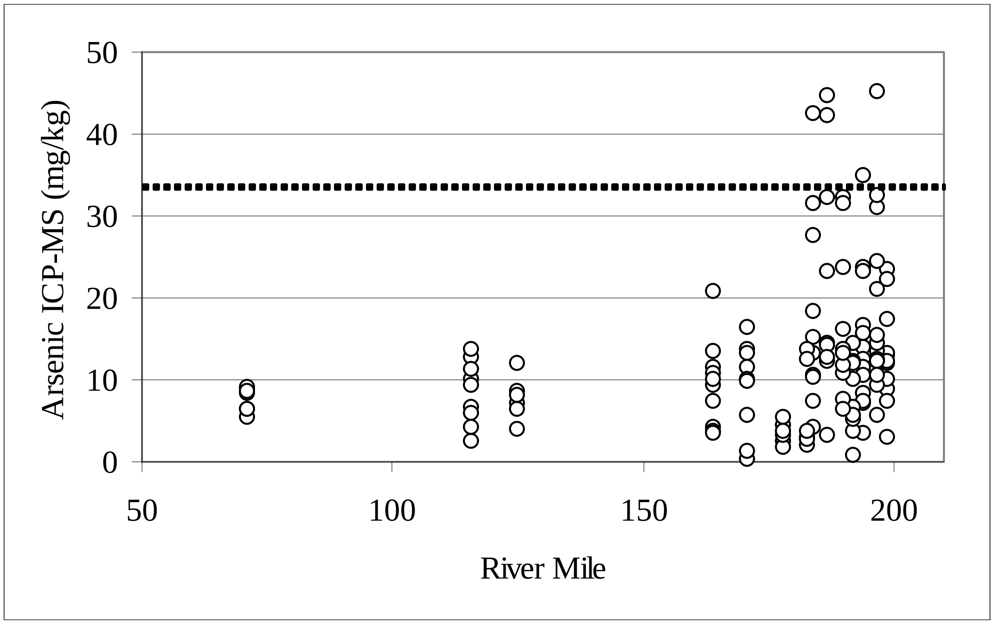


Figure 12. Distribution of cadmium in Illinois River Lake sediments as a function of distance from the junction with the Mississippi Rive. The dashed line is the PEC of 5 mg/kg for cadmium (MacDonald et al., 2000).

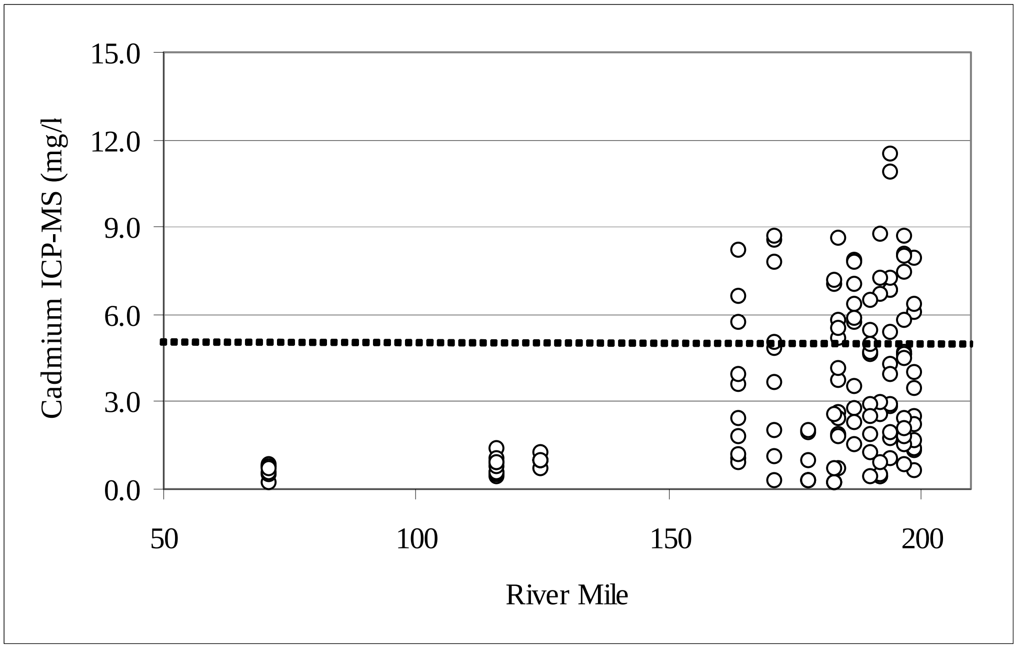


Figure 13. Distribution of mercury in Illinois River Lake sediments as a function of distance from the junction with the Mississippi River. The dashed line is the PEC of 1,006 µg/kg for mercury (MacDonald et al., 2000).

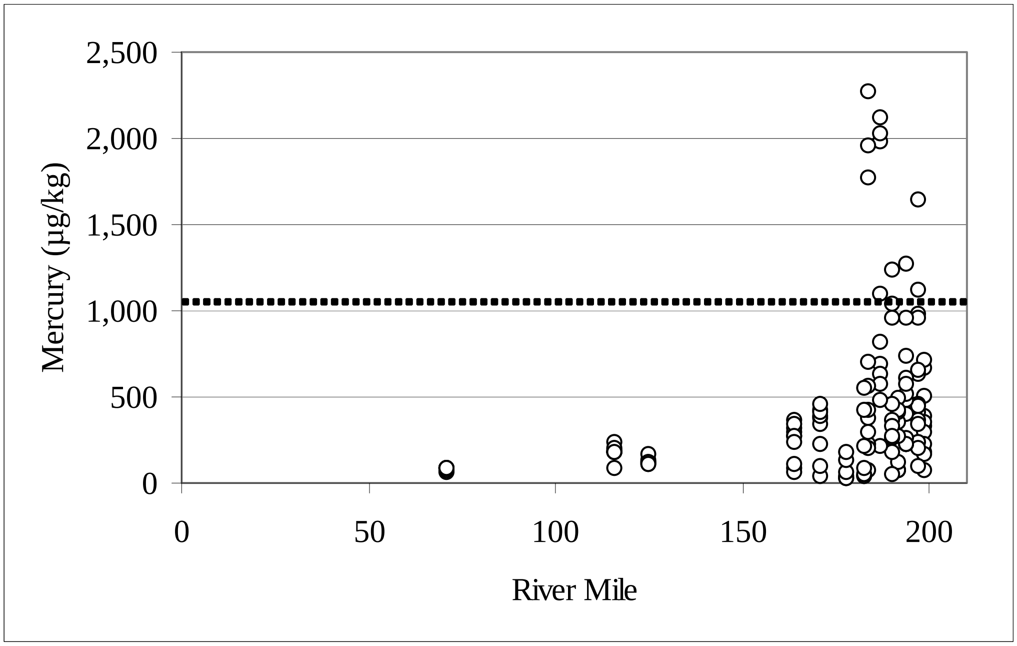
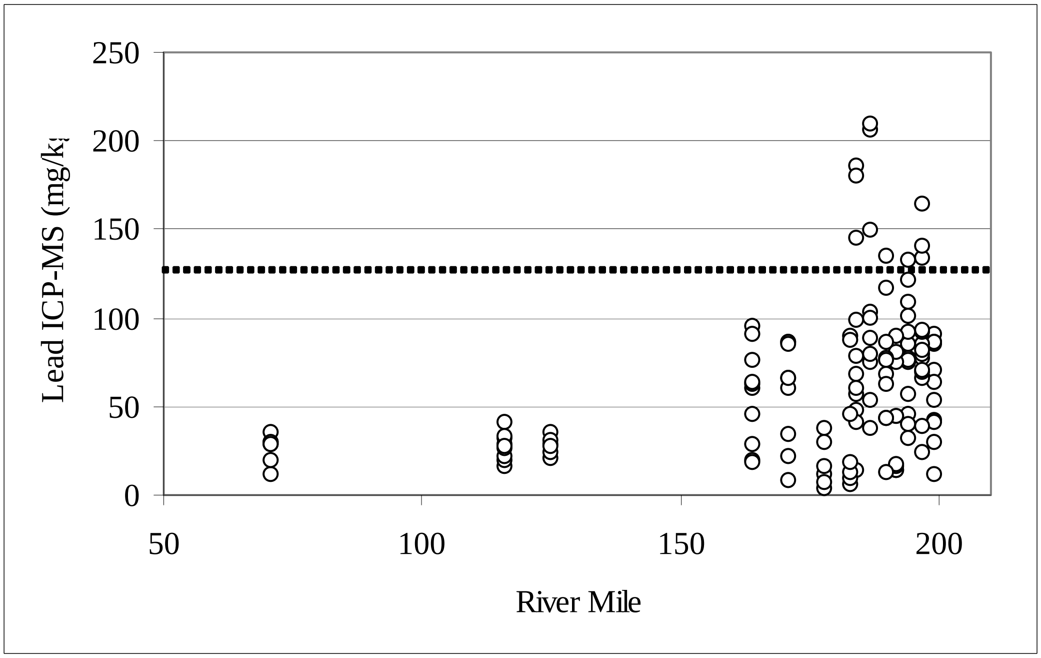


Figure 14. Distribution of lead in Illinois River Lake sediments as a function of distance from the junction with the Mississippi River. The dashed line is the PEC of 128 mg/kg for lead (MacDonald et al., 2000).



The concentrations of metals did not exceed probable effect concentrations in the intervals tested in Peoria Lake at river mile 178, Quiver Lake, Matanzas Lake or Meredosia Lake. Only nickel and cadmium concentrations exceeded the PEC in Senachwine Lake, Weiss Lake, Babb Slough, and in Peoria Lake at river mile 171. Nickel, copper, zinc, arsenic, cadmium mercury and lead concentrations exceeded the PEC in some intervals in Sawmill, Billsbach, Goose, and Wightman Lakes and in Peoria Lake at river mile 164. In general, the deeper sediment intervals, between 1.0 to 1.3 m, were where concentrations exceeded PEC values. These deeper sediments were likely deposited in the early part of the 20th century prior to the implementation of pollution controls.

Comparison to Previous Results

The concentrations of metals in sediments from lakes associated with the Illinois River collected between 1975 and 1998 are summarized in Table 15 (Cahill and Steele, 1986, Demissie et al., 1996, Cahill 2001b). The table excludes sediment cores collected from Lake DePue. The cores from Lake DePue were atypical since they were from a lake adjacent to a former zinc smelter that is a known Superfund site (Cahill and Bogner, 2002; Cahill, 2002).

Table 15. Median, mean, standard deviation, minimum, maximum and number of samples above detection limit in sediments from lakes associated with the Illinois River. All values in mg/kg on a dry-weight basis unless noted otherwise.

	Median	Mean	Std. Dev.	Minimum	Maximum	N> Det. Limit
Cr	103	110	35	24	218	178
Ni	34	37	15	8	81	168
Cu	37	47	22	8	159	150
Zn	168	227	121	29	651	179
As	11.4	12.2	5.8	3.0	48	181
Cd	3.2	4.1	3.2	0.7	13.4	169
Hg (µg/kg)	190	260	290	40	2,110	119
Pb	54	68	62	2	661	140

Data taken from Cahill and Steele (1986), Demissie et al.(1996), and Cahill (2001b).

Comparison of Metal Concentration to Other Locations in Illinois

Concentrations of metals were determined by the U.S. EPA in sediments from the Chicago River (Collier and Cieniawski, 2003), and by the ISGS and ISWS in sediments from the West Branch of the Grand Calumet River (Cahill et al. 1999). The ranges in concentrations of selected metals from these studies are listed in Table 16. The mean and maximum concentrations of metals in these urban rivers are much higher than those observed in this study. The mean concentration of mercury in this study was 420 µg/kg compared to 2,400 µg/kg in the Chicago River and 8,000 µg/kg in the Grand Calumet River. There are known sources of metal contamination in these areas from steel production and numerous manufacturing plants.

Table 16. Mean and range of the concentration of selected metals in the Chicago and West Branch of the Grand Calumet Rivers in Illinois. All values in mg/kg on the dried basis unless noted otherwise.

	Chicago River *			**Grand Calumet River ****		
	Mean	**Minimum**	**Maximum**	**Mean**	**Minimum**	**Maximum**
Cr	352	31	1,700	160	19	680
Ni	118	23	548	51	<5	87
Cu	369	64	716	144	9	335
Zn	1,421	161	5,470	1,141	27	2,803
As	11.5	6.6	39.8	18	4	38
Cd	33.2	2.1	140.0	7	<4	10
Hg (µg/kg)	2,400	900	7,300	8,000	<200	26,200
Pb	643	157	2,080	371	50	1,040

* 12 locations in the Chicago River from Collier and Cieniawski, 2003.
** Seven locations in the West branch of the Grand Calumet River in Illinois from Cahill, Demissie and Bogner, 1999.

The mean and range in concentrations for 8 metals in Illinois soils from two ISGS studies are summarized in Table 17 (Frost, 1995; Dreher and Follmer, 2006). The mean concentrations of Ni, Cu, Zn, Cd, Hg and Pb in the sediment associated with the Illinois River were, in general, 2 - 4 times greater than background soil concentrations.

Table 17. Mean, minimum and maximum concentrations of metals in Illinois Soils from 2 ISGS Studies. All values in mg/kg on the dried basis unless noted otherwise.

	*****			*** ***		
	Mean	**Minimum**	**Maximum**	**Mean**	**Minimum**	**Maximum**
Cr	59	13	91	67	24	633
Ni	24	<15	79	20	<5	49
Cu	30	8	73	25	10	138
Zn	72	17	258	72	7	209
As	10.1	1.6	46.0	&	&	&
Cd	<3		<3	&	&	&
Hg (µg/kg)	&	&	&	<2	35	123
Pb	26	<10	250	28	9	147

***** Concentration in 94 soils cores from 54 counties (Frost, 1995)
** Concentrations in the upper intervals of 137 soil cores from a 20 mile grid for the entire state (Dreher and Follmer, 2006) & Not measured

Cesium-137 Sedimentation Rate Results and Discussion

Sedimentation rates have been estimated in lakes associated with the Illinois River using traditional bathymetric profiling (Demissie and Bhowmik, 1987; Lee, 1983; U.S. COE, 2003) and by measuring changes in surface areas (Bellrose et al. 1983). The combinations of traditional methods and radiometric dating using ^{137}Cs have been shown to yield complementary results (Demissie, Fitzpatrick and Cahill, 1992; Algire and Cahill, 2001).

For accurate sediment dating, the grain size should be uniform throughout the core and the depositional rate, and the marker should be undisturbed by physical or chemical processes following deposition or during coring operation. Sediment cores that are collected in high energy areas where the upper sediments are physically mixed by wind, waves, currents or navigational activities generally will not have an undisturbed or preserved ^{137}Cs record. Most sediments that are primarily composed of sand-sized particles will not have a ^{137}Cs record.

Sedimentation rate measurements are calculated based on the depth in the core of the interval with the maximum activity of ^{137}Cs which was deposited in approximately 1963, the year that corresponds to maximum fallout from atmospheric nuclear weapon testing. The position of the onset of ^{137}Cs activity in a core corresponds to the start of widespread atmospheric testing of nuclear weapons in 1954. The determination of the exact location of the 1954 horizon is generally difficult. There were much smaller amounts of ^{137}Cs deposited in 1954 than in the peak years of atmospheric testing, 1961-1963. Also, more than one half-life has passed since 1954, which would reduce the amount of ^{137}Cs present by more than 50 percent due to radioactive decay.

The ^{137}Cs profiles from the cores collected in this study are given in Appendix 9. Table 18 is a summary of sedimentation rates determined by ^{137}Cs. All of the vibracores were of sufficient length to reach sediment layers with no detectable ^{137}Cs activity (pre 1954). The ^{137}Cs profiles and sedimentation rates were variable. In some cores the ^{137}Cs profiles were not preserved or appeared to be disturbed. This was the case in the cores from Upper Peoria Lake at RM 178, and in Quiver Lake.

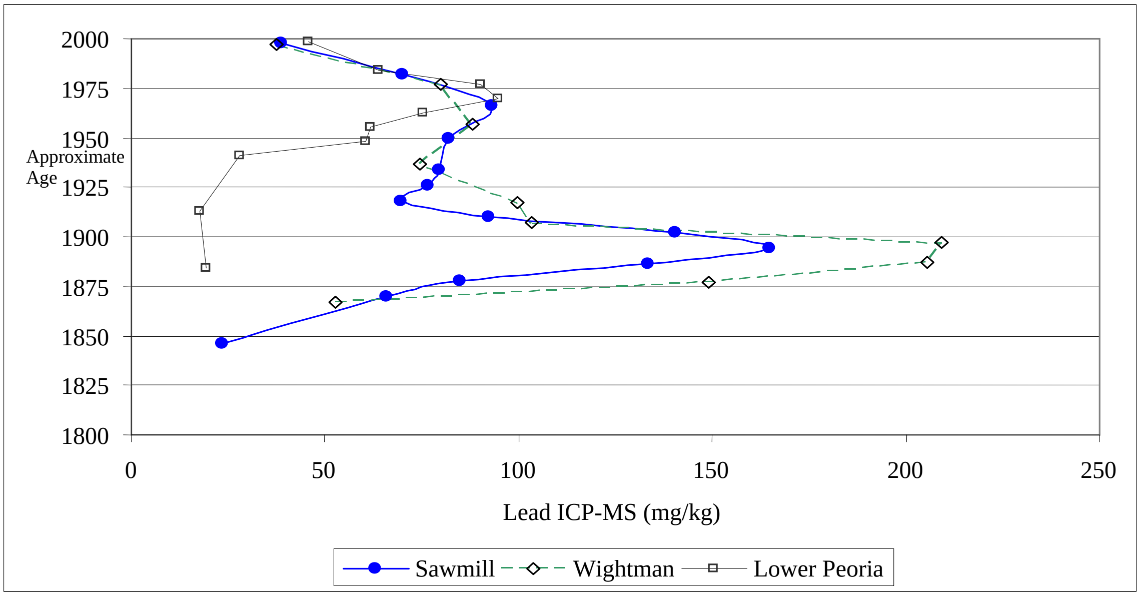
Table 18. Summary of sedimentation rates determined by ^{137}Cs in lakes associated with the Illinois River.

Core ID	Location	Depth to peak ^{137}Cs activity (cm)	Depth to onset of ^{137}Cs activity (cm)	1963-date sedimentation rate (cm/y)	1954-date sedimentation rate (cm/y)
02-1	Senachwine	35	55	0.9	1.1
02-2	Sawmill	45	65	1.2	1.3
02-3	Billsbach	75	95	1.9	2.0
02-4	Weiss	25	45	0.6	0.9
02-5	Goose	35	55	0.6	1.1
02-6	Wightman	35	55	0.9	1.1
02-7	Meadow	45	65	1.2	1.3
02-8	Babb Slough	15	35	0.4	0.7
02-9	U. Peoria RM 178	25	35	0.6	0.7
02-10	U. Peoria RM 171	45	65	1.2	1.3
02-11	L. Peoria RM 164	45	75	1.2	1.6
02-12	Quiver	5	25	0.1	0.3
02-13	Matanzas	45	65	1.2	1.3
02-14	Meredosia	45	65	1.2	1.3

The sedimentation rates determined are similar to the 1.4 cm/yr in Sawmill Lake and the 0.8 to 2.0 cm/yr in Upper Peoria Lake measured in previous studies (Cahill and Steele, 1986). The sedimentation rates determined are also similar to the long-term estimates of sedimentation rates (1903 to 2001) using traditional bathymetric surveys that ranged from 0.5 to 1.0 cm/yr in Babb Slough, Sawyer Slough, Meadow Lake and Wightman Lake (U.S. COE, 2003).

The approximate date of deposition of metals and organic compounds can be estimated using ^{137}Cs sedimentation rates. The concentrations of lead in Sawmill Lake, Wightman Lake and Lower Peoria Lake are plotted versus the approximate date of deposition in Figure 15. The plot shows that the amount of lead entering these lakes has decreased dramatically, and lead concentrations of the most recent sediments are close to background levels. Organic lead compounds were added to gasoline starting in the 1920's. The U.S. EPA ordered incremental reduction of these compounds beginning in 1973 and the total removal from gasoline by 1986. The peak lead concentrations in Sawmill and Wightman lakes appear to have occurred around 1900. This may reflect local sources that used lead in industrial and agricultural practices including manufacture of textiles or the agricultural use of insecticides.

Figure 15. Approximate date of the incorporation of lead in sediment cores from Sawmill, Wightman, and Lower Lake Peoria



CONCLUSIONS

- The sediment quality of backwater lakes associated with the Illinois River has improved over the last 30 years.

- The concentrations of phenolic compounds, chlorinated pesticides, and PCBs are below method detection limits. PAH compounds were detected in sediment cores at a wide range of concentrations. The concentrations were much lower than ranges of concentrations previously reported for the Chicago River or the Grand Calumet River. The lower sections of the cores from this study have PAH concentrations equivalent to background soils in Illinois.

- The sediments contained a wide range in concentrations of nickel, copper, zinc, arsenic, cadmium, mercury and lead. Lower concentrations generally were found in the upper 0.5 m of cores but concentrations were elevated at depths ranging from 1.0 to 1.5 m. The concentrations were much lower than the ranges of concentrations reported for the Chicago River or the Grand Calumet River. The lower sections of the cores from this study have metal concentrations equivalent to background soils in Illinois.

- Long-term sedimentation rates based on ^{137}Cs ranged from 0.1-2.0 cm/yr, with an average of 1.4 cm/yr. These rates are comparable to those reported in previous studies.

RECOMMENDATIONS

- A detailed sampling and analysis of sediment cores should be conducted in areas proposed for dredging to determine the extent of contaminated sediments, particularly in the Peoria Pool of the Illinois River.

- Future studies should include the measurement of geotechnical properties including grain size and unit density.

- Sedimentation rates determined by ^{137}Cs should be confirmed with traditional bathymetric profiling and ^{210}Pb dating of the sediments.

REFERENCES

Algire, R. L. and R. A. Cahill. 2001. Benchmark Sedimentation Survey of the Lower Cache River Wetlands, Illinois State Water Survey Contract Report 2001-17, 42 p.

Bellrose, F. C., S. P. Havera, R. L. Paveglio and D. W. Steffeck. 1983. The fate of lakes in the Illinois River Valley, Illinois Natural History Survey Biological Notes No. 119, 27 p.

Bhowmik, N. G., E. Bauer, W. C. Bogner and M. Demissie. 2001. Historical Sedimentation at the Mouths of Five Deltas on Peoria Lake, Illinois State Water Survey Contract Report 2001-8, 74 p.

Bzdusek, P.A., E.R. Christensen, A. Li and Q. Zou. 2004. Source Apportionment of Sediment PAHs in Lake Calumet, Chicago: Application of Factor Analysis with Nonnegative Constraints, Environmental Science & Technology, Vol. 38, 97-103.

Cahill, R.A. and J.D. Steele. 1986. Inorganic Composition and Sedimentation Rates of Backwater Lakes Associated with the Illinois River, Environmental Geology Notes 115. Springfield, IL: IDNR.

Cahill, R. A. and M. T. Unger. 1993. Evaluation of the extent of contaminated sediments in the west branch of the Grand Calumet River, Indiana-Illinois, USA: Water Science & Technology, Vol. 28, 53-58.

Cahill, R. A., M. Demissie, and W. C. Bogner. 1999. Characterization and Assessment of the Sediment Quality and Transport Processes in the West Branch of the Grand Calumet River in Illinois, Illinois State Geological Survey Open File Series, OFS 1996-6, 122 p.

Cahill, R. A. 2001a. Results from the Chemical Analysis of Sediment Core Samples Collected in 1998, 1999 and 2000, Open File Series 2001-4. Springfield, IL: IDNR.

Cahill, R. A. 2001b. Assessment of Sediment Quality and Sedimentation Rates in Peoria Lake, Proceeding: Governors 2001 Conference on the Management of the Illinois River System, October 2-4, 2001, Peoria, IL, 79-88.

Cahill, R.A. and W.C. Bogner. 2002. Investigation of Metal Distributions and Sedimentation Patterns in DePue and Tuner Lakes, Illinois Waste Management and Research Center Report RR-98, Illinois Department of Natural Resources, 97 p.

Cahill, R. A. 2002. Lake DePue Sediment Quality: An Update of Metal Concentrations and Sedimentation Rate Estimates Based on Vibracores Collected in April 2002. Final Draft Report submitted to Steve Davis, IDNR Division of Resource Review and Coordination, 50 p.

Cahill, R. A. and J. A. Slowikowski. 2002. Quality Assurance Project Plan for the Investigation of Metal and Organic Contaminant Distributions and Sedimentation Rates in Backwater Lakes along the Illinois River (on file at ISTC – available upon request).

Christensen, E.R. and Z. Zhang. 1993. Sources of Polycyclic Aromatic Hydrocarbons to Lake Michigan Determined form Sedimentary Record, Environmental Science and Technology, Vol. 27, 139-146.

Collier, D. and S. Cieniawski. 2003. October 2000 and August 2002 Surveys of sediment contamination in the Chicago River, Chicago, Illinois, Final Report Prepared for U.S EPA, Great Lakes National Program Office, Chicago, IL, 18 p. + appendices.

Demissie, M. and N. G. Bhowmik. 1987. Long-Term Impacts of River Basin Development on Lake Sedimentation: The Case of Peoria Lake, Water International, Vol. 12, 23-32.

Demissie, M., W. P. Fitzpatrick and R. A. Cahill. 1992. Sedimentation in the Cache River wetlands: Comparison of two methods. Illinois State Water Survey Miscellaneous Publication No. 129, 43 p.

Demissie, M., et al. 1996. Impact of the 1993 Flood on Sedimentation and Sediment Quality in Backwater Lakes of Illinois, Illinois State Water Survey Contract Report 593, 205 p.

Doyle, B. C. and A. W. Hatheway. 2006. Former Manufactured Gas Plants, Locations of Gas Plants and Other Coal-tar Sites in the U.S., The State of Illinois. http://www.hatheway.net/

Dreher, G. B. and L. R. Follmer. 2006. The Geology and Chemical Composition of Soils in Illinois, Final Draft for Open-File Series, Illinois State Geological Survey.

Electric Power Research Institute. 2003. Polycyclic aromatic hydrocarbons (PAHs) in surface soil in Illinois, Final Report, Prepared by META Environmental, Inc. Watertown, MA and Ish, Inc. Sunnyvale, CA.

Frost, J. K. 1995. Background Concentrations in Illinois Soil, Illinois State Geological Survey, unpublished results.

Geiger, J. W. and G. A. Kientop. 2004. Illinois State Geological Survey, ESA Section Former Manufactured Gas Plant Project, (unpublished GIS Database).

Gill, T.E. 1993a. Certificate of Analysis Standard Reference Material 2709, San Joaquin Soil, National Institute of Standards and Technology, 7 p.

Gill, T.E. 1993b. Certificate of Analysis Standard Reference Material 2711, Montana Soil, Moderately Elevated Trace Element Concentrations, National Institute of Standards and Technology, 7 p.

Illinois Environmental Protection Agency. 1994. A Summary of Selected Background Conditions for Inorganics in Soil, IEPA/ENV/94-161.

Illinois Compiled Statutes. 1997. Environmental Safety, Environmental Protection Act 415 ILCS5/ title XVII: Site Remediation Program (415 ILCS 5/58), Appendix B.

Lee, M.T. 1983. Sedimentation in the Backwater Lakes and Side Channels Along the Illinois River, Illinois State Water Survey Reprint Series No. 717, 14 p.

Li, A., J. K. Jang, and P.A. Scheff. 2003. Application of EPA CMB8.2 Model for Source Apportionment of Sediment PAHs in Lake Calumet, Chicago, Environmental Science and Technology, Vol. 37, 2958-2965.

Lima, A.L., T.I. Eglinton and C. M. Reddy. 2003. High-Resolution Record of Pyrogenic Polycyclic Aromatic Hydrocarbon Deposition during the 20th Century, Environmental Science & Technology, Vol. 37, 53-61.

MacDonald, D. D., C. G. Ingersoll and T. A. Berger. 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems, 2000, Archives of Environmental Contamination and Toxicology, Vol. 29, 20-31.

Machesky, M.L., J. A. Slowikowski, R. A. Cahill, W. C. Bogner, J. C. Marlin, T. R. Holm and R. G. Darmody. 2005. Sediment quality and quantity issues related to the restoration of backwater lakes along the Illinois River waterway, Aquatic Ecosystem Health & Management, Vol. 8, 33-40.

May, W. E. and T. E. Gill. 1999. Certificate of Analysis Standard Reference Material 1944, New York/New Jersey Waterway Sediment, National Institute of Standards and Technology, 17 p.

May, W. E. and T. E. Gill. 2000. Certificate of Analysis Standard Reference Material 8704, Buffalo River Sediment, National Institute of Standards and Technology, 4 p.

Mitzelfelt, J. D. 1996. Sediment Classification for Illinois Inland Lakes (1996 Update), IEPA Bureau of Water, 5 p.

United States Environmental Protection Agency. 2001. Methods for Collection, Storage and Manipulation of Sediments for Chemical and Toxicological Analyses: Technical Manual, EPA-823-B-010002, U.S. Environmental Protection Agency, Office of Water, Washington, DC.

U.S. Army Corps of Engineers. 2003a. Peoria Riverfront Development Ecosystem Restoration Study, Illinois Feasibility Report with Integrated Environmental Assessment, Rock Island District, Rock Island, Illinois, 166 p. with appendices.

U.S. Army Corps of Engineers. 2003b. An Evaluation of Sedimentation Rates Between 1903 and 2001 for 4 Backwater Lakes on the Illinois River (Meadow Lake, Wightman Lake, Babbs Slough, and Sawyer Slough), Rock Island District, and Rock Island, Illinois, 51 p.

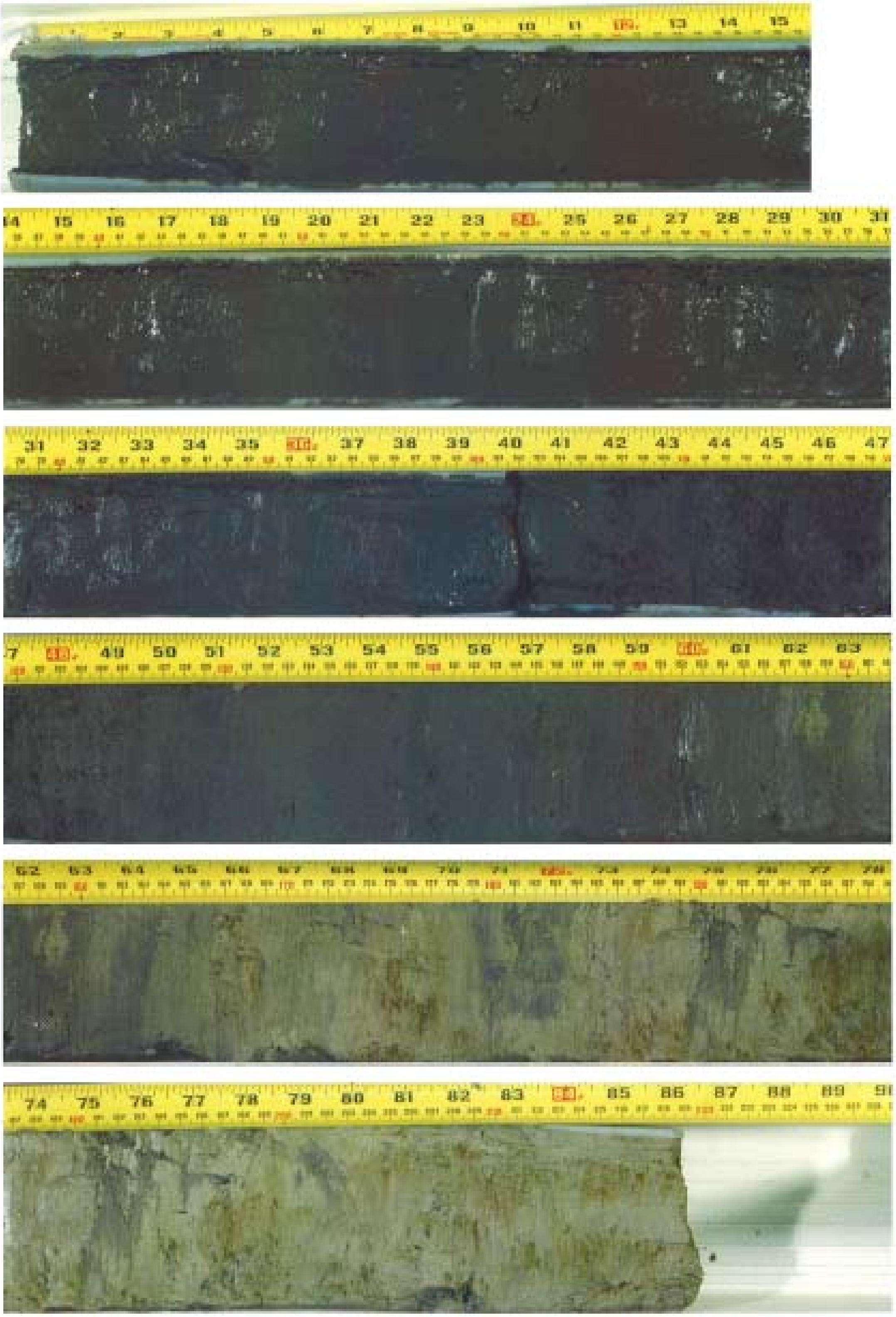
U.S. Army Corps of Engineers. 2007. Illinois River Basin Restoration-Comprehensive Plan, with Integrated Environmental Assessment, Rock Island District, Rock Island, Illinois, 1,229 p.
Note: All USCOE Reports available at: www.mvr.usace.army.mil/Products/Projects.asp

Van Metre, P. C., B. J. Mahler and E. T. Furlong. 2000. Urban Sprawl Leaves its PAH Signature, Environmental Science & Technology, Vol. 34, 4064-4070.

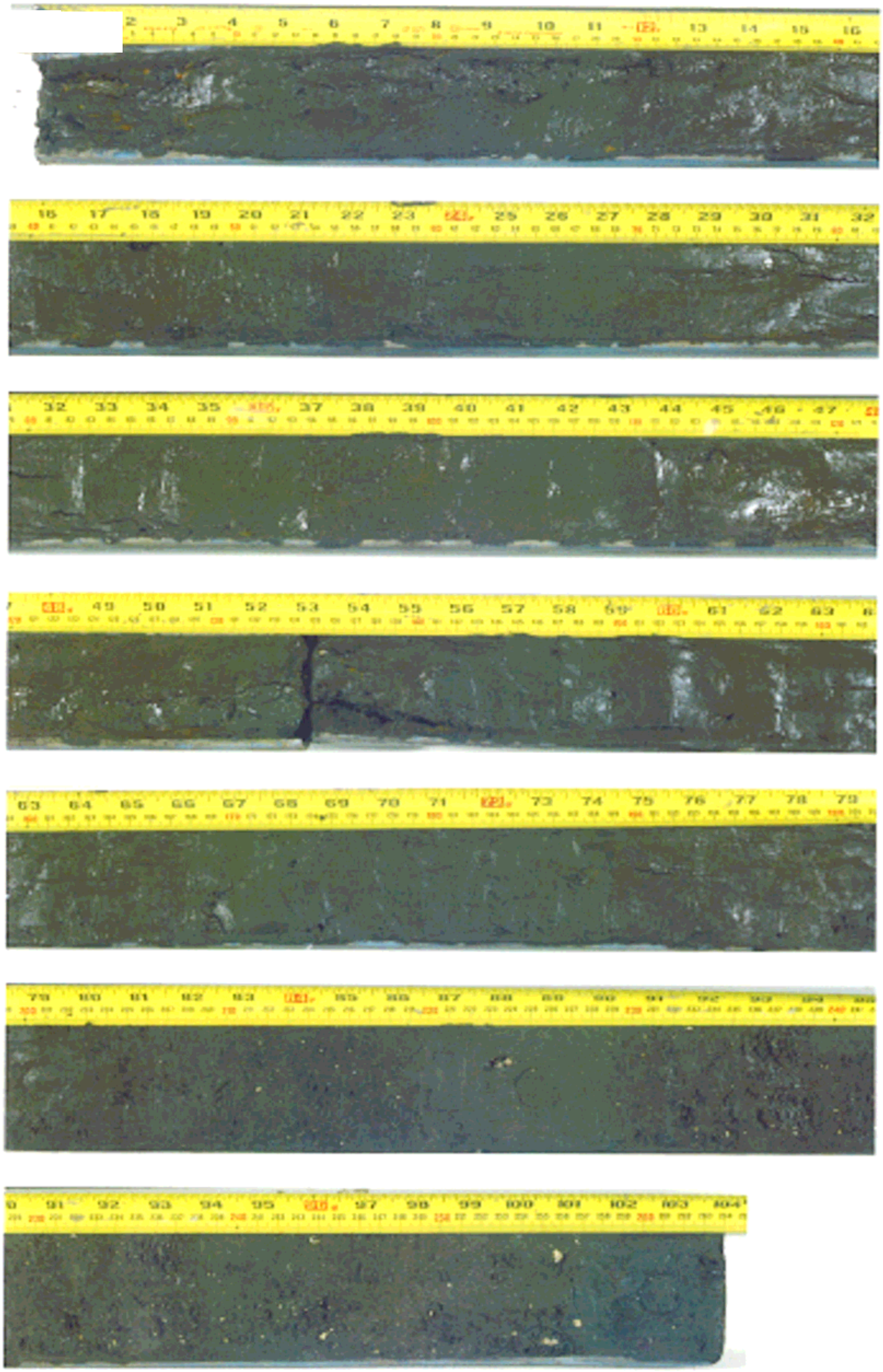
Woermann, J. W. 1905. Maps of Illinois and Des Plaines River from Lockport, Illinois to the Mouth of the Illinois River, Washington, D.C.: U. S. Army Corps of Engineers.

