**FINAL REPORT**

to

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# Contaminant Sediment Profiles of the St. Jones River Marsh, Delaware: A Historical Analysis

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## Executive Summary

This study involved the chemical analysis of three dated sediment cores taken from the upper tidal St. Jones Estuary. The cores were obtained and chronologies calculated by Dr. Christopher Sommerfield (CMES, University of Delaware). The main objective was to evaluate historical trends in organic chemical contaminants (e.g., polychlorinated biphenyls, chlordanes, and polycyclic aromatic hydrocarbons) and nutrients (i.e., sediment phosphorus and nitrogen). An additional objective was to evaluate if a historical record of eutrophication can be derived from algal analysis, i.e., diatoms, from the sediments along with other indicators of ecosystem change (e.g., $\delta^{13}$C-OM and $\delta^{15}$N-TN).

Organic contaminants, notably PCBs, DDX, PAHs, and chlordanes show distinct profiles in the sediments, suggesting changes in the source and deposition over time. For example, total PCBs showed higher concentrations at depth with decreasing concentrations towards the surface. Total PCBs, DDX and chlordane concentrations showed a sharp maximum at similar depths decreasing towards the surface; especially in the upper sections (near the 1960s or 1970s). The congener composition of the PCBs showed a shift from mid to higher molecular weight compounds (i.e., homologs 5+6+7) to lower molecular weight compounds (i.e., homologs 3+4+5) from the upper sections to the lower sections. While post-depositional alterations may have occurred, these changes can also be due to changes in the type, use, source and importantly, degradation of PCBs over time.

Total PAHs showed a distinct peak concentrations at depth in two cores (WC-1 and LH-2), with low and little trend in WC-2. In LH-2, total PAH concentrations were some of the highest observed (Kennish, 1992 and others). Sources in WC-1 suggest petrogenic inputs while in LH-2, sources appear to be mostly combustion products. Further analysis will be undertaken to help evaluate the inputs at these depths.

Preliminary analysis of the diatom assemblages and metrics indicate a shift toward more eutrophic species starting in the late 1940s. Only in WC-1 was there a possible relationship between total sediment P and diatom metrics, suggesting nutrient enrichment also impacted the diatom community composition. While diatom indices in WC-2 remain constant from the 1950s to the present, the eutrophic index in WC-1 and LH-2 shows some sign of decrease, possibly related to nutrient controls and treatment.

Overall, this study documents the chemical analysis of three cores taken around the upper tidal St. Jones Estuary. Changes were observed in contaminant levels across time that reflect usage globally and most likely locally. In one core there was a clear shift towards diatom species that reflect eutrophic conditions and this correlates to some degree with sediment P levels, suggesting that phosphorus levels could be more limiting to species development and growth in the long term. Further analysis of the data will be undertaken to better quantify observed relationships. Additionally, isotopic analysis of C and N, to be completed in the future, will help this interpretation process.

## A) Introduction

A1: *Background*

Trace metals and organic contaminants in water are derived from many sources. Natural sources of metals include the weathering products of soils which are then transported in the dissolved or particulate phases. Anthropogenic sources of metals and organic contaminants are introduced to the water via atmospheric deposition, industrial (e.g., mining, metal processing, manufacturing) and municipal (waste water treatment) discharges and stormwater runoff. Due to the particle reactive nature of most trace metals and organic compounds, sediments are potential repositories for contaminants and, under certain conditions, can be used to provide a historical record of pollution (Simpson et al., 1983; Orson et al., 1990; 1992; Valette-Silver, 1993; Hornberger et al., 1999; Cooper and Brush, 1993; Church et al., 2006; Velinsky et al. 2007; Riedel et al. 2007 and others). With minimal diagenetic remobilization, biological mixing, and hydraulic processes, the sediment column can reflect the chronological deposition/inputs of most contaminants. Sediment cores are extremely useful in determining if various pollution control actions were/are effective in reducing contaminant loadings, as well as providing a time frame for system response. This is important for modeling programs in which time responses need to be placed into realistic contexts.

The tidal St. Jones River has long suffered from pollution problems related to human activities. In support of remediation efforts by the State of Delaware (i.e., a TMDL process), multiple cores were taken in the tidal portion of the St. Jones River (Sommerfield, 2005). Several cores yielded accurate sediment chronologies and were subsequently chosen for geochemical and ecological characterization. Sediment sections were analyzed for organic contaminants (e.g., PCBs, PAHs, organochlorine pesticides such as DDTs), organic carbon, total nitrogen, total and inorganic forms of phosphorus, and the stable isotopes of carbon and nitrogen. In addition, various species of diatoms were identified from selected core sections as a means to infer nutrient conditions and ecological status relative to historic changes in algal growth in the tidal freshwater section of the St. Jones River. Water chemistry conditions will be reconstructed using diatom species assemblages in the wetland sediment cores. Paleolimnological studies conducted in eastern North America and Europe have shown strong response of diatom species composition to nutrient conditions. Total phosphorus (TP) and total nitrogen (TN) inference models are widely used for reconstruction of eutrophication of lakes due to industrialization, watershed

development, and for lake management purposes (Dixit and Smol, 1994; Reavie et al., 1995; Hall and Smol, 1999; Bennion et al., 2000; 2001; Bradshaw and Anderson, 2001). Using this inference-model approach, the results of this study will help with management decisions and resource protection efforts, as well as with establishment of reference conditions and nutrient criteria for other systems.

A2: *Objectives of Study*

The objective of this study was to analyze previously-collected sediment cores from the tidal freshwater region of the St. Jones River (near Dover, DE) and determine the chronology of chemical contaminant deposition, nutrient loadings and related ecological response.

To meet this objective, we analyzed the chemical characteristics of sediment cores collected within the tidal St. Jones River (Sommerfield, 2005). Cores from approximately Court Street (LH-1) to Lebanon (DE), near the Wildcat landfill (WC-1 and WC-2), were analyzed, while other cores that were collected remain preserved at -10$^{o}$C for possible future analyses. This study aims to quantify the magnitude and extent of sediment contamination in the upper tidal river and estimates the contaminant deposition rate in the upper tidal marshes of the St. Jones watershed.

A3: *Study Area*

Much of the physical setting of the St. Jones watershed and estuary are described in Sommerfield (2005), DNREC (1999) HydroQual (2006), and Moskalski (2005). Below is a summary from those documents.

The St. Jones River watershed drains a portion of the coastal plain in central Kent County, DE, including the city of Dover, industrial areas, agricultural areas and Dover Air Force Base. The upper St. Jones is impounded by a dam 17 km upstream from the Bay to form Silver Lake. The estuarine portion of the watershed is 17 km long from the approximate head of tides in Dover to Delaware Bay (**Figure 1**). The river-estuary occupies a Pleistocene-aged river valley that flooded with rising sea level during the Holocene and has been filled over time with muddy, peat-rich sediments from the watershed (Wilson, 2005; Moskalski, 2005; Leorri et al. 2006). The watershed of the tidal river occupies an area of ~15 km$^2$ with salinities varying tidally and seasonally, but is generally within the 5-8 psu range (DNREC, 1999).

Land use in the lower St. Jones River watershed is dominated by agriculture (48%) with a smaller fraction of urbanized (25%) and undeveloped cover (27%). In undeveloped areas, the predominant vegetation is salt marsh cordgrass (*Spartina alterniflora*) at 62% by area. The common reed (*Phragmites australis*) occupies 13%, and the remaining area is covered by other forms of *Spartina* and various marsh shrubs (DNREC, 1999). Non-vegetated, intertidal waters are characterized by muddy tidal channel banks and flats. Sources of fine-grained, inorganic sediment include delivery from the upland watershed, within-estuary marsh and tidal channel erosion, and tidal influx from Delaware Bay (Wilson, 2004; Sommerfield 2005).

There are multiple sources of chemical contaminants to the tidal St. Jones Estuary. Sources of chemical contaminants and nutrients to the tidal waters are both from the surrounding non-tidal and tidal land areas and include current and previous industrial activity (Kennish, 2004), atmospheric deposition (Goel et al., 2006), stormwater runoff and groundwater discharge from Dover and other developed areas (e.g., Hinaman and Tenbus, 2000), and runoff from agricultural areas. The City of Dover discharged effluent from its waste water treatment plant (WWTP) to the upper St. Jones River up to the early 1970s, after which its discharge was directed to the Muderkill River. Currently, the State of Delaware has listed specific segments of this river system as impaired water bodies (i.e., 303(d) list) due to low dissolved oxygen and high bacteria concentrations resulting from high levels of nitrogen and phosphorus (DNREC, 1999; HydroQual, 2006; U.S. EPA 2006). As such, load allocations for both nitrogen and phosphorus are currently being developed to help reduce ambient levels and to improve water quality.

In addition, there are four noted Superfund sites located in the tidal river watershed. These include Dover Air Force Base, Fraizers and Wildcat Landfills and Dover Gas and Light Company. Kennish (2004) reviewed some of the characteristics of these sites and their impact to the river. While the Air Force Base is a source of volatile chemicals, both the Wildcat Landfill and Dover Gas and Light are large sources of PCBs, PAHs (coal tar) and other chemicals to the tidal river. The Wildcat Landfill, located 2.5 km downstream of Dover, is a 44-acre site which operated from approximately 1962 to 1973. Groundwater and subsurface sediments are contaminated with a variety of heavy metals, volatile organic compounds (e.g., benezene), and moderate levels of polychlorinated biphenyls (PCBs).

These sources have lead to various biotic impacts in the river. While Pinkney and Harshberger (2004) found no evidence of tumors in various species of fish, fish burdens of

chemicals are elevated. The State maintains fish consumption advisories on fish caught from the tidal St. Jones River due to PCBs and dioxin (State of Delaware, 2006). As a result of the advisory, Delaware listed the area in question on its Clean Water Act Section 303(d) list of impaired waters. A PCB TMDL for this reach is currently scheduled to be completed by the end of 2011. Given the nature of the sources and their historical impact, sediment cores from marshes in the river provide an excellent means for documenting long-term (e.g., decadal scales) chemical loadings and related ecological parameters. Chronologies could help provide an understanding of whether or not source reduction programs (i.e., wastewater treatment; landfill remediation, source reductions) are successful and under what time scales a river-estuarine-wide response can be detected.

Selected sections from three cores, collected in Sommerfield's study (2005), were analyzed for a suite of organic contaminants and ancillary parameters (e.g., sediment C, N and P). In addition, stables isotopes of C and N were determined as well as diatom community structure. Cores WC-1 and WC-2 near the Wildcat Landfill as well as LH-2, near Court Street, Legislative House, were selected (**Figure 1**). The LH-2 core, located in downtown Dover, contained 1-5 cm of thick beds of sand, interbedded with clayey silt, probably derived from upstream sources (Sommerfield, 2005). Cores WC-1 and WC-2, located downstream from Dover, and contained clayey silt with either gas inclusions or peat fragments (Sommerfield, 2005).

## B) Field and Laboratory Methods

### B1: *Field Sampling*

Sediment cores were collected in 2003 by University of Delaware staff (Sommerfield, 2005) at locations in the tidal river (**Figure 1**). For a complete discussion of field collection and analysis see Sommerfield (2005). Samples were stored in pre-cleaned jars at -10$^{o}$C at DNREC facilities. Chain-of custody procedures were followed from the time of collection, shipping and until the analyses were completed.

### B2: *Laboratory Methods*

Organic contaminant clean-techniques were used throughout and are well published (Ashley and Baker, 1999; others) and are similar to those used by EPA and NOAA (U.S. EPA, 1987; NOAA, 1993; Wade et al., 1994). All materials coming in contact with the samples were either

glass or metal that was cleaned of any contaminants prior to use. Sample ID forms were used and each sample was given a unique laboratory number for sample tracking.

Sediments were analyzed for the following parameters at laboratories operated by the Academy of Natural Sciences (Patrick Center): carbon, nitrogen and phosphorus, PAHs (41+ compounds), total PCBs (100+ congeners), selected pesticides including DDTs and chlordane, and stable isotopes of carbon and nitrogen. In addition, specific sections were analyzed for diatoms via sample digestion, mounting and glass slide light microscopy. Below are brief descriptions of each chemical or physical method:

**B2.1: Total Organic Carbon and Total Nitrogen**

Total organic carbon and total nitrogen was measured using a CE Flash Elemental Analyzer following the guidelines in EPA 440.0, manufacturer instructions and ANSP-PC SOP. Samples were pre-treated with acid to remove inorganic carbon.

**B2.2: Total Phosphorus**

Total sediment phosphorus was determined using a dry oxidation method modified from Aspila et al. (1976) and Ruttenberg (1992). Solubilized inorganic phosphorus was measured with standard phosphate procedures using an Alpkem Rapid Flow Analyzer. Standard reference material (spinach leaves) and procedural blanks were analyzed periodically during this study. All concentrations were reported on a dry weight basis.

**B2.3: Stable Isotopes of Carbon and Nitrogen**

The stable isotopic composition of sediments was analyzed using a Finnigan Delta XL coupled to an NA2500 Elemental Analyzer (EA-IRMS). Samples were run in duplicate or triplicate with the results reported in the standard δ (‰) notation: $\delta X = (R_{sample}/R_{standard}) - 1) \times 1000$; where X is either $^{13}C$ or $^{15}N$ and R is either $^{13}C/^{12}C$ or $^{15}N/^{14}N$. The $\delta^{15}N$ standard was air ($\delta^{15}N = 0$), and for $\delta^{13}C$ the standard is the Vienna PeeDee Belemite (VPDB) limestone that has been assigned a value of 0.0 ‰. Analytical accuracy was based on the standardization of the UHP $N_2$ and $CO_2$ used for continuous flow-IRMS with IAEA N-1 and N-2 for nitrogen and IAEA sucrose for carbon, respectively. An in-house calibrated sediment standard was analyzed every tenth sample. Generally, precision based on replicate sample analysis was better than 0.2‰ for carbon and 0.6‰ for nitrogen.

**B2.4: Diatoms**

Core sediment was collected (≈1g) and the organic component was oxidized with 70% nitric acid while heated in a CEM microwave (165ºC) for an hour and a half. Diatoms were settled and supernatant was decanted until it reached a neutral pH. A measured amount of digested sample was dripped onto a microscope coverslip and dried. Coverslips were then mounted onto slides using a high refractive index mounting media (Naphrax™). Diatoms were counted and identified using a Zeiss Axioskop with DIC optics. Three hundred valves were counted on 1000x magnification. Identifications were made using the extensive diatom library at ANSP. Several diatom community metrics were calculated based on species autecological preferences

based on van Dam et al. (1994). Metrics were calculated using the Phyco-Aide program developed at ANSP.

**B2.5: Sedimentary Organics**

Prior to organic contaminant analyses, samples were kept frozen at -20 $^{o}$C. Standard operating procedures for the extraction, clean-up and quantification of organic contaminants in sediments are summarized in their respective operating procedure. Briefly, sediment samples were extracted with dichloromethane for 24 hr using a Soxhlet apparatus. PAHs were quantified using a capillary gas chromatograph coupled with a mass spectrometer in the electron impact mode after a clean-up procedure employing liquid-solid chromatography with alumina as the stationary phase (Ashley and Baker, 1999). After PAH determination, samples were further cleaned-up using liquid-solid chromatography with florisil as the stationary phase. Congener-specific PCBs and OCPs were analyzed using a gas chromatograph equipped with a $^{63}$Ni electron capture detector (Ashley and Baker, 1999; Kucklick et al., 1996).

## C) Results

C1: *Sediment Organic Carbon, Total Nitrogen and Total Phosphorus*

Sediment carbon (SC) concentrations for all cores ranged between <3.6 and 24.1 % on a dry weight basis (dw) with an average of 8.5 ± 3.4 %OC (± standard deviation; **Table**s **1-3; Figure 2**). Similarly, total nitrogen ranged from 0.25 to 1.27 %N with an overall average of 0.57%; while total sediment phosphorus (TSP) ranged from 319 to 1944 μg/g dw with an overall average of 735 μg/g dw.

In the WC cores, SC was near constant with depth and exhibited a maximum at depth (**Figure 2**). In core WC-1, the maximum was centered on 80 cm while in WC-2 the depth of maximum concentration was centered at 60 cm. In core LH-2, SC was highest near the surface decreasing to a minimum at 14-16 cm below which there are two sub-surface maximums (**Figure 2**). The C to N ratio (molar) reflected changes in SC and exhibited similar distributions with depth. TSP in WC-1 showed a distinct maximum centered around 30-32 cm, while in WC-2 and LH-2, the TSP distribution was similar to TC (**Figure 2**). For cores WC-2 and LH-2 there was a positive relationship between TSP and SC concentrations ($r^2 = 0.304$; n = 34), while for WC-1 there was no relationship (**Figure 3**).

C2: *Stable Isotopes of Carbon and Nitrogen*: To be completed

C3: *Diatom Analysis and Assemblages*

Samples from 25 sections were analyzed for diatom composition from the 3 cores. At least 300 valves were counted for each sample and over 136 taxa (e.g., **Figure 4; Appendix III**) were identified from the samples allowing a robust analysis for salinity and nutrient conditions. Below is a brief discussion related to the nutrient conditions derived from the cores.

Four different autecological metrics were calculated including, salinity, pH, nitrogen uptake metabolism, and the trophic state (van Dam et al., 1994**; Table 4; Figure 5**). It appears that the area is elevated in nutrients overall. The diatom community composition shows that at the bottom and top of the cores the nutrient levels are lower and are highest in the mid-section. The bottoms of the cores seem to show the lowest nutrient levels. The bottom sections of the cores had the lowest percentage of eutrophentic taxa and had the highest percentage of oligotrophentic indicators (**Table 5**). Samples taken from 36 cm and 56 cm in WC-1 have the highest percentage of eutrophentic indicators, 60% and 54% respectively.

C4: *Polycyclic Aromatic Hydrocarbons*

Polycyclic aromatic hydrocarbons (PAHs) were detected in all samples analyzed. The PAHs for this analysis comprised 34 individual compounds ranging from the low molecular weight naphthalene and phenanthrene (2- and 3-rings) to high molecular weight compounds with 4- and 5- rings, including pyrene and dibenz[a,h]anthracene. Total PAHs (methyl-substituted and unsubstituted forms) ranged from 0.84 to 1111 μg/g dw (note unit conversion from **Tables 1-3; Appendix I**) with generally similar profiles for most cores (**Tables 1-3)**. Concentrations in Core WC-2 were lowest followed by WC-1 and then LH-2. In Cores WC-1, WC-2 and LH-2 concentrations were lowest near the surface increasing to a subsurface maximum centered at 80-82 cm, 34-36cm, and 50-52 cm, respectively (**Figure 6**). The concentrations at the maxima varied widely between the three cores. The highest concentration (1110 μg/g dw) was found in LH-2. The concentrations between 40 and 60 cm within this core are substantially higher than any values observed from sediment cores within the Anacostia River and Baltimore Harbor (Wade et al., 1994; Ashley and Baker, 1999; Riedel et al., 2007).

There were 34 individual compounds that were summed to comprise the PAH fraction. These compounds ranged from 2-ring compounds such as naphthalene to 5-ring aromatic compounds such as di-benzo[a,h]anthracene (**Tables 1-3; Appendix I**). Also included within the

34 individual PAHs are 6 methyl-substituted forms including methylnaphthalene, methylfluorene, and methylphenanthrene. Both the distribution of parent PAHs and methyl-substituted PAHs can be used to determine the sources of hydrocarbons to the tidal river (i.e., combustion or petrogenic).

The phenanthrene to anthracene ratio can be used to help distinguish between combustion (pyrogenic) versus direct oil (petrogenic) sources in aquatic systems as undegraded oil has a very high ratio (50) compared to combustion sources (ca. 0.3; Wakeham et al., 1980; Wade et al., 1994; O'Malley et al., 1994; 1996). In WC-1, the phenanthrene to anthracene ratio ranged from 0.6 to 3 for all sections analyzed which is characteristic and typical of many urban environments having a preponderance of combustion sources (Gschwend and Hites, 1981; Hoffman et al., 1984; Van Metre et al., 2000). The highest ratio was at the concentration maximum at 80-82 cm, suggesting more of a petrogenic source to this horizon. This is further supported by the ratio of low molecular weight PAHs to total parent PAHs (LMW:tPAHp; **Figures 6-7; Tables 1-3 and 5, Appendix I**). In the upper section of this core the ratio ranged from 0.2 to 0.4, suggesting a combustion source, while at maximum concentration the ratio increased to 0.90, more of petrogenic source. For core WC-2, the phenanthrene to anthracene ratio did not vary substantially with depth and averaged 1.1 ± 0.2, while in LH-2 the ratio was slightly higher (2.3 ± 0.8) indicating slightly more petrogenic hydrocarbons, however there was not a large difference between sites. Interestingly, the ratio of LMW to tPAHp, in both cores did not increase at the concentration maxima as in WC-1 (**Figures 6-7**), possibly due to a different source of hydrocarbons at these sites.

Overall, there are both pyrogenic and petrogenic sources of PAHs to the sub-surface sediments of the tidal St. Jones River. Sources of PAHs related to urban areas include tire wear, crankcase oil, and car soot and exhaust (Wakeham et al., 1980; O'Malley et al., 1994; Van Metre et al, 2000). In addition, in core WC-1, there also appears to be a substantial input of petrogenic hydrocarbons dominated by low molecular weight compounds such as phenanthrene, anthracene, and fluoranthene as well as a number of methyl-substituted compounds like 2-methylphenanthrene, 2-methylanthracene, 1-methylanthracene, 1-methylphenanthrene, 9-methylanthracene and 4,5-methylenephenanthrene.

C5: *Polychlorinated Biphenyls*

Total polychlorinated biphenyls (tPCBs) were composed of approximately 110 congeners (compounds) that were quantified either individually or co-eluted with multiple (2 or 3) congeners (**Tables 1-3; Appendix II**). Congeners 1 and 3 (compounds with 1 chlorine group) were excluded from the totals due to analytical difficulties in accurately quantifying their presence. Concentrations of tPCBs ranged from 4.2 ng/g dw (near the method detection limit of ≈1.2 ng/g dw; calculated as the mean plus three times the SD of the blanks) to approximately 782 ng/g dw with a median concentration of 101 ng/g dw (**Tables 1-3; Figure 8)**. Surface concentrations ranged from 39 to 166 ng/g dw increasing to either a sharp concentration maximum (at approximately 26-28 cm in WC-2 and 20-22 cm in LH-2) or a broad maximum as seen in WC-1 (e.g., 140 ng/g dw centered around 40 to 50 cm; **Figure 8**). Total PCBs were low throughout the bottom section of the cores, decreasing to the lowest levels by 100-102 cm in WC-1 (4 ng/g dw), 66-68 cm in WC-2 (14 ng/g dw) and 64-66 cm in LH-2 (35ng/g dw).

The 110 congeners (excluding congener 1 and 3; monochlorinated biphenyls) determined in the study were grouped into homolog groups (from 1 to 10) based on the number of chlorine atoms substituted on the biphenyl ring (e.g., homolog group H5 contains measured congeners with 5 chlorines; **Appendix II**). In addition, the homologs were summarized into low molecular weight congeners (LMW; i.e., H1 to H5) and high molecular weight congeners (HMW; i.e., H6 to H10). Important in this analysis is the assessment of blank levels, given an MDL for tPCBs of approximately 1.2 ng/g dw, we assume that that congener pattern will be sufficiently biased by the blank for concentrations below a value 10 times the MDL or approximately 10 ng/g dw. Therefore samples near the bottom of the cores (those with lower concentrations) may have biased patterns but are still shown for completeness in the following analysis.

For simplicity, the ratio of the LMW PCBs to the total PCBs are presented in **Figure 8**. The changes in the LMW to tPCB ratio along with homolog patterns reveal some interesting changes with depth in many of the cores. In most cores, the LMW to tPCB ratio was approximately 0.5 to 0.6 in the upper sections, increasing with depth. The increase in LMW/tPCBs occurred just below the peak in concentration.

To further illustrate the compositional change in each core with depth, the homolog patterns for selected sections are presented in **Figure 8**. In the surface sections the H4 is the dominant PCB group followed by H5 to H7. This pattern (as reflected in the LMW to tPCB ratio) is

similar with depth to the peak in concentration. Below this peak the homolog pattern shifts to lower molecular weight congeners (H2 to H4). Degradation of the PCB molecule is suspected, as there is a shift from higher molecular weight congeners to lower molecular weight congeners over time (and depth) (Brown et al., 1984;1987; Quensen et al., 1988; 1990). This is evident in the patterns from the St. Jones cores.

C6: *DDT and Chlordane*

The parent and breakdown products of DDT and chlordane were detectable in all sediment layers, especially in the upper, more fine-grained sections of each core (**Tables 1-3; Appendix II**). Total DDX (all forms; tDDX) ranged from < 2 to approximately 430 ng/g dw (median of 64 ng/g dw), while total chlordanes ranged from < 1 to 88 ng/g dw (median of 7.3 ng/g dw).

The distribution with depth of both groups of pesticides was slightly different from each other (**Figures 9-10**). In WC-1, tDDX and total chlordanes (tChl) concentrations were low throughout the core and exhibited peak concentration centered on 50 cm for tDDX and 80 cm for tChl, respectively. For WC-2, concentrations of both groups of compounds exhibited distinct maxima with depth with one group higher just above the other (**Figures 9-10**). Concentrations of tDDX were highest (363 ng/g dw) at 32-33 cm while tChl concentrations were highest (40 ng/g dw) at 26-28 cm. The layering of the two groups was also evident in LH-2 in that highest concentrations of tDDX were below peak concentrations of tChl. Concentrations in the deepest sections were near the detection limit for all cores.

In summary there was a wide range in concentrations of these parameters with depth and somewhat spatially (i.e., upstream to downstream). For comparison, NOAA sampled the tidal St. Jones River in 2000 (Hartwell et al., 2001) at three stations (**Table 6**). One station was located in the upper tidal reach (near LH; 89), one was located in the middle tidal reach (near Barkers Landing; 90), and one was located near the mouth (Sta. 88). The data for the core tops from this study are in fairly good agreement compared to Hartwell et al. (2001; **Table 6**). While the agreement is good, three points need to be stated that could impact this comparison. These include the interval sampled (0-2 cm versus 0 to ~ 6cm), locations are not exactly the same, and the total concentrations are the sum of a different number of compounds. For example, Hartwell et al. (2001) summed 28 congeners to obtained total PCBs while in the current study, 110 congeners were analyzed and summed. Given these caveats, there is a good overall agreement.

C7: *Historical Analysis of Chemical Contaminants*

The activity of $^{210}Pb$ and $^{137}Cs$ (reported as disintegrations per minute per gram of sediment; dpm/g) with depth can be used to determine the sedimentation rate and historical record of contaminants in sediments (Simpson et al., 1983; Orson et al., 1990; 1992; Valette-Silver, 1993; Appleby, 2001; Smol, 2002; Ridgway and Shimmield, 2002; Sommerfield, 2005). This information can be used for the construction of sediment budgets (Schubel and Hirschberg, 1977; Brush et al., 1982; Officer et al., 1984) and to understand chemical contaminant accumulation in aquatic environments (Cornwell et al., 1996; Latimer and Quinn, 1996; Van Metre et al., 1997; Church et al., 2006). Also, dated sediment cores can provide information as to the changes in loadings of contaminants over time (e.g., Gevo et al., 1997). Such information is especially useful in tracking the effectiveness of various management actions designed to reduce inputs to specific areas (Owens and Cornwell, 1995; Zhang et al., 1993). However, there are many variables that can affect the usefulness of $^{210}Pb$ and $^{137}Cs$ dating in a given area (Appleby and Oldfield, 1978; Crusius and Anderson, 1991; Appleby, 2001). These include mixing of the sediment by benthic organisms (i.e., burrowing organisms), physical mixing from dredging and storm events, post-depositional movement of contaminants and of the $^{210}Pb$ or $^{137}Cs$, and additional inputs of $^{210}Pb$ from sources in the urban landscape (i.e., urban sediment focusing). Sommerfield (2005) presented this information and discussion for the cores analyzed in this study. In summary, sedimentation rates for WC-1, WC-2 and LH-2 for $^{210}Pb$ and $^{137}Cs$ ranged from 0.96-1.2 cm/yr, 0.94-0.92 cm/yr and 0.84-0.78 cm/yr, respectively. For the historical analysis, the average of the $^{210}Pb$ and $^{137}Cs$ rates was used for time chronologies.

*Total PAHs:* Total PAH concentrations in WC-1 were highest in the early 1920s (245 μg/g dw) decreasing to lower levels by 1940 and remaining nearly constant (0.85 to 2.2 μg/g dw) to the present (**Figure 11**). At WC-2, the chronology only goes back to the 1930s and as such does not show the 1920s peak concentration. In this core, tPAH concentrations were highest (8.9 μg/g dw) in the mid-1960s decreasing to < 3 μg/g dw by 2003. Concentrations in core LH-2 were highest (> 1000 μg/g dw) in the early 1940s decreasing to 56 μg/g dw by 1960. After this date, concentrations decrease to a minimum of 8 μg/g dw in the late 1970s, increasing slightly to the present.

It is difficult to determine the exact source(s) of PAHs to these cores, but the LH-2 site may be influenced by runoff, either surface or subsurface, from a contaminated site in Dover, DE. Importantly, a coal-gasification facility (Dover Gas Light Company) was located approximately 2.5 km southwest of the LH-2 site and is currently under clean up action (Superfund site) from the US EPA (US EPA, 1994 and other documents). From 1859 to 1948 the facility produced gas from coal which was used for street lamps and other purposes. While the plant was closed in 1948, it left behind substantial contamination in the soils and in groundwater of coal oil and/or coal tar (US EPA, 1994). Given the substantial levels of tPAHs, the high molecular weight of the PAHs and peak concentration in the early to mid-1940s, the data suggests that the PAHs present in the bottom of LH-2 are derived from the old Dover Gas Light site.

For core WC-1, the molecular distribution of PAHs indicates that a direct hydrocarbon spill or intentional discharge occurred over many years. As opposed to the more recent sediments at the surface the sections deeper down were dominated by low molecular weight compounds which suggest petrogenic sources.

*Total PCBs:* Polychlorinated biphenyls (PCBs) were mainly produced by the Monsanto Corporation from 1930 to 1977 and it is estimated that $5.4 \times 10^8$ kg has been produced within the United States (Kennish, 1992). These compounds have been fully regulated since 1976 and while their manufacture in the U.S. ceased since 1977, they are still in use as electrical insulators in many transformers. They are also used as a fire retardant, and additives to oils and paints. Persistence of PCBs in aquatic sediments is due to their slow rate of degradation and vaporization, low water solubility, and partitioning to particles and organic carbon. Bacteria degrade PCB, with the rate dependent on the position and degree of chlorination of the biphenyl ring and in many cases the absolute concentration present in the sediments (see Kennish, 1992 and others). Current sources to this area are thought to be from contaminated sediments, runoff from old landfills, accidental spills (e.g., transformer fluids) and atmospheric deposition.

Concentrations of tPCBs in all cores started to increase after 1930 with highest values after 1960 (**Figure 12**). Total PCB concentrations in WC-1 were highest in the late 1950s and early 1960s, decreasing to < 50 ng/g dw by 2003 (**Figure 12**), while in both WC-2 and LH-2, concentrations generally were highest in the late 1970s to early 1980s. Concentrations in all cases decreased towards the surface illustrating that most likely usage and regulations have been

effective in the input of PCBs over time. The differences in historical structure of tPCBs in each core may be due to site-specific differences in sedimentation (i.e., averaging over specific time intervals), more local inputs (i.e., WC-1 is within a know landfill) and post-depositional migration. It is doubtful that atmospheric deposition of PCBs would be a major contributor to the concentration gradient. Also, the cores were sampled at 2-cm intervals but not every section was analyzed for contaminants. Therefore the resolution of the profile may be altered dependent on the section analyzed, and as such, analysis of the un-analyzed sections is warranted.

*Total DDX and Chlordanes:* DDT and its breakdown products (2,4'+ 4,4' forms of DDT (1,1'-(2,2,2-trichloroethylidene)bis[4-chlorobenzene]; DDE (1,1'-(2,2,2-trichloroethenylidene)bis[4-chlorobenzene]) and DDD (1,1'-(2,2-dichloroethylidene)bis[4-chlorobenzene]) was used for insect controls starting in the mid-1940s. DDT was banned in 1972 and has been found to have an approximate environmental half-life of 10 to 20 years (Woodwell et al., 1971). While it was banned nearly 30 years ago, parent DDT is still detectable (and in substantial concentrations) in the sedimentary material collected from various locations (Wade et al., 1994).

Chlordane is a multi-component mixture of polychloro-methanoindenes (e.g., oxy-, γ-, and α-chlordane, heptachlor, heptachlor epoxide and cis+trans-nonachlor). Technical grade chlordane contains more than 140 components of which only 120 compounds can be resolved by current analytical techniques. Alpha (α)-chlordane, gamma (γ)-chlordane, heptachlor and trans-nonachlor are the dominant constituents (Dearth and Hites, 1991), and are used to control termites and ants. Because of the toxicity, potential carcinogenicity and environmental persistence of these components and/or metabolites, e.g., heptachlor, heptachlor epoxide and oxychlordane, the use of chlordane is under federal regulation. The use of chlordane was halted in 1988 after a phased reduction in use since approximately 1975. The half-life of chlordane is similar to that of DDT (i.e., approximately 10 to 20 years), and therefore its persistence is to be expected for many years. However, while the large scale use of chlordane decreased in the late 1980s, it was not fully phased out and was still used in the area.

