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# An Assessment of Chemical Contaminants, Toxicity and Benthic Infauna in Sediments from the St. Croix East End Marine Park (STXEEMP), US Virgin Islands

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*Images throughout this report courtesy of Bioimpact, Inc.*



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**December 2024**

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***ABSTRACT***
*This project resulted in the collection and analysis of sediments for chemical contaminants and bioeffects within the St. Croix East End Marine Park or STXEEMP. Working with partners from the USVI Department of Planning and Natural Resources, seven strata were established, and a total of 38 sediment samples were collected from stratified random sites and targeted sites. Samples were analyzed for a suite of over 270 core organic (e.g., hydrocarbons and pesticides) and inorganic (e.g., metals) chemical contaminants. In addition, nine of the targeted site sediment samples were analyzed for two emerging classes of chemical contaminants, PBDEs and PFAS. Sediments were also analyzed for bioeffects, including the Cytochrome P450 toxicity assay, the sea urchin embryo development assay, and an assessment of the benthic infaunal community. Overall, results indicated low concentrations of chemical contaminants and impacts as gauged by the toxicity assessments at all the stratified random sites. Contaminant concentrations were well below published sediment quality guidelines at these sites, indicating that effects from the chemicals analyzed were unlikely. Targeted sites, in general had higher concentrations of chemical contaminants. At one targeted site, chromium, nickel and zinc were above a guideline (ERL) indicating that effects could be occurring in more sensitive benthic infaunal organisms. At this same site, copper was above a guideline (ERM) indicating that adverse effects were likely. The concentration of the emerging contaminants PBDEs and PFAS were low at most of the sites where they were analyzed. The results of the sea urchin development assay were confounded by high levels of unionized ammonia, the cause of which is unknown. The Cytochrome P450 toxicity assay indicated low responses, and is in line with the low concentrations of organic chemical contaminants present. The benthic infaunal analysis indicated similar benthic communities throughout the STXEEMP, typical of subtropical habitats. The data from this project provides an overview of the current level of chemical contamination in the sediments in the STXEEMP, and can serve as a baseline to measure changes that may occur in the future.*


Figure 1. Map of St. Croix showing the general area of study.

**INTRODUCTION**

The St. Croix East End Marine Park, referred to as STXEEMP or the Park in this report, surrounds the East End of the island of St. Croix, in the USVI (Figure 1). As early as 1960, it was recommended that the East End be designated as a nature preserve. In 1980, the USVI Department of Planning and Natural Resources (DPNR) designated the East End as an Area of Particular Concern or APC, due to "many areas which are of natural, cultural, geological, recreational, and scenic importance" (IRF, 1993). In addition, the offshore areas of the East End were considered for designation as a NOAA National Marine Sanctuary in 1982.

The STXEEMP was established in 2003 under VI Code Title 12, Section 903-906 (STXEEMP, 2016), and designated a multi-use marine park, entirely managed by DPNR. In the 2002 management plan, the goals were to: 1) protect and maintain the biological diversity and other natural values of the area; 2) promote sound management practices for sustainable production purposes; 3) protect the natural resource base from being alienated for other land use purposes that would be detrimental to the area's biological diversity; and 4) to contribute to regional and national development (TNC, 2002).

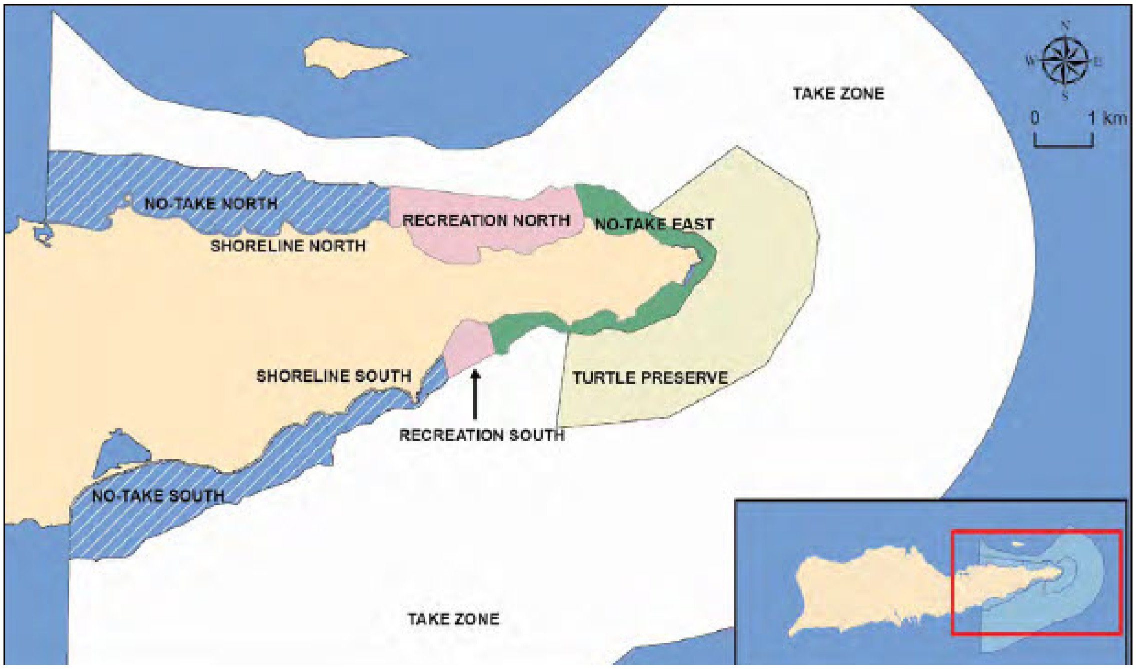


Figure 2. Boundaries of the STXEEMP (from Pittman *et al.*, 2013). Zones are also shown on the map.

Extending three nautical miles from the shoreline, the STXEEMP has an area of approximately 155 $km^2$ (TNC, 2002). A number of zones have been designated for fishing and recreational activities, no take zones, and an area designated as a turtle preserve (Figure 2). Six watersheds border the STXEEMP including Southgate, Solitude, Teague Bay, Turner Hole, Madam Carty, and Great Pond Bay (Figure 3). The land area bordering the STXEEMP is 31.4 $km^2$ or 3,140 sq hectares (Horsley Witten Group, 2011a).

There are approximately 27 km of coastline bordering the STXEEMP (TNC, 2002). Chenay Bay on the north shore marks the western border of the Park, which then extends around the eastern tip of St. Croix. Great Pond Bay marks the western border on the south shore of the island (Figure 3).

**Land Use and Land Cover**

Settlement of the East End of St. Croix occurred in the 1740s (DPNR, 1993). While sugarcane was grown in other parts of St. Croix, the climate was too dry on the East End.

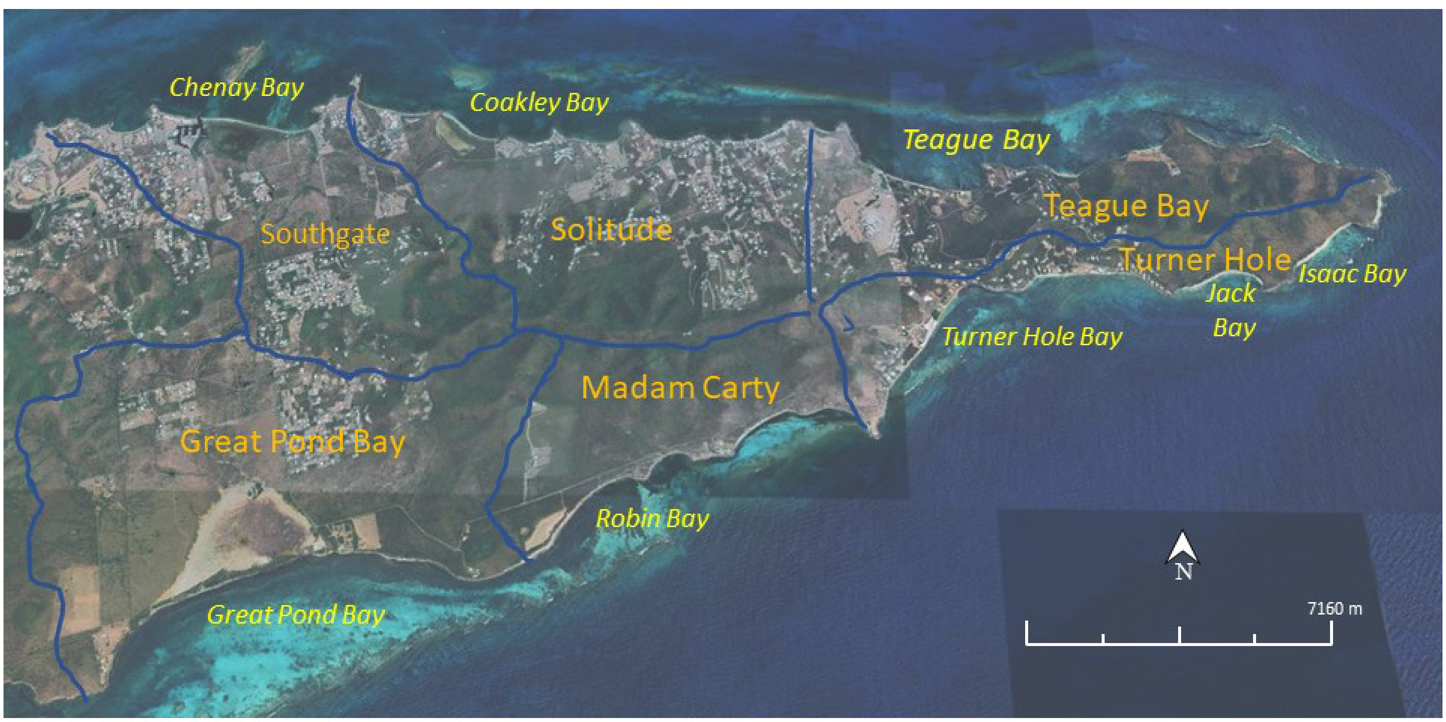


Figure 3. Watersheds and waterbodies in St. Croix's East End.

Some cotton plantations were located adjacent to Teague Bay and in Cotton Garden in the Teague Bay watershed. A few sugar mills, powered by the wind, were also located in the eastern part of St. Croix. Because St. Croix is a relatively low lying island (highest point of 355 m in the north), and has lost much of its historic old growth forest due to changes in land use over the years, rainfall is fairly low. Average annual rainfall is 40 inches in the west, but only 30 inches in the east. The rainy season on St. Croix occurs from June to November (TNC, 2002).

Table 1. Land use in the watersheds in the East End of St. Croix.

| | Watershed | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Southgate (562) | Solitude (661) | Teague Bay (411) | Turner Hole (281) | Madam Carty (419) | Great Pond Bay (806) | East End (3,140) |
| Land Use (%) | | | | | | | |
| Undeveloped | 50 | 50 | 44 | 66 | >99 | 55 | 59 |
| Open Space/Parks | 0 | 0 | 34 | 10 | 0 | 1 | 5 |
| Agriculture | 24 | 18 | 6 | 0 | 0 | 29 | 16 |
| Residential | 23 | 31 | 14 | 20 | <1 | 9 | 17 |
| Hotel/Resort | 1 | 2 | 0 | 4 | 0 | 0 | <1 |
| Marina | 0 | 0 | 1 | 0 | 0 | 0 | <1 |

Adapted from Horsley Witten Group, 2011. Numbers in parentheses are hectares.

Land bordering the STXEEMP is predominantly undeveloped, although there are some agricultural and pasturelands (Table 1), along with single-family homes and commercial businesses (e.g., hotels and restaurants) scattered throughout the watersheds, including the north shore, and also on the south shore in the Turner Hole watershed (Horsley Witten Group, 2011a).

Table 1 also provides a breakdown of land use by watershed in the East End. Undeveloped land is the largest use category by percent, ranging from 44 percent to greater than 99 percent with a mean of 59 percent.

The highest concentration of residential dwellings is in the Southgate (23%) and Solitude (31%) watersheds on the north shore (Table 1). There are a number of resorts and condominiums along the north shore as well, and in the Turner Hole watershed on the southeastern coast. Other commercial activities appear somewhat limited on the East End, and include a number of restaurants, along with a marina and a yacht club (Horsley Witten Group, 2011a). There appears to be no industrial activity on the East End of St. Croix.

Soils on the hilltops and along the slopes of the East End are typically shallow and well-drained loams. In the flatter areas in the East End, particularly in the Southgate and Great Pond watersheds, the soils are less suitable for septic systems and for infiltration of stormwater. The terrestrial environment of the East End is dominated by remnants of tropical dry forests (DPNR, 1993), shrubland, and herbaceous savannas (Horsley Witten Group, 2011b). Soils there show a high potential for erosion, due to the combination of topography, soil type, land cover, and the density of roads. In 1989, Hurricane Hugo is said to have devastated St. Croix, resulting in shifts in vegetation in the higher elevations in the East End from machineel (beach apple) trees to thorn scrub, sea grapes, and tan-tan trees (small fast-growing mimosoid trees) (Horsley Witten Group, 2011a). Hurricanes Irma and then Maria, both Category 5 hurricanes that struck St. Croix in 2017, likely continued this shift in vegetation.

**Marine Habitat**

The STXEEMP has an abundance of coral reef and seagrass habitats. The longest contiguous coral reef structures occur on the northeastern shore of the Preserve, containing barrier, patch and fringing reefs, with the barrier reefs occurring approximately 0.8 km offshore (STXEEMP, 2016). The linear or barrier reef structures are most concentrated around the eastern tip of the STXEEMP and then continue to Isaac Bay on the south shore, after which the barrier reef structure become less contiguous. Lang Bank, a submerged shallow platform, extends to the east of Point Udall, the most eastern point on St. Croix, for approximately 18 km, with gorgonian communities, patch reefs, sandy bottoms and seagrass beds. The reefs have also changed over time, due to hurricanes and anthropogenic pressures (STXEEMP, 2016).

Corals commonly found in the STXEEMP include brain coral (*Diploria strigosa*), golfball coral (*Favia fragum*), finger coral (*Porites porites*), mustard hill coral (*Porites astreoides*) boulder star coral (*Orbicella annularis*), and elkhorn coral (*Acropora palmata*). Coral populations have been in decline in the STXEEMP since the 1980s as a result of bleaching events caused by increased sea temperatures, water quality issues, disease, and damage from hurricanes (Horsley Witten Group, 2011b).

Water quality in some of the bays of the STXEEMP is impaired as a result of land-based sources of pollution or LBSP (Horsley Witten Group, 2011b). Pittman *et al.* (2013) found that areas with predicted low or moderate terrestrial impacts from land-based sources of pollution had greater acreages of coral reef and hardbottom habitats, compared to areas that had a predicted high impact from

LBSP. Very few observations of the ESA (Endangered Species Act) listed staghorn coral (*Acropora cervicornis*) have been found in the STXEEMP, and none in the high impact zones identified by Pittman *et al*. (2013). Likewise, yellow pencil coral (*Madracis mirabilis*), and some of the other corals were also absent in the predicted high impact zone.

It has been estimated that there are approximately 400 species of fish around the STXEEMP (TNC, 2002). Pittman *et al*. (2013) found that the most abundant species of fish included bluehead wrasse (*Thalassoma bifasciatum*), ocean surgeonfish (*Acanthurus tractus*), slippery dick (*Halichoeres bivittatus*), bicolor damselfish (*Stegastes partitus*), blue tang (*Acanthurus coeruleus*), striped parrotfish (*Scarus iseri*), and yellowhead wrasse (*Halichoeres garnoti*). Pittman *et al.* (2013) also found that wrasse were the most abundant and widespread fish family in the STXEEMP, noting that the small-bodied species have a lower vulnerability to fishing pressures. Other species identified in the STXEEMP included yellowtail snapper (*Ocyurus chrysurus*), French grunt (*Haemulon flavolineatum*), and threespot damselfish (*Stegastes planifrons*).

**Water Quality**

DPNR designated the East End as an Area of Particular Concern (APC). While recognizing the importance of all areas within the coastal zone, APCs are defined as those areas of greater significance. Among the factors considered for designation as an APC include significant natural, culturally important, and recreational areas. In addition, the USVI has designated waters as Class A, B or C based on their desired use, in accordance with the Clean Water Act, with Class A criteria being the most stringent. Each class has associated water quality criteria concentrations that should not be exceeded if the water body is to meet a designated class. The water quality criteria for the USVI include dissolved oxygen, *Enterococcus* bacteria, phosphorus and turbidity (USVI, 2015). The waters around the STXEEMP have been designated as Class B, which is for the maintenance and propagation of aquatic life and for primary contact recreation (DPNR, 2018). The area offshore, near Buck Island has been designated as Class A.

To facilitate the assessment of water quality in the STXEEMP, DPNR has established a series of Water Quality Assessment Units or WQAUs, both inshore and offshore. Ambient monitoring sites within each WQAU are used to determine if water quality supports the designated use or is impaired. Figure 4 shows the nearshore WQAUs in the STXEEMP. A number of WQAUs on the north and south shores of the STXEEMP are not meeting the established water quality criteria, which is indicated by the yellow shading in Figure 4. Impairments in these areas include elevated levels of *Enterococcus* bacteria, turbidity, pH, temperature, and low levels of dissolved oxygen. Water quality in some of the bays of the STXEEMP have been listed as impaired due to turbidity and bacteria from LBSP, which can be associated with unpaved roads, construction activities, stormwater runoff and wastewater discharges (Horsley Witten Group, 2011b). In an analyses conducted by the World Resources Institute and NOAA NCCOS for St. Croix, it was found that the majority of the East End was highly vulnerable to land erosion from dirt roads in the area (WRI and NOAA, 2006).

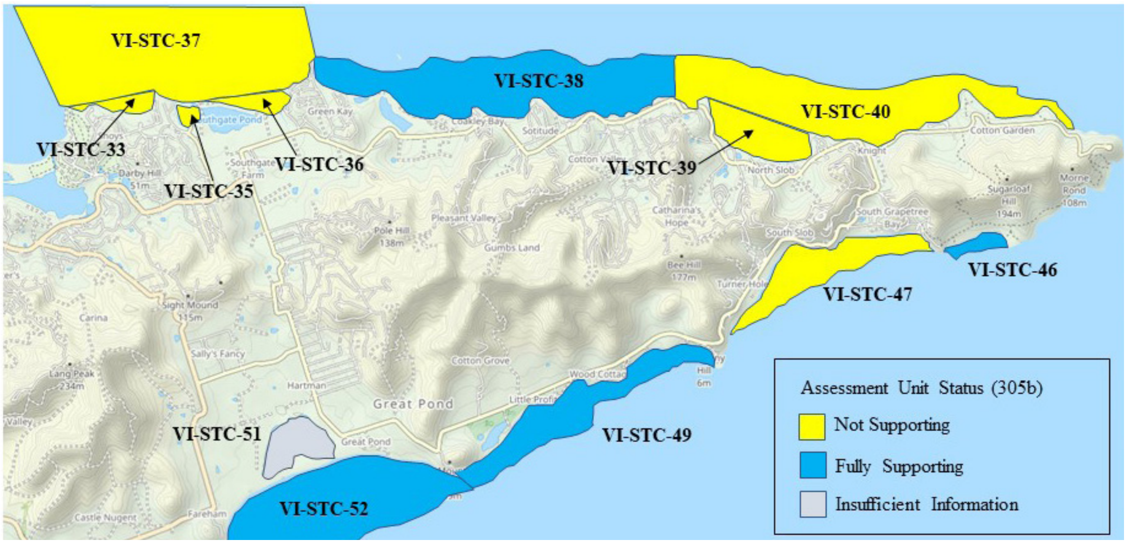

Figure 4. Status of nearshore Water Quality Assessment Units (WQAUs) in the STXEEMP.

As part of the requirements of Section 303(d) of the Clean Water Act, states and territories are required to develop a list of impaired waterbodies that do not attain or maintain compliance with the applicable water quality criteria (DPNR, 2016). To address impaired waters, TMDLs or Total Maximum Daily Loads are developed to identify how much pollution a waterbody can receive and still meet the applicable water quality criteria. It does not appear that TMDLs have been established yet for the WQAUs in the STXEEMP.

**NCCOS Involvement**
NOAA's National Centers for Coastal Ocean Science (NCCOS) has worked closely with the USVI's DPNR on a number of contaminant-related projects in the past including Coral Bay on St. John (Whitall *et al.*, 2014), and in the STEER on St. Thomas (Pait *et al*., 2013). In addition, NCCOS worked closely with DPNR and the National Park Service (NPS) to conduct an ecological characterization of Salt River Bay National Historical Park and Ecological Preserve or SARI in St. Croix in 2005 (Kendall *et al.*, 2005), and in 2018 an assessment of chemical contaminants and bioeffects (Pait *et al.*, 2020).

Discussions centering on the need for an assessment of chemical contaminants and bioeffects in the STXEEMP were first held in September 2018, during field work in the SARI. During subsequent discussions with DPNR, planning for work in the STXEEMP including the chemical contaminants to be analyzed and a sampling strategy were developed. The work that NCCOS has conducted in close coordination with DPNR in the SARI, STEER, Coral Bay, and now in the STXEEMP, allows direct comparison of environmental conditions between these managed areas of the USVI.

Originally, the project in the STXEEMP was to be conducted from the NOAA Ship *Nancy Foster* in the Spring of 2020, using the *Foster* as a base of operations for sample processing, with sampling occurring from the ship's launches. However, the COVID-19 pandemic forced cancellation of the field work due to travel restrictions. Because of this, the environmental firm, Bioimpact, Inc., based in St. Croix, was contracted to conduct the sampling of sediments in 2021.

This report presents the results of the assessment of chemical contaminants and bioeffects in sediments from the STXEEMP. A second related project, was conducted in the STXEEMP beginning in 2022, to collect fish for chemical contaminant analysis. The results from that effort will be included in a later report.

## MATERIALS AND METHODS
Using available bottom-type data, a stratified-random sampling design was developed for sampling sediments in the STXEEMP. The strata were based on the USVI's WQAUs (Figure 4). A stratified-random sampling design allows for the statistical comparison of contaminant concentrations between strata. The approach taken combines the strengths of a stratified design with the random-probabilistic selection of sampling locations, allowing the data generated within each stratum to be attributed to the size of that stratum with a quantifiable degree of confidence (Heimbuch *et al.*, 1995).

A map of the seven strata developed for this project can be seen in Figure 5. Sampling sites were randomly assigned to the seven strata. For most strata, four sampling sites were established. Because of its small size, only three random sites could be placed in Stratum 7. Both primary (green) and alternate sites (red) were established. Alternate sites were sampled in the event that a primary site was unsuitable for sampling due to hard bottom, obstructions, etc. A total of 27 primary sediment sites were established in the STXEEMP (Figure 5, and Appendix A).

DPNR personnel requested that targeted sites also be established and sampled in the STXEEMP. These non-random sites represent locations where DPNR had site specific questions regarding environmental quality. The ten targeted sites are highlighted in blue in Figure 5. Finally, NCCOS established a targeted site within the marina area adjacent to Stratum 1. The marker for this site is shaded in tan and can also be seen in Figure 5.

It should be noted that not all the primary and alternate sites shown on Figure 5 were sampled; the map shows all the sampling sites (primary, alternate and targeted) that were available. The sites that were sampled for this project have an asterisk (*) beside the site name in Figure 5.

As noted, the field work for this project was conducted by the environmental firm Bioimpact, Inc. based in St. Croix. NCCOS shipped the sampling equipment and containers needed to collect the samples, to St. Croix. The field work took place in March 2021. Sampling of sediments occurred from a Bioimpact boat. A total of 23 primary sediment sites, and four alternate sites for a total of 27 stratified random sites were sampled, along with 11 targeted (10 DPNR sites and one NCCOS site) (Appendix A) in the seven strata, and subsequently analyzed for chemical contaminants, sediment toxicity, and the benthic infaunal community.

**Water Quality Measurements**
A series of water parameters (dissolved oxygen, temperature, salinity, and conductivity) were measured at each site, using a YSI® salinity/conductivity/temperature meter. The instrument probe was submerged to a depth of approximately 0.5 meters for the surface measurement, and within a meter of the sediment for the bottom measurement.

**Sediment Collection**
At each site, a PONAR sediment grab (Figure 6) was deployed multiple times to get enough sediment for the different analyses. Sediments were collected using stan-

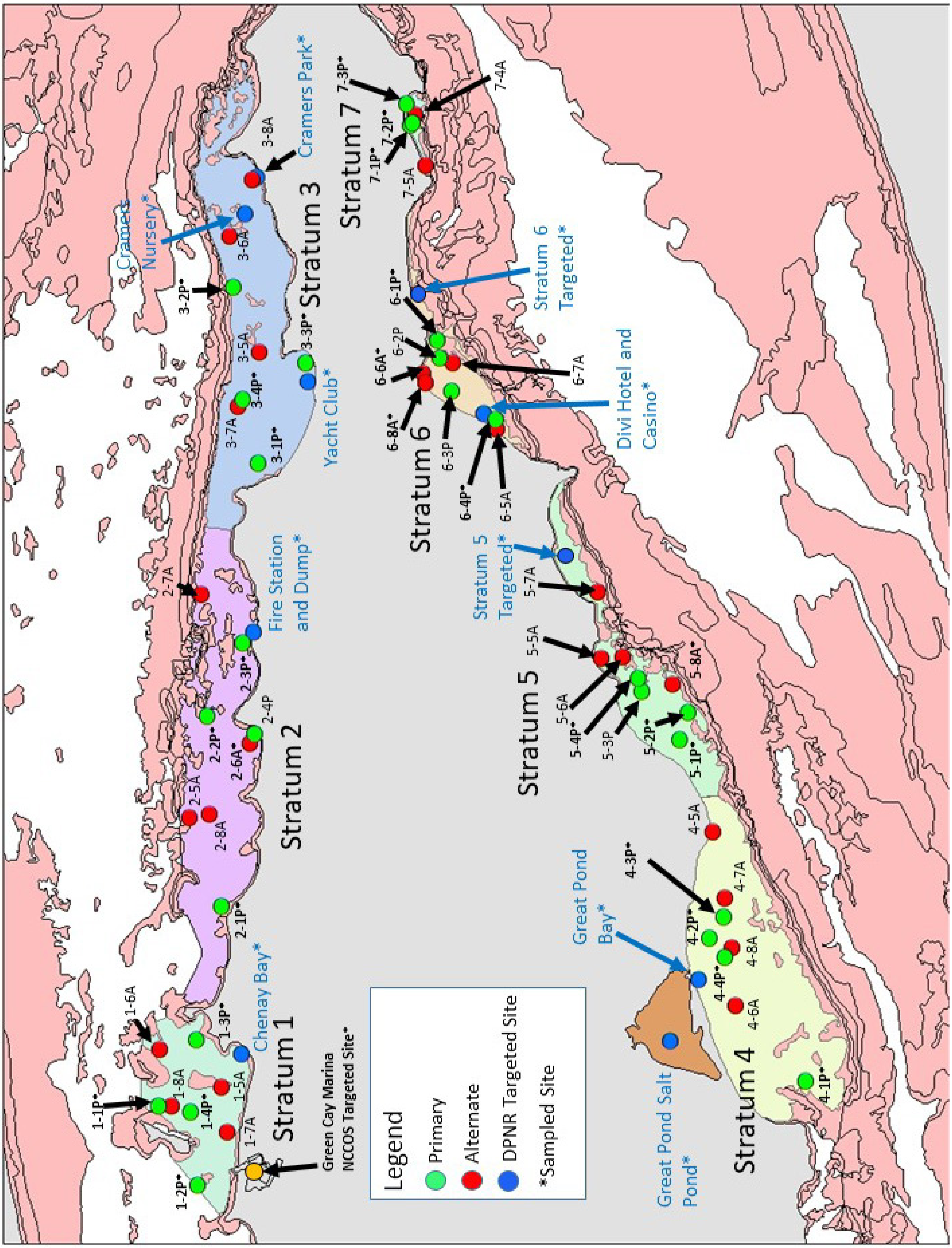

Figure 5. Sediment sampling sites in the STXEEMP.

dard NOAA National Status and Trends (NS&T) protocols (Apeti *et al*., 2012). The NS&T Program within NCCOS monitors the Nation's estuarine and coastal waters for contaminants in bivalve mollusk tissues and sediments, along with sediment toxicity (bioeffects).

A series of protocols (Apeti *et al*., 2012) were used to avoid contamination of the sediment samples by equipment and cross contamination between sites. Personnel handling the samples wore disposable nitrile gloves. All equipment was rinsed with site water and then wiped down with alcohol wipes, and finally rinsed with distilled water, just prior to deployment at a site.

The PONAR grab was deployed multiple times at a site, using a pulley and davit, and retrieved by hand. Rocks and bits of seagrass were removed from the sample. If a particular grab did not result in 200-300 g of sediment, a second grab was made and composited with material from the first. If after three deployments of the grab at a primary site in which little or no sediment was retained in the grab, the site was abandoned, and the Bioimpact crew moved on to an alternate site.

When one of the deployments of the PONAR resulted in a full grab sample, the entire contents of the grab were rinsed into a plastic tub for the benthic infauna sample. The contents of subsequent grab samples were composited in a bucket with a solvent-rinsed liner, homogenized, and then subsampled into various containers for contaminant analyses and bioassays. For the chemical contaminant samples and bioassays, the top 3 cm of sediment were collected from the PONAR grab, using a solvent-rinsed stainless steel sediment scoop. This top layer of sediment is referred to as surficial sediment, and is typically indicative of more recent deposition. Two certified clean (I-Chem®) 250 ml labeled jars were filled, one for organic chemical analysis, the other for major and trace element analysis, capped and then placed on ice in a cooler. In addition, sediment was placed in another I-Chem® 250 ml jar for the P450 assay, and two 300 ml plastic containers were filled with sediment for the sea urchin toxicity test. Finally, sediments for grain size analysis were placed in a WhirlPak® bag, sealed and placed on ice in a cooler.

At the end of each day, sediment samples for contaminant or bioeffects analysis were placed in a freezer at the Bioimpact facility in Christiansted. The WhirlPak® bags for the grain size analysis were placed in a refrigerator rather than frozen, to avoid altering the grain size structure of the sediment.

**Sediment Chemical Contaminants**

All sediment samples collected were analyzed for a suite of over 270 core chemical contaminants, including organic (e.g., hydrocarbons and pesticides), and major and trace elements (e.g., metals) by TDI-Brooks International, using protocols established by the NS&T Program. The list of core chemical contaminants analyzed in the sediments is shown in Table 2. The 64 polycyclic aromatic hydrocarbons (PAHs) were analyzed using gas chromatography/mass spectrometry in the selected ion monitoring mode. The 33 organochlorine pesticides and 157 polychlorinated biphenyls (PCBs) were analyzed using gas chromatography/electron capture detection. Four butyltins were analyzed using gas chromatography/flame photometric detection after derivatization. The 16 major and trace elements were analyzed using inductively coupled plasma mass spectrometry and atomic-fluorescence spectroscopy. Detailed descriptions of the NS&T protocols, including quality assurance/quality control (QA/QC) used in the analysis of the organic contaminants, can be found in Kimbrough *et al.* (2006); for inorganic analyses, Kimbrough and Lauenstein (2006). Each of these contaminant classes contains individual compounds or elements shown to be toxic to aquatic biota. In addition, two classes of contaminants of emerging concern (CECs), PBDEs or polybrominated diphenyl ethers (flame retardants) and PFAS or per- and polyfluoroalkyl substances were analyzed at the DPNR and NCCOS targeted sites, and are shown in Table 3. A brief summary of the generation, use and impacts of the contaminants analyzed in the sediments from the STXEEMP follows.

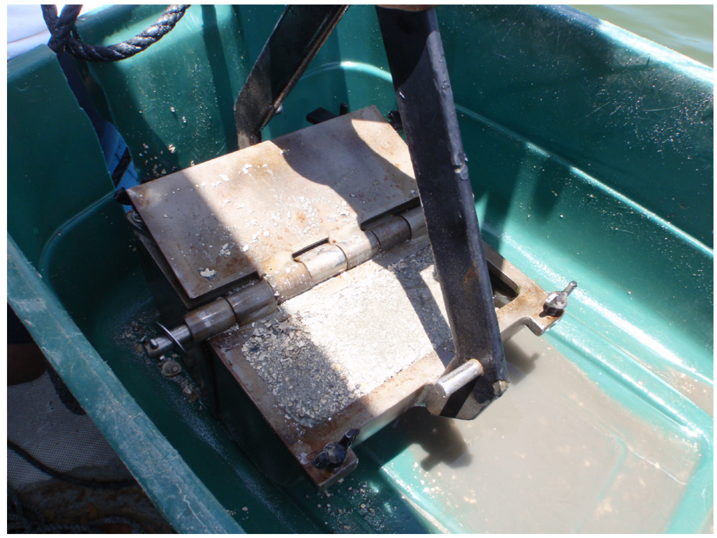

Figure 6. Image of the PONAR grab used to collect sediments in the STXEEMP.

