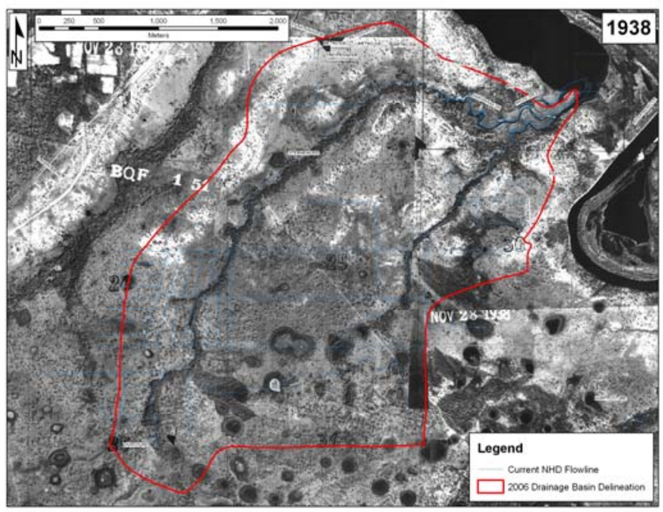
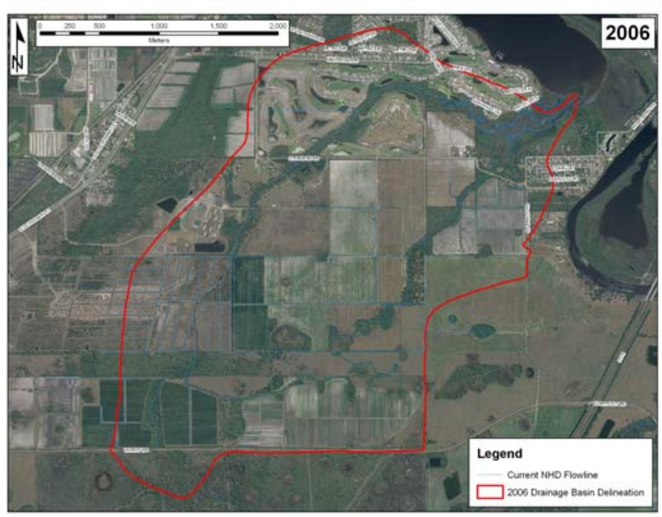
Tampa Bay Tidal Tributaries

Environmental Protection Commission
of Hillsborough County

Tidal Tributary Study Final Report

Water Quality, Sediment Chemistry, Benthic Macrofauna, and Watershed Characterization





September 2007

Tidal Tributary Study Summary Report

Water Quality, Sediment Chemistry, Benthic Macrofauna, and Watershed Characterization

Edward T. Sherwood, David J. Karlen, Thomas L. Dix, Barbara K. Goetting, Sara E. Markham, Anthony Chacour, Melissa Miller

September 2007

Environmental Protection Commission of Hillsborough County
Environmental Resource Management Division
3629 Queen Palm Dr.
Tampa, FL 33619

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1. INTRODUCTION

Rapid and continued urbanization along coastal watersheds which input to estuarine waterbodies through both major and minor tributary systems have shown varying response to increasing anthropogenic development intensity (Holland et al. 2004; Estevez 2006; Buzzelli et al. 2007; Krebs et al. 2007). In Tampa Bay, nutrient enrichment and eutrophication which occurs through various land use practices and development impacts have been identified as priority issues for the Bay's management (TBEP 1996). In the tidal reaches of the Bay's tributaries, changes in the quality, quantity, location, and timing of freshwater inflows – associated with the operation of regional water supply, stormwater conveyance and wastewater treatment systems, and changes in land use development – have become issues of concern and are contributing factors to Tampa Bay eutrophication.

Preliminary analyses of water quality and benthic contaminant data from major tidal tributary stations monitored by the Environmental Protection Commission (EPC) of Hillsborough County's long-term ambient water and benthic quality monitoring programs suggest that future management efforts in these areas will involve a number of issues. On the positive side, significant reductions in annual mean water column nutrient concentrations has occurred at a number of long-term monitoring locations during the 1984 – 2003 period, presumably reflecting the nitrogen load reduction efforts that have been underway in the Tampa Bay watershed since the early 1980s (Morrison and Boler 2003). However, in other tributaries to the Bay, increasing nutrient concentrations, sediment contamination, and depressed benthic communities still exist or are in flux due, in part, to past or continued landscape development. Consequently, exceedances of the State's estuarine chlorophyll-a guideline (11 μg/L), an increasing frequency of mid-depth dissolved oxygen concentrations <4 mg/L, occurrences of mid-depth hypoxia, and possible changes in salinity regimes due to changes in stormwater conveyance persist in many of these tidal tributary habitats.