Similar temporal distributions of tChl were observed as tDDX in WC-2 and LH-2, but the date of peak concentrations were shifted from one another (**Figures 13-14**). In WC-2, highest concentrations of tDDX were observed in the mid-1960s, compared to the mid-1970s for tChl (**Figures 13-14**). In LH-2 there was a bimodal distribution of both pesticide groups, again with a

shift in the date of peak concentrations. For tDDX, concentrations were highest around 1940 and mid-1960s (**Figures 13-14**) while for tChl, peak concentrations were observed in the early 1950s and early 1980s (**Figures 13-14**).

It is not clear why the two distributions are shifted, but the most likely reason is the use history for each class of pesticides and specifically the use/disposal history in this area (i.e., which could be different from other locations). For tDDXs, both cores showed a peak in the 1960s with decreasing concentrations to the present. While there was a ban in DDT use in the early 1970s, there could be a more local decrease in usage starting at an earlier date. While for tChl, both cores exhibited a peak in concentration in the late 1970s or early 1980s in agreement with the phased ban starting in 1975. The earlier peaks in time for both pesticides in 1940s and 1950s are interesting and may be the result of limited use as these chemicals became available. Only with specific historical use records from the area could the distributions observed in these cores be verified.

*Diatom Metrics:* The eutrophentic metrics were plotted along with the total sediment phosphorus concentrations (TSP) to understand if P appears to be causing a shift in diatoms species over time, resulting in more eutrophentic conditions (**Figure 15**). It should be noted that phosphorus undergoes substantial diagenetic remobilization (Berner, 1980; Burdige, 2006). In this regard, phosphate was shown to have a substantial movement out of the sediments in core incubations by Owens and Cornwell (2003). As such, only in specific cases (see for example Church et al., 2006) does the sedimentary record reflect sources and inputs. At this stage of the analysis there appears to be a good relationship between the diatom index of eutrophentic conditions and TSP for WC-1 and possibly WC-2, but not for LH-2. Concentrations of nutrients, as indicated by the diatoms, seem to have peaked in the 1950s and 1960s, have dropped off since, and were lowest from 1900 to 1920. For WC-2, there was a large shift to eutrophentic species between 1951 and 1965, and it appears that nutrients (phosphorus?) have stayed high ever since. The shifting of the City of Dover's WWTP in the early 1970s may not have impacted the change in diatoms even 30 years later. A similar result is observed in LH-2 but there is little trend based on TSP. This suggests that nutrients, including phosphorus and nitrogen, are a key parameter that results in an ecological shift in diatom assemblages. Further analysis of the data is currently in progress to

evaluate this trend and the mechanism of change. This may be supported by the analysis of the stable isotopes of C and N (Church et al., 2006 and others).

## D) Summary and Conclusions

This study involved the chemical analysis of three dated sediment cores taken from the upper tidal St. Jones Estuary. The cores were obtained and chronologies calculated by Dr. Christopher Sommerfield (CMES, University of Delaware). The main objective was to evaluate historical trends in organic chemical contaminants (e.g., polychlorinated biphenyls, chlordanes, and polycyclic aromatic hydrocarbons) and nutrients (i.e., sediment phosphorus and nitrogen). An additional objective was to evaluate if a historical record of eutrophication can be derived from algae analysis, i.e., diatoms, from the sediments along with other indicators of ecosystem change (e.g., $\delta^{13}$C-OM and $\delta^{15}$N-TN).

Organic contaminants, notably PCBs, DDX, PAHs, and chlordanes show distinct profiles in the sediments suggesting changes in the source and deposition over time. For example, total PCBs showed higher concentrations at depth with decreasing concentrations towards the surface. Total PCBs, DDX and chlordane concentrations showed a sharp maximum at similar depths decreasing towards the surface; especially in the upper sections (near the 1960s or 1970s). The congener composition of the PCBs showed a shift from mid to higher molecular weight compounds (i.e., homologs 5+6+7) to lower molecular weight compounds (i.e., homologs 3+4+5) from the upper sections to the lower sections. While post-depositional alterations may have occurred, these changes can also be due to changes in the type, use, source and importantly degradation of PCBs over time.

Total PAHs showed a distinct peak concentrations are depth in two cores (WC-1 and LH-2) with low and little trend in WC-2. In LH-2, total PAH concentrations were some of the highest concentrations observed (Kennish, 1992 and others) and maybe related to an adjacent contaminated site (US EPA, 1994). Sources in WC-1 suggest petrogenic inputs while in LH-2, sources appear to be mostly combustion products. Further analysis will be undertaken to help evaluate the source of these inputs to these depths.

Preliminary analysis of the diatom assemblages and metrics indicate a shift toward more eutrophic species starting in the late 1940s. Only in WC-1 was there a possible relationship between total sediment P and diatom metrics, suggesting nitrogen enrichment is also causing an impact to the diatom community. While diatom indices in WC-2 remain constant from the 1950s

to the present, the eutrophic index in WC-1 and LH-2 shows some sign of decreasing possibly related to nutrient controls and treatment.

Overall, this study documents the chemical analysis of three cores taken around the upper tidal St. Jones Estuary. Changes were observed in contaminant levels across time that reflect usage globally and most likely locally. There was in one core a clear shift in diatom species that reflect eutrophic conditions and this correlates to some degree with sediment P levels suggesting that phosphorus levels could be more limiting to species development and growth in the long term. Further analysis of the data will be undertaken to better quantify relationships observed in the data. Additionally, isotopic data of C and N, to be completed in the future, will help this interpretation process.

## E) Acknowledgments

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**Table 1. Concentrations of various parameters for Core WC-1.**

| Core ID | Depth Interval | Mid Point | Chem ID# | Approx Date | SN | SC | C/N | $\delta^{15}N$ | $\delta^{13}C$ | TSP | Total PAHs | Total PCBs | Total DDX | Total Chlordanes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | cm | cm | | yr | % | % | molar | permil | permil | µg/g | µg/g | ng/g | ng/g | ng/g |
| WC 1 | 0-2 | 1 | 6127 | 2003 | 0.50 | 5.86 | 13.7 | ND | ND | 912 | 1.06 | 39.3 | 20.25 | 3.64 |
| WC 1 | 4-6 | 5 | 6129 | 1998 | 0.44 | 5.50 | 14.6 | ND | ND | 735 | 1.85 | 78.5 | 23.59 | 3.58 |
| WC 1 | 10-12 | 11 | 6132 | 1992 | 0.48 | 3.35 | 8.10 | ND | ND | ND | 2.22 | 31.5 | 15.55 | 2.17 |
| WC 1 | 20-22 | 21 | 6137 | 1981 | 0.42 | 5.59 | 15.4 | ND | ND | 679 | 0.95 | 88.6 | 19.63 | 3.09 |
| WC 1 | 30-32 | 31 | 6142 | 1971 | 0.38 | 4.92 | 15.0 | ND | ND | 1944 | 0.84 | 100.8 | 24.41 | 7.30 |
| WC 1 | 40-42 | 41 | 6147 | 1960 | 0.34 | 4.36 | 14.8 | ND | ND | 1759 | 1.15 | 139.3 | 38.04 | 1.99 |
| WC 1 | 50-52 | 51 | 6152 | 1950 | 0.41 | 5.86 | 16.8 | ND | ND | 1108 | 2.25 | 138.6 | 165.4 | 2.20 |
| WC 1 | 60-62 | 61 | 6157 | 1939 | 0.49 | 7.00 | 16.7 | ND | ND | 591 | 4.14 | 35.4 | 6.40 | 0.96 |
| WC 1 | 70-72 | 71 | 6162 | 1929 | 0.43 | 5.79 | 15.8 | ND | ND | 868 | 62.4 | 7.8 | 1.55 | 0.89 |
| WC 1 | 80-82 | 81 | 6167 | 1919 | 0.75 | 12.96 | 20.2 | ND | ND | 780 | 243 | 37.9 | 54.43 | 16.07 |
| WC 1 | 90-92 | 91 | 6172 | 1908 | 0.53 | 7.66 | 16.9 | ND | ND | 1425 | 43.8 | 5.5 | 2.02 | 0.90 |
| WC 1 | 100-102 | 101 | 6177 | 1898 | 0.59 | 9.08 | 17.8 | ND | ND | 832 | 5.65 | 4.2 | 1.81 | 1.07 |

Concentrations on a dry weight basis. ND- Not determined, NC – Not calculated. . Total PAHs is the sum of 39 individual compounds, total PCBs is the sum of 110 congeners, total DDX is the sum of o,p+pp forms of DDD, DDE, and DDT, and total chlordane is the sum of alpha+gamma chlordane, heptachlor, heptachlor epoxide, oxychlordane, nonachlor and nonachlor epoxide (See Appendix XX).

**Table 2. Concentrations of various parameters for Core WC-2.**

| Core ID | Depth Interval cm | Mid Point cm | Chem ID# | Approx Date yr | SN % | SC % | C/N molar | $\delta^{15}N$ permil | $\delta^{13}C$ permil | TSP µg/g | Total PAHs µg/g | Total PCBs ng/g | Total DDX ng/g | Total Chlordanes ng/g |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WC 2 | 0-2 | 1 | 6180 | 2003 | 0.68 | 8.23 | 14.1 | ND | ND | 756 | 2.24 | 60.36 | 38.99 | 4.29 |
| WC 2 | 2-4 | 3 | 6181 | 2001 | 0.63 | 7.23 | 13.3 | ND | ND | 695 | 2.56 | 68.44 | 30.46 | 4.38 |
| WC 2 | 4-6 | 5 | 6182 | 1999 | 0.65 | 7.85 | 14.1 | ND | ND | 687 | 2.42 | 60.33 | 32.25 | 4.13 |
| WC 2 | 6-8 | 7 | 6183 | 1997 | 0.59 | 6.91 | 13.7 | ND | ND | 684 | 2.74 | 81.08 | 37.90 | 4.61 |
| WC 2 | 8-10 | 9 | 6184 | 1994 | 0.61 | 7.82 | 14.9 | ND | ND | 691 | 4.45 | 75.39 | 46.59 | 5.57 |
| WC 2 | 10-12 | 11 | 6185 | 1992 | 0.56 | 7.51 | 15.6 | ND | ND | 624 | 2.49 | 82.56 | 45.33 | 6.24 |
| WC 2 | 12-14 | 13 | 6186 | 1990 | 0.57 | 7.62 | 15.6 | ND | ND | 657 | 3.99 | 91.55 | 53.08 | 7.08 |
| WC 2 | 14-16 | 15 | 6187 | 1988 | 0.58 | 8.08 | 16.2 | ND | ND | 672 | 3.83 | 104.63 | 63.54 | 7.72 |
| WC 2 | 16-18 | 17 | 6188 | 1986 | 0.56 | 7.50 | 15.7 | ND | ND | 696 | 4.48 | 114.26 | 64.72 | 11.65 |
| WC 2 | 18-20 | 19 | 6189 | 1984 | 0.62 | 8.36 | 15.7 | ND | ND | 667 | 5.49 | 102.44 | 66.86 | 11.62 |
| WC 2 | 20-22 | 21 | 6190 | 1982 | 0.69 | 10.9 | 18.4 | ND | ND | 677 | 6.01 | 100.91 | 53.93 | 8.67 |
| WC 2 | 22-24 | 23 | 6191 | 1979 | 0.61 | 9.30 | 17.9 | ND | ND | 730 | 4.88 | 148.41 | 88.38 | 15.43 |
| WC 2 | 24-26 | 25 | 6192 | 1977 | 0.65 | 10.0 | 17.9 | ND | ND | 697 | 5.21 | 161.45 | 120.24 | 23.42 |
| WC 2 | 26-28 | 27 | 6193 | 1975 | 0.66 | 10.4 | 18.3 | ND | ND | 653 | 5.81 | 218.26 | 177.45 | 40.21 |
| WC 2 | 28-30 | 29 | 6194 | 1973 | 0.56 | 8.37 | 17.3 | ND | ND | 598 | 4.98 | 135.15 | 155.44 | 20.37 |
| WC 2 | 30-32 | 31 | 6195 | 1971 | 0.44 | 6.21 | 16.4 | ND | ND | 565 | 8.01 | 177.89 | 285.82 | 13.90 |
| WC 2 | 32-34 | 33 | 6196 | 1969 | 0.50 | 7.30 | 17.1 | ND | ND | 595 | 8.59 | 177.86 | 363.06 | 9.87 |
| WC 2 | 34-36 | 35 | 6197 | 1967 | 0.46 | 6.72 | 17.1 | ND | ND | 554 | 8.87 | 128.87 | 294.25 | 4.39 |
| WC 2 | 38-40 | 39 | 6199 | 1962 | 0.60 | 8.42 | 16.5 | ND | ND | 539 | 7.57 | 76.83 | 124.37 | 2.84 |
| WC 2 | 44-46 | 45 | 6202 | 1956 | 0.81 | 11.8 | 17.0 | ND | ND | 638 | 5.30 | 61.85 | 18.64 | 0.96 |
| WC 2 | 60-62 | 61 | 6210 | 1939 | 1.27 | 24.1 | 22.1 | ND | ND | 811 | 3.79 | 37.15 | 12.40 | 0.73 |
| WC 2 | 66-68 | 67 | 6213 | 1932 | 0.54 | 7.66 | 16.6 | ND | ND | 349 | 5.40 | 14.40 | 9.63 | 0.45 |

Concentrations on a dry weight basis. ND- Not determined, NC – Not calculated. . Total PAHs is the sum of 39 individual compounds, total PCBs is the sum of 110 congeners, total DDX is the sum of o,p+pp forms of DDD, DDE, and DDT, and total chlordane is the sum of alpha+gamma chlordane, heptachlor, heptachlor epoxide, oxychlordane, nonachlor and nonachlor epoxide (See Appendix XX).

**Table 3. Concentrations of various parameters for Core LH-2.**

| Core ID | Depth Interval | Mid Point | Chem ID# | Approx Date | SN | SC | C/N | $\delta^{15}N$ | $\delta^{13}C$ | TSP | Total PAHs | Total PCBs | Total DDX | Total Chlordanes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | cm | cm | | yr | % | % | molar | permil | permil | µg/g | µg/g | ng/g | ng/g | ng/g |
| LH 2 | 0-2 | 1 | 6214 | 2003 | 0.96 | 14.4 | 17.5 | ND | ND | 785 | 19.5 | 166.1 | 114.1 | 48.4 |
| LH 2 | 4-6 | 5 | 6216 | 1998 | 0.27 | 3.90 | 16.7 | ND | ND | 319 | 11.5 | 147.8 | 112.6 | 25.5 |
| LH 2 | 14-16 | 15 | 6221 | 1986 | 0.25 | 3.56 | 16.3 | ND | ND | 357 | 5.8 | 213.0 | 76.7 | 50.5 |
| LH 2 | 20-22 | 21 | 6224 | 1979 | 0.56 | 11.9 | 24.8 | ND | ND | 767 | 8.2 | 782.0 | 206.2 | 88.4 |
| LH 2 | 26-28 | 27 | 6227 | 1971 | 0.50 | 10.4 | 24.3 | ND | ND | 575 | 14.9 | 453.8 | 314.9 | 16.3 |
| LH 2 | 30-32 | 31 | 6229 | 1966 | 0.36 | 5.39 | 17.6 | ND | ND | 730 | 41.4 | 267.0 | 427.2 | 15.8 |
| LH 2 | 34-36 | 35 | 6231 | 1961 | 0.31 | 4.46 | 16.8 | ND | ND | 681 | 60.9 | 242.7 | 227.3 | 8.8 |
| LH 2 | 40-42 | 41 | 6234 | 1954 | 0.59 | 9.11 | 17.9 | ND | ND | 572 | 246 | 278.9 | 78.9 | 67.4 |
| LH 2 | 44-46 | 45 | 6236 | 1949 | 0.55 | 9.01 | 19.3 | ND | ND | 608 | 1063 | 388.5 | 158.2 | 27.7 |
| LH 2 | 50-52 | 51 | 6239 | 1942 | 0.64 | 11.7 | 21.3 | ND | ND | 847 | 1111 | 282.1 | 331.3 | 13.6 |
| LH 2 | 54-56 | 55 | 6241 | 1937 | 0.68 | 12.7 | 21.7 | ND | ND | 817 | 1006 | 412.3 | 336.0 | 22.6 |
| LH 2 | 60-62 | 61 | 6244 | 1929 | 0.60 | 8.19 | 15.8 | ND | ND | 510 | 223 | 100.2 | 222.4 | 23.9 |
| LH 2 | 64-66 | 65 | 6246 | 1924 | 0.61 | 8.84 | 16.8 | ND | ND | 383 | 5.5 | 34.9 | 17.2 | 2.9 |

Concentrations on a dry weight basis. ND- Not determined, NC – Not calculated. . Total PAHs is the sum of 39 individual compounds, total PCBs is the sum of 110 congeners, total DDX is the sum of o,p+pp forms of DDD, DDE, and DDT, and total chlordane is the sum of alpha+gamma chlordane, heptachlor, heptachlor epoxide, oxychlordane, nonachlor and nonachlor epoxide (See Appendix XX).

**Table 4. Diatom Metrics determined from species identification.**

| Core ID/ Depth Interval (cm) | Mid-Depth (cm) | Year | Eutrophentic | Meso/ eurotrophentic | Mesotrophentic | Oligotrophentic | Oligo/ mesotrophentic | Poly-trophic | Unknown |
|---|---|---|---|---|---|---|---|---|---|
| WC-1_0-2cm | 1 | 2003 | 29.33 | 3.67 | 0.33 | 0.00 | 7.33 | 0.67 | 57.00 |
| WC-1_6-8 | 7 | 1996 | 35.24 | 2.22 | 2.54 | 0.32 | 6.03 | 2.22 | 49.21 |
| WC-1_16-18 | 17 | 1985 | 33.43 | 2.25 | 1.12 | 0.00 | 11.52 | 0.00 | 50.00 |
| WC-1_20-22cm | 21 | 1981 | 40.67 | 12.00 | 0.33 | 1.33 | 6.67 | 0.00 | 34.33 |
| WC-1_26-28cm | 27 | 1975 | 42.67 | 5.00 | 2.33 | 0.00 | 14.00 | 0.00 | 33.67 |
| WC-1_36-38 | 37 | 1964 | 60.45 | 1.59 | 0.91 | 0.23 | 2.27 | 1.14 | 30.91 |
| WC-1_46-48cm | 47 | 1956 | 59.33 | 3.33 | 0.00 | 0.67 | 0.00 | 0.00 | 27.00 |
| WC-1_56-58 | 57 | 1944 | 53.89 | 3.22 | 1.07 | 0.27 | 0.54 | 0.00 | 38.87 |
| WC-1_72-74cm | 73 | 1927 | 33.43 | 10.76 | 2.83 | 0.57 | 1.42 | 0.28 | 49.29 |
| WC-1_80-82 | 81 | 1919 | 18.33 | 24.33 | 3.33 | 1.33 | 3.67 | 2.67 | 19.67 |
| WC-1_96-98 | 97 | 1902 | 28.47 | 6.19 | 2.48 | 0.00 | 3.22 | 0.00 | 40.59 |
| | | | | | | | | | |
| WC-2_0-2cm | 1 | 2003 | 63.67 | 0.67 | 0.00 | 0.00 | 3.33 | 0.33 | 30.67 |
| WC-2_8-10cm | 9 | 1993 | 65.00 | 3.67 | 0.00 | 0.00 | 3.00 | 0.00 | 25.33 |
| WC-2_24-26cm | 25 | 1976 | 61.33 | 6.33 | 0.00 | 0.00 | 9.67 | 0.67 | 20.67 |
| WC-2_40-42cm | 41 | 1956 | 63.33 | 4.67 | 0.33 | 0.00 | 2.33 | 0.00 | 28.33 |
| WC-2_48-50cm | 49 | 1951 | 15.33 | 34.00 | 2.33 | 3.33 | 4.00 | 0.33 | 16.67 |
| WC-2_60-62cm | 61 | 1938 | 13.67 | 15.33 | 1.00 | 2.33 | 4.67 | 0.00 | 25.67 |
| | | | | | | | | | |
| LH-2_0-2cm | 1 | 2003 | 50.00 | 6.00 | 0.67 | 0.00 | 16.33 | 1.00 | 12.67 |
| LH-2_8-10cm | 9 | 1992 | 52.67 | 3.00 | 0.67 | 0.33 | 24.00 | 1.00 | 11.00 |
| LH-2_14-16cm | 15 | 1984 | 50.00 | 12.67 | 1.33 | 0.33 | 17.33 | 1.67 | 8.33 |
| LH-2_22-24cm | 23 | 1975 | 57.33 | 12.33 | 1.00 | 0.67 | 10.33 | 8.00 | 5.67 |
| LH-2_30-32cm | 31 | 1965 | 63.33 | 5.00 | 3.67 | 0.00 | 10.00 | 1.33 | 6.33 |
| LH-2_40-42cm | 41 | 1952 | 49.00 | 9.00 | 6.33 | 0.67 | 7.00 | 0.67 | 13.00 |
| LH-2_50-52cm | 51 | 1940 | 32.00 | 10.67 | 4.00 | 0.00 | 17.67 | 2.67 | 17.33 |
| LH-2_62-64cm | 63 | 1925 | 44.67 | 11.33 | 2.67 | 0.67 | 2.33 | 0.00 | 21.00 |

Metrics based on van Dam et al. (1994).

**Table 5. List of compounds in Figure 7.**

| PAH Compound | Cmpd # |
|---|---|
| Naphthalene | 1 |
| biphenyl | 2 |
| Acenaphthylene | 3 |
| Acenaphthene | 4 |
| Fluorene | 5 |
| Dibenzothiophene | 6 |
| Phenanthrene | 7 |
| Anthracene | 8 |
| Fluoranthene | 9 |
| BenzoAfluorene | 10 |
| BenzoBfluorene | 11 |
| Pyrene | 12 |
| Cyclopenta[cd]pyrene | 13 |
| Chrysene + Triphenylene | 14 |
| Naphthacene | 15 |
| Benzo[b]fluoranthene | 16 |
| Benzo[k]fluoranthene | 17 |
| Benzo[e]pyrene | 18 |
| Benzo[a]pyrene | 19 |
| Perylene | 20 |
| Indeno[1,2,3-cd]pyrene | 21 |
| Dibenzo[a,h+a,c]anthracene | 22 |
| Benzo[g,h,i]perylene | 23 |
| Coronene | 24 |

**Table 6. Selected sediment data for the tidal Saint Jones River as presented in Hartwell, et.al., 2001.**

| Station | Description | PCB (ug/kg dw) | PAH (ug/kg dw) | DDT (ug/kg dw) | Chlordane (ug/kg dw) | TOC (%) |
|---|---|---|---|---|---|---|
| 89 | upper tidal | 415.7 | 10977 | 170.0 | 74.6 | 20.5 |
| 90 | mid tidal | 50.4 | 1742 | 30.9 | 6.62 | 3.9 |
| 88 | lower tidal | 11.6 | 1178 | 9.32 | 2.12 | 5.07 |
| | | | | | | |
| **Station** | **Description** | **PCB (ug/kg dw)** | **PAH (ug/kg dw)** | **DDT (ug/kg dw)** | **Chlordane (ug/kg dw)** | **TOC (%)** |
| LH-2 | This Study | 166.1 | 19500 | 114 | 48.4 | 14.4 |
| WC-1 | This Study | 39.3 | 1060 | 20.3 | 3.64 | 5.86 |
| WC-2 | This Study | 60.4 | 2240 | 39.0 | 4.29 | 8.23 |

Note: the individual compounds that are summed for the totals for both studies are slightly different.

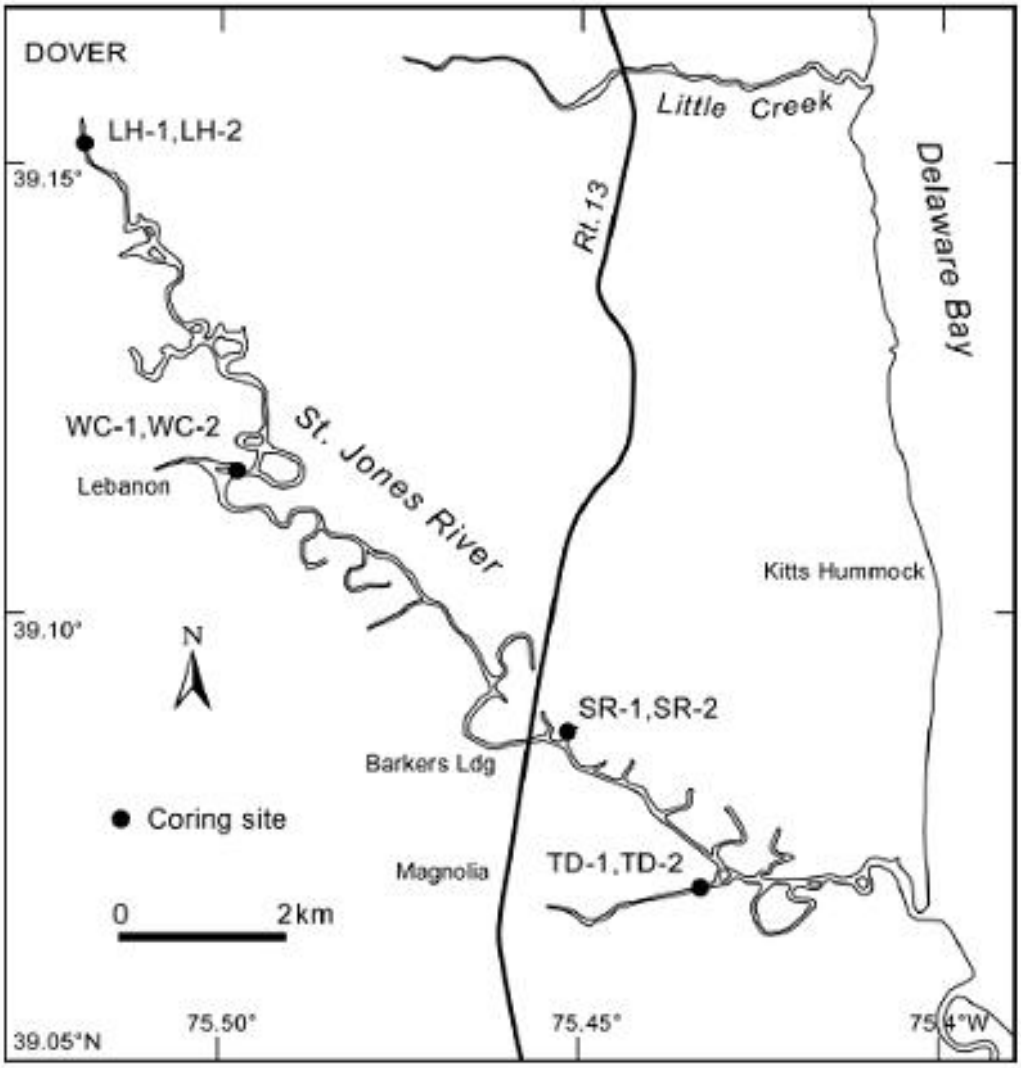


Figure 1. Study area showing locations of cores analyzed in this study (Sommerfield, 2005).

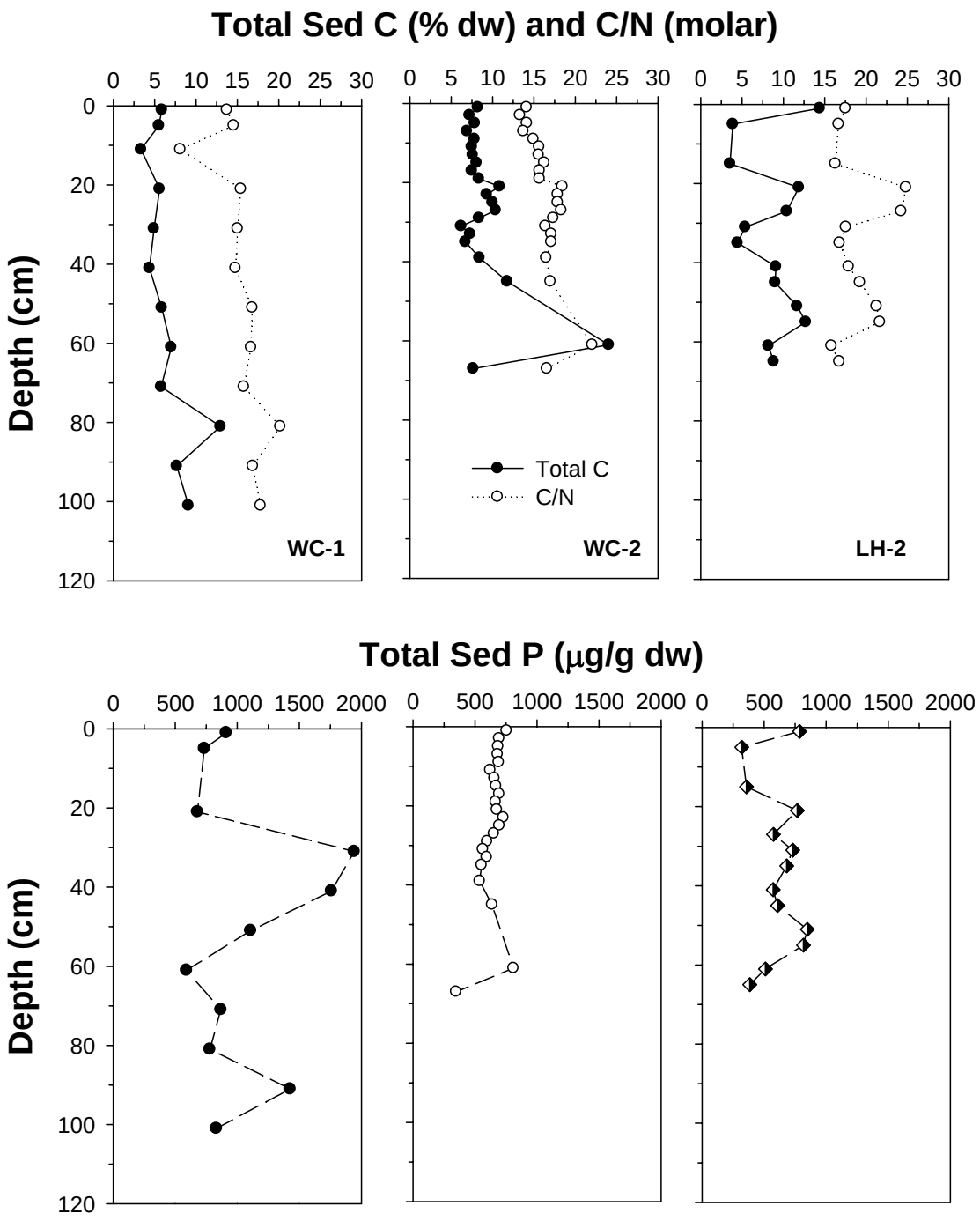


Figure 2. Sediment organic carbon, C/N and sediment phosphorus distribution with depth.

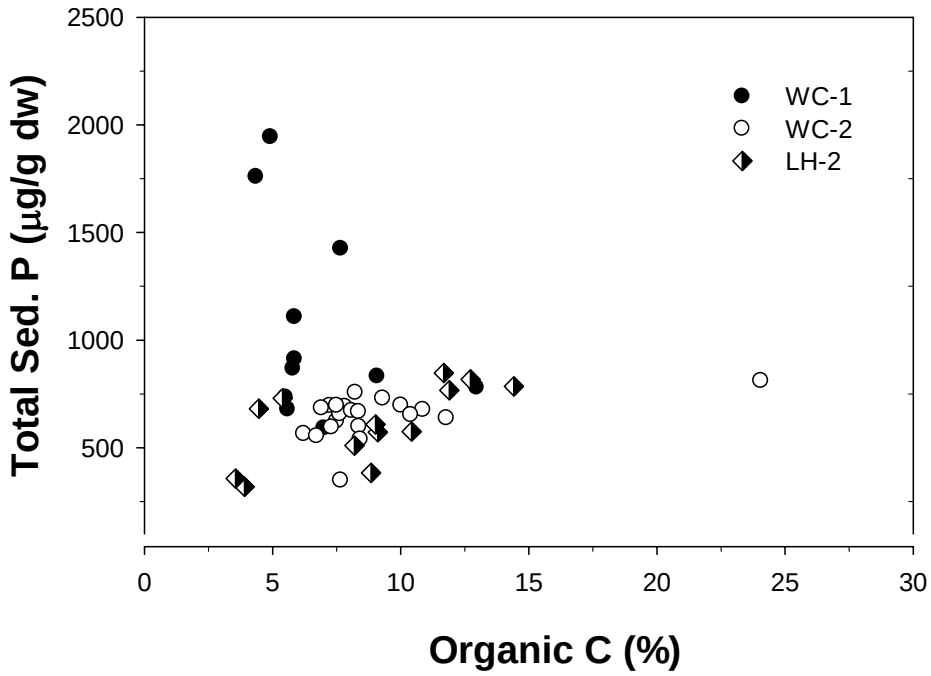


Figure 3. Relationship between sediment P and C.