LIST OF APPENDICES

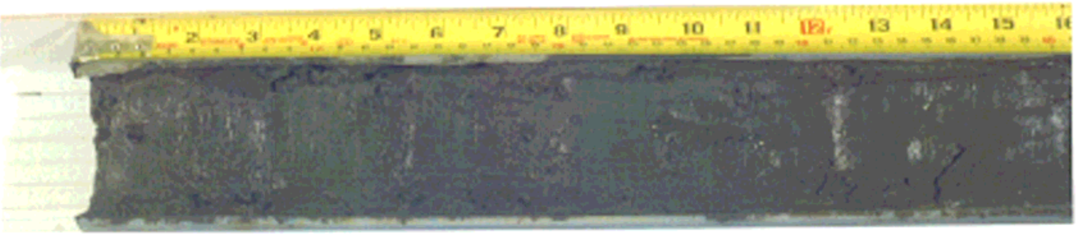
02-1
Senachwine Lake

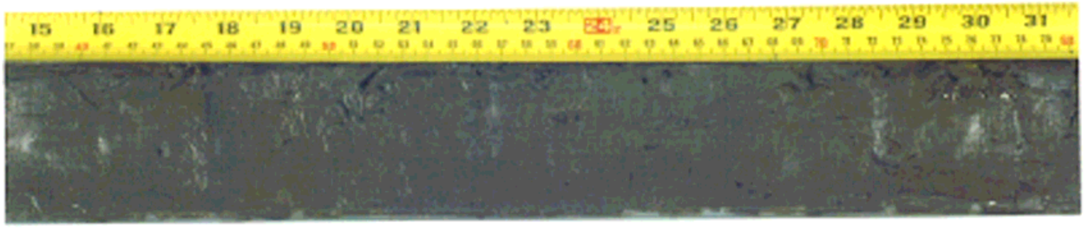


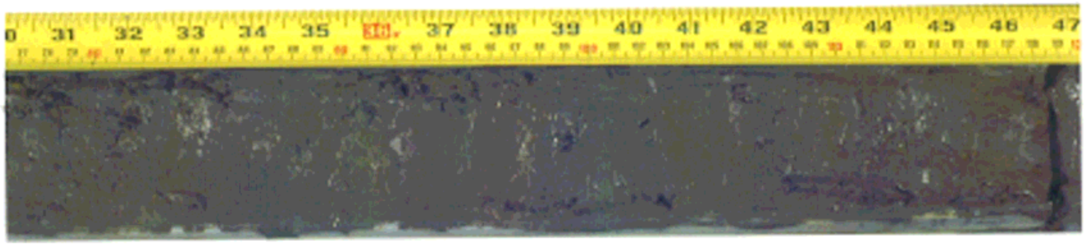
02-2
Sawmill Lake

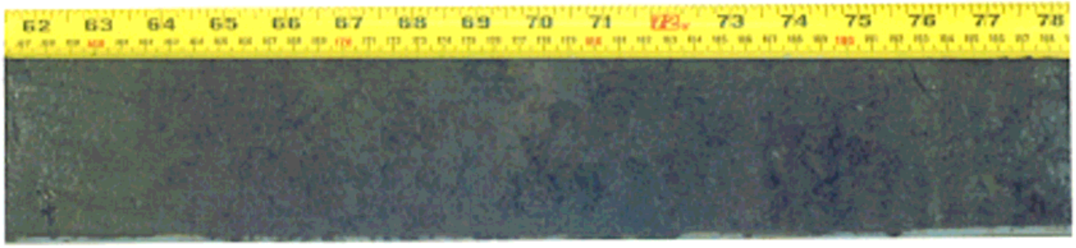


02-3
Billsbach Lake

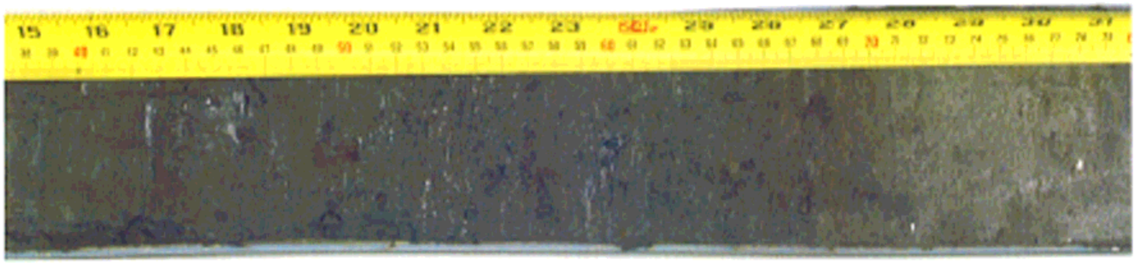


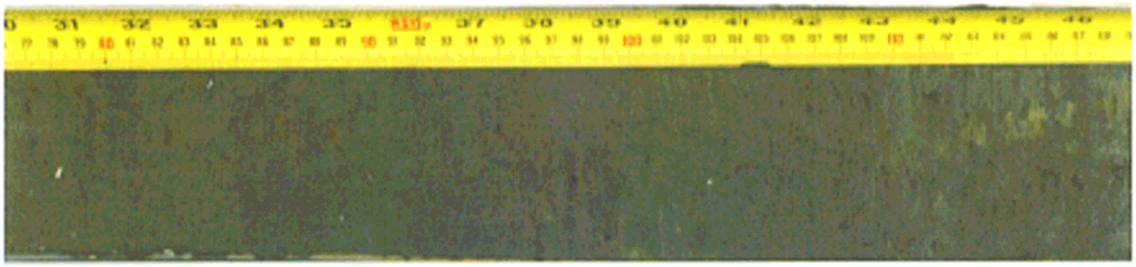




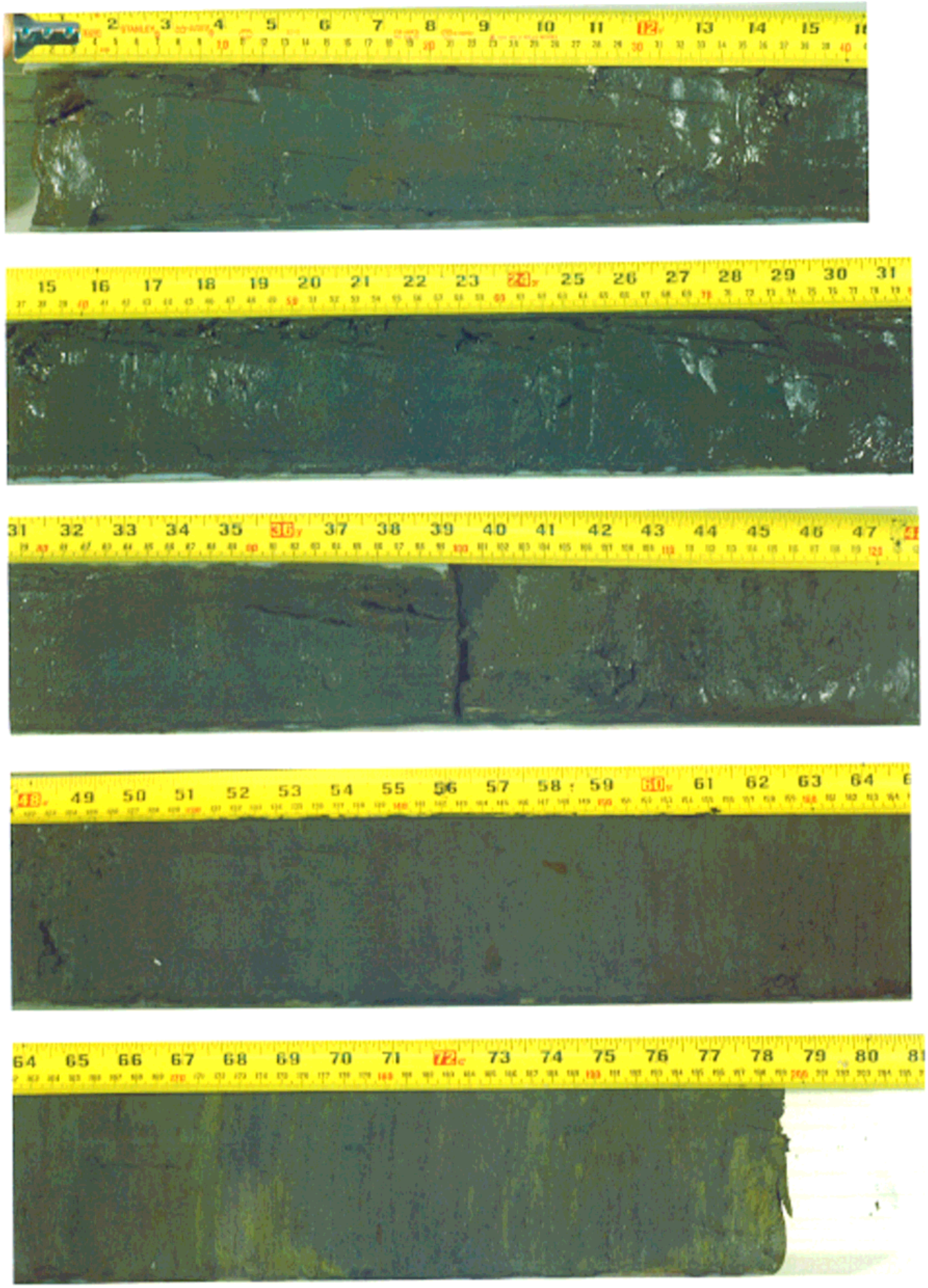


02-4
Weiss Lake

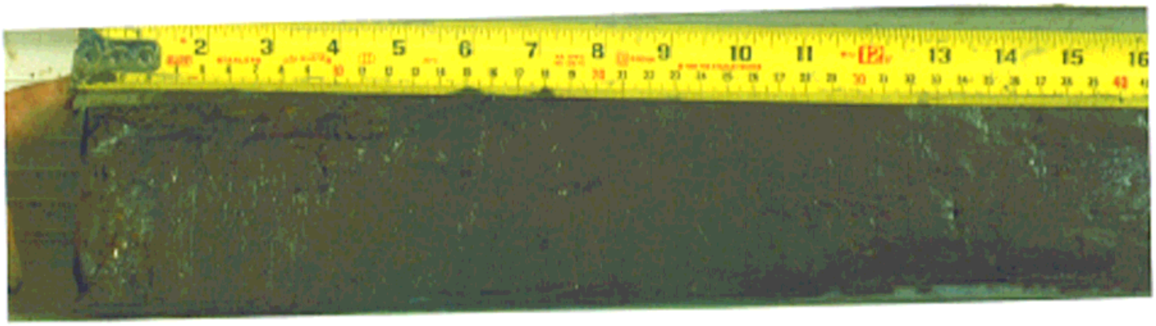


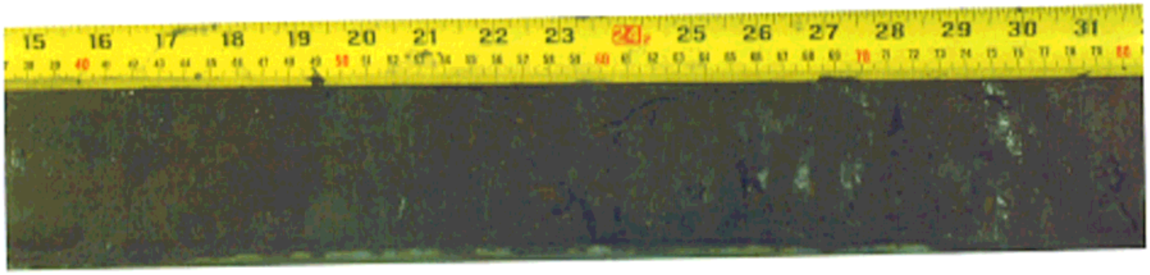


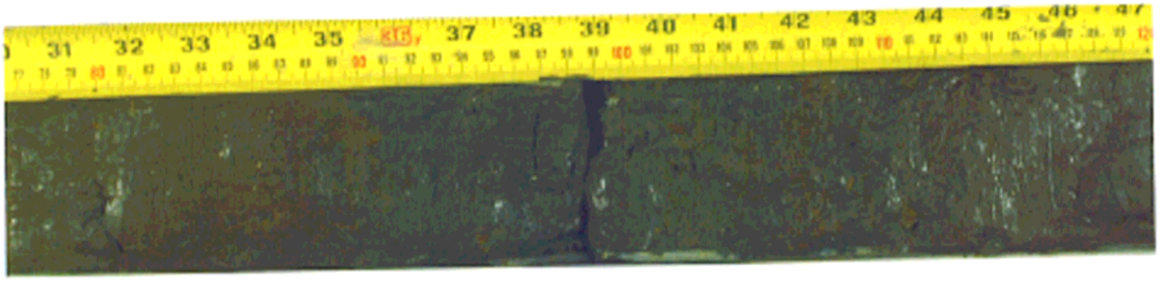
02-5
Goose Lake

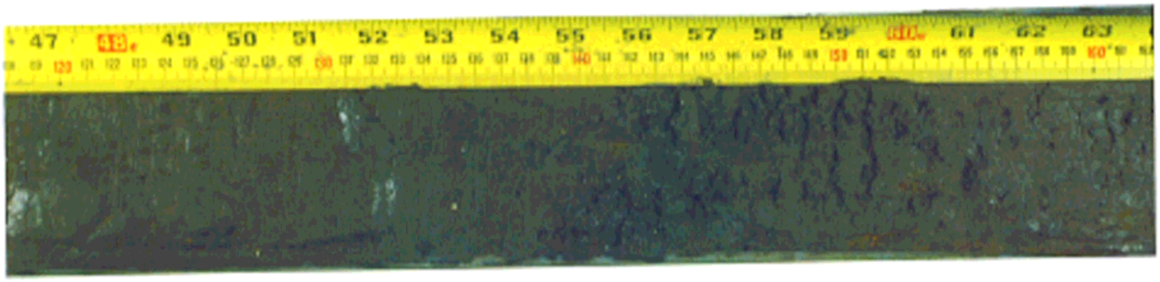


02-6
Wightman Lake

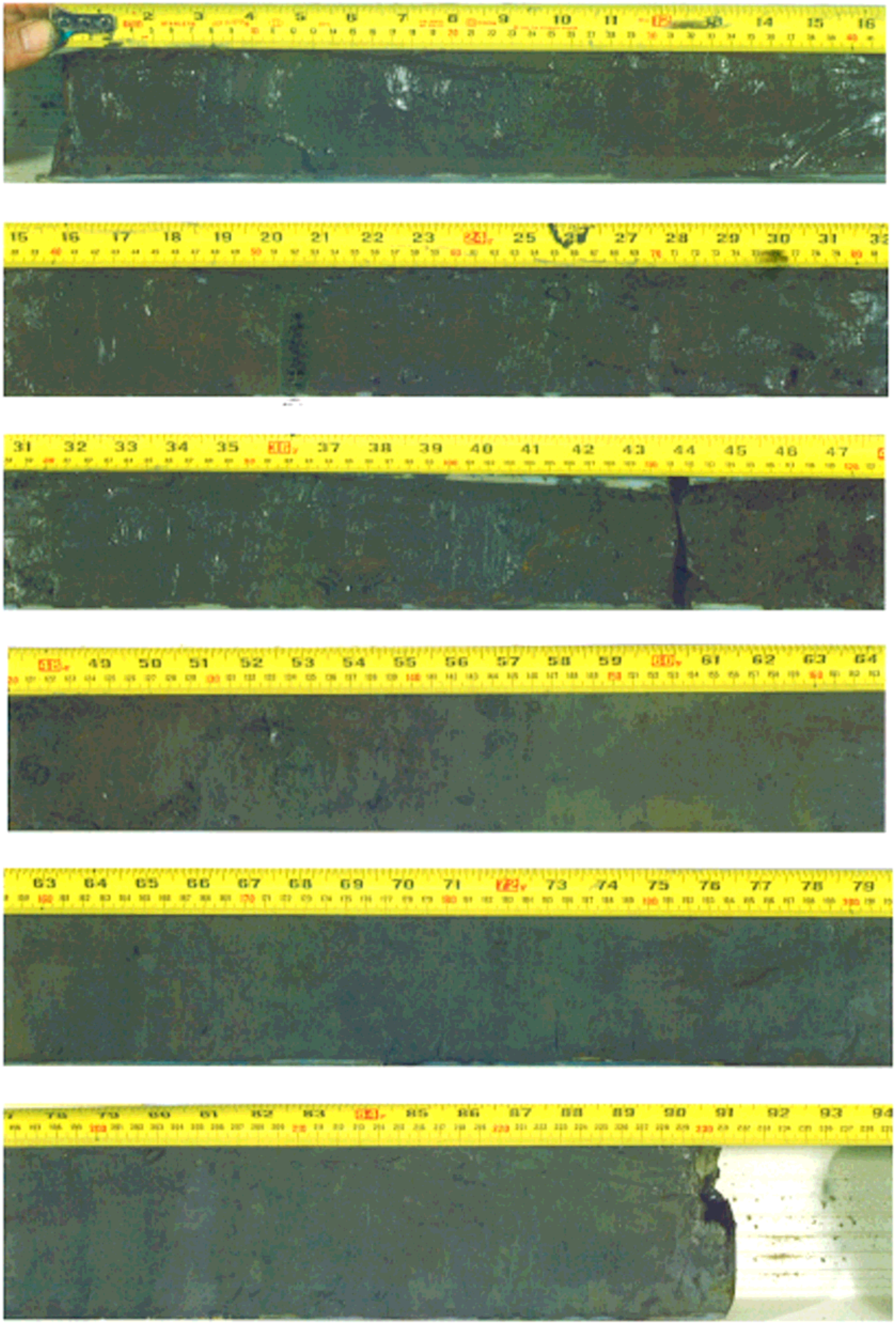




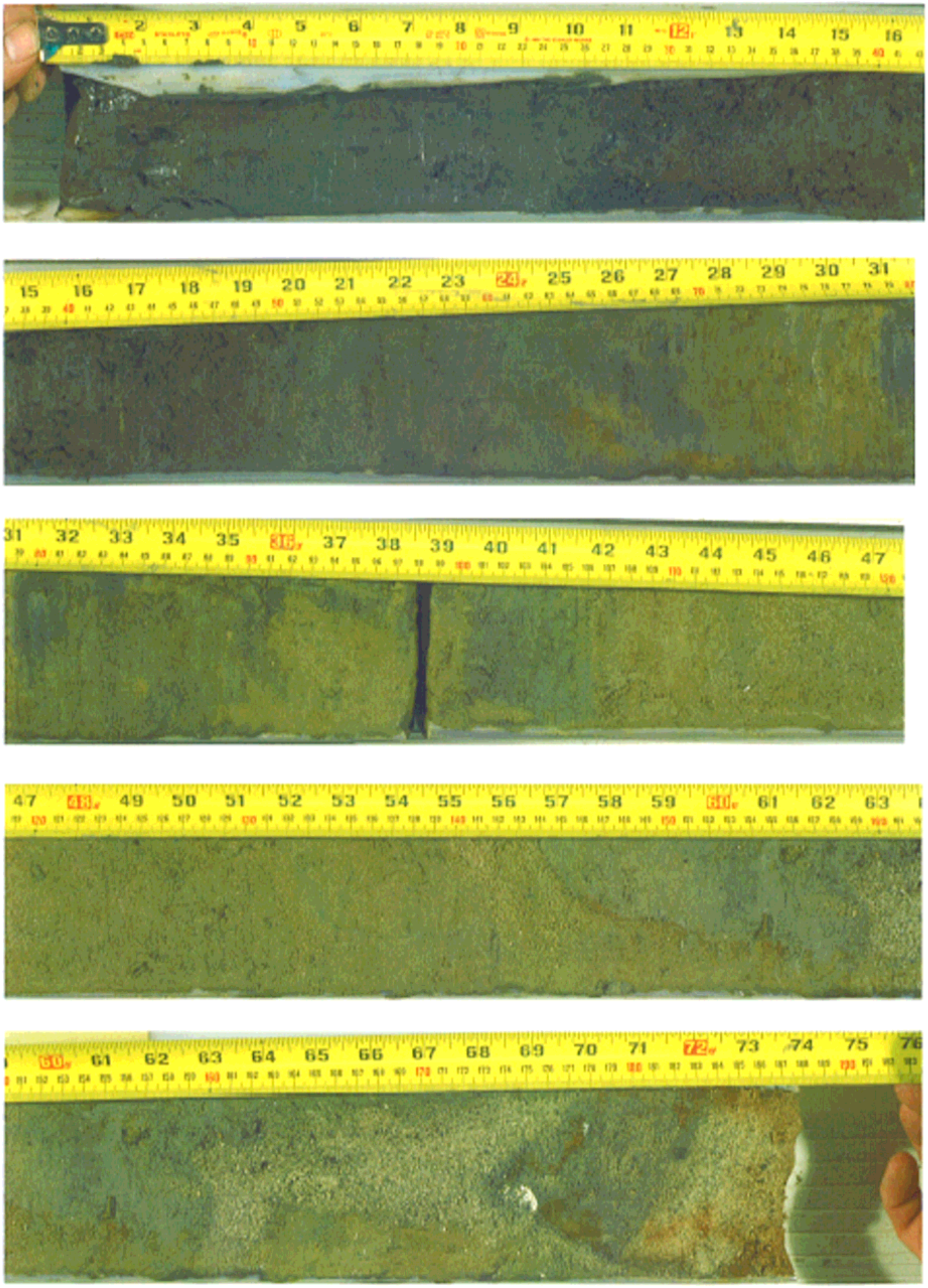




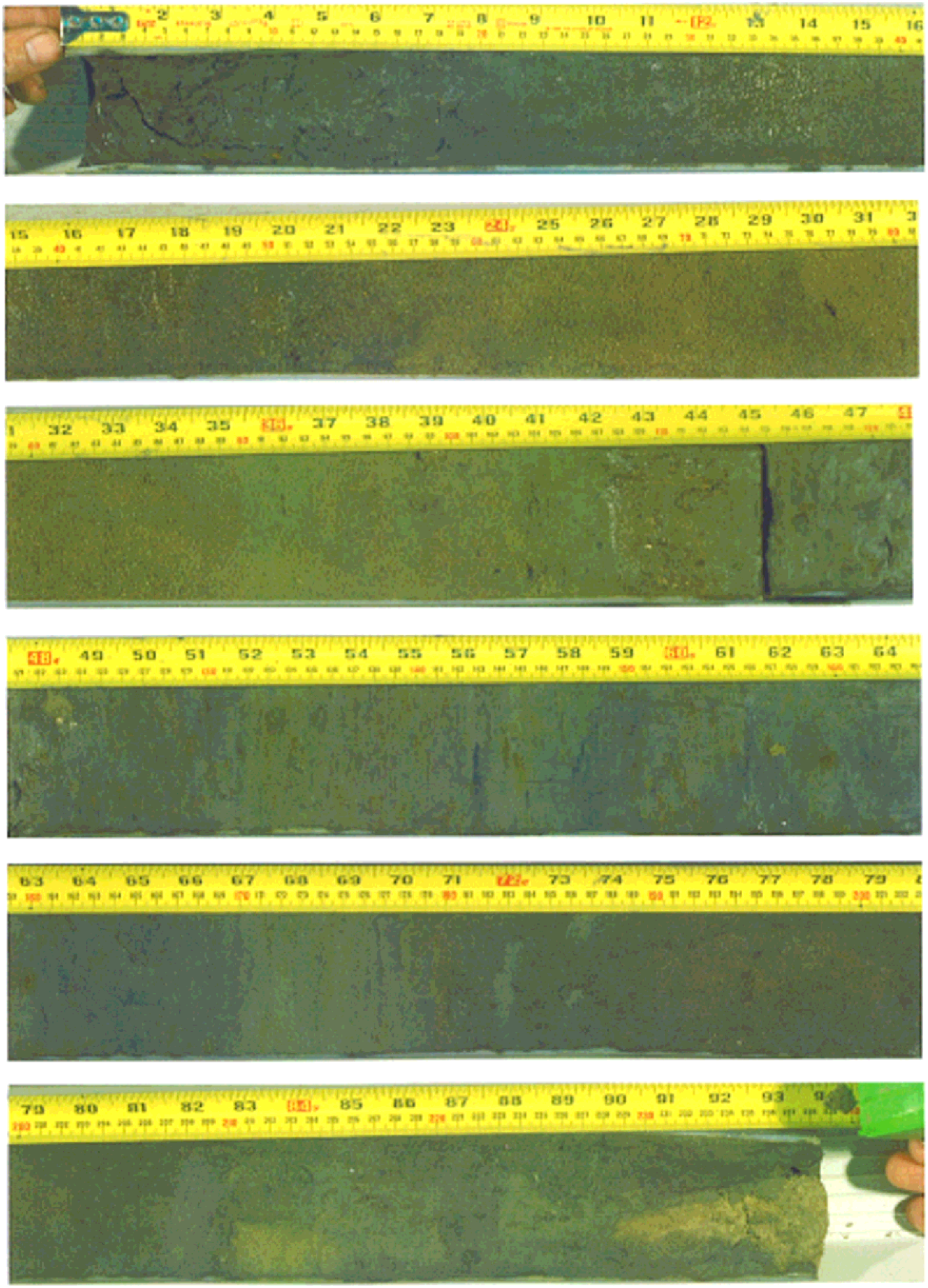
02-7
Meadow Lake



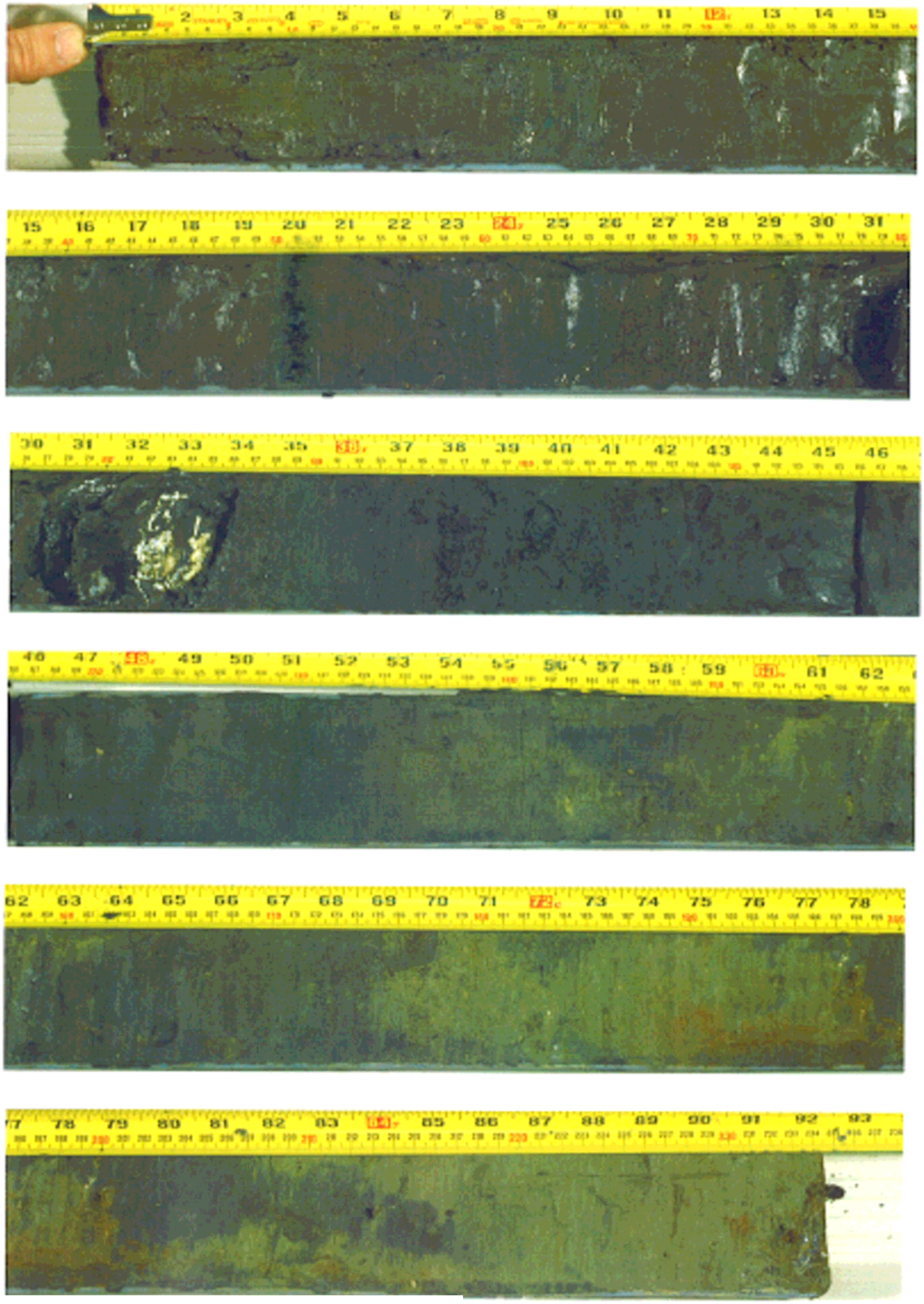
02-8
Babb Slough



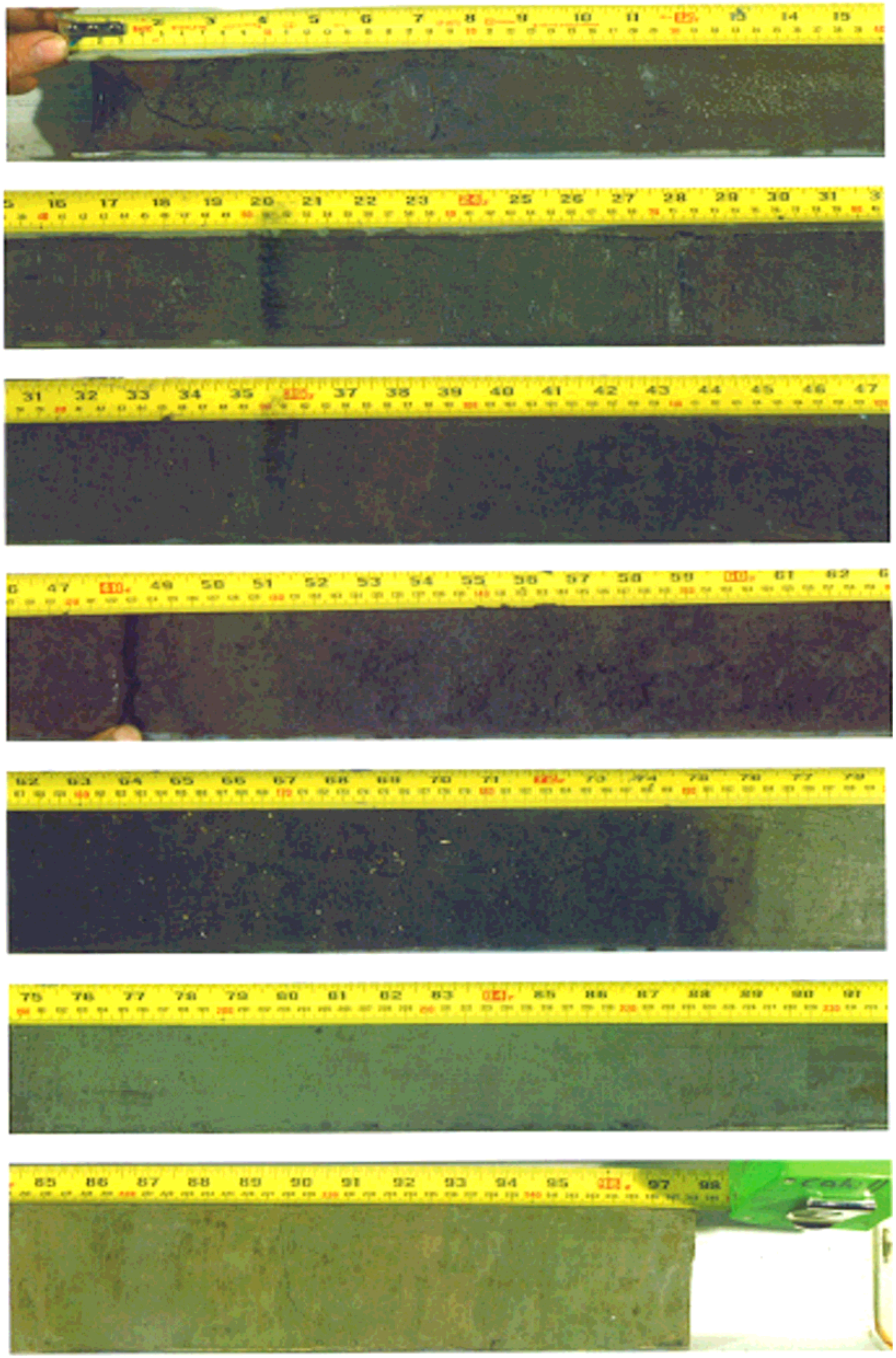
02-9
Upper Peoria RM 178



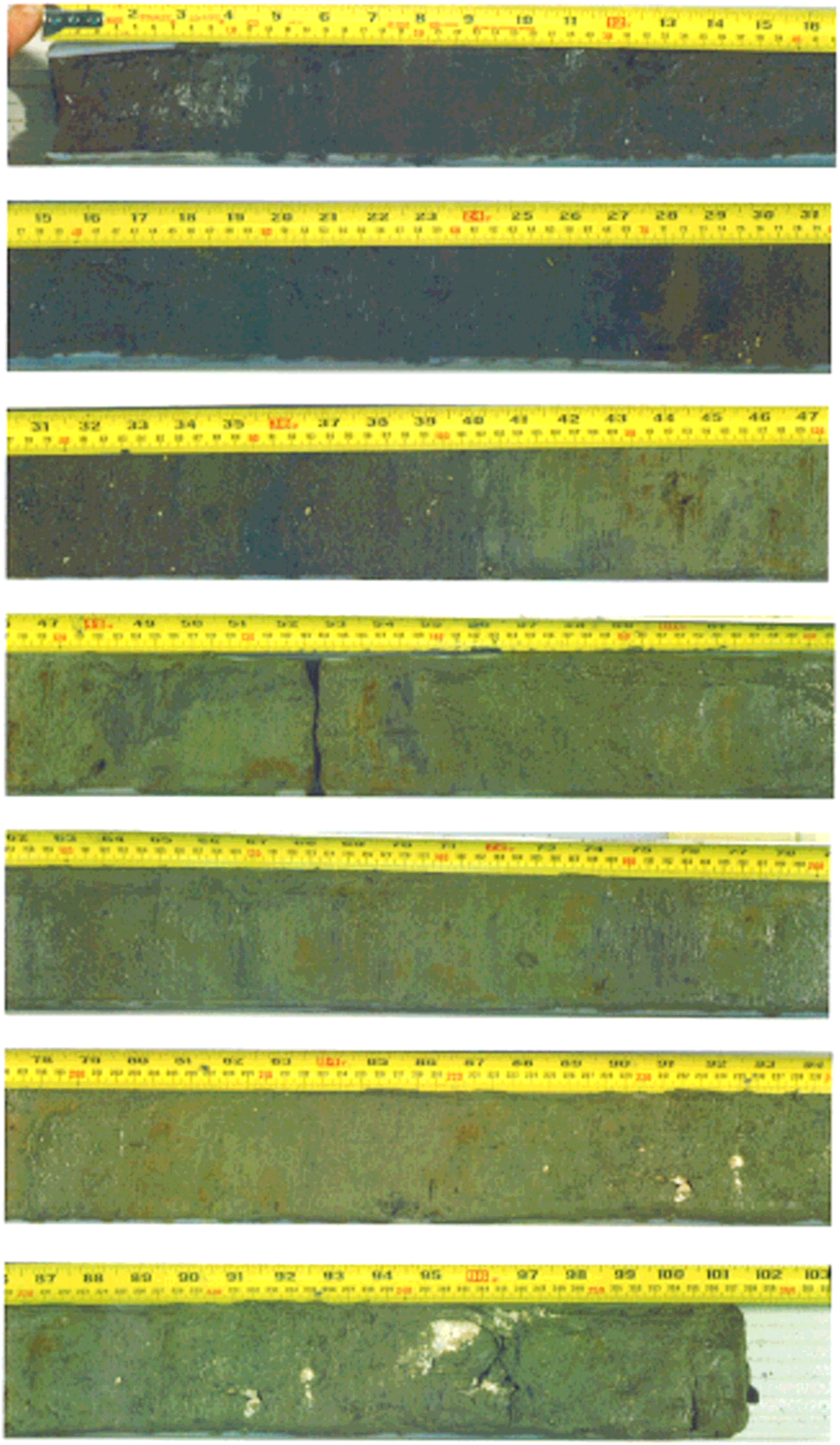
02-10
Upper Peoria RM 171



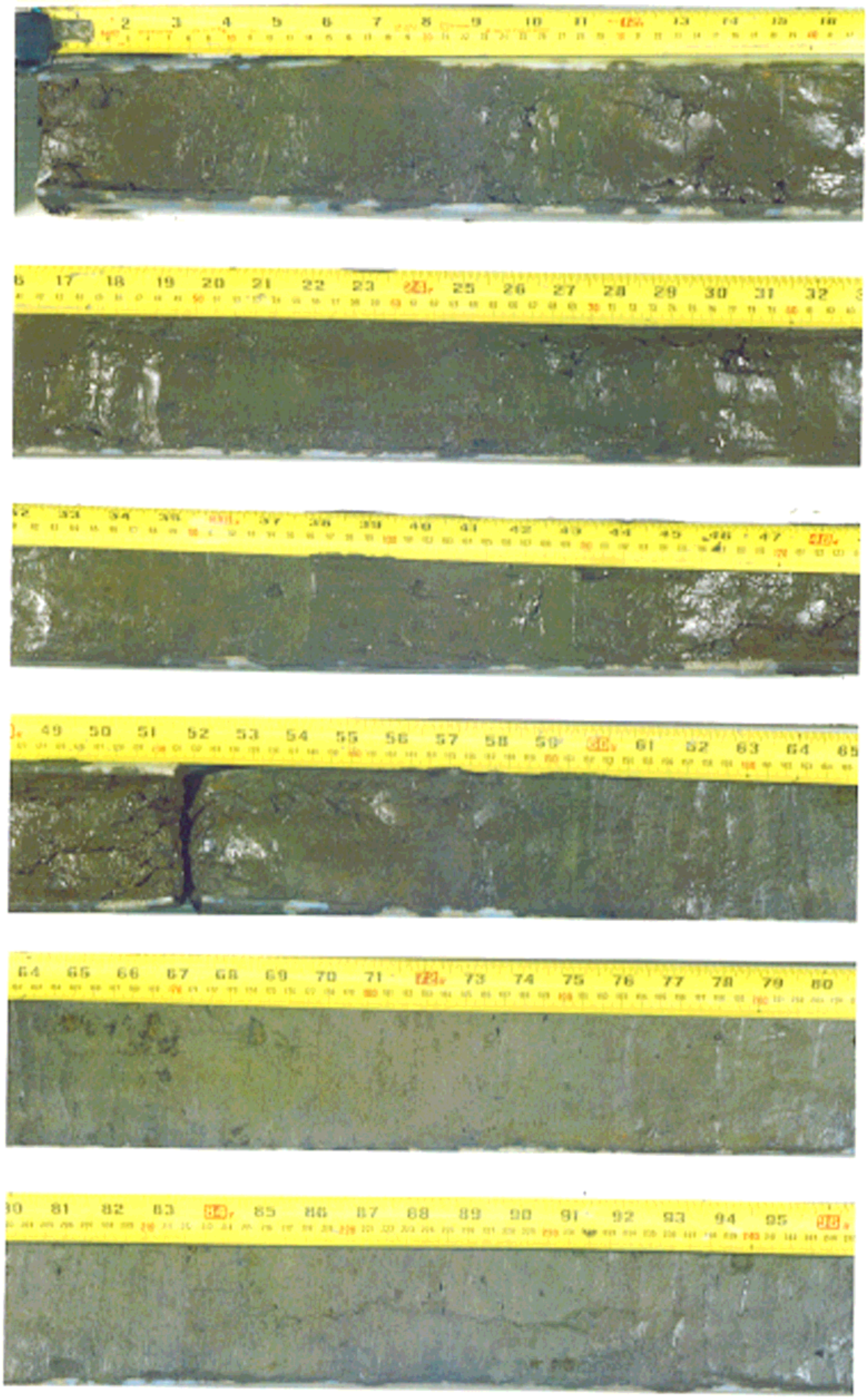
02-11
Lower Peoria RM 164



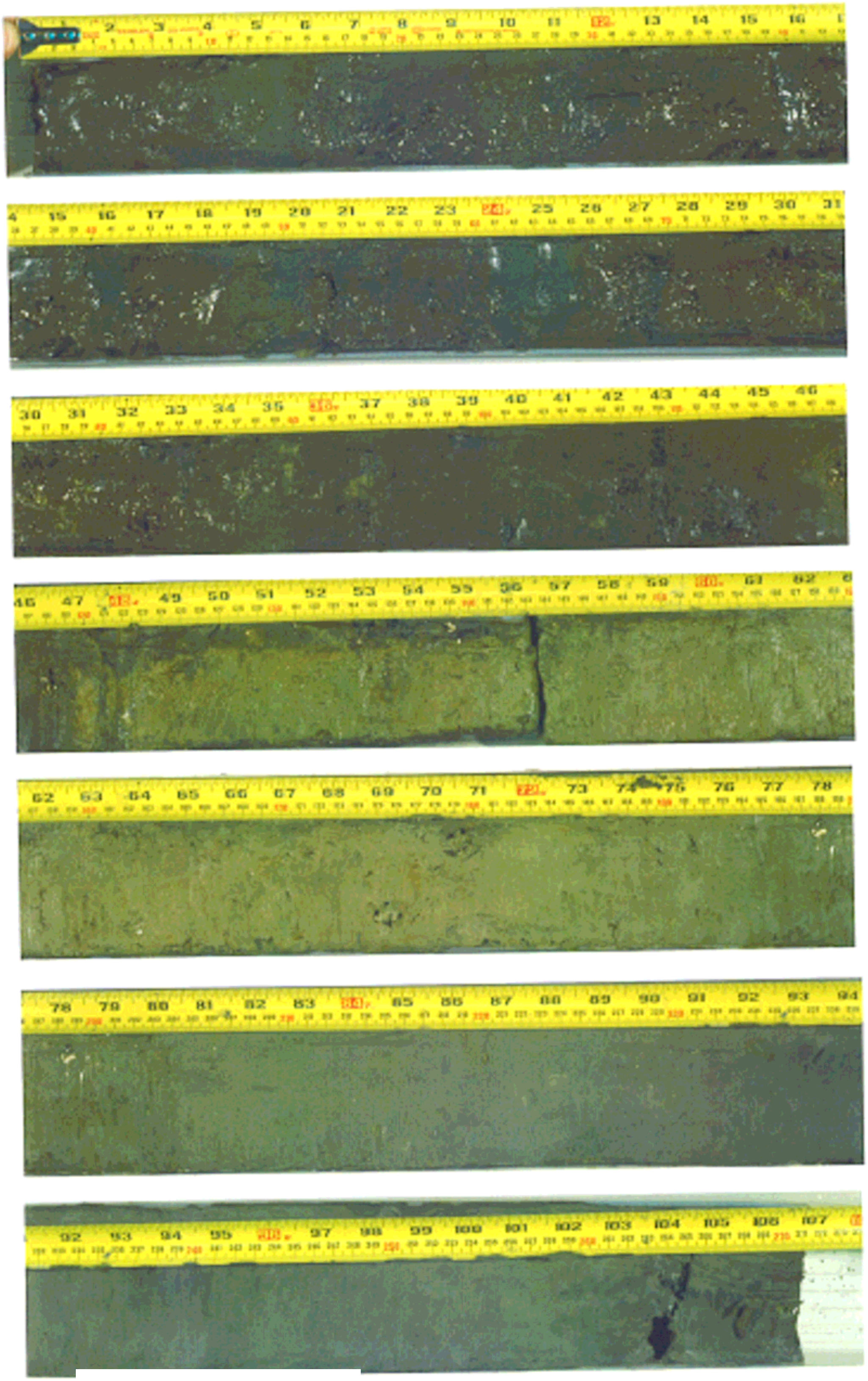
02-12
Quiver Lake



02-13
Matanzas Lake



02-14
Matanzas Lake



Appendix 1. Air-Dried Loss, 110°C Loss, Total Carbon, Inorganic Carbon and Organic Carbon Concentrations in Sediments from lakes along the Illinois River. All values in %.

Lab Number	Core ID	Depth Interval (cm)	Air Dried Loss	110°C Loss	Total Carbon	Inorganic Carbon	Organic Carbon
02-1 Senachwine Lake							
R22716	1-16	190-218	22.24	1.48	4.53	3.92	0.61
R22717	1-15	165-190	23.35	1.02	4.68	4.00	0.68
R22718	1-14	145-165	24.41	2.74	2.56	1.35	1.21
R22719	1-13	120-145	29.23	2.58	2.31	0.25	2.06
R22720	1-12	110-120	51.38	4.00	7.92	0.34	7.57
R22721	1-11	100-110	62.80	4.35	7.14	0.99	6.15
R22722	1-10	90-100	60.84	3.69	5.26	0.77	4.50
R22723	1-9	80-90	62.06	3.48	5.21	0.67	4.54
R22724	1-8	70-80	61.24	3.11	5.05	0.78	4.26
R22725	1-7	60-70	58.22	2.91	4.47	0.92	3.55
R22726	1-6	50-60	54.62	3.06	4.13	1.06	3.06
R22727	1-5	40-50	55.03	2.90	4.09	1.12	2.97
R22728	1-4	30-40	55.24	3.26	3.95	0.85	3.10
R22729	1-3	20-30	55.42	3.04	3.78	0.95	2.84
R22730	1-2	10-20	57.62	2.81	4.23	1.59	3.66
R22731	1-1	0-10	58.58	2.72	3.71	1.66	2.06
R22961	1-G	0-5	64.50	2.49	4.37	1.77	2.59
02-2 Sawmill Lake							
R22732	2-23	230-265	50.71	2.42	10.01	3.29	6.72
R22733	2-22	210-230	54.19	2.88	9.98	1.87	8.10
R22734	2-21	200-210	56.46	2.44	9.66	1.99	7.67
R22735	2-20	190-200	55.69	2.62	4.86	0.71	4.15
R22736	2-19	180-190	56.46	2.49	4.90	0.91	3.99
R22737	2-18	170-180	54.35	1.99	4.40	0.70	3.69
R22738	2-17	160-170	55.16	1.99	4.62	0.86	3.76
R22739	2-16	150-160	54.45	1.87	4.58	0.78	3.79
R22740	2-15	140-150	54.33	2.21	4.80	0.97	3.82
R22741	2-14	130-140	53.14	1.92	4.87	0.94	3.94
R22742	2-13	120-130	52.88	1.94	4.95	1.17	3.77
R22743	2-12	110-120	51.77	1.91	4.11	0.96	3.15
R22744	2-11	100-110	52.96	2.15	4.20	0.86	3.34
R22745	2-10	90-100	51.46	2.17	4.10	0.88	3.22
R22746	2-9	80-90	52.04	2.17	4.26	0.87	3.39
R22747	2-8	70-80	51.50	1.90	3.96	1.07	2.88
R22748	2-7	60-70	53.86	1.88	4.15	1.18	2.97
R22749	2-6	50-60	53.34	2.30	4.26	1.51	2.74
R22750	2-5	40-50	54.25	1.47	4.25	1.03	3.23
R22751	2-4	30-40	52.68	2.67	4.49	1.28	3.21
R22752	2-3	20-30	52.20	2.65	3.77	0.95	2.82
R22753	2-2	10-20	53.21	1.99	4.20	1.14	3.06
R22754	2-1	0-10	56.06	2.38	4.24	1.70	2.54
R22962	2-G	0-5	65.20	1.72	4.46	1.63	2.83
02-3 Billsbach Lake							
R22755	3-20	210-234	33.96	1.95	4.35	1.27	3.08
R22756	3-19	190-210	51.75	4.40	10.38	0.20	9.86
R22757	3-18	170-190	51.98	4.77	10.05	0.15	9.90
R22758	3-17	160-170	51.97	4.53	7.52	0.10	7.42
R22759	3-16	150-160	48.42	2.88	4.86	0.14	4.72
R22760	3-15	140-150	55.32	1.21	4.73	0.75	3.98
R22761	3-14	130-140	57.17	2.84	4.60	0.79	3.81
R22762	3-13	120-130	55.13	2.57	4.37	0.83	3.54
R22763	3-12	110-120	53.83	2.23	3.95	0.96	2.99
R22764	3-11	100-110	53.17	2.70	3.94	1.04	2.90
R22765	3-10	90-100	52.77	2.68	3.81	0.92	2.89
R22766	3-9	80-90	52.56	1.73	4.03	0.99	3.04
R22767	3-8	70-80	50.32	2.70	4.29	1.10	3.19
R22768	3-7	60-70	49.68	2.45	3.99	0.96	3.02
R22769	3-6	50-60	48.30	2.44	3.85	1.16	2.70
R22770	3-5	40-50	47.29	1.90	4.05	1.18	2.86
R22771	3-4	30-40	48.36	1.72	4.21	1.68	2.53
R22772	3-3	20-30	45.83	2.74	4.07	1.46	2.61
R22773	3-2	10-20	42.01	1.43	4.17	2.06	2.11
R22774	3-1	0-10	43.78	0.97	4.28	1.51	2.77
R22963	3-G	0-5	53.10	0.98	4.93	2.08	2.85

Appendix 1. Air-Dried Loss, 110°C Loss, Total Carbon, Inorganic Carbon and Organic Carbon Concentrations in Sediments from lakes along the Illinois River. All values in %.

Lab Number	Core ID	Depth Interval (cm)	Air Dried Loss	110°C Loss	Total Carbon	Inorganic Carbon	Organic Carbon
02-4 Weiss Lake							
R22775	4-18	230-248	20.81	0.74	3.89	2.87	1.02
R22776	4-17	205-230	20.71	0.50	3.99	3.57	0.42
R22777	4-16	180-205	21.18	0.78	3.46	3.00	0.45
R22778	4-15	155-180	17.75	0.49	3.04	2.71	0.33
R22779	4-14	130-155	17.88	0.74	1.81	1.39	0.42
R22780	4-13	120-130	20.78	1.49	0.93	0.10	0.83
R22781	4-12	110-120	21.58	0.98	1.47	0.07	1.40
R22782	4-11	100-110	24.09	1.25	1.27	0.10	1.16
R22783	4-10	90-100	26.69	1.23	1.64	0.08	1.56
R22784	4-9	80-90	26.84	1.23	1.55	0.15	1.40
R22785	4-8	70-80	31.03	1.74	2.29	0.11	2.18
R22786	4-7	60-70	41.39	2.49	4.68	0.31	4.37
R22787	4-6	50-60	45.03	1.74	4.33	0.50	3.83
R22788	4-5	40-50	48.56	1.75	3.84	1.00	2.84
R22789	4-4	30-40	46.42	1.24	3.89	1.03	2.86
R22790	4-3	20-30	48.13	1.50	3.60	1.01	2.60
R22791	4-2	10-20	46.95	1.72	3.97	1.00	2.97
R22792	4-1	0-10	50.37	1.71	4.20	1.30	2.90
R22964	4-G	0-5	59.90	1.27	3.96	1.63	2.33
02-5 Goose Lake							
R22793	5-15	170-198	19.06	0.98	2.10	1.28	0.82
R22794	5-14	145-170	21.98	1.75	1.32	0.23	1.09
R22795	5-13	120-145	28.91	2.34	2.19	0.12	2.07
R22796	5-12	110-120	47.67	2.94	4.56	0.23	4.32
R22797	5-11	100-110	55.83	3.19	4.78	0.42	4.36
R22798	5-10	90-100	59.27	2.40	4.85	0.89	3.95
R22799	5-9	80-90	57.37	2.25	4.38	0.79	3.59
R22800	5-8	70-80	55.44	2.18	4.32	0.86	3.47
R22801	5-7	60-70	54.28	2.94	3.82	0.86	2.97
R22802	5-6	50-60	54.12	1.99	3.79	0.94	2.85
R22803	5-5	40-50	53.73	2.16	3.84	0.98	2.86
R22804	5-4	30-40	52.55	2.14	3.73	1.04	2.69
R22805	5-3	20-30	53.86	1.95	3.52	0.79	2.73
R22806	5-2	10-20	55.14	1.97	3.75	1.04	2.69
R22807	5-1	0-10	58.20	1.96	4.04	1.37	2.67
R22965	5-G	0-5	63.50	1.65	4.05	1.46	2.58
02-6 Wightman Lake							
R22808	6-17	180-206	26.74	2.09	1.86	0.27	1.59
R22809	6-16	155-180	32.74	2.11	2.62	0.07	2.54
R22810	6-15	140-155	42.50	2.96	3.86	0.12	3.74
R22811	6-14	130-140	51.87	2.43	4.14	0.69	3.45
R22812	6-13	120-130	54.12	2.00	5.10	0.98	4.12
R22813	6-12	110-120	54.57	1.46	4.81	0.95	3.86
R22814	6-11	100-110	54.73	1.89	4.87	1.03	3.84
R22815	6-10	90-100	49.14	1.50	4.15	0.71	3.44
R22816	6-9	80-90	48.73	1.63	3.82	0.80	3.02
R22817	6-8	70-80	47.36	1.36	3.55	0.78	2.77
R22818	6-7	60-70	47.09	1.99	3.46	0.86	2.60
R22819	6-6	50-60	47.35	1.44	3.51	0.77	2.74
R22820	6-5	40-50	49.42	1.47	3.48	0.83	2.65
R22821	6-4	30-40	50.95	1.58	3.66	0.85	2.80
R22822	6-3	20-30	51.27	1.49	3.59	1.02	2.58
R22823	6-2	10-20	49.96	1.25	3.70	1.04	2.65
R22824	6-1	0-10	48.82	0.63	3.80	1.49	2.31
R22966	6-G	0-5	58.90	0.97	4.04	1.78	2.26

Appendix 1. Air-Dried Loss, 110ºC Loss, Total Carbon, Inorganic Carbon and Organic Carbon Concentrations in Sediments from lakes along the Illinois River. All values in %.

Lab Number	Core ID	Depth Interval (cm)	Air Dried Loss	110°C Loss	Total Carbon	Inorganic Carbon	Organic Carbon
02-7 Meadow Lake							
R22825	7-17	215-234	24.42	2.18	1.88	0.42	1.46
R22826	7-16	190-215	26.03	2.24	2.14	0.45	1.69
R22827	7-15	165-190	28.46	2.39	2.45	0.51	1.94
R22828	7-14	140-165	30.64	2.05	2.81	0.76	2.05
R22829	7-13	120-140	39.23	2.56	3.83	0.73	3.10
R22830	7-12	110-120	46.31	3.00	5.16	0.55	4.62
R22831	7-11	100-110	49.99	2.69	4.50	1.08	3.42
R22832	7-10	90-100	51.39	2.26	5.01	1.26	3.75
R22833	7-9	80-90	52.76	2.34	5.24	1.53	3.72
R22834	7-8	70-80	50.28	2.22	5.00	1.23	3.77
R22835	7-7	60-70	51.63	2.74	4.25	1.33	2.92
R22836	7-6	50-60	52.39	2.48	3.96	1.30	2.66
R22837	7-5	40-50	52.29	2.60	3.87	1.11	2.76
R22838	7-4	30-40	50.62	2.69	3.88	1.24	2.64
R22839	7-3	20-30	50.67	2.54	3.76	1.36	2.39
R22840	7-2	10-20	53.09	2.63	4.00	1.40	2.60
R22841	7-1	0-10	53.93	2.56	3.97	1.55	2.42
R22967	7-G	0-5	62.00	2.17	4.12	1.68	2.44
02-8 Babb Slough							
R22842	8-13	165-188	15.38	0.22	2.43	1.94	0.48
R22843	8-12	140-165	15.93	0.44	2.67	2.04	0.63
R22844	8-11	115-140	14.70	0.24	2.32	2.05	0.26
R22845	8-10	90-115	16.38	0.48	2.54	2.20	0.34
R22846	8-9	80-90	18.82	0.49	2.34	1.76	0.58
R22847	8-8	70-80	20.63	0.98	2.71	1.84	0.87
R22848	8-7	60-70	23.43	1.17	1.98	0.85	1.13
R22849	8-6	50-60	30.46	1.37	2.41	0.61	1.80
R22850	8-5	40-50	38.75	1.34	2.91	0.32	2.58
R22851	8-4	30-40	43.33	1.88	4.01	0.41	3.60
R22852	8-3	20-30	52.65	2.72	4.84	0.82	4.02
R22853	8-2	10-20	53.48	1.90	4.29	1.12	3.17
R22854	8-1	0-10	56.01	1.56	3.91	1.37	2.54
R22968	8-G	0-5	60.20	1.86	4.19	1.47	2.72
02-9 Upper Peoria RM 178							
R22855	9-13	210-238	17.08	0.48	1.35	0.70	0.64
R22856	9-12	185-210	17.96	0.23	1.04	0.58	0.46
R22857	9-11	165-185	20.99	0.49	1.07	0.31	0.75
R22858	9-10	140-165	21.94	1.13	2.19	1.36	0.84
R22559	9-9	114-140	20.80	0.72	2.56	1.86	0.69
R22860	9-8	85-114	15.13	0.60	1.73	1.36	0.37
R22861	9-7	60-85	19.92	0.47	0.87	0.61	0.26
R22862	9-6	50-60	17.00	0.54	0.81	0.65	0.16
R22863	9-5	40-50	18.26	0.69	1.01	0.48	0.52
R22864	9-4	30-40	24.15	0.50	1.56	0.85	0.70
R22865	9-3	20-30	37.89	0.71	2.42	1.18	1.24
R22866	9-2	10-20	45.20	0.73	2.97	1.37	1.60
R22867	9-1	0-10	48.93	0.70	3.41	1.52	1.89
R22969	9-G	0-5	60.60	1.15	3.94	1.50	2.44

Appendix 1. Air-Dried Loss, 110ºC Loss, Total Carbon, Inorganic Carbon and Organic Carbon Concentrations in Sediments from lakes along the Illinois River. All values in %.

Lab Number	Core ID	Depth Interval (cm)	Air Dried Loss	110ºC Loss	Total Carbon	Inorganic Carbon	Organic Carbon
02-10 Upper Peoria RM 171							
R22868	10-16	212-232	23.20	0.98	2.63	2.28	0.34
R22869	10-15	187-212	22.44	0.50	3.30	2.54	0.75
R22870	10-14	162-187	21.74	0.49	3.05	2.28	0.77
R22871	10-13	137-162	22.06	0.25	2.80	2.05	0.75
R22872	10-12	112-137	32.77	1.24	3.01	0.60	2.41
R22873	10-11	100-112	39.65	1.93	5.25	0.18	5.07
R22874	10-10	90-100	45.78	2.44	6.65	0.41	6.24
R22875	10-9	80-90	45.50	2.00	4.89	0.52	4.37
R22876	10-8	70-80	50.26	1.99	4.03	0.87	3.16
R22877	10-7	60-70	51.30	1.72	3.55	0.97	2.58
R22878	10-6	50-60	50.51	1.72	3.55	0.85	2.70
R22879	10-5	40-50	50.11	1.74	3.53	1.11	2.42
R22880	10-4	30-40	46.89	1.50	3.72	1.15	2.57
R22881	10-3	20-30	45.54	0.97	3.59	1.33	2.26
R22882	10-2	10-20	47.04	1.47	3.80	1.47	2.32
R22883	10-1	0-10	47.19	1.23	4.07	1.95	2.10
R22970	10-G	0-5	48.10	0.98	4.07	1.92	2.15
02-11 Lower Peoria RM 164							
R22884	11-22	240-251	29.32	0.49	4.45	3.11	1.35
R22885	11-21	215-240	27.88	0.74	4.30	3.10	1.20
R22886	11-20	192-215	27.00	0.49	4.66	3.39	1.28
R22887	11-19	180-192	64.65	2.97	15.77	2.32	13.40
R22888	11-18	170-180	65.66	1.72	16.18	2.33	13.84
R22889	11-17	160-170	66.05	2.97	15.36	1.50	13.81
R22890	11-16	150-160	62.15	3.50	13.83	0.42	13.41
R22891	11-15	140-150	54.21	2.48	10.94	0.18	10.76
R22892	11-14	130-140	53.24	2.74	10.20	0.12	10.08
R22893	11-13	120-130	57.13	2.25	10.38	0.24	10.15
R22994	11-12	110-120	57.50	3.23	11.78	0.33	11.45
R22895	11-11	100-110	58.11	2.76	10.78	0.46	10.31
R22896	11-10	90-100	60.44	2.22	9.21	1.00	8.21
R22897	11-9	80-90	61.27	2.70	8.43	0.96	7.47
R22898	11-8	70-80	59.02	1.50	6.51	0.92	5.58
R22899	11-7	60-70	55.76	1.22	4.18	1.44	2.74
R22900	11-6	50-60	56.53	0.98	3.83	1.20	2.63
R22901	11-5	40-50	54.79	1.22	3.82	1.11	2.70
R22902	11-4	30-40	54.79	0.99	3.71	1.08	2.63
R22903	11-3	20-30	56.76	1.46	3.72	1.13	2.60
R22904	11-2	10-20	57.19	1.25	3.91	1.56	2.35
R22905	11-1	0-10	58.35	1.24	4.04	1.55	2.49
R22971	11-G	0-5	62.90	1.00	4.23	1.46	2.77
02-12 Quiver Lake							
R22906	12-17	220-257	17.90	0.26	2.63	2.35	0.28
R22907	12-16	195-220	20.08	0.34	2.78	2.45	0.33
R22908	12-15	170-195	19.97	0.36	2.66	2.37	0.29
R22909	12-14	145-170	19.66	0.24	2.06	1.79	0.27
R22910	12-13	120-145	17.50	0.20	1.81	1.40	0.44
R22911	12-12	110-120	19.93	0.52	2.74	2.30	0.41
R22912	12-11	100-110	20.32	0.69	2.23	1.75	0.47
R22913	12-10	90-100	19.62	0.07	0.55	0.22	0.33
R22914	12-9	80-90	17.10	0.07	0.67	0.42	0.25
R22915	12-8	70-80	21.77	0.15	0.52	0.35	0.17
R22916	12-7	60-70	53.16	2.34	4.77	0.92	3.85
R22917	12-6	50-60	58.59	2.90	4.76	0.95	3.81
R22918	12-5	40-50	50.56	1.97	4.55	1.08	3.47
R22919	12-4	30-40	47.39	1.83	4.15	1.03	3.12
R22920	12-3	20-30	45.96	2.12	3.77	1.10	2.67
R22921	12-2	10-20	45.94	1.90	3.98	1.10	2.87
R22922	12-1	0-10	52.42	2.51	4.02	1.13	2.89
R22972	12-G	0-5	60.00	2.12	4.20	1.45	2.75

Appendix 1. Air-Dried Loss, 110°C Loss, Total Carbon, Inorganic Carbon and Organic Carbon Concentrations in Sediments from lakes along the Illinois River. All values in %.

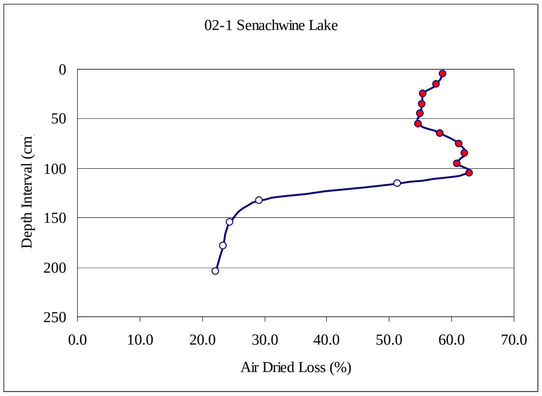
Lab Number	Core ID	Depth Interval (cm)	Air Dried Loss	110°C Loss	Total Carbon	Inorganic Carbon	Organic Carbon
02-13 Mantanzas Lake							
R22923	13-20	230-257	28.03	2.22	1.09	0.06	1.03
R22924	13-19	205-230	29.72	1.70	1.24	0.08	1.16
R22925	13-18	185-205	29.53	1.71	1.18	0.08	1.10
R22926	13-17	160-185	31.03	1.74	1.12	0.05	1.07
R22927	13-16	150-160	36.38	2.44	2.18	0.16	2.02
R22928	13-15	140-150	43.33	1.95	2.30	0.37	1.94
R22929	13-14	130-140	45.09	1.97	2.30	0.34	1.96
R22930	13-13	120-130	46.36	1.72	2.15	0.28	1.86
R22931	13-12	110-120	50.88	2.20	2.47	0.39	2.09
R22932	13-11	100-110	50.89	2.21	2.48	0.41	2.08
R22933	13-10	90-100	49.79	1.69	2.27	0.34	1.93
R22934	13-9	80-90	50.05	2.20	2.30	0.40	1.90
R22935	13-8	70-80	51.73	2.21	2.58	0.61	1.96
R22936	13-7	60-70	50.58	2.21	2.87	0.51	2.36
R22937	13-6	50-60	52.23	1.99	2.69	0.71	1.98
R22938	13-5	40-50	54.55	1.96	3.00	0.97	2.03
R22939	13-4	30-40	53.40	1.98	2.76	0.73	2.03
R22940	13-3	20-30	52.32	2.22	2.69	0.73	1.96
R22941	13-2	10-20	55.97	1.99	2.97	0.99	1.98
R22942	13-1	0-10	58.87	1.71	3.42	1.23	2.19
R22973	13-G	0-5	67.80	1.47	4.00	1.50	2.50
02-14 Meredosia Lake							
R22943	14-18	230-271	28.81	3.04	1.60	0.13	1.46
R22944	14-17	205-230	26.80	2.19	2.16	1.55	0.60
R22945	14-16	185-205	21.22	1.16	0.94	0.53	0.41
R22946	14-15	160-185	21.47	0.90	1.44	1.05	0.39
R22947	14-14	135-160	21.94	1.00	1.59	1.29	0.29
R22948	14-13	120-135	22.98	1.34	2.12	1.64	0.48
R22949	14-12	110-120	37.15	1.69	4.04	1.73	2.31
R22950	14-11	100-110	52.79	2.82	3.19	1.03	2.16
R22951	14-10	90-100	59.62	3.29	3.30	0.59	2.71
R22952	14-9	80-90	58.42	3.35	2.89	0.38	2.50
R22953	14-8	70-80	59.33	3.64	2.99	0.43	2.56
R22954	14-7	60-70	60.94	3.65	2.90	0.47	2.43
R22955	14-6	50-60	61.35	3.56	3.38	0.78	2.50
R22956	14-5	40-50	61.76	3.27	3.46	0.93	2.53
R22957	14-4	30-40	61.73	3.69	3.52	0.79	2.73
R22958	14-3	20-30	61.01	3.61	3.18	0.74	2.45
R22959	14-2	10-20	63.14	3.10	3.70	1.23	2.48
R22960	14-1	0-10	65.53	3.41	4.03	1.29	2.73
R22974	14-G	0-5	71.40	3.08	4.17	1.36	2.81

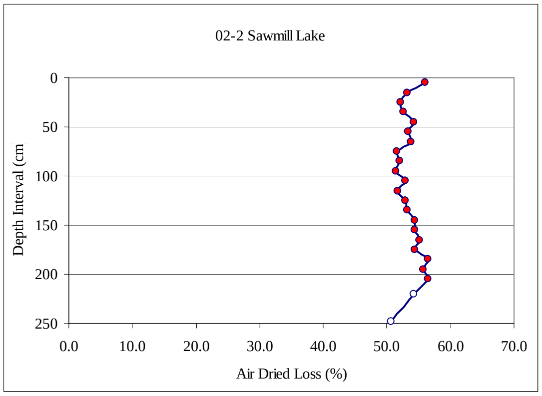
Quality-assurance - Quality Control Samples

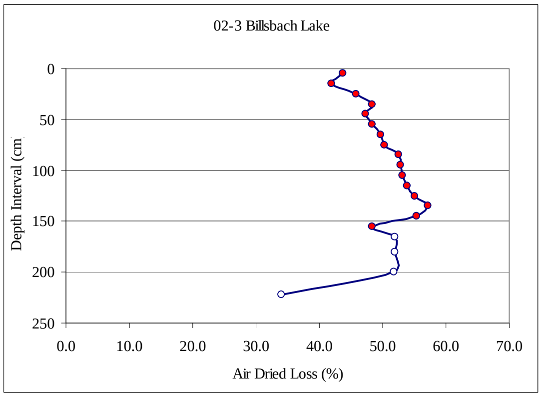
R22982	NIST 8704 Buffalo River Sediment	3.53	0.90	2.63
	Certified Total Concentrations	3.35		
R22983	NIST 2709 San Joaquin Soil	1.36	0.40	0.96
	Certified Total Concentrations	(1.2)		
R22984	Peoria Secondary Reference			
		4.05	1.12	2.94
R22985	NIES-CRM-02 Pond Sediment			
	Certified Total Concentrations			
R22986	NIST 2711 Montana Soil	1.88	0.64	1.24
	Certified Total Concentrations	(2)		
R22987	Grand Calumet Sediment			
	Mean of 5 Replicates (Cahill, 1999)	5.03	2.29	2.74

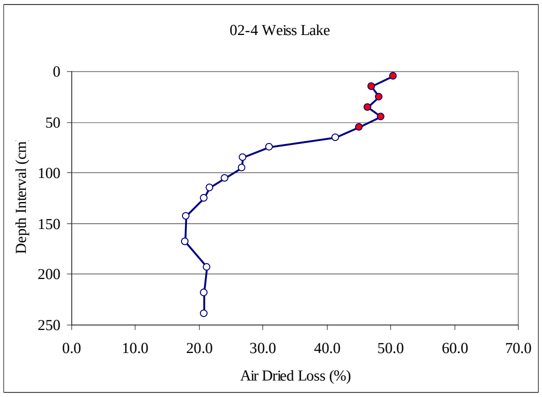
Noncertified Total Concentrations shown in parentheses

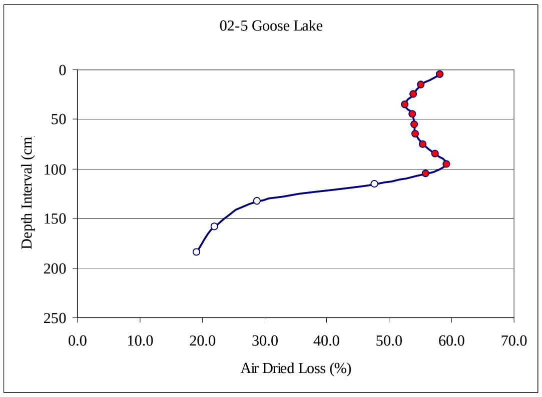
Appendix 2. Plots of Air-Dried Loss, Organic Carbon and Inorganic Carbon from lakes along the Illinois River.

