



# Keeyask Generation Project Aquatic Effects Monitoring Plan

## Benthic Macroinvertebrate Monitoring Report

AEMP-2019-08



# **KEEYASK GENERATION PROJECT**

## **AQUATIC EFFECTS MONITORING PLAN**

REPORT #AEMP-2019-08

### **BENTHIC MACROINVERTEBRATE MONITORING IN THE NELSON RIVER, 2018: YEAR 5 CONSTRUCTION**

Prepared for

Manitoba Hydro

By

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June 2019



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# SUMMARY

## Background

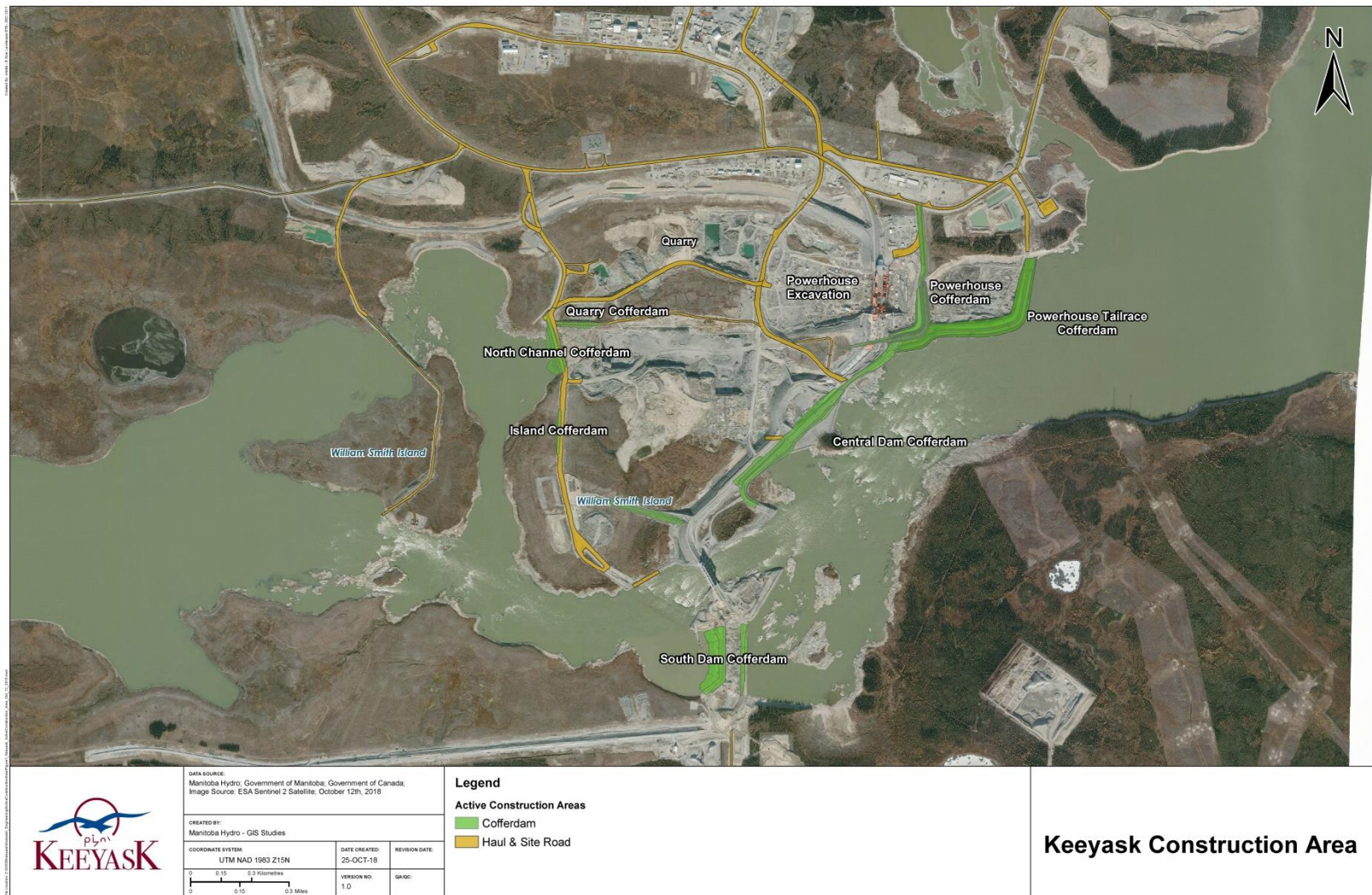
The Keeyask Hydropower Limited Partnership (KHLP) was required to prepare a plan to monitor the effects of construction and operation of the Keeyask Generating Station (GS) on the environment. Besides measuring the accuracy of the predictions made and actual effects of the GS on the environment, monitoring results will provide information on how construction and operation of the GS will affect the environment and if more needs to be done to reduce harmful effects.

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams that blocked flow in the north and central channels of Gull Rapids (see instream structures map below). During the winter of 2015/2016, the Spillway Cofferdam, which partially blocks the south channel was constructed. Beginning late in 2016 and continuing in 2017, the Tailrace Cofferdam was constructed. Work was completed in fall 2017 with the exception of an opening that was left to allow fish movement into and out of the cofferdam over the 2017/18 winter. This opening was closed in spring 2018, and the area was dewatered. The spillway was commissioned in August 2018. The South Dam Cofferdam was completed in fall 2018, blocking the channel and forcing the entire flow of the river through the spillway.

Benthic macroinvertebrates (BMIs) are tiny animals without backbones, such as insect larvae and clams, which live in, or on, the bottom sediments of lakes and rivers. The BMI community is an important part of the overall plan to monitor the effects of construction and operation of the Keeyask GS on the aquatic environment. BMIs are often used to determine the health of lakes and rivers, and are used in monitoring programs all over the world. For example, observing the changes in the numbers of mayflies, which is one of many different kinds of BMIs, is very helpful because these insects spend the early part of their lives in the bottom sediments and are sensitive to changes in the environment. BMIs are also a valuable food source for fish, including Lake Sturgeon, and important in describing the quality of habitat for fish.

This report describes the results of the BMI community monitoring conducted during fall 2018 (fifth year of construction at Gull Rapids). Samples were collected upstream of construction activities in Split Lake, immediately downstream of construction activities in the Nelson River, and farther downstream in Stephens Lake.





**Map of instream structures at the Keeyask generating station site, October 2018.**

## Why is the study being done?

The study is being done to address a key question:

*Are construction activities changing the numbers and/or kinds of BMIs living in the bottom sediments of the Nelson River downstream of the Keeyask GS into Stephens Lake in comparison to either upstream and/or pre-construction conditions?*

When construction work for a GS is done in a lake or river, sediments (the mud at the bottom of a lake or river) often get disturbed and mixed into the water; sediments mixed in the water will travel downstream with the current and eventually settle to the bottom. To understand if the numbers and kinds of BMIs changed downstream of the construction site, BMIs are sampled at locations in the Nelson River and Stephens Lake. Negative effects of increased sediments in the water may include decreases in the numbers of fingernail clams and mayflies.

## What was done?

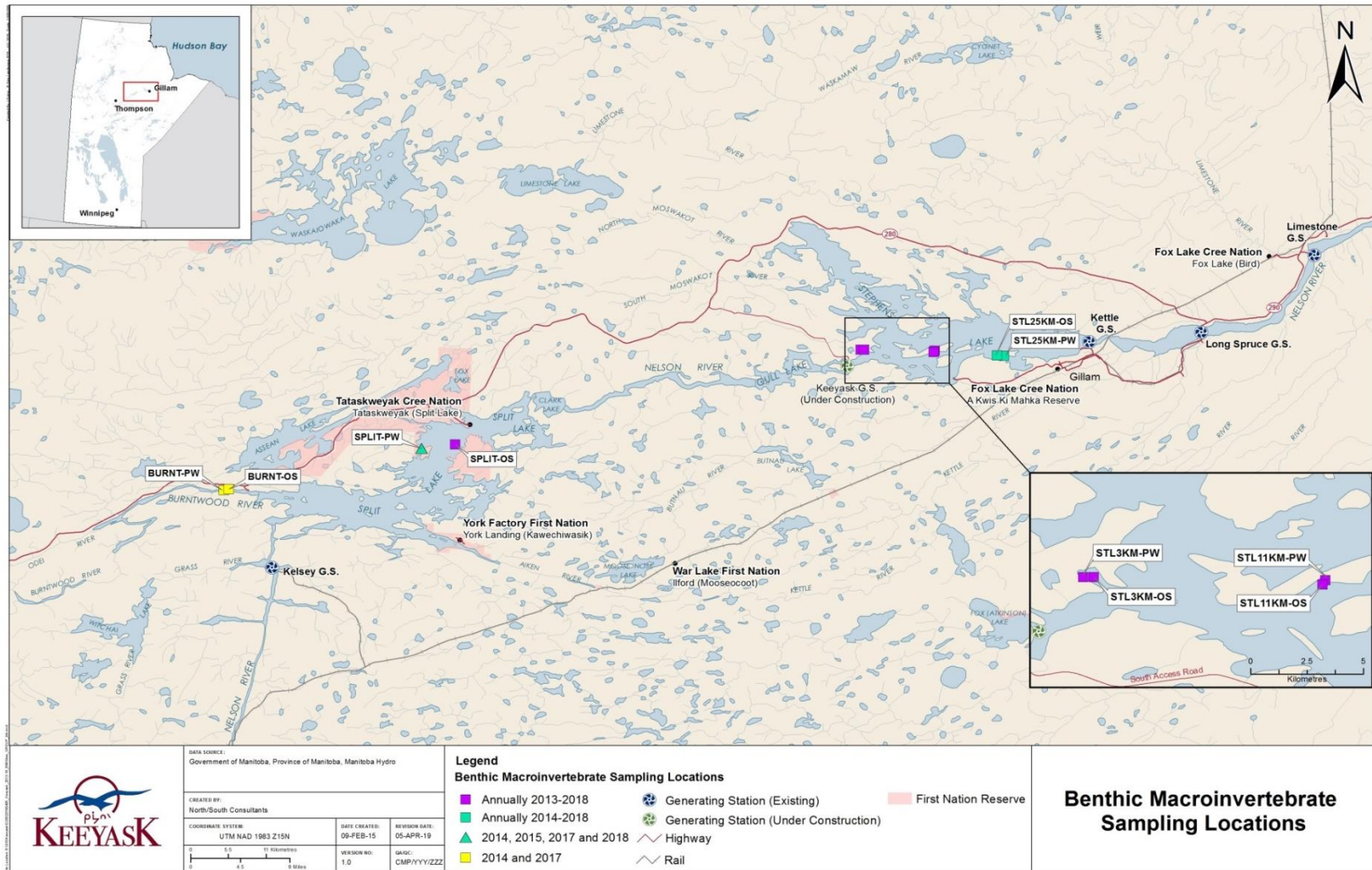
BMIs were collected in late August/early September of 2018 (Year 5 of construction) in three areas downstream of Gull Rapids. The areas were approximately 3 kilometres (km) (near-field), 11 km (mid-field area), and 25 km (far-field area) downstream of the construction site at Gull Rapids (see map below). Within each sampling area, BMIs were sampled from both nearshore (close to the shoreline in shallow water) and offshore (far from the shoreline in deeper water) habitat types. Five stations were sampled with a dredge (see photo below) to collect bottom sediments and BMIs in these two habitat types.



### Collecting a benthic macroinvertebrate grab with an Ekman dredge.

BMIs were also sampled in Split Lake in late August 2018 as an example of conditions within an area unaffected by construction to monitor natural changes over time.





**Locations of the reference and impact BMI sampling areas at the Burntwood River, Split Lake, and the sites downstream of Gull Rapids in Stephens Lake: 2013 (pre-construction), 2014 (Year 1), 2015 (Year 2), 2016 (Year 3), 2017 (Year 4), and 2018 (Year 5).**

## What was found?

### Nearshore Habitat

- There were no marked differences between BMIs in nearshore habitat at 3 km downstream of Gull Rapids in 2018 and pre-construction.
- In comparison to pre-construction, and similar to 2016 and 2017, the proportion of mayflies, stoneflies and caddisflies in samples collected at 11 km downstream of Gull Rapids was lower. The density of mayflies at this site was also lower than pre-construction.
- Results at 25 km downstream of Gull Rapids were not markedly different from pre-construction or any other years of monitoring.

### Offshore Habitat

- The increase in sand substrate (compared to pre-construction) that was first observed in 2017 was still obvious in offshore habitat 3 km downstream of Gull Rapids in 2018. The number, diversity and richness of invertebrates, and the number of mayflies, stoneflies and caddisflies in 2018 were similar to pre-construction, and there was an increase in fingernail clams.
- Compared to pre-construction, there was a decrease in the density of mayflies in samples collected at 11 km downstream of Gull Rapids in 2018. The proportion of mayflies, stoneflies and caddisflies also decreased at this site.
- The density of mayflies in samples collected at 25 km downstream of Gull Rapids in 2018 was lower than pre-construction.

## What does it mean?

Overall, the variety of results observed in Stephens Lake since the start of construction suggest that observed changes to BMIs are not related to construction; instead, they are more likely due to natural variation.

## What will be done next?

BMI monitoring will be conducted in late August of 2019 (Year 6 of construction). Results of monitoring conducted in 2019 will be compared to pre-construction results, as well as results from Split Lake, and presented in the Year 6 monitoring report.



# ACKNOWLEDGEMENTS

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The collection of biological samples described in this report was authorized by Manitoba Conservation and Water Stewardship, Fisheries Branch, under terms of the Scientific Collection Permit #22-18.

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# 1.0 INTRODUCTION

The Keeyask Generation Project (the Project) is a 695-megawatt (MW) hydroelectric generating station at Gull (Keeyask) Rapids on the lower Nelson River in northern Manitoba. The Project is approximately 725 kilometres (km) northeast of Winnipeg, 35 km upstream of the existing Kettle Generating Station, where Gull Lake flows into Stephens Lake, 60 km east of the community of Split Lake, 180 km east-northeast of Thompson and 30 km west of Gillam (Map 1). Construction of the Project began in July 2014.

The *Keeyask Generation Project: Response to EIS Guidelines*, completed in June 2012, provides a summary of predicted effects and planned mitigation for the Project. Technical supporting information for the aquatic environment, including a description of the environmental setting, effects and mitigation, and a summary of proposed monitoring and follow-up programs is provided in the *Keeyask Generation Project Environmental Impact Statement: Aquatic Environment Supporting Volume* (AE SV). As part of the licencing process for the Project, an *Aquatic Effects Monitoring Plan* (AEMP) was developed detailing the monitoring activities of various components of the aquatic environment including the focus of this report, specifically monitoring the benthic macroinvertebrate (BMI) community, for the construction and operation phases of the Project.

Construction monitoring of the BMI community specifically addresses the biological effects of increases in total suspended solids (TSS) due to in-stream work on the Nelson River (Map 2). Monitoring of BMI occurred immediately downstream of instream construction activities where effects, should they be measureable, would be greatest. Locations farther downstream in Stephens Lake were also sampled. Benthic macroinvertebrates were also assessed upstream of construction in waterbodies unaffected by the Project (Split Lake and the Burntwood River) using data collected as part of Manitoba and Manitoba Hydro's Coordinated Aquatic Monitoring Program (CAMP); these sites provide an ongoing reference to support the assessment of Project effects on BMIs throughout construction and into operation.

The key questions during construction phase monitoring are:

- *To what degree will benthic invertebrate abundance and/or community composition change during construction activities in comparison to either upstream or pre-Project conditions?*
- *Are there any unexpected effects on benthic macroinvertebrates that may be related to GS construction activities?*

Unlike water or sediment, where protection of aquatic life guidelines may be used to develop triggers or thresholds for an assessment of effects, there are no universal benchmarks for BMI metrics such as abundance and diversity. Rather, the magnitude of change or difference relative to expected conditions is used to establish an appropriate benchmark for biological variables. Based on guidance provided in the Metal Mining Environmental Effects Monitoring (EEM)



document (EC 2012) and scientific literature, experience with other AEMPs (e.g., Azimuth 2012), and power analysis utilizing CAMP data, an effect size of  $\pm 50$  percent (%) change in the mean of a metric was chosen as the benchmark for comparison to reference areas and/or pre-construction data. This was deemed most appropriate for the AEMP as it is realistically achievable with a well-designed program.

The following report presents the results of BMI monitoring completed in the fall of 2018 during Year 5 of construction. Results are assessed using the framework summarized in Section 3.4.2 and detailed in the AEMP.

## 2.0 STUDY SETTING

The study area for the 2018 BMI construction monitoring program included Split Lake, downstream of Gull Rapids on the Nelson River, and Stephens Lake (Map 1).

Split Lake is immediately downstream of the Kelsey GS at the confluence of the Burntwood and Nelson rivers (Map 3). Due to large inflows from the Nelson and Burntwood rivers, the lake has a detectable current in several locations. Split Lake has maximum and mean depths of 28.0 m and 3.9 m respectively, at a water surface elevation of 167.0 m above sea level (ASL) (Lawrence *et al.* 1999). The surface area of Split Lake was determined to be 26,100 hectare (ha) (excluding islands), with a total shoreline length, including islands, of 940.0 km (Lawrence *et al.* 1999). The numerous islands in Split Lake represent 411.6 km of the total shoreline.

Gull Rapids is located approximately 3 km downstream of Caribou Island on the Nelson River (Map 3). Two large islands and several small islands occur within the rapids, prior to the river narrowing. The rapids are approximately 2 km in length, and the river elevation drops approximately 11 m along its 2 km length. A summary of construction activities at Gull Rapids is provided in Section 2.1.

Just below Gull Rapids, the Nelson River enters Stephens Lake (Map 1). Stephens Lake was formed in 1971 by construction of the Kettle GS. Kettle GS is located approximately 40 km downstream of Gull Rapids. Between Gull Rapids and Stephens Lake, there is an approximately 6 km long reach of the Nelson River that, although affected by water regulation at the Kettle GS, remains riverine habitat with moderate velocity. Construction has altered the flow distribution immediately downstream of Gull Rapids as all flow now passes via the south channel of Gull Rapids. In August 2018, flow was further constricted when the spillway was commissioned (see Section 2.1).

### 2.1 CONSTRUCTION SUMMARY

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams in the north and central channels of Gull Rapids (Map 2). These cofferdams resulted in the dewatering of the north and central channels and the diversion of all flow to the south channel. Construction of the Spillway Cofferdam (SWCD), which extends into the south channel of Gull Rapids, was completed in 2015. The rock placement for the inner and outer groins of the Tailrace Cofferdam (TRCD) started in late 2016 and the impervious fill placement was completed in fall 2017. An opening was created to allow fish to move freely over the winter of 2017–2018. The opening was closed in spring 2018 and dewatering of the TRCD occurred in July, at which time a fish salvage was completed. In preparation for commissioning of the spillway, the SWCD was watered-up on both sides of the structure in June 2018. Removal of the SWCD started in early July and continued into August. The spillway was commissioned

between August 3 and 7, 2018. Closing the south channel with the upstream South Dam Cofferdam (SDCD) commenced at the beginning of August and river closure was achieved on August 16. This closure and the work that continued to seal the cofferdam forced the entire river flow through the spillway. The downstream SDCD was completed in September and the area between the two cofferdams was dewatered, allowing for fish salvage to be completed by late September 2018. Work continued on the upstream SDCD until it was complete in late fall 2018.

## 2.2 FLOWS AND WATER LEVELS

From October 2017 to October 2018, Split Lake outflow ranged from about 2,800–4,000 m<sup>3</sup>/s. Flow typically fell in the range of about 3,000–3,500 m<sup>3</sup>/s, which is near the historical annual median flow of approximately 3,300 m<sup>3</sup>/s. Flow was generally higher during the 2017/2018 winter period, gradually declining from about 3,800 m<sup>3</sup>/s at the end of February 2018 to about 2,800 m<sup>3</sup>/s by the beginning of May. From early May 2018 to the beginning of July, flow gradually increased to about 3,500 m<sup>3</sup>/s and remained at that level to the end of July. The flow subsequently declined to about 2,800 m<sup>3</sup>/s by the end of September. Water levels varied in conjunction with the flows, ranging from about 153.4–155.2 m ASL on Gull Lake.



## 3.0 METHODS

The following sections provide a description of the study design, sampling sites, field and laboratory methods, and data analysis methods for the BMI construction monitoring program.

### 3.1 STUDY DESIGN

The AEMP sampling design is comparable to the current CAMP design, such that data generated by the latter program will be used to augment AEMP reporting. Sampling areas (*i.e.*, polygons) were stratified by water depth and constrained by other aquatic habitat attributes (*e.g.*, substrate type, presence/absence of aquatic plants, water velocity, *etc.*) such that sampling areas represent the predominant habitat types(s). Sampling downstream of the construction site follows a gradient design: it extends from the area of maximum predicted sediment deposition at the inlet of Stephens Lake, where effects are most likely (near-field), out into the south basin of the lake (mid-field and far-field sites). Sampling conducted in 2013 (pre-construction/baseline) was based on the sampling design refined during AEMP development in an attempt to minimize the inherent variability within the benthic invertebrate data. As such, 2013 results are directly comparable to data collected during the five years of construction (2014–2018). The construction monitoring program is designed to facilitate comparisons of BMI metrics spatially (*i.e.*, upstream and downstream of construction activities) to delineate Project-related effects. Specifically, the program is designed to facilitate statistical comparisons of community metrics in reference areas to those monitored downstream of construction activities (*i.e.*, areas that are predicted to be most affected by the Project). The overall objectives of monitoring during the construction period are to determine if instream activities result in or contribute to exceedances of the benchmark and to confirm predictions in the AE SV.

### 3.2 SAMPLING LOCATIONS

Benthic macroinvertebrate sampling was conducted in late August/September from 2013–2018 (Table 1). Reference sites upstream of the Project area are sampled under CAMP (Split Lake is sampled annually and the Burntwood River is sampled on a 3-year rotational basis; Map 3) and AEMP monitoring sites downstream of Gull Rapids into Stephens Lake (at approximately 3 km, 11 km, and 25 km downstream of the construction site; Map 3) are sampled annually. In most years, a total of 40 samples are collected (10 at each site), but a total of 50 were collected in those years that the Burntwood River was also sampled (*i.e.*, 2014 and 2017).

Note that Stephens Lake 25 km downstream sites (nearshore and offshore habitats) were added after 2013 to address concerns with unanticipated downstream effects. Split Lake nearshore habitat was also not sampled in 2013. In 2016, nearshore habitat in Split Lake was not sampled for logistical reasons.

Within each sampling polygon, samples were collected from the nearshore in predominantly wetted (PW) habitat and in the deeper offshore (OS) habitat. For PW habitat, water depths of between 1 and 3 m, areas with consistent water movement (*i.e.*, standing water, low water velocity), and homogeneous substrate were targeted; areas with aquatic macrophyte beds were avoided. For the OS, sampling sites were constrained by the same habitat attributes, with the exception of water depth, which was between 3 and 10 m. The spatial extent of a polygon was at least 100 m x 100 m, and large enough to adequately accommodate five replicate stations. For pre-construction and construction monitoring, the locations of the five replicate stations were established by field crews and selected based on specific habitat attributes (*i.e.*, water depth, substrate type, absence of aquatic plants, water velocity) and the spatial separation criteria outlined in Metal Mining Technical Guidance for EEM (EC 2012). By EEM definition, a replicate station is a specific, fixed sampling location within an area that can be recognized, re-sampled, and defined quantitatively (*e.g.*, UTM position and a written description). The geographic extent of each replicate station was minimally 10 m x 10 m and separated from other replicate stations by at least 20 m. Within the habitat type(s), a replicate station consisted of three (construction) to five (pre-construction) randomly collected benthic invertebrate sub-samples; the sub-samples were composited to provide an estimate of the benthic community at each station. Field sub-samples were collected using a random number table and from designated sampling locations around an anchored boat within the 10 m x 10 m replicate station area.

### **3.3 FIELD SAMPLING AND LABORATORY METHODS**

#### **3.3.1 SUPPORTING *IN SITU* MEASUREMENTS AND SEDIMENT SAMPLING**

Supporting environmental variables measured/recorded at each replicate station included:

- Water temperature (using a hand-held thermometer for water surface measurement);
- UTM position (using a hand-held GPS receiver);
- Water transparency (using a Secchi disk);
- Water velocity (using a Swoffer current velocity meter at approximately 20 centimetres [cm] below water surface or visually estimated);
- Aquatic macrophytes (description of relative abundance and dominant type); and
- Dominant and secondary substrate types.

An additional benthic grab was taken at each replicate station and sub-sampled with a 5 cm diameter core tube (0.002 square metres [m<sup>2</sup>] surface area) to provide a sample of approximately 100 millilitres (mL) of sediment to characterize the general type of sediments in terms of total organic carbon (TOC) content and particle size composition. Sediment samples

were sent frozen in coolers to the North/South Consultants Inc. (NSC) laboratory (Winnipeg, MB) and stored frozen/cold pending submission to the analytical laboratory. Sediment laboratory analyses were conducted by ALS Laboratory Group (ALS; Winnipeg, MB).

Supporting environmental variables measured/recorded at each sub-sample/grab site included:

- Water depth (using a hand-held depth sounder or metered benthic dredge rope);
- Presence/absence of aquatic macrophytes in sub-sample; and
- Substrate composition (visual description e.g., percent cobble, gravel, silt, *etc.*).

### 3.3.2 BENTHIC MACROINVERTEBRATES

Benthic invertebrates were sampled at sites using either a petite Ponar dredge or an Ekman dredge (both with 0.023 m<sup>2</sup> opening). All sites were accessed by boat.

At each site within a replicate station, one benthic invertebrate sample was retrieved to the surface and carefully sieved through a 500 micrometre (or micron; µm) mesh rinsing bag. An acceptable sample required that the jaws be completely closed upon retrieval. If the jaws were not completely closed, the sample was discarded into a bucket (and disposed of once sampling was completed) and the procedure was repeated. All sampling equipment was rinsed before sampling at the next site. All material retained by the screen, including invertebrates, was transferred to labelled plastic jars and fixed with 10% formaldehyde. Fixed samples were shipped to the NSC laboratory (Winnipeg, MB) for processing.

At the laboratory, samples from all locations were rinsed with water through a 500 µm sieve and sorted under a 3X magnifying lamp. The invertebrates were transferred to 70% ethanol prior to being identified to the appropriate taxonomic level. A Leica Mz125 microscope (maximum 100x magnification) and reference texts from Clifford (1991), Merritt and Cummins (1996), Peckarsky *et al.* (1990), Smith (2001), Stewart and Stark (2002), and Wiggins (2004) were used for taxonomic identification. Scientific names used followed the Integrated Taxonomic Information System (ITIS 2018) classification. Invertebrates were identified to major group (subclass, order, or family) and Ephemeroptera were identified to genus. All invertebrate identification and enumeration was performed by an invertebrate taxonomist at NSC.

All samples were processed following NSC's Quality Assurance/Quality Control (QA/QC) guidelines (Appendix 1). All sorted samples were checked by a second laboratory technician (QA/QC technician). Additional invertebrates collected during the QA/QC process were combined with the original sample, but counted separately. Sorting efficiency must be ≥ 95%. The QA/QC technician checked on a tray-by-tray basis so that the sample was handled as few times as possible; the QA/QC technician sorted any remaining invertebrates from the tray and recorded the number of missed invertebrates per tray. The QA/QC technician also checked the bench sheet data to ensure it matched the sample data. Ten percent (10%) of the in-house identifications were randomly selected and re-identified by a taxonomist from ALS Laboratories

Inc. for QA/QC. The accuracy of the sample subset was assessed for identification and enumeration. The target overall accuracy level for in-house invertebrate identifications and enumeration was 95%. Corrected identifications and enumeration values were used in place of any data discrepancies.

All sorted samples will be retained and archived for the duration of the construction phase should further identification be required. A reference collection of benthic invertebrates will be maintained to ensure taxonomic consistency throughout the monitoring program duration.

## 3.4 DATA ANALYSIS

### 3.4.1 BENTHIC MACROINVERTEBRATES

To prepare the data for analysis, abundance of invertebrates was converted to density (number of invertebrates per square metre [individuals/m<sup>2</sup>]) by dividing the total number of invertebrates by the area of the sampling device (0.023 m<sup>2</sup>). The mean, standard deviation ( $\pm$ SD), standard error ( $\pm$ SE), median, minimum, maximum, coefficient of variation (COV; %), and mean  $\pm$ 50% were calculated to characterize each aquatic habitat type sampled within a polygon for each waterbody.

Benthic invertebrate community descriptors were calculated for each replicate station and habitat type. Composition metrics included:

- Total macroinvertebrate density;
- Densities and relative proportions of major groups (non-Insecta: Oligochaeta, Amphipoda, Bivalvia, Gastropoda; Insecta: Chironomidae, Ephemeroptera, Plecoptera, Trichoptera);
- Percent Ephemeroptera;
- Percent Ephemeroptera, Plecoptera, and Trichoptera (EPT) (EPT index; Sullivan *et al.* 2004);
- Percent of total organisms made up of Oligochaeta and Chironomidae; and
- Ratio of EPT to Chironomidae.

Richness measures included:

- Total taxonomic richness (family-level; total number of invertebrate families within a habitat polygon; Barbour *et al.* 1999; Klemm *et al.* 2002; Resh *et al.* 1997); and
- EPT richness (family-level; total number of families of Ephemeroptera, Plecoptera, and Trichoptera within a habitat polygon).

Diversity indices included:

- Simpson's Diversity Index (EC 2012; Magurran 1988, 2004; Mandaville 2002).

The AEMP identified the following BMI community metrics (which are sensitive to environmental change) and a benchmark to focus the monitoring program and provide a framework for adaptive management:

- Total macroinvertebrate abundance;
- Total taxonomic richness; and
- Simpson's Diversity Index.

Results of the BMI monitoring program are subject to the steps outlined in Figure 1. This framework prescribes data analysis methods and other tasks to be undertaken based on results of the monitoring program. Step 1 of the framework entails comparison of the mean values of replicate samples for metrics to the benchmark identified in the AEMP. If the benchmark is not exceeded, the assessment would proceed to Response Level 1: trend analysis. If the benchmark is exceeded, the assessment would proceed to Step 2: determination of whether there is a statistical difference between upstream and downstream areas (*i.e.*, control-impact) and/or relative to pre-construction conditions (before-after). If a statistical difference is not observed, the assessment would proceed to Response Level 1. Where statistical differences are identified, the assessment would proceed to Step 3, in which a determination of cause (*i.e.*, is the difference Project-related?) would be undertaken.

All metrics were reviewed and compared to the benchmark (*i.e.*,  $\pm 50\%$  change in the mean of a metric in comparison to each previous year of monitoring data) to identify the potential for effects on the BMI community. For each metric that exceeded the benchmark, a statistical comparison between every year of data was undertaken. Prior to statistical analyses, macroinvertebrate metrics were tested for normality and homogeneity of variances and where the assumptions were met, were compared through a t-test or an Analysis of Variance (ANOVA) with Bonferroni pairwise comparison ( $\alpha = 0.05$ ). Where these assumptions were not met, non-parametric analyses were applied such as the Mann-Whitney U-test or Kruskal-Wallis test followed by Dunn's multiple pairwise comparisons procedure ( $\alpha = 0.05$ ). When data are non-normal, non-parametric tests are more powerful than parametric ones, *i.e.*, non-parametric analyses may be able to detect significant differences in the data when parametric analyses would not (Zar 1999). Non-parametric analyses are performed on ranks of the data and therefore do not require transformation of data; thus, all analyses are performed on the raw data. Since 2015, to reduce the likelihood of false-positives, the Bonferroni Correction has been applied when more than two years of data are compared. In these cases, a modified significance level (MSL) was obtained by dividing the critical p value ( $\alpha$ ) by the number of samples being compared. All analyses were performed using a current version of XLStat.

During the analyses conducted in support of this report, the power analyses conducted in support of the Keeyask Generation Project AEMP were revisited and, based on the consistency of data collected from Split Lake for the Keeyask EIS, it was determined that a measure of change benchmark of  $\pm 25\%$  was more appropriate for two of the three metrics that are sensitive



to environmental change: total taxonomic richness and Simpson's Diversity index. Results from all years of monitoring were assessed using this new, more stringent benchmark, and any changes/trends that were identified as a result of this adjustment are highlighted in the discussion of this report.

### **3.4.2 SUPPORTING SEDIMENTS**

Summary statistics (mean,  $\pm$ SD,  $\pm$ SE, median, minimum, and maximum, and COV [%]) were calculated to characterize the general type of sediments observed in each aquatic habitat type sampled within a polygon. To facilitate these calculations, any parameters measured below the analytical detection limit were assigned a value of one-half the detection limit.

Statistical comparisons (ANOVA, Mann-Whitney or Kruskal-Wallis; as described in Section 3.4.1) were conducted to determine if changes to substrate composition and TOC that had occurred between monitoring years were statistically significant. In monitoring conducted prior to 2017 (Zrum and Gill 2015, 2016; Dawson 2017), only those results that exhibited a change that exceeded a  $\pm$ 50% difference in the mean of a metric between years were selected for further statistical analyses. However, since 2017 (Dawson 2018), statistical comparisons have been applied to all sediment data. The 50% difference was identified specifically for benthic invertebrate data, as the target minimum difference that could be detected with the sample size in the study.

## 4.0 RESULTS

### 4.1 BENTHIC MACROINVERTEBRATES

Environmental conditions at each replicate station from 2013 to 2018 are presented in Table 1. Benthic macroinvertebrate data for individual replicate stations sampled in each year are presented in Appendix 2. Summary statistics by habitat type for metrics not presented in the following sections are provided in Appendix 3. The text in Sections 4.1.1 and 4.1.2 compares the 2018 monitoring results to baseline (2013; where available) and also highlights differences between 2018 and previous years of construction monitoring (2014–2017). When the results from a particular year are not mentioned, it means they were similar to what was seen in 2018. Trends in the data over time are also described.

Differences between the BMI communities in Split Lake (reference) and Stephens Lake (impact) were noted for the pre-construction program (Zrum and Gill 2015). For example, the mean total macroinvertebrate density in offshore habitat at the 3 km and 11 km downstream sites in Stephens Lake in 2013 was more than 50% lower than the mean total macroinvertebrate density in offshore habitat in Split Lake in the same year, a difference that already exceeded the benchmark and construction had yet to begin. As such, assessment of construction effects could not be based on a direct upstream/downstream comparison; instead, the identification of potential effects of construction-related activities on downstream BMIs was based on changes over time within a given polygon. However, data collected from the reference waterbodies can be used to identify changes in BMI metrics that occur in waterbodies throughout the study area and are therefore likely due to changes in environmental conditions that are not related to construction (e.g., water temperature). For this reason, results from sites downstream of the construction site are discussed first in the sections below, followed by results from the upstream reference sites to provide regional context.

#### 4.1.1 KEY METRICS

As described in Section 3.4.1, total macroinvertebrate abundance, total taxonomic richness, and Simpson's Diversity index were selected as indicators of construction effects because of their sensitivity to environmental change.

#### **4.1.1.1 TOTAL MACROINVERTEBRATE DENSITY**

##### **4.1.1.1.1 NEARSHORE HABITAT**

In Stephens Lake at 3 km downstream from construction (Stephens Lake 3 km), mean total macroinvertebrate density has been consistent from 2013–2018, never exceeding the  $\pm 50\%$  benchmark between years (Table 2; Figure 2). For the first time since construction began in 2014, mean total macroinvertebrate density 11 km downstream of the construction site (Stephens Lake 11 km) was within the  $\pm 50\%$  of the pre-project (2013) mean; in all other years of monitoring (2014–2017) total macroinvertebrate density was less than 50% of the 2013 mean (Table 3; Figure 2; Appendix 3). Average total density of macroinvertebrates at 25 km downstream of the construction site (Stephens Lake 25 km) has varied from year-to-year during the monitoring program, reaching a low in 2016. The 2018 mean was not significantly different from previous years' means; however, it was more than 50% greater than the 2016 and 2017 means (Table 4; Figure 2).

Mean macroinvertebrate density in Split Lake in 2018 was similar to 2014 and 2017. Mean density in 2018 was more than 50% lower than the 2015 mean, however, this difference was not significant (Table 5; Figure 2).

##### **4.1.1.1.2 OFFSHORE HABITAT**

Every year since the start of construction except 2015 (*i.e.*, 2014, 2016, 2017 and, 2018), mean total macroinvertebrate density at Stephens Lake 3 km has been within the  $\pm 50\%$  benchmark compared to the pre-project mean (Table 2; Figure 3; Appendix 3). Although total invertebrate density at Stephens Lake 11 km in 2018 was lower than the pre-project mean, it was actually closer to the 2013 mean than any other year of monitoring and was well within the  $\pm 50\%$  benchmark (Table 3; Figure 3). Mean total macroinvertebrate abundance at Stephens Lake 25 km has been consistent throughout construction monitoring, never exceeding the  $\pm 50\%$  benchmark between years (Table 4; Figure 3).

The statistically significant decrease in mean total invertebrate density that was observed in Split Lake in 2016 and 2017 (compared to the pre-project mean) did not persist into 2018, although density in 2018 was still more than 50% lower than the 2013 mean (Table 5; Figure 3).

#### **4.1.1.2 TOTAL TAXONOMIC RICHNESS**

##### **4.1.1.2.1 NEARSHORE HABITAT**

Consistent with 2017, mean total taxonomic richness (at the family level) in nearshore habitat at Stephens Lake 3 km in 2018 was below the  $\pm 25\%$  benchmark compared to the 2013, 2014 and 2016 means. However, as in 2017, none of these differences were statistically significant (Table 2; Figure 4; Appendix 3). In 2018, mean total richness at Stephens Lake 11 km was identical to 2017, and similar to the pre-project mean (Table 3; Figure 4; Appendix 3). Mean total richness

at Stephens Lake 25 km in 2018 was within the benchmark compared to all other years of monitoring except it was more than 25% higher than the 2016 mean (not a statistically significant difference) (Table 4; Figure 4).

In 2018, mean total richness in Split Lake was lower than all previous years of monitoring, a difference that was statistically significant compared to 2015 and 2017 (Table 5; Figure 4).

#### **4.1.1.2.2 OFFSHORE HABITAT**

Total taxonomic richness at Stephens Lake 3 km was higher in 2018 than all previous years of monitoring, including 2013, and was more than 25% higher than all years of construction monitoring (2014–2017). The difference between 2015 and 2018 was statistically significant (Table 2; Figure 5; Appendix 3). At Stephens Lake 11 km and 25 km, the 2018 taxonomic richness means were not significantly different from any previous year of monitoring, although they were more than 25% higher than the 2015 means at both sites, and more than 25% higher than the 2013 mean at Stephens Lake 11 km (Tables 3 and 4; Figure 5).

Mean total taxonomic richness in Split Lake was consistent between years until 2018, when it decreased by more than 25% below the 2013, 2014 and 2015 means. The difference between the 2015 and 2018 means was statistically significant (Table 5; Figure 5).

### **4.1.1.3 SIMPSON'S DIVERSITY INDEX**

#### **4.1.1.3.1 NEARSHORE HABITAT**

Mean Simpson's diversity at Stephens Lake 3 km in 2018 was 0.01 higher than 2017, with the 2018 mean more than 25% lower than the 2013 mean and more than 25% higher than the 2015 mean (Table 2; Figure 6). Neither of these differences were statistically significant (Appendix 3). At Stephens Lake 11 km, mean Simpson's diversity has steadily increased each year since monitoring began, and from 2016–2018 this metric has been more than 25% higher than the pre-construction (2013) mean (all statistically significant differences) (Table 3; Figure 6; Appendix 3). Mean Simpson's diversity at Stephens Lake 25 km has been consistent over time and has remained within the benchmark between years (Table 4; Figure 6).

In previous years, mean Simpson's diversity in nearshore habitat in Split Lake has been consistent and inter-annual changes have never exceeded the  $\pm 25\%$  benchmark, but in 2018 this metric decreased by more than 25% compared to the 2017 mean, a change that was statistically significant (Table 5; Figure 6).

#### **4.1.1.3.2 OFFSHORE HABITAT**

At Stephens Lake 3 km in 2018, mean Simpson's diversity was within  $\pm 25\%$  of all previous years' means except 2015, however, the difference was not statistically significant (Table 2; Figure 7). Results from offshore habitat at Stephens Lake 11 km are similar to those from

nearshore habitat: mean Simpson's diversity from 2015–2018 has been significantly higher than the pre-project mean (Table 3; Figure 7; Appendix 3). Simpson's diversity at Stephens Lake 25 km has been inconsistent between years, with the 2018 mean more than 25% lower than the 2014, 2016 and 2017 means, but only significantly lower than the 2016 mean (Table 4; Figure 7).

Concurrent with the observed decrease in total richness in offshore habitat in Split Lake, Simpson's diversity in offshore habitat also decreased in 2018. It was more than 25% lower than the means for all previous years of monitoring except 2017. None of these differences were statistically significant (Table 5; Figure 7).

## **4.1.2 ADDITIONAL METRICS**

Benthic macroinvertebrate metrics expected to be negatively affected by increases in TSS include a decrease in Ephemeroptera (mayfly) abundance, % EPT (% mayfly, stonefly, and caddisfly), and Pisidiidae (fingernail clam) abundance; as such, they are presented in the following sections.

### **4.1.2.1 EPHEMEROPTERA DENSITY**

#### **4.1.2.1.1 NEARSHORE HABITAT**

While Ephemeroptera density at 3 km Stephens Lake had been highly variable in previous years of monitoring, mean density in nearshore habitat was identical in 2017 and 2018 (Table 2; Figure 8; Appendix 3). The 2017 and 2018 means were more than 50% higher than all other years except 2014 (and significantly higher than 2015). Mean Ephemeroptera density at Stephens Lake 11 km in 2018 was lower than all previous years of monitoring: it was outside the 50% benchmark compared to the 2013, 2014, 2015 and 2017 means, and it was significantly lower than the 2013 mean (Table 3; Figure 8; Appendix 3). Mean Ephemeroptera abundance at Stephens Lake 25 km in 2018 was similar to the 2014 and 2017 means, more than 50% higher than the 2016 mean, and more than 50% lower than the 2015 mean (but not significantly different from either) (Table 4; Figure 8; Appendix 3).

Ephemeroptera abundance has also been variable in Split Lake nearshore habitat: the 2018 mean was higher than all previous years of monitoring, and was more than 50% higher than the 2014 and 2017 means (a statistically significant difference compared to 2014) (Table 5; Figure 8; Appendix 3).

#### **4.1.2.1.2 OFFSHORE HABITAT**

In 2018, mean Ephemeroptera density in offshore habitat at Stephens Lake 3 km was more than 50% higher than all other years of monitoring except 2017, but it was only significantly different from the 2015 mean, when the mean Ephemeroptera density was 0.0 (Table 2;

Figure 9). Mean Ephemeroptera density has generally decreased over time in offshore habitat at Stephens Lake 11 km, with the 2018 mean being more than 50% lower than the 2013–2016 means, a difference that was statistically significant compared to 2013 and 2014 (Table 3; Figure 9, Appendix 3). In 2018, mean Ephemeroptera density at Stephens Lake 25 km was lower than all previous years of monitoring, and outside the 50% benchmark relative to all years except 2015 (Table 4; Figure 9). The 2018 mean was significantly different from the 2014 mean (Appendix 3).

Mean Ephemeroptera density in offshore habitat in Split Lake has been relatively consistent since 2016. The 2018 mean was more than 50% lower than the 2013 mean and more than 50% higher than the 2015 mean (although neither of these differences was statistically significant) (Table 5; Figure 9; Appendix 3).

## **4.1.2.2 PERCENT EPT**

### **4.1.2.2.1 NEARSHORE HABITAT**

At Stephens Lake 3 km in 2018, % EPT was more than 50% higher than all other years except 2017, and it was significantly different from the 2015 mean (Table 2; Figure 10; Appendix 3). In 2018, mean % EPT at Stephens Lake 11 km was lower than all previous years of monitoring and, similar to 2016 and 2017, it differed from the 2013 mean by a statistically significant amount (Table 3; Figure 10; Appendix 3). The 2018 mean at Stephens Lake 25 km was within the  $\pm 50\%$  benchmark compared to all other years except 2016 (a difference that was not statistically significant) (Table 4; Figure 10; Appendix 3).