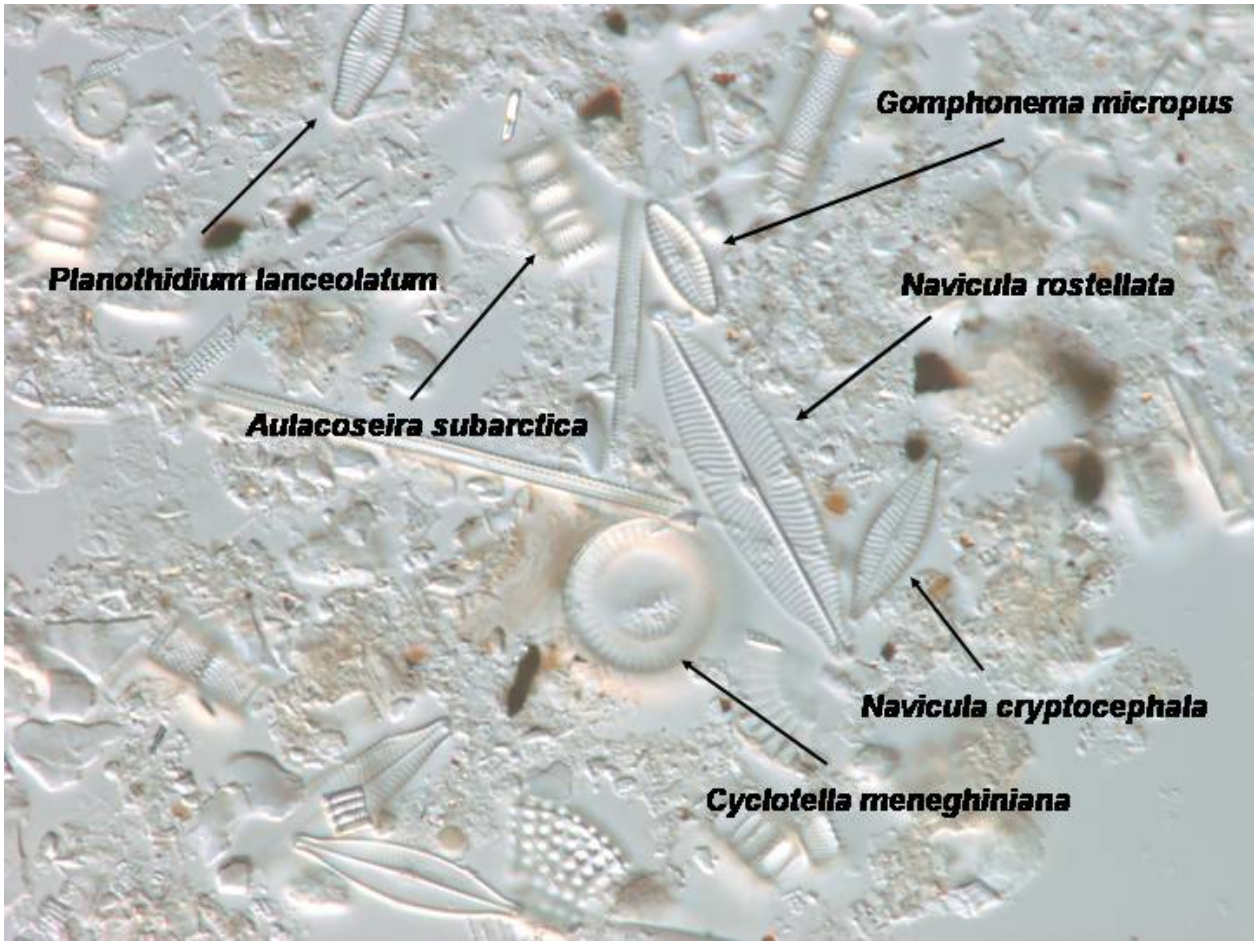


Figure 4. Image of diatom assemblage from core LH-1 (16-20 cm).

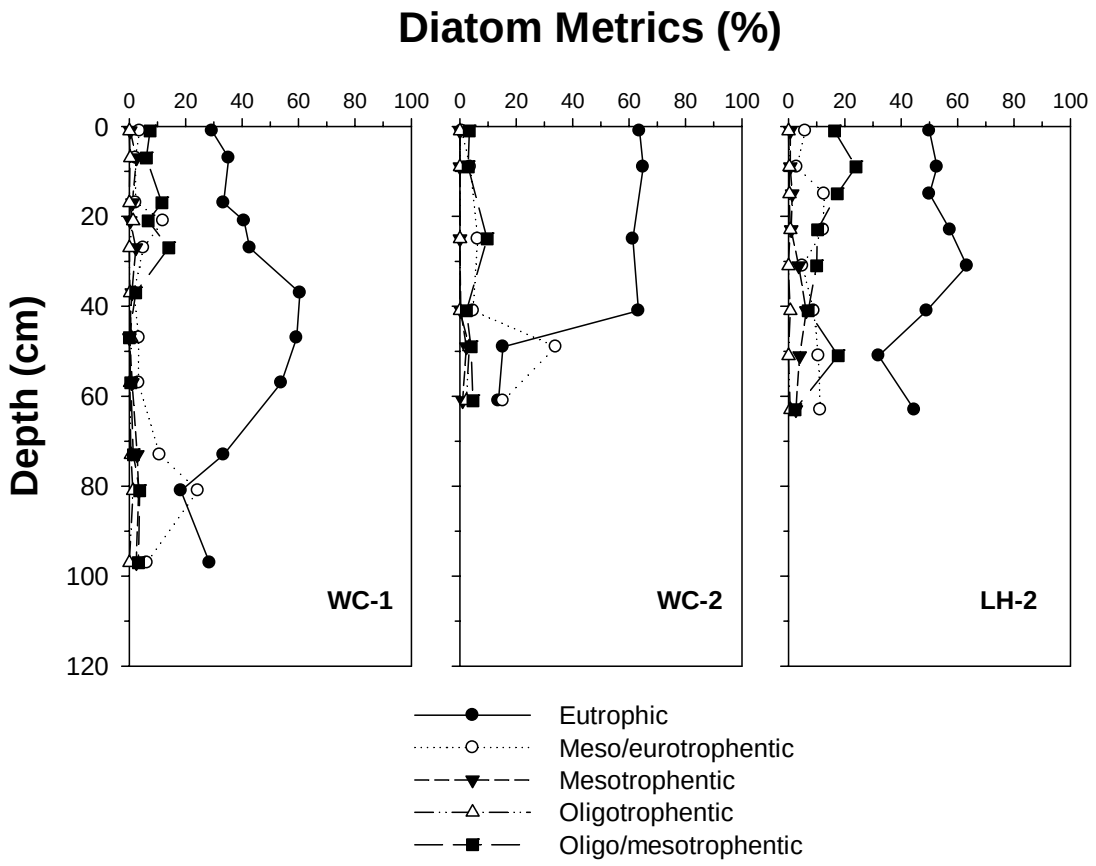


Figure 5. Depth distribution of diatom metrics for St. Jones cores.

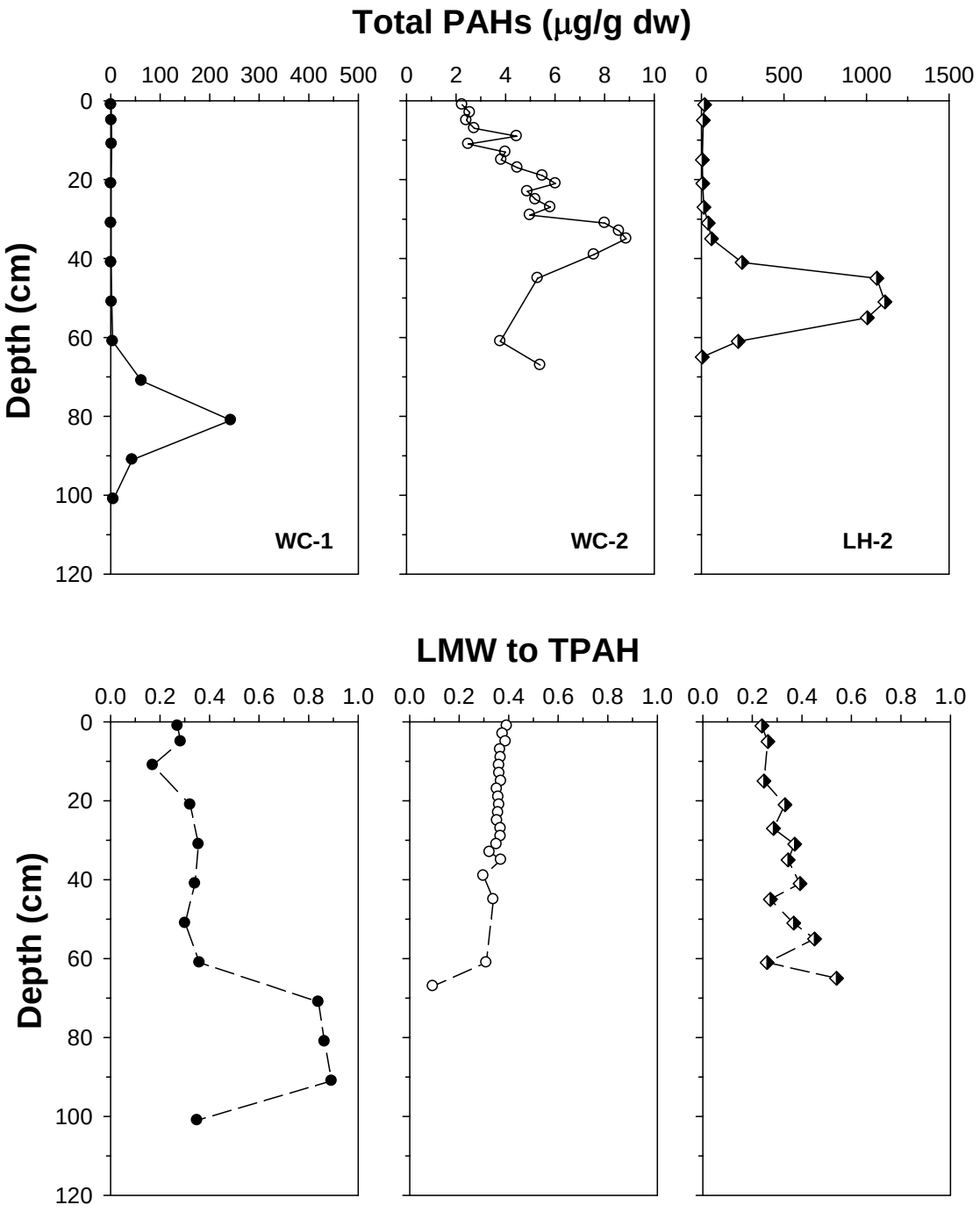


Figure 6. Depth distribution of total PAHs and the LMW to tPAHs ratio with depth.

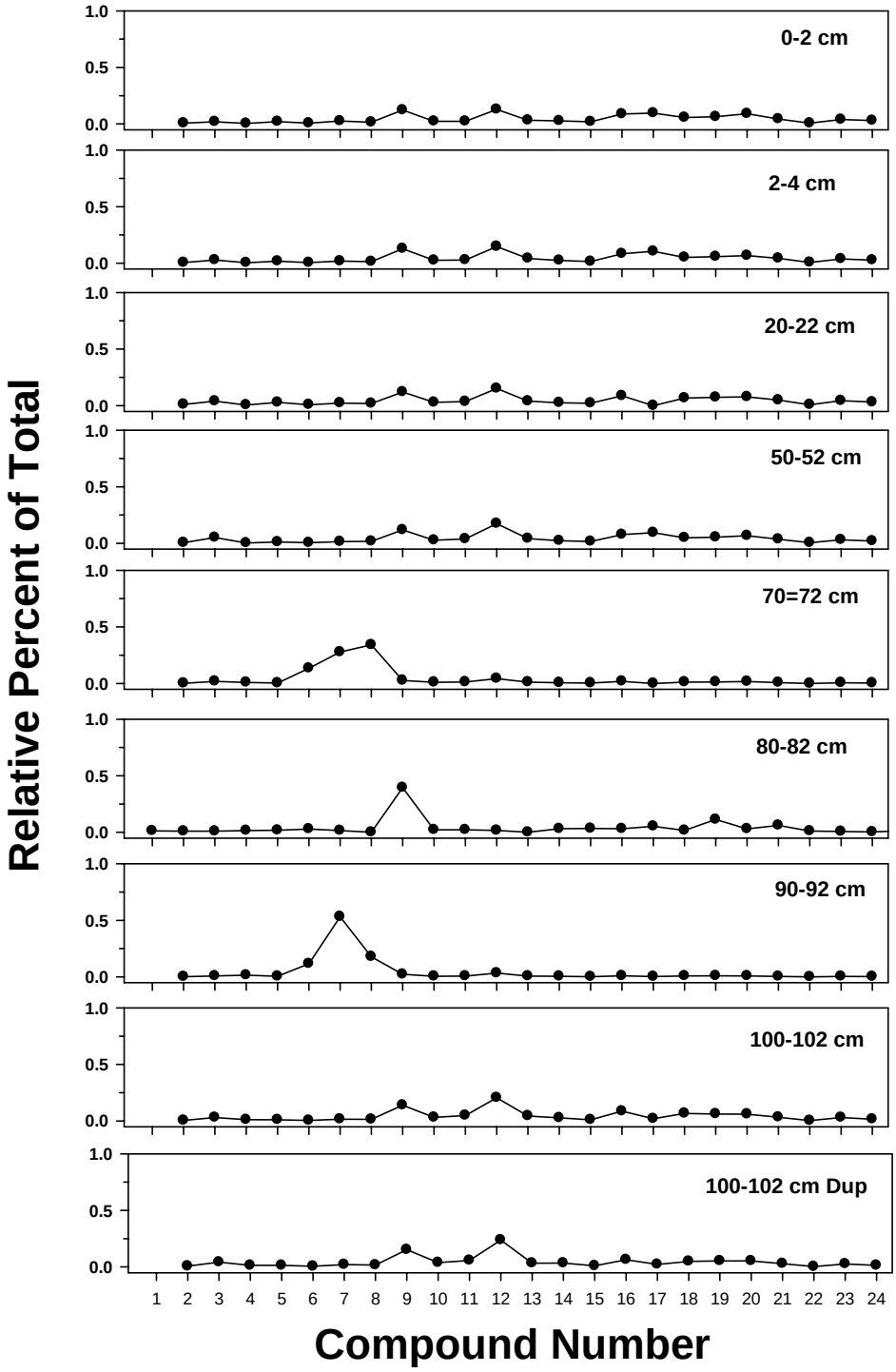


Figure 7. PAH compositional changes with depth in WC-1.

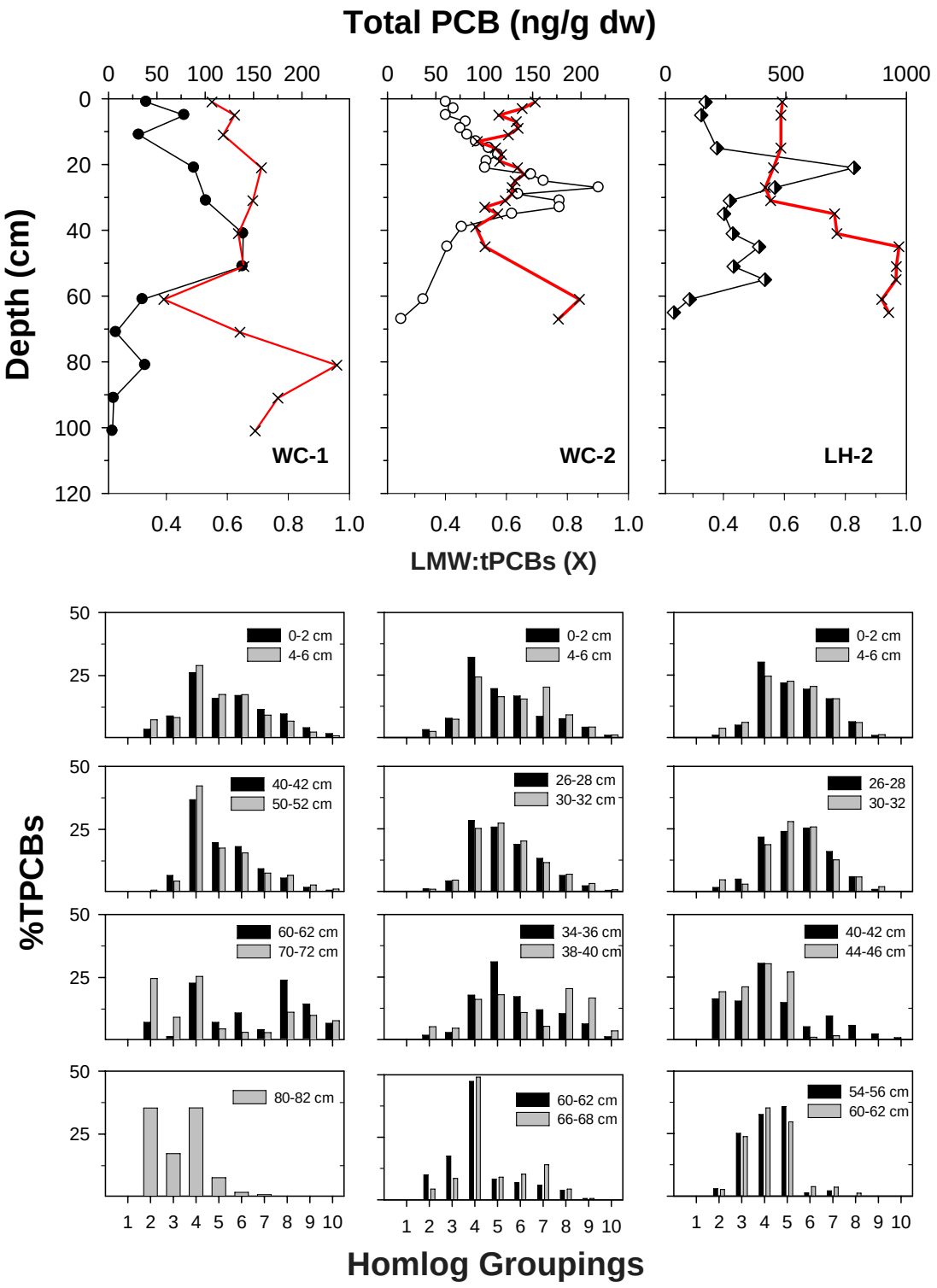


Figure 8. Depth distribution of total PCBs and the LMW to tPCBs ratio with depth.

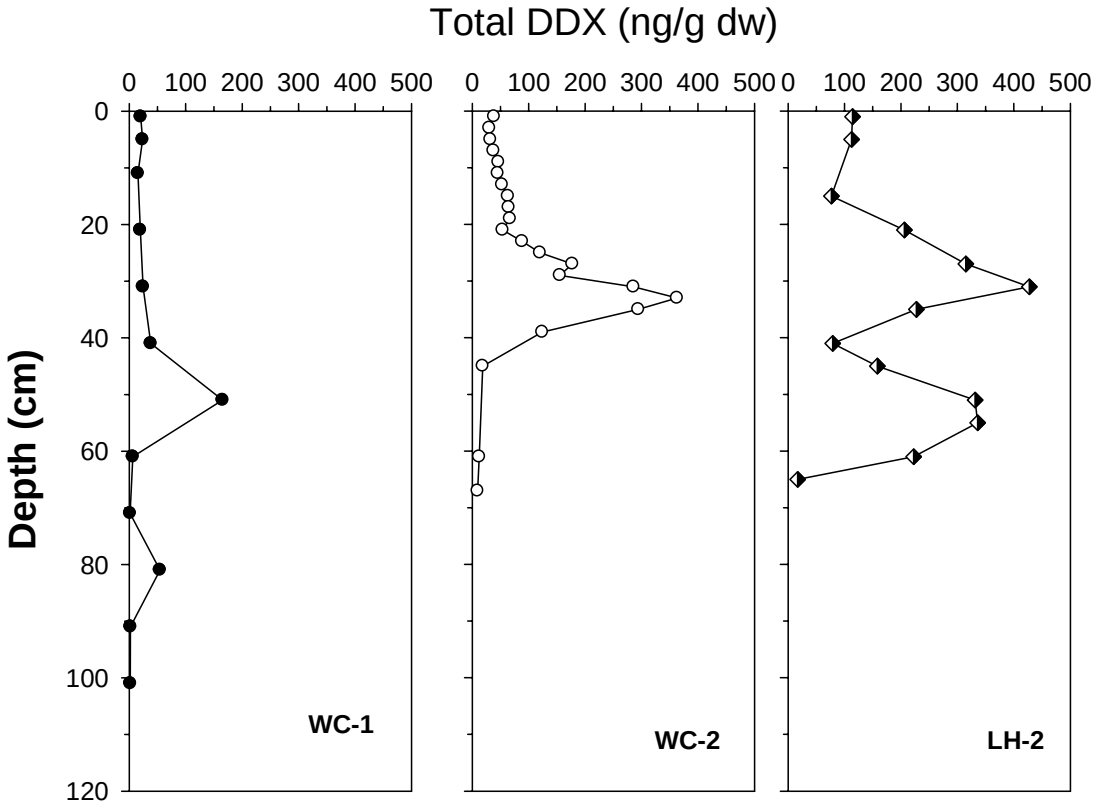


Figure 9. Total DDX (DDT+DDD+DDE all forms) with depth in the St Jones Estuary.

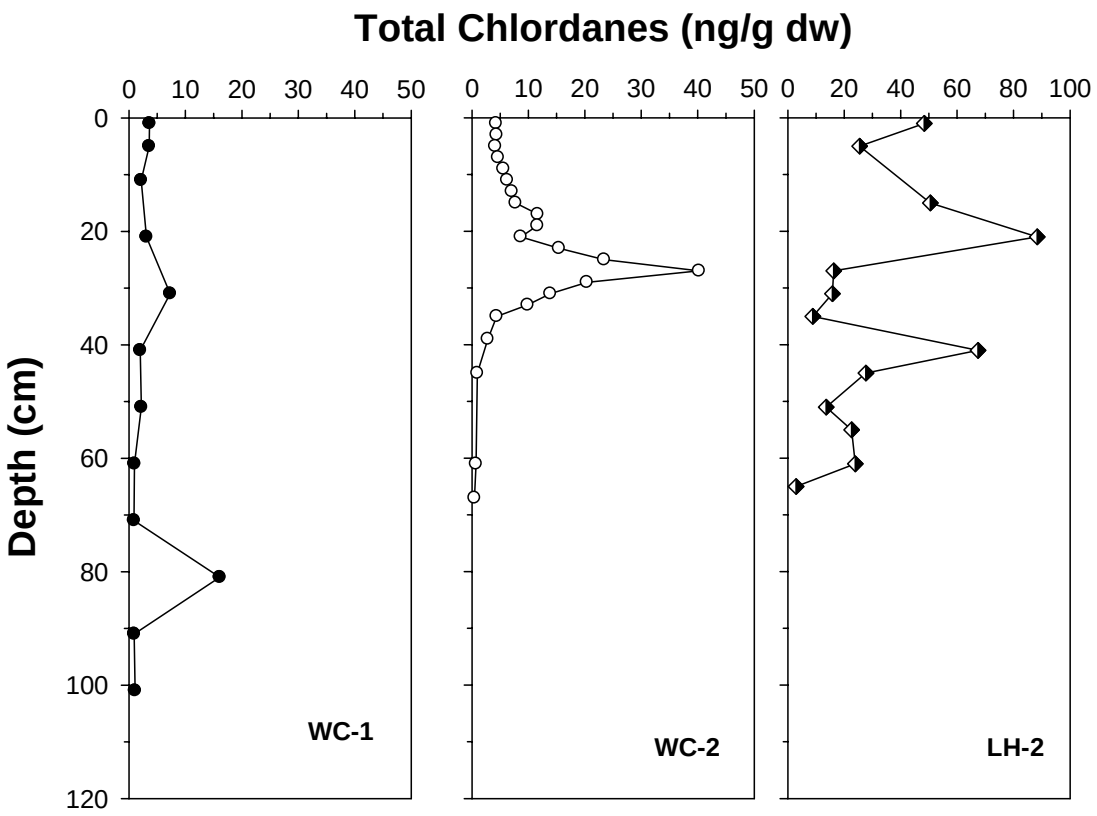


Figure 10. Total chlordanes (all forms) with depth in the St Jones Estuary.

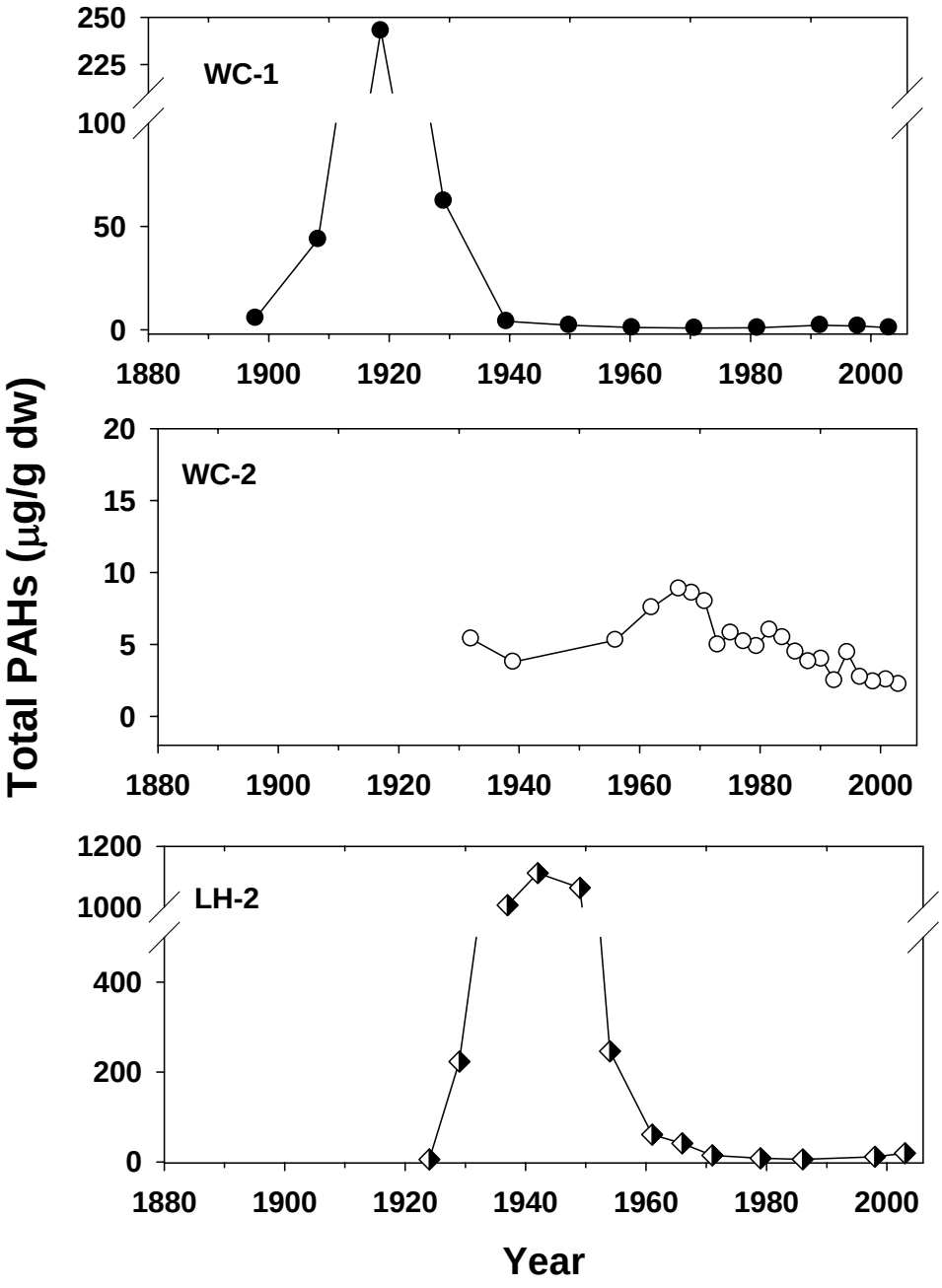


Figure 11. Concentrations of tPAHs from 1900 to 2003.

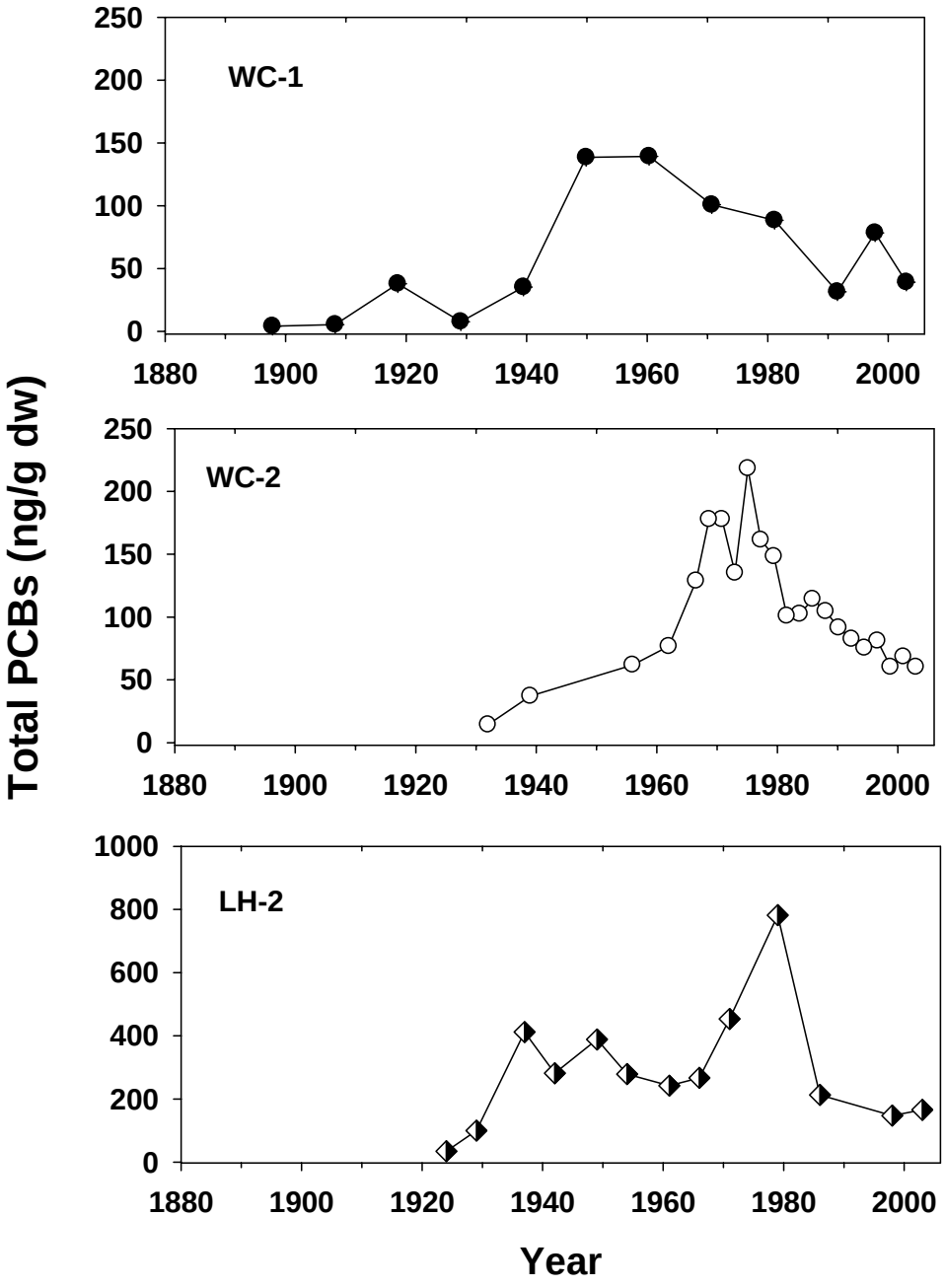


Figure 12. Concentrations of tPCBs from 1900 to 2003.