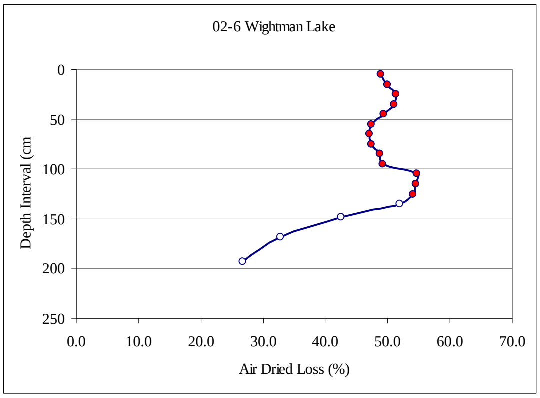

02-1 Senachwine Lake

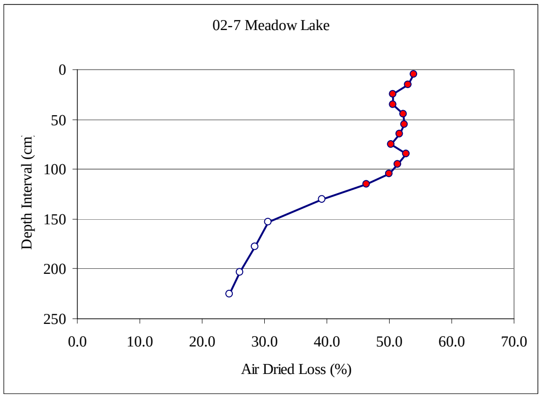

02-2 Sawmill Lake

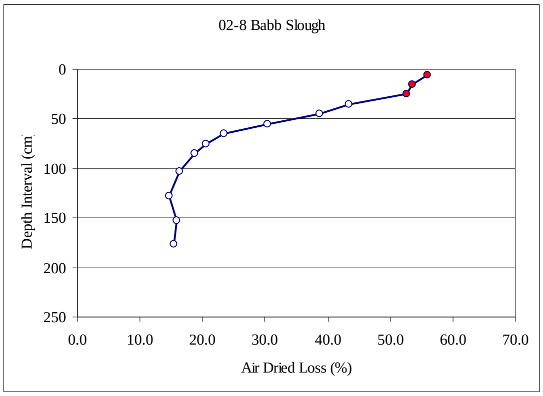

02-3 Billsbach Lake


02-4 Weiss Lake

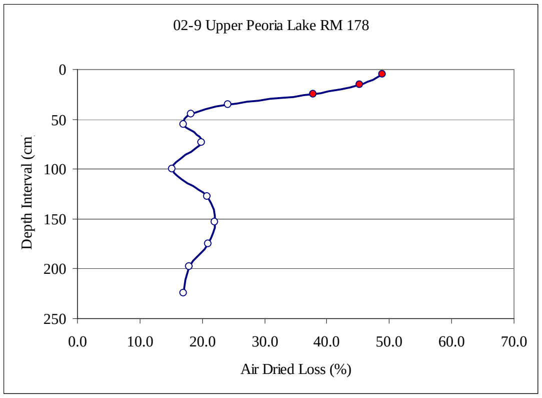

02-5 Goose Lake

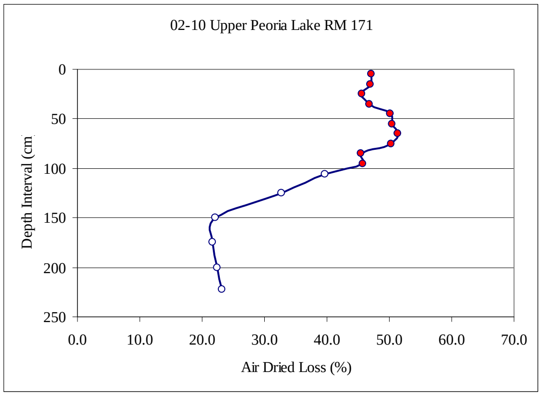

02-6 Wightman Lake

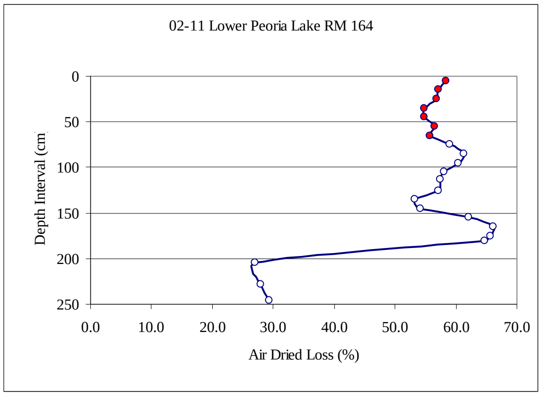

02-7 Meadow Lake

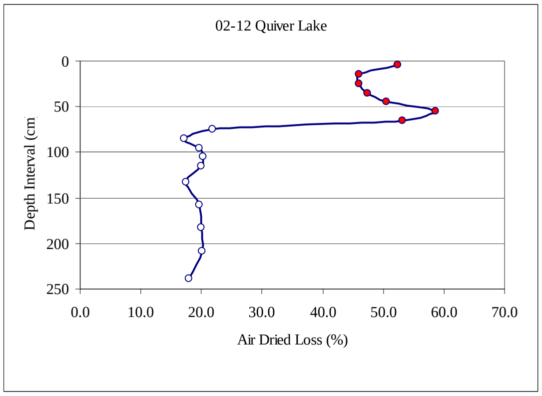

02-8 Babb Slough

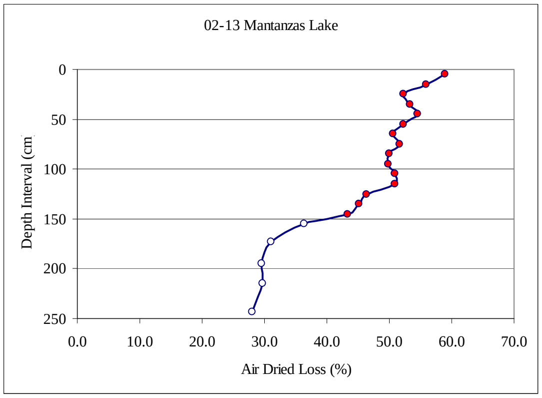
Appendix 2. Plots of Air-Dried Loss, Organic Carbon and Inorganic Carbon from lakes along the Illinois River.

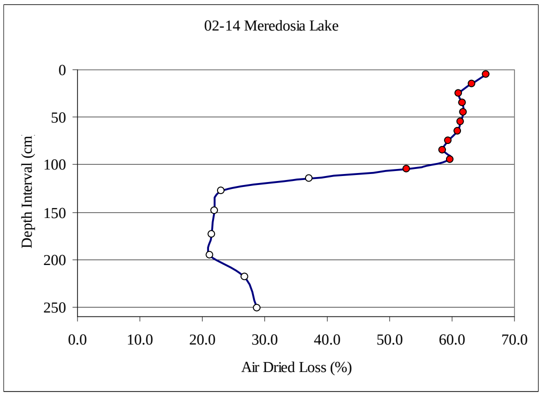




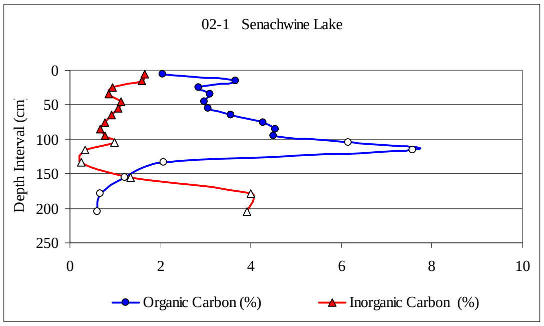


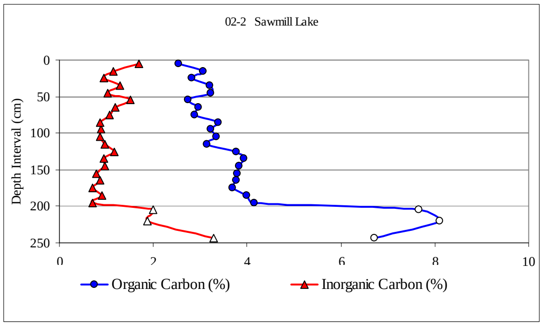


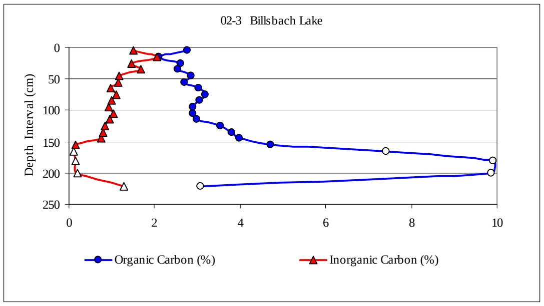


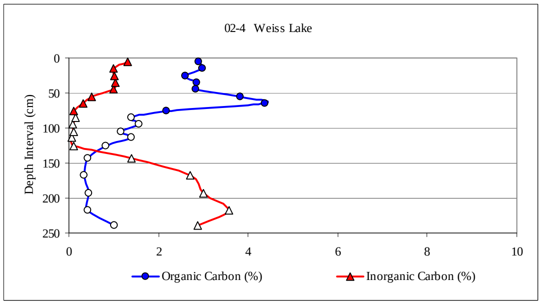


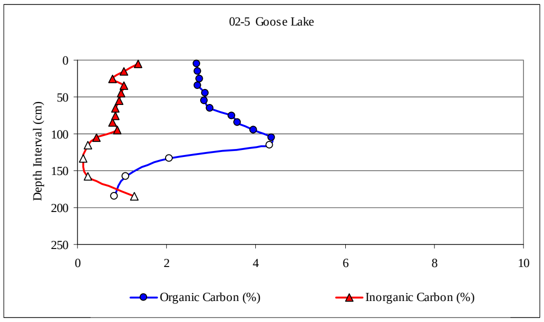
Appendix 2. Plots of Air-Dried Loss, Organic Carbon and Inorganic Carbon from lakes along the Illinois River.

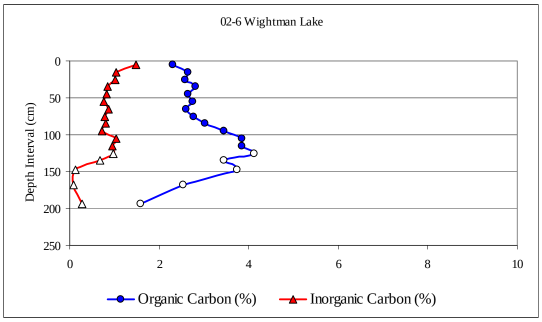


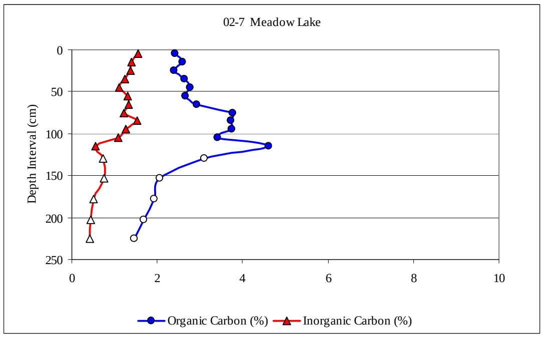


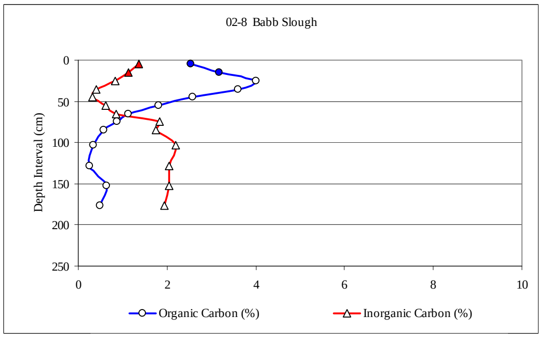




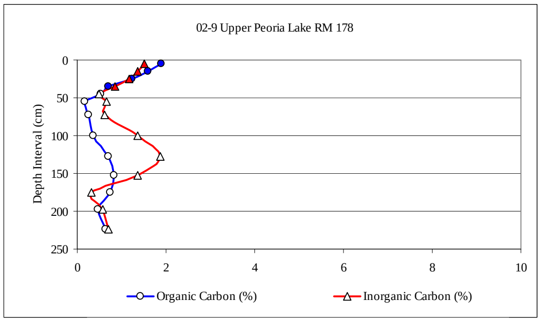


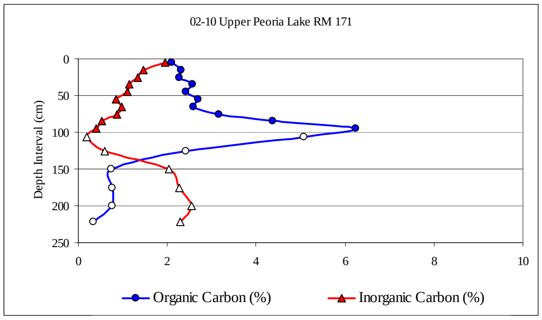


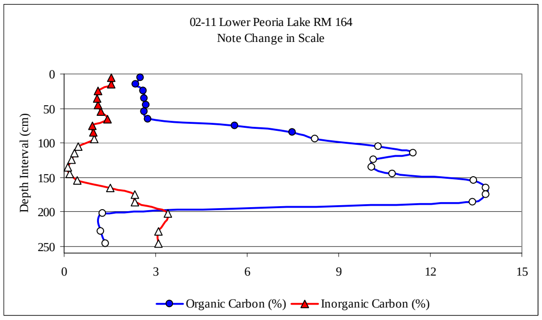


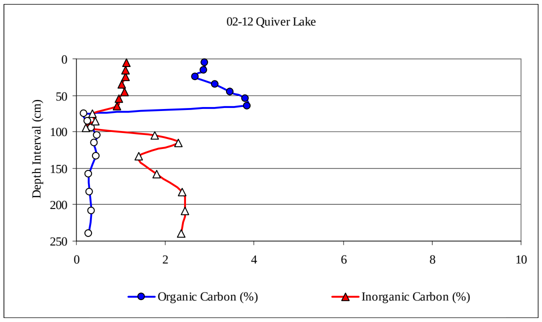


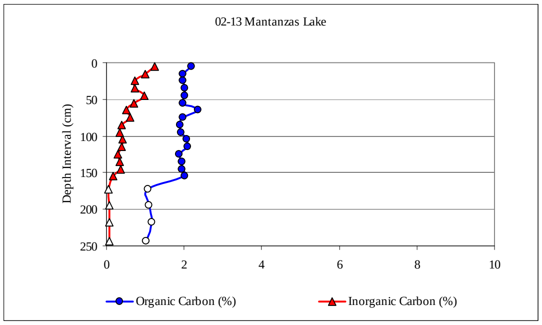
Appendix 2. Plots of Air-Dried Loss, Organic Carbon and Inorganic Carbon from lakes along the Illinois River.

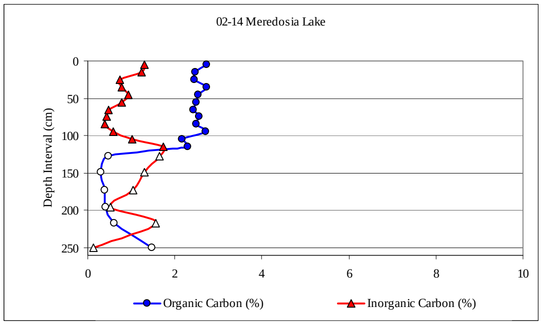












Appendix 3. Concentration of Organic Compounds in sediment cores from lakes along the Illinois River Determined by GC-MS at ISGS. All values in µg/kg unless noted otherwise.

* Denotes Replicate	02-1 Senachwine Lake						02-2 Sawmill Lake							
	20-30	40-50	60-70	70-80	100-110	165-190	20-30	20-30*	60-70	60-70*	100-110	100-110*	120-130	140-150
PHENOLS														
Phenol	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
2-Chlorophenol	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3
2-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
3-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
4-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
2-Nitrophenol	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
2,4-Dimethylphenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,4-Dichlorophenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,6-Dichlorophenol	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9
4-Chloro-3-methylphenol	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2,3,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,4-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4-Dinitrophenol	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0	<13.0
4-Nitrophenol	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8
2,3,4,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,5,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,4,5-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2-Methyl-4,6-dinitrophenol	<16.5	<16.5	<16.5	<16.5	<16.5	<16.5	<16.5	<16.5	<16.5	<16.5	<16.5	<16.5	<16.5	<16.5
3,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
Pentachlorophenol	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5	<12.5
CHLORINATED PESTICIDES														
a-BHC	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
g-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
b-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
d-BHC	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
2-(1-Methylpropyl)-4,6-nitrophenol	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400
Heptachlor	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Aldrin	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Heptachlor Epoxide	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
Endosulfan I	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
4,4'-DDE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dieldrin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Endrin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Endosulfan II	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6
4,4'-DDD	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endrin Aldehyde	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
4,4'-DDT	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endosulfan Sulfate	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70
Methoxychlor	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
Endrin Ketone	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
PAHs														
Naphthalene	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	387	415	725	846	174	183	<1.6	402
Acenaphthylene	113	264	318	266	75	<3.5	278	256	470	451	485	476	748	1,151
Acenaphthene	<1.9	56	<1.9	<1.9	<1.9	<1.9	111	103	245	204	<1.9	<1.9	124	376
Fluorene	<1.9	150	85	57	<1.9	<1.9	237	219	242	220	167	144	280	494
Phenanthrene	193	354	190	214	162	<5.4	457	411	400	391	401	389	984	1,165
Anthracene	114	257	265	241	91	<1.9	265	244	146	141	420	410	770	1,117
Fluoranthene	332	569	627	657	406	<2.2	683	642	586	571	1,041	994	903	2,010
Pyrene	402	693	689	677	450	<1.9	828	770	628	530	1,402	1,381	1,047	2,002
Chrysene	477	540	697	609	335	39	636	587	457	454	1,325	1,296	659	695
Benzo(a)anthracene	570	667	771	675	354	36	797	742	1,499	1,554	1,542	1,552	1,912	2,758
Benzo(k)fluoranthene	497	701	755	592	256	59	834	778	408	410	1,407	1,403	2,101	2,936
Benzo(b)fluoranthene	482	595	705	596	285	65	830	901	1,530	1,710	1,082	1,044	1,519	1,978
Benzo(a)pyrene	464	712	755	632	323	78	758	701	1,418	1,316	1,302	1,249	1,893	2,548
Indeno[1,2,3-cd]pyrene	537	736	768	655	216	98	1,033	942	559	628	440	439	938	3,582
Dibenz(a-h)anthracene	439	424	437	376	144	145	569	518	608	592	713	695	868	1,733
Benzo(g,h,i)perylene	485	365	771	641	277	157	929	856	354	357	524	514	550	2,687
PCBs														
Aroclor 1016	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31
Aroclor 1221	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Aroclor 1232	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
Aroclor 1242	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39
Aroclor 1248	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36
Aroclor 1254	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37
Aroclor 1260	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32
Aroclor 1262	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
INTERNAL STANDARDS (mg/kg)														
Acenaphthene-d_{10}	5.10	4.93	5.01	5.10	5.11	4.89	5.07	5.01	5.01	4.96	5.01	4.99	4.97	5.05
Chrysene-d_{12}	4.97	5.01	4.88	4.97	4.84	4.97	5.02	5.00	4.97	5.01	5.07	5.05	5.04	5.11
Phenanthrene-d_{10}	5.00	5.02	4.95	4.99	5.02	5.02	4.95	5.03	5.03	5.00	5.01	5.08	4.92	5.03

Appendix 3. Concentration of Organic Compounds in sediment cores from lake along the Illinois River Determined by GC-MS at ISGS. All values in µg/kg unless noted otherwise.

* Denotes Replicate	**02-2 Sawmill Lake**				**02-3 Billsbach Lake**						**02-4 Weiss Lake**			**02-5 Goose Lake**	
	150-160	150-160*	190-200	190-200*	20-30	60-70	70-80	80-90	90-100	150-160	20-30	60-70	110-120	20-30	60-70
PHENOLS															
Phenol	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
2-Chlorophenol	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3
2-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
3-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
4-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
2-Nitrophenol	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
2,4-Dimethylphenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,4-Dichlorophenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,6-Dichlorophenol	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9
4-Chloro-3-methylphenol	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2,3,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,4-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4-Dinitrophenol	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0
4-Nitrophenol	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8
2,3,4,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,5,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,4,5-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2-Methyl-4,6-dinitrophenol	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5
3,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
Pentachlorophenol	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5
CHLORINATED PESTICIDES															
a-BHC	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
g-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
b-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
d-BHC	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
2-(1-Methylpropyl)-4,6-nitrophenol	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400	<400
Heptachlor	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Aldrin	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Heptachlor Epoxide	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
Endosulfan I	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
4,4'-DDE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dieldrin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Endrin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Endosulfan II	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6
4,4'-DDD	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endrin Aldehyde	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
4,4'-DDT	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endosulfan Sulfate	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70
Methoxychlor	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
Endrin Ketone	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
PAHs															
Naphthalene	230	238	59	56	347	449	125	185	234	<1.6	70	129	<1.6	<1.6	185
Acenaphthylene	697	674	62	63	360	439	351	346	120	63	235	54	28	135	207
Acenaphthene	145	131	<1.9	<1.9	122	136	95	108	42	<1.9	<1.9	<1.9	<1.9	<1.9	57
Fluorene	404	390	105	102	225	331	271	247	133	37	60	46	<1.9	69	178
Phenanthrene	930	917	286	297	644	864	657	576	248	211	293	200	46	282	276
Anthracene	839	903	262	289	385	541	454	466	149	105	218	188	32	162	204
Fluoranthene	2,030	2,062	299	305	968	1,158	1,004	867	326	391	127	122	41	480	521
Pyrene	2,143	2,214	283	245	1,021	934	1,198	975	352	386	551	137	45	615	565
Chrysene	2,427	2,289	284	277	953	1,334	1,097	950	213	310	428	108	60	400	453
Benzo(a)anthracene	2,640	2,694	274	268	1,208	1,644	1,332	1,193	263	369	536	130	72	499	530
Benzo(k)fluoranthene	2,195	2,182	234	238	1,292	178	130	220	192	274	19	101	61	457	464
Benzo(b)fluoranthene	2,080	2,075	289	294	1,157	1,787	1,500	1,298	162	245	156	106	54	415	421
Benzo(a)pyrene	2,602	2,585	236	218	1,148	1,676	1,464	1,333	157	281	529	131	79	437	483
Indeno[1,2,3-cd]pyrene	3,732	3,904	21	20	102	2,195	2,063	1,735	194	166	472	6	3	311	371
Dibenz(a-h)anthracene	1,822	1,802	111	105	349	804	419	395	186	332	285	77	31	433	241
Benzo(g,h,i)perylene	2,864	2,796	18	17	104	1,819	97	97	70	51	494	157	48	341	21
PCBs															
Aroclor 1016	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31
Aroclor 1221	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Aroclor 1232	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
Aroclor 1242	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39
Aroclor 1248	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36
Aroclor 1254	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37
Aroclor 1260	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32
Aroclor 1262	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
INTERNAL STANDARDS (mg/kg)															
Acenaphthene-d_{10}	4.97	5.01	5.05	5.00	4.89	5.07	5.00	5.03	5.09	4.98	4.93	5.09	4.88	4.97	5.03
Chrysene-d_{12}	5.04	5.12	4.99	5.07	4.97	5.03	4.99	5.00	5.04	4.92	4.96	5.03	4.89	5.00	5.01
Phenanthrene-d_{10}	4.92	4.99	5.04	4.93	5.00	5.01	4.97	4.99	5.06	4.95	4.95	5.05	4.86	4.98	5.01

Appendix 3. Concentration of Organic Compounds in sediment cores from lake along the Illinois River Determined by GC-MS at ISGS. All values in µg/kg unless noted otherwise.

* Denotes Replicate	02-5 Goose Lake				02-6 Wightman Lake						02-7 Meadow Lake				
	70-80	80-90	90-100	145-170	20-30	60-70	90-100	100-110	110-120	130-140	20-30	20-30*	50-60	50-60*	70-80
PHENOLS															
Phenol	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
2-Chlorophenol	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3
2-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
3-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
4-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
2-Nitrophenol	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
2,4-Dimethylphenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,4-Dichlorophenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,6-Dichlorophenol	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9
4-Chloro-3-methylphenol	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2,3,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,4-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4-Dinitrophenol	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0
4-Nitrophenol	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8
2,3,4,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,5,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,4,5-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2-Methyl-4,6-dinitrophenol	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5
3,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
Pentachlorophenol	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5
CHLORINATED PESTICIDES															
a-BHC	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
g-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
b-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
d-BHC	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
2-(1-Methylpropyl)-4,6-nitrophenol	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Heptachlor	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Aldrin	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Heptachlor Epoxide	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
Endosulfan I	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
4,4'-DDE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dieldrin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Endrin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Endosulfan II	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6
4,4'-DDD	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endrin Aldehyde	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
4,4'-DDT	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endosulfan Sulfate	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70
Methoxychlor	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
Endrin Ketone	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
PAHs															
Naphthalene	80	610	43	<1.6	381	115	<1.6	166	74	87	<1.6	<1.6	<1.6	<1.6	1,005
Acenaphthylene	494	993	514	<3.5	245	246	315	776	682	299	288	276	202	203	38
Acenaphthene	111	148	45	<1.9	123	120	56	74	321	<1.9	50	45	43	44	255
Fluorene	219	398	193	<1.9	207	219	162	164	365	103	125	119	140	141	733
Phenanthrene	448	897	605	60	429	392	413	940	1,061	280	314	309	318	311	1,825
Anthracene	453	922	541	32	237	272	346	932	1,034	264	306	300	280	282	1,634
Fluoranthene	1,019	988	1,553	55	585	742	686	1,746	1,159	650	618	613	669	632	3,222
Pyrene	1,076	1,064	1,774	49	725	764	784	1,959	1,165	719	767	781	734	758	3,601
Chrysene	1,042	1,867	1,566	105	512	574	723	1,989	2,461	936	780	812	668	679	3,637
Benzo(a)anthracene	1,155	1,903	1,743	92	597	634	876	2,300	2,750	24	932	988	817	874	4,009
Benzo(k)fluoranthene	1,142	1,782	1,522	48	529	517	851	1,656	3,389	803	1,030	1,101	809	821	3,355
Benzo(b)fluoranthene	979	1,507	1,015	48	516	437	685	1,345	897	808	952	927	742	668	2,834
Benzo(a)pyrene	1,131	779	1,420	60	536	524	836	801	2,318	426	506	550	377	401	2,041
Indeno[1,2,3-cd]pyrene	1,268	919	1,427	19	441	390	859	677	1,174	988	1,290	1,327	865	893	4,948
Dibenz(a-h)anthracene	650	1,278	724	19	266	256	545	754	1,158	478	635	671	478	786	2,480
Benzo(g,h,i)perylene	1,104	2,060	1,218	<4.1	460	463	808	358	638	61	1,110	1,078	966	1,009	3,563
PCBs															
Aroclor 1016	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31
Aroclor 1221	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Aroclor 1232	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
Aroclor 1242	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39
Aroclor 1248	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36
Aroclor 1254	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37
Aroclor 1260	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32
Aroclor 1262	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
INTERNAL STANDARDS (mg/kg)															
Acenaphthene-d_{10}	5.00	5.08	5.07	5.07	4.88	5.05	5.07	4.89	5.02	5.00	4.94	5.03	5.03	5.04	251.45
Chrysene-d_{12}	4.97	5.05	5.09	5.10	4.92	5.03	5.10	5.00	5.06	5.07	5.03	5.00	4.98	5.07	5.06
Phenanthrene-d_{10}	4.97	5.02	5.06	5.06	4.95	5.09	5.07	4.96	5.03	5.03	4.99	5.08	5.00	5.03	5.08

Appendix 3. Concentration of Organic Compounds in sediment cores from lake along the Illinois River Determined by GC-MS at ISGS. All values in µg/kg unless noted otherwise.

* Denotes Replicate	**02-7 Meadow Lake**			**02-8 Babb Slough**				**02-9 Upper Peoria RM-178**			**02-10 Upper Peoria RM-171**					
	90-100	100-110	100-110*	20-30	20-30*	80-90	80-90*	20-30	50-60	165-185	20-30	30-40	40-50	60-70	90-100	162-187
PHENOLS																
Phenol	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
2-Chlorophenol	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3
2-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
3-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
4-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
2-Nitrophenol	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
2,4-Dimethylphenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,4-Dichlorophenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,6-Dichlorophenol	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9
4-Chloro-3-methylphenol	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2,3,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,4-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4-Dinitrophenol	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0
4-Nitrophenol	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8
2,3,4,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,5,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,4,5-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2-Methyl-4,6-dinitrophenol	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5
3,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
Pentachlorophenol	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5
CHLORINATED PESTICIDES																
a-BHC	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
g-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
b-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
d-BHC	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
2-(1-Methylpropyl)-4,6-nitrophenol	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Heptachlor	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Aldrin	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Heptachlor Epoxide	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
Endosulfan I	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
4,4'-DDE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dieldrin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Endrin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<8	<8
Endosulfan II	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6
4,4'-DDD	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endrin Aldehyde	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
4,4'-DDT	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endosulfan Sulfate	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70
Methoxychlor	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
Endrin Ketone	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
PAHs																
Naphthalene	557	171	163	2	2	<1.6	<1.6	<1.6	59	<1.6	177	<1.6	40	162	<1.6	<1.6
Acenaphthylene	260	171	184	8	7	<3.5	<3.5	200	39	<3.5	587	309	482	328	118	<3.5
Acenaphthene	49	<13	<13	<1.9	<1.9	<1.9	<1.9	13	<1.9	<1.9	139	28	36	126	21	<1.9
Fluorene	698	310	297	76	74	<1.9	<1.9	82	24	<1.9	174	119	240	251	71	<1.9
Phenanthrene	1,537	910	979	521	519	53	50	341	195	67	628	471	711	523	372	121
Anthracene	1,803	900	831	413	422	38	36	208	124	56	582	385	555	416	170	100
Fluoranthene	3,942	43	45	882	861	17	17	538	63	110	1,208	990	1,243	1,155	600	127
Pyrene	4,478	56	54	1,095	1,065	15	15	626	62	124	1,490	1,186	1,418	1,238	560	93
Chrysene	5,119	109	116	881	873	20	21	520	86	182	1,383	1,058	1,201	912	541	263
Benzo(a)anthracene	2,380	580	603	1,029	1,008	20	18	633	75	223	1,773	1,366	1,530	1,117	558	52
Benzo(k)fluoranthene	4,364	239	251	61	66	48	49	511	59	90	1,732	1,299	1,521	1,041	457	142
Benzo(b)fluoranthene	2,512	10	10	1,056	1,018	26	25	501	68	81	1,810	1,212	1,334	934	533	137
Benzo(a)pyrene	2,627	66	72	448	461	7	8	548	82	100	1,810	1,365	1,548	1,050	475	307
Indeno[1,2,3-cd]pyrene	1,059	31	33	1,074	993	11	10	456	35	45	789	85	96	98	57	10
Dibenz(a-h)anthracene	2,496	41	47	427	57	5	5	243	42	67	829	717	814	533	276	55
Benzo(g,h,i)perylene	759	18	16	960	947	21	20	33	31	25	361	223	396	360	403	16
PCBs																
Aroclor 1016	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31
Aroclor 1221	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Aroclor 1232	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
Aroclor 1242	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39
Aroclor 1248	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36
Aroclor 1254	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37
Aroclor 1260	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32
Aroclor 1262	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
INTERNAL STANDARDS (mg/kg)																
Acenaphthene-d_{10}	4.97	5.02	4.89	4.99	5.03	5.00	5.02	5.08	5.01	5.01	4.98	5.12	5.01	4.94	5.10	4.93
Chrysene-d_{12}	5.00	4.99	5.01	4.92	5.07	4.97	4.99	5.05	5.06	5.09	4.97	5.07	5.00	4.98	4.97	5.01
Phenanthrene-d_{10}	5.02	5.00	5.01	4.91	5.02	4.99	4.93	5.06	5.02	5.06	4.99	5.09	5.20	4.99	5.00	5.02

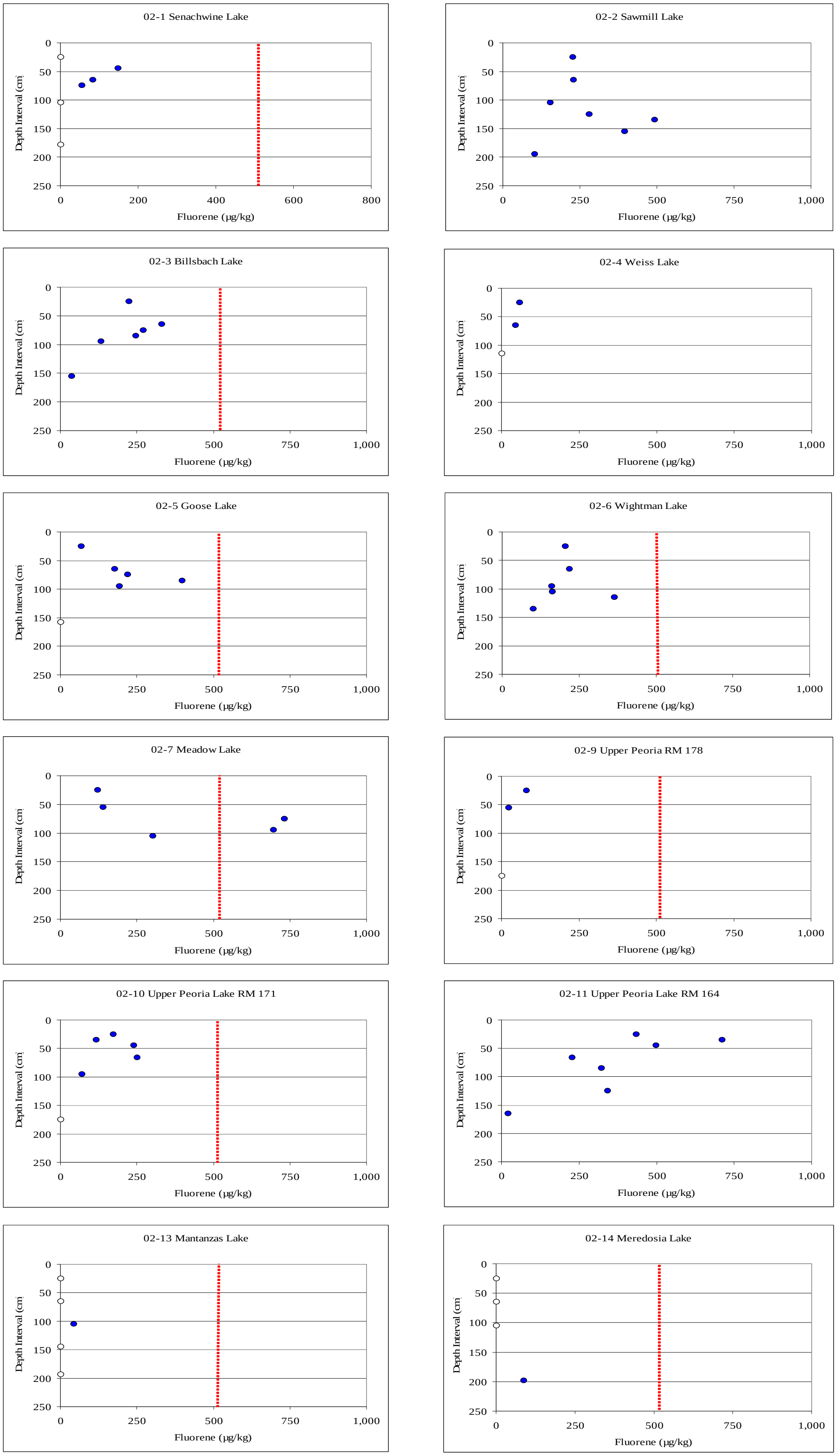
Appendix 3. Concentration of Organic Compounds in sediment cores from lake along the Illinois River Determined by GC-MS at ISGS. All values in µg/kg unless noted otherwise.

* Denotes Replicate	02-11 Lower Peoria RM-164										02-12 Quiver Lake			
	20-30	20-30*	30-40	40-50	60-70	60-70*	80-90	80-90*	120-130	160-170	20-30	20-30*	60-70	60-70*
PHENOLS														
Phenol	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
2-Chlorophenol	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3
2-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
3-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
4-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
2-Nitrophenol	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
2,4-Dimethylphenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,4-Dichlorophenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,6-Dichlorophenol	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9
4-Chloro-3-methylphenol	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2,3,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,4-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4-Dinitrophenol	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0
4-Nitrophenol	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8
2,3,4,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,5,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,4,5-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2-Methyl-4,6-dinitrophenol	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5
3,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
Pentachlorophenol	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5
CHLORINATED PESTICIDES														
a-BHC	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
g-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
b-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
d-BHC	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
2-(1-Methylpropyl)-4,6-nitrophenol	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Heptachlor	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Aldrin	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Heptachlor Epoxide	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
Endosulfan I	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
4,4'-DDE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dieldrin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Endrin	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
Endosulfan II	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6
4,4'-DDD	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endrin Aldehyde	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
4,4'-DDT	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endosulfan Sulfate	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70
Methoxychlor	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
Endrin Ketone	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
PAHs														
Naphthalene	476	436	1,107	85	307	322	362	355	849	49	81	88	40	38
Acenaphthylene	584	562	1,193	907	226	212	283	301	130	88	58	60	45	44
Acenaphthene	265	271	534	237	111	103	181	172	210	10	<1.9	<1.9	<1.9	<1.9
Fluorene	423	448	711	499	232	225	325	318	343	21	49	52	37	36
Phenanthrene	986	958	1,765	1,534	544	526	922	1,006	985	96	150	159	122	128
Anthracene	615	602	1,310	1,113	296	237	384	379	974	89	65	68	56	58
Fluoranthene	1,607	1,689	2,577	2,337	769	795	1,001	1,000	430	126	189	196	241	259
Pyrene	2,013	2,105	3,111	2,731	907	943	1,114	1,143	383	176	207	213	237	242
Chrysene	1,558	1,500	2,543	2,169	837	847	782	778	378	218	141	148	187	198
Benzo(a)anthracene	1,993	2,038	3,166	2,802	851	869	1,008	1,015	368	269	181	185	214	219
Benzo(k)fluoranthene	2,003	2,061	3,204	2,830	1,135	1,151	1,094	1,105	546	427	178	181	180	188
Benzo(b)fluoranthene	2,149	2,123	2,873	2,423	1,144	1,168	1,042	1,102	509	399	149	151	212	220
Benzo(a)pyrene	2,048	2,115	3,097	2,825	839	863	1,059	1,024	336	291	189	192	199	205
Indeno[1,2,3-cd]pyrene	853	838	1,370	1,147	576	590	343	362	76	7	82	85	146	153
Dibenz(a-h)anthracene	1,109	159	1,396	1,152	331	325	365	395	355	91	91	94	84	88
Benzo(g,h,i)perylene	351	363	633	963	604	588	306	331	162	12	146	150	200	214
PCBs														
Aroclor 1016	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31
Aroclor 1221	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Aroclor 1232	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
Aroclor 1242	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39
Aroclor 1248	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36
Aroclor 1254	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37
Aroclor 1260	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32
Aroclor 1262	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
INTERNAL STANDARDS (mg/kg)														
Acenaphthene-d_{10}	5.01	5.06	5.10	5.11	4.89	4.93	5.07	5.03	5.01	5.01	4.99	5.03	4.91	4.95
Chrysene-d_{12}	4.88	5.03	4.97	4.84	4.97	4.99	5.02	2.00	4.97	5.07	5.00	5.07	4.90	4.99
Phenanthrene-d_{10}	4.95	5.05	4.99	5.02	5.02	4.99	4.95	5.02	5.03	5.01	5.01	5.06	4.92	4.93

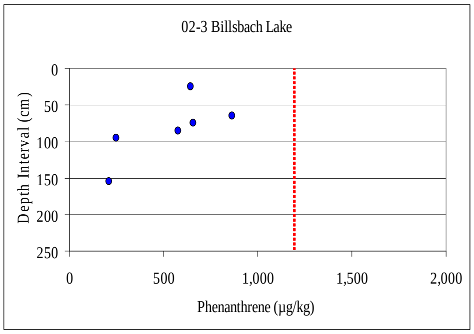
Appendix 3. Concentration of Organic Compounds in sediment cores from lake along the Illinois River Determined by GC-MS at ISGS. All values in µg/kg unless noted otherwise.

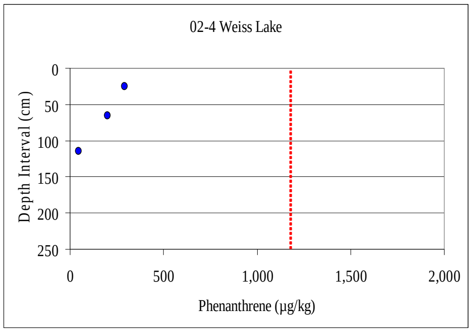
* Denotes Replicate	02-13 Mantanzas Bay										02-14 Lake Meridosia							
	20-30	20-30*	60-70	60-70*	100-110	100-110*	140-150	140-150*	185-205	185-205*	20-30	20-30*	60-70	60-70*	100-110	100-110*	185-210	185-210*
PHENOLS																		
Phenol	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
2-Chlorophenol	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3	< 3.3
2-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
3-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
4-Methylphenol	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0	< 9.0
2-Nitrophenol	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6	< 3.6
2,4-Dimethylphenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,4-Dichlorophenol	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7	< 2.7
2,6-Dichlorophenol	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9	< 2.9
4-Chloro-3-methylphenol	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
2,3,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,4-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,3,6-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
2,4-Dinitrophenol	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0	< 13.0
4-Nitrophenol	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8	< 2.8
2,3,4,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,5,6-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2,3,4,5-Tetrachlorophenol	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
2-Methyl-4,6-dinitrophenol	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5	< 16.5
3,4,5-Trichlorophenol	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
Pentachlorophenol	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5	< 12.5
CHLORINATED PESTICIDES																		
a-BHC	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
g-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
b-BHC	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
d-BHC	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
2-(1-Methylpropyl)-4,6-nitrophenol	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Heptachlor	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Aldrin	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Heptachlor Epoxide	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
Endosulfan I	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80	<80
4,4'-DDE	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dieldrin	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Endrin	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8	<8
Endosulfan II	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6	<6
4,4'-DDD	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endrin Aldehyde	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
4,4'-DDT	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Endosulfan Sulfate	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70	<70
Methoxychlor	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9	<9
Endrin Ketone	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40	<40
PAHs																		
Naphthalene	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	177	183	<1.6	<1.6	<1.6	<1.6	43	45
Acenaphthylene	47	44	51	<3.5	71	78	<3.5	<3.5	<3.5	<3.5	40	42	18	16	<3.5	<3.5	9	8
Acenaphthene	<1.9	<1.6	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	<1.9	15	15	<1.9	<1.9	<1.9	<1.9	22	23
Fluorene	<1.9	<1.9	<1.9	<1.9	45	44	<1.9	<1.9	<1.9	<1.9	2	<1.9	<1.9	<1.9	<1.9	<1.9	89	88
Phenanthrene	102	98	175	180	187	193	177	180	163	158	284	293	170	162	336	326	554	568
Anthracene	48	51	106	110	115	107	150	162	142	144	263	266	148	145	200	230	514	520
Fluoranthene	161	176	67	75	364	369	136	147	40	37	98	103	119	120	213	204	3	4
Pyrene	193	203	97	80	194	201	272	265	17	15	101	107	147	123	180	188	110	118
Chrysene	143	152	64	66	234	240	89	83	12	12	96	99	96	99	119	124	49	52
Benzo(a)anthracene	194	206	85	81	268	291	107	111	10	10	84	86	106	100	128	120	86	89
Benzo(k)fluoranthene	181	195	145	152	202	216	101	105	33	34	179	192	111	109	119	130	41	43
Benzo(b)fluoranthene	170	177	135	141	223	240	81	82	29	27	167	184	107	101	114	121	21	20
Benzo(a)pyrene	188	192	84	88	142	148	80	82	13	13	187	190	124	125	25	22	32	33
Indeno[1,2,3-cd]pyrene	106	100	30	31	<1.7	<1.7	37	35	<1.7	<1.7	62	66	50	53	62	47	<1.7	<1.7
Dibenz(a-h)anthracene	76	83	55	56	89	93	41	36	<2.5	<2.5	50	53	47	46	50	52	75	73
Benzo(g,h,i)perylene	160	175	55	54	35	34	61	60	8	7	93	106	80	87	86	82	89	82
PCBs																		
Aroclor 1016	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31	< 31
Aroclor 1221	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Aroclor 1232	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
Aroclor 1242	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39	<39
Aroclor 1248	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36	<36
Aroclor 1254	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37	<37
Aroclor 1260	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32	<32
Aroclor 1262	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35
INTERNAL STANDARDS (mg/kg)																		
Acenaphthene-d_{10}	4.98	5.03	5.06	5.08	5.02	5.00	5.02	5.05	5.03	5.07	4.98	5.03	5.12	5.01	5.01	5.03	5.02	4.94
Chrysene-d_{12}	4.97	5.03	5.03	5.09	5.05	4.98	5.05	5.02	5.01	5.04	4.97	5.00	5.07	5.02	5.00	5.02	4.99	4.98
Phenanthrene-d_{10}	4.99	5.01	5.00	5.06	5.00	4.99	5.00	5.06	5.04	5.06	4.99	5.01	5.09	5.04	5.20	5.03	4.93	4.99

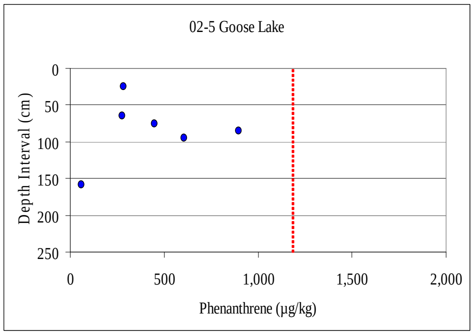
Appendix 4. Distribution of selected Fluorene in sediment cores from lakes along the Illinois River. PEC = 536 µg/kg

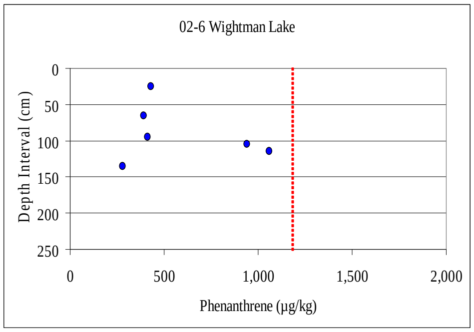


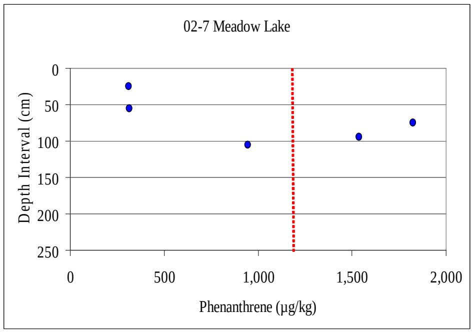
Appendix 4. Distribution of selected Phenanthrene in sediment cores from lakes along the Illinois River. PEC = 1,170 µg/kg

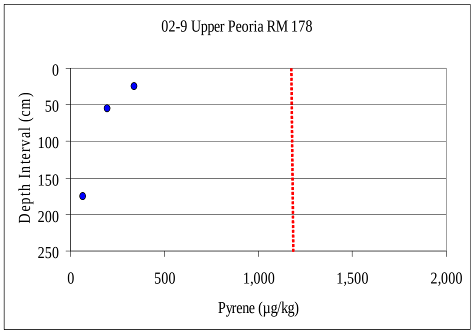


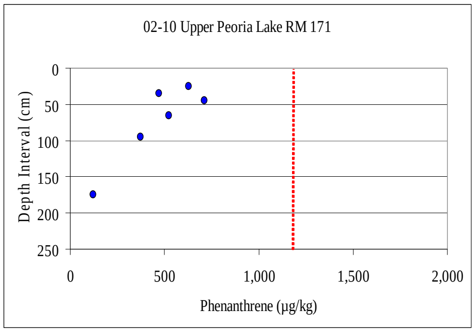


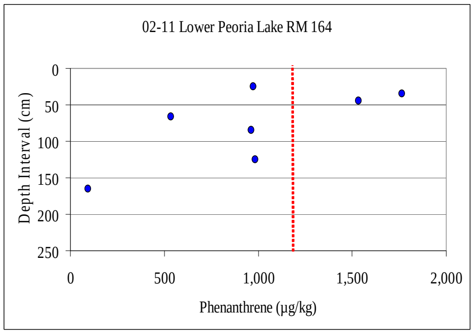


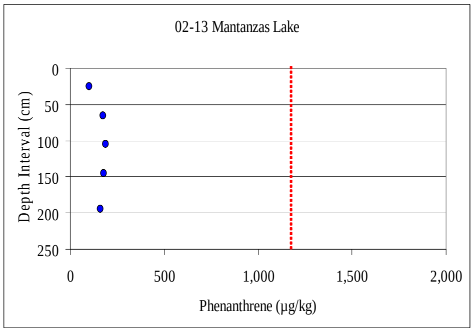


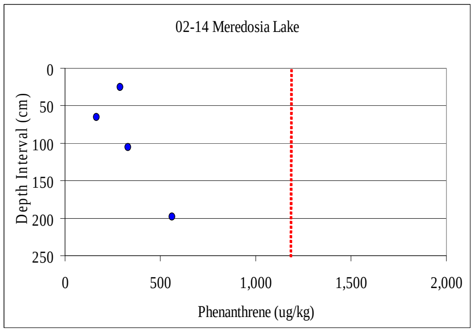




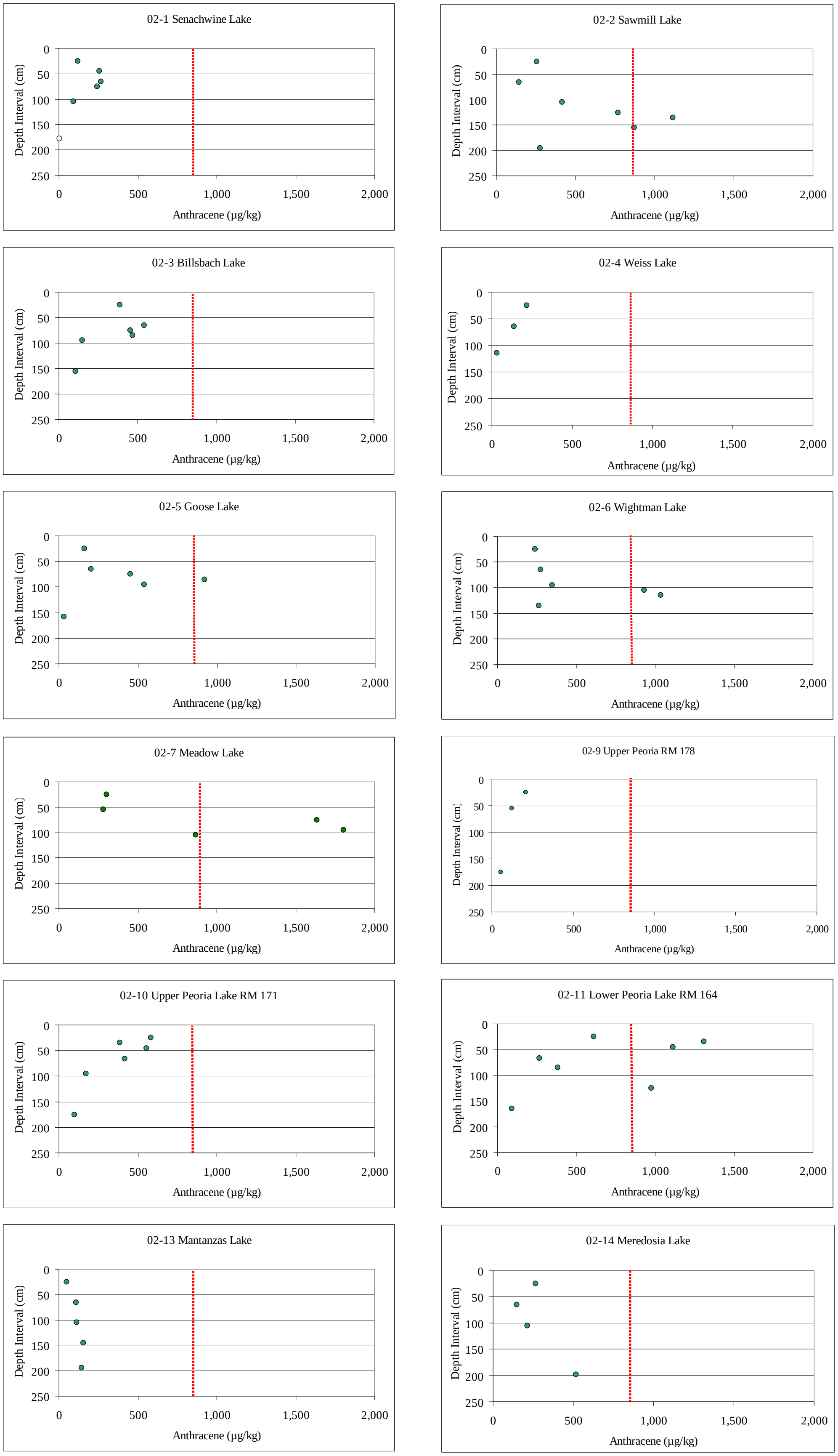




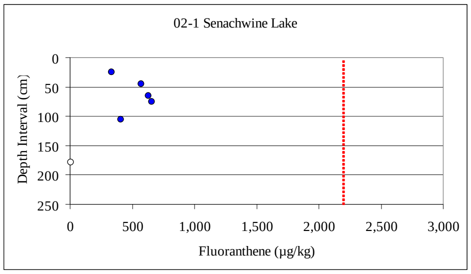


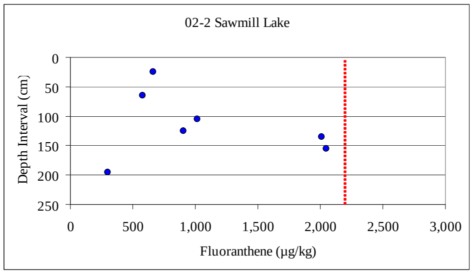


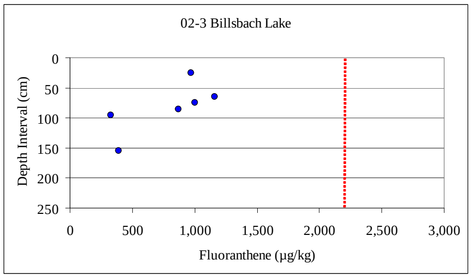
Appendix 4. Distribution of selected Anthracene in sediment cores from lakes along the Illinois River. PEC = 845 µg/kg

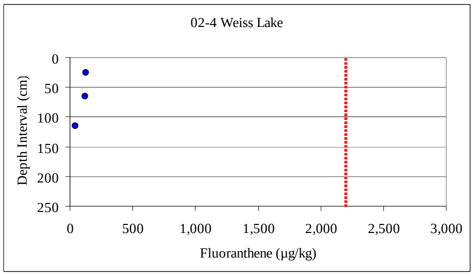


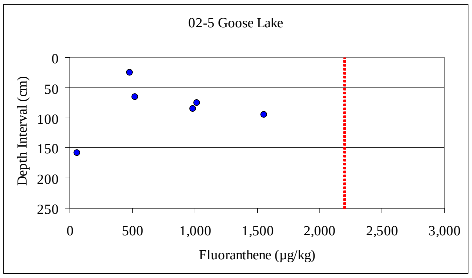
Appendix 4. Distribution of selected Fluoranthene in sediment cores from lakes along the Illinois River. PEC = 2,230 µg/kg