The degree to which observed water and sediment quality impairments affect the biological communities in tidal tributaries has been investigated in major river systems that discharge to Tampa Bay; however, very little information exists regarding minor first and second order tidal tributaries. For the water and benthic quality elements of the tidal tributary assessment project, the EPC focused on initially characterizing water and benthic quality within a select set of tidal tributaries. The characterization of these tributaries serves to fill information gaps that exist relative to other more studied areas in Tampa Bay.

As an initial working hypothesis, we postulated that tidal tributaries which exhibit degraded water or benthic quality will also show high levels of anthropogenic land use/land cover changes in their contributing watersheds, and that tidal tributaries whose watersheds remain largely undisturbed by human activities will show the highest levels of water and benthic quality. The primary objective of this project was to test this hypothesis.

An interdisciplinary working group was formed in response to the priority research need identified by the TBEP to determine the current state of tidal tributaries and the contribution of tidal tributaries to Tampa Bay's productivity. The results of this study will be used to support this TBEP research priority. As part of this working group and to test the aforementioned hypothesis, the EPC and the Manatee County Environmental Management Department (MCEMD) conducted a one-year sampling program in tidal tributaries of four select watersheds to Tampa Bay (Figure 1). To provide unbiased estimates of water and benthic conditions and to support the primary objective of this component of the overall project, water quality, sediment quality, and benthic biota data were collected during 2006. Water and sediment quality indicators were then compared to the tidal tributaries' contributing watersheds land use/land cover information collated from the Southwest Florida Water Management District's (SWFWMD) 2004 land use/land cover dataset.

It should be noted that annual hydrologic conditions were below normal during 2006 in the select tidal tributary watersheds (Figure 2). Deficits in dry season rainfall drove the overall total annual rainfall level below median historic (1915-2006) conditions in each watershed. In light of the reduced hydrologic conditions during 2006, landscape links to in situ tributary conditions should be viewed as preliminary as watershed runoff for the majority of the year (dry season encompasses roughly eight months of the year) was below normal.

2. METHODS

2.1 STUDY SITES

This study focused on four tidal tributary watersheds (Figure 1). Two watersheds represented second order tributary systems which discharged into larger, first order river systems: the Alafia and Little Manatee Rivers. An a priori selection of tributaries draining into the Alafia River as the more disturbed system, based upon a higher degree of land use alterations in the Alafia River watershed compared to the Little Manatee River's, was determined collectively by the interdisciplinary work group. Two other watersheds represented minor first order tributary systems which discharged directly into Tampa Bay embayments: Feather Sound and Terra Ceia Bay. An a priori selection of tributaries draining into the Feather Sound area as the more disturbed system, based upon historic mosquito ditching along the banks of this area, was also determined collectively by the interdisciplinary work group. Comparison of the paired first and second order tributary systems was to be performed based upon the a priori selection of the disturbed vs. undisturbed watersheds.

2.2 MONTHLY WATER QUALITY MONITORING

Up to four primary sites were randomly selected in each priority watershed on a monthly basis using the sampling universe and sample site selection process described in the quality assurance project plan (QAPP 2006) (Table 1). Four sites were sampled monthly within each of the two largest systems – the Alafia River and the Little Manatee River tidal tributary watersheds. Three sites were sampled monthly in the Terra Ceia Bay's tributaries. Except for in January when low water conditions prevented navigation within the Grassy Creek tributary, two sites were sampled monthly in the Feather Sound area. In addition, an effort was made to compare the data collected for this project to existing ambient water quality data collections from other agencies in the vicinity of the tributaries for additional comparisons with the waterbodies to which the select tidal tributary systems drain (Table 2).

Instantaneous measurements of physical water quality parameters (temperature (^{o}C), dissolved oxygen (mg/L), conductivity (μmhos/cm), salinity (PSU), and pH) were taken at the time of sampling from the bottom, mid-depth, and surface of the water-column, if water depths were greater than 0.5m. Samples collected for laboratory analysis were taken concurrently with the collection of instantaneous measurements. Water samples were collected with a Horizontal Alpha Bottler sampler at ≤0.5-m depth. All environmental samples collected followed the standard procedures outlined in the QAPP (2006). Tidal tributary sample collection and bottle prep for this project were tailored to the collection of a core group of chemical parameters identified by the Tampa Bay Estuary Program (TBEP) Regional Ambient Monitoring Program (RAMP). The core group of laboratory analytes included: color (PCU), turbidity (NTU), total suspended solids (TSS, mg/L), chlorophyll-a (μg/L), total kjeldahl nitrogen (TKN, mg/L), dissolved ammonia nitrogen (mg/L), dissolved organic nitrogen (DON, mg/L), dissolved nitrate + nitrite nitrogen (mg/L), dissolved orthophosphate (soluble reactive phosphorus, SRP, mg/L), total phosphorus (mg/L), reactive silica (mg/L), fecal coliform bacteria (# of col./100mL), and enterococci bacteria (# of col./100mL).