Mean % EPT in nearshore habitat in Split Lake was much higher in 2018 than previous years of monitoring (*i.e.*, 2014, 2015, and 2017), a difference that was statistically significant in all cases (Table 5; Figure 10; Appendix 3).

### **4.1.2.2.2 OFFSHORE HABITAT**

There has been a general increase in % EPT over time at Stephens Lake 3 km, but the 2018 mean represents a large increase as it was more than 50% higher than the 2013–2017 means, and significantly higher than the 2014 mean (Table 2; Figure 11, Appendix 3). The decreasing trend observed at Stephens Lake 11 km in 2017 persisted into 2018, with mean % EPT once again lower than all previous years of monitoring (Table 3; Figure 11). The 2018 mean was more than 50% lower than the 2013–2016 means, and significantly lower than the 2013, 2014, and 2016 means (Table 3; Appendix 3). Mean % EPT at Stephens Lake 25 km also decreased in 2018 compared to previous years, and was more than 50% lower than the 2014, 2016, and 2017 means, but these differences were not statistically significant (Table 4; Figure 11; Appendix 3).



In Split Lake in 2018, mean % EPT in offshore habitat was similar to the 2013, 2016, and 2017 means, but was above the 50% benchmark compared to 2014 and 2015 (Table 5; Figure 11). The 2018 mean was not significantly different from the mean in any other year (Appendix 3).

### **4.1.2.3 PISIDIIDAE DENSITY**

#### **4.1.2.3.1 NEARSHORE HABITAT**

In 2018, mean Pisidiidae density at Stephens Lake 3 km was more than 50% lower than the recorded means for 2013 and 2016, and more than 50% higher than the 2017 mean, but none of these differences were statistically significant (Table 2; Figure 12; Appendix 3). At Stephens Lake 11 km, mean Pisidiidae density in 2018 was more than 50% higher than the calculated means for all previous years of monitoring, but none of these differences were statistically significant (Tables 3 and 4; Figure 12). At Stephens Lake 25 km, mean Pisidiidae density in 2018 was very similar to the 2014, 2015 and 2017 means, but was more than 50% higher than the 2016 mean (this difference was not significant) (Appendix 3).

Mean Pisidiidae density in nearshore habitat in Split Lake in 2018 was more than 50% higher than the 2014 mean, and more than 50% lower than the 2015 and 2017 means (Table 5; Figure 12). None of these differences were statistically significant.

#### **4.1.2.3.2 OFFSHORE HABITAT**

From 2013–2017, Pisidiidae abundance was consistently low in offshore habitat at Stephens Lake 3 km, but it increased in 2018 (Figure 13). This increase was statistically significant compared to the 2013 and 2015 means (Table 2; Figure 13). Pisidiidae have been completely absent from offshore habitat in Stephens Lake 11 km in all years (Figure 13). At Stephens Lake 25 km, Pisidiidae were present in 2014 samples in very low numbers but have not been captured since.

In Split Lake, Pisidiidae density in offshore habitat in 2013 was high and decreased each year to a complete absence in 2017 (Figure 13). In 2018, a small number were present in offshore samples, but density was still more than 50% lower than the means from 2013–2016, and the 2013 and 2018 means were significantly different (Table 5; Figure 13; Appendix 3).

## **4.2 SUPPORTING SEDIMENTS**

Sediment data for individual replicate stations sampled in 2013 (pre-construction) and 2014–2018 (construction monitoring) are presented in Appendix 2. As mentioned in Section 3.4.2, changes in sediment composition between years were compared to the  $\pm 50\%$  benchmark in previous reports, but in this year's report, statistically significant changes are highlighted instead.

## **4.2.1 TOC (%)**

### **4.2.1.1 NEARSHORE HABITAT**

At all nearshore sites monitored in 2018, % TOC was lower than in 2017, but there were no significant differences between 2018 results and previous years' means, including 2013 (Figure 14; Appendix 3).

### **4.2.1.2 OFFSHORE HABITAT**

Mean % TOC in offshore samples from Stephens Lake in 2018 was not significantly different from previous years of monitoring; the increase observed at Stephens Lake 11 km in 2016 and 2017 did not persist in 2018 (Figure 15; Appendix 3). The increase in mean % TOC observed in offshore samples from Split Lake in 2016 and 2017 persisted in 2018 (Appendix 3).

## **4.2.2 SAND (%)**

### **4.2.2.1 NEARSHORE HABITAT**

Mean % sand in nearshore habitat at sites downstream of construction and in Split Lake was not significantly different in 2018 than in any previous sampling year (Figure 16; Appendix 3).

### **4.2.2.2 OFFSHORE HABITAT**

At Stephens Lake 3 km, mean % sand in 2018 samples was higher than all previous monitoring years, and significantly higher than in 2013 and 2015 (Figure 17; Appendix 3). Similar to what was seen in 2017, this increase was not uniform; the patchy nature of sand substrate resulted in one grab with very high sand content that skewed the 2018 mean. In all years of sampling, the mean % sand at Stephens Lake 11 km was very low (< 1%), with no significant difference between years. Sand also comprised a very low proportion of the sediment at Stephens Lake 25 km in all sampling years (< 2%), but the 2016, 2017 and 2018 means were significantly higher than the 2014 mean. Because these values were all so low, the change in laboratory detection limit in 2016 may have been at least partially responsible for this reported increase. The mean % sand in samples collected from offshore habitat in Split Lake was consistent between years.

### **4.2.3 SILT (%)**

#### **4.2.3.1 NEARSHORE HABITAT**

In 2018 mean % silt at Stephens Lake 11 km and 25 km and Split Lake was not significantly different from previous years of monitoring; however, the mean % silt from Stephens Lake 3 km varied between years (Figure 16; Appendix 3). As in 2017, the 2018 mean % silt was significantly higher than in 2015 and 2016, but did not differ from other sampling years, including baseline.

#### **4.2.3.2 OFFSHORE HABITAT**

The mean % silt in samples collected offshore at Stephens Lake 3 km and 11 km was not significantly different between years (Figure 17; Appendix 3). Mean % silt in samples from Stephens Lake 25 km offshore was quite variable, but the only significant difference compared to 2018 results was the 2016 mean, which has been significantly lower than all years sampled, save 2014. Mean % silt in samples collected from offshore habitat in Split Lake in 2018 was higher than in previous years, and significantly higher than the 2014 mean.

### **4.2.4 CLAY (%)**

#### **4.2.4.1 NEARSHORE HABITAT**

On Stephens Lake, the pattern observed for % silt was also seen for % clay: no significant differences were measured at Stephens Lake 11 km or 25 km, but at Stephens Lake 3 km there was a statistically significant change. As in 2017, the % clay was significantly lower than in previous sampling years (*i.e.*, 2013, 2014, and 2016) (Figure 16; Appendix 3). Mean % clay in nearshore habitat in Split Lake has remained consistent in all monitoring years.

#### **4.2.4.2 OFFSHORE HABITAT**

Mean % clay in offshore samples at Stephens Lake 3 km was lower in 2018 than all previous sampling years, and significantly lower than the 2013 mean (Figure 17; Appendix 3). At Stephens Lake 11 km and 25 km there was no significant difference between years, although results at 25 km exhibited high variability between years. Offshore samples collected from Split Lake in 2018 contained a much lower proportion of clay than in previous years, significantly lower than in 2014 and 2016.

## 5.0 DISCUSSION

### 5.1 STEPHENS LAKE

Decreases in mean species richness, diversity, and fingernail clam density, and increases in mean mayfly density and % Ephemeroptera, Plecoptera, and Trichoptera (EPT) were observed in nearshore samples at Stephens Lake 3 KM in 2017, likely related to changes in sediment composition. Some of these decreases persisted in 2018. Monitoring results from nearshore habitat at Stephens Lake 3 km in 2018 were very similar to 2017 (Tables 2 and 6). The decreases in mean richness and diversity observed in 2017 persisted in 2018, as did the increases in mean mayfly density and % EPT (Table 2). None of these differences were statistically significant compared to pre-construction (2013), but they were all outside the 50% benchmark (Table 2; Appendix 3). The changes in substrate composition observed in 2017 (decreased % clay and increased % silt compared to previous years) also persisted in 2018, although the increased proportion of silt was no longer statistically significant compared to baseline (*i.e.*, 2013) (Figure 15; Appendix 3).

Similar changes in substrate were observed in offshore samples collected from Stephens Lake 3 km were observed in both 2017 and 2018. The average proportion of sand was significantly higher than 2013 and the proportion of clay was significantly lower than 2013 (Figure 15). Unlike in nearshore samples, % silt did not show a significant difference in any sampling year. While offshore substrate distribution in 2018 was still patchy, examination of substrate composition over time reveals somewhat uniform changes that support the measured mean decrease (% clay) and increase (% sand) over time (Appendix 2).

Despite substrate conditions similar to 2017, changes in BMI metrics were observed in offshore samples from Stephens Lake 3 km: taxonomic richness, % EPT, and Pisidiidae (fingernail clam) density all increased by more than 50% compared to the 2017 mean, and the increase in fingernail clam density was significantly higher than the 2013 mean (Tables 2 and 6; Appendix 3). It should be noted that the 2018 means for the six key metrics that are negatively affected by increases in TSS were either within the benchmark set by all other years of monitoring or more than 50% higher (*i.e.*, there were no decreases), although only a few of the observed increases were statistically significant (Table 2).

For the past three years (2016–2018), diversity in nearshore habitat at Stephens Lake 11 km has been significantly higher than baseline, while % EPT has been significantly lower than baseline (Table 7; Figures 6 and 10). These two significant differences are tied to the high number and proportion of Ephemeroptera (mayfly) present in 2013 samples. The fact that mayflies comprised 62% of all organisms in Stephens Lake 11 km nearshore samples in 2013 means that diversity in that year was low (so it has been significantly higher in subsequent

years), and % EPT was high (leading to relatively low % EPT going forward). Together, these changes should be treated as one change to BMI metrics, not two. Mayfly density has remained less than 50% of that in 2013 in all sampling years since, a difference that was significant in both 2016 and 2018. The 2018 decrease in mayfly density did not negatively impact total invertebrate density, which showed an increase compared to previous years of monitoring and was within 50% of the 2013 mean for the first time since 2014 (Table 7; Figure 2). An increase in fingernail clam density compared to all previous years (outside the benchmark, but not statistically significant) was at least partially responsible for the increase in total invertebrate density (Tables 3; Appendix 3). As in previous years of monitoring, significant changes to the nearshore substrate were not observed at Stephens Lake 11 km (Figures 14 and 15).

The 2018 decrease in mayfly density observed in nearshore habitat was also detected in offshore samples at Stephens Lake 11 km (Table 7; Figure 9). Offshore mayfly abundance at Stephens Lake 11 km had already been below the baseline benchmark since 2015, but a further decrease in 2018 made the difference statistically significant (Table 8). The coincident statistically significant decrease in % EPT was due in part to this lower mayfly density, but the significant increase in amphipod density seen in 2017 that persisted in 2018 also contributed (Table 7; Figure 11; Appendix 3). In all years since 2013, diversity in offshore habitat at 11 km has consistently been more than 25% higher than the pre-construction mean (statistically significant increases in all years except 2014; once again likely related to decreases in mayfly density), and total taxonomic richness has been more than 25% higher than the 2013 mean since 2016 (Table 7; Figures 5 and 7). Significant changes in offshore substrate were not observed during 2018 monitoring (Figure 17; Appendix 3).

Results across years from nearshore habitat sites at Stephens Lake 25 km have been consistent, except in 2016 when the majority of BMI metrics experienced a decrease due to low water levels that left some sites exposed for a portion of the open-water season (Table 4; Appendix 3). There have been no significant differences between years (2014–2018) for the six key metrics that are negatively affected by increases in TSS, and substrate conditions have remained consistent.

Offshore habitat at Stephens Lake 25 km experienced a decrease in mayfly density in 2018, however the difference was only significant when compared to 2014 (Table 4; Figure 9; Appendix 3). This decrease resulted in a coincident decrease in % EPT, although it was not statistically significant because Trichoptera density was high in 2018 compared to previous years. Simpson's diversity also decreased compared to previous years, but was only significantly lower than 2016. Total invertebrate density in 2018 remained within the benchmark for all previous years of monitoring thanks to an increased density of gastropods (Table 4; Figure 11; Appendix 3). A close examination of the six key metrics negatively affected by increases in TSS reveals that all years are similar with respect to total invertebrate abundance, total taxonomic richness, and Pisidiidae density. The differences observed in 2015 and 2018 are almost identical and related to a decrease in mayflies in both years (Table 4; Figures 3, 5, 7, 9 and 11).

## 5.2 REFERENCE WATERBODIES

Pre-construction sampling revealed inherent differences in the BMI communities in the main reference waterbody (Split Lake) and the impact waterbody (Stephens Lake) that preclude a direct upstream/downstream comparison (see Section 4.1). Identification of potential construction-related effects to benthos are limited to changes over time within each habitat polygon. Data collected from the reference waterbodies were instead used to identify changes in BMI metrics in response to environmental conditions throughout the study area.

Results between years of nearshore sampling on Split Lake have been variable (Table 5; Appendix 3). In 2018, oligochaetes, amphipods and Trichoptera were completely absent from samples for the first time since monitoring began, which contributed to significant decreases in total richness (compared to 2015 and 2017) and Simpson's diversity (compared to 2017). Mayfly density increased significantly in nearshore habitat on Split Lake compared to 2014, and % EPT was significantly higher in 2018 than all previous years of monitoring (Table 5).

Decreases in total taxonomic richness and Simpson's diversity were also observed in offshore habitat on Split Lake in 2018, although these decreases were not statistically significant (Table 8). Mean gastropod density in samples has been decreasing since 2014, and a complete absence from samples in 2018 likely contributed to the observed decreases in richness and diversity (Appendices 2 and 3). In 2018, total invertebrate density was still more than 50% lower than the 2013 benchmark (similar to 2016 and 2017), but for the first time in three years the difference was not statistically significant (Table 8). The statistically significant decrease in Pisidiidae density observed in 2017 persisted in 2018 (Table 8). Since 2016, mayfly densities in offshore habitat in Split Lake have been consistently more than 50% lower than the baseline mean, similar to Stephens Lake 11 km, although the significant decreases in mayfly density observed in offshore habitat at Stephens Lake 11 km and 25 km in 2018 were not detected in Split Lake (Tables 3, 7, and 8).

The statistically significant changes in Split Lake BMI metrics in 2018 (decreased taxonomic richness and diversity, and increased mayfly density and % EPT in nearshore habitat, and a decrease in Pisidiidae density in offshore habitat) were not consistent with changes observed in Stephens Lake: an increased proportion of sand and density of fingernail clams in offshore samples from the 3 km site; increased diversity and decreased mayfly density in % EPT in nearshore and offshore samples from the 11 km site; and decreased mayfly density in offshore samples from the 25 km site. While these differences could be interpreted as a sign that construction is impacting the BMI community in Stephens Lake (since it is experiencing different changes than the reference waterbody), the inter-annual variability in monitoring results from Split Lake suggest that the observed differences are more likely related to the timing of BMI proliferation, which is variable from year to year, and the patchy distribution of organisms at monitoring sites.



## 5.3 KEY QUESTIONS

Two key questions were considered.

*To what degree will benthic invertebrate abundance and/or community composition change during construction activities in comparison to either upstream or pre-project conditions?*

The AE SV (KHLP 2012) considered the following pathways of effect during construction of the Project:

- Changes to water quality, such as increases in concentration of TSS and related variables (e.g., turbidity). However, it was expected that measures to protect water quality would reduce the likelihood of any measurable effects on the BMI community; and
- Deposition of sediments in Stephens Lake. This was not expected to affect BMI as the total amount of sediments deposited was predicted to be very small (less than 0.6 cm thickness over the period of construction) and the composition of bottom substrate would not be changed.

From 2014–2017 there were only a handful of statistically significant changes 3 km downstream of the construction site, but benchmark exceedances are frequent and often shift back and forth from one year to the next (Table 6). Between 2017 and 2018, there were few shifts compared to the 2013 benchmark: nearshore habitat was consistent except the increase in % silt was no longer statistically significant, while in offshore habitat there was a decrease in Simpson's diversity (not statistically significant) and a statistically significant increase in the density of fingernail clams. It is possible that the increase in clams was linked to the increase in sand substrate that persisted from 2017 to 2018.

Monitoring results in nearshore and offshore habitat 11 km downstream of Gull Rapids have been similar between years of construction monitoring, with the majority of observed shifts due to changes in the density of Ephemeroptera relative to very high numbers in 2013 (Table 7). Mayfly density experienced a significant decrease in both nearshore and offshore habitat in 2018, which was the first year a significant change in this metric was detected offshore. The only changes in 2018 not related to mayflies was a nearshore increase in Pisidiidae abundance within the benchmark that resulted in an increase in total invertebrate density, also within the benchmark.

BMI metrics in nearshore habitat at Stephens Lake 25 km have been consistent, with results generally remaining within the benchmark from one year to the next (Table 4). The exception would be 2016, when low water levels resulted in decreases that were outside the benchmark but not statistically significant. Results for offshore habitat mimicked those observed in 2015, when a similar statistically significant decrease in mayflies occurred.

The statistically significant changes observed in Split Lake in 2018 were not consistent with those observed in Stephens Lake in 2018 (*i.e.*, there was no indication of a regional change in the BMI).

Despite the persistence of statistically significant changes to substrate composition in both nearshore and offshore habitat in 2018, the observed changes in BMI metrics at Stephens Lake 3 km indicate that the BMI community has not been negatively impacted by construction. In the nearshore habitat, decreases in total richness and Pisidiidae density were not statistically significant, and in offshore habitat, none of the six key metrics that are negatively affected by increases in TSS exhibited decreases in 2018.

Because Ephemeroptera density was more than 50% higher than the baseline mean in both nearshore and offshore habitat at the site closest to construction (Stephens Lake 3 km), it is unlikely that the statistically significant decreases in mayfly density at Stephens Lake 11 km and 25 km were due to construction. Instead, these changes were more likely a result of natural variability (*i.e.*, patchy distribution, life history, environmental conditions) than construction effects.

*Are there any unexpected effects on benthic macroinvertebrates that may be related to GS construction activities?*

To date, BMI monitoring during construction has not indicated any effects associated with instream construction activities.

## 6.0 SUMMARY AND CONCLUSIONS

Benthic macroinvertebrates were sampled in late August and early September of 2018 (Year 5 of construction) in one area of Split Lake and three areas of Stephens Lake to monitor for effects from construction. The three areas in Stephens Lake were located approximately 3 km (near-field area), 11 km (mid-field area), and 25 km (far-field area) downstream of Gull Rapids. Within each sampling area, BMIs were sampled from both nearshore (close to the shoreline in shallow water) and offshore (further from the shoreline in deeper water) habitat types. Five stations were sampled with a bottom dredge to collect bottom sediments and BMIs from each of these two habitat types. Sampling sites in Stephens Lake were wetted for the entire open-water season (Figure 18). Split Lake served as a reference area.

Notable differences between 2018 and baseline (2013) results at 3 km, 11 km and 25 km downstream of Gull Rapids were as follows:

- At Stephens Lake 3 km, the significant changes in nearshore % clay (decrease) and offshore % sand (increase) that were first detected in 2017 persisted in 2018, but nearshore % silt decreased slightly and was no longer significantly higher than baseline. As in 2017, three BMI metrics (richness, diversity, and fingernail clam density) in nearshore habitat were more than 50% lower than the baseline mean, however, these differences were not significant. No marked differences were noted in the offshore samples.
- The majority of differences from baseline at Stephens Lake 11 km are linked to decreases in mayfly density. Mayfly density has been low in both nearshore and offshore habitat since 2014. Mayfly density in both locations was significantly lower in 2018 than baseline. Statistically significant decreases in % EPT were also detected in both locations.
- Monitoring results from nearshore habitat at Stephens Lake 25 km have been within or above the benchmark between years except in 2016 when low water levels resulted in decreases outside the benchmark for nearly all metrics. Offshore results were relatively consistent for all metrics other than Mayfly density. Mayfly density was significantly lower in 2018 than in 2014, 2016, or 2017, while % EPT and Simpson's diversity were outside the 50% benchmarks.

Similar to 2016 and 2017, it is unlikely that the significant decreases in BMI metrics observed in Stephens Lake in 2018 resulted from construction activities, as TSS increases due to construction were not observed, and changes to the BMI community were not detected at the site closest to construction (3 km downstream).

Overall, the lack of consistent changes in the BMI community in Stephens Lake, together with the variability observed in samples collected from Split Lake, make it unlikely that differences from the baseline at 3 km, 11 km, and 25 km downstream of Gull Rapids are the result of

construction effects. Instead, patchy BMI distribution (both spatially and temporally), as the result of each species' unique growth and movement patterns as well as the timing of their proliferation (which can vary from year to year), likely caused the observed inter-annual differences in BMI metrics.

The key questions related to BMI monitoring during construction are addressed below:

- *To what degree will benthic invertebrate abundance and/or community composition change during construction activities in comparison to either upstream or pre-project conditions?*

Monitoring in 2018 did not identify changes to the BMI community that were linked with construction.

- *Are there any unexpected effects on benthic macroinvertebrates that may be related to GS construction activities?*

BMI monitoring during construction has not detected any unexpected effects that may be related to instream construction.

Based on the analyses completed to date, no change to monitoring activity is anticipated. BMI monitoring will be conducted in late August of 2019 (Year 6 of construction) as set out in the AEMP.

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## **TABLES**

**Table 1: Coordinates and supporting habitat variables measured at benthic macroinvertebrate monitoring sites sampled in 2013 (pre-construction)<sup>a,b</sup>, 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), 2017 (Year 4 construction) and 2018 (Year 5 construction).**

Site ID	Habitat Type	Study Year	Sample Date	UTM (NAD 83)			Water Temperature (°C)	Mean Water Velocity (m/sec)	Mean Water Depth (m)	Mean Secchi Depth (m)	Substrate Description
				Zone	Easting	Northing					
SPLIT-PW	NRSH-PW	2014	23-Aug-14	14	673602	6232992	17	0.00	2.6	0.30	clay
		2015	23-Aug-15	14	673607	6232997	16	-	1.1	0.60	clay/OM
		2017	24-Aug-17	14	673612	6233004	18	0.00	1.9	0.67	clay/sand/OM
		2018	24-Aug-18	14	673658	6233005	15	0.15	1.3	0.41	clay/OM
SPLIT-OS	OFFSH	2013	22-Aug-13	14	678461	6233976	17	0.00	7.4	0.46	clay
		2014	23-Aug-14	14	678466	6233977	18	0.00	7.8	0.52	clay
		2015	23-Aug-15	14	678468	6233975	16	-	5.9	0.60	clay
		2016	27-Aug-16	14	678463	6233981	18	0.07	7.0	0.50	clay/silt
		2017	24-Aug-17	14	678460	6233995	18	0.23	7.3	0.69	clay/shells
		2018	24-Aug-18	14	678462	6233995	14.5	0.15	6.5	0.43	clay/shells
STL3KM-PW	NRSH-PW	2013	25-Sep-13	15	365672	6248917	14	0.00	2.8	0.33	clay
		2014	16-Sep-14	15	365666	6248912	10	0.00	2.8	0.30	silt/OM
		2015	20-Aug-15	15	365666	6248914	16	-	2.3	-	clay/OM/gravel
		2016	10-Sep-16	15	365664	6248906	15	0.05	2.5	0.40	silt/clay/OM
		2017	23-Sep-17	15	365672	6248915	12	0.07	2.2	0.48	silt/clay/sand
		2018	30-Aug-18	15	365675	6248915	15	0.02	2.6	0.38	clay/silt/sand/OM
STL3KM-OS	OFFSH	2013	25-Sep-13	15	366128	6248908	14	0.02	6.1	0.30	clay
		2014	16-Sep-14	15	366127	6248901	10	0.00	6.0	0.30	silt/clay
		2015	20-Aug-15	15	366125	6248901	16	-	5.3	-	clay
		2016	10-Sep-16	15	366122	6248910	15	0.08	5.6	0.40	silt/clay
		2017	23-Sep-17	15	366137	6248901	12	0.07	5.3	0.48	silt/clay/OM
		2018	30-Aug-18, 03-Sep-18	15	366130	6248912	15	0.03	5.7	0.48	clay/silt/OM
STL11KM-PW	NRSH-PW	2013	26-Sep-13	15	376454	6248753	11	0.00	2.4	0.58	clay
		2014	16-Sep-14	15	376451	6248753	10	0.00	2.2	0.30	silt/clay/OM
		2015	21-Aug-15	15	376445	6248747	16	-	2.1	-	clay
		2016	10-Sep-16	15	376455	6248750	15	0.05	1.7	0.43	sand/OM/silt
		2017	22-Sep-17	15	376450	6248761	12	0.05	2.1	0.48	clay/silt
		2018	30-Aug-18	15	376451	6248761	15	0.01	2.0	0.48	clay/silt/OM
STL11KM-OS	OFFSH	2013	26-Sep-13	15	376340	6248573	11	0.00	6.9	0.70	clay
		2014	16-Sep-14	15	376354	6248567	10	0.00	6.8	0.30	clay
		2015	20-Aug-15	15	376351	6248567	16	-	6.3	-	clay
		2016	10-Sep-16	15	376360	6248559	15	0.03	6.7	0.41	silt
		2017	22-Sep-17	15	385544	6248051	12	0.04	6.5	0.48	OM/sand/clay
		2018	30-Aug-18	15	376341	6248569	15	0.02	6.6	0.48	clay/silt/OM
STL25KM-PW	NRSH-PW	2014	17-Sep-14	15	386545	6247951	10	0.00	2.5	0.35	silt/clay
		2015	08-Sep-15	15	386545	6247952	15.5	-	1.6	0.50	sand/clay/OM
		2016	10-Sep-16	15	386569	6247952	15	0.07	2.1	0.40	gravel/sand/silt/OM
		2017	22-Sep-17	15	386559	6247962	12	0.18	2.1	0.48	sand/silt/clay/OM
		2018	29-Aug-18	15	386556	6247965	15	0.02	2.2	0.48	sand/OM/clay

**Table 1: Coordinates and supporting habitat variables measured at benthic macroinvertebrate monitoring sites sampled in 2013 (pre-construction)<sup>a,b</sup>, 2014 (Year 1 construction), 2015 (Year 2 construction), 2016 (Year 3 construction), 2017 (Year 4 construction) and 2018 (Year 5 construction).**

Site ID	Habitat Type	Study Year	Sample Date	UTM (NAD 83)			Water Temperature (°C)	Mean Water Velocity (m/sec)	Mean Water Depth (m)	Mean Secchi Depth (m)	Substrate Description
				Zone	Easting	Northing					
STL25KM-OS	OFFSH	2014	17-Sep-14	15	385548	6248048	10	0.00	9.1	0.35	clay
		2015	21-Aug-15	15	385549	6248050	16	-	8.9	-	clay
		2016	10-Sep-16	15	385559	6248050	15	0.06	9.1	0.42	silt/OM
		2017	22-Sep-17	15	385544	6248051	12	0.10	9.1	0.48	clay/silt/OM
		2018	29-Aug-18	15	385539	6248061	14	0.03	8.9	0.48	clay/silt/OM

a. Stephens Lake sites 25 km downstream added after 2013 to address concerns with unanticipated downstream effects.

b. Split Lake predominantly wetted was first added to CAMP sampling in 2014, and could not be sampled in 2016 for logistical reasons.

OS = offshore.

PW = predominantly wetted (nearshore).

OM = organic matter.

**Table 2: Comparison of Year 5 construction (2018) BMI monitoring results at 3 km downstream in Stephens Lake against baseline (2013) and Years 1–4 of construction monitoring (2014–2017) results for metrics expected to be negatively affected by increases in TSS.**

Key Metrics	Magnitude of Change Benchmark	Nearshore 2018					Offshore 2018				
		2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Total Invertebrate Density	± 50%	√	√	√	√	√	√	√	↑	↑	√
Total Taxonomic Richness (25%)	± 25%	↓	↓	√	↓	√	√	↑	↑	↑	↑
Simpson's Diversity Index (25%)	± 25%	↓	√	↑	√	√	√	√	↑	√	√
Ephemeroptera Density	± 50%	↑	√	↑	↑	√	↑	↑	↑	↑	√
% EPT	± 50%	↑	↑	↑	↑	√	↑	↑	↑	↑	↑
Pisidiidae Density	± 50%	↓	√	√	↓	↑	↑	↑	↑	↑	↑

√ = 2018 mean was within the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016, or 2017 mean.

↑ = 2018 mean increased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference not statistically significant).

↓ = 2018 mean decreased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference not statistically significant).

↑ = 2018 mean increased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference statistically significant).

↓ = 2018 mean decreased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference statistically significant).

**Table 3: Comparison of Year 5 construction (2018) BMI monitoring results at 11 km downstream in Stephens Lake against baseline (2013) and Years 1–4 of construction monitoring (2014–2017) results for metrics expected to be negatively affected by increases in TSS.**

Key Metrics	Magnitude of Change Benchmark	Nearshore 2018					Offshore 2018				
		2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Total Invertebrate Density	± 50%	√	√	√	√	√	√	√	√	↑	√
Total Taxonomic Richness	± 25%	√	↑	↑	√	√	↑	√	↑	√	√
Simpson's Diversity Index	± 25%	↑	√	√	√	√	↑	↑	√	√	√
Ephemeroptera Density	± 50%	↓	↓	↓	√	↓	↓	↓	↓	↓	√
% EPT	± 50%	↓	↓	↓	√	√	↓	↓	↓	↓	√
Pisidiidae Density	± 50%	↑	↑	↑	↑	↑	√	√	√	√	√

√ = 2018 mean was within the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016, or 2017 mean.

↑ = 2018 mean increased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference not statistically significant).

↓ = 2018 mean decreased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference not statistically significant).

↑ = 2018 mean increased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference statistically significant).

↓ = 2018 mean decreased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference statistically significant).

**Table 4: Comparison of Year 5 construction (2018) BMI monitoring results at 25 km downstream in Stephens Lake against baseline (2013) and Years 1–4 of construction monitoring (2014–2017) results for metrics expected to be negatively affected by increases in TSS.**

Key Metrics	Magnitude of Change Benchmark	Nearshore 2018				Offshore 2018			
		2014	2015	2016	2017	2014	2015	2016	2017
Total Invertebrate Density	± 50%	√	↓	↑	↑	√	√	√	√
Total Taxonomic Richness	± 25%	√	√	↑	√	√	↑	√	√
Simpson's Diversity Index	± 25%	√	√	√	√	↓	√	↓	↓
Ephemeroptera Density	± 50%	√	↓	↑	√	↓	√	↓	↓
% EPT	± 50%	√	√	↑	√	↓	√	↓	↓
Pisidiidae Density	± 50%	√	√	↑	√	↓	√	√	√

√ = 2018 mean was within the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016, or 2017 mean.

↑ = 2018 mean increased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference not statistically significant).

↓ = 2018 mean decreased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference not statistically significant).

↑ = 2018 mean increased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference statistically significant).

↓ = 2018 mean decreased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference statistically significant).



**Table 5: Comparison of Year 5 construction (2018) BMI monitoring results in Split Lake against baseline (2013) and Years 1–4 of construction monitoring (2014–2017) results for metrics expected to be negatively affected by increases in TSS.**

Key Metrics	Magnitude of Change Benchmark	Nearshore 2018			Offshore 2018				
		2014	2015	2017	2013	2014	2015	2016	2017
Total Invertebrate Density	± 50%	√	↓	√	↓	↓	√	√	√
Total Taxonomic Richness	± 25%	√	↓	↓	↓	↓	↓	√	√
Simpson's Diversity Index	± 25%	√	√	↓	↓	↓	↓	↓	√
Ephemeroptera Density	± 50%	↑	√	↑	↓	√	↑	√	√
% EPT	± 50%	↑	↑	↑	√	↑	↑	√	√
Pisidiidae Density	± 50%	↑	↓	↓	↓	↓	↓	↓	↓

√ = 2018 mean was within the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016, or 2017 mean.

↑ = 2018 mean increased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference not statistically significant).

↓ = 2018 mean decreased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference not statistically significant).

↑ = 2018 mean increased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference statistically significant).

↓ = 2018 mean decreased by more than the magnitude of change benchmark relative to the 2013, 2014, 2015, 2016 or 2017 mean (difference statistically significant).

**Table 6: Summary of benchmark exceedances (compared to 2013 baseline) for metrics expected to be negatively affected by increases in TSS at 3 km downstream in Stephens Lake.**

Key Metric	Nearshore <sup>1</sup>			Offshore <sup>1</sup>		
	+MCB	-MCB	sig.	+MCB	-MCB	sig.
Total Invertebrate Density						
2014	N	N	-	N	N	-
2015	N	N	-	-	Y	N
2016	N	N	-	N	N	-
2017	N	N	-	N	N	-
2018	N	N	-	N	N	-
Total Taxonomic Richness						
2014	N	N	-	-	Y	N
2015	-	Y	N	-	Y	Y
2016	N	N	-	-	Y	N
2017	-	Y	N	N	N	-
2018	-	Y	N	N	N	-
Simpson's Diversity Index						
2014	N	N	-	N	N	-
2015	-	Y	N	-	Y	N
2016	N	N	-	N	N	-
2017	-	Y	N	Y	-	N
2018	-	Y	N	N	N	-
Ephemeroptera Density						
2014	Y	-	N	N	N	-
2015	-	Y	N	-	Y	N
2016	Y	-	N	N	N	-
2017	Y	-	N	Y	-	N
2018	Y	-	N	Y	-	N
Percent EPT						
2014	Y	-	N	N	N	-
2015	-	Y	N	Y	-	N
2016	N	N	-	N	N	-
2017	Y	-	N	Y	-	N
2018	Y	-	N	Y	-	N
Pisidiidae Density						
2014	-	Y	N	Y	-	N
2015	-	Y	N	-	Y	N
2016	N	N	-	Y	-	N
2017	-	Y	N	Y	-	N
2018	-	Y	N	Y	-	Y

1 - MCB = magnitude of change benchmark; 25% for Total Taxonomic Richness and Simpson's Diversity Index, 50% for EPT and all density metrics.

Y = yes, the benchmark was exceeded (or the exceedance was statistically significant).

N = no, the benchmark was not exceeded (or the exceedance was not statistically significant).

**Table 7: Summary of benchmark exceedances (compared to 2013 baseline) for metrics expected to be negatively affected by increases in TSS at 11 km downstream in Stephens Lake.**

Key Metric	Nearshore <sup>1</sup>			Offshore <sup>1</sup>		
	+MCB	-MCB	sig.	+MCB	-MCB	sig.
Total Invertebrate Density						
2014	N	N	-	N	N	-
2015	-	Y	N	N	N	-
2016	-	Y	Y	N	N	-
2017	-	Y	N	N	N	-
2018	N	N	-	N	N	-
Total Taxonomic Richness						
2014	N	N	-	N	N	-
2015	N	N	-	N	N	-
2016	N	N	-	Y	-	N
2017	N	N	-	Y	-	N
2018	N	N	-	Y	-	N
Simpson's Diversity Index						
2014	N	N	-	Y	-	N
2015	N	N	-	Y	-	Y
2016	Y	-	Y	Y	-	Y
2017	Y	-	Y	Y	-	Y <sup>2</sup>
2018	Y	-	Y	Y	-	Y
Ephemeroptera Density						
2014	-	Y	N	N	N	-
2015	-	Y	N	-	Y	N
2016	-	Y	Y	-	Y	N
2017	-	Y	N	-	Y	N
2018	-	Y	Y	-	Y	Y
Percent EPT						
2014	N	N	-	N	N	-
2015	N	N	-	N	N	-
2016	-	Y	Y	N	N	-
2017	-	Y	Y	-	Y	Y
2018	-	Y	Y	-	Y	Y
Pisidiidae Density						
2014	N	N	-	N	N	-
2015	N	N	-	N	N	-
2016	N	N	-	N	N	-
2017	Y	-	N	N	N	-
2018	Y	-	N	N	N	-

1 - MCB = magnitude of change benchmark; 25% for Total Taxonomic Richness and Simpson's Diversity Index, 50% for EPT and all density metrics.

2 – Due to inclusion of 2018 data, results of statistical comparison are different from previous years.

Y = yes, the benchmark was exceeded (or the exceedance was statistically significant).

N = no, the benchmark was not exceeded (or the exceedance was not statistically significant).

**Table 8: Summary of offshore benchmark exceedances in the reference waterbody Split Lake (compared to 2013 baseline).**

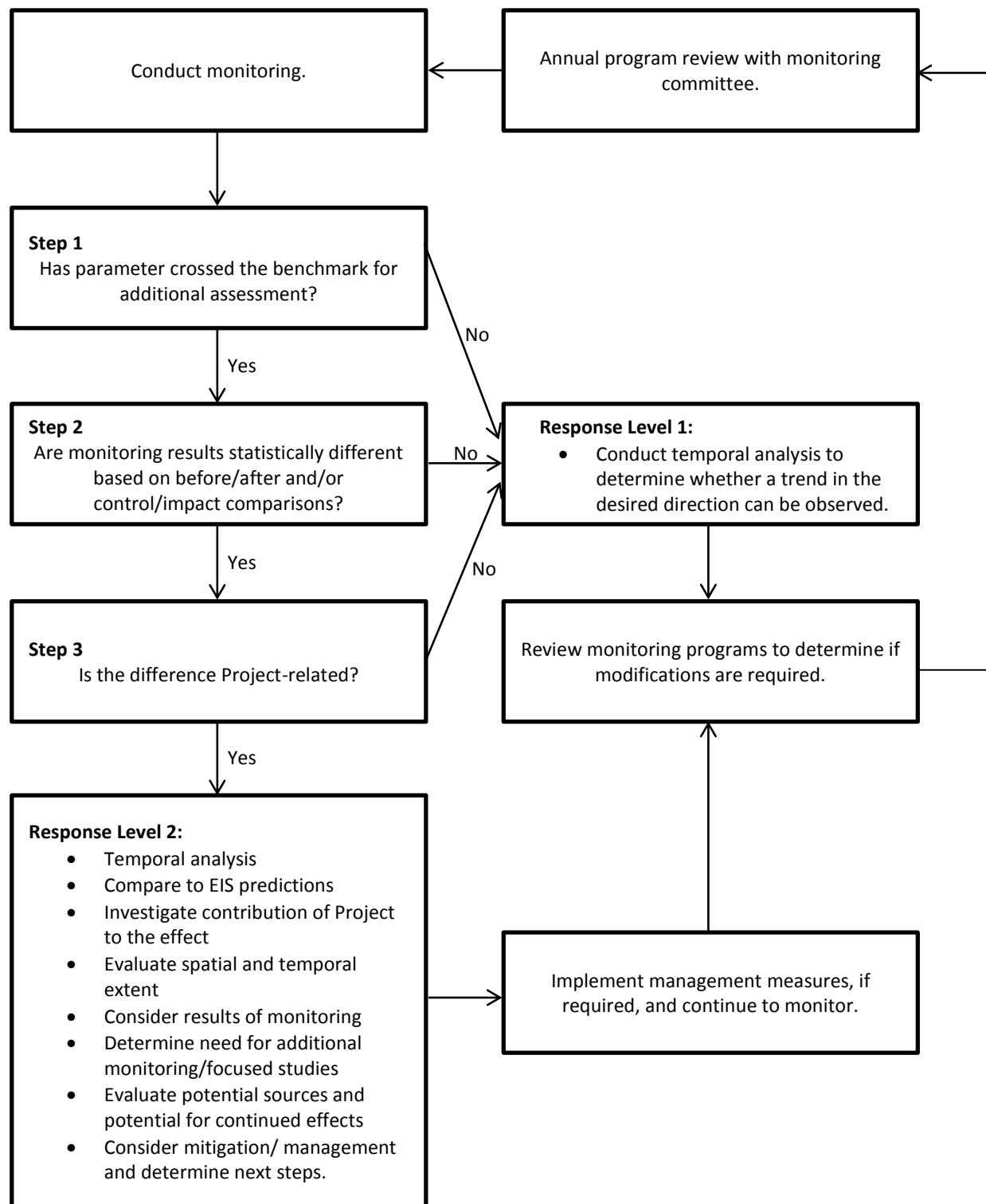
Metric	Offshore <sup>1</sup>		
	+MCB	-MCB	sig.
Total Invertebrate Density			
2014	N	N	-
2015	-	Y	N
2016	-	Y	Y
2017	-	Y	Y
2018	-	Y	N
Total Taxonomic Richness			
2014	N	N	-
2015	N	N	-
2016	N	N	-
2017	N	N	-
2018	-	Y	N
Simpson's Diversity Index			
2014	N	N	-
2015	N	N	-
2016	N	N	-
2017	N	N	-
2018	-	Y	N
Ephemeroptera Density			
2014	N	N	-
2015	-	Y	Y
2016	-	Y	N
2017	-	Y	N
2018	-	Y	N
Percent EPT			
2014	-	Y	N
2015	-	Y	N
2016	N	N	-
2017	N	N	-
2018	N	N	-
Pisidiidae Density			
2014	N	N	-
2015	-	Y	N
2016	-	Y	N
2017	-	Y	Y
2018	-	Y	Y

1 - MCB = magnitude of change benchmark; 25% for Total Taxonomic Richness and Simpson's Diversity Index, 50% for EPT and all density metrics.

Y = yes, the benchmark was exceeded (or the exceedance was statistically significant).

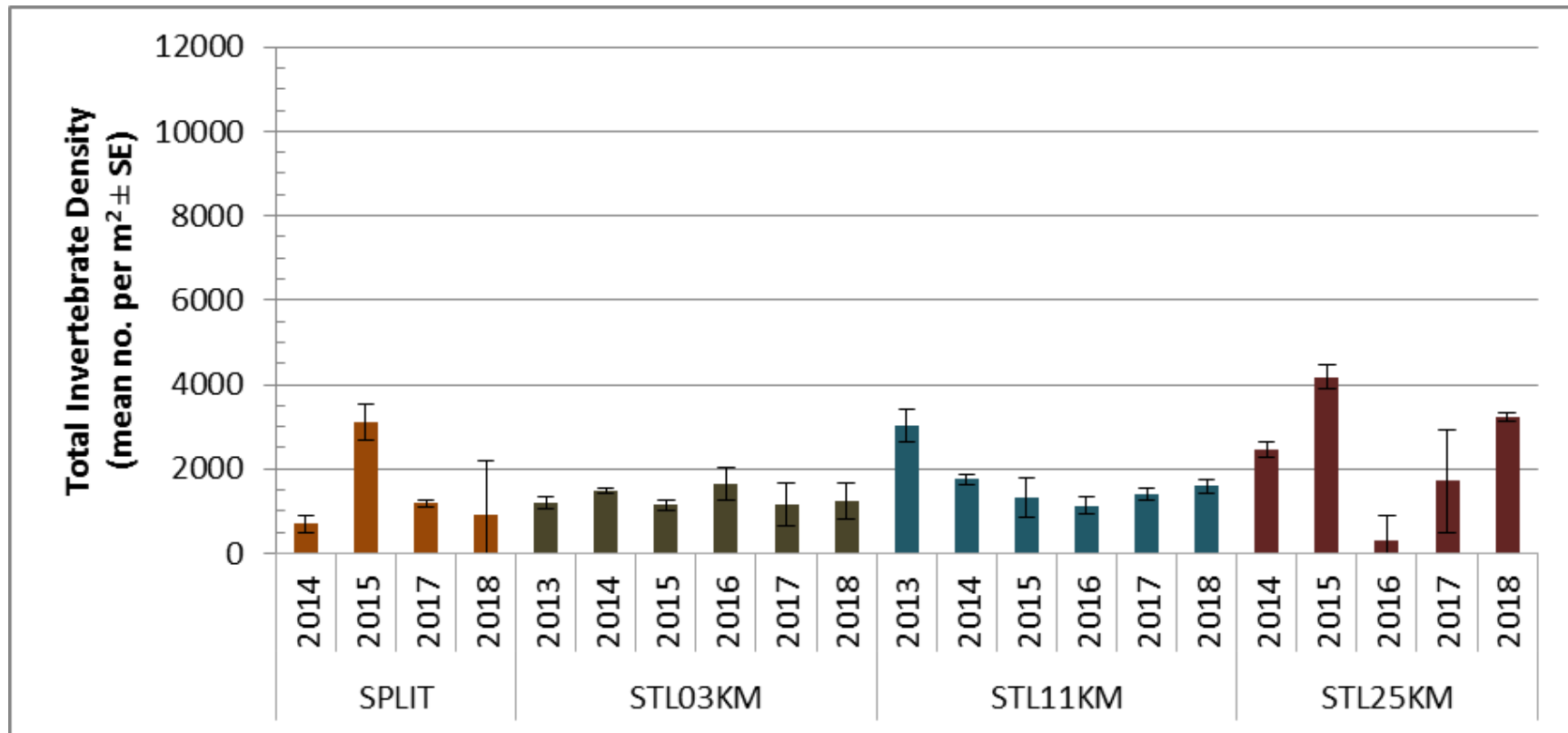
N = no, the benchmark was not exceeded (or the exceedance was not statistically significant).