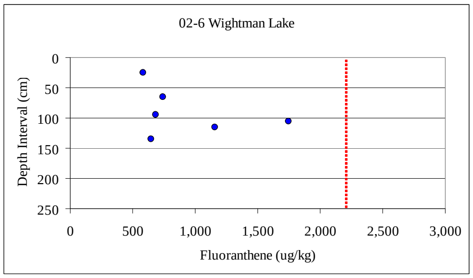

02-1 Senachwine Lake

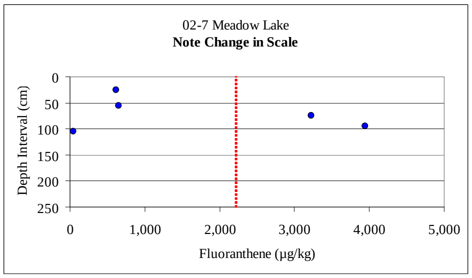

02-2 Sawmill Lake

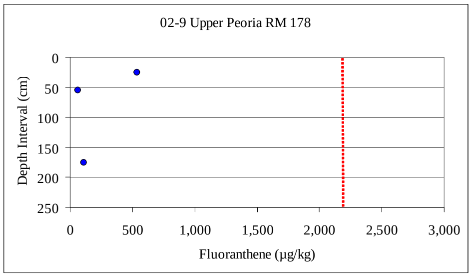

02-3 Billsbach Lake

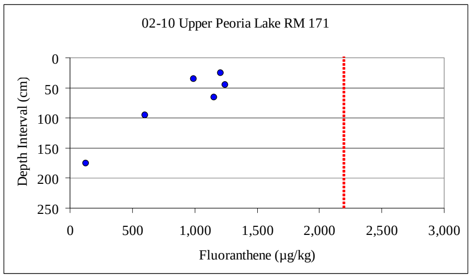

02-4 Weiss Lake

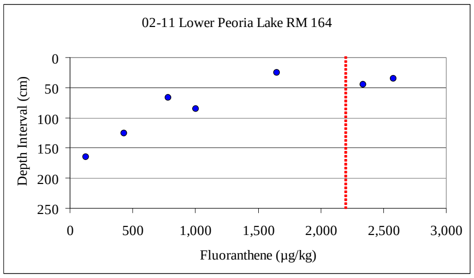

02-5 Goose Lake

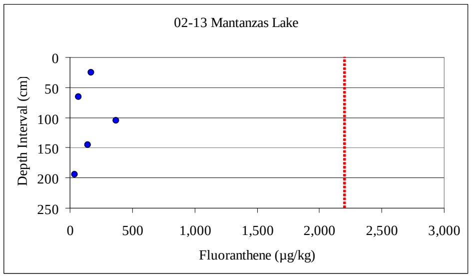

02-6 Wightman Lake

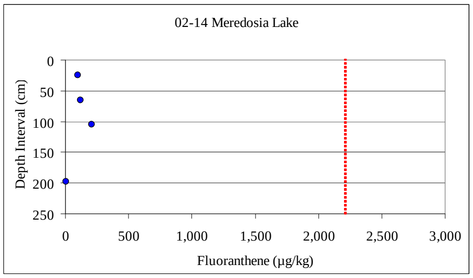

02-7 Meadow Lake
Note Change in Scale


02-9 Upper Peoria RM 178

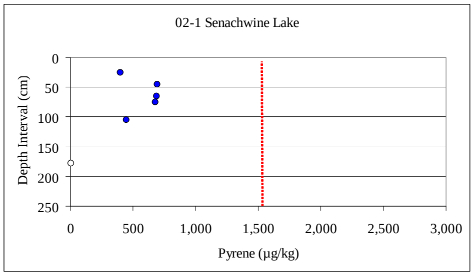

02-10 Upper Peoria Lake RM 171

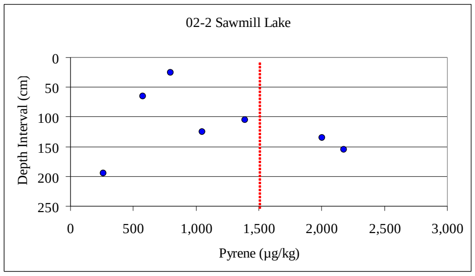

02-11 Lower Peoria Lake RM 164

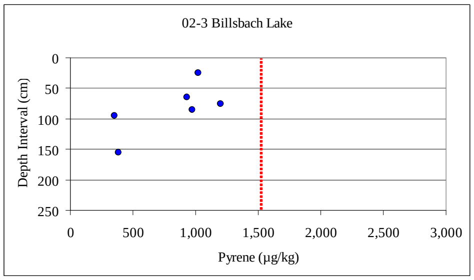

02-13 Mantanzas Lake

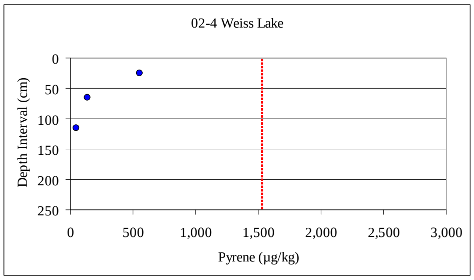

02-14 Meredosia Lake

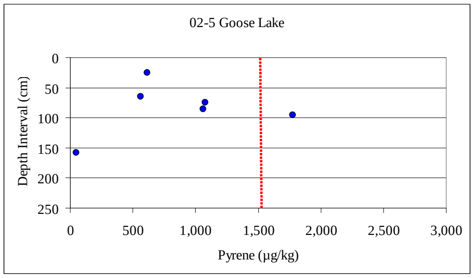
Appendix 4. Distribution of selected Pyrene in sediment cores from lakes along the Illinois River. PEC = 1,520 µg/kg

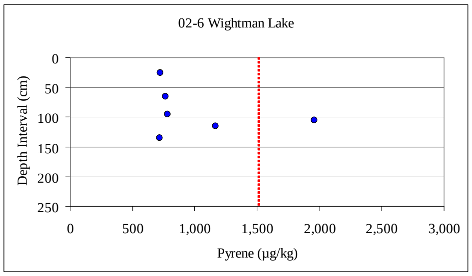

02-1 Senachwine Lake

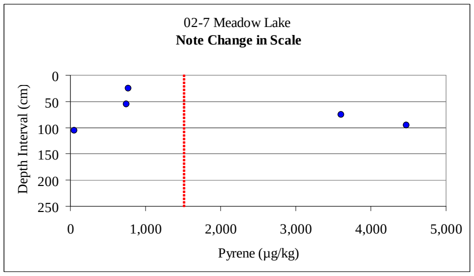

02-2 Sawmill Lake

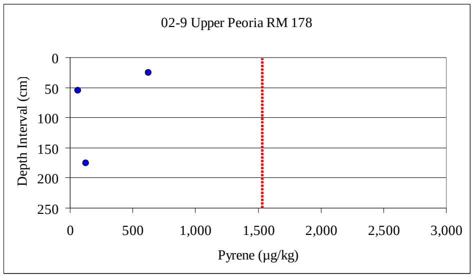

02-3 Billsbach Lake

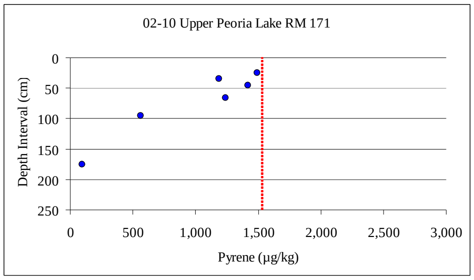

02-4 Weiss Lake

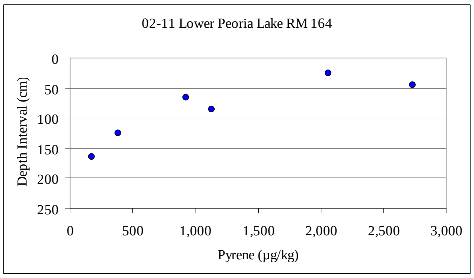

02-5 Goose Lake

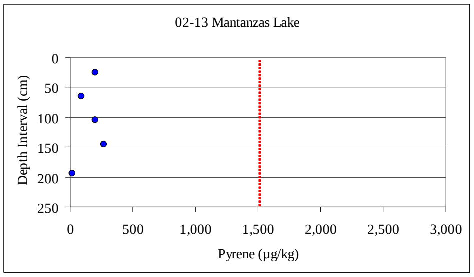

02-6 Wightman Lake

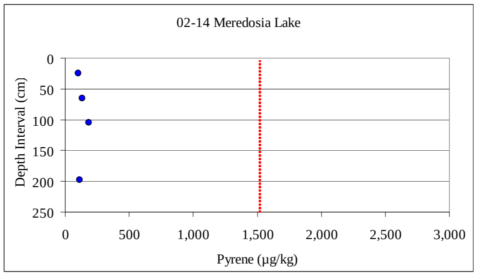

02-7 Meadow Lake
Note Change in Scale


02-9 Upper Peoria RM 178

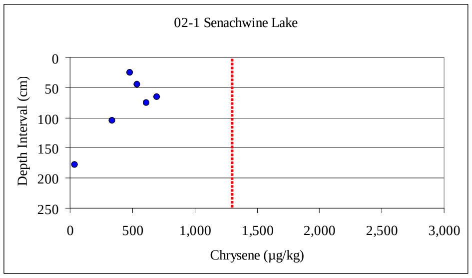

02-10 Upper Peoria Lake RM 171

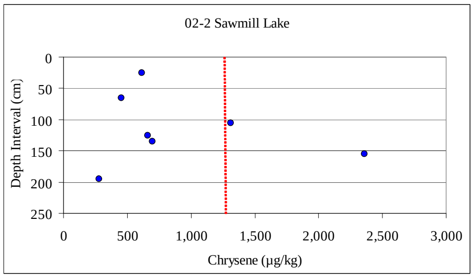

02-11 Lower Peoria Lake RM 164

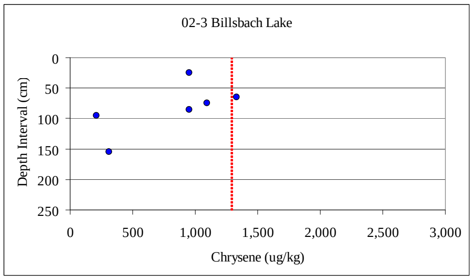

02-13 Mantanzas Lake

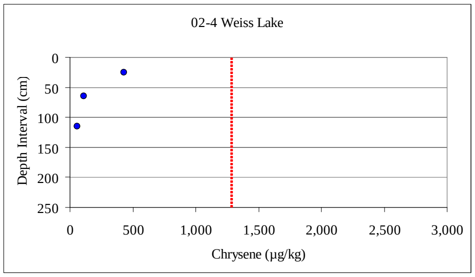

02-14 Meredosia Lake

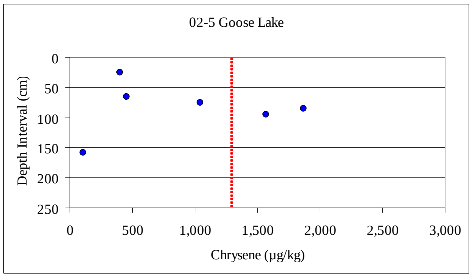
Appendix 4. Distribution of selected Chrysene in sediment cores from lakes along the Illinois River. PEC = 1,290 µg/kg

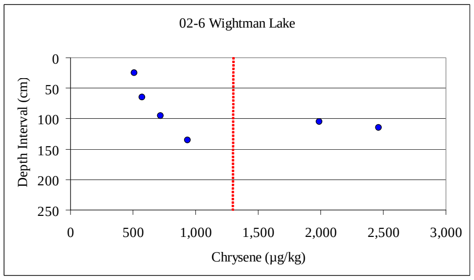


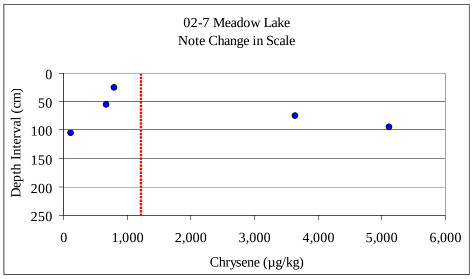


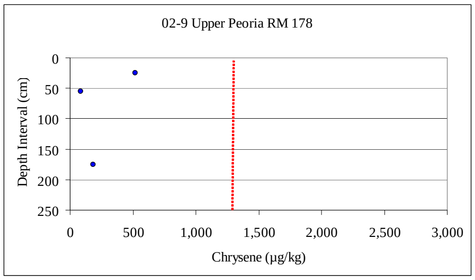


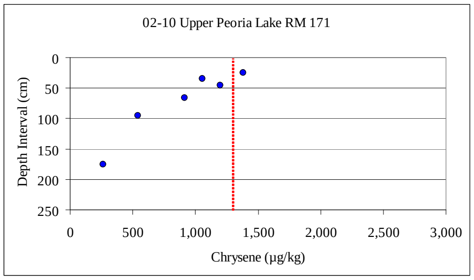


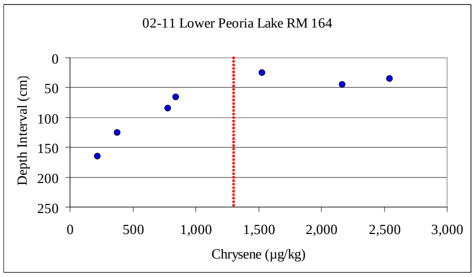


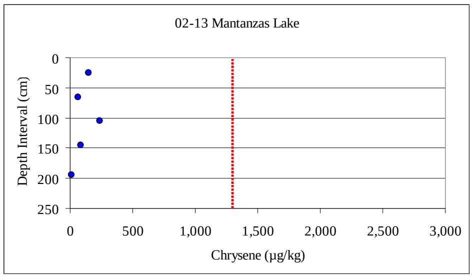


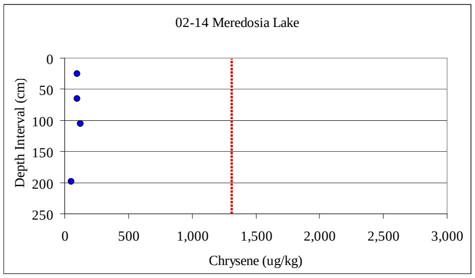




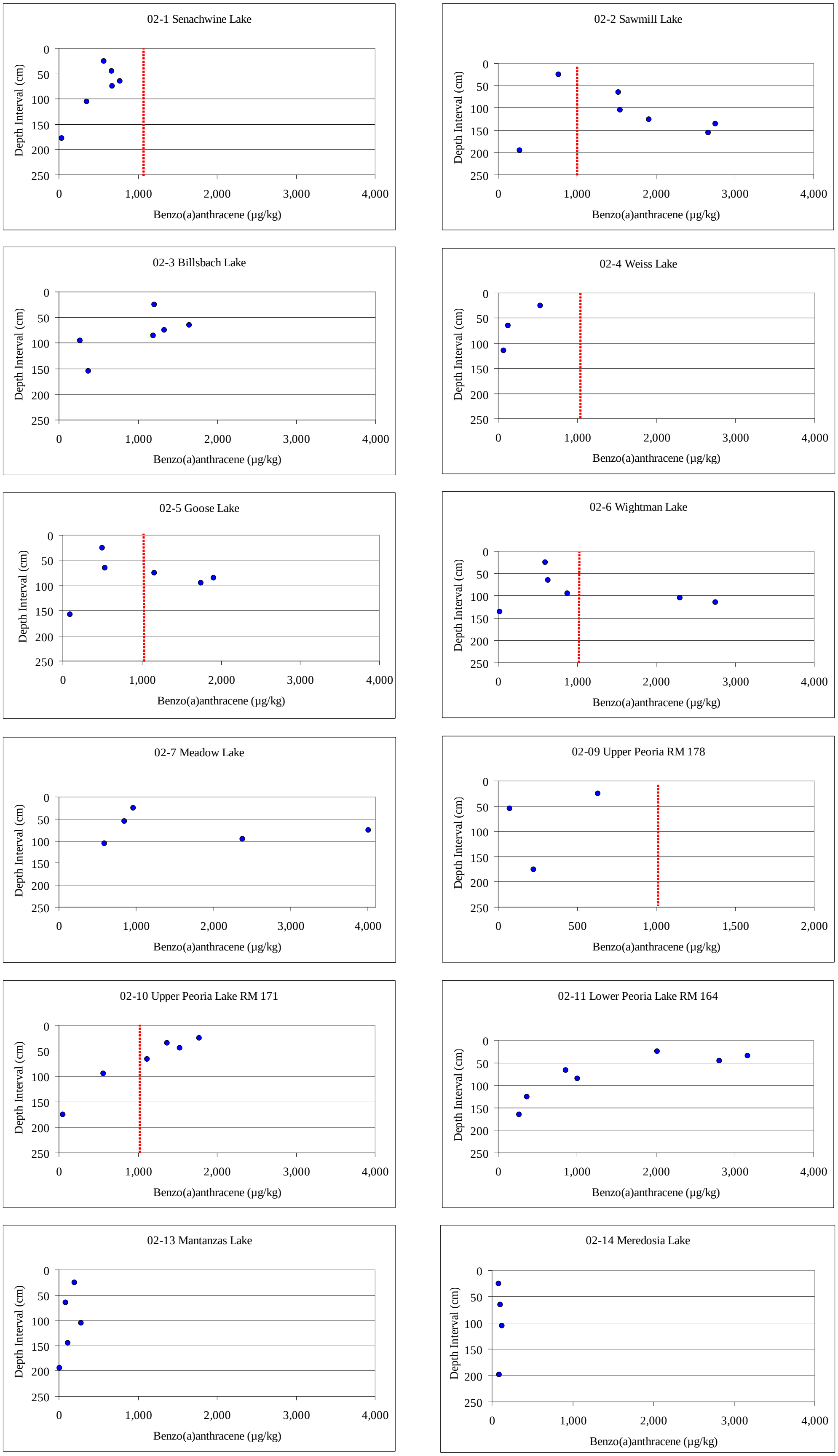




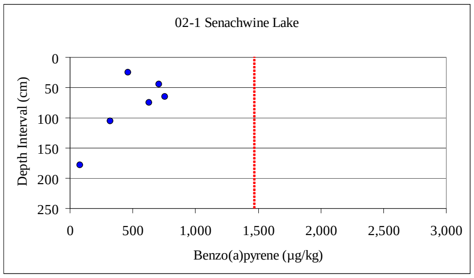


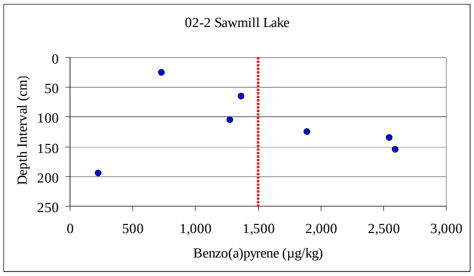


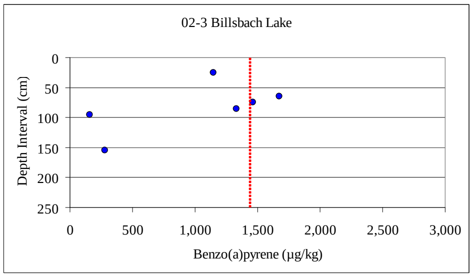
Appendix 4. Distribution of selected Benzo(a)anthracene in sediment cores from lakes along the Illinois River. PEC = 1,050 µg/kg

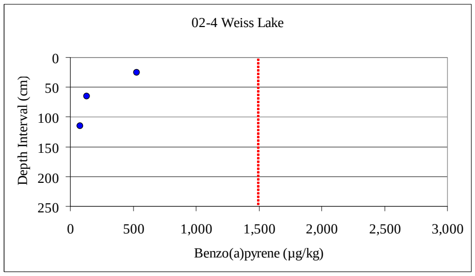


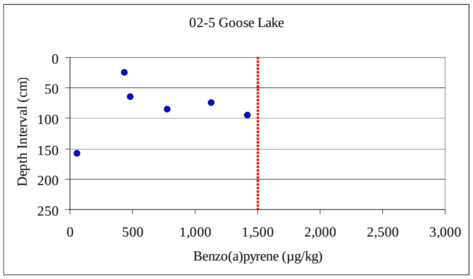
Appendix 4. Distribution of Benzo(a)byrene in sediment cores from lakes along the Illinois River. PEC = 1,450 µg/kg

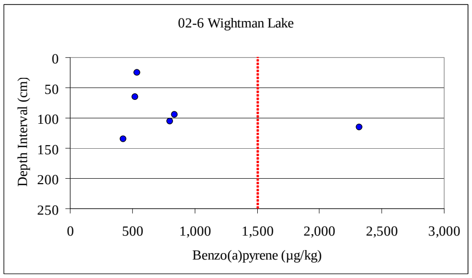


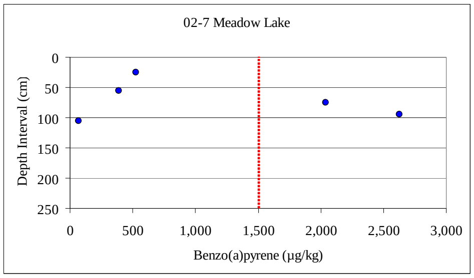


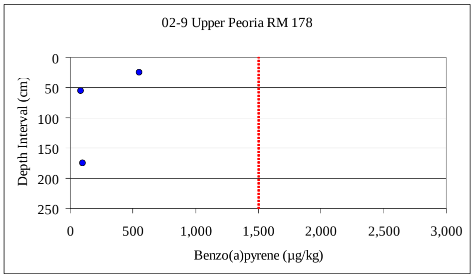


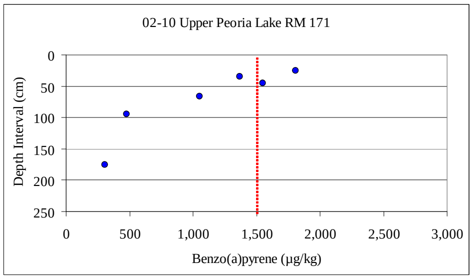


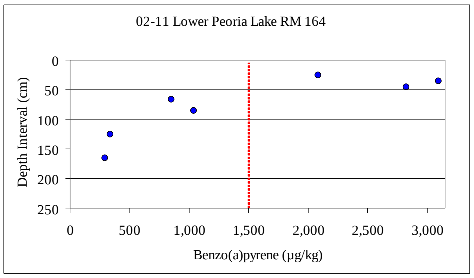


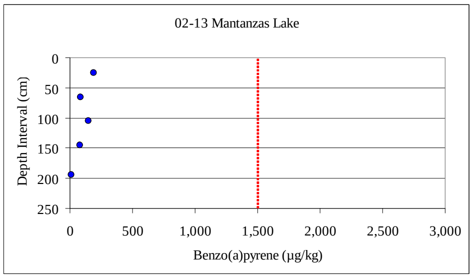


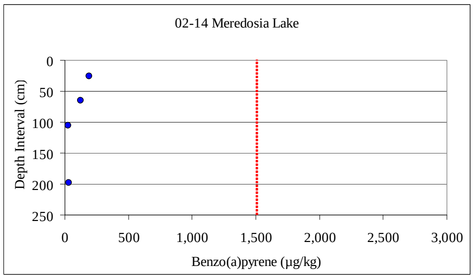




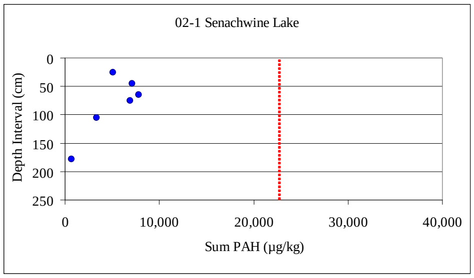


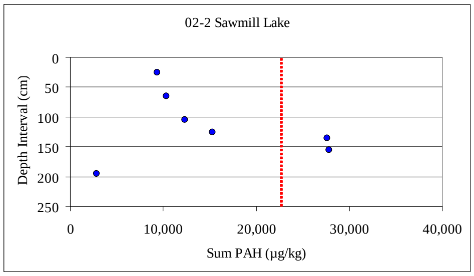


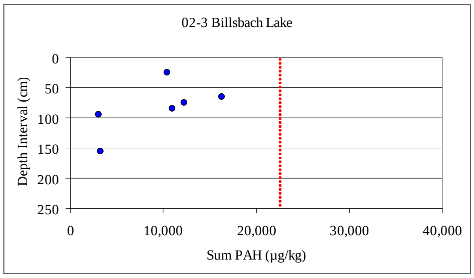


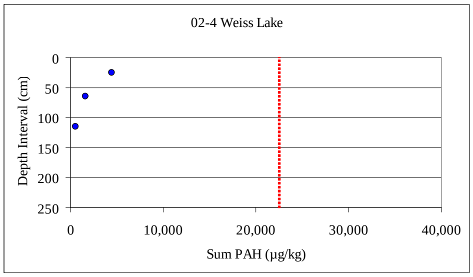


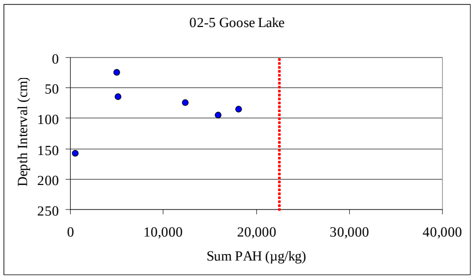
Appendix 4. Distribution of Total PAH Compounds in sediment cores from lakes along the Illinois River. PEC + 22,800µg/kg

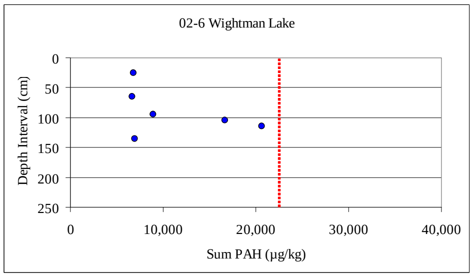


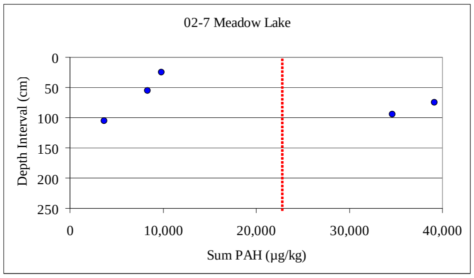


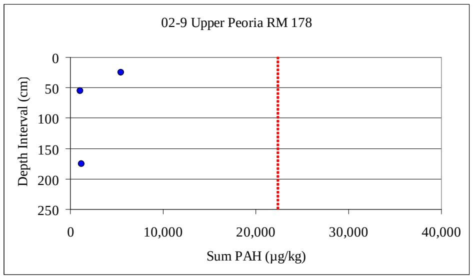


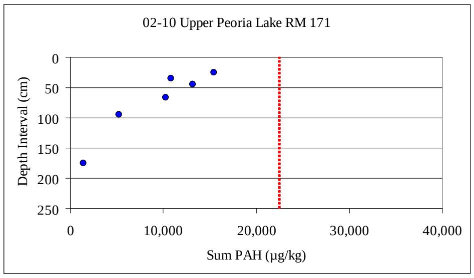


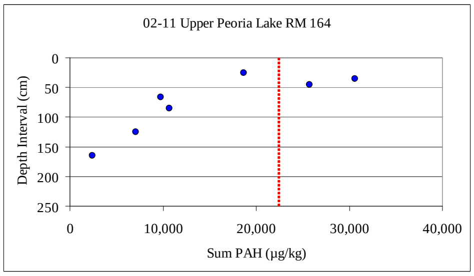


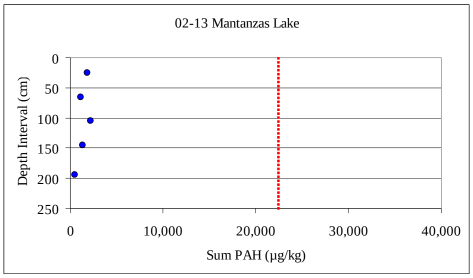


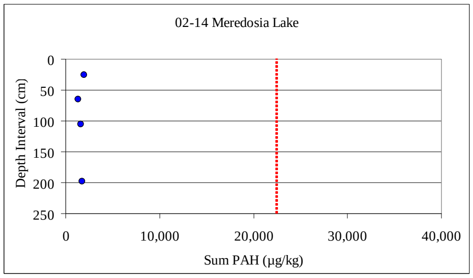












Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID	Depth Interval (cm)	Li	Be	B	Na (%)	Mg (%)	Al (%)	K (%)	Ca (%)	V	Cr	Mn
02-1 Senachwine												
R22717 1-15	165-190	19.9	0.8	17	0.025	2.14	1.54	0.32	10.35	32	22.0	889
R22721 1-11	100-110	29.2	1.2	17	0.024	0.95	2.49	0.40	2.70	46	34.6	410
R22722 1-10	90-100	25.1	1.2	15	0.021	0.95	2.26	0.26	2.27	44	36.8	501
R22723 1-9	80-90	25.6	1.1	16	0.022	0.96	2.27	0.28	2.22	44	44.2	488
R22724 1-8	70-80	28.5	1.3	12	0.025	1.01	2.50	0.33	2.47	42	58.5	541
R22725 1-7	60-70	27.9	1.3	12	0.021	0.94	2.46	0.42	2.70	46	64.6	472
R22726 1-6	50-60	29.5	1.4	17	0.026	0.97	2.80	0.42	2.75	49	74.1	546
R22727 1-5	40-50	28.8	1.3	19	0.030	1.12	3.10	0.45	3.20	46	86.5	844
R22728 1-4	30-40	31.6	1.3	19	0.031	1.14	3.28	0.48	2.37	50	83.3	785
R22729 1-3	20-30	27.1	1.5	11	0.023	1.05	2.44	0.37	2.40	51	60.8	676
R22961 1-G	0-5	28.8	1.2	17	0.040	1.30	2.60	0.47	4.43	44	47.4	856
02-2 Sawmill												
R22735 2-20	190-200	25.5	1.3	7	0.017	0.87	2.08	0.31	1.85	46	30.6	445
R22738 2-17	160-170	32.7	1.3	20	0.028	1.17	3.22	0.50	2.07	48	53.8	621
R22739 2-16	150-160	26.2	1.1	9	0.019	1.03	2.21	0.32	1.94	45	57.6	553
R22740 2-15	140-150	31.4	1.3	19	0.029	1.08	2.93	0.49	2.13	47	86.1	567
R22741 2-14	130-140	24.7	1.1	17	0.020	1.00	2.10	0.28	2.18	39	96.5	474
R22742 2-13	120-130	29.9	1.3	18	0.029	1.07	2.93	0.48	2.58	48	93.8	529
R22743 2-12	110-120	26.5	1.1	20	0.019	0.93	2.48	0.30	1.92	45	74.2	429
R22744 2-11	100-110	31.2	1.5	14	0.024	0.99	2.86	0.46	2.55	52	72.0	517
R22744 2-11 Rep.		32.8	1.4	18	0.022	1.01	2.89	0.50	2.48	56	72.1	488
R22745 2-10	90-100	25.7	1.3	18	0.019	0.91	2.39	0.30	2.19	45	75.6	513
R22746 2-9	80-90	28.9	1.3	17	0.029	0.97	2.87	0.44	2.29	51	84.2	519
R22748 2-7	60-70	32.7	1.5	20	0.025	1.15	2.75	0.54	3.02	51	86.5	546
R22750 2-5	40-50	25.0	1.4	12	0.028	1.06	2.53	0.33	2.82	39	92.7	763
R22752 2-3	20-30	36.1	1.6	23	0.032	1.27	3.29	0.62	2.66	59	75.3	645
R22962 2-G	0-5	29.5	1.3	20	0.042	1.23	2.76	0.49	4.49	40	46.6	821
02-3 Billsbach												
R22759 3-16	150-160	39.7	1.5	20	0.025	0.89	3.46	0.58	0.91	61	46.3	327
R22760 3-15	140-150	18.4	1.1	9	0.015	0.83	1.52	0.16	1.82	36	50.4	490
R22761 3-14	130-140	20.8	1.0	8	0.019	0.95	1.77	0.19	2.32	38	78.2	550
R22762 3-13	120-130	20.3	1.0	6	0.022	0.90	2.02	0.24	2.71	32	70.5	510
R22762 3-13 Rep.		21.2	1.1	7	0.022	0.94	2.10	0.26	2.93	35	74.0	551
R22763 3-12	110-120	20.3	1.1	10	0.018	0.90	1.96	0.21	2.79	39	62.1	518
R22763 3-12 Rep.		20.3	1.0	9	0.018	0.89	1.93	0.21	2.75	38	62.4	498
R22764 3-11	100-110	25.2	1.3	12	0.027	0.99	2.53	0.34	2.86	42	72.7	474
R2276 5 3-10	90-100	34.8	1.5	22	0.028	1.14	3.14	0.60	2.70	57	80.6	528
R22766 3-9	80-90	19.0	1.0	11	0.018	1.06	1.67	0.18	2.72	35	96.3	776
R22767 3-8	70-80	24.6	1.2	15	0.031	1.24	2.47	0.35	2.71	39	117.8	922
R22768 3-7	60-70	30.3	1.4	21	0.028	1.26	2.87	0.49	2.58	50	88.6	706
R22770 3-5	40-50	22.1	1.0	15	0.033	1.20	2.26	0.35	2.85	37	57.2	565
R22772 3-3	20-30	21.0	1.0	13	0.025	1.37	1.90	0.31	3.33	36	46.9	598
R22963 3-G	0-5	19.0	0.7	15	0.038	1.72	1.54	0.30	4.56	26	39.3	657
02-4 Weiss												
R22777 4-16	180-205	17.2	0.5	6	0.013	2.24	1.01	0.11	6.88	24	18.2	802
R22781 4-12	110-120	19.6	0.9	7	0.014	0.52	1.71	0.24	0.42	37	25.1	190
R22784 4-9	80-90	21.6	1.1	13	0.025	0.61	2.18	0.28	0.47	39	30.6	232
R22786 4-7	60-70	19.2	1.0	7	0.013	0.66	1.62	0.19	1.14	37	25.1	381
R22787 4-6	50-60	16.3	0.8	10	0.012	0.71	1.43	0.14	1.50	32	34.2	393
R22788 4-5	40-50	29.2	1.3	20	0.027	1.06	3.05	0.47	2.61	51	80.3	512
R22789 4-4	30-40	29.4	1.3	22	0.031	1.16	3.11	0.51	2.75	53	86.6	634
R22790 4-3	20-30	23.8	1.3	7	0.022	1.07	1.92	0.24	2.70	40	87.7	886
R22964 4-G	0-5	25.6	1.1	17	0.035	1.43	2.38	0.43	4.13	40	50.9	749

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID		Depth Interval (cm)	Li	Be	B	Na (%)	Mg (%)	Al (%)	K (%)	Ca (%)	V	Cr	Mn
02-5	**Goose**												
R22794	5-14	145-170	17.8	1.1	3	0.013	0.47	1.60	0.15	0.62	40	25.8	1,211
R22797	5-11	100-110	35.1	1.5	18	0.031	0.96	3.40	0.51	1.36	59	48.5	502
R22798	5-10	90-100	29.3	1.3	12	0.022	1.01	2.66	0.38	2.49	56	62.9	537
R22799	5-9	80-90	33.9	1.3	20	0.031	1.09	3.19	0.50	2.32	46	87.8	524
R22800	5-8	70-80	21.1	1.1	10	0.016	0.91	1.87	0.21	2.62	42	78.6	531
R22801	5-7	60-70	31.4	1.4	16	0.025	0.97	2.96	0.45	2.35	59	68.5	521
R22802	5-6	50-60	21.3	1.1	12	0.018	0.88	2.06	0.23	2.70	40	59.2	487
R22803	5-5	40-50	29.8	1.4	18	0.032	1.08	3.16	0.43	2.82	48	78.4	700
R22805	5-3	20-30	31.7	1.5	18	0.029	1.16	3.38	0.49	2.05	65	79.4	675
R22965	5-G	0-5	26.6	1.2	12	0.036	1.31	2.49	0.38	4.20	40	48.4	800
02-6	**Wightman**												
R22811	6-14	130-140	33.3	1.4	19	0.027	1.01	2.98	0.52	1.60	55	45.4	452
R22811	6-14 Rep.		35.2	1.3	20	0.027	1.05	3.13	0.52	1.58	58	47.4	457
R22812	6-13	120-130	22.2	0.9	14	0.019	1.06	1.88	0.24	2.39	39	85.1	481
R22813	6-12	110-120	25.2	1.1	11	0.029	1.06	2.14	0.29	2.51	41	122.9	529
R22814	6-11	100-110	23.9	1.0	9	0.027	1.12	2.10	0.25	2.55	33	119.0	543
R22815	6-10	90-100	29.6	1.4	19	0.023	1.05	2.82	0.48	1.84	54	85.8	462
R22816	6-9	80-90	23.8	1.0	11	0.023	1.05	2.34	0.31	2.12	36	80.0	547
R22818	6-7	60-70	27.0	1.2	16	0.022	0.99	2.37	0.42	1.87	50	76.4	478
R22820	6-5	40-50	25.6	1.3	13	0.027	1.11	2.43	0.34	2.26	38	85.9	694
R22822	6-3	20-30	26.2	1.2	14	0.025	1.03	2.43	0.36	2.20	49	82.6	627
R22966	6-G	0-5	19.6	0.8	11	0.032	1.44	1.62	0.28	3.88	24	38.5	659
02-7	**Meadow**												
R22827	7-15	165-190	21.1	0.9	7	0.016	0.90	1.62	0.21	1.29	43	27.2	292
R22830	7-12	110-120	25.5	1.1	12	0.021	0.94	2.35	0.31	1.43	39	39.0	548
R22831	7-11	100-110	21.1	0.9	8	0.017	1.05	1.81	0.25	2.48	40	38.7	551
R22832	7-10	90-100	24.9	1.0	12	0.024	1.27	2.11	0.29	3.28	36	78.1	592
R22833	7-9	80-90	22.6	1.0	14	0.018	1.07	1.85	0.23	3.58	35	102.3	514
R22834	7-8	70-80	23.2	1.0	13	0.025	1.19	2.21	0.30	3.16	34	100.3	515
R22835	7-7	60-70	22.8	0.9	16	0.021	0.93	2.03	0.26	3.57	37	61.9	459
R22836	7-6	50-60	24.7	1.5	8	0.027	0.99	2.25	0.34	3.34	50	68.4	519
R22837	7-5	40-50	25.2	1.3	14	0.027	1.15	2.32	0.35	2.94	36	95.3	806
R22839	7-3	20-30	24.4	1.2	13	0.025	1.19	2.24	0.36	2.82	45	59.0	592
R22967	7-G	0-5	25.9	1.1	16	0.037	1.50	2.45	0.41	4.41	36	48.1	753
02-8	**Babb Slough**												
R22842	8-13	165-188	5.6	0.2	4	0.010	1.55	0.33	0.03	3.96	11	7.0	312
R22846	8-9	80-90	14.5	0.6	8	0.019	1.59	1.10	0.18	3.80	26	19.3	346
R22848	8-7	60-70	16.1	0.8	8	0.018	1.05	1.48	0.16	1.76	29	22.2	631
R22850	8-5	40-50	19.6	0.9	11	0.021	0.79	1.81	0.21	1.03	32	27.8	262
R22852	8-3	20-30	27.8	1.3	19	0.030	1.05	2.52	0.43	2.10	46	88.5	832
R22853	8-2	10-20	14.9	1.0	7	0.021	0.99	1.41	0.15	2.61	29	78.4	741
R22968	8-G	0-5	26.9	1.1	18	0.041	1.39	2.72	0.43	3.67	38	51.1	769
02-9	**Upper Peoria RM 178**												
R22857	9-11	165-185	22.4	1.0	13	0.022	0.76	1.90	0.29	0.78	35	25.7	126
R22862	9-6	50-60	4.5	0.2	1	0.018	0.55	0.39	0.08	0.96	12	7.5	123
R22863	9-5	40-50	6.2	0.3	5	0.021	0.58	0.63	0.08	1.12	10	10.3	189
R22864	9-4	30-40	7.1	0.3	4	0.016	0.90	0.61	0.07	1.96	11	15.5	334
R22865	9-3	20-30	16.9	0.7	9	0.025	1.09	1.46	0.26	2.62	30	33.7	526
R22969	9-G	0-5	23.0	1.1	15	0.037	1.37	2.29	0.40	3.79	33	42.3	767

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID		Depth Interval (cm)	Li	Be	B	Na (%)	Mg (%)	Al (%)	K (%)	Ca (%)	V	Cr	Mn
02-10	**Upper Peoria RM 171**												
R22870	10-14	162-187	13.2	0.6	7	0.019	1.91	1.10	0.16	4.96	18	15.2	324
R22870	10-14 Rep.		12.5	0.7	6	0.020	2.01	0.98	0.15	4.79	21	14.7	293
R22874	10-10	90-100	22.0	1.2	9	0.021	0.62	1.83	0.23	0.87	39	27.7	334
R22876	10-8	70-80	17.5	1.0	8	0.018	0.87	1.48	0.16	2.25	35	47.6	562
R22877	10-7	60-70	24.1	1.1	8	0.021	1.00	2.08	0.27	2.78	45	62.4	642
R22878	10-6	50-60	19.7	1.0	10	0.019	1.04	1.78	0.19	2.15	36	62.1	596
R22879	10-5	40-50	20.5	1.0	9	0.023	1.17	1.83	0.24	2.47	29	81.7	762
R22880	10-4	30-40	18.9	1.0	11	0.022	1.32	1.70	0.22	2.90	26	82.1	793
R22880	10-4 Rep.		20.4	1.1	12	0.026	1.36	1.95	0.25	2.88	31	85.4	866
R22881	10-3	20-30	19.5	1.0	8	0.022	1.30	1.79	0.24	2.97	33	82.0	854
R22970	10-G	0-5	17.0	0.8	12	0.034	1.70	1.62	0.28	4.10	20	35.5	676
02-11	**Lower Peoria RM 164**												
R22889	11-17	160-170	20.1	0.8	10	0.022	0.94	1.44	0.18	5.07	34	27.6	317
R22893	11-13	120-130	28.3	1.3	13	0.021	0.74	2.01	0.30	1.42	47	32.3	254
R22897	11-9	80-90	28.6	1.3	18	0.030	1.09	2.19	0.39	2.61	48	38.0	451
R22898	11-8	70-80	19.2	0.9	11	0.017	0.91	1.47	0.16	2.25	36	36.6	436
R22899	11-7	60-70	31.0	1.2	19	0.032	1.14	2.79	0.44	3.58	48	61.7	594
R22900	11-6	50-60	22.0	1.0	10	0.020	1.15	1.74	0.19	2.74	37	71.2	726
R22900	11-6 Rep.		21.5	1.0	10	0.021	1.13	1.83	0.20	2.86	35	71.4	750
R22901	11-5	40-50	30.2	1.3	13	0.026	1.40	2.29	0.32	2.99	36	101.9	918
R22902	11-4	30-40	26.8	1.1	12	0.028	1.25	2.30	0.29	2.76	34	89.8	774
R22903	11-3	20-30	31.2	1.4	21	0.036	1.32	2.75	0.49	2.81	54	70.9	675
R22971	11-G	0-5	27.6	1.1	17	0.038	1.49	2.55	0.43	3.72	34	50.5	860
02-12	**Quiver**												
R22916	12-7	60-70	17.0	1.1	9	0.023	0.60	1.85	0.28	2.82	31	26.3	778
R22918	12-5	40-50	17.8	0.9	8	0.019	1.02	1.72	0.21	3.12	33	30.2	676
R22919	12-4	30-40	15.7	0.9	8	0.018	0.96	1.76	0.20	2.83	30	27.1	680
R22920	12-3	20-30	17.1	1.1	10	0.032	0.93	2.00	0.25	2.54	38	30.1	662
R22921	12-2	10-20	14.8	0.9	8	0.047	0.93	1.82	0.19	2.74	29	30.4	756
R22972	12-G	0-5	19.9	1.1	9	0.031	1.04	2.33	0.31	4.09	32	31.7	1,114
02-13	**Mantanzas**												
R22925	13-18	185-205	25.0	1.2	9	0.024	0.57	2.13	0.31	0.46	43	33.0	279
R22928	13-15	140-150	21.4	1.0	6	0.019	0.54	2.20	0.26	1.15	44	31.9	596
R22930	13-13	130-140	21.1	1.1	8	0.018	0.65	2.32	0.26	0.96	40	31.4	562
R22932	13-11	100-110	22.0	1.1	5	0.021	0.61	2.37	0.27	1.33	49	34.4	637
R22934	13-9	80-90	23.4	1.2	9	0.019	0.70	2.52	0.28	1.25	43	37.8	664
R22936	13-7	60-70	20.6	1.3	4	0.018	0.70	2.36	0.24	1.65	56	35.1	743
R22936	13-7 Rep.		23.3	1.2	7	0.018	0.69	2.61	0.27	1.56	59	37.1	773
R22938	13-5	40-50	24.1	1.2	11	0.024	0.85	2.75	0.31	2.92	46	44.3	967
R22940	13-3	20-30	23.6	1.3	9	0.024	0.77	2.57	0.32	2.19	52	40.6	803
R22973	13-G	0-5	23.6	1.2	12	0.030	0.95	2.45	0.36	4.63	38	35.8	1,045
02-14	**Meredosia**												
R22945	14-16	185-205	15.2	0.8	5	0.023	0.61	1.54	0.20	1.48	34	23.5	195
R22950	14-11	100-110	23.2	1.1	9	0.028	0.74	2.75	0.34	3.15	53	36.8	592
R22952	14-9	80-90	20.7	1.3	6	0.020	0.69	2.79	0.28	1.60	49	36.5	811
R22954	14-7	60-70	30.5	1.7	12	0.029	0.78	3.92	0.46	1.86	72	48.5	792
R22956	14-5	40-50	21.1	1.4	7	0.023	0.76	2.66	0.28	3.36	47	37.5	1,020
R22958	14-3	20-30	28.4	1.3	12	0.030	0.82	3.83	0.48	2.37	68	49.2	793
R22974	14-G	0-5	26.0	1.5	10	0.038	0.86	3.25	0.40	4.71	53	42.0	1,300

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID	Depth Interval (cm)	Li	Be	B	Na (%)	Mg (%)	Al (%)	K (%)	Ca (%)	V	Cr	Mn
Quality-assurance - Quality Control Samples												
R22982 NIST 8704 Buffalo River Sediment		28.2	0.7	5	0.024	0.85	1.35	0.16	2.34	19	71.7	513
R22988		27.6	0.7	4	0.016	0.86	1.21	0.14	2.17	22	71.0	499
R22982 Set 2		27.5	0.7	7	0.019	0.84	1.23	0.12	2.23	18	76.1	495
R22982 Set 3		24.5	0.6	7	0.013	0.81	1.05	0.08	2.24	22	71.4	478
Certified Total Concentrations 8704					0.553	1.20	6.10	2.00	2.64	94.6	121.9	544
Certified Total Concentrations 2704		47.5			0.547	1.20	6.11	2.00	2.60	95	135	555
R22983 NIST 2709 San Joaquin Soil		33.5	0.9	26	0.057	1.13	2.32	0.36	1.39	70	68.4	471
R22983 Set 2		41.1	0.9	37	0.070	1.38	3.08	0.41	1.51	73	79.7	528
R22983 Set 3		29.1	0.7	36	0.052	1.06	1.94	0.27	1.25	60	59.5	416
Certified Total Concentrations 2709					1.160	1.51	7.50	2.03	1.89	112	130	538
Noncertified Leachable Concentrations 2709					0.068	1.4	2.6	0.32	1.5	62	79	470
R22984 Peoria Sediment Sec. Ref		21.9	1.2	8	0.019	1.04	2.05	0.27	2.04	40	56.8	557
Split Tested 8/2002 (Cahill 2002)		26.8	1.3	13	0.028	1.17	2.43	0.35	2.02	39	63.6	646
R22985 NIES-CRM-02 Pond Sediment		15.2	0.9	4	0.034	0.47	7.09	0.11	0.46	189	40.4	625
R22985 Set 2		15.4	0.8	8	0.042	0.50	7.02	0.10	0.44	185	41.1	639
Certified Total Concentrations					0.570		10.6	0.68	0.81	(250)	75	(770)
R22986 NIST 2711- Montana Soil		15.3	1.1	6	0.026	0.76	1.95	0.47	2.10	52	22.9	555
R22986 Set 2		17.8	1.1	11	0.033	0.80	2.14	0.50	2.16	50	24.3	540
Certified Total Concentrations 2711					1.14	1.05	6.53	2.45	2.88	81.6	(47)	638
Noncertified Leachable Concentrations 2711					0.026	0.81	1.8	0.38	2.10	42	20	490
R22987 Grand Calumet Sediment		15.2	0.6	14	0.073	1.97	0.96	0.25	4.29	21	24.2	393
Mean of 5 replicates (Cahill 1999)		16.7	1.1	55	0.670	2.03	4.16	1.97	4.21	35	53.0	387
Noncertified total concentrations shown in parentheses												
Contract Laboratory Control Material												
USGS GXR-1 Set 1 Jasperoid : Utah												
USGS GXR-1 Set 2		4.9	0.9	11	0.041	0.14	0.33	0.03	0.76	71	6.4	859
USGS GXR-1 Set 3		4.4	0.8	15	0.038	0.13	0.32	0.03	0.77	73	7.9	853
Certified TotalConcentrations GXR-1		8.2	1.22	15	0.052	0.217	3.15	0.05	0.96	80	12	852
USGS GXR-2 Soil (B zone) : Utah		43.9	0.9	14	0.112	0.45	3.20	0.65	0.67	42	22.7	1,010
USGS GXR-2 Set 2		47.9	1.0	20	0.132	0.55	3.57	0.70	0.67	39	23.3	1,030
USGS GXR-2 Set 3		42.7	0.9	27	0.126	0.46	3.26	0.57	0.65	38	22.6	939
Certified Total Concentrations GXR-2		54.0	1.7	42	0.556	0.850	16.5	1.37	0.93	52	36	1,007
USGS GXR-4 -Porphyry Copper Mill Heads : Utah		8.7	1.4	<1	0.092	1.51	2.65	1.74	0.83	85	54.6	137
USGS GXR-4 -Set 2		10.3	1.6	4	0.117	1.69	2.98	1.97	0.89	83	60.9	152
USGS GXR-4 -Set 3		9.3	1.4	4	0.115	1.52	2.82	1.64	0.83	81	55.4	138
Certified Total Concentrations GXR-4		11.1	1.9	4.5	0.564	1.658	7.20	4.01	1.01	87	64	155
USGS GXR-6 Soil (B zone): North Carolina		25.9	0.9	1	0.059	0.34	6.66	1.05	0.17	152	72.7	991
USGS GXR -6 Set 2		27.4	1.0	5	0.067	0.45	7.83	1.25	0.16	170	83.1	1,070
USGS GXR -6 Set 3		25.0	1.0	7	0.062	0.39	7.12	1.02	0.15	164	75.3	1,020
Certified Total Concentrations GXR-6		32.0	1.4	9.8	0.104	0.609	17.7	1.87	0.18	186	96	1,007
SO-2 Canadian Soil (Mercury Only)												
SO-2 Set 2												
SO-2 Set 3												
Certified Total Concentrations SO-2												

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID	Depth Interval (cm)	Fe (%)	Co	Ni	Cu	Ni	Cu	Zn	Ga	Ge	As	Se
02-1 Senachwine												
R22717 1-15	165-190	2.24	10.4	28.2	17.5	28.2	17.5	96.5	4.2	<0.1	2.9	0.3
R22721 1-11	100-110	3.14	11.5	35.7	38.1	35.7	38.1	239	7.4	<0.1	8.9	1.8
R22722 1-10	90-100	3.31	12.2	35.8	37.4	35.8	37.4	275	6.7	<0.1	12.9	1.5
R22723 1-9	80-90	3.23	12.1	36.0	43.2	36.0	43.2	301	6.6	<0.1	17.4	2.0
R22724 1-8	70-80	3.72	12.9	42.7	63.5	42.7	63.5	371	8.1	<0.1	23.3	1.7
R22725 1-7	60-70	3.25	11.1	39.9	75.2	39.9	75.2	378	7.0	<0.1	22.2	1.4
R22726 1-6	50-60	3.51	12.6	48.6	58.6	48.6	58.6	341	8.9	<0.1	13.2	1.4
R22727 1-5	40-50	3.79	13.3	66.2	64.1	66.2	64.1	406	8.9	<0.1	11.8	1.3
R22728 1-4	30-40	3.66	13.5	63.7	63.2	63.7	63.2	379	9.5	<0.1	10.1	1.2
R22729 1-3	20-30	3.53	12.0	51.7	65.7	51.7	65.7	294	7.2	<0.1	12.2	1.1
R22961 1-G	0-5	3.23	11.3	35.9	64.1	35.9	64.1	223	7.9	0.1	7.3	0.9
02-2 Sawmill												
R22735 2-20	190-200	3.44	12.6	35.0	32.0	35.0	32.0	163	6.5	<0.1	9.2	0.9
R22738 2-17	160-170	3.92	12.8	39.5	46.9	39.5	46.9	266	9.1	<0.1	13.4	1.2
R22739 2-16	150-160	3.60	11.3	34.8	63.0	34.8	63.0	320	6.2	<0.1	20.9	1.5
R22740 2-15	140-150	3.81	12.0	41.7	91.5	41.7	91.5	438	8.7	<0.1	31.0	1.3
R22741 2-14	130-140	3.38	10.7	41.9	137.3	41.9	137.3	577	6.2	<0.1	45.2	1.8
R22742 2-13	120-130	3.63	11.8	45.1	107.9	45.1	107.9	483	8.9	<0.1	32.5	1.5
R22743 2-12	110-120	3.36	11.5	54.2	172.3	54.2	172.3	370	7.4	<0.1	24.4	1.5
R22744 2-11	100-110	3.58	11.6	42.0	63.0	42.0	63.0	313	8.3	<0.1	14.8	1.6
R22744 2-11 Rep.		3.75	11.4	54.7	88.2	54.7	88.2	307	8.3	<0.1	13.9	1.4
R22745 2-10	90-100	3.31	11.2	38.3	66.0	38.3	66.0	355	6.8	<0.1	15.4	1.4
R22746 2-9	80-90	3.44	12.1	47.2	65.3	47.2	65.3	351	8.5	<0.1	12.3	1.3
R22748 2-7	60-70	3.64	11.9	52.7	69.9	52.7	69.9	402	7.8	<0.1	12.1	1.5
R22750 2-5	40-50	3.48	13.6	68.3	72.9	68.3	72.9	429	7.2	<0.1	12.2	1.3
R22752 2-3	20-30	3.93	13.1	59.6	70.4	59.6	70.4	303	8.7	<0.1	10.6	1.0
R22962 2-G	0-5	3.25	11.4	35.9	45.2	35.9	45.2	200	8.3	<0.1	5.6	0.9
02-3 Billsbach												
R22759 3-16	150-160	4.02	14.1	40.5	39.9	40.5	39.9	202	9.9	<0.1	7.0	1.4
R22760 3-15	140-150	3.01	11.7	35.5	69.7	35.5	69.7	314	4.8	<0.1	23.7	1.6
R22761 3-14	130-140	3.33	11.6	41.4	95.5	41.4	95.5	470	5.6	<0.1	34.9	1.6
R22762 3-13	120-130	3.25	11.2	42.0	74.2	42.0	74.2	378	5.8	<0.1	22.3	1.1
R22762 3-13 Rep.		3.53	11.7	43.2	78.3	43.2	78.3	404	6.6	<0.1	23.8	1.3
R22763 3-12	110-120	3.20	11.6	40.3	54.9	40.3	54.9	353	6.1	<0.1	16.9	1.3
R22763 3-12 Rep.		3.14	11.0	39.3	53.4	39.3	53.4	348	6.1	<0.1	16.4	1.4
R22764 3-11	100-110	3.57	12.5	53.4	56.0	53.4	56.0	359	8.1	<0.1	14.0	1.2
R2276 5 3-10	90-100	3.65	12.9	62.1	59.9	62.1	59.9	384	8.7	<0.1	12.4	1.5
R22766 3-9	80-90	3.23	12.6	72.5	77.0	72.5	77.0	522	5.3	<0.1	15.7	1.4
R22767 3-8	70-80	3.61	14.3	81.8	87.2	81.8	87.2	530	7.7	<0.1	11.5	1.4
R22768 3-7	60-70	3.59	13.0	64.6	79.2	64.6	79.2	413	7.7	<0.1	10.6	1.3
R22770 3-5	40-50	2.84	10.6	46.4	54.9	46.4	54.9	262	6.8	<0.1	8.3	0.9
R22772 3-3	20-30	2.85	10.3	34.2	49.1	34.2	49.1	233	5.5	<0.1	7.3	1.1
R22963 3-G	0-5	2.36	9.3	26.6	40.5	26.6	40.5	182	4.5	<0.1	3.5	1.0
02-4 Weiss												
R22777 4-16	180-205	1.89	10.9	33.3	42.9	33.4	43.0	56.3	3.3	<0.1	3.6	0.6
R22781 4-12	110-120	2.74	10.9	27.0	23.8	27.0	23.8	72.7	5.4	<0.1	5.1	0.2
R22784 4-9	80-90	2.70	12.4	29.4	19.4	29.4	19.4	76.3	5.9	<0.1	0.6	0.5
R22786 4-7	60-70	2.52	10.4	28.1	24.4	28.1	24.4	104	5.2	<0.1	6.5	1.1
R22787 4-6	50-60	2.63	10.6	31.1	36.5	31.1	36.5	230	4.6	<0.1	10.0	1.2
R22788 4-5	40-50	3.47	11.5	45.3	56.3	45.3	56.3	346	8.3	<0.1	12.2	1.2
R22789 4-4	30-40	3.47	13.1	63.8	61.1	63.8	61.1	381	9.2	<0.1	12.1	1.2
R22790 4-3	20-30	3.38	13.5	66.6	76.1	66.6	76.1	458	6.2	<0.1	14.5	1.4
R22964 4-G	0-5	3.10	11.3	35.8	46.4	35.8	46.4	241	6.8	<0.1	5.7	1.1