2.3 SEASONAL BENTHIC BIOTA & SEDIMENT QUALITY MONITORING

Benthic biota and sediment samples were collected using a petite ponar grab ($0.023m^2$) within the tidal tributaries during Spring (May 2006) and Fall (September 2006) periods following the field protocols outlined in Courtney et al. (1995) and the QAPP (2006). Ancillary collections during the Spring period in the vicinity of the tidal tributaries (mainstem rivers and embayments) used the petite ponar grab sampler for sample collection, while during the Fall period a Young grab sampler ($0.04\ m^2$) was used following the protocols outlined in the long-term, bay-wide benthic monitoring program administered by the TBEP (Versar 1993). Benthic biota samples were rinsed through a 0.5-mm mesh using the water-cushion method and were then fixed in 10% borax-buffered formalin with rose bengal stain for later laboratory identification. All species were identified to the lowest practical taxon and enumerated for each sample. Species counts were standardized to the approximate area sampled.

For sediment quality analyses (laboratory analysis for metals and organic contaminants), the upper 2-cm of sediment was removed from a separate grab sample (taken proximal to the biota sample) following the methodologies outlined in the QAPP (2006). Sediment quality samples were processed using standard analytical methods, including EPA Method 8080 for organochlorines and poly-chlorinated biphenyls (PCBs), and Method 8270 for poly-aromatic hydrocarbons (PAHs). Chemical contaminants monitored included selected EPA priority pollutant metals and selected EPA priority pollutant organic compounds.

Samples to determine physical sediment characteristics (i.e., percent silt+clay) were collected from a separate, proximal grab sample using a 60cc syringe to core the entire grab sample. Additionally, benthic microalgae community (BMAC) biomass, as indicated by chlorophyll-a concentration in the upper 1-cm of sediment, was determined from a proportional number of sites from the tidal tributary watersheds with a "mini corer" (10cc syringe with the barrel cut off). BMAC samples were collected in a similar manner as sediment samples for silt-clay analysis except for truncating the sample to the upper 1-cm of substrate. Benthic microalgae chlorophyll-a samples were processed using the spectrophotometric method of Whitney and Darley (1979), which is designed to yield accurate chlorophyll-a concentrations in samples with high quantities of chlorophyll-a degradation products.

2.4 ANALYSIS

2.4.1 Water Quality Monitoring Analysis

Water quality monitoring data collected over the one-year sampling program were summarized in box plot displays for each system and in monthly scatter plots. Two general linear models were used to detect differences in water quality parameters within the tidal tributary systems (i.e., select tributaries versus the areas to which they drain) and between the major system types (i.e., tributaries draining to a-priori impacted versus unimpacted rivers or embayments). Temporal trends were accounted for in both models by including sample month as a factor. For comparisons within the tidal tributary watersheds the model took the form:

$$(\text{Parameter})_{ij} = \mu + \alpha_i + \beta_j + \alpha\beta_{ij}\ \ X_1 + \varepsilon_{ij}$$

where $(\text{Parameter})_{ij}$ = any given water quality parameter;
μ = the overall unknown grand mean;

α_i = the effect of level i of inside or outside the tributary stratum (e.g., 2nd Order Alafia Tributaries vs. Mainstem Alafia River, 1st Order Terra Ceia Bay Tributaries vs. Terra Ceia Bay etc.);
β_j = the effect of level j of sampled tidal tributary;
$\alpha\beta_{ij}$= the crossed effect of inside or outside stratum with the sampled tidal tributary;
X_1 = the continuous effect of month sampled;
ε_{ij} = overall random error.

Post hoc comparisons of individual tidal tributaries with the reference mainstem river or embayment to which they drained were accomplished using Dunnett's multiple comparisons test.

For comparisons between a-priori disturbed versus undisturbed tidal tributary watersheds, the model took the form:

$$(\text{Parameter})_{ij} = \mu + \alpha_i + \beta_{ij} + X_1 + \varepsilon_{ij}$$

where $(\text{Parameter})_{ij}$ = any given water quality parameter;
μ = the overall unknown grand mean;
α_i = the effect of level i of between systems (e.g., Alafia vs. Little Manatee River 2nd order tributaries, Feather Sound vs. Terra Ceia Bay 1st order tributaries);
β_{ij} = the random effect of sampled tidal tributary nested within major system type when comparisons between disturbed vs. undisturbed systems was made;
X_1 = the continuous effect of month sampled;
ε_{ij} = overall random error.