*Polycyclic Aromatic Hydrocarbons*. Also referred to as PAHs, polycyclic aromatic hydrocarbons are associated with the use and combustion of fossil fuels (e.g., oil, gaso-

Table 2. Core chemical contaminants analyzed in the sediment samples from the STXEEMP.

| PAHs - Low MW | PAHs - High MW | Organochlorine Pesticides | PCBs | PCBs (continued) | PCBs (continued) | PCBs (continued) | PCBs (continued) |
|---|---|---|---|---|---|---|---|
| cis/trans Decalin | Fluoranthene | Aldrin | PCB 1 | PCB 51 | PCB 88 | PCB 134/133 | PCB 170/190 |
| C1-Decalins | Pyrene | Dieldrin | PCB 2 | PCB 45 | PCB 91 | PCB 165/131 | PCB 189 |
| C2-Decalins | C1-Fluoranthenes/Pyrenes | Endrin | PCB 3 | PCB 46/69/73 | PCB 92 | PCB 142/146/161 | PCB 202 |
| C3-Decalins | C2-Fluoranthenes/Pyrenes | Endrin Aldehyde | PCB 4/10 | PCB 52 | PCB 101/84/90 | PCB 153/168 | PCB 201 |
| C4-Decalins | C3-Fluoranthenes/Pyrenes | Endrin Ketone | PCB 7/9 | PCB 43 | PCB 89/113 | PCB 132 | PCB 204 |
| Naphthalene | C4-Fluoranthenes/Pyrenes | Heptachlor | PCB 6 | PCB 49 | PCB 99 | PCB 141 | PCB 197 |
| C1-Naphthalenes | Naphthobenzothiophene | Heptachlor-Epoxide | PCB 8/5 | PCB 48/75/47 | PCB 119 | PCB 137 | PCB 200 |
| C2-Naphthalenes | C1-Naphthobenzothiophenes | Oxychlordane | PCB 14 | PCB 65 | PCB 112 | PCB 130 | PCB 198 |
| C3-Naphthalenes | C2-Naphthobenzothiophenes | Alpha-Chlordane | PCB 11 | PCB 62 | PCB 120/83 | PCB 138/164/163 | PCB 199 |
| C4-Naphthalenes | C3-Naphthobenzothiophenes | Gamma-Chlordane | PCB 12 | PCB 44 | PCB 97/125/86 | PCB 160/158 | PCB 203/196 |
| Benzothiophene | C4-Naphthobenzothiophenes | Trans-Nonachlor | PCB 13 | PCB 59 | PCB 116/117 | PCB 129 | PCB 195 |
| C1-Benzothiophenes | Benz(a)anthracene | Cis-Nonachlor | PCB 15 | PCB 42 | PCB 111/115/87 | PCB 166 | PCB 194 |
| C2-Benzothiophenes | Chrysene/Triphenylene | Alpha-HCH | PCB 19 | PCB 72 | PCB 109 | PCB 159 | PCB 205 |
| C3-Benzothiophenes | C1-Chrysenes | Beta-HCH | PCB 30 | PCB 71 | PCB 85 | PCB 162 | PCB 208 |
| C4-Benzothiophenes | C2-Chrysenes | Delta-HCH | PCB 18 | PCB 68/41/64 | PCB 110 | PCB 128/167 | PCB 207 |
| Biphenyl | C3-Chrysenes | Gamma-HCH | PCB 17 | PCB 40/57 | PCB 82 | PCB 156 | PCB 206 |
| Acenaphthylene | C4-Chrysenes | DDMU | PCB 27 | PCB 67 | PCB 124 | PCB 157 | PCB 209 |
| Acenaphthene | Benzo(b)fluoranthene | 2,4'-DDD | PCB 24 | PCB 58 | PCB 106/107 | PCB 169 | |
| Dibenzofuran | Benzo(k,j)fluoranthene | 4,4'-DDD | PCB 16/32 | PCB 63 | PCB 123 | PCB 188 | **Major and Trace Elements** |
| Fluorene | Benzo(a)fluoranthene | 2,4'-DDE | PCB 34 | PCB 61/74 | PCB 118/108 | PCB 184 | Aluminum (Al) |
| C1-Fluorenes | Benzo(e)pyrene | 4,4'-DDE | PCB 23 | PCB 76/70 | PCB 114/122 | PCB 179 | Antimony (Sb) |
| C2-Fluorenes | Benzo(a)pyrene | 2,4'-DDT | PCB 29 | PCB 66/80 | PCB 105/127 | PCB 176 | Arsenic (As) |
| C3-Fluorenes | Perylene | 4,4'-DDT | PCB 26 | PCB 55 | PCB 126 | PCB 186/178 | Cadmium (Cd) |
| Carbazole | Indeno(1,2,3-c,d)pyrene | 1,2,3,4-Tetrachlorobenzene | PCB 25 | PCB 56 | PCB 155 | PCB 175 | Chromium (Cr) |
| Anthracene | Dibenzo(a,h)anthracene | 1,2,4,5-Tetrachlorobenzene | PCB 28/31 | PCB 60 | PCB 150 | PCB 187/182 | Copper (Cu) |
| Phenanthrene | C1-Dibenzo(a,h)anthracenes | Hexachlorobenzene | PCB 21/20/33 | PCB 79 | PCB 152 | PCB 183 | Iron (Fe) |
| C1-Phenanthrenes/Anthracenes | C2-Dibenzo(a,h)anthracenes | Pentachloroanisole | PCB 22 | PCB 78 | PCB 148/145 | PCB 185 | Lead (Pb) |
| C2-Phenanthrenes/Anthracenes | C3-Dibenzo(a,h)anthracenes | Pentachlorobenzene | PCB 36 | PCB 81 | PCB 136/154 | PCB 174 | Manganese (Mn) |
| C3-Phenanthrenes/Anthracenes | Benzo(g,h,i)perylene | Endosulfan II | PCB 39 | PCB 77 | PCB 151 | PCB 181 | Mercury (Hg) |
| C4-Phenanthrenes/Anthracenes | | Endosulfan I | PCB 38 | PCB 104 | PCB 135 | PCB 177 | Nickel (Ni) |
| Dibenzothiophene | **Butyltins** | Endosulfan Sulfate | PCB 35 | PCB 96/103 | PCB 144 | PCB 171 | Selenium (Se) |
| C1-Dibenzothiophenes | Monobutyltin | Mirex | PCB 37 | PCB 100 | PCB 147 | PCB 173 | Silicon (Si) |
| C2-Dibenzothiophenes | Dibutyltin | Chlorpyrifos | PCB 54 | PCB 94 | PCB 149/139 | PCB 192/172 | Silver (Ag) |
| C3-Dibenzothiophenes | Tributyltin | | PCB 50 | PCB 102/98 | PCB 140 | PCB 180/193 | Tin (Sn) |
| C4-Dibenzothiophenes | Tetrabutyltin | | PCB 53 | PCB 121/93/95 | PCB 143 | PCB 191 | Zinc (Zn) |

Abbreviations: MW, molecular weight; PAH, polycyclic aromatic hydrocarbons; HCH, hexachlorocyclohexane; DDMU, 1-chloro-2,2- (p-chlorophenyl)ethylene; DDT, dichlorodiphenyltrichloroethane; DDD, dichlorodiphenyldichloroethane; DDE, dichlorodiphenyldichloroethylene; PCB, polychlorinated biphenyl line, and diesel) and other organic materials (e.g., wood and trash). Natural sources of PAHs include forest fires and the decay of vegetation. The PAHs analyzed are two to six ring aromatic compounds. A number of PAHs bioaccumulate in aquatic and terrestrial organisms, are toxic, and some including 1-methylphenanthrene, benzo[a]pyrene, benz[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, and indeno[1,2,3-c,d]pyrene, are likely carcinogens (USDHHS, 1995).

*Alkylated Hydrocarbons*. In addition to the PAHs, another group of hydrocarbons, the alkylated hydrocarbons were analyzed in the sediments. Alkylated hydrocarbons are straight chain or branched nonaromatic structures. Aliphatic hydrocarbons are typically associated with uncombusted fuels such gasoline, diesel or oil.

*Polychlorinated Biphenyls.* Commonly referred to as PCBs, polychlorinated biphenyls are synthetic compounds which have been used in numerous applications ranging from electrical transformers and capacitors, to hydraulic and heat transfer fluids, to pesticides and in paints. The PCBs analyzed for this project can be seen in Table 2. Approximately 60 percent of PCBs manufactured in the U.S. were used in electrical applications (EPA, 1997). PCBs have a biphenyl ring structure (two benzene rings with a carbon to carbon bond) and a varying number of chlorine atoms. There are 209 PCB congeners possible. PCBs were manufactured in the U.S. between 1929 and 1977. In the United States, all PCBs were produced by a single manufacturer, and the commercial products were referred to as Aroclors. Aroclors are mixtures of PCB congeners. The manufacture of PCBs in the U.S. was banned in 1979 due to their toxicity (Markowitz, 2018). Because PCBs bioaccumulate and degradation in the environment proceeds only slowly, they are ubiquitous contaminants. Exposure to PCBs in fish has been linked to reduced growth, reproductive impairment and vertebral abnormalities (EPA, 1997). In addition, some of the PCBs have been labeled as probable carcinogens (ATSDR, 2000).

*Organochlorine Pesticides.* Beginning in the 1950s and continuing into the early 1970s, a series of chlorine containing hydrocarbon insecticides were used to control mosquitoes and agricultural pests. One of the best known organochlorine pesticides was the insecticide DDT (dichlorodiphenyltrichloroethane). Other organochlorine insecticides included aldrin, dieldrin, and chlordane.

The use of many of the organochlorine pesticides, including DDT, was banned due to their environmental persistence, potential to bioaccumulate, and especially the chronic (i.e., longer-term) effects on nontarget organisms. Organochlorine pesticides are typically neurotoxins, and DDT along with PCBs have also been shown to interfere with the endocrine system. The DDT metabolite DDE, for example, was specifically linked to eggshell thinning in birds, particularly raptors, and also in pelicans (Lincer, 1975). A number of organochlorine pesticides are toxic to nontarget aquatic life as well, including crayfish, shrimp and some species of fish. While DDT was banned by the EPA for most uses in the U.S. in 1972, it is still effectively used in some developing countries, particularly on the inside of living areas to help control mosquitoes that can transmit malaria (Jaga and Dharmani, 2003). Most uses of the organochlorine insecticide chlordane were canceled in 1978, and all uses were canceled by 1988. A primary non-agricultural use of chlordane was in the treatment of wooden structures to prevent damage from termites. Because of their persistence and heavy use in the past, residues of organochlorine pesticides can still be found in the environment, including in biota. The persistence of these compounds and toxicity to nontarget organisms continues to be an environmental concern.

*Butyltins.* This compound class has had a range of uses, from biocides to catalysts to glass coatings. In the 1950s, tributyltin, or TBT, was first shown to have biocidal properties (Bennett, 1996). In the late 1960s, TBT was incorporated into an antifoulant paint system, quickly becoming one of the most effective paints ever used on boat hulls (Birchenough *et al*., 2002). TBT was incorporated into a polymer paint system that released the biocide at a constant and minimal rate, to control fouling organisms such as barnacles, mussels, weeds, and algae (Bennett, 1996). TBT, however, was subsequently linked to endocrine disruption, specifically an imposex (females developing male characteristics) condition in marine gastropods, and in other mollusks (e.g., oysters) abnormal shell development and poor weight gain (Batley, 1996).

Beginning in 1989, the use of TBT as an antifouling agent was banned in the U.S. on non-aluminum vessels smaller than 25 meters in length (Gibbs and Bryan, 1996). In a survey of TBT in the USVI, Strand *et al*. (2009) found evidence of elevated levels of TBT and its degradation products in gastropod species, as well as imposex at several locations, including the harbor in Charlotte Amalie, St. Thomas. In the aquatic environment, TBT is degraded by microorganisms and sunlight (Bennett, 1996). The transformation involves sequential debutylization resulting in dibutyltin, monobutyltin, and finally inorganic tin (Batley, 1996).

*Major and Trace Elements.* All of the major and trace elements occur naturally to some extent in the environment. Aluminum, iron, and silicon are major elements in the Earth's crust. As their name implies, trace elements occur at lower concentrations in crustal material, however, mining and manufacturing processes along with the use and disposal of products containing trace elements can lead to elevated concentrations in the environment.

A number of trace elements are toxic at low concentrations. Cadmium, used in metal plating and solders, has been shown to impair development and reproduction in several invertebrate species, and osmoregulation in herring larvae (USDHHS, 1999; Eisler, 1985). Mercury is volatile and can enter the atmosphere through processes including mining, manufacturing, combustion of coal and volcanic eruptions (Eisler, 1987). Mercury is currently used in compact and other fluorescent light bulbs, electrical switches and relays. Effects of mercury on copepods include reduced growth and rates of reproduction (Eisler, 1987). Chromium is used in stainless steel production, chrome plating and wood preservation (e.g., marine pilings), to name a few applications. Chromium has been shown to reduce survival and fecundity in the cladoceran *Daphnia magna*, and reduced growth in fingerling chinook salmon (*Oncorhynchus tshawytscha*) (Eisler, 1986).

Copper has a number of uses such as in antifouling paints for boats, wood preservatives, heat exchangers in power plants, electrical wires, coinage, and in agricultural fungicides. While an essential biological element, elevated levels of copper can impact aquatic organisms, including the functioning of gills along with reproduction and development (Eisler, 1998). Most of the current uses of lead appear to be in lead-acid batteries. Other uses of lead include oxides in glass and ceramics. In the past, lead was used in paints and also as an additive in gasoline, however, these uses have ended due to environmental and human health concerns. Nickel has many applications in both industrial and consumer products. Approximately 65 percent of the nickel in the U.S. is used to make stainless steel. Other uses include its incorporation into a series of alloys, in rechargeable batteries (Ni-Cd), catalysts, coins, plating, and in foundry products. Corrosion-resistant zinc plating of steel (hot-dip galvanization) is an important application, accounting for roughly 50 percent of zinc use. In the marine industry, zinc anodes are used to protect vital engine and boat parts (e.g., propellers, struts, rudders, and outboard and inboard engines), and is a component in some antifoulant paint formulations. Zinc is also used in batteries, and in alloys such as brass.

### *PBDEs*

Polybrominated diphenyl ethers, a class of CECs that had widespread use as flame retardants, have been found in the environment as well as in human tissues. PBDEs are analogous to PCBs in structure, having 209 congeners, but contain bromine atoms (rather than chlorines) bonded to the aromatic rings. They were used in many products, most notably in high impact polystyrene (plastics), foams, carpets and upholstery, textiles, office furniture, electronic equipment, and electronic circuits (McDonald, 2002). Most PBDEs released into the environment tend to persist in sediment and soils. The fully brominated deca-BDE is not as readily bioaccumulated as the other PBDE congeners, however, it can degrade to penta-BDE through metabolic or environmental processes. The penta-BDE is rapidly and almost completely absorbed, not eliminated from the body quickly, and tends to bioaccumulate. PBDEs have been shown to affect thyroid hormone function, and have been associated with impaired liver function and neural development (McDonald, 2002). Manufacturers of pentaBDE and octaBDE in the US voluntarily stopped production of these congeners in 2004, and most uses of decaBDE were phased out as of 2023. PBDEs were analyzed using gas chromatography/mass spectrometry in the selected ion monitoring mode. For this project, 51 PBDE congeners (Table 3) were analyzed in nine of the targeted sites.

Table 3. Chemicals of emerging concern (CECs) analyzed in STXEEMP sediments.

| PBDEs | PBDEs (cont.) | PFAS |
|---|---|---|
| PBDE-1 | PBDE-126 | PFBA |
| PBDE-2 | PBDE-85 | PFPeA |
| PBDE-3 | PBDE-155 | PFBS |
| PBDE-10 | PBDE-154 | 4:2 FTS |
| PBDE-7 | PBDE-153 | 6:2 FTS |
| PBDE-11 | PBDE-138 | 8:2 FTS |
| PBDE-8 | PBDE-166 | PFHxA |
| PBDE-12 | PBDE-183 | PFPeS |
| PBDE-13 | PBDE-181 | PFHpA |
| PBDE-15 | PBDE-190 | PFHxS |
| PBDE-32 | PBDE-202 | PFOA |
| PBDE-30 | PBDE-201 | PFHpS |
| PBDE-17 | PBDE-204 | PFNA |
| PBDE-25 | PBDE-197 | PFOS |
| PBDE-33 | PBDE-198/199/203/200 | PFDA |
| PBDE-28 | PBDE-196 | PFNS |
| PBDE-35 | PBDE-205 | PFUnA |
| PBDE-37 | PBDE-194 | PFDoA |
| PBDE-75 | PBDE-195 | PFTriA |
| PBDE-71/49 | PBDE-208 | PFTreA |
| PBDE-47 | PBDE-207 | PFOSA |
| PBDE-66 | PBDE-206 | N-EtFOSAA |
| PBDE-77 | PBDE-209 | N-MeFOSAA |
| PBDE-100 | | PFDS |
| PBDE-119 | | HFPO-DA |
| PBDE-99 | | ADONA |
| PBDE-116 | | 9Cl-PF3ONS |
| PBDE-118 | | 11Cl-PF3OUdS |

Abbreviations: PBDEs, polybrominated diphenylethers; PFAS, per- and polyfluoroalkyl substances.

*PFAS*
Per- and polyfluoroalkyl substances (PFAS) are a group of nearly 15,000 compounds, many of which have been in use for over 50 years in applications including surface treatments for carpet and clothing to resist stains, nonstick coatings for cookware, industrial surfactants, coatings for paper and packaging, and in firefighting foams. PFAS compounds include the perfluorocarboxylic acids such as perfluorooctanoic acid or PFOA, and the perfluorosulfonic acids such as perfluorooctanesulfonic acid or PFOS, the structure of which is shown in Figure 7.

PFAS are typically comprised of a hydrophobic perfluorocarbon backbone that repels water and a charged end or functional group that is hydrophilic. This gives them the unique ability to repel both grease and water, along with their stability to heat, low degradation rates and subsequent environmental persistence. Because of this, PFAS have been labeled as "forever chemicals", and can be found in various matrices including ground and surface waters, air, sediments, wildlife, and in humans.

Certain PFAS have been shown to bioaccumulate, and their presence has been documented in both aquatic and terrestrial species. However, the factors affecting the accumulation of PFAS appear to be different from traditional bioaccumulative contaminants. The lipid-based partitioning models developed for neutral organic compounds like PCBs may not be appropriate for predicting the accumulation of PFAS, due to the additional binding of PFAS to proteins and phospholipids. As a result, while many investigations in wildlife analyze whole body concentrations of PFAS, others also focus on individual tissues such as muscle, liver, skin, and blood.

Exposure to PFAS in humans appears to be mainly through the diet and from the air, however in aquatic wildlife, exposure is thought to be from both the diet and water exposures (De Silva *et al.*, 2021). While much is unknown about the health effects of PFAS compounds, PFOA and PFOS have specifically been linked with reproductive, developmental, and immunological effects, as well as impacts on liver and kidney function in laboratory animals. PFOA and possibly PFOS have also been identified as carcinogens. For this project, 28 PFAS compounds (Table 3) were analyzed in sediment samples collected from nine of the targeted sites using liquid chromatography mass spectrometry (LCMS).

*Bacterial Indicator*
Although not a chemical contaminant, the bacterium *Clostridium perfringens* has been used as an indicator of fecal pollution in the environment, and was analyzed in the sediment samples from the STXEEMP. This bacterium oc-

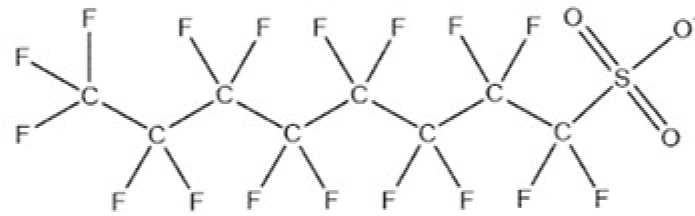

Figure 7. Structure of perfluorooctanesulfonic acid or PFOS.

curs in the intestines of humans and in some domestic and feral animals, and is a common cause of food poisoning. To assess the presence of viable *C. perfringens*, sediment extracts are plated on growth medium, and the number of colonies that develop are counted.

**Sediment Toxicity Bioassays**
The protocols for the bioassays were based on standard methods, as outlined by the EPA (1999, 2002) and ASTM (2008). A 500 mL sediment sample was collected for the sea urchin embryo (porewater extraction) test. For the P450 test, a sample of sediment was taken out of the 250 ml organics jar and extracted.

*Sea Urchin Embryo Development Assay.* The green sea urchin (*Lytechinus variegatus*) was used in this test following the methods of Carr and Chapman (1992) and Carr *et al.* (1996). Gravid sea urchins were induced to spawn using potassium chloride (0.5 M) injections. Embryos were exposed to sediment porewater for 48 hours, and after that time, embryo developmental stage and developmental aberrations were scored, with a target of 100 embryos evaluated per sample replicate.

*P450 Toxicity Assay.* Cytochrome P450s are a family of membrane-bound enzymes that metabolize a diverse number of compounds, including natural substrates, drugs, hormones, and many toxic compounds. They are present in a wide variety of animals, plants and other organisms. P450 is shorthand for Pigment and 450 is the wavelength at which they most strongly absorb light.

Different compounds stimulate P450 production to differing degrees, which can be calibrated. PCBs and PAHs stimulate certain Cytochrome P450 enzymes (e.g. CYP1A), but each individual compound exhibits its own level of stimulation. Heavy metals do not stimulate P450 at all. Under appropriate test conditions, induction of CYP1A is evidence that the cells have been exposed to one or more xenobiotic organic compounds, including dioxins, furans, planar PCBs, and several PAHs. The CYP1A bioassays were run by the Southern California Coastal Water Research Project (SCCWRP). For this assay, samples of sediment (15 grams dry weight) were extracted in DMSO (dimethylsulfoxide) and analyzed using the CellSensor® TM CYP1A bioassay. The assay measures the induction of CYP1A through the aryl hydrocarbon receptor (AhR). A calibration curve was generated and used to convert the results to 2,3,7,8-tetrachlorodibenzodioxin equivalents (ng TCDD/g).

CYP1A1 induction is regulated by the AhR (aryl hydrocarbon) receptor, a transcription factor existing in a multiprotein complex in the cytoplasm. Ligands bind AhR in the cytoplasm of the cells, whereupon the AhR-ligand complex translocates to the nucleus and forms a heterodimer with AhR nuclear translocator (Arnt). This complex then binds the dioxin response element (DRE) in the 5' upstream region of the CYP1A1 promoter, enhancing CYP1A1 expression.

**Benthic Infaunal Analysis**

A benthic community sample was taken with the PONAR grab sampler, in addition to the samples for chemical analysis and toxicity testing. The entire contents of an acceptable grab (at least 5 cm deep) was sieved on site through a 0.5 mm mesh. All organisms were retained in plastic containers and preserved in buffered 10 percent formalin containing Rose Bengal stain and sodium borate buffer. The following data and information were recorded at each site: stratum, site, date, water depth, time, latitude, longitude, and depth of sediment in the grab. Also included was a written description of each sampling site including digital color photographs of the site, a physical description of sediment characteristics (texture, color, odor, benthos, sheen) and photographs of the undisturbed sediment.

The benthic infaunal analysis was carried out by Barry A. Vittor & Associates, Inc. All animals were carefully segregated into major groups (e.g. worms, clams, shrimp and crabs). They were then identified to species unless the specimen was a juvenile or damaged. At a minimum, 10 percent of all samples were resorted and recounted on a regular basis. Also, 10 percent of samples were randomly selected and reidentified. The minimum acceptable sorting and taxonomic efficiency was 95 percent. A voucher collection composed of representative individuals of each species encountered in the project was accumulated and retained.

The benthic communities were characterized by abundance (number of animals), number of species, and diversity (a type of ratio of abundance and number of species). Abundance was calculated as the total number of individuals per grab; species richness as the total number of species represented at a given site. Diversity (H') was calculated with the Shannon-Weiner Index (Shannon and Weaver, 1949), using the following formula:

$$H' = -\sum_{i=1}^{S} pi\ (\ln pi)$$

where, S = is the number of species in the sample, i is the ith species in the sample, and pi is the number of individuals of the ith species divided by the total number of individuals in the sample.

**Statistical Analysis**

The sediment contaminant data from this project were analyzed using JMP® statistical software. A Shapiro-Wilk test was first run on individual parameters to see if the data were normally distributed. None of the data were normally distributed, and transformations were not effective. As a result, nonparametric tests (i.e., Wilcoxon and Kruskal-Wallis tests) were used to compare differences in contaminant levels between strata ; Spearman Rank tests were used to assess correlations between parameters.

## RESULTS AND DISCUSSION

**Water Quality Parameters**

A summary of the water quality parameters measured in the STXEEMP can be seen in Tables 4 and 5, and in Appendix A. The mean surface water temperature was 26.9 ±0.1 ºC, bottom temperature was 26.8 ±0.2 ºC. There were significant differences (ChiSquare = 17.5706, $p = 0.0074$) in surface water temperature between strata, with strata 3, 5, and 6 having slightly higher surface temperatures, and could be related to the shallower waters found at some of these sites. There were also significant differences between

Table 4. Water quality parameters at random sampling sites in the STXEEMP. For each parameter, mean, minimum, and maximum values and variation by stratum are included.

| Parameter | Mean ±SE | Minimum | Maximum | Varied by Stratum? |
|---|---|---|---|---|
| Suface Temperature (°C) | 26.9 ±0.1 | 25.7 | 27.8 | Yes |
| Bottom Temperature (°C) | 26.8 ±0.1 | 25.6 | 27.8 | Yes |
| Suface Salinity (psu) | 35.3 ±0.1 | 34.5 | 36.4 | Yes |
| Bottom_Salinity (psu) | 35.3 ±0.1 | 32.1 | 36.5 | Yes |
| Surface Dissolved Oxygen (mg/L) | 6.3 ±0.1 | 4.4 | 7.6 | No |
| Bottom Dissolved Oxygen (mg/L) | 6.4 ±0.1 | 4.4 | 8.2 | No |

psu, practical salinity unit

strata for bottom temperature (ChiSquare = 18.5413, $p$ = 0.0050), with the same strata (3, 5, and 6) having slightly higher temperatures. The mean surface salinity across the strata was 35.3 ± 0.1 psu (practical salinity unit); the mean salinity in the bottom water was also 35.3 ± 0.1 psu. A nonparametric comparison using the Kruskal-Wallis test, indicated a significant difference between strata for surface salinity (ChiSquare = 18.4786, $p$ = 0.0051), and that strata 4, 5, and 6 were slightly higher. Bottom salinity also varied by stratum (ChiSquare = 15.6558, $p$ = 0.0157), the salinity in Stratum 4 was slightly higher than in strata 2 and 3.

The mean dissolved oxygen (DO) level in the surface waters sampled in the STXEEMP strata was 6.3 ±0.1 mg/L, while the mean bottom dissolved oxygen was 6.4 ±0.1 mg/L (Table 4). A nonparametric comparison (Kruskal-Wallis) indicated no significant difference in the mean dissolved oxygen (DO) concentration between strata for surface (ChiSquare = 9.4302, $p$ = 0.1508) or the bottom (ChiSquare = 9.2633, $p$ = 0.1593). It should be noted that many of the sites sampled in the STXEEMP were fairly shallow. The average depth was 2.68 ± 0.25 meters.

The targeted sites could not be included in the statistical comparisons between strata, however, a comparison can be made between water quality in the strata versus water quality in the targeted sites. A comparison of random versus targeted sites using the Wilcoxon test indicated no significant differences for surface temperature (ChiSquare = 1.0952, $p$ = 0.2953) or bottom temperature (ChiSquare = 0.9377, $p$ = 0.3329), however, surface salinity (ChiSquare = 9.9100, $p$ = 0.0016) and bottom salinity (ChiSquare = 10.2082, $p$ = 0.0014) were slightly higher in the targeted sites. Dissolved oxygen in the surface waters (ChiSquare = 0.5162, $p$ = 0.4725) and in bottom waters (ChiSquare = 0.1729, $p$ = 0.6776) did not vary significantly between random and targeted sites.

Table 5. Summary of water quality parameters by stratum and in the targeted sites.

| | Stratum | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Targeted |
| Mean surface temperature (°C) | 26.3 ±0.0 | 26.5 ±0.1 | 27.0 ±0.1 | 26.9 ±0.1 | 27.3 ±0.1 | 27.0 ±0.1 | 26.8 ±0.4 | 27.0 ±0.2 |
| Mean bottom temperature (°C) | 26.3 ±0.0 | 26.4 ±0.1 | 27.0 ±0.2 | 26.9 ±0.1 | 27.4 ±0.1 | 27.0 ±0.1 | 26.4 ±0.0 | 26.9 ±0.2 |
| Mean surface salinity (psu) | 35.6 ±0.3 | 35.0 ±0.0 | 35.0 ±0.0 | 35.3 ±0.0 | 35.4 ±0.0 | 35.5 ±0.0 | 34.7 ±0.2 | 35.6 ±0.1 |
| Mean bottom salinity (psu) | 35.7 ±0.3 | 34.2 ±0.7 | 35.0 ±0.0 | 35.4 ±0.0 | 35.4 ±0.0 | 35.5 ±0.0 | 34.8 ±0.2 | 35.6 ±0.1 |
| Mean surface dissolved oxygen (mg/L) | 6.0 ±0.2 | 6.2 ±0.2 | 6.4 ±0.1 | 6.0 ±0.1 | 6.6 ±0.1 | 6.4 ±0.3 | 6.3 ±0.1 | 6.40 ±0.33 |
| Mean bottom dissolved oxygen (mg/L) | 5.9 ±0.2 | 6.4 ±0.2 | 6.7 ±0.1 | 6.3 ±0.4 | 6.8 ±0.1 | 6.5 ±0.4 | 6.3 ±0.1 | 6.52 ±0.38 |

psu, practical salinity unit

As noted earlier, the USVI has established water quality criteria for a number of parameters in accordance with the Clean Water Act. For dissolved oxygen (DO), the criteria for the STXEEMP (Class B waters) is 5.5 mg/L. The mean dissolved oxygen concentration in the strata and for the targeted sites (Tables 4 and 5) were all above this criteria, for both surface and bottom waters. At individual sites, however, dissolved oxygen dipped below the criteria, specifically at two targeted locations, Green Cay Marina (4.42 mg/L), and Cramers Park (5.41 mg/L) (Appendix A).

**Sediment Characteristics**

Table 6 contains a summary of the sediment parameters across the STXEEMP strata, and Table 7 contains a summary by stratum and targeted sites. Detailed information by site can be found in Appendix B. A quick look at Tables 6 and 7 show that sand dominated the grain size of sediments in all the strata. This can also be seen graphically in Figure 8. The mean sand fraction for all strata sites was 88.0 ±2.47 % (Table 6). Gravel was the second highest size class, accounting for less than 10% of the sediment composition across the strata. Stratum 4 had the highest mean sand concentration at 95.9 ±.0.7 %, followed closely by Stratum 5 with 95.7 ±.0.7 % (Table 7). A nonparametric Kruskal-Wallis test indicated that sand did not vary statis-

Table 6. Summary of sediment parameters across the strata in the STXEEMP.

| Parameter | Mean ±SE | Minimum | Maximum | Varied by Stratum? |
|---|---|---|---|---|
| Gravel (%) | 9.26 ±2.488 | 0 | 49.1 | No |
| Sand (%) | 88.0 ±2.47 | 49.4 | 98.5 | No |
| Silt (%) | 1.67 ±0.68 | 0 | 18.4 | Yes |
| Clay (%) | 1.05 ±0.20 | 0 | 5.01 | Yes |
| Total Organic Carbon (% TOC) | 4.37 ±0.23 | 1.52 | 6.65 | No |
| Total Inorganic Carbon (% TIC) | 5.98 ±0.23 | 3.58 | 8.65 | No |

tically (Chi-Square = 6.5252, $p$ = 0.3670) across the strata. In addition, a Wilcoxon test indicated that the sand fraction was significantly lower (ChiSquare = 4.7260, $p$ = 0.0297) in the targeted sites, meaning there were higher amounts of silts and clays compared to the random sites.

Table 7. Summary of sediment parameters by stratum and targeted sites in the STXEEMP.

| | Stratum | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Targeted |
| Gravel | 27.3 ±7.3 | 10.0 ±5.0 | 1.22 ±0.49 | 1.30 ±0.51 | 2.38 ±0.64 | 12.5 ±8.3 | 10.6 ±8.8 | 6.51 ±2.20 |
| Sand | 72.0 ±7.6 | 89.6 ±5.1 | 90.3 ±5.5 | 95.9 ±0.7 | 95.7 ±0.7 | 86.1 ±8.2 | 86.2 ±9.6 | 75.5 ±7.8 |
| Silt | 0.33 ±0.16 | 0.41 ±0.22 | 6.90 ±3.90 | 1.25 ±0.24 | 0.57 ±0.37 | 0.64 ±0.23 | 1.48 ±0.65 | 11.5 ±5.7 |
| Clay | 0.42 ±0.25 | 0.08 ±0.08 | 1.57 ±1.19 | 1.57 ±0.13 | 1.41 ±0.19 | 0.74 ±0.19 | 1.76 ±0.28 | 6.47 ±3.46 |
| TOC | 4.74 ±0.34 | 4.77 ±0.48 | 3.08 ±0.75 | 4.71 ±0.48 | 3.99 ±0.43 | 4.69 ±0.70 | 4.73 ±1.08 | 3.47 ±0.39 |
| TIC | 5.43 ±0.39 | 5.45 ±0.45 | 7.50 ±0.58 | 5.98 ±0.39 | 6.56 ±0.35 | 5.25 ±0.54 | 5.60 ±1.05 | 5.56 ±0.46 |

All values are %; TOC, total organic carbon; TIC, total inorganic carbon

TDI-Brooks, Inc., the laboratory that conducted the grain size analysis, indicated that the gravel component was actually shell hash, and that the sand component was smaller shell fragments. The grain size of a sediment influences the accumulation of chemical contaminants. Smaller grain sizes have proportionally higher surface areas for adsorption of chemical contaminants. This is particularly true for the silts and clays. In addition, silts have typically higher total organic carbon content or TOC, which binds organic (carbon-containing) contaminants. Sediments with higher silt content tend to bind organic contaminants to a greater degree than sediments containing high amounts of sand or gravel. Metals bind to sediments with higher clay content due to the charge structure on the surface of the clay particles. The mean silt content of the sediments collected in the STXEEMP strata was 1.67 ±.0.68 % (Table 6). A Kruskal-Wallis test indicated a significant (Chi Square = 14.4500, $p$ = 0.0250) difference between strata for silt, with Stratum 3 being significantly different (higher silt content) than a number of the other strata. The mean silt content in Stratum 3 was 6.90 ± 3.90 %. (Table 7). Looking at Figure 8, it can be seen that several random sites had elevated silt levels, including 3-3P (18.41%) and 3-1P (4.68%). Site 3-3P is adjacent to the Yacht Club targeted site. The targeted Yacht Club site had a similar silt content (19.91%).

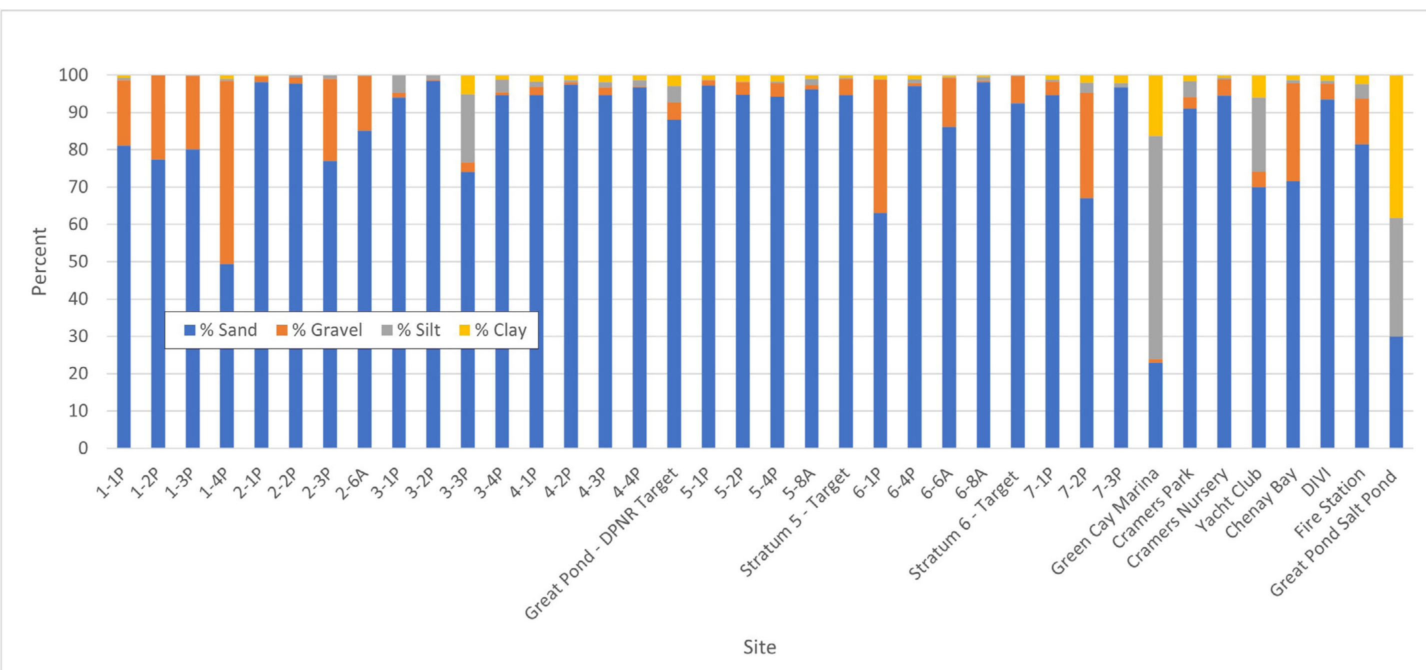

Figure 8. Grain size distribution in STXEEMP sediment samples.

The highest silt content for any of the sites sampled during the project was the Green Cay Marina site, the NCCOS targeted site, with a silt content of 59.85% (Figure 8 and Appendix B). The Green Cay Marina site is an enclosed embayment with a narrow entrance, and it seems likely that smaller grain size sediments would accumulate over time within this embayment. Silt content at another targeted site, Great Pond Salt Pond was 31.9%.

As noted, TOC is often correlated with the finer grain sizes like silts, particularly in estuaries. At the randomized sites in the STXEEMP, however, there was no correlation between TOC and % silt (Spearman Rho = -0.2695, $p$ = 0.1741) of the sediments. In addition, there was no significant correlation between TOC and % clay (Spearman Rho = -0.1828, $p$ = 0.3614) or the sum of silt plus clay (referred to as fines) and TOC (Spearman Rho = -0.2828, $p$ = 0.1529). TOC is typically associated with the smaller size fractions, particularly the silts. It is unclear why a significant relationship between TOC and grain size did not exist for the sediments. This lack of correlation was also seen in the St. Thomas East End Reserves or STEER (Pait *et al.*, 2013) Perhaps the organic carbon in these sediments is in a different form or is cycled differently than in estuarine and/or temperate areas.

### Polycyclic Aromatic Hydrocarbons (PAHs)

Results from the analysis of sediments for total PAHs are shown in Tables 8 and 9, and in Figure 9. Site by site and individual PAH data can be found in Appendix C.

The mean concentration of total PAHs in the sediments collected at the stratified random sites in the STXEEMP was 1.53 ± 0.20 ng/g (Table 8). The mean for total PAHs at the targeted sites in the STXEEMP was 33.0 ± 21.1 ng/g (Table 9). As can be seen from the standard error (21.1 ng/g), the variation in concentration of total PAHs was quite large among the targeted sites. Total PAHs in this report is the sum of the 64 PAHs measured (Table 2).