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID		Depth Interval (cm)	Fe (%)	Co	Ni	Cu	Ni	Cu	Zn	Ga	Ge	As	Se
02-5	**Goose**												
R22794	5-14	145-170	2.65	14.8	28.5	25.1	28.5	25.1	69.4	4.7	<0.1	7.5	0.4
R22797	5-11	100-110	3.92	14.5	42.7	36.6	42.7	36.6	231	10.5	<0.1	10.7	1.5
R22798	5-10	90-100	3.75	12.2	37.0	64.8	37.0	64.8	345	7.8	0.1	23.7	1.7
R22799	5-9	80-90	3.79	12.6	45.6	98.2	45.6	98.2	482	9.6	<0.1	32.1	1.5
R22800	5-8	70-80	3.40	11.8	42.8	92.6	42.8	92.6	477	6.1	<0.1	31.4	1.7
R22801	5-7	60-70	3.72	11.5	41.6	61.4	41.6	61.4	331	8.4	0.1	16.0	1.3
R22802	5-6	50-60	3.15	11.1	98.0	210.7	98.0	210.7	304	6.2	<0.1	13.8	1.4
R22803	5-5	40-50	3.55	13.0	62.0	56.1	62.0	56.1	350	8.6	<0.1	11.7	1.2
R22805	5-3	20-30	3.72	13.3	57.2	65.0	57.2	65.0	368	9.3	<0.1	13.2	1.1
R22965	5-G	0-5	3.35	12.2	37.8	44.7	37.8	44.7	235	7.4	<0.1	6.3	1.0
02-6	**Wightman**												
R22811	6-14	130-140	3.68	12.8	35.7	43.7	35.7	43.7	297	8.3	<0.1	13.8	1.1
R22811	6-14 Rep.		3.65	13.0	37.8	45.0	37.8	45.0	316	9.0	<0.1	14.8	1.4
R22812	6-13	120-130	3.46	11.6	37.5	103.5	37.5	103.5	511	6.2	<0.1	32.1	1.9
R22813	6-12	110-120	3.69	13.0	45.4	154.8	45.4	154.8	626	6.7	<0.1	42.2	1.9
R22814	6-11	100-110	3.66	12.7	48.9	173.2	48.9	173.2	690	7.2	<0.1	44.6	1.5
R22815	6-10	90-100	3.46	11.3	42.2	81.4	42.2	81.4	455	9.3	<0.1	23.1	1.5
R22816	6-9	80-90	3.30	11.8	45.9	67.8	45.9	67.8	414	6.9	<0.1	14.5	1.1
R22818	6-7	60-70	3.25	11.3	38.8	68.0	38.8	68.0	389	7.4	<0.1	14.3	1.0
R22820	6-5	40-50	3.39	13.0	65.6	68.2	65.6	68.2	407	6.3	<0.1	12.1	1.2
R22822	6-3	20-30	3.40	12.4	59.6	70.6	59.6	70.6	368	7.1	<0.1	12.7	1.1
R22966	6-G	0-5	2.55	9.9	28.3	40.0	28.3	40.0	197	5.0	<0.1	3.1	0.7
02-7	**Meadow**												
R22827	7-15	165-190	2.91	11.0	28.3	27.6	28.3	27.6	96.9	5.1	<0.1	7.2	0.7
R22830	7-12	110-120	3.51	13.1	37.1	38.5	37.1	38.5	317	7.5	<0.1	10.5	1.4
R22831	7-11	100-110	3.24	11.2	30.1	45.7	30.1	45.7	308	5.7	<0.1	18.2	1.3
R22832	7-10	90-100	3.44	11.9	35.5	87.7	35.5	87.7	453	6.5	<0.1	27.6	1.3
R22833	7-9	80-90	3.26	10.6	38.9	139.4	38.9	139.4	648	5.7	<0.1	42.5	1.6
R22834	7-8	70-80	3.21	10.9	43.1	137.4	43.1	137.4	627	6.7	<0.1	31.6	1.3
R22835	7-7	60-70	3.04	10.5	41.2	54.7	41.2	54.7	351	5.8	<0.1	13.2	1.6
R22836	7-6	50-60	3.32	11.6	54.1	58.9	54.1	58.9	343	6.4	<0.1	15.1	1.0
R22837	7-5	40-50	3.32	13.1	78.1	76.0	78.1	76.0	440	6.8	<0.1	10.5	0.9
R22839	7-3	20-30	3.21	11.3	49.3	60.3	49.3	60.3	305	6.4	<0.1	10.3	1.0
R22967	7-G	0-5	3.15	11.2	34.8	44.4	34.8	44.4	229	6.6	<0.1	4.2	0.8
02-8	**Babb Slough**												
R22842	8-13	165-188	1.09	5.0	15.1	6.5	15.1	6.5	22.4	1.1	<0.1	2.9	0.4
R22846	8-9	80-90	1.76	7.0	18.6	14.0	18.6	14.0	40.1	3.3	<0.1	2.6	0.3
R22848	8-7	60-70	2.22	10.5	24.4	13.3	24.4	13.3	47.6	4.5	<0.1	1.8	0.3
R22850	8-5	40-50	2.32	10.6	27.5	19.8	27.5	19.8	85.0	5.1	<0.1	2.6	0.9
R22852	8-3	20-30	3.66	14.6	78.0	75.1	78.0	75.1	435	7.5	<0.1	13.7	1.4
R22853	8-2	10-20	2.77	12.5	65.0	65.2	65.0	65.2	399	4.4	<0.1	12.5	1.5
R22968	8-G	0-5	3.14	11.9	38.1	52.3	38.1	52.3	237	7.7	<0.1	3.7	1.0
02-9	**Upper Peoria RM 178**												
R22857	9-11	165-185	2.18	8.9	23.5	22.7	23.5	22.7	62.9	5.8	<0.1	4.3	0.4
R22862	9-6	50-60	0.73	2.5	7.7	9.4	7.7	9.4	18.7	1.4	<0.1	2.4	<0.1
R22863	9-5	40-50	0.98	3.8	15.8	6.4	15.8	6.4	30.7	1.8	<0.1	1.6	0.2
R22864	9-4	30-40	1.20	5.1	18.8	11.7	18.8	11.7	64.0	2.0	<0.1	3.1	0.3
R22865	9-3	20-30	2.12	7.9	31.0	27.6	31.0	27.6	137	4.4	<0.1	5.5	0.6
R22969	9-G	0-5	3.02	11.2	34.2	41.7	34.2	41.7	196	6.3	<0.1	3.7	0.7

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID		Depth Interval (cm)	Fe (%)	Co	Ni	Cu	Ni	Cu	Zn	Ga	Ge	As	Se
02-10	**Upper Peoria RM 171**												
R22870	10-14	162-187	1.65	7.9	18.5	13.6	18.5	13.6	40.1	3.1	<0.1	0.2	<0.1
R22870	10-14 Rep.		1.43	7.4	18.1	18.4	18.1	18.4	40.0	2.5	<0.1	0.4	0.3
R22874	10-10	90-100	2.48	10.1	29.0	34.2	29.0	34.2	131	5.7	<0.1	5.7	1.3
R22876	10-8	70-80	2.82	12.2	42.6	42.6	42.6	42.6	298	4.7	<0.1	16.5	1.4
R22877	10-7	60-70	3.45	12.8	48.1	52.2	48.1	52.2	314	6.5	<0.1	13.7	1.4
R22878	10-6	50-60	2.92	11.9	55.9	46.0	55.9	46.0	304	5.5	<0.1	13.1	1.5
R22879	10-5	40-50	3.12	12.9	67.8	61.1	67.8	61.1	389	5.9	<0.1	11.5	1.0
R22880	10-4	30-40	2.87	12.2	71.1	62.0	71.1	62.0	393	5.3	<0.1	9.4	0.9
R22880	10-4 Rep.		3.10	12.7	74.8	66.4	74.8	66.4	413	6.0	<0.1	10.3	1.0
R22881	10-3	20-30	3.00	12.0	66.7	71.3	66.7	71.3	418	5.0	<0.1	9.7	0.9
R22970	10-G	0-5	2.41	9.1	27.7	36.5	27.7	36.5	178	4.4	<0.1	1.2	0.7
02-11	**Lower Peoria RM 164**												
R22889	11-17	160-170	2.20	10.7	34.1	32.6	34.1	32.6	87.6	3.8	<0.1	4.1	2.7
R22893	11-13	120-130	2.77	12.2	34.5	32.4	34.5	32.4	104	6.4	<0.1	3.7	2.0
R22897	11-9	80-90	3.38	12.3	35.6	30.9	35.6	30.9	140	7.0	<0.1	7.4	1.3
R22898	11-8	70-80	2.95	12.3	38.2	34.2	38.2	34.2	209	4.96	<0.1	20.7	2.0
R22899	11-7	60-70	3.49	13.1	54.9	43.9	54.9	43.9	287	8.2	<0.1	9.3	1.3
R22900	11-6	50-60	3.26	13.3	69.2	51.4	69.2	51.4	345	5.4	<0.1	14.2	1.4
R22900	11-6 Rep.		3.20	13.7	68.4	50.0	68.4	50.0	347	5.5	<0.1	12.6	1.0
R22901	11-5	40-50	3.55	14.6	84.9	68.7	84.9	68.7	421	7.5	<0.1	11.5	1.1
R22902	11-4	30-40	3.16	13.6	74.5	67.1	74.5	67.1	380	7.2	<0.1	10.8	1.2
R22903	11-3	20-30	3.58	13.4	57.1	59.7	57.1	59.7	299	8.3	<0.1	9.9	1.2
R22971	11-G	0-5	3.20	11.8	37.1	49.5	37.1	49.5	234	6.9	<0.1	3.3	1.2
02-12	**Quiver**												
R22916	12-7	60-70	2.77	8.5	22.2	27.7	22.2	27.7	97.9	5.0	<0.1	7.1	1.6
R22918	12-5	40-50	2.72	11.7	32.3	29.2	32.3	29.2	128	4.6	<0.1	11.8	1.4
R22919	12-4	30-40	2.74	10.4	32.9	27.0	32.9	27.0	111	5.2	<0.1	8.5	1.1
R22920	12-3	20-30	2.86	9.4	30.7	27.9	30.7	27.9	112	5.7	<0.1	6.4	1.0
R22921	12-2	10-20	2.94	9.7	34.0	26.6	34.0	26.6	122	5.2	<0.1	8.1	1.0
R22972	12-G	0-5	3.24	10.4	30.4	33.5	30.4	33.5	130	6.2	<0.1	3.9	0.9
02-13	**Mantanzas**												
R22925	13-18	185-205	3.79	13.1	30.1	24.6	30.1	24.6	101	6.3	<0.1	2.5	0.5
R22928	13-15	140-150	3.27	11.4	29.0	27.5	29.0	27.5	103	7.0	<0.1	6.5	0.9
R22930	13-13	130-140	3.11	12.0	33.6	29.5	33.6	29.5	108	6.4	<0.1	5.9	1.0
R22932	13-11	100-110	3.55	11.7	31.8	35.2	31.8	35.2	131	6.7	<0.1	12.7	1.0
R22934	13-9	80-90	3.39	11.9	34.9	37.2	34.9	37.2	139	7.4	<0.1	10.1	1.1
R22936	13-7	60-70	3.48	12.1	34.0	37.0	34.0	37.0	136	7.2	<0.1	14.3	1.1
R22936	13-7 Rep.		3.48	12.1	35.0	35.8	35.0	35.8	133	8.0	<0.1	12.8	0.9
R22938	13-5	40-50	3.19	12.7	45.6	38.2	45.6	38.2	176	7.5	<0.1	9.4	1.0
R22940	13-3	20-30	3.38	12.0	38.0	34.7	38.0	34.7	148	7.9	<0.1	11.3	1.0
R22973	13-G	0-5	3.23	11.6	32.4	34.4	32.4	34.4	141	7.3	<0.1	4.2	0.9
02-14	**Meredosia**												
R22945	14-16	185-205	2.30	8.7	21.2	18.4	21.2	18.4	57.9	4.7	<0.1	5.4	0.3
R22950	14-11	100-110	3.48	10.9	29.6	29.5	29.6	29.5	104	8.3	<0.1	6.4	1.1
R22952	14-9	80-90	3.87	12.5	35.6	30.5	35.6	30.5	128	7.9	0.1	8.7	1.2
R22954	14-7	60-70	4.21	12.7	39.1	35.6	39.1	35.6	144	11.0	<0.1	8.3	1.4
R22956	14-5	40-50	3.57	12.4	41.6	31.9	41.6	31.9	140	7.1	<0.1	9.1	1.2
R22958	14-3	20-30	4.06	12.2	38.4	35.5	38.4	35.5	147	10.1	<0.1	8.5	1.0
R22974	14-G	0-5	4.03	12.3	35.3	37.4	35.3	37.4	166	9.3	<0.1	6.2	1.2

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID	Depth Interval (cm)	Fe (%)	Co	Ni	Cu	Ni	Cu	Zn	Ga	Ge	As	Se
Quality-assurance - Quality Control Samples												
R22982 NIST 8704 Buffalo River Sediment		3.39	12.3	39.3	86.9	39.3	86.9	378	4.44	<0.1	11.8	1.2
R22988		3.28	12.2	38.7	85.3	38.7	85.3	379	4.20	<0.1	13.7	1.1
R22982 Set 2		3.18	12.2	41.0	86.6	41.0	86.6	366	3.99	<0.1	14.3	1.1
R22982 Set 3		3.14	11.9	37.8	83.5	37.8	83.5	367	3.49	<0.1	15.3	1.0
Certified Total Concentrations 8704		3.97	13.57	42.9		42.9		408				
Certified Total Concentrations 2704		4.11	14.0	44.1	98.6	44.1	98.6	438	(15)		23.4	1.12
R22983 NIST 2709 San Joaquin Soil		2.96	12.2	73.7	29.7	73.7	29.7	94	7.66	<0.1	17.0	1.7
R22983 Set 2		3.22	13.2	87.5	32.4	87.5	32.4	97	8.17	<0.1	16.4	1.5
R22983 Set 3		2.58	10.9	68.4	27.2	68.4	27.2	79.9	5.51	<0.1	15.6	1.4
Certified Total Concentrations 2709		3.50	13.4	88	34.6	88	34.6	106	(14)		17.7	1.57
Noncertified Leachable Concentrations 2709		3.0	12	78	32	78	32	100			<20	
R22984 Peoria Sediment Sec. Ref		2.90	11.7	49.6	49.0	49.6	49.0	287	6.10	<0.1	9.4	1.1
Split Tested 8/2002 (Cahill 2002)		3.09	12.3	52.7	46.3	52.7	46.3	292	6.56	<0.1	6.6	0.8
R22985 NIES-CRM-02 Pond Sediment		5.62	23.0	31.8	181	31.8	181	296	16.2	0.1	9.8	1.1
R22985 Set 2		5.46	22.2	32.1	177	32.1	177	282	15.7	0.1	8.1	1.0
Certified Total Concentrations		6.53	27	40	210	40	210	343			12.0	
R22986 NIST 2711- Montana Soil		2.57	8.8	17.6	111	17.6	111	325	6.78	<0.1	95.3	1.8
R22986 Set 2		2.54	9.0	19.0	109	19.0	109	320	6.78	0.1	103.2	1.6
Certified Total Concentrations 2711		2.89	(10)	20.6	114	20.6	114	350	(15)		105	1.52
Noncertified Leachable Concentrations 2711		2.2	8.2	16.0	100	16.0	100	310			90.0	
R22987 Grand Calumet Sediment		1.82	7.7	19.8	54.7	19.8	54.7	267	3.18	<0.1	7.2	0.7
Mean of 5 replicates (Cahill 1999)		2.10	12.0	35.0	42.1	35.0	42.0	272	14.00		8.3	1.2
Noncertified total concentrations shown in parentheses												
Contract Laboratory Control Material												
USGS GXR-1 Set 1 Jasperoid : Utah												
USGS GXR-1 Set 2		24.1	7.7	39.5	1070	39.5	1070	754	3.53	1.1	440	15.2
USGS GXR-1 Set 3		23.7	7.6	39.7	1,110	39.7	1,110	781	5.27	1.0	437	14.1
Certified TotalConcentrations GXR-1		23.6	8.2	41	1,110	41	1,110	760	13.8		427	16.6
USGS GXR-2 Soil (B zone) : Utah		1.82	8.3	16.8	72.0	16.8	72.0	521	12.2	<0.1	15.9	0.4
USGS GXR-2 Set 2		1.78	8.6	20.0	75.2	20.0	75.2	518	10.3	<0.1	11.1	0.3
USGS GXR-2 Set 3		1.69	8.0	16.4	72.0	16.4	72.0	519	8.39	<0.1	11.4	0.7
Certified Total Concentrations GXR-2		1.86	8.6	21	76	21	76	530	37		25	0.61
USGS GXR-4 -Porphyry Copper Mill Heads : Utah		3.07	14.3	38.0	6,410	38.0	6,410	71.1	10.9	0.2	101	5.2
USGS GXR-4 -Set 2		3.03	14.9	43.7	6320	43.7	6320	70.7	11.7	0.4	112	6.5
USGS GXR-4 -Set 3		3.01	14.2	39.1	5,990	39.1	5,990	69.7	11.6	0.4	111	6.0
Certified Total Concentrations GXR-4		3.09	14.6	42	6,520	42	6,520	73	20		98	5.6
USGS GXR-6 Soil (B zone): North Carolina		5.24	12.9	22.1	61.9	22.1	61.9	114	16.0	<0.1	220	0.2
USGS GXR -6 Set 2		5.55	13.6	24.2	67.5	24.2	67.5	119	18.5	<0.1	224	0.3
USGS GXR -6 Set 3		5.39	12.8	23.5	65.6	23.5	65.6	116	16.6	<0.1	253	0.5
Certified Total Concentrations GXR-6		5.58	13.8	27	66	27	66	118	35		330	0.94
SO-2 Canadian Soil (Mercury Only)												
SO-2 Set 2												
SO-2 Set 3												
Certified Total Concentrations SO-2												

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID	Depth Interval (cm)	Rb	Sr	Y	Zr	Nb	Mo	Ag	Cd	In	Sn	Sb
02-1 Senachwine												
R22717 1-15	165-190	21.9	90.7	9.6	7.0	0.2	0.93	<0.05	0.6	0.02	1.36	0.14
R22721 1-11	100-110	38.4	53.3	13.9	6.4	0.8	2.33	0.08	1.3	0.04	1.20	0.27
R22722 1-10	90-100	27.7	39.2	14.5	5.3	0.7	1.77	0.35	1.3	0.04	1.91	0.62
R22723 1-9	80-90	29.8	37.7	14.0	4.6	0.7	1.53	0.54	1.7	0.04	2.52	0.71
R22724 1-8	70-80	32.7	46.9	13.8	5.6	0.8	1.67	1.02	2.5	0.05	3.76	0.63
R22725 1-7	60-70	36.7	49.9	13.5	5.8	0.8	1.46	1.12	3.5	0.05	3.51	0.46
R22726 1-6	50-60	39.6	58.3	15.8	5.1	0.7	1.88	1.07	6.1	0.05	2.36	0.57
R22727 1-5	40-50	39.9	61.1	16.0	4.2	0.7	1.54	1.36	7.9	0.06	2.60	0.45
R22728 1-4	30-40	46.0	56.8	15.5	4.5	0.8	1.86	1.36	6.4	0.05	2.49	0.46
R22729 1-3	20-30	34.6	56.6	15.0	5.1	0.9	1.67	0.84	4.0	0.05	2.33	0.32
R22961 1-G	0-5	39.2	72.1	12.6	3.1	0.7	1.04	0.49	2.2	0.04	1.56	0.18
02-2 Sawmill												
R22735 2-20	190-200	25.9	35.3	13.6	5.4	0.7	1.83	<0.05	0.8	0.03	0.54	0.24
R22738 2-17	160-170	43.1	42.1	13.9	5.0	0.7	1.91	0.74	1.5	0.05	4.80	0.49
R22739 2-16	150-160	30.8	40.3	13.3	4.7	0.8	1.49	1.06	1.8	0.05	5.82	0.50
R22740 2-15	140-150	40.7	42.5	12.7	4.3	0.7	1.78	1.83	2.4	0.06	5.36	0.66
R22741 2-14	130-140	27.5	37.3	12.3	3.8	0.6	1.89	2.63	4.6	0.05	6.38	1.38
R22742 2-13	120-130	41.7	51.8	13.8	5.1	0.8	1.93	1.99	5.8	0.06	5.34	0.68
R22743 2-12	110-120	32.6	40.2	14.3	4.7	0.7	1.83	1.27	4.7	0.04	3.26	0.90
R22744 2-11	100-110	41.4	55.1	15.2	5.9	0.8	1.73	0.94	4.6	0.04	2.85	0.50
R22744 2-11 Rep.		46.3	53.9	15.1	5.5	0.8	1.67	0.89	4.5	0.05	2.82	0.49
R22745 2-10	90-100	31.1	44.5	14.8	4.4	0.7	1.95	1.35	7.4	0.05	2.67	0.93
R22746 2-9	80-90	37.7	48.9	16.0	5.3	0.8	1.95	1.42	8.0	0.05	2.57	0.62
R22748 2-7	60-70	45.5	61.4	20.3	4.8	0.8	1.67	1.40	8.0	0.06	3.01	0.50
R22750 2-5	40-50	29.3	56.4	16.7	4.8	0.7	1.83	1.58	8.7	0.06	3.16	0.51
R22752 2-3	20-30	51.6	59.4	16.6	5.5	0.8	1.91	1.00	4.5	0.05	2.66	0.33
R22962 2-G	0-5	38.2	74.9	12.0	3.5	0.6	1.02	0.50	2.1	0.04	1.50	0.19
02-3 Billsbach												
R22759 3-16	150-160	52.9	34.9	15.7	6.3	0.9	1.49	0.25	1.0	0.05	1.02	0.26
R22760 3-15	140-150	18.6	32.9	13.5	3.5	0.4	1.46	1.06	1.7	0.04	4.14	0.80
R22761 3-14	130-140	20.3	36.6	13.9	3.4	0.5	1.87	1.99	2.9	0.05	5.35	1.30
R22762 3-13	120-130	20.3	44.3	12.4	3.8	0.6	1.59	1.42	4.2	0.04	3.58	0.60
R22762 3-13 Rep.		21.9	47.9	13.4	4.0	0.6	1.56	1.42	4.5	0.04	3.96	0.58
R22763 3-12	110-120	21.5	49.0	14.4	3.6	0.5	1.72	1.08	5.4	0.04	2.26	1.02
R22763 3-12 Rep.		23.1	49.3	14.1	3.5	0.5	1.77	0.98	5.3	0.04	2.21	1.01
R22764 3-11	100-110	30.1	59.6	15.7	4.5	0.7	1.99	1.20	6.8	0.05	2.49	0.65
R2276 5 3-10	90-100	51.6	63.0	20.0	5.3	0.8	1.82	1.16	6.8	0.05	2.58	0.51
R22766 3-9	80-90	20.9	53.8	17.3	2.8	0.5	1.85	1.90	10.9	0.06	3.55	1.06
R22767 3-8	70-80	32.4	60.1	16.0	3.2	0.7	2.03	2.21	11.5	0.06	4.24	0.67
R22768 3-7	60-70	42.3	63.2	15.0	4.7	0.8	1.88	1.61	7.2	0.05	3.79	0.47
R22770 3-5	40-50	29.8	51.8	12.4	3.0	0.6	1.63	0.92	3.9	0.04	2.39	0.39
R22772 3-3	20-30	28.4	61.3	11.9	3.5	0.7	1.56	0.81	2.9	0.03	2.12	0.34
R22963 3-G	0-5	22.0	60.7	9.6	1.4	0.5	1.20	0.63	1.9	0.03	1.99	0.25
02-4 Weiss												
R22777 4-16	180-205	10.4	54.2	10.0	4.3	0.2	0.61	<0.05	0.4	0.02	0.10	0.25
R22781 4-12	110-120	21.0	19.1	11.7	5.1	0.4	0.55	<0.05	0.4	0.03	0.24	0.12
R22784 4-9	80-90	25.6	21.5	11.7	2.2	0.4	0.61	<0.05	0.4	0.03	0.28	0.10
R22786 4-7	60-70	17.9	24.3	11.8	3.8	0.5	0.72	<0.05	0.9	0.03	0.34	0.13
R22787 4-6	50-60	16.8	28.5	12.8	3.9	0.5	1.15	0.44	2.6	0.03	1.28	0.65
R22788 4-5	40-50	41.6	51.8	14.8	4.7	0.7	1.76	1.17	6.7	0.05	2.40	0.48
R22789 4-4	30-40	43.0	52.8	17.4	4.6	0.7	1.72	1.26	7.3	0.05	2.56	0.51
R22790 4-3	20-30	24.5	54.8	16.0	4.7	0.7	1.44	1.63	8.7	0.05	3.20	0.46
R22964 4-G	0-5	33.4	68.1	12.0	3.5	0.7	1.11	0.65	2.9	0.04	1.76	0.21

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID		Depth Interval (cm)	Rb	Sr	Y	Zr	Nb	Mo	Ag	Cd	In	Sn	Sb
02-5	**Goose**												
R22794	5-14	145-170	15.7	20.1	10.3	3.7	0.3	0.68	<0.05	0.4	0.02	0.22	0.09
R22797	5-11	100-110	42.9	37.0	16.0	6.0	0.9	1.75	0.30	1.2	0.05	1.40	0.31
R22798	5-10	90-100	36.3	49.4	14.8	5.2	0.9	1.42	1.03	1.9	0.05	4.65	0.58
R22799	5-9	80-90	41.2	45.1	13.9	4.6	0.8	1.61	2.02	2.9	0.05	5.39	0.62
R22800	5-8	70-80	24.3	45.3	13.8	3.6	0.6	1.76	1.79	4.6	0.04	4.37	1.26
R22801	5-7	60-70	43.8	54.1	15.4	5.9	0.9	1.54	0.92	4.7	0.05	2.56	0.56
R22802	5-6	50-60	25.4	47.8	15.0	3.5	0.6	1.82	0.88	5.0	0.04	1.63	0.92
R22803	5-5	40-50	37.9	57.5	17.3	4.3	0.7	1.63	1.07	6.4	0.06	2.21	0.45
R22805	5-3	20-30	46.0	55.0	16.5	4.7	0.9	1.61	1.20	5.4	0.05	2.71	0.44
R22965	5-G	0-5	30.3	72.3	12.1	3.4	0.7	1.06	0.58	2.5	0.04	1.64	0.22
02-6	**Wightman**												
R22811	6-14	130-140	45.6	37.6	14.3	5.2	0.8	1.49	0.48	1.5	0.05	3.90	0.36
R22811	6-14 Rep.		46.2	39.4	14.0	5.2	0.8	1.53	0.49	1.5	0.05	4.88	0.37
R22812	6-13	120-130	25.2	38.7	12.7	3.2	0.6	1.84	2.27	2.8	0.05	8.96	1.35
R22813	6-12	110-120	24.9	42.7	12.6	3.5	0.8	1.93	3.34	3.5	0.05	9.64	1.06
R22814	6-11	100-110	22.3	45.6	12.7	3.4	0.7	2.20	3.37	6.4	0.06	8.60	1.12
R22815	6-10	90-100	42.7	40.6	13.6	5.0	0.9	1.55	1.45	5.7	0.05	4.41	0.56
R22816	6-9	80-90	26.0	39.2	13.3	4.0	0.6	1.80	1.32	7.0	0.04	3.30	0.71
R22818	6-7	60-70	39.4	45.9	14.7	4.8	0.9	1.74	1.28	7.8	0.05	3.03	0.54
R22820	6-5	40-50	27.6	47.8	17.8	3.7	0.6	1.98	1.40	7.8	0.05	2.84	0.67
R22822	6-3	20-30	34.9	54.8	14.4	4.7	0.8	1.69	1.45	5.8	0.05	3.20	0.44
R22966	6-G	0-5	22.7	63.5	9.9	2.0	0.5	1.04	0.57	2.3	0.03	1.87	0.23
02-7	**Meadow**												
R22827	7-15	165-190	18.9	25.6	11.9	3.2	0.4	0.69	<0.05	0.7	0.03	0.30	0.12
R22830	7-12	110-120	26.5	31.2	14.1	5.2	0.7	1.68	0.41	1.8	0.04	2.14	0.41
R22831	7-11	100-110	22.9	36.2	11.9	4.4	0.6	1.35	0.64	1.8	0.03	5.01	0.42
R22832	7-10	90-100	24.8	48.0	12.6	3.0	0.7	1.59	1.85	2.6	0.07	9.70	0.84
R22833	7-9	80-90	25.1	54.0	12.7	3.3	0.7	1.66	3.01	3.7	0.05	9.10	1.42
R22834	7-8	70-80	25.7	51.2	12.1	3.5	0.7	1.55	2.75	5.8	0.05	8.03	0.91
R22835	7-7	60-70	28.5	60.9	13.6	4.7	0.6	1.48	1.04	5.2	0.04	2.45	0.74
R22836	7-6	50-60	32.0	63.0	14.9	5.3	0.8	1.53	0.83	5.5	0.04	2.28	0.56
R22837	7-5	40-50	27.8	58.6	14.9	2.9	0.6	1.38	1.60	8.6	0.05	3.15	0.50
R22839	7-3	20-30	31.8	57.6	12.5	4.1	0.7	1.49	0.87	4.2	0.04	2.51	0.40
R22967	7-G	0-5	31.7	74.7	11.8	2.7	0.6	0.95	0.63	2.4	0.03	1.70	0.20
02-8	**Babb Slough**												
R22842	8-13	165-188	3.2	20.7	4.7	1.6	0.1	0.32	<0.05	0.2	<0.02	<0.05	0.13
R22846	8-9	80-90	13.9	29.9	7.6	2.6	0.3	0.39	<0.05	0.2	<0.02	0.19	0.11
R22848	8-7	60-70	14.8	21.3	8.8	2.2	0.2	0.46	<0.05	0.2	0.02	0.19	0.14
R22850	8-5	40-50	17.1	25.5	10.2	2.3	0.4	0.63	0.08	0.7	0.03	0.34	0.17
R22852	8-3	20-30	39.4	51.3	15.1	5.2	0.9	1.54	1.36	7.0	0.05	3.30	0.49
R22853	8-2	10-20	15.9	47.7	13.6	2.3	0.4	1.66	1.60	7.2	0.04	2.57	0.82
R22968	8-G	0-5	36.0	70.7	12.1	3.3	0.6	1.00	0.65	2.5	0.04	1.71	0.20
02-9	**Upper Peoria RM 178**												
R22857	9-11	165-185	23.9	20.5	9.9	2.2	0.5	0.48	<0.05	0.2	0.02	0.29	0.11
R22862	9-6	50-60	6.2	10.4	3.8	0.6	0.3	0.21	<0.05	0.3	<0.02	0.06	0.08
R22863	9-5	40-50	6.8	12.4	4.4	1.1	0.2	0.41	<0.05	0.3	<0.02	0.12	0.10
R22864	9-4	30-40	6.8	18.5	5.6	1.3	0.2	0.38	0.14	0.9	<0.02	0.34	0.12
R22865	9-3	20-30	23.7	37.5	9.1	1.8	0.5	0.70	0.39	1.9	0.03	0.98	0.19
R22969	9-G	0-5	30.3	63.0	10.9	2.2	0.5	0.87	0.50	2.0	0.04	1.33	0.17

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID		Depth Interval (cm)	Rb	Sr	Y	Zr	Nb	Mo	Ag	Cd	In	Sn	Sb
02-10	**Upper Peoria RM 171**												
R22870	10-14	162-187	12.5	33.7	7.6	3.0	0.3	0.23	<0.05	0.3	<0.02	0.11	0.09
R22870	10-14 Rep.		11.5	30.8	7.2	2.9	0.3	0.22	<0.05	0.3	<0.02	0.11	0.09
R22874	10-10	90-100	20.3	29.3	11.8	5.1	0.6	1.03	<0.05	1.1	0.03	0.37	0.20
R22876	10-8	70-80	18.3	38.4	14.3	3.0	0.5	1.47	0.65	3.7	0.03	1.56	1.05
R22877	10-7	60-70	25.7	47.7	14.8	5.2	0.8	1.67	0.85	4.8	0.04	1.87	0.46
R22878	10-6	50-60	22.0	39.1	17.1	2.7	0.5	1.75	0.91	5.0	0.04	1.68	0.98
R22879	10-5	40-50	18.8	45.2	15.3	2.9	0.5	1.67	1.41	8.5	0.05	2.85	0.54
R22880	10-4	30-40	17.7	46.4	13.1	2.6	0.5	1.40	1.41	8.5	0.04	2.99	0.52
R22880	10-4 Rep.		21.4	50.0	14.1	2.6	0.5	1.52	1.45	8.9	0.05	3.19	0.50
R22881	10-3	20-30	22.5	51.4	14.0	3.6	0.7	1.32	1.44	7.8	0.04	3.07	0.42
R22970	10-G	0-5	21.4	57.4	9.4	1.8	0.4	0.85	0.47	2.0	0.03	1.31	0.18
02-11	**Lower Peoria RM 164**												
R22889	11-17	160-170	14.6	50.8	9.5	9.6	0.7	1.97	<0.05	1.1	0.02	0.34	0.19
R22893	11-13	120-130	22.4	34.9	12.6	7.2	0.8	1.31	<0.05	0.9	0.03	0.36	0.16
R22897	11-9	80-90	32.4	43.0	11.9	5.9	0.8	1.36	<0.05	1.1	0.03	0.59	0.25
R22898	11-8	70-80	18.4	35.3	12.7	3.5	0.6	1.96	0.44	1.8	0.03	1.07	1.09
R22899	11-7	60-70	41.3	55.5	14.2	5.8	0.8	1.45	0.55	3.6	0.04	1.72	0.59
R22900	11-6	50-60	22.8	47.4	16.5	3.0	0.6	1.85	1.04	5.8	0.05	1.95	1.04
R22900	11-6 Rep.		22.7	46.6	17.4	3.5	0.5	1.78	1.02	5.6	0.04	1.97	1.01
R22901	11-5	40-50	25.6	58.6	15.2	3.2	0.6	1.64	1.60	8.2	0.05	3.10	0.52
R22902	11-4	30-40	26.6	53.1	14.6	3.4	0.6	1.68	1.58	6.6	0.05	3.09	0.51
R22903	11-3	20-30	43.3	60.2	13.9	5.2	0.8	1.73	0.93	3.9	0.04	2.64	0.39
R22971	11-G	0-5	33.6	69.5	11.9	2.2	0.5	1.06	0.73	2.4	0.04	1.68	0.22
02-12	**Quiver**												
R22916	12-7	60-70	25.4	33.8	9.5	4.0	0.6	0.70	0.14	0.7	0.02	0.54	0.28
R22918	12-5	40-50	18.3	34.2	12.5	4.4	0.6	0.72	0.21	1.0	0.03	0.75	0.42
R22919	12-4	30-40	18.4	31.2	12.8	4.4	0.6	0.70	0.15	1.0	0.03	0.59	0.39
R22920	12-3	20-30	25.3	32.8	12.4	5.5	0.8	0.60	0.10	0.9	0.03	0.55	0.24
R22921	12-2	10-20	19.0	32.2	12.4	4.1	0.6	0.68	0.20	1.3	0.03	0.62	0.31
R22972	12-G	0-5	27.8	48.7	12.1	2.7	0.5	0.51	0.13	1.0	0.03	0.55	0.14
02-13	**Mantanzas**												
R22925	13-18	185-205	25.3	27.4	12.1	10.3	0.4	0.27	<0.05	0.4	0.03	0.33	0.09
R22928	13-15	140-150	26.3	29.2	13.8	5.5	0.8	0.61	<0.05	0.5	0.03	0.37	0.20
R22930	13-13	130-140	23.3	26.0	14.4	4.3	0.5	0.98	0.11	0.5	0.04	0.47	0.34
R22932	13-11	100-110	26.0	29.2	13.6	5.7	0.8	0.91	0.08	0.6	0.04	0.74	0.34
R22934	13-9	80-90	26.4	29.2	15.0	5.2	0.6	0.90	0.17	0.8	0.04	0.66	0.34
R22936	13-7	60-70	23.7	30.5	15.0	6.2	0.8	0.96	0.07	0.9	0.04	0.55	0.35
R22936	13-7 Rep.		29.0	33.5	15.0	6.8	0.8	0.93	0.06	0.8	0.04	0.60	0.33
R22938	13-5	40-50	28.8	46.4	14.6	4.8	0.6	0.90	0.30	1.4	0.04	0.84	0.29
R22940	13-3	20-30	29.9	41.0	13.5	5.9	0.8	0.95	0.11	1.0	0.04	0.79	0.23
R22973	13-G	0-5	32.1	65.1	12.2	3.3	0.5	0.62	0.10	0.9	0.04	0.70	0.15
02-14	**Meredosia**												
R22945	14-16	185-205	16.7	25.5	10.8	12.7	0.2	0.17	<0.05	0.2	0.02	0.23	0.06
R22950	14-11	100-110	32.8	46.5	16.8	7.4	0.8	0.71	<0.05	0.5	0.04	0.44	0.18
R22952	14-9	80-90	23.5	30.9	17.9	5.8	0.7	0.90	0.11	0.5	0.05	0.56	0.31
R22954	14-7	60-70	44.6	43.8	18.4	8.8	0.7	0.94	<0.05	0.7	0.05	0.63	0.27
R22956	14-5	40-50	23.8	54.2	17.7	5.3	0.6	0.91	0.16	0.8	0.05	0.64	0.27
R22958	14-3	20-30	44.4	52.7	16.8	7.3	0.7	1.02	<0.05	0.7	0.05	0.64	0.22
R22974	14-G	0-5	35.1	71.3	15.5	4.5	0.6	0.54	<0.05	0.7	0.05	0.61	0.17

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID	Depth Interval (cm)	Rb	Sr	Y	Zr	Nb	Mo	Ag	Cd	In	Sn	Sb
Quality-assurance - Quality Control Samples												
R22982 NIST 8704 Buffalo River Sediment		13.2	36.4	11.4	0.9	0.3	3.23	0.24	2.9	0.08	3.01	1.10
R22988		11.9	36.9	11.0	1.4	0.4	3.50	0.21	2.8	0.07	3.55	1.34
R22982 Set 2		10.9	35.6	11.0	0.8	0.3	3.09	0.31	2.9	0.07	3.09	1.34
R22982 Set 3		9.8	34.9	11.4	1.5	0.3	3.42	0.33	2.9	0.07	3.22	2.82
Certified Total Concentrations 8704									2.94			3.07
Certified Total Concentrations 2704		(100)	(130)		(300)				3.45		(9.5)	3.79
R22983 NIST 2709 San Joaquin Soil		28.2	97.4	10.2	3.3	0.5	1.35	0.22	0.3	0.04	0.37	2.16
R22983 Set 2		32.3	109	11.6	3.6	0.5	1.58	0.32	0.3	0.04	0.48	2.65
R22983 Set 3		27.7	89.4	10.2	2.4	0.4	1.37	0.26	0.3	0.03	0.18	3.44
Certified Total Concentrations 2709		(96)	231	(18)	(160)		(2)	0.41	0.38			7.9
Noncertified Leachable Concentrations 2709			101				<2		<1			<10
R22984 Peoria Sediment Sec. Ref		21.6	43.1	12.5	4.5	0.7	1.13	0.74	4.3	0.04	1.87	0.33
Split Tested 8/2002 (Cahill 2002)		28.4	46.7	13.7	4.3	0.4	0.78	0.24	4.5	0.04	0.55	0.02
R22985 NIES-CRM-02 Pond Sediment		11.6	56.9	16.3	14.0	1.3	0.74	0.66	0.7	0.08	3.59	0.69
R22985 Set 2		11.6	55.8	16.8	13.4	1.0	0.74	0.75	0.7	0.08	3.43	0.67
Certified Total Concentrations		(42)	(110)						0.82			(2)
R22986 NIST 2711- Montana Soil		28.9	47.2	16.6	3.6	2.6	1.19	4.40	37.6	0.93	1.19	9.12
R22986 Set 2		33.1	49.8	17.3	3.3	2.1	1.27	4.48	40.1	0.98	1.27	8.98
Certified Total Concentrations 2711		(110)	245.3	(25)	(230)		(1.6)	4.63	41.70	(1.1)		19.4
Noncertified Leachable Concentrations 2711			50				<2	4	40			<10
R22987 Grand Calumet Sediment		13.7	35.2	6.0	4.3	0.5	1.92	0.14	1.0	0.03	2.31	0.87
Mean of 5 replicates (Cahill 1999)		81.0	125.0		41.0		<10	<1	<5		<7	2.6
Noncertified total concentrations shown in parentheses												
Contract Laboratory Control Material												
USGS GXR-1 Set 1 Jasperoid : Utah												
USGS GXR-1 Set 2		2.1	176	27.4	7.5	<0.1	18.2	32.5	2.7	0.78	11.6	53.1
USGS GXR-1 Set 3		2.1	166	26.6	6.2	<0.1	16.8	30.9	2.5	0.71	9.93	71.9
Certified TotalConcentrations GXR-1		14	275	32	38	0.8	18	31	3.3	0.77	54	122
USGS GXR-2 Soil (B zone) : Utah		44.9	81.4	9.5	9.9	2.0	0.83	17.1	3.6	0.04	0.45	19.0
USGS GXR-2 Set 2		48.2	84.5	10.2	10.0	1.9	0.73	17.6	3.8	0.04	0.46	12.6
USGS GXR-2 Set 3		50.7	84.1	10.4	10.0	1.7	0.69	17.0	3.6	0.04	0.28	17.4
Certified Total Concentrations GXR-2		78	160	17	269	11	2.1	17	4.1	0.252	1.7	49
USGS GXR-4 -Porphyry Copper Mill Heads : Utah		90.3	70.9	11.1	6.3	0.2	315	3.49	0.1	0.20	2.60	2.01
USGS GXR-4 -Set 2		99.2	80.7	12.4	7.7	0.2	333	3.83	<0.1	0.22	2.81	1.41
USGS GXR-4 -Set 3		105.1	73.6	12.2	5.9	0.2	318	3.56	<0.1	0.21	2.26	2.27
Certified Total Concentrations GXR-4		160	221	14	186	10	310	4	0.86	0.27	5.6	4.8
USGS GXR-6 Soil (B zone): North Carolina		56.6	35.7	5.9	13.5	<0.1	1.36	0.18	<0.1	0.05	0.40	1.28
USGS GXR -6 Set 2		61.8	32.2	6.4	7.6	<0.1	0.64	0.28	0.1	0.06	0.43	0.47
USGS GXR -6 Set 3		65.1	31.9	6.5	10.5	<0.1	1.31	0.30	<0.1	0.06	0.29	1.54
Certified Total Concentrations GXR-6		90	35	14	110	7.5	2.4	1.3	1	0.26	1.7	3.6
SO-2 Canadian Soil (Mercury Only)												
SO-2 Set 2												
SO-2 Set 3												
Certified Total Concentrations SO-2												

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID	Depth Interval (cm)	Te	Cs	Ba	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu
02-1 Senachwine												
R22717 1-15	165-190	0.06	1.4	106	18.3	36.5	17.1	3.5	0.7	0.4	0.7	0.1
R22721 1-11	100-110	0.07	1.5	166	22.5	41.7	21.9	4.4	0.9	0.5	0.9	0.1
R22722 1-10	90-100	0.06	0.9	182	20.6	43.0	21.5	4.5	0.9	0.6	1.1	0.1
R22723 1-9	80-90	0.06	1.1	182	21.9	45.2	21.8	4.4	0.9	0.5	1.0	0.1
R22724 1-8	70-80	0.10	1.1	212	28.2	54.5	26.7	5.4	1.0	0.6	1.2	0.2
R22725 1-7	60-70	0.04	1.3	207	24.1	45.4	22.6	4.5	0.9	0.5	1.0	0.1
R22726 1-6	50-60	0.10	1.7	220	26.0	49.2	24.8	5.0	1.0	0.6	1.1	0.2
R22727 1-5	40-50	0.10	2.0	221	27.6	51.1	25.1	4.9	0.9	0.6	1.2	0.2
R22728 1-4	30-40	0.10	2.2	232	28.2	52.9	24.9	5.0	1.0	0.6	1.2	0.2
R22729 1-3	20-30	0.08	1.4	204	25.1	45.4	23.8	4.7	1.0	0.6	1.1	0.2
R22961 1-G	0-5	0.04	2.3	206	25.2	48.2	22.1	4.4	0.9	0.5	1.0	0.1
02-2 Sawmill												
R22735 2-20	190-200	0.06	0.7	169	21.8	40.8	21.3	4.4	0.9	0.5	1.0	0.1
R22738 2-17	160-170	0.09	2.0	184	25.2	48.9	24.0	4.8	0.9	0.5	1.1	0.1
R22739 2-16	150-160	0.04	1.0	172	28.1	53.2	25.8	5.1	0.9	0.5	1.0	0.1
R22740 2-15	140-150	0.12	2.1	210	29.0	55.9	26.4	5.3	0.9	0.5	1.1	0.1
R22741 2-14	130-140	0.11	1.2	229	21.1	42.8	21.2	4.2	0.8	0.5	0.9	0.1
R22742 2-13	120-130	0.11	1.8	225	28.9	49.3	25.7	5.1	0.9	0.5	1.1	0.1
R22743 2-12	110-120	0.09	1.3	219	23.3	46.2	23.5	4.7	1.0	0.6	1.1	0.2
R22744 2-11	100-110	0.06	1.5	211	26.9	46.4	23.5	4.8	1.0	0.5	1.2	0.2
R22744 2-11 Rep.		0.07	1.9	207	25.1	46.2	23.7	4.5	1.0	0.6	1.1	0.1
R22745 2-10	90-100	0.04	1.2	213	22.3	44.9	22.8	4.7	0.9	0.6	1.1	0.2
R22746 2-9	80-90	0.09	1.6	214	27.5	51.9	25.5	5.1	1.0	0.6	1.2	0.2
R22748 2-7	60-70	<0.02	2.1	204	27.6	49.3	25.7	5.2	1.1	0.7	1.4	0.2
R22750 2-5	40-50	0.10	1.2	206	25.0	47.9	24.2	4.9	0.9	0.6	1.2	0.2
R22752 2-3	20-30	0.05	2.5	223	28.6	53.0	25.6	5.3	1.1	0.6	1.2	0.2
R22962 2-G	0-5	0.03	2.3	169	23.9	45.5	21.4	4.2	0.9	0.5	0.9	0.1
02-3 Billsbach												
R22759 3-16	150-160	0.03	2.1	209	28.0	51.7	25.8	5.3	1.1	0.6	1.2	0.2
R22760 3-15	140-150	0.08	0.6	171	22.8	48.1	23.6	4.5	0.8	0.5	0.9	0.1
R22761 3-14	130-140	0.11	0.7	210	23.2	48.0	23.1	4.6	0.9	0.5	1.0	0.1
R22762 3-13	120-130	0.11	0.6	195	24.0	43.7	22.8	4.5	0.9	0.5	0.9	0.1
R22762 3-13 Rep.		0.05	0.6	213	26.0	46.5	24.0	4.8	0.9	0.5	1.1	0.1
R22763 3-12	110-120	0.07	0.8	199	20.4	42.2	20.9	4.6	0.9	0.6	1.1	0.1
R22763 3-12 Rep.		0.05	0.8	191	19.7	41.2	20.5	4.3	0.9	0.5	1.1	0.1
R22764 3-11	100-110	0.11	1.2	200	26.0	49.2	24.7	4.9	1.0	0.6	1.2	0.2
R2276 5 3-10	90-100	0.04	2.5	207	28.9	51.9	26.0	5.2	1.1	0.6	1.4	0.2
R22766 3-9	80-90	0.05	1.0	199	20.3	41.2	20.2	4.4	0.9	0.6	1.2	0.2
R22767 3-8	70-80	0.09	1.7	210	26.2	48.7	24.8	4.9	1.0	0.6	1.3	0.2
R22768 3-7	60-70	0.05	2.1	202	26.2	47.6	23.9	4.8	1.0	0.5	1.1	0.2
R22770 3-5	40-50	0.07	1.6	154	23.5	43.7	21.6	4.3	0.8	0.5	1.0	0.1
R22772 3-3	20-30	0.04	1.8	141	21.7	40.6	20.7	4.2	0.8	0.5	0.9	0.1
R22963 3-G	0-5	0.04	1.4	125	19.4	37.7	17.6	3.5	0.7	0.4	0.7	0.1
02-4 Weiss												
R22777 4-16	180-205	0.05	0.6	75	14.0	31.5	14.9	3.2	0.7	0.4	0.7	<0.1
R22781 4-12	110-120	0.03	1.0	103	22.6	44.9	21.9	4.4	0.9	0.5	0.9	0.1
R22784 4-9	80-90	0.04	1.3	135	24.1	47.7	23.6	4.7	0.9	0.5	0.9	0.1
R22786 4-7	60-70	<0.02	0.7	132	20.0	38.5	19.9	4.0	0.8	0.5	0.8	0.1
R22787 4-6	50-60	0.05	0.6	143	17.4	37.0	18.3	4.0	0.8	0.5	0.9	0.1
R22788 4-5	40-50	0.08	2.0	199	26.4	49.0	24.6	5.0	0.9	0.5	1.1	0.2
R22789 4-4	30-40	0.06	2.3	203	28.6	53.5	25.7	5.4	1.0	0.6	1.3	0.2
R22790 4-3	20-30	0.05	1.0	200	24.6	44.9	22.0	4.7	1.0	0.6	1.2	0.2
R22964 4-G	0-5	<0.02	1.9	171	24.9	47.2	21.8	4.4	0.9	0.5	0.9	0.1