## FIGURES

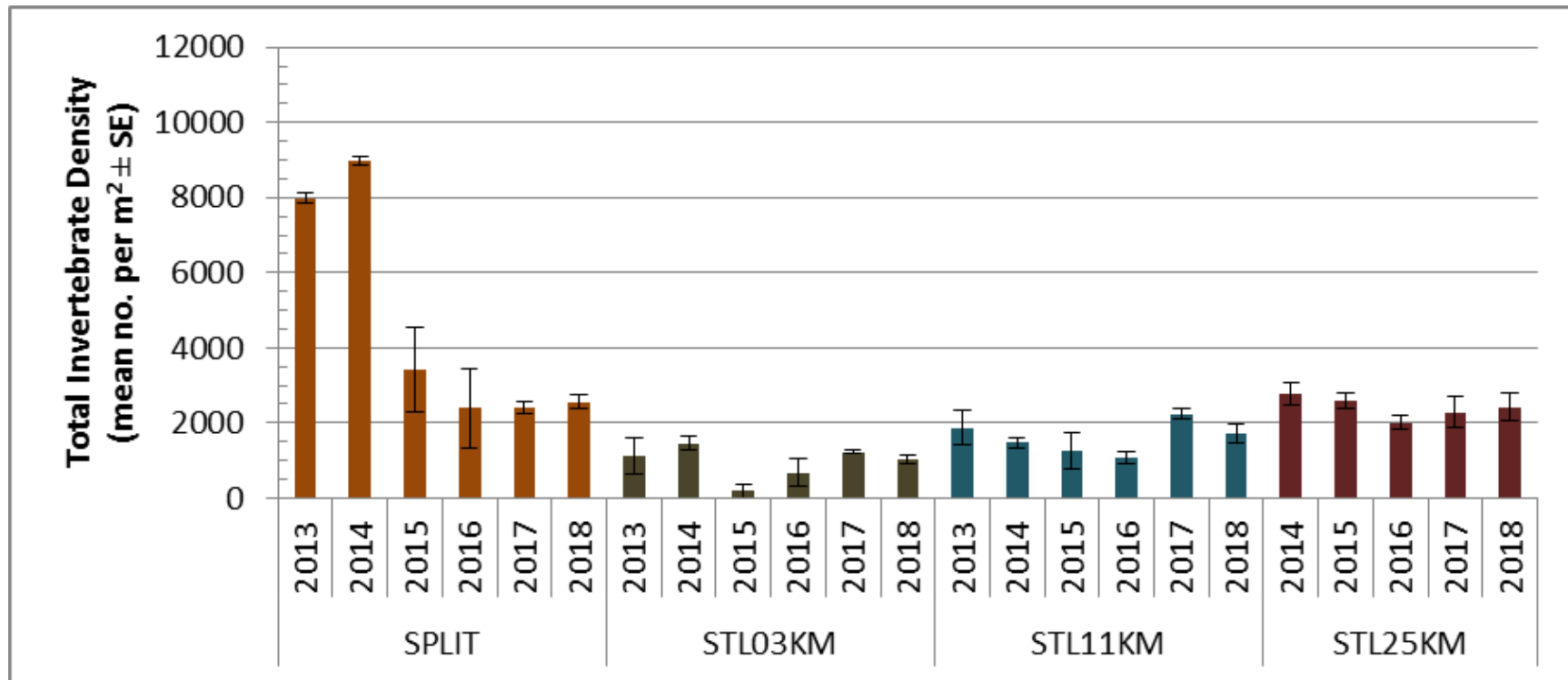


**Figure 1: Benthic macroinvertebrate response framework.**

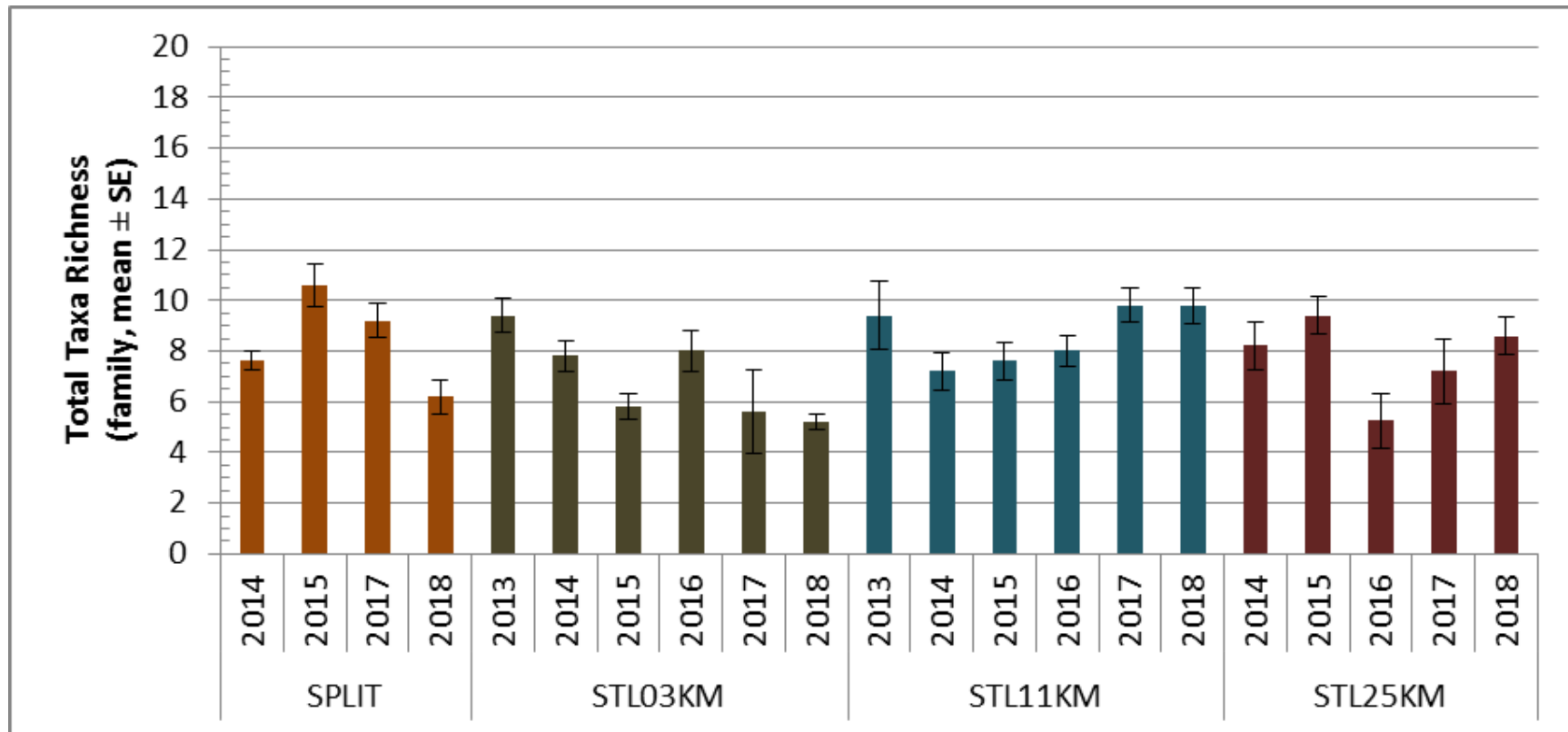




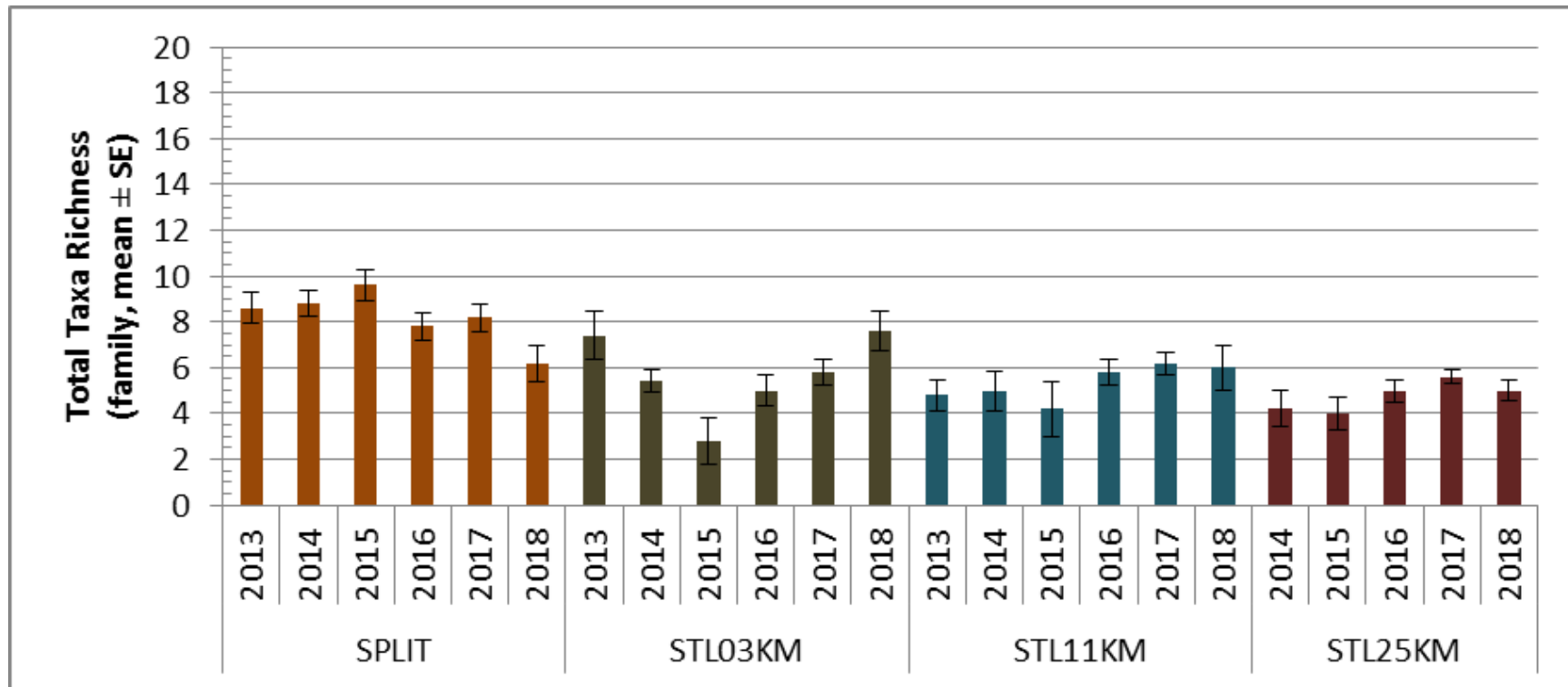
**Figure 2: Total macroinvertebrate density (mean no. per m<sup>2</sup> ± SE) in nearshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).**



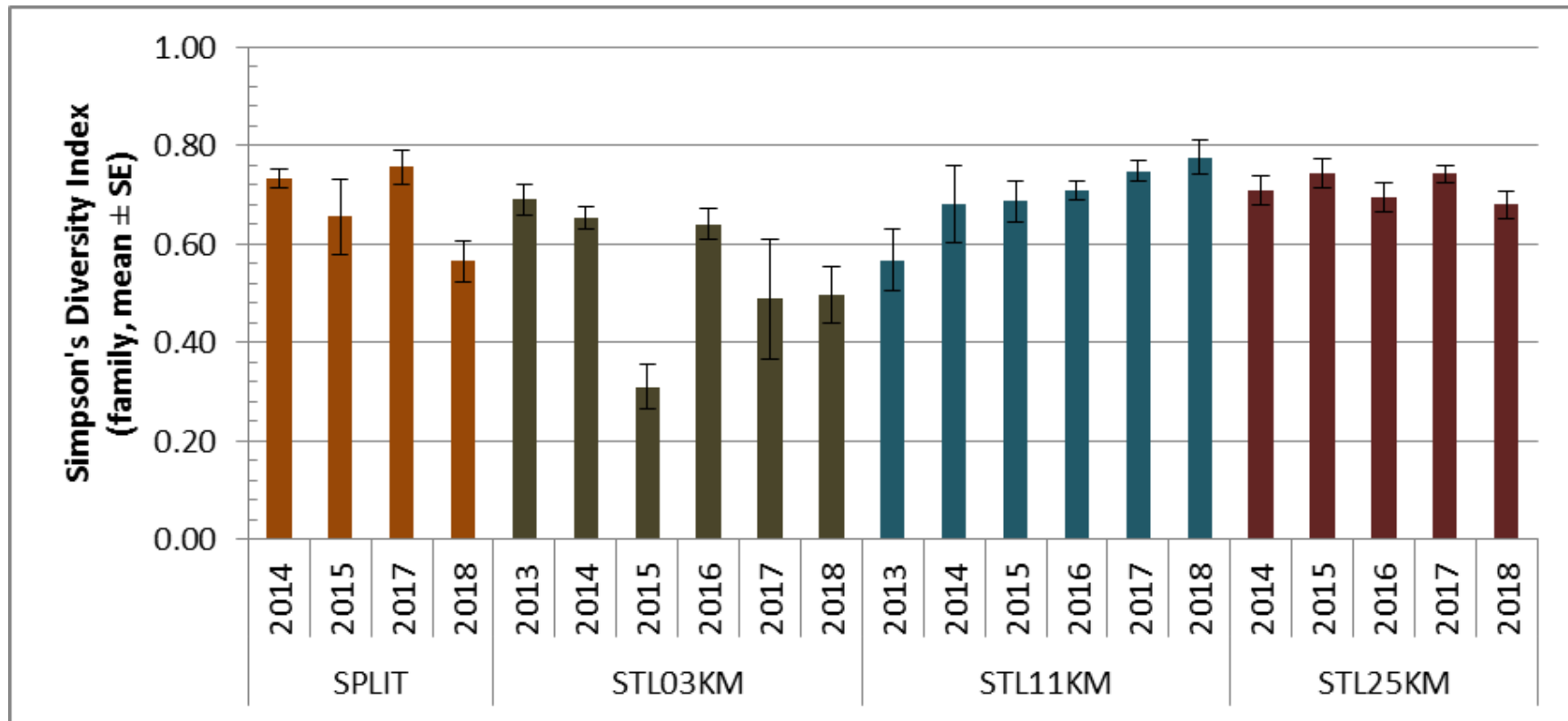
**Figure 3: Total macroinvertebrate density (mean no. per m<sup>2</sup> ± SE) in offshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).**



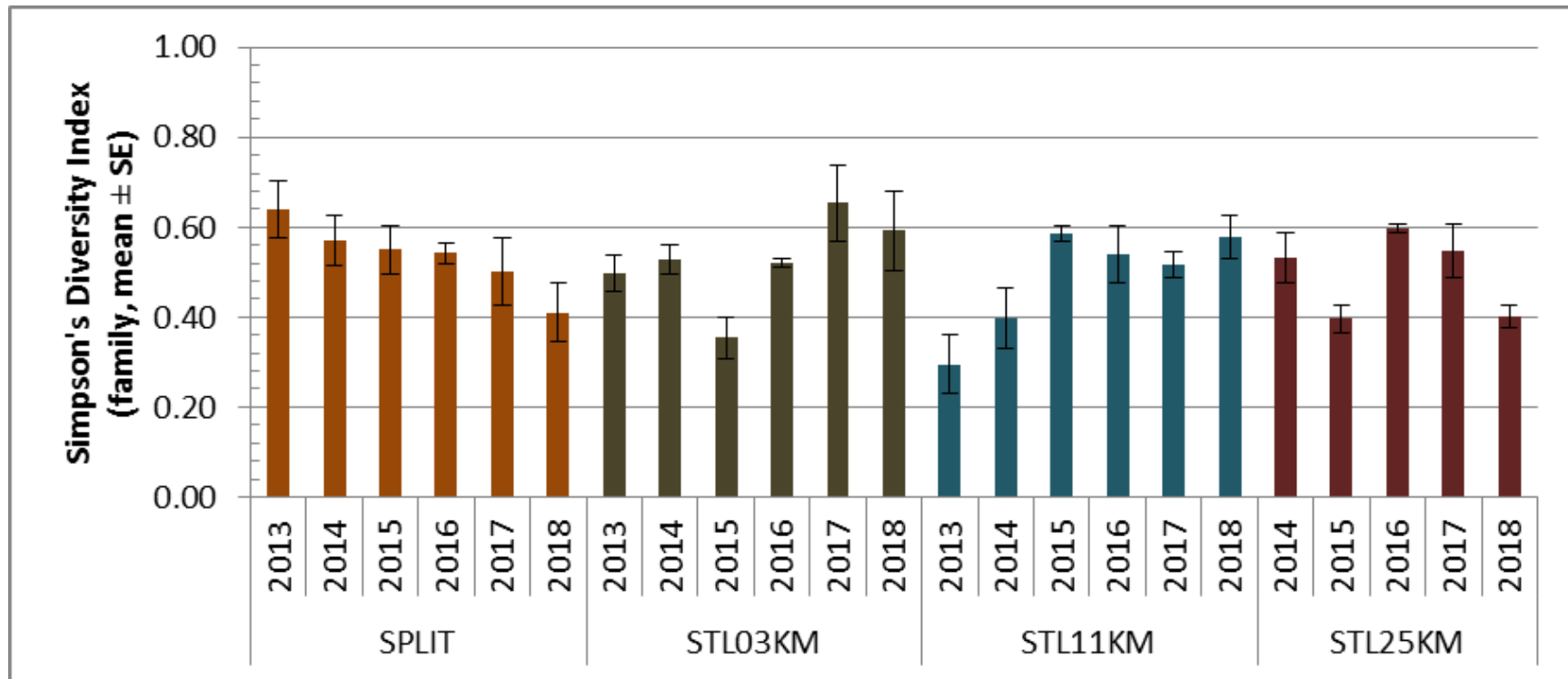
**Figure 4:** Total richness (Family-level, mean  $\pm$  SE) in nearshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).



**Figure 5:** Total richness (Family-level, mean  $\pm$  SE) in offshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).

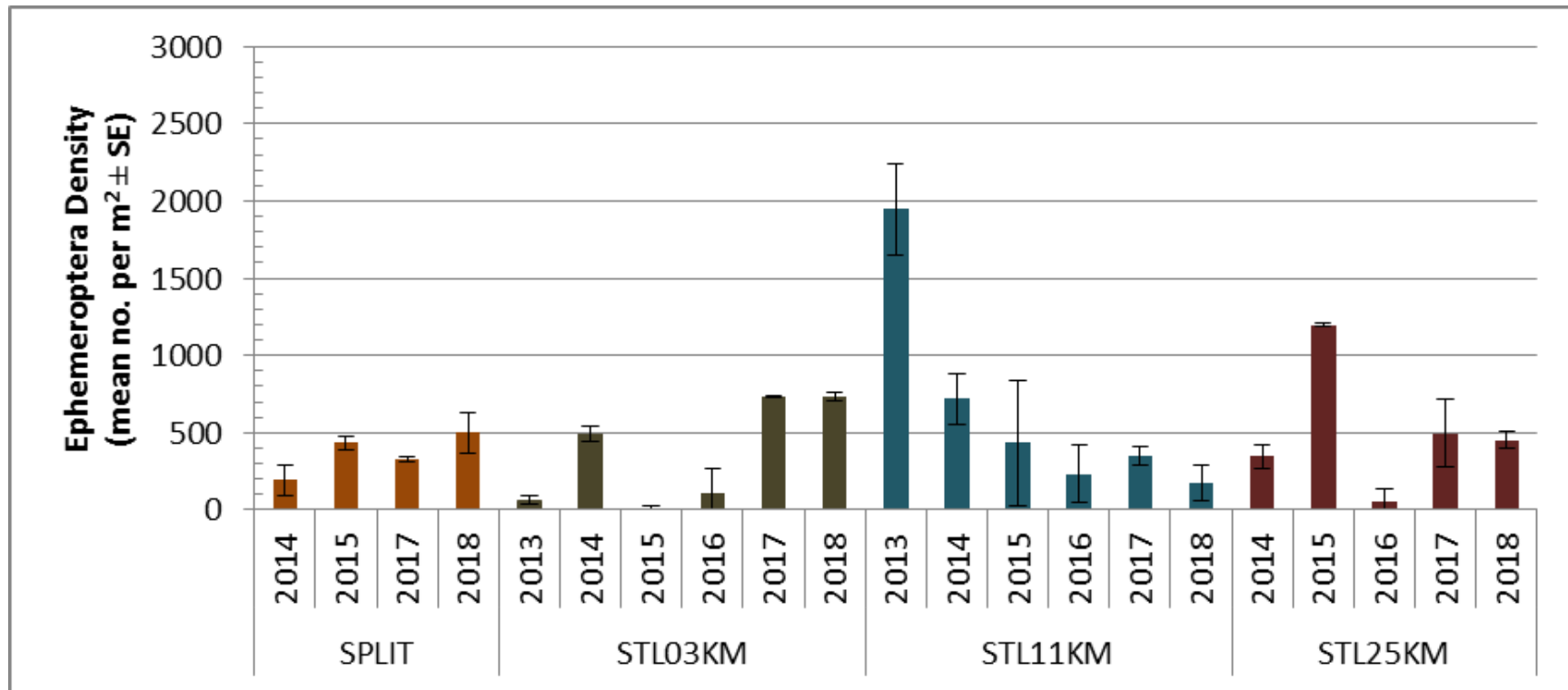


**Figure 6:** Simpson's diversity index (mean  $\pm$  SE) in nearshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).

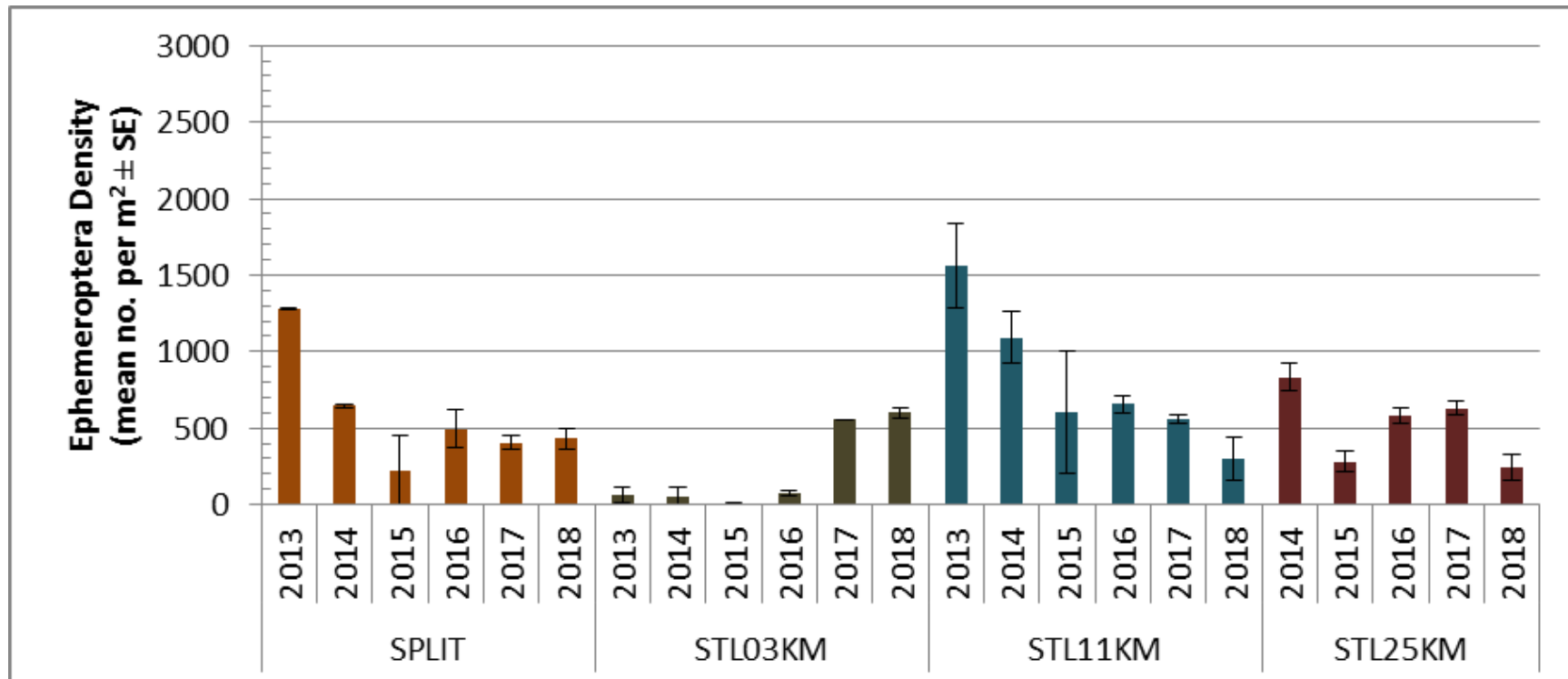


**Figure 7:** Simpson's diversity index (mean  $\pm$  SE) in offshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).

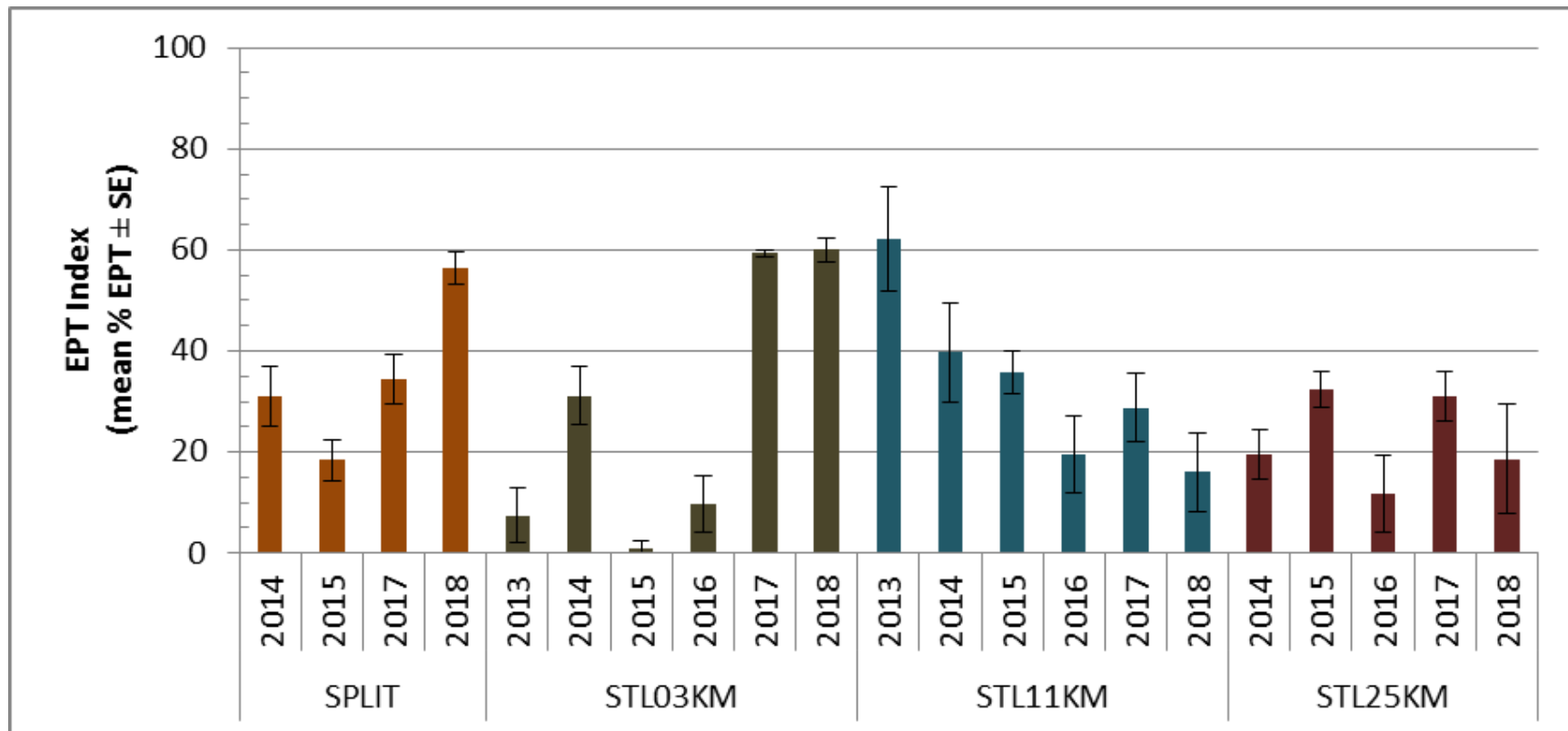




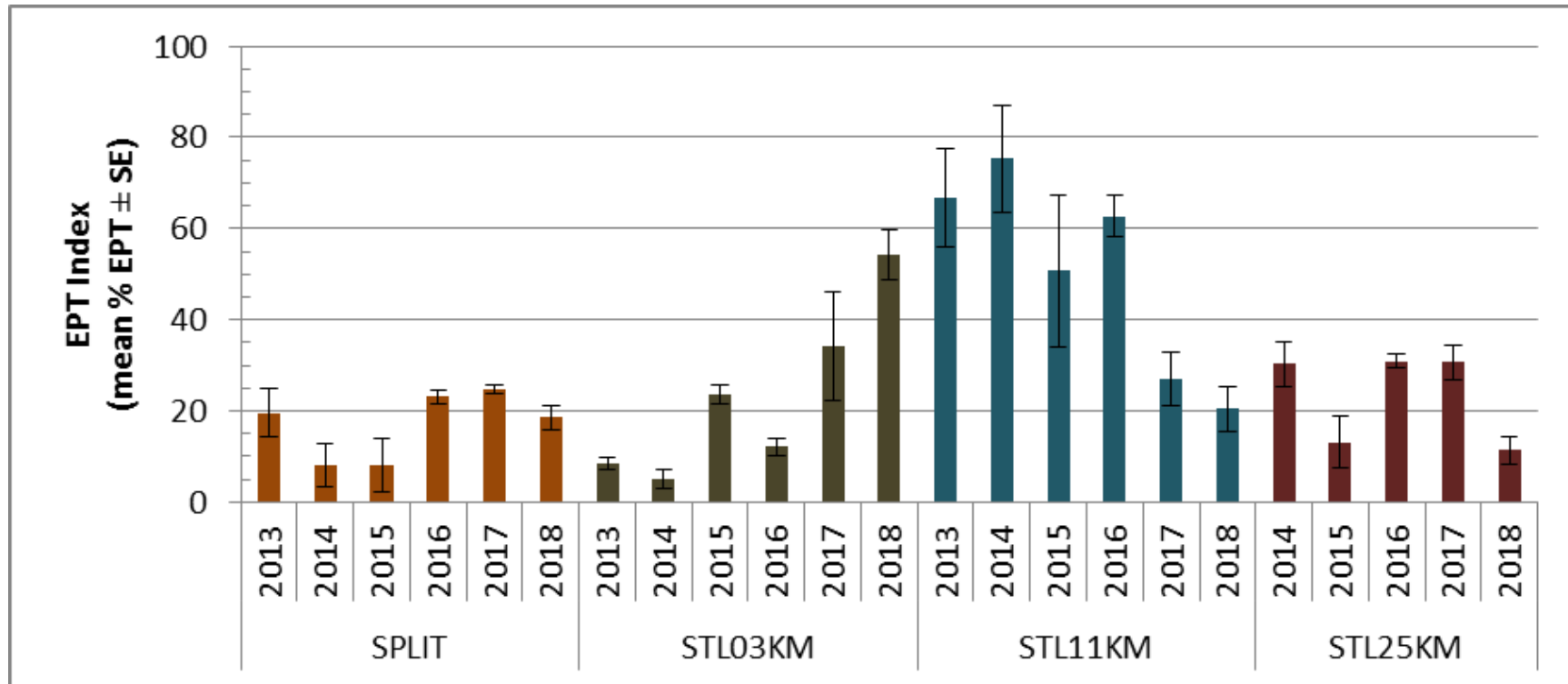
**Figure 8:** Ephemeroptera density (mean no. per m<sup>2</sup> ± SE) in nearshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).



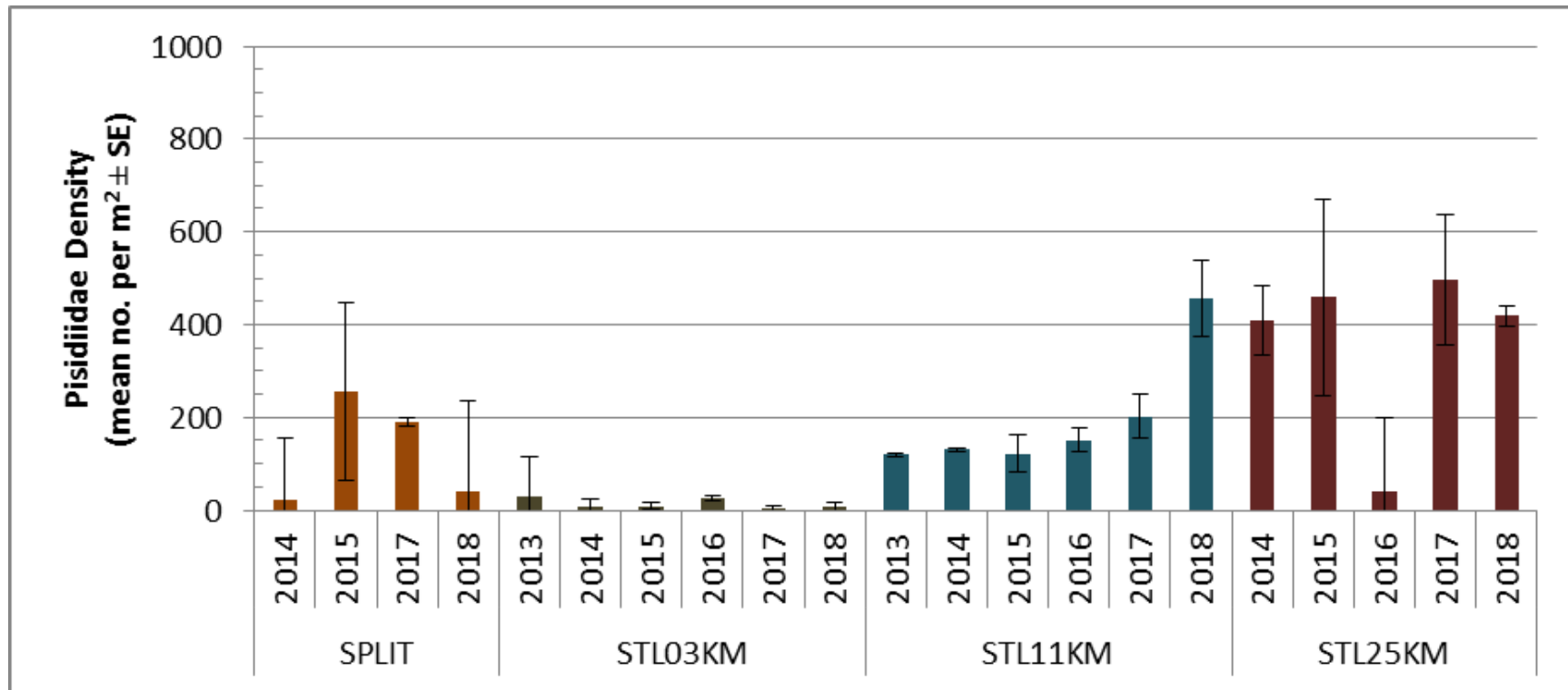
**Figure 9:** Ephemeroptera density (mean no. per m<sup>2</sup> ± SE) in offshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).



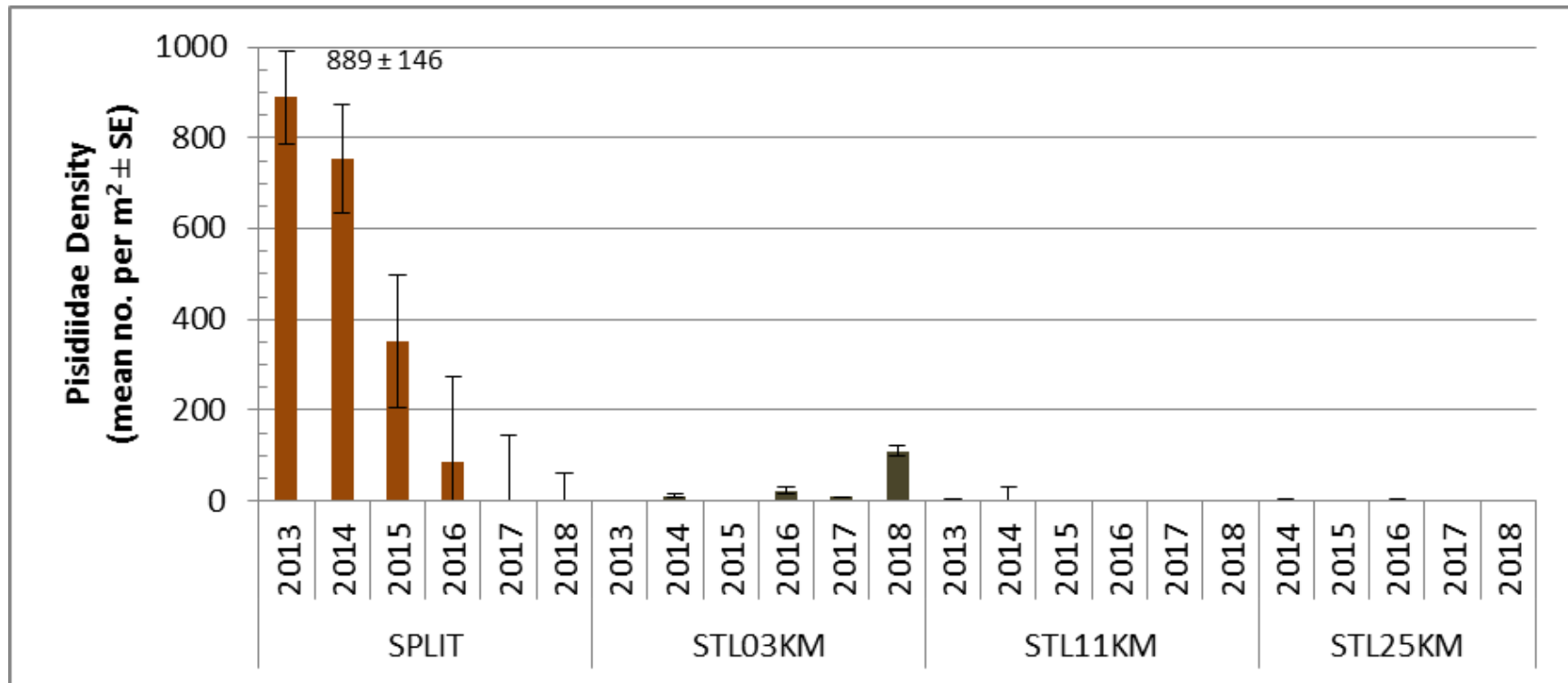
**Figure 10: Percent EPT (mean ± SE) in nearshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).**



**Figure 11: Percent EPT (mean ± SE) in offshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).**

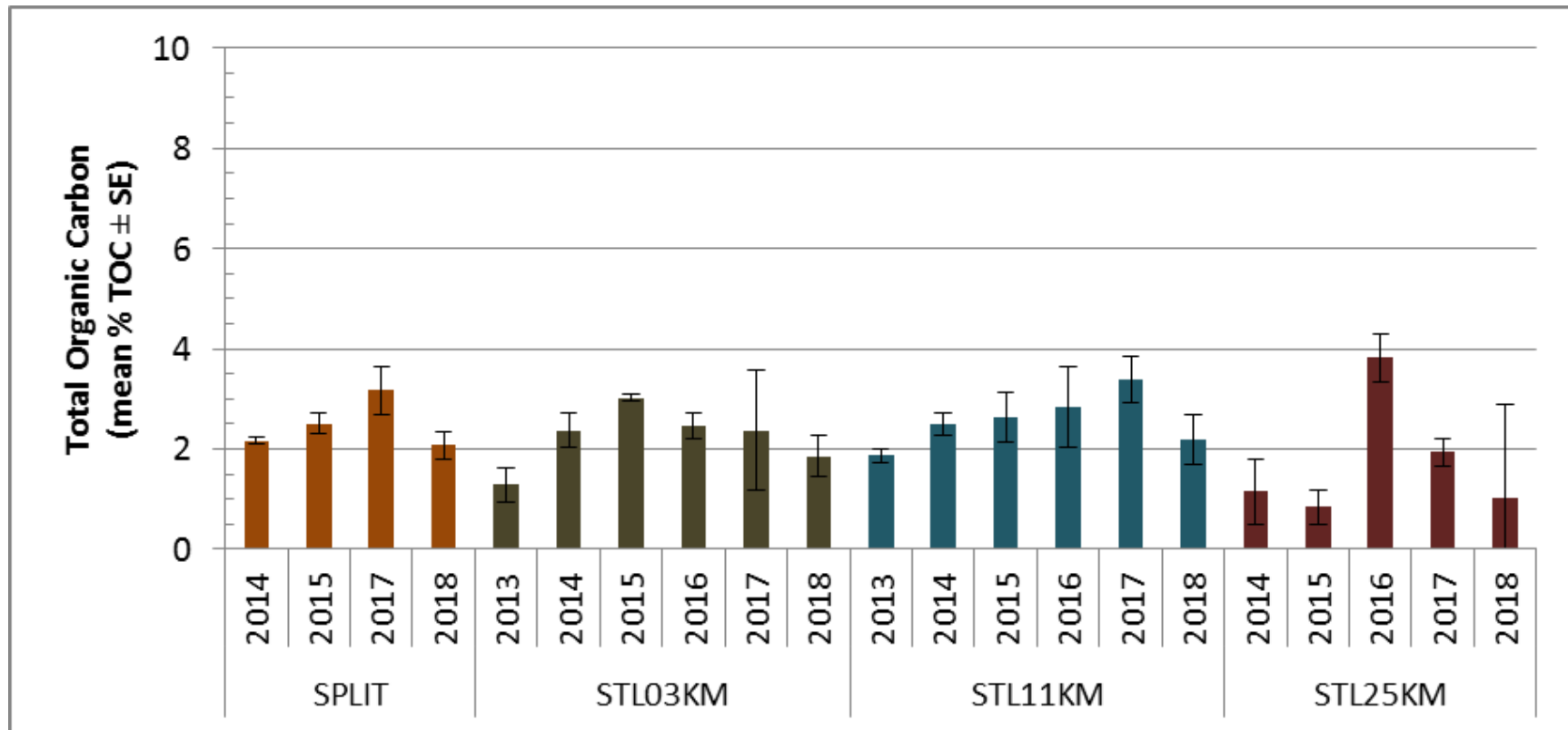


**Figure 12:** Pisidiidae density (mean no. per m<sup>2</sup> ± SE) in nearshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).