The concentrations of total PAHs, particularly in the stratified random sites, were low. The minimum concentration detected at the random sites was 0.57 ng/g at 2-2P; the maximum concentration at the stratified random sites was 4.61 ng/g (Table 8) at 3-4P (Appendix C). Table 9 also shows the mean total PAH concentrations by stratum. A Kruskal-Wallis nonparametric test indicated no differences in the concentration of total PAHs between strata (ChiSquare = 1.2910, p = 0.9722). Figure 9 shows that the three highest concentrations of total PAHs from this study were found at the targeted sites. The highest total PAH concentration found in the STXEEMP sediments was 220 ng/g at the Green Cay Marina, the NCCOS targeted site. The second highest was 111 ng/g at Great Pond Salt Pond, followed by the Fire Station site at 10.6 ng/g (Figure 9). Not surprisingly, a Wilcoxon test indicated that the targeted sites were significantly different (higher) (ChiSquare = 8.6746, $p$ = 0.0032) than the stratified random samples.

Table 8. Summary of organic contaminants at random sampling sites in the STXEEMP. Mean, minimum and maximum, and variation by stratum are included, along with available ERL and ERM values.

| Compound Class | Mean ±SE | Minimum | Maximum | Varied by Stratum? | ERL | ERM |
|---|---|---|---|---|---|---|
| Total PAHs | 1.53 ±0.20 | 0.6 | 4.61 | No | 4,022 | 44,792 |
| Total PCBs | 0 | 0 | 0.01 | No | 22.7 | 180 |
| Total DDT | 0 | 0 | 0 | No | 1.58 | 46.1 |
| Tributyltin (TBT) | 0.001 ±0.001 | 0 | 0.04 | No | – | – |

PAHs, polycyclic aromatic hydrocarbons; PCBs, polychlorinated biphenyls; DDT, dichlorodiphenyltrichloroethane; ERL, Effects-Range Low; ERM, Effects-Range Median; –, not available

A series of effects-based, numeric guidelines to estimate the toxicological relevance of certain sediment chemical contaminants were developed for NOAA (Long *et al.*, 1998). These guidelines, the Effects Range-Low (ERL) and the Effects Range-Median (ERM) define sediment contaminant concentration ranges that are rarely (<ERL), occasionally (ERL to ERM), or frequently (>ERM) associated with toxic effects in aquatic biota (NOAA, 1998). The ERL and ERM values for total PAHs are also shown in Table 8. The ERL for total PAHs is 4,022 ng/g. Total PAHs in the sediments sampled in both the stratified random sites and the targeted sites were far below both the ERL and ERM, indicating that effects from the concentrations of PAHs found in the sediments during this project were unlikely.

A number of studies have been conducted in the USVI and Puerto Rico by NCCOS, and the results from these studies can be compared to what was found in the STXEEMP. In the Salt River Bay National Historical Park and Ecological Preserve (SARI), the mean total PAH concentration was 124.2 ng/g (Pait *et al.*, 2020). In the St. Thomas East End Reserves or STEER, the mean concentration of total PAHs in the sediments was 142 ±58 ng/g (Pait *et al.*, 2013). In Coral Bay in St. John, Whitall *et al.* (2014) detected a mean total PAH concentration of 31.7 ng/g. In southwest Puerto Rico in the La Parguera area, the mean concentration of total PAHs was 80.6 ng/g (Pait *et al.*, 2007).

The mean total PAH concentration found in the STXEEMP sediments was the lowest found in any of the NCCOS studies in the area, both for the stratified random sites, and the STXEEMP targeted sites. The lower levels of silt and clays and correspondingly higher levels of sand in the sediments in the STXEEMP, likely contributed to overall lower levels of total PAHs. In addition, the land bordering the STXEEMP is predominantly undeveloped, and less likely to contribute substantial amounts of PAHs. While there are a series of dirt and paved roads in the STXEEMP, the contribution from vehicles to the total PAH levels in the sediment appeared negligible. As will be seen, the low levels of total PAHs found in the STXEEMP sediments were repeated for a number of the other contaminant classes.

Table 9. Mean concentrations of organic contaminants in sediments from the STXEEMP. Table includes concentrations of organic contaminants by stratum and in the targeted sites.

| | Stratum | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Targeted |
| Total PAHs | 1.26 ±0.35 | 1.83 ±0.67 | 2.28 ±0.94 | 1.12 ±0.14 | 1.13 ±0.14 | 1.20 ±0.18 | 2.01 ±0.86 | 33.0 ±21.1 |
| Total PCBs | 0 | 0 | 0 | 0 | 0.00 | 0 | 0.00 | 0.06 ±0.0.06 |
| Total DDT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| Tributyltin | 0 | 0 | 0.01±0.01 | 0 | 0 | 0 | 0 | 0.018±0.013 |
| Total PBDEs | – | – | – | – | – | – | – | 3.89 ±3.56 |
| Total PFAS | – | – | – | – | – | – | – | 0.34 ±0.09 |

PAHs, polycyclic aromatic hydrocarbons; DDT, dichlorodiphenyltrichloroethane; PCBs, polychlorinated biphenyls; PBDEs, polybrominated diphenyl ethers; Total PFAS is the sum of the 28 compounds analyzed; –, not analyzed

Alkylated PAHs (Appendix D) were also analyzed in the sediment samples for this project. The presence of alkylated (e.g., containing methyl groups) PAHs has been used to assess petrogenic (uncombusted) versus pyrogenic (combusted) sources (Colombo *et al*., 1989). Alkylated PAHs are more abundant in raw and refined petroleum products than in combusted materials. From the analysis of the sediment samples in the STXEEMP, the Green Cay Marina site (234 ng/g) (Appendix D), along with Great Pond Salt Pond (106

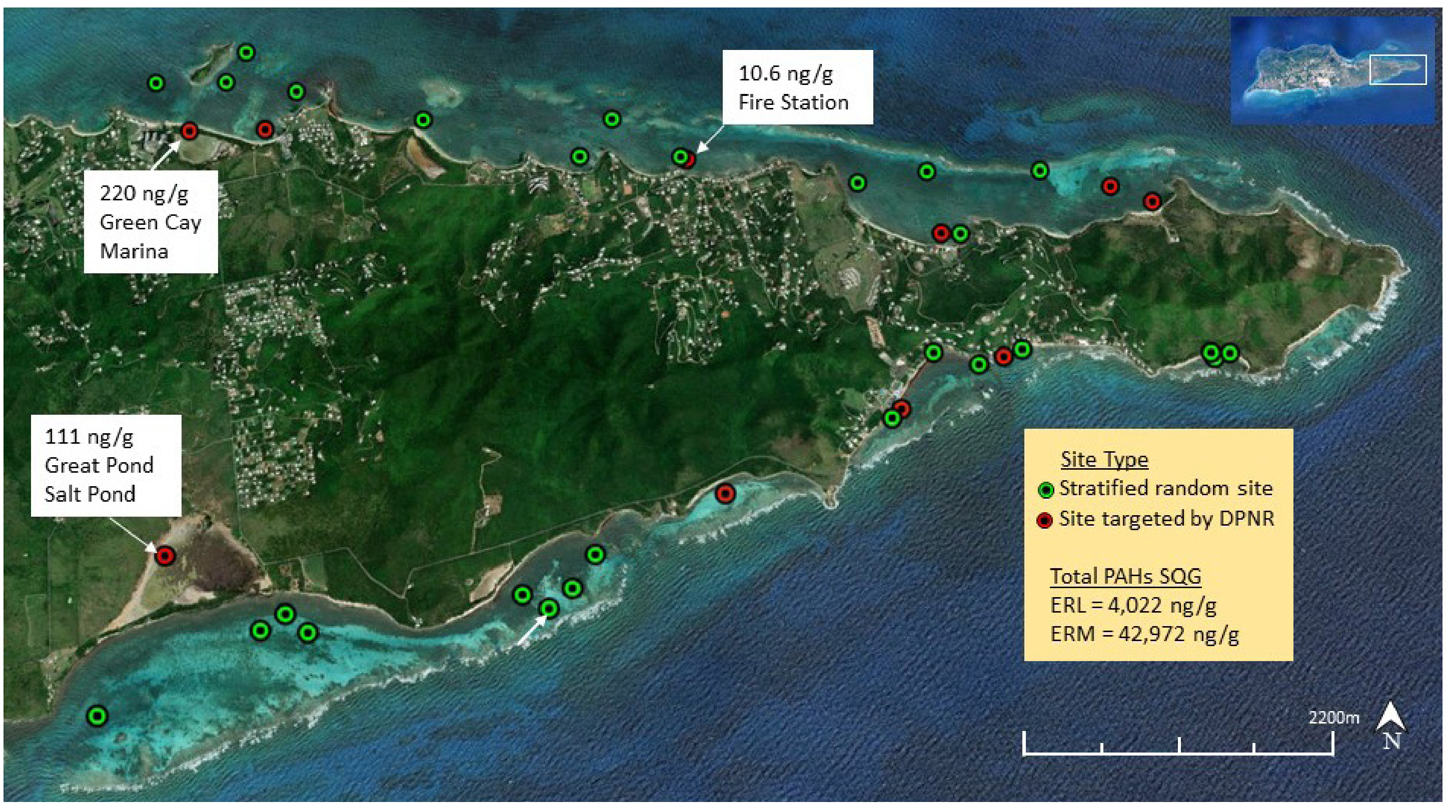

Figure 9. Total PAHs in sediments sampled from the STXEEMP.

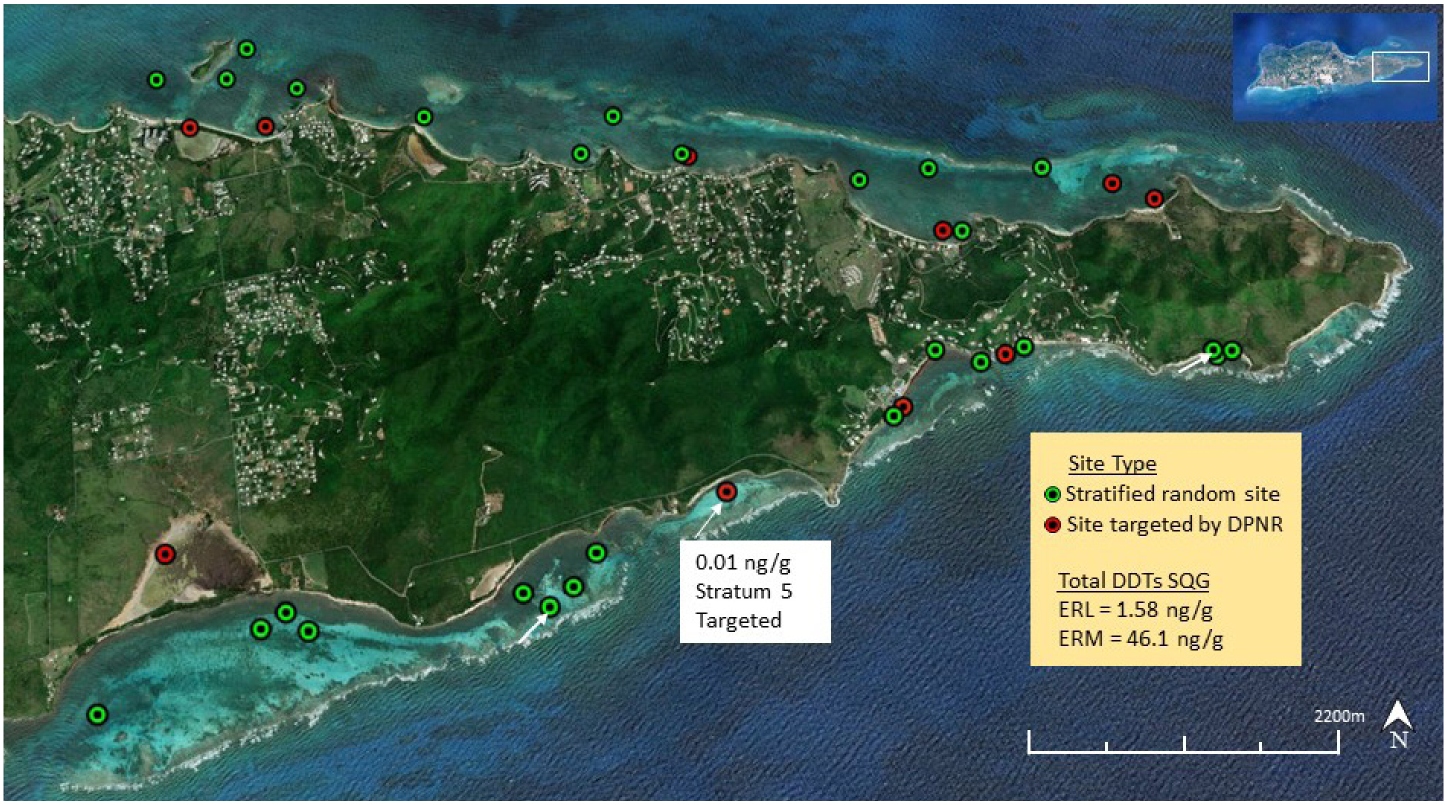

Figure 10. Total DDTs detected in sediments sampled from the STXEEMP.

ng/g), had somewhat elevated levels of the alkylated PAHs. In particular, the C29 and C30 hopanes were elevated at these sites, and could be related to the use and discharge of fuels (Huang *et al*., 1994; Volkman *et al*., 1992), or lubricating oils. Some of the other sites, particularly the targeted sites had detectable concentrations of other alkylated PAHs, but those concentrations were all less than 10 ng/g.

The Limetree Bay petroleum refinery, formerly HOVENSA, is approximately 10 km west of the STXEEMP. The refinery started operations in 1965, but as of the writing of this report, is currently closed. In 2021, two incidents resulted in the aerial discharge of oil droplets that affected surrounding communities, and led to the closure of the facility (EPA, 2021). The prevailing winds on St. Croix are from the east and northeast, which would tend to carry aerial concentrations of PAHs that originated from the refinery away from the STXEEMP. In addition, the longshore water currents appear to be in an east to west direction, which would also tend to carry discharges that may have occurred from the refinery, away from the STXEEMP. Although the refinery operated for at least 50 years in an area not that far from the STXEEMP, there is little evidence of PAH contamination in the sediments in the STXEEMP that could be linked to the refinery operations In Stratum 4, closest the refinery, concentrations of total PAHs and alkylated PAHs were all less than 5 ng/g.

**Organochlorine Pesticides**

A total of 33 organochlorine pesticides were analyzed in the sediments from the STXEEMP (Appendix E). Only one site, a targeted site, had a detectable concentration of any of the organochlorine pesticides analyzed. That site, the Stratum 5 site targeted by DPNR (Figure 10), had a concentration of 0.01 ng/g of 4,4'-DDE, a metabolite of the banned insecticide DDT. The ERL and ERM for total DDT (Figure 10), which is the sum of the parent compound and metabolites, are far above the concentration found in the STXEEMP sediments, indicating that effects from DDT were unlikely. In addition, the organochlorine insecticide endrin was detected in the sediment sample from this site at a concentration of 0.04 ng/g. Endrin was used to control insects and rodents, on agricultural crops, and cotton seeds, and was banned in the US in 1984. An ERL or ERM have not been established for endrin.

**Polychlorinated Biphenyls (PCBs)**

The results from the analysis of PCBs in sediments collected from the STXEEMP can be seen in Tables 8 and 9, and in Figure 11. Detailed results from the analysis of each sample for PCBs can be found in Appendix F. Overall, the concentrations of total PCBs in the sediments were very low. At the stratified random sites, 93 percent of the sediment samples had no detectable concentration of total PCBs. The mean total PCBs concentration at the stratified random sites was only 0.0007 ng/g; at the targeted sites,

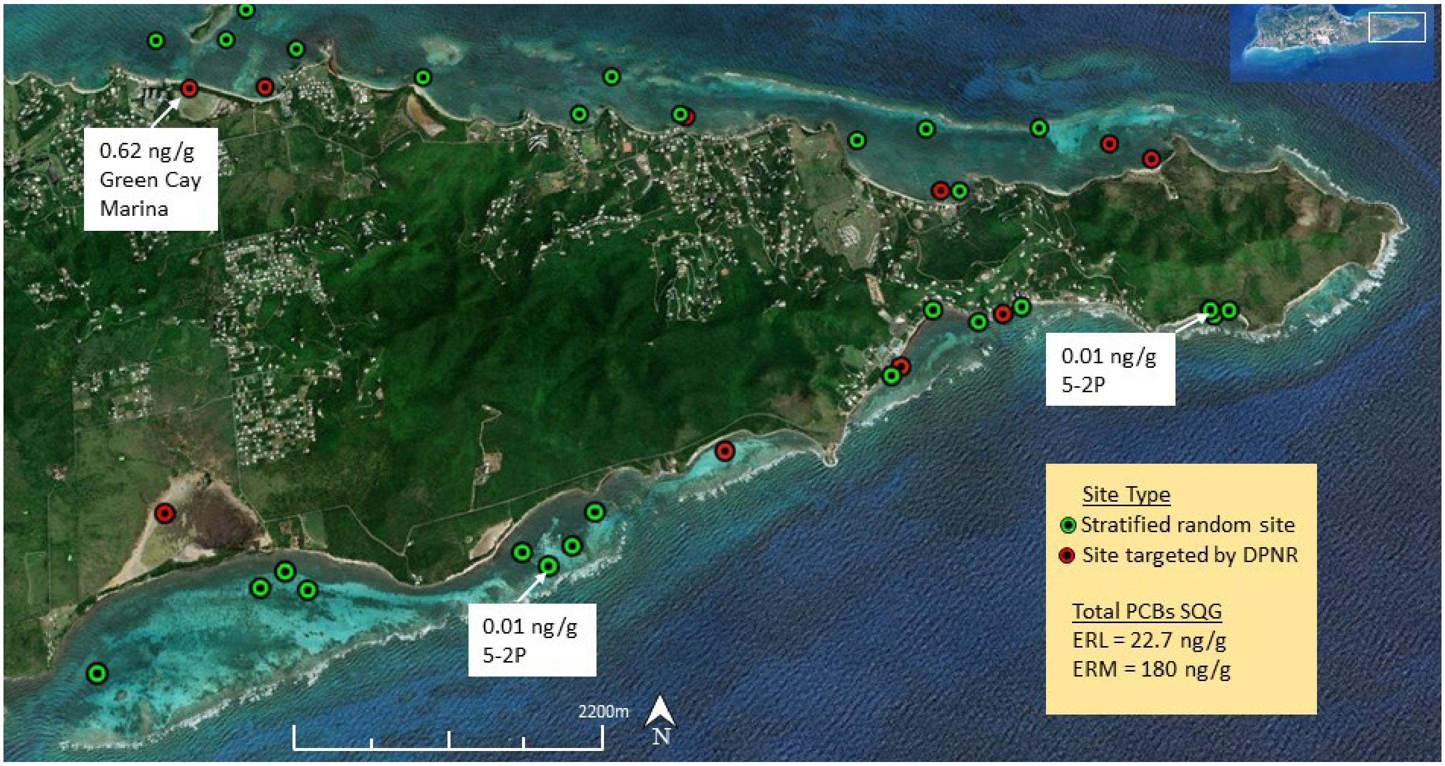

Figure 11. Total PCBs detected in sediments sampled from the STXEEMP.

the mean total PCBs concentration was 0.056 ng/g. The highest concentration detected at the stratified random sites was 0.01 ng/g (Appendix F). Only one of the targeted sites had a measurable total PCBs concentration. That site was Green Cay Marina, and the concentration was less than 1 ppb (0.62 ng/g). Because of the low number of detections of total PCBs, no statistical tests could be run.

ERL and ERM values have been developed for total PCBs (Table 8). When detected, the concentrations of total PCBs in the sediments from the STXEEMP were far below the ERL and ERM, indicating that effects from PCBs in the sediments were unlikely. As noted earlier, a second NCCOS project was conducted in the STXEEMP, to assess chemical contaminants in fish. While the sediments had low levels of PAHs and PCBs, the project to assess chemical contaminants in fish from the STXEEMP is being used to assess the presence of chemical contaminants in another matrix, in this case biota in the STXEEMP. Because the high levels of sand from the STXEEMP make it less likely that sediments will accumulate organic contaminants, the fish tissue will provide the means to better assess whether chemical contaminants are low in the STXEEMP, or if the sediments are not accumulating organic contaminants that may be present in this environment.

Other NCCOS work in the USVI and Puerto Rico has shown variability in the concentration of total PCBs in sediments. In the SARI, the mean concentration of total PCBs in the sediments was 3.63 ±.1.77 ng/g (Pait *et al.*, 2020). In the STEER in St. Thomas, Pait *et al.* (2013) detected a mean total PCB concentration of 1 ng/g. In Coral Bay, Whitall *et al*. (2014) detected a mean total PCBs concentration of 0.68 ng/g, higher than the mean in the STXEEMP. In southwest Puerto Rico, Pait *et al.* (2007) detected a mean total PCBs concentration outside of Guanica Bay of 18.2 ng/g. Inside Guanica Bay, however, concentrations as high as 2,710 ng/g were detected, and were likely the result of past industrial activities along the shore of Guanica Bay. The mean total PCBs concentration in the STXEEMP sediments, like total PAHs, was the lowest for any of the studies conducted by NCCOS in the region.

**Tributyltin**

The results from the analysis of TBT in the sediment samples can be seen in Tables 8 and 9, and in Appendix G. Tributyltin or TBT was the key ingredient in a very effective antifoulant paint formulation for boat hulls, that was banned for use in the US beginning in 1989, due to impacts on nontarget organisms. The mean concentration of TBT in the sediments from the strata was very low, only 0.001 ng Sn/g. In the targeted sites, the mean TBT concentration was 0.018 ng Sn/g. The highest concentration of TBT found in the strata was 0.04 Sn/g (Table 8) at Site 3-3P, near the Yacht Club targeted site in Teague Bay (Figure 5). Unfortunately, an ERL and ERM have not been established for TBT.

Table 10. Mean concentrations of trace and major elements from the STXEEMP. Mean, minimum and maximum for trace and major elements at stratified random sampling sites (n = 27), variation by stratum and available ERL and ERM values.

| Element | Mean ±SE | Minimum | Maximum | Varied by Stratum? | ERL | ERM |
|---|---|---|---|---|---|---|
| Aluminum (Al) | 2,226 ±477 | 195 | 9,800 | No | NA | NA |
| Antimony (Sb) | 0.05 ±0.01 | 0 | 0.21 | No | NA | NA |
| Arsenic (As) | 2.47 ±0.14 | 0.85 | 4.05 | No | 8.2 | 70 |
| Cadmium (Cd) | 0 | 0 | 0 | No | 1.2 | 9.6 |
| Chromium (Cr) | 10.7 ±0.91 | 5.58 | 29.2 | No | 81 | 370 |
| Copper (Cu) | 0.42 ±0.20 | 0 | 3.52 | No | 34 | 270 |
| Iron (Fe) | 1,181 ±219 | 121 | 4,520 | No | NA | NA |
| Lead (Pb) | 0.41 ±0.09 | 0 | 1.60 | Yes | 46.7 | 218 |
| Manganese (Mn) | 33.8 ±4.39 | 9.71 | 102 | No | NA | NA |
| Mercury (Hg) | 0 | 0 | 0.01 | No | 0.15 | 0.71 |
| Nickel (Ni) | 6.21 ±0.27 | 4.50 | 9.94 | No | 20.9 | 51.6 |
| Selenium (Se) | 0 | 0 | 0 | No | NA | NA |
| Silicon (Si) | 10,300 ±2,320 | 1100 | 49,300 | No | NA | NA |
| Silver (Ag) | 0.12 ±0.07 | 0 | 1.26 | No | 1 | 3.7 |
| Tin (Sn) | 0.16 ±0.03 | 0 | 0.50 | Yes | NA | NA |
| Zinc (Zn) | 2.64 ±0.46 | 0.74 | 9.64 | No | 150 | 410 |

ERL, Effects-Range Low; ERM, Effects-Range Median; NA, not available or not applicable.

Ninety-six percent of sediment samples from the stratified random sites had no detectable TBT at all. For the DPNR targeted sites, 80 percent of the sediment samples had no detectable TBT. The highest TBT concentration found in the targeted sites was 0.13 ng Sn/g at the Yacht Club site. Unfortunately, there wasn't enough sediment available in the sample from the NCCOS targeted site, Green Cay Marina, for butyltin analysis. While a comparison of TBT between strata was not possible, a comparison between the stratified random and the targeted sites could be carried out. A Wilcoxon nonparametric test, however, indicated no significant differences (ChiSquare = 2.7602, $p = 0.0966$) between the stratified random sites and the targeted sites for TBT.

TBT degrades to dibutyltin, monobutyltin and finally to elemental tin. Seventy four percent of the sediment samples contained no measurable monobutyltin. The stratified random site with the highest monobutyltin concentration was 3-3P, with a monobutyltin concentration of 0.82 ng Sn/g. The targeted Yacht Club site had a monobutyltin concentration of 1.09 ng Sn/g

NOAA's NCCOS has assessed TBT in a number of areas in the USVI. In the SARI, the mean concentration of TBT in the sediments was 4.56 ±2.07 ng Sn/g. In Coral Bay in St. John, Whitall *et al*. (2014) detected a mean TBT concentration of 1.01 ng Sn/g. In the STEER in St. Thomas, the mean TBT concentration in the sediments was 1.85 ± 1.30 ng Sn/g. As can be seen from the standard error, there was a substantial amount of variation in the concentration of TBT in the STEER. A follow up study in the STEER by Hartwell *et al*. (2017a) found highly elevated levels of TBT in sediment cores taken adjacent to marina areas. Concentrations exceeding 5,000 ng Sn/g were found in the deeper sections of the cores taken in the Benner Bay area of the STEER. As with total PAHs and total PCBs, the mean concentration of TBT in the stratified random and targeted sites in the STXEEMP was lower than the means found in the other studies conducted by NCCOS in the region.

**Major and Trace Elements**

Mean values, along with the minimum and maximum concentrations of the major and trace elements detected in the sediments from the stratified random sites in the STXEEMP, can be seen in Tables 10 and 11, and in Figure 12. Detailed results can be found in Appendix H. Note that the units for major and trace elements are in ppm (µg/g), as opposed to ppb (ng/g) the units for organic contaminants. Not surprisingly, the major crustal elements, silicon, aluminum, and iron had the highest concentrations in the sediments.

Other than the major crustal elements, the concentrations of the trace elements were low in the stratified random sites. A Kruskal-Wallis nonparametric test indicated few differences in concentrations between strata. Lead (ChiSquare

Table 11. Mean concentrations of trace and major elements analyzed by stratum. Mean concentrations by stratum and in the targeted sites in the STXEEMP.

| | Stratum | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Element | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Targeted |
| Aluminum (Al) | 2,968 ±1,295 | 3,333 ±1,475 | 1,905 ±1,275 | 1,031 ±257 | 445 ±43 | 3,811 ±2,178 | 2,047 ±133 | 15,559 ±4851 |
| Antimony (Sb) | 0.14±0.01 | 0.07±0.04 | 0.03±0.03 | 0.09±0.05 | 0 | 0 | 0.04±0.04 | 0.15±0.03 |
| Arsenic (As) | 2.91 ±0.11 | 2.79 ±0.69 | 2.75 ±0.47 | 1.93 ±0.07 | 2.32 ±0.31 | 2.25 ±0.21 | 2.32 ±0.19 | 3.95 ±0.72 |
| Cadmium (Cd) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chromium (Cr) | 9.11 ±1.69 | 9.89 ±1.76 | 10.1 ±1.57 | 12.5 ±0.25 | 7.83 ±0.67 | 11.1 ±2.46 | 15.8 ±6.70 | 25.1 ±7.31 |
| Copper (Cu) | 0.15±0.15 | 0.91±0.78 | 0.78±0.78 | 0 | 0 | 0.99±0.85 | 0 | 39.8 ±30.8 |
| Iron (Fe) | 1,694 ±632 | 1,459 ±583 | 950 ±632 | 580 ±97.1 | 335 ±20.9 | 1,989 ±963 | 1,289±185 | 8,757 ±2,995 |
| Lead (Pb) | 0.86±0.07 | 1.04±0.20 | 0.52±0.19 | 0 | 0 | 0.23±0.23 | 0.18±0.18 | 2.38±1.11 |
| Manganese (Mn) | 41.8 ±14.3 | 37.7 ±11.1 | 27.1 ±11.2 | 22.6 ±3.83 | 17.6 ±0.50 | 54.8 ±18.5 | 35.4 ±2.49 | 141 ±39.4 |
| Mercury (Hg) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.01 ±0.00 |
| Nickel (Ni) | 6.71 ±0.40 | 6.73 ±0.63 | 5.82 ±0.86 | 5.50 ±0.27 | 5.03 ±0.11 | 7.08 ±1.29 | 6.74 ±0.26 | 13.3 ±3.81 |
| Selenium (Se) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.10 ±0.10 |
| Silicon (Si) | 12,250 ±4790 | 18,870 ±6,740 | 8,895 ±6,030 | 3,848 ±990 | 1,575 ±185 | 18,120 ±11,040 | 7,953 ±523 | 65,040 ±18,700 |
| Silver (Ag) | 0.24±0.24 | 0.32±0.32 | 0.03±0.03 | 0 | 0 | 0 | 0.31±0.31 | 0.02±0.01 |
| Tin (Sn) | 0.36±0.05 | 0.31±0.06 | 0.06±0.06 | 0.15±0.09 | 0.07±0.07 | 0 | 0.17±0.08 | 0.54±0.37 |
| Zinc (Zn) | 2.88 ±0.50 | 3.15 ±1.03 | 3.02 ±1.97 | 1.16 ±0.11 | 0.97 ±0.04 | 4.17 ±1.97 | 3.30 ±0.83 | 31.3 ±18.4 |

= 17.8149, $p$ = 0.0067), and tin (ChiSquare = 14.9942, $p$ = 0.0203) were higher in stratum 1 and 2 than in the other strata (Table 10). There were no detections of cadmium, mercury, or selenium in any of the samples from the strata. Below is a summary of some of the individual trace elements.

Chromium was detected in all the stratified random sites. The mean concentration was 10.7 ±0.91 µg/g (Table 10). The highest concentration of chromium was 29.2 µg/g (Appendix H), and occurred in Stratum 7. There were no differences in the concentration of chromium between strata (ChiSquare = 6.3849, $p$ = 0.3815).

Chromium was also detected in all the targeted sites (Appendix H). The mean chromium concentration in the targeted sites was 25.1 ±7.31 µg/g (Table 11). The highest chromium concentration was 85.2 µg/g, at the Green Cay Marina site (Figure 12). This concentration exceeded the chromium ERL of 81 µg/g, but was below the ERM (Table 10). A Wilcoxon nonparametric test indicated the targeted sites had significantly higher (ChiSquare = 6.3044, $p$ = 0.0120) levels of chromium than the stratified random sites.

In the SARI, Pait *et al*. (2020) detected a mean chromium concentration in the sediments of 18.5 ±1.60 µg/g, slightly higher than in the STXEEMP stratified random sites, but

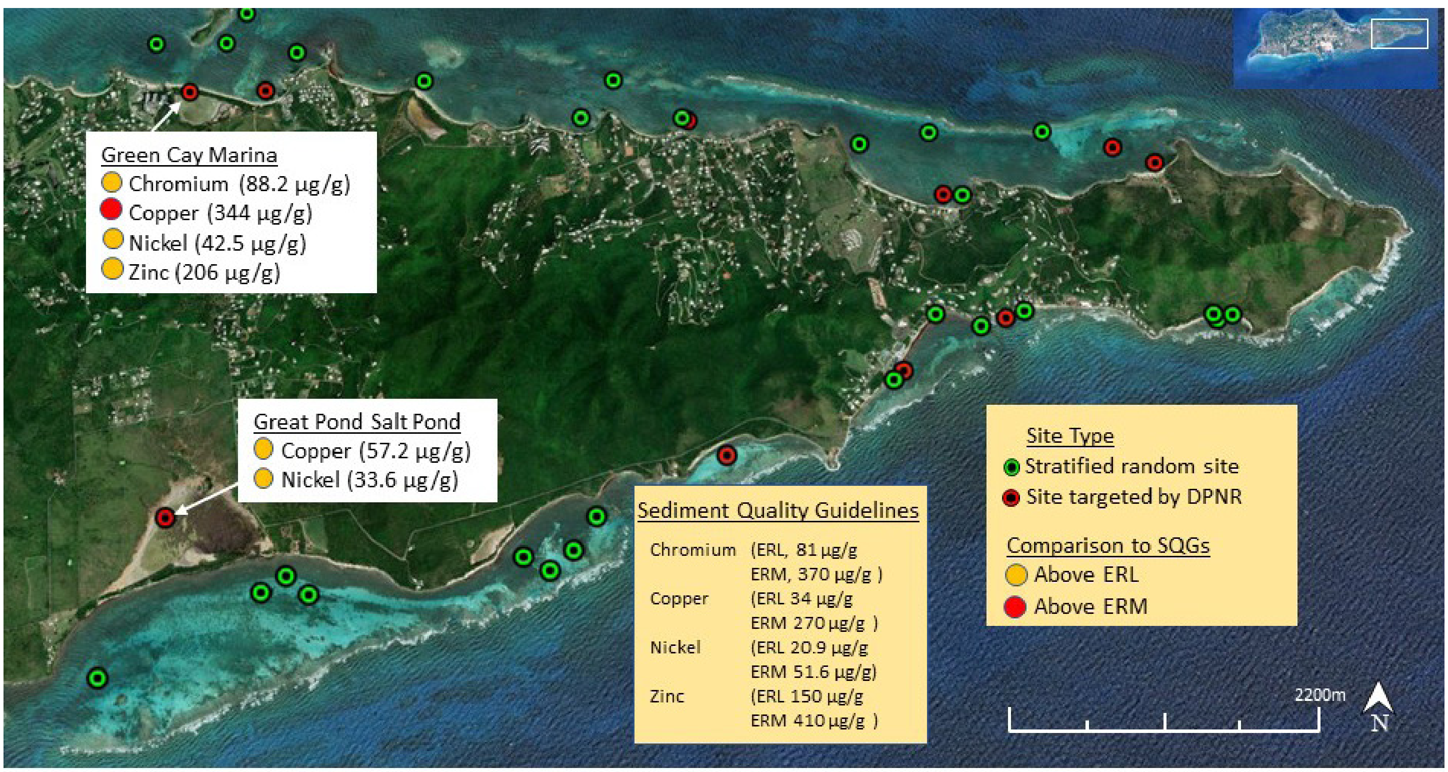

Figure 12. Trace elements detected in sediments sampled from the STXEEMP.

lower than in the targeted sites. In the STEER, Pait e*t al.* (2013) detected a mean chromium concentration of 14.1 ±1.76 µg/g. In Coral Bay, Whitall *et al.* (2014) detected a mean chromium concentration of 10.9 µg/g, very close to the mean in the STXEEMP stratified random samples.

In southwest Puerto Rico, Pait *et al.* (2007) detected a mean chromium concentration outside of Guanica Bay of 12.4 ± 1.29 µg/g. Inside Guanica Bay, however, concentrations as high as 440 µg/g were detected, and may have been related to industrial activities that took place in the area in the past.

While the mean chromium concentration at the stratified random sites in the STXEEMP was lower than in the other NCCOS studies, the mean chromium concentration at the targeted sites (25.1 ng/g) was higher than the mean found in the other NCCOS studies.

Copper was detected in six of the 27 stratified random sites (Appendix H). The mean concentration of copper in the stratified random sites was 0.42 ±0.20 µg/g (Table 10). The highest copper concentration detected in the stratified random sites was 3.52 µg/g at site 6-8A (Figure 5) on the south shore. There was no significant difference (ChiSquare = 6.3877, $p$ = 0.3812) in the concentration of copper between the strata.