2.4.2 Sediment Quality and Benthic Biota Analysis

SYSTAT® 11 (SYSTAT Software, Inc. 2004) was used for all parametric statistical tests on the hydrological, sediment chemistry, silt/clay and univariate biological metrics (Species Richness, Abundance, Diversity, Tampa Bay Benthic Index). Abundance data were log (n+1) transformed and percent silt/clay data were arcsine transformed for normality. Analysis of Variance (ANOVA) and post hoc Tukey pair-wise test was used to test for differences between seasons within tidal streams and between tidal streams and respective reference sites within seasons.

Benthic community indices (species richness, abundance, diversity), Principle Components Analysis (PCA), Bray-Curtis Similarity, Non-metric Multi-Dimensional Scaling (MDS), Similarity Percentage (SIMPER), Analysis of Similarity (ANOSIM), and BIO-ENV analysis were conducted using PRIMER v6 (PRIMER-E, Ltd. 2006). The Tampa Bay Benthic Index (TBBI; Janicki Environmental 2005; Malloy et al. 2007) was calculated using Microsoft Excel. Graphs were generated using SigmaPlot 10.0 (SYSTAT Software, Inc. 2006).

Descriptive categories for depth, salinity; dissolved oxygen, sediment type, and TBBI score are presented in Table 3. Cutoff points for depth were based largely on the median and 1st and 3rd quartile values for all sampling sites collected for the bay-wide benthic monitoring program from 1993-2005. The dissolved oxygen cutoffs are based on the state water quality standards and salinity cutoffs are based on the Venice System (Venice Symposium, 1959). Sediment categories were estimated from %SC measurements based on the Wentworth size class system (cf. Percival and Lindsay 1997). Sediment grain size (Φ) was determined by regressing percent silt+clay (%SC) vs. mean grain Φ size for Tampa Bay data collected by Long et al. (1994) using

TableCurve 2D ver. 5.0 (AISN, 2000). These data were used to develop the following relationship between %SC and mean grain size: %SC= 1/ (0.0097+1.575*e^{Φ}) (Adjusted r^2=0.947). Cutoffs for the Tampa Bay Benthic Index were derived by Janicki Environmental (2005) and Malloy et al. (2007) with the following modifications: Negative TBBI scores were labeled as "Undefined"; depauperate samples were assigned a TBBI score of 0 and labeled as "Empty".

The sediment contaminant levels (heavy metals and organics) were evaluated using the Threshold Effects Levels (TELs) and Probable Effects Levels (PELs) established by MacDonald (1994) for Florida coastal waters. The metals data was additionally assessed by normalizing with aluminum (Schropp et al. 1990).

2.5 WATERSHED CHARACTERIZATION

A geographic information systems (GIS) analysis was performed to assess watershed landscape development intensity (LDI) in each tidal tributary watershed as outlined in Brown and Vivas (2005). Tidal tributary flowlines and waterbody attributes with direct hydrologic connection to the priority tidal tributary watersheds were extracted from the National Hydrologic Dataset (NHD) obtained from the U.S. Geological Society (USGS 2007). One-hundred meter corridors around the NHD flow line and connected waterbody attributes were created using ArcGIS 9.2's (ESRI, Inc. 2006) buffer tool. Land use/land cover GIS data obtained from the Southwest Florida Water Management District (SWFWMD 2004) was clipped along the 100-m stream corridors for further processing. Florida land use cover classification codes (FDOT 1999) extracted from the SWFWMD dataset were categorized into landscape development intensity indices described in Brown and Vivas (2005) (Table 4). Area-weighted averages of LDI's along the stream corridors were then determined for each priority watershed using ArcGIS. Correlations of each tidal tributary LDI with water, sediment, and benthic biota metrics were determined using SAS 9.1.3 (SAS Institute, Inc. 2003).

3. RESULTS

3.1 WATER QUALITY MONITORING RESULTS

3.1.1 Physical Water Quality Parameters

Summary graphics of physical water quality parameters are contained in Figures A-1 through A-9 for each system and B-1 through B-9 for each system by month.

3.1.1.1 Second Order Tributary Systems (Alafia & Little Manatee River)

Depths in the second order tidal tributaries draining to the rivers tended to be shallower than the mainstem rivers (Tables 5 & 6; Figures A-1 & B-1); however, no difference in depths between the tributaries draining to the Alafia or Little Manatee