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID		Depth Interval (cm)	Te	Cs	Ba	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu
02-5	**Goose**												
R22794	5-14	145-170	<0.02	0.7	176	20.3	40.7	20.0	3.9	0.8	0.4	0.7	<0.1
R22797	5-11	100-110	0.07	1.8	206	29.1	54.7	26.8	5.4	1.1	0.6	1.3	0.2
R22798	5-10	90-100	0.06	1.4	204	31.6	59.2	28.5	5.5	1.0	0.6	1.1	0.2
R22799	5-9	80-90	0.06	2.0	223	29.2	57.7	27.1	5.4	0.9	0.5	1.1	0.1
R22800	5-8	70-80	0.10	0.9	230	22.1	44.6	22.1	4.5	0.9	0.5	1.1	0.1
R22801	5-7	60-70	0.04	1.9	231	27.8	50.9	25.2	5.1	1.1	0.6	1.1	0.2
R22802	5-6	50-60	0.07	0.9	195	20.4	41.7	21.3	4.5	0.9	0.5	1.1	0.2
R22803	5-5	40-50	0.08	1.9	211	28.0	52.4	25.5	5.3	1.1	0.6	1.3	0.2
R22805	5-3	20-30	0.06	2.3	229	28.4	52.7	26.2	5.3	1.1	0.6	1.2	0.2
R22965	5-G	0-5	0.03	1.4	167	23.5	44.7	21.7	4.6	0.9	0.5	1.0	0.1
02-6	**Wightman**												
R22811	6-14	130-140	<0.02	2.0	174	25.3	47.5	22.7	4.6	1.0	0.6	1.1	0.1
R22811	6-14 Rep.		0.04	2.1	182	26.4	48.9	23.9	4.9	1.1	0.6	1.2	0.2
R22812	6-13	120-130	0.07	1.1	197	26.6	55.1	25.9	5.2	0.8	0.5	1.0	0.1
R22813	6-12	110-120	0.10	1.1	219	26.9	53.1	25.5	4.9	0.9	0.5	0.9	0.1
R22814	6-11	100-110	0.13	0.8	234	25.3	45.4	23.6	4.8	0.8	0.5	0.9	0.1
R22815	6-10	90-100	0.05	2.1	212	27.0	49.5	24.4	5.0	1.0	0.6	1.0	0.1
R22816	6-9	80-90	0.09	1.0	194	23.5	45.1	22.9	4.6	0.9	0.5	1.0	0.1
R22818	6-7	60-70	0.03	1.9	188	25.4	46.4	23.5	4.5	1.0	0.5	1.1	0.2
R22820	6-5	40-50	0.10	1.2	198	27.1	49.4	24.5	5.0	1.0	0.6	1.3	0.2
R22822	6-3	20-30	0.08	1.7	193	25.2	46.0	22.1	4.6	0.9	0.5	1.1	0.1
R22966	6-G	0-5	0.03	1.4	128	20.5	38.9	19.1	3.9	0.8	0.4	0.7	0.1
02-7	**Meadow**												
R22827	7-15	165-190	0.03	1.0	95	21.8	43.4	20.9	4.3	0.9	0.5	0.7	0.1
R22830	7-12	110-120	0.08	1.0	163	24.3	47.4	23.7	4.8	1.0	0.6	1.0	0.1
R22831	7-11	100-110	0.07	0.9	143	21.2	40.6	19.7	4.2	0.9	0.5	0.9	0.1
R22832	7-10	90-100	0.09	1.1	183	30.8	60.0	28.2	5.5	0.8	0.5	0.9	0.1
R22833	7-9	80-90	0.08	1.1	225	25.0	51.9	24.6	4.8	0.8	0.5	0.9	0.1
R22834	7-8	70-80	0.12	1.1	227	26.3	46.2	23.8	4.6	0.8	0.5	1.0	0.1
R22835	7-7	60-70	0.05	1.0	192	20.2	41.1	20.1	4.3	0.9	0.5	1.0	0.1
R22836	7-6	50-60	0.09	1.5	183	24.4	45.3	22.7	4.5	1.0	0.5	1.1	0.2
R22837	7-5	40-50	0.08	1.3	185	23.4	45.6	22.3	4.6	0.9	0.5	1.2	0.2
R22839	7-3	20-30	0.08	1.5	171	24.0	44.1	21.2	4.3	0.9	0.5	0.9	0.1
R22967	7-G	0-5	0.07	1.5	152	23.4	44.5	21.0	4.2	0.8	0.5	0.9	0.1
02-8	**Babb Slough**												
R22842	8-13	165-188	<0.02	0.2	30	6.3	13.9	7.0	1.5	0.3	0.2	0.3	<0.1
R22846	8-9	80-90	<0.02	1.0	67	16.3	32.3	15.4	2.9	0.6	0.3	0.6	<0.1
R22848	8-7	60-70	0.04	0.7	106	17.3	35.6	17.6	3.5	0.7	0.4	0.7	<0.1
R22850	8-5	40-50	0.05	0.7	124	18.7	38.1	18.8	3.9	0.7	0.4	0.8	0.1
R22852	8-3	20-30	0.03	2.1	195	25.6	46.7	23.1	4.6	0.9	0.5	1.1	0.2
R22853	8-2	10-20	0.12	0.6	180	17.1	35.4	17.9	3.8	0.8	0.5	1.0	0.1
R22968	8-G	0-5	0.08	1.8	164	23.9	45.4	21.2	4.3	0.9	0.5	0.9	0.1
02-9	**Upper Peoria RM 178**												
R22857	9-11	165-185	<0.02	1.4	110	20.0	38.9	18.4	3.7	0.7	0.4	0.7	0.1
R22862	9-6	50-60	<0.02	0.4	29	8.6	16.0	8.0	1.5	0.3	0.2	0.3	<0.1
R22863	9-5	40-50	0.04	0.4	45	10.2	19.5	10.1	1.9	0.3	0.2	0.4	<0.1
R22864	9-4	30-40	0.04	0.3	52	11.2	21.2	10.6	2.0	0.4	0.2	0.4	<0.1
R22865	9-3	20-30	<0.02	1.3	104	17.8	33.8	16.2	3.2	0.6	0.4	0.7	<0.1
R22969	9-G	0-5	0.11	1.6	147	22.8	43.1	20.3	4.1	0.8	0.4	0.9	0.1

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Laboratory Number/Core ID		Depth Interval (cm)	Te	Cs	Ba	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu
02-10	**Upper Peoria RM 171**												
R22870	10-14	162-187	0.04	0.8	71	15.4	30.2	14.4	2.9	0.6	0.3	0.5	<0.1
R22870	10-14 Rep.		0.05	0.7	71	15.3	30.1	14.2	2.9	0.5	0.3	0.6	<0.1
R22874	10-10	90-100	0.03	0.7	155	19.1	37.5	18.4	3.7	0.8	0.5	0.9	0.1
R22876	10-8	70-80	0.08	0.6	165	19.0	40.3	19.4	4.2	0.9	0.5	1.0	0.1
R22877	10-7	60-70	0.09	0.9	182	24.7	46.7	22.4	4.6	1.0	0.6	1.1	0.1
R22878	10-6	50-60	0.07	0.9	174	21.3	44.3	21.8	4.5	0.9	0.6	1.3	0.2
R22879	10-5	40-50	0.10	0.7	166	22.2	43.8	21.9	4.4	0.9	0.5	1.2	0.2
R22880	10-4	30-40	0.05	0.8	154	20.0	39.0	19.4	3.9	0.8	0.5	1.0	0.1
R22880	10-4 Rep.		0.07	1.1	166	22.5	42.9	21.1	4.3	0.9	0.5	1.1	0.2
R22881	10-3	20-30	0.06	1.1	176	23.2	42.3	20.8	4.3	0.9	0.5	1.0	0.2
R22970	10-G	0-5	<0.02	1.2	119	20.2	38.6	18.3	3.8	0.7	0.4	0.7	<0.1
02-11	**Lower Peoria RM 164**												
R22889	11-17	160-170	0.03	1.0	138	16.3	32.3	15.9	3.3	0.7	0.4	0.7	<0.1
R22893	11-13	120-130	0.07	1.4	174	22.3	43.8	20.9	4.3	0.9	0.5	1.0	0.1
R22897	11-9	80-90	0.07	1.7	154	21.4	42.6	20.5	4.1	0.9	0.5	0.9	0.1
R22898	11-8	70-80	0.03	0.7	146	16.9	36.5	18.2	3.7	0.7	0.5	0.9	0.1
R22899	11-7	60-70	0.06	2.1	180	25.7	47.8	22.2	4.6	1.0	0.5	1.1	0.2
R22900	11-6	50-60	0.07	0.9	176	20.9	44.8	21.4	4.4	0.9	0.6	1.2	0.2
R22900	11-6 Rep.		0.07	0.9	180	20.4	43.3	20.6	4.3	0.9	0.6	1.2	0.2
R22901	11-5	40-50	0.10	1.2	180	24.1	46.5	23.3	4.7	0.9	0.5	1.2	0.2
R22902	11-4	30-40	0.08	1.1	186	23.5	45.8	22.0	4.4	0.9	0.5	1.1	0.2
R22903	11-3	20-30	0.06	2.5	186	26.1	49.9	23.4	4.8	1.0	0.6	1.1	0.2
R22971	11-G	0-5	0.03	1.8	162	24.5	47.4	21.9	4.4	0.9	0.5	0.9	0.1
02-12	**Quiver**												
R22916	12-7	60-70	0.03	1.3	163	18.3	34.3	16.2	3.2	0.7	0.4	0.8	0.1
R22918	12-5	40-50	0.05	0.7	136	22.2	44.3	21.5	4.4	0.8	0.5	0.9	0.1
R22919	12-4	30-40	0.06	0.8	133	22.9	42.7	22.0	4.2	0.9	0.5	1.0	0.1
R22920	12-3	20-30	0.06	1.4	151	25.1	47.6	22.3	4.4	0.9	0.5	0.9	0.1
R22921	12-2	10-20	0.04	0.8	141	22.4	43.3	20.8	4.2	0.8	0.5	0.9	0.1
R22972	12-G	0-5	<0.02	1.3	166	24.5	46.5	22.0	4.5	0.9	0.5	1.0	0.1
02-13	**Mantanzas**												
R22925	13-18	185-205	<0.02	1.5	219	27.9	54.1	24.6	5.0	1.0	0.5	0.9	0.1
R22928	13-15	140-150	<0.02	1.3	169	28.3	54.3	25.2	5.2	1.1	0.6	1.1	0.1
R22930	13-13	130-140	0.09	0.9	162	25.6	51.4	24.6	5.1	1.0	0.6	1.1	0.2
R22932	13-11	100-110	<0.02	1.2	181	26.3	50.8	24.1	4.8	1.0	0.6	1.0	0.1
R22934	13-9	80-90	0.06	1.0	181	27.0	53.8	25.7	5.2	1.0	0.6	1.2	0.2
R22936	13-7	60-70	0.05	1.0	183	27.8	52.7	23.4	4.9	1.0	0.6	1.2	0.2
R22936	13-7 Rep.		0.10	1.3	189	28.3	53.4	25.7	5.1	1.1	0.6	1.1	0.2
R22938	13-5	40-50	0.07	1.3	181	26.0	53.0	24.4	5.0	1.0	0.6	1.2	0.2
R22940	13-3	20-30	<0.02	1.3	176	26.1	51.8	23.4	4.7	1.0	0.6	1.1	0.1
R22973	13-G	0-5	<0.02	1.6	160	23.7	46.4	20.9	4.2	0.8	0.5	0.9	0.1
02-14	**Meredosia**												
R22945	14-16	185-205	0.04	1.1	109	24.7	50.0	23.0	4.4	0.8	0.5	0.9	0.1
R22950	14-11	100-110	0.06	1.6	210	29.2	54.5	27.2	5.5	1.1	0.7	1.3	0.2
R22952	14-9	80-90	0.08	0.7	227	28.7	56.2	27.4	5.8	1.2	0.7	1.5	0.2
R22954	14-7	60-70	<0.02	2.1	262	31.7	62.0	29.0	6.0	1.3	0.7	1.5	0.2
R22956	14-5	40-50	0.06	0.7	226	26.4	52.3	25.7	5.3	1.1	0.7	1.3	0.2
R22958	14-3	20-30	0.07	2.1	244	30.0	55.3	25.6	5.4	1.2	0.7	1.3	0.2
R22974	14-G	0-5	0.03	1.7	233	28.4	54.5	24.7	5.4	1.1	0.6	1.3	0.2

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID	Depth Interval (cm)	Te	Cs	Ba	La	Ce	Nd	Sm	Eu	Tb	Yb	Lu
Quality-assurance - Quality Control Samples												
R22982 NIST 8704 Buffalo River Sediment		0.06	1.6	90.6	13.3	28.2	15.1	3.7	0.7	0.5	0.9	0.1
R22988		0.13	1.7	88.2	12.0	26.4	14.2	3.4	0.7	0.5	0.8	0.1
R22982 Set 2		0.12	1.3	84.5	10.7	23.9	13.7	3.3	0.7	0.4	0.9	0.1
R22982 Set 3		0.15	1.6	84.4	8.3	20.4	11.9	3.1	0.7	0.5	0.8	0.1
Certified Total Concentrations 8704			5.83	413		66.5			1.31			
Certified Total Concentrations 2704			(6)	414	(29)	(72)		(6.7)	(1.3)		(2.8)	(0.6)
R22983 NIST 2709 San Joaquin Soil		0.05	2.3	372	17.0	33.2	14.1	2.9	0.6	0.4	0.8	0.1
R22983 Set 2		0.07	2.4	415	19.1	38.2	16.3	3.4	0.6	0.4	1.0	0.1
R22983 Set 3		0.08	2.2	375	13.7	29.9	12.4	2.6	0.5	0.4	0.8	<0.1
Certified Total Concentrations 2709			(5.3)	968	23	(42)		(3.8)	(0.9)		(1.6)	
Noncertified Leachable Concentrations 2709				398								
R22984 Peoria Sediment Sec. Ref		0.05	1.0	165	23.0	43.3	20.5	4.3	0.9	0.5	1.0	0.1
Split Tested 8/2002 (Cahill 2002)		0.04	0.9	181	23.5	45.8	21.2	4.4	0.9	0.5	1.0	0.1
R22985 NIES-CRM-02 Pond Sediment		0.12	1.6	167	12.6	26.7	13.6	3.4	0.9	0.5	1.7	0.2
R22985 Set 2		0.15	1.5	169	12.3	27.1	14.2	3.4	1.0	0.5	1.7	0.2
Certified Total Concentrations					(17)							
R22986 NIST 2711- Montana Soil		1.46	3.2	199	28.7	52.3	23.0	4.4	0.7	0.6	1.5	0.2
R22986 Set 2		1.43	3.3	199	29.2	54.9	24.1	4.7	0.7	0.6	1.5	0.2
Certified Total Concentrations 2711			(6.1)	726	(40)	(69)	(31)	(5.9)	(1.1)		(2.7)	
Noncertified Leachable Concentrations 2711				200								
R22987 Grand Calumet Sediment		0.21	0.7	74.8	11.6	23.6	10.8	2.2	0.4	0.2	0.5	<0.1
Mean of 5 replicates (Cahill 1999)			3.3	429	21.0	41.6		4.9	0.8	0.5	1.4	0.4
Noncertified total concentrations shown in parentheses												
Contract Laboratory Control Material												
USGS GXR-1 Set 1 Jasperoid : Utah												
USGS GXR-1 Set 2		10.7	2.8	482	6.0	11.6	6.5	2.4	0.5	0.7	2.2	0.3
USGS GXR-1 Set 3		12.1	2.8	463	4.0	10.1	5.4	2.2	0.5	0.7	2.1	0.3
Certified TotalConcentrations GXR-1		13	3	750	7.5	17	18	2.7	0.69	0.83	1.9	0.28
USGS GXR-2 Soil (B zone) : Utah		0.27	3.9	1,080	21.3	41.9	16.0	3.0	0.5	0.4	0.8	0.1
USGS GXR-2 Set 2		0.24	4.2	1,170	23.2	45.2	17.7	3.2	0.6	0.4	0.8	0.1
USGS GXR-2 Set 3		0.24	4.2	1,280	19.5	42.2	16.4	3.0	0.6	0.4	0.8	<0.1
Certified Total Concentrations GXR-2		0.69	5.2	2,240	25.6	51.4	19	3.5	0.81	0.48	2.04	0.27
USGS GXR-4 -Porphyry Copper Mill Heads : Utah		0.79	2.4	36.8	49.9	87.1	32.7	5.4	1.2	0.5	0.8	0.1
USGS GXR-4 -Set 2		0.71	2.6	74.8	59.7	106.0	40.4	6.2	1.3	0.5	0.9	0.1
USGS GXR-4 -Set 3		0.79	2.7	103	52.8	100.5	37.5	6.1	1.4	0.5	0.9	0.1
Certified Total Concentrations GXR-4		0.97	2.8	1,640	64.5	102	45	6.6	1.63	0.36	1.6	0.17
USGS GXR-6 Soil (B zone): North Carolina		0.07	3.1	1,070	11.2	30.8	9.9	2.1	0.5	0.2	0.7	<0.1
USGS GXR -6 Set 2		0.04	3.3	942	11.6	32.0	11.1	2.2	0.5	0.3	0.7	<0.1
USGS GXR -6 Set 3		0.03	3.5	992	10.5	31.1	10.4	2.2	0.6	0.3	0.7	<0.1
Certified Total Concentrations GXR-6		0.018	4.2	1,300	13.9	36	13	2.7	0.76	0.415	2.4	0.33
SO-2 Canadian Soil (Mercury Only)												
SO-2 Set 2												
SO-2 Set 3												
Certified Total Concentrations SO-2												

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID		Depth Interval (cm)	Hf	Ta	W	Re	Au (µg/g)	Hg (µg/g)	Tl	Pb	Bi	Th	U
02-1	**Senachwine**												
R22717	1-15	165-190	0.2	<0.05	<0.2	0.003	<0.2	74	0.26	11.7	0.14	4.5	1.1
R22721	1-11	100-110	0.1	<0.05	<0.2	0.002	<0.2	180	0.39	29.8	0.28	4.1	1.6
R22722	1-10	90-100	0.1	<0.05	<0.2	0.003	7.8	323	0.38	41.5	0.38	4.4	1.3
R22723	1-9	80-90	<0.1	<0.05	<0.2	0.003	14.2	494	0.38	53.6	0.44	4.4	1.3
R22724	1-8	70-80	0.1	<0.05	<0.2	0.005	10.0	663	0.45	90.8	0.62	4.7	1.4
R22725	1-7	60-70	0.1	<0.05	<0.2	0.001	4.7	715	0.45	86.1	0.67	4.7	1.2
R22726	1-6	50-60	<0.1	<0.05	<0.2	0.001	<0.2	383	0.47	69.8	0.58	5.0	1.5
R22727	1-5	40-50	<0.1	<0.05	<0.2	0.002	1.1	351	0.53	85.2	0.62	5.4	1.5
R22728	1-4	30-40	<0.1	<0.05	<0.2	0.001	3.4	295	0.52	85.5	0.60	5.3	1.4
R22729	1-3	20-30	0.1	<0.05	<0.2	0.003	<0.2	226	0.45	63.5	0.50	4.7	1.1
R22961	1-G	0-5	<0.1	<0.05	<0.2	0.002	<0.2	162	0.45	40.4	0.44	4.8	0.9
02-2	**Sawmill**												
R22735	2-20	190-200	0.1	<0.05	<0.2	0.001	<0.2	92	0.36	23.6	0.27	3.5	1.4
R22738	2-17	160-170	<0.1	<0.05	<0.2	0.003	2.6	634	0.49	66.0	0.51	5.0	1.4
R22739	2-16	150-160	0.1	<0.05	<0.2	0.002	5.6	975	0.40	84.8	0.59	4.2	1.2
R22740	2-15	140-150	<0.1	<0.05	<0.2	0.001	16.7	1,115	0.54	133.3	0.91	4.8	1.3
R22741	2-14	130-140	<0.1	<0.05	<0.2	0.001	44.4	1,637	0.52	164.6	1.34	4.7	1.2
R22742	2-13	120-130	<0.1	<0.05	<0.2	0.001	14.2	953	0.53	140.6	1.11	5.2	1.3
R22743	2-12	110-120	<0.1	<0.05	<0.2	0.001	14.6	650	0.51	92.1	0.85	5.4	1.3
R22744	2-11	100-110	0.1	<0.05	<0.2	0.001	<0.2	460	0.49	70.9	0.64	5.1	1.2
R22744	2-11 Rep.		0.1	<0.05	<0.2	0.002	<0.2	459	0.47	68.0	0.64	5.4	1.3
R22745	2-10	90-100	<0.1	<0.05	<0.2	<0.001	14.4	403	0.48	76.4	0.69	5.4	1.6
R22746	2-9	80-90	<0.1	<0.05	<0.2	0.001	<0.2	355	0.50	79.5	0.66	5.1	1.8
R22748	2-7	60-70	<0.1	<0.05	<0.2	0.002	<0.2	437	0.56	82.0	0.55	5.4	1.8
R22750	2-5	40-50	<0.1	<0.05	<0.2	0.001	2.9	337	0.50	93.2	0.65	5.0	1.8
R22752	2-3	20-30	0.1	<0.05	<0.2	0.002	<0.2	237	0.54	70.1	0.53	5.8	1.3
R22962	2-G	0-5	<0.1	<0.05	<0.2	0.005	<0.2	195	0.45	38.7	0.41	4.9	1.1
02-3	**Billsbach**												
R22759	3-16	150-160	0.1	<0.05	<0.2	<0.001	<0.2	209	0.49	31.3	0.31	5.3	2.3
R22760	3-15	140-150	<0.1	<0.05	<0.2	0.004	22.1	958	0.38	84.5	0.58	2.7	1.1
R22761	3-14	130-140	<0.1	<0.05	<0.2	0.003	27.4	1,265	0.43	132.7	1.03	3.6	1.2
R22762	3-13	120-130	<0.1	<0.05	<0.2	0.003	6.4	726	0.37	105.8	0.86	4.0	1.1
R22762	3-13 Rep.		<0.1	<0.05	<0.2	0.003	6.8	728	0.39	111.1	0.86	4.3	1.1
R22763	3-12	110-120	<0.1	<0.05	<0.2	<0.001	11.7	469	0.41	75.9	0.63	4.2	1.2
R22763	3-12 Rep.		<0.1	<0.05	<0.2	0.003	10.7	476	0.38	73.6	0.60	4.1	1.1
R22764	3-11	100-110	<0.1	<0.05	<0.2	0.001	<0.2	416	0.44	77.1	0.60	4.6	1.8
R2276 5	3-10	90-100	<0.1	<0.05	<0.2	0.002	4.4	510	0.52	75.3	0.54	5.7	1.9
R22766	3-9	80-90	<0.1	<0.05	<0.2	0.002	15.1	601	0.50	101.2	0.77	4.0	1.8
R22767	3-8	70-80	<0.1	<0.05	<0.2	0.001	8.8	570	0.54	121.3	0.84	4.8	2.4
R22768	3-7	60-70	<0.1	<0.05	<0.2	0.003	3.5	400	0.50	92.1	0.66	5.1	1.4
R22770	3-5	40-50	<0.1	<0.05	<0.2	0.001	<0.2	255	0.39	56.8	0.52	4.0	1.0
R22772	3-3	20-30	<0.1	<0.05	<0.2	0.005	5.4	259	0.37	45.8	0.46	4.3	1.1
R22963	3-G	0-5	<0.1	<0.05	<0.2	0.002	-0.2	247	0.31	39.1	0.42	3.2	0.9
02-4	**Weiss**												
R22777	4-16	180-205	<0.1	<0.05	<0.2	0.001	0.7	73	0.19	13.7	0.19	4.0	1.1
R22781	4-12	110-120	0.1	<0.05	<0.2	<0.001	<0.2	75	0.22	14.1	0.16	4.5	0.7
R22784	4-9	80-90	<0.1	<0.05	<0.2	<0.001	<0.2	67	0.24	15.7	0.18	3.5	0.7
R22786	4-7	60-70	0.1	<0.05	<0.2	<0.001	<0.2	122	0.20	17.4	0.19	2.4	1.2
R22787	4-6	50-60	<0.1	<0.05	<0.2	0.001	9.3	345	0.25	43.6	0.38	2.9	1.1
R22788	4-5	40-50	<0.1	<0.05	<0.2	0.002	<0.2	493	0.50	74.9	0.56	5.1	1.8
R22789	4-4	30-40	<0.1	<0.05	<0.2	0.002	<0.2	408	0.53	80.6	0.58	5.3	1.8
R22790	4-3	20-30	<0.1	<0.05	<0.2	0.001	<0.2	422	0.48	89.2	0.63	4.5	1.7
R22964	4-G	0-5	<0.1	<0.05	<0.2	0.002	<0.2	269	0.43	44.3	0.44	4.8	1.0

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID		Depth Interval (cm)	Hf	Ta	W	Re	Au (µg/g)	Hg (µg/g)	Tl	Pb	Bi	Th	U
02-5	**Goose**												
R22794	5-14	145-170	<0.1	<0.05	<0.2	0.002	<0.2	50	0.16	12.7	0.16	3.7	0.6
R22797	5-11	100-110	0.1	<0.05	<0.2	0.001	<0.2	251	0.49	42.7	0.40	5.2	1.6
R22798	5-10	90-100	0.1	<0.05	<0.2	0.001	3.6	955	0.47	86.2	0.60	5.1	1.3
R22799	5-9	80-90	<0.1	<0.05	<0.2	0.003	23.3	1,238	0.53	135.1	1.01	5.3	1.3
R22800	5-8	70-80	<0.1	<0.05	<0.2	0.001	20.7	1,038	0.47	116.7	1.01	3.9	1.2
R22801	5-7	60-70	0.1	<0.05	<0.2	0.002	<0.2	449	0.53	67.7	0.58	5.7	1.3
R22802	5-6	50-60	<0.1	<0.05	<0.2	0.001	6.7	356	0.39	62.3	0.53	4.5	1.6
R22803	5-5	40-50	<0.1	<0.05	<0.2	0.001	<0.2	324	0.53	76.5	0.57	5.6	1.7
R22805	5-3	20-30	<0.1	<0.05	<0.2	0.002	<0.2	270	0.50	75.4	0.57	5.7	1.4
R22965	5-G	0-5	<0.1	<0.05	<0.2	0.003	<0.2	178	0.40	42.5	0.43	4.6	0.9
02-6	**Wightman**												
R22811	6-14	130-140	0.1	<0.05	<0.2	0.001	<0.2	667	0.44	51.7	0.41	5.3	1.2
R22811	6-14 Rep.		0.1	<0.05	<0.2	0.002	<0.2	697	0.47	54.1	0.43	5.4	1.4
R22812	6-13	120-130	<0.1	<0.05	<0.2	0.001	43.5	1,980	0.50	149.1	1.14	4.3	1.2
R22813	6-12	110-120	<0.1	<0.05	<0.2	0.004	48.3	2,121	0.50	205.7	1.53	4.3	1.2
R22814	6-11	100-110	<0.1	<0.05	<0.2	0.003	23.5	2,019	0.49	209.3	1.64	4.3	1.3
R22815	6-10	90-100	<0.1	<0.05	<0.2	0.002	5.5	1,097	0.50	103.4	0.91	5.4	1.2
R22816	6-9	80-90	<0.1	<0.05	<0.2	<0.001	<0.2	812	0.41	99.5	0.73	4.7	1.2
R22818	6-7	60-70	<0.1	<0.05	<0.2	0.001	<0.2	629	0.46	74.4	0.58	5.0	1.6
R22820	6-5	40-50	<0.1	<0.05	<0.2	<0.001	<0.2	567	0.45	88.3	0.60	4.9	1.9
R22822	6-3	20-30	<0.1	<0.05	<0.2	<0.001	2.0	481	0.48	79.7	0.58	4.8	1.3
R22966	6-G	0-5	<0.1	<0.05	<0.2	0.002	<0.2	214	0.32	37.6	0.39	4.0	0.9
02-7	**Meadow**												
R22827	7-15	165-190	<0.1	<0.05	<0.2	0.002	<0.2	67	0.18	13.6	0.18	3.5	0.9
R22830	7-12	110-120	0.1	<0.05	<0.2	0.006	<0.2	367	0.38	47.7	0.39	4.2	1.3
R22831	7-11	100-110	<0.1	<0.05	<0.2	0.002	0.6	697	0.35	56.4	0.45	3.7	0.9
R22832	7-10	90-100	<0.1	<0.05	<0.2	0.003	26.0	1,769	0.46	144.8	1.00	4.6	1.2
R22833	7-9	80-90	<0.1	<0.05	<0.2	0.003	60.4	2,265	0.52	185.8	1.64	4.6	1.1
R22834	7-8	70-80	<0.1	<0.05	<0.2	0.002	26.9	1,949	0.53	179.5	1.62	5.0	1.2
R22835	7-7	60-70	<0.1	<0.05	<0.2	0.004	13.6	556	0.43	78.0	0.66	5.1	1.3
R22836	7-6	50-60	0.1	<0.05	<0.2	<0.001	<0.2	224	0.49	67.6	0.51	5.3	1.5
R22837	7-5	40-50	<0.1	<0.05	<0.2	0.001	19.4	415	0.49	98.8	0.68	5.0	1.7
R22839	7-3	20-30	<0.1	<0.05	<0.2	0.004	<0.2	287	0.44	59.6	0.49	4.7	1.1
R22967	7-G	0-5	<0.1	<0.05	<0.2	0.001	<0.2	199	0.39	40.7	0.43	4.5	0.9
02-8	**Babb Slough**												
R22842	8-13	165-188	<0.1	<0.05	<0.2	0.001	2.1	34	0.07	6.0	0.08	1.5	0.6
R22846	8-9	80-90	<0.1	<0.05	<0.2	0.001	<0.2	37	0.16	8.7	0.11	3.3	0.6
R22848	8-7	60-70	<0.1	<0.05	<0.2	<0.001	<0.2	41	0.16	11.9	0.13	2.4	0.6
R22850	8-5	40-50	<0.1	<0.05	<0.2	0.001	<0.2	84	0.20	18.6	0.19	2.1	0.9
R22852	8-3	20-30	<0.1	<0.05	<0.2	0.002	4.5	547	0.59	89.9	0.60	5.1	1.6
R22853	8-2	10-20	<0.1	<0.05	<0.2	0.001	23.0	414	0.41	87.3	0.72	2.4	1.2
R22968	8-G	0-5	<0.1	<0.05	<0.2	0.002	<0.2	205	0.43	44.7	0.43	4.9	1.0
02-9	**Upper Peoria RM 178**												
R22857	9-11	165-185	<0.1	<0.05	<0.2	0.002	<0.2	34	0.22	11.5	0.15	3.3	0.6
R22862	9-6	50-60	<0.1	<0.05	<0.2	<0.001	<0.2	19	0.05	3.7	0.04	1.1	0.3
R22863	9-5	40-50	<0.1	<0.05	<0.2	0.001	<0.2	26	0.08	6.8	0.05	1.2	0.4
R22864	9-4	30-40	<0.1	<0.05	<0.2	0.001	<0.2	63	0.13	15.8	0.12	1.4	0.4
R22865	9-3	20-30	<0.1	<0.05	<0.2	<0.001	<0.2	130	0.28	29.4	0.24	2.9	0.7
R22969	9-G	0-5	<0.1	<0.05	<0.2	0.002	<0.2	177	0.37	37.5	0.38	4.2	0.9

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID		Depth Interval (cm)	Hf	Ta	W	Re	Au (µg/g)	Hg (µg/g)	Tl	Pb	Bi	Th	U
02-10	**Upper Peoria RM 171**												
R22870	10-14	162-187	<0.1	<0.05	<0.2	0.002	<0.2	32	0.13	7.7	0.10	3.1	0.5
R22870	10-14 Rep.		<0.1	<0.05	<0.2	0.001	<0.2	31	0.13	8.0	0.10	3.2	0.6
R22874	10-10	90-100	0.1	<0.05	<0.2	0.003	<0.2	96	0.22	21.0	0.21	2.9	1.4
R22876	10-8	70-80	<0.1	<0.05	<0.2	0.003	8.8	372	0.36	65.2	0.54	3.2	1.1
R22877	10-7	60-70	0.1	<0.05	<0.2	0.003	<0.2	339	0.35	59.5	0.46	4.5	1.5
R22878	10-6	50-60	<0.1	<0.05	<0.2	0.002	8.1	421	0.37	65.3	0.55	4.0	1.6
R22879	10-5	40-50	<0.1	<0.05	<0.2	0.002	3.8	387	0.38	86.0	0.57	4.1	1.4
R22880	10-4	30-40	<0.1	<0.05	<0.2	0.001	4.8	391	0.38	82.1	0.54	4.0	1.5
R22880	10-4 Rep.		<0.1	<0.05	<0.2	0.001	3.3	432	0.41	89.4	0.65	4.5	1.6
R22881	10-3	20-30	<0.1	<0.05	<0.2	<0.001	6.4	453	0.44	84.7	0.62	4.5	1.8
R22970	10-G	0-5	<0.1	<0.05	<0.2	0.001	<0.2	219	0.29	33.6	0.29	3.7	0.8
02-11	**Lower Peoria RM 164**												
R22889	11-17	160-170	0.3	<0.05	<0.2	0.012	<0.2	80	0.22	19.2	0.19	3.6	2.2
R22893	11-13	120-130	0.2	<0.05	<0.2	0.002	<0.2	61	0.26	17.5	0.22	3.6	2.2
R22897	11-9	80-90	0.1	<0.05	<0.2	0.002	<0.2	107	0.36	27.8	0.24	3.8	1.4
R22898	11-8	70-80	<0.1	<0.05	<0.2	0.002	8.3	265	0.30	60.5	0.38	2.7	1.4
R22899	11-7	60-70	<0.1	<0.05	<0.2	0.002	<0.2	286	0.45	61.8	0.38	5.3	1.5
R22900	11-6	50-60	<0.1	<0.05	<0.2	0.002	13.4	323	0.42	76.3	0.55	3.7	1.5
R22900	11-6 Rep.		<0.1	<0.05	<0.2	0.001	15.0	313	0.39	74.7	0.57	4.5	1.5
R22901	11-5	40-50	<0.1	<0.05	<0.2	<0.001	5.4	362	0.42	94.7	0.63	4.9	1.7
R22902	11-4	30-40	<0.1	<0.05	<0.2	0.001	11.0	342	0.39	90.3	0.62	4.6	1.3
R22903	11-3	20-30	<0.1	<0.05	<0.2	0.002	<0.2	269	0.51	63.7	0.51	5.6	1.3
R22971	11-G	0-5	<0.1	<0.05	<0.2	0.003	<0.2	228	0.37	45.7	0.45	4.4	1.0
02-12	**Quiver**												
R22916	12-7	60-70	<0.1	<0.05	<0.2	0.004	<0.2	131	0.26	20.6	0.19	3.4	0.8
R22918	12-5	40-50	<0.1	<0.05	<0.2	<0.001	2.2	167	0.27	35.1	0.28	4.2	0.8
R22919	12-4	30-40	<0.1	<0.05	<0.2	0.002	<0.2	115	0.25	28.5	0.25	4.6	0.7
R22920	12-3	20-30	<0.1	<0.05	<0.2	0.003	<0.2	107	0.29	24.1	0.23	4.9	0.8
R22921	12-2	10-20	<0.1	<0.05	<0.2	0.001	<0.2	117	0.25	30.8	0.25	4.5	0.7
R22972	12-G	0-5	<0.1	<0.05	<0.2	0.003	<0.2	101	0.29	26.7	0.26	4.6	0.6
02-13	**Mantanzas**												
R22925	13-18	185-205	0.2	<0.05	<0.2	<0.001	<0.2	175	0.26	16.1	0.22	7.3	0.8
R22928	13-15	140-150	0.1	<0.05	<0.2	0.003	<0.2	171	0.27	18.8	0.24	5.8	0.9
R22930	13-13	130-140	<0.1	<0.05	<0.2	0.001	<0.2	173	0.26	21.8	0.27	5.5	1.1
R22932	13-11	100-110	<0.1	<0.05	<0.2	0.004	<0.2	227	0.31	28.0	0.30	5.6	1.0
R22934	13-9	80-90	<0.1	<0.05	<0.2	0.002	<0.2	184	0.32	31.7	0.34	6.3	0.9
R22936	13-7	60-70	0.1	<0.05	<0.2	0.002	<0.2	175	0.32	26.1	0.35	5.8	0.9
R22936	13-7 Rep.		0.1	<0.05	<0.2	0.003	<0.2	172	0.33	26.0	0.33	6.5	1.0
R22938	13-5	40-50	<0.1	<0.05	<0.2	0.001	<0.2	194	0.37	40.6	0.35	6.3	0.9
R22940	13-3	20-30	<0.1	<0.05	<0.2	0.002	<0.2	170	0.35	32.6	0.32	5.7	0.9
R22973	13-G	0-5	<0.1	<0.05	<0.2	0.003	<0.2	80	0.36	27.1	0.28	5.3	0.7
02-14	**Meredosia**												
R22945	14-16	185-205	0.3	<0.05	<0.2	<0.001	<0.2	62	0.18	11.4	0.17	6.1	0.6
R22950	14-11	100-110	0.1	<0.05	<0.2	0.001	<0.2	75	0.33	19.4	0.26	6.4	1.1
R22952	14-9	80-90	0.1	<0.05	<0.2	0.002	<0.2	86	0.32	29.4	0.38	6.6	1.1
R22954	14-7	60-70	0.1	<0.05	<0.2	0.003	<0.2	84	0.45	28.7	0.37	7.7	1.5
R22956	14-5	40-50	<0.1	<0.05	<0.2	0.001	<0.2	86	0.32	35.4	0.37	6.0	0.9
R22958	14-3	20-30	0.1	<0.05	<0.2	0.001	<0.2	78	0.45	29.4	0.33	7.1	1.2
R22974	14-G	0-5	<0.1	<0.05	<0.2	0.002	<0.2	76	0.43	28.0	0.33	6.4	0.8

Appendix 5. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP-MS at a contract lab using an aqua regia digestion. All values in mg/kg unless noted otherwise.

Laboratory Number/Core ID	Depth Interval (cm)	Hf	Ta	W	Re	Au (µg/g)	Hg (µg/g)	Tl	Pb	Bi	Th	U
Quality-assurance - Quality Control Samples												
R22982 NIST 8704 Buffalo River Sediment		<0.1	<0.05	<0.2	0.001	<0.2	1,096	0.55	141.4	0.57	2.7	0.8
R22988		<0.1	<0.05	0.2	0.002	<0.2	993	0.54	141.8	0.58	2.5	0.7
R22982 Set 2		<0.1	<0.05	0.2	0.005	<0.2	895	0.53	146.8	0.61	2.3	0.7
R22982 Set 3		<0.1	<0.05	0.4	0.003	4.9	956	0.52	134.5	0.67	2.2	0.7
Certified Total Concentrations 8704		8.4							150		9.07	3.09
Certified Total Concentrations 2704		(8)					1,470	1.06	161		(9.2)	3.13
R22983 NIST 2709 San Joaquin Soil		<0.1	<0.05	<0.2	<0.001	140	1,312	0.27	11.9	0.25	7.1	1.4
R22983 Set 2		<0.1	<0.05	<0.2	0.001	157	1,278	0.31	13.7	0.29	7.9	1.6
R22983 Set 3		<0.1	<0.05	<0.2	0.001	174	1,372	0.27	11.7	0.29	6.7	1.4
Certified Total Concentrations 2709		(3.7)		(2)		(300)	1,400	0.74	18.9		(11)	(3)
Noncertified Leachable Concentrations 2709									13.0			
R22984 Peoria Sediment Sec. Ref		<0.1	<0.05	<0.2	0.001	<0.2	283	0.34	54.5	0.44	4.1	1.3
Split Tested 8/2002 (Cahill 2002)		<0.1	<0.05	<0.2	<0.001	4.9	321	0.37	58.0	0.54	4.6	1.5
R22985 NIES-CRM-02 Pond Sediment		0.2	<0.05	0.2	0.001	46.5	1,170	0.21	89.1	0.56	2.2	0.6
R22985 Set 2		0.2	<0.05	<0.2	0.001	66.5	1,018	0.21	100.5	0.65	2.7	0.7
Certified Total Concentrations							(1,300)		105			
R22986 NIST 2711- Montana Soil		<0.1	<0.05	0.5	0.005	6.1	6,430	1.70	1,110	2.30	7.0	1.2
R22986 Set 2		<0.1	<0.05	0.4	0.003	24.2	6,447	1.80	1,100	2.44	7.8	1.2
Certified Total Concentrations 2711		(7.3)		(3)		(30)	6,250	2.47	1,162		(14)	(2.6)
Noncertified Leachable Concentrations 2711									1,100			
R22987 Grand Calumet Sediment		<0.1	<0.05	<0.2	0.004	<0.2	1,761	0.28	73.3	0.27	2.3	0.9
Mean of 5 replicates (Cahill 1999)		3.6	0.50	0.9		<100	1,900	2	120.0		5.3	3.6
Noncertified total concentrations shown in parentheses												
Contract Laboratory Control Material												
USGS GXR-1 Set 1 Jasperoid : Utah							3,815					
USGS GXR-1 Set 2		0.1	<0.05	150	0.005	3270	4,033	0.39	752	1,580	1.6	32.2
USGS GXR-1 Set 3		<0.1	<0.05	160	0.003	2,990	3,890	0.33	652	1,490	1.5	29.8
Certified TotalConcentrations GXR-1		0.96	0.175	164		3,300	3,900	0.39	730	1,380	2.44	34.9
USGS GXR-2 Soil (B zone) : Utah		0.1	<0.05	<0.2	0.001	13.9	2,965	0.59	664	0.29	4.0	1.4
USGS GXR-2 Set 2		0.1	<0.05	<0.2	<0.001	22.8	2,891	0.57	662	0.30	3.9	1.5
USGS GXR-2 Set 3		<0.1	<0.05	<0.2	0.001	32.8	2,895	0.58	633	0.31	4.1	1.5
Certified Total Concentrations GXR-2		8.3	0.9	1.9		36	2,900	1.03	690	0.69	8.8	2.9
USGS GXR-4 -Porphyry Copper Mill Heads : Utah		0.2	<0.05	9.0	0.172	460	100	2.90	41.4	19.6	18.2	4.7
USGS GXR-4 -Set 2		0.2	<0.05	9.6	0.174	504	109	2.91	44.9	20.7	19.9	5.2
USGS GXR-4 -Set 3		0.2	<0.05	11.1	0.184	692	117	2.93	41.7	20.7	19.8	5.1
Certified Total Concentrations GXR-4		6.3	0.79	30.8		470	110	3.2	52	19	22.5	6.2
USGS GXR-6 Soil (B zone): North Carolina		0.3	<0.05	<0.2	<0.001	67.4		1.65	90.6	0.16	3.7	0.7
USGS GXR -6 Set 2		<0.1	<0.05	<0.2	0.001	60.7		1.78	98.2	0.16	3.6	0.7
USGS GXR -6 Set 3		0.2	<0.05	<0.2	<0.001	85.7		1.74	99.0	0.18	3.5	0.8
Certified Total Concentrations GXR-6		4.3	0.485	1.9		95		2.2	101	0.29	5.3	1.54
SO-2 Canadian Soil (Mercury Only)							74					
SO-2 Set 2							78					
SO-2 Set 3							79					
Certified Total Concentrations SO-2							72-91					

Appendix 6. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP using strong acid digestion at ISGS. All values in mg/kg unless noted otherwise..

*Denotes replicate Lab Number	Core ID	Depth Interval (cm)	Li	Be	B	Na	Mg (%)	Al (%)	Si (%)	P	S	K (%)
02-6	**Wightman**											
R22808	6-17	180-206	42	1.3	15	217	0.91	2.88	0.29	490	187	0.46
R22809	6-16	155-180	51	1.5	44	325	0.82	4.00	0.54	570	726	0.86
R22810	6-15	140-155	48	1.2	30	322	0.81	3.74	0.28	620	1,350	0.84
R22810	*6-15		45	1.0	31	260	0.79	3.44	0.30	640	1,350	0.67
R22811	6-14	130-140	42	1.3	33	316	1.10	3.62	0.29	1,120	1,750	0.87
R22812	6-13	120-130	42	1.0	36	393	1.30	3.79	0.33	1,410	2,820	0.90
R22813	6-12	110-120	42	1.0	31	383	1.21	3.50	0.34	1,470	2,980	0.77
R22814	6-11	100-110	41	0.9	24	332	1.20	3.31	0.38	1,360	3,010	0.81
R22815	6-10	90-100	39	1.4	29	297	1.05	3.46	0.33	1,140	1,430	0.76
R22816	6-9	80-90	37	1.0	33	286	1.06	3.21	0.41	1,210	1,680	0.76
R22817	6-8	70-80	36	0.9	22	274	1.06	3.03	0.32	1,180	1,170	0.71
R22818	6-7	60-70	34	1.0	26	274	1.08	3.11	0.45	1,280	1,360	0.71
R22819	6-6	50-60	37	1.3	24	306	1.09	3.24	0.52	1,340	1,370	0.75
R22820	6-5	40-50	38	1.0	28	366	1.17	3.63	0.54	2,030	1,460	0.73
R22820	*6-5		38	1.3	31	400	1.18	3.85	0.56	2,080	1,450	0.89
R22821	6-4	30-40	37	1.0	25	357	1.15	3.51	0.53	2,200	1,260	0.85
R22822	6-3	20-30	39	1.4	34	458	1.20	4.14	0.49	1,690	1,470	0.97
R22823	6-2	10-20	38	1.0	30	427	1.24	3.73	0.56	1,360	1,790	0.90
R22824	6-1	0-10	31	1.0	28	356	1.48	3.02	0.55	1,290	1,310	0.75
02-13	**Mantanzas**											
R22923	13-20	230-257	37	1.2	24	322	0.64	3.47	0.52	380	610	0.76
R22924	13-19	205-230	38	0.9	17	305	0.66	3.38	0.52	470	682	0.76
R22925	13-18	185-205	32	1.0	<5	188	0.58	2.51	0.54	380	385	0.43
R22926	13-17	160-185	37	1.2	16	249	0.64	3.18	0.46	380	198	0.58
R22927	13-16	150-160	30	0.8	6	192	0.56	2.41	0.22	660	441	0.54
R22928	13-15	140-150	29	0.9	<5	241	0.57	2.83	0.17	720	676	0.48
R22929	13-14	130-140	31	1.0	25	281	0.59	3.25	0.28	760	1,000	0.64
R22929	*13-14		28	1.0	25	190	0.53	2.52	0.30	720	940	0.48
R22930	13-13	120-130	32	1.0	<5	224	0.59	2.87	0.17	630	1,530	0.44
R22931	13-12	110-120	33	1.0	10	262	0.64	3.27	0.23	720	1,900	0.60
R22932	13-11	100-110	33	1.4	9	231	0.68	3.15	0.24	770	1,780	0.51
R22933	13-10	90-100	36	1.0	9	225	0.71	3.25	0.37	780	1,540	0.59
R22934	13-9	80-90	36	1.5	13	282	0.72	3.66	0.32	790	1,570	0.69
R22935	13-8	70-80	36	1.5	17	314	0.76	3.82	0.33	750	1,420	0.78
R22936	13-7	60-70	29	1.3	<5	193	0.67	2.52	0.52	840	1,150	0.37
R22937	13-6	50-60	33	1.4	5	395	0.71	2.84	0.49	810	1,310	0.42
R22937	*13-6		34	1.3	10	250	0.76	3.35	0.33	920	1,390	0.48
R22938	13-5	40-50	32	1.0	13	268	0.77	3.22	0.30	1,020	1,110	0.57
R22939	13-4	30-40	33	1.0	8	250	0.80	2.87	0.33	1,020	1,010	0.51
R22940	13-3	20-30	30	0.9	8	265	0.76	2.75	0.48	860	1,000	0.44
R22941	13-2	10-20	35	1.3	14	275	0.86	3.16	0.41	770	1,470	0.53
R22942	13-1	0-10	33	1.0	17	292	0.89	3.17	0.41	870	1,320	0.56

Quality Assurance - Quality Control Samples

	Li	Be	B	Na	Mg (%)	Al (%)	Si (%)	P	S	K (%)
Q00271 NIST 2709	41	0.8	30	712	1.24	3.07	0.48	440	705	0.45
Certified Total Concentrations 2709				1,160	1.51	7.50	29.66	620	890	2.03
Noncertified Leachable Concentrations 2709				680	1.4	2.6		700		0.32
Q00272 NIST 8704	32	0.9	6	195	0.85	1.64	0.19	760	3,330	0.37
Certified Total Concentrations 8704				553	1.20	6.10				2.00
Certified Total Concentrations 2704	47.5			548	1.20	6.11	29.08	998	3,970	2.00

Noncertified total concentrations shown in parentheses

Appendix 6. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP using strong acid digestion at ISGS. All values in mg/kg unless noted otherwise..

*Denotes replicate Lab Number	Core ID	Depth Interval (cm)	Ca (%)	Sc	Ti	V	Cr	Mn	Fe (%)	Co	Ni	Cu
02-6	**Wightman**											
R22808	6-17	180-206	0.96	6.5	158	30	30	672	3.17	13	32	26
R22809	6-16	155-180	0.64	8.2	412	50	40	276	3.16	15	34	30
R22810	6-15	140-155	0.68	7.9	308	44	36	258	3.30	16	35	36
R22810	*6-15		0.69	7.2	302	40	34	259	3.28	13	34	31
R22811	6-14	130-140	1.52	7.5	426	42	42	409	3.50	13	34	38
R22812	6-13	120-130	2.42	7.7	521	43	86	463	3.70	14	35	96
R22813	6-12	110-120	2.32	6.9	458	38	105	475	3.67	14	56	134
R22814	6-11	100-110	2.44	6.9	445	33	104	473	3.62	14	43	142
R22815	6-10	90-100	1.82	7.1	506	37	78	430	3.30	14	35	69
R22816	6-9	80-90	1.85	6.8	486	35	71	483	3.23	15	38	56
R22817	6-8	70-80	1.75	6.5	412	37	56	481	3.14	14	35	47
R22818	6-7	60-70	1.90	6.7	474	34	68	458	3.14	15	34	58
R22819	6-6	50-60	1.83	6.9	466	40	63	431	3.13	13	43	49
R22820	6-5	40-50	1.98	7.3	536	40	74	577	3.29	10	52	55
R22820	*6-5		1.88	7.9	574	45	77	584	3.30	15	52	54
R22821	6-4	30-40	2.12	7.2	539	41	82	677	3.24	15	58	61
R22822	6-3	20-30	2.17	8.0	625	47	75	574	3.20	14	55	56
R22823	6-2	10-20	2.46	7.3	595	45	60	524	3.02	15	45	55
R22824	6-1	0-10	3.39	6.2	505	33	43	541	2.62	10	30	38
02-13	**Mantanzas**											
R22923	13-20	230-257	0.48	7.3	511	37	33	198	3.23	12	25	16
R22924	13-19	205-230	0.49	7.3	494	38	33	247	3.45	14	27	19
R22925	13-18	185-205	0.46	5.8	362	25	25	244	3.33	10	23	15
R22926	13-17	160-185	0.49	6.8	425	32	28	266	3.56	16	26	16
R22927	13-16	150-160	0.84	5.5	208	37	21	429	3.22	12	26	21
R22928	13-15	140-150	1.07	6.0	322	27	27	538	2.91	14	25	23
R22929	13-14	130-140	1.27	6.6	448	39	29	538	2.83	14	30	24
R22929	*13-14		1.21	5.4	310	28	22	510	2.61	12	26	21
R22930	13-13	120-130	0.95	6.0	317	34	24	496	2.87	10	27	19
R22931	13-12	110-120	1.36	6.8	383	39	30	556	3.08	15	29	25
R22932	13-11	100-110	1.31	6.5	327	32	32	585	3.09	14	29	28
R22933	13-10	90-100	1.07	6.8	364	35	30	579	3.12	10	34	25
R22934	13-9	80-90	1.33	7.5	474	39	35	615	3.15	15	37	35
R22935	13-8	70-80	1.78	7.8	463	45	35	660	3.15	15	35	30
R22936	13-7	60-70	1.60	5.9	192	21	26	677	2.92	13	34	30
R22937	13-6	50-60	2.16	6.6	254	28	24	723	3.02	9	38	28
R22937	*13-6		2.12	7.3	354	37	32	727	3.16	14	36	35
R22938	13-5	40-50	2.84	6.7	394	35	35	820	2.93	15	41	30
R22939	13-4	30-40	2.10	6.2	296	29	34	791	2.86	15	36	34
R22940	13-3	20-30	2.07	5.9	269	28	28	703	2.82	14	36	28
R22941	13-2	10-20	2.82	6.6	362	34	34	718	2.88	13	34	30
R22942	13-1	0-10	3.65	6.4	396	36	30	862	2.84	10	28	25

Quality Assurance - Quality Control Samples

	Ca (%)	Sc	Ti	V	Cr	Mn	Fe (%)	Co	Ni	Cu
Q00271 NIST 2709	1.27	7.5	704	63	65	409	2.62	12	63	25
Certified Total Concentrations 2709	1.89	(12)	3420	112	130	538	3.50	13.4	88	34.6
Noncertified Leachable Concentrations 2709	1.5		380	62	79	470	3.00	12	78	32
Q00272 NIST 8704	2.24	3.6	86	9	59	432	2.9	14	39	77
Certified Total Concentrations 8704	2.64		4570	95	122	544	3.97	13.6	43	
Certified Total Concentrations 2704	2.60	(12)	4570	95	135	555	4.11	14	44	98.6

Noncertified total concentrations shown in parentheses

Appendix 6. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by ICP using strong acid digestion at ISGS. All values in mg/kg unless noted otherwise..

*Denotes replicate		Depth											
Lab Number	Core ID	Interval (cm)	Zn	As	Se	Sr	Mo	Cd	Sb	Ba	Tl	Pb	Hg (µg/kg)
02-6 Wightman													
R22808	6-17	180-206	108	<50	<50	43	<10	<2	<50	152	<100	<25	175
R22809	6-16	155-180	119	<50	<50	55	<10	<2	<50	204	<100	<25	266
R22810	6-15	140-155	146	<50	<50	44	<10	<2	<50	201	<100	20	285
R22810	*6-15		146	<50	<50	44	<10	<2	<50	192	<100	18	283
R22811	6-14	130-140	281	<50	<50	42	<10	2.5	<50	205	<100	49	705
R22812	6-13	120-130	500	<50	<50	53	<10	5.3	<50	256	<100	140	2,210
R22813	6-12	110-120	605	<50	<50	57	<10	4.3	<50	264	<100	180	2,600
R22814	6-11	100-110	656	<50	<50	52	<10	6.6	<50	273	<100	180	2,180
R22815	6-10	90-100	427	<50	<50	51	<10	6.9	<50	245	<100	100	1,050
R22816	6-9	80-90	384	<50	<50	46	<10	8.1	<50	224	<100	91	833
R22817	6-8	70-80	342	<50	<50	47	<10	7.5	<50	208	<100	73	793
R22818	6-7	60-70	368	<50	<50	48	<10	8.7	<50	214	<100	69	668
R22819	6-6	50-60	323	<50	<50	49	<10	7.6	<50	217	<100	64	526
R22820	6-5	40-50	372	<50	<50	60	<10	7.4	<50	236	<100	71	636
R22820	*6-5		371	<50	<50	59	<10	9.3	<50	248	<100	69	638
R22821	6-4	30-40	382	<50	<50	61	<10	8.1	<50	240	<100	76	527
R22822	6-3	20-30	345	<50	<50	66	<10	6.1	<50	264	<100	68	508
R22823	6-2	10-20	285	<50	<50	69	<10	5.5	<50	230	<100	53	419
R22824	6-1	0-10	225	<50	<50	71	<10	2.9	<50	190	<100	30	367
02-13 Mantanzas													
R22923	13-20	230-257	99	<50	<50	45	<10	<2	<50	280	<100	16	131
R22924	13-19	205-230	98	<50	<50	42	<10	<2	<50	257	<100	<25	204
R22925	13-18	185-205	93	<50	<50	35	<10	<2	<50	210	<100	<25	200
R22926	13-17	160-185	98	<50	<50	44	<10	1.6	<50	235	<100	15	166
R22927	13-16	150-160	93	<50	<50	33	<10	2.5	<50	184	<100	23	189
R22928	13-15	140-150	103	<50	<50	41	<10	<2	<50	197	<100	18	184
R22929	13-14	130-140	105	<50	<50	48	<10	<2	<50	213	<100	20	166
R22929	*13-14		99	<50	<50	38	<10	<2	<50	178	<100	15	163
R22930	13-13	120-130	108	<50	<50	38	<10	2.9	<50	195	<100	<25	191
R22931	13-12	110-120	126	<50	<50	44	<10	<2	<50	217	<100	30	243
R22932	13-11	100-110	135	<50	<50	41	<10	<2	<50	216	<100	25	248
R22933	13-10	90-100	149	<50	<50	40	<10	<2	<50	222	<100	28	227
R22934	13-9	80-90	145	<50	<50	44	<10	2.5	<50	235	<100	22	207
R22935	13-8	70-80	147	<50	<50	45	<10	<2	<50	246	<100	28	180
R22936	13-7	60-70	138	<50	<50	34	<10	<2	<50	195	<100	27	190
R22937	13-6	50-60	164	<50	<50	42	<10	<2	<50	200	<100	27	178
R22937	*13-6		251	<50	<50	48	<10	<2	<50	223	<100	33	178
R22938	13-5	40-50	166	<50	<50	56	<10	2.5	<50	210	<100	38	213
R22939	13-4	30-40	171	<50	<50	48	<10	2.9	<50	194	<100	44	201
R22940	13-3	20-30	147	<50	<50	47	<10	1.9	<50	188	<100	28	199
R22941	13-2	10-20	152	<50	<50	51	<10	<2	<50	200	<100	34	185
R22942	13-1	0-10	147	<50	<50	61	<10	<2	<50	195	<100	24	165

Quality Assurance - Quality Control Samples

	Zn	As	Se	Sr	Mo	Cd	Sb	Ba	Tl	Pb	Hg (µg/kg)
Q00271 NIST 2709	85	<50	<50	97	<10	1.2	<50	395	<100	10	1,420
Certified Total Concentrations 2709	106	17.7	1.57	231	(2)	0.38	7.9	968	0.74	18.9	1,400
Noncertified Leachable Concentrations 2709	100	<20		101	<2	<1	<10	398		13	
Q00272 NIST 8704	355	<50	<50	41	<10	3.6	<50	107	<100	130	992
Certified Total Concentrations 8704	408	(17)				2.9	3.1	413		150	
Certified Total Concentrations 2704	438	23.4	1.12	(130)		3.45	3.79	414	1.06	161	1,470

Noncertified total concentrations shown in parentheses

Appendix 7. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by EDX at ISGS. All values in mg/kg.