In the targeted sites, the mean copper concentration was 39.8 ±30.8 µg/g (Table 11). A Wilcoxon test indicated a significant (ChiSquare = 12.7588, $p$ = 0.0004) difference in the concentration of copper between the targeted and stratified random sites, with the targeted sites having an overall higher concentration. The highest concentration of copper detected at the targeted sites was at the Green Cay Marina, with a concentration of 344 µg/g (Figure 12, Appendix H). The second highest concentration of copper at the targeted sites was 57.2 µg/g at Great Pond Salt Pond, the inland pond adjacent to Great Pond Bay (Figure 5). The ERL for copper is 34 µg/g, the ERM is 270 µg/g. The concentration of copper in the sediment at Great Pond Salt Pond, was above the concentration (ERL) at which effects begin to occur in benthic infauna (organisms inhabiting the sediment) from copper exposure. At Green Cay Marina, the concentration of copper exceeded the ERM, indicating that toxic effects were likely on benthic infaunal organisms inhabiting this site. It is perhaps not surprising that the highest copper concentration was found in the sample from Green Cay Marina. Copper has been used for years as a component in antifoulant paints for boats.

In the SARI, Pait *et al*. (2020) detected a mean copper concentration of 58.2 ±16.4 µg/g, higher than the mean concentration at both the stratified random and the targeted sites in the STXEEMP. In the STEER in St. Thomas, Pait *et al*. (2013) detected a mean copper concentration of 21 ±7.46 µg/g. In Coral Bay, Whitall *et al.* (2014) detected a mean copper concentration of 8.79 µg/g, lower than the mean concentration in the targeted samples collected from the STXEEMP. In southwest Puerto Rico, Pait *et al.* (2007) detected a mean copper concentration of 5.21 ± 2.02 µg/g.

From these results, it appears the mean concentration of copper at the STXEEMP stratified random sites were substantially lower than in the other NCCOS studies in the USVI and Puerto Rico, while the concentration of copper from the targeted sites were similar to what was found in the other NCCOS studies.

The mean concentration of nickel in the sediments from the stratified random sites in the STXEEMP was 6.21 ± 0.27 µg/g. The maximum found at these sites was 9.94 µg/g (Site 6-8A). There were no significant differences (ChiSquare = 8.6230, $p$ = 0.1959) in the concentration of nickel between the strata. The highest concentration of nickel at the targeted sites, like copper, was at the Green Cay Marina, with a concentration of 42.5 µg/g, followed closely by Great Pond Salt Pond (33.6 µg/g).

The ERL for nickel is 20.9 µg/g. The highest concentration of nickel found at the stratified random sites (9.94 µg/g) in the STXEEMP was below the ERL, indicating that effects on biota from the concentrations found at these sites would be unlikely. The highest concentration of nickel at the targeted sites (42.5 µg/g), was above the ERL, indicating that sensitive species could begin to be impacted at this concentration.

The highest concentration of tin found in the sediments from the STXEEMP was at the Green Cay Marina targeted site, with a concentration of 4.15 µg/g. All of the other sites (stratified random and targeted) were less than 1 ug/g. As noted earlier, tributyltin degrades over time to dibutyltin, monobutyltin, and then finally to elemental tin. It's possible that the higher level of elemental tin found in the sediments in Green Cay Marina could be due in part, to TBT that was present at one time in the sediments that ultimately degraded to elemental tin. There is no ERL or ERM for tin.

The results of the analysis of zinc in sediments from the STXEEMP can be seen in Tables 10 and 11, and in Figure 12. Zinc has a number of uses in boating-related activities including use in anodes to protect engines and rudders, in antifoulant paint formulations, in brass, and zinc is also used in the manufacture of tires. The mean concentration

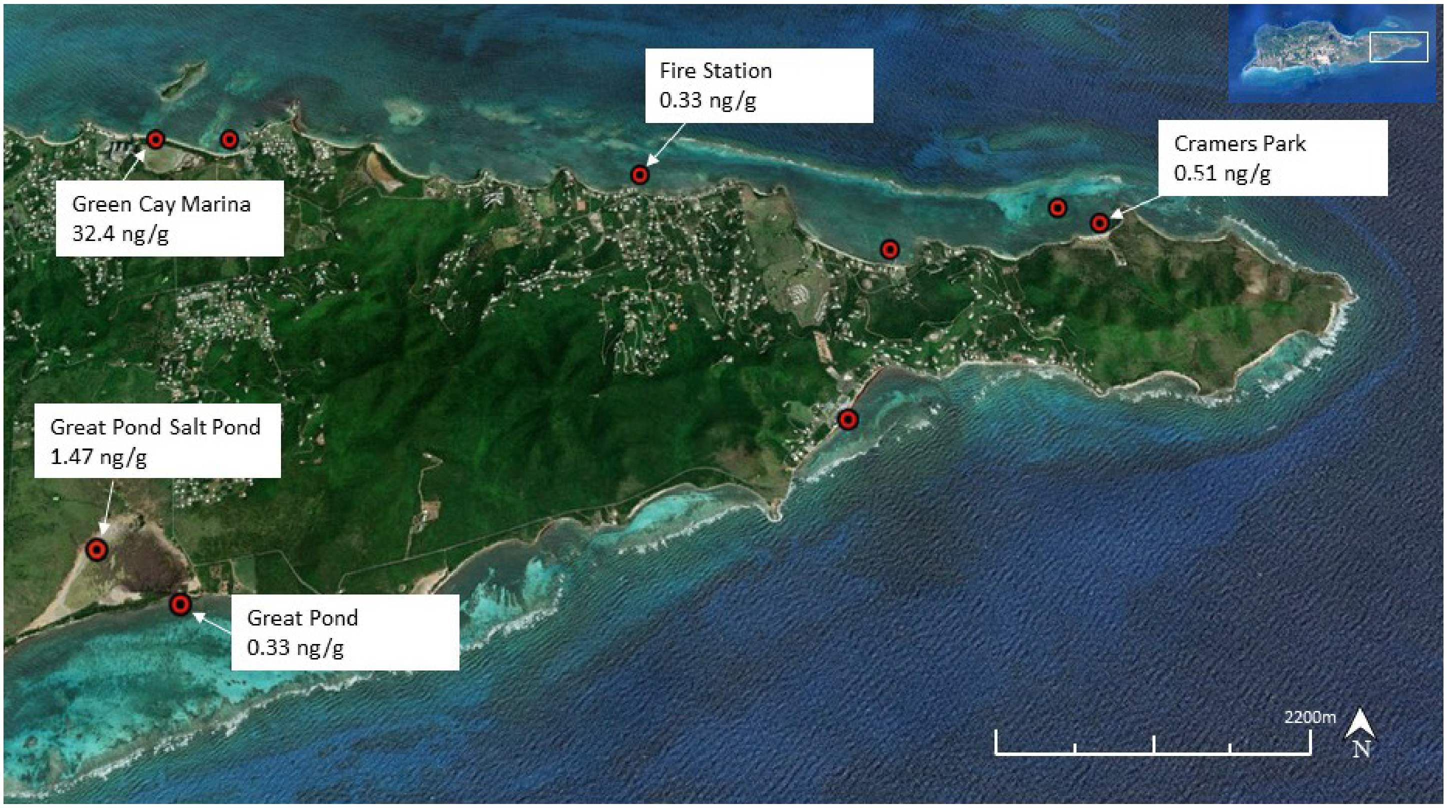


Figure 13. Total PBDEs detected in the targeted sites in the STXEEMP.

of zinc from the stratified random sites was 2.64 ±0.46 µg/g. The highest concentration of zinc found in the stratified random sites was at Site 6-8A, at 9.64 µg/g (Appendix H). The highest concentration of zinc in the targeted sites was 206 µg/g at Green Cay Marina.

An analysis of the variation of zinc between strata (Kruskal-Wallis nonparametric test), indicated no significant difference (ChiSquare = 11.8310, $p = 0.06581$). A Wilcoxon test was conducted to assess/compare the differences between the zinc concentration at the stratified random sites and the targeted sites indicated a significant (ChiSquare = 18.2995, $p = 0.0040$) difference, with the targeted sites having an overall higher zinc concentration.

The ERL for zinc is 150 µg/g, the ERM is 410 µg/g. The concentrations of zinc at all the stratified random sites were below the zinc ERL. The concentration of zinc at the Green Cay Marina (206 µg/g) targeted site, was above the zinc ERL, indicating that more sensitive benthic infaunal organisms could begin to be affected by that concentration of zinc. Higher levels of zinc have been shown to impact the functioning of gills in a number of aquatic organisms (Lall and Kaushik, 2021).

**Polybrominated Diphenyl Ethers (PBDEs)**

PBDEs were one of two classes of emerging contaminants analyzed at some of the targeted sites for this project. The results of the analysis can be seen in Table 9, and in Figure 13. More detailed information can be seen in Appendix I. For both PBDEs and PFAS emerging contaminants, nine targeted sites were analyzed. Stratum 5 and 6 DPNR targeted sites were not analyzed for these contaminants. Of the sites analyzed, only two had PBDE concentrations above 1 ng/g total PBDEs, Great Pond Salt Pond and the NCCOS targeted site Green Cay Marina. The concentration of total PBDEs at Great Pond Salt Pond was 1.47 ng/g, while the concentration of total PBDEs in the sediment sample from Green Cay Marina was 32.38 ng/g (Appendix I). At both sites, the concentrations of the penta and octa PBDEs, which were voluntarily withdrawn from production in 2004 (Herbstman and Mall, 2014), were less than 1 ng/g.

At the Green Cay Marina, the concentration of the decaBDE (PBDE-209) was 20.82 ng/g. The decaBDE has been used in a number applications, including as a fire retardant in televisions, monitors and electronics. There are no ERLs or ERMs for total PBDEs or individual PBDEs. However, Canada has established Federal Environmental Quality Guidelines for PBDEs, and for decaBDE the guideline to protect aquatic life is 19 ng/g (Environment Canada, 2013). At 20.82 ng/g the concentration of decaBDE in the sediment sample from the Green Cay Marina site was slightly above this guideline. Overall, however, the concentrations of PBDEs found at the sites analyzed in the STXEEMP were low.

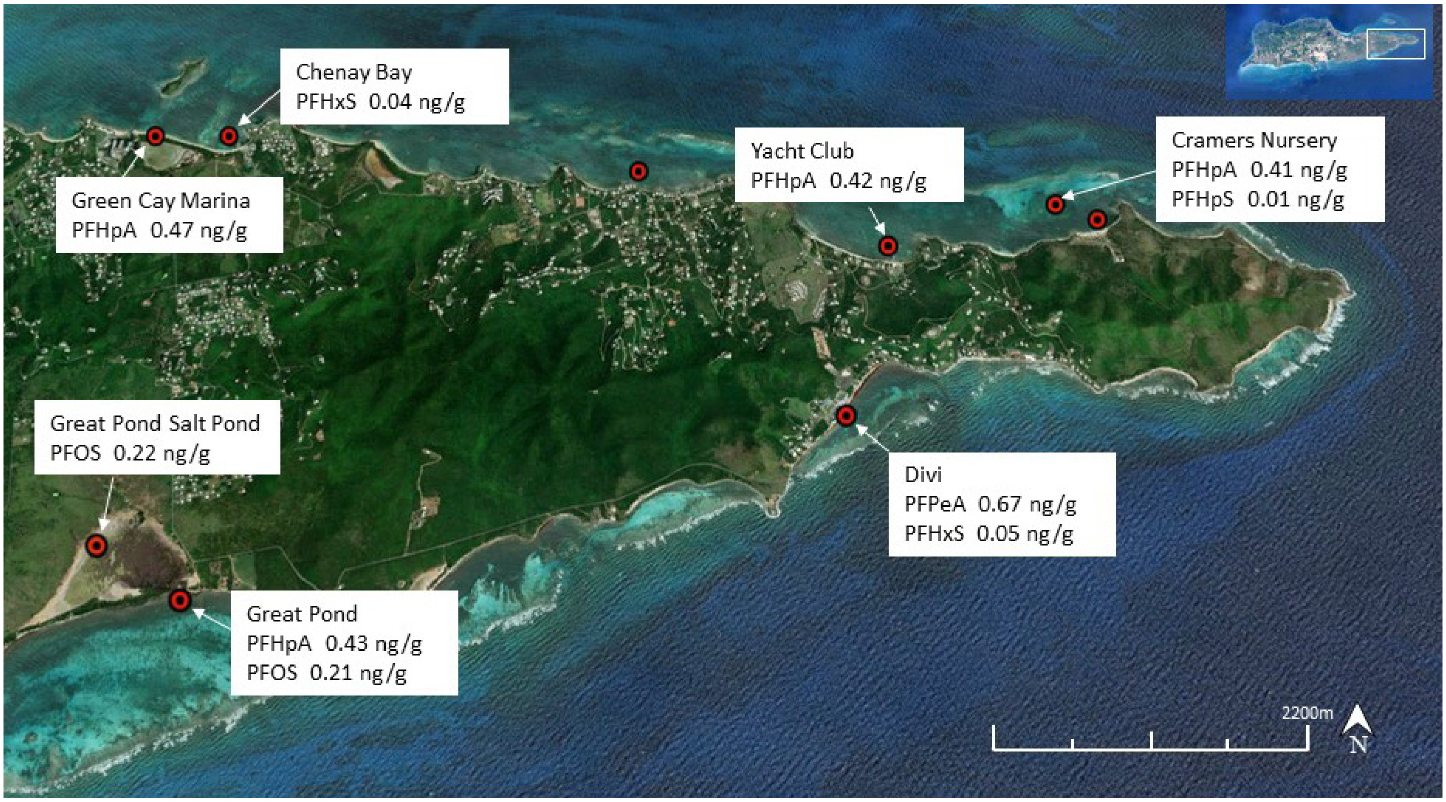


Figure 14. PFAS detected in the targeted sites in the STXEEMP.

**Per- and Polyfluoroalkyl Substances (PFAS)**
The results from the analysis of PFAS can be seen in Table 9 and in Figure 14. Detailed results for each PFAS compound for the sites analyzed can be found in Appendix J. The totals for the PFAS compounds analyzed was less than 1 ng/g (Appendix J). Currently, there is no ERL or ERM for total PFAS or for any of the individual PFAS compounds. Figure 14 highlights the sites where PFAS compounds were found in the sediments, along with the concentrations. The highest concentration of any PFAS compound was PFPeA (perfluoro-n-pentanoic acid) at a concentration of 0.67 ng/g at the Divi site (Figure 14). PFPeA has been identified as a breakdown product in stain resistant coatings, and grease proof coatings on food packaging. Another PFAS compound, PFHpA (perfluoroheptanoic acid) was found at a concentration of around 0.4 ng/g at a number of sites including Green Cay Marina, Great Pond, Yacht Club, and Cramers Nursery (Figure 14 and Appendix J). PFHpA has uses similar to PFPeA. At Great Pond and at Great Pond Salt Pond, PFOS was found at a concentration of approximately 0.2 ng/g. PFOS was a key ingredient in stain resistant coatings such as Scotchgard® produced by 3M. PFOS was phased out of production and use in the US beginning in 2002.

***Clostridium perfringens***
This anaerobic, gram-positive staining rod-shaped bacteria frequently occurs in the intestines of humans, as well as in domestic and wild animals, and has been used as a sewage indicator. There were a few elevated levels of *C. perfringens* in the sediments from the STXEEMP (Appendix K). The mean concentration of *C. perfringens* in the samples from the stratified random sites was 40.20 CFU/g. In the targeted areas where *C. perfringens* was analyzed, the mean was 61.6 CFU/g. The highest concentration was found in the sediments from the Green Cay Marina, with a concentration of 868 CFU/g (Appendix K). In the SARI, the mean concentration of *C. perfringens* was substantially higher, 1,608 CFU/g (Pait *et al*., 2020). The mean concentration in the STEER was also higher (291 CFU/g) (Pait *et al.*, 2013). There do not appear to be any sediment quality guidelines for *C. perfringens*. C. *perfringens* is a common cause of food-borne illnesses. A more severe form of the disease can be fatal, and results from ingesting large numbers of the active bacteria, typically from food.

**Sea Urchin Development Assay**
The results from the sea urchin development assay using *Lytechinus variegatus* can be seen in Figure 15. In this assay, porewater, which is the water that occurs in the spaces between sediment particles, is extracted and then exposed to the sea urchin embryos for a period of 48 hours. After that time, embryo development stage along with any developmental abnormalities are scored.

It can be seen in Figure 15 that sea urchin development was either arrested or the embryos were underdeveloped or malformed in all the samples, indicating the sediment extracts were toxic to the sea urchin embryos. In most of the samples, development of the sea urchin embryos was totally arrested. The ASW (artificial seawater) and the SDS (sodium dodecyl sulfate) were the negative and positive controls, respectively run as part of the assays.

In preparation for the toxicity test, a series of water quality measurements (Table 12) of the sediment were made, including salinity, dissolved oxygen (DO), and pH. Total ammonia nitrogen and unionized ammonia were also quantified in the sediment samples, prior to running the test. Ammonia exists in two forms, $NH_3$ which is unionized ammonia, and $NH_4^+$, which is referred to as ionized ammonia or ammonium. The sum of these two forms is total ammonia nitrogen or TAN. $NH_3$ or unionized ammonia is the principal form of toxic ammonia, and is shown as UAN in Table 12. The NCCOS laboratory in Charleston, SC that conducted the assays indicated that concentrations of ammonia nitrogen ($NH_3$-N) above the LOEC (lowest observable effect concentration of 149 µg/L) for abnormal development (Balthis *et al.* 2018), were observed in *L. variegatus*. In addition, the US Environmental Protection Agency (EPA, 1989) established a seawater chronic (4-day average) ammonia (UAN) criterion of <35 µg/L). Samples with ammonia values that were above the EPA chronic criterion are highlighted in red.

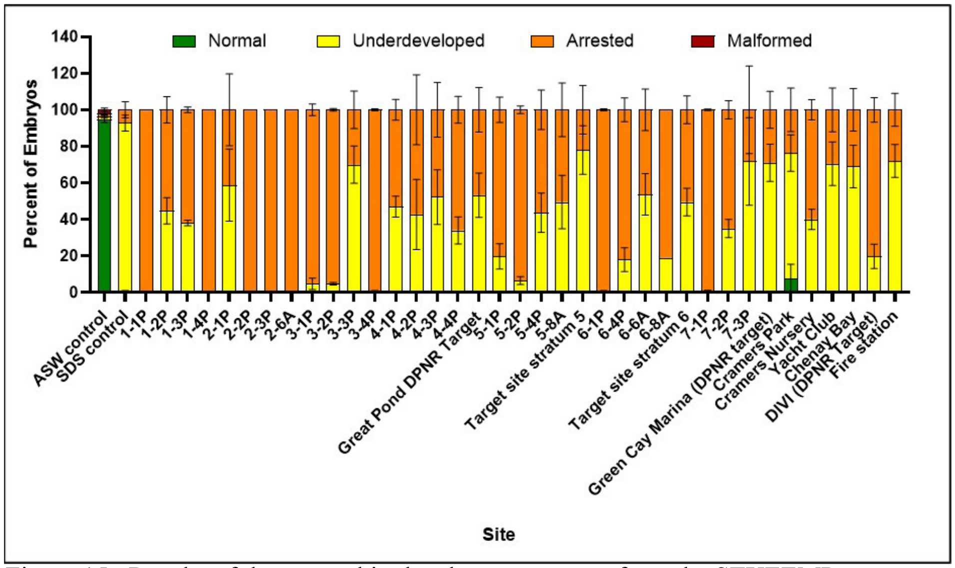

Figure 15. Results of the sea urchin development assays from the STXEEMP.

While the concentration of dissolved oxygen and the pH of the samples were within the normal range, the concentration of the UAN was elevated in nearly 60 percent of the samples. The NCCOS laboratory in Charleston, SC indicated that the ammonia present may have contributed to the toxicity observed. Additional work would be needed to assess why there were higher levels of ammonia, and why the sites with lower ammonia levels also showed either arrested development or underdevelopment in the sea urchin embryos. For the other sites, however, that had lower levels of ammonia present, it is not clear why there was arrested development or underdevelopment.

Table 12. Water quality measurements made in the sediments for the sea urchin development assay.

| Site/Treatment | Salinity (ppt) | pH | TAN (mg/L) | UAN (µg/L) |
|---|---|---|---|---|
| 1-1P | 35 | 7.86 | <MDL | - |
| 1-2P | 37 | 7.91 | 2.645 | 103 |
| 1-3P | 37 | 7.97 | 1.714 | 76 |
| 1-4P | 36 | 7.82 | 0.567 | 18 |
| 2-1P | 35 | 8.09 | 1.247 | 72 |
| 2-2P | 37 | 7.99 | 1.134 | 53 |
| 2-3P | 35 | 7.82 | <MDL | - |
| 2-6P | 37 | 7.83 | 0.331 | 11 |
| 3-1P | 37 | 7.95 | 0.547 | 23 |
| 3-2P | 36 | 8.03 | 1.421 | 72 |
| 3-3P | 36 | 8.07 | 2.355 | 130 |
| 3-4P | 36 | 8.07 | 0.353 | 20 |
| 4-1P | 37 | 7.83 | 0.995 | 32 |
| 4-2P | 37 | 7.89 | 1.476 | 55 |
| 4-3P | 36 | 8.21 | 2.027 | **152** |
| 4-4P | 36 | 7.92 | 1.91 | 76 |
| Great Pond (DPNR Target) | 37 | 8.11 | 4.039 | **244** |
| 5-1P | 37 | 7.89 | 0.476 | 18 |
| 5-2P | 37 | 7.83 | 0.454 | 15 |
| 5-4P | 36 | 7.93 | 3.015 | 123 |
| 5-8A | 37 | 7.98 | 1.702 | 77 |
| Target site stratum 5 (DPNR Target) | 36 | 7.94 | 3.383 | 141 |
| 6-1P | 35 | 7.88 | 0.038 | 1 |
| 6-4P | 37 | 7.92 | 1.128 | 45 |
| 6-6A | 37 | 7.92 | 2.347 | 93 |
| 6-8A | 37 | 7.92 | 0.193 | 8 |
| Target site stratum 6 (DPNR Target) | 35 | 7.89 | 2.215 | 82 |
| 7-1P | 37 | 7.89 | 0.24 | 9 |
| 7-2P | 37 | 7.95 | 0.402 | 17 |
| 7-3P | 37 | 8.17 | 1.729 | 119 |
| Green Cay Marina (NCCOS Target) | 35 | 8.13 | 3.286 | **207** |
| Cramers Park (DPNR Target) | 36 | 7.92 | 1.719 | 68 |
| Cramers Nursery (DPNR Target) | 37 | 7.89 | 1.555 | 58 |
| Yacht Club (DPNR Target) | 36 | 8.03 | 1.894 | 96 |
| Chenay Bay (DPNR Target) | 37 | 7.9 | 2.04 | 78 |
| DIVI (DPNR Target) | 37 | 7.78 | 0.884 | 26 |
| Fire Station (DPNR Target) | 37 | 7.82 | 0.603 | 19 |
| ASW | 36 | 8.56 | 0.1 | 15 |
| SDS, 4 mg/L | 36 | 8.55 | 0.072 | 11 |

Samples with ammonia values above the EPA chronic criterion are shown in red text. Samples above the lowest observable effect concentration (LOEC) of 149 ug/L are in bold.
Abbreviations: DO, dissolved oxygen; ppt, parts per thousand; TAN, total ammonia nitrogen; UAN, unioinzed ammonia; ASW, artificial seawater; SDS, sodium dodecyl sulfate; MDL minimum detectable limit.

**P450 Toxicity Assay**
The results from the P450 toxicity assay are in Table 13. The P450 assay responds to the presence of contaminants like PAHs, PCBs, furans, and dioxins in sediment extracts. The results are given in TCDD (2,3,7,8-tetrachlorodibenzodioxin) equivalents (ng TCDD/g).

From Table 13, it can be seen that all the equivalent concentrations of TCDD were less than one. The highest TCDD equivalent concentration was 0.25 ng/g, found in Stratum 7 at site 7-3P. In comparison, Traven *et al.* (2008) carried out a P450 assay on sediments from Croatia on the Adriatic Sea, and also analyzed the sediments for organic chemical contaminants. Areas sampled included a harbor, bulk cargo shipyard terminal, and an area adjacent to a petroleum processing facility. TCDD equivalents in these areas ranged from 19 - 132 ng/g, substantially above those found in the STXEEMP.

Overall, the results from the P450 toxicity assay indicate that concentrations of compounds like PCBs, PAHs, furans, dioxins and planar PCBs which can stimulate P450 production, were low in the sediment samples from the STXEEMP. This is in line with the results of the chemical contaminant analysis in the sediments, which showed low levels of organic (carbon-containing) chemical contaminants analyzed in the sediments.

Table 13. Results of P450 assays in sediments from the STXEEMP.

| Site | Collection Date | Sample Type | AhR BEQ (TCDD ng/g) |
|---|---|---|---|
| 1-1P | 3/11/2021 | Sediment grab | 0.09 |
| 1-2P | 3/11/2021 | Sediment grab | < 0.05 |
| 1-3P | 3/11/2021 | Sediment grab | < 0.05 |
| 1-4P | 3/11/2021 | Sediment grab | < 0.05 |
| 2-1P | 3/12/2021 | Sediment grab | DNQ |
| 2-2P | 3/12/2021 | Sediment grab | 0.05 |
| 2-3P | 3/12/2021 | Sediment grab | 0.06 |
| 2-6A | 3/12/2021 | Sediment grab | 0.06 |
| 3-1P | 3/12/2021 | Sediment grab | < 0.05 |
| 3-2P | 3/12/2021 | Sediment grab | < 0.05 |
| 3-3P | 3/12/2021 | Sediment grab | 0.16 |
| 3-4P | 3/12/2021 | Sediment grab | < 0.05 |
| 4-1P | 3/24/2021 | Sediment grab | < 0.05 |
| 4-2P | 3/24/2021 | Sediment grab | < 0.05 |
| 4-3P | 3/24/2021 | Sediment grab | 0.06 |
| 4-4P | 3/24/2021 | Sediment grab | DNQ |
| Great Pond - DPNR Target | 3/25/2021 | Sediment grab | 0.06 |
| 5-1P | 3/24/2021 | Sediment grab | 0.05 |
| 5-2P | 3/24/2021 | Sediment grab | 0.05 |
| 5-4P | 3/24/2021 | Sediment grab | 0.06 |
| 5-8A | 3/24/2021 | Sediment grab | < 0.05 |
| Stratum 5 - DPNR Target | 5/28/2021 | Sediment grab | < 0.05 |
| 6-1P | 5/28/2021 | Sediment grab | 0.12 |
| 6-4P | 5/28/2021 | Sediment grab | < 0.05 |
| 6-6A | 5/28/2021 | Sediment grab | 0.08 |
| 6-8A | 3/25/2021 | Sediment grab | 0.06 |
| Stratum 6 - DPNR Target | 5/28/2021 | Sediment grab | 0.07 |
| 7-1P | 3/23/2021 | Sediment grab | DNQ |
| 7-2P | 3/23/2021 | Sediment grab | 0.06 |
| 7-3P | 3/23/2021 | Sediment grab | 0.25 |
| Green Cay Marina - NCCOS Target | 3/26/2021 | Sediment grab | DNQ |
| Cramers Park - DPNR Target | 3/26/2021 | Sediment grab | 0.07 |
| Cramers Nursery - DPNR Target | 3/26/2021 | Sediment grab | DNQ |
| Yacht Club - DPNR Target | 3/26/2021 | Sediment grab | 0.05 |
| Chenay Bay - DPNR Target | 3/26/2021 | Sediment grab | < 0.05 |
| DIVI - DPNR Target | 3/26/2021 | Sediment grab | < 0.05 |
| Fire Station - DPNR Target | 3/26/2021 | Sediment grab | 0.1 |
| Great Pond Salt Pond - DPNR Target | 5/28/2021 | Sediment grab | 0.06 |

Abbreviation: DNQ, did not quantify due to matrix/solvent interferences.

**Benthic Infaunal Analysis**
A total of 1,831 organisms were enumerated, including 1,375 from the stratified random sites, and 456 organisms from the targeted sites, and were comprised of 195 taxa (species or higher taxonomic level) (Appendix L).

Annelids (segmented worms) accounted for 42 percent of the taxa in the stratified random sites (Table 14), and dominated the targeted sites accounting with nearly 77 percent of taxa (Table 15). Arthropods and mollusks accounted for 26 and 13 percent in the stratified random sites, respectively (Table 14). In the targeted sites, arthropods and molluscs accounted for 7.5 and 4 percent, respectively (Table 15). A Wilcoxon test indicated that annelids were significantly (ChiSquare = 8.9600, $p = 0.0028$) higher in the targeted sites compared to the stratified random sites.

Roughly 15 taxa in the stratified random sites accounted for 50 percent of the abundance of the benthic infauna (Figure 16). In the targeted sites, six species accounted for 50 percent of the organisms living in the sediments at these sites (Figure 17).

Table 14. Percent abundance of major taxonomic groups in the STXEEMP random sites.

| Site | Annelida | Arthropoda | Mollusca | Other Taxa |
|---|---|---|---|---|
| 1-1P | 73.3 | 16.7 | 10.0 | 0.0 |
| 1-2P | 7.1 | 21.4 | 7.1 | 64.3 |
| l-3P | 10.0 | 50.0 | 30.0 | 10.0 |
| 1-4P | 59.0 | 7.7 | 9.0 | 24.4 |
| Mean | 37.4 | 24.0 | 14.0 | 24.7 |
| | | | | |
| 2-1P | 0.0 | 0.0 | 0.0 | 100.0 |
| 2-2P | 22.9 | 51.4 | 25.7 | 0.0 |
| 2-3P | 27.8 | 57.4 | 13.0 | 1.9 |
| 2-6A | 7.1 | 0.0 | 14.3 | 78.6 |
| Mean | 14.5 | 27.2 | 13.3 | 45.1 |
| | | | | |
| 3-1P | 16.7 | 21.4 | 54.8 | 7.1 |
| 3-2P | 14.3 | 78.6 | 0.0 | 7.1 |
| 3-3P | 64.2 | 7.5 | 7.5 | 20.9 |
| 3-4P | 10.3 | 24.1 | 58.6 | 6.9 |
| Mean | 26.4 | 32.9 | 30.2 | 10.5 |
| | | | | |
| 4-1P | 44.7 | 46.7 | 5.3 | 3.3 |
| 4-2P | 35.3 | 47.1 | 17.6 | 0.0 |
| 4-3P | 51.1 | 22.7 | 15.9 | 10.2 |
| 4-4P | 33.3 | 0.0 | 44.4 | 22.2 |
| Mean | 41.1 | 29.1 | 20.8 | 8.9 |
| | | | | |
| 5-1P | 66.7 | 8.3 | 16.7 | 8.3 |
| 5-2P | 76.2 | 14.3 | 0.0 | 9.5 |
| 5-4P | 81.0 | 6.9 | 1.7 | 10.3 |
| 5-8A | 0.0 | 0.0 | 0.0 | 100.0 |
| Mean | 56.0 | 7.4 | 4.6 | 32.0 |
| | | | | |
| 6-1P | 48.6 | 48.6 | 0.0 | 2.9 |
| 6-4P | 80.0 | 6.7 | 6.7 | 6.7 |
| 6-6A | 96.6 | 2.3 | 1.1 | 0.0 |
| 6-8A | 100.0 | 0.0 | 0.0 | 0.0 |
| Mean | 81.3 | 14.4 | 2.0 | 2.4 |
| | | | | |
| 7-1P | 32.0 | 64.6 | I.I | 2.2 |
| 7-2P | 63.2 | 25.6 | 4.5 | 6.8 |
| 7-3P | 19.0 | 81.0 | 0.0 | 0.0 |
| Mean | 38.1 | 57.1 | 1.9 | 3 |
| Overall Random Means | 42.2 | 26.3 | 13.2 | 18.7 |

Tables 16 and 17 contain summaries of the benthic infaunal parameters measured in the stratified random and targeted sites in the STXEEMP. The average abundance (number of individuals) in the stratified random sites showed some variation, with Stratum 5 having the lowest mean abundance at 23 organisms (Table 16). The highest abundance at a stratified random site was at 7-1P with 178 organisms. The lowest was at 5-8A, with only one organism present. A Kruskal-Wallis test, however, indicated no significant (ChiSquare = 5.9957, $p$ = 0.4237) difference in the abundance of benthic infaunal organisms between strata. A comparison of abundance was also made between the stratified random and targeted sites. A Wilcoxon test indicated no significant (ChiSquare = 0.1685, $p$ = 0.6814) difference in the abundance of benthic infaunal organisms between stratified random and targeted sites.

The mean taxa richness (number of species) in the stratified random sites was 16 (Table 16). Stratum 7 had the highest mean taxa richness with 34. The lowest mean taxa richness in the stratified random sites was 8.8 in Stratum 6, interestingly adjacent to the stratum with the highest taxa richness.

The lowest taxa richness value found in a stratified random site was at site 5-8A, which recorded only one species, the same site that had the lowest abundance. Although there appeared to be some variation in taxa richness between strata, there was no significant difference in taxa richness between strata (ChiSquare = 4.5350, $p$ = 0.6047).

The mean taxa richness in the targeted sites was 14 (Table 17). The lowest taxa richness was at Green Cay Marina with three species. A Wilcoxon test indicated no significant difference (ChiSquare = 0.1419, $p$ = 0.7064) between the stratified random sites and the targeted sites in terms of taxa richness. A significant and positive correlation (Spearman Rho = 0.7144, $p < 0.0001$) was found between abundance and taxa richness in the stratified random sites, indicating that as the number of individuals increased, the number of species also tended to increase.

Table 15. Percent abundance of major taxonomic groups in the STXEEMP targeted sites.

| Targeted Sites | Annelida | Arthropoda | Mollusca | Other Taxa |
|---|---|---|---|---|
| Green Cay Marina | 100.0 | 0.0 | 0.0 | 0.0 |
| Chenay Bay | 91.7 | 8.3 | 0.0 | 0.0 |
| Fire Station and Dump | 84.3 | 7.9 | 1.1 | 6.7 |
| Yacht Club | 85.5 | 8.2 | 5.0 | 1.3 |
| Cramers Nursery | 80.0 | 20.0 | 0.0 | 0.0 |
| Cramers Park | 72.0 | 4.0 | 16.0 | 8.0 |
| Great Pond Bay | 90.0 | 0.0 | 9.5 | 0.0 |
| Stratum 5 Targeted Site | 66.7 | 0.0 | 0.0 | 33.3 |
| Divi Hotel and Casino | 58.3 | 26.7 | 8.3 | 6.7 |
| Stratum 6 Targeted Site | 37.5 | 0.0 | 0.0 | 62.5 |
| Mean | 76.6 | 7.5 | 4.0 | 11.9 |

Several authors have investigated pollution tolerant species. Authors including Lenihan and Micheli (2001) and Llansó e*t al.*(2002) noted that several types of polychaetes, such as the Capitellids, and some members of the Naididae family (formerly oligochaete tubificids), are considered to be tolerant of contamination and/or other stressful conditions, including low oxygen levels. Harlan (2008) published a review on using polychaetes of the family Capitellidae, as indicator species for marine pollution. Members of the *Capitella capitata* species complex, are often dominant in areas with high organic material, and members of the Naididae family (oligochaete worms) are highly resistant to lower oxygen levels and higher organic pollution levels.

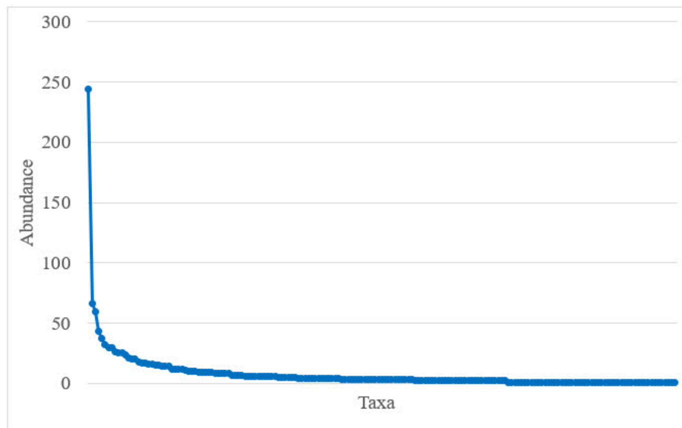


Figure 16. Plot of total abundance of each taxa at the stratified random sites in the STXEEMP. Each point represents the abundance of each individual taxa collected.

In Stratum 6, *Capitella capitata* accounted for approximately 80 percent of the organisms present in the sediment, which could indicate higher levels of organic materials in the sediment. As noted above, however, there were no differences between the strata in terms of taxa richness.