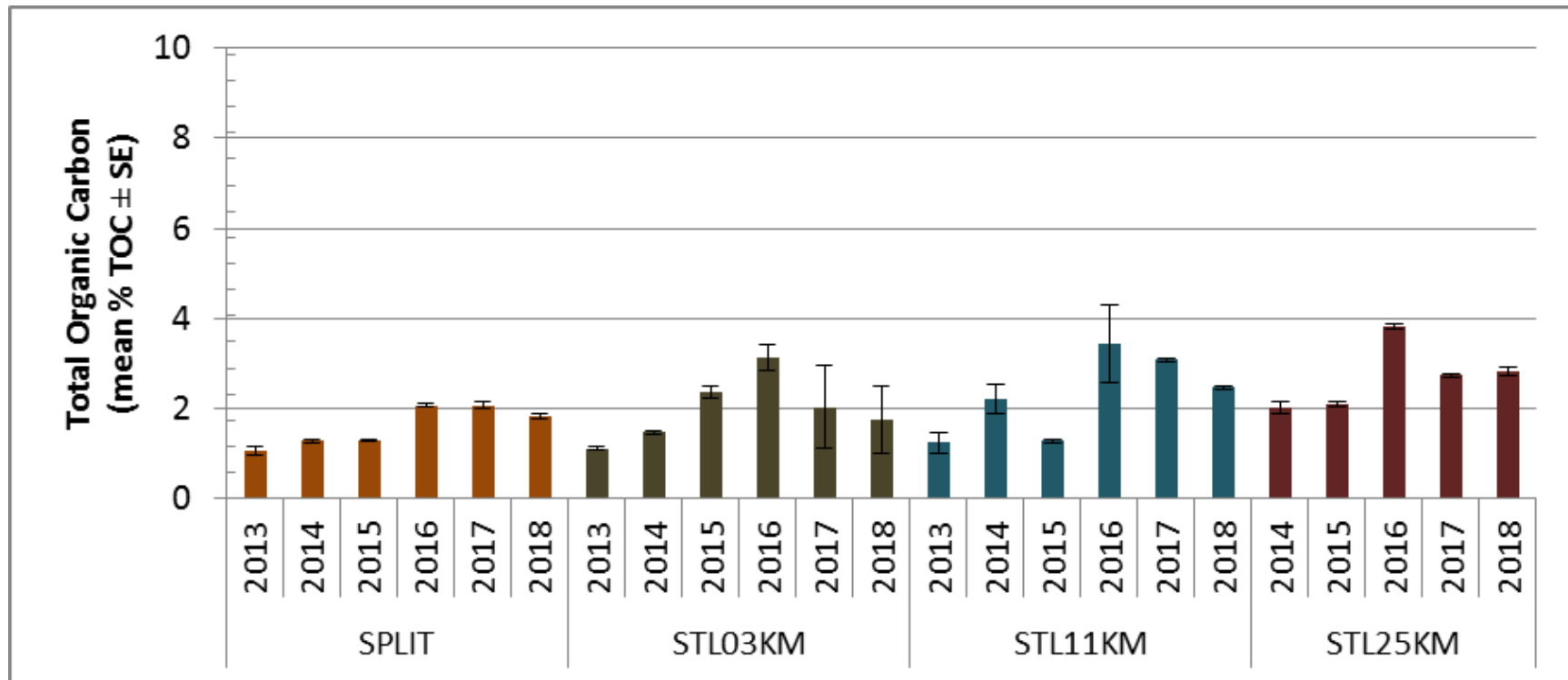


**Figure 13: Pisiidiidae density (mean no. per m<sup>2</sup> ± SE) in offshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).**

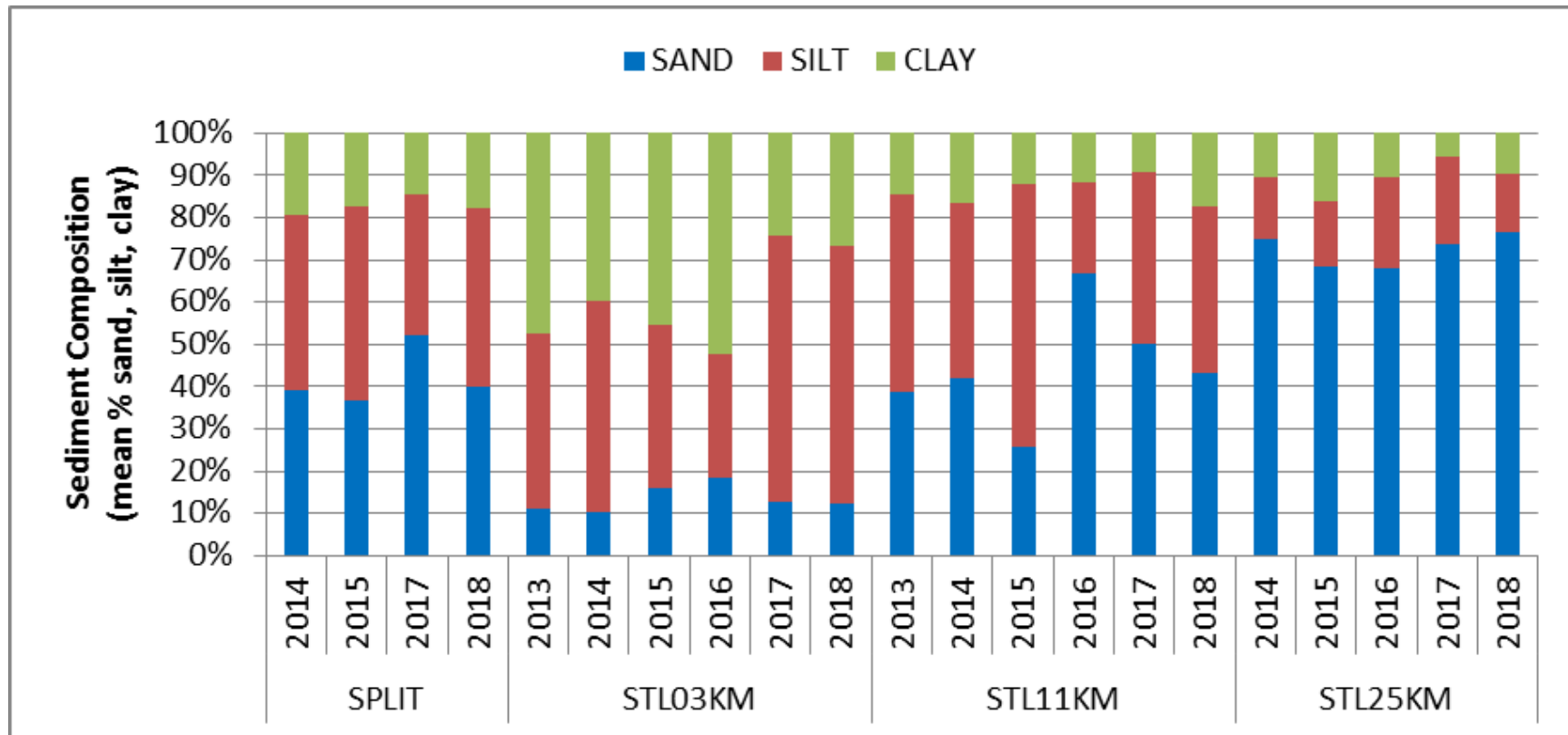




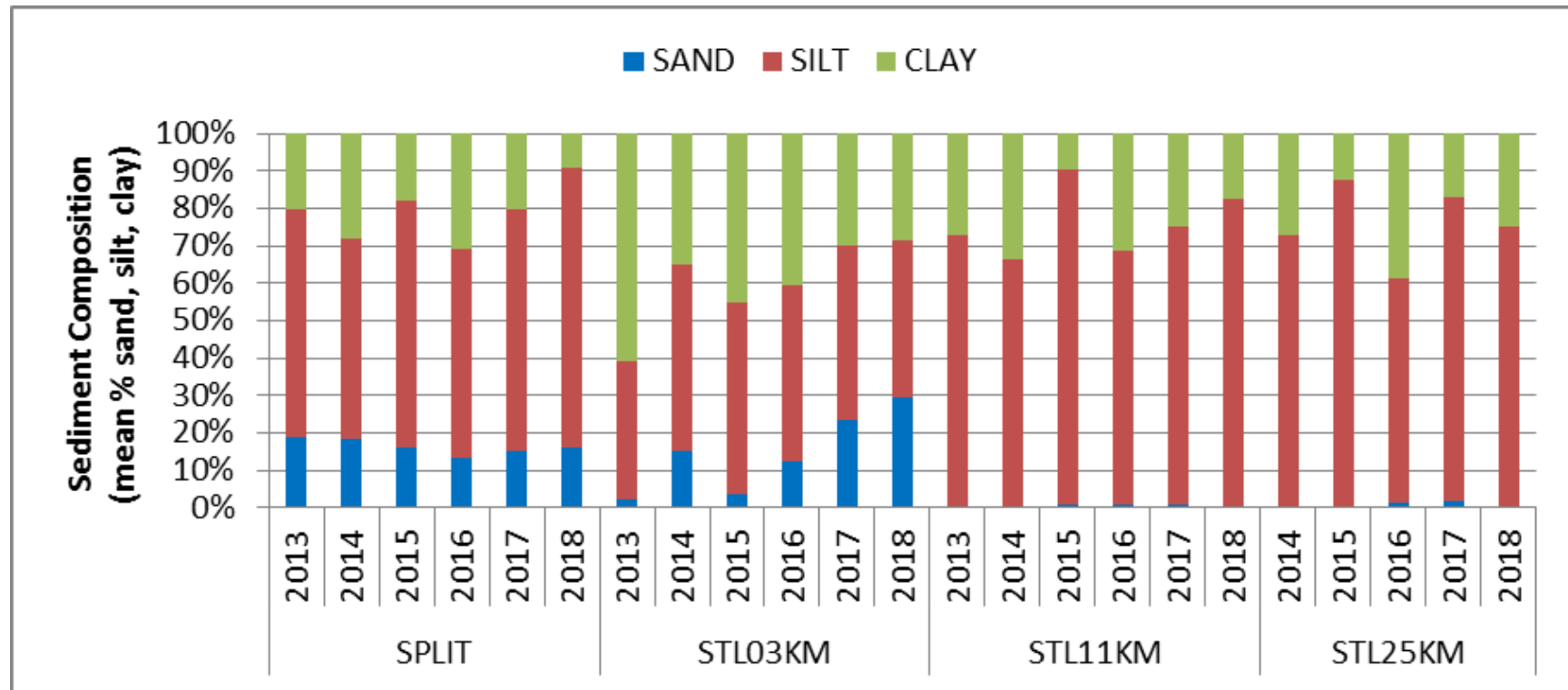
**Figure 14: Percent TOC (mean ± SE) in nearshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).**



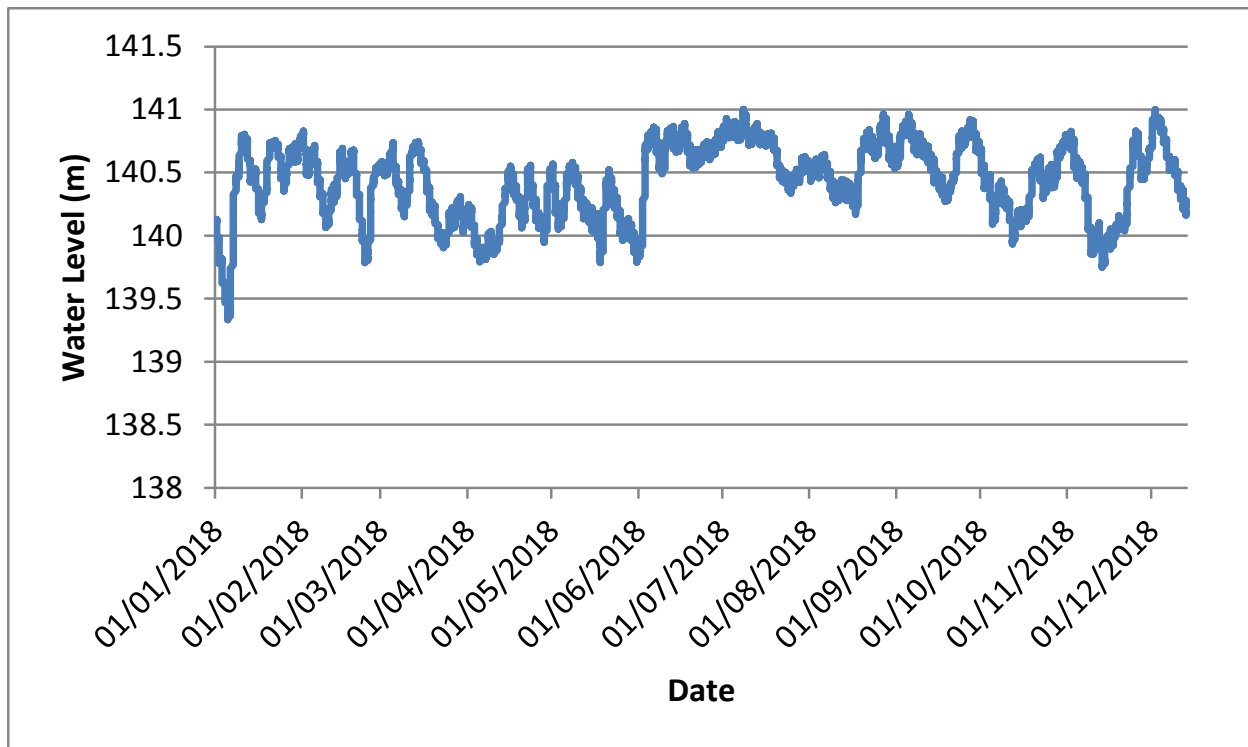
**Figure 15: Percent TOC (mean  $\pm$  SE) in offshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).**



**Figure 16: Sediment composition (mean  $\pm$  SE) in nearshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).**

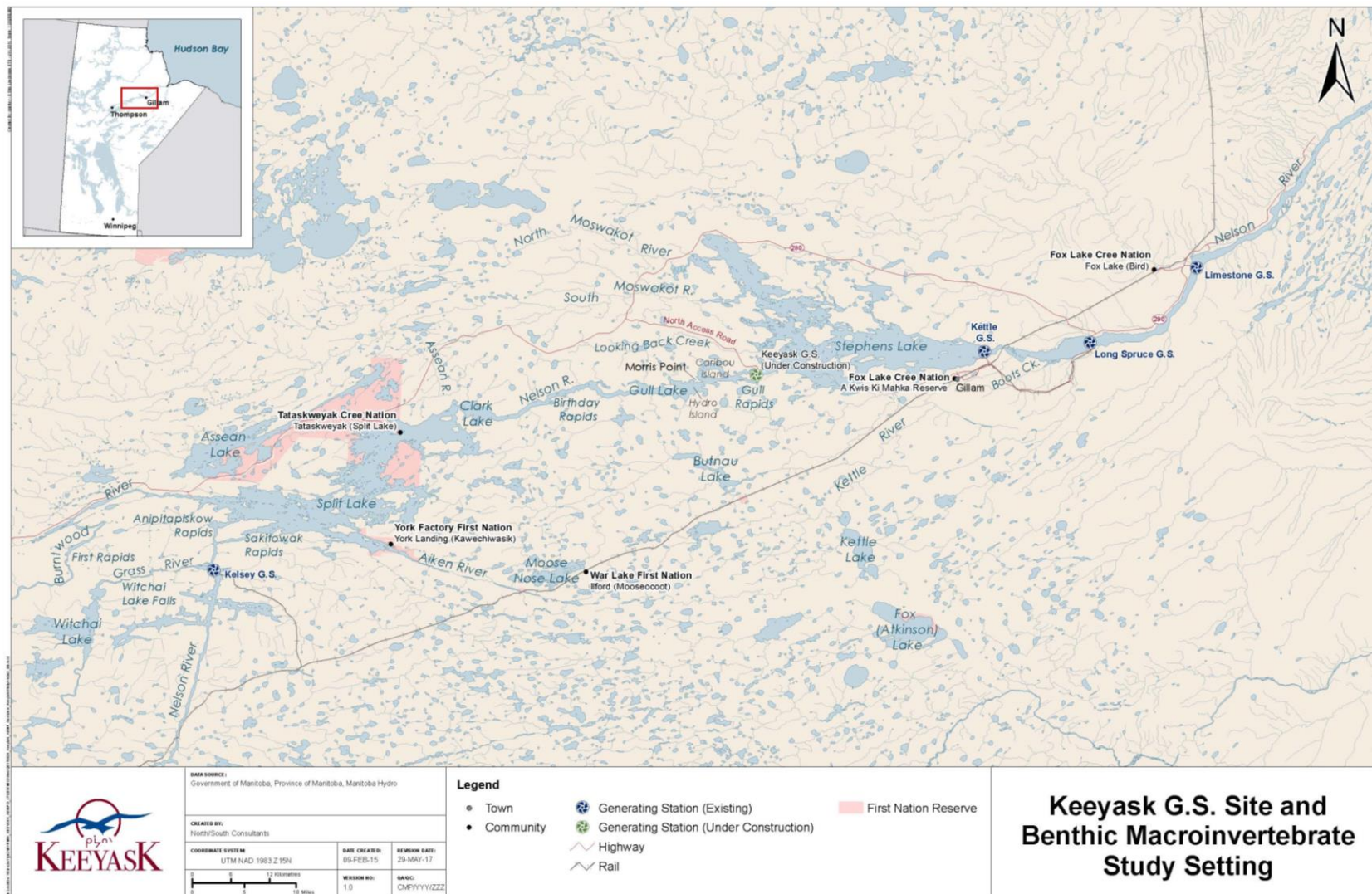


**Figure 17: Substrate composition (mean  $\pm$  SE) in offshore habitat in 2013 (pre-construction) and 2014, 2015, 2016, 2017 and 2018 (construction).**



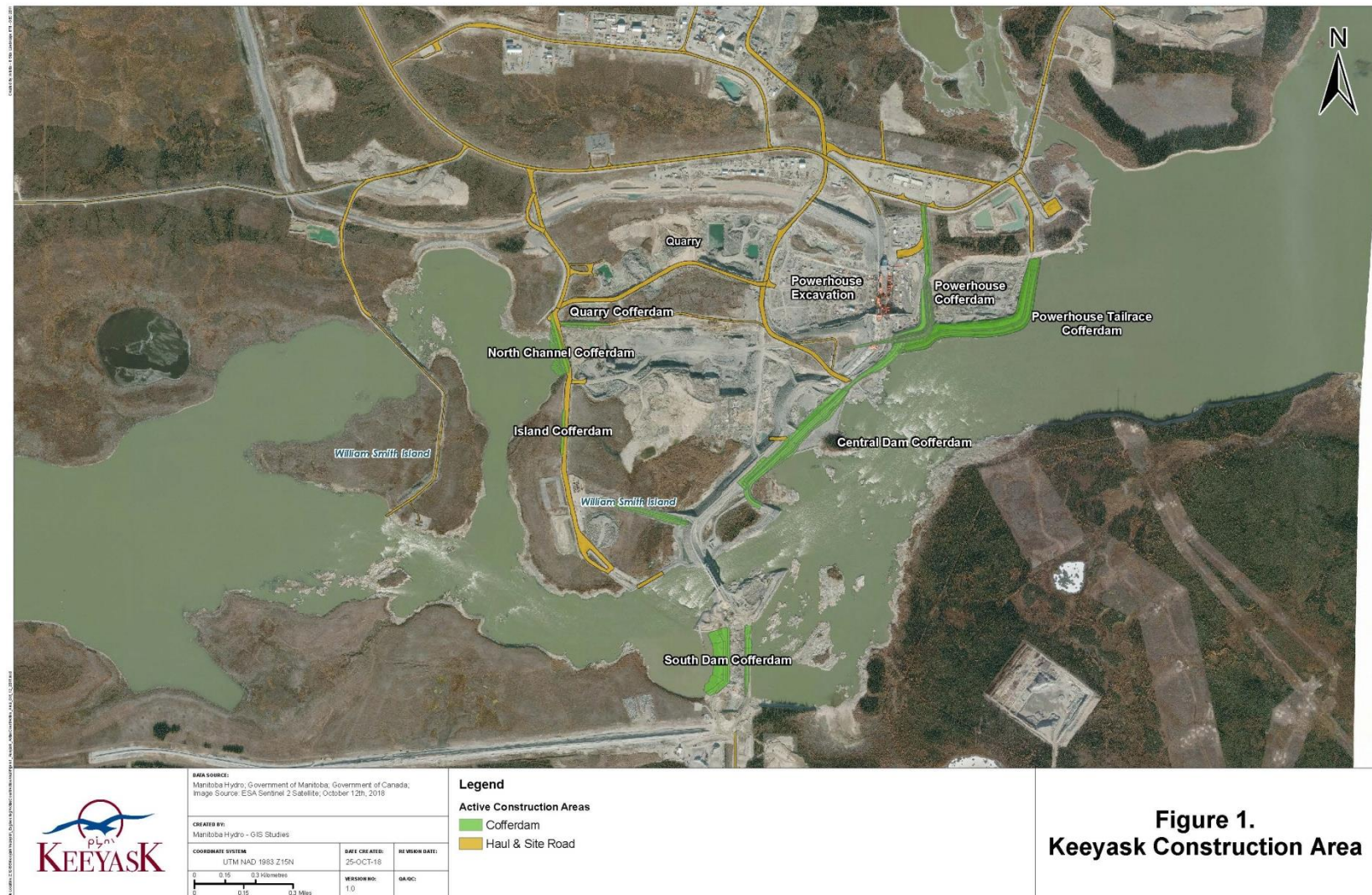
**Figure 18: Stephens Lake water level (mASL), 2018.**

# MAPS



**Map 1: Map of the Nelson River showing the site of the Keeyask Generating Station and the benthic macroinvertebrate monitoring study setting.**

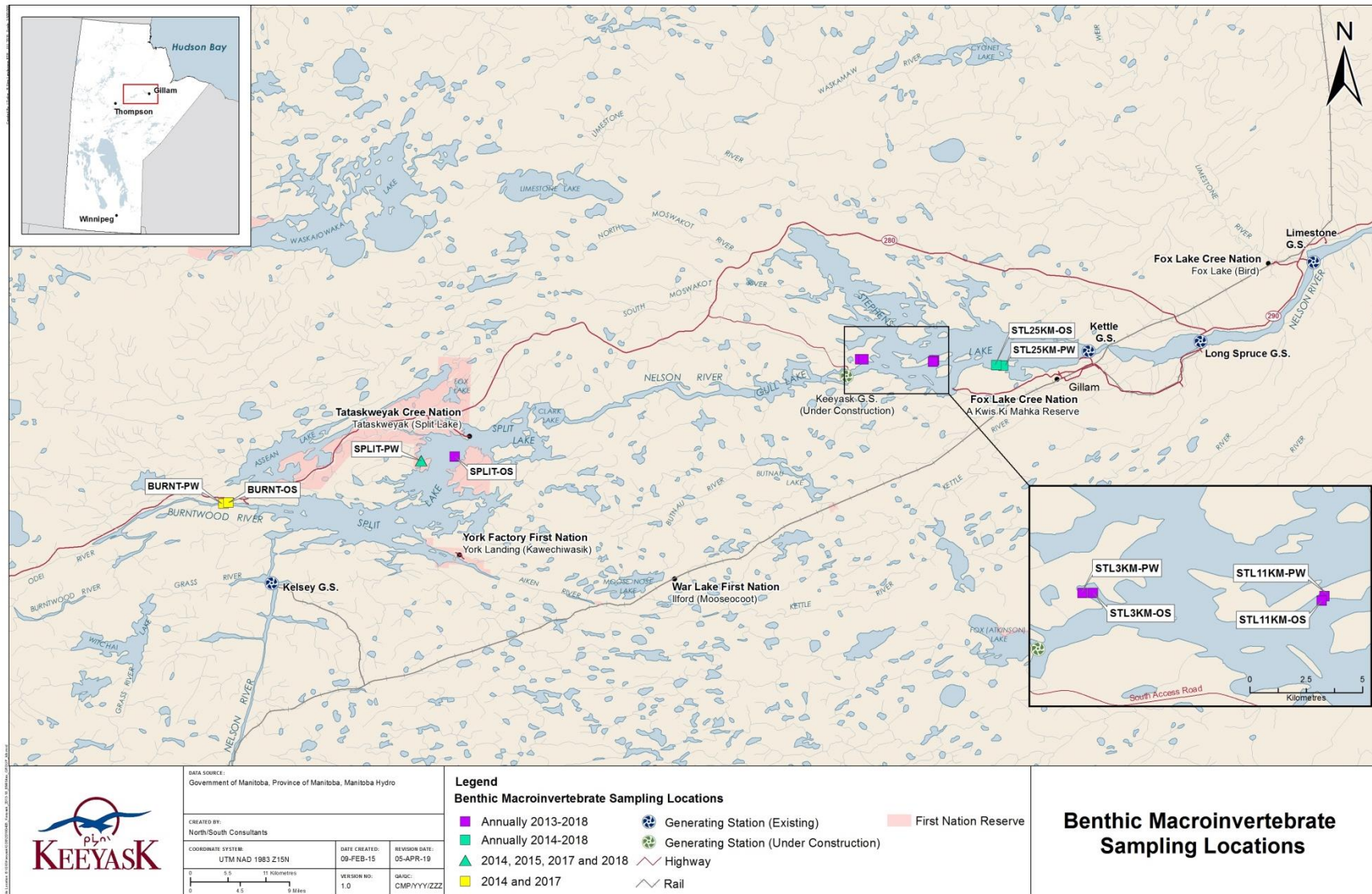




Satellite Imagery - October 12th, 2018

**Map 2: Map of instream structures at the Keeyask Generating Station site, September 2017.**





**Map 3: Benthic macroinvertebrate sampling locations during pre-construction (2013) and construction (2014–2018).**

# APPENDICES

# **APPENDIX 1:**

## **QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC) PROCEDURES FOR AQUATIC MACROINVERTEBRATE SAMPLE PROCESSING**

Detailed sample processing protocols are developed on a by-project-basis depending on the specific needs of each client. The following provides an overview of standard QA/QC procedures employed for each project.

### **Large &/or Rare Search for Samples Requiring Sub-Sampling**

- Sample is washed and sieved using appropriate sized mesh;
- Entire sample is scanned for large &/or rare invertebrates in an appropriately sized tray. This scan is conducted on a per sample basis to avoid under-representing taxa that tend to occur singly or in few numbers that may be missed as a result of sub-sampling;
- Large organisms tend to occur in small numbers (e.g., Belostomatidae, crayfish); these organisms are rare in relation to the overall number of organisms in the sample being processed. Based on the overall number of organisms in the sample, if an organism tends to occur rarely with respect to the rest of the organisms in the sample, this organism is removed (or more, if > 1) and retained in a separate vial for taxonomic identification; and
- Large &/or rare organisms are not included in the split correction and this is indicated clearly on the bench sheet. It is noted that there is a separate vial containing large &/or rare organisms.

### **Sample Processing**

#### **Sub-Sampling**

- Most samples are sub-sampled (unless requested by the client) to decrease processing time. A minimum of 300 organisms processed ensures the inclusion of more rare taxa and permits comparisons of richness among sites;
- The entire sample is examined in a large tray and estimate the number of splits necessary to produce the appropriate number of aliquots needed to achieve a 300-organism target;
- If a sample contains > 300 organisms, large &/or rare invertebrates and any small fish are removed from the whole sample before sub-sampling (see above);
- When > 300 organisms are present, the sample is split into halves. In order to reduce any bias created by the mixing/splitting process, the well-cleaned and mixed sample is split using a 1.0 or 4.0 L [specific to sample volume] Folsom Plankton Splitter. Each sub-sample is subsequently sorted until at least 300 animals are counted. When the 300-organism count

is achieved part way through a sub-sample, the remainder of this fraction is sorted so that a known fraction is sorted. All splitting information is recorded on the bench sheet.

- In sparse samples (*i.e.*, containing ~300 animals or less), the entire sample is processed;
- To be counted, a specimen must have enough intact body parts to permit its identification to the targeted level, and it must have a head (this prevents a body and detached head from being counted as two animals);
- Larval exuviae (exoskeleton remains), and empty shells (snails and clams) and cases (caddisflies) are not counted in the 300-fixed count. If there are no “live” molluscs in the sample, a few empty shells are set aside for identification; these are placed into vial with the large &/or rare specimens;
- The taxa Porifera, Nemata, Copepoda, Cladocera, Rotifera, Platyhelminthes, Ostracoda, and non-aquatic (terrestrial) taxa are not included in the 300 organism count because they are not considered as part of the benthic macroinvertebrate community. Typically, they are counted and their numbers recorded on the bench sheet.

## Sorting Samples

- Sorting aquatic samples involves removing aquatic macroinvertebrates from organic and inorganic materials within each sample;
- All sorting is conducted with a 3x desktop magnifier or stereomicroscope [specific to Project];
- All sorted samples are checked by a 2nd laboratory technician (QA/QC technician);
- Any additional invertebrates collected during the QA/QC process are combined with the original sample, but counted separately;
- Sorting efficiency must be  $\geq 95\%$ . The QA/QC technician checks on a tray-by-tray basis so that the sample is handled as few times as possible; the QA/QC technician will sort any remaining invertebrates from the tray and record the number of missed invertebrates per tray;
- The QA/QC technician will also check the bench sheet data to ensure it matches the sample data; and
- Sorted invertebrate samples are stored in 70% ethanol prior to delivery to the taxonomist.

## Verification of Taxonomic Identification

- NSC taxonomists regularly communicate with external taxonomic specialists to ensure accuracy and consistency.

## Sample Identifications

- Samples are identified to the appropriate taxonomic level [specific to client] by an in-house or external taxonomist. Ten percent (10%) of the in-house identifications are randomly

selected and sent to an external taxonomy specialist for QA/QC. The accuracy of the sample subset is assessed for identification and enumeration; all unknown invertebrates are sent to an external specialist; incorrect identifications and/or enumeration discrepancies are noted on the laboratory datasheet;

- The target overall accuracy level for in-house invertebrate identifications and enumeration is 95% at the Family level and 90% at the Genus level. Corrected identifications and enumeration values received from the external taxonomist are used in place of in-house data discrepancies. If the average error rate of audited samples is outside the target, the entire project must be re-identified by someone other than the original taxonomist.

## **Data Processing**

- Data from field books and laboratory bench sheets are entered into an MS Excel® data template;
- Data templates specify the Project Name, Study Area, Site Location/Description, GPS coordinates (Global Positioning System), Site Label, Sampling Date, Time of Day, Gear Type, Sieve Mesh Size in Field/Laboratory, Presence or Absence of Vegetation/Algae, Water Temperature, Water Depth, Velocity, Substrate Type, Number of Splits, Taxonomic List, Life Stage, and Enumeration List;
- A 2nd and 3rd technician sequentially verify all entered data and formulae to original field book and laboratory bench sheets (*i.e.*, verification is done twice) and a final verification is conducted by the project biologist and/or report author.

## APPENDIX 2: MEANS OF BENTHIC MACROINVERTEBRATE METRICS AND SUPPORTING SEDIMENT RESULTS BY REPLICATE STATION FOR 2013 (PRE-CONSTRUCTION), 2014 (YEAR 1 CONSTRUCTION), 2015 (YEAR 2 CONSTRUCTION), 2016 (YEAR 3 CONSTRUCTION), 2017 (YEAR 4 CONSTRUCTION) AND 2018 (YEAR 5 CONSTRUCTION)

Note: results for each site continue over four pages.

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP1	2.6	808	14	115	0	144
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP2	2.9	721	0	0	29	29
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP3	2.6	649	144	0	14	58
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP4	2.4	866	29	0	58	202
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP5	2.5	404	14	0	14	14
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R1	0.9	2323	29	87	43	115
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R2	1.1	2222	159	14	144	29
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R3	1.2	1111	289	0	72	43
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R4	1.0	1659	43	0	0	289
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R5	1.1	8281	1039	0	1024	390
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R1	1.8	1010	0	29	87	130
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R2	1.4	1443	115	0	404	72
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R3	2.4	1226	375	0	58	0
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R4	2.3	736	43	0	0	58
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R5	1.7	1544	159	14	404	87
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R1	1.2	938	0	0	43	14
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R2	1.3	678	0	0	101	43
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R3	1.3	909	0	0	0	14
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R4	1.3	1053	0	0	29	58
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R5	1.3	909	0	0	29	29



Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP1	3.0	1264	164	9	35	338
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP2	2.8	1524	26	0	26	866
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP3	3.1	727	17	0	52	216
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP4	2.6	1143	35	0	9	511
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP5	2.5	1368	156	0	17	883
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP1	3.0	779	0	0	0	43
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP2	3.1	476	58	0	29	87
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP3	3.0	2352	231	0	0	289
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP4	2.7	2280	101	0	0	188
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP5	2.2	1515	144	14	14	231
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R1	2.4	216	14	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R2	2.8	3015	14	14	29	14
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R3	2.7	231	29	0	0	72
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R4	2.2	1414	101	0	14	245
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R5	1.4	808	0	0	0	14
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R1	2.6	1428	0	14	0	87
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R2	2.8	707	29	0	29	144
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R3	2.7	1154	159	14	58	101
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R4	2.6	1746	87	0	43	317
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R5	1.8	3203	87	0	0	851
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R1	2.3	2150	43	29	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R2	2.8	404	0	0	0	14
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R3	2.3	693	43	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R4	2.1	505	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R5	1.4	1991	14	0	14	101
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R1	2.6	1327	0	0	14	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R2	3.1	1197	14	0	14	29
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R3	2.8	1414	14	0	0	14
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R4	2.8	736	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R5	1.7	1443	14	0	0	303
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP1	3.0	3298	78	0	242	416
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP2	2.2	2329	130	0	156	649
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP3	2.2	3740	312	9	139	641
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP4	2.1	1567	78	0	26	476
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP5	2.6	4242	130	0	35	286
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP1	3.4	1832	58	29	173	390

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP2	2.1	1529	58	0	144	433
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP3	2.0	2496	115	0	159	808
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP4	1.9	1472	0	0	29	606
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP5	1.5	1428	144	0	144	43
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R1	3.5	1443	14	87	188	274
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R2	1.8	1010	0	0	274	115
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R3	2.2	1284	43	0	29	144
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R4	1.8	1068	29	0	43	87
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R5	1.1	1803	115	0	72	216
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R1	2.7	1558	101	29	476	361
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R2	1.6	851	14	0	101	664
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R3	1.2	721	130	29	58	188
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R4	1.9	1515	130	0	43	87
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R5	1.2	995	260	0	72	29
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R1	4.2	1861	14	260	447	14
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R2	2.1	765	43	43	231	87
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R3	1.2	1313	159	0	231	332
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R4	1.9	1630	0	0	101	216
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R5	1.2	1414	14	14	0	476
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R1	3.3	2236	14	87	952	332
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R2	1.9	1962	101	0	981	375
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R3	1.6	967	29	0	231	173
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R4	1.8	837	29	0	101	303
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R5	1.2	1919	0	0	14	1197
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP1	2.9	1169	14	43	188	707
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP2	2.5	2669	462	0	332	1039
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP3	1.9	2727	245	0	274	1197
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP4	3.2	1313	188	0	216	159
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP5	2.3	4429	476	14	1039	2539
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R1	2.0	1457	43	14	620	260
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R2	1.3	4357	375	0	361	1068
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R3	1.0	3203	130	0	72	1573
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R4	2.4	3174	346	0	346	433
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R5	1.1	8685	346	29	895	3347
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	3.5	491	43	14	43	0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	1.5	0	0	0	0	0



Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	1.5	491	14	0	101	101
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	3.1	72	0	29	14	0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	1.3	159	0	14	0	72
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R1	3.0	779	0	0	346	173
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R2	1.7	2669	0	0	519	1241
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R3	1.5	1472	29	0	303	404
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R4	3.0	1645	87	0	534	173
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R5	1.3	2049	87	0	779	418
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R1	3.1	649	0	14	274	130
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R2	1.5	2308	303	0	216	981
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R3	1.9	4299	245	0	375	3059
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R4	3.0	2914	72	0	678	837
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R5	1.6	5915	606	0	548	3708
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP1	7.0	4040	14	1544	332	130
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP2	6.3	9248	29	1818	1125	4069
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP3	9.1	7517	58	1919	1111	2626
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP4	6.4	10806	0	895	895	6983
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP5	8.3	8281	29	895	981	5800
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP1	7.2	6175	29	1371	260	3506
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP2	6.8	7012	29	1212	649	4415
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP3	9.3	11311	58	2308	1125	6983
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP4	6.9	11311	29	1241	1241	6896
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP5	8.9	9060	0	1789	491	6233
Split Lake	OFFSH	2015	reference	SPLIT-OS-R1	6.1	3939	14	2193	534	87
Split Lake	OFFSH	2015	reference	SPLIT-OS-R2	5.9	3506	0	1601	750	202
Split Lake	OFFSH	2015	reference	SPLIT-OS-R3	6.5	3477	29	2684	0	29
Split Lake	OFFSH	2015	reference	SPLIT-OS-R4	5.7	3001	29	1616	447	58
Split Lake	OFFSH	2015	reference	SPLIT-OS-R5	5.4	3246	14	2583	29	87
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP1	6.9	1962	43	1226	0	14
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP2	6.2	2958	29	1573	303	58
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP3	9.4	2222	29	1385	0	0
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP4	6.2	2712	29	1457	130	173
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP5	6.3	2106	43	1746	0	0
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP1	7.5	3102	101	1991	0	0
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP2	6.3	3852	72	2698	0	0
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP3	9.4	1371	43	822	0	0

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP4	6.7	1443	0	952	0	14
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP5	6.4	2207	0	1731	0	0
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP1	6.0	2121	0	1688	0	0
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP2	5.6	3015	0	2323	0	0
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP3	8.4	2395	0	1775	0	0
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP4	7.5	2352	29	1515	14	0
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP5	4.9	2914	29	2251	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP1	6.3	1394	0	9	0	744
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP2	6.0	710	9	0	0	164
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP3	6.0	822	0	0	0	424
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP4	6.2	900	17	0	0	121
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP5	6.2	1679	35	0	9	156
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP1	6.5	404	0	0	14	216
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP2	6.1	1082	14	29	0	202
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP3	6.1	1428	0	43	0	491
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP4	5.1	2684	29	14	43	1630
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP5	6.3	1731	0	14	0	1111
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R1	5.7	159	0	0	0	29
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R2	5.2	346	0	14	0	14
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R3	5.3	43	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R4	4.9	72	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R5	5.4	303	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R1	6.0	505	0	43	0	433
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R2	5.2	1197	29	29	14	620
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R3	5.7	447	0	43	0	202
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R4	4.9	649	0	0	43	491
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R5	6.0	577	0	0	58	361
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R1	6.2	2106	115	0	14	14
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R2	5.1	923	29	14	0	231
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R3	5.3	462	0	0	0	101
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R4	4.5	2482	0	0	14	1212
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R5	5.3	173	0	0	14	115
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R1	6.3	1125	0	0	29	130
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R2	5.0	1313	0	0	87	87
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R3	5.5	1154	29	14	101	101
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R4	5.6	1053	29	14	115	72

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R5	5.8	505	0	0	216	144
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP1	6.6	2190	0	130	0	52
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP2	7.3	2225	9	130	0	9
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP3	7.1	2779	26	69	0	9
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP4	7.2	2199	35	69	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP5	6.6	0	0	0	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP1	6.4	1284	0	202	0	43
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP2	6.8	1818	14	361	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP3	6.5	1890	14	433	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP4	7.6	1140	0	72	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP5	6.9	1313	0	72	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R1	5.9	1702	0	765	0	29
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R2	6.3	1111	0	491	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R3	6.6	1414	0	433	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R4	6.8	895	0	115	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R5	6.1	1125	0	159	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R1	6.3	736	0	231	0	115
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R2	6.3	1977	14	317	0	115
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R3	7.2	505	0	87	0	14
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R4	6.8	1284	0	332	0	14
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R5	7.2	866	0	144	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R1	5.8	2554	0	1876	0	72
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R2	6.3	3232	14	2323	0	101
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R3	6.8	1472	0	1039	0	14
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R4	6.7	1876	0	1111	0	14
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R5	6.8	2078	14	534	0	115
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R1	6.1	1933	0	1342	0	317
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R2	6.8	1818	0	1082	0	188
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R3	6.7	2251	29	1486	0	274
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R4	6.8	981	0	462	0	14
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R5	6.8	1544	0	736	0	43
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP1	9.1	2857	0	1616	14	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP2	9.2	3102	14	2020	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP3	8.6	3232	43	2034	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP4	9.5	2135	0	1226	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP5	9.2	2510	0	1544	0	0

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Water Depth	Total Invertebrate Density	Oligochaeta Density	Amphipoda Density	Pisidiidae Density	Gastropoda Density
Units					meters	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R1	9.0	3434	0	2871	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R2	8.5	2453	0	2005	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R3	8.6	3419	14	2813	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R4	9.3	1255	0	707	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R5	8.9	2409	0	1659	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R1	9.4	2294	0	1298	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R2	8.9	1241	0	548	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R3	5.8	2871	0	1544	0	29
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R4	9.6	995	0	447	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R5	9.4	2669	0	1702	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R1	8.8	1327	0	736	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R2	9.3	3434	0	2280	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R3	8.3	1645	0	995	0	14
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R4	9.7	3116	0	2020	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R5	9.1	1904	0	938	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R1	8.6	2453	0	2020	0	29
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R2	8.9	2510	0	1847	0	14
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R3	8.5	2409	0	1847	0	173
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R4	9.5	3059	0	2409	0	0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R5	8.8	1674	0	1111	0	0

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density
Units					no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP1	274	216	0	14	231
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP2	390	159	0	0	159
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP3	159	159	0	14	173
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP4	231	245	0	0	245
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP5	144	188	0	14	202
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R1	1601	202	0	43	245
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R2	1241	433	0	14	447
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R3	361	245	0	58	303
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R4	822	361	0	14	375
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R5	4386	923	0	29	952
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R1	260	289	0	101	390
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R2	317	390	0	87	476
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R3	433	245	0	43	289
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R4	216	375	0	14	390
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R5	476	361	0	14	375
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R1	260	577	0	0	577
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R2	0	447	0	0	447
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R3	462	346	0	0	346
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R4	361	505	0	0	505
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R5	173	620	0	0	620
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP1	398	69	0	43	113
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP2	398	104	0	0	104
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP3	208	69	0	26	95
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP4	390	43	0	9	52
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP5	190	35	0	17	52
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP1	491	202	0	14	216
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP2	245	58	0	0	58
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP3	837	923	0	14	938
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP4	1183	664	0	87	750
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP5	462	635	0	14	649
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R1	188	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R2	2886	14	0	14	29
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R3	115	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R4	952	43	0	0	43
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R5	794	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R1	1039	115	0	0	115

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density
Units					no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R2	346	72	0	14	87
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R3	447	159	0	29	188
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R4	895	173	0	14	188
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R5	1962	43	0	0	43
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R1	332	1674	0	0	1674
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R2	216	115	0	0	115
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R3	303	317	0	0	317
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R4	58	418	0	14	433
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R5	620	1154	0	14	1169
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R1	115	1082	0	0	1082
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R2	592	491	0	14	505
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R3	188	1169	0	0	1169
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R4	202	418	0	0	418
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R5	548	519	0	0	519
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP1	173	2329	0	9	2337
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP2	147	1229	0	9	1238
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP3	225	2372	0	9	2381
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP4	147	788	0	17	805
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP5	718	3004	0	35	3038
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP1	216	952	0	0	952
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP2	58	822	0	0	822
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP3	188	1226	0	0	1226
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP4	606	216	0	14	231
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP5	606	375	0	29	404
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R1	519	361	0	0	361
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R2	87	462	0	0	462
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R3	433	592	0	0	592
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R4	346	491	0	14	505
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R5	1039	260	0	0	260
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R1	101	447	0	0	447
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R2	14	29	0	14	43
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R3	289	0	0	29	29
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R4	433	548	0	144	693
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R5	491	130	0	14	144
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R1	534	563	0	14	577
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R2	72	274	0	0	274