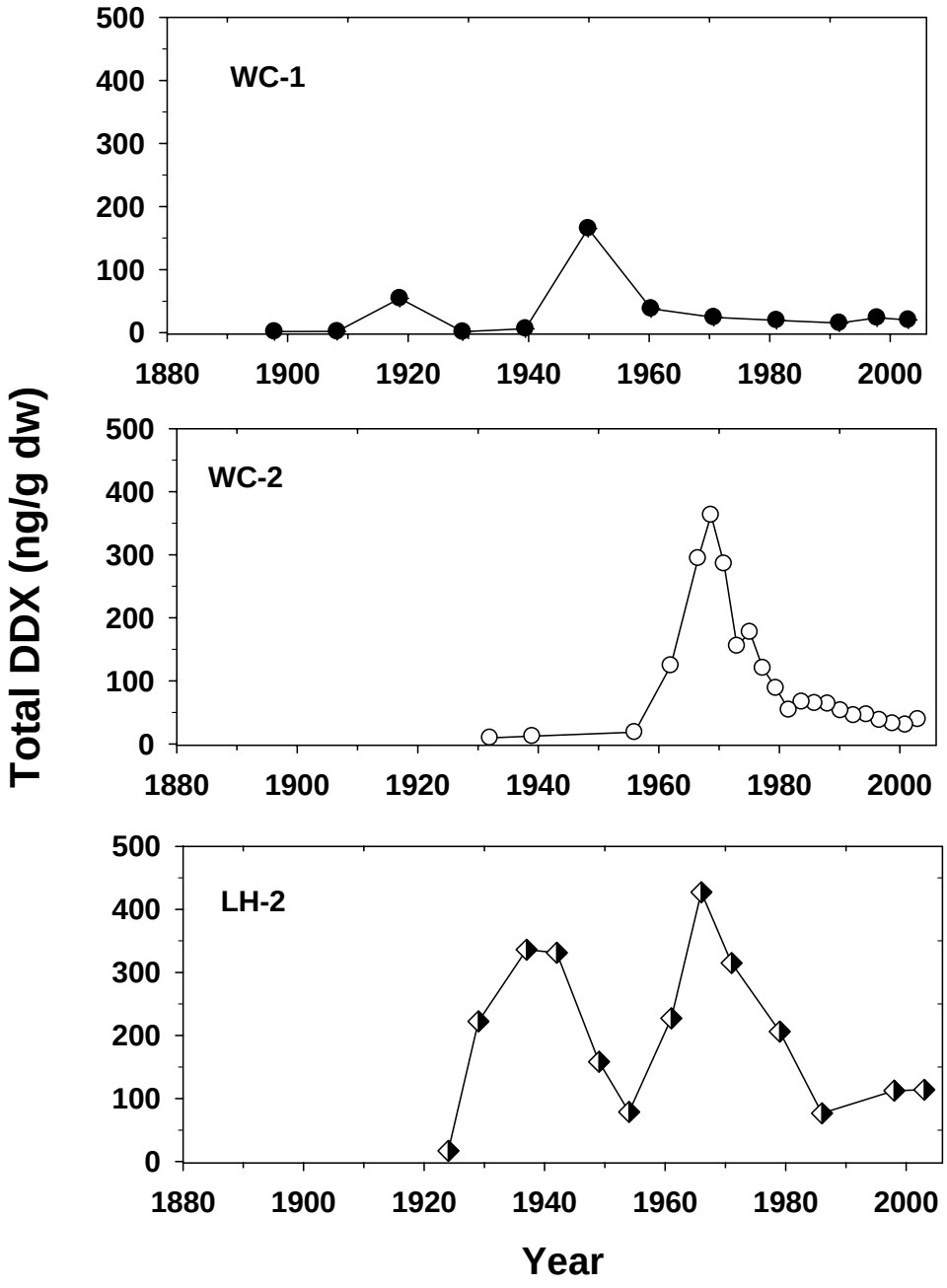


Figure 13. Concentrations of tDDXs from 1900 to 2003.

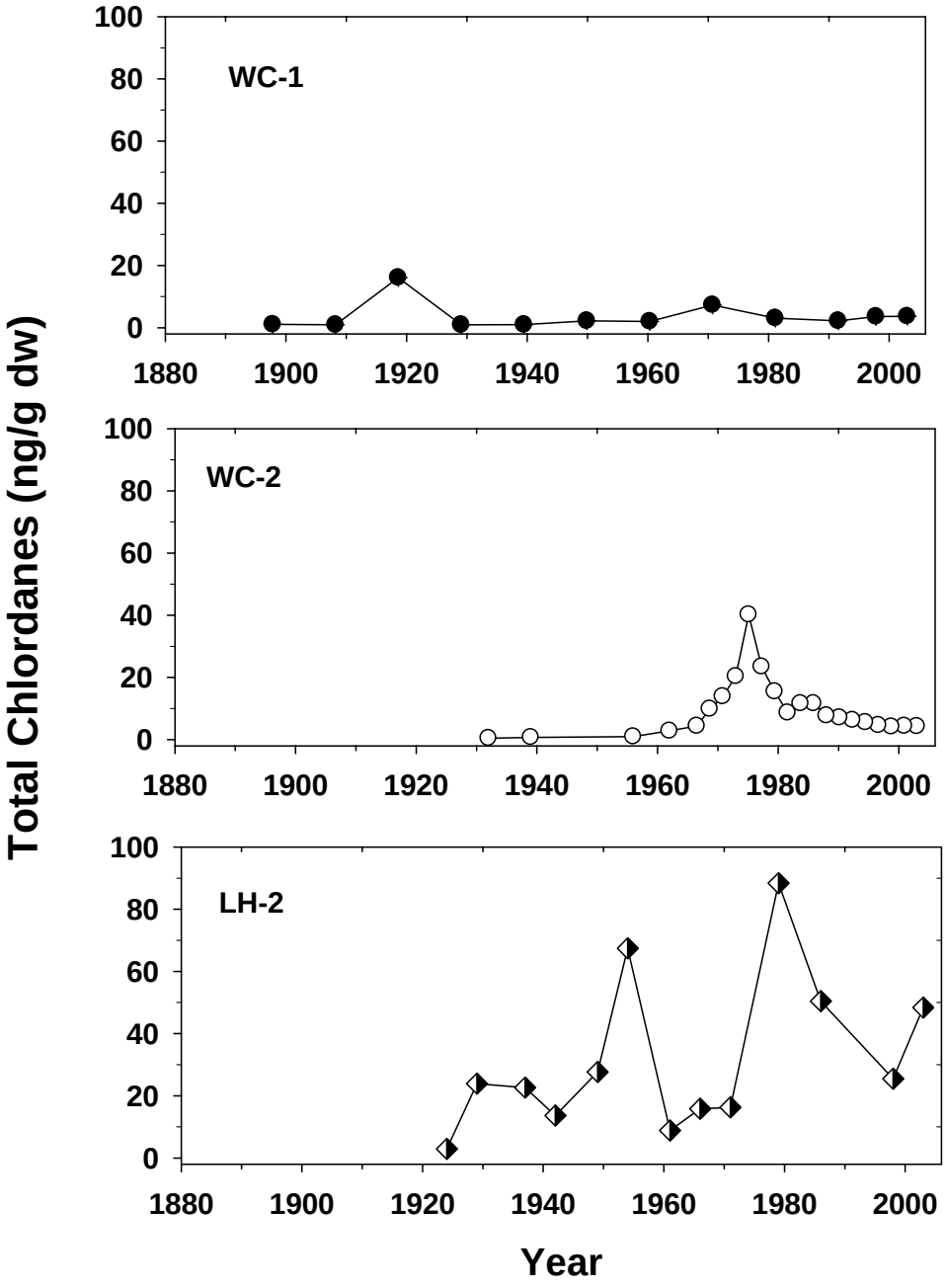


Figure 14. Concentrations of total chlordanes from 1900 to 2003.

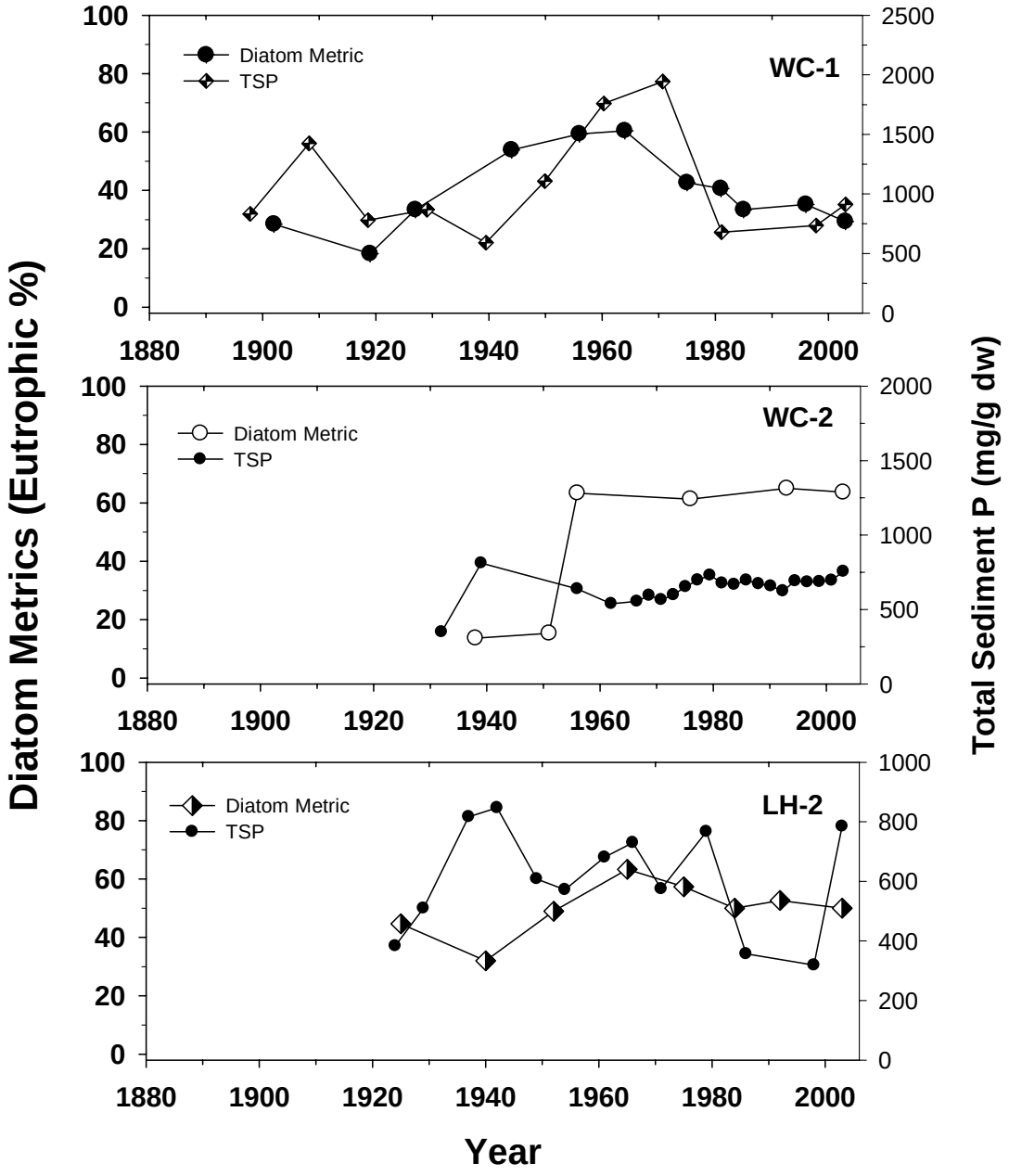


Figure 15. Depth distribution of eutrophication index (eutrophic only) derived from diatom composition with total sediment P.

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# Appendices

## Appendix I: PAH Data for Core WC-1

| Chem ID | | | 6127 | 6129 | 6132 | 6137 | 6142 | 6147 | 6152 | 6157 | 6162 | 6167 | 6172 | 6177 | 6177dup |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site | | | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 |
| Depth Interval (cm) | | | 0-2 | 4-6 | 10-12 | 20-22 | 30-32 | 40-42 | 50-52 | 60-62 | 70-72 | 80-82 | 90-92 | 100-102 | 100-102 |
| Mid-Pt (cm) | | | 1 | 5 | 11 | 21 | 31 | 41 | 51 | 61 | 71 | 81 | 91 | 101 | 101 |
| Mass extracted (g) | | | 10.0 | 10.0 | 10.0 | 10.1 | 10.1 | 10.0 | 10.1 | 10.5 | 10.3 | 10.2 | 10.0 | 10.5 | 10.2 |
| % Dry Mass | | | 0.31 | 0.34 | 0.33 | 0.38 | 0.40 | 0.42 | 0.38 | 0.37 | 0.40 | 0.27 | 0.35 | 0.32 | 0.32 |
| Solid Mass (g dw) | | | 3.09 | 3.45 | 3.30 | 3.80 | 4.06 | 4.23 | 3.88 | 3.91 | 4.11 | 2.77 | 3.45 | 3.33 | 3.25 |
| **Surrogate Recoveries %** | | | | | | | | | | | | | | | |
| Phenanthrene d10 | | | 74 | 80 | 94 | 70 | 79 | 77 | 72 | 75 | 4251 | 89 | 4099 | 68 | 82 |
| Perylene d12 | | | 66 | 84 | 97 | 86 | 77 | 81 | 81 | 70 | 78 | 18 | 91 | 92 | 82 |
| Acenaphthene d10 | | | 63 | 74 | 94 | 60 | 63 | 54 | 58 | 57 | 65 | 48 | 63 | 65 | 69 |
| 14 | | | 68 | 75 | 48 | 64 | 105 | 62 | 66 | 64 | 65 | 50 | 63 | 67 | 65 |
| 65 | | | 69 | 71 | 46 | 58 | 61 | 59 | 66 | 63 | 66 | 56 | 64 | 66 | 65 |
| 166 | | | 68 | 72 | 47 | 60 | 63 | 59 | 68 | 63 | 68 | 68 | 70 | 71 | 68 |
| **Concentrations (ng/g dw)** | | | | | | | | | | | | | | | |
| Total PAHs (w/o Naphthalene) | | | 1069 | 1851 | 2228 | 963 | 849 | 1151 | 2249 | 4145 | 62449 | 242918 | 43850 | 5569 | 5740 |
| **Polycyclic Aromatic Hydrocarbons** | **Rings** | | | | | | | | | | | | | | |
| | | | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* |
| | | **MDL** | | | | | | | | | | | | | |
| Naphthalene | 2 | 449.35 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| biphenyl | 2 | 3.61 | 7.78 | 10.72 | 9.88 | 10.17 | 10.90 | 12.46 | 13.08 | 32.22 | 37.39 | 37.07 | 25.31 | 27.74 | 33.69 |
| Acenaphthylene | 2 | 3.14 | 19.29 | 48.37 | 28.27 | 34.63 | 31.79 | 42.95 | 103.26 | 320.80 | 379.52 | 1142.71 | 141.30 | 149.19 | 206.13 |
| Acenaphthene | 2 | 3.22 | 4.84 | 8.92 | 9.63 | 5.14 | 5.05 | 5.28 | 7.13 | 31.97 | 181.63 | 228.97 | 252.38 | 61.28 | 66.79 |
| Fluorene | 2 | 3.91 | 20.73 | 31.82 | 28.89 | 25.47 | 22.51 | 21.29 | 26.09 | 70.65 | 93.06 | 875.48 | 90.54 | 51.22 | 64.59 |
| Dibenzothiophene | 2 | 3.55 | 6.70 | 9.48 | 9.04 | 7.28 | 6.85 | 9.76 | 12.06 | 30.76 | 2566.98 | 5545.41 | 1908.22 | 25.48 | 27.68 |
| Phenanthrene | 3 | 4.96 | 25.28 | 34.10 | 31.90 | 20.28 | 21.72 | 31.48 | 30.87 | 61.51 | 5345.23 | 22814.65 | 8744.89 | 83.12 | 103.15 |
| Anthracene | 3 | 4.02 | 15.62 | 23.89 | 16.96 | 16.79 | 16.55 | 21.41 | 36.66 | 92.38 | 6572.48 | 38715.14 | 2937.20 | 72.18 | 81.12 |
| Fluoranthene | 3 | 6.92 | 121.38 | 219.37 | 178.23 | 104.64 | 102.25 | 115.23 | 240.00 | 378.33 | 526.39 | 422.45 | 385.92 | 667.65 | 731.34 |
| BenzoAfluorene | 3 | 4.36 | 22.67 | 44.81 | 16.98 | 25.13 | 24.30 | 28.97 | 56.45 | 122.95 | 222.56 | 1924.22 | 103.11 | 158.43 | 181.33 |
| BenzoBfluorene | 3 | 4.26 | 23.13 | 50.04 | 24.64 | 30.40 | 27.81 | 33.17 | 79.20 | 162.16 | 263.32 | 2693.37 | 124.22 | 234.03 | 271.68 |
| Pyrene | 4 | 8.89 | 127.38 | 250.12 | 206.71 | 131.11 | 119.57 | 141.35 | 350.93 | 609.83 | 851.53 | 1410.99 | 559.19 | 982.18 | 1139.44 |
| Cyclopenta[cd]pyrene | 4 | 4.58 | 32.67 | 72.26 | 6.08 | 34.38 | 34.95 | 35.16 | 85.42 | 196.48 | 252.45 | 1665.85 | 118.79 | 212.28 | 155.28 |
| Chrysene + Triphenylene | 4 | 4.22 | 27.27 | 43.45 | 35.35 | 22.40 | 20.85 | 25.70 | 46.42 | 90.49 | 141.55 | 4.99 | 90.09 | 140.02 | 162.84 |
| Naphthacene | 4 | 4.58 | 19.64 | 27.27 | 20.05 | 18.72 | 16.01 | 16.98 | 32.98 | 53.70 | 81.65 | 8.75 | 42.77 | 51.75 | 49.61 |
| Benzo[b]fluoranthene | 4 | 5.07 | 86.91 | 143.00 | 227.18 | 75.30 | 68.20 | 98.77 | 155.11 | 270.79 | 374.66 | 25.44 | 172.28 | 411.28 | 308.37 |
| Benzo[k]fluoranthene | 4 | 3.49 | 95.62 | 179.70 | 114.74 | BDL | BDL | BDL | 190.91 | 3.81 | 4.53 | 47.35 | 62.54 | 100.39 | 105.20 |
| Benzo[e]pyrene | 5 | 4.39 | 56.94 | 89.20 | 158.56 | 57.40 | 42.33 | 58.01 | 98.11 | 216.83 | 251.68 | 1781.03 | 139.58 | 322.76 | 233.10 |
| Benzo[a]pyrene | 5 | 5.07 | 62.94 | 98.65 | 208.17 | 63.47 | 46.79 | 64.15 | 108.52 | 239.93 | 278.52 | 1956.35 | 154.41 | 298.68 | 257.93 |
| Perylene | 5 | 3.68 | 89.41 | 116.79 | 244.14 | 67.46 | 48.17 | 66.82 | 137.71 | 287.67 | 349.58 | 440.34 | 148.68 | 293.35 | 257.26 |
| Indeno[1,2,3-cd]pyrene | 5 | 4.01 | 43.67 | 73.55 | 232.60 | 42.70 | 32.67 | 42.92 | 74.65 | 134.91 | 164.99 | 870.73 | 85.12 | 161.14 | 141.21 |
| Dibenzo[a,h+a,c]anthracene | 5 | 3.84 | 7.57 | 11.86 | 25.75 | 7.71 | 3.97 | 5.37 | 11.43 | 17.64 | 20.92 | 181.85 | 12.49 | 22.34 | 18.51 |
| Benzo[g,h,i]perylene | 6 | 3.90 | 39.13 | 64.18 | 139.55 | 37.91 | 29.88 | 37.74 | 64.20 | 133.73 | 151.68 | 3064.61 | 77.51 | 152.42 | 129.02 |
| Coronene | 6 | 4.23 | 29.58 | 47.43 | 98.05 | 27.42 | 21.84 | 25.89 | 42.40 | 70.67 | 86.43 | 83.71 | 47.88 | 82.71 | 68.79 |
| o-terphenyl | | 3.20 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 79.48 | 114.75 | 50.95 | BDL | BDL |
| 1-methylnaphthalene | | 4.65 | 9.88 | 12.19 | 15.06 | 9.09 | 10.25 | 11.47 | 12.82 | 25.81 | 29.21 | 22.88 | 22.80 | 17.34 | 20.25 |
| 1Methylfuorene | | 3.51 | BDL | 3.88 | 4.40 | BDL | BDL | 5.16 | 6.06 | 12.69 | 1004.52 | 5845.76 | 764.09 | 10.11 | 11.19 |
| 2-Methylphenanthrene | | 7.71 | 16.25 | 34.92 | 26.54 | 19.90 | 20.83 | 40.97 | 45.99 | 63.93 | 4915.05 | 47634.91 | 3941.04 | 105.27 | 118.04 |
| 2-Methylanthracene | | 5.01 | 8.62 | 17.50 | 27.08 | 11.09 | 10.32 | 14.99 | 30.89 | 91.95 | 7944.33 | 57271.39 | 2475.22 | 71.44 | 84.38 |
| 1-Methylanthracene | | 3.73 | 11.99 | 24.70 | 12.31 | 8.44 | 7.64 | 14.89 | 24.88 | 42.79 | 3122.81 | 15894.28 | 2351.17 | 67.48 | 79.26 |
| 1-Methylphenanthrene | | 3.46 | 6.09 | 9.75 | 18.30 | 7.43 | 6.71 | 11.26 | 16.55 | 27.94 | 2021.41 | 5276.95 | 1721.63 | 31.97 | 43.84 |
| 9-Methylanthracene | | 3.57 | BDL | 4.21 | BDL | BDL | BDL | BDL | 7.18 | 21.84 | 1396.33 | 12325.41 | 434.15 | 8.29 | 10.94 |
| 4,5Methylenephenanthrene | | 3.54 | 17.22 | 34.63 | 40.16 | 25.50 | 22.09 | 32.14 | 78.12 | 181.26 | 19828.10 | 10936.12 | 14519.61 | 458.57 | 534.95 |
| 3,6-Dimethylphenanthrene | | 3.77 | 6.10 | 9.62 | 8.60 | 6.72 | 8.08 | 13.98 | 20.93 | 45.69 | 2909.43 | 1653.77 | 1144.73 | 34.77 | 41.39 |

**Appendix I: PAH Data for Core WC-2**

| Chem ID | | | 6180 | 6181 | 6182 | 6183 | 6184 | 6185 | 6185Rdup | 6185Rtrip | 6186 | 6187 | 6188 | 6189 | 6189dup | 6189trip | 6190 | 6191 | 6192 | 6193 | 6194 | 6195 | 6196 | 6197 | 6199 | 6202 | 6210 | 6210dup | 6213 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site | | | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 |
| Depth Interval (cm) | | | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 | 10-12 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 18-20 | 18-20 | 20-22 | 22-24 | 24-26 | 26-28 | 28-30 | 30-32 | 32-34 | 34-36 | 38-40 | 44-46 | 60-62 | 60-62 | 66-68 |
| Mid-Pt (cm) | | | 1 | 3 | 5 | 7 | 9 | 11 | 11 | 11 | 13 | 15 | 17 | 19 | 19 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | 33 | 35 | 39 | 45 | 61 | 61 | 67 |
| Mass extracted (g) | | | 2.073 | 1.932 | 1.953 | 1.942 | 1.997 | 1.902 | 2.063 | 2.067 | 2.199 | 2.113 | 2.061 | 2.109 | 2.114 | 2.048 | 1.841 | 1.993 | 2.003 | 2.217 | 2.001 | 2.087 | 2.048 | 2.005 | 2.118 | 1.983 | 2.106 | 1.996 | 2.063 |
| % Dry Mass | | | 0.31 | 0.33 | 0.31 | 0.31 | 0.30 | 0.30 | 0.30 | 0.30 | 0.29 | 0.29 | 0.33 | 0.32 | 0.32 | 0.32 | 0.48 | 0.27 | 0.27 | 0.28 | 0.36 | 0.36 | 0.34 | 0.38 | 0.34 | 0.35 | 0.15 | 0.15 | 0.38 |
| Solid Mass (g dw) | | | 0.64 | 0.64 | 0.60 | 0.60 | 0.61 | 0.58 | 0.63 | 0.63 | 0.64 | 0.61 | 0.68 | 0.67 | 0.67 | 0.65 | 0.89 | 0.53 | 0.55 | 0.61 | 0.72 | 0.75 | 0.70 | 0.76 | 0.72 | 0.70 | 0.32 | 0.30 | 0.78 |
| Surrogate Recoveries % | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Phenanthrene d10 | | | 67 | 83 | 91 | 94 | 45 | 67 | 79 | 94 | 84 | 70 | 91 | 75 | 83 | 76 | 69 | 83 | 66 | 73 | 67 | 77 | 81 | 62 | 102 | 102 | 60 | 83 | 62 |
| Perylene d12 | | | 43 | 78 | 82 | 94 | 32 | 68 | 98 | 98 | 87 | 80 | 83 | 87 | 87 | 74 | 73 | 85 | 69 | 76 | 71 | 82 | 71 | 69 | 87 | 87 | 61 | 80 | 98 |
| Acenaphthene d10 | | | 79 | 95 | 81 | 84 | 29 | 72 | 78 | 101 | 85 | 76 | 85 | 80 | 86 | 73 | 66 | 77 | 64 | 76 | 71 | 72 | 72 | 68 | 96 | 88 | 65 | 76 | 74 |
| 14 | | | 90 | 86 | 89 | 86 | 90 | 84 | 87 | 87 | 84 | 90 | 82 | 81 | 86 | 89 | 85 | 82 | 80 | 88 | 86 | 81 | 82 | 90 | 83 | 84 | 86 | 88 | 90 |
| 65 | | | 91 | 91 | 90 | 87 | 90 | 84 | 88 | 88 | 84 | 90 | 80 | 79 | 87 | 88 | 86 | 83 | 80 | 85 | 86 | 80 | 82 | 88 | 84 | 85 | 85 | 88 | 90 |
| 166 | | | 95 | 91 | 88 | 90 | 93 | 84 | 92 | 91 | 85 | 91 | 80 | 80 | 89 | 93 | 88 | 88 | 83 | 86 | 91 | 77 | 81 | 91 | 84 | 87 | 90 | 90 | 92 |
| Concentrations (ng/g dw) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total PAHs (w/o Naphthalene) | | | 2019 | 2178 | 2200 | 2459 | 3820 | 2303 | 2406 | 2551 | 3812 | 3835 | 4046 | 5012 | 5123 | 4105 | 3502 | 4786 | 4555 | 4605 | 4026 | 6711 | 9097 | 8006 | 6675 | 3770 | 4711 | 5772 | 4840 |
| Polycyclic Aromatic Hydrocarbons | Rings | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* |
| | | MDL | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Naphthalene | 2 | 2032 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 2256.31 | BDL |
| biphenyl | 2 | 16.34 | 56.77 | 58.86 | 61.42 | 60.67 | 68.09 | 64.31 | 59.45 | 60.14 | 63.77 | 66.58 | 60.74 | 61.30 | 61.31 | 63.44 | 46.09 | 77.60 | 74.60 | 66.50 | 57.51 | 56.77 | 62.08 | 57.96 | 74.09 | 56.00 | 123.45 | 130.91 | 45.62 |
| Acenaphthylene | 2 | 14.22 | 47.00 | 47.21 | 50.77 | 51.25 | 64.29 | 52.52 | 49.38 | 51.04 | 60.51 | 62.33 | 58.70 | 58.02 | 57.59 | 59.60 | 43.04 | 72.30 | 70.05 | 62.93 | 54.03 | 53.82 | 62.94 | 55.05 | 92.68 | 58.15 | 116.30 | 122.38 | 36.93 |
| Acenaphthene | 2 | 14.58 | 51.81 | 51.93 | 54.10 | 54.55 | 62.47 | 56.34 | 54.34 | 52.64 | 58.96 | 63.31 | 56.65 | 57.72 | 57.29 | 58.67 | 43.27 | 73.25 | 70.41 | 63.42 | 53.89 | 52.35 | 57.19 | 55.45 | 67.57 | 56.43 | 115.99 | 122.38 | 41.15 |
| Fluorene | 2 | 17.68 | 60.80 | 63.42 | 65.59 | 68.44 | 65.28 | 69.69 | 63.77 | 66.04 | 64.39 | 69.53 | 65.12 | 65.03 | 64.88 | 65.43 | 48.13 | 81.95 | 78.78 | 73.17 | 64.75 | 63.99 | 75.15 | 75.69 | 168.99 | 92.62 | 119.72 | 126.64 | 47.54 |
| Dibenzothiophene | 2 | 16.07 | 55.99 | 57.28 | 61.09 | 61.00 | 55.69 | 62.41 | 57.85 | 58.22 | 53.06 | 55.78 | 51.83 | 52.50 | 52.23 | 53.30 | 39.43 | 65.49 | 62.95 | 56.42 | 48.60 | 49.80 | 54.89 | 51.74 | 71.87 | 57.29 | 102.93 | 108.93 | 45.62 |
| Phenanthrene | 3 | 22.42 | 55.37 | 59.96 | 61.76 | 71.58 | 60.32 | 61.88 | 65.21 | 72.42 | 55.70 | 61.18 | 68.33 | 60.71 | 59.37 | 60.98 | 43.38 | 70.98 | 65.50 | 57.24 | 50.69 | 59.84 | 82.48 | 62.20 | 125.98 | 83.28 | 70.90 | 74.81 | 33.61 |
| Anthracene | 3 | 18.19 | 48.08 | 49.73 | 52.27 | 54.88 | 46.77 | 54.26 | 52.10 | 53.60 | 44.22 | 46.95 | 48.04 | 45.94 | 44.04 | 46.23 | 33.44 | 56.59 | 56.04 | 48.46 | 40.94 | 47.80 | 70.27 | 58.23 | 122.23 | 63.18 | 78.67 | 83.34 | 36.81 |
| Fluoranthene | 3 | 31.29 | 113.54 | 123.85 | 121.35 | 154.89 | 130.23 | 124.64 | 141.92 | 166.69 | 134.21 | 130.71 | 147.18 | 134.54 | 131.24 | 123.03 | 92.19 | 152.74 | 136.28 | 132.36 | 125.88 | 181.81 | 324.32 | 261.09 | 698.99 | 420.57 | 103.24 | 111.22 | 42.30 |
| BenzoAfluorene | 3 | 19.71 | 53.51 | 55.71 | 58.09 | 59.51 | 62.64 | 60.32 | 60.73 | 57.58 | 58.65 | 61.35 | 56.51 | 57.27 | 57.14 | 58.83 | 42.70 | 71.17 | 68.96 | 60.81 | 52.63 | 53.55 | 78.03 | 62.06 | 165.24 | 88.45 | 109.46 | 115.49 | 42.68 |
| BenzoBfluorene | 3 | 19.26 | 56.93 | 58.86 | 62.59 | 64.30 | 68.25 | 65.35 | 62.01 | 64.44 | 65.32 | 68.87 | 62.64 | 62.79 | 62.79 | 63.90 | 47.22 | 80.44 | 77.14 | 68.46 | 58.76 | 60.38 | 83.49 | 73.58 | 206.31 | 104.82 | 120.65 | 126.32 | 45.88 |
| Pyrene | 4 | 40.22 | 117.73 | 123.85 | 122.35 | 159.52 | 139.48 | 128.10 | 150.55 | 182.96 | 140.26 | 142.32 | 155.94 | 142.44 | 145.08 | 138.85 | 98.06 | 163.15 | 150.47 | 146.99 | 144.81 | 193.46 | 338.69 | 273.79 | 778.21 | 562.44 | 101.37 | 105.97 | 43.58 |
| Cyclopenta[cd]pyrene | 4 | 20.69 | 59.25 | 64.21 | 63.59 | 67.28 | 74.86 | 68.13 | 63.13 | 72.26 | 69.35 | 73.29 | 66.73 | 67.12 | 66.81 | 70.50 | 48.47 | 84.41 | 81.51 | 71.06 | 61.13 | 61.85 | 89.24 | 70.40 | 272.08 | 95.20 | 125.01 | 132.55 | 47.03 |
| Chrysene + Triphenylene | 4 | 19.10 | 50.26 | 52.88 | 55.10 | 58.68 | 67.92 | 56.68 | 55.30 | 63.17 | 64.70 | 66.42 | 61.47 | 61.75 | 62.65 | 63.13 | 44.63 | 75.71 | 74.60 | 64.72 | 55.28 | 57.57 | 85.64 | 64.05 | 311.62 | 124.78 | 111.01 | 118.11 | 37.32 |
| Naphthacene | 4 | 20.72 | 66.39 | 62.32 | 65.09 | 72.07 | 76.19 | 68.13 | 63.61 | 63.80 | 73.54 | 74.43 | 72.28 | 72.64 | 69.79 | 74.65 | 52.76 | 84.04 | 85.51 | 74.31 | 64.61 | 65.47 | 70.70 | 61.80 | 162.19 | 83.57 | 139.31 | 145.67 | 48.69 |
| Benzo[b]fluoranthene | 4 | 22.93 | 77.87 | 102.13 | 97.88 | 129.60 | 130.23 | 99.85 | 141.44 | 139.57 | 123.97 | 121.87 | 136.67 | 127.38 | 130.05 | 119.50 | 82.81 | 141.76 | 146.83 | 115.61 | 99.28 | 140.31 | 330.65 | 175.87 | 359.76 | 164.41 | 111.01 | 120.74 | 42.56 |
| Benzo[k]fluoranthene | 4 | 15.76 | 61.42 | 74.91 | 64.42 | 86.62 | 80.48 | 72.11 | 87.58 | 94.11 | 72.61 | 70.51 | 79.43 | 81.29 | 70.83 | 70.96 | 53.21 | 91.99 | 81.69 | 70.24 | 64.89 | 85.01 | 149.01 | 81.78 | 127.09 | 64.90 | 109.15 | 117.46 | 43.07 |
| Benzo[e]pyrene | 5 | 19.87 | 71.82 | 83.56 | 78.90 | 97.37 | 100.81 | 83.73 | 101.17 | 115.49 | 94.18 | 93.57 | 99.87 | 95.91 | 90.92 | 91.70 | 63.38 | 109.59 | 101.71 | 87.32 | 82.29 | 105.50 | 182.21 | 113.27 | 463.26 | 206.19 | 109.77 | 120.41 | 44.22 |
| Benzo[a]pyrene | 5 | 22.91 | 75.07 | 87.03 | 82.56 | 103.15 | 94.20 | 87.37 | 105.32 | 136.86 | 103.64 | 101.59 | 108.05 | 102.17 | 105.20 | 96.46 | 67.78 | 121.32 | 116.26 | 97.07 | 89.26 | 113.26 | 231.93 | 134.32 | 615.47 | 234.77 | 116.92 | 127.30 | 46.26 |
| Perylene | 5 | 16.63 | 66.70 | 87.18 | 80.73 | 110.59 | 80.81 | 94.13 | 129.45 | 107.67 | 108.14 | 110.42 | 149.52 | 132.60 | 123.50 | 117.19 | 112.52 | 199.49 | 187.95 | 147.32 | 101.09 | 146.06 | 138.81 | 127.17 | 478.66 | 270.09 | 712.41 | 1034.49 | 1611.77 |
| Indeno[1,2,3-cd]pyrene | 5 | 18.11 | 53.67 | 64.99 | 66.58 | 75.55 | 75.69 | 67.61 | 74.80 | 78.48 | 71.68 | 74.76 | 73.30 | 74.73 | 70.38 | 71.88 | 50.73 | 87.25 | 83.51 | 71.87 | 65.86 | 70.42 | 102.46 | 72.78 | 226.15 | 100.80 | 123.45 | 168.97 | 42.68 |
| Dibenzo[a,h+a,c]anthracene | 5 | 17.39 | 54.44 | 56.81 | 59.26 | 58.85 | 61.97 | 61.19 | 57.22 | 56.94 | 58.03 | 61.67 | 56.07 | 56.38 | 56.25 | 58.37 | 42.59 | 70.98 | 68.23 | 60.98 | 52.08 | 50.34 | 57.19 | 50.42 | 64.24 | 55.71 | 122.21 | 156.83 | 45.24 |
| Benzo[g,h,i]perylene | 6 | 17.62 | 60.18 | 66.88 | 67.25 | 74.06 | 74.04 | 69.17 | 71.76 | 79.60 | 68.11 | 69.36 | 75.34 | 68.31 | 67.41 | 67.89 | 48.69 | 80.82 | 81.69 | 68.94 | 64.19 | 70.42 | 99.44 | 70.66 | 227.40 | 105.25 | 111.95 | 115.16 | 45.11 |
| Coronene | 6 | 19.11 | 63.28 | 66.73 | 69.58 | 71.91 | 69.91 | 72.81 | 71.44 | 72.42 | 63.77 | 63.47 | 63.22 | 61.90 | 62.94 | 64.05 | 44.74 | 73.63 | 78.05 | 62.93 | 59.60 | 59.44 | 73.86 | 55.84 | 92.13 | ND | 114.43 | 118.44 | 50.86 |
| o-terphenyl | | 14.48 | 47.15 | 49.41 | 51.60 | 50.58 | 49.08 | 53.04 | 48.90 | 48.49 | 46.08 | 48.75 | 43.51 | 44.60 | 44.04 | 46.08 | 33.21 | 55.83 | 53.49 | 48.62 | 41.49 | 39.49 | 42.82 | 39.30 | 41.07 | 42.22 | 92.04 | 97.44 | 39.11 |
| 1-methylnaphthalene | | 21.04 | 58.79 | 60.59 | 61.42 | 61.49 | 72.72 | 63.79 | 62.49 | 62.05 | 67.65 | 71.00 | 65.12 | 65.18 | 65.92 | 68.35 | 49.14 | 83.09 | 78.24 | 72.03 | 63.22 | 60.65 | 67.25 | 62.72 | 79.08 | 68.35 | 129.98 | 136.82 | 43.32 |
| 1Methylfluorene | | 15.89 | 57.86 | 59.80 | 61.76 | 63.31 | 54.04 | 65.18 | 59.77 | 59.66 | 50.42 | 53.17 | 53.00 | 51.01 | 50.59 | 53.30 | 38.41 | 66.06 | 64.23 | 56.59 | 49.01 | 46.59 | 52.74 | 47.77 | ND | ND | 105.41 | 113.85 | 48.05 |
| 2-Methylphenanthrene | | 34.86 | 56.62 | 56.18 | 59.93 | 62.49 | 53.88 | 61.88 | 58.49 | 62.37 | 55.85 | 74.11 | 56.80 | 58.02 | 58.33 | 49.92 | 44.40 | 74.38 | 1911.49 | 58.54 | 54.44 | 56.23 | 56.04 | 108.51 | 106.42 | 78.69 | 655.50 | 1127.34 | 43.58 |
| 2-Methylanthracene | | 22.66 | 57.08 | 58.54 | 58.76 | 62.32 | 59.83 | 61.02 | 60.09 | 65.88 | 56.94 | 60.20 | 56.51 | 60.26 | 57.29 | 57.91 | 44.40 | 67.38 | 64.77 | 58.05 | 50.82 | 55.83 | 69.69 | 54.52 | 84.22 | 69.07 | 103.55 | 109.91 | 43.07 |
| 1-Methylanthracene | | 16.86 | 54.13 | 57.44 | 59.09 | 58.02 | 58.17 | 62.23 | 56.10 | 56.47 | 55.70 | 57.42 | 51.54 | 54.59 | 52.38 | 55.29 | 41.69 | 67.76 | 66.23 | 56.91 | 50.41 | 52.08 | 61.36 | 51.34 | 65.35 | 72.94 | 110.39 | 116.47 | 44.47 |
| 1-Methylphenanthrene | | 15.63 | 55.06 | 55.40 | 58.09 | 59.51 | 36.69 | 63.10 | 56.26 | 59.66 | 34.29 | 35.99 | 35.19 | 35.35 | 33.93 | 33.18 | 24.85 | 41.64 | 38.57 | 37.07 | 32.86 | 34.01 | 41.10 | 35.20 | 62.16 | 56.57 | 63.12 | 65.29 | 43.83 |
| 9-Methylanthracene | | 16.13 | 52.43 | 56.02 | 58.09 | 58.35 | 57.35 | 59.98 | 56.42 | 55.67 | 52.44 | 56.44 | 50.52 | 52.65 | 52.38 | 53.14 | 37.62 | 63.97 | 61.68 | 55.28 | 47.06 | 46.99 | 49.72 | 44.20 | 47.03 | 55.14 | 103.55 | 111.22 | 44.35 |
| 4,5Methylenephenanthrene | | 15.99 | 50.41 | 51.78 | 54.27 | 61.49 | 45.45 | 54.78 | 54.82 | 61.25 | 43.75 | 48.09 | 50.23 | 43.70 | 42.56 | 44.24 | 34.23 | 60.00 | 56.58 | 50.89 | 44.84 | 55.43 | 66.24 | 79.40 | 162.88 | 125.78 | 75.25 | 81.04 | 39.74 |
| 3,6-Dimethylphenanthrene | | 17.04 | 51.34 | 52.72 | 55.10 | 55.05 | 55.20 | 57.20 | 53.06 | 53.28 | 51.82 | 54.64 | 49.21 | 50.71 | 49.85 | 51.76 | 37.73 | 63.59 | 60.77 | 54.96 | 47.20 | 46.46 | 51.01 | 46.32 | 54.66 | 51.84 | 102.93 | 108.27 | 41.79 |