Naididae oligochaete worms were also present in a number of strata and in the targeted sites. In Stratum 4, Naididae accounted for 13 percent of the organisms; in Stratum 5, Naididae accounted for approximately 14 percent. In the targeted sites, Naididae accounted for approximately 36 percent of the organisms in the sediment from the Fire Station and Dump targeted site. In the sediment sample from the Green Cay Marina targeted site, Naididae worms dominated, accounting for 92 percent of the organisms in the sediment sample. From this, it appears that a number of strata had sites where stressful conditions (perhaps lower oxygen levels in the sediments) favored Naididae tubificids.

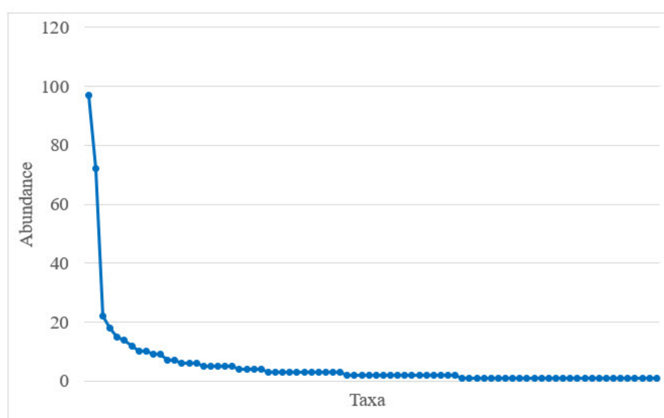


Figure 17. Plot of total abundance of each taxa at the targeted sites in the STXEEMP. Each point represents the abundance of each individual taxa collected.

The density of organisms (individuals/m$^2$) at each site is also included in Tables 16 and 17. Stratum 7 had the highest, with a mean density of 2,767 per square meter

(Table 16). The highest density for any site was in the same stratum at Site 7-1P on the south side of the STXEEMP. This site also had the third highest taxa richness (42 species), and included members of the Leptocheliidae family (malacostracan arthropods). There were however, no significant differences (ChiSquare = 5.9957, $p = 0.4237$ between strata in terms of density of organisms.

In the targeted sites, the Yacht Club site had the highest density of organisms with 3,975/m$^2$ (Table 17), however the majority (85.5%) were annelids. A Wilcoxon test indicated no significant difference (ChiSquare = 0.1685, $p = 0.6814$) between the stratified random sites and the targeted sites in terms of density.

Diversity (H' or Shannon-Wiener index) or biodiversity, has two components; the number of species present (taxa richness), and the relative abundance of those species. The Shannon-Wiener index integrates both parameters. From Table 16, it can be seen that the lowest diversity values occurred in Stratum 6, with a value of 1.25. The highest diversity occurred in Stratum 7, with a diversity score of 2.92 (Table 16). The stratified random site with the highest diversity score (3.59) was 4-1P in the Salt Pond stratum. The stratified random site with the lowest diversity was Site 5-8A, with only one organism present. A Kruskal-Wallis test, however, indicated no significant (ChiSquare = 5.7670, $p = 0.4498$) differences in diversity between the strata.

In the targeted sites, the highest diversity was at the Yacht Club

Table 16. Summary of benthic assemblage parameters for the STXEEMP random sites.

| Random Sites | Abundance (# of individuals) | Taxa Richness (# of species) | Density numbers/m$^2$ | Diversity (H') | Evenness (J') |
|---|---|---|---|---|---|
| | | Stratum 1 | | | |
| 1-1P | 30 | 14 | 750 | 2.29 | 0.87 |
| l-2P | 14 | 4 | 350 | 0.99 | 0.71 |
| l-3P | 10 | 9 | 250 | 2.16 | 0.98 |
| l-4P | 78 | 24 | 1,950 | 2.33 | 0.73 |
| Mean | 33 | 12.8 | 825 | 1.95 | 0.83 |
| SD | 31 | 8.5 | 781 | 0.64 | 0.13 |
| | | Stratum 2 | | | |
| 2-1P | 2 | 2 | 50 | 0.69 | 1 |
| 2-2P | 35 | 21 | 875 | 2.8 | 0.92 |
| 2-3P | 54 | 17 | 1,350 | 2.53 | 0.89 |
| 2-6A | 14 | 5 | 350 | 0.99 | 0.62 |
| Mean | 26 | 11.3 | 656 | 1.76 | 0.86 |
| SD | 23 | 9.2 | 575 | 1.07 | 0.17 |
| | | Stratum 3 | | | |
| 3-1P | 42 | 24 | 1,050 | 2.91 | 0.92 |
| 3-2P | 13 | 4 | 325 | 0.79 | 0.57 |
| 3-3P | 67 | 20 | 1,675 | 2.63 | 0.88 |
| 3-4P | 29 | 16 | 725 | 2.55 | 0.92 |
| Mean | 38 | 16 | 944 | 2.22 | 0.82 |
| SD | 23 | 8.6 | 571 | 0.96 | 0.17 |
| | | Stratum 4 | | | |
| 4-1P | 150 | 55 | 3,750 | 3.59 | 0.9 |
| 4-2P | 17 | 8 | 425 | 1.79 | 0.86 |
| 4-3P | 88 | 31 | 2,200 | 3.07 | 0.89 |
| 4-4P | 9 | 7 | 225 | 1.89 | 0.97 |
| Mean | 66 | 25.3 | 1,650 | 2.59 | 0.91 |
| SD | 66 | 22.7 | 1,658 | 0.89 | 0.05 |
| | | Statum 5 | | | |
| 5-1P | 12 | 10 | 300 | 2.25 | 0.98 |
| 5-2P | 21 | 15 | 525 | 2.58 | 0.95 |
| 5-4P | 58 | 21 | 1,450 | 2.65 | 0.87 |
| 5-8A | 1 | 1 | 25 | 0 | |
| Mean | 23 | 11.8 | 575 | 1.87 | 0.93 |
| SD | 25 | 8.5 | 618 | 1.26 | 0.06 |
| | | Stratum 6 | | | |
| 6-1P | 35 | 12 | 875 | 2.09 | 0.84 |
| 6-4P | 15 | 11 | 375 | 2.3 | 0.96 |
| 6-6A | 88 | 9 | 2,200 | 0.54 | 0.25 |
| 6-8A | 161 | 3 | 4,025 | 0.08 | 0.07 |
| Mean | 75 | 8.8 | 1,869 | 1.25 | 0.53 |
| SD | 65 | 4 | 1,631 | 1.11 | 0.44 |
| | | Stratum 7 | | | |
| 7-1P | 178 | 42 | 4,450 | 3.17 | 0.85 |
| 7-2P | 133 | 50 | 3,325 | 3.54 | 0.91 |
| 7-3P | 21 | 10 | 525 | 2.07 | 0.9 |
| Mean | 111 | 34 | 2,767 | 2.92 | 0.88 |
| SD | 81 | 21.2 | 2,021 | 0.77 | 0.03 |
| Overall Random Means | 51 | 16 | 1,273 | 2.05 | 0.82 |

Abundance, H', Shannon's diversity index; J', Pielou's eveness index.

(2.95) and the lowest diversity was found in the Green Cay Marina sample (0.32). A Wilcoxon test indicated no significant difference (ChiSquare = 0.2811, $p$ = 0.5960) in diversity between the stratified random sites and the targeted sites.

Table 17. Summary of the benthic infaunal assemblage parameters for the STXEEMP targeted sites.

| Targeted Sites | Abundance (# of individuals) | Taxa Richness (# of species) | Density numbers/m$^2$ | Diversity (H') | Evenness (J') |
|---|---|---|---|---|---|
| Green Cay Marina | 50 | 3 | 1,250 | 0.32 | 0.29 |
| Chenay Bay | 12 | 7 | 300 | 1.59 | 0.82 |
| Fire Station and Dump | 89 | 24 | 2,225 | 2.30 | 0.72 |
| Yacht Club | 159 | 35 | 3,975 | 2.95 | 0.83 |
| Cramers Nursery | 5 | 5 | 125 | 1.61 | 1.00 |
| Cramers Park | 25 | 17 | 625 | 2.65 | 0.94 |
| Great Pond Bay | 42 | 13 | 1,050 | 1.94 | 0.75 |
| Stratum 5 Targeted Site | 6 | 6 | 150 | 1.79 | 1.00 |
| Divi Hotel and Casino | 60 | 24 | 1,500 | 2.87 | 0.90 |
| Stratum 6 Targeted Site | 8 | 4 | 200 | 1.21 | 0.88 |
| Mean | 46 | 14 | 1,140 | 1.92 | 0.81 |
| SD | 31 | 11 | 765 | 0.84 | 0.06 |

Abundance, H', Shannon's diversity index; J', Pielou's eveness index.

Pielou's evenness (J') values shown in Table 16 indicated fairly consistent values across the sites sampled in the STXEEMP. As with diversity, there were no significant (ChiSquare = 4.2449, $p$ = 0.6436) differences between the strata, nor were there differences (ChiSquare = 0.0703, $p$ = 0.7909) between the stratified random and targeted sites. The evenness values provides a measure of how numerically equal the community is across species.

Table 18. Spearman rank correlation coefficients for the stratified random sites. Correlation coefficients and significance levels for community parameters, physical/chemical parameters and toxicological results.

parameters and toxicological results at the stratified random sites.

| Parameter | Statistics | Stratum | ERMq | AhR BEQ (TCDD ng/g) | TOC | %Silt | %Clay | % Sand |
|---|---|---|---|---|---|---|---|---|
| Taxa Richness | Spearman Rho | 0.1097 | 0.0452 | -0.1784 | 0.3748 | 0.3174 | 0.4110 | -0.4274 |
| (# of species) | Significance | 0.5860 | 0.8228 | 0.5996 | 0.0541 | 0.1067 | 0.0332* | 0.0262* |
| Abundance | Spearman Rho | 0.3157 | 0.3125 | -0.3900 | 0.3097 | 0.2737 | 0.2958 | -0.3406 |
| (# of individuals) | Significance | 0.1087 | 0.1126 | 0.2357 | 0.1159 | 0.1672 | 0.1342 | 0.0822 |
| Diversity | Spearman Rho | 0.0694 | -0.0143 | -0.2131 | 0.3316 | 0.3166 | 0.4200 | -0.3142 |
| (H') | Significance | 0.7310 | 0.9434 | 0.5292 | 0.0911 | 0.1076 | 0.0292* | 0.1105 |

*, statistically significant (0.05); ERMq, ERM quotient; AhR BEQ (TCDD ng/g) 2,3,7,8-tetrachlorodibenzodioxin equivalent in ng TCDD/g; H', Shannon's diversity index

Annelids, arthropods and molluscs were found throughout the STXEEMP stratified random sites. Although there was variation between individual sites, these differences were not significant at the stratum level. There were no significant differences in abundance, taxa richness, density, or diversity between the strata. In addition, there were no differences in these parameters between the stratified random sites and the targeted sites. Barry A. Vittor & Associates, Inc. who conducted the benthic infaunal analysis for this project, indicated that the “high degree of variability observed at the East End Marine Park sampling stations is generally typical of subtropical estuarine habitats”.

Table 19. Spearman rank correlation coefficients for the targeted sites. Correlation coefficients and significance levels for community parameters, physical/chemical parameters and toxicological results.

| Parameter | Statistics | Stratum | ERMq | AhR BEQ (TCDD ng/g) | TOC | %Silt | %Clay | % Sand |
|---|---|---|---|---|---|---|---|---|
| Taxa Richness | Spearman Rho | N/A | -0.0486 | 0.6325 | -0.2675 | 0.3283 | 0.3465 | -0.1398 |
| (# of species) | Significance | N/A | 0.8939 | 0.3675 | 0.4550 | 0.3544 | 0.3267 | 0.7001 |
| Abundance | Spearman Rho | N/A | 0.4909 | 0.1362 | -0.5273 | 0.7333 | 0.7818 | -0.6485 |
| (# of individuals) | Significance | N/A | 0.1497 | 0.6838 | 0.1173 | 0.0158* | 0.0075* | 0.0425* |
| Diversity | Spearman Rho | N/A | -0.2485 | 0.3162 | -0.0182 | 0.2970 | 0.7727 | 0.0667 |
| (H') | Significance | N/A | 0.4888 | 0.6838 | 0.9602 | 0.4047 | 0.2848 | 0.8548 |

N/A, not applicable; *, statistically significant (0.05); ERMq, ERM quotient; AhR BEQ (TCDD ng/g) 2,3,7,8-tetrachlorodibenzodioxin equivalent in ng TCDD/g; H', Shannon's diversity index

Tables 18 and 19 contain a series of correlations run between the benthic infaunal parameters for the stratified random and targeted sites, and some of the other parameters measured in this project. From both of these tables, it can be seen that the significant correlations were between the sediment characteristics and some of the benthic infaunal parameters. Specifically, at the stratified random sites (Table 18), the finest (i.e., smallest) sediment grain size (clays) was correlated positively with taxa richness and diversity. The percent sand in the samples was negatively correlated with taxa richness, perhaps indicating the harsh and challenging environment of sediments containing mostly sand and at some of these sites in the STXEEMP, high wave energy.

There were no significant correlations between the ERMQ and the benthic infaunal parameters. The ERMq is calculated by dividing the concentration of each contaminant analyzed in the sediment by its available ERM to produce a quotient. There was also no correlation between the benthic infaunal parameters and the AhR BEQ at the stratified random sites. This is perhaps not too surprising, as the levels of chemical contaminants in the sediments from the stratified random sites were low.

In the targeted sites (Table 19), although concentrations of chemical contaminants (e.g., copper, chromium and zinc) were higher at some sites, for example in the sediments from Green Cay Marina and Great Pond Salt Pond, there was no significant correlation between the toxicological results (ERMq and AhR BEQ) and the benthic infaunal parameters measured. There was a negative correlation between the percent sand in a sediment sample and abundance, while there was a positive correlation between abundance and percent silt and also percent clay in the sediment samples from the targeted sites.

## SUMMARY AND CONCLUSIONS

Working closely with partners from the USVI Department of Planning and Natural Resources (DPNR), this project resulted in the collection and analysis of sediments for chemical contaminants and bioeffects within the St. Croix East End Marine Park or STXEEMP. Seven strata were established in the STXEEMP, and 27 sediment samples (23 primary sites and four alternate sites) were collected randomly within the seven strata. In addition, a total of 11 targeted sites were established and sampled, 10 of those targeted sites were requested by DPNR, and one targeted site was established by NCCOS, for a grand total of 38 sediment samples collected and analyzed for this project.

All sediment samples were analyzed for grain size and organic/inorganic carbon, along with a suite of over 270 core organic (e.g., hydrocarbons and pesticides) and inorganic (e.g., metals) chemical contaminants. In addition, nine of the targeted sites were analyzed for two classes of emerging contaminants, PBDEs, and PFAS. The 38 sediment samples collected were also analyzed for bioeffects including a Cytochrome P450 toxicity assay used to identify the presence of certain organic chemical contaminants, some of which may not have been included in the chemical analysis of sediments. A sea urchin embryo development assay was also conducted on the sediment samples. Lastly, an assessment of the benthic infaunal community in 37 of the sediment samples taken was performed. A benthic infaunal community analysis was not conducted on the sample from Great Pond Salt Pond, due to semi-dry conditions at that site.

There were some differences in the distribution of grain sizes (i.e., gravel, silt and clay) between the strata in the samples from the STXEEMP. Samples from Stratum 3 contained higher levels of silt than some of the other strata, and Stratum 4 and 5 contained higher levels of clay. The stratified random sites contained somewhat higher levels of sand, while the targeted sites had higher levels of clay. Overall, however, sand was the dominant grain size in all the samples from the STXEEMP, accounting for 88 percent of the sediment in the stratified random sites, and 76 percent in the targeted sites.

The results of the chemical contaminant analysis in the stratified random sites indicated low concentrations of the contaminants analyzed, concentrations far below published ERL and ERM sediment quality guidelines, indicating that effects from the concentrations of the contaminants analyzed on the benthic infaunal communities were unlikely.

There were few differences in concentrations of the core chemical contaminants analyzed between strata. The only contaminants that varied by strata were lead and tin, which were higher in strata 1 and 2.

The targeted sites had higher concentrations of a number of contaminants compared to the stratified random sites. Specifically, PAHs along with a number of trace elements including chromium, copper, lead, nickel and zinc were higher in the targeted sites compared to the stratified random sites. The concentration of chromium, copper, nickel, and zinc were all above the ERL at the Green Cay Marina site, indicating that effects from these trace elements might be occurring in more sensitive benthic infaunal organisms. The concentration of copper in the sediment sample from the Green Cay Marina was above the ERM, indicating that effects on benthic infaunal organisms were likely in the area where the sample was collected.

The concentrations of the two classes of contaminants of emerging concern (CECs), PBDEs and PFAS were low at most of the targeted sites where they were analyzed. At Green Cay Marina, the concentration of decaBDE (PBDE-209) was 20.82 ng/g. While there are no ERL or ERM values for PBDEs, the concentration of decaBDE slightly exceeded a Canadian environmental quality guideline. Total PFAS (sum of 28 compounds analyzed) were all less than 1 ng/g at the nine sites where PFAS was analyzed. There are no ERL or ERM guidelines for PFAS.

The results of the sea urchin embryo development assay were confounded by the presence of high levels of unionized ammonia, which has been shown to be toxic to the sea urchin embryos used in the assay. It is unclear why there were high levels of unionized ammonia in the sediment samples. The low levels of chemical contaminants found in most of the sediment samples, however, would seem to reduce the likelihood that contaminants were responsible for the observed toxicity to the developing sea urchin embryos.

The results from the Cytochrome P450 toxicity assay indicated low responses, in terms of TCDD (dioxin) equivalents, and is in line with the low concentrations of organic (carbon-containing) chemical contaminants found in the sediment samples. Although there were other organic chemical contaminants not analyzed in the sediment samples, the levels of other, unidentified contaminants would also seem to be low, given the low responses seen in the assay.

The benthic infaunal analysis revealed similar benthic communities throughout the strata. Annelids, arthropods and molluscs were found in all the strata, and there were no significant differences in abundance (number of individuals), taxa richness (number of species), density (individuals/m$^2$), diversity (H'), or Pielou's Evenness values between strata. There were also no significant differences between the stratified random and targeted sites.

Correlations between the benthic infaunal community parameters and the ERMq or the AhR BEQ indicated no significant negative correlations either in the stratified random or targeted sites. For the targeted sites, although there were exceedences of ERLs and at one site an exceedence of an ERM, there were no significant correlations across the sites.

Overall, the levels of chemical contaminants and bioeffects found in the STXEEMP were low. While encouraging, part of this is likely due to the sediment type encountered in the STXEEMP, that is, mainly sand. Sand does not typically accumulate chemical contaminants, particularly organic (carbon-containing) chemical contaminants.

It is very possible that the STXEEMP has with a few exceptions, low and in some cases very low environmental concentrations of chemical contaminants. In order to provide a broader multi-matrix assessment of chemical contaminants in the STXEEMP, a follow up project was recently conducted, in which fish were collected and as of the writing of this report, are currently being analyzed for the same suite of chemical contaminants analyzed in the sediments.

Analyzing for chemical contaminants in fish, provides the opportunity to assess whether chemical contaminants, while not elevated in STXEEMP sediments, could be elevated in another matrix, in this case fish tissue. This situation was seen in an NCCOS survey of chemical contaminants by Hartwell *et al.* (2017b) around Cocos Island at the southern tip of the island of Guam. The sediments collected around Cocos Island consisted primarily of sand, and had only low levels of chemical contaminants present, similar to the STXEEMP. The fish collected from around Cocos Island, however, had elevated and in some cases highly elevated levels of chemical contaminants, particularly PCBs. While the overall levels of contaminants and bioeffects found in the sediments from the STXEEMP were low, the results of the analysis of chemical contaminants in fish will help confirm the condition of the valuable natural resources of the STXEEMP.

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## Appendix A. Site and water quality data from the sampling sites in the STXEEMP.

| Stratum | Site | Date | Depth (m) | Latitude (DD) | Longitude (DD) | Surface Temperature (°C) | Bottom Temperature (°C) | Surface Salinity (psu) | Bottom Salinity (psu) | Surface DO (mg/L) | Bottom DO (mg/L) | Secchi Depth (m) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1-1P | 3/11/2021 | 6.07 | 17.76758 | -64.66277 | 26.4 | 26.4 | 35.60 | 35.74 | 6.08 | 5.99 | Bottom | Sand, shell/rock, tan color, no odor, worms, molluscs, and algae present |
| 1 | Green Cay Marina - NCCOS Targeted Site | 3/26/2021 | 2.93 | 17.75981 | -64.66581 | 27.4 | 26.9 | 35.20 | 35.20 | 4.42 | 4.36 | 1.0 | Mud (silty), shell/rock, black and brown, sulfur, sewage smell, no benthos |
| 1 | 1-2P | 3/11/2021 | 6.25 | 17.76408 | -64.66975 | 26.2 | 26.2 | 35.50 | 35.65 | 5.66 | 5.80 | Bottom | Course sand, shell/rock, no odor, patchy seagrass, Halimeda skeletons, molluscs |
| 1 | 1-3P | 3/11/2021 | 4.24 | 17.76414 | -64.65765 | 26.3 | 26.4 | 34.96 | 34.92 | 6.45 | 6.45 | Bottom | Sand gray and tan, no odor |
| 1 | 1-4P | 3/11/2021 | 3.11 | 17.76459 | -64.66381 | 26.3 | 26.3 | 36.44 | 36.53 | 5.70 | 5.50 | Bottom | Sand, shell/rock, tan color, no odor, worms, tubes, molluscs, and Halimeda skeletons |
| 1 | Chenay Bay - DPNR Targeted Site | 3/26/2021 | 1.62 | 17.76040 | -64.65950 | 27.3 | 27.3 | 35.69 | 35.90 | 7.45 | 7.41 | Bottom | Sand, Shell/rock, tan color, no odor, molluscs, and Halimeda skeletons |
| 2 | 2-1P | 3/12/2021 | 1.49 | 17.76226 | -64.64641 | 26.3 | 26.2 | 35.05 | 34.98 | 6.57 | 6.05 | Bottom | Shallow, sand and seagrass, gray color, no odor, molluscs, Sargassum on beach |
| 2 | 2-2P | 3/12/2021 | 4.85 | 17.76349 | -64.63057 | 26.6 | 26.4 | 34.99 | 34.80 | 5.85 | 6.51 | Bottom | Large sand patch, gray and tan, no odor, turtle grass and algae, molluscs present |
| 2 | 2-3P | 3/12/2021 | 3.29 | 17.76042 | -64.62443 | 26.7 | 26.7 | 35.02 | 35.06 | 6.41 | 6.29 | Bottom | Sand. Shell/rock, gray, no odor, molluscs present |
| 2 | 2-6A | 3/12/2021 | 2.19 | 17.75983 | -64.63281 | 26.4 | 26.3 | 35.02 | 32.12 | 5.87 | 6.81 | Bottom | Sand, shell/rock, gray color, no odor, molluscs |
| 2 | Fire Station - DPNR Target | 3/26/2021 | 2.83 | 17.76022 | -64.62392 | 26.8 | 26.8 | 35.36 | 35.77 | 6.47 | 6.31 | Bottom | Sand, mud, shell/rock, gray color, sulfur smell, molluscs |
| 3 | 3-1P | 3/12/2021 | 2.80 | 17.75914 | -64.60961 | 26.8 | 26.8 | 35.01 | 34.99 | 6.22 | 6.62 | Bottom | Seagrass thin layer, finer sand than strata 1 or 2, gray color, no odor, molluscs and |
| 3 | 3-2P | 3/12/2021 | 4.72 | 17.76134 | -64.59460 | 27.1 | 27.0 | 35.04 | 35.03 | 6.22 | 6.47 | Bottom | Big sand patch, but sand is shallow, hard bottom underneath, sand pink and tan, no odor |
| 3 | 3-3P | 3/12/2021 | 1.13 | 17.75521 | -64.60102 | 27.3 | 27.5 | 35.09 | 35.12 | 6.61 | 6.88 | Bottom | Silt and mud, brown and gray color, mangrove smell but not sulfur smell |
| 3 | 3-4P | 3/12/2021 | 6.13 | 17.76058 | -64.60395 | 26.9 | 26.8 | 34.96 | 35.02 | 6.34 | 6.74 | Bottom | Fine sand, lots of seagrass, found open patch to sample, gray color, no odor, worms, molluscs |
| 3 | Cramers Nursery - DPNR Target | 3/26/2021 | 2.90 | 17.76034 | -64.58880 | 26.3 | 26.3 | 35.57 | 35.60 | 6.13 | 6.14 | Bottom | Sand, shell/rock, tan and pink color, no odor, sea grass, molluscs present |
| 3 | Cramers Park - DPNR Target | 3/26/2021 | 1.92 | 17.75922 | -64.58537 | 25.7 | 25.6 | 35.58 | 35.62 | 5.41 | 5.53 | Bottom | Mostly finer sand gray, some shell/rock, no odor, larger bivalves |
| 3 | Yacht Club - DPNR Target | 3/26/2021 | 2.19 | 17.75514 | -64.60256 | 26.5 | 26.5 | 35.80 | 35.79 | 5.60 | 5.48 | Bottom | Silt, mud, shell/rock, black and gray color, no odor, molluscs present |
| 4 | 4-1P | 3/24/2021 | 4.57 | 17.71378 | -64.66111 | 26.5 | 26.5 | 35.21 | 35.26 | 6.20 | 7.54 | Bottom | Sand, shell/rock, tan color no odor, molluscs and algae present |
| 4 | 4-2P | 3/24/2021 | 1.98 | 17.72167 | -64.64930 | 26.9 | 26.9 | 35.34 | 35.39 | 5.58 | 5.51 | Bottom | Sand, shell/rock, tan and gray color, no odor, patchy seagrass, molluscs, algae |

Abbreviations: DO, dissolved oxygen; DD, decimal degrees; psu, practical salinity unit; NA indicates that site was too shallow for some measurements.

Appendix A. Site and water quality data from the sampling sites in the STXEEMP (cont.).

| Stratum | Site | Date | Depth (m) | Latitude (DD) | Longitude (DD) | Surface Temperature (°C) | Bottom Temperature (°C) | Surface Salinity (psu) | Bottom Salinity (psu) | Surface DO (mg/L) | Bottom DO (mg/L) | Secchi Depth (m) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 4-3P | 3/24/2021 | 2.23 | 17.72049 | -64.64738 | 27.0 | 27.0 | 35.39 | 35.44 | 6.05 | 6.08 | Bottom | Sand, small amounts of shell/rock, tan and gray, no odor, molluscs, seagrass and algae |
| 4 | 4-4P | 3/24/2021 | 2.01 | 17.72039 | -64.65086 | 27.0 | 27.0 | 35.36 | 35.43 | 5.96 | 5.92 | Bottom | Finer sand, some shell/rock, gray and tan, slight sulfur smell, patchy seagrass, worms, molluscs, algae |
| 4 | Great Pond - DPNR Target | 3/25/2021 | 1.40 | 17.72206 | -64.65165 | 27.8 | 27.8 | 35.73 | 35.62 | 7.63 | 8.15 | Bottom | Sand, black and gray, slight sulfur smell, patchy seagrass, algae, moved to nearest sand patch |
| 4 | Great Pond Salt Pond - DPNR Target | 6/4/2021 | NA | 17.72424 | -64.65177 | NA | NA | NA | NA | NA | NA | NA | Pond was completely dry but sediment samples were collected from a moist spot near where there was a lot of run-off input. |
| 5 | 5-1P | 3/24/2021 | 1.28 | 17.72428 | -64.63225 | 27.4 | 27.4 | 35.40 | 35.44 | 6.60 | 6.73 | Bottom | Sand, shell/rock, gray and tan, no odor, worms, echinoderm, seagrass |
| 5 | 5-2P | 3/24/2021 | 1.80 | 17.72346 | -64.63018 | 27.2 | 27.3 | 35.36 | 35.37 | 6.41 | 6.56 | Bottom | Sand, shell/rock, pink and tan, no odor, lots of small polychaetes, tubes, molluscs |
| 5 | 5-4P | 3/24/2021 | 1.40 | 17.72756 | -64.62730 | 27.5 | 27.5 | 35.40 | 35.43 | 6.91 | 7.05 | Bottom | Sand, shell/rock, pink and tan, no odor, molluscs and algae |
| 5 | 5-8A | 3/24/2021 | 0.73 | 17.72501 | -64.62865 | 27.2 | NA | 35.50 | NA | 6.33 | NA | Bottom | Too shallow for bottom measurement, sand and shell/rock, gray and tan, no odor, molluscs |
| 5 | Stratum 5 - DPNR Target | 3/25/2021 | 1.62 | 17.73277 | -64.61810 | 27.5 | 27.5 | 35.55 | 35.58 | 6.93 | 7.56 | Bottom | Sand. Shell/rock, gray and tan, no odor, molluscs including conch |
| 6 | Stratum 6 - DPNR Target | 3/25/2021 | 3.81 | 17.74507 | -64.59734 | 27.2 | 27.3 | 35.57 | 35.57 | 7.61 | 7.68 | 1.0 | Reef and hardbottom, moved to closest sand patch, sand, shell/rock, gray and tan, no odor, mollusks |
| 6 | 6-1P | 3/25/2021 | 3.41 | 17.74428 | -64.59925 | 27.3 | 27.3 | 35.54 | 35.54 | 7.34 | 7.31 | Bottom | Coarser sand and shell/rock, gray and tan, no odor, worms, and molluscs |
| 6 | 6-4P | 3/25/2021 | 1.83 | 17.73949 | -64.60583 | 26.8 | 26.8 | 35.42 | 35.45 | 5.98 | 6.16 | Bottom | Sand, shell/rock, pink and tan, no odor, worms, molluscs, and algae (Sargassum) |
| 6 | 6-6A | 3/25/2021 | 0.98 | 17.74549 | -64.60190 | 27.0 | NA | 35.56 | NA | 6.33 | NA | Bottom | Too shallow for bottom measurement, sand and shell/rock, gray and tan, no odor, worms, molluscs, seagrass |
| 6 | 6-8A | 3/25/2021 | 1.31 | 17.74499 | -64.60284 | 27.0 | 27.0 | 35.52 | 35.55 | 6.03 | 6.02 | Bottom | Fine sand and shell/rock, gray and tan, no odor, worms, molluscs, seagrass |
| 6 | DIVI - DPNR Target | 3/25/2021 | 2.68 | 17.74027 | -64.60513 | 27.2 | 27.2 | 35.53 | 35.54 | 6.33 | 6.53 | Bottom | Large sand patch in front of hotel, sand and shelf/rock, gray and tan, sulfur smell, molluscs, algae and seagrass |
| 7 | 7-1P | 3/23/2021 | 1.98 | 17.74659 | -64.58111 | 26.4 | 26.4 | 34.50 | 34.50 | 6.23 | 6.19 | Bottom | Thin layer of sand, sand, shell/rock, gray, tan and pink, no odor, worms, molluscs, crustacea and algae |
| 7 | 7-2P | 3/23/2021 | 2.10 | 17.74617 | -64.58083 | 26.4 | 26.4 | 35.00 | 34.99 | 6.38 | 6.35 | Bottom | Thin layer of sand, sand, shell/rock, gray, tan and pink, no odor, worms, molluscs and algae |
| 7 | 7-3P | 3/23/2021 | 1.22 | 17.74665 | -64.57963 | 27.5 | NA | 34.60 | NA | 6.23 | NA | Bottom | Too shallow for bottom measurement, sand, gray and tan and pink, no odor, molluscs |

Abbreviations: DO, dissolved oxygen; DD, decimal degrees; psu, practical salinity unit; NA indicates that site was too shallow for some measurements.

Appendix B. Sediment total organic carbon and grain size at the sites sampled in the STXEEMP.

| Measurement | 1-1P | 1-2P | 1-3P | 1-4P | 2-1P | 2-2P | 2-3P | 2-6A | 3-1P | 3-2P |
|---|---|---|---|---|---|---|---|---|---|---|
| % Total Organic Carbon (TOC) | 5.40 | 4.86 | 4.90 | 3.78 | 4.77 | 5.84 | 4.97 | 3.50 | 4.47 | 2.09 |
| % Total Inorganic Carbon (TIC) | 5.08 | 4.94 | 5.12 | 6.58 | 5.06 | 4.74 | 5.26 | 6.75 | 6.33 | 8.65 |
| % Total Carbon (TC) | 10.48 | 9.80 | 10.02 | 10.36 | 9.84 | 10.59 | 10.23 | 10.25 | 10.81 | 10.75 |
| % Gravel | 17.55 | 22.64 | 19.78 | 49.08 | 1.56 | 1.67 | 21.97 | 14.69 | 1.28 | 0.29 |
| % Sand | 81.1 | 77.4 | 80.1 | 49.4 | 98.1 | 97.8 | 77.1 | 85.2 | 94.0 | 98.5 |
| % Silt | 0.68 | 0.00 | 0.13 | 0.50 | 0.00 | 0.56 | 0.95 | 0.13 | 4.68 | 1.20 |
| % Clay | 0.68 | 0.00 | 0.00 | 0.99 | 0.32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Note: Gravel component was shell hash and sand component was smaller shell, for all sites except for Green Cay Marina and Great Pond Salt Pond.

| Measurement | 3-3P | 3-4P | 4-1P | 4-2P | 4-3P | 4-4P | Great Pond - DPNR Target | 5-1P | 5-2P | 5-4P |
|---|---|---|---|---|---|---|---|---|---|---|
| % Total Organic Carbon (TOC) | 1.52 | 4.23 | 5.98 | 4.60 | 4.62 | 3.63 | 2.60 | 3.23 | 3.63 | 5.23 |
| % Total Inorganic Carbon (TIC) | 8.31 | 6.69 | 4.94 | 6.20 | 5.95 | 6.84 | 5.97 | 7.12 | 6.91 | 5.56 |
| % Total Carbon (TC) | 9.83 | 10.92 | 10.92 | 10.80 | 10.57 | 10.47 | 8.57 | 10.35 | 10.54 | 10.79 |
| % Gravel | 2.55 | 0.77 | 2.21 | 0.62 | 2.12 | 0.23 | 4.71 | 1.45 | 3.29 | 3.65 |
| % Sand | 74.0 | 94.7 | 94.6 | 97.5 | 94.7 | 96.8 | 88.0 | 97.2 | 94.9 | 94.3 |
| % Silt | 18.41 | 3.32 | 1.43 | 0.54 | 1.36 | 1.65 | 4.38 | 0.13 | 0.11 | 0.37 |
| % Clay | 5.01 | 1.25 | 1.74 | 1.35 | 1.86 | 1.34 | 2.87 | 1.20 | 1.74 | 1.71 |

Note: Gravel component was shell hash and sand component was smaller shell, for all sites except for Green Cay Marina and Great Pond Salt Pond.

Appendix B. Sediment total organic carbon and grain size at the sites sampled in the STXEEMP (cont.).

| Measurement | 5-8A | Stratum 5 - DPNR | 6-1P | 6-4P | 6-6A | 6-8A | Stratum 6 - DPNR | 7-1P | 7-2P | 7-3P |
|---|---|---|---|---|---|---|---|---|---|---|
| % Total Organic Carbon (TOC) | 3.87 | 3.97 | 5.68 | 4.67 | 5.69 | 2.72 | 6.12 | 6.65 | 4.61 | 2.92 |
| % Total Inorganic Carbon (TIC) | 6.66 | 6.50 | 4.44 | 5.78 | 4.26 | 6.51 | 4.07 | 3.58 | 6.12 | 7.11 |
| % Total Carbon (TC) | 10.53 | 10.47 | 10.13 | 10.45 | 9.94 | 9.23 | 10.19 | 10.24 | 10.73 | 10.03 |
| % Gravel | 1.12 | 4.41 | 35.73 | 0.76 | 13.10 | 0.29 | 7.33 | 3.60 | 28.13 | 0.00 |
| % Sand | 96.2 | 94.7 | 63.0 | 97.1 | 86.2 | 98.2 | 92.5 | 94.7 | 67.1 | 96.7 |
| % Silt | 1.66 | 0.24 | 0.21 | 0.98 | 0.30 | 1.08 | 0.19 | 0.53 | 2.72 | 1.19 |
| % Clay | 0.98 | 0.64 | 1.03 | 1.12 | 0.40 | 0.41 | 0.00 | 1.20 | 2.01 | 2.08 |

Note: Gravel component was shell hash and sand component was smaller shell, for all sites except for Green Cay Marina and Great Pond Salt Pond.

| Measurement | Green Cay Marina - NCCOS Target | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|---|
| % Total Organic Carbon (TOC) | 2.45 | 3.56 | 4.94 | 2.69 | 2.24 | 4.04 | 1.75 | 3.82 |
| % Total Inorganic Carbon (TIC) | 4.83 | 6.53 | 5.67 | 6.75 | 5.71 | 6.26 | 7.07 | 1.83 |
| % Total Carbon (TC) | 7.27 | 10.09 | 10.60 | 9.44 | 7.95 | 10.30 | 8.82 | 5.65 |
| % Gravel | 0.93 | 3.09 | 4.31 | 4.12 | 26.32 | 4.18 | 12.21 | 0.00 |
| % Sand | 23.0 | 91.1 | 94.6 | 70.0 | 71.6 | 93.6 | 81.5 | 30.0 |
| % Silt | 59.85 | 4.27 | 0.45 | 19.91 | 0.81 | 0.83 | 3.87 | 31.85 |
| % Clay | 16.22 | 1.54 | 0.67 | 5.95 | 1.27 | 1.42 | 2.40 | 38.15 |

Note: Gravel component was shell hash and sand component was smaller shell, for all sites except for Green Cay Marina and Great Pond Salt Pond.