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density
Units					no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R3	346	202	0	0	202
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R4	938	216	0	101	317
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R5	289	505	0	87	592
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R1	577	202	0	29	231
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R2	159	202	0	29	231
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R3	274	173	0	72	245
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R4	101	159	0	43	202
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R5	505	130	0	43	173
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP1	0	202	0	0	202
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP2	505	231	0	43	274
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP3	491	404	0	14	418
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP4	101	649	0	0	649
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP5	101	245	0	0	245
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R1	72	433	0	0	433
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R2	808	1587	0	29	1616
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R3	462	952	0	0	952
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R4	534	1486	0	14	1500
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R5	2395	1529	0	0	1529
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	173	216	0	0	216
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	0	0	0	0	0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	260	14	0	0	14
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	29	0	0	0	0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	58	0	0	0	0
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R1	14	231	14	0	245
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R2	274	577	0	29	606
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R3	260	462	0	0	462
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R4	173	606	0	43	649
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R5	130	606	0	14	620
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R1	58	159	0	0	159
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R2	202	534	0	14	548
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R3	159	332	0	87	418
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R4	563	750	0	0	750
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R5	505	491	0	29	519
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP1	216	1587	0	101	1688
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP2	462	1558	0	58	1616
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP3	418	1298	0	58	1356



Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density
Units					no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP4	346	1587	0	87	1674
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP5	144	375	0	58	433
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP1	159	808	0	0	808
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP2	72	534	0	58	592
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP3	231	491	0	87	577
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP4	173	1039	0	58	1096
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP5	144	346	0	29	375
Split Lake	OFFSH	2015	reference	SPLIT-OS-R1	563	361	0	43	404
Split Lake	OFFSH	2015	reference	SPLIT-OS-R2	592	130	0	101	231
Split Lake	OFFSH	2015	reference	SPLIT-OS-R3	404	159	0	72	231
Split Lake	OFFSH	2015	reference	SPLIT-OS-R4	505	274	0	29	303
Split Lake	OFFSH	2015	reference	SPLIT-OS-R5	245	173	0	58	231
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP1	159	491	0	29	519
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP2	231	592	0	43	635
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP3	115	462	0	202	664
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP4	159	649	0	0	649
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP5	0	274	0	14	289
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP1	173	462	0	346	808
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP2	58	548	0	404	952
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP3	115	289	0	101	390
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP4	87	303	0	43	346
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP5	14	418	0	29	447
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP1	115	231	0	29	260
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP2	72	505	0	87	592
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP3	144	404	0	58	462
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP4	202	519	0	58	577
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP5	87	491	0	14	505
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP1	493	69	0	43	113
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP2	424	95	0	9	104
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP3	364	9	0	9	17
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP4	684	52	0	26	78
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP5	1324	95	0	43	139
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP1	173	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP2	721	101	0	14	115
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP3	794	87	0	14	101
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP4	909	43	0	14	58



Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density
Units					no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP5	505	43	0	58	101
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R1	87	0	0	43	43
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R2	289	0	0	14	14
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R3	0	0	0	29	29
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R4	58	0	0	14	14
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R5	289	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R1	0	29	0	0	29
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R2	202	188	0	72	260
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R3	58	115	0	14	130
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R4	101	14	0	0	14
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R5	144	14	0	0	14
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R1	476	1428	0	0	1428
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R2	317	274	0	29	303
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R3	130	115	0	29	144
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R4	245	952	0	14	967
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R5	29	0	0	0	0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R1	202	664	0	58	721
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R2	101	1039	0	0	1039
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R3	115	765	0	14	779
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R4	202	505	0	14	519
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R5	72	43	0	14	58
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP1	173	1801	0	0	1801
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP2	242	1818	0	0	1818
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP3	390	2277	0	0	2277
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP4	164	1922	0	0	1922
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP5	0	0	0	0	0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP1	72	938	0	14	952
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP2	188	1241	0	0	1241
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP3	216	1226	0	0	1226
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP4	29	1039	0	0	1039
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP5	173	1024	0	0	1024
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R1	289	606	0	0	606
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R2	101	491	0	0	491
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R3	317	664	0	0	664
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R4	144	620	0	0	620
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R5	303	649	0	0	649

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density
Units					no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R1	14	375	0	0	375
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R2	375	1082	0	0	1082
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R3	43	332	0	0	332
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R4	87	808	0	14	822
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R5	43	678	0	0	678
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R1	159	447	0	0	447
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R2	173	620	0	0	620
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R3	87	274	0	43	317
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R4	72	649	0	14	664
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R5	491	808	0	58	866
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R1	87	173	0	14	188
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R2	260	289	0	0	289
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R3	245	188	0	14	202
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R4	202	303	0	0	303
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R5	173	534	0	14	548
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP1	245	967	0	0	967
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP2	216	851	0	0	851
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP3	231	909	0	0	909
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP4	173	736	0	0	736
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP5	274	693	0	0	693
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R1	188	375	0	0	375
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R2	260	188	0	0	188
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R3	404	188	0	0	188
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R4	202	332	0	14	346
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R5	390	332	0	14	346
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R1	245	736	0	0	736
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R2	274	404	0	14	418
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R3	707	563	0	14	577
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R4	159	375	0	0	375
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R5	115	808	0	29	837
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R1	101	462	0	14	476
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R2	289	837	0	14	851
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R3	115	476	0	43	519
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R4	375	678	0	14	693
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R5	216	707	0	29	736
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R1	130	260	0	14	274

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Chironomidae Density	Ephemeroptera Density	Plecoptera Density	Trichoptera Density	EPT Density
Units					no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>	no. per m <sup>2</sup>
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R2	346	260	0	43	303
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R3	231	159	0	0	159
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R4	346	274	0	29	303
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R5	274	260	0	29	289

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Ratio of EPT to Chironomidae	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae
Units					-	%	%	%
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP1	0.8	26.79	28.57	35.71
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP2	0.4	22.00	22.00	54.00
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP3	1.1	24.44	26.67	46.67
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP4	1.1	28.33	28.33	30.00
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP5	1.4	46.43	50.00	39.29
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R1	0.2	8.70	10.56	70.19
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R2	0.4	19.48	20.13	62.99
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R3	0.8	22.08	27.27	58.44
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R4	0.5	21.74	22.61	52.17
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R5	0.2	11.15	11.50	65.51
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R1	1.5	28.57	38.57	25.71
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R2	1.5	27.00	33.00	30.00
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R3	0.7	20.00	23.53	65.88
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R4	1.8	50.98	52.94	35.29
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R5	0.8	23.36	24.30	41.12
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R1	2.2	61.54	61.54	27.69
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R2	-	65.96	65.96	0.00
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R3	0.8	38.10	38.10	50.79
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R4	1.4	47.95	47.95	34.25
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R5	3.6	68.25	68.25	19.05
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP1	0.3	5.48	8.90	44.52
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP2	0.3	6.82	6.82	27.84
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP3	0.5	9.52	13.10	30.95
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP4	0.1	3.79	4.55	37.12
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP5	0.3	2.53	3.80	25.32
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP1	0.4	25.93	27.78	62.96
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP2	0.2	12.12	12.12	63.64
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP3	1.1	39.26	39.88	45.40
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP4	0.6	29.11	32.91	56.33
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP5	1.4	41.90	42.86	40.00
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R1	-	0.00	0.00	93.33
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R2	0.0	0.48	0.96	96.17
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R3	-	0.00	0.00	62.50
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R4	0.0	3.06	3.06	74.49
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R5	-	0.00	0.00	98.21

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Ratio of EPT to Chironomidae	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae
<b>Units</b>					-	%	%	%
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R1	0.1	8.08	8.08	72.73
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R2	0.3	10.20	12.24	53.06
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R3	29.0	13.75	16.25	52.50
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R4	0.2	9.92	10.74	56.20
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R5	0.0	1.35	1.35	63.96
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R1	5.0	77.85	77.85	17.45
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R2	0.5	28.57	28.57	53.57
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R3	1.0	45.83	45.83	50.00
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R4	7.5	82.86	85.71	11.43
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R5	1.9	57.97	58.70	31.88
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R1	9.4	81.52	81.52	9.70
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R2	0.9	40.96	42.17	50.60
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R3	6.2	82.65	82.65	14.29
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R4	2.1	56.86	56.86	27.45
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R5	1.0	36.00	36.00	39.00
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP1	13.5	70.60	70.87	7.61
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP2	8.4	52.79	53.16	11.90
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP3	10.6	63.43	63.66	14.35
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP4	5.5	50.28	51.38	14.36
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP5	4.2	70.82	71.63	20.00
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP1	4.4	51.97	51.97	14.96
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP2	14.3	53.77	53.77	7.55
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP3	6.5	49.13	49.13	12.14
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP4	0.4	14.71	15.69	41.18
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP5	0.7	26.26	28.28	52.53
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R1	0.7	25.00	25.00	37.00
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R2	5.3	45.71	45.71	8.57
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R3	1.4	46.07	46.07	37.08
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R4	1.5	45.95	47.30	35.14
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R5	0.3	14.40	14.40	64.00
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R1	4.4	28.70	28.70	12.96
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R2	3.0	3.39	5.08	3.39
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R3	0.1	0.00	4.00	58.00
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R4	1.6	36.19	45.71	37.14
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R5	0.3	13.04	14.49	75.36

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Ratio of EPT to Chironomidae	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae
Units					-	%	%	%
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R1	1.1	30.23	31.01	29.46
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R2	3.8	35.85	35.85	15.09
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R3	0.6	15.38	15.38	38.46
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R4	0.3	13.27	19.47	57.52
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R5	2.1	35.71	41.84	21.43
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R1	0.4	9.03	10.32	26.45
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R2	1.5	10.29	11.76	13.24
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R3	0.9	17.91	25.37	31.34
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R4	2.0	18.97	24.13	15.52
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R5	0.3	6.77	9.02	26.32
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP1	-	17.28	17.28	1.23
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP2	0.5	8.65	10.27	36.22
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP3	0.9	14.81	15.34	26.98
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP4	6.4	49.45	49.45	21.98
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP5	2.4	5.54	5.54	13.03
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R1	6.0	29.70	29.70	7.92
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R2	2.0	36.42	37.09	27.15
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R3	2.1	29.73	29.73	18.47
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R4	2.8	46.82	47.27	27.73
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R5	0.6	17.61	17.61	31.56
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	1.3	44.12	44.12	44.12
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	-	0.00	0.00	0.00
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	0.1	2.94	2.94	55.88
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	0.0	0.00	0.00	40.00
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	0.0	0.00	0.00	36.36
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R1	17.0	29.63	31.48	1.85
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R2	2.2	21.62	22.70	10.27
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R3	1.8	31.37	31.37	19.61
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R4	3.8	36.84	39.47	15.79
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R5	4.8	29.58	30.28	10.56
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R1	2.8	24.44	24.44	8.89
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R2	2.7	23.13	23.75	21.88
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R3	2.6	7.72	9.73	9.40
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R4	1.3	25.74	25.74	21.78
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R5	1.0	8.29	8.78	18.78

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Ratio of EPT to Chironomidae	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae
Units					-	%	%	%
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP1	7.8	39.29	41.79	5.71
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP2	3.5	16.85	17.47	5.30
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP3	3.2	17.27	18.04	6.33
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP4	4.8	14.69	15.49	3.20
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP5	3.0	4.53	5.23	2.09
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP1	5.1	13.08	13.08	3.04
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP2	8.2	7.61	8.44	1.44
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP3	2.5	4.34	5.10	2.55
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP4	6.3	9.18	9.69	1.79
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP5	2.6	3.82	4.14	1.59
Split Lake	OFFSH	2015	reference	SPLIT-OS-R1	0.7	9.16	10.26	14.65
Split Lake	OFFSH	2015	reference	SPLIT-OS-R2	0.4	3.70	6.58	16.87
Split Lake	OFFSH	2015	reference	SPLIT-OS-R3	0.6	4.56	6.64	12.45
Split Lake	OFFSH	2015	reference	SPLIT-OS-R4	0.6	9.13	10.10	17.79
Split Lake	OFFSH	2015	reference	SPLIT-OS-R5	0.9	5.33	7.11	8.00
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP1	3.3	25.00	26.47	10.29
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP2	2.8	20.00	21.46	8.78
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP3	5.8	20.78	29.87	6.49
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP4	4.1	23.94	23.94	6.91
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP5	-	13.01	13.70	2.05
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP1	4.7	14.88	26.05	8.84
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP2	16.5	14.23	24.72	3.37
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP3	3.4	21.05	28.42	11.58
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP4	4.0	21.00	24.00	6.00
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP5	31.0	18.95	20.26	0.65
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP1	2.3	10.88	12.24	5.44
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP2	8.2	16.75	19.62	2.39
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP3	3.2	16.87	19.28	6.02
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP4	2.9	22.09	25.00	9.82
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP5	5.8	16.83	17.00	3.96
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP1	0.2	4.97	8.07	35.40
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP2	0.2	13.41	14.63	60.98
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP3	0.0	1.05	2.11	44.21
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP4	0.1	5.77	8.65	77.88
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP5	0.1	5.67	8.25	80.93



Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Ratio of EPT to Chironomidae	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae
<b>Units</b>					-	%	%	%
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP1	0.0	0.00	0.00	42.86
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP2	0.2	9.33	10.67	68.00
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP3	0.1	6.06	7.07	55.56
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP4	0.1	1.61	2.15	34.95
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP5	0.2	2.50	5.83	29.17
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R1	0.5	0.00	27.27	54.55
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R2	0.1	0.00	4.17	83.33
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R3	-	0.00	66.67	0.00
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R4	0.3	0.00	20.00	80.00
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R5	0.0	0.00	0.00	95.24
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R1	-	5.71	5.71	0.00
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R2	1.3	15.66	21.69	19.28
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R3	2.3	25.81	29.03	12.90
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R4	0.1	2.22	2.22	15.56
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R5	0.1	2.50	2.50	25.00
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R1	3.0	67.81	67.81	28.08
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R2	1.0	29.69	32.81	37.50
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R3	1.1	25.00	31.25	28.13
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R4	3.9	38.37	38.95	9.88
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R5	0.0	0.00	0.00	16.67
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R1	3.6	58.97	64.10	17.95
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R2	10.3	79.12	79.12	7.69
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R3	6.8	66.25	67.50	12.50
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R4	2.6	47.95	49.32	21.92
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R5	0.8	8.57	11.43	14.29
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP1	10.4	82.21	82.21	7.91
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP2	7.5	81.71	81.71	11.28
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP3	5.8	81.93	81.93	14.95
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP4	11.7	87.40	87.40	9.06
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP5	-	0.00	0.00	0.00
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP1	13.2	73.03	74.16	5.62
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP2	6.6	68.25	68.25	11.11
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP3	5.7	64.89	64.89	12.21
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP4	36.0	91.14	91.14	2.53
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP5	5.9	78.02	78.02	13.19



Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Ratio of EPT to Chironomidae	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae
Units					-	%	%	%
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R1	2.1	35.59	35.59	16.95
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R2	4.9	44.16	44.16	9.09
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R3	2.1	46.94	46.94	22.45
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R4	4.3	69.35	69.35	16.13
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R5	2.1	57.69	57.69	26.92
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R1	26.0	50.98	50.98	1.96
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R2	2.9	54.74	54.74	19.71
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R3	7.7	65.71	65.71	8.57
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R4	9.5	62.92	64.04	6.74
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R5	15.7	78.33	78.33	5.00
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R1	2.8	17.51	17.51	6.21
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R2	3.6	19.20	19.20	5.80
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R3	3.7	18.63	21.57	5.88
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R4	9.2	34.62	35.38	3.85
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R5	1.8	38.89	41.67	24.31
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R1	2.17	8.96	9.70	4.48
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R2	1.1	15.87	15.87	14.29
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R3	0.8	8.33	8.97	12.18
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R4	1.5	30.88	30.88	20.59
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R5	3.2	34.58	35.51	11.21
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP1	3.9	33.84	33.84	8.59
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP2	3.9	27.44	27.44	7.44
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP3	3.9	28.13	28.13	8.48
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP4	4.3	34.46	34.46	8.11
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP5	2.5	27.59	27.59	10.92
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R1	2.0	10.92	10.92	5.46
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R2	0.7	7.65	7.65	10.59
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R3	0.5	5.49	5.49	12.24
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R4	1.7	26.44	27.59	16.09
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R5	0.9	13.77	14.37	16.17
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R1	3.0	32.08	32.08	10.69
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R2	1.5	32.56	33.72	22.09
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R3	0.8	19.60	20.10	24.62
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R4	2.4	37.68	37.68	15.94
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R5	7.3	30.27	31.35	4.32

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Ratio of EPT to Chironomidae	Percent Ephemeroptera	Percent EPT (EPT Index)	Percent of Oligochaeta and Chironomidae
<b>Units</b>					-	%	%	%
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R1	4.7	34.78	35.87	7.61
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R2	3.0	24.37	24.79	8.40
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R3	4.5	28.95	31.58	7.02
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R4	1.8	21.76	22.22	12.04
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R5	3.4	37.12	38.64	11.36
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R1	2.1	10.59	11.18	5.29
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R2	0.9	10.34	12.07	13.79
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R3	0.7	6.59	6.59	9.58
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R4	0.9	8.96	9.91	11.32
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R5	1.1	15.52	17.24	16.38

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index	Total Organic Carbon	Sand	Silt	Clay
Units					-	-	-	%	%	%	%
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP1	8	2	0.77	3.97	25.9	49.1	25.0
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP2	6	1	0.64	1.51	55.0	30.0	15.0
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP3	10	2	0.81	2.21	40.6	40.0	19.4
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP4	7	1	0.78	1.65	33.6	47.3	19.1
Split Lake	NRSH-PW	2014	reference	SPLIT-PW-REP5	7	2	0.65	1.51	41.4	40.2	18.4
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R1	11	2	0.51	2.67	24.5	53.0	22.5
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R2	11	2	0.64	3.26	29.3	46.6	24.0
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R3	11	1	0.77	2.78	29.6	57.6	12.8
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R4	8	1	0.67	1.67	41.8	41.8	16.4
Split Lake	NRSH-PW	2015	reference	SPLIT-PW-R5	12	2	0.67	2.17	58.2	29.8	12.0
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R1	11	5	0.83	3.58	37.7	46.4	15.9
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R2	10	4	0.80	2.85	63.6	22.7	13.6
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R3	9	3	0.74	4.09	35.8	45.3	18.9
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R4	7	2	0.65	2.01	70.3	21.6	8.1
Split Lake	NRSH-PW	2017	reference	SPLIT-PW-R5	9	2	0.77	3.29	52.4	30.8	16.8
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R1	6	1	0.54	2.94	22.7	62.9	14.5
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R2	5	1	0.53	2.51	24.3	52.6	23.1
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R3	5	1	0.59	2.45	27.4	43.0	29.5
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R4	7	1	0.64	1.36	62.5	25.5	12.0
Split Lake	NRSH-PW	2018	reference	SPLIT-PW-R5	8	2	0.52	1.09	63.5	27.6	8.9
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP1	11	3	0.79	1.48	12.6	42.8	44.6
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP2	8	1	0.61	1.13	11.4	42.8	45.8
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP3	9	3	0.78	1.14	9.4	38.2	52.4
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP4	10	3	0.69	1.25	10.2	40.7	49.1
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL3KM-PW-REP5	9	2	0.57	1.41	12.5	42.8	44.7
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP1	6	2	0.53	1.96	3.5	61.2	35.3
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP2	6	1	0.68	1.67	11.8	50.8	37.3
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP3	9	2	0.70	3.13	7.8	43.5	48.6
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP4	10	4	0.64	2.84	9.6	52.2	38.2
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL3KM-PW-REP5	8	2	0.71	2.28	18.2	42.1	39.7
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R1	3	0	0.24	6.83	7.4	48.7	43.9
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R2	8	1	0.08	0.89	30.6	20.3	49.1
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R3	5	0	0.67	1.16	21.6	40.4	38.0
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R4	11	2	0.52	4.89	12.2	51.1	36.8
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-3KM-PW-R5	2	0	0.04	1.36	8.7	33.0	58.3
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R1	7	1	0.45	3.32	10.6	36.5	52.9

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index	Total Organic Carbon	Sand	Silt	Clay
Units					-	-	-	%	%	%	%
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R2	9	2	0.72	1.59	49.1	15.9	35
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R3	8	2	0.78	3.43	13.4	41.3	45.2
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R4	8	2	0.68	1.49	11.8	21.6	66.6
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-3KM-PW-R5	8	1	0.58	2.48	7.4	30.7	61.9
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R1	5	1	0.37	2.03	8.1	66.2	25.7
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R2	4	1	0.61	2.54	6.8	68.0	25.2
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R3	4	1	0.59	2.64	17.4	61.1	21.6
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R4	4	2	0.30	2.08	14.3	55.2	30.5
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-3KM-PW-R5	11	2	0.57	2.52	17.3	64.9	17.8
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R1	4	1	0.32	1.16	17.7	37.2	45.1
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R2	7	2	0.59	1.62	14.0	58.2	27.8
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R3	6	1	0.30	2.44	7.4	73.2	19.5
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R4	3	1	0.58	2.18	10.0	69.1	20.9
Stephens Lake 3 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-3KM-PW-R5	6	1	0.69	1.89	12.0	68.3	19.7
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP1	8	3	0.48	1.97	4.0	71.0	25.0
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP2	8	2	0.63	0.49	75.7	16.5	7.8
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP3	9	2	0.56	1.57	54.6	33.5	11.9
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP4	10	3	0.69	1.68	49.6	40.3	10.1
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2013	impact	STL11KM-PW-REP5	12	5	0.48	3.61	10.3	71.6	18.1
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP1	8	1	0.66	2.47	35.7	51.0	13.3
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP2	6	1	0.62	1.26	52.9	34.9	12.2
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP3	7	2	0.71	1.59	54.6	35.2	10.2
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP4	6	2	0.68	1.64	55.5	36.1	8.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL11KM-PW-REP5	9	3	0.73	5.60	10.6	51.4	37.9
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R1	7	1	0.76	2.35	1.2	83.1	15.7
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R2	6	1	0.69	1.04	65.0	26.5	8.5
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R3	7	1	0.67	3.78	3.8	87.7	8.5
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R4	8	1	0.67	3.16	18.8	70.3	10.9
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-11KM-PW-R5	10	1	0.64	2.87	40.8	42.7	16.5
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R1	7	1	0.77	4.42	35.5	46.6	17.9
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R2	9	2	0.60	2.90	68.8	17.7	13.6
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R3	8	2	0.76	1.65	91.5	4.2	4.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R4	10	3	0.76	3.28	70.3	21.6	8.1
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-11KM-PW-R5	6	2	0.67	1.94	68.4	18.2	13.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R1	8	2	0.75	4.26	1.8	83.3	14.8
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R2	8	1	0.76	1.56	66.8	24.9	8.4

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index	Total Organic Carbon	Sand	Silt	Clay
Units					-	-	-	%	%	%	%
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R3	9	1	0.83	3.45	62.7	32.9	4.4
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R4	12	5	0.64	5.23	57.4	34.9	7.7
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-11KM-PW-R5	12	4	0.76	2.42	61.4	26.9	11.7
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R1	12	4	0.73	3.3	1.3	80.6	18.2
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R2	8	2	0.71	1.6	59.9	28.4	11.7
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R3	9	2	0.82	1.48	70.9	20.8	8.3
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R4	9	2	0.87	2.63	47.5	39.3	13.2
Stephens Lake 11 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-11KM-PW-R5	11	4	0.75	2.01	36.1	27.8	36.1
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP1	8	2	0.76	0.36	54.0	18.8	27.2
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP2	10	4	0.76	2.52	74.1	17.7	8.3
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP3	11	2	0.73	0.35	90.4	5.4	4.2
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP4	5	1	0.69	2.15	65.7	27.4	6.9
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2014	impact	STL25KM-PW-REP5	7	1	0.60	0.40	90.1	4.7	5.2
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R1	7	1	0.70	0.74	16.0	25.1	58.9
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R2	12	2	0.77	0.90	78.2	15.4	6.4
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R3	7	1	0.74	0.24	87.4	9.7	2.9
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R4	8	1	0.72	1.80	72.0	19.5	8.5
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2015	impact	STL-25KM-PW-R5	13	2	0.79	0.53	88.6	7.7	3.7
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R1	6	2	0.71	7.11	42.9	35.5	21.6
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R2	0	0	-	-	-	-	-
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R3	6	1	0.65	0.69	95.7	2.6	1.7
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R4	3	0	0.65	3.67	65.9	25.8	8.3
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2016	impact	STL-25KM-PW-R5	6	0	0.77	-	-	-	-
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R1	5	2	0.67	1.50	49.7	46.3	4.00
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R2	7	2	0.80	1.60	82.3	13.1	4.60
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R3	6	1	0.77	1.30	83.3	11.5	5.20
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R4	9	2	0.74	4.40	63.5	26.1	10.40
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2017	impact	STL-25KM-PW-R5	9	2	0.73	1.00	89.2	7.5	3.30
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R1	6	1	0.71	1.49	37.6	33.6	28.70
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R2	10	2	0.77	0.60	92.6	3.8	3.60
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R3	11	3	0.54	0.55	90.2	5.7	4.00
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R4	7	1	0.79	2.22	67.7	22.4	9.90
Stephens Lake 25 km downstream of Gull Rapids	NRSH-PW	2018	impact	STL-25KM-PW-R5	9	2	0.59	0.24	95.1	2.0	2.80
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP1	10	3	0.69	1.08	17.8	66.0	16.2
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP2	10	2	0.72	1.15	17.6	79.7	2.7
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP3	9	2	0.76	1.04	19.0	50.5	30.4

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index	Total Organic Carbon	Sand	Silt	Clay
Units					-	-	-	%	%	%	%
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP4	7	2	0.55	1.01	19.5	55.2	25.3
Split Lake	OFFSH	2013	reference	SPLIT-OS-REP5	7	2	0.48	1.05	19.0	55.6	25.4
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP1	8	1	0.61	1.34	19.5	50.0	30.5
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP2	10	3	0.56	1.31	14.8	56.6	28.6
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP3	10	3	0.60	1.32	17.7	53.5	28.8
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP4	9	2	0.59	1.10	24.2	54.8	20.9
Split Lake	OFFSH	2014	reference	SPLIT-OS-REP5	7	2	0.48	1.33	16.4	52.2	31.4
Split Lake	OFFSH	2015	reference	SPLIT-OS-R1	11	1	0.64	1.53	11.9	77.7	10.3
Split Lake	OFFSH	2015	reference	SPLIT-OS-R2	11	1	0.71	1.31	18.8	58.7	22.5
Split Lake	OFFSH	2015	reference	SPLIT-OS-R3	9	1	0.39	1.08	22.1	59.0	18.8
Split Lake	OFFSH	2015	reference	SPLIT-OS-R4	8	1	0.65	1.24	12.9	62.4	24.7
Split Lake	OFFSH	2015	reference	SPLIT-OS-R5	9	1	0.36	1.24	15.2	71.3	13.5
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP1	6	2	0.54	2.13	18.4	54.0	27.6
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP2	9	2	0.66	2.00	14.8	56.2	29.0
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP3	10	4	0.58	1.90	7.7	53.9	38.4
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP4	8	1	0.64	2.15	11.5	57.6	30.9
Split Lake	OFFSH	2016	reference	SPLIT-OS-REP5	6	2	0.30	2.19	13.8	58.4	27.8
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP1	10	5	0.57	1.99	16.5	53.9	29.7
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP2	11	5	0.48	2.11	15.7	71.7	12.6
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP3	7	4	0.59	2.01	17.9	68.9	13.2
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP4	8	3	0.52	2.02	14.8	54.8	30.3
Split Lake	OFFSH	2017	reference	SPLIT-OS-REP5	5	2	0.35	2.21	10.2	75.1	14.7
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP1	7	2	0.35	1.86	25.4	70.0	4.6
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP2	5	2	0.38	1.95	16.1	79.2	4.7
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP3	5	2	0.42	1.77	10.7	80.5	8.8
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP4	7	2	0.53	1.80	14.6	76.6	8.9
Split Lake	OFFSH	2018	reference	SPLIT-OS-REP5	7	2	0.37	1.84	14.5	68.1	17.4
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP1	9	3	0.59	1.16	1.1	45.3	53.7
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP2	8	3	0.59	0.75	2.1	40.2	57.6
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP3	5	2	0.54	1.59	3.5	21.5	75.0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP4	5	2	0.40	1.16	1.7	52.3	46.1
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2013	impact	STL3KM-OS-REP5	10	3	0.37	0.93	1.9	26.7	71.4
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP1	3	0	0.53	1.67	14.8	46.8	38.5
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP2	6	2	0.51	2.43	9.6	51.8	38.6
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP3	5	2	0.57	0.77	45.2	30.6	24.2
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP4	7	2	0.52	0.96	2.2	61.3	36.5

Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index	Total Organic Carbon	Sand	Silt	Clay
Units					-	-	-	%	%	%	%
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2014	impact	STL3KM-OS-REP5	6	2	0.51	1.51	4.1	59.9	36.0
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R1	3	0	0.60	3.75	0.5	64.6	34.9
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R2	5	0	0.30	4.98	3.5	65.6	30.8
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R3	2	0	0.45	2.23	8.8	48.8	42.4
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R4	2	0	0.32	0.27	0.8	49.5	49.7
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2015	impact	STL-3KM-OS-R5	2	0	0.09	0.59	4.3	27.2	68.6
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R1	3	1	0.26	2.47	11.8	40.4	47.8
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R2	8	2	0.71	5.37	6.2	59.9	33.9
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R3	6	2	0.70	2.53	8.9	50.9	40.2
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R4	4	1	0.40	-	2.4	51	46.6
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2016	impact	STL-3KM-OS-R5	4	1	0.54	2.21	33.5	32.1	34.4
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R1	6	1	0.49	2.17	17.4	58.2	24.5
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R2	8	2	0.75	2.8	24.3	55.4	20.3
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R3	5	2	0.79	2.00	43.8	34.5	21.7
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R4	6	2	0.72	1.96	20.3	44	35.7
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2017	impact	STL-3KM-OS-R5	4	0	0.52	1.27	10.8	41.7	47.6
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R1	7	2	0.61	1.66	31.0	40.5	28.5
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R2	5	1	0.36	2.63	20.9	53.1	26
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R3	9	2	0.54	2.31	18.3	65.8	15.8
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R4	10	2	0.71	1.38	54.9	21.9	23.3
Stephens Lake 3 km downstream of Gull Rapids	OFFSH	2018	impact	STL-3KM-OS-R5	7	2	0.74	0.80	22.2	29.5	48.3
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP1	6	1	0.31	1.11	0.5	73.7	25.8
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP2	6	1	0.32	1.36	0.5	75.7	23.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP3	6	1	0.31	1.23	0.6	75.1	24.3
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP4	6	2	0.24	1.20	0.5	69.8	29.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2013	impact	STL11KM-OS-REP5	0	0	-	1.30	0.3	68.1	31.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP1	6	2	0.44	1.48	0.5	67.4	32.1
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP2	6	1	0.49	5.71	0.1	59.9	40.0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP3	5	1	0.52	1.30	0.4	67.3	32.3
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP4	3	1	0.16	1.28	0.3	68.6	31.2
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2014	impact	STL11KM-OS-REP5	5	1	0.37	1.27	0.2	68.2	31.6
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R1	6	1	0.64	1.38	1.4	97.5	1.1
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R2	4	1	0.60	1.22	0.9	89.5	9.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R3	3	1	0.64	1.40	1.0	98.5	0.5
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R4	4	1	0.48	1.19	0.6	84.8	14.6
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2015	impact	STL-11KM-OS-R5	4	1	0.58	1.19	0.6	77.1	22.2



Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index	Total Organic Carbon	Sand	Silt	Clay
Units					-	-	-	%	%	%	%
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R1	4	1	0.62	3.48	1.1	67.2	31.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R2	8	1	0.64	3.51	1.5	70.1	28.5
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R3	7	1	0.54	3.41	0.5	67.4	31.8
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R4	7	2	0.54	3.25	0.5	66.7	32.5
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2016	impact	STL-11KM-OS-R5	3	1	0.36	3.53	0.5	66.7	32.8
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R1	4	1	0.43	2.98	1.5	74.9	23.6
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R2	6	1	0.44	2.91	1.8	80.8	17.4
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R3	6	2	0.46	2.94	0.5	78.2	21
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R4	6	2	0.53	2.93	0.5	66	33.1
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2017	impact	STL-11KM-OS-R5	9	2	0.72	3.65	0.5	71.6	27.7
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R1	6	2	0.49	2.61	0.5	88.1	11.0
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R2	5	1	0.59	2.53	0.5	87.6	11.6
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R3	8	2	0.53	2.41	0.5	72.7	26.8
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R4	4	1	0.64	2.34	0.5	81.3	18.2
Stephens Lake 11 km downstream of Gull Rapids	OFFSH	2018	impact	STL-11KM-OS-R5	7	2	0.64	2.43	0.5	80.7	19.0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP1	5	1	0.56	1.88	0.1	76.7	23.1
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP2	5	1	0.50	1.93	0.2	76.6	23.2
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP3	5	1	0.52	2.23	0.3	71.5	28.2
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP4	3	1	0.55	2.01	0.1	66.2	33.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2014	impact	STL25KM-OS-REP5	3	1	0.53	2.09	0.1	72.3	27.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R1	4	1	0.29	2.04	0.3	89.1	10.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R2	3	1	0.31	2.09	0.4	94.3	5.4
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R3	4	1	0.31	2.22	0.2	85.2	14.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R4	4	1	0.59	2.11	0.3	85.9	13.9
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2015	impact	STL-S-OS-R5	5	1	0.48	2.00	0.4	82.3	17.3
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R1	5	1	0.59	3.68	0.5	60.1	39.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R2	4	2	0.65	3.57	0.5	60.7	38.9
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R3	6	2	0.61	4.16	4.1	55.7	40.2
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R4	4	1	0.63	3.85	0.5	63.6	36.1
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2016	impact	STL-25KM-OS-R5	6	2	0.51	3.82	0.5	60.6	39.3
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R1	5	2	0.57	3.08	0.5	84.5	15.0
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R2	5	2	0.49	3.00	0.5	85.0	14.7
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R3	5	2	0.54	2.29	4.0	69.2	26.7
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R4	7	2	0.52	2.31	3.3	81.1	15.6
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2017	impact	STL-25KM-OS-R5	6	3	0.61	3.00	0.5	87.0	12.4
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R1	5	2	0.31	2.83	0.5	84.3	15.5



Waterbody/ Site Location	Habitat Type	Study Year	Site Type	Site ID	Total Richness (Family-level)	EPT Richness (Family-level)	Simpson's Diversity Index	Total Organic Carbon	Sand	Silt	Clay
<b>Units</b>					-	-	-	%	%	%	%
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R2	5	2	0.43	2.72	0.5	78.7	20.8
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R3	5	1	0.40	2.85	0.5	63.2	36.5
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R4	6	4	0.36	2.86	0.5	83.3	16.4
Stephens Lake 25 km downstream of Gull Rapids	OFFSH	2018	impact	STL-25KM-OS-R5	4	2	0.51	2.94	0.5	64.2	35.5

## APPENDIX 3: SUMMARY STATISTICS FOR ADDITIONAL METRICS BY HABITAT TYPE FOR 2013 (PRE-CONSTRUCTION), 2014 (YEAR 1 CONSTRUCTION), 2015 (YEAR 2 CONSTRUCTION), 2016 (YEAR 3 CONSTRUCTION), 2017 (YEAR 4 CONSTRUCTION), AND 2018 (YEAR 5 CONSTRUCTION)

*Note: results for each parameter continue over two pages.*

### **Nearshore Habitat**

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Total Invertebrate Density (no. per m <sup>2</sup> )									
n	5	5	5	5	5	5	5	5	5	5
Mean	689.64	3119.23	1191.71	897.40	1204.99	1480.26	1136.89	1647.62	1148.43	1223.40
Minimum	403.97	1110.92	735.80	678.00	727.15	476.11	216.41	706.95	403.97	736.00
Maximum	865.65	8281.39	1543.74	1053.00	1523.55	2351.69	3015.35	3202.91	2149.70	1443.00
Median	721.38	2221.84	1226.34	909.00	1263.85	1514.89	807.94	1428.32	692.52	1327.00
Standard deviation (n-1)	179.74	2926.29	327.51	136.26	301.52	851.38	1159.93	949.34	849.79	288.77
Standard error of the mean	80.38	1308.68	146.47	60.94	134.84	380.75	518.74	424.56	380.04	129.14
COV (%)	26.06	93.81	27.48	15.18	25.02	57.52	102.03	57.62	74.00	23.60
+50% Mean	1034.45	4678.84	1787.57	1346.10	1807.48	2220.39	1705.33	2471.43	1722.65	1835.10
-50% Mean	344.82	1559.61	595.86	448.70	602.49	740.13	568.44	823.81	574.22	611.70
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2015)	-	No	No (both)	No (all)	No (all)	No (all)
Modified Significance Level	0.0083				N/A					
Significant Inter-annual Difference	-	Yes 0.0003 (2014)	No 0.028 (2014) 0.164 (2015)	No 0.016 (2015)	-	N/A	N/A	N/A	N/A	N/A

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Total Invertebrate Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	3034.97	1751.50	1321.56	1128.23	1396.58	1584.20	2461.33	4175.32	302.98	1722.65	3217.00
Minimum	1566.83	1428.32	1009.93	721.38	764.66	837.00	1168.63	1457.18	72.14	779.09	649.00
Maximum	4241.69	2495.96	1803.44	1558.17	1861.15	2236.00	4429.25	8685.36	490.54	2669.09	5915.00
Median	3298.13	1529.32	1284.05	995.50	1413.90	1919.00	2669.09	3202.91	324.62	1644.74	2914.00
Standard deviation (n-1)	1081.24	445.22	320.12	385.43	411.42	636.18	1320.63	2725.34	219.44	700.26	1997.66
Standard error of the mean	483.55	199.11	143.16	172.37	183.99	284.51	590.61	1218.81	109.72	313.17	893.38
COV (%)	35.63	25.42	24.22	34.16	29.46	40.16	53.66	65.27	72.43	40.65	62.10
+50% Mean	4552.46	2627.25	1982.34	1692.35	2094.88	2376.30	3692.00	6262.98	454.47	2583.97	4825.50
-50% Mean	1517.49	875.75	660.78	564.12	698.29	792.10	1230.67	2087.66	151.49	861.32	1608.50
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	Yes (2013)	Yes (2013)	No (all)	-	Yes	Yes (both)	Yes (2015, 2016)	Yes (2016, 2017)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.008 (2013)	Yes 0.002 (2013)	No 0.016 (2013)	N/A	-	No 0.127	Yes 0.073 (2014) 0.003 (2015)	No 0.034 (2015) 0.228 (2016)	No 0.019 (2016) 0.180 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Total Richness (Family level)									
n	5	5	5	5	5	5	5	5	5	5
Mean	7.60	10.60	9.20	6.20	9.40	7.80	5.80	8.00	5.60	5.20
Minimum	6.00	8.00	7.00	5.00	8.00	6.00	2.00	7.00	4.00	3.00
Maximum	10.00	12.00	11.00	8.00	11.00	10.00	11.00	9.00	11.00	7.00
Median	7.00	11.00	9.00	6.00	9.00	8.00	5.00	8.00	4.00	6.00
Standard deviation (n-1)	1.52	1.52	1.48	1.30	1.14	1.79	3.70	0.71	3.05	1.64
Standard error of the mean	0.68	0.68	0.66	0.58	0.51	0.80	1.66	0.32	1.36	0.73
COV (%)	19.95	14.31	16.12	21.03	12.13	22.93	63.82	8.84	54.46	31.60
+25% Mean	9.50	13.25	11.50	7.75	11.75	9.75	7.25	10.00	7.00	6.50
-25% Mean	5.70	7.95	6.90	4.65	7.05	5.85	4.35	6.00	4.20	3.90
Benchmark Exceedance (temporal comparison)	-	Yes	No (both)	Yes (2015, 2017)	-	No	Yes (2013, 2014)	Yes (2015)	Yes (2013, 2014, 2016)	Yes (2013, 2014, 2016)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	Yes 0.005	N/A	Yes 0.0002 (2015) 0.005 (2017)	-	N/A	No 0.019 (2013) 0.175 (2014)	No 0.137 (2015)	No 0.014 (2013) 0.137 (2014) 0.106 (2016)	No 0.007 (2013) 0.082 (2014) 0.062 (2016)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Total Richness (Family level)										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	9.40	7.20	7.60	8.20	9.80	9.80	8.20	9.40	5.25	7.20	8.60
Minimum	8.00	6.00	6.00	5.00	8.00	8.00	5.00	7.00	3.00	5.00	6.00
Maximum	12.00	9.00	10.00	10.00	12.00	12.00	11.00	13.00	6.00	9.00	11.00
Median	9.00	7.00	7.00	8.00	9.00	9.00	8.00	8.00	6.00	7.00	9.00
Standard deviation (n-1)	1.67	1.30	1.52	2.05	2.05	1.64	2.39	2.88	1.50	1.79	2.07
Standard error of the mean	0.75	0.58	0.68	0.92	0.92	0.73	1.07	1.29	0.75	0.80	0.93
COV (%)	17.80	18.11	19.95	24.99	20.91	16.77	29.12	30.65	28.57	24.85	24.11
+25% Mean	11.75	9.00	9.50	10.25	12.25	12.25	10.25	11.75	6.56	9.00	10.75
-25% Mean	7.05	5.40	5.70	6.15	7.35	7.35	6.15	7.05	3.94	5.40	6.45
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (2014, 2015)	Yes (2014, 2015)	-	No	Yes (2014, 2015)	Yes (2016)	Yes (2016)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	No 0.034 (2014) 0.070 (2015)	No 0.022 (2014) 0.048 (2015)	-	N/A	No 0.061 (2014) 0.011 (2015)	No 0.204 (2016)	No 0.329 (2016)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Simpson's Diversity Index									
n	5	5	5	5	5	5	5	5	5	5
Mean	0.73	0.65	0.76	0.56	0.69	0.65	0.31	0.64	0.49	0.50
Minimum	0.64	0.51	0.65	0.52	0.57	0.53	0.04	0.45	0.30	0.30
Maximum	0.81	0.77	0.83	0.64	0.79	0.71	0.67	0.78	0.61	0.69
Median	0.77	0.67	0.77	0.54	0.69	0.68	0.24	0.68	0.57	0.58
Standard deviation (n-1)	0.08	0.09	0.07	0.05	0.10	0.07	0.28	0.13	0.14	0.18
Standard error of the mean	0.04	0.04	0.03	0.02	0.04	0.03	0.12	0.06	0.06	0.08
COV (%)	10.74	14.42	9.28	8.92	14.40	10.95	88.93	20.09	29.40	35.34
+25% Mean	0.92	0.82	0.95	0.71	0.86	0.82	0.39	0.80	0.61	0.62
-25% Mean	0.55	0.49	0.57	0.42	0.52	0.49	0.23	0.48	0.37	0.37
Benchmark Exceedance (temporal comparison)	-	No	No (both)	Yes (2017)	-	No	Yes (both)	Yes (2015)	Yes (2013–2015)	Yes (2013, 2015)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	Yes 0.0009 (2017)	-	N/A	No 0.006 (2013) 0.018 (2014)	No 0.024 (2015)	No 0.044 (2013) 0.106 (2014) 0.451 (2015)	No 0.078 (2013) 0.315 (2015)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Simpson's Diversity Index										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	0.57	0.68	0.69	0.71	0.75	0.78	0.71	0.74	0.69	0.74	0.68
Minimum	0.48	0.62	0.64	0.60	0.64	0.71	0.60	0.70	0.65	0.67	0.54
Maximum	0.69	0.73	0.76	0.77	0.83	0.87	0.76	0.79	0.77	0.80	0.79
Median	0.56	0.68	0.67	0.76	0.76	0.75	0.73	0.74	0.68	0.74	0.71
Standard deviation (n-1)	0.09	0.04	0.05	0.08	0.07	0.07	0.07	0.04	0.06	0.05	0.11
Standard error of the mean	0.04	0.02	0.02	0.03	0.03	0.03	0.03	0.02	0.03	0.02	0.05
COV (%)	16.29	6.23	6.89	10.66	9.03	8.63	9.45	5.17	7.95	6.32	16.24
+25% Mean	0.71	0.85	0.86	0.89	0.93	0.97	0.89	0.93	0.87	0.93	0.85
-25% Mean	0.43	0.51	0.51	0.53	0.56	0.58	0.53	0.56	0.52	0.56	0.51
Benchmark Exceedance (temporal comparison)	-	No	No (both)	Yes (2013)	Yes (2013)	Yes (2013)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	0.0033						N/A				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	Yes 0.0028 (2013)	Yes 0.0003 (2013)	Yes < 0.0001 (2013)	-	N/A	N/A	N/A	N/A