Lab Number	Core ID	Depth Interval (cm)	Zn	Br	Rb	Sr	Ag	Cd	In	Sn	Sb	Ba	La	Ce
02-1 Senachwine Lake														
R22716	1-16	190-218	57	3.1	77	134	1.1	1.9	<0.5	3.4	0.5	399	32	51
R22717	1-15	165-190	64	2.3	74	127	2.3	1.1	<0.5	5.2	1.3	386	32	51
R22718	1-14	145-165	56	1.2	99	107	1.5	1.7	<0.5	5.2	1.5	492	40	59
R22719	1-13	120-145	71	1.8	116	101	<0.5	1.2	<0.5	4.3	0.8	540	45	69
R22720	1-12	110-120	64	2.1	114	95	1.3	2.1	<0.5	4.2	0.8	494	34	57
R22721	1-11	100-110	197	6.6	123	98	<0.5	1.2	<0.5	4.3	0.8	540	45	69
R22722	1-10	90-100	227	5.5	133	95	2.1	1.7	<0.5	9.0	2.7	554	41	64
R22723	1-9	80-90	272	5.5	130	96	1.9	2.5	<0.5	9.5	2.5	564	40	64
R22724	1-8	70-80	356	4.7	130	100	2.9	2.7	<0.5	9.1	2.2	582	46	71
R22725	1-7	60-70	379	4.2	130	102	2.0	3.9	1.3	12.0	3.0	595	44	67
R22726	1-6	50-60	327	3.5	129	110	2.4	4.8	<0.5	9.0	2.8	608	41	68
R22727	1-5	40-50	408	7.7	123	118	2.5	7.6	<0.5	9.1	2.4	600	41	60
R22728	1-4	30-40	380	4.2	125	108	2.9	6.7	<0.5	9.2	2.8	593	42	64
R22729	1-3	20-30	302	4.4	127	105	3.6	5.3	1.2	9.3	3.3	585	44	68
R22730	1-2	10-20	260	4.4	115	124	2.1	3.0	0.6	7.1	0.9	575	38	63
R22731	1-1	0-10	231	3.7	116	128	0.9	2.6	<0.5	6.0	0.8	597	37	59
R22961	1-G	0-5	225	4.2	107	129	2.3	2.5	<0.5	6.6	1.4	568	36	64
02-2 Sawmill Lake														
R22732	2-23	230-265	<50	4.6	79	143	2.5	2.5	<0.5	4.5	2.1	410	26	43
R22733	2-22	210-230	61	4.6	103	117	2.2	2.0	0.8	5.2	1.6	453	31	50
R22734	2-21	200-210	91	7.1	104	117	2.3	1.1	<0.5	5.3	1.2	447	26	46
R22735	2-20	190-200	130	3.8	136	89	1.9	0.9	<0.5	6.2	1.7	557	40	60
R22736	2-19	180-190	212	5.6	137	101	2.3	2.9	<0.5	6.8	2.5	586	34	59
R22737	2-18	170-180	237	4.8	136	93	1.9	2.5	<0.5	8.8	1.7	574	38	59
R22738	2-17	160-170	240	4.6	131	95	2.6	2.6	0.5	13.0	1.0	548	42	65
R22739	2-16	150-160	315	4.0	128	93	2.8	2.4	0.8	14.0	2.2	556	48	76
R22740	2-15	140-150	428	5.8	134	98	3.4	3.6	<0.5	14.7	2.2	569	48	71
R22741	2-14	130-140	594	5.9	127	96	3.9	5.8	0.6	19.1	3.5	579	42	67
R22742	2-13	120-130	538	5.6	129	99	4.0	6.3	0.5	15.6	3.4	587	46	64
R22743	2-12	110-120	360	5.0	132	94	2.1	4.1	<0.5	11.0	3.4	580	43	67
R22744	2-11	100-110	328	4.6	133	106	3.4	4.6	0.6	8.4	2.7	573	42	64
R22745	2-10	90-100	378	4.9	131	100	3.5	8.3	<0.5	9.8	3.1	583	45	72
R22746	2-9	80-90	372	4.0	130	102	3.2	7.5	0.8	9.0	2.3	602	46	67
R22747	2-8	70-80	349	4.5	134	107	5.7	8.9	2.1	9.8	4.0	580	47	70
R22748	2-7	60-70	452	4.9	127	114	2.7	5.6	<0.5	8.2	2.3	560	49	72
R22749	2-6	50-60	449	4.6	125	123	5.3	11.4	1.5	11.4	3.0	564	44	63
R22750	2-5	40-50	429	4.7	121	113	3.7	8.5	0.9	9.7	2.2	562	45	64
R22751	2-4	30-40	337	3.8	129	110	2.9	5.7	0.5	10.9	2.9	580	39	63
R22752	2-3	20-30	284	4.4	125	108	2.5	5.6	<0.5	8.4	1.5	554	38	63
R22753	2-2	10-20	242	4.2	125	116	2.8	4.6	1.5	8.3	2.5	559	42	61
R22754	2-1	0-10	214	4.6	114	130	2.9	2.8	<0.5	8.1	1.8	530	34	58
R22962	2-G	0-5	216	4.5	114	132	1.5	2.3	<0.5	7.8	1.2	522	35	59
02-3 Billsbach Lake														
R22755	3-20	210-234	<50	1.3	90	98	2.0	1.7	<0.5	5.7	1.8	504	32	56
R22756	3-19	190-210	73	3.6	89	86	1.9	1.8	0.7	4.6	1.2	521	33	55
R22757	3-18	170-190	<50	3.7	96	87	1.9	2.5	<0.5	8.8	1.7	574	38	59
R22758	3-17	160-170	68	3.5	113	90	<0.5	1.3	<0.5	4.1	1.0	533	34	62
R22759	3-16	150-160	177	3.3	142	85	2.8	2.9	<0.5	7.1	2.2	575	42	65
R22760	3-15	140-150	354	5.8	130	92	3.2	2.9	1.4	14.3	3.4	566	47	33
R22761	3-14	130-140	508	5.4	132	96	3.2	3.4	1.7	15.5	3.6	595	47	74
R22762	3-13	120-130	421	5.3	129	100	3.5	4.4	0.5	13.2	2.6	601	41	64
R22763	3-12	110-120	374	4.5	131	107	3.3	6.3	0.6	10.0	3.4	576	45	63
R22764	3-11	100-110	384	4.2	129	112	2.7	6.1	<0.5	8.7	3.4	576	45	69
R22765	3-10	90-100	376	4.7	123	113	3.5	7.5	1.4	9.5	3.2	560	45	69
R22766	3-9	80-90	538	3.9	116	113	4.3	10.1	1.6	11.9	3.8	567	42	64
R22767	3-8	70-80	524	4.9	106	118	3.0	9.0	1.1	11.5	3.3	564	43	62
R22768	3-7	60-70	389	4.8	112	116	4.4	7.7	1.6	12.1	3.5	556	43	61
R22769	3-6	50-60	297	4.0	109	117	3.3	5.5	1.5	11.1	2.2	546	38	57
R22770	3-5	40-50	268	3.6	103	116	3.9	4.5	0.5	8.1	2.0	521	41	61
R22771	3-4	30-40	257	3.8	97	129	2.3	4.8	<0.5	9.2	3.0	513	37	60
R22772	3-3	20-30	221	4.4	93	127	3.0	3.9	1.1	8.6	1.8	490	36	60
R22773	3-2	10-20	159	4.2	77	130	1.6	2.8	<0.5	7.0	1.3	474	30	51
R22774	3-1	0-10	133	2.9	77	134	2.1	2.7	0.5	7.9	2.4	473	30	49
R22963	3-G	0-5	162	4.4	80	132	1.5	2.2	<0.5	8.1	0.9	473	33	50

Appendix 7. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by EDX at ISGS. All values in mg/kg.

Lab Number	Core ID	Depth Interval (cm)	Zn	Br	Rb	Sr	Ag	Cd	In	Sn	Sb	Ba	La	Ce
02-4	**Weiss Lake**													
R22775	4-18	230-248	71	2.2	84	119	0.6	1.0	<0.5	3.0	<0.5	411	32	52
R22776	4-17	205-230	80	2.1	83	128	1.1	1.7	0.8	3.9	0.5	404	31	55
R22777	4-16	180-205	<50	2.6	85	117	2.1	2.0	1.2	4.7	2.3	401	36	52
R22778	4-15	155-180	<50	2.0	82	101	1.7	1.3	<0.5	3.8	<0.5	411	27	54
R22779	4-14	130-155	<50	2.2	86	99	2.2	1.6	<0.5	4.7	1.8	447	37	56
R22780	4-13	120-130	<50	0.9	97	98	2.8	2.2	1.3	5.1	2.1	502	43	70
R22781	4-12	110-120	<50	1.1	99	100	2.0	1.6	1.0	5.7	2.2	492	44	63
R22782	4-11	100-110	<50	1.1	100	103	1.1	0.7	<0.5	3.7	0.8	521	36	64
R22783	4-10	90-100	<50	1.7	102	98	1.6	1.3	<0.5	3.3	0.5	510	39	64
R22784	4-9	80-90	<50	1.2	102	100	2.2	2.4	0.9	5.3	2.5	501	45	67
R22785	4-8	70-80	<50	0.8	101	103	1.3	0.9	<0.5	3.3	<0.5	541	38	66
R22786	4-7	60-70	<50	2.5	104	100	1.5	1.7	<0.5	4.7	1.2	505	39	59
R22787	4-6	50-60	201	2.2	107	98	4.3	5.5	2.4	8.6	2.0	489	46	63
R22788	4-5	40-50	348	3.3	123	108	4.0	7.5	1.0	9.4	4.4	553	45	68
R22789	4-4	30-40	381	4.6	119	109	4.0	8.5	1.4	10.2	3.1	552	44	68
R22790	4-3	20-30	430	4.4	111	112	3.3	7.0	<0.5	10.4	3.0	569	44	68
R22791	4-2	10-20	381	4.1	114	117	2.7	5.3	0.7	8.7	1.0	587	37	60
R22792	4-1	0-10	279	4.4	112	123	0.7	3.4	<0.5	6.7	0.5	568	36	59
R22964	4-G	0-5	236	3.9	101	126	1.7	2.4	<0.5	7.1	1.4	510	34	60
02-5	**Goose Lake**													
R22793	5-15	170-198	<50	1.2	77	91	3.3	2.6	<0.5	4.5	0.9	416	33	50
R22794	5-14	145-170	<50	0.8	92	93	2.0	1.4	1.0	5.6	0.7	523	37	61
R22795	5-13	120-145	56	1.2	107	95	2.7	2.7	0.9	7.0	2.4	469	41	63
R22796	5-12	110-120	129	3.7	131	90	2.6	3.0	0.9	6.2	3.2	578	43	68
R22797	5-11	100-110	205	4.1	133	89	1.9	2.3	<0.5	7.3	1.3	595	40	67
R22798	5-10	90-100	341	5.9	127	98	2.8	2.5	1.1	12.5	2.0	555	44	74
R22799	5-9	80-90	494	5.0	128	98	2.6	3.7	<0.5	14.9	1.5	596	47	72
R22800	5-8	70-80	518	6.0	130	103	2.9	4.5	0.9	13.7	2.7	597	44	68
R22801	5-7	60-70	322	3.9	133	104	2.0	5.4	<0.5	9.0	2.6	598	46	64
R22802	5-6	50-60	328	3.6	130	110	1.7	5.2	<0.5	8.5	3.5	578	44	63
R22803	5-5	40-50	368	3.9	129	117	2.7	6.1	0.5	9.1	3.0	591	46	72
R22804	5-4	30-40	423	4.9	119	113	3.3	5.6	<0.5	8.4	2.7	588	44	70
R22805	5-3	20-30	354	4.4	128	106	2.4	5.4	<0.5	8.4	2.0	597	43	66
R22806	5-2	10-20	381	4.1	114	117	2.7	5.3	0.7	8.7	1.0	587	37	60
R22807	5-1	0-10	278	4.8	115	127	2.8	3.4	<0.5	7.4	1.8	542	40	62
R22965	5-G	0-5	248	4.3	116	133	1.9	3.1	<0.5	7.2	2.0	531	36	63
02-6	**Wightman Lake**													
R22808	6-17	180-206	98	2.2	126	103	1.0	1.2	<0.5	5.4	1.2	524	43	70
R22809	6-16	155-180	110	2.4	135	103	1.0	1.5	<0.5	4.8	0.8	551	45	69
R22810	6-15	140-155	148	3.5	136	98	0.7	0.6	<0.5	5.2	0.8	551	44	65
R22811	6-14	130-140	309	4.9	133	94	1.4	1.7	<0.5	11.2	1.3	560	37	64
R22812	6-13	120-130	567	6.6	122	101	3.3	2.7	<0.5	20.0	2.3	572	46	82
R22813	6-12	110-120	704	7.7	122	100	4.1	4.2	1.0	21.8	3.3	588	45	69
R22814	6-11	100-110	772	7.1	126	105	3.4	4.9	<0.5	22.3	3.4	613	45	67
R22815	6-10	90-100	515	6.2	125	102	2.6	5.1	<0.5	13.9	2.8	602	42	65
R22816	6-9	80-90	411	3.6	118	104	2.7	5.9	<0.5	11.1	3.2	592	39	64
R22817	6-8	70-80	362	3.7	121	106	1.1	5.1	<0.5	8.6	2.6	584	42	64
R22818	6-7	60-70	346	3.2	123	107	1.3	7.0	<0.5	9.1	2.8	601	40	67
R22819	6-6	50-60	340	3.5	118	106	1.3	5.4	<0.5	7.2	1.3	586	40	65
R22820	6-5	40-50	408	4.0	122	108	2.0	5.7	<0.5	8.8	2.2	588	40	69
R22821	6-4	30-40	439	4.6	118	114	4.2	7.5	1.1	9.7	2.7	559	45	66
R22822	6-3	20-30	383	4.2	117	113	3.3	5.3	0.8	9.5	1.4	572	44	68
R22823	6-2	10-20	296	3.5	111	118	3.2	4.9	0.7	10.0	3.2	534	44	65
R22824	6-1	0-10	220	2.8	94	128	3.2	3.2	0.9	8.5	2.0	489	40	60
R22966	6-G	0-5	188	4.4	90	137	1.9	3.3	0.8	8.1	2.1	478	33	50

Appendix 7. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by EDX at ISGS. All values in mg/kg.

Lab Number	Core ID	Depth Interval (cm)	Zn	Br	Rb	Sr	Ag	Cd	In	Sn	Sb	Ba	La	Ce
02-7	**Meadow Lake**													
R22825	7-17	215-234	69	1.1	100	106	1.1	1.4	<0.5	3.6	1.9	477	41	66
R22826	7-16	190-215	58	1.7	99	107	0.7	0.6	<0.5	3.3	<0.5	480	41	66
R22827	7-15	165-190	58	1.4	99	108	1.6	1.8	<0.5	4.4	1.4	466	38	70
R22828	7-14	140-165	96	3.9	93	101	1.4	1.5	<0.5	5.0	0.7	462	39	64
R22829	7-13	120-140	103	3.3	111	101	1.3	1.9	<0.5	5.8	1.7	485	38	62
R22830	7-12	110-120	272	3.2	126	93	1.6	2.9	<0.5	15.9	1.3	572	41	60
R22831	7-11	100-110	296	4.2	112	101	2.7	2.6	1.0	12.4	1.7	531	39	59
R22832	7-10	90-100	459	5.4	110	106	2.9	2.7	<0.5	20.2	2.0	544	47	78
R22833	7-9	80-90	575	6.2	120	114	6.6	7.1	3.4	23.0	4.9	573	54	77
R22834	7-8	70-80	667	5.2	114	109	4.1	6.0	0.8	23.2	3.7	592	45	64
R22835	7-7	60-70	372	4.6	120	123	3.4	6.6	1.0	10.7	3.4	554	41	64
R22836	7-6	50-60	346	3.4	122	122	2.9	7.5	1.8	9.0	3.6	543	46	62
R22837	7-5	40-50	480	4.4	117	122	4.1	8.0	1.4	10.8	3.4	551	39	65
R22838	7-4	30-40	393	3.9	112	116	3.7	6.3	1.0	10.9	2.3	578	41	66
R22839	7-3	20-30	314	5.0	114	120	3.5	5.0	0.9	8.8	2.5	531	45	66
R22840	7-2	10-20	332	4.1	108	121	3.2	4.9	0.5	9.8	2.5	533	42	65
R22841	7-1	0-10	316	5.0	107	129	3.6	4.8	0.7	9.2	2.6	525	41	65
R22967	7-G	0-5	223	3.8	104	133	1.1	2.2	<0.5	5.6	0.8	634	33	56
02-8	**Babb Slough**													
R22842	8-13	165-188	<50	0.5	44	87	1.6	0.8	<0.5	2.7	<0.5	304	21	28
R22843	8-12	140-165	<50	<0.5	45	90	<0.5	<0.5	<0.5	2.1	<0.5	317	19	27
R22844	8-11	115-140	<50	<0.5	42	86	1.2	0.6	<0.5	3.3	<0.5	296	20	27
R22845	8-10	90-115	<50	1.7	52	93	2.2	1.6	0.5	5.0	0.7	326	25	37
R22846	8-9	80-90	<50	<0.5	57	92	2.2	1.5	<0.5	3.7	0.5	359	26	37
R22847	8-8	70-80	60	3.8	75	100	1.8	2.5	0.5	5.1	1.9	419	35	54
R22848	8-7	60-70	<50	<0.5	74	93	1.5	1.2	<0.5	4.1	0.5	447	34	50
R22849	8-6	50-60	<50	1.2	85	94	0.8	0.6	<0.5	3.5	0.9	456	33	52
R22850	8-5	40-50	<50	1.4	89	87	1.5	0.9	<0.5	3.5	<0.5	474	34	52
R22851	8-4	30-40	101	2.8	104	93	1.4	0.9	<0.5	4.6	<0.5	490	37	52
R22852	8-3	20-30	435	4.6	111	105	2.9	6.5	<0.5	10.8	1.9	540	37	62
R22853	8-2	10-20	408	3.9	116	115	3.4	6.9	1.5	10.5	2.8	566	42	62
R22854	8-1	0-10	271	5.0	117	124	2.0	4.4	0.7	7.1	1.4	523	40	57
R22968	8-G	0-5	241	4.7	114	131	1.1	1.6	<0.5	6.2	0.5	531	31	54
02-9	**Upper Peoria RM 178**													
R22855	9-13	210-238	<50	<0.5	53	76	0.6	0.6	<0.5	1.5	<0.5	351	18	30
R22856	9-12	185-210	<50	<0.5	58	78	<0.5	0.5	<0.5	1.8	<0.5	382	19	34
R22857	9-11	165-185	<50	<0.5	78	82	0.7	0.6	<0.5	3.2	<0.5	442	53	46
R22858	9-10	140-165	64	1.7	89	98	0.8	<0.5	<0.5	2.8	<0.5	515	34	60
R22559	9-9	114-140	54	1.4	64	92	1.3	0.6	<0.5	3.1	<0.5	493	33	58
R22860	9-8	85-114	<50	1.1	40	87	1.2	0.5	<0.5	3.0	<0.5	377	16	28
R22861	9-7	60-85	<50	<0.5	28	73	<0.5	0.5	<0.5	<0.5	<0.5	288	11	13
R22862	9-6	50-60	<50	<0.5	35	77	1.2	0.5	<0.5	2.6	<0.5	328	13	18
R22863	9-5	40-50	<50	<0.5	44	89	1.2	1.0	<0.5	3.9	0.6	361	19	27
R22864	9-4	30-40	<50	<0.5	51	89	1.6	1.2	<0.5	2.2	<0.5	394	20	25
R22865	9-3	20-30	93	1.2	75	105	3.1	3.8	0.9	5.4	2.2	460	30	45
R22866	9-2	10-20	171	1.8	93	116	1.9	2.7	<0.5	5.7	<0.5	510	34	53
R22867	9-1	0-10	191	3.9	98	120	2.4	2.9	0.5	6.8	1.2	504	33	54
R22969	9-G	0-5	183	4.3	101	126	2.7	3.0	<0.5	7.6	2.1	509	40	57

Appendix 7. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by EDX at ISGS. All values in mg/kg.

Lab Number	Core ID	Depth Interval (cm)	Zn	Br	Rb	Sr	Ag	Cd	In	Sn	Sb	Ba	La	Ce
02-10 Upper Peoria RM 171														
R22868	10-16	212-232	<50	1.4	87	108	1.1	1.2	<0.5	4.4	<0.5	476	36	56
R22869	10-15	187-212	<50	1.9	69	106	0.8	0.5	<0.5	3.8	1	410	29	46
R22870	10-14	162-187	<50	1.1	60	97	2.2	1.5	<0.5	3.4	0.9	383	29	40
R22871	10-13	137-162	<50	1.2	65	103	0.7	0.7	<0.5	2.2	<0.5	411	25	40
R22872	10-12	112-137	<50	0.8	77	97	0.5	1.1	<0.5	3.7	<0.5	489	33	50
R22873	10-11	100-112	<50	1.4	85	95	2.1	1.9	<0.5	3.8	0.9	468	32	50
R22874	10-10	90-100	69	3.4	111	94	1.3	2.3	<0.5	4.8	1.2	514	39	55
R22875	10-9	80-90	185	4.1	112	97	2.2	3.1	1.0	7	1.6	545	39	63
R22876	10-8	70-80	309	3.1	117	102	1.5	4.0	<0.5	7.9	1.7	565	41	63
R22877	10-7	60-70	287	3.9	121	107	2.2	5.2	<0.5	9.2	1.8	596	40	66
R22878	10-6	50-60	322	3.4	124	105	3.1	6.9	<0.5	9.9	4.3	611	46	72
R22879	10-5	40-50	401	3.8	112	106	2.7	8.6	<0.5	10.1	3.7	579	41	68
R22880	10-4	30-40	412	3.1	101	119	3.0	7.3	<0.5	10.1	2.1	568	37	61
R22881	10-3	20-30	394	2.7	96	123	4.0	7.0	<0.5	10.2	3.3	555	36	58
R22882	10-2	10-20	331	5.0	99	121	3.1	6.3	1.7	9.3	2.7	541	41	58
R22883	10-1	0-10	211	4.6	90	129	2.3	2.6	<0.5	5.7	1.9	492	39	54
R22970	10-G	0-5	164	3.2	83	131	0.7	1.2	<0.5	6.3	<0.5	487	29	49
02-11 Lower Peoria RM 164														
R22884	11-22	240-251	63	2.7	79	118	2.4	2.8	0.6	5.6	1.8	406	33	55
R22885	11-21	215-240	52	2.9	80	117	1.3	0.7	<0.5	2.8	0.6	424	32	50
R22886	11-20	192-215	53	2.5	70	124	1.9	1.4	<0.5	4.3	<0.5	388	29	45
R22887	11-19	180-192	<50	5.4	61	106	1.8	1.6	<0.5	3.6	<0.5	360	21	29
R22888	11-18	170-180	<50	4.7	63	99	1.6	2.2	<0.5	4.1	0.6	352	22	37
R22889	11-17	160-170	<50	4.3	73	91	1.8	2.0	<0.5	8.5	0.9	466	34	52
R22890	11-16	150-160	60	5.2	86	81	1.2	2.6	0.9	4.8	<0.5	464	30	46
R22891	11-15	140-150	<50	4.0	97	87	<0.5	<0.5	<0.5	3	<0.5	518	33	54
R22892	11-14	130-140	51	4.9	91	88	1.1	1.3	<0.5	4.1	<0.5	508	35	58
R22893	11-13	120-130	<50	4.8	95	86	1.5	1.2	<0.5	3.4	0.8	486	33	54
R22994	11-12	110-120	<50	4.2	93	82	1.7	1.4	<0.5	3.6	0.7	463	32	54
R22895	11-11	100-110	55	5.1	97	84	1.4	1.8	<0.5	4.6	1.1	467	35	55
R22896	11-10	90-100	81	5.8	100	95	1.7	1.6	<0.5	4.8	<0.5	459	33	51
R22897	11-9	80-90	100	5.9	111	93	1.7	2.2	<0.5	5.7	0.5	481	34	53
R22898	11-8	70-80	212	5.0	115	98	3.0	3.0	0.8	7.2	1.8	539	40	63
R22899	11-7	60-70	293	4.4	121	110	3.4	4.3	1.0	8.3	3.6	555	44	65
R22900	11-6	50-60	343	4.3	120	109	3.0	6.3	0.6	10.7	3.7	583	42	66
R22901	11-5	40-50	426	3.5	116	115	3.9	7.9	1.3	10.6	3.4	566	41	66
R22902	11-4	30-40	382	4.5	113	114	2.6	6.6	1.2	11.8	3.1	596	45	71
R22903	11-3	20-30	284	2.8	116	119	2.7	4.4	<0.5	8.5	1.5	562	38	61
R22904	11-2	10-20	272	4.2	114	124	1.5	3.3	<0.5	7.3	1.2	542	39	64
R22905	11-1	0-10	240	4.1	102	121	3.6	2.9	0.9	8.2	2.0	530	40	61
R22971	11-G	0-5	237	4.9	104	126	1.4	2.3	<0.5	7.7	1.0	512	33	53
02-12 Quiver Lake														
R22906	12-17	220-257	<50	1.9	51	99	0.5	<0.5	<0.5	1.7	<0.5	389	22	32
R22907	12-16	195-220	<50	0.7	59	106	<0.5	0.5	<0.5	2.6	<0.5	432	25	38
R22908	12-15	170-195	<50	1.8	56	103	0.6	1.5	<0.5	2.9	<0.5	403	24	36
R22909	12-14	145-170	<50	0.6	51	104	1.5	1.3	<0.5	2.7	<0.5	384	20	34
R22910	12-13	120-145	<50	0.5	45	91	1.4	0.5	<0.5	3.3	<0.5	359	22	32
R22911	12-12	110-120	<50	1.2	51	96	2.1	0.7	<0.5	3.7	0.9	405	30	43
R22912	12-11	100-110	<50	1.1	56	104	0.7	0.8	<0.5	3.3	<0.5	440	28	46
R22913	12-10	90-100	<50	<0.5	24	71	0.8	1.0	<0.5	1.1	<0.5	271	12	19
R22914	12-9	80-90	<50	<0.5	24	75	1.5	1.4	<0.5	1.9	<0.5	269	10	10
R22915	12-8	70-80	<50	<0.5	28	77	1.3	<0.5	<0.5	0.9	<0.5	288	11	15
R22916	12-7	60-70	<50	3.2	73	90	1.7	2.0	0.5	4.8	<0.5	458	24	38
R22917	12-6	50-60	147	4.4	106	102	1.9	1.7	<0.5	5.4	1.4	589	43	63
R22918	12-5	40-50	93	2.8	88	107	2.2	1.8	<0.5	5.4	1.5	517	36	57
R22919	12-4	30-40	85	3.5	86	107	1.9	2.1	0.8	5.7	0.9	551	35	60
R22920	12-3	20-30	83	2.6	81	106	2.0	1.8	0.5	4.8	1.3	560	35	56
R22921	12-2	10-20	100	2.1	81	106	2.2	2.2	<0.5	4.4	1.1	562	37	59
R22922	12-1	0-10	128	4.0	91	105	3.1	2.2	0.7	5.5	1.6	539	40	61
R22972	12-G	0-5	132	4.7	91	113	0.5	1.5	<0.5	4.8	0.5	547	35	57

Appendix 7. Concentrations of Inorganic Elements in sediment cores from lakes along the Illinois River determined by EDX at ISGS. All values in mg/kg.

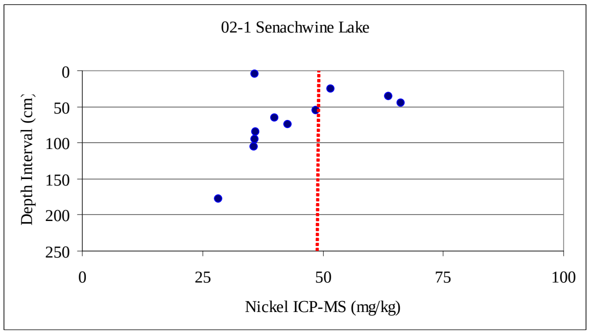
Lab Number	Core ID	Depth Interval (cm)	Zn	Br	Rb	Sr	Ag	Cd	In	Sn	Sb	Ba	La	Ce
02-13 Mantanzas Lake														
R22923	13-20	230-257	72	1.2	100	108	0.6	0.6	<0.5	5.6	0.8	641	41	68
R22924	13-19	205-230	79	1.7	99	108	1.5	1.0	<0.5	4.9	0.7	630	46	69
R22925	13-18	185-205	74	1.2	101	108	1.5	0.6	<0.5	4.0	1.0	616	44	76
R22926	13-17	160-185	86	1.8	94	103	1.1	0.7	<0.5	5.5	1.1	612	44	69
R22927	13-16	150-160	55	1.7	90	103	1.3	0.6	<0.5	4.7	2.0	569	39	67
R22928	13-15	140-150	67	1.7	98	108	1.5	0.6	<0.5	5.3	0.9	598	43	65
R22929	13-14	130-140	63	2.5	101	113	0.8	<0.5	<0.5	4.2	1.9	610	38	66
R22930	13-13	120-130	99	2.5	107	108	2.2	2.1	1.0	4.9	2.1	587	45	68
R22931	13-12	110-120	122	2.9	110	109	1.4	1.8	<0.5	4.8	1.9	592	46	71
R22932	13-11	100-110	146	4.2	109	106	1.9	1.7	<0.5	5.5	2.8	595	49	71
R22933	13-10	90-100	153	4.0	112	100	1.5	2.1	1.0	4.8	1.1	597	48	68
R22934	13-9	80-90	145	3.4	110	104	1.8	1.5	<0.5	5.1	0.9	607	49	68
R22935	13-8	70-80	163	4.0	113	101	2.5	2.4	<0.5	6.5	2.6	617	49	71
R22936	13-7	60-70	137	2.7	113	102	2.5	1.8	<0.5	5.7	2.5	574	48	69
R22937	13-6	50-60	163	3.4	110	106	2.3	2.0	<0.5	6.8	2.2	578	49	71
R22938	13-5	40-50	164	4.7	103	112	1.6	2.0	<0.5	5.9	2.2	562	41	69
R22939	13-4	30-40	188	3.4	105	110	2.6	1.6	<0.5	5.4	1.9	562	48	68
R22940	13-3	20-30	160	2.9	105	105	1.4	2.1	<0.5	6.7	2.7	574	44	67
R22941	13-2	10-20	147	4.7	103	110	1.6	1.9	1.0	5.9	2.4	546	43	65
R22942	13-1	0-10	117	3.2	98	119	2.0	2.2	<0.5	6.3	1.3	537	39	60
R22973	13-G	0-5	155	4.5	102	126	2.2	2.0	<0.5	4.8	0.5	542	37	65
02-14 Meredosia Lake														
R22943	14-18	230-271	69	1.1	94	112	3.3	2.2	<0.5	5.1	1.2	673	49	82
R22944	14-17	205-230	78	1.7	85	136	2.2	1.9	1.0	4.5	1.8	563	40	69
R22945	14-16	185-205	<50	<0.5	75	129	<0.5	<0.5	<0.5	2.6	<0.5	551	33	57
R22946	14-15	160-185	<50	1.1	65	139	2.4	1.2	0.5	3.2	<0.5	527	36	57
R22947	14-14	135-160	<50	1.1	65	131	3.6	1.9	1.4	4.3	2.3	498	38	57
R22948	14-13	120-135	<50	2.3	63	131	2.8	1.6	0.8	3.9	1.0	477	35	54
R22949	14-12	110-120	50	2.6	76	130	2.3	1.2	<0.5	4.1	0.7	519	38	60
R22950	14-11	100-110	94	3.4	102	116	1.3	0.9	<0.5	5.4	<0.5	589	39	64
R22951	14-10	90-100	127	3.4	111	96	2.4	2.2	<0.5	6.2	1.4	633	43	73
R22952	14-9	80-90	151	3.0	122	97	2.1	0.8	<0.5	5.0	1.9	663	44	73
R22953	14-8	70-80	128	3.8	118	96	2.8	1.8	1.5	5.2	2.8	640	45	72
R22954	14-7	60-70	144	3.4	124	104	1.1	0.7	<0.5	5.3	1.3	642	43	71
R22955	14-6	50-60	149	4.4	118	111	2.8	1.8	1.5	5.2	2.8	641	45	72
R22956	14-5	40-50	153	3.8	117	118	1.1	1.5	<0.5	4.3	0.9	623	41	68
R22957	14-4	30-40	152	4.3	119	106	1.3	1.0	<0.5	5.2	2.3	626	46	71
R22958	14-3	20-30	134	3.5	115	105	1.0	1.9	<0.5	5.7	<0.5	506	35	63
R22959	14-2	10-20	144	5.1	113	118	2.4	1.7	0.8	5.2	2.4	606	43	68
R22960	14-1	0-10	229	6.8	105	116	2.9	2.7	<0.5	6.2	1.4	581	44	76
R22974	14-G	0-5	145	4.9	104	123	1.7	1.8	<0.5	4.9	0.9	542	39	61

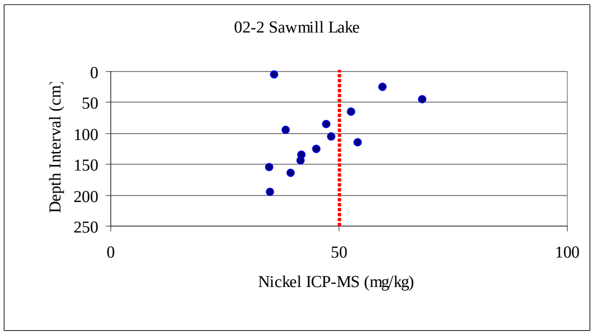
Quality-assurance - Quality Control Samples

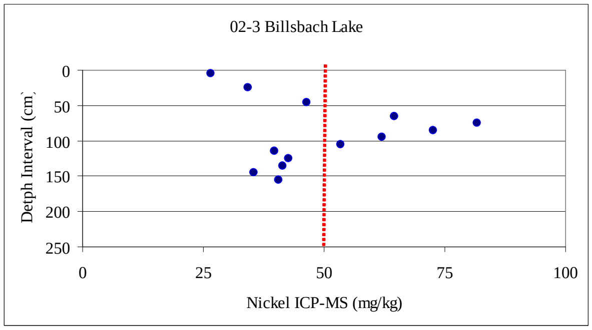
	Zn	Br	Rb	Sr	Ag	Cd	In	Sn	Sb	Ba	La	Ce
R22982 NIST 8704 Buffalo River Sedir	383	5.7	98	136	1.5	3.1	<0.5	11	3.0	459	36	59
Certified Total Concentrations 8704	408					2.9			3.1	413		
Certified Total Concentrations 2704	438	(7)	(100)	(130)		3.5		(9.5)	3.8	414	(29)	(72)
R22983 NIST 2709 San Joaquin Soil	82	5.7	90	222	2.5	1.6	0.7	5.4	8.2	960	31	49
Certified Total Concentrations 2709	106		(96)	231	0.4	0.4			7.9	968	(23)	(42)
R22984 Peoria Sediment Sec. Ref	289	3.8	114	113	3.3	4.8	0.4	10	2.6	560	39	65
R22985 NIES-CRM-02 Pond Sediment	315	9.7	41	105	2.9	2.7	0.7	12	2.4	332	20	30
Certified Total Concentrations	343	(17)	(42)	(110)		0.8			(2)		(17)	
R22986 NIST 2711- Montana Soil	349	13.8	112	242	7.5	33	3.2	9.3	18.9	749	49	73
Certified Total Concentrations 2711	350	(5)	(110)	245	4.6	42	1.1		19.4	726	(40)	(69)
R22987 Grand Calumet Sediment	245	3.8	68	120	1	2.2	<0.5	8.4	3.1	427	22	32
Mean of 5 replicates (Cahill 1999)	272		81	125	<1	<5		<7	2.6	429	21	42

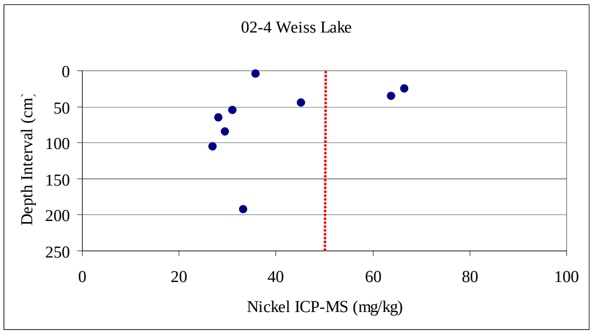
Noncertified total concentrations shown in parentheses

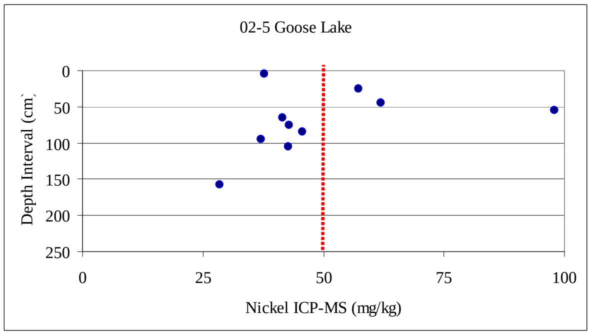
Appendix 8. Concentrations of Nickel in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs and ICP at ISGS. PEC = 49 mg/kg

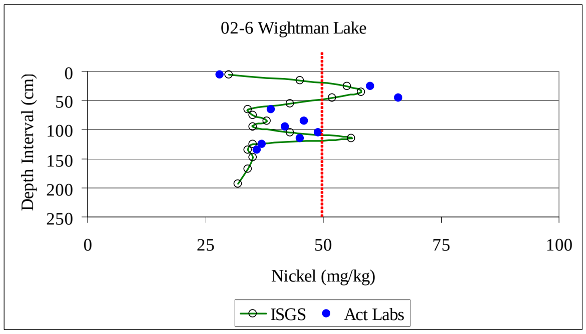


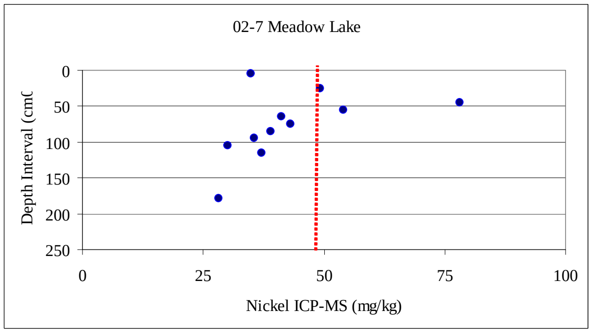


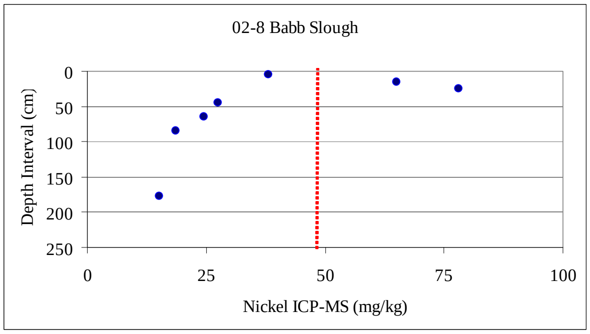




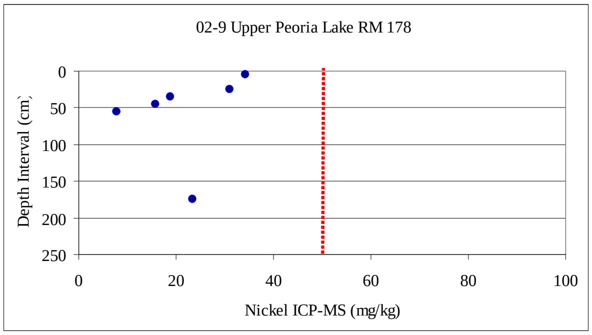


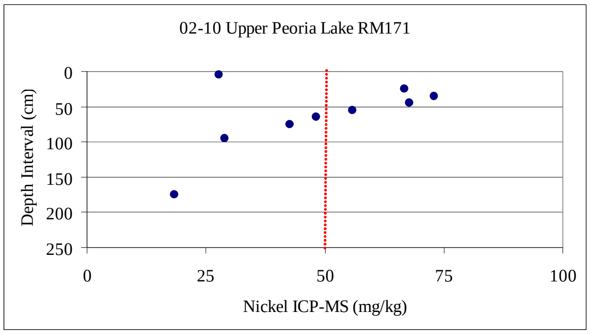


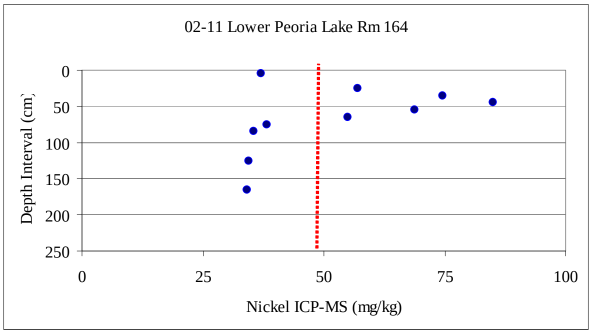


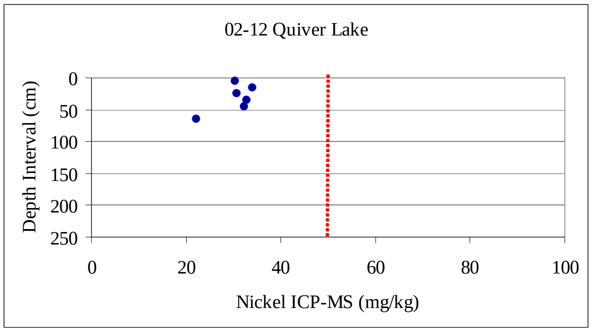


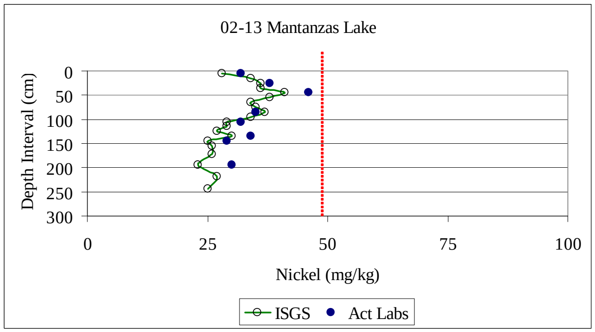
Appendix 8. Concentrations of Nickel in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs and ICP at ISGS. PEC = 49 mg/kg

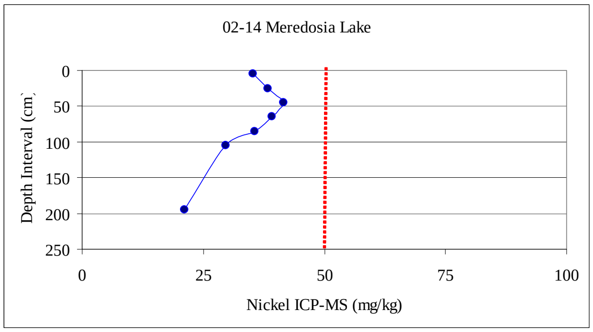




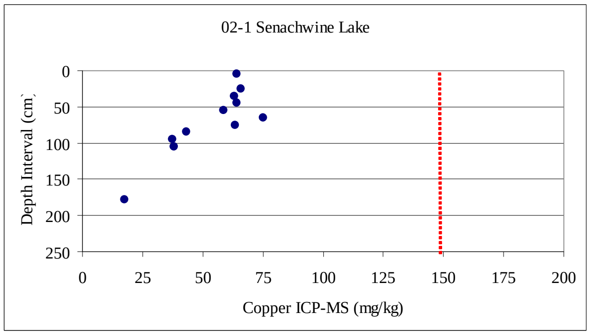


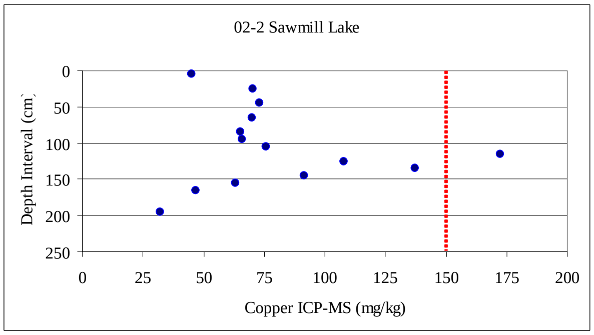


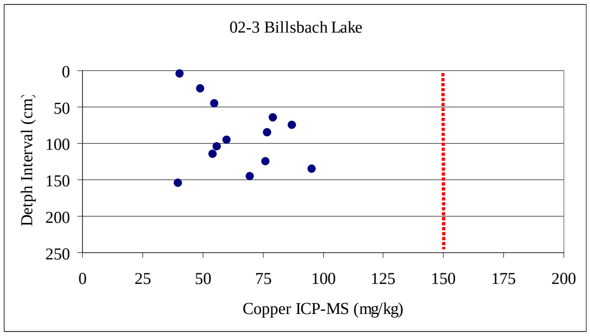


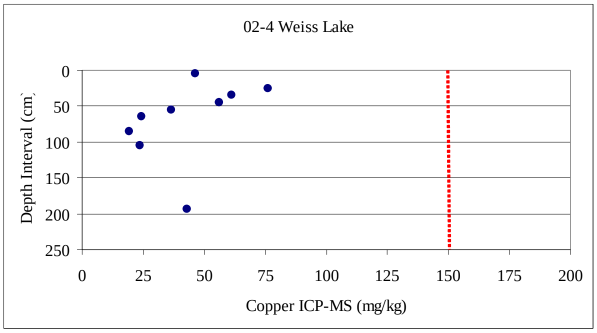


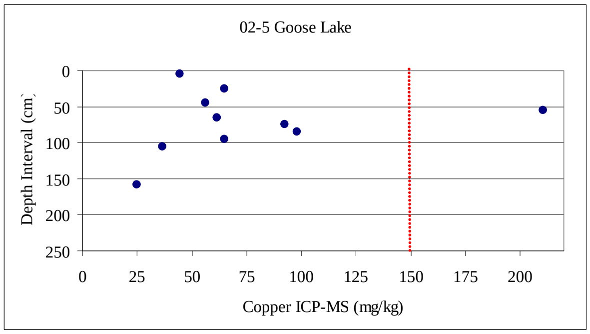
Appendix 8. Distributions of Copper in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs and ICP at ISGS. PEC = 149 mg/kg.

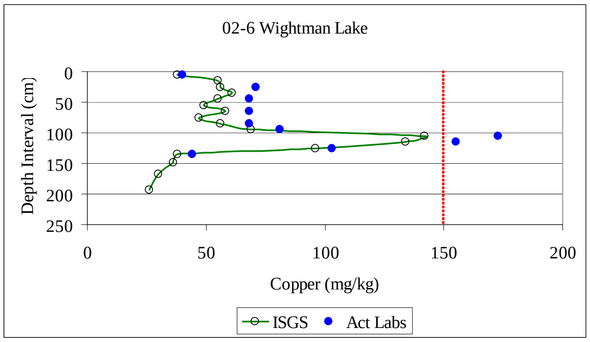


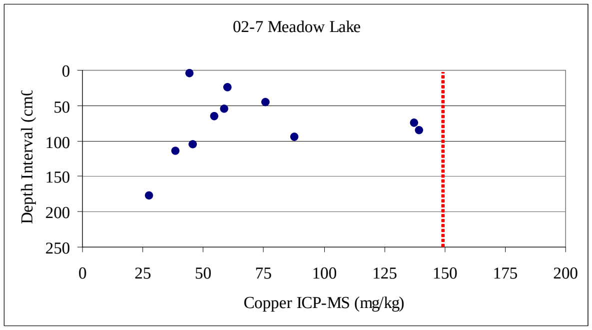


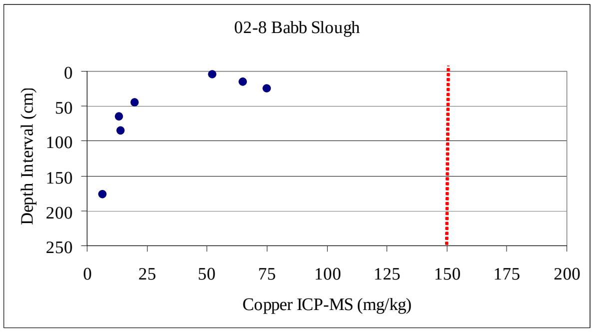




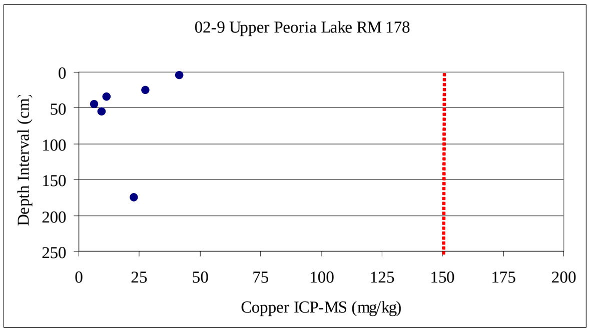


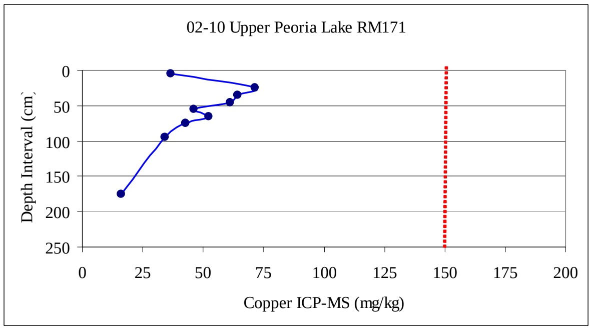


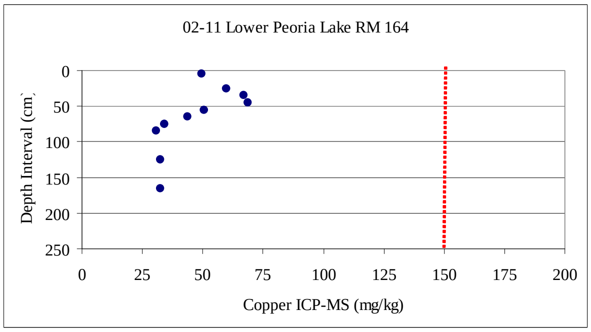


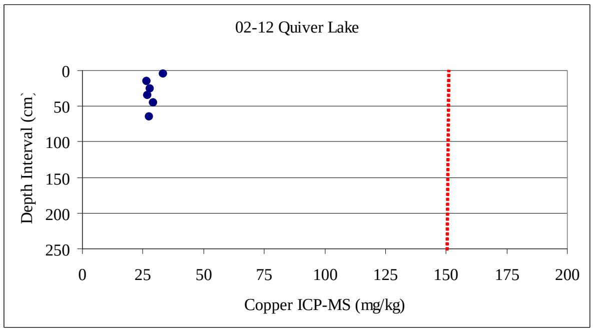


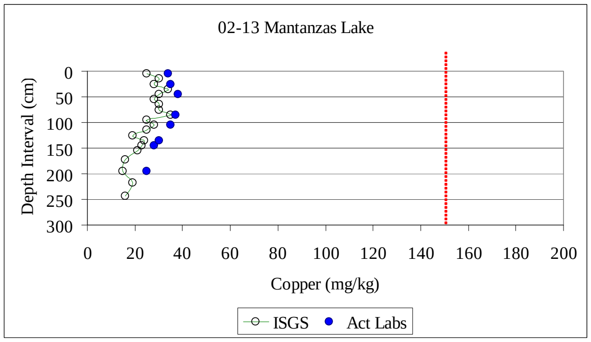
Appendix 8. Distributions of Copper in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs and ICP at ISGS. PEC = 149 mg/kg.