## Appendix C. Total PAHs (ng/g) in the sediments from the STXEEMP.

| Compound | 1-1P | 1-2P | 1-3P | 1-4P | 2-1P | 2-2P | 2-3P | 2-6A | 3-1P | 3-2P | 3-3P |
|---|---|---|---|---|---|---|---|---|---|---|---|
| cis/trans Decalin | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Naphthalene | 0.102 | 0.108 | 0.169 | 0.171 | 0.107 | 0.067 | 0.138 | 0.156 | 0.108 | 0.099 | 0.250 |
| C1-Naphthalenes | 0.087 | 0.068 | 0.134 | 0.205 | 0.096 | 0.067 | 0.172 | 0.166 | 0.097 | 0.073 | 0.244 |
| C2-Naphthalenes | 0.0 | 0.0 | 0.0 | 0.693 | 0.0 | 0.0 | 0.0 | 0.540 | 0.0 | 0.0 | 0.0 |
| C3-Naphthalenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Naphthalenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Biphenyl | 0.112 | 0.075 | 0.113 | 0.163 | 0.092 | 0.086 | 0.155 | 0.111 | 0.097 | 0.067 | 0.159 |
| Acenaphthylene | 0.042 | 0.038 | 0.037 | 0.039 | 0.037 | 0.040 | 0.041 | 0.038 | 0.041 | 0.038 | 0.036 |
| Acenaphthene | 0.116 | 0.059 | 0.094 | 0.134 | 0.054 | 0.064 | 0.118 | 0.108 | 0.077 | 0.064 | 0.129 |
| Dibenzofuran | 0.042 | 0.052 | 0.087 | 0.090 | 0.063 | 0.034 | 0.068 | 0.073 | 0.055 | 0.040 | 0.112 |
| Fluorene | 0.093 | 0.101 | 0.173 | 0.177 | 0.057 | 0.057 | 0.143 | 0.192 | 0.087 | 0.071 | 0.332 |
| C1-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Carbazole | 0.030 | 0.0 | 0.0 | 0.041 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.057 |
| Anthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.025 |
| Phenanthrene | 0.109 | 0.113 | 0.184 | 0.2 | 0.224 | 0.066 | 0.172 | 0.164 | 0.137 | 0.098 | 0.232 |
| C1-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.173 |
| C2-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.466 |
| C3-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Fluoranthene | 0.071 | 0.058 | 0.106 | 0.123 | 0.165 | 0.036 | 0.195 | 0.186 | 0.069 | 0.044 | 0.122 |
| Pyrene | 0.074 | 0.058 | 0.083 | 0.110 | 0.194 | 0.049 | 0.181 | 0.157 | 0.070 | 0.048 | 0.121 |
| C1-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Naphthobenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benz(a)anthracene | 0.0 | 0.0 | 0.0 | 0.036 | 0.093 | 0.0 | 0.084 | 0.067 | 0.012 | 0.0 | 0.035 |
| Chrysene/Triphenylene | 0.0 | 0.0 | 0.0 | 0.068 | 0.107 | 0.0 | 0.131 | 0.126 | 0.030 | 0.0 | 0.080 |
| C1-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(b)fluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.176 | 0.339 | 0.0 | 0.0 | 0.089 |
| Benzo(k,j)fluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.234 | 0.0 | 0.0 | 0.069 |
| Benzo(a)fluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(e)pyrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.196 | 0.0 | 0.0 | 0.0 |
| Benzo(a)pyrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.146 | 0.0 | 0.0 | 0.0 |
| Perylene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.073 |
| Indeno(1,2,3-c,d)pyrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.327 | 0.0 | 0.0 | 0.078 |
| Dibenzo(a,h)anthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(g,h,i)perylene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.312 | 0.0 | 0.0 | 0.102 |
| Total PAHs | 0.878 | 0.730 | 1.18 | 2.26 | 1.29 | 0.566 | 1.77 | 3.69 | 0.880 | 0.642 | 2.98 |

Appendix C. Total PAHs (ng/g) in the sediments from the STXEEMP (cont.).

| Compound | 3-4P | 4-1P | 4-2P | 4-3P | 4-4P | Great Pond - DPNR Target | 5-1P | 5-2P | 5-4P | 5-8A |
|---|---|---|---|---|---|---|---|---|---|---|
| cis/trans Decalin | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.89 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.20 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Naphthalene | 0.125 | 0.132 | 0.137 | 0.123 | 0.145 | 0.316 | 0.104 | 0.098 | 0.143 | 0.169 |
| C1-Naphthalenes | 0.134 | 0.117 | 0.113 | 0.119 | 0.153 | 0.265 | 0.103 | 0.063 | 0.150 | 0.154 |
| C2-Naphthalenes | 0.0 | 0.481 | 0.0 | 0.0 | 0.0 | 0.883 | 0.486 | 0.0 | 0.0 | 0.0 |
| C3-Naphthalenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Naphthalenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Biphenyl | 0.103 | 0.101 | 0.118 | 0.115 | 0.113 | 0.157 | 0.122 | 0.117 | 0.148 | 0.119 |
| Acenaphthylene | 0.0 | 0.036 | 0.039 | 0.034 | 0.035 | 0.0 | 0.039 | 0.034 | 0.054 | 0.042 |
| Acenaphthene | 0.0 | 0.086 | 0.055 | 0.095 | 0.100 | 0.179 | 0.103 | 0.095 | 0.129 | 0.0 |
| Dibenzofuran | 0.062 | 0.066 | 0.062 | 0.064 | 0.084 | 0.113 | 0.062 | 0.048 | 0.114 | 0.083 |
| Fluorene | 0.149 | 0.162 | 0.098 | 0.133 | 0.124 | 0.670 | 0.097 | 0.098 | 0.173 | 0.174 |
| C1-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Carbazole | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Anthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Phenanthrene | 0.189 | 0.161 | 0.135 | 0.152 | 0.187 | 0.224 | 0.134 | 0.131 | 0.275 | 0.169 |
| C1-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Fluoranthene | 0.225 | 0.067 | 0.052 | 0.059 | 0.071 | 0.121 | 0.045 | 0.047 | 0.088 | 0.058 |
| Pyrene | 0.251 | 0.068 | 0.052 | 0.055 | 0.062 | 0.118 | 0.050 | 0.049 | 0.068 | 0.062 |
| C1-Fluoranthenes/Pyrenes | 0.220 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Naphthobenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benz(a)anthracene | 0.280 | 0.013 | 0.0 | 0.007 | 0.033 | 0.037 | 0.0 | 0.0 | 0.0 | 0.0 |
| Chrysene/Triphenylene | 0.307 | 0.031 | 0.0 | 0.016 | 0.017 | 0.059 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(b)fluoranthene | 0.426 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(k,j)fluoranthene | 0.436 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(a)fluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(e)pyrene | 0.359 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(a)pyrene | 0.514 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Perylene | 0.136 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Indeno(1,2,3-c,d)pyrene | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Dibenzo(a,h)anthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(g,h,i)perylene | 0.325 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total PAHs | 4.61 | 1.52 | 0.861 | 0.972 | 1.12 | 6.30 | 1.35 | 0.780 | 1.34 | 1.03 |

Appendix C.  Total PAHs (ng/g) in the sediments from the STXEEMP (cont.).

| Compound | Stratum 5 - DPNR Target | 6-1P | 6-4P | 6-6A | 6-8A | Stratum 6 - DPNR Target | 7-1P | 7-2P | 7-3P | Green Cay Marina - NCCOS Target |
|---|---|---|---|---|---|---|---|---|---|---|
| cis/trans Decalin | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.96 |
| C1-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.97 |
| C2-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.69 |
| C3-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Naphthalene | 0.130 | 0.142 | 0.117 | 0.232 | 0.256 | 0.295 | 0.148 | 0.194 | 0.151 | 3.38 |
| C1-Naphthalenes | 0.099 | 0.112 | 0.068 | 0.231 | 0.207 | 0.293 | 0.111 | 0.139 | 0.112 | 2.14 |
| C2-Naphthalenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.491 | 0.415 | 0.371 | 0.0 | 5.63 |
| C3-Naphthalenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.82 |
| C4-Naphthalenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Biphenyl | 0.078 | 0.070 | 0.069 | 0.149 | 0.183 | 0.143 | 0.123 | 0.212 | 0.091 | 1.10 |
| Acenaphthylene | 0.047 | 0.048 | 0.045 | 0.056 | 0.054 | 0.062 | 0.055 | 0.0 | 0.036 | 0.220 |
| Acenaphthene | 0.128 | 0.096 | 0.084 | 0.088 | 0.089 | 0.120 | 0.114 | 0.082 | 0.0 | 0.865 |
| Dibenzofuran | 0.057 | 0.051 | 0.052 | 0.116 | 0.127 | 0.089 | 0.064 | 0.102 | 0.0 | 0.821 |
| Fluorene | 0.095 | 0.090 | 0.125 | 0.135 | 0.147 | 0.089 | 0.112 | 0.125 | 0.090 | 6.18 |
| C1-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.41 |
| C2-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.92 | 0.0 | 0.0 | 0.0 |
| Carbazole | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.071 | 0.0 | 0.511 |
| Anthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.35 |
| Phenanthrene | 0.143 | 0.137 | 0.154 | 0.203 | 0.200 | 0.138 | 0.174 | 0.150 | 0.158 | 2.98 |
| C1-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.81 |
| C2-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.15 |
| C3-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.66 |
| C4-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.22 |
| Dibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.271 |
| C1-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.388 |
| C2-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.24 |
| C3-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.72 |
| C4-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.63 |
| Fluoranthene | 0.042 | 0.077 | 0.062 | 0.106 | 0.104 | 0.053 | 0.056 | 0.051 | 0.063 | 10.8 |
| Pyrene | 0.036 | 0.065 | 0.051 | 0.103 | 0.090 | 0.057 | 0.056 | 0.080 | 0.055 | 12.3 |
| C1-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.57 |
| C2-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.97 |
| C3-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.29 |
| C4-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.88 |
| Naphthobenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.34 |
| C1-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.25 |
| C2-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benz(a)anthracene | 0.0 | 0.022 | 0.0 | 0.046 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.08 |
| Chrysene/Triphenylene | 0.0 | 0.035 | 0.0 | 0.061 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.98 |
| C1-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.72 |
| C2-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.68 |
| C3-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.146 | 0.0 | 0.0 | 0.0 |
| C4-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(b)fluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.0 |
| Benzo(k,j)fluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| Benzo(a)fluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.51 |
| Benzo(e)pyrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.70 |
| Benzo(a)pyrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.150 | 0.0 | 0.0 | 9.02 |
| Perylene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.0 |
| Indeno(1,2,3-c,d)pyrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 |
| Dibenzo(a,h)anthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.61 |
| C1-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(g,h,i)perylene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.97 |
| Total PAHs | 0.855 | 0.945 | 0.827 | 1.53 | 1.46 | 1.83 | 3.65 | 1.62 | 0.756 | 220 |

Appendix C. Total PAHs (ng/g) in the sediments from the STXEEMP (cont.).

| Compound | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|
| cis/trans Decalin | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.75 |
| C1-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.00 |
| C2-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.46 |
| C3-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Decalins | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Naphthalene | 0.305 | 0.148 | 0.274 | 0.238 | 0.122 | 0.244 | 3.60 |
| C1-Naphthalenes | 0.245 | 0.107 | 0.220 | 0.168 | 0.097 | 0.202 | 2.16 |
| C2-Naphthalenes | 0.0 | 0.720 | 0.531 | 0.470 | 0.0 | 0.6 | 1.42 |
| C3-Naphthalenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.23 |
| C4-Naphthalenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C1-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C4-Benzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Biphenyl | 0.153 | 0.068 | 0.187 | 0.115 | 0.086 | 0.198 | 0.948 |
| Acenaphthylene | 0.038 | 0.0 | 0.0 | 0.037 | 0.046 | 0.036 | 0.273 |
| Acenaphthene | 0.101 | 0.083 | 0.129 | 0.0 | 0.076 | 0.121 | 0.513 |
| Dibenzofuran | 0.115 | 0.058 | 0.143 | 0.081 | 0.060 | 0.124 | 0.818 |
| Fluorene | 0.318 | 0.095 | 1.052 | 0.447 | 0.190 | 0.521 | 5.18 |
| C1-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.750 |
| C2-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.94 |
| C3-Fluorenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.99 |
| Carbazole | 0.082 | 0.0 | 0.079 | 0.0 | 0.0 | 0.0 | 0.846 |
| Anthracene | 0.0 | 0.0 | 0.096 | 0.0 | 0.0 | 0.055 | 0.336 |
| Phenanthrene | 0.222 | 0.123 | 0.380 | 0.251 | 0.173 | 0.341 | 2.55 |
| C1-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.266 | 1.59 |
| C2-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.652 | 1.87 |
| C3-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.13 |
| C4-Phenanthrenes/Anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.000 |
| Dibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.233 |
| C1-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.256 |
| C2-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.741 |
| C3-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.09 |
| C4-Dibenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.000 |
| Fluoranthene | 0.105 | 0.049 | 0.337 | 0.1180 | 0.090 | 0.625 | 3.68 |
| Pyrene | 0.142 | 0.047 | 0.277 | 0.1040 | 0.076 | 0.602 | 3.08 |
| C1-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.488 | 2.10 |
| C2-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.367 | 0.0 |
| C3-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.133 | 0.0 |
| C4-Fluoranthenes/Pyrenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Naphthobenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.930 |
| C1-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.14 |
| C2-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.38 |
| C3-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.29 |
| C4-Naphthobenzothiophenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.67 |
| Benz(a)anthracene | 0.0 | 0.0 | 0.124 | 0.0 | 0.027 | 0.349 | 1.41 |
| Chrysene/Triphenylene | 0.0 | 0.0 | 0.223 | 0.0 | 0.032 | 0.512 | 3.45 |
| C1-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.432 | 2.68 |
| C2-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.52 |
| C3-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.65 |
| C4-Chrysenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(b)fluoranthene | 0.0 | 0.0 | 0.258 | 0.0 | 0.0 | 0.712 | 2.57 |
| Benzo(k,j)fluoranthene | 0.0 | 0.0 | 0.188 | 0.0 | 0.0 | 0.555 | 2.28 |
| Benzo(a)fluoranthene | 0.0 | 0.0 | 0.189 | 0.0 | 0.0 | 0.106 | 0.0 |
| Benzo(e)pyrene | 0.0 | 0.0 | 0.202 | 0.0 | 0.0 | 0.494 | 2.09 |
| Benzo(a)pyrene | 0.0 | 0.0 | 0.353 | 0.245 | 0.0 | 0.575 | 2.31 |
| Perylene | 0.0 | 0.0 | 0.178 | 0.0 | 0.0 | 0.166 | 1.30 |
| Indeno(1,2,3-c,d)pyrene | 0.0 | 0.0 | 0.237 | 0.0 | 0.0 | 0.545 | 2.22 |
| Dibenzo(a,h)anthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.37 |
| C1-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C2-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C3-Dibenzo(a,h)anthracenes | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(g,h,i)perylene | 0.0 | 0.0 | 0.307 | 0.0 | 0.0 | 0.530 | 2.26 |
| Total PAHs | 1.83 | 1.54 | 5.96 | 2.27 | 1.08 | 10.6 | 111 |

Appendix D. Alkylated PAHs (ng/g) in the sediments from the STXEEMP.

| Compound | 1-1P | 1-2P | 1-3P | 1-4P | 2-1P | 2-2P | 2-3P | 2-6A | 3-1P | 3-2P | 3-3P |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 0.088 | 0.101 | 0.200 | 0.195 | 0.095 | 0.073 | 0.159 | 0.164 | 0.090 | 0.070 | 0.241 |
| 1-Methylnaphthalene | 0.044 | 0.0 | 0.0 | 0.116 | 0.051 | 0.029 | 0.103 | 0.089 | 0.057 | 0.041 | 0.129 |
| 2,6-Dimethylnaphthalene | 0.0 | 0.0 | 0.0 | 0.570 | 0.0 | 0.0 | 0.0 | 0.510 | 0.0 | 0.0 | 0.0 |
| 1,6,7-Trimethylnaphthalene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1-Methylfluorene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2/3-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 |
| 2-Methylanthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4/9-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3,6-Dimethylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Retene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2-Methylfluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(b)fluorene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C29-Hopane | 0.0 | 0.6 | 0.8 | 0.8 | 0.0 | 0.0 | 1.4 | 1.5 | 0.8 | 0.0 | 2.1 |
| 18a-Oleanane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 |
| C30-Hopane | 0.0 | 0.8 | 0.9 | 0.8 | 0.0 | 0.0 | 1.4 | 1.6 | 1.2 | 0.0 | 2.6 |
| C20-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C21-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C26(20S)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C26(20R)/C27(20S)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 |
| C28(20S)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| C27(20R)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 |
| C28(20R)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 0.1 | 1.5 | 1.8 | 2.5 | 0.1 | 0.1 | 3.1 | 3.8 | 2.2 | 0.1 | 8.2 |

Appendix D.  Alkylated PAHs (ng/g) in the sediments from the STXEEMP (cont.).

| Compound | 3-4P | 4-1P | 4-2P | 4-3P | 4-4P | Great Pond - DPNR Target | 5-1P | 5-2P | 5-4P | 5-8A |
|---|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 0.130 | 0.111 | 0.109 | 0.116 | 0.149 | 0.251 | 0.094 | 0.063 | 0.142 | 0.145 |
| 1-Methylnaphthalene | 0.073 | 0.067 | 0.063 | 0.065 | 0.083 | 0.153 | 0.062 | 0.033 | 0.086 | 0.088 |
| 2,6-Dimethylnaphthalene | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.231 | 0.501 | 0.0 | 0.0 | 0.0 |
| 1,6,7-Trimethylnaphthalene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1-Methylfluorene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2/3-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2-Methylanthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4/9-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3,6-Dimethylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Retene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2-Methylfluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Benzo(b)fluorene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C29-Hopane | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 18a-Oleanane | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C30-Hopane | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| C20-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C21-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C26(20S)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C26(20R)/C27(20S)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C28(20S)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C27(20R)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| C28(20R)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 1.7 | 0.4 | 0.2 | 0.2 | 0.2 | 2.8 | 0.7 | 0.1 | 0.2 | 0.2 |

Appendix D. Alkylated PAHs (ng/g) in the sediments from the STXEEMP (cont.).

| Compound | Stratum 5 - DPNR Target | 6-1P | 6-4P | 6-6A | 6-8A | Stratum 6 - DPNR Target | 7-1P | 7-2P | 7-3P | Green Cay Marina - NCCOS Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 0.100 | 0.107 | 0.066 | 0.215 | 0.204 | 0.286 | 0.113 | 0.130 | 0.105 | 2.11 |
| 1-Methylnaphthalene | 0.050 | 0.063 | 0.038 | 0.137 | 0.111 | 0.158 | 0.056 | 0.081 | 0.064 | 1.14 |
| 2,6-Dimethylnaphthalene | 0.000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.189 | 0.218 | 0.223 | 0.0 | 5.13 |
| 1,6,7-Trimethylnaphthalene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.662 |
| 1-Methylfluorene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.468 |
| 4-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.350 |
| 2/3-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.113 |
| 1-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.053 |
| 3-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.942 |
| 2-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.88 |
| 2-Methylanthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.885 |
| 4/9-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.08 |
| 1-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.589 |
| 3,6-Dimethylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.785 |
| Retene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.868 |
| 2-Methylfluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.10 |
| Benzo(b)fluorene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.13 |
| C29-Hopane | 0.0 | 0.0 | 0.0 | 1.84 | 1.42 | 0.0 | 0.0 | 0.0 | 0.0 | 77.4 |
| 18a-Oleanane | 0.0 | 0.0 | 0.0 | 0.0 | 0.553 | 0.0 | 0.0 | 0.0 | 0.0 | 8.75 |
| C30-Hopane | 0.0 | 0.0 | 0.0 | 2.41 | 1.71 | 0.0 | 0.0 | 0.0 | 0.0 | 96.45 |
| C20-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.101 | 0.0 | 0.0 | 0.434 |
| C21-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.228 | 0.0 | 0.0 | 0.437 |
| C26(20S)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.447 | 0.0 | 0.0 | 2.95 |
| C26(20R)/C27(20S)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.28 | 0.0 | 0.0 | 7.11 |
| C28(20S)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.693 | 0.0 | 0.0 | 8.65 |
| C27(20R)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.08 | 0.0 | 0.0 | 8.54 |
| C28(20R)-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.559 | 0.0 | 0.0 | 3.67 |
| Total | 0.2 | 0.2 | 0.1 | 4.6 | 4.0 | 0.6 | 4.8 | 0.4 | 0.2 | 234 |

Appendix D. Alkylated PAHs (ng/g) in the sediments from the STXEEMP (cont.).

| Compound | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 0.240 | 0.109 | 0.210 | 0.166 | 0.099 | 0.193 | 2.10 |
| 1-Methylnaphthalene | 0.132 | 0.052 | 0.124 | 0.089 | 0.047 | 0.114 | 1.19 |
| 2,6-Dimethylnaphthalene | 0.0 | 0.331 | 0.298 | 0.180 | 0.209 | 0.444 | 0.584 |
| 1,6,7-Trimethylnaphthalene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 1-Methylfluorene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.121 |
| 4-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.172 |
| 2/3-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.118 |
| 1-Methyldibenzothiophene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.050 |
| 3-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.091 | 0.411 |
| 2-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.134 | 0.742 |
| 2-Methylanthracene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.022 | 0.280 |
| 4/9-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.057 | 0.341 |
| 1-Methylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.070 | 0.459 |
| 3,6-Dimethylphenanthrene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.042 | 0.128 |
| Retene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.000 | 0.000 |
| 2-Methylfluoranthene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.070 | 0.303 |
| Benzo(b)fluorene | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.070 | 0.229 |
| C29-Hopane | 2.22 | 0.0 | 3.31 | 0.0 | 0.0 | 2.75 | 25.2 |
| 18a-Oleanane | 0.900 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.35 |
| C30-Hopane | 3.11 | 0.0 | 4.01 | 0.0 | 0.0 | 3.19 | 27.2 |
| C20-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.779 |
| C21-TAS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.10 |
| C26(20S)-TAS | 0.667 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.46 |
| C26(20R)/C27(20S)-TAS | 0.628 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.8 |
| C28(20S)-TAS | 0.645 | 0.0 | 0.609 | 0.0 | 0.0 | 0.514 | 8.75 |
| C27(20R)-TAS | 0.648 | 0.0 | 0.655 | 0.0 | 0.0 | 0.643 | 7.24 |
| C28(20R)-TAS | 0.266 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.85 |
| Total | 9.4 | 0.5 | 9.2 | 0.4 | 0.4 | 8.4 | 106 |

Appendix E.  Organochlorine pesticides in the sediments from the STXEEMP.

| Compound | 1-1P | 1-2P | 1-3P | 1-4P | 2-1P | 2-2P | 2-3P | 2-6A | 3-1P | 3-2P | 3-3P |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aldrin | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dieldrin | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin Aldehyde | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin Ketone | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Heptachlor | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Heptachlor-Epoxide | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Oxychlordane | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Alpha-Chlordane | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gamma-Chlordane | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Trans-Nonachlor | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Cis-Nonachlor | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Alpha-HCH | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Beta-HCH | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Delta-HCH | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gamma-HCH | 0.00 | 0.00 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| DDMU | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,2,3,4-Tetrachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,2,4,5-Tetrachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hexachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pentachloroanisole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pentachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan II | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan I | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan Sulfate | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mirex | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Chlorpyrifos | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total Chlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix E. Organochlorine pesticides in the sediments from the STXEEMP (cont.).

| Compound | 3-4P | 4-1P | 4-2P | 4-3P | 4-4P | Great Pond - DPNR Target | 5-1P | 5-2P | 5-4P | 5-8A |
|---|---|---|---|---|---|---|---|---|---|---|
| Aldrin | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dieldrin | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin Aldehyde | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin Ketone | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Heptachlor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Heptachlor-Epoxide | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Oxychlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Alpha-Chlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gamma-Chlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Trans-Nonachlor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Cis-Nonachlor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Alpha-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Beta-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Delta-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gamma-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| DDMU | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,2,3,4-Tetrachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,2,4,5-Tetrachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hexachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pentachloroanisole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pentachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan II | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan I | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan Sulfate | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mirex | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Chlorpyrifos | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total Chlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix E. Organochlorine pesticides in the sediments from the STXEEMP (cont.).

| Compound | Stratum 5 - DPNR Target | 6-1P | 6-4P | 6-6A | 6-8A | Stratum 6 - DPNR Target | 7-1P | 7-2P | 7-3P | Green Cay Marina - NCCOS Target |
|---|---|---|---|---|---|---|---|---|---|---|
| Aldrin | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dieldrin | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin Aldehyde | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin Ketone | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Heptachlor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Heptachlor-Epoxide | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Oxychlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Alpha-Chlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gamma-Chlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Trans-Nonachlor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Cis-Nonachlor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Alpha-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Beta-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Delta-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gamma-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| DDMU | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDE | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,2,3,4-Tetrachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,2,4,5-Tetrachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hexachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pentachloroanisole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pentachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan II | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan I | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan Sulfate | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mirex | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Chlorpyrifos | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total Chlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total DDT | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix E.  Organochlorine pesticides in the sediments from the STXEEMP (cont.).

| Compound | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|
| Aldrin | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dieldrin | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin Aldehyde | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endrin Ketone | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Heptachlor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Heptachlor-Epoxide | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Oxychlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Alpha-Chlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gamma-Chlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Trans-Nonachlor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Cis-Nonachlor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Alpha-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Beta-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Delta-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Gamma-HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| DDMU | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,4'-DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4,4'-DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,2,3,4-Tetrachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,2,4,5-Tetrachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hexachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pentachloroanisole | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Pentachlorobenzene | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan II | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan I | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Endosulfan Sulfate | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mirex | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Chlorpyrifos | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total HCH | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total Chlordane | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total DDT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix F.  Polychlorinated biphenyls (PCBs) in the sediments from the STXEEMP (ng/g).

| Compound | 1-1P | 1-2P | 1-3P | 1-4P | 2-1P | 2-2P | 2-3P | 2-6A | 3-1P | 3-2P | 3-3P | 3-4P | 4-1P | 4-2P | 4-3P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 4/10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 7/9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 8/5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 16/32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 28/31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 21/20/33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 46/69/73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 48/75/47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 68/41/64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 40/57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 61/74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 76/70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 66/80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 104 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 96/103 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 102/98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 121/93/95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 101/84/90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 89/113 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 119 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 112 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 120/83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 97/125/86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix F. Polychlorinated biphenyls (PCBs) in the sediments from the STXEEMP (ng/g) (cont.).

| Compound | 1-1P | 1-2P | 1-3P | 1-4P | 2-1P | 2-2P | 2-3P | 2-6A | 3-1P | 3-2P | 3-3P | 3-4P | 4-1P | 4-2P | 4-3P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB 116/117 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 111/115/87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 109 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 110 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 124 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 106/107 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 123 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 118/108 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 114/122 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 105/127 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 126 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 155 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 150 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 152 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 148/145 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 136/154 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 151 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 135 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 144 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 147 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 149/139 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 140 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 143 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 134/133 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 165/131 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 142/146/161 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 153/168 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 132 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 141 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 137 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 130 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 138/164/163 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 160/158 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 129 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 166 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 159 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 162 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 128/167 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 156 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 157 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 169 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 188 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 184 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 179 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 176 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 186/178 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 175 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 187/182 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 183 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 185 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 174 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 181 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 177 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 171 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 173 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 192/172 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 180/193 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 191 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 170/190 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 189 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 202 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 201 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 204 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 197 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 200 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 198 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 199 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 203/196 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 195 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 194 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 205 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 208 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 207 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 206 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 209 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total PCB | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix F.  Polychlorinated biphenyls (PCBs) in the sediments from the STXEEMP (ng/g) (cont.).

| Compound | 4-4P | Great Pond - DPNR Target | 5-1P | 5-2P | 5-4P | 5-8A | Stratum 5 - DPNR Target | 6-1P | 6-4P | 6-6A | 6-8A | Stratum 6 - DPNR Target | 7-1P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 4/10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 7/9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 8/5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 16/32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 28/31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 21/20/33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 46/69/73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 48/75/47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 68/41/64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 40/57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 61/74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 76/70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 66/80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 104 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 96/103 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 102/98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 121/93/95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 101/84/90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 89/113 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 119 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 112 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 120/83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 97/125/86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix F. Polychlorinated biphenyls (PCBs) in the sediments from the STXEEMP (ng/g) (cont.).

| Compound | 4-4P | Great Pond - DPNR Target | 5-1P | 5-2P | 5-4P | 5-8A | Stratum 5 - DPNR Target | 6-1P | 6-4P | 6-6A | 6-8A | Stratum 6 - DPNR Target | 7-1P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB 116/117 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 111/115/87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 109 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 110 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 124 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 106/107 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 123 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 118/108 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| PCB 114/122 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 105/127 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 126 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 155 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 150 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 152 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 148/145 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 136/154 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 151 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 135 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 144 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 147 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 149/139 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 140 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 143 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 134/133 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 165/131 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 142/146/161 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 153/168 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 132 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 141 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 137 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 130 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 138/164/163 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 160/158 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 129 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 166 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 159 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 162 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 128/167 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 156 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 157 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 169 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 188 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 184 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 179 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 176 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 186/178 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 175 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 187/182 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 183 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 185 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 174 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 181 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 177 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 171 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 173 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 192/172 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 180/193 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 191 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 170/190 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 189 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 202 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 201 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 204 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 197 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 200 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 198 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 199 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 203/196 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 195 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 194 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 205 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 208 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 207 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 206 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 209 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total PCB | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |

Appendix F.  Polychlorinated biphenyls (PCBs) in the sediments from the STXEEMP (ng/g) (cont.).

| Compound | 7-2P | 7-3P | Green Cay Marina - NCCOS Target | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|---|---|---|
| PCB 1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 4/10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 7/9 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 6 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 8/5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 19 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 16/32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 34 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 23 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 26 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 28/31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 21/20/33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 22 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 39 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 54 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 50 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 53 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 46/69/73 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 52 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 43 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 48/75/47 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 44 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 59 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 42 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 72 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 71 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 68/41/64 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 40/57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 58 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 63 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 61/74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 76/70 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 66/80 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 55 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 56 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 60 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 79 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 78 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 81 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 104 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 96/103 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 94 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 102/98 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 121/93/95 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 88 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 91 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 92 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 101/84/90 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 89/113 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 119 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 112 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 120/83 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 97/125/86 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix F.  Polychlorinated biphenyls (PCBs) in the sediments from the STXEEMP (ng/g) (cont.).

| Compound | 7-2P | 7-3P | Green Cay Marina - NCCOS Target | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Por DPNR Target |
|---|---|---|---|---|---|---|---|---|---|---|
| PCB 116/117 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 111/115/87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 109 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 110 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 82 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 124 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 106/107 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 123 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 118/108 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 114/122 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 105/127 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 126 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 155 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 150 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 152 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 148/145 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 136/154 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 151 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 135 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 144 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 147 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 149/139 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 140 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 143 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 134/133 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 165/131 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 142/146/161 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 153/168 | 0.00 | 0.00 | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 132 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 141 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 137 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 130 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 138/164/163 | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 160/158 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 129 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 166 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 159 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 162 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 128/167 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 156 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 157 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 169 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 188 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 184 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 179 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 176 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 186/178 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 175 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 187/182 | 0.00 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 183 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 185 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 174 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 181 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 177 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 171 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 173 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 192/172 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 180/193 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 191 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 170/190 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 189 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 202 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 201 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 204 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 197 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 200 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 198 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 199 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 203/196 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 195 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 194 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 205 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 208 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 207 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 206 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PCB 209 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total PCB | 0.00 | 0.00 | 0.62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix G. Butyltins in the sediments from the STXEEMP.

| Compound | 1-1P | 1-2P | 1-3P | 1-4P | 2-1P | 2-2P | 2-3P | 2-6A | 3-1P | 3-2P |
|---|---|---|---|---|---|---|---|---|---|---|
| Monobutyltin (MBT) | 0.31 | 0.00 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dibutyltin (DBT) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tributyltin (TBT) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tetrabutyltin (TeBT) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Compound | 3-3P | 3-4P | 4-1P | 4-2P | 4-3P | 4-4P | Great Pond - DPNR Target | 5-1P | 5-2P | 5-4P |
|---|---|---|---|---|---|---|---|---|---|---|
| Monobutyltin (MBT) | 0.82 | 0.28 | 0.33 | 0.00 | 0.00 | 0.00 | 0.58 | 0.00 | 0.00 | 0.35 |
| Dibutyltin (DBT) | 0.18 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tributyltin (TBT) | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tetrabutyltin (TeBT) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Compound | 5-8A | Stratum 5 - DPNR Target | 6-1P | 6-4P | 6-6A | 6-8A | Stratum 6 - DPNR Target | 7-1P | 7-2P | 7-3P |
|---|---|---|---|---|---|---|---|---|---|---|
| Monobutyltin (MBT) | 0.32 | 0.25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dibutyltin (DBT) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tributyltin (TBT) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tetrabutyltin (TeBT) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| Compound | Green Cay Marina - NCCOS Target | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|---|
| Monobutyltin (MBT) | N/A | 0.00 | 0.00 | 1.09 | 0.30 | 0.35 | 0.42 | 0.00 |
| Dibutyltin (DBT) | N/A | 0.00 | 0.00 | 0.41 | 0.00 | 0.00 | 0.12 | 0.00 |
| Tributyltin (TBT) | N/A | 0.00 | 0.00 | 0.13 | 0.00 | 0.05 | 0.00 | 0.00 |
| Tetrabutyltin (TeBT) | N/A | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix H. Trace and major elements in the sediments from the STXEEMP.

| Element | 1-1P | 1-2P | 1-3P | 1-4P | 2-1P | 2-2P | 2-3P | 2-6A | 3-1P | 3-2P | 3-3P |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | 1,320 | 6,600 | 3,040 | 912 | 2,810 | 432 | 2,640 | 7,450 | 1,270 | 195 | 5,670 |
| Antimony (Sb) | 0.13 | 0.18 | 0.12 | 0.12 | 0.00 | 0.16 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 |
| Arsenic (As) | 2.87 | 3.04 | 3.11 | 2.63 | 0.85 | 3.91 | 3.66 | 2.75 | 2.80 | 4.05 | 2.22 |
| Cadmium (Cd) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Chromium (Cr) | 8.20 | 13.7 | 8.96 | 5.58 | 6.46 | 9.28 | 9.03 | 14.8 | 10.2 | 6.13 | 13.8 |
| Copper (Cu) | 0.00 | 0.61 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 | 3.22 | 0.00 | 0.00 | 3.13 |
| Iron (Fe) | 852 | 3,540 | 1,490 | 893 | 1,220 | 265 | 1,290 | 3,060 | 617 | 121 | 2,820 |
| Lead (Pb) | 0.68 | 0.99 | 0.93 | 0.84 | 1.04 | 1.60 | 0.66 | 0.85 | 0.51 | 0.70 | 0.87 |
| Manganese (Mn) | 21.3 | 82.5 | 40.9 | 22.3 | 44.8 | 9.71 | 33.6 | 62.6 | 16.9 | 16.0 | 60.8 |
| Mercury (Hg) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| Nickel (Ni) | 6.25 | 7.90 | 6.45 | 6.23 | 7.60 | 4.97 | 6.64 | 7.71 | 5.93 | 4.50 | 8.21 |
| Selenium (Se) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Silicon (Si) | 5,360 | 24,600 | 15,000 | 4,040 | 15,100 | 1,580 | 27,200 | 31,600 | 5,220 | 1,100 | 26,800 |
| Silver (Ag) | 0.96 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.26 | 0.00 | 0.13 | 0.00 | 0.00 |
| Tin (Sn) | 0.50 | 0.25 | 0.36 | 0.34 | 0.24 | 0.23 | 0.47 | 0.28 | 0.23 | 0.00 | 0.00 |
| Zinc (Zn) | 2.48 | 4.33 | 2.60 | 2.10 | 2.39 | 1.10 | 3.15 | 5.95 | 1.54 | 0.74 | 8.92 |