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Ephemeroptera Density (no. per m <sup>3</sup> )									
n	5	5	5	5	5	5	5	5	5	5
Mean	193.33	432.83	331.83	499.00	64.06	496.31	11.54	112.53	735.80	735.80
Minimum	158.70	201.99	245.27	346.00	34.63	57.71	0.00	43.28	115.42	418.00
Maximum	245.27	923.36	389.54	620.00	103.88	923.36	43.28	173.13	1673.59	1169.00
Median	187.56	360.69	360.69	505.00	69.25	634.81	0.00	115.42	418.40	519.00
Standard deviation (n-1)	37.62	289.09	62.06	108.25	27.10	356.57	18.81	55.32	654.82	358.97
Standard error of the mean	16.83	129.29	27.75	48.41	12.12	159.46	8.41	24.74	292.85	160.54
COV (%)	19.46	66.79	18.70	21.69	42.30	71.84	162.98	49.15	88.99	48.79
+50% Mean	289.99	649.24	497.75	748.50	96.09	744.46	17.31	168.80	1103.70	1103.70
-50% Mean	96.66	216.41	165.92	249.50	32.03	248.15	5.77	56.27	367.90	367.90
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2014)	Yes (2014, 2017)	-	Yes	Yes (both)	Yes (all)	Yes (2013, 2015, 2016)	Yes (2013, 2015, 2016)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.030 (2014)	No 0.186 (2014)	Yes 0.0077 (2014) 0.115 (2017)	-	No 0.040	Yes 0.323 (2013) 0.002 (2014)	No 0.429 (2013) 0.208 (2014) 0.075 (2015)	Yes 0.015 (2013) 0.0006 (2015) 0.102 (2016)	Yes 0.006 (2013) 0.0002 (2015) 0.052 (2016)



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Ephemeroptera Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	1944.25	718.49	432.83	230.84	352.03	173.20	346.26	1197.48	57.71	496.31	453.20
Minimum	787.74	216.41	259.70	0.00	201.99	130.00	201.99	432.83	0.00	230.84	159.00
Maximum	3003.81	1226.34	591.53	548.25	562.67	202.00	649.24	1587.03	216.41	605.96	750.00
Median	2328.60	822.37	461.68	129.85	274.12	173.00	245.27	1486.03	7.21	577.10	491.00
Standard deviation (n-1)	908.57	416.33	127.01	250.93	169.36	30.52	186.72	497.49	106.02	159.88	222.09
Standard error of the mean	406.33	186.19	56.80	112.22	75.74	13.65	83.51	222.48	53.01	71.50	99.32
COV (%)	46.73	57.94	29.34	108.70	48.11	17.62	53.93	41.54	183.71	32.21	49.00
+25% Mean	2916.38	1077.74	649.24	346.26	528.05	259.80	519.39	1796.23	86.57	744.46	679.80
-25% Mean	972.13	359.25	216.41	115.42	176.02	86.60	173.13	598.74	28.86	248.15	226.60
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2013)	Yes (2013, 2014)	Yes (2013, 2014, 2016)	Yes (2013, 2014, 2015, 2017)	-	Yes	Yes (both)	Yes (2015, 2016)	Yes (2015, 2016)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.190 (2013)	No 0.052 (2013)	Yes 0.0006 (2013) 0.036 (2014)	No 0.017 (2013) 0.281 (2014) 0.306 (2016)	Yes 0.0002 (2013) 0.014 (2014) 0.067 (2015) 0.167 (2017)	N/A	No 0.024 (2013)	Yes 0.124 (2014) 0.0002 (2015)	No 0.172 (2015) 0.017 (2016)	No 0.081 (2015) 0.043 (2016)

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***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Percent EPT (EPT Index)									
n	5	5	5	5	5	5	5	5	5	5
Mean	31.11	18.41	34.47	56.40	7.43	31.11	0.80	9.73	59.33	60.00
Minimum	22.00	10.56	23.53	38.00	3.80	12.12	0.00	1.35	28.57	36.00
Maximum	50.00	27.27	52.94	68.00	13.10	42.86	3.06	16.25	85.71	83.00
Median	28.33	20.13	33.00	62.00	6.82	32.91	0.00	10.74	58.70	57.00
Standard deviation (n-1)	10.88	7.22	12.08	12.92	3.75	12.14	1.33	5.54	23.28	21.92
Standard error of the mean	4.87	3.23	5.40	5.78	1.68	5.43	0.59	2.48	10.41	9.80
COV (%)	34.98	39.21	35.03	22.90	50.42	39.03	165.29	56.92	39.24	36.53
+50% Mean	46.67	27.62	51.70	84.60	11.15	46.66	1.21	14.60	89.00	90.00
-50% Mean	15.56	9.21	17.23	28.20	3.72	15.55	0.40	4.87	29.67	30.00
Benchmark Exceedance (temporal comparison)	-	No	Yes (2015)	Yes (2014, 2015, 2017)	-	Yes	Yes (both)	Yes (2014, 2015)	Yes (all)	Yes (2013, 2014, 2015, 2016)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.035 (2015)	Yes 0.002 (2014) < 0.0001 (2015) 0.006 (2017)	-	No 0.122	No 0.222 (2013) 0.006 (2014)	No 0.196 (2014) 0.141 (2015)	Yes 0.007 (2013) 0.250 (2014) < 0.0001 (2015) 0.015 (2016)	Yes 0.008 (2013) 0.265 (2014) 0.0001 (2015) 0.016 (2016)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Percent EPT (EPT Index)										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	62.14	39.77	35.70	19.60	28.71	16.00	19.58	32.28	11.76	31.06	18.60
Minimum	51.38	15.69	14.40	4.00	15.38	9.00	5.54	17.61	0.00	22.70	9.00
Maximum	71.63	53.77	47.30	45.71	41.84	25.00	49.45	47.27	44.12	39.47	26.00
Median	63.66	49.13	45.71	14.49	31.01	12.00	15.34	29.73	1.47	31.37	24.00
Standard deviation (n-1)	9.55	16.92	15.09	17.64	11.09	7.84	17.32	10.91	21.61	5.95	8.35
Standard error of the mean	4.27	7.56	6.75	7.89	4.96	3.51	7.74	4.88	10.81	2.66	3.74
COV (%)	15.37	42.53	42.26	90.01	38.61	49.01	88.45	33.80	183.71	19.15	44.92
+25% Mean	93.21	59.65	53.54	29.40	43.06	24.00	29.37	48.42	17.65	46.59	27.90
-25% Mean	31.07	19.88	17.85	9.80	14.35	8.00	9.79	16.14	5.88	15.53	9.30
Benchmark Exceedance (temporal comparison)	-	No	No (both)	Yes (2013, 2014)	Yes (2013)	Yes (2013, 2014, 2015)	-	Yes	Yes (2015)	Yes (2014, 2016)	Yes (2016)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	Yes < 0.0001 (2013) 0.027 (2014)	Yes 0.0007 (2013)	Yes < 0.0001 (2013) 0.011 (2014) 0.030 (2015)	-	No 0.155 (2013)	No 0.036 (2015)	No 0.197 (2014) 0.047 (2016)	No 0.462 (2016)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Pisidiidae Density (no. per m <sup>2</sup> )									
n	5	5	5	5	5	5	5	5	5	5
Mean	23.08	256.81	190.44	40.40	27.70	8.66	8.66	25.97	2.89	5.60
Minimum	0.00	0.00	0.00	0.00	8.66	0.00	0.00	0.00	0.00	0.00
Maximum	57.71	1024.35	403.97	101.00	51.94	28.86	28.86	57.71	14.43	14.00
Median	14.43	72.14	86.57	29.00	25.97	0.00	0.00	28.86	0.00	0.00
Standard deviation (n-1)	21.88	432.27	197.40	37.32	16.65	12.90	12.90	25.81	6.45	7.67
Standard error of the mean	9.79	193.32	88.28	16.69	7.45	5.77	5.77	11.54	2.89	3.43
COV (%)	94.79	168.32	103.65	92.38	60.11	149.07	149.07	99.38	223.61	136.93
+50% Mean	34.63	385.21	285.66	60.60	41.55	12.98	12.98	38.95	4.33	8.40
-50% Mean	11.54	128.40	95.22	20.20	13.85	4.33	4.33	12.98	1.44	2.80
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2014)	Yes (2014, 2015, 2017)	-	Yes	Yes (2013)	Yes (2014, 2015)	Yes (all)	Yes (2013, 2016, 2017)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.091	No 0.068 (2014)	No 0.502 (2014) 0.307 (2015) 0.248 (2017)	-	No 0.069	No 0.065 (2013)	No 0.249 (2014) 0.249 (2015)	No 0.012 (2013) 0.513 (2014) 0.513 (2015) 0.071 (2016)	No 0.026 (2013) 0.124 (2016) 0.788 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Pisidiidae Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	119.46	129.85	121.19	150.05	201.99	455.80	409.74	458.80	39.68	496.31	418.20
Minimum	25.97	28.86	28.86	43.28	0.00	14.00	187.56	72.14	0.00	302.98	216.00
Maximum	242.38	173.13	274.12	476.11	447.25	981.00	1038.78	894.51	100.99	779.09	678.00
Median	138.50	144.28	72.14	72.14	230.84	231.00	274.12	360.69	28.86	519.39	375.00
Standard deviation (n-1)	90.46	57.71	105.82	183.52	167.94	472.67	355.98	311.35	44.66	188.28	192.28
Standard error of the mean	40.45	25.81	47.33	82.07	75.11	211.38	159.20	139.24	22.33	84.20	85.99
COV (%)	75.72	44.44	87.32	122.31	83.15	103.70	86.88	67.86	112.57	37.94	45.98
+25% Mean	179.19	194.77	181.79	225.07	302.98	683.70	614.61	688.19	59.51	744.46	627.30
-25% Mean	59.73	64.92	60.60	75.02	100.99	227.90	204.87	229.40	19.84	248.15	209.10
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (2013–2015)	Yes (all)	-	No	Yes (both)	Yes (2016)	Yes (2016)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	No 0.506 (2013) 0.746 (2014) 0.565 (2015)	No 0.250 (2013) 0.419 (2014) 0.289 (2015) 0.258 (2016) 0.627 (2017)	N/A	N/A	No 0.040 (2014) 0.022 (2015)	No 0.014 (2016)	No 0.036 (2016)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Water Depth (m)									
n	5	5	5	5	5	5	5	5	5	5
Mean	2.60	1.07	1.92	1.28	2.79	2.81	2.30	2.50	2.18	2.60
Minimum	2.40	0.93	1.40	1.20	2.50	2.23	1.37	1.80	1.40	1.70
Maximum	2.90	1.17	2.40	1.30	3.08	3.07	2.80	2.80	2.80	3.10
Median	2.60	1.10	1.80	1.30	2.82	3.03	2.40	2.60	2.30	2.80
Standard deviation (n-1)	0.19	0.09	0.42	0.04	0.25	0.36	0.58	0.40	0.51	0.53
Standard error of the mean	0.08	0.04	0.19	0.02	0.11	0.16	0.26	0.18	0.23	0.24
COV (%)	7.20	8.27	21.91	3.49	9.11	12.69	25.06	16.00	23.25	20.53
+50% Mean	3.90	1.60	2.88	1.92	4.18	4.22	3.45	3.75	3.27	3.90
-50% Mean	1.30	0.53	0.96	0.64	1.39	1.41	1.15	1.25	1.09	1.30
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2015)	Yes (2014)	-	No	No (both)	No (all)	No (all)	No (all)
Modified Significance Level	0.0083				N/A					
Significant Inter-annual Difference <sup>1</sup>	-	Yes < 0.0001	Yes 0.197 (2014) 0.007 (2015)	Yes 0.0078 (2014)	-	N/A	N/A	N/A	N/A	N/A

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Water Depth (m)										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	2.41	2.18	2.10	1.72	2.12	1.96	2.55	1.56	2.35	2.10	2.22
Minimum	2.14	1.47	1.13	1.20	1.20	1.20	1.90	1.03	1.30	1.30	1.50
Maximum	3.00	3.43	3.50	2.70	4.20	3.30	3.20	2.40	3.50	3.00	3.10
Median	2.18	2.00	1.83	1.60	1.90	1.80	2.50	1.27	2.30	1.70	1.90
Standard deviation (n-1)	0.37	0.74	0.87	0.62	1.23	0.80	0.51	0.62	1.11	0.83	0.77
Standard error of the mean	0.17	0.33	0.39	0.28	0.55	0.36	0.23	0.28	0.56	0.37	0.35
COV (%)	15.36	34.12	41.56	36.17	58.10	40.59	19.91	39.73	47.32	39.70	34.80
+25% Mean	3.62	3.27	3.15	2.58	3.18	2.94	3.82	2.34	3.53	3.15	3.33
-25% Mean	1.21	1.09	1.05	0.86	1.06	0.98	1.27	0.78	1.18	1.05	1.11
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	No (all)	-	No	Yes (2015)	No (all)	No (all)
Modified Significance Level	N/A						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	N/A	N/A	-	N/A	No 0.170 (2015)	N/A	N/A

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Oligochaeta Density (no. per m <sup>2</sup> )									
n	5	5	5	5	5	5	5	5	5	5
Mean	40.40	311.63	138.50	0.00	79.64	106.76	31.74	72.14	20.20	8.40
Minimum	0.00	28.86	0.00	0.00	17.31	0.00	0.00	0.00	0.00	0.00
Maximum	144.28	1038.78	375.12	0.00	164.47	230.84	100.99	158.70	43.28	14.00
Median	14.43	158.70	115.42	0.00	34.63	100.99	14.43	86.57	14.43	14.00
Standard deviation (n-1)	58.96	419.71	145.92	0.00	73.81	87.52	40.03	61.21	21.88	7.67
Standard error of the mean	26.37	187.70	65.26	0.00	33.01	39.14	17.90	27.37	9.79	3.43
COV (%)	145.95	134.68	105.36	-	92.68	81.98	126.13	84.85	108.33	91.29
+50% Mean	60.60	467.45	207.76	0.00	119.46	160.15	47.61	108.21	30.30	12.60
-50% Mean	20.20	155.82	69.25	0.00	39.82	53.38	15.87	36.07	10.10	4.20
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (all)	-	No	Yes (both)	Yes (2015)	Yes (2013, 2014, 2016)	Yes (all)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.090 (2014)	No 0.286 (2014) 0.529 (2015)	Yes 0.147 (2014) <b>0.002 (2015)</b> 0.012 (2017)	-	N/A	No 0.218 (2013) 0.186 (2014)	No 0.375 (2015)	No 0.111 (2013) 0.092 (2014) 0.212 (2016)	No 0.014 (2013) 0.011 (2014) 0.218 (2015) 0.034 (2016) 0.385 (2017)



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Oligochaeta Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	145.43	75.02	40.40	126.96	46.17	34.60	277.01	248.15	14.43	40.40	245.20
Minimum	77.91	0.00	0.00	14.43	0.00	0.00	14.43	43.28	0.00	0.00	0.00
Maximum	311.63	144.28	115.42	259.70	158.70	101.00	476.11	375.12	43.28	86.57	606.00
Median	129.85	57.71	28.86	129.85	14.43	29.00	245.27	346.26	7.21	28.86	245.00
Standard deviation (n-1)	96.47	56.25	44.93	88.00	64.84	39.03	194.74	151.11	20.40	43.76	236.45
Standard error of the mean	43.14	25.16	20.10	39.35	29.00	17.45	87.09	67.58	10.20	19.57	105.74
COV (%)	66.34	74.98	111.23	69.31	140.45	112.80	70.30	60.89	141.42	108.33	96.43
+25% Mean	218.14	112.53	60.60	190.44	69.25	51.90	415.51	372.23	21.64	60.60	367.80
-25% Mean	72.71	37.51	20.20	63.48	23.08	17.30	138.50	124.08	7.21	20.20	122.60
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	Yes (2014, 2015)	Yes (2013, 2016)	Yes (2013, 2014, 2016)	-	No	Yes (both)	Yes (all)	Yes (2016, 2017)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.028 (2013)	No 0.460 (2014) 0.087 (2015)	No 0.040 (2013) 0.117 (2016)	No 0.018 (2013) 0.256 (2014) 0.061 (2016)	-	N/A	No 0.018 (2014) 0.018 (2015)	No 0.045 (2014) 0.045 (2015) 0.626 (2016)	No 0.059 (2016) 0.138 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Amphipoda Density (no. per m <sup>2</sup> )									
n	5	5	5	5	5	5	5	5	5	5
Mean	23.08	20.20	8.66	0.00	1.73	2.89	2.89	5.77	5.77	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	115.42	86.57	28.86	0.00	8.66	14.43	14.43	14.43	28.86	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	51.62	37.62	12.90	0.00	3.87	6.45	6.45	7.90	12.90	0.00
Standard error of the mean	23.08	16.83	5.77	0.00	1.73	2.89	2.89	3.53	5.77	0.00
COV (%)	223.61	186.26	149.07	-	223.61	223.61	223.61	136.93	223.61	0.00
+50% Mean	34.63	30.30	12.98	0.00	2.60	4.33	4.33	8.66	8.66	0.00
-50% Mean	11.54	10.10	4.33	0.00	0.87	1.44	1.44	2.89	2.89	0.00
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (all)	-	Yes	Yes (2013)	Yes (all)	Yes (2013–2015)	Yes (all)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.648 (2014) 0.944 (2015)	No 0.399 (2014) 0.170 (2015) 0.193 (2017)	-	No 0.898	No 0.898 (2013)	No 0.367 (2013) 0.440 (2014) 0.440 (2015)	No 0.797 (2013) 0.898 (2014) 0.898 (2015)	No 0.520 (2013) 0.440 (2014) 0.440 (2015) 0.122 (2016) 0.367 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Amphipoda Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	1.73	5.77	17.31	11.54	63.48	17.40	11.54	8.66	14.43	0.00	2.80
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	8.66	28.86	86.57	28.86	259.70	87.00	43.28	28.86	28.86	0.00	14.00
Median	0.00	0.00	0.00	0.00	14.43	0.00	0.00	0.00	14.43	0.00	0.00
Standard deviation (n-1)	3.87	12.90	38.71	15.80	111.10	38.91	18.81	12.90	11.78	0.00	6.26
Standard error of the mean	1.73	5.77	17.31	7.07	49.69	17.40	8.41	5.77	5.89	0.00	2.80
COV (%)	223.61	223.61	223.61	136.93	175.01	223.61	162.98	149.07	81.65	0.00	223.61
+25% Mean	2.6	8.66	25.97	17.31	95.22	26.10	17.31	12.98	21.64	0.00	4.20
-25% Mean	0.87	2.89	8.66	5.77	31.74	8.70	5.77	4.33	7.21	0.00	1.40
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2013, 2014)	Yes (all)	Yes (2013, 2014, 2016, 2017)	-	No	Yes (2015)	Yes (all)	Yes (all)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.894 (2013)	No 0.790 (2013) 0.894 (2014)	No 0.451 (2013) 0.535 (2014)	No 0.110 (2013) 0.143 (2014) 0.184 (2015) 0.400 (2016)	No 0.756 (2013) 0.859 (2014) 0.658 (2016) 0.199 (2017)	-	N/A	No 0.313 (2015)	No 0.157 (2014) 0.181 (2015) 0.023 (2016)	No 0.336 (2014) 0.378 (2015) 0.066 (2016) 0.649 (2017)

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**Nearshore Habitat – continued.**

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Gastropoda Density (no. per m <sup>2</sup> )									
n	5	5	5	5	5	5	5	5	5	
Mean	89.45	173.13	69.25	31.60	562.67	167.36	69.25	300.09	23.08	69.20
Minimum	14.43	28.86	0.00	14.00	216.41	43.28	0.00	86.57	0.00	0.00
Maximum	201.99	389.54	129.85	58.00	882.96	288.55	245.27	851.22	100.99	303.00
Median	57.71	115.42	72.14	29.00	510.73	187.56	14.43	144.28	0.00	14.00
Standard deviation (n-1)	80.59	159.03	47.19	19.06	303.16	101.30	102.22	321.54	44.00	131.25
Standard error of the mean	36.04	71.12	21.11	8.52	135.58	45.30	45.71	143.80	19.68	58.70
COV (%)	90.09	91.86	68.15	60.32	53.88	60.53	147.61	107.15	190.60	189.66
+50% Mean	134.18	259.70	103.88	47.40	844.01	251.04	103.88	450.14	34.63	103.80
-50% Mean	44.73	86.57	34.63	15.80	281.34	83.68	34.63	150.05	11.54	34.60
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2015)	Yes (2014, 2015, 2017)	-	Yes	Yes (both)	Yes (2014, 2015)	Yes (all)	Yes (2013, 2014, 2016, 2017)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.487 (2014)	No 0.438 (2015)	No 0.209 (2014) 0.051 (2015) 0.239 (2017)	-	No 0.125	No 0.006 (2013) 0.234 (2014)	No 0.639 (2014) 0.097 (2015)	Yes 0.0005 (2013) 0.051 (2014) 0.449 (2015) 0.016 (2016)	Yes 0.0027 (2013) 0.144 (2014) 0.054 (2016) 0.626 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Gastropoda Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	493.42	455.91	167.36	265.47	225.07	476.00	1128.23	1335.99	43.28	481.88	1743.00
Minimum	285.66	43.28	86.57	28.86	14.43	173.00	158.70	259.70	0.00	173.13	130.00
Maximum	649.24	807.94	274.12	663.67	476.11	1197.00	2539.24	3347.18	100.99	1240.77	3708.00
Median	476.11	432.83	144.28	187.56	216.41	332.00	1038.78	1067.64	36.07	403.97	981.00
Standard deviation (n-1)	154.49	283.57	76.75	255.78	185.77	410.04	883.35	1239.66	51.35	440.64	1548.90
Standard error of the mean	69.09	126.81	34.32	114.39	83.08	183.37	395.05	554.39	25.67	197.06	692.69
COV (%)	31.31	62.20	45.86	96.35	82.54	86.14	78.29	92.79	118.63	91.44	88.86
+25% Mean	740.13	683.86	251.04	398.20	337.60	714.00	1692.35	2003.98	64.92	722.82	2614.50
-25% Mean	246.71	227.95	83.68	132.73	112.53	238.00	564.12	667.99	21.64	240.94	871.50
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2015)	Yes (2013, 2014)	Yes (2015, 2016, 2017)	-	No	Yes (both)	Yes (all)	Yes (2014, 2016, 2017)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.051 (2013) 0.082 (2014)	No 0.543 (2015)	No 0.104 (2013) 0.159 (2014)	No 0.064 (2015) 0.197 (2016) 0.127 (2017)	-	N/A	Yes 0.009 (2014) 0.004 (2015)	No 0.395 (2014) 0.245 (2015) 0.073 (2016)	Yes 0.788 (2014) 0.004 (2016) 0.263 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Chironomidae Density (no. per m <sup>2</sup> )									
n	5	5	5	5	5	5	5	5	5	5
Mean	239.50	1682.25	340.49	251.20	316.83	643.47	986.84	937.79	305.86	329.00
Minimum	144.28	360.69	216.41	0.00	190.44	245.27	115.42	346.26	57.71	115.00
Maximum	389.54	4385.96	476.11	462.00	398.20	1183.06	2885.50	1962.14	620.38	592.00
Median	230.84	1240.77	317.41	260.00	389.54	490.54	793.51	894.51	302.98	202.00
Standard deviation (n-1)	99.23	1580.94	111.10	177.33	107.70	368.62	1122.69	642.63	205.66	223.01
Standard error of the mean	44.37	707.02	49.69	79.31	48.17	164.85	502.08	287.39	91.97	99.73
COV (%)	41.43	93.98	32.63	70.59	33.99	57.29	113.77	68.53	67.24	67.78
+50% Mean	359.25	2523.37	510.73	376.80	475.24	965.20	1480.26	1406.68	458.80	493.50
-50% Mean	119.75	841.12	170.24	125.60	158.41	321.73	493.42	468.89	152.93	164.50
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2015)	Yes (2015)	-	Yes	Yes (both)	Yes (2013)	Yes (2014–2016)	Yes (2015, 2016)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	Yes 0.005	No 0.078 (2015)	No 0.016 (2015)	-	No 0.151 (2013)	No 0.332 (2013) 0.640 (2014)	No 0.062 (2013)	No 0.114 (2014) 0.265 (2015) 0.044 (2016)	No 0.265 (2015) 0.044 (2016)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Chironomidae Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	282.20	334.72	484.76	265.47	435.71	323.20	239.50	854.11	129.85	170.24	297.40
Minimum	147.16	57.71	86.57	14.43	72.14	101.00	0.00	72.14	28.86	14.43	58.00
Maximum	718.49	605.96	1038.78	490.54	937.79	577.00	504.96	2394.97	259.70	274.12	563.00
Median	173.13	216.41	432.83	288.55	346.26	274.00	100.99	533.82	115.42	173.13	202.00
Standard deviation (n-1)	245.96	254.72	349.49	205.71	325.40	209.89	239.38	900.62	106.67	105.73	223.16
Standard error of the mean	110.00	113.91	156.30	92.00	145.52	93.87	107.06	402.77	53.34	47.28	99.80
COV (%)	87.16	76.10	72.10	77.49	74.68	64.94	99.95	105.45	82.15	62.10	75.04
+25% Mean	423.30	502.08	727.15	398.20	653.57	484.80	359.25	1281.16	194.77	255.37	446.10
-25% Mean	141.10	167.36	242.38	132.73	217.86	161.60	119.75	427.05	64.92	85.12	148.70
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	No (all)	Yes (2013, 2016)	No (all)	-	Yes	Yes (2015)	Yes (2015)	Yes (2015, 2016, 2017)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.248 (2013)	N/A	No 0.379 (2013) 0.330 (2016)	N/A	-	No 0.089	No 0.036 (2015)	No 0.089 (2015)	No 0.347 (2015) 0.225 (2016) 0.447 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Plecoptera Density (no. per m <sup>2</sup> )									
n	5	5	5	5	5	5	5	5	5	5
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard error of the mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COV (%)	-	-	-	-	-	-	-	-	-	-
+50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	-	No	No (both)	No (all)	No (all)	No (all)
Modified Significance Level	N/A				N/A					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	-	N/A	N/A	N/A	N/A	N/A



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Plecoptera Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.89	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.43	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.45	0.00
Standard error of the mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.89	0.00
COV (%)	-	-	-	-	-	-	-	-	-	223.61	-
+25% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.33	0.00
-25% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.44	0.00
Benchmark Exceedance (temporal comparison)	-	N/A	No (both)	No (all)	No (all)	No (all)	-	No	No (both)	Yes (all)	Yes (2017)
Modified Significance Level	N/A						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A	No 0.121 (2014) 0.121 (2015) 0.144 (2016) 0.121 (2017)	No 0.121 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Trichoptera Density (no. per m <sup>2</sup> )									
n	5	5	5	5	5	5	5	5	5	5
Mean	8.66	31.74	51.94	0.00	19.04	25.97	2.89	11.54	5.77	2.80
Minimum	0.00	14.43	14.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	14.43	57.71	100.99	0.00	43.28	86.57	14.43	28.86	14.43	14.00
Median	14.43	28.86	43.28	0.00	17.31	14.43	0.00	14.43	0.00	0.00
Standard deviation (n-1)	7.90	18.81	40.29	0.00	16.65	34.45	6.45	12.07	7.90	6.26
Standard error of the mean	3.53	8.41	18.02	0.00	7.45	15.40	2.89	5.40	3.53	2.80
COV (%)	91.29	59.27	77.58	-	87.43	132.64	223.61	104.58	136.93	223.61
+50% Mean	12.98	47.61	77.91	0.00	28.57	38.95	4.33	17.31	8.66	4.20
-50% Mean	4.33	15.87	25.97	0.00	9.52	12.98	1.44	5.77	2.89	1.40
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2014, 2015, 2017)	-	No	Yes (both)	Yes (2014, 2015)	Yes (all)	Yes (2013, 2014, 2016, 2017)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.088	No 0.041 (2014) 0.737 (2015)	Yes 0.241 (2014) <b>0.004 (2015)</b> <b>0.001 (2017)</b>	-	N/A	No 0.042 (2013) 0.057 (2014)	No 0.547 (2014) 0.194 (2015)	No 0.130 (2013) 0.168 (2014) 0.600 (2015) 0.438 (2016)	No 0.027 (2013) 0.038 (2014) 0.140 (2016) 0.485 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Trichoptera Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	15.58	8.66	2.89	40.40	40.40	43.20	11.54	8.66	0.00	17.31	26.00
Minimum	8.66	0.00	0.00	0.00	0.00	29.00	0.00	0.00	0.00	0.00	0.00
Maximum	34.63	28.86	14.43	144.28	100.99	72.00	43.28	28.86	0.00	43.28	87.00
Median	8.66	0.00	0.00	14.43	14.43	43.00	0.00	0.00	0.00	14.43	14.00
Standard deviation (n-1)	11.29	12.90	6.45	58.96	49.35	17.56	18.81	12.90	0.00	18.81	36.15
Standard error of the mean	5.05	5.77	2.89	26.37	22.07	7.85	8.41	5.77	0.00	8.41	16.16
COV (%)	72.44	149.07	223.61	145.95	122.16	40.64	162.98	149.07	-	108.65	139.02
+25% Mean	23.37	12.98	4.33	60.60	60.60	64.80	17.31	12.98	0.00	25.97	39.00
-25% Mean	7.79	4.33	1.44	20.20	20.20	21.60	5.77	4.33	0.00	8.66	13.00
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (all)	Yes (2013–2015)	Yes (2013–2015)	-	No	Yes (both)	Yes (all)	Yes (all)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.132 (2013) 0.582 (2014)	No 0.741 (2013) 0.199 (2014) 0.066 (2015)	No 0.854 (2013) 0.255 (2014) 0.091 (2015)	No 0.106 (2013) 0.010 (2014) <b>0.002 (2015)</b>	-	N/A	No 0.268 (2014) 0.441 (2015)	No 0.835 (2014) 0.473 (2015) 0.189 (2016)	No 0.775 (2014) 0.424 (2015) 0.169 (2016) 0.924 (2017)

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***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	EPT Density (no. per m <sup>2</sup> )									
n	5	5	5	5	5	5	5	5	5	5
Mean	201.99	464.57	383.77	499.00	83.10	522.28	14.43	124.08	741.57	738.60
Minimum	158.70	245.27	288.55	346.00	51.94	57.71	0.00	43.28	115.42	418.00
Maximum	245.27	952.22	476.11	620.00	112.53	937.79	43.28	187.56	1673.59	1169.00
Median	201.99	375.12	389.54	505.00	95.22	649.24	0.00	115.42	432.83	519.00
Standard deviation (n-1)	36.78	282.98	66.59	108.25	29.10	370.85	20.40	63.38	655.43	356.63
Standard error of the mean	16.45	126.55	29.78	48.41	13.01	165.85	9.12	28.35	293.12	159.49
COV (%)	18.21	60.91	17.35	21.69	35.02	71.01	141.42	51.08	88.38	48.28
+50% Mean	302.98	696.85	575.66	748.50	124.65	783.41	21.64	186.11	1112.36	1107.90
-50% Mean	100.99	232.28	191.89	249.50	41.55	261.14	7.21	62.04	370.79	369.30
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2014)	Yes (2014)	-	Yes	Yes (both)	Yes (2014, 2015)	Yes (2013, 2015, 2016)	Yes (2013, 2015, 2016)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.017	No 0.084 (2014)	No 0.0084 (2014)	-	No 0.067	Yes 0.202 (2013) 0.002 (2014)	No 0.161 (2014) 0.088 (2015)	Yes 0.027 (2013) 0.0005 (2015) 0.075 (2016)	Yes 0.012 (2013) 0.0001 (2015) 0.037 (2016)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	EPT Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5		5	5	4	5	5
Mean	1959.83	727.15	435.71	271.24	392.43	216.40	357.80	1206.14	57.71	516.51	478.80
Minimum	805.06	230.84	259.70	28.86	201.99	173.00	201.99	432.83	0.00	245.27	159.00
Maximum	3038.43	1226.34	591.53	692.52	591.53	245.00	649.24	1615.88	216.41	649.24	750.00
Median	2337.26	822.37	461.68	144.28	317.41	231.00	274.12	1500.46	7.21	605.96	519.00
Standard deviation (n-1)	913.45	406.10	128.80	289.52	180.03	28.88	182.04	505.33	106.02	168.07	215.59
Standard error of the mean	408.51	181.61	57.60	129.48	80.51	12.91	81.41	225.99	53.01	75.16	96.42
COV (%)	46.61	55.85	29.56	106.74	45.87	13.34	50.88	41.90	183.71	32.54	45.03
+25% Mean	2939.75	1090.72	653.57	406.86	588.64	324.60	536.70	1809.21	86.57	774.76	718.20
-25% Mean	979.92	363.57	217.86	135.62	196.21	108.20	178.90	603.07	28.86	258.25	239.40
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2013)	Yes (2013, 2014)	Yes (2013)	Yes (2013, 2014, 2015)	-	Yes	Yes (both)	Yes (2015, 2016)	Yes (2015, 2016)
Modified Significance Level				0.0033					0.0050		
Significant Inter-annual Difference <sup>1</sup>	-	No 0.151	No 0.042 (2013)	Yes 0.0008 (2013) 0.057 (2014)	No 0.015 (2013)	Yes 0.0003 (2013) 0.031 (2014) 0.118 (2015)	-	No 0.032	Yes 0.226 (2014) 0.003 (2015)	No 0.126 (2015) 0.070 (2016)	No 0.053 (2015) 0.133 (2016)

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***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Ratio of EPT to Chironomidae									
n	5	5	5	4	5	5	2	5	5	5
Mean	0.96	0.41	1.25	1.99	0.28	0.77	0.03	5.92	3.20	3.90
Minimum	0.41	0.15	0.67	0.75	0.13	0.24	0.01	0.02	0.53	0.85
Maximum	1.40	0.84	1.80	3.58	0.46	1.41	0.05	29.00	7.50	9.38
Median	1.06	0.36	1.50	1.81	0.27	0.63	0.03	0.21	1.88	2.07
Standard deviation (n-1)	0.37	0.27	0.50	1.22	0.12	0.48	0.03	12.90	2.97	3.77
Standard error of the mean	0.16	0.12	0.22	0.61	0.05	0.22	0.02	5.77	1.33	1.69
COV (%)	38.27	66.71	39.60	61.39	41.16	63.17	90.42	218.01	92.87	96.73
+50% Mean	1.44	0.61	1.88	2.98	0.42	1.15	0.04	8.88	4.80	5.84
-50% Mean	0.48	0.20	0.63	0.99	0.14	0.38	0.01	2.96	1.60	1.95
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2015)	Yes (all)	-	Yes	Yes (both)	Yes (all)	Yes (2013–2015)	Yes (2013–2015)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.195	No 0.057 (2015)	Yes 0.032 (2014) <b>0.002 (2015)</b> 0.110 (2017)	-	No 0.319	No 0.252 (2013) 0.058 (2014)	No 0.968 (2013) 0.300 (2014) 0.265 (2015)	No 0.035 (2013) 0.265 (2014) 0.006 (2015)	No 0.023 (2013) 0.202 (2014) 0.021 (2015)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Ratio of EPT to Chironomidae										
n	5	5	5	5	5	5	4	5	2	5	5
Mean	8.44	5.25	1.82	1.88	1.57	1.02	2.56	2.70	0.65	5.90	2.09
Minimum	4.23	0.38	0.25	0.10	0.34	0.34	0.54	0.64	0.06	1.78	1.03
Maximum	13.50	14.25	5.33	4.43	3.80	2.00	6.43	6.00	1.25	17.00	2.75
Median	8.41	4.40	1.37	1.60	1.08	0.89	1.64	2.06	0.65	3.75	2.64
Standard deviation (n-1)	3.77	5.66	2.03	1.84	1.41	0.71	2.71	2.00	0.84	6.32	0.84
Standard error of the mean	1.68	2.53	0.91	0.82	0.63	0.32	1.35	0.90	0.60	2.83	0.38
COV (%)	44.63	107.85	111.26	97.52	89.66	69.75	105.57	74.12	129.39	107.04	40.16
+25% Mean	12.66	7.87	2.73	2.83	2.36	1.52	3.84	4.05	0.98	8.85	3.14
-25% Mean	4.22	2.62	0.91	0.94	0.79	0.51	1.28	1.35	0.33	2.95	1.05
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2013, 2014)	Yes (2013, 2014)	Yes (2013, 2014)	-	No	Yes (both)	Yes (all)	Yes (2016, 2017)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.018 (2013) 0.298 (2014)	No 0.015 (2013) 0.265 (2014)	No 0.015 (2013) 0.265 (2014)	No 0.006 (2013) 0.161 (2014)	-	N/A	No 0.264 (2014) 0.128 (2015)	No 0.186 (2014) 0.359 (2015) 0.027 (2016)	No 0.160 (2016) 0.285 (2017)

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***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Percent Ephemeroptera									
n	5	5	5	5	5	5	5	5	5	
Mean	29.60	16.63	29.98	56.40	5.63	29.67	0.71	8.66	58.62	59.80
Minimum	22.00	8.70	20.00	38.00	2.53	12.12	0.00	1.35	28.57	36.00
Maximum	46.43	22.08	50.98	68.00	9.52	41.90	3.06	13.75	82.86	83.00
Median	26.79	19.48	27.00	62.00	5.48	29.11	0.00	9.92	57.97	57.00
Standard deviation (n-1)	9.71	6.26	12.20	12.92	2.72	11.87	1.33	4.57	22.50	22.13
Standard error of the mean	4.34	2.80	5.46	5.78	1.22	5.31	0.60	2.04	10.06	9.90
COV (%)	32.80	37.66	40.69	22.90	48.32	40.03	188.12	52.79	38.38	37.01
+50% Mean	44.40	24.94	44.97	84.60	8.44	44.50	1.06	12.99	87.93	89.70
-50% Mean	14.80	8.31	14.99	28.20	2.81	14.83	0.35	4.33	29.31	29.90
Benchmark Exceedance (temporal comparison)	-	No	Yes (2015)	Yes (all)	-	Yes	Yes (both)	Yes (all)	Yes (all)	Yes (2013, 2014, 2015, 2016)
Modified Significance Level		0.0083					0.0033			
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.035 (2015)	Yes 0.002 (2014) < 0.0001 (2015) 0.006 (2017)	-	No 0.072	No 0.314 (2013) 0.005 (2014)	No 0.615 (2013) 0.196 (2014) 0.131 (2015)	Yes 0.005 (2013) 0.297 (2014) 0.0001 (2015) 0.019 (2016)	Yes 0.004 (2013) 0.281 (2014) 0.0001 (2015) 0.018 (2016)



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Percent Ephemeroptera										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	61.58	39.17	35.43	16.27	26.09	12.60	19.15	32.06	11.76	29.81	17.80
Minimum	50.28	14.71	14.40	0.00	13.27	7.00	5.54	17.61	0.00	21.62	8.00
Maximum	70.82	53.77	46.07	36.19	35.85	19.00	49.45	46.82	44.12	36.84	26.00
Median	63.43	49.13	45.71	13.04	30.23	10.00	14.81	29.73	1.47	29.63	23.00
Standard deviation (n-1)	9.69	17.62	14.84	15.75	11.00	5.50	17.58	10.69	21.61	5.46	9.01
Standard error of the mean	4.33	7.88	6.64	7.04	4.92	2.46	7.86	4.78	10.81	2.44	4.03
COV (%)	15.73	44.98	41.88	96.84	42.15	43.69	91.81	33.33	183.71	18.30	50.62
+25% Mean	92.37	58.75	53.14	24.40	39.14	18.90	28.72	48.08	17.65	44.71	26.70
-25% Mean	30.79	19.58	17.71	8.13	13.05	6.30	9.57	16.03	5.88	14.90	8.90
Benchmark Exceedance (temporal comparison)	-	No	No (both)	Yes (all)	Yes (2013, 2016)	Yes (2013, 2014, 2015, 2017)	-	Yes	Yes (2015)	Yes (2014, 2016)	Yes (2016)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	Yes < 0.0001 (2013) 0.011 (2014) 0.029 (2015)	Yes 0.0002 (2013) 0.246 (2016)	Yes < 0.0001 (2013) 0.0037 (2014) 0.011 (2015) 0.116 (2017)	-	No 0.151	No 0.039 (2015)	No 0.232 (2014) 0.063 (2016)	No 0.518 (2016)