**Appendix I: PAH Data for Core LH-2**

| Chem ID | | 6214 | 6216 | 6221 | 6224 | 6227 | 6229 | 6231 | 6234 | 6236 | 6239 | 6239dup | 6241 | 6244 | 6246 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site | | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 |
| Depth Interval (cm) | | 0-2 | 4-6 | 14-16 | 20-22 | 26-28 | 30-32 | 34-36 | 40-42 | 44-46 | 50-52 | 50-52 | 54-56 | 60-62 | 64-66 |
| Mid-Pt (cm) | | 1 | 5 | 15 | 21 | 27 | 31 | 35 | 41 | 45 | 51 | 51 | 55 | 61 | 65 |
| Mass extracted (g) | | 2.035 | 2.052 | 2.172 | 2.237 | 2.086 | 2.217 | 2.212 | 2.035 | 2.152 | 2.161 | 2.042 | 1.988 | 2.148 | 1.925 |
| % Dry Mass | | 0.34 | 0.42 | 0.67 | 0.52 | 0.59 | 0.53 | 0.53 | 0.37 | 0.38 | 0.35 | 0.35 | 0.38 | 0.39 | 0.47 |
| Solid Mass (g dw) | | 0.69 | 0.87 | 1.47 | 1.15 | 1.23 | 1.18 | 1.16 | 0.75 | 0.81 | 0.76 | 0.72 | 0.76 | 0.83 | 0.91 |
| **Surrogate Recoveries %** | | | | | | | | | | | | | | | |
| Phenanthrene d10 | | 98 | 94 | 99 | 72 | 81 | 96 | 89 | 78 | 87 | 66 | 66 | 61 | 44 | 71 |
| Perylene d12 | | 98 | 98 | 95 | 75 | 88 | 83 | 111 | 70 | 123 | 78 | 185 | 76 | 62 | 98 |
| Acenaphthene d10 | | 105 | 105 | 105 | 83 | 83 | 111 | 122 | 91 | 115 | 156 | 105 | 171 | 54 | 83 |
| 14 | | 95 | 89 | 94 | 88 | 69 | 78 | 84 | 89 | 46 | 105 | 88 | 129 | 79 | 89 |
| 65 | | 82 | 86 | 86 | 85 | 82 | 83 | 85 | 93 | 84 | 50 | 99 | 98 | 80 | 86 |
| 166 | | 88 | 92 | 86 | 95 | 88 | 93 | 91 | 90 | 89 | 96 | 87 | 91 | 90 | 91 |
| **Concentrations (ng/g dw)** | | | | | | | | | | | | | | | |
| Total PAHs (w/o Naphthalene) | | 19538 | 11540 | 5786 | 8236 | 14864 | 41388 | 60888 | 246433 | 937915 | 1188090 | 1111378 | 1005591 | 223165 | 5533 |
| Polycyclic Aromatic Hydrocarbons | ngs | | | | | | | | | | | | | | |
| | | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* |
| | MDL | | | | | | | | | | | | | | |
| Naphthalene | 2032 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| biphenyl | 16.34 | 54.21 | 42.73 | 27.49 | 41.71 | 40.63 | 59.38 | 75.43 | 251.49 | 1162.14 | 2515.75 | 2167.24 | 3711.58 | 312.38 | 53.43 |
| Acenaphthylene | 14.22 | 122.70 | 67.90 | 84.52 | 86.02 | 257.15 | 954.36 | 1223.09 | 2404.12 | 6814.29 | 6825.18 | 6008.68 | 10638.30 | 1424.41 | 43.23 |
| Acenaphthene | 14.58 | 67.62 | 62.59 | 88.62 | 246.10 | 355.62 | 3054.06 | 2904.71 | 7268.84 | 15192.11 | 28482.79 | 24936.33 | 23978.07 | 1991.83 | 389.69 |
| Fluorene | 17.68 | 93.85 | 84.30 | 57.10 | 185.49 | 344.12 | 2265.93 | 2922.52 | 9985.73 | 22626.31 | 45180.73 | 39133.25 | 47575.10 | 3466.94 | 153.05 |
| Dibenzothiophene | 16.07 | 85.25 | 65.48 | 47.68 | 105.45 | 141.96 | 377.30 | 576.45 | 5122.47 | 13982.76 | 23155.75 | 18828.10 | 21312.48 | 3136.45 | 201.21 |
| Phenanthrene | 22.42 | 516.90 | 322.08 | 139.92 | 255.12 | 354.73 | 1014.67 | 1773.91 | 11929.35 | 47417.22 | 111381.67 | 95007.11 | 105847.79 | 5173.67 | 316.19 |
| Anthracene | 18.19 | 136.99 | 86.73 | 63.51 | 105.62 | 158.03 | 531.28 | 2252.91 | 4603.23 | 25202.33 | 52739.09 | 42238.52 | 50060.62 | 3633.51 | 133.08 |
| Fluoranthene | 31.29 | 2775.71 | 1752.65 | 555.02 | 794.94 | 1529.61 | 3712.44 | 4958.86 | 25614.90 | 47287.51 | 52312.85 | 42935.23 | 43255.48 | 20276.56 | 761.06 |
| BenzoAfluorene | 19.71 | 276.74 | 176.11 | 100.89 | 168.58 | 246.71 | 792.46 | 816.86 | 2652.02 | 8638.71 | 12746.98 | 8982.56 | 9329.17 | 3921.86 | 68.13 |
| BenzoBfluorene | 19.26 | 259.84 | 167.68 | 96.60 | 154.10 | 217.18 | 750.52 | 877.24 | 3235.20 | 8826.27 | 13739.86 | 9944.68 | 8952.59 | 3996.10 | 71.42 |
| Pyrene | 40.22 | 2434.56 | 1576.55 | 708.38 | 1160.19 | 2170.46 | 5149.08 | 6886.73 | 33129.10 | 63758.96 | 60845.24 | 52936.95 | 66338.19 | 28991.04 | 851.25 |
| Cyclopenta[cd]pyrene | 20.69 | 458.32 | 277.96 | 204.04 | 257.38 | 539.84 | 1486.92 | 1844.62 | 6159.89 | 20652.98 | 16997.81 | 13574.15 | 13797.18 | 10081.43 | 65.28 |
| Chrysene + Triphenylene | 19.10 | 565.58 | 340.44 | 148.17 | 207.43 | 367.45 | 747.80 | 1121.51 | 3708.22 | 10182.79 | 10582.25 | 8856.01 | 7544.75 | 5603.25 | 56.61 |
| Naphthacene | 20.72 | 255.61 | 136.15 | 39.57 | 76.31 | 90.15 | 225.36 | 632.88 | 1230.03 | 1464.17 | 1825.61 | 1088.67 | 1291.79 | 883.30 | 48.93 |
| Benzo[b]fluoranthene | 22.93 | 2665.10 | 1479.08 | 532.92 | 604.42 | 1379.34 | 2592.28 | 4150.77 | 12783.21 | 79959.84 | 82498.01 | 87050.92 | 54822.66 | 17312.23 | 128.03 |
| Benzo[k]fluoranthene | 15.76 | 1261.87 | 687.92 | 392.12 | 228.41 | 764.52 | 1297.54 | 2262.46 | 7242.20 | 40882.53 | 40072.57 | 42680.89 | 23936.41 | 10343.72 | 76.03 |
| Benzo[e]pyrene | 19.87 | 1492.85 | 886.78 | 420.09 | 412.17 | 901.83 | 2207.57 | 3386.55 | 9998.12 | 59777.62 | 54203.35 | 67471.42 | 41099.88 | 14229.37 | 101.37 |
| Benzo[a]pyrene | 22.91 | 1539.93 | 861.03 | 588.18 | 517.62 | 1196.51 | 3309.36 | 5121.85 | 13336.81 | 94068.97 | 88006.77 | 109170.11 | 65590.83 | 20405.11 | 125.40 |
| Perylene | 16.63 | 439.37 | 244.82 | 160.18 | 130.42 | 231.70 | 586.41 | 779.87 | 2094.28 | 12453.31 | 10361.02 | 12879.10 | 7988.48 | 2682.85 | 165.99 |
| Indeno[1,2,3-cd]pyrene | 18.11 | 1250.07 | 616.09 | 266.19 | 247.14 | 569.70 | 1889.23 | 3098.07 | 8483.15 | 53181.23 | 59496.64 | 71519.02 | 41427.69 | 9461.62 | 58.04 |
| Dibenzo[a,h+a,c]anthracene | 17.39 | 147.77 | 78.76 | 40.25 | 65.12 | 86.64 | 250.80 | 425.76 | 1231.76 | 7363.59 | 7319.33 | 9788.92 | 5476.55 | 1243.84 | 40.37 |
| Benzo[g,h,i]perylene | 17.62 | 917.66 | 457.19 | 203.84 | 260.85 | 481.26 | 1586.79 | 2623.54 | 7206.76 | 44065.20 | 52206.09 | 58193.54 | 36105.45 | 7995.45 | 58.37 |
| Coronene | 19.11 | 579.42 | 250.48 | 118.50 | 114.81 | 334.49 | 1593.68 | 2711.36 | 6365.69 | 38586.74 | 37656.39 | 46587.54 | 29801.88 | 5723.11 | 57.05 |
| o-terphenyl | 14.48 | 44.59 | 35.57 | 21.56 | 27.40 | 26.27 | 30.63 | 31.05 | 66.20 | 108.27 | 152.68 | 125.30 | 147.61 | 47.19 | 33.57 |
| 1-methylnaphthalene | 21.04 | 61.79 | 48.62 | 30.83 | 54.11 | 76.93 | 188.95 | 257.52 | 864.78 | 3048.38 | 5424.90 | 4652.79 | 4267.83 | 363.31 | 50.14 |
| 1Methylfuorene | 15.89 | 56.83 | 45.61 | 30.83 | 72.15 | 46.34 | 164.28 | 191.46 | 1133.72 | 3316.46 | 6756.37 | 5732.04 | 5575.79 | 697.54 | 66.59 |
| 2-Methylphenanthrene | 34.86 | 181.29 | 141.70 | 137.12 | 427.52 | 459.07 | 1037.81 | 1442.16 | 14608.81 | 47035.54 | 69183.75 | 48270.46 | 69900.59 | 10471.78 | 464.84 |
| 2-Methylanthracene | 22.66 | 223.70 | 150.13 | 157.04 | 473.56 | 571.25 | 1025.82 | 1458.68 | 17705.87 | 56939.83 | 80875.97 | 61843.91 | 70532.02 | 11072.16 | 249.26 |
| 1-Methylanthracene | 16.86 | 74.47 | 56.93 | 44.75 | 131.20 | 124.90 | 421.03 | 1274.01 | 2904.98 | 18640.88 | 27127.65 | 24390.40 | 25028.67 | 2777.24 | 66.81 |
| 1-Methylphenanthrene | 15.63 | 124.02 | 92.85 | 84.59 | 194.94 | 306.35 | 620.36 | 961.96 | 8807.38 | 33432.60 | 41777.17 | 26505.44 | 40158.77 | 5613.03 | 195.50 |
| 9-Methylanthracene | 16.13 | 84.67 | 43.19 | 26.54 | 39.98 | 39.73 | 88.48 | 114.40 | 314.37 | 1259.76 | 1415.33 | 1235.44 | 1167.44 | 230.90 | ND |
| 4,5Methylenephenanthrene | 15.99 | 221.65 | 150.93 | 111.33 | 199.97 | 301.94 | 1147.30 | 1481.47 | 12149.14 | 43319.30 | 76895.96 | 60244.76 | 62159.87 | 8088.03 | 321.56 |
| 3,6-Dimethylphenanthrene | 17.04 | 66.74 | 52.89 | 58.05 | 189.82 | 151.91 | 228.42 | 247.20 | 1841.05 | 7266.46 | 7328.49 | 6398.43 | 6769.91 | 1513.85 | 61.44 |

**Appendix G-II Concentrations of PCBs in Sediment Cores**

| Chem ID | | 6127 | 6129 | 6132 | 6137 | 6142 | 6147 | 6152 | 6157 | 6162 | 6167 | 6172 | 6177 | 6177dup |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site | | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 |
| Depth Interval (cm) | | 0-2 | 4-6 | 10-12 | 20-22 | 30-32 | 40-42 | 50-52 | 60-62 | 70-72 | 80-82 | 90-92 | 100-102 | 100-102 |
| Mid-Pt (cm) | | 1 | 5 | 11 | 21 | 31 | 41 | 51 | 61 | 71 | 81 | 91 | 101 | 101 |
| Mass extracted (g) | | 10.02 | 10.0 | 10.0 | 10.1 | 10.1 | 10.0 | 10.1 | 10.5 | 10.3 | 10.2 | 10.0 | 10.5 | 10.2 |
| % Dry Mass | | 0.31 | 0.34 | 0.33 | 0.38 | 0.40 | 0.42 | 0.38 | 0.37 | 0.40 | 0.27 | 0.35 | 0.32 | 0.32 |
| Solid Mass (g dw) | | 3.11 | 3.51 | 3.32 | 3.54 | 4.04 | 4.01 | 3.93 | 4.09 | 3.81 | 2.76 | 3.20 | 3.14 | 3.07 |
| | | 3.11 | | | | | | | | | | | | |
| **Surrogate Recoveries %** | | | | | | | | | | | | | | |
| PCB 14 | | 68 | 75 | 48 | 64 | 105 | 62 | 66 | 64 | 65 | 50 | 63 | 67 | 65 |
| PCB 65 | | 69 | 71 | 46 | 58 | 61 | 59 | 66 | 63 | 66 | 56 | 64 | 66 | 65 |
| PCB 166 | | 68 | 72 | 47 | 60 | 63 | 59 | 68 | 63 | 68 | 68 | 70 | 71 | 68 |
| **Concentrations (ng/g dw)** | | | | | | | | | | | | | | |
| Total PCBs | | 43.94 | 84.81 | 35.44 | 98.92 | 135.28 | 148.55 | 145.26 | 36.15 | 10.19 | 40.76 | 7.00 | 5.16 | 5.90 |
| **Polychlorinated Biphenyls** | **MDL** | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* |
| 1 | 0.525 | 1.541 | 1.681 | 0.715 | 2.622 | 5.381 | 0.679 | 1.693 | BDL | 0.903 | 0.991 | 0.737 | 0.650 | BDL |
| 3 | 3.014 | 3.150 | 4.702 | 3.200 | 7.811 | 29.098 | 8.721 | 4.972 | BDL | BDL | BDL | BDL | BDL | BDL |
| 4+10 | 0.093 | 0.109 | 0.193 | BDL | 0.223 | 0.100 | ND | 0.204 | 0.288 | 0.361 | 1.748 | 0.166 | 0.112 | 0.128 |
| 7 | 0.020 | 0.025 | 0.046 | BDL | 0.037 | 1.725 | 0.046 | 0.030 | 0.021 | 0.048 | 0.029 | BDL | BDL | 0.027 |
| 6 | 0.038 | 0.060 | 0.051 | BDL | 0.113 | 0.720 | 0.113 | 0.100 | BDL | 0.058 | 0.083 | 0.066 | BDL | BDL |
| 8+5 | 0.211 | 1.224 | 5.427 | 0.371 | 18.851 | 0.578 | BDL | 0.827 | 2.208 | 1.374 | 11.266 | 1.165 | 0.409 | 0.456 |
| 19 | 0.023 | 0.083 | 0.052 | 0.035 | 0.032 | 0.123 | 0.033 | 0.052 | BDL | 0.033 | 0.649 | 0.067 | 0.028 | 0.036 |
| 12+13 | 0.063 | 0.069 | 0.166 | 0.082 | 0.194 | 0.436 | 0.148 | 0.146 | BDL | 0.076 | 0.304 | 0.073 | BDL | BDL |
| 18 | 0.075 | 0.369 | 0.773 | 0.260 | 0.493 | 0.430 | 0.846 | 0.490 | BDL | 0.088 | 0.629 | 0.093 | BDL | BDL |
| 17 | 0.064 | 0.258 | 0.624 | 0.205 | 0.475 | 0.485 | 0.595 | 0.321 | 0.094 | 0.162 | 0.573 | 0.077 | BDL | BDL |
| 24+27 | 0.087 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 16+32 | 0.091 | 0.259 | 0.661 | 0.290 | 0.492 | 0.686 | 0.926 | 0.638 | BDL | BDL | 1.668 | BDL | BDL | BDL |
| 29 | 0.035 | 0.097 | 0.046 | BDL | BDL | BDL | 0.070 | BDL | BDL | 0.057 | 1.034 | 0.047 | BDL | 0.039 |
| 26 | 0.017 | 0.183 | 0.221 | 0.113 | 0.489 | 0.320 | 0.380 | 0.203 | 0.020 | 0.038 | 0.175 | 0.050 | 0.022 | 0.034 |
| 25 | 0.014 | 0.163 | 0.159 | 0.075 | 0.261 | 0.279 | 0.266 | 0.169 | 0.021 | 0.029 | 0.091 | 0.033 | 0.020 | 0.025 |
| 31+28 | 0.186 | 1.270 | 2.350 | 1.233 | 1.953 | 2.634 | 3.431 | 2.186 | BDL | BDL | 0.595 | BDL | BDL | BDL |
| 53+33+21 | 0.094 | 0.310 | 0.783 | 0.375 | 0.733 | 1.187 | 2.054 | 1.385 | BDL | BDL | 0.259 | BDL | BDL | BDL |
| 22 | 0.099 | 0.379 | 0.559 | 0.293 | 0.235 | 0.189 | 0.332 | 0.220 | BDL | BDL | 0.787 | BDL | BDL | BDL |
| 45 | 0.030 | 0.095 | ND | 0.090 | 0.254 | 0.233 | 0.368 | 0.994 | 0.034 | 0.191 | 0.634 | 0.142 | 0.033 | 0.095 |
| 46 | 0.122 | BDL | 0.125 | BDL | 0.160 | 0.370 | 0.236 | 0.167 | BDL | BDL | 0.856 | BDL | BDL | BDL |
| 52 | 0.057 | 0.483 | 1.593 | 0.556 | 2.130 | 2.226 | 3.813 | 3.079 | 0.302 | 0.091 | 0.427 | 0.103 | BDL | 0.155 |
| 49 | 0.046 | 0.633 | 1.420 | 0.695 | 2.284 | 2.854 | 4.143 | 3.477 | 0.254 | BDL | 0.203 | BDL | BDL | BDL |
| 47 | 0.390 | BDL | 0.858 | 0.405 | 1.463 | 1.966 | 2.567 | 2.010 | BDL | BDL | BDL | BDL | BDL | BDL |
| 48 | 0.272 | BDL | 0.286 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 44 | 0.075 | 0.480 | 1.296 | 0.507 | 1.323 | 1.350 | 2.489 | 1.979 | 0.187 | 0.089 | 0.280 | 0.081 | BDL | 0.102 |
| 37+42 | 0.073 | 0.363 | 0.868 | 0.361 | 0.937 | 1.317 | 1.654 | 1.654 | 0.109 | BDL | 0.142 | BDL | BDL | BDL |
| 41+71 | 0.086 | 0.468 | 1.656 | 0.409 | 1.022 | 0.833 | 1.792 | 1.238 | 0.104 | BDL | 0.178 | BDL | BDL | BDL |
| 64 | 0.561 | 0.979 | 1.657 | BDL | ND | 1.622 | 1.548 | 1.877 | 1.870 | 0.597 | 4.216 | 0.584 | 0.577 | 0.824 |
| 40 | 0.025 | 0.159 | 0.612 | 0.164 | 1.039 | 3.005 | 1.223 | 0.990 | 0.062 | 0.090 | 0.213 | 0.064 | BDL | 0.035 |
| 100 | 0.028 | 0.098 | 0.142 | 0.046 | 0.100 | 0.251 | ND | 0.058 | 0.052 | 0.042 | 2.057 | 0.038 | BDL | 0.041 |
| 63 | 0.022 | 0.070 | 0.134 | BDL | ND | 0.037 | 0.063 | ND | 0.102 | 0.106 | 4.715 | 0.119 | 0.041 | 0.106 |
| 74 | 0.051 | 0.295 | 0.570 | 0.256 | 0.440 | 0.521 | 0.970 | 0.536 | 0.118 | 0.070 | 0.470 | BDL | BDL | BDL |
| 70+76 | 0.086 | 1.126 | 2.346 | 0.975 | 2.297 | 3.259 | 5.202 | 4.427 | 0.418 | 0.132 | 0.228 | BDL | BDL | BDL |
| 66 | 0.106 | 1.456 | 2.199 | 1.208 | 2.558 | 3.581 | 4.881 | 4.070 | 0.222 | BDL | 0.159 | BDL | BDL | BDL |
| 95 | 0.040 | 0.672 | 2.134 | 0.603 | 1.992 | 2.603 | 4.974 | 4.107 | 0.324 | 0.046 | 0.108 | BDL | BDL | 0.059 |
| 91 | 0.032 | 0.276 | 0.480 | 0.149 | 0.860 | 1.379 | 1.849 | 1.660 | 0.106 | 0.047 | 0.049 | BDL | BDL | BDL |
| 56+60 | 0.178 | 2.955 | 6.759 | 3.363 | 10.134 | 19.648 | 19.258 | 31.393 | 3.897 | BDL | 0.392 | BDL | BDL | BDL |
| 101 | 0.026 | 0.794 | 1.933 | 0.745 | 1.639 | 2.153 | 4.361 | 4.074 | 0.385 | 0.041 | 0.101 | 0.041 | BDL | BDL |
| 99 | 0.028 | 0.918 | 1.629 | 0.663 | 1.814 | 2.572 | 3.141 | 2.652 | 0.216 | BDL | 0.068 | 0.029 | BDL | BDL |
| 83 | 0.012 | 0.027 | 0.072 | 0.027 | ND | 0.056 | 0.160 | 0.222 | 0.040 | 0.014 | 0.077 | 0.026 | ND | 0.013 |
| 97 | 0.022 | 0.196 | 0.569 | 0.172 | 0.438 | 0.607 | 1.274 | 1.118 | 0.078 | BDL | 0.086 | 0.027 | BDL | 0.025 |
| 87+81 | 0.227 | 0.273 | 0.663 | BDL | BDL | BDL | 0.535 | 0.438 | BDL | BDL | BDL | BDL | BDL | BDL |
| 85 | 0.004 | 0.985 | 1.333 | 0.825 | 1.056 | 1.014 | 1.938 | 2.504 | 0.237 | 0.010 | 0.005 | ND | ND | ND |
| 136 | 0.016 | 0.063 | 0.311 | 0.090 | 0.307 | 0.496 | 0.721 | 0.592 | 2.375 | 0.020 | 0.100 | 0.027 | ND | 0.018 |
| 77+110 | 0.046 | 1.124 | 2.761 | 0.956 | 1.998 | 2.559 | 5.522 | 4.822 | 0.139 | BDL | 0.158 | BDL | BDL | BDL |
| 82 | 0.020 | 0.059 | 0.181 | 0.027 | 0.030 | 0.044 | 0.159 | 0.081 | 0.342 | BDL | 0.100 | BDL | BDL | BDL |
| 151 | 0.026 | 0.257 | 0.472 | 0.188 | 0.279 | 0.310 | 0.925 | 0.664 | BDL | BDL | 0.079 | BDL | BDL | BDL |
| 135+144 | 0.014 | 0.184 | 0.419 | 0.125 | 0.279 | 0.321 | 0.776 | 0.640 | 0.086 | BDL | 0.058 | 0.015 | ND | BDL |
| 107 | 0.008 | 0.088 | 0.126 | 0.042 | 0.111 | 0.084 | 0.268 | 0.235 | 0.065 | BDL | 0.027 | 0.012 | ND | ND |
| 149 | 0.032 | 1.044 | 2.281 | 0.896 | 2.289 | 3.297 | 4.960 | 4.317 | 0.043 | 0.039 | 0.140 | BDL | BDL | BDL |
| 118 | 0.080 | 0.716 | 1.701 | 0.590 | 1.256 | 1.561 | 3.205 | 2.529 | 0.480 | BDL | BDL | BDL | BDL | BDL |
| 134 | 0.025 | BDL | 0.030 | BDL | 0.040 | 0.027 | BDL | 0.090 | 0.125 | BDL | 0.118 | BDL | BDL | 0.030 |
| 131 | 0.006 | 0.025 | 0.045 | 0.016 | 0.023 | 0.040 | 0.065 | 0.847 | 0.025 | ND | 0.034 | ND | ND | ND |
| 146 | 0.018 | 0.369 | 0.715 | 0.286 | 0.674 | 0.791 | 1.208 | 1.022 | BDL | BDL | 0.034 | 0.030 | ND | BDL |
| 153+132+105 | 0.087 | 2.653 | 5.154 | 2.260 | 4.958 | 6.926 | 10.076 | 8.371 | 0.769 | BDL | BDL | BDL | BDL | BDL |
| 141 | 0.019 | 0.152 | 0.278 | 0.088 | 0.251 | 0.252 | 0.485 | 0.564 | 0.086 | BDL | 0.039 | 0.025 | BDL | 0.021 |
| 137+176 | 0.015 | 0.022 | 0.135 | 0.051 | 0.114 | 0.085 | 0.455 | 0.266 | BDL | 0.024 | BDL | BDL | 0.021 | BDL |
| 163+138 | 0.045 | 1.799 | 3.527 | 1.332 | 2.015 | 2.272 | 5.690 | 4.536 | 0.353 | BDL | BDL | BDL | ND | BDL |
| 158 | 0.154 | 0.200 | 0.430 | BDL | BDL | 0.154 | 0.518 | 0.335 | BDL | BDL | BDL | BDL | BDL | BDL |
| 129+178 | 0.016 | 0.175 | 0.381 | 0.144 | 0.267 | 0.250 | 0.474 | 0.393 | 0.074 | BDL | 0.044 | 0.019 | 0.037 | 0.021 |
| 187+182 | 0.119 | 1.020 | 1.125 | 0.497 | 0.976 | 1.250 | 1.822 | 1.398 | 0.392 | BDL | BDL | BDL | BDL | ND |
| 183 | 0.021 | 0.243 | 0.492 | 0.217 | 0.413 | 0.507 | 1.004 | 0.889 | 0.372 | 0.024 | 0.036 | 0.033 | 0.050 | 0.060 |
| 128 | 0.018 | 0.260 | 0.588 | 0.189 | 0.213 | 0.255 | 0.911 | 0.687 | 0.023 | BDL | 0.023 | 0.026 | 0.075 | 0.048 |
| 185 | 0.010 | 0.023 | 0.059 | 0.025 | 0.060 | 0.041 | 0.136 | 0.103 | BDL | BDL | 0.016 | 0.012 | 0.024 | 0.026 |
| 174 | 0.025 | 0.314 | 0.615 | 0.231 | 0.404 | 0.557 | 1.214 | 1.100 | 0.095 | BDL | 0.033 | 0.046 | 0.049 | 0.061 |
| 177 | 0.013 | 0.305 | 0.522 | 0.249 | 0.441 | 0.525 | 0.860 | 0.723 | 0.047 | BDL | 0.022 | 0.018 | 0.020 | 0.026 |
| 202+171 | 0.134 | 0.324 | 0.431 | 0.174 | 0.413 | 0.424 | 0.573 | 0.500 | 0.303 | BDL | BDL | BDL | BDL | BDL |
| 157+200 | 0.019 | 0.192 | 0.271 | 0.093 | 0.260 | 0.357 | 0.345 | 0.548 | 0.404 | 0.021 | 0.033 | 0.039 | 0.053 | 0.067 |
| 172+197 | 0.018 | 0.089 | 0.180 | 0.069 | ND | 0.177 | 0.381 | 0.263 | 0.019 | BDL | BDL | 0.029 | 0.038 | 0.023 |
| 180 | 0.061 | 1.185 | 1.968 | 0.879 | 1.713 | 1.972 | 3.495 | 2.851 | 0.251 | BDL | BDL | BDL | BDL | BDL |
| 193 | 0.018 | 0.176 | 0.162 | 0.081 | 0.158 | 0.167 | 0.343 | 0.239 | 0.020 | BDL | 0.022 | 0.042 | 0.047 | 0.036 |
| 191 | 0.015 | 0.040 | 0.053 | 0.046 | 0.080 | 0.045 | 0.091 | 0.100 | BDL | BDL | 0.016 | 0.017 | 0.025 | 0.024 |
| 199 | 0.007 | 0.019 | 0.034 | 0.020 | 0.025 | 0.037 | 0.080 | 0.054 | 0.037 | ND | 0.007 | BDL | 0.019 | 0.010 |
| 170+190 | 0.022 | 0.805 | 1.405 | 0.561 | 1.159 | 1.456 | 2.493 | 2.091 | 0.086 | BDL | 0.024 | BDL | BDL | 0.028 |
| 198 | 0.012 | BDL | BDL | 0.013 | ND | 0.026 | 0.041 | 0.048 | 0.026 | BDL | BDL | 0.025 | 0.018 | 0.016 |
| 201 | 0.017 | 0.838 | 1.238 | 0.663 | 1.183 | 1.483 | 1.906 | 2.066 | 1.529 | 0.157 | 0.019 | 0.028 | 0.035 | 0.034 |
| 203+196 | 0.021 | 0.854 | 1.299 | 0.669 | 1.338 | 1.611 | 2.019 | 2.367 | 2.560 | 0.182 | 0.042 | 0.037 | 0.037 | 0.042 |
| 189 | 0.024 | 0.037 | 0.111 | 0.046 | 0.093 | 0.082 | 0.251 | 0.171 | 0.045 | BDL | 0.071 | 0.029 | 0.043 | 0.050 |
| 208+195 | 0.024 | 1.516 | 1.998 | 1.052 | 1.941 | 2.272 | 2.670 | 3.524 | 3.823 | 0.494 | 0.050 | 0.077 | 0.093 | 0.038 |
| 207 | 0.011 | 0.174 | 0.222 | 0.125 | 0.246 | 0.270 | 0.288 | 0.485 | 0.855 | 0.123 | 0.023 | 0.044 | 0.045 | 0.029 |
| 194 | 0.011 | 0.313 | 0.470 | 0.231 | 0.484 | 0.640 | 0.766 | 0.703 | 0.180 | 0.016 | 0.020 | 0.019 | 0.019 | 0.020 |
| 205 | 0.019 | 0.058 | 0.053 | 0.038 | 0.088 | 0.109 | 0.106 | 0.122 | 0.032 | BDL | BDL | BDL | BDL | 0.033 |
| 206 | 0.016 | 1.452 | 1.740 | 0.977 | 1.805 | 2.149 | 2.454 | 3.479 | 4.061 | 0.629 | 0.043 | 0.071 | 0.043 | 0.058 |
| 209 | 0.074 | 0.796 | 0.959 | 0.540 | 1.006 | 1.093 | 1.277 | 1.855 | 2.431 | 0.618 | 0.158 | 0.298 | 0.261 | 0.245 |