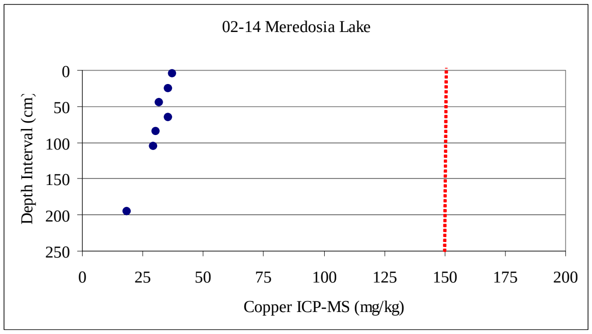

02-9 Upper Peoria Lake RM 178


02-10 Upper Peoria Lake RM171

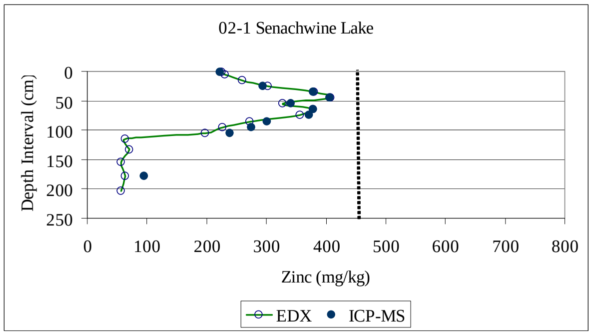

02-11 Lower Peoria Lake RM 164

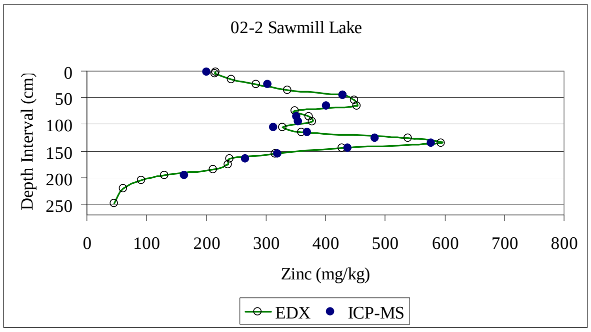

02-12 Quiver Lake

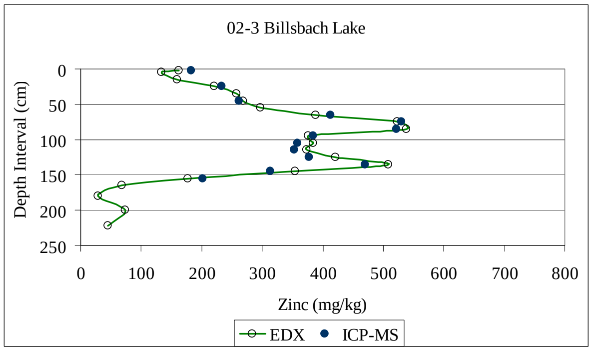

02-13 Mantanzas Lake

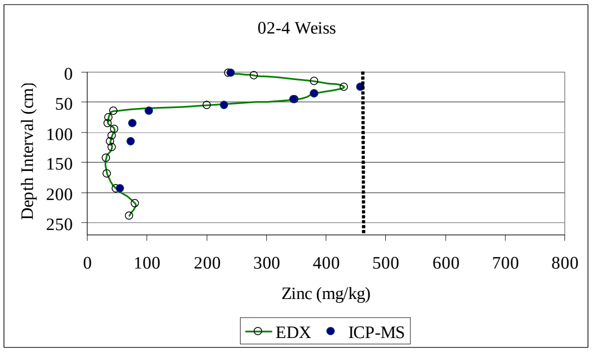

02-14 Meredosia Lake

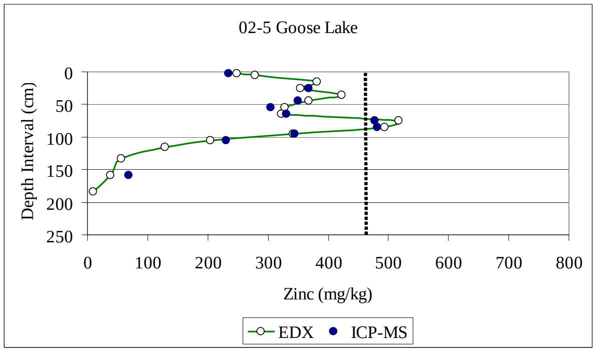
Appendix 8. Distributions of Zinc in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs and EDX at ISGS. PEC = 459 mg/kg.

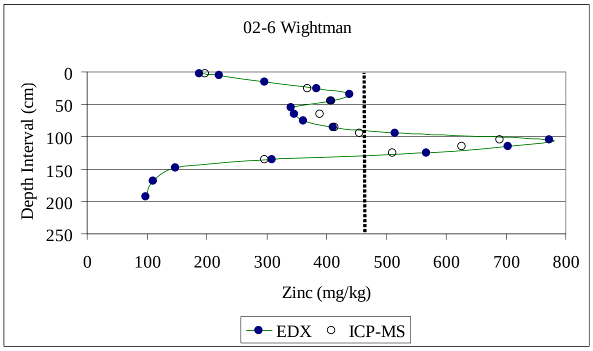


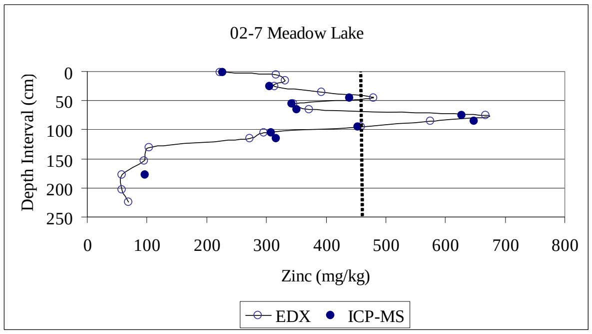


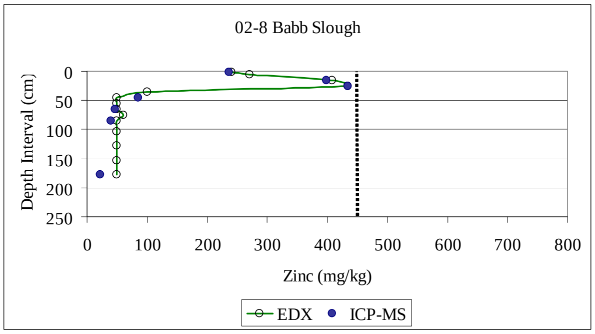




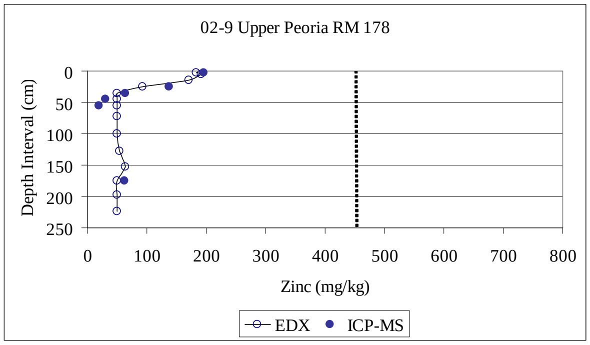


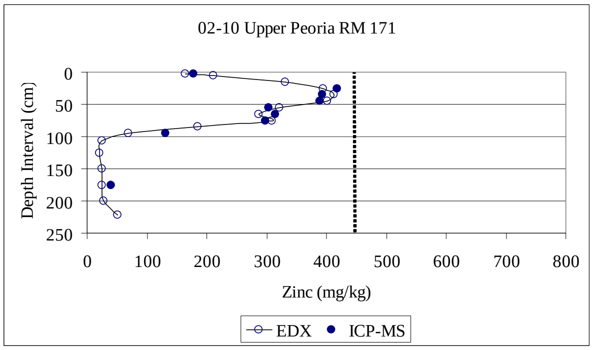


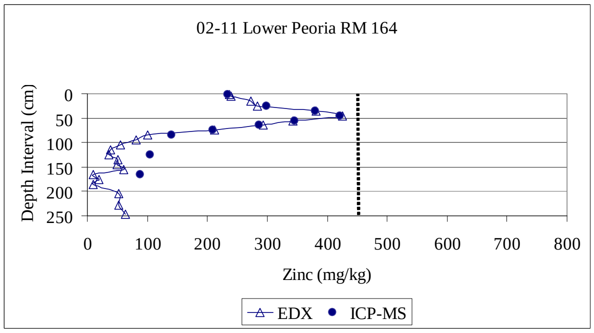


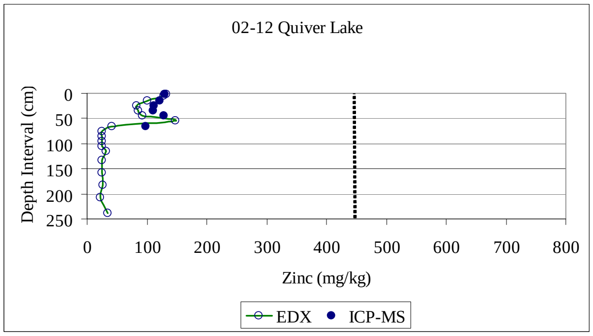


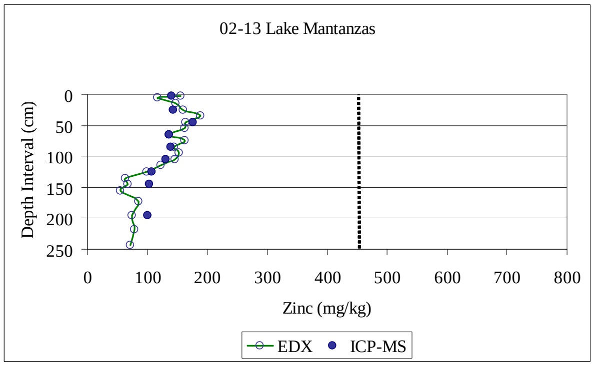
Appendix 8. Distributions of Zinc in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs and EDX at ISGS. PEC = 459 mg/kg.

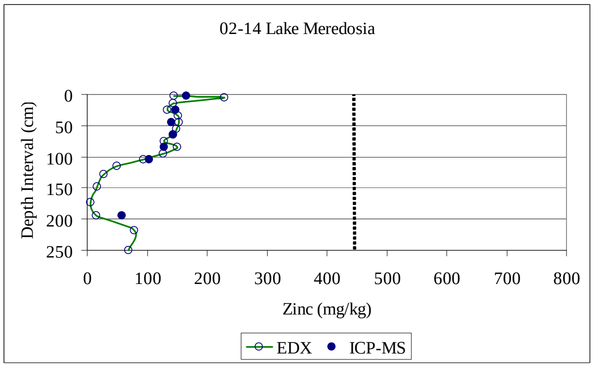




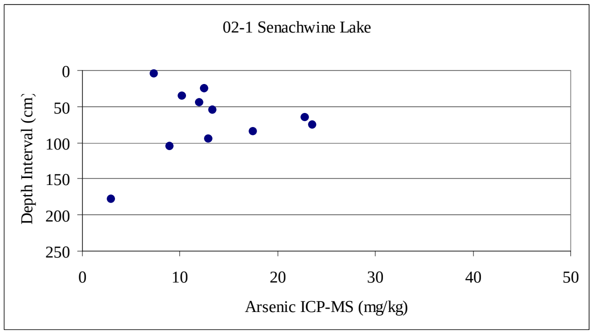


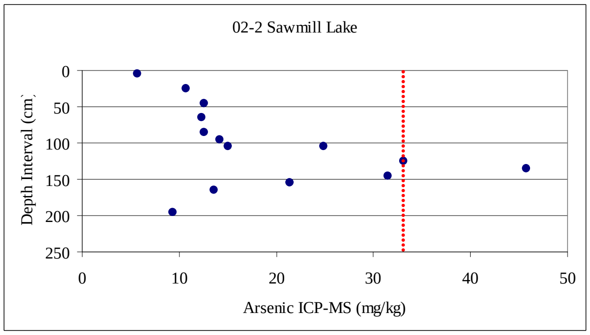


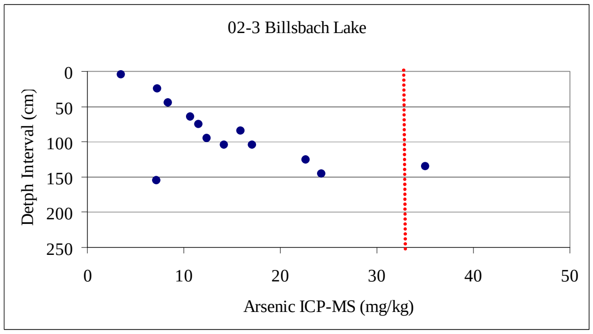


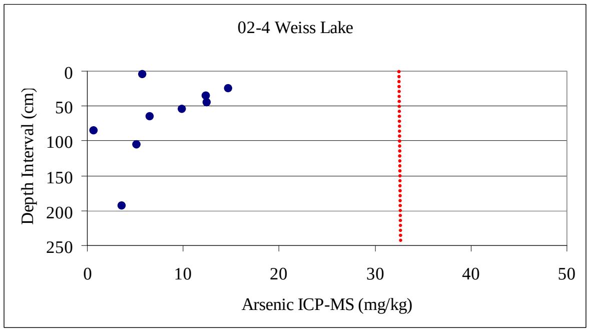


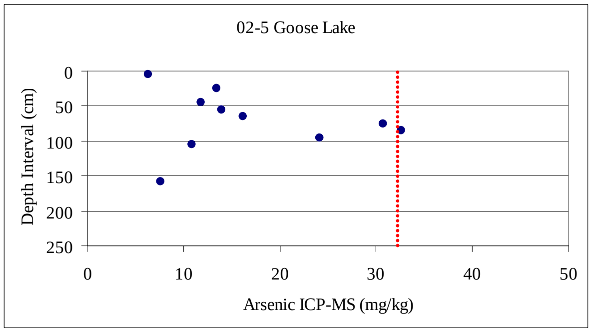
Appendix 8. Distribution of Arsenic in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs. PEC = 33 mg/kg

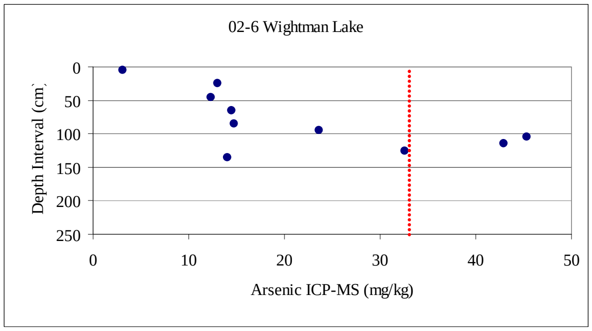

02-1 Senachwine Lake

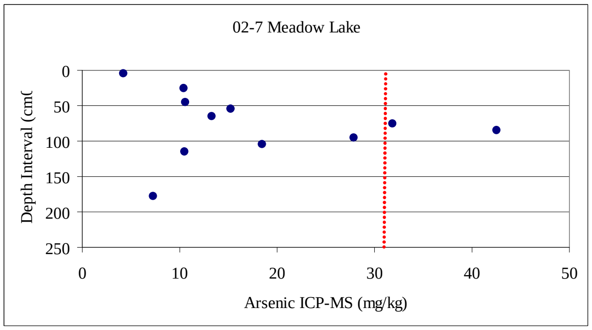

02-2 Sawmill Lake

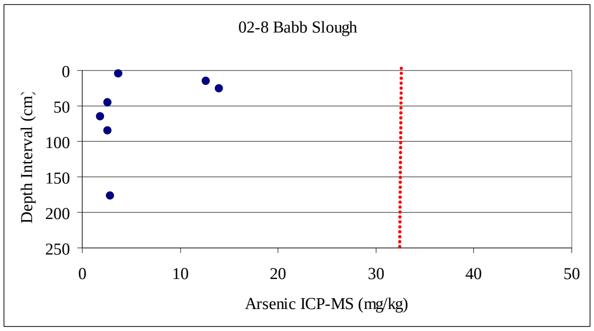

02-3 Billsbach Lake


02-4 Weiss Lake

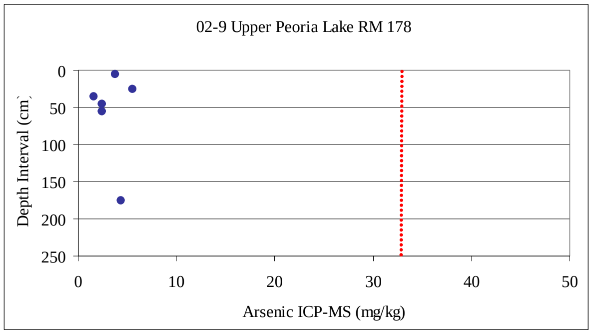

02-5 Goose Lake

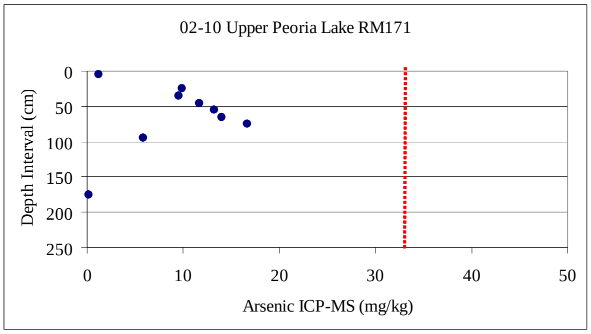

02-6 Wightman Lake

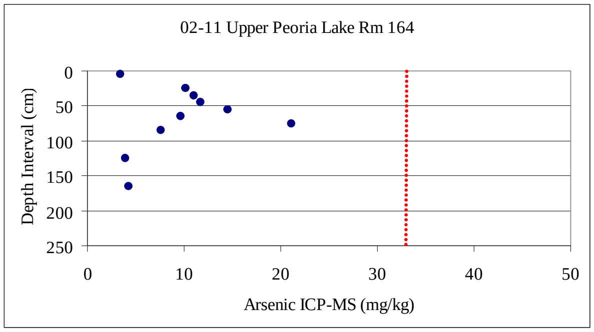

02-7 Meadow Lake

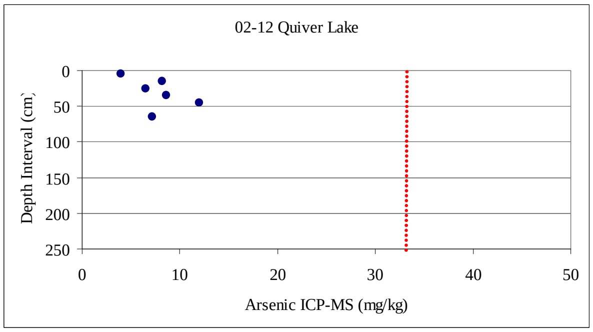

02-8 Babb Slough

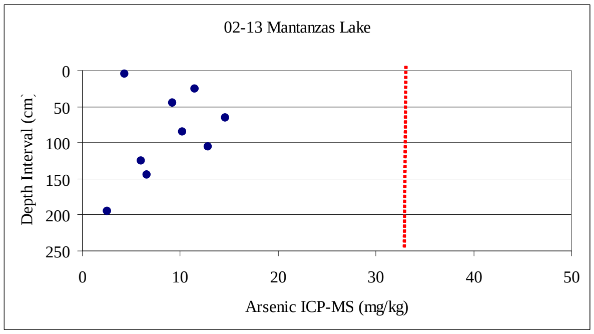
Appendix 8. Distribution of Arsenic in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs. PEC = 33 mg/kg

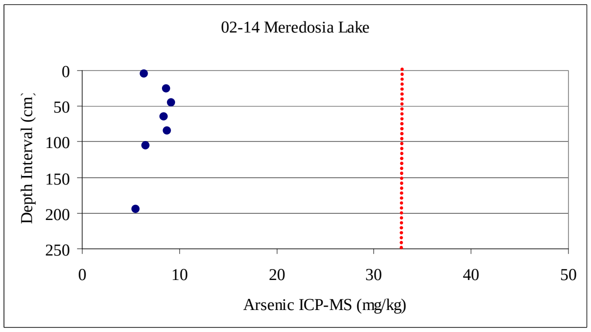




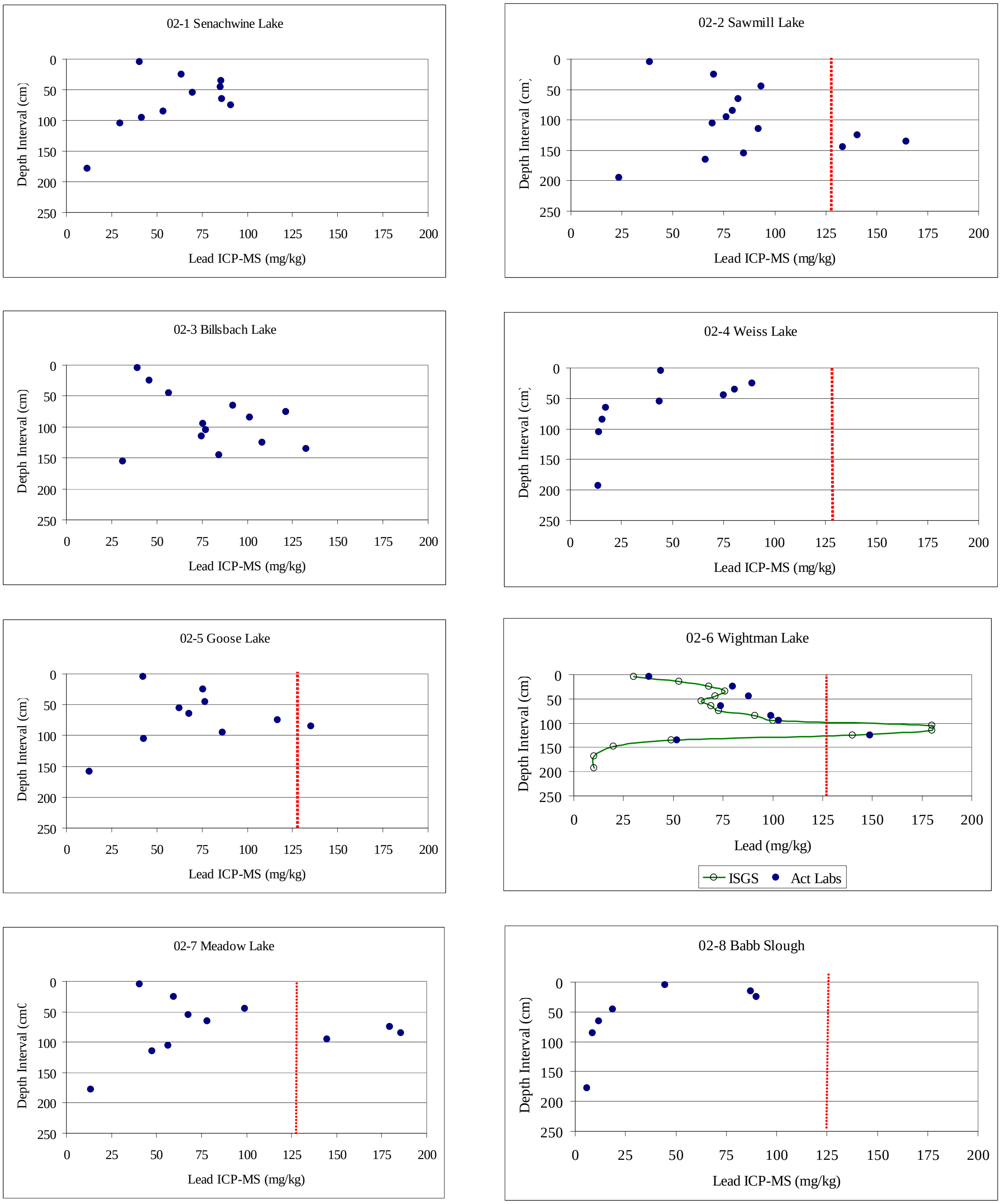




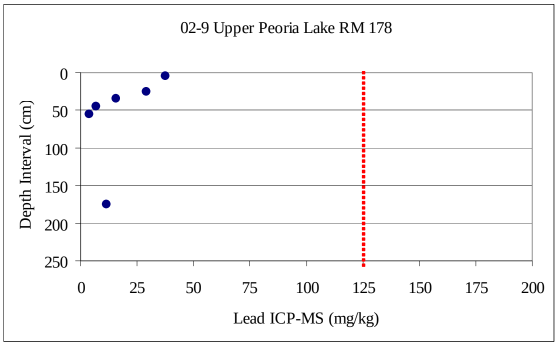


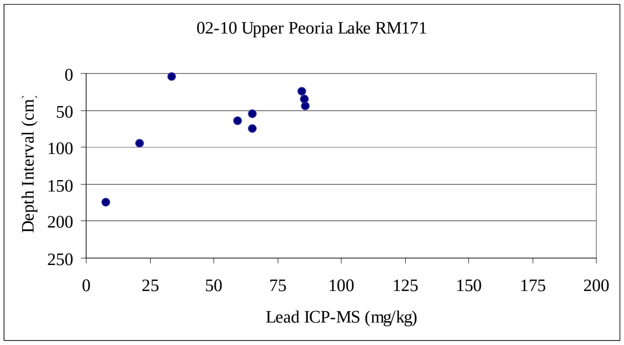


Appendix 8. Distribution of Lead in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs and ICP at ISGS. PEC = 128 mg/kg



Appendix 8. Distribution of Lead in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs and ICP at ISGS. PEC = 128 mg/kg


02-9 Upper Peoria Lake RM 178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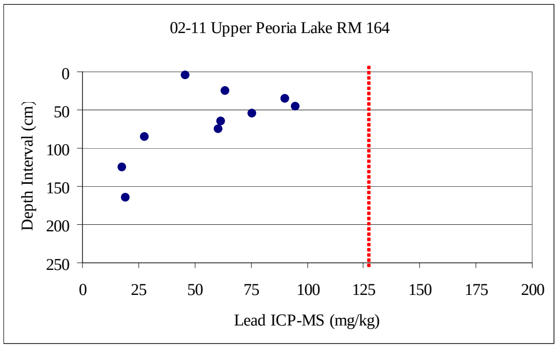
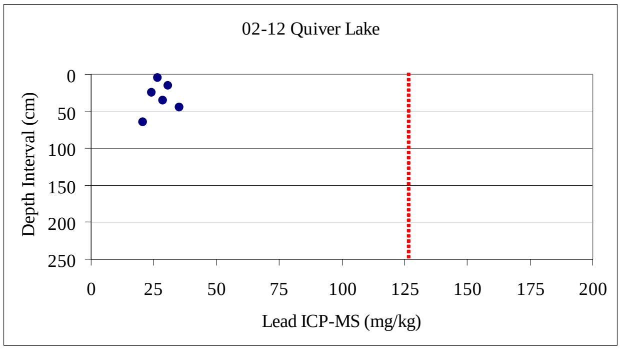
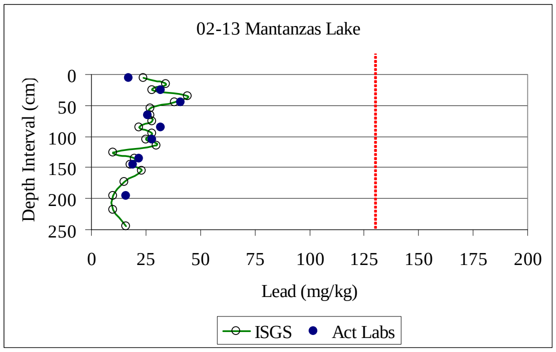
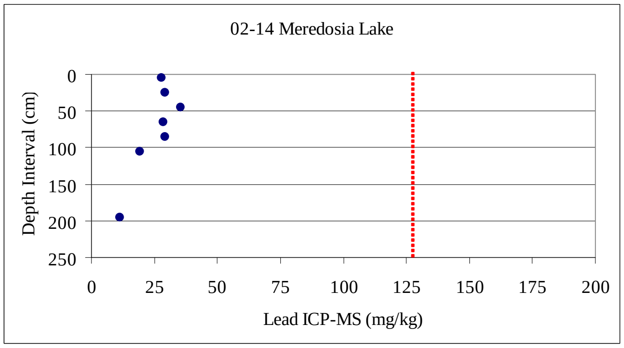
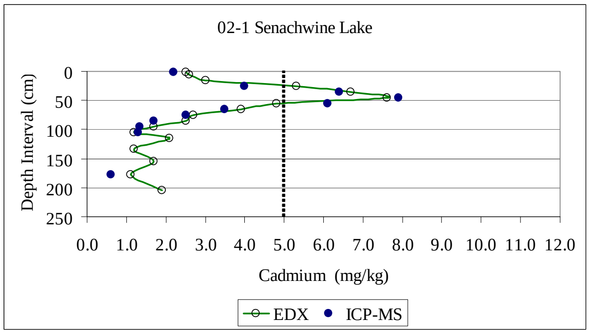

02-11 Upper Peoria Lake RM 164

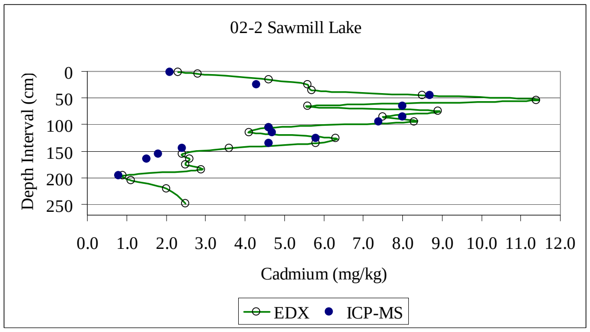

02-12 Quiver Lake

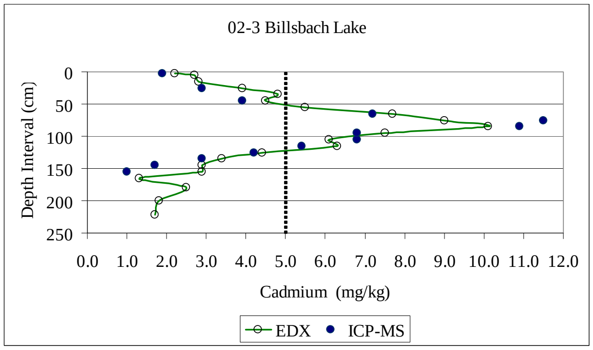

02-13 Mantanzas Lake

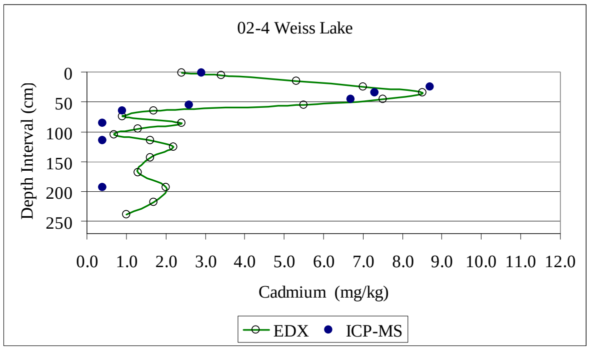

02-14 Meredosia Lake

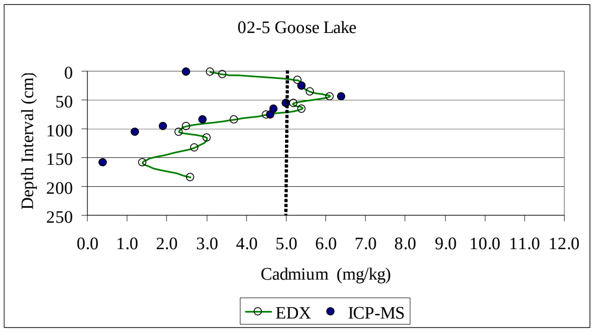
Appendix 8. Distribution of Cadmium in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs and ISGS. PEC = 5 mg/kg

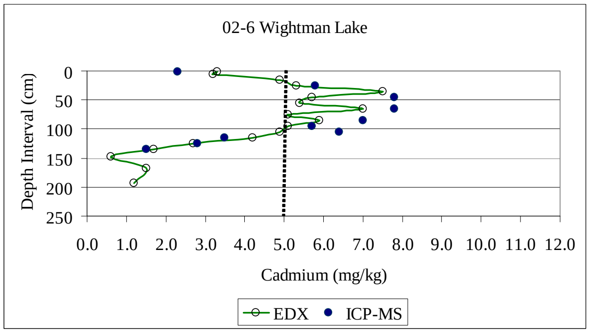


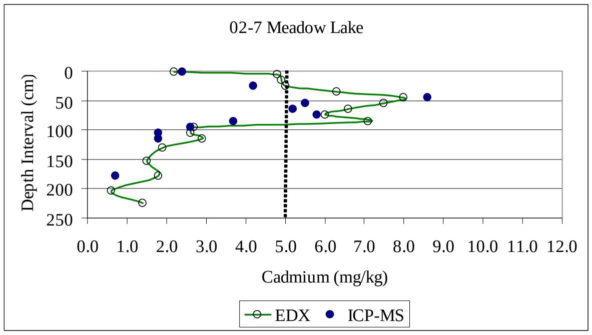


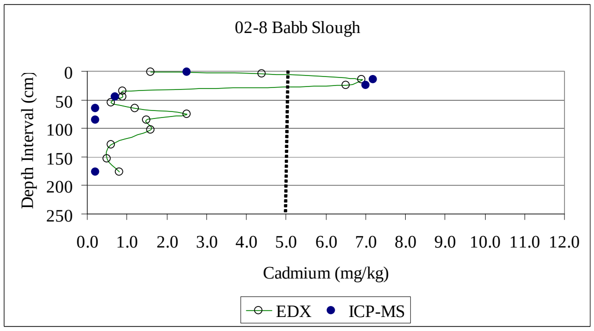




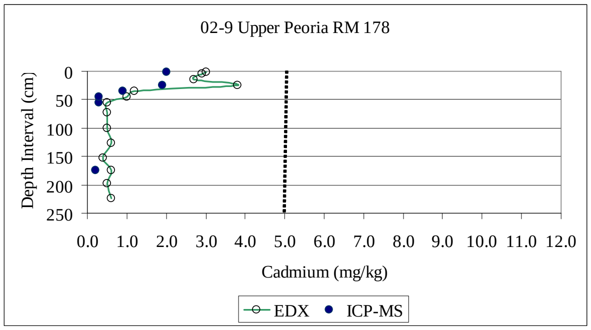


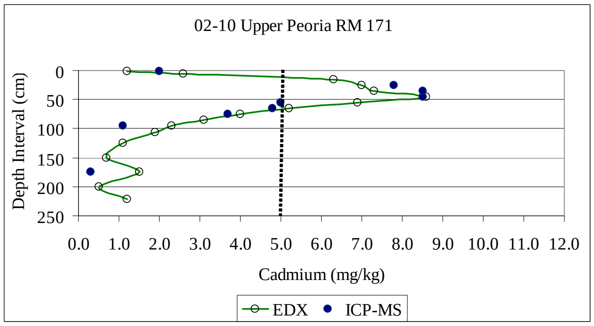


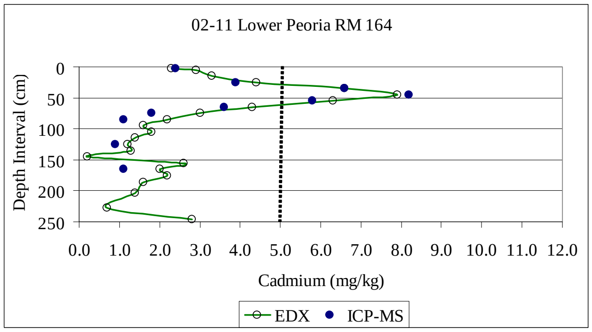


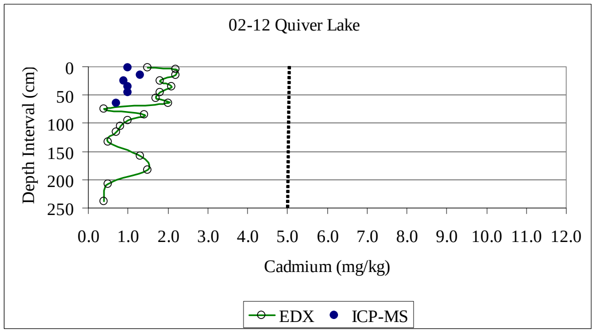


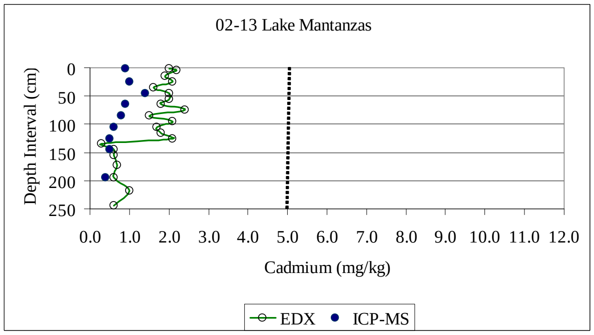
Appendix 8. Distribution of Cadmium in Sediments of Lakes Associated with the Illinois River Determined by ICP-MS at Act Labs and ISGS. PEC = 5 mg/kg

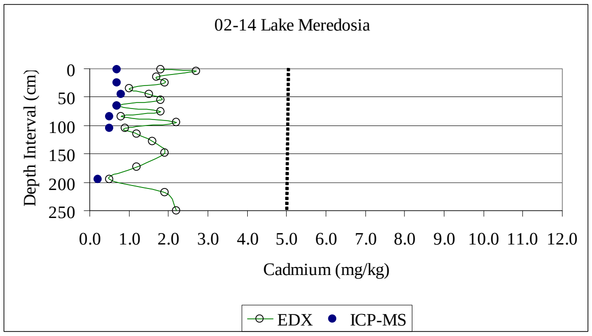




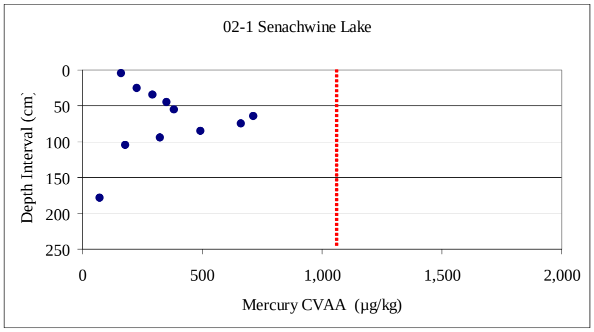








Appendix 8. Distribution of Mercury in Sediments of Lakes Associated with the Illinois River Determined by CVAA at Act Labs and ISGS. PEC = 1,060 µg/kg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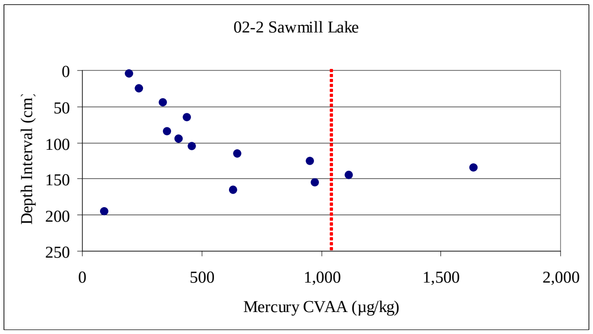
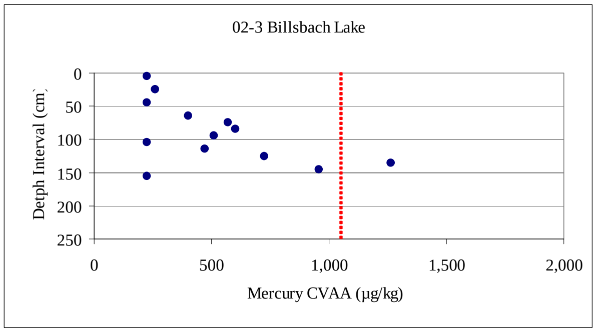
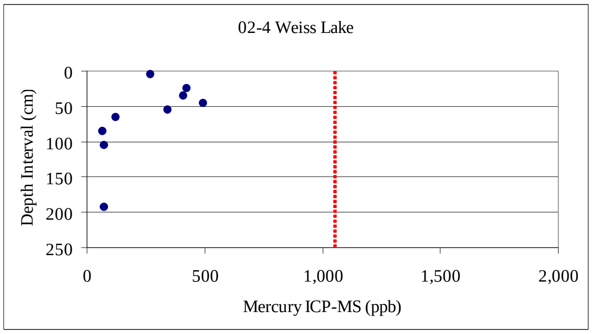
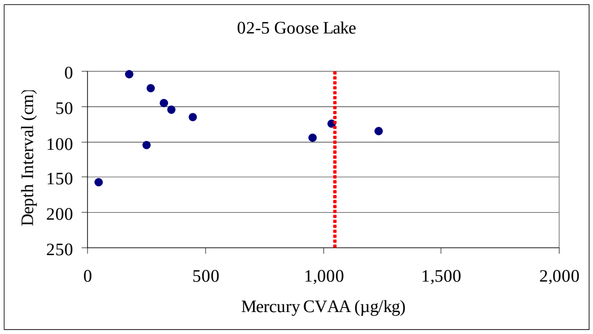
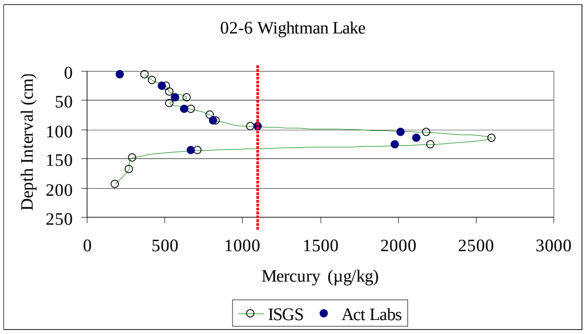
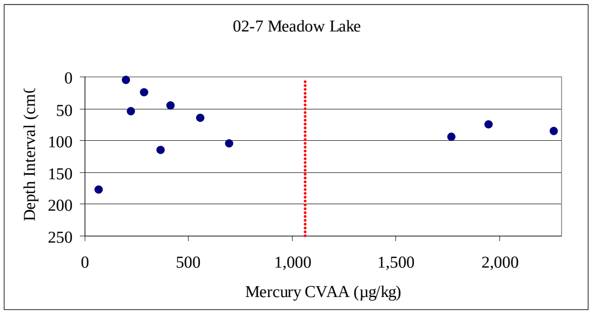

02-2 Sawmill Lake

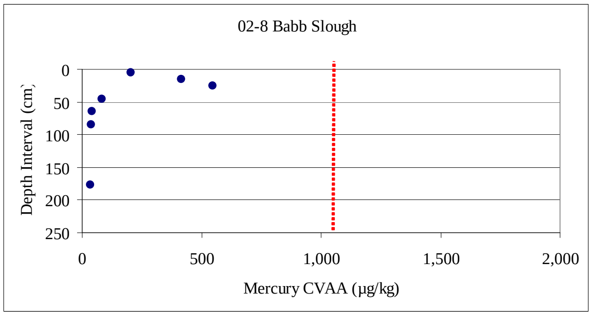

02-3 Billsbach Lake


02-4 Weiss Lake

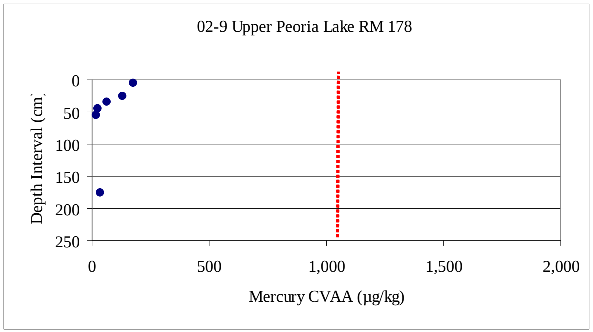

02-5 Goose Lake

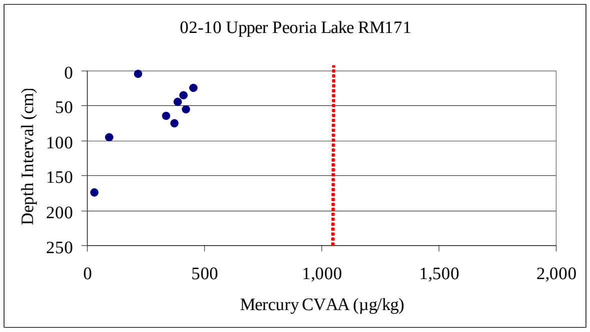

02-6 Wightman Lake

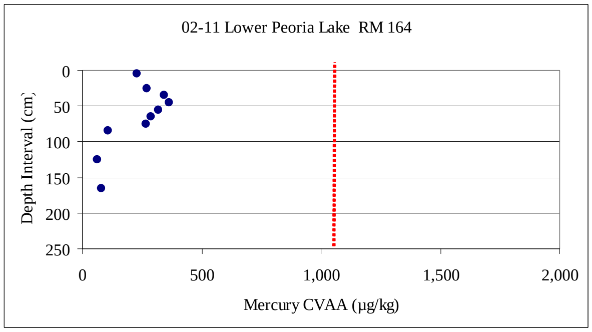

02-7 Meadow Lake

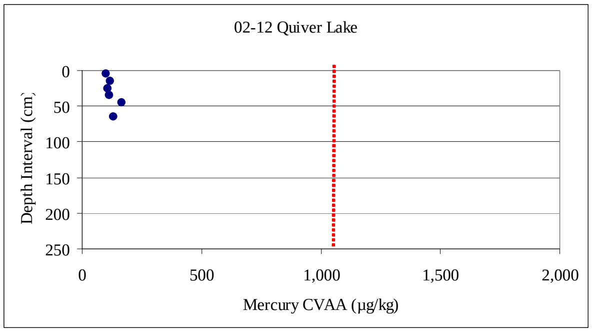

02-8 Babb Slough

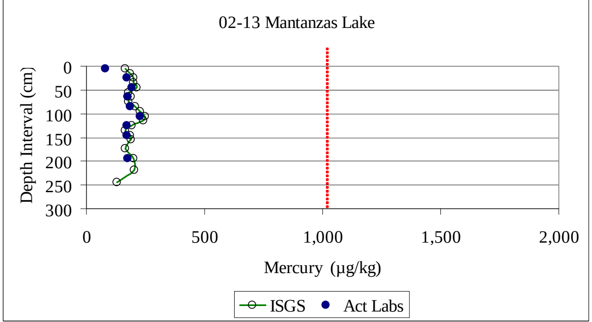
Appendix 8. Distribution of Mercury in Sediments of Lakes Associated with the Illinois River Determined by CVAA at Act Labs and ISGS. PEC = 1,060 µg/kg

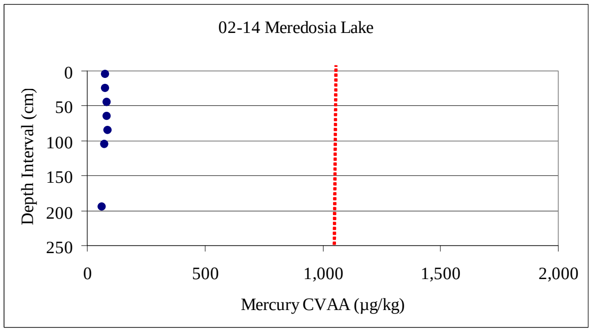




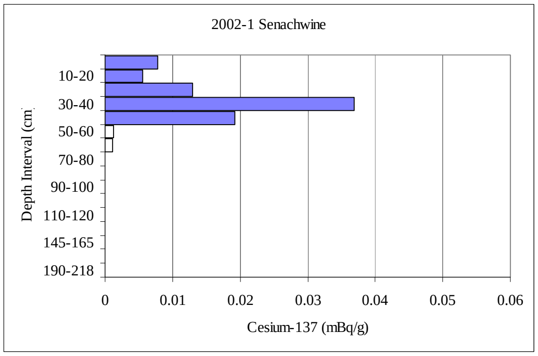


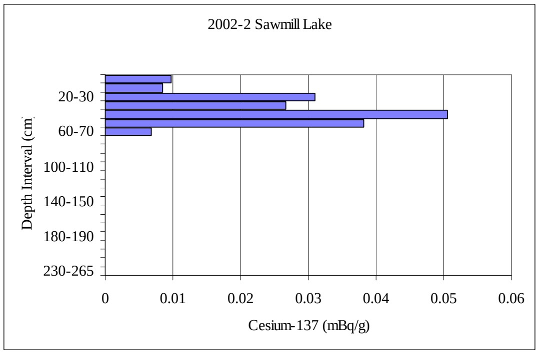


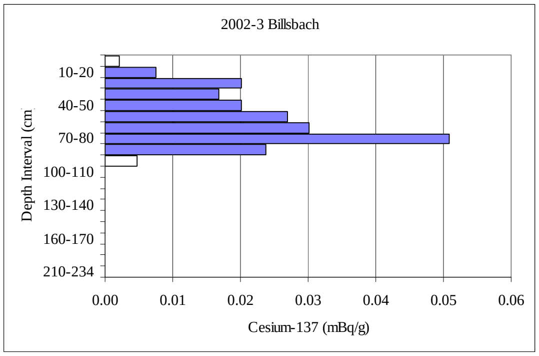


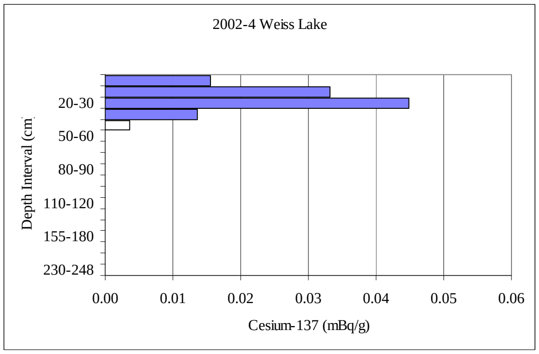


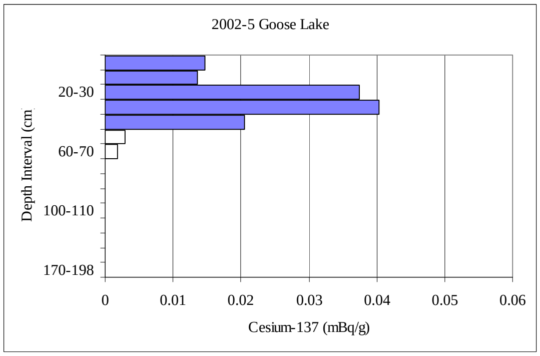
Appendix 9. Cesium-137 profiles for sediment cores from lakes along the Illinois River.

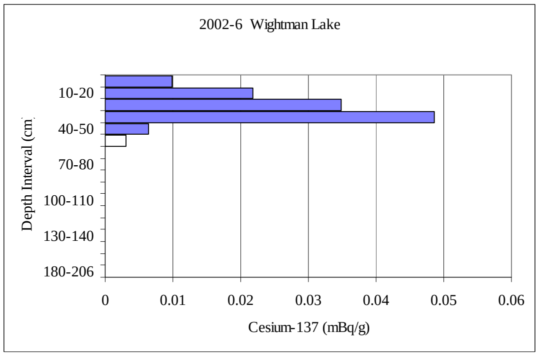


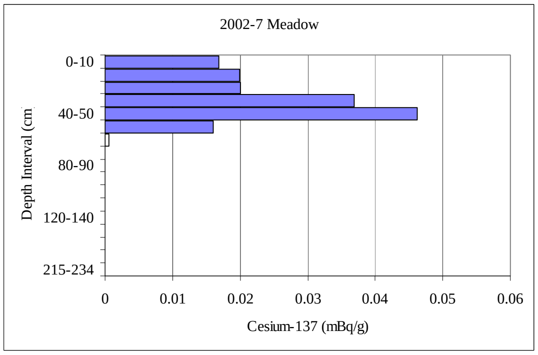


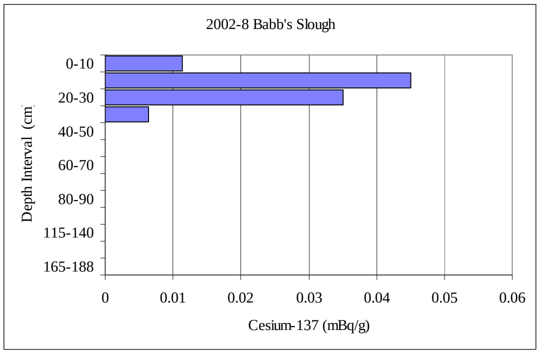




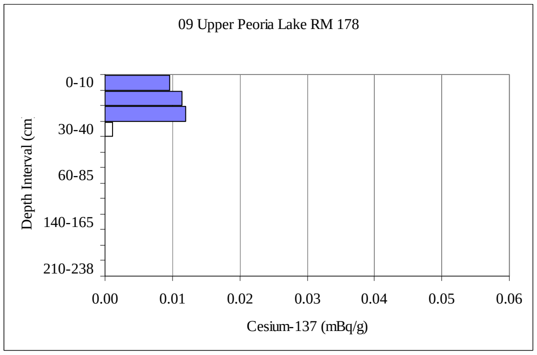


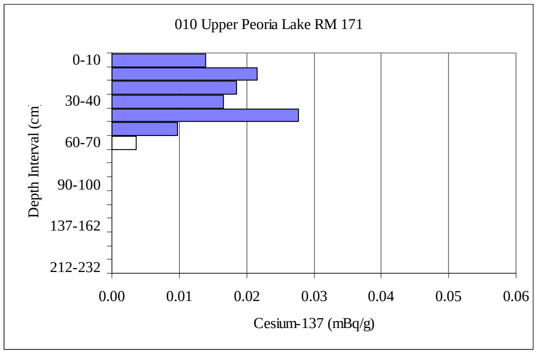


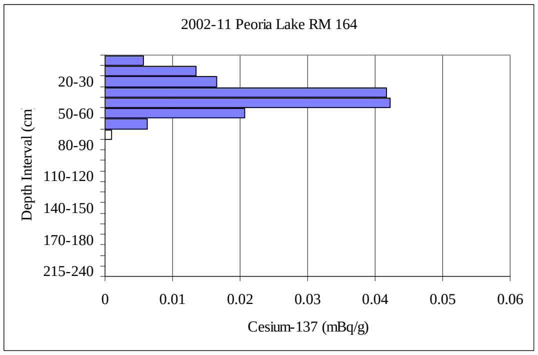


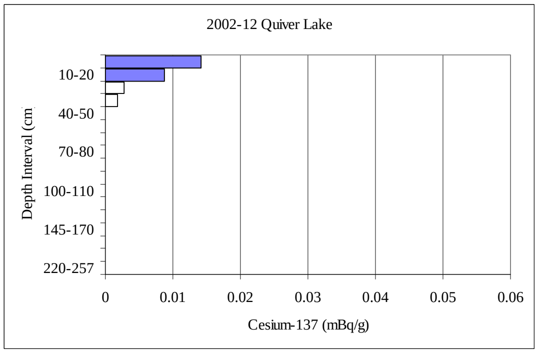


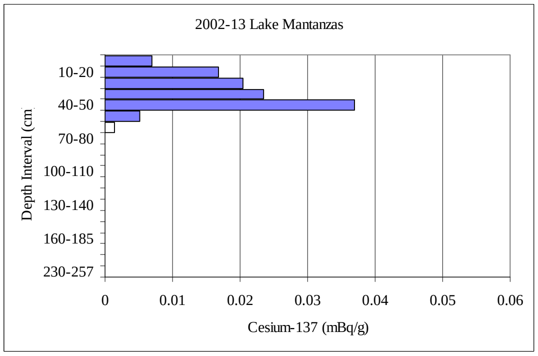
Appendix 9. Cesium-137 profiles for sediment cores from lakes along the Illinois River.

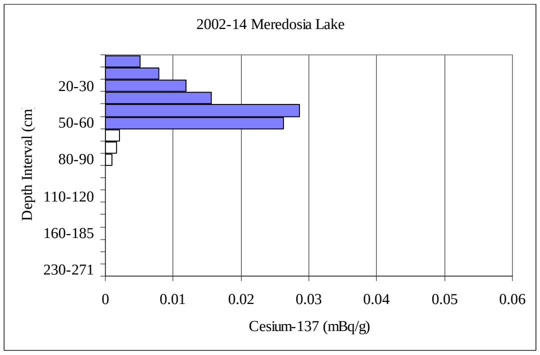

09 Upper Peoria Lake RM 178


010 Upper Peoria Lake RM 171


2002-11 Peoria Lake RM 164


2002-12 Quiver Lake


2002-13 Lake Mantanzas


2002-14 Meredosia Lake