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***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Percent of Oligochaeta + Chironomidae									
n	5	5	5	5	5	5	5	5	5	5
Mean	41.13	61.86	39.60	26.40	33.15	53.67	84.94	59.69	32.87	28.00
Minimum	30.00	52.17	25.71	0.00	25.32	40.00	62.50	52.50	11.43	9.00
Maximum	54.00	70.19	65.88	51.00	44.52	63.64	98.21	72.73	53.57	51.00
Median	39.29	62.99	35.29	28.00	30.95	56.33	93.33	56.20	31.88	27.00
Standard deviation (n-1)	9.39	6.88	15.78	18.82	7.74	10.58	15.70	8.60	18.84	17.38
Standard error of the mean	4.20	3.08	7.06	8.42	3.46	4.73	7.02	3.85	8.43	7.77
COV (%)	22.84	11.12	39.86	71.30	23.34	19.72	18.48	14.41	57.34	62.06
+50% Mean	61.70	92.79	59.40	39.60	49.73	80.50	127.41	89.54	49.30	42.00
-50% Mean	20.57	30.93	19.80	13.20	16.58	26.83	42.47	29.85	16.43	14.00
Benchmark Exceedance (temporal comparison)	-	Yes	No	Yes (2015)	-	Yes	Yes (both)	Yes (2013)	Yes (2015)	Yes (2015, 2016)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.029	N/A	Yes 0.001 (2015)	-	No 0.012	Yes < 0.0001 (2013) 0.002 (2014)	Yes 0.006 (2013)	Yes < 0.0001 (2015)	Yes < 0.0001 (2015) 0.001 (2016)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Percent of Oligochaeta + Chironomidae										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	13.64	25.67	36.36	37.37	32.39	22.40	19.89	22.57	44.09	11.62	16.20
Minimum	7.61	7.55	8.57	3.39	15.09	13.00	1.23	7.92	36.36	1.85	9.00
Maximum	20.00	52.53	64.00	75.36	57.52	31.00	36.22	31.56	55.88	19.61	22.00
Median	14.35	14.96	37.00	37.14	29.46	26.00	21.98	27.15	42.06	10.56	19.00
Standard deviation (n-1)	4.50	19.92	19.61	30.08	16.56	7.57	13.38	9.49	8.48	6.70	6.69
Standard error of the mean	2.01	8.91	8.77	13.45	7.40	3.39	5.98	4.24	4.24	3.00	2.99
COV (%)	32.95	77.62	53.94	80.49	51.11	33.79	67.29	42.03	19.22	57.67	41.27
+25% Mean	20.47	38.50	54.54	56.06	48.59	33.60	29.83	33.85	66.14	17.42	24.30
-25% Mean	6.82	12.83	18.18	18.69	16.20	11.20	9.94	11.28	22.05	5.81	8.10
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2013)	Yes (2013)	Yes (2013)	Yes (2013)	-	No	Yes (both)	Yes (2016)	Yes (2016)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.289	No 0.044 (2013)	No 0.091 (2013)	No 0.048 (2013)	No 0.257 (2013)	-	N/A	Yes 0.001 (2014) 0.003 (2015)	Yes < 0.0001 (2016)	Yes 0.0003 (2016)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	EPT Richness (Family level)									
n	5	5	5	5	5	5	5	5	5	5
Mean	1.60	1.60	3.20	1.20	2.40	2.20	0.60	1.60	1.40	1.20
Minimum	1.00	1.00	2.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Maximum	2.00	2.00	5.00	2.00	3.00	4.00	2.00	2.00	2.00	2.00
Median	2.00	2.00	3.00	1.00	3.00	2.00	0.00	2.00	1.00	1.00
Standard deviation (n-1)	0.55	0.55	1.30	0.45	0.89	1.10	0.89	0.55	0.55	0.45
Standard error of the mean	0.24	0.24	0.58	0.20	0.40	0.49	0.40	0.24	0.24	0.20
COV (%)	34.23	34.23	40.75	37.27	37.27	49.79	149.07	34.23	39.12	37.27
+25% Mean	2.00	2.00	4.00	1.50	3.00	2.75	0.75	2.00	1.75	1.50
-25% Mean	1.20	1.20	2.40	0.90	1.80	1.65	0.45	1.20	1.05	0.90
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (all)	-	No	Yes (both)	Yes (2013, 2014, 2015)	Yes (2013, 2014, 2015)	Yes (2013, 2014, 2015, 2016)
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.042 (2014) 0.042 (2015)	Yes 0.323 (2014) 0.323 (2015) 0.003 (2016)	-	N/A	Yes 0.0029 (2013) 0.012 (2014)	No 0.215 (2013) 0.434 (2014) 0.082 (2015)	No 0.093 (2013) 0.222 (2014) 0.194 (2015)	No 0.034 (2013) 0.097 (2014) 0.390 (2015) 0.380 (2016)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	EPT Richness (Family level)										
n	5	5	5	5	5	5	5	5	4	5	5
Mean	3.00	1.80	1.00	2.00	2.60	2.80	2.00	1.40	0.75	1.80	1.80
Minimum	2.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	0.00	1.00	1.00
Maximum	5.00	3.00	1.00	3.00	5.00	4.00	4.00	2.00	2.00	2.00	3.00
Median	3.00	2.00	1.00	2.00	2.00	2.00	2.00	1.00	0.50	2.00	2.00
Standard deviation (n-1)	1.22	0.84	0.00	0.71	1.82	1.10	1.22	0.55	0.96	0.45	0.84
Standard error of the mean	0.55	0.37	0.00	0.32	0.81	0.49	0.55	0.24	0.48	0.20	0.37
COV (%)	40.82	46.48	0.00	35.36	69.87	39.12	61.24	39.12	127.66	24.85	46.48
+25% Mean	3.75	2.25	1.25	2.50	3.25	3.50	2.50	1.75	0.94	2.25	2.25
-25% Mean	2.25	1.35	0.75	1.50	1.95	2.10	1.50	1.05	0.56	1.35	1.35
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2013, 2015)	Yes (2014–2016)	Yes (2014–2016)	-	Yes	Yes (2014, 2015)	Yes (2015, 2016)	Yes (2015, 2016)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.114 (2013)	Yes 0.002 (2013) 0.142 (2014)	No 0.236 (2013) 0.062 (2015)	No 0.522 (2014) 0.035 (2015) 0.807 (2016)	No 0.182 (2014) 0.005 (2015) 0.347 (2016)	-	No 0.410 (2014)	No 0.081 (2014) 0.332 (2015)	No 0.332 (2015) 0.059 (2016)	No 0.438 (2015) 0.089 (2016)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Total Organic Carbon (TOC, %)									
n	5	5	5	5	5	5	5	5	5	5
Mean	2.17	2.51	3.16	2.07	1.28	2.38	3.03	2.46	2.36	1.86
Minimum	1.51	1.67	2.01	1.09	1.13	1.67	0.89	1.49	2.03	1.16
Maximum	3.97	3.26	4.09	2.94	1.48	3.13	6.83	3.43	2.64	2.44
Median	1.65	2.67	3.29	2.45	1.25	2.28	1.36	2.48	2.52	1.89
Standard deviation (n-1)	1.05	0.61	0.79	0.80	0.16	0.61	2.68	0.92	0.28	0.50
Standard error of the mean	0.47	0.27	0.35	0.36	0.07	0.27	1.20	0.41	0.13	0.22
COV (%)	48.24	24.25	24.87	38.64	12.33	25.47	88.62	37.33	12.04	26.74
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	N/A	No 0.524 (2014)	No 0.075 (2014) 0.228 (2015)	No 0.851 (2014) 0.412 (2015) 0.052 (2017)	N/A	No 0.012 (2013)	No 0.118 (2013) 0.341 (2014)	No 0.013 (2013) 0.971 (2014) 0.360 (2015)	No 0.008 (2013) 0.886 (2014) 0.273 (2015) 0.857 (2016)	No 0.146 (2013) 0.289 (2014) 0.914 (2015) 0.306 (2016) 0.229 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Total Organic Carbon (TOC, %)										
n	5	5	5	5	5	5	5	5	3	5	5
Mean	1.86	2.51	2.64	2.84	3.38	2.20	1.16	0.84	3.82	1.94	1.02
Minimum	0.49	1.26	1.04	1.65	1.56	1.48	0.35	0.24	0.69	1.00	0.24
Maximum	3.61	5.60	3.78	4.42	5.23	3.30	2.52	1.80	7.11	4.35	2.22
Median	1.68	1.64	2.87	2.90	3.45	2.01	0.40	0.74	3.67	1.46	0.60
Standard deviation (n-1)	1.13	1.78	1.03	1.11	1.45	0.76	1.08	0.59	3.21	1.37	0.82
Standard error of the mean	0.50	0.80	0.46	0.50	0.65	0.34	0.48	0.26	1.85	0.61	0.37
COV (%)	60.39	70.98	39.12	39.08	42.91	34.47	93.80	70.04	84.03	70.50	80.05
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	N/A	No 0.422 (2013)	No 0.337 (2013) 0.873 (2014)	No 0.231 (2013) 0.685 (2014) 0.805 (2015)	No 0.067 (2013) 0.282 (2014) 0.357 (2015) 0.498 (2016)	No 0.672 (2013) 0.701 (2014) 0.587 (2015) 0.432 (2016) 0.150 (2017)	N/A	No 0.834 (2014)	No 0.122 (2014) 0.084 (2015)	No 0.208 (2014) 0.142 (2015) 0.647 (2016)	No 0.981 (2014) 0.816 (2015) 0.127 (2016) 0.217 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Sand (%)									
n	5	5	5	5	5	5	5	5	5	5
Mean	39.30	36.68	51.96	40.08	11.22	10.18	16.10	18.46	12.78	12.22
Minimum	25.90	24.50	35.80	22.70	9.38	3.46	7.40	7.40	6.80	7.40
Maximum	55.00	58.20	70.30	63.50	12.60	18.20	30.60	49.10	17.40	17.70
Median	40.60	29.60	52.40	27.40	11.40	9.60	12.20	11.80	14.30	12.00
Standard deviation (n-1)	10.78	13.62	15.30	20.99	1.41	5.43	9.82	17.27	5.04	3.92
Standard error of the mean	4.82	6.09	6.84	9.39	0.63	2.43	4.39	7.72	2.26	1.75
COV (%)	27.42	37.14	29.45	52.38	12.61	53.33	61.01	93.55	39.46	32.06
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	N/A	No 0.794 (2014)	No 0.218 (2014) 0.142 (2015)	No 0.938 (2014) 0.735 (2015) 0.247 (2017)	N/A	No 0.602 (2013)	No 0.640 (2013) 0.323 (2014)	No 0.733 (2013) 0.388 (2014) 0.900 (2015)	No 0.801 (2013) 0.440 (2014) 0.829 (2015) 0.928 (2016)	No 0.829 (2013) 0.461 (2014) 0.801 (2015) 0.900 (2016) 0.971 (2017)



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Sand (%)										
n	5	5	5	5	5	5	5	5	3	5	5
Mean	38.84	41.86	25.93	66.90	50.02	43.14	74.86	68.44	68.17	73.60	76.64
Minimum	4.01	10.60	1.22	35.50	1.80	1.30	54.00	16.00	42.90	49.70	37.60
Maximum	75.70	55.50	65.00	91.50	66.80	70.90	90.40	88.60	95.70	89.20	95.10
Median	49.60	52.90	18.80	68.80	61.40	47.50	74.10	78.20	65.90	82.30	90.20
Standard deviation (n-1)	30.62	19.27	26.92	20.05	27.16	26.79	15.76	30.10	26.47	16.48	24.41
Standard error of the mean	13.69	8.62	12.04	8.97	12.15	11.98	7.05	13.46	15.28	7.37	10.92
COV (%)	78.83	46.04	103.81	29.98	54.31	62.10	21.05	43.98	38.84	22.39	31.85
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	N/A	No 0.886 (2013)	No 0.419 (2013) 0.506 (2014)	No 0.095 (2013) 0.070 (2014) 0.013(2015)	No 0.506 (2013) 0.419 (2014) 0.141 (2015) 0.314 (2016)	No 0.900 (2013) 0.788 (2014) 0.350 (2015) 0.122 (2016) 0.590 (2017)	N/A	No 0.744 (2014)	No 0.861 (2014) 0.914 (2015)	No 0.744 (2014) 1.00 (2015) 0.914 (2016)	No 0.576 (2014) 0.376 (2015) 0.510 (2016) 0.376 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Silt (%)									
n	5	5	5	5	5	5	5	5	5	5
Mean	41.32	45.76	33.36	42.32	41.46	49.96	38.70	29.20	63.08	61.20
Minimum	30.00	29.80	21.60	25.50	38.20	42.10	20.30	15.90	55.20	37.20
Maximum	49.10	57.60	46.40	62.90	42.80	61.20	51.10	41.30	68.00	73.20
Median	40.20	46.60	30.80	43.00	42.80	50.80	40.40	30.70	64.90	68.30
Standard deviation (n-1)	7.54	10.77	11.95	16.04	2.04	7.67	12.53	10.45	5.08	14.51
Standard error of the mean	3.37	4.82	5.34	7.17	0.91	3.43	5.60	4.67	2.27	6.49
COV (%)	18.25	23.53	35.82	37.90	4.91	15.36	32.37	35.78	8.05	23.70
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	N/A	No 0.566 (2014)	No 0.309 (2014) 0.121 (2015)	No 0.897 (2014) 0.656 (2015) 0.254 (2017)	N/A	No 0.179 (2013)	No 0.657 (2013) 0.079 (2014)	Yes 0.057 (2013) <b>0.002 (2014)</b> 0.135 (2015)	Yes <b>0.002 (2013)</b> 0.043 (2014) <b>0.001 (2015)</b> <b>&lt; 0.0001 (2016)</b>	Yes 0.004 (2013) 0.080 (2014) <b>0.001 (2015)</b> <b>&lt; 0.0001 (2016)</b> 0.762 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Silt (%)										
n	5	5	5	5	5	5	5	5	3	5	5
Mean	46.58	41.72	62.06	21.66	40.58	39.38	14.80	15.48	21.30	20.90	13.50
Minimum	16.50	34.90	26.50	4.20	24.90	20.80	4.72	7.68	2.60	7.50	2.00
Maximum	71.60	51.40	87.70	46.60	83.30	80.60	27.40	25.10	35.50	46.30	33.60
Median	40.30	36.10	70.30	18.20	32.90	28.40	17.70	15.40	25.80	13.10	5.70
Standard deviation (n-1)	24.17	8.67	26.49	15.45	24.23	23.97	9.66	7.12	16.91	15.82	13.88
Standard error of the mean	10.81	3.88	11.85	6.91	10.84	10.72	4.32	3.19	9.76	7.07	6.21
COV (%)	51.90	20.77	42.69	71.32	59.72	60.88	65.29	46.03	79.37	75.69	102.80
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	N/A	No 0.788 (2013)	No 0.369 (2013) 0.530 (2014)	No 0.072 (2013) 0.039 (2014) 0.007 (2015)	No 0.628 (2013) 0.451 (2014) 0.167 (2015) 0.190 (2016)	No 0.615 (2013) 0.440 (2014) 0.161 (2015) 0.196 (2016) 0.986 (2017)	N/A	No 0.934 (2014)	No 0.494 (2014) 0.539 (2015)	No 0.459 (2014) 0.509 (2015) 0.966 (2016)	No 0.874 (2014) 0.809 (2015) 0.413 (2016) 0.370 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

***Nearshore Habitat – continued.***

Site	SPLIT				STL3KM					
Year	2014	2015	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Clay (%)									
n	5	5	5	5	5	5	5	5	5	5
Mean	19.38	17.54	14.66	17.60	47.32	39.82	45.22	52.32	24.16	26.60
Minimum	15.00	12.00	8.10	8.90	44.60	35.30	36.80	35.00	17.80	19.50
Maximum	25.00	24.00	18.90	29.50	52.40	48.60	58.30	66.60	30.50	45.10
Median	19.10	16.40	15.90	14.50	45.80	38.20	43.90	52.90	25.20	20.90
Standard deviation (n-1)	3.60	5.50	4.13	8.49	3.37	5.16	8.82	12.72	4.76	10.89
Standard error of the mean	1.61	2.46	1.85	3.80	1.51	2.31	3.94	5.69	2.13	4.87
COV (%)	18.57	31.33	28.18	48.26	7.13	12.96	19.50	24.30	19.70	40.93
Modified Significance Level	0.0083				0.0033					
Significant Inter-annual Difference <sup>1</sup>	N/A	No 0.620 (2014)	No 0.213 (2014) 0.440 (2015)	No 0.631 (2014) 0.987 (2015) 0.431 (2017)	N/A	No 0.169 (2013)	No 0.695 (2013) 0.317 (2014)	No 0.353 (2013) 0.026 (2014) 0.192 (2015)	Yes 0.0002 (2013) 0.007 (2014) 0.001 (2015) < 0.0001 (2016)	Yes 0.001 (2013) 0.020 (2014) 0.002 (2015) < 0.0001 (2016) 0.648 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Clay (%)										
n	5	5	5	5	5	5	5	5	3	5	5
Mean	14.58	16.39	12.01	11.48	9.40	17.50	10.34	16.09	10.53	5.50	9.80
Minimum	7.82	8.36	8.46	4.40	4.40	8.30	4.18	2.94	1.70	3.30	2.80
Maximum	25.00	37.90	16.50	17.90	14.80	36.10	27.20	58.90	21.60	10.40	28.70
Median	11.90	12.20	10.90	13.40	8.40	13.20	6.88	6.43	8.30	4.60	4.00
Standard deviation (n-1)	6.96	12.17	3.88	5.27	3.98	10.99	9.55	24.04	10.14	2.83	10.94
Standard error of the mean	3.11	5.44	1.73	2.36	1.78	4.92	4.27	10.75	5.85	1.26	4.89
COV (%)	47.74	74.25	32.27	45.88	42.33	62.81	92.42	149.42	96.23	51.43	111.58
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	N/A	No 1.00 (2013)	No 0.829 (2013) 0.829 (2014)	No 0.653 (2013) 0.653 (2014) 0.815 (2015)	No 0.196 (2013) 0.196 (2014) 0.281 (2015) 0.398 (2016)	No 0.733 (2013) 0.733 (2014) 0.578 (2015) 0.429 (2016) 0.102 (2017)	N/A	No 0.709 (2014)	No 0.736 (2014) 0.989 (2015)	No 0.414 (2014) 0.658 (2015) 0.711 (2016)	No 0.470 (2014) 0.727 (2015) 0.772 (2016) 0.926 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Total Invertebrate Density (no. per m <sup>2</sup> )											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	7978.42	8973.92	3433.75	2392.08	2394.97	2559.40	1101.11	1465.84	184.67	675.21	1229.22	1030.00
Minimum	4039.70	6174.98	3000.92	1962.14	1370.61	2121.00	709.83	403.97	43.28	447.25	173.13	505.00
Maximum	10806.21	11311.17	3938.71	2957.64	3852.15	3015.00	1679.36	2683.52	346.26	1197.48	2481.53	1313.00
Median	8281.39	9060.48	3477.03	2221.84	2207.41	2395.00	900.28	1428.32	158.70	577.10	923.36	1125.00
Standard deviation (n-1)	2521.25	2377.87	348.06	423.64	1074.05	385.86	415.67	841.05	135.50	301.67	1016.83	308.48
Standard error of the mean	1127.54	1063.42	155.66	189.46	480.33	172.56	185.89	376.13	60.60	134.91	454.74	137.96
COV (%)	31.60	26.50	10.14	17.71	44.85	15.08	37.75	57.38	73.37	44.68	82.72	29.95
+50% Mean	11967.62	13460.87	5150.62	3588.12	3592.45	3839.10	1651.66	2198.75	277.01	1012.81	1843.84	1545.00
-50% Mean	3989.21	4486.96	1716.87	1196.04	1197.48	1279.70	550.55	732.92	92.34	337.60	614.61	515.00
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2013, 2014)	Yes (2013, 2014)	Yes (2013, 2014)	-	No	Yes (both)	Yes (2014, 2015)	Yes (2015, 2016)	Yes (2015, 2016)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.141 (2013) 0.098 (2014)	Yes 0.001 (2013) 0.0007 (2014)	Yes 0.003 (2013) 0.002 (2014)	Yes 0.005 (2013) 0.0029 (2014)	-	N/A	Yes 0.023 (2013) 0.002 (2014)	No 0.046 (2014) 0.204 (2015)	No 0.010 (2015) 0.153 (2016)	No 0.034 (2015) 0.355 (2016)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Total Invertebrate Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	1878.46	1488.92	1249.42	1073.41	2242.04	1705.40	2767.20	2594.07	2014.08	2285.32	2421.00
Minimum	0.00	1139.77	894.51	504.96	1471.61	981.00	2135.27	1255.19	995.50	1327.33	1674.00
Maximum	2778.74	1890.00	1702.45	1976.57	3231.76	2251.00	3231.76	3433.75	2871.08	3433.75	3059.00
Median	2198.75	1312.90	1125.35	865.65	2077.56	1818.00	2856.65	2452.68	2293.98	1904.43	2453.00
Standard deviation (n-1)	1079.20	340.56	313.38	578.87	676.68	477.75	447.53	899.00	848.14	933.09	493.49
Standard error of the mean	482.63	152.30	140.15	258.88	302.62	213.65	200.14	402.04	379.30	417.29	220.70
COV (%)	57.45	22.87	25.08	53.93	30.18	28.01	16.17	34.66	42.11	40.83	20.38
+50% Mean	2817.69	2233.38	1874.13	1610.11	3363.05	2558.10	4150.80	3891.10	3021.12	3427.98	3631.50
-50% Mean	939.23	744.46	624.71	536.70	1121.02	852.70	1383.60	1297.03	1007.04	1142.66	1210.50
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (2014–2016)	Yes (2016)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	No 0.072 (2014) 0.020 (2015) 0.007 (2016)	No 0.127 (2016)	-	N/A	N/A	N/A	N/A

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Total Richness (Family level)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	8.60	8.80	9.60	7.80	8.20	6.20	7.40	5.40	2.80	5.20	5.80	7.60
Minimum	7.00	7.00	8.00	6.00	5.00	5.00	5.00	3.00	2.00	3.00	4.00	5.00
Maximum	10.00	10.00	11.00	10.00	11.00	7.00	10.00	7.00	5.00	9.00	8.00	10.00
Median	9.00	9.00	9.00	8.00	8.00	7.00	8.00	6.00	2.00	4.00	6.00	7.00
Standard deviation (n-1)	1.52	1.30	1.34	1.79	2.39	1.10	2.30	1.52	1.30	2.39	1.48	1.95
Standard error of the mean	0.68	0.58	0.60	0.80	1.07	0.49	1.03	0.68	0.58	1.07	0.66	0.87
COV (%)	17.63	14.82	13.98	22.93	29.12	17.67	31.11	28.08	46.57	45.91	25.57	25.65
+25% Mean	10.75	11.00	12.00	9.75	10.25	7.75	9.25	6.75	3.50	6.50	7.25	9.50
-25% Mean	6.45	6.60	7.20	5.85	6.15	4.65	5.55	4.05	2.10	3.90	4.35	5.70
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	Yes (2013–2015)	-	Yes	Yes (both)	Yes (2013, 2015)	Yes (2015)	Yes (2014–2017)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	N/A	Yes 0.028 (2013) 0.019 (2014) 0.0030 (2015)	-	No 0.091	Yes 0.0005 (2013) 0.031 (2014)	No 0.045 (2013) 0.064 (2015)	No 0.014 (2015)	Yes 0.064 (2014) 0.0003 (2015) 0.031 (2016) 0.126 (2017)



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Total Richness (Family level)										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	4.80	5.00	4.20	6.00	6.20	6.00	4.20	4.00	5.00	5.60	5.00
Minimum	0.00	3.00	3.00	3.00	4.00	4.00	3.00	3.00	4.00	5.00	4.00
Maximum	6.00	6.00	6.00	9.00	9.00	8.00	5.00	5.00	6.00	7.00	6.00
Median	6.00	5.00	4.00	7.00	6.00	6.00	5.00	4.00	5.00	5.00	5.00
Standard deviation (n-1)	2.68	1.22	1.10	2.45	1.79	1.58	1.10	0.71	1.00	0.89	0.71
Standard error of the mean	1.20	0.55	0.49	1.10	0.80	0.71	0.49	0.32	0.45	0.40	0.32
COV (%)	55.90	24.49	26.08	40.82	28.85	26.35	26.08	17.68	20.00	15.97	14.14
+50% Mean	6.00	6.25	5.25	7.50	7.75	7.50	5.25	5.00	6.25	7.00	6.25
-50% Mean	3.60	3.75	3.15	4.50	4.65	4.50	3.15	3.00	3.75	4.20	3.75
Benchmark Exceedance (temporal comparison)	-	No	No	Yes (2013, 2015)	Yes (2013, 2015)	Yes (2013, 2015)	-	No	Yes (2015)	Yes (2014, 2015)	Yes (2015)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	No 0.399 (2013) 0.182 (2015)	No 0.241 (2013) 0.098 (2015)	No 0.313 (2013) 0.135 (2015)	-	N/A	No 0.098 (2015)	No 0.048 (2014) 0.011 (2015)	No 0.089 (2015)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site		SPLIT					STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric												
Simpson's Diversity Index												
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	0.64	0.57	0.55	0.54	0.50	0.41	0.50	0.53	0.35	0.52	0.65	0.59
Minimum	0.48	0.48	0.36	0.30	0.35	0.35	0.37	0.51	0.09	0.26	0.49	0.36
Maximum	0.76	0.61	0.71	0.66	0.59	0.53	0.59	0.57	0.60	0.71	0.79	0.74
Median	0.69	0.59	0.64	0.58	0.52	0.38	0.54	0.52	0.32	0.54	0.72	0.61
Standard deviation (n-1)	0.12	0.05	0.16	0.15	0.09	0.07	0.11	0.02	0.19	0.20	0.14	0.15
Standard error of the mean	0.05	0.02	0.07	0.07	0.04	0.03	0.05	0.01	0.08	0.09	0.06	0.07
COV (%)	18.67	9.05	29.89	26.97	18.81	17.50	21.36	4.61	53.47	37.61	21.73	25.71
+25% Mean	0.80	0.71	0.69	0.68	0.63	0.51	0.62	0.66	0.44	0.65	0.82	0.74
-25% Mean	0.48	0.43	0.41	0.41	0.38	0.31	0.37	0.40	0.27	0.39	0.49	0.44
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	Yes (2013–2016)	-	No	Yes (2013, 2014)	Yes (2015)	Yes (2013, 2015, 2016)	Yes (2015)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	N/A	No 0.004 (2013) 0.038 (2014) 0.067 (2015) 0.080 (2016)	-	N/A	No 0.135 (2013) 0.073 (2014)	No 0.085 (2015)	No 0.105 (2013) 0.0036 (2015) 0.165 (2016)	No 0.017 (2015)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Simpson's Diversity Index										
n	4	5	5	5	5	5	5	5	5	5	5
Mean	0.30	0.40	0.59	0.54	0.52	0.58	0.53	0.40	0.60	0.55	0.40
Minimum	0.24	0.16	0.48	0.36	0.43	0.49	0.50	0.29	0.51	0.49	0.31
Maximum	0.32	0.52	0.64	0.64	0.72	0.64	0.56	0.59	0.65	0.61	0.51
Median	0.31	0.44	0.60	0.54	0.46	0.59	0.53	0.31	0.61	0.54	0.40
Standard deviation (n-1)	0.04	0.14	0.07	0.11	0.12	0.07	0.02	0.13	0.06	0.04	0.08
Standard error of the mean	0.02	0.06	0.03	0.05	0.05	0.03	0.01	0.06	0.03	0.02	0.03
COV (%)	11.92	35.73	11.46	20.62	23.67	11.57	4.12	33.16	9.37	7.87	18.73
+50% Mean	0.37	0.50	0.73	0.67	0.65	0.72	0.66	0.50	0.75	0.68	0.50
-50% Mean	0.22	0.30	0.44	0.40	0.39	0.43	0.40	0.30	0.45	0.41	0.30
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2013, 2014)	Yes (2013, 2014)	Yes (2013, 2014)	-	Yes (2014)	Yes (2015)	Yes (2015)	Yes (2014, 2016, 2017)
Modified Significance Level	0.00333						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.143	Yes 0.0002 (2013) 0.006 (2014)	Yes 0.001 (2013) 0.035 (2014)	Yes 0.0031 (2013) 0.071 (2014)	Yes 0.00329 (2013) 0.009 (2014)	-	No 0.112	Yes 0.004 (2015)	No 0.059 (2015)	Yes 0.086 (2014) 0.003 (2016) 0.043 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Ephemeroptera Density (no. per m <sup>2</sup> )											
n	5	5	5	5	5		5	5	5	5	5	5
Mean	1281.16	643.47	219.30	493.42	403.97	430.00	64.06	54.82	0.00	72.14	554.02	603.20
Minimum	375.12	346.26	129.85	274.12	288.55	231.00	8.66	0.00	0.00	14.43	0.00	43.00
Maximum	1587.03	1038.78	360.69	649.24	548.25	519.00	95.22	100.99	0.00	187.56	1428.32	1039.00
Median	1558.17	533.82	173.13	490.54	418.40	491.00	69.25	43.28	0.00	28.86	274.12	664.00
Standard deviation (n-1)	520.83	277.07	95.92	144.06	109.40	119.94	36.01	40.03	0.00	77.02	612.50	368.53
Standard error of the mean	232.92	123.91	42.90	64.42	48.93	53.64	16.10	17.90	0.00	34.45	273.92	164.81
COV (%)	40.65	43.06	43.74	29.20	27.08	27.89	56.21	73.02	-	106.77	110.56	61.10
+50% Mean	1921.75	965.20	328.95	740.13	605.96	645.00	96.09	82.24	0.00	108.21	831.02	904.80
-50% Mean	640.58	321.73	109.65	246.71	201.99	215.00	32.03	27.41	0.00	36.07	277.01	301.60
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2013, 2015)	Yes (2013, 2015)	Yes (2013, 2015)	-	No	Yes (both)	Yes (2015)	Yes (all)	Yes (2013–2016)
Modified Significance Level				0.0033						0.0033		
Significant Inter-annual Difference <sup>1</sup>	N/A	N/A	Yes 0.0002 (2013) 0.006 (2014)	No 0.141 (2013) 0.025 (2015)	No 0.028 (2013) 0.127 (2015)	No 0.062 (2013) 0.064 (2015)	N/A	N/A	No 0.043 (2013) 0.083 (2014)	No 0.049 (2015)	Yes 0.255 (2013) 0.153 (2014) 0.002 (2015) 0.233 (2016)	Yes 0.120 (2013) 0.065 (2014) 0.0003 (2015) 0.108 (2016)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Ephemeroptera Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	1563.37	1093.61	605.96	655.01	559.79	297.40	831.02	282.78	577.10	631.93	242.60
Minimum	0.00	937.79	490.54	331.83	274.12	173.00	692.52	187.56	375.12	461.68	159.00
Maximum	2276.66	1240.77	663.67	1082.06	807.94	534.00	966.64	375.12	807.94	836.80	274.00
Median	1817.87	1038.78	620.38	678.09	620.38	289.00	851.22	331.83	562.67	678.09	260.00
Standard deviation (n-1)	894.76	133.56	68.44	311.88	204.65	144.50	115.24	88.70	193.30	160.46	47.13
Standard error of the mean	400.15	59.73	30.61	139.48	91.52	64.62	51.54	39.67	86.44	71.76	21.08
COV (%)	57.23	12.21	11.29	47.61	36.56	48.59	13.87	31.37	33.49	25.39	19.43
+50% Mean	2345.05	1640.41	908.93	982.51	839.68	446.10	1246.54	424.17	865.65	947.89	363.90
-50% Mean	781.68	546.80	302.98	327.50	279.89	148.70	415.51	141.39	288.55	315.96	121.30
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	Yes (2013)	Yes (2013)	Yes (2013–2016)	-	Yes	Yes (2015)	Yes (2015)	Yes (2014, 2016, 2017)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	N/A	N/A	No 0.091 (2013)	No 0.167 (2013)	No 0.055 (2013)	Yes 0.002 (2013) 0.001 (2014) 0.141 (2015) 0.075 (2016)	N/A	Yes < 0.0001	Yes 0.002 (2015)	Yes 0.0004 (2015)	Yes < 0.0001 (2014) 0.006 (2016) 0.027 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

SPLIT							STL3KM					
Site	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Percent EPT (EPT Index)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	19.60	8.09	8.14	23.09	24.69	18.60	8.34	5.14	23.62	12.23	34.16	54.20
Minimum	5.23	4.14	6.58	13.70	20.26	12.00	2.11	0.00	0.00	2.22	0.00	11.00
Maximum	41.79	13.08	10.26	29.87	28.42	25.00	14.63	10.67	66.67	29.03	67.81	79.00
Median	17.47	8.44	7.11	23.94	24.72	19.00	8.25	5.83	20.00	5.71	32.81	64.00
Standard deviation (n-1)	13.44	3.61	1.87	6.10	2.99	4.72	4.43	4.19	26.53	12.34	24.15	26.43
Standard error of the mean	6.01	1.61	0.84	2.73	1.34	2.11	1.98	1.87	11.87	5.52	10.80	11.82
COV (%)	68.57	44.63	23.02	26.43	12.13	25.39	53.15	81.38	112.32	100.88	70.68	48.77
+50% Mean	29.40	12.14	12.21	34.63	37.03	27.90	12.51	7.72	35.43	18.35	51.25	81.30
-50% Mean	9.80	4.05	4.07	11.54	12.34	9.30	4.17	2.57	11.81	6.12	17.08	27.10
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2013)	Yes (2014, 2015)	Yes (2014, 2015)	Yes (2014, 2015)	-	No	Yes (both)	Yes (2014)	Yes (2013, 2014, 2016)	Yes (all)
Modified Significance Level				0.0033						0.0033		
Significant Inter-annual Difference <sup>1</sup>	N/A	No 0.012	No 0.012 (2013)	Yes 0.002 (2014) 0.002 (2015)	Yes 0.001 (2014) 0.001 (2015)	No 0.020 (2014) 0.020 (2015)	-	N/A	No 0.590 (2013) 0.250 (2014)	No 0.495 (2014)	No 0.161 (2013) 0.044 (2014) 0.184 (2016)	Yes 0.018 (2013) 0.0029 (2014) 0.067 (2015) 0.021 (2016) 0.332 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Percent EPT (EPT Index)										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	66.65	75.29	50.75	62.76	27.07	20.40	30.29	13.20	30.99	30.62	11.40
Minimum	0.00	64.89	35.59	50.98	17.51	9.00	27.44	5.49	20.10	22.22	7.00
Maximum	87.40	91.14	69.35	78.33	41.67	36.00	34.46	27.59	37.68	38.64	17.00
Median	81.93	74.16	46.94	64.04	21.57	16.00	28.13	10.92	32.08	31.58	11.00
Standard deviation (n-1)	37.33	10.22	13.06	10.68	10.79	12.38	3.54	8.72	6.56	7.02	3.65
Standard error of the mean	16.70	4.57	5.84	4.77	4.83	5.54	1.58	3.90	2.93	3.14	1.63
COV (%)	56.01	13.57	25.73	17.01	39.87	60.69	11.68	66.02	21.17	22.93	31.99
+50% Mean	99.98	112.94	76.12	94.15	40.60	30.60	45.44	19.80	46.48	45.93	17.10
-50% Mean	33.33	37.65	25.37	31.38	13.53	10.20	15.15	6.60	15.49	15.31	5.70
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (2013, 2014, 2016)	Yes (2013–2016)	-	Yes	Yes (2015)	Yes (2015)	Yes (2014, 2016, 2017)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	N/A	N/A	N/A	N/A	Yes 0.002 (2013) 0.0004 (2014) 0.005 (2016)	Yes 0.001 (2013) < 0.0001 (2014) 0.016 (2015) 0.001 (2016)	N/A	No 0.016	No 0.011 (2015)	No 0.013 (2015)	No 0.011 (2014) 0.008 (2016) 0.009 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Pisidiidae Density (no. per m <sup>2</sup> )											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	888.73	753.12	352.03	86.57	0.00	2.80	1.73	11.54	0.00	23.08	8.66	109.60
Minimum	331.83	259.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.00
Maximum	1125.35	1240.77	750.23	302.98	0.00	14.00	8.66	43.28	0.00	57.71	14.43	216.00
Median	981.07	649.24	447.25	0.00	0.00	0.00	0.00	0.00	0.00	14.43	14.43	101.00
Standard deviation (n-1)	325.60	418.20	327.51	133.41	0.00	6.26	3.87	18.81	0.00	26.21	7.90	67.88
Standard error of the mean	145.61	187.02	146.47	59.66	0.00	2.80	1.73	8.41	0.00	11.72	3.53	30.36
COV (%)	36.64	55.53	93.03	154.11	-	223.61	223.61	162.98	-	113.54	91.29	61.94
+50% Mean	1333.10	1129.67	528.05	129.85	0.00	4.20	2.60	17.31	0.00	34.63	12.98	164.40
-50% Mean	444.37	376.56	176.02	43.28	0.00	1.40	0.87	5.77	0.00	11.54	4.33	54.80
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (all)	Yes (all)	Yes (all)	-	Yes	Yes (both)	Yes (all)	Yes (2013, 2015, 2016)	Yes (all)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.160 (2013) 0.238 (2014)	No 0.008 (2013) 0.016 (2014) 0.216 (2013)	Yes 0.0007 (2013) 0.0002 (2014) 0.047 (2015) 0.454 (2016)	Yes 0.002 (2013) 0.004 (2014) 0.085 (2015) 0.626 (2016) 0.793 (2017)	-	No 0.458	No 0.740 (2013) 0.282 (2014)	No 0.154 (2013) 0.494 (2014) 0.079 (2015)	No 0.309 (2013) 0.177 (2015) 0.681 (2016)	No 0.001 (2013) 0.009 (2014) 0.0002 (2015) 0.053 (2016) 0.019 (2017)



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Pisidiidae Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	0.00	0.00	0.00	0.00	0.00	0.00	2.89	0.00	0.00	0.00	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	14.43	0.00	0.00	0.00	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	0.00	0.00	0.00	0.00	0.00	0.00	6.45	0.00	0.00	0.00	0.00
Standard error of the mean	0.00	0.00	0.00	0.00	0.00	0.00	2.89	0.00	0.00	0.00	0.00
COV (%)	-	-	-	-	-	-	223.61	-	-	-	-
+50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	4.33	0.00	0.00	0.00	0.00
-50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	1.44	0.00	0.00	0.00	0.00
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	No (all)	-	Yes	Yes (2014)	Yes (2014)	Yes (2014)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	N/A	N/A	-	No 0.114	No 0.114 (2014)	No 0.114 (2014)	No 0.114 (2014)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Water Depth (m)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	7.42	7.82	5.91	7.00	7.26	6.48	6.14	6.02	5.31	5.56	5.28	5.64
Minimum	6.30	6.80	5.40	6.20	6.30	4.90	5.98	5.10	4.90	4.90	4.50	5.00
Maximum	9.10	9.30	6.47	9.40	9.40	8.40	6.30	6.47	5.73	6.00	6.20	6.30
Median	7.00	7.20	5.90	6.30	6.70	6.00	6.16	6.13	5.33	5.70	5.30	5.60
Standard deviation (n-1)	1.23	1.19	0.41	1.37	1.29	1.43	0.13	0.53	0.30	0.49	0.61	0.47
Standard error of the mean	0.55	0.53	0.18	0.61	0.57	0.64	0.06	0.24	0.13	0.22	0.27	0.21
COV (%)	16.60	15.17	6.90	19.61	17.71	22.13	2.12	8.88	5.62	8.87	11.55	8.37
+50% Mean	11.13	11.73	8.86	10.50	10.89	9.72	9.21	9.03	7.97	8.34	7.92	8.46
-50% Mean	3.71	3.91	2.95	3.50	3.63	3.24	3.07	3.01	2.66	2.78	2.64	2.82
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	No (all)	-	No	No (both)	No (all)	No (all)	No (all)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Water Depth (m)										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	6.95	6.84	6.33	6.76	6.48	6.64	9.13	8.84	8.62	9.04	8.86
Minimum	6.58	6.40	5.90	6.30	5.80	6.10	8.63	8.47	5.80	8.30	8.50
Maximum	7.28	7.57	6.77	7.20	6.80	6.80	9.53	9.33	9.60	9.70	9.50
Median	7.06	6.83	6.33	6.80	6.70	6.80	9.17	8.87	9.40	9.10	8.80
Standard deviation (n-1)	0.33	0.45	0.35	0.45	0.43	0.30	0.32	0.34	1.60	0.53	0.39
Standard error of the mean	0.15	0.20	0.16	0.20	0.19	0.14	0.14	0.15	0.71	0.24	0.17
COV (%)	4.71	6.61	5.49	6.67	6.67	4.59	3.54	3.90	18.53	5.83	4.41
+50% Mean	10.42	10.26	9.50	10.14	9.72	9.96	13.69	13.26	12.93	13.56	13.29
-50% Mean	3.47	3.42	3.17	3.38	3.24	3.32	4.56	4.42	4.31	4.52	4.43
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	No (all)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Oligochaeta Density (no. per m <sup>2</sup> )											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	25.97	28.86	17.31	34.63	43.28	11.60	12.12	8.66	0.00	5.77	28.86	11.60
Minimum	0.00	0.00	0.00	28.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	57.71	57.71	28.86	43.28	100.99	29.00	34.63	28.86	0.00	28.86	115.42	29.00
Median	28.86	28.86	14.43	28.86	43.28	0.00	8.66	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	21.40	20.40	12.07	7.90	44.47	15.88	14.49	12.90	0.00	12.90	49.98	15.88
Standard error of the mean	9.57	9.12	5.40	3.53	19.89	7.10	6.48	5.77	0.00	5.77	22.35	7.10
COV (%)	82.40	70.71	69.72	22.82	102.74	136.93	119.52	149.07	-	223.61	173.21	136.93
+50% Mean	38.95	43.28	25.97	51.94	64.92	17.40	18.18	12.98	0.00	8.66	43.28	17.40
-50% Mean	12.98	14.43	8.66	17.31	21.64	5.80	6.06	4.33	0.00	2.89	14.43	5.80
Benchmark Exceedance (temporal comparison)	-	No	No (both)	Yes (2015)	Yes (2013, 2015)	Yes (2013, 2014, 2016, 2017)	-	No	Yes (both)	Yes (2013, 2015)	Yes (all)	Yes (2015–2017)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	N/A	N/A	N/A	No 0.124 (2015)	No 0.314 (2013) 0.234 (2015)	No 0.798 (2013) 0.332 (2014) 0.107 (2016) 0.206 (2017)	N/A	N/A	No 0.075 (2013) 0.265 (2014)	No 0.247 (2013) 0.622 (2015)	No 0.748 (2013) 0.732 (2014) 0.145 (2015) 0.403 (2016)	No 0.748 (2013) 0.732 (2014) 0.145 (2015) 0.403 (2016) 1.000 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Oligochaeta Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	13.85	5.77	0.00	2.89	5.77	5.80	11.54	2.89	0.00	0.00	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	34.63	14.43	0.00	14.43	14.43	29.00	43.28	14.43	0.00	0.00	0.00
Median	8.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	15.73	7.90	0.00	6.45	7.90	12.97	18.81	6.45	0.00	0.00	0.00
Standard error of the mean	7.03	3.53	0.00	2.89	3.53	5.80	8.41	2.89	0.00	0.00	0.00
COV (%)	113.54	136.93	-	223.61	136.93	223.61	162.98	223.61	-	-	-
+50% Mean	20.78	8.66	0.00	4.33	8.66	8.70	17.31	4.33	0.00	0.00	0.00
-50% Mean	6.93	2.89	0.00	1.44	2.89	2.90	5.77	1.44	0.00	0.00	0.00
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2013, 2015)	Yes (2013, 2015, 2016)	Yes (2013, 2015, 2016)	-	Yes	Yes (both)	Yes (2014, 2015)	Yes (2014, 2015)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	N/A	No 0.398	No 0.037 (2013) 0.213 (2014)	No 0.142 (2013) 0.534 (2015)	No 0.398 (2013) 0.213 (2015) 0.534 (2016)	No 0.197 (2013) 0.424 (2015) 0.859 (2016)	N/A	No 0.304	No 0.052 (2014) 0.361 (2015)	No 0.052 (2014) 0.361 (2015)	No 0.052 (2014) 0.361 (2015)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Amphipoda Density (no. per m <sup>2</sup> )											
n	5	5	5	5	5		5	5	5	5	5	5
Mean	1413.90	1584.14	2135.27	1477.38	1638.97	1910.40	1.73	20.20	2.89	23.08	2.89	5.60
Minimum	894.51	1211.91	1601.45	1226.34	822.37	1515.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	1918.86	2308.40	2683.52	1745.73	2697.95	2323.00	8.66	43.28	14.43	43.28	14.43	14.00
Median	1543.74	1370.61	2192.98	1457.18	1731.30	1775.00	0.00	14.43	0.00	28.86	0.00	0.00
Standard deviation (n-1)	493.60	465.99	514.46	195.60	773.36	357.21	3.87	16.45	6.45	21.88	6.45	7.67
Standard error of the mean	220.75	208.40	230.07	87.47	345.86	159.75	1.73	7.36	2.89	9.79	2.89	3.43
COV (%)	34.91	29.42	24.09	13.24	47.19	18.70	223.61	81.44	223.61	94.79	223.61	136.93
+50% Mean	2120.84	2376.21	3202.91	2216.07	2458.45	2865.60	2.60	30.30	4.33	34.63	4.33	8.40
-50% Mean	706.95	792.07	1067.64	738.69	819.48	955.20	0.87	10.10	1.44	11.54	1.44	2.80
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	No (all)	No (all)	No (all)	-	Yes	Yes (both)	Yes (2013, 2015)	Yes (2013, 2014, 2016)	Yes (all)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.031 (2013)	N/A	N/A	N/A	-	No 0.025	No 0.855 (2013) 0.040 (2014)	No 0.059 (2013) 0.088 (2015)	No 0.855 (2013) 0.040 (2014) 0.088 (2016)	No 0.611 (2013) 0.084 (2014) 0.745 (2015) 0.167 (2016) 0.745 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Amphipoda Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	79.64	227.95	392.43	222.18	1376.39	1021.60	1688.02	2011.20	1108.03	1393.70	1846.80
Minimum	0.00	72.14	115.42	86.57	533.82	462.00	1226.34	706.95	447.25	735.80	1111.00
Maximum	129.85	432.83	764.66	331.83	2322.83	1486.00	2034.28	2871.08	1702.45	2279.55	2409.00
Median	69.25	201.99	432.83	230.84	1110.92	1082.00	1615.88	2005.42	1298.48	995.50	1847.00
Standard deviation (n-1)	53.85	164.94	265.13	106.80	714.02	423.29	342.48	895.53	576.51	702.86	471.03
Standard error of the mean	24.08	73.76	118.57	47.76	319.32	189.30	153.16	400.49	257.82	314.33	210.65
COV (%)	67.62	72.36	67.56	48.07	51.88	41.43	20.29	44.53	52.03	50.43	25.51
+50% Mean	119.46	341.93	588.64	333.28	2064.58	1532.40	2532.03	3016.79	1662.05	2090.55	2770.20
-50% Mean	39.82	113.98	196.21	111.09	688.19	510.80	844.01	1005.60	554.02	696.85	923.40
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2013)	Yes (all)	Yes (2013–2016)	-	No	No (both)	No (all)	Yes (2016)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.258	No 0.046 (2013) 0.388 (2014)	No 0.208 (2013)	Yes 0.0001 (2013) 0.007 (2014) 0.064 (2015) 0.010 (2016)	Yes 0.0004 (2013) 0.017 (2014) 0.127 (2015) 0.024 (2016)	N/A	N/A	N/A	N/A	No 0.077 (2016)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Gastropoda Density (no. per m <sup>2</sup> )											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	3921.40	5606.53	92.34	49.05	2.89	0.00	322.02	730.03	8.66	421.28	334.72	106.80
Minimum	129.85	3505.89	28.86	0.00	0.00	0.00	121.19	201.99	0.00	201.99	14.43	72.00
Maximum	6982.92	6982.92	201.99	173.13	14.43	0.00	744.46	1630.31	28.86	620.38	1211.91	144.00
Median	4068.56	6232.69	86.57	14.43	0.00	0.00	164.47	490.54	0.00	432.83	115.42	101.00
Standard deviation (n-1)	2691.54	1563.89	65.80	73.28	6.45	0.00	265.36	623.61	12.90	155.19	496.38	29.83
Standard error of the mean	1203.69	699.39	29.43	32.77	2.89	0.00	118.67	278.89	5.77	69.40	221.99	13.34
COV (%)	68.64	27.89	71.26	149.39	223.61	0.00	82.40	85.42	149.07	36.84	148.30	27.93
+50% Mean	5882.10	8409.80	138.50	73.58	4.33	-	483.03	1095.05	12.98	631.93	502.08	160.20
-50% Mean	1960.70	2803.27	46.17	24.53	1.44	0.00	161.01	365.02	4.33	210.64	167.36	53.40
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2013, 2014)	Yes (all)	Yes (all)	-	Yes	Yes (both)	Yes (2015)	Yes (2014, 2015)	Yes (all)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.191 (2013) 0.087 (2014)	No 0.025 (2013) 0.008 (2014)	Yes 0.002 (2013) 0.0004 (2014) 0.071 (2015) 0.387 (2016)	Yes 0.0008 (2013) 0.0002 (2014) 0.041 (2015) 0.269 (2016) 0.811 (2017)	-	No 0.332	No 0.007 (2013) 0.0002 (2014)	Yes 0.0006 (2015)	No 0.102 (2014) 0.040 (2015)	No 0.150 (2013) 0.016 (2014) 0.202 (2015) 0.031 (2016) 0.440 (2017)