**Appendix G-II Concentrations of PCBs in Sediment Cores**

| Chem ID | | 6180 | 6181 | 6182 | 6183 | 6184 | 6185 | 6185Rdup | 6185Rtrip | 6186 | 6187 | 6188 | 6189 | 6189dup | 6189trip | 6190 | 6191 | 6192 | 6193 | 6194 | 6195 | 6196 | 6197 | 6199 | 6202 | 6210 | 6210dup | 6213 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site | | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 |
| Depth Interval (cm) | | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 | 10-12 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 18-20 | 18-20 | 20-22 | 22-24 | 24-26 | 26-28 | 28-30 | 30-32 | 32-34 | 34-36 | 38-40 | 44-46 | 60-62 | 60-62 | 66-68 |
| Mid-Pt (cm) | | 1 | 3 | 5 | 7 | 9 | 11 | 11 | 11 | 13 | 15 | 17 | 19 | 19 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | 33 | 35 | 39 | 45 | 61 | 61 | 67 |
| Mass extracted (g) | | 2.073 | 1.932 | 1.953 | 1.942 | 1.997 | 1.902 | 2.063 | 2.067 | 2.199 | 2.113 | 2.061 | 2.109 | 2.114 | 2.048 | 1.841 | 1.993 | 2.003 | 2.217 | 2.001 | 2.087 | 2.048 | 2.005 | 2.118 | 1.983 | 2.106 | 1.996 | 2.063 |
| % Dry Mass | | 0.31 | 0.33 | 0.31 | 0.31 | 0.30 | 0.30 | 0.30 | 0.30 | 0.29 | 0.29 | 0.33 | 0.32 | 0.32 | 0.32 | 0.48 | 0.27 | 0.27 | 0.28 | 0.36 | 0.36 | 0.34 | 0.38 | 0.34 | 0.35 | 0.15 | 0.15 | 0.38 |
| Solid Mass (g dw) | | 0.64 | 0.64 | 0.60 | 0.60 | 0.61 | 0.58 | 0.63 | 0.63 | 0.64 | 0.61 | 0.68 | 0.67 | 0.67 | 0.65 | 0.89 | 0.53 | 0.55 | 0.61 | 0.72 | 0.75 | 0.70 | 0.76 | 0.72 | 0.70 | 0.32 | 0.30 | 0.78 |
| **Surrogate Recoveries %** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PCB 14 | | 90 | 86 | 89 | 86 | 90 | 84 | 87 | 87 | 84 | 90 | 82 | 81 | 86 | 89 | 85 | 82 | 80 | 88 | 86 | 81 | 82 | 90 | 83 | 84 | 86 | 88 | 90 |
| PCB 65 | | 91 | 91 | 90 | 87 | 90 | 84 | 88 | 88 | 84 | 90 | 80 | 79 | 87 | 88 | 86 | 83 | 80 | 85 | 86 | 80 | 82 | 88 | 84 | 85 | 85 | 88 | 90 |
| PCB 166 | | 95 | 91 | 88 | 90 | 93 | 84 | 92 | 91 | 85 | 91 | 80 | 80 | 89 | 93 | 88 | 88 | 83 | 86 | 91 | 77 | 81 | 91 | 84 | 87 | 90 | 90 | 92 |
| **Concentrations (ng/g dw)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total PCBs | | 60.20 | 68.16 | 60.18 | 80.88 | 75.01 | 83.28 | 90.87 | 72.91 | 91.44 | 104.63 | 113.90 | 111.16 | 95.84 | 99.31 | 98.80 | 148.32 | 160.59 | 216.15 | 133.63 | 175.32 | 178.74 | 127.50 | 76.35 | 61.68 | 30.16 | 44.16 | 14.40 |
| Polychlorinated Biphenyls | MDL | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw |
| 1 | 2.372 | BDL | BDL | 2.75 | BDL | BDL | BDL | 2.50 | BDL | 2.70 | BDL | 3.25 | BDL | BDL | BDL | BDL | 3.00 | 3.24 | 2.38 | BDL | BDL | BDL | 4.42 | 3.14 | BDL | BDL | 4.16 | BDL |
| 3 | 13.625 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 16.16 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 4+10 | 0.422 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 7 | 0.092 | BDL | BDL | BDL | BDL | 0.13 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.12 | BDL | BDL | BDL | BDL | BDL | BDL | 0.11 | 0.17 | BDL |
| 6 | 0.174 | 0.18 | 0.18 | BDL | BDL | BDL | BDL | 0.30 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.19 | 0.24 | 0.24 | 0.22 | BDL | BDL | BDL | BDL | 0.24 | BDL | 0.17 | 0.36 | BDL |
| 8+5 | 0.953 | 0.99 | 1.13 | BDL | BDL | BDL | BDL | 1.15 | BDL | BDL | 0.98 | BDL | BDL | BDL | BDL | 0.97 | 1.66 | 1.54 | 1.07 | BDL | 1.23 | 1.56 | 1.42 | 2.54 | 7.30 | 0.99 | 1.14 | BDL |
| 19 | 0.102 | BDL | 0.11 | BDL | BDL | BDL | 0.14 | 0.19 | BDL | BDL | BDL | BDL | BDL | BDL | 0.12 | 0.18 | BDL | BDL | 0.19 | BDL | 0.18 | 0.11 | 0.19 | 0.12 | 0.14 | 0.16 | 0.15 | BDL |
| 12+13 | 0.285 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.39 | BDL | BDL | BDL | BDL |
| 18 | 0.339 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.35 | 0.43 | 0.35 | BDL | 0.34 | 0.36 | BDL | 0.37 | 0.36 | 0.57 | 0.36 | 0.41 | 0.36 | BDL | 0.34 | BDL | BDL | BDL | BDL |
| 17 | 0.291 | BDL | BDL | BDL | 0.33 | 0.32 | 0.32 | BDL | 0.31 | BDL | 0.41 | 0.44 | BDL | 0.34 | 0.42 | 0.37 | 0.43 | 0.37 | 0.46 | BDL | BDL | BDL | BDL | 0.30 | BDL | 0.29 | BDL | BDL |
| 24+27 | 0.392 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 16+32 | 0.411 | BDL | BDL | BDL | 0.45 | BDL | BDL | BDL | BDL | BDL | 0.49 | 0.41 | 0.42 | 0.45 | 0.46 | 0.44 | 0.60 | 0.65 | 0.61 | 0.54 | 0.57 | 0.42 | 0.50 | BDL | BDL | BDL | BDL | ND |
| 29 | 0.157 | BDL | 0.22 | BDL | BDL | 0.17 | BDL | 0.17 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.17 | BDL | BDL | 0.23 | 0.25 | BDL |
| 26 | 0.075 | 0.11 | 0.21 | 0.15 | 0.16 | 0.31 | 0.21 | 0.21 | 0.17 | 0.15 | 0.21 | 0.20 | 0.15 | 0.17 | 0.13 | 0.16 | 0.28 | 0.20 | 0.23 | 0.13 | 0.16 | 0.13 | 0.13 | 0.12 | 0.14 | 0.13 | 0.17 | BDL |
| 25 | 0.064 | 0.09 | 0.10 | 0.10 | 0.14 | 0.19 | 0.12 | 0.17 | 0.09 | 0.12 | 0.13 | 0.12 | 0.14 | 0.12 | 0.12 | 0.12 | 0.19 | 0.17 | 0.12 | 0.08 | 0.11 | 0.10 | 0.11 | 0.12 | 0.07 | 0.09 | 0.10 | BDL |
| 31+28 | 0.842 | 1.84 | 2.08 | 1.87 | 2.25 | 2.44 | 2.64 | 2.59 | 2.17 | 2.32 | 2.39 | 2.55 | 2.40 | 2.45 | 2.68 | 2.10 | 3.08 | 3.29 | 3.75 | 2.36 | 2.16 | 1.72 | 1.02 | BDL | BDL | 0.90 | 0.97 | BDL |
| 53+33+21 | 0.423 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.43 | 0.52 | 0.46 | BDL | 0.53 | 0.44 | BDL | 0.65 | 0.64 | 0.77 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 22 | 0.449 | 0.57 | 0.52 | BDL | 0.51 | 0.70 | 0.61 | 0.58 | 0.46 | 0.61 | 0.70 | 0.77 | 0.52 | 0.67 | 0.66 | 0.56 | 0.86 | 0.92 | 0.92 | 0.62 | 0.56 | BDL | ND | BDL | BDL | BDL | BDL | BDL |
| 45 | 0.137 | 0.23 | 0.23 | BDL | BDL | 0.20 | BDL | 0.17 | 0.15 | 0.15 | 0.19 | 0.21 | 0.16 | 0.19 | 0.15 | 0.16 | 0.35 | 0.44 | 0.63 | 0.54 | 1.13 | 1.35 | 1.48 | 0.38 | 0.15 | 0.24 | BDL | BDL |
| 46 | 0.552 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 52 | 0.258 | 0.55 | 0.65 | 0.49 | 1.43 | 0.84 | 0.80 | 0.93 | 0.89 | 0.95 | 1.12 | 1.30 | 1.30 | 1.33 | 1.30 | 1.24 | 1.82 | 1.90 | 2.91 | 2.02 | 2.22 | 2.44 | 0.93 | 0.68 | BDL | BDL | BDL | BDL |
| 49 | 0.210 | 0.77 | 1.00 | 0.82 | 0.81 | 0.97 | 0.99 | 1.17 | 1.03 | 0.93 | 1.20 | 1.51 | 1.48 | 1.45 | 1.57 | 1.43 | 1.94 | 2.30 | 2.93 | 1.84 | 1.72 | 1.79 | 1.11 | 0.46 | BDL | BDL | BDL | 0.25 |
| 47 | 1.763 | 2.55 | 2.00 | BDL | BDL | BDL | 1.90 | 1.86 | BDL | BDL | BDL | BDL | BDL | BDL | 1.90 | 2.40 | 3.94 | 4.10 | 3.74 | BDL | 3.21 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 48 | 1.230 | BDL | 1.32 | BDL | 2.07 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 2.22 | 1.93 | 1.81 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 44 | 0.339 | 0.63 | 0.77 | 0.39 | 0.98 | 0.79 | 0.75 | 0.91 | 0.71 | 0.80 | 1.12 | 1.26 | 1.15 | 1.24 | 1.20 | 1.06 | 1.62 | 1.86 | 2.91 | 1.59 | 1.96 | 1.87 | 1.33 | 0.87 | BDL | 0.35 | BDL | BDL |
| 37+42 | 0.332 | 0.59 | 0.39 | 0.42 | 0.83 | 0.60 | 0.64 | 0.83 | 0.56 | 0.91 | 0.86 | 1.02 | 0.93 | 1.00 | 1.24 | 0.99 | 1.70 | 1.58 | 1.73 | 1.12 | 1.05 | 0.97 | 0.65 | BDL | BDL | BDL | BDL | BDL |
| 41+71 | 0.388 | 0.62 | 1.05 | 0.85 | 1.47 | 0.64 | 1.23 | 1.59 | 1.21 | 1.26 | 1.49 | 1.64 | 1.78 | 1.85 | 1.83 | 1.65 | 2.83 | 3.16 | 3.90 | 2.58 | 2.50 | 2.17 | 1.36 | 0.99 | 0.42 | BDL | 0.46 | BDL |
| 64 | 2.535 | 2.84 | BDL | BDL | BDL | BDL | BDL | 2.92 | BDL | BDL | BDL | 3.58 | 3.09 | BDL | BDL | 2.70 | 4.10 | 5.13 | 8.43 | 3.60 | BDL | BDL | BDL | BDL | BDL | 3.11 | 3.84 | BDL |
| 40 | 0.114 | 0.23 | 0.31 | 0.24 | 0.26 | 0.45 | 0.39 | 0.63 | 0.61 | 0.45 | 0.77 | 1.10 | 1.33 | 1.30 | 1.05 | 1.85 | 2.73 | 3.68 | 4.29 | 2.13 | 2.68 | 2.18 | 1.06 | 0.38 | 0.13 | 0.12 | 0.16 | BDL |
| 100 | 0.129 | 0.39 | 0.36 | 0.31 | 0.27 | 0.41 | 0.40 | 0.50 | 0.43 | 0.36 | 0.44 | 0.49 | 0.69 | 0.55 | 0.57 | 1.08 | 1.46 | 1.99 | 2.06 | 1.15 | 1.19 | 0.69 | 0.36 | 0.36 | 0.32 | 0.18 | 0.20 | BDL |
| 63 | 0.100 | 0.23 | 0.15 | 0.12 | BDL | 0.11 | BDL | BDL | 0.12 | BDL | BDL | BDL | BDL | BDL | 0.12 | 0.12 | 0.17 | 0.15 | 0.19 | BDL | 0.25 | 0.16 | 0.16 | 0.20 | 0.41 | 0.30 | 0.14 | 0.21 |
| 74 | 0.230 | 0.37 | 0.52 | 0.37 | 0.62 | 0.59 | 0.58 | 0.83 | 0.50 | 0.46 | 0.63 | 0.77 | 0.74 | 0.68 | 0.91 | 0.73 | 1.03 | 1.12 | 1.69 | 0.92 | 0.88 | 0.71 | 0.45 | 0.23 | BDL | BDL | BDL | BDL |
| 70+76 | 0.390 | 1.57 | 1.78 | 1.43 | 2.58 | 2.16 | 2.18 | 2.53 | 1.97 | 2.07 | 2.33 | 2.89 | 2.83 | 2.78 | 3.23 | 2.72 | 4.02 | 4.57 | 6.62 | 3.86 | 4.58 | 4.25 | 2.55 | 1.16 | BDL | BDL | 0.48 | BDL |
| 66 | 0.478 | 1.87 | 2.39 | 1.97 | 2.56 | 2.66 | 2.67 | 2.91 | 2.60 | 2.54 | 3.36 | 3.62 | 3.93 | 3.97 | 4.08 | 3.20 | 5.14 | 5.46 | 7.31 | 4.05 | 3.81 | 3.03 | 1.77 | 1.09 | BDL | 0.48 | 0.55 | BDL |
| 95 | 0.182 | 0.54 | 0.53 | 0.54 | 1.46 | 0.67 | 1.14 | 1.24 | 0.90 | 1.11 | 0.95 | 1.58 | 1.55 | 1.47 | 1.35 | 1.99 | 2.44 | 3.11 | 4.16 | 2.85 | 3.42 | 4.08 | 2.72 | 0.77 | 0.18 | BDL | BDL | BDL |
| 91 | 0.144 | BDL | BDL | BDL | BDL | 0.15 | 0.23 | 0.21 | 0.18 | 0.23 | 0.31 | 0.73 | 0.87 | 1.02 | 0.91 | 1.17 | 1.67 | 2.44 | 3.91 | 1.67 | 1.11 | 0.71 | 0.62 | BDL | BDL | BDL | 0.23 | BDL |
| 56+60 | 0.804 | 1.19 | 2.62 | 1.31 | 2.30 | 1.99 | 3.15 | 5.85 | 1.86 | 3.66 | 5.28 | 7.69 | 5.81 | 2.83 | 3.17 | 2.20 | 3.73 | 3.18 | 6.80 | 3.63 | 10.91 | 3.49 | 2.90 | BDL | BDL | BDL | BDL | BDL |
| 101 | 0.118 | 1.12 | 1.16 | 0.98 | 1.99 | 1.87 | 1.60 | 2.32 | 1.67 | 1.67 | 1.81 | 2.53 | 2.27 | 2.51 | 3.01 | 2.47 | 3.51 | 4.10 | 5.81 | 3.70 | 5.95 | 6.56 | 4.69 | 1.54 | 0.28 | BDL | BDL | BDL |
| 99 | 0.129 | 1.49 | 1.60 | 1.30 | 1.71 | 1.84 | 2.31 | 2.53 | 2.15 | 2.17 | 2.56 | 3.27 | 3.37 | 3.07 | 3.39 | 4.06 | 5.75 | 7.76 | 8.95 | 4.87 | 5.16 | 3.77 | 2.14 | 0.97 | 0.17 | BDL | 0.14 | BDL |
| 83 | 0.056 | 0.12 | BDL | BDL | BDL | 0.11 | 0.11 | 0.06 | 0.06 | 0.06 | 0.11 | 0.09 | 0.16 | 0.16 | 0.12 | 0.46 | 0.40 | 0.57 | 0.54 | 0.75 | 2.97 | 4.28 | 3.19 | 0.66 | BDL | BDL | 0.09 | BDL |
| 97 | 0.099 | 0.27 | 0.23 | 0.19 | 0.54 | 0.34 | 0.20 | 0.41 | 0.31 | 0.35 | 0.42 | 0.54 | 0.55 | 0.57 | 0.57 | 0.60 | 0.80 | 0.97 | 1.46 | 0.85 | 1.08 | 1.22 | 0.73 | 0.22 | BDL | BDL | BDL | BDL |
| 87+81 | 1.027 | 1.32 | ND | BDL | 1.97 | BDL | BDL | 1.34 | 1.18 | 1.07 | 1.17 | 1.11 | 1.13 | 1.25 | 1.33 | 1.08 | 1.47 | 1.74 | 2.21 | 1.93 | 2.06 | 2.42 | 1.66 | BDL | BDL | BDL | BDL | BDL |
| 85 | 0.019 | 1.51 | 1.63 | 1.52 | 1.77 | 2.32 | 2.42 | 2.63 | 2.27 | 2.44 | 2.66 | 3.33 | 3.39 | 3.33 | 3.61 | 2.94 | 4.66 | 5.99 | 8.12 | 6.39 | 13.34 | 15.70 | 12.60 | 3.58 | 0.42 | 0.03 | 0.04 | BDL |
| 136 | 0.071 | 0.18 | 0.11 | BDL | 0.13 | 0.17 | 0.12 | 0.15 | 0.13 | ND | 0.16 | 0.22 | 0.18 | 0.18 | 0.24 | 0.20 | 0.25 | 0.31 | 0.42 | 0.30 | 0.36 | 0.73 | 0.31 | 0.15 | BDL | BDL | 0.14 | BDL |
| 77+110 | 0.210 | 1.62 | 1.87 | 1.54 | 3.00 | 2.00 | 2.33 | 2.63 | 2.36 | 2.12 | 2.45 | 3.47 | 3.44 | 3.53 | 3.75 | 3.39 | 4.74 | 6.28 | 8.11 | 4.96 | 6.33 | 7.25 | 4.23 | 1.63 | BDL | BDL | 0.28 | BDL |
| 82 | 0.092 | 0.09 | 0.10 | BDL | 0.16 | 0.20 | BDL | BDL | 0.10 | BDL | 0.20 | 0.14 | 0.16 | 0.13 | 0.17 | 0.16 | 0.19 | 0.19 | 0.38 | 0.24 | 0.36 | 0.39 | 0.23 | BDL | BDL | BDL | BDL | BDL |
| 151 | 0.119 | 0.29 | 0.35 | 0.23 | 0.42 | 0.34 | 0.38 | 0.47 | 0.40 | 0.57 | 0.47 | 0.63 | 0.63 | 0.63 | 0.67 | 0.66 | 0.91 | 1.05 | 1.63 | 0.97 | 1.29 | 1.43 | 0.74 | 0.22 | BDL | BDL | BDL | BDL |
| 135+144 | 0.061 | 0.13 | 0.12 | 0.10 | 0.28 | 0.23 | 0.21 | 0.28 | 0.21 | 0.34 | 0.28 | 0.36 | 0.35 | 0.33 | 0.37 | 0.26 | 0.37 | 0.44 | 1.08 | 0.42 | BDL | 0.96 | 0.27 | 0.17 | BDL | BDL | 0.06 | 0.10 |
| 107 | 0.035 | 0.10 | 0.09 | 0.08 | 0.13 | 0.09 | 0.12 | 0.15 | 0.12 | 0.14 | 0.15 | 0.19 | 0.21 | 0.18 | 0.17 | 0.14 | 0.18 | 0.23 | 0.32 | 0.20 | 0.27 | 0.28 | 0.20 | 0.14 | 0.10 | BDL | BDL | BDL |
| 149 | 0.146 | 1.01 | 1.25 | 1.20 | 1.48 | 1.74 | 1.85 | 2.24 | 1.96 | 2.38 | 2.19 | 2.93 | 2.96 | 3.01 | 2.97 | 2.90 | 4.02 | 4.64 | 6.32 | 3.70 | 4.84 | 5.41 | 3.16 | 1.06 | 0.25 | BDL | 0.19 | BDL |
| 118 | 0.361 | 0.84 | 1.10 | 1.02 | 1.60 | 1.29 | 1.41 | 1.66 | 1.39 | 1.42 | 1.57 | 2.14 | 2.19 | 2.16 | 2.26 | 2.09 | 2.91 | 3.31 | 4.38 | 2.43 | 3.09 | 3.59 | 2.31 | 0.81 | BDL | BDL | BDL | BDL |
| 134 | 0.114 | 0.12 | ND | BDL | BDL | BDL | ND | ND | 0.11 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | ND | ND | ND | 0.14 | ND | 0.15 | ND | BDL | BDL | BDL | 0.14 | BDL |
| 131 | 0.027 | 0.06 | 0.07 | 0.05 | 0.05 | 0.05 | 0.08 | 0.07 | 0.08 | 0.05 | 0.05 | 0.08 | 0.12 | 0.12 | 0.12 | 0.27 | 0.23 | 0.32 | 0.24 | 0.34 | 0.97 | 1.18 | 0.95 | 0.28 | 0.03 | BDL | 0.03 | BDL |
| 146 | 0.080 | 0.40 | 0.39 | 0.30 | 0.67 | 0.62 | 0.65 | 0.72 | 0.57 | 0.84 | 0.80 | 1.01 | 0.93 | 0.97 | 1.04 | 0.88 | 1.15 | 1.42 | 1.77 | 1.08 | 1.12 | 1.37 | 0.89 | 0.24 | BDL | BDL | BDL | BDL |
| 153+132+105 | 0.393 | 3.26 | 3.57 | 3.18 | 6.09 | 4.93 | 5.21 | 5.63 | 4.82 | 7.34 | 6.90 | 7.87 | 7.48 | 7.63 | 8.18 | 7.09 | 9.75 | 10.67 | 14.53 | 9.32 | 10.47 | 11.81 | 6.31 | 2.53 | 0.61 | BDL | BDL | BDL |
| 141 | 0.085 | 0.25 | 0.15 | 0.09 | 0.15 | 0.24 | 0.21 | 0.28 | 0.19 | 0.25 | 0.30 | 0.29 | 0.19 | 0.25 | 0.40 | 0.22 | 0.37 | 0.48 | 0.46 | 0.34 | 0.76 | 0.51 | 0.54 | 0.18 | 0.47 | 0.11 | BDL | BDL |
| 137+176 | 0.067 | ND | ND | 0.14 | ND | ND | 0.27 | ND | ND | 0.14 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.28 | 0.31 | 0.13 | ND | BDL | 0.08 | BDL | BDL |
| 163+138 | 0.202 | 2.13 | 2.36 | 1.89 | 4.23 | 3.24 | 3.35 | 4.06 | 3.15 | 4.44 | 3.67 | 4.67 | 5.00 | 4.78 | 4.90 | 4.37 | 6.63 | 7.63 | 10.39 | 6.98 | 8.15 | 8.62 | 5.55 | 2.31 | 0.45 | BDL | BDL | BDL |
| 158 | 0.696 | BDL | BDL | BDL | 0.82 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 1.11 | 1.13 | 0.93 | 1.37 | 1.13 | 1.02 | BDL | BDL | BDL | BDL | BDL |
| 129+178 | 0.074 | 0.16 | 0.21 | 0.21 | 0.22 | 0.25 | 0.73 | 0.35 | 0.27 | 0.55 | 0.24 | 0.37 | 0.34 | 0.50 | 0.45 | 0.40 | 0.65 | 2.77 | 0.72 | 0.48 | 1.05 | 1.23 | 0.46 | 0.25 | 0.15 | 0.14 | BDL | BDL |
| 187+182 | 0.539 | 0.85 | 1.07 | 4.92 | 0.76 | 1.36 | 7.26 | 1.59 | 1.47 | 3.79 | 6.01 | 6.17 | 6.99 | 2.10 | 2.22 | 2.32 | 2.79 | 3.60 | 7.76 | 3.80 | 5.94 | 9.70 | 5.32 | 0.62 | 0.76 | BDL | 0.92 | 0.76 |
| 183 | 0.093 | ND | 0.20 | 0.18 | 0.12 | 0.13 | 0.53 | ND | ND | 0.19 | 0.35 | 0.68 | 0.46 | ND | ND | 0.14 | BDL | 0.24 | 1.75 | 0.43 | 1.52 | 1.27 | 0.71 | BDL | 0.20 | 0.11 | 0.37 | 0.11 |
| 128 | 0.082 | 0.43 | 0.41 | 0.51 | 0.67 | 0.55 | 1.03 | 0.57 | 0.56 | 0.64 | 1.07 | 1.28 | 1.25 | 0.79 | 0.71 | 0.75 | 0.92 | 1.49 | 1.90 | 1.13 | 1.88 | 2.23 | 1.21 | 0.18 | 0.30 | 0.21 | 0.84 | 0.47 |
| 185 | 0.047 | 0.06 | 0.16 | 0.06 | 0.14 | 0.06 | 0.15 | 0.06 | 0.05 | 0.23 | 0.13 | 0.37 | 0.27 | 0.08 | 0.12 | 0.11 | 0.09 | 0.14 | 0.56 | 0.22 | 0.31 | 0.40 | 0.17 | 0.06 | 0.09 | 0.07 | 0.43 | ND |
| 174 | 0.114 | 0.14 | 0.44 | 0.87 | 0.50 | 0.28 | 0.50 | 0.26 | 0.26 | 0.81 | 1.31 | 1.07 | 1.18 | 0.65 | 0.78 | 0.84 | 1.22 | 1.39 | 2.31 | 1.52 | 2.12 | 2.20 | 0.96 | BDL | 0.42 | BDL | BDL | 0.11 |
| 177 | 0.059 | 0.30 | 0.37 | 0.49 | 0.47 | 0.45 | 0.41 | 0.63 | 0.50 | 0.89 | 1.11 | 1.16 | 1.57 | 0.78 | 0.77 | 0.75 | 1.10 | 1.20 | 2.13 | 0.88 | 1.88 | 1.61 | 0.66 | 0.15 | 0.19 | BDL | 0.18 | 0.08 |
| 202+171 | 0.607 | BDL | BDL | BDL | BDL | BDL | 0.66 | BDL | BDL | 0.73 | 0.93 | 0.75 | BDL | BDL | BDL | BDL | BDL | 0.75 | 0.99 | BDL | 0.67 | 0.73 | 0.74 | 0.76 | 0.79 | BDL | 0.80 | BDL |
| 157+200 | 0.087 | BDL | 0.27 | 0.33 | 0.24 | 0.17 | 0.24 | 0.09 | 0.16 | 0.35 | 0.51 | 0.55 | 1.10 | 0.21 | 0.27 | 0.21 | 0.31 | 0.25 | 0.94 | 0.15 | 0.79 | 1.05 | 0.36 | ND | 0.35 | 0.19 | 0.51 | 0.23 |
| 172+197 | 0.083 | 0.12 | 0.26 | 0.17 | 0.21 | 0.16 | 0.27 | 0.14 | 0.15 | 0.50 | 0.61 | 0.67 | 0.69 | 0.17 | 0.21 | 0.16 | 0.24 | 0.37 | 0.73 | 0.31 | 0.89 | 0.68 | 0.33 | 0.16 | 0.22 | 0.13 | 0.23 | 0.09 |
| 180 | 0.274 | 1.26 | 1.64 | 1.69 | 2.41 | 1.96 | 2.24 | 2.33 | 1.87 | 4.37 | 2.43 | 2.78 | 2.70 | 2.70 | 2.68 | 2.36 | 3.57 | 3.90 | 5.27 | 3.27 | 3.98 | 4.75 | 2.59 | 1.07 | 0.58 | BDL | 0.30 | BDL |
| 193 | 0.079 | 0.15 | 0.28 | 0.36 | 0.29 | 0.20 | 0.25 | 0.27 | 0.18 | 0.43 | 0.69 | 0.89 | 0.45 | 0.35 | 0.25 | 0.25 | 0.30 | 0.34 | 0.96 | 0.33 | 0.98 | 0.86 | 0.25 | 0.11 | 0.21 | 0.10 | 0.36 | 0.11 |
| 191 | 0.070 | 0.14 | 0.24 | 0.15 | 0.19 | 0.13 | 0.15 | 0.14 | 0.18 | 0.25 | 0.52 | 0.47 | 0.37 | 0.23 | 0.11 | 0.31 | 0.16 | 0.19 | 1.26 | 0.24 | 0.70 | 0.14 | 0.20 | 0.12 | 0.21 | BDL | 0.25 | ND |
| 199 | 0.032 | 0.06 | 0.14 | 0.06 | 0.08 | 0.04 | 0.05 | 0.04 | 0.04 | 0.10 | 0.18 | 0.11 | 0.06 | 0.06 | 0.06 | 0.06 | 0.04 | 0.04 | 0.26 | 0.08 | 0.25 | 0.04 | 0.10 | ND | 0.05 | 0.04 | 0.11 | ND |
| 170+190 | 0.099 | 0.84 | 1.62 | 0.80 | 1.58 | 1.49 | 1.39 | 1.53 | 1.39 | 2.81 | 2.12 | 1.87 | 2.11 | 1.90 | 1.98 | 2.03 | 2.28 | 2.97 | 3.01 | 2.35 | 2.74 | 3.23 | 1.82 | 0.52 | 0.20 | 0.11 | 0.39 | BDL |
| 198 | 0.055 | ND | 0.06 | 0.07 | 0.08 | BDL | ND | BDL | ND | 0.07 | 0.20 | BDL | 0.15 | BDL | BDL | BDL | ND | 0.07 | 0.14 | 0.09 | 0.24 | 0.11 | 0.06 | ND | 0.14 | 0.06 | 0.14 | ND |
| 201 | 0.075 | 0.94 | 1.21 | 0.92 | 0.93 | 1.10 | 1.03 | 1.68 | 1.24 | 2.17 | 2.04 | 1.74 | 2.26 | 1.78 | 1.78 | 1.27 | 2.43 | 2.17 | 3.29 | 1.92 | 3.12 | 3.22 | 2.63 | 3.06 | 2.20 | 0.08 | 0.41 | ND |
| 203+196 | 0.093 | 0.47 | 1.03 | 0.88 | 0.68 | 0.85 | 1.22 | 1.60 | 0.92 | 2.75 | 2.74 | 1.29 | 2.83 | 1.68 | 1.51 | 1.46 | 2.12 | 2.33 | 3.14 | 2.25 | 2.90 | 4.05 | 3.03 | 2.95 | 2.87 | 0.10 | 0.49 | ND |
| 189 | 0.108 | BDL | 0.14 | 0.12 | BDL | BDL | BDL | BDL | BDL | 0.14 | ND | BDL | BDL | BDL | BDL | BDL | BDL | 0.14 | BDL | BDL | 0.24 | 0.11 | 0.17 | BDL | BDL | BDL | 0.14 | ND |
| 208+195 | 0.107 | 1.73 | 1.96 | 1.82 | 2.24 | 2.46 | 2.60 | 3.10 | 2.23 | 2.80 | 2.95 | 2.78 | 1.92 | 2.61 | 2.84 | 2.21 | 3.39 | 3.37 | 3.56 | 2.90 | 3.88 | 4.93 | 5.07 | 7.27 | 5.72 | BDL | 0.38 | BDL |
| 207 | 0.051 | 0.22 | 0.28 | 0.16 | 0.29 | 0.34 | 0.35 | 0.38 | 0.31 | 0.30 | 0.74 | 0.41 | 0.46 | 0.40 | 0.44 | 0.33 | 0.53 | 0.52 | 0.62 | 0.44 | 0.66 | 0.81 | 0.92 | 1.39 | 1.13 | BDL | 0.14 | BDL |
| 194 | 0.048 | 0.30 | 0.31 | 0.35 | 0.49 | 0.49 | 0.55 | 0.61 | 0.50 | 1.04 | 0.69 | 0.72 | 0.75 | 0.73 | 0.80 | 0.61 | 0.92 | 1.02 | 1.22 | 0.78 | 1.01 | 1.15 | 0.71 | 0.46 | 0.25 | BDL | 0.16 | BDL |
| 205 | 0.084 | BDL | 0.18 | BDL | 0.12 | 0.09 | 0.10 | 0.10 | BDL | 0.16 | 0.35 | 0.17 | 0.17 | BDL | 0.11 | 0.12 | 0.13 | 0.22 | BDL | 0.15 | 0.30 | 0.20 | 0.18 | 0.14 | BDL | BDL | 0.18 | BDL |
| 206 | 0.073 | 1.70 | 2.15 | 1.88 | 2.31 | 2.45 | 2.52 | 3.38 | 2.07 | 2.46 | 2.53 | 2.71 | 2.89 | 2.59 | 2.85 | 2.09 | 3.32 | 3.12 | 3.56 | 3.20 | 4.43 | 5.62 | 6.15 | 9.49 | 7.81 | BDL | 0.37 | BDL |
| 209 | 0.333 | 0.45 | 0.58 | 0.53 | 0.66 | 0.58 | 0.62 | 0.93 | 0.49 | 0.62 | 0.67 | 0.69 | 0.64 | 0.62 | 0.87 | 0.53 | 0.68 | 0.62 | 0.76 | 0.76 | 1.01 | 1.30 | 1.32 | 2.35 | 1.86 | BDL | BDL | BDL |