Appendix H. Trace and major elements in the sediments from the STXEEMP (cont.).

| Element | 3-4P | 4-1P | 4-2P | 4-3P | 4-4P | Great Pond - DPNR Target | 5-1P | 5-2P | 5-4P | 5-8A |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | 484 | 752 | 1,800 | 810 | 763 | 25,600 | 538 | 366 | 378 | 498 |
| Antimony (Sb) | 0.13 | 0.00 | 0.21 | 0.16 | 0.00 | 0.19 | 0.00 | 0.00 | 0.00 | 0.00 |
| Arsenic (As) | 1.94 | 1.82 | 2.03 | 2.07 | 1.81 | 3.25 | 2.95 | 2.73 | 1.85 | 1.74 |
| Cadmium (Cd) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Chromium (Cr) | 9.99 | 12.7 | 12.6 | 11.7 | 12.8 | 20.6 | 9.53 | 6.42 | 8.20 | 7.20 |
| Copper (Cu) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 11.5 | 0.00 | 0.00 | 0.00 | 0.00 |
| Iron (Fe) | 240 | 371 | 840 | 571 | 536 | 12,000 | 362 | 280 | 325 | 372 |
| Lead (Pb) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.42 | 0.00 | 0.00 | 0.00 | 0.00 |
| Manganese (Mn) | 14.7 | 15.9 | 33.6 | 20.9 | 19.9 | 217 | 18.8 | 16.5 | 18.0 | 17.2 |
| Mercury (Hg) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Nickel (Ni) | 4.63 | 5.87 | 4.70 | 5.77 | 5.65 | 10.80 | 5.06 | 4.79 | 4.94 | 5.33 |
| Selenium (Se) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Silicon (Si) | 2,460 | 3,140 | 6,790 | 2,950 | 2,510 | 101,000 | 1,970 | 1,280 | 1,240 | 1,810 |
| Silver (Ag) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Tin (Sn) | 0.00 | 0.27 | 0.00 | 0.34 | 0.00 | 0.25 | 0.00 | 0.00 | 0.27 | 0.00 |
| Zinc (Zn) | 0.89 | 1.02 | 1.46 | 1.13 | 1.01 | 22.10 | 0.86 | 1.05 | 0.99 | 0.98 |

Appendix H. Trace and major elements in the sediments from the STXEEMP (cont.).

| Element | Stratum 5 - DPNR Target | 6-1P | 6-4P | 6-6A | 6-8A | Stratum 6 - DPNR Target | 7-1P | 7-2P | 7-3P | Green Cay Marina - NCCOS Target |
|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum (Al) | 1,440 | 844 | 339 | 4,260 | 9,800 | 6,800 | 2,270 | 2,060 | 1,810 | 32,000 |
| Antimony (Sb) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 | 0.12 | 0.00 | 0.32 |
| Arsenic (As) | 1.61 | 2.42 | 1.74 | 2.10 | 2.73 | 4.90 | 1.96 | 2.60 | 2.41 | 8.82 |
| Cadmium (Cd) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 |
| Chromium (Cr) | 7.31 | 8.33 | 7.12 | 10.7 | 18.1 | 12.6 | 9.02 | 29.2 | 9.19 | 85.2 |
| Copper (Cu) | 0.00 | 0.00 | 0.00 | 0.45 | 3.52 | 4.27 | 0.00 | 0.00 | 0.00 | 344.00 |
| Iron (Fe) | 800 | 729 | 277 | 2,430 | 4,520 | 6,000 | 1,580 | 1,340 | 947 | 24,000 |
| Lead (Pb) | 0.00 | 0.00 | 0.00 | 0.00 | 0.91 | 1.03 | 0.00 | 0.53 | 0.00 | 10.1 |
| Manganese (Mn) | 28.5 | 39.5 | 15.2 | 62.4 | 102 | 87.1 | 35.1 | 39.8 | 31.2 | 400 |
| Mercury (Hg) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 |
| Nickel (Ni) | 4.70 | 4.85 | 4.95 | 8.57 | 9.94 | 7.19 | 6.36 | 7.24 | 6.63 | 42.5 |
| Selenium (Se) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.13 |
| Silicon (Si) | 5,150 | 3,610 | 1,360 | 18,200 | 49,300 | 25,300 | 8,990 | 7,550 | 7,320 | 134,000 |
| Silver (Ag) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.93 | 0.00 | 0.10 |
| Tin (Sn) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.24 | 4.15 |
| Zinc (Zn) | 2.07 | 1.63 | 0.99 | 4.41 | 9.64 | 7.94 | 2.71 | 4.94 | 2.24 | 206 |

Appendix H. Trace and major elements in the sediments from the STXEEMP (cont.).

| Element | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|
| Aluminum (Al) | 4,960 | 206 | 8,400 | 29,700 | 1,980 | 11,200 | 49,300 |
| Antimony (Sb) | 0.23 | 0.00 | 0.11 | 0.18 | 0.00 | 0.14 | 0.31 |
| Arsenic (As) | 2.17 | 1.85 | 2.80 | 3.83 | 1.95 | 4.70 | 7.59 |
| Cadmium (Cd) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Chromium (Cr) | 14.5 | 9.55 | 16.8 | 32.2 | 8.04 | 14.1 | 54.9 |
| Copper (Cu) | 0.92 | 0.00 | 7.62 | 8.17 | 0.00 | 4.65 | 57.2 |
| Iron (Fe) | 2,230 | 181 | 4,180 | 11,100 | 1,180 | 4,560 | 30,100 |
| Lead (Pb) | 0.67 | 0.00 | 1.20 | 1.22 | 0.00 | 1.22 | 9.36 |
| Manganese (Mn) | 55.2 | 13.2 | 74.4 | 247 | 31.2 | 89.0 | 309 |
| Mercury (Hg) | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.02 |
| Nickel (Ni) | 8.20 | 4.49 | 10.70 | 8.31 | 5.69 | 9.70 | 33.6 |
| Selenium (Se) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Silicon (Si) | 23,300 | 863 | 41,800 | 118,000 | 5,650 | 75,400 | 185,000 |
| Silver (Ag) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 |
| Tin (Sn) | 0.00 | 0.00 | 0.23 | 0.20 | 0.00 | 0.21 | 0.92 |
| Zinc (Zn) | 4.97 | 0.00 | 10.3 | 14.20 | 2.23 | 7.61 | 66.8 |

Appendix I. PBDE compounds in selected sediment samples from the STXEEMP.

| Compound | Great Pond - DPNR Target | Green Cay Marina - NCCOS Target | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|---|---|
| PBDE-1 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-2 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-7 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-8 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-32 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-25 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-28 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-71/49 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-47 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.25 |
| PBDE-66 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-77 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.00 |
| PBDE-100 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-119 | 0.00 | 0.17 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.32 |
| PBDE-99 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 |
| PBDE-116 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-118 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-126 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-85 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-155 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-154 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-153 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-138 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-166 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-183 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix I. PBDE compounds in selected sediment samples from the STXEEMP (cont.).

| Compound | Great Pond - DPNR Target | Green Cay Marina - NCCOS Target | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|---|---|
| PBDE-181 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-190 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-202 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-201 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-204 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-197 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-198/199/203/200 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-196 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-205 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-194 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-195 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-208 | 0.00 | 10.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-207 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-206 | 0.00 | 0.57 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PBDE-209 | 0.33 | 20.82 | 0.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.91 |
| Total PBDEs | 0.33 | 32.38 | 0.51 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 1.47 |

Appendix J.  PFAS compounds in selected sediment samples from the STXEEMP.

| Compound | Great Pond - DPNR Target | Green Cay Marina - DPNR Target | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|---|---|
| PFBA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFPeA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.67 | 0.00 | 0.00 |
| PFBS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 4:2 FTS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 6:2 FTS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 8:2 FTS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFHxA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFPeS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFHpA | 0.43 | 0.47 | 0.00 | 0.41 | 0.42 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFHxS | 0.04 | 0.04 | 0.04 | 0.00 | 0.00 | 0.04 | 0.05 | 0.00 | 0.00 |
| PFOA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFHpS | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFNA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFOS | 0.21 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 |
| PFDA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFNS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFUnA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFDoA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFTriA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFTreA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFOSA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| N-EtFOSAA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| N-MeFOSAA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| PFDS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| HFPO-DA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| ADONA | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 9Cl-PF3ONS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 11Cl-PF3OUdS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Appendix K. *Clostridium perfringens* in the sediments from the STXEEMP.

| Analyte | 1-1P | 1-2P | 1-3P | 1-4P | 2-1P | 2-2P | 2-3P | 2-6A | 3-1P | 3-2P |
|---|---|---|---|---|---|---|---|---|---|---|
| C. perfringens (CFU/g dry wt.) | 36.5 | <1 | 7.32 | 89.7 | <1 | 34 | 125 | 8.06 | 66.8 | 18.5 |
| C. perfringens (Colonies/g) | 23 | <1 | 5 | 54 | <1 | 24 | 83 | 5 | 51 | 13 |
| Solids (%) | 63 | 77 | 68 | 60 | 84 | 71 | 66 | 62 | 76 | 70 |
| Water (%) | 37 | 23 | 32 | 40 | 16 | 29 | 34 | 38 | 24 | 30 |

| Analyte | 3-3P | 3-4P | 4-1P | 4-2P | 4-3P | 4-4P | Great Pond - DPNR Target | 5-1P | 5-2P | 5-4P |
|---|---|---|---|---|---|---|---|---|---|---|
| C. perfringens (CFU/g dry wt.) | 205 | 192 | 127 | <1 | 71.6 | 24.3 | 104 | 11.5 | 35 | <1 |
| C. perfringens (Colonies/g) | 146 | 153 | 97 | <1 | 53 | 19 | 70 | 9 | 27 | <1 |
| Solids (%) | 71 | 80 | 76 | 80 | 74 | 78 | 68 | 78 | 77 | 80 |
| Water (%) | 29 | 20 | 24 | 20 | 26 | 22 | 32 | 22 | 23 | 20 |

| Analyte | 5-8A | Stratum 5 - DPNR Target | 6-1P | 6-4P | 6-6A | 6-8A | Stratum 6 - DPNR Target | 7-1P | 7-2P | 7-3P |
|---|---|---|---|---|---|---|---|---|---|---|
| C. perfringens (CFU/g dry wt.) | <1 | <1 | <1 | <1 | <1 | 2.66 | 12.6 | <1 | 19.6 | <1 |
| C. perfringens (Colonies/g) | <1 | <1 | <1 | <1 | <1 | 2 | 11 | <1 | 15 | <1 |
| Solids (%) | 78 | 82 | 70 | 71 | 77 | 75 | 87 | 83 | 76 | 76 |
| Water (%) | 22 | 18 | 30 | 29 | 23 | 25 | 13 | 17 | 24 | 24 |

| Analyte | Green Cay Marina - NCCOS Target | Cramers Park - DPNR Target | Cramers Nursery - DPNR Target | Yacht Club - DPNR Target | Chenay Bay - DPNR Target | DIVI - DPNR Target | Fire Station - DPNR Target | Great Pond Salt Pond - DPNR Target |
|---|---|---|---|---|---|---|---|---|
| C. perfringens (CFU/g dry wt.) | 868 | 3.96 | <1 | 8.76 | <1 | <1 | <1 | 253 |
| C. perfringens (Colonies/g) | 339 | 3 | <1 | 6 | <1 | <1 | <1 | 160 |
| Solids (%) | 39 | 76 | 79 | 68 | 75 | 78 | 72 | 63 |
| Water (%) | 61 | 24 | 21 | 32 | 25 | 22 | 28 | 37 |

Appendix L.  Benthic infaunal data from the STXEEMP.

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| 1-1P | Mollusca | Gastropoda | Patellogastropoda | Acmaeidae | Acmaea pustulata | 1 |
| 1-1P | Mollusca | Bivalvia | Veneroida | Ungulinidae | Diplodonta punctata | 1 |
| 1-1P | Mollusca | Bivalvia | Veneroida | Semelidae | Semele bellastriata | 1 |
| 1-1P | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 1 |
| 1-1P | Arthropoda | Malacostraca | Isopoda | | Isopoda (LPIL) | 1 |
| 1-1P | Arthropoda | Malacostraca | Tanaidacea | Nototanaidae | Nototanaidae (LPIL) | 3 |
| 1-1P | Annelida | Polychaeta | Sabellida | Serpulidae | Hydroides dianthus | 1 |
| 1-1P | Annelida | Polychaeta | Eunicida | Onuphidae | Onuphidae (LPIL) | 7 |
| 1-1P | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 7 |
| 1-1P | Annelida | Polychaeta | Eunicida | Eunicidae | Nematonereis hebes | 2 |
| 1-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Sphaerosyllis piriferopsis | 1 |
| 1-1P | Annelida | Polychaeta | Phyllodocida | Nereididae | Nereis falsa | 2 |
| 1-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis lutea | 1 |
| 1-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Haplosyllis spongicola | 1 |
| 1-2P | Sipuncula | Phascolosomatidea | Aspidosiphoniformes | Aspidosiphonidae | Aspidosiphon (LPIL) | 9 |
| 1-2P | Mollusca | Gastropoda | Archaeogastropoda | Tricoliidae | Tricolia (LPIL) | 1 |
| 1-2P | Arthropoda | Malacostraca | Amphipoda | Corophiidae | Apocorophium (LPIL) | 3 |
| 1-2P | Annelida | Polychaeta | Eunicida | Eunicidae | Nematonereis hebes | 1 |
| 1-3P | Echinodermata | Ophiuroidea | Ophiurida | Ophiodermatidae | Ophioderma (LPIL) | 1 |
| 1-3P | Mollusca | Bivalvia | | | Bivalvia (LPIL) | 1 |
| 1-3P | Mollusca | Bivalvia | Mytiloida | Mytilidae | Musculus lateralis | 1 |
| 1-3P | Mollusca | Bivalvia | Venerida | Veneridae | Pitar fulminatus | 1 |
| 1-3P | Arthropoda | Malacostraca | Isopoda | Sphaeromatidae | Sphaeromatidae (LPIL) | 2 |
| 1-3P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis bacescui | 1 |
| 1-3P | Arthropoda | Malacostraca | Tanaidacea | Parapseudidae | Parapseudidae (LPIL) | 1 |
| 1-3P | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 1 |
| 1-3P | Arthropoda | Malacostraca | Tanaidacea | Nototanaidae | Pseudonototanais (LPIL) | 1 |
| 1-4P | Mollusca | Polyplacophora | Chitonida | Chitonidae | Chitonidae (LPIL) | 2 |
| 1-4P | Mollusca | Bivalvia | Veneroida | Mesodesmatidae | Ervilia concentrica | 1 |
| 1-4P | Mollusca | Bivalvia | Venerida | Veneridae | Chione cancellata | 1 |
| 1-4P | Sipuncula | Phascolosomatidea | Aspidosiphoniformes | Aspidosiphonidae | Aspidosiphon (LPIL) | 17 |
| 1-4P | Mollusca | Scaphopoda | Dentaliida | Dentaliidae | Dentalium (LPIL) | 2 |
| 1-4P | Arthropoda | Malacostraca | Isopoda | Anthuridae | Anthuridae (LPIL) | 1 |
| 1-4P | Arthropoda | Malacostraca | Tanaidacea | Nototanaidae | Nototanaidae (LPIL) | 2 |
| 1-4P | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 1 |
| 1-4P | Arthropoda | Malacostraca | Amphipoda | Melitidae | Melitidae (LIPL) | 1 |
| 1-4P | Arthropoda | Malacostraca | Amphipoda | Ischyroceridae | Cerapus (LPIL) | 1 |
| 1-4P | Cnidaria | Anthozoa | Actiniaria | | Actiniaria (LPIL) | 2 |
| 1-4P | Mollusca | Gastropoda | Neotaenioglossa | Rissoidae | Rissoina bryerea | 1 |
| 1-4P | Annelida | Polychaeta | Phyllodocida | Syllidae | Haplosyllis spongicola | 28 |
| 1-4P | Annelida | Polychaeta | Phyllodocida | Nereididae | Nereididae (LPIL) | 1 |
| 1-4P | Annelida | Polychaeta | Phyllodocida | Syllidae | Sphaerosyllis taylori | 3 |
| 1-4P | Annelida | Polychaeta | Eunicida | Eunicidae | Eunicidae (LPIL) | 3 |
| 1-4P | Annelida | Polychaeta | Phyllodocida | Chrysopetalidae | Bhawania reyssi | 2 |
| 1-4P | Annelida | Polychaeta | Orbiniida | Orbiniidae | Scoloplos texana | 1 |
| 1-4P | Annelida | Polychaeta | Phyllodocida | Syllidae | Pionosyllis spinisetosa | 1 |
| 1-4P | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 2 |
| 1-4P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 1 |
| 1-4P | Annelida | Polychaeta | Eunicida | Lumbrineridae | Lumbrineridae (LPIL) | 2 |
| 1-4P | Annelida | Polychaeta | Phyllodocida | Glyceridae | Glyceridae (LPIL) | 1 |
| 1-4P | Annelida | Polychaeta | Phyllodocida | Pholoidae | Taylorpholoe hirsuta | 1 |
| 2-1P | Sipuncula | Phascolosomatidea | Aspidosiphoniformes | Aspidosiphonidae | Aspidosiphon (LPIL) | 1 |
| 2-1P | Sipuncula | Sipunculidea | Golfingiida | Phascolionidae | Phascolion strombus | 1 |

Appendix L. Benthic infaunal data from the STXEEMP (cont.).

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| 2-2P | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 3 |
| 2-2P | Annelida | Polychaeta | Phyllodocida | Chrysopetalidae | Bhawania reyssi | 2 |
| 2-2P | Annelida | Polychaeta | Phyllodocida | Syllidae | Haplosyllis spongicola | 1 |
| 2-2P | Annelida | Polychaeta | Eunicida | Onuphidae | Onuphidae (LPIL) | 1 |
| 2-2P | Mollusca | Bivalvia | Veneroida | Ungulinidae | Diplodonta punctata | 3 |
| 2-2P | Mollusca | Bivalvia | Venerida | Veneridae | Chione cancellata | 1 |
| 2-2P | Mollusca | Gastropoda | Cephalaspidea | Haminoeidae | Atys caribaeus | 1 |
| 2-2P | Mollusca | Gastropoda | Neogastropoda | Columbellidae | Columbellidae (LPIL) | 1 |
| 2-2P | Mollusca | Gastropoda | | | Gastropoda (LPIL) | 1 |
| 2-2P | Mollusca | Gastropoda | Neogastropoda | Nassariidae | Nassarius vibex | 1 |
| 2-2P | Mollusca | Bivalvia | | | Bivalvia (LPIL) | 1 |
| 2-2P | Arthropoda | Malacostraca | Isopoda | Limnoriidae | Limnoria (LPIL) | 1 |
| 2-2P | Arthropoda | Malacostraca | Isopoda | Anthuridae | Anthuridae (LPIL) | 1 |
| 2-2P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptocheliidae (LPIL) | 2 |
| 2-2P | Arthropoda | Malacostraca | Amphipoda | Isaeidae | Chevalia (LPIL) | 7 |
| 2-2P | Arthropoda | Malacostraca | Amphipoda | Isaeidae | Photis (LPIL) | 1 |
| 2-2P | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 3 |
| 2-2P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Bodotriidae (LPIL) | 1 |
| 2-2P | Arthropoda | Malacostraca | Decapoda | Tychidae | Pitho aculeata | 1 |
| 2-2P | Arthropoda | Malacostraca | Tanaidacea | Nototanaidae | Nototanaidae (LPIL) | 1 |
| 2-2P | Annelida | Polychaeta | Eunicida | Eunicidae | Eunicidae (LPIL) | 1 |
| 2-3P | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 9 |
| 2-3P | Annelida | Polychaeta | Eunicida | Eunicidae | Eunicidae (LPIL) | 5 |
| 2-3P | Annelida | Polychaeta | Phyllodocida | Syllidae | Sphaerosyllis piriferopsis | 1 |
| 2-3P | Sipuncula | Phascolosomatidea | Aspidosiphoniformes | Aspidosiphonidae | Aspidosiphon (LPIL) | 1 |
| 2-3P | Mollusca | Polyplacophora | Chitonida | Chitonidae | Chitonidae (LPIL) | 3 |
| 2-3P | Mollusca | Gastropoda | Neogastropoda | Nassariidae | Nassarius vibex | 1 |
| 2-3P | Mollusca | Bivalvia | Venerida | Veneridae | Chione cancellata | 1 |
| 2-3P | Mollusca | Bivalvia | Veneroida | Lucinidae | Radiolucina amianta | 2 |
| 2-3P | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 2 |
| 2-3P | Arthropoda | Malacostraca | Amphipoda | Ampeliscidae | Ampelisca (LPIL) | 1 |
| 2-3P | Arthropoda | Malacostraca | Cumacea | | Cumacea (LPIL) | 2 |
| 2-3P | Arthropoda | Malacostraca | Isopoda | Anthuridae | Anthuridae (LPIL) | 2 |
| 2-3P | Arthropoda | Malacostraca | Isopoda | Stenetriidae | Stenetrium (LPIL) | 4 |
| 2-3P | Arthropoda | Malacostraca | Tanaidacea | Metapseudidae | Metapseudidae (LPIL) | 4 |
| 2-3P | Arthropoda | Malacostraca | Tanaidacea | | Tanaidacea (LPIL) | 2 |
| 2-3P | Arthropoda | Malacostraca | Tanaidacea | Nototanaidae | Nototanaidae (LPIL) | 3 |
| 2-3P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptochelia forresti | 11 |
| 2-6A | Annelida | Polychaeta | Sabellida | Sabellidae | Sabellidae (LPIL) | 1 |
| 2-6A | Sipuncula | | | | Sipuncula (LPIL) | 10 |
| 2-6A | Sipuncula | Phascolosomatidea | Aspidosiphoniformes | Aspidosiphonidae | Aspidosiphon (LPIL) | 1 |
| 2-6A | Mollusca | Bivalvia | Veneroida | Lucinidae | Radiolucina amianta | 1 |
| 2-6A | Mollusca | Gastropoda | | | Gastropoda (LPIL) | 1 |
| 3-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis broomensis | 1 |
| 3-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllidae (LPIL) | 1 |
| 3-1P | Annelida | Polychaeta | Terebellida | Ampharetidae | Ampharetidae (LPIL) | 1 |
| 3-1P | Annelida | Polychaeta | Eunicida | Lumbrineridae | Lumbrineridae (LPIL) | 1 |
| 3-1P | Annelida | Polychaeta | Phyllodocida | Nereididae | Nereididae (LPIL) | 1 |
| 3-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 2 |
| 3-1P | Sipuncula | Sipunculidea | Golfingiida | Phascolionidae | Phascolion strombus | 3 |
| 3-1P | Mollusca | Bivalvia | Veneroida | Lucinidae | Radiolucina amianta | 8 |
| 3-1P | Mollusca | Gastropoda | Neogastropoda | Nassariidae | Nassarius vibex | 1 |
| 3-1P | Mollusca | Bivalvia | Veneroida | Tellinidae | Angulus versicolor | 1 |

Appendix L.  Benthic infaunal data from the STXEEMP (cont.).

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| 3-1P | Mollusca | Gastropoda | Neritopsina | Neritidae | Smaragdia viridis | 1 |
| 3-1P | Mollusca | Gastropoda | Cephalaspidea | Cylichnidae | Acteocina bullata | 2 |
| 3-1P | Mollusca | Gastropoda | Neogastropoda | Cysticidae | Gibberula lavalleeana | 3 |
| 3-1P | Mollusca | Bivalvia | | | Bivalvia (LPIL) | 1 |
| 3-1P | Mollusca | Gastropoda | Archaeogastropoda | Turbinidae | Turbo canaliculatus | 1 |
| 3-1P | Mollusca | Gastropoda | Neotaenioglossa | Cerithiopsidae | Cerithium litteratum | 4 |
| 3-1P | Arthropoda | Malacostraca | Decapoda | | Decapoda (LPIL) | 1 |
| 3-1P | Arthropoda | Malacostraca | Decapoda | Alpheidae | Alpheus (LPIL) | 1 |
| 3-1P | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Nannastacidae (LPIL) | 1 |
| 3-1P | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 1 |
| 3-1P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptochelia forresti | 3 |
| 3-1P | Arthropoda | Malacostraca | Decapoda | Paguridae | Paguridae (LPIL) | 1 |
| 3-1P | Arthropoda | Malacostraca | Decapoda | Calappidae | Calappidae (LPIL) | 1 |
| 3-1P | Mollusca | Gastropoda | Neotaenioglossa | Cerithiidae | Cerithium muscarum | 1 |
| 3-2P | Annelida | Polychaeta | Scolecida | Maldanidae | Maldanidae (LPIL) | 1 |
| 3-2P | Cnidaria | Anthozoa | Actiniaria | | Actiniaria (LPIL) | 1 |
| 3-2P | Arthropoda | Malacostraca | Amphipoda | Ischyroceridae | Cerapus (LPIL) | 10 |
| 3-2P | Arthropoda | Malacostraca | Amphipoda | Ischyroceridae | Ericthonius (LPIL) | 1 |
| 3-3P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis cornuta | 1 |
| 3-3P | Annelida | Polychaeta | Scolecida | Paraonidae | Aricidea taylori | 11 |
| 3-3P | Annelida | Polychaeta | Orbiniida | Orbiniidae | Orbiniidae (LPIL) | 4 |
| 3-3P | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 8 |
| 3-3P | Annelida | Polychaeta | Terebellida | Ampharetidae | Isolda pulchella | 3 |
| 3-3P | Annelida | Oligochaeta | Enchytraeida | Enchytraeidae | Enchytraeidae (LPIL) | 6 |
| 3-3P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 1 |
| 3-3P | Annelida | Polychaeta | Eunicida | Dorvilleidae | Schistomeringos pectinata | 1 |
| 3-3P | Annelida | Polychaeta | Terebellida | Cirratulidae | Cirratulidae (LPIL) | 3 |
| 3-3P | Annelida | Polychaeta | Eunicida | Lumbrineridae | Lumbrineridae (LPIL) | 3 |
| 3-3P | Annelida | Polychaeta | Scolecida | Maldanidae | Maldanidae (LPIL) | 2 |
| 3-3P | Cnidaria | Anthozoa | Actiniaria | | Actiniaria (LPIL) | 11 |
| 3-3P | Nemertea | Anopla | Paleonemertea | Tubulanidae | Tubulanus sp. A | 1 |
| 3-3P | Nemertea | Anopla | Heteronemertea | Lineidae | Lineidae (LPIL) | 1 |
| 3-3P | Nemertea | | | | Nemertea (LPIL) | 1 |
| 3-3P | Mollusca | Bivalvia | Venerida | Veneridae | Chione cancellata | 4 |
| 3-3P | Mollusca | Gastropoda | Cephalaspidea | Bullidae | Bulla striata | 1 |
| 3-3P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptocheliidae (LPIL) | 3 |
| 3-3P | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 1 |
| 3-3P | Arthropoda | Malacostraca | Amphipoda | Caprellidae | Caprellidae (LPIL) | 1 |
| 3-4P | Annelida | Polychaeta | Phyllodocida | Sigalionidae | Sigalionidae (LPIL) | 1 |
| 3-4P | Annelida | Polychaeta | Scolecida | Maldanidae | Maldanidae (LPIL) | 1 |
| 3-4P | Annelida | Polychaeta | Phyllodocida | Nereididae | Nereididae (LPIL) | 1 |
| 3-4P | Nemertea | | | | Nemertea (LPIL) | 1 |
| 3-4P | Nemertea | Anopla | Paleonemertea | Tubulanidae | Tubulanus sp. A | 1 |
| 3-4P | Mollusca | Gastropoda | | | Gastropoda (LPIL) | 1 |
| 3-4P | Mollusca | Gastropoda | Neogastropoda | Nassariidae | Nassarius vibex | 2 |
| 3-4P | Mollusca | Bivalvia | Veneroida | Lucinidae | Radiolucina amianta | 6 |
| 3-4P | Mollusca | Gastropoda | Neotaenioglossa | Cerithiopsidae | Cerithium litteratum | 1 |
| 3-4P | Mollusca | Gastropoda | Archaeogastropoda | Tricoliidae | Tricolia affinis | 1 |
| 3-4P | Mollusca | Bivalvia | Veneroida | Tellinidae | Tellinidae (LPIL) | 2 |
| 3-4P | Mollusca | Gastropoda | Littorinimorpha | Eulimidae | Eulima (LPIL) | 4 |
| 3-4P | Arthropoda | Malacostraca | Cumacea | | Cumacea (LPIL) | 1 |
| 3-4P | Arthropoda | Malacostraca | Tanaidacea | Parapseudidae | Parapseudidae (LPIL) | 1 |
| 3-4P | Arthropoda | Malacostraca | Tanaidacea | Metapseudidae | Metapseudidae (LPIL) | 2 |

Appendix L. Benthic infaunal data from the STXEEMP (cont.).

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| 3-4P | Arthropoda | Malacostraca | Decapoda | Paguridae | Paguridae (LPIL) | 3 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone hebes | 3 |
| 4-1P | Annelida | Polychaeta | Scolecida | Paraonidae | Paradoneis lyra | 3 |
| 4-1P | Annelida | Polychaeta | Opheliida | Opheliidae | Armandia maculata | 1 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 2 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Nereididae | Ceratonereis longicirrata | 1 |
| 4-1P | Annelida | Polychaeta | Terebellida | Cirratulidae | Caulleriella sp. J | 3 |
| 4-1P | Annelida | Polychaeta | Oweniida | Oweniidae | Owenia fusiformis | 1 |
| 4-1P | Annelida | Polychaeta | Scolecida | Maldanidae | Maldanidae (LPIL) | 3 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Hesionidae | Podarke obscura | 1 |
| 4-1P | Annelida | Polychaeta | Scolecida | Paraonidae | Aricidea taylori | 2 |
| 4-1P | Annelida | Polychaeta | Scolecida | Capitellidae | Capitellidae (LPIL) | 1 |
| 4-1P | Annelida | Polychaeta | Scolecida | Capitellidae | Notomastus latericeus | 1 |
| 4-1P | Annelida | Polychaeta | Terebellida | Cirratulidae | Cirratulidae (LPIL) | 3 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Glyceridae | Glyceridae (LPIL) | 1 |
| 4-1P | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 17 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllidae (LPIL) | 1 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Eulepethidae | Grubeulepis mexicana | 1 |
| 4-1P | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 8 |
| 4-1P | Annelida | Polychaeta | Terebellida | Terebellidae | Pista (LPIL) | 1 |
| 4-1P | Annelida | Polychaeta | Sabellida | Sabellidae | Sabellidae (LPIL) | 2 |
| 4-1P | Annelida | Polychaeta | Orbiniida | Orbiniidae | Orbiniidae (LPIL) | 1 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Pholoidae | Pholoidae (LPIL) | 2 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Parapionosyllis (LPIL) | 1 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Sphaerosyllis piriferopsis | 3 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Grubeosyllis clavata | 2 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis cornuta | 1 |
| 4-1P | Nemertea | Anopla | Paleonemertea | Tubulanidae | Tubulanus sp. A | 2 |
| 4-1P | Nemertea | | | | Nemertea (LPIL) | 1 |
| 4-1P | Cnidaria | Anthozoa | Actiniaria | | Actiniaria (LPIL) | 1 |
| 4-1P | Sipuncula | | | | Sipuncula (LPIL) | 1 |
| 4-1P | Mollusca | Gastropoda | Neogastropoda | Nassariidae | Nassarius vibex | 3 |
| 4-1P | Mollusca | Bivalvia | Veneroida | Lucinidae | Radiolucina amianta | 1 |
| 4-1P | Mollusca | Scaphopoda | Dentaliida | Dentaliidae | Dentalium (LPIL) | 1 |
| 4-1P | Mollusca | Gastropoda | Patellogastropoda | Acmaeidae | Acmaea pustulata | 1 |
| 4-1P | Mollusca | Bivalvia | Veneroida | Lucinidae | Parvilucina crenella | 1 |
| 4-1P | Mollusca | Bivalvia | Solemyoida | Solemyidae | Solemya (LPIL) | 1 |
| 4-1P | Arthropoda | Malacostraca | Decapoda | Paguridae | Paguridae (LPIL) | 5 |
| 4-1P | Arthropoda | Malacostraca | Amphipoda | Aeginellidae | Deutella incerta | 2 |
| 4-1P | Arthropoda | Malacostraca | Isopoda | | Isopoda (LPIL) | 3 |
| 4-1P | Arthropoda | Malacostraca | Amphipoda | Oedicerotidae | Americhelidium americanum | 1 |
| 4-1P | Arthropoda | Malacostraca | Amphipoda | Liljeborgiidae | Idunella barnardi | 1 |
| 4-1P | Arthropoda | Malacostraca | Amphipoda | Synopiidae | Synopiidae (LPIL) | 1 |
| 4-1P | Arthropoda | Malacostraca | Amphipoda | Melitidae | Elasmopus (LPIL) | 3 |
| 4-1P | Arthropoda | Malacostraca | Amphipoda | Ischyroceridae | Ericthonius (LPIL) | 1 |
| 4-1P | Arthropoda | Malacostraca | Amphipoda | Aoridae | Aoridae (LPIL) | 1 |
| 4-1P | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 6 |
| 4-1P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Vaunthompsonia minor | 4 |
| 4-1P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Bodotriidae (LPIL) | 4 |
| 4-1P | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Cumella (LPIL) | 6 |
| 4-1P | Arthropoda | Malacostraca | Cumacea | | Cumacea (LPIL) | 2 |
| 4-1P | Arthropoda | Malacostraca | Tanaidacea | Kalliapseudidae | Kalliapseudes bahamaensis | 9 |
| 4-1P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptochelia forresti | 13 |

Appendix L. Benthic infaunal data from the STXEEMP (cont.).