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Gastropoda Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	13.85	8.66	5.77	51.94	63.48	167.20	0.00	0.00	5.77	2.89	43.20
Minimum	0.00	0.00	0.00	0.00	14.43	14.00	0.00	0.00	0.00	0.00	0.00
Maximum	51.94	43.28	28.86	115.42	115.42	317.00	0.00	0.00	28.86	14.43	173.00
Median	8.66	0.00	0.00	14.43	72.14	188.00	0.00	0.00	0.00	0.00	14.00
Standard deviation (n-1)	21.73	19.36	12.90	58.25	47.41	135.25	0.00	0.00	12.90	6.45	73.54
Standard error of the mean	9.72	8.66	5.77	26.05	21.20	60.49	0.00	0.00	5.77	2.89	32.89
COV (%)	156.87	223.61	223.61	112.15	74.69	80.89	-	-	223.61	223.61	170.24
+50% Mean	20.78	12.98	8.66	77.91	95.22	250.80	0.00	0.00	8.66	4.33	64.80
-50% Mean	6.93	4.33	2.89	25.97	31.74	83.60	0.00	0.00	2.89	1.44	21.60
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	Yes (all)	Yes (2013–2015)	Yes (all)	-	No	Yes (both)	Yes (all)	Yes (all)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.555 (2013)	No 0.071 (2015)	No 0.090 (2013) 0.027 (2014) 0.022 (2015)	No 0.022 (2013) 0.005 (2014) 0.004 (2015) 0.285 (2016) 0.555 (2017)	-	N/A	No 0.442 (2014) 0.442 (2015)	No 0.480 (2014) 0.480 (2015) 0.951 (2016)	No 0.018 (2014) 0.018 (2015) 0.110 (2016) 0.097 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Chironomidae Density (no. per m <sup>2</sup> )											
n	5	5	5	5	5		5	5	5	5	5	5
Mean	317.41	155.82	461.68	132.73	89.45	124.00	657.89	620.38	144.28	100.99	239.50	138.40
Minimum	144.28	72.14	245.27	0.00	14.43	72.00	363.57	173.13	0.00	0.00	28.86	72.00
Maximum	461.68	230.84	591.53	230.84	173.13	202.00	1324.45	908.93	288.55	201.99	476.11	202.00
Median	346.26	158.70	504.96	158.70	86.57	115.00	493.42	721.38	86.57	100.99	245.27	115.00
Standard deviation (n-1)	134.18	57.17	140.62	84.99	59.84	51.57	391.56	290.17	135.34	77.69	172.11	60.09
Standard error of the mean	60.01	25.57	62.89	38.01	26.76	23.06	175.11	129.77	60.53	34.75	76.97	26.87
COV (%)	42.28	36.69	30.46	64.03	66.89	41.59	59.52	46.77	93.81	76.93	71.86	43.42
+50% Mean	476.11	233.73	692.52	199.10	134.18	186.00	986.84	930.57	216.41	151.49	359.25	207.60
-50% Mean	158.70	77.91	230.84	66.37	44.73	62.00	328.95	310.19	72.14	50.50	119.75	69.20
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2014)	Yes (2013, 2015)	Yes (2013, 2015)	Yes (2013, 2015)	-	No	Yes (both)	Yes (2013, 2014)	Yes (all)	Yes (2013, 2014)
Modified Significance Level				0.0033						0.0033		
Significant Inter-annual Difference <sup>1</sup>	-	No 0.178	No 0.023 (2014)	No 0.098 (2013) 0.010 (2015)	Yes 0.010 (2013) 0.0005 (2015)	Yes 0.031 (2013) 0.002 (2015)	-	N/A	No 0.009 (2013) 0.010 (2014)	Yes 0.0028 (2013) 0.0032 (2014)	No 0.078 (2013) 0.085 (2014) 0.388 (2015) 0.222 (2016)	No 0.016 (2013) 0.018 (2014)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Chironomidae Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	193.91	135.62	230.84	112.53	196.21	193.40	227.95	288.55	300.09	219.30	265.40
Minimum	0.00	28.86	100.99	14.43	72.14	87.00	173.13	187.56	115.42	100.99	130.00
Maximum	389.54	216.41	317.41	375.12	490.54	260.00	274.12	403.97	706.95	375.12	346.00
Median	173.13	173.13	288.55	43.28	158.70	202.00	230.84	259.70	245.27	216.41	274.00
Standard deviation (n-1)	141.00	80.72	100.48	149.03	170.28	68.76	37.34	102.53	236.28	116.05	90.25
Standard error of the mean	63.06	36.10	44.93	66.65	76.15	30.75	16.70	45.85	105.67	51.90	40.36
COV (%)	72.71	59.52	43.53	132.43	86.78	35.55	16.38	35.53	78.73	52.92	34.01
+50% Mean	290.86	203.43	346.26	168.80	294.32	290.10	341.93	432.83	450.14	328.95	398.10
-50% Mean	96.95	67.81	115.42	56.27	98.11	96.70	113.98	144.28	150.05	109.65	132.70
Benchmark Exceedance (temporal comparison)	-	No	Yes (2014)	Yes (2015)	Yes (2016)	Yes (2016)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.642 (2014)	No 0.145 (2015)	No 0.297 (2016)	No 0.313 (2016)	-	N/A	N/A	N/A	N/A

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Plecoptera Density (no. per m <sup>2</sup> )											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-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
Standard error of the mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COV (%)	-	-	-	-	-	-	-	-	-	-	-	-
+50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	No (all)	-	No	No (both)	No (all)	No (all)	No (all)
Modified Significance Level	N/A						N/A					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	N/A	N/A

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Plecoptera Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Median	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard deviation (n-1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard error of the mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
COV (%)	-	-	-	-	-	-	-	-	-	-	-
+50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-50% Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	No (all)	No (all)	-	No	No (both)	No (all)	No (all)
Modified Significance Level	N/A						N/A				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	N/A	N/A	-	N/A	N/A	N/A	N/A

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Trichoptera Density (no. per m <sup>2</sup> )											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	72.14	46.17	60.60	57.71	184.67	49.20	25.97	20.20	20.20	17.31	14.43	20.00
Minimum	57.71	0.00	28.86	0.00	28.86	14.00	8.66	0.00	0.00	0.00	0.00	0.00
Maximum	100.99	86.57	100.99	201.99	403.97	87.00	43.28	57.71	43.28	72.14	28.86	58.00
Median	57.71	57.71	57.71	28.86	100.99	58.00	25.97	14.43	14.43	0.00	14.43	14.00
Standard deviation (n-1)	20.40	32.90	27.75	82.25	177.11	28.42	17.31	21.88	16.45	31.28	14.43	22.09
Standard error of the mean	9.12	14.71	12.41	36.78	79.21	12.71	7.74	9.79	7.36	13.99	6.45	9.88
COV (%)	28.28	71.26	45.80	142.52	95.91	57.76	66.67	108.33	81.44	180.66	100.00	110.45
+50% Mean	108.21	69.25	90.89	86.57	277.01	73.80	38.95	30.30	30.30	25.97	21.64	30.00
-50% Mean	36.07	23.08	30.30	28.86	92.34	24.60	12.98	10.10	10.10	8.66	7.21	10.00
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (all)	Yes (2017)	-	No	No (both)	No (all)	No (all)	No (all)
Modified Significance Level	0.0033						N/A					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	No 0.679 (2013) 0.135 (2014) 0.397 (2015) 0.054 (2016)	No 0.296 (2017)	-	N/A	N/A	N/A	N/A	N/A

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Trichoptera Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	0.00	2.89	0.00	2.89	23.08	8.40	0.00	5.77	11.54	23.08	23.00
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.43	0.00
Maximum	0.00	14.43	0.00	14.43	57.71	14.00	0.00	14.43	28.86	43.28	43.00
Median	0.00	0.00	0.00	0.00	14.43	14.00	0.00	0.00	14.43	14.43	29.00
Standard deviation (n-1)	0.00	6.45	0.00	6.45	26.21	7.67	0.00	7.90	12.07	12.90	16.45
Standard error of the mean	0.00	2.89	0.00	2.89	11.72	3.43	0.00	3.53	5.40	5.77	7.36
COV (%)	-	223.61	-	223.61	113.54	91.29	-	136.93	104.58	55.90	71.51
+50% Mean	0.00	4.33	0.00	4.33	34.63	12.60	0.00	8.66	17.31	34.63	34.50
-50% Mean	0.00	1.44	0.00	1.44	11.54	4.20	0.00	2.89	5.77	11.54	11.50
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2014)	Yes (2013, 2015)	Yes (all)	Yes (all)	-	Yes	Yes (both)	Yes (all)	Yes (2014–2016)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.474	No 0.474 (2014)	No 0.474 (2013) 0.474 (2015)	No 0.017 (2013) 0.096 (2014) 0.017 (2015) 0.096 (2016)	No 0.083 (2013) 0.309 (2014) 0.083 (2015) 0.309 (2016) 0.518 (2017)	-	No 0.363	No 0.117 (2014) 0.510 (2015)	Yes 0.004 (2014) 0.048 (2015) 0.187 (2016)	No 0.010 (2014) 0.093 (2015) 0.306 (2016)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	EPT Density (no. per m <sup>2</sup> )											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	1353.30	689.64	279.89	551.13	588.64	479.20	90.03	75.02	20.20	89.45	568.44	623.20
Minimum	432.83	375.12	230.84	288.55	346.26	260.00	17.31	0.00	0.00	14.43	0.00	58.00
Maximum	1688.02	1096.49	403.97	663.67	952.22	592.00	138.50	115.42	43.28	259.70	1428.32	1039.00
Median	1615.88	591.53	230.84	634.81	447.25	505.00	103.88	100.99	14.43	28.86	302.98	721.00
Standard deviation (n-1)	531.71	274.20	76.07	157.52	273.25	133.51	46.05	47.19	16.45	106.71	606.52	366.41
Standard error of the mean	237.79	122.63	34.02	70.44	122.20	59.71	20.59	21.11	7.36	47.72	271.24	163.87
COV (%)	39.29	39.76	27.18	28.58	46.42	27.86	51.15	62.91	81.44	119.29	106.70	58.80
+50% Mean	2029.95	1034.45	419.84	826.70	882.96	718.80	135.04	112.53	30.30	134.18	852.67	934.80
-50% Mean	676.65	344.82	139.95	275.57	294.32	239.60	45.01	37.51	10.10	44.73	284.22	311.60
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2013, 2015)	Yes (2013, 2015)	Yes (2013, 2015)	-	No	Yes (both)	Yes (2015)	Yes (all)	Yes (2013–2016)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	Yes 0.0002 (2013) 0.011 (2014)	No 0.131 (2013) 0.028 (2015)	No 0.078 (2013) 0.052 (2015)	No 0.034 (2013) 0.114 (2015)	-	N/A	No 0.109 (2013) 0.272 (2014)	No 0.280 (2015)	No 0.314 (2013) 0.131 (2014) 0.009 (2015) 0.126 (2016)	Yes 0.131 (2013) 0.044 (2014) 0.002 (2015) 0.042 (2016)



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	EPT Density (no. per m <sup>2</sup> )										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	1563.37	1096.49	605.96	657.89	582.87	306.00	831.02	288.55	588.64	655.01	265.60
Minimum	0.00	952.22	490.54	331.83	317.41	188.00	692.52	187.56	375.12	476.11	159.00
Maximum	2276.66	1240.77	663.67	1082.06	865.65	548.00	966.64	375.12	836.80	851.22	303.00
Median	1817.87	1038.78	620.38	678.09	620.38	289.00	851.22	346.26	577.10	692.52	289.00
Standard deviation (n-1)	894.76	129.45	68.44	313.71	210.22	144.57	115.24	92.94	198.71	155.59	60.78
Standard error of the mean	400.15	57.89	30.61	140.30	94.01	64.65	51.54	41.57	88.87	69.58	27.18
COV (%)	57.23	11.81	11.29	47.68	36.07	47.25	13.87	32.21	33.76	23.75	22.89
+50% Mean	2345.05	1644.74	908.93	986.84	874.31	459.00	1246.54	432.83	882.96	982.51	398.40
-50% Mean	781.68	548.25	302.98	328.95	291.44	153.00	415.51	144.28	294.32	327.50	132.80
Benchmark Exceedance (temporal comparison)	-	No	Yes (2013)	Yes (2013)	Yes (2013)	Yes (2013, 2014, 2016)	-	Yes	Yes (2015)	Yes (2015)	Yes (2014, 2016, 2017)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.085 (2013)	No 0.161 (2013)	No 0.072 (2013)	Yes 0.001 (2013) 0.001 (2014) 0.067 (2016)	-	Yes < 0.0001	Yes 0.002 (2015)	Yes 0.0003 (2015)	Yes < 0.0001 (2014) 0.001 (2016) 0.0002 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Ratio of EPT to Chironomidae											
n	5	5	5	4	5	5	5	4	3	4	5	5
Mean	4.47	4.94	0.64	3.97	11.91	4.47	0.15	0.11	0.27	0.94	1.80	4.80
Minimum	3.00	2.50	0.39	2.75	3.38	2.25	0.05	0.00	0.05	0.10	0.00	0.80
Maximum	7.80	8.20	0.94	5.75	31.00	8.20	0.24	0.20	0.50	2.25	3.94	10.29
Median	3.50	5.09	0.60	3.68	4.67	3.20	0.11	0.13	0.25	0.71	1.11	3.57
Standard deviation (n-1)	1.99	2.45	0.20	1.31	11.97	2.49	0.09	0.08	0.23	1.03	1.62	3.76
Standard error of the mean	0.89	1.10	0.09	0.66	5.35	1.12	0.04	0.04	0.13	0.51	0.72	1.68
COV (%)	44.46	49.56	31.57	33.06	100.54	55.84	57.53	72.00	84.55	108.93	89.74	78.31
+50% Mean	6.71	7.42	0.97	5.95	17.86	6.70	0.22	0.17	0.40	1.42	2.70	7.19
-50% Mean	2.24	2.47	0.32	1.98	5.95	2.23	0.07	0.06	0.13	0.47	0.90	2.40
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2015)	Yes (all)	Yes (2015, 2017)	-	No	Yes (both)	Yes (all)	Yes (all)	Yes (all)
Modified Significance Level	0.0033						0.003333					
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.009 (2013) 0.007 (2014)	No 0.026 (2015)	Yes 0.393 (2013) 0.435 (2014) <b>0.0006 (2015)</b> 0.306 (2016)	No 0.021 (2015) 0.250 (2017)	-	N/A	No 0.633 (2013) 0.679 (2014)	No 0.306 (2013) 0.355 (2014) 0.658 (2015)	No 0.082 (2013) 0.112 (2014) 0.305 (2015) 0.539 (2016)	Yes <b>0.03330 (2013)</b> 0.007 (2014) 0.039 (2015) 0.081 (2016) 0.231 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Ratio of EPT to Chironomidae										
n	4	5	5	5	5	5	5	5	5	5	5
Mean	8.86	13.48	3.10	12.34	4.21	1.75	3.72	1.16	2.99	3.48	1.12
Minimum	5.84	5.67	2.09	2.88	1.76	0.82	2.53	0.46	0.82	1.85	0.69
Maximum	11.68	36.00	4.86	26.00	9.20	3.17	4.25	2.00	7.25	4.71	2.11
Median	8.95	6.62	2.14	9.50	3.58	1.50	3.94	0.89	2.36	3.40	0.88
Standard deviation (n-1)	2.66	12.97	1.37	8.90	2.89	0.94	0.68	0.66	2.52	1.17	0.57
Standard error of the mean	1.33	5.80	0.61	3.98	1.29	0.42	0.30	0.30	1.13	0.53	0.25
COV (%)	30.08	96.20	44.08	72.12	68.80	53.56	18.28	57.32	84.25	33.74	50.52
+50% Mean	13.29	20.22	4.65	18.52	6.31	2.63	5.58	1.74	4.49	5.22	1.68
-50% Mean	4.43	6.74	1.55	6.17	2.10	0.88	1.86	0.58	1.50	1.74	0.56
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (2015)	Yes (2013, 2014, 2016)	Yes (2013, 2014, 2016, 2017)	-	Yes	Yes (2015)	Yes (2015)	Yes (2014, 2016, 2017)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.986	No 0.034 (2013) 0.023 (2014)	No 0.021 (2015)	No 0.096 (2013) 0.075 (2014) 0.069 (2016)	No 0.004 (2013) 0.002 (2014) 0.002 (2016)	-	No 0.007	No 0.043 (2015)	No 0.012 (2015)	No 0.006 (2014) 0.039 (2016) 0.011 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Percent Ephemeroptera											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	18.52	7.61	6.38	20.55	18.02	16.80	6.18	3.90	0.00	10.38	32.17	52.20
Minimum	4.53	3.82	3.70	13.01	14.23	11.00	1.05	0.00	0.00	2.22	0.00	9.00
Maximum	39.29	13.08	9.16	25.00	21.05	22.00	13.41	9.33	0.00	25.81	67.81	79.00
Median	16.85	7.61	5.33	20.78	18.95	17.00	5.67	2.50	0.00	5.71	29.69	59.00
Standard deviation (n-1)	12.71	3.79	2.59	4.70	3.28	3.90	4.49	3.76	0.00	10.20	24.50	26.64
Standard error of the mean	5.68	1.70	1.16	2.10	1.47	1.74	2.01	1.68	0.00	4.56	10.96	11.91
COV (%)	68.60	49.84	40.62	22.88	18.22	23.21	72.66	96.41	-	98.27	76.15	51.03
+50% Mean	27.79	11.41	9.57	30.82	27.04	25.20	9.26	5.85	0.00	15.57	48.26	78.30
-50% Mean	9.26	3.80	3.19	10.27	9.01	8.40	3.09	1.95	0.00	5.19	16.09	26.10
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (2013)	Yes (2014, 2015)	Yes (2014, 2015)	Yes (2014, 2015)	-	No	Yes (both)	Yes (all)	Yes (all)	Yes (all)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.010	No 0.005 (2013)	Yes 0.0030 (2014) 0.001 (2015)	No 0.014 (2014) 0.007 (2015)	No 0.028 (2014) 0.014 (2015)	-	N/A	No 0.065 (2013) 0.143 (2014)	No 0.731 (2013) 0.470 (2014) 0.029 (2015)	Yes 0.233 (2013) 0.116 (2014) 0.002 (2015) 0.396 (2016)	Yes 0.036 (2013) 0.013 (2014) < 0.0001 (2015) 0.080 (2016) 0.366 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Percent Ephemeroptera										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	66.65	75.07	50.75	62.54	25.77	19.80	30.29	12.85	30.44	29.40	10.60
Minimum	0.00	64.89	35.59	50.98	17.51	8.00	27.44	5.49	19.60	21.76	7.00
Maximum	87.40	91.14	69.35	78.33	38.89	35.00	34.46	26.44	37.68	37.12	16.00
Median	81.93	73.03	46.94	62.92	19.20	16.00	28.13	10.92	32.08	28.95	10.00
Standard deviation (n-1)	37.33	10.26	13.06	10.65	10.16	12.52	3.54	8.22	6.66	6.57	3.36
Standard error of the mean	16.70	4.59	5.84	4.76	4.54	5.60	1.58	3.68	2.98	2.94	1.50
COV (%)	56.01	13.67	25.73	17.04	39.42	63.22	11.68	63.98	21.87	22.34	31.71
+50% Mean	99.98	112.60	76.12	93.81	38.65	29.70	45.44	19.28	45.65	44.09	15.90
-50% Mean	33.33	37.53	25.37	31.27	12.88	9.90	15.15	6.43	15.22	14.70	5.30
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (2013, 2014, 2016)	Yes (2013–2016)	-	Yes	Yes (2015)	Yes (2015)	Yes (2014, 2016, 2017)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	Yes 0.002 (2013) 0.0003 (2014) 0.004 (2016)	Yes 0.001 (2013) < 0.0001 (2014) 0.014 (2015) 0.001 (2016)	-	No 0.014	No 0.009 (2015)	No 0.016 (2015)	No 0.009 (2014) 0.0052 (2016) 0.010 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Percent of Oligochaeta + Chironomidae											
n	5.00	5.00	5.00	5.00	5.00	5.00	5	5	5	5	5	5
Mean	4.53	2.08	13.95	6.91	6.09	5.40	59.88	46.11	62.62	14.55	24.05	15.00
Minimum	2.09	1.44	8.00	2.05	0.65	2.00	35.40	29.17	0.00	0.00	9.88	8.00
Maximum	6.33	3.04	17.79	10.29	11.58	10.00	80.93	68.00	95.24	25.00	37.50	22.00
Median	5.30	1.79	14.65	6.91	6.00	5.00	60.98	42.86	80.00	15.56	28.08	14.00
Standard deviation (n-1)	1.80	0.68	3.92	3.11	4.32	2.97	20.08	15.74	38.02	9.31	10.83	5.29
Standard error of the mean	0.81	0.31	1.75	1.39	1.93	1.33	8.98	7.04	17.00	4.17	4.84	2.37
COV (%)	39.75	32.87	28.09	45.03	70.95	54.93	33.54	34.13	60.71	64.02	45.02	35.28
+50% Mean	6.79	3.12	20.93	10.36	9.13	8.10	89.82	69.16	93.94	21.82	36.08	22.50
-50% Mean	2.26	1.04	6.98	3.45	3.04	2.70	29.94	23.05	31.31	7.27	12.03	7.50
Benchmark Exceedance (temporal comparison)	-	Yes	Yes (both)	Yes (all)	Yes (2014, 2015)	Yes (2014, 2015)	-	No	No (both)	Yes (all)	Yes (2013, 2015, 2016)	Yes (2013–2015)
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.255	Yes 0.009 (2013) 0.0002 (2014)	No 0.329 (2013) 0.034 (2014) 0.100 (2015)	No 0.093 (2014) 0.038 (2015)	No 0.134 (2014) 0.024 (2015)	-	N/A	N/A	No 0.005 (2013) 0.025 (2014) 0.011 (2015)	No 0.046 (2013) 0.081 (2015) 0.429 (2016)	No 0.005 (2013) 0.021 (2014) 0.010 (2015)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Percent of Oligochaeta + Chironomidae										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	8.64	8.93	18.31	8.40	9.21	12.40	8.71	12.11	15.53	9.29	11.20
Minimum	0.00	2.53	9.09	1.96	3.85	4.00	7.44	5.46	4.32	7.02	5.00
Maximum	14.95	13.19	26.92	19.71	24.31	21.00	10.92	16.17	24.62	12.04	16.00
Median	9.06	11.11	16.95	6.74	5.88	12.00	8.48	12.24	15.94	8.40	11.00
Standard deviation (n-1)	5.53	4.63	6.76	6.78	8.49	6.11	1.32	4.44	8.29	2.27	4.21
Standard error of the mean	2.47	2.07	3.02	3.03	3.80	2.73	0.59	1.99	3.71	1.02	1.88
COV (%)	63.98	51.78	36.94	80.71	92.17	49.25	15.11	36.66	53.36	24.45	37.56
+50% Mean	12.96	13.40	27.46	12.59	13.82	18.60	13.06	18.16	23.30	13.93	16.80
-50% Mean	4.32	4.47	9.15	4.20	4.61	6.20	4.35	6.05	7.77	4.64	5.60
Benchmark Exceedance (temporal comparison)	-	No	Yes (both)	Yes (2015)	No (all)	No (all)	-	No	Yes (2014)	No (all)	No (all)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.027 (2013) 0.033 (2014)	No 0.027 (2015)	N/A	N/A	-	N/A	No 0.033 (2014)	N/A	N/A

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site							STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	EPT Richness (Family level)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	2.20	2.20	1.00	2.20	3.80	2.00	2.60	1.60	0.00	1.40	1.40	1.80
Minimum	2.00	1.00	1.00	1.00	2.00	2.00	2.00	0.00	0.00	1.00	0.00	1.00
Maximum	3.00	3.00	1.00	4.00	5.00	2.00	3.00	2.00	0.00	2.00	2.00	2.00
Median	2.00	2.00	1.00	2.00	4.00	2.00	3.00	2.00	0.00	1.00	2.00	2.00
Standard deviation (n-1)	0.45	0.84	0.00	1.10	1.30	0.00	0.55	0.89	0.00	0.55	0.89	0.45
Standard error of the mean	0.20	0.37	0.00	0.49	0.58	0.00	0.24	0.40	0.00	0.24	0.40	0.20
COV (%)	20.33	38.03	0.00	49.79	34.31	0.00	21.07	55.90	-	39.12	63.89	24.85
+25% Mean	2.75	2.75	1.25	2.75	4.75	2.50	3.25	2.00	0.00	1.75	1.75	2.25
-25% Mean	1.65	1.65	0.75	1.65	2.85	1.50	1.95	1.20	0.00	1.05	1.05	1.35
Benchmark Exceedance (temporal comparison)		No	Yes (both)	Yes (2015)	Yes (all)	Yes (2015, 2017)	-	No	Yes (both)	Yes (2013, 2015)	Yes (2013, 2015)	Yes (2015–2017)
Modified Significance Level				0.0033						0.0033		
Significant Inter-annual Difference <sup>1</sup>	-	N/A	No 0.012 (2013) 0.015 (2014)	No 0.029 (2015)	Yes 0.108 (2013) 0.096 (2014) <b>&lt; 0.0001 (2015)</b> 0.055 (2016)	No 0.033 (2015) 0.048 (2017)	-	N/A	Yes <b>&lt; 0.0001 (2013)</b> 0.013 (2014)	No 0.027 (2013) 0.052 (2015)	No 0.040 (2013) 0.036 (2015)	No 0.007 (2015) 0.438 (2016) 0.535 (2017)



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	EPT Richness (Family level)										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	1.00	1.20	1.00	1.20	1.60	1.60	1.00	1.00	1.60	2.20	2.20
Minimum	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00
Maximum	2.00	2.00	1.00	2.00	2.00	2.00	1.00	1.00	2.00	3.00	4.00
Median	1.00	1.00	1.00	1.00	2.00	2.00	1.00	1.00	2.00	2.00	2.00
Standard deviation (n-1)	0.71	0.45	0.00	0.45	0.55	0.55	0.00	0.00	0.55	0.45	1.10
Standard error of the mean	0.32	0.20	0.00	0.20	0.24	0.24	0.00	0.00	0.24	0.20	0.49
COV (%)	70.71	37.27	0.00	37.27	34.23	34.23	0.00	0.00	34.23	20.33	49.79
+50% Mean	1.25	1.50	1.25	1.50	2.00	2.00	1.25	1.25	2.00	2.75	2.75
-50% Mean	0.75	0.90	0.75	0.90	1.20	1.20	0.75	0.75	1.20	1.65	1.65
Benchmark Exceedance (temporal comparison)	-	No	No (both)	No (all)	Yes (all)	Yes (2013–2016)	-	No	Yes (both)	Yes (all)	Yes (2014–2016)
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	N/A	N/A	N/A	No 0.066 (2013) 0.188 (2014) 0.048 (2015) 0.188 (2016)	No 0.085 (2013) 0.206 (2014) 0.058 (2015) 0.206 (2016)	-	N/A	No 0.097 (2014) 0.097 (2015)	Yes 0.002 (2014) 0.002 (2015) 0.170 (2016)	No 0.011 (2014) 0.011 (2015) 0.386 (2016)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Total Organic Carbon (TOC, %)											
n	5	5	5	5	5	5	5	5	5	4	5	5
Mean	1.07	1.28	1.28	2.07	2.07	1.84	1.12	1.47	2.36	3.15	2.04	1.76
Minimum	1.01	1.10	1.08	1.90	1.99	1.77	0.75	0.77	0.27	2.21	1.27	0.80
Maximum	1.15	1.34	1.53	2.19	2.21	1.95	1.59	2.43	4.98	5.37	2.80	2.63
Median	1.05	1.32	1.24	2.13	2.02	1.84	1.16	1.51	2.23	2.50	2.00	1.66
Standard deviation (n-1)	0.05	0.10	0.16	0.12	0.09	0.07	0.32	0.65	2.02	1.49	0.55	0.73
Standard error of the mean	0.02	0.05	0.07	0.05	0.04	0.03	0.14	0.29	0.90	0.74	0.24	0.33
COV (%)	4.99	7.91	12.75	5.81	4.44	3.73	28.18	44.58	85.43	47.37	26.80	41.61
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.172	No 0.289 (2013) 0.760 (2014)	Yes < 0.0001 (2013) 0.010 (2014) 0.004 (2015)	Yes < 0.0001 (2013) 0.010 (2014) 0.004 (2015) 1.00 (2016)	Yes 0.008 (2013) 0.202 (2014) 0.114 (2015) 0.196 (2016) 0.196 (2017)	-	No 0.435	No 0.147 (2013) 0.504 (2014)	No 0.005 (2013) 0.040 (2014) 0.154 (2015)	No 0.075 (2013) 0.316 (2014) 0.738 (2015) 0.266 (2016)	No 0.169 (2013) 0.552 (2014) 0.941 (2015) 0.134 (2016) 0.683 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Total Organic Carbon (TOC, %)										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	1.24	2.21	1.28	3.44	3.08	2.46	2.03	2.09	3.82	2.74	2.84
Minimum	1.11	1.27	1.19	3.25	2.91	2.34	1.88	2.00	3.57	2.29	2.72
Maximum	1.36	5.71	1.40	3.53	3.65	2.61	2.23	2.22	4.16	3.08	2.94
Median	1.23	1.30	1.22	3.48	2.94	2.43	2.01	2.09	3.82	3.00	2.85
Standard deviation (n-1)	0.10	1.96	0.11	0.11	0.32	0.11	0.14	0.08	0.22	0.40	0.08
Standard error of the mean	0.04	0.88	0.05	0.05	0.14	0.05	0.06	0.04	0.10	0.18	0.04
COV (%)	7.71	88.75	8.23	3.30	10.34	4.31	6.82	3.99	5.84	14.60	2.78
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.184	No 0.990 (2013) 0.229 (2014)	Yes 0.0004 (2013) 0.027 (2014) 0.001 (2015)	Yes 0.0027 (2013) 0.095 (2014) 0.004 (2015) 0.590 (2016)	No 0.055 (2013) 0.553 (2014) 0.072 (2015) 0.106 (2016) 0.281 (2017)	-	No 0.731	Yes < 0.0001 (2014) 0.003 (2015)	No 0.015 (2014) 0.037 (2015) 0.132 (2016)	No 0.027 (2014) 0.062 (2015) 0.086 (2016) 0.830 (2017)

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**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Sand (%)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	18.58	18.52	16.18	13.24	15.02	16.26	2.05	15.17	3.57	12.56	23.32	29.46
Minimum	17.60	14.80	11.90	7.70	10.20	10.70	1.08	2.18	0.51	2.40	10.80	18.30
Maximum	19.50	24.20	22.10	18.40	17.90	25.40	3.51	45.20	8.79	33.50	43.80	54.90
Median	19.00	17.70	15.20	13.80	15.70	14.60	1.90	9.63	3.54	8.90	20.30	22.20
Standard deviation (n-1)	0.83	3.61	4.24	3.97	2.93	5.48	0.90	17.50	3.35	12.21	12.46	15.00
Standard error of the mean	0.37	1.62	1.90	1.78	1.31	2.45	0.40	7.83	1.50	5.46	5.57	6.71
COV (%)	4.48	19.51	26.21	30.00	19.48	33.73	43.99	115.35	93.85	97.20	53.44	50.92
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.980	No 0.327 (2013) 0.339 (2014)	No 0.035 (2013) 0.037 (2014) 0.232 (2015)	No 0.150 (2013) 0.157 (2014) 0.633 (2015) 0.465 (2016)	No 0.343 (2013) 0.355 (2014) 0.974 (2015) 0.220 (2016) 0.610 (2017)	-	No 0.048	No 0.666 (2013) 0.122 (2014)	No 0.052 (2013) 0.971 (2014) 0.131 (2015)	Yes 0.002 (2013) 0.281 (2014) 0.009 (2015) 0.265 (2016)	Yes 0.0005 (2013) 0.131 (2014) 0.002 (2015) 0.122 (2016) 0.666 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Sand (%)										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	0.47	0.29	0.90	0.82	0.96	0.50	0.18	0.30	1.22	1.76	0.50
Minimum	0.27	0.11	0.61	0.50	0.50	0.50	0.11	0.20	0.50	0.50	0.50
Maximum	0.57	0.48	1.43	1.50	1.80	0.50	0.31	0.38	4.10	4.00	0.50
Median	0.50	0.29	0.88	0.50	0.50	0.50	0.14	0.28	0.50	0.50	0.50
Standard deviation (n-1)	0.12	0.15	0.33	0.46	0.64	0.00	0.08	0.07	1.61	1.74	0.00
Standard error of the mean	0.05	0.07	0.15	0.21	0.29	0.00	0.04	0.03	0.72	0.78	0.00
COV (%)	24.94	52.13	36.88	56.15	66.54	0.00	46.98	24.48	131.96	99.03	0.00
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.099	Yes 0.033 (2013) 0.0002 (2014)	No 0.242 (2013) 0.005 (2014) 0.334 (2015)	No 0.188 (2013) 0.0030 (2014) 0.414 (2015) 0.882 (2016)	No 0.882 (2013) 0.072 (2014) 0.047 (2015) 0.307 (2016) 0.242 (2017)	-	No 0.439	Yes 0.001 (2013) 0.012 (2014)	Yes 0.0004 (2014) 0.006 (2015) 0.802 (2016)	Yes 0.004 (2014) 0.034 (2015) 0.699 (2016) 0.524 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Silt (%)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	61.40	53.42	65.82	56.02	64.88	74.88	37.20	50.08	51.14	46.86	46.76	42.16
Minimum	50.50	50.00	58.70	53.90	53.90	68.10	21.50	30.60	27.20	32.10	34.50	21.90
Maximum	79.70	56.60	77.70	58.40	75.10	80.50	52.30	61.30	65.60	59.90	58.20	65.80
Median	55.60	53.50	62.40	56.20	68.90	76.60	40.20	51.80	49.50	50.90	44.00	40.50
Standard deviation (n-1)	11.69	2.51	8.37	2.05	9.87	5.54	12.84	12.40	15.58	10.76	9.86	17.69
Standard error of the mean	5.23	1.12	3.74	0.92	4.41	2.48	5.74	5.55	6.97	4.81	4.41	7.91
COV (%)	19.04	4.70	12.71	3.65	15.21	7.41	34.51	24.77	30.47	22.96	21.09	41.96
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.136	No 0.281 (2013) 0.010 (2014)	No 0.530 (2013) 0.389 (2014) 0.088 (2015)	No 0.640 (2013) 0.050 (2014) 0.541 (2015) 0.273 (2016)	Yes 0.048 (2013) <b>0.001 (2014)</b> 0.369 (2015) 0.009 (2016) 0.131 (2017)	-	No 0.143	No 0.115 (2013) 0.902(2014)	No 0.268 (2013) 0.709 (2014) 0.620 (2015)	No 0.273 (2013) 0.700 (2014) 0.612 (2015) 0.991 (2016)	No 0.556 (2013) 0.362 (2014) 0.302 (2015) 0.586 (2016) 0.594 (2017)

Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Silt (%)										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	72.48	66.28	89.48	67.62	74.30	82.08	72.66	87.36	60.14	81.36	74.74
Minimum	68.10	59.90	77.10	66.70	66.00	72.70	66.20	82.30	55.70	69.20	63.20
Maximum	75.70	68.60	98.50	70.10	80.80	88.10	76.70	94.30	63.60	87.00	84.30
Median	73.70	67.40	89.50	67.20	74.90	81.30	72.30	85.90	60.60	84.50	78.70
Standard deviation (n-1)	3.36	3.61	8.96	1.42	5.79	6.27	4.33	4.57	2.84	7.12	10.30
Standard error of the mean	1.50	1.61	4.01	0.64	2.59	2.80	1.94	2.04	1.27	3.18	4.61
COV (%)	4.63	5.44	10.01	2.10	7.79	7.64	5.96	5.23	4.72	8.75	13.79
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.167	Yes 0.037 (2013) 0.0005 (2014)	Yes 0.136 (2013) 0.914 (2014) 0.0004 (2015)	No 0.914 (2013) 0.136 (2014) 0.048 (2015) 0.110 (2016)	No 0.151 (2013) 0.005 (2014) 0.518 (2015) 0.003 (2016) 0.184 (2017)	-	Yes 0.002	Yes 0.006 (2014) < 0.0001 (2015)	Yes 0.044 (2014) 0.154 (2015) < 0.0001 (2016)	Yes 0.613 (2014) 0.0054 (2015) 0.002 (2016) 0.177 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.

**Offshore Habitat – continued.**

Site	SPLIT						STL3KM					
Year	2013	2014	2015	2016	2017	2018	2013	2014	2015	2016	2017	2018
Metric	Clay (%)											
n	5	5	5	5	5	5	5	5	5	5	5	5
Mean	20.00	28.04	17.96	30.74	20.10	8.88	60.76	34.76	45.28	40.58	29.96	28.38
Minimum	2.72	20.90	10.30	27.60	12.60	4.60	46.10	24.20	30.80	33.90	20.30	15.80
Maximum	30.40	31.40	24.70	38.40	30.30	17.40	75.00	38.60	68.60	47.80	47.60	48.30
Median	25.30	28.80	18.80	29.00	14.70	8.80	57.60	36.50	42.40	40.20	24.50	26.00
Standard deviation (n-1)	10.94	4.16	6.03	4.48	9.07	5.21	12.15	6.02	14.91	6.54	11.57	12.11
Standard error of the mean	4.89	1.86	2.70	2.00	4.06	2.33	5.43	2.69	6.67	2.93	5.17	5.42
COV (%)	54.67	14.83	33.56	14.57	45.14	58.62	20.00	17.31	32.93	16.13	38.62	42.67
Modified Significance Level	0.0033						0.0033					
Significant Inter-annual Difference <sup>1</sup>	-	No 0.086	No 0.653 (2013) 0.034 (2014)	No 0.025 (2013) 0.553 (2014) 0.009 (2015)	No 0.983 (2013) 0.090 (2014) 0.638 (2015) 0.026 (2016)	Yes 0.021 (2013) <b>0.0003 (2014)</b> 0.055 (2015) <b>&lt; 0.0001 (2016)</b> 0.020 (2017)	-	Yes <b>0.001</b>	No 0.036 (2013) 0.144 (2014)	No 0.008 (2013) 0.412 (2014) 0.507 (2015)	Yes <b>0.0002 (2013)</b> 0.498 (2014) 0.038 (2015) 0.141 (2016)	Yes <b>0.0001 (2013)</b> 0.369 (2014) 0.023 (2015) 0.093 (2016) 0.823 (2017)



Site	STL11KM						STL25KM				
Year	2013	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Metric	Clay (%)										
n	5	5	5	5	5	5	5	5	5	5	5
Mean	27.04	33.44	9.62	31.46	24.56	17.32	27.14	12.35	38.82	16.88	24.94
Minimum	23.70	31.20	0.53	28.50	17.40	11.00	23.10	5.36	36.10	12.40	15.50
Maximum	31.70	40.00	22.20	32.80	33.10	26.80	33.60	17.30	40.20	26.70	36.50
Median	25.80	32.10	9.66	31.80	23.60	18.20	27.60	13.90	39.30	15.00	20.80
Standard deviation (n-1)	3.50	3.69	9.19	1.72	6.08	6.44	4.33	4.58	1.59	5.62	10.30
Standard error of the mean	1.57	1.65	4.11	0.77	2.72	2.88	1.94	2.05	0.71	2.51	4.61
COV (%)	12.94	11.04	95.57	5.46	24.74	37.21	15.95	37.08	4.10	33.31	41.30
Modified Significance Level	0.0033						0.0050				
Significant Inter-annual Difference <sup>1</sup>	-	No 0.167	Yes 0.030 (2013) 0.0004 (2014)	Yes 0.196 (2013) 0.928 (2014) 0.0005 (2015)	No 0.760 (2013) 0.091 (2014) 0.062 (2015) 0.110 (2016)	No 0.136 (2013) 0.004 (2014) 0.495 (2015) 0.005 (2016) 0.236 (2017)	-	No 0.018	Yes 0.122 (2014) <0.0001 (2015)	Yes 0.103 (2014) 0.465 (2015) 0.001 (2016)	No 0.731 (2014) 0.043 (2015) 0.059 (2016) 0.197 (2017)

1 – due to inclusion of 2018 data, results of statistical comparisons may be different from previous years.