**Appendix G-II Concentrations of PCBs in Sediment Cores**

| Chem ID | | 6214 | 6216 | 6221 | 6224 | 6227 | 6229 | 6231 | 6234 | 6236 | 6239 | 6239dup | 6241 | 6244 | 6246 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site | | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 | LH-2 |
| Depth Interval (cm) | | 0-2 | 4-6 | 14-16 | 20-22 | 26-28 | 30-32 | 34-36 | 40-42 | 44-46 | 50-52 | 50-52 | 54-56 | 60-62 | 64-66 |
| Mid-Pt (cm) | | 1 | 5 | 15 | 21 | 27 | 31 | 35 | 41 | 45 | 51 | 51 | 55 | 61 | 65 |
| Mass extracted (g) | | 2.035 | 2.052 | 2.172 | 2.237 | 2.086 | 2.217 | 2.212 | 2.035 | 2.152 | 2.161 | 2.042 | 1.988 | 2.148 | 1.925 |
| % Dry Mass | | 0.34 | 0.42 | 0.67 | 0.52 | 0.59 | 0.53 | 0.53 | 0.37 | 0.38 | 0.35 | 0.35 | 0.38 | 0.39 | 0.47 |
| Solid Mass (g dw) | | 0.69 | 0.87 | 1.47 | 1.15 | 1.23 | 1.18 | 1.16 | 0.75 | 0.81 | 0.76 | 0.72 | 0.76 | 0.83 | 0.91 |
| **Surrogate Recoveries %** | | | | | | | | | | | | | | | |
| PCB 14 | | 95 | 89 | 94 | 88 | 69 | 78 | 84 | 89 | 46 | 105 | 88 | 129 | 79 | 89 |
| PCB 65 | | 82 | 86 | 86 | 85 | 82 | 83 | 85 | 93 | 84 | 50 | 99 | 98 | 80 | 86 |
| PCB 166 | | 88 | 92 | 86 | 95 | 88 | 93 | 91 | 90 | 89 | 96 | 87 | 91 | 90 | 91 |
| **Concentrations (ng/g dw)** | | | | | | | | | | | | | | | |
| Total PCBs | | 166.01 | 147.32 | 211.72 | 782.08 | 454.55 | 268.87 | 243.18 | 278.81 | 388.53 | 303.88 | 260.40 | 412.26 | 100.16 | 34.90 |
| Polychlorinated Biphenyls | MDL | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw |
| 1 | 2.37 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 2.70 | BDL | 3.64 | 2.82 | BDL | 2.63 |
| 3 | 13.62 | BDL | BDL | BDL | BDL | 15.58 | BDL | 60.83 | BDL | 14.69 | BDL | BDL | BDL | BDL | BDL |
| 4+10 | 0.42 | BDL | BDL | BDL | BDL | 0.44 | 1.38 | 3.45 | 1.16 | 3.46 | 4.30 | 8.24 | 4.90 | 0.55 | BDL |
| 7 | 0.09 | BDL | BDL | BDL | BDL | BDL | 0.13 | 0.26 | BDL | 0.14 | 0.60 | 0.97 | 1.03 | BDL | 0.11 |
| 6 | 0.17 | BDL | BDL | BDL | BDL | 0.38 | BDL | 0.62 | 0.18 | 0.63 | 1.56 | 1.29 | 1.47 | 0.77 | 0.23 |
| 8+5 | 0.95 | BDL | 3.47 | 2.36 | BDL | 5.40 | 9.97 | 17.95 | 41.79 | 64.32 | ND | ND | ND | ND | 9.64 |
| 19 | 0.10 | BDL | 0.42 | 0.14 | ND | BDL | 0.28 | 0.99 | 2.59 | 1.74 | ND | 5.07 | 3.23 | 2.44 | 0.21 |
| 12+13 | 0.28 | 0.54 | 1.28 | 0.76 | BDL | 0.51 | 0.30 | 0.68 | 1.43 | 2.25 | 1.43 | 2.47 | 4.61 | 1.08 | BDL |
| 18 | 0.34 | 0.67 | 1.84 | 0.98 | 2.21 | 1.47 | 0.50 | 0.77 | 2.47 | 3.06 | 1.81 | 7.36 | 8.14 | 2.39 | BDL |
| 17 | 0.29 | BDL | 0.70 | 0.81 | 2.03 | 1.02 | 0.42 | 0.99 | 1.85 | 2.73 | 4.92 | 5.30 | 4.76 | 2.44 | BDL |
| 24+27 | 0.39 | BDL | BDL | BDL | BDL | BDL | BDL | 0.88 | 8.50 | 14.97 | 13.86 | 27.40 | 18.93 | 3.06 | BDL |
| 16+32 | 0.41 | 0.99 | 0.75 | 1.31 | 4.64 | 2.97 | 2.00 | 1.71 | 12.75 | 24.82 | 15.50 | 48.72 | 18.54 | 4.49 | BDL |
| 29 | 0.16 | BDL | 0.16 | BDL | 0.28 | 0.18 | 0.42 | 0.51 | 3.30 | 6.02 | 1.18 | 9.01 | 2.62 | 0.94 | BDL |
| 26 | 0.07 | 0.20 | 0.26 | 0.28 | 1.02 | 0.65 | 0.18 | 0.32 | 1.54 | 1.48 | 5.61 | 2.98 | 2.01 | 0.70 | 0.11 |
| 25 | 0.06 | 0.12 | 0.22 | 0.22 | 0.54 | 0.43 | 0.17 | 0.20 | 0.96 | 1.88 | 1.67 | 3.09 | 2.62 | 0.43 | 0.09 |
| 31+28 | 0.84 | 3.16 | 1.92 | 4.10 | 14.78 | 8.53 | 1.45 | 1.13 | 2.69 | 13.48 | 32.92 | 30.77 | 29.68 | 1.74 | BDL |
| 53+33+21 | 0.42 | 0.72 | 0.74 | 1.30 | 5.30 | 2.34 | 0.71 | 0.54 | 1.67 | 4.64 | 5.14 | 15.91 | 5.69 | 1.05 | BDL |
| 22 | 0.45 | 1.11 | 1.03 | 1.17 | 4.30 | 2.32 | 0.87 | 1.36 | 3.61 | 3.55 | 6.95 | 6.33 | 5.46 | 2.74 | BDL |
| 45 | 0.14 | 0.19 | 0.76 | 0.44 | 1.11 | 0.87 | 0.78 | 1.41 | 3.49 | ND | ND | ND | ND | 1.69 | BDL |
| 46 | 0.55 | BDL | 0.58 | BDL | 1.23 | 0.61 | BDL | 0.83 | 1.20 | 1.56 | 2.61 | 10.05 | 5.64 | 1.54 | BDL |
| 52 | 0.26 | 1.75 | 1.97 | 3.40 | 17.45 | 10.00 | 5.04 | 5.31 | 3.73 | 1.47 | 1.45 | 6.45 | 3.37 | 1.22 | BDL |
| 49 | 0.21 | 4.29 | 4.40 | 2.60 | 10.75 | 6.52 | 2.10 | 25.00 | 2.30 | 0.69 | 1.17 | 2.46 | 0.91 | ND | BDL |
| 47 | 1.76 | BDL | BDL | 2.03 | 5.57 | 3.81 | BDL | BDL | 1.80 | BDL | 1.81 | 2.23 | BDL | 2.21 | BDL |
| 48 | 1.23 | BDL | BDL | BDL | 1.97 | 1.47 | BDL | BDL | 1.76 | BDL | 1.62 | 1.62 | 1.53 | 1.83 | BDL |
| 44 | 0.34 | 2.21 | 1.32 | 3.31 | 13.88 | 7.19 | 4.88 | 2.65 | 2.22 | 1.97 | 1.20 | 1.92 | 1.08 | 0.80 | BDL |
| 37+42 | 0.33 | 1.63 | 0.99 | 2.27 | 6.97 | 3.20 | 0.68 | 0.51 | 1.16 | 1.34 | 0.83 | 0.68 | 0.67 | 0.39 | BDL |
| 41+71 | 0.39 | 5.42 | 2.88 | 3.76 | 10.51 | 7.40 | 2.27 | 0.62 | 1.40 | 1.61 | 1.21 | ND | 1.22 | BDL | BDL |
| 64 | 2.54 | 17.55 | 5.85 | 18.93 | 34.43 | 7.48 | 3.83 | 8.69 | 28.22 | 32.06 | 28.71 | 12.06 | 11.26 | 4.79 | BDL |
| 40 | 0.11 | 2.27 | 1.43 | 2.12 | 10.22 | 2.36 | 1.32 | 0.86 | 1.56 | 1.70 | 1.41 | 0.75 | 0.80 | 0.23 | BDL |
| 100 | 0.13 | 6.32 | 3.32 | 1.88 | 5.86 | 1.45 | 2.51 | 3.17 | 28.03 | 95.50 | 130.27 | ND | 135.78 | 24.66 | 0.26 |
| 63 | 0.10 | 0.77 | 0.69 | 0.55 | 0.98 | 1.41 | 1.89 | 2.11 | 20.68 | 61.70 | 2.49 | ND | 94.75 | 11.64 | 0.19 |
| 74 | 0.23 | 0.79 | 0.93 | 2.05 | 7.30 | 3.44 | 2.07 | 1.13 | 5.78 | 4.95 | 8.95 | ND | 3.17 | 2.28 | BDL |
| 70+76 | 0.39 | 3.27 | 3.18 | 6.90 | 29.73 | 15.40 | 9.75 | 3.73 | 2.65 | ND | 1.78 | 1.31 | 2.45 | 0.82 | BDL |
| 66 | 0.48 | 3.12 | 3.28 | 8.09 | 23.79 | 11.16 | 4.25 | 1.83 | 2.26 | ND | ND | 2.35 | 0.83 | 0.90 | BDL |
| 95 | 0.18 | 2.57 | 2.85 | 4.63 | 28.55 | 15.32 | 9.43 | 3.41 | 1.93 | ND | ND | 1.16 | 0.35 | 0.63 | BDL |
| 91 | 0.14 | 0.42 | 0.53 | 1.02 | 4.74 | 2.37 | 1.72 | 0.41 | ND | 0.59 | 0.35 | 0.89 | 0.53 | 0.58 | BDL |
| 56+60 | 0.80 | 2.64 | 2.55 | 5.99 | 17.87 | 8.17 | 3.40 | 1.52 | 3.02 | 1.50 | 1.24 | 5.09 | 2.09 | 2.47 | BDL |
| 101 | 0.12 | 2.65 | 3.28 | 5.26 | 27.63 | 15.42 | 10.29 | 4.73 | 2.41 | 0.26 | 0.14 | 1.30 | 0.55 | 0.24 | BDL |
| 99 | 0.13 | 10.26 | 8.17 | 7.46 | 25.73 | 8.63 | 5.71 | 2.13 | 1.29 | 0.23 | 0.18 | 0.54 | 0.44 | ND | BDL |
| 83 | 0.06 | 0.34 | 0.15 | 0.39 | 2.81 | 2.02 | 0.98 | 0.51 | 0.28 | 0.72 | 0.64 | 0.97 | 2.13 | 0.19 | BDL |
| 97 | 0.10 | 0.69 | 0.77 | 1.63 | 8.63 | 4.57 | 3.45 | 1.34 | 0.43 | 1.25 | 1.41 | 2.22 | 3.05 | 0.40 | BDL |
| 87+81 | 1.03 | BDL | 1.71 | 2.30 | 10.40 | 6.22 | 4.49 | 1.99 | 2.01 | BDL | BDL | BDL | ND | BDL | BDL |
| 85 | 0.02 | 2.29 | 2.17 | 2.77 | 8.57 | 11.53 | 9.58 | 5.97 | 0.80 | 0.06 | 0.07 | 0.09 | 0.12 | 0.04 | BDL |
| 136 | 0.07 | 0.64 | 0.41 | 0.78 | 4.23 | 2.59 | 1.88 | 1.46 | 3.98 | 0.20 | 0.54 | 0.84 | 1.15 | 0.35 | BDL |
| 77+110 | 0.21 | 4.76 | 4.98 | 8.47 | 43.16 | 22.58 | 14.94 | 5.03 | 1.87 | BDL | BDL | 0.62 | 0.37 | 0.48 | BDL |
| 82 | 0.09 | 0.25 | 0.34 | 0.70 | 3.69 | 1.71 | 1.14 | 0.37 | 0.53 | 1.01 | 0.90 | 2.06 | 0.59 | 0.26 | BDL |
| 151 | 0.12 | 1.34 | 1.35 | 1.97 | 8.32 | 5.26 | 2.72 | 0.85 | 0.60 | 0.46 | 0.71 | 0.97 | 0.61 | 0.30 | BDL |
| 135+144 | 0.06 | 0.67 | 0.70 | 1.34 | 6.57 | 3.59 | 1.91 | 0.42 | 0.31 | 0.13 | 0.19 | 0.29 | 0.26 | 0.26 | BDL |
| 107 | 0.03 | 0.30 | 0.21 | 0.53 | 2.78 | 1.40 | 1.15 | 0.89 | 0.22 | 0.28 | 0.23 | 0.61 | 0.36 | 0.13 | BDL |
| 149 | 0.15 | 4.67 | 4.27 | 6.64 | 29.41 | 16.69 | 9.34 | 2.98 | 1.59 | 0.66 | 0.41 | 0.94 | 0.94 | 0.26 | BDL |
| 118 | 0.36 | 2.76 | 2.68 | 5.08 | 27.15 | 13.18 | 9.25 | 3.24 | 0.87 | BDL | BDL | ND | BDL | BDL | BDL |
| 134 | 0.11 | 0.32 | BDL | 0.18 | 0.58 | 0.21 | 0.12 | ND | 0.59 | 0.35 | 0.29 | ND | 0.28 | 0.55 | ND |
| 131 | 0.03 | 0.17 | 0.25 | 0.19 | 1.14 | 0.98 | 0.56 | 0.26 | 0.07 | 0.05 | BDL | 0.19 | 0.06 | 0.05 | BDL |
| 146 | 0.08 | 1.59 | 1.26 | 2.17 | 9.67 | 5.37 | 2.71 | 0.92 | 0.42 | 0.11 | BDL | 0.22 | 0.14 | 0.13 | 0.10 |
| 153+132+105 | 0.39 | 11.00 | 9.90 | 15.40 | 68.68 | 38.36 | 22.39 | 7.96 | 3.29 | BDL | BDL | 0.66 | 0.45 | BDL | BDL |
| 141 | 0.09 | 0.53 | 0.55 | 0.89 | 3.34 | 2.31 | 1.15 | 0.47 | 0.60 | 0.14 | ND | 0.39 | 0.31 | 0.32 | BDL |
| 137+176 | 0.07 | ND | ND | 0.28 | 1.26 | 0.77 | 0.20 | 0.10 | ND | 0.16 | ND | 0.22 | BDL | 0.17 | ND |
| 163+138 | 0.20 | 8.86 | 8.45 | 12.13 | 57.86 | 29.81 | 17.66 | 6.23 | 2.42 | 0.25 | BDL | 0.45 | BDL | 0.27 | BDL |
| 158 | 0.70 | 1.15 | 1.29 | 1.67 | 9.50 | 4.93 | 5.46 | 7.19 | BDL | BDL | ND | BDL | BDL | BDL | BDL |
| 129+178 | 0.07 | 0.66 | 1.02 | 0.71 | 3.04 | 2.33 | 1.20 | 0.36 | 0.51 | 2.64 | 1.82 | 2.48 | 4.41 | 0.62 | 0.08 |
| 187+182 | 0.54 | 6.05 | 4.67 | 7.69 | 21.89 | 15.09 | 8.10 | 2.83 | 14.27 | 0.59 | 0.59 | 0.57 | BDL | 0.63 | BDL |
| 183 | 0.09 | 0.88 | 0.83 | 2.15 | 7.77 | 5.14 | 0.21 | 0.56 | 0.90 | 0.42 | 0.23 | 0.35 | 0.23 | 0.44 | BDL |
| 128 | 0.08 | 1.32 | 1.29 | 2.22 | 11.13 | 5.09 | 3.05 | 0.80 | 0.42 | 0.10 | 0.10 | 0.32 | 0.26 | 0.43 | BDL |
| 185 | 0.05 | 0.34 | 0.25 | 0.40 | 1.22 | 0.88 | 0.48 | 0.37 | 2.06 | 0.83 | BDL | 1.10 | 2.68 | 0.19 | BDL |
| 174 | 0.11 | 1.30 | 0.85 | 2.48 | 8.38 | 6.84 | 2.89 | 1.12 | 1.03 | 0.29 | 0.12 | 0.27 | 0.35 | 0.36 | BDL |
| 177 | 0.06 | 1.17 | 0.91 | 1.70 | 5.94 | 4.21 | 1.97 | 0.78 | 0.84 | 0.11 | 0.08 | ND | 0.09 | 0.25 | 0.08 |
| 202+171 | 0.61 | 0.65 | BDL | 0.81 | 2.62 | 1.50 | 1.15 | 0.67 | 0.69 | BDL | BDL | BDL | BDL | BDL | BDL |
| 157+200 | 0.09 | 0.38 | 0.23 | 0.48 | 0.64 | 0.59 | 0.45 | 0.29 | 0.41 | BDL | 0.11 | 0.16 | 0.13 | 0.60 | BDL |
| 172+197 | 0.08 | 0.57 | 0.47 | 0.74 | 2.57 | 1.79 | 0.82 | 0.34 | 0.47 | 0.14 | BDL | 0.13 | BDL | 0.13 | ND |
| 180 | 0.27 | 8.03 | 6.40 | 7.39 | 25.12 | 17.40 | 9.02 | 3.40 | 2.85 | BDL | ND | BDL | BDL | BDL | BDL |
| 193 | 0.08 | 0.76 | 0.44 | 0.68 | 2.54 | 1.61 | 0.69 | 0.36 | 0.28 | 0.17 | ND | BDL | BDL | 0.24 | 0.08 |
| 191 | 0.07 | 0.20 | 0.42 | 0.29 | 1.01 | 0.59 | 0.49 | 0.30 | 1.21 | 0.11 | BDL | 0.10 | BDL | 0.09 | BDL |
| 199 | 0.03 | 0.04 | 0.12 | 0.08 | 0.40 | 0.30 | 0.15 | 0.18 | 0.82 | 0.05 | BDL | BDL | BDL | 0.05 | BDL |
| 170+190 | 0.10 | 4.56 | 5.43 | 6.13 | 20.78 | 12.56 | 5.96 | 1.77 | 1.11 | 0.18 | BDL | BDL | BDL | BDL | BDL |
| 198 | 0.05 | 0.10 | 0.14 | 0.17 | 0.43 | 0.36 | 0.61 | 1.00 | 0.17 | BDL | BDL | 0.05 | BDL | 0.06 | BDL |
| 201 | 0.07 | 2.56 | 1.94 | 3.22 | 8.04 | 6.59 | 4.44 | 2.34 | 3.26 | 0.10 | BDL | 0.09 | BDL | 0.12 | BDL |
| 203+196 | 0.09 | 3.06 | 2.94 | 3.15 | 9.80 | 7.54 | 4.49 | 2.52 | 3.01 | 0.11 | BDL | 0.10 | 0.10 | BDL | 0.11 |
| 189 | 0.11 | 0.17 | 0.16 | 0.17 | 0.63 | 0.38 | 0.24 | 0.21 | 0.22 | BDL | ND | BDL | BDL | BDL | BDL |
| 208+195 | 0.11 | 1.85 | 1.35 | 1.53 | 5.47 | 4.59 | 3.71 | 2.52 | 5.12 | BDL | BDL | BDL | BDL | BDL | BDL |
| 207 | 0.05 | 0.11 | 0.36 | 0.29 | 0.26 | 0.29 | 0.79 | 1.34 | 0.52 | BDL | ND | BDL | BDL | BDL | BDL |
| 194 | 0.05 | 1.27 | 1.13 | 1.47 | 4.50 | 3.40 | ND | 0.90 | 0.80 | ND | ND | BDL | BDL | BDL | BDL |
| 205 | 0.08 | 0.59 | 0.42 | 0.90 | 1.15 | 1.47 | 0.58 | 0.48 | 1.85 | BDL | ND | BDL | ND | BDL | BDL |
| 206 | 0.07 | 1.20 | 1.17 | 0.83 | 3.01 | 2.72 | 3.75 | 2.83 | 5.21 | ND | ND | 0.09 | ND | 0.08 | BDL |
| 209 | 0.33 | BDL | BDL | BDL | BDL | BDL | BDL | 0.97 | 2.00 | ND | ND | BDL | ND | BDL | BDL |

**Appendix G-II Concentrations of OC Pesticides in Sediment Cores**

| Chem ID | | 6127 | 6129 | 6132 | 6137 | 6142 | 6147 | 6152 | 6157 | 6162 | 6167 | 6172 | 6177 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site | | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 | WC-1 |
| Depth Interval (cm) | | 0-2 | 4-6 | 10-12 | 20-22 | 30-32 | 40-42 | 50-52 | 60-62 | 70-72 | 80-82 | 90-92 | 100-102 |
| Mid-Pt (cm) | | 1 | 5 | 11 | 21 | 31 | 41 | 51 | 61 | 71 | 81 | 91 | 101 |
| Mass extracted (g) | | 10.02 | 10.0 | 10.0 | 10.1 | 10.1 | 10.0 | 10.1 | 10.5 | 10.3 | 10.2 | 10.0 | 10.5 |
| % Dry Mass | | 0.31 | 0.34 | 0.33 | 0.38 | 0.40 | 0.42 | 0.38 | 0.37 | 0.40 | 0.27 | 0.35 | 0.32 |
| Solid Mass (g dw) | | 3.11 | 3.51 | 3.32 | 3.54 | 4.04 | 4.01 | 3.93 | 4.09 | 3.81 | 2.76 | 3.20 | 3.14 |
| | | 3.11 | | | | | | | | | | | |
| Surrogate Recoveries % | | | | | | | | | | | | | |
| PCB 14 | | 68 | 75 | 48 | 64 | 105 | 62 | 66 | 64 | 65 | 50 | 63 | 67 |
| PCB 65 | | 69 | 71 | 46 | 58 | 61 | 59 | 66 | 63 | 66 | 56 | 64 | 66 |
| PCB 166 | | 68 | 72 | 47 | 60 | 63 | 59 | 68 | 63 | 68 | 68 | 70 | 71 |
| Concentrations (ng/g dw) | | | | | | | | | | | | | |
| Total DDXs | | 20.14 | 23.59 | 15.55 | 19.63 | 24.41 | 36.06 | 165.35 | 6.40 | 1.55 | 54.43 | 2.02 | 1.68 |
| Total Chlordanes | | 3.72 | 4.23 | 2.49 | 4.40 | 14.76 | 4.75 | 4.23 | 1.13 | 1.06 | 16.94 | 1.05 | 1.14 |
| Organochlorine Pesticides | | | | | | | | | | | | | |
| | | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* |
| opDDE | 0.03 | 1.19 | 1.73 | 0.67 | 1.66 | 2.12 | 2.98 | 4.23 | 0.37 | 0.04 | 0.13 | 0.04 | BDL |
| ppDDE | 0.04 | 8.87 | 12.00 | 7.42 | 9.50 | 9.13 | 17.44 | 22.53 | 2.14 | 0.09 | 0.05 | BDL | BDL |
| o,p DDT | 0.90 | 1.49 | BDL | BDL | BDL | 1.01 | BDL | BDL | BDL | BDL | 4.47 | BDL | BDL |
| p,p DDT | 2.90 | BDL | BDL | BDL | BDL | BDL | BDL | 99.77 | BDL | BDL | 45.09 | BDL | BDL |
| o,p DDD | 0.06 | 1.48 | 1.56 | 0.98 | 1.30 | 1.39 | 1.05 | 4.67 | 0.68 | 0.17 | 1.57 | 0.08 | 0.16 |
| p.p DDD | 0.07 | 5.65 | 6.23 | 3.85 | 5.57 | 8.96 | 12.72 | 33.31 | 1.54 | 0.08 | 3.12 | BDL | 0.17 |
| alpha BHC | 0.03 | 0.11 | 0.11 | 0.06 | 0.18 | 0.45 | 0.21 | 0.17 | 0.21 | 0.25 | 4.11 | 0.20 | 0.14 |
| beta BHC | 0.28 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.36 | 0.32 | 12.07 | BDL | 0.41 |
| delta BHC | 0.07 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.13 | BDL | BDL |
| lindane | 0.04 | BDL | 0.14 | BDL | 0.10 | 0.13 | 0.35 | 0.06 | 0.13 | 0.12 | 0.22 | BDL | 0.05 |
| heptaclor | 0.10 | BDL | 0.65 | 0.31 | 1.31 | 7.47 | 2.86 | 2.04 | 0.17 | 0.16 | 0.87 | 0.15 | BDL |
| heptachlor epoxide | 0.03 | 0.22 | 0.23 | 0.04 | 0.26 | 1.38 | 0.69 | 0.46 | 0.22 | 0.17 | 11.41 | 0.23 | 0.23 |
| oxychlordane | 0.05 | 0.22 | 0.12 | 0.07 | 0.09 | 0.52 | 0.11 | 0.10 | 0.16 | 0.26 | 0.62 | 0.08 | 0.29 |
| gamma chlordane | 0.04 | 1.47 | 1.61 | 1.04 | 1.56 | 3.06 | 0.52 | 1.01 | 0.30 | 0.29 | 3.05 | 0.29 | 0.39 |
| alpha chlordane | 0.03 | 0.99 | 0.84 | 0.66 | 0.62 | 1.09 | 0.29 | 0.33 | 0.20 | 0.14 | 0.80 | 0.25 | 0.15 |
| cis nonachlor | 0.03 | 0.05 | 0.20 | BDL | 0.12 | 0.28 | 0.17 | 0.21 | 0.04 | BDL | 0.09 | 0.03 | BDL |
| trans nonachlor | 0.02 | 0.67 | 0.58 | 0.32 | 0.44 | 0.97 | 0.11 | 0.09 | 0.05 | 0.02 | 0.10 | 0.02 | BDL |
| dieldrin | 0.05 | 0.58 | 0.31 | 0.12 | 0.14 | 0.42 | 1.24 | 0.74 | 0.20 | 0.19 | 0.45 | 0.13 | BDL |
| endrin | 0.38 | 3.76 | 4.73 | 8.43 | 3.24 | 2.47 | 2.91 | 5.17 | 11.05 | 12.36 | 4.79 | 8.89 | 14.33 |
| aldrin | 0.02 | 0.03 | 0.04 | BDL | 0.02 | 0.09 | 0.37 | 0.13 | 0.05 | 0.05 | 0.33 | 0.05 | 0.04 |
| endosulfan I | 0.04 | 0.06 | BDL | BDL | BDL | 0.12 | BDL | BDL | 0.07 | ND | 0.38 | BDL | BDL |
| endosulfan II | 0.07 | BDL | BDL | BDL | BDL | 0.28 | 0.08 | 0.31 | 0.21 | 0.13 | 1.60 | BDL | BDL |