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| 4-1P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptocheliidae (LPIL) | 7 |
| 4-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone rolani | 1 |
| 4-1P | Arthropoda | Malacostraca | Amphipoda | Ampeliscidae | Ampelisca (LPIL) | 1 |
| 4-2P | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 4 |
| 4-2P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 1 |
| 4-2P | Annelida | Polychaeta | Opheliida | Opheliidae | Armandia maculata | 1 |
| 4-2P | Mollusca | Bivalvia | Veneroida | Lucinidae | Parvilucina crenella | 1 |
| 4-2P | Mollusca | Bivalvia | Veneroida | Tellinidae | Tellinidae (LPIL) | 2 |
| 4-2P | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 1 |
| 4-2P | Arthropoda | Malacostraca | Tanaidacea | Kalliapseudidae | Kalliapseudes bahamaensis | 6 |
| 4-2P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptochelia forresti | 1 |
| 4-3P | Annelida | Polychaeta | Terebellida | Terebellidae | Pista cristata | 1 |
| 4-3P | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 7 |
| 4-3P | Annelida | Polychaeta | Eunicida | Dorvilleidae | Protodorvillea kefersteini | 1 |
| 4-3P | Annelida | Polychaeta | Phyllodocida | Glyceridae | Glycera americana | 3 |
| 4-3P | Annelida | Polychaeta | Spionida | Spionidae | Prionospio steenstrupi | 2 |
| 4-3P | Annelida | Polychaeta | Eunicida | Dorvilleidae | Schistomeringos pectinata | 2 |
| 4-3P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis cornuta | 5 |
| 4-3P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone dispar | 1 |
| 4-3P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 3 |
| 4-3P | Annelida | Polychaeta | Opheliida | Opheliidae | Armandia maculata | 2 |
| 4-3P | Annelida | Polychaeta | Scolecida | Paraonidae | Aricidea taylori | 1 |
| 4-3P | Annelida | Polychaeta | Terebellida | Cirratulidae | Caulleriella cf. alata | 1 |
| 4-3P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone (LPIL) | 2 |
| 4-3P | Annelida | Polychaeta | Sabellida | Sabellidae | Fabricinuda trilobata | 1 |
| 4-3P | Nemertea | | | | Nemertea (LPIL) | 1 |
| 4-3P | Sipuncula | | | | Sipuncula (LPIL) | 4 |
| 4-3P | Nemertea | Anopla | Paleonemertea | Tubulanidae | Tubulanus sp. A | 3 |
| 4-3P | Sipuncula | Phascolosomatidea | Aspidosiphoniformes | Aspidosiphonidae | Aspidosiphon (LPIL) | 1 |
| 4-3P | Mollusca | Bivalvia | Veneroida | Lucinidae | Radiolucina amianta | 4 |
| 4-3P | Mollusca | Bivalvia | Veneroida | Lucinidae | Parvilucina crenella | 8 |
| 4-3P | Mollusca | Gastropoda | Archaeogastropoda | Tricoliidae | Tricolia affinis | 1 |
| 4-3P | Mollusca | Gastropoda | Archaeogastropoda | Turbinidae | Turbo canaliculatus | 1 |
| 4-3P | Arthropoda | Malacostraca | Decapoda | Paguridae | Paguridae (LPIL) | 1 |
| 4-3P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Vaunthompsonia minor | 2 |
| 4-3P | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Cumella (LPIL) | 2 |
| 4-3P | Arthropoda | Malacostraca | Tanaidacea | Kalliapseudidae | Kalliapseudes bahamaensis | 3 |
| 4-3P | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 9 |
| 4-3P | Arthropoda | Malacostraca | Amphipoda | Aoridae | Aoridae (LPIL) | 1 |
| 4-3P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Bodotriidae (LPIL) | 1 |
| 4-3P | Arthropoda | Malacostraca | Decapoda | Leucosiidae | Iliacantha (LPIL) | 1 |
| 4-3P | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 13 |
| 4-4P | Annelida | Polychaeta | Scolecida | Capitellidae | Capitella capitata | 2 |
| 4-4P | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 1 |
| 4-4P | Nemertea | | | | Nemertea (LPIL) | 2 |
| 4-4P | Mollusca | Bivalvia | Cardiida | Tellinidae | Oudardia sandix | 1 |
| 4-4P | Mollusca | Bivalvia | Veneroida | Lucinidae | Radiolucina amianta | 1 |
| 4-4P | Mollusca | Bivalvia | Venerida | Veneridae | Pitar fulminatus | 1 |
| 4-4P | Mollusca | Gastropoda | Sacoglossa | Cylindrobullidae | Cylindrobulla beauii | 1 |
| 5-1P | Annelida | Polychaeta | Opheliida | Opheliidae | Armandia maculata | 1 |
| 5-1P | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 1 |
| 5-1P | Annelida | Polychaeta | Phyllodocida | Sigalionidae | Sigalion arenicola | 1 |
| 5-1P | Annelida | Polychaeta | Phyllodocida | Phyllodocidae | Hesionura sp. A | 2 |

Appendix L.  Benthic infaunal data from the STXEEMP (cont.).

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| 5-1P | Annelida | Polychaeta | Archiannelida | Saccocirridae | Saccocirridae (LPIL) | 1 |
| 5-1P | Annelida | Polychaeta | Phyllodocida | Goniadidae | Goniada teres | 1 |
| 5-1P | Annelida | Polychaeta | Eunicida | Lumbrineridae | Lumbrinerides acuta | 1 |
| 5-1P | Echinodermata | | | | Echinodermata (LPIL) | 1 |
| 5-1P | Mollusca | Gastropoda | Cephalaspidea | Cylichnidae | Acteocina bullata | 2 |
| 5-1P | Arthropoda | Malacostraca | Tanaidacea | Nototanaidae | Nototanaidae (LPIL) | 1 |
| 5-2P | Annelida | Polychaeta | Eunicida | Lumbrineridae | Lumbrinerides acuta | 1 |
| 5-2P | Annelida | Polychaeta | Scolecida | Capitellidae | Capitella capitata | 1 |
| 5-2P | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 1 |
| 5-2P | Annelida | Polychaeta | Eunicida | Eunicidae | Nematonereis hebes | 1 |
| 5-2P | Annelida | Polychaeta | Phyllodocida | Phyllodocidae | Hesionura elongata | 2 |
| 5-2P | Annelida | Polychaeta | Phyllodocida | Hesionidae | Microphthalmus (LPIL) | 2 |
| 5-2P | Annelida | Polychaeta | Eunicida | Dorvilleidae | Protodorvillea kefersteini | 4 |
| 5-2P | Annelida | Polychaeta | Phyllodocida | Syllidae | Pionosyllis gesae | 1 |
| 5-2P | Annelida | Polychaeta | Opheliida | Opheliidae | Armandia maculata | 1 |
| 5-2P | Annelida | Polychaeta | Opheliida | Opheliidae | Ophelina cf. acuminata | 1 |
| 5-2P | Annelida | Polychaeta | Phyllodocida | Sigalionidae | Fimbriosthenelais minor | 1 |
| 5-2P | Nemertea | | | | Nemertea (LPIL) | 1 |
| 5-2P | Sipuncula | Phascolosomatidea | Aspidosiphoniformes | Aspidosiphonidae | Aspidosiphon (LPIL) | 1 |
| 5-2P | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Nannastacidae (LPIL) | 2 |
| 5-2P | Arthropoda | Malacostraca | Tanaidacea | | Tanaidacea (LPIL) | 1 |
| 5-4P | Annelida | Polychaeta | Phyllodocida | Sigalionidae | Fimbriosthenelais minor | 1 |
| 5-4P | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 4 |
| 5-4P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis cornuta | 4 |
| 5-4P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis broomensis | 1 |
| 5-4P | Annelida | Polychaeta | Eunicida | Eunicidae | Nematonereis hebes | 3 |
| 5-4P | Annelida | Polychaeta | Phyllodocida | Hesionidae | Heteropodarke formalis | 8 |
| 5-4P | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 12 |
| 5-4P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 2 |
| 5-4P | Annelida | Polychaeta | Eunicida | Dorvilleidae | Pettiboneia duofurca | 1 |
| 5-4P | Annelida | Polychaeta | Scolecida | Paraonidae | Paradoneis lyra | 1 |
| 5-4P | Annelida | Polychaeta | Phyllodocida | Phyllodocidae | Hesionura elongata | 1 |
| 5-4P | Annelida | Polychaeta | Eunicida | Dorvilleidae | Schistomeringos pectinata | 1 |
| 5-4P | Sipuncula | Phascolosomatidea | Aspidosiphoniformes | Aspidosiphonidae | Aspidosiphon (LPIL) | 1 |
| 5-4P | Nemertea | | | | Nemertea (LPIL) | 1 |
| 5-4P | Cnidaria | Anthozoa | Actiniaria | | Actiniaria (LPIL) | 1 |
| 5-4P | Echinodermata | | | | Echinodermata (LPIL) | 3 |
| 5-4P | Mollusca | Polyplacophora | Chitonida | Chitonidae | Chitonidae (LPIL) | 1 |
| 5-4P | Arthropoda | Malacostraca | Isopoda | Sphaeromatidae | Sphaeromatidae (LPIL) | 2 |
| 5-4P | Arthropoda | Malacostraca | Isopoda | Anthuridae | Anthuridae (LPIL) | 2 |
| 5-4P | Annelida | Polychaeta | Spionida | Chaetopteridae | Mesochaetopterus (LPIL) | 7 |
| 5-4P | Annelida | Polychaeta | Phyllodocida | Nereididae | Ceratocephale oculata | 1 |
| 5-8A | Nemertea | | | | Nemertea (LPIL) | 1 |
| 6-1P | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 10 |
| 6-1P | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 4 |
| 6-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 1 |
| 6-1P | Annelida | Polychaeta | Phyllodocida | Glyceridae | Glyceridae (LPIL) | 1 |
| 6-1P | Nemertea | | | | Nemertea (LPIL) | 1 |
| 6-1P | Arthropoda | Malacostraca | Isopoda | Sphaeromatidae | Sphaeromatidae (LPIL) | 1 |
| 6-1P | Arthropoda | Malacostraca | Isopoda | Anthuridae | Anthuridae (LPIL) | 2 |
| 6-1P | Arthropoda | Malacostraca | Amphipoda | Melitidae | Melitidae (LIPL) | 8 |
| 6-1P | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Cumella (LPIL) | 3 |
| 6-1P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis bacescui | 1 |

Appendix L.  Benthic infaunal data from the STXEEMP (cont.).

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| 6-1P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis (LPIL) | 2 |
| 6-1P | Annelida | Polychaeta | Terebellida | Terebellidae | Streblosoma hartmanae | 1 |
| 6-4P | Annelida | Polychaeta | Eunicida | Onuphidae | Onuphidae (LPIL) | 2 |
| 6-4P | Annelida | Polychaeta | Opheliida | Opheliidae | Armandia maculata | 3 |
| 6-4P | Annelida | Polychaeta | Opheliida | Opheliidae | Armandia agilis | 1 |
| 6-4P | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 1 |
| 6-4P | Annelida | Polychaeta | Phyllodocida | Syllidae | Pionosyllis gesae | 2 |
| 6-4P | Annelida | Polychaeta | Phyllodocida | Glyceridae | Glyceridae (LPIL) | 1 |
| 6-4P | Annelida | Polychaeta | Scolecida | Capitellidae | Capitellidae (LPIL) | 1 |
| 6-4P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 1 |
| 6-4P | Mollusca | Gastropoda | Sacoglossa | Cylindrobullidae | Cylindrobulla beauii | 1 |
| 6-4P | Nemertea | Anopla | Paleonemertea | Tubulanidae | Tubulanus sp. A | 1 |
| 6-4P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Bodotriidae (LPIL) | 1 |
| 6-6A | Annelida | Polychaeta | Sabellida | Sabellidae | Sabellidae (LPIL) | 2 |
| 6-6A | Annelida | Polychaeta | Opheliida | Opheliidae | Ophelina cf. acuminata | 1 |
| 6-6A | Annelida | Polychaeta | Scolecida | Capitellidae | Capitella capitata | 79 |
| 6-6A | Annelida | Polychaeta | Phyllodocida | Hesionidae | Microphthalmus (LPIL) | 1 |
| 6-6A | Annelida | Polychaeta | Spionida | Spionidae | Scolelepis texana | 1 |
| 6-6A | Mollusca | Gastropoda | | | Gastropoda (LPIL) | 1 |
| 6-6A | Arthropoda | Malacostraca | Amphipoda | Ischyroceridae | Ericthonius (LPIL) | 1 |
| 6-6A | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis (LPIL) | 1 |
| 6-6A | Annelida | Polychaeta | Terebellida | Cirratulidae | Cirratulidae (LPIL) | 1 |
| 6-8A | Annelida | Polychaeta | Opheliida | Opheliidae | Armandia agilis | 1 |
| 6-8A | Annelida | Polychaeta | Scolecida | Capitellidae | Capitella capitata | 159 |
| 6-8A | Annelida | Polychaeta | Spionida | Spionidae | Spionidae (LPIL) | 1 |
| 7-1P | Cnidaria | Anthozoa | Actiniaria | | Actiniaria (LPIL) | 2 |
| 7-1P | Echinodermata | Holothuroidea | Apodida | Synaptidae | Synaptidae (LPIL) | 1 |
| 7-1P | Echinodermata | Ophiuroidea | Ophiurida | Amphiuridae | Amphiuridae (LPIL) | 1 |
| 7-1P | Mollusca | Gastropoda | Cephalaspidea | Haminoeidae | Atys caribaeus | 2 |
| 7-1P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Pseudoleptochelia (LPIL) | 23 |
| 7-1P | Arthropoda | Malacostraca | Tanaidacea | Nototanaidae | Nototanaidae (LPIL) | 7 |
| 7-1P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptochelia forresti | 29 |
| 7-1P | Arthropoda | Malacostraca | Isopoda | Cirolanidae | Cirolanidae (LPIL) | 2 |
| 7-1P | Arthropoda | Malacostraca | Isopoda | Anthuridae | Anthuridae (LPIL) | 1 |
| 7-1P | Arthropoda | Malacostraca | Isopoda | Sphaeromatidae | Sphaeromatidae (LPIL) | 11 |
| 7-1P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis bacescui | 4 |
| 7-1P | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Cumella serrata | 2 |
| 7-1P | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Nannastacidae (LPIL) | 3 |
| 7-1P | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Cumella (LPIL) | 8 |
| 7-1P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Bodotriidae (LPIL) | 3 |
| 7-1P | Arthropoda | Malacostraca | Cumacea | | Cumacea (LPIL) | 2 |
| 7-1P | Arthropoda | Malacostraca | Amphipoda | Melitidae | Melitidae (LIPL) | 5 |
| 7-1P | Arthropoda | Malacostraca | Amphipoda | Caprellidae | Caprellidae (LPIL) | 1 |
| 7-1P | Arthropoda | Malacostraca | Amphipoda | Aoridae | Lembos unifasciatus | 1 |
| 7-1P | Arthropoda | Malacostraca | Amphipoda | Photidae | Gammaropsis (LPIL) | 1 |
| 7-1P | Arthropoda | Malacostraca | Amphipoda | Isaeidae | Photis (LPIL) | 1 |
| 7-1P | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 11 |
| 7-1P | Annelida | Polychaeta | Opheliida | Opheliidae | Armandia agilis | 3 |
| 7-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Odontosyllis enopla | 6 |
| 7-1P | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 2 |
| 7-1P | Annelida | Polychaeta | Eunicida | Eunicidae | Nematonereis hebes | 1 |
| 7-1P | Annelida | Polychaeta | Eunicida | Onuphidae | Onuphidae (LPIL) | 9 |
| 7-1P | Annelida | Polychaeta | Spionida | Chaetopteridae | Mesochaetopterus (LPIL) | 4 |

Appendix L.  Benthic infaunal data from the STXEEMP (cont.).

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| 7-1P | Annelida | Polychaeta | Spionida | Acrocirridae | Macrochaeta sp. A | 1 |
| 7-1P | Annelida | Polychaeta | Phyllodocida | Chrysopetalidae | Bhawania reyssi | 1 |
| 7-1P | Annelida | Polychaeta | Phyllodocida | Nereididae | Nereididae (LPIL) | 2 |
| 7-1P | Annelida | Polychaeta | Sabellida | Sabellidae | Chone (LPIL) | 2 |
| 7-1P | Annelida | Polychaeta | Scolecida | Capitellidae | Notomastus latericeus | 10 |
| 7-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis cornuta | 4 |
| 7-1P | Annelida | Polychaeta | Terebellida | Terebellidae | Polycirrus (LPIL) | 1 |
| 7-1P | Annelida | Polychaeta | Scolecida | Maldanidae | Maldanidae (LPIL) | 4 |
| 7-1P | Annelida | Polychaeta | Archiannelida | Saccocirridae | Saccocirridae (LPIL) | 1 |
| 7-1P | Annelida | Polychaeta | Eunicida | Dorvilleidae | Dorvilleidae (LPIL) | 1 |
| 7-1P | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 1 |
| 7-1P | Annelida | Oligochaeta | Enchytraeida | Enchytraeidae | Enchytraeidae (LPIL) | 1 |
| 7-1P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone dispar | 2 |
| 7-1P | Annelida | Polychaeta | Sabellida | Sabellidae | Fabricinuda trilobata | 1 |
| 7-2P | Cnidaria | Anthozoa | Actiniaria |  | Actiniaria (LPIL) | 4 |
| 7-2P | Sipuncula |  |  |  | Sipuncula (LPIL) | 2 |
| 7-2P | Nemertea |  |  |  | Nemertea (LPIL) | 1 |
| 7-2P | Echinodermata | Holothuroidea | Apodida | Synaptidae | Synaptidae (LPIL) | 1 |
| 7-2P | Mollusca | Gastropoda |  |  | Gastropoda (LPIL) | 2 |
| 7-2P | Mollusca | Bivalvia | Venerida | Veneridae | Chione cancellata | 1 |
| 7-2P | Mollusca | Polyplacophora | Chitonida | Chitonidae | Chitonidae (LPIL) | 1 |
| 7-2P | Mollusca | Bivalvia | Veneroida | Lucinidae | Radiolucina amianta | 1 |
| 7-2P | Mollusca | Gastropoda | Sacoglossa | Cylindrobullidae | Cylindrobulla beauii | 1 |
| 7-2P | Arthropoda | Malacostraca | Decapoda | Tychidae | Pitho aculeata | 1 |
| 7-2P | Arthropoda | Malacostraca | Decapoda | Paguridae | Paguridae (LPIL) | 4 |
| 7-2P | Chordata | Leptocardii | Amphioxiformes | Branchiostomatidae | Branchiostoma (LPIL) | 1 |
| 7-2P | Arthropoda | Malacostraca | Isopoda | Cirolanidae | Cirolanidae (LPIL) | 2 |
| 7-2P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis bacescui | 2 |
| 7-2P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis unicornis | 2 |
| 7-2P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis (LPIL) | 1 |
| 7-2P | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Cumella (LPIL) | 1 |
| 7-2P | Arthropoda | Malacostraca | Amphipoda | Isaeidae | Photis (LPIL) | 1 |
| 7-2P | Arthropoda | Malacostraca | Amphipoda |  | Amphipoda (LPIL) | 7 |
| 7-2P | Arthropoda | Malacostraca | Tanaidacea | Nototanaidae | Pseudonototanais (LPIL) | 7 |
| 7-2P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Pseudoleptochelia (LPIL) | 3 |
| 7-2P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptochelia forresti | 2 |
| 7-2P | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptochelia dubia | 1 |
| 7-2P | Annelida | Polychaeta | Spionida | Chaetopteridae | Mesochaetopterus (LPIL) | 14 |
| 7-2P | Annelida | Polychaeta | Phyllodocida | Syllidae | Odontosyllis enopla | 6 |
| 7-2P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis broomensis | 2 |
| 7-2P | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis cornuta | 10 |
| 7-2P | Annelida | Polychaeta | Eunicida | Onuphidae | Onuphidae (LPIL) | 10 |
| 7-2P | Annelida | Polychaeta | Phyllodocida | Chrysopetalidae | Bhawania reyssi | 1 |
| 7-2P | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 3 |
| 7-2P | Annelida | Polychaeta | Terebellida | Terebellidae | Terebellidae (LPIL) | 3 |
| 7-2P | Annelida | Polychaeta | Scolecida | Capitellidae | Notomastus latericeus | 3 |
| 7-2P | Annelida | Polychaeta | Scolecida | Capitellidae | Capitella capitata | 3 |
| 7-2P | Annelida | Polychaeta | Terebellida | Cirratulidae | Caulleriella sp. J | 2 |
| 7-2P | Annelida | Polychaeta | Orbiniida | Orbiniidae | Orbiniidae (LPIL) | 1 |
| 7-2P | Annelida | Polychaeta | Phyllodocida | Glyceridae | Glyceridae (LPIL) | 2 |
| 7-2P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 1 |
| 7-2P | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 5 |
| 7-2P | Annelida | Polychaeta | Scolecida | Maldanidae | Maldanidae (LPIL) | 1 |

Appendix L.  Benthic infaunal data from the STXEEMP (cont.).

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| 7-2P | Annelida | Polychaeta | Eunicida | Oenonidae | Oenonidae (LPIL) | 1 |
| 7-2P | Annelida | Polychaeta | Eunicida | Eunicidae | Nematonereis hebes | 1 |
| 7-2P | Annelida | Polychaeta | Spionida | Spionidae | Spionidae (LPIL) | 1 |
| 7-2P | Annelida | Polychaeta | Sabellida | Sabellidae | Sabellidae (LPIL) | 4 |
| 7-2P | Annelida | Polychaeta | Terebellida | Cirratulidae | Cirratulidae (LPIL) | 2 |
| 7-2P | Annelida | Polychaeta | Eunicida | Dorvilleidae | Schistomeringos pectinata | 1 |
| 7-2P | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone (LPIL) | 1 |
| 7-2P | Annelida | Polychaeta | Orbiniida | Orbiniidae | Proscoloplos (LPIL) | 3 |
| 7-2P | Annelida | Polychaeta | Terebellida | Cirratulidae | Cirriformia (LPIL) | 1 |
| 7-2P | Annelida | Polychaeta | Phyllodocida | Nereididae | Nereididae (LPIL) | 1 |
| 7-2P | Annelida | Polychaeta | Eunicida | Dorvilleidae | Dorvilleidae (LPIL) | 1 |
| 7-3P | Annelida | Polychaeta | Scolecida | Capitellidae | Capitella capitata | 1 |
| 7-3P | Annelida | Polychaeta | Scolecida | Capitellidae | Notomastus latericeus | 1 |
| 7-3P | Annelida | Polychaeta | Eunicida | Onuphidae | Onuphidae (LPIL) | 1 |
| 7-3P | Annelida | Polychaeta | Sabellida | Sabellidae | Sabellidae (LPIL) | 1 |
| 7-3P | Arthropoda | Malacostraca | Amphipoda | Ischyroceridae | Cerapus (LPIL) | 5 |
| 7-3P | Arthropoda | Malacostraca | Tanaidacea |  | Tanaidacea (LPIL) | 1 |
| 7-3P | Arthropoda | Malacostraca | Amphipoda | Megaluropidae | Megaluropidae (LPIL) | 4 |
| 7-3P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis bacescui | 4 |
| 7-3P | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Cumella serrata | 1 |
| 7-3P | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis (LPIL) | 2 |
| Cramers Park - DPNR Target | Nemertea | Anopla | Paleonemertea | Tubulanidae | Tubulanus sp. A | 1 |
| Cramers Park - DPNR Target | Nemertea |  |  |  | Nemertea (LPIL) | 1 |
| Cramers Park - DPNR Target | Mollusca | Bivalvia | Veneroida | Lucinidae | Radiolucina amianta | 3 |
| Cramers Park - DPNR Target | Mollusca | Bivalvia | Venerida | Veneridae | Chione cancellata | 1 |
| Cramers Park - DPNR Target | Arthropoda | Malacostraca | Tanaidacea | Nototanaidae | Pseudonototanais (LPIL) | 1 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Eunicida | Onuphidae | Onuphidae (LPIL) | 1 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Scolecida | Maldanidae | Maldanidae (LPIL) | 2 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Orbiniida | Orbiniidae | Scoloplos rubra | 2 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Spionida | Spionidae | Prionospio heterobranchia | 1 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 1 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Phyllodocida | Syllidae | Sphaerosyllis piriferopsis | 1 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Sabellida | Sabellidae | Fabricinuda trilobata | 1 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Sabellida | Sabellidae | Sabellidae (LPIL) | 5 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Scolecida | Capitellidae | Notomastus latericeus | 1 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Terebellida | Ampharetidae | Isolda pulchella | 1 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Terebellida | Terebellidae | Terebellidae (LPIL) | 1 |
| Cramers Park - DPNR Target | Annelida | Polychaeta | Eunicida | Dorvilleidae | Schistomeringos pectinata | 1 |
| Cramers Nursery - DPNR Target | Arthropoda | Malacostraca | Decapoda | Portunidae | Portunus (LPIL) | 1 |
| Cramers Nursery - DPNR Target | Annelida | Polychaeta | Opheliida | Opheliidae | Ophelina cf. acuminata | 1 |
| Cramers Nursery - DPNR Target | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 1 |
| Cramers Nursery - DPNR Target | Annelida | Polychaeta | Phyllodocida | Phyllodocidae | Hesionura elongata | 1 |
| Cramers Nursery - DPNR Target | Annelida | Polychaeta | Eunicida | Dorvilleidae | Protodorvillea kefersteini | 1 |
| DIVI - DPNR Target | Nemertea | Enopla | Hoplonemertea | Amphiporidae | Amphiporidae (LPIL) | 1 |
| DIVI - DPNR Target | Nemertea | Anopla | Paleonemertea | Tubulanidae | Tubulanus sp. A | 2 |
| DIVI - DPNR Target | Mollusca | Gastropoda | Sacoglossa | Cylindrobullidae | Cylindrobulla beauii | 2 |
| DIVI - DPNR Target | Mollusca | Gastropoda | Neogastropoda | Nassariidae | Nassarius vibex | 1 |
| DIVI - DPNR Target | Mollusca | Bivalvia | Veneroida | Tellinidae | Tellinidae (LPIL) | 1 |
| DIVI - DPNR Target | Mollusca | Gastropoda |  |  | Gastropoda (LPIL) | 1 |
| DIVI - DPNR Target | Arthropoda | Malacostraca | Amphipoda | Aoridae | Lembos unifasciatus | 9 |
| DIVI - DPNR Target | Arthropoda | Malacostraca | Amphipoda | Synopiidae | Synopiidae (LPIL) | 1 |
| DIVI - DPNR Target | Arthropoda | Malacostraca | Amphipoda |  | Amphipoda (LPIL) | 1 |
| DIVI - DPNR Target | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Pseudoleptochelia (LPIL) | 5 |

Appendix L. Benthic infaunal data from the STXEEMP (cont.).

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| DIVI - DPNR Target | Nemertea | | | | Nemertea (LPIL) | 1 |
| DIVI - DPNR Target | Annelida | Polychaeta | Spionida | Magelonidae | Magelona sp. C | 9 |
| DIVI - DPNR Target | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 1 |
| DIVI - DPNR Target | Annelida | Polychaeta | Terebellida | Terebellidae | Terebellidae (LPIL) | 4 |
| DIVI - DPNR Target | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 3 |
| DIVI - DPNR Target | Annelida | Polychaeta | Scolecida | Capitellidae | Capitella capitata | 3 |
| DIVI - DPNR Target | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 3 |
| DIVI - DPNR Target | Annelida | Polychaeta | Scolecida | Paraonidae | Aricidea taylori | 1 |
| DIVI - DPNR Target | Annelida | Polychaeta | Scolecida | Paraonidae | Cirrophorus ilvana | 2 |
| DIVI - DPNR Target | Annelida | Polychaeta | Scolecida | Paraonidae | Paradoneis lyra | 1 |
| DIVI - DPNR Target | Annelida | Polychaeta | Eunicida | Dorvilleidae | Protodorvillea kefersteini | 2 |
| DIVI - DPNR Target | Annelida | Polychaeta | Spionida | Magelonidae | Magelona pettiboneae | 1 |
| DIVI - DPNR Target | Annelida | Polychaeta | Scolecida | Capitellidae | Capitellidae (LPIL) | 3 |
| DIVI - DPNR Target | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis alternata | 2 |
| Fire Station - DPNR Target | Nemertea | Anopla | Paleonemertea | Tubulanidae | Tubulanus sp. A | 4 |
| Fire Station - DPNR Target | Chordata | Leptocardii | Amphioxiformes | Branchiostomatidae | Branchiostoma (LPIL) | 2 |
| Fire Station - DPNR Target | Mollusca | Bivalvia | Veneroida | Tellinidae | Tellinidae (LPIL) | 1 |
| Fire Station - DPNR Target | Arthropoda | Malacostraca | Decapoda | Leucosiidae | Iliacantha (LPIL) | 1 |
| Fire Station - DPNR Target | Arthropoda | Malacostraca | Tanaidacea | Metapseudidae | Metapseudidae (LPIL) | 2 |
| Fire Station - DPNR Target | Arthropoda | Malacostraca | Tanaidacea | | Tanaidacea (LPIL) | 1 |
| Fire Station - DPNR Target | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis unicornis | 2 |
| Fire Station - DPNR Target | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis (LPIL) | 1 |
| Fire Station - DPNR Target | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 32 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Scolecida | Maldanidae | Maldanidae (LPIL) | 1 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Phyllodocida | Syllidae | Pionosyllis gesae | 3 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 3 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Spionida | Spionidae | Spio (LPIL) | 1 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Phyllodocida | Glyceridae | Glyceridae (LPIL) | 1 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Eunicida | Lumbrineridae | Lumbrineridae (LPIL) | 2 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Terebellida | Terebellidae | Pista (LPIL) | 1 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Phyllodocida | Hesionidae | Podarke obscura | 1 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Terebellida | Cirratulidae | Caulleriella (LPIL) | 1 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Spionida | Magelonidae | Magelona sp. C | 1 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Scolecida | Paraonidae | Paradoneis lyra | 2 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Scolecida | Paraonidae | Aricidea taylori | 20 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Orbiniida | Orbiniidae | Orbiniidae (LPIL) | 3 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Terebellida | Terebellidae | Polycirrus (LPIL) | 1 |
| Fire Station - DPNR Target | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone hebes | 2 |
| Great Pond - DPNR Target | Mollusca | Bivalvia | Veneroida | Lucinidae | Radiolucina amianta | 2 |
| Great Pond - DPNR Target | Mollusca | Gastropoda | Neogastropoda | Nassariidae | Nassarius vibex | 1 |
| Great Pond - DPNR Target | Mollusca | Gastropoda | Heterostropha | Pyramidellidae | Eulimastoma (LPIL) | 1 |
| Great Pond - DPNR Target | Annelida | Polychaeta | Scolecida | Maldanidae | Maldanidae (LPIL) | 3 |
| Great Pond - DPNR Target | Annelida | Polychaeta | Scolecida | Capitellidae | Notomastus latericeus | 2 |
| Great Pond - DPNR Target | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 4 |
| Great Pond - DPNR Target | Annelida | Polychaeta | Scolecida | Paraonidae | Aricidea taylori | 20 |
| Great Pond - DPNR Target | Annelida | Polychaeta | Scolecida | Capitellidae | Capitella capitata | 1 |
| Great Pond - DPNR Target | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 1 |
| Great Pond - DPNR Target | Annelida | Polychaeta | Terebellida | Cirratulidae | Cirratulidae (LPIL) | 1 |
| Great Pond - DPNR Target | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis cornuta | 2 |
| Great Pond - DPNR Target | Annelida | Polychaeta | Eunicida | Dorvilleidae | Dorvilleidae (LPIL) | 2 |
| Great Pond - DPNR Target | Annelida | Polychaeta | Eunicida | Dorvilleidae | Schistomeringos pectinata | 2 |
| Green Cay Marina - NCCOS Target | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 46 |
| Green Cay Marina - NCCOS Target | Annelida | Polychaeta | Spionida | Spionidae | Spio (LPIL) | 3 |

Appendix L.  Benthic infaunal data from the STXEEMP (cont.).

| Site | Phylum | Class | Order | Family | Taxa | Count |
|---|---|---|---|---|---|---|
| Green Cay Marina - NCCOS Target | Annelida | Polychaeta | Scolecida | Capitellidae | Capitella capitata | 1 |
| Chenay Bay - DPNR Target | Arthropoda | Malacostraca | Amphipoda | | Amphipoda (LPIL) | 1 |
| Chenay Bay - DPNR Target | Annelida | Polychaeta | Sabellida | Sabellidae | Fabricinuda trilobata | 1 |
| Chenay Bay - DPNR Target | Annelida | Polychaeta | Amphinomida | Amphinomidae | Paramphinome sp. B | 1 |
| Chenay Bay - DPNR Target | Annelida | Polychaeta | Orbiniida | Orbiniidae | Scoloplos rubra | 1 |
| Chenay Bay - DPNR Target | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 1 |
| Chenay Bay - DPNR Target | Annelida | Polychaeta | Scolecida | Paraonidae | Aricidea taylori | 1 |
| Chenay Bay - DPNR Target | Annelida | Polychaeta | Terebellida | Ampharetidae | Isolda pulchella | 6 |
| Stratum 5 - DPNR Target | Echinodermata | | | | Echinodermata (LPIL) | 1 |
| Stratum 5 - DPNR Target | Cnidaria | Anthozoa | Actiniaria | | Actiniaria (LPIL) | 1 |
| Stratum 5 - DPNR Target | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 1 |
| Stratum 5 - DPNR Target | Annelida | Polychaeta | Phyllodocida | Glyceridae | Glyceridae (LPIL) | 1 |
| Stratum 5 - DPNR Target | Annelida | Polychaeta | Eunicida | Lumbrineridae | Lumbrinerides dayi | 1 |
| Stratum 5 - DPNR Target | Annelida | Polychaeta | Phyllodocida | Sigalionidae | Sigalion sp. B | 1 |
| Stratum 6 - DPNR Target | Echinodermata | | | | Echinodermata (LPIL) | 4 |
| Stratum 6 - DPNR Target | Nemertea | | | | Nemertea (LPIL) | 1 |
| Stratum 6 - DPNR Target | Annelida | Polychaeta | Opheliida | Opheliidae | Armandia maculata | 1 |
| Stratum 6 - DPNR Target | Annelida | Polychaeta | Eunicida | Dorvilleidae | Protodorvillea kefersteini | 2 |
| Yacht Club - DPNR Target | Cnidaria | Anthozoa | Actiniaria | | Actiniaria (LPIL) | 2 |
| Yacht Club - DPNR Target | Mollusca | Gastropoda | Neogastropoda | Olividae | Olividae (LPIL) | 2 |
| Yacht Club - DPNR Target | Mollusca | Gastropoda | Neritopsina | Neritidae | Smaragdia viridis | 1 |
| Yacht Club - DPNR Target | Mollusca | Bivalvia | Veneroida | Tellinidae | Tellinidae (LPIL) | 1 |
| Yacht Club - DPNR Target | Mollusca | Gastropoda | Neogastropoda | Nassariidae | Nassarius vibex | 2 |
| Yacht Club - DPNR Target | Mollusca | Bivalvia | Venerida | Veneridae | Chione cancellata | 2 |
| Yacht Club - DPNR Target | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis unicornis | 1 |
| Yacht Club - DPNR Target | Arthropoda | Malacostraca | Cumacea | Bodotriidae | Cyclaspis (LPIL) | 2 |
| Yacht Club - DPNR Target | Arthropoda | Malacostraca | Cumacea | Nannastacidae | Cumella (LPIL) | 1 |
| Yacht Club - DPNR Target | Arthropoda | Malacostraca | Decapoda | Tychidae | Pitho aculeata | 1 |
| Yacht Club - DPNR Target | Arthropoda | Malacostraca | Amphipoda | Ampeliscidae | Ampelisca (LPIL) | 1 |
| Yacht Club - DPNR Target | Arthropoda | Malacostraca | Isopoda | Janiridae | Carpias (LPIL) | 1 |
| Yacht Club - DPNR Target | Arthropoda | Malacostraca | Amphipoda | Isaeidae | Photis (LPIL) | 2 |
| Yacht Club - DPNR Target | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Leptochelia forresti | 2 |
| Yacht Club - DPNR Target | Arthropoda | Malacostraca | Tanaidacea | Leptocheliidae | Pseudoleptochelia (LPIL) | 1 |
| Yacht Club - DPNR Target | Arthropoda | Malacostraca | Tanaidacea | Nototanaidae | Pseudonototanais (LPIL) | 1 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Eunicida | Eunicidae | Nematonereis hebes | 2 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Scolecida | Maldanidae | Maldanidae (LPIL) | 9 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Terebellida | Ampharetidae | Isolda pulchella | 3 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Eunicida | Lumbrineridae | Lumbrineridae (LPIL) | 10 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Phyllodocida | Syllidae | Pionosyllis gesae | 19 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Terebellida | Cirratulidae | Cirratulidae (LPIL) | 6 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Sabellida | Sabellidae | Fabricinuda trilobata | 4 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Orbiniida | Orbiniidae | Scoloplos rubra | 15 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Scolecida | Capitellidae | Capitella jonesi | 1 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Spionida | Spionidae | Spionidae (LPIL) | 4 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Eunicida | Dorvilleidae | Schistomeringos pectinata | 3 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Scolecida | Paraonidae | Aricidea taylori | 32 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Terebellida | Cirratulidae | Tharyx acutus | 2 |
| Yacht Club - DPNR Target | Annelida | Oligochaeta | Tubificida | Naididae | Naididae (LPIL) | 10 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Phyllodocida | Nereididae | Nereididae (LPIL) | 2 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Spionida | Spionidae | Prionospio (LPIL) | 5 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Terebellida | Trichobranchidae | Terebellides stroemi | 1 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Phyllodocida | Syllidae | Exogone lourei | 1 |
| Yacht Club - DPNR Target | Annelida | Polychaeta | Phyllodocida | Syllidae | Syllis cornuta | 7 |

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