**Appendix G-II Concentrations of OC Pesticides in Sediment Cores**

| Chem ID | | 6180 | 6181 | 6182 | 6183 | 6184 | 6185 | 6185Rdup | 6185Rtrip | 6186 | 6187 | 6188 | 6189 | 6189dup | 6189trip | 6190 | 6191 | 6192 | 6193 | 6194 | 6195 | 6196 | 6197 | 6199 | 6202 | 6210 | 6210dup | 6213 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Site | | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 | WC-2 |
| Depth Interval (cm) | | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 | 10-12 | 10-12 | 12-14 | 14-16 | 16-18 | 18-20 | 18-20 | 18-20 | 20-22 | 22-24 | 24-26 | 26-28 | 28-30 | 30-32 | 32-34 | 34-36 | 38-40 | 44-46 | 60-62 | 60-62 | 66-68 |
| Mid-Pt (cm) | | 1 | 3 | 5 | 7 | 9 | 11 | 11 | 11 | 13 | 15 | 17 | 19 | 19 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | 33 | 35 | 39 | 45 | 61 | 61 | 67 |
| Mass extracted (g) | | 2.073 | 1.932 | 1.953 | 1.942 | 1.997 | 1.902 | 2.063 | 2.067 | 2.199 | 2.113 | 2.061 | 2.109 | 2.114 | 2.048 | 1.841 | 1.993 | 2.003 | 2.217 | 2.001 | 2.087 | 2.048 | 2.005 | 2.118 | 1.983 | 2.106 | 1.996 | 2.063 |
| % Dry Mass | | 0.31 | 0.33 | 0.31 | 0.31 | 0.30 | 0.30 | 0.30 | 0.30 | 0.29 | 0.29 | 0.33 | 0.32 | 0.32 | 0.32 | 0.48 | 0.27 | 0.27 | 0.28 | 0.36 | 0.36 | 0.34 | 0.38 | 0.34 | 0.35 | 0.15 | 0.15 | 0.38 |
| Solid Mass (g dw) | | 0.64 | 0.64 | 0.60 | 0.60 | 0.61 | 0.58 | 0.63 | 0.63 | 0.64 | 0.61 | 0.68 | 0.67 | 0.67 | 0.65 | 0.89 | 0.53 | 0.55 | 0.61 | 0.72 | 0.75 | 0.70 | 0.76 | 0.72 | 0.70 | 0.32 | 0.30 | 0.78 |
| **Surrogate Recoveries %** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PCB 14 | | 90 | 86 | 89 | 86 | 90 | 84 | 87 | 87 | 84 | 90 | 82 | 81 | 86 | 89 | 85 | 82 | 80 | 88 | 86 | 81 | 82 | 90 | 83 | 84 | 86 | 88 | 90 |
| PCB 65 | | 91 | 91 | 90 | 87 | 90 | 84 | 88 | 88 | 84 | 90 | 80 | 79 | 87 | 88 | 86 | 83 | 80 | 85 | 86 | 80 | 82 | 88 | 84 | 85 | 85 | 88 | 90 |
| PCB 166 | | 95 | 91 | 88 | 90 | 93 | 84 | 92 | 91 | 85 | 91 | 80 | 80 | 89 | 93 | 88 | 88 | 83 | 86 | 91 | 77 | 81 | 91 | 84 | 87 | 90 | 90 | 92 |
| **Concentrations (ng/g dw)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total DDXs | | 36.53 | 28.95 | 30.45 | 35.75 | 44.19 | 44.04 | 43.69 | 41.74 | 50.12 | 59.76 | 61.50 | 64.18 | 67.68 | 58.82 | 51.49 | 84.17 | 114.28 | 168.01 | 146.32 | 270.69 | 342.50 | 277.47 | 115.58 | 17.17 | 13.99 | 8.40 | 8.68 |
| Total Chlordanes | | 5.02 | 5.68 | 4.62 | 4.71 | 6.87 | 6.89 | 7.39 | 6.23 | 7.32 | 7.71 | 11.63 | 12.37 | 11.66 | 12.37 | 9.33 | 16.99 | 26.95 | 46.38 | 25.34 | 20.14 | 15.93 | 9.38 | 5.45 | 1.55 | 1.84 | 1.22 | 0.42 |
| **Organochlorine Pesticides** | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MDL | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw | ng/g dw |
| opDDE | 0.12 | 0.80 | 0.78 | 0.62 | 0.50 | 1.76 | 1.54 | 1.89 | 1.46 | 1.48 | 1.83 | 2.53 | 2.58 | 2.67 | 3.47 | 2.97 | 4.39 | 6.73 | 9.94 | 6.84 | 14.36 | 16.13 | 13.10 | 4.15 | 0.25 | BDL | BDL | BDL |
| ppDDE | 0.17 | 13.60 | 14.64 | 13.69 | 15.90 | 20.88 | 21.80 | 23.67 | 20.41 | 21.93 | 23.93 | 30.01 | 30.55 | 30.00 | 32.52 | 26.49 | 41.92 | 53.93 | 73.08 | 57.47 | 120.10 | 141.31 | 113.41 | 32.25 | 3.77 | 0.23 | 0.34 | BDL |
| o,p DDT | 4.08 | 4.85 | BDL | BDL | 5.96 | 7.60 | BDL | BDL | BDL | BDL | 7.53 | BDL | 4.97 | 4.39 | BDL | BDL | BDL | BDL | BDL | BDL | 6.76 | 7.68 | 6.79 | 10.57 | BDL | 5.03 | BDL | BDL |
| p,p DDT | 13.10 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 15.32 | 15.46 | 27.56 | 22.59 | BDL | BDL | BDL | BDL | BDL |
| o,p DDD | 0.27 | 1.54 | 2.25 | 2.02 | 2.37 | 2.83 | 3.80 | 3.96 | 3.73 | 9.18 | 3.62 | 5.57 | 4.98 | 5.47 | 4.92 | 4.16 | 7.98 | 12.97 | 19.61 | 17.98 | 30.51 | 41.11 | 33.32 | 16.86 | 1.98 | 0.33 | 0.55 | BDL |
| p.p DDD | 0.30 | 6.92 | 7.94 | 7.33 | 8.68 | 10.55 | 12.26 | 12.92 | 11.88 | 12.33 | 13.66 | 17.44 | 16.47 | 16.49 | 16.87 | 14.68 | 25.99 | 43.71 | 60.89 | 53.87 | 98.62 | 129.28 | 105.04 | 54.05 | 7.33 | 0.32 | 0.32 | BDL |
| alpha BHC | 0.16 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| beta BHC | 1.29 | BDL | 1.51 | 1.79 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 1.46 | 2.26 | 4.38 | 2.60 | 1.60 | BDL | BDL | BDL | BDL |
| delta BHC | 0.31 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.63 | 1.02 | 3.25 | 4.08 | 3.20 | 3.09 | 1.21 | 1.15 | 1.36 | BDL |
| lindane | 0.18 | BDL | BDL | BDL | 0.19 | BDL | BDL | BDL | BDL | 0.26 | 0.32 | ND | 0.20 | 0.49 | BDL | BDL | 0.21 | 0.19 | 0.29 | 0.21 | 0.59 | 0.78 | 0.37 | BDL | BDL | 0.18 | 0.65 | 0.34 |
| heptaclor | 0.47 | 1.07 | 1.65 | 0.82 | 0.49 | 1.77 | 1.18 | 1.36 | 0.85 | 0.86 | 0.65 | 0.97 | 1.73 | 1.16 | 1.60 | 1.31 | 2.80 | 5.44 | 9.42 | 6.63 | 7.39 | 6.94 | 5.38 | 2.87 | 0.67 | 1.08 | 0.64 | ND |
| heptachlor epoxide | 0.12 | 0.22 | 0.19 | 0.16 | 0.27 | 0.24 | 0.23 | BDL | 0.17 | 0.28 | 0.27 | 0.39 | 0.84 | 0.51 | 0.47 | 0.33 | 0.50 | 0.84 | 1.23 | 1.16 | 0.59 | 0.36 | 0.28 | 0.12 | BDL | 0.14 | BDL | BDL |
| oxychlordane | 0.21 | 0.27 | 0.27 | 0.31 | 0.24 | 0.27 | 0.27 | 0.27 | 0.32 | 0.53 | 0.50 | 0.62 | 0.55 | 0.66 | 0.53 | 0.27 | 0.22 | 0.31 | 0.83 | 0.51 | 0.28 | 0.64 | 0.25 | 0.32 | 0.39 | BDL | BDL | BDL |
| gamma chlordane | 0.17 | 1.85 | 1.84 | 1.70 | 2.09 | 2.63 | 3.13 | 3.20 | 2.75 | 3.24 | 3.81 | 5.68 | 5.48 | 5.43 | 5.63 | 4.28 | 8.26 | 12.52 | 19.79 | 9.99 | 7.11 | 5.15 | 2.43 | 1.27 | BDL | BDL | BDL | 0.19 |
| alpha chlordane | 0.15 | 1.08 | 1.18 | 1.19 | 1.30 | 1.56 | 1.71 | 2.03 | 1.71 | 2.14 | 2.03 | 3.26 | 3.06 | 3.17 | 3.20 | 1.62 | 3.41 | 5.41 | 10.72 | 4.92 | 3.51 | 2.65 | 0.81 | 0.86 | 0.30 | 0.25 | BDL | BDL |
| cis nonachlor | 0.13 | 0.16 | 0.16 | BDL | 0.23 | 0.18 | 0.14 | 0.21 | 0.21 | 0.19 | 0.20 | 0.33 | 0.33 | 0.30 | 0.37 | 0.66 | 0.69 | 0.69 | 0.83 | 0.66 | 0.37 | 0.27 | 0.30 | BDL | BDL | BDL | BDL | BDL |
| trans nonachlor | 0.07 | 0.70 | 0.74 | 0.67 | 0.48 | 0.68 | 0.75 | 0.81 | 0.72 | 0.70 | 0.92 | 1.37 | 1.38 | 1.41 | 1.55 | 1.52 | 2.36 | 3.64 | 6.82 | 3.12 | 2.05 | 0.79 | 0.32 | 0.15 | BDL | ND | 0.16 | BDL |
| dieldrin | 0.22 | 0.98 | 1.00 | 0.95 | 0.41 | 0.25 | BDL | BDL | BDL | 0.22 | 0.24 | 0.27 | BDL | 0.25 | BDL | BDL | 0.32 | 0.36 | 0.37 | 0.25 | 0.29 | BDL | BDL | 0.35 | BDL | BDL | BDL | BDL |
| endrin | 1.70 | 3.56 | 2.32 | 2.00 | 5.73 | 5.77 | 3.73 | BDL | 3.16 | 4.21 | 5.63 | 5.79 | 4.63 | 5.78 | BDL | 3.35 | 4.27 | 7.34 | 3.38 | 4.87 | 5.65 | 23.33 | 15.01 | 48.78 | 18.31 | 4.62 | BDL | BDL |
| aldrin | 0.08 | 0.09 | 0.09 | BDL | BDL | BDL | BDL | BDL | BDL | 0.08 | 0.11 | 0.08 | BDL | 0.17 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.09 | BDL | 0.11 | BDL | 0.08 | BDL | BDL |
| endosulfan I | 0.18 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | 0.26 | BDL | BDL |
| endosulfan II | 0.30 | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL | BDL |

## Appendix G-II Concentrations of OC Pesticides in Sediment Cores

| Chem ID | | 6214 | 6216 | 6221 | 6224 | 6227 | 6229 | 6231 | 6234 | 6236 | 6239 | 6239dup | 6241 | 6244 | 6246 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Site** | | **LH-2** | **LH-2** | **LH-2** | **LH-2** | **LH-2** | **LH-2** | **LH-2** | **LH-2** | **LH-2** | **LH-2** | **LH-2** | **LH-2** | **LH-2** | **LH-2** |
| **Depth Interval (cm)** | | **0-2** | **4-6** | **14-16** | **20-22** | **26-28** | **30-32** | **34-36** | **40-42** | **44-46** | **50-52** | **50-52** | **54-56** | **60-62** | **64-66** |
| **Mid-Pt (cm)** | | **1** | **5** | **15** | **21** | **27** | **31** | **35** | **41** | **45** | **51** | **51** | **55** | **61** | **65** |
| **Mass extracted (g)** | | **2.035** | **2.052** | **2.172** | **2.237** | **2.086** | **2.217** | **2.212** | **2.035** | **2.152** | **2.161** | **2.042** | **1.988** | **2.148** | **1.925** |
| **% Dry Mass** | | **0.34** | **0.42** | **0.67** | **0.52** | **0.59** | **0.53** | **0.53** | **0.37** | **0.38** | **0.35** | **0.35** | **0.38** | **0.39** | **0.47** |
| **Solid Mass (g dw)** | | **0.69** | **0.87** | **1.47** | **1.15** | **1.23** | **1.18** | **1.16** | **0.75** | **0.81** | **0.76** | **0.72** | **0.76** | **0.83** | **0.91** |
| **Surrogate Recoveries %** | | | | | | | | | | | | | | | |
| **PCB 14** | | **95** | **89** | **94** | **88** | **69** | **78** | **84** | **89** | **46** | **105** | **88** | **129** | **79** | **89** |
| **PCB 65** | | **82** | **86** | **86** | **85** | **82** | **83** | **85** | **93** | **84** | **50** | **99** | **98** | **80** | **86** |
| **PCB 166** | | **88** | **92** | **86** | **95** | **88** | **93** | **91** | **90** | **89** | **96** | **87** | **91** | **90** | **91** |
| **Concentrations (ng/g dw)** | | | | | | | | | | | | | | | |
| **Total DDXs** | | **114.08** | **112.58** | **76.73** | **206.21** | **314.90** | **427.23** | **227.28** | **78.86** | **158.19** | **331.34** | **8.29** | **336.01** | **222.42** | **17.17** |
| **Total Chlordanes** | | **54.30** | **30.37** | **66.10** | **125.38** | **28.77** | **31.97** | **18.46** | **105.10** | **41.77** | **22.44** | **26.56** | **39.34** | **28.18** | **3.20** |
| **Organochlorine Pesticides** | | | | | | | | | | | | | | | |
| | **MDL** | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* | *ng/g dw* |
| **opDDE** | **0.12** | 14.45 | 8.92 | 6.19 | 19.41 | 13.05 | 9.26 | 5.66 | 1.50 | 0.61 | 0.44 | 0.89 | 0.46 | 0.30 | BDL |
| **ppDDE** | **0.17** | 20.65 | 19.57 | 24.94 | 77.13 | 103.79 | 86.23 | 53.71 | 7.24 | 0.58 | 0.63 | 0.84 | 1.10 | 0.36 | BDL |
| **o,p DDT** | **4.08** | 33.09 | 10.47 | BDL | 19.17 | 16.33 | 164.55 | 88.50 | 6.77 | 35.43 | 41.11 | BDL | 97.95 | BDL | BDL |
| **p,p DDT** | **13.10** | 17.10 | 51.42 | BDL | 27.27 | 29.88 | 55.62 | 30.31 | 53.24 | 107.51 | 276.79 | BDL | 221.09 | 208.92 | BDL |
| **o,p DDD** | **0.27** | 6.00 | 3.88 | 7.73 | 13.57 | 30.89 | 24.62 | 12.91 | 9.26 | 0.95 | 2.02 | 1.12 | 1.48 | 5.10 | BDL |
| **p.p DDD** | **0.30** | 22.81 | 18.33 | 29.85 | 49.67 | 120.96 | 86.95 | 36.18 | 0.84 | 13.11 | 10.34 | BDL | 13.92 | 5.01 | BDL |
| **alpha BHC** | **0.16** | 0.16 | BDL | 0.23 | 0.16 | 0.23 | 1.72 | 2.35 | 5.73 | 7.78 | 3.94 | 249.57 | 16.72 | 3.42 | 0.75 |
| **beta BHC** | **1.29** | BDL | BDL | 3.05 | 14.08 | 6.19 | 2.88 | 2.95 | 12.86 | 23.69 | 58.99 | 40.41 | 45.73 | 5.46 | BDL |
| **delta BHC** | **0.31** | BDL | BDL | 0.45 | 1.24 | 1.74 | 0.99 | BDL | 0.46 | 0.98 | 0.41 | 1.57 | 0.40 | BDL | BDL |
| **lindane** | **0.18** | BDL | BDL | 0.57 | 0.36 | 0.47 | 10.75 | 9.79 | 0.39 | 0.63 | 1.20 | 0.32 | 1.22 | 0.20 | BDL |
| **heptaclor** | **0.47** | 5.93 | 4.92 | 15.63 | 37.01 | 12.49 | 16.15 | 9.62 | 37.67 | 14.08 | 8.82 | 18.11 | 16.72 | 4.27 | BDL |
| **heptachlor epoxide** | **0.12** | 2.06 | 0.42 | 0.86 | 2.26 | 0.70 | 0.90 | 0.47 | 1.65 | 9.45 | BDL | 3.88 | 9.13 | 1.52 | BDL |
| **oxychlordane** | **0.21** | 0.43 | BDL | 0.52 | 1.48 | 0.34 | 1.42 | 0.45 | 0.46 | 4.20 | 4.59 | 2.18 | 3.46 | 0.50 | 0.34 |
| **gamma chlordane** | **0.17** | 17.27 | 9.33 | 25.08 | 41.44 | 5.77 | 5.35 | 0.22 | 1.21 | 13.03 | 8.35 | 0.80 | 8.32 | 0.18 | 0.32 |
| **alpha chlordane** | **0.15** | 16.46 | 6.08 | 12.57 | 19.72 | 7.58 | 6.71 | 7.46 | 63.13 | 0.29 | 0.49 | BDL | 0.81 | 21.42 | 2.08 |
| **cis nonachlor** | **0.13** | 0.58 | 0.89 | 0.51 | 4.17 | ND | ND | ND | 0.51 | 0.39 | 0.20 | 0.76 | 0.51 | 0.15 | BDL |
| **trans nonachlor** | **0.07** | 11.57 | 8.53 | 10.91 | 19.29 | 1.90 | 1.44 | 0.23 | 0.48 | 0.32 | ND | 0.73 | 0.41 | 0.14 | BDL |
| **dieldrin** | **0.22** | 7.91 | 0.64 | 0.27 | 0.26 | 1.35 | 0.59 | 1.46 | 1.55 | 0.40 | 0.81 | 1.33 | 0.72 | BDL | 0.31 |
| **endrin** | **1.70** | 10.55 | 31.04 | 19.52 | 49.63 | 62.14 | 122.11 | 17.24 | 39.30 | 48.51 | 22.13 | 12.91 | 97.28 | 22.27 | 14.26 |
| **aldrin** | **0.08** | 3.29 | 0.67 | 0.27 | 2.33 | 0.82 | 0.45 | 0.58 | 8.04 | 2.76 | 0.40 | 0.58 | 0.32 | 4.98 | 0.63 |
| **endosulfan I** | **0.18** | BDL | BDL | BDL | 0.70 | BDL | BDL | BDL | 0.40 | 0.51 | 0.20 | 0.38 | 0.60 | BDL | BDL |
| **endosulfan II** | **0.30** | 0.32 | BDL | 0.30 | BDL | ND | 0.85 | 0.44 | 1.32 | 1.39 | 3.77 | 1.04 | 3.20 | BDL | BDL |

**Appendix III: Taxa List**

| Species | Number of valves counted |
|---|---|
| Achnanthes brevipes Agardh | 9 |
| Achnanthes levanderi Hustedt | 1 |
| Achnanthes ventralis (Krasske) Lange-Bertalot | 2 |
| Achnanthidium exiguum (Grunow) Czarnecki | 18 |
| Achnanthidium minutissimum (Kützing) | 24 |
| Actinoptychus senarius (Ehrenberg) Ehrenberg | 5 |
| Amphora acutiuscula Kützing | 9 |
| Amphora coffeaeformis (Agardh) Kützing | 23 |
| Amphora copulata (Kützing) Schoeman et Archibald | 9 |
| Amphora pediculus (Kützing) Grunow | 9 |
| Asterionella formosa Hassal | 6 |
| Aulacoseira ambigua (Grunow) Simonsen | 813 |
| Aulacoseira crassipunctata Krammer | 24 |
| Aulacoseira crenulata (Ehrenberg) Thwaites | 6 |
| Aulacoseira granulata (Ehrenberg) Simonsen | 332 |
| Aulacoseira islandica (Müller) Simonsen | 2 |
| Aulacoseira italica (Ehrenberg) Simonsen | 25 |
| Aulacoseira muzzanensis (Meister) Krammer | 77 |
| Aulacoseira perglabra (Østrup) Haworth | 2 |
| Aulacoseira pfaffiana (Reinsch) Krammer | 23 |
| Aulacoseira subarctica (Müller) Haworth | 515 |
| Aulacoseira valida (Grunow) Krammer | 159 |
| Bacillaria paradoxa Gmelin | 127 |
| Biremis circumtexta (Meister ex Hustedt) Lange-Bertalot | 55 |
| Brachysira vitrea (Grunow) Ross | 1 |
| Caloneis bacillum (Grunow) Cleve | 29 |
| Caloneis hyalina Hüstedt | 6 |
| Capartogramma crucicula (Grunow ex Cleve) Ross | 5 |
| Chamaepinnularia sp. 1 | 2 |
| Cocconeis placentula var. lineata (Ehrenberg) Van | 1 |
| Cocconeis scutellum Ehrenberg | 1 |
| Cosmioneis pusilla (Smith) Mann et Stickle | 5 |
| Craticula accomodiformis Lange-Bertalot | 2 |
| Craticula cuspida (Kützing) Mann | 1 |
| Craticula halophila (Grunow) Mann | 2 |
| Craticula molestiformis (Hüstedt) Lange-Bertalot | 3 |
| Cyclotella meneghiniana Kützing | 571 |
| Cyclotella ocellata Pantocsek | 4 |
| Cyclotella striata (Kützing) Grunow | 97 |
| Cymatosira belgica Grunow | 26 |
| Cymbella cuspidata Kützing | 2 |
| Cymbella gracilis (Ehrenberg) Kützing | 15 |
| Cymbella norvegica Grunow | 5 |
| Cymbella subcuspidata Krammer | 1 |
| Decussata placenta (Ehrenberg) Lange-Bertalot | 5 |
| Delphineis minutissima (Hustedt) Simonsen | 77 |
| Denticula subtilis Grunow | 21 |
| Diadesmis confervacea Kützing | 32 |
| Diatoma mesodon (Ehrenberg) Kützing | 4 |
| Diploneis elliptica (Kützing) Cleve | 17 |

| Species | Number of valves counted |
|---|---|
| Diploneis interrupta (Kützing) Cleve | 1 |
| Diploneis smithii (Brébisson ex Smith) Cleve | 23 |
| Diploneis subovalis Cleve | 11 |
| Discostella stelligera (Hustedt) Houk et Klee | 51 |
| Encyonema silesiacum (Bleisch) Mann | 11 |
| Entomoneis ornata (Bailey) Reimer | 2 |
| Eunotia bilunaris (Ehrenberg) Mills | 10 |
| Eunotia fallax var. groenlandica (Grunow) Lange- | 4 |
| Eunotia formica Ehrenberg | 6 |
| Eunotia implicata Nörpel, Lange-Bertalot et Alles | 43 |
| Eunotia incisa Smith ex Gregory | 2 |
| Eunotia praerupta var. bidens (Ehrenberg) Grunow | 2 |
| Eunotia serra var. diadema (Ehrenberg) Patrick | 3 |
| Fallacia omissa (Hüstedt) Mann | 2 |
| Fallacia pygmaea (Kützing) Stickle et Mann | 34 |
| Fallacia sp. 1 | 331 |
| Fallacia tenera (Hüstedt) Mann | 1 |
| Fragilaria improbula Witkowski et Lange-Bertalot | 1 |
| Fragilaria vaucheriae (Kützing) Petersen | 34 |
| Fragilariforma lata (Cleve-Euler) Williams et Round | 37 |
| Frustulia crassinervia (Brebisson) Lange-Bertalot et | 4 |
| Frustulia vulgaris (Thwaites) deToni | 12 |
| Geissleria aikenensis (Patrick) Torgan et Olivera | 2 |
| Gomphonema acuminatum Ehrenberg | 2 |
| Gomphonema affine Kützing | 9 |
| Gomphonema angustatum (Kützing) Rabenhorst | 17 |
| Gomphonema parvulum (Kützing) Kützing | 32 |
| Gyrosigma acuminatum (Kützing) Rabenhorst | 8 |
| Gyrosigma attenuatum (Kützing) Rabenhorst | 1 |
| Gyrosigma nodiferum (Grunow) Reimer | 5 |
| Gyrosigma parkerii (Harrison) Elmore | 3 |
| Hantzschia amphioxys (Ehrenberg) Grunow | 1 |
| Hantzschia sp. 1 | 3 |
| Hippodonta capitata (Ehrenberg) Lange-Bertalot, Hippodonta hungarica (Grunow) Lange-Bertalot, Karayevia laterostrata (Hustedt) Round et Lemnicola hungarica (Grunow) Round et Basson Luticola mutica (Kützing) Mann | 42 / 17 / 1 / 2 / 57 |
| Melosira varians Agardh | 5 |
| Meridion circulare (Greville) Agardh | 8 |
| Meridion circulare var. constrictum (Ralfs) Van | 8 |
| Navicula canalis Patrick | 5 |
| Navicula cincta (Ehrenberg) Ralfs | 64 |
| Navicula cryptotenella Lange-Bertalot ex Krammer et Lange- | 56 |
| Navicula erifuga Lange-Bertalot | 13 |
| Navicula geronimensis Potapova | 2 |

| Species | Number of valves counted |
|---|---|
| Navicula globulifera Hüstedt | 1 |
| Navicula gregaria Donkin | 120 |
| Navicula hanseatica Lange-Bertalot et Stachura | 5 |
| Navicula ingrata Krasske | 16 |
| Navicula lanceolata (Agardh) Ehrenberg | 1 |
| Navicula menisculus Schumann | 2 |
| Navicula minima Grunow | 49 |
| Navicula peregrina (Ehrenberg) Kützing | 46 |
| Navicula pseudoventralis Hüstedt | 3 |
| Navicula recens Lange-Bertalot | 2 |
| Navicula rhynchocephala Kützing | 13 |
| Navicula rostellata Kützing | 24 |
| Navicula ruttnerii var. capitata Hüstedt | 9 |
| Navicula salinarum Grunow | 508 |
| Navicula schroeteri var. escambia Patrick | 8 |
| Navicula sp. 1 | 35 |
| Navicula sp. 2 | 8 |
| Navicula sp. 3 | 21 |
| Navicula symmetrica Patrick | 20 |
| Navicula tenelloides Hüstedt | 18 |
| Navicula tripunctata (Müller) Bory | 2 |
| Navicula veneta Kützing | 3 |
| Neidium affine (Ehrenberg) Pfitzer | 6 |
| Neidium bisulcatum (Lagerstedt) Cleve | 2 |
| Neidium iridis var. ampliatum (Ehrenberg) | 3 |
| Nitzschia acidoclinata Lange-Bertalot | 15 |
| Nitzschia amphibia Grunow | 3 |
| Nitzschia archibaldii Lange-Bertalot | 2 |
| Nitzschia brevissima Grunow ex Van Heurck | 320 |
| Nitzschia capitellata Hüstedt | 9 |
| Nitzschia clausii Hantzsch | 37 |
| Nitzschia dissipata (Kützing) Grunow | 36 |
| Nitzschia fasciculata (Grunow) Grunow | 1 |
| Nitzschia filiformis (Smith) Van Heurck | 4 |
| Nitzschia fonticola Grunow | 4 |
| Nitzschia gessneri Hustedt | 4 |
| Nitzschia granulata Grunow ex Cleve et Möller | 7 |
| Nitzschia heufleriana Grunow | 4 |
| Nitzschia inconspicua Grunow | 15 |
| Nitzschia intermedia Hantzsch ex Cleve et | 6 |
| Nitzschia laevis Hustedt | 8 |
| Nitzschia liebethruthii Rabenhorst | 2 |
| Nitzschia microcephala Grunow | 22 |
| Nitzschia nana Grunow ex Van Heurck | 22 |
| Nitzschia obtusa Smith | 1 |
| Nitzschia palea (Kützing) Smith | 65 |
| Nitzschia recta Hantzsch ex Rabenhorst | 14 |
| Nitzschia sigma (Kützing) Smith | 71 |
| Nitzschia siliqua Archibald | 3 |
| Nitzschia sp. 1 | 24 |
| Nitzschia sp. 2 | 5 |
| Nitzschia sp. 3 | 1 |
| Nitzschia subacicularis Hüstedt | 21 |
| Nitzschia subconstricta Grunow | 1 |
| Nitzschia umbilicata Hustedt | 2 |

| Species | Number of valves counted |
|---|---|
| Odontella aurita (Lyngbye) Agardh | 8 |
| Opephora sp. 1 ? | 1 |
| Paralia sulcata (Ehrenberg) Cleve | 62 |
| Parlibellus crucicula (Smith) Witkowski, Lange- | 4 |
| Pinnuavis elegans (W.Smith) Okuno | 2 |
| Pinnularia acrosphaeria (Brébisson) Smith | 3 |
| Pinnularia borealis Ehrenberg | 1 |
| Pinnularia gibba Ehrenberg | 6 |
| Pinnularia ignobilis (Krasske) Cleve-Euler | 6 |
| Pinnularia interrupta Smith | 16 |
| Pinnularia lundii Hüstedt | 4 |
| Pinnularia microstauron (Ehrenberg) Cleve | 3 |
| Pinnularia nodosa (Ehrenberg) Smith | 2 |
| Pinnularia obscura Krasske | 5 |
| Pinnularia parvulissima Krammer | 1 |
| Pinnularia subcapitata Gregory | 6 |
| Pinnularia viridis (Nitzsch) Ehrenberg | 2 |
| Placoneis clementis (Grunow) Cox | 3 |
| Placoneis elginensis (Gregory) Cox | 16 |
| Placoneis sp. 1 | 4 |
| Plagiotropis lepidoptera var. proboscidea (Cleve) | 1 |
| Planothidium apiculatum (Patrick) Lange-Bertalot | 2 |
| Planothidium delicatulum (Kützing) Round et | 14 |
| Planothidium frequentissimum (Lange- | 50 |
| Planothidium granum (Hohn et Hellerman) | 7 |
| Planothidium lanceolatum (Brébisson ex Kützing) | 2 |
| Planothidium peragalli var. parvulum (Patrick) | 1 |
| Planothidium rostratum (Østrup) Lange-Bertalot | 18 |
| Planothidium sp. 1 | 17 |
| Platessa conspicua (Mayer) Lange-Bertalot | 12 |
| Psammothidium chlidanos (Hohn et Hellerman) | 9 |
| Psammothidium sp. 1 | 5 |
| Pseudostaurosira brevistriata (Grunow) | 431 |
| Pseudostaurosira brevistriata var. 0A UL | 4 |
| Rhaphoneis amphiceros (Ehrenberg) Ehrenberg | 21 |
| Rhopalodia acuminata Krammer | 2 |
| Rhopalodia gibberula (Ehrenberg) Müller | 3 |
| Rhopalodia musculus (Kützing) Müller | 2 |
| Sellaphora americana (Ehrenberg) Mann | 2 |
| Sellaphora bacillum (Ehrenberg) Mann | 1 |
| Sellaphora laevissima (Kützing) Mann | 1 |
| Sellaphora pupula (Kützing) Meresckowsky | 89 |
| Sellaphora seminulum (Grunow) Mann | 8 |
| Skeletonema costatum (Greville) Cleve | 30 |
| Stauroneis agrestis Petersen | 2 |
| Stauroneis anceps Ehrenberg | 22 |
| Stauroneis kriegeri Patrick | 10 |
| Stauroneis phoenicenteron (Nitzsch) | 4 |
| Stauroneis smithii Grunow | 4 |
| Staurosira construens var. venter (Ehrenberg) | 336 |
| Staurosirella pinnata (Ehrenberg) Williams et | 19 |
| Surirella angusta Kützing | 1 |
| Surirella brebissonii var. kuetzingii Krammer et | 9 |
| Surirella brightwellii Smith | 2 |
| Surirella linearis Smith | 8 |

| Species | Number of valves counted |
|---|---|
| Surirella robusta Ehrenberg | 1 |
| Surirella striatula Turpin | 1 |
| Synedra acus Kützing | 23 |
| Synedra parasitica (Smith) | 13 |
| Synedra ulna (Nitzsch) | 13 |
| Tabellaria flocculosa (Roth) | 21 |
| Thalassionema nitzschioides | 239 |
| Thalassiosira cf. lineata | 100 |
| Thalassiosira eccentrica | 50 |
| Thalassiosira oestrupii | 6 |
| Trachyneis aspera | 1 |
| Tryblionella apiculata Gregory | 52 |
| Tryblionella calida (Grunow ex Cleve | 27 |
| Tryblionella coarctata | 6 |
| Tryblionella compressa | 2 |
| Tryblionella debilis Arnott | 26 |
| Tryblionella levidensis Smith | 9 |
| Tryblionella littoralis (Grunow) | 27 |
| Tryblionella victoriae Grunow | 9 |
| Undetermined Pennate sp. 1 | 125 |
| Undetermined Pennate sp. 2 | 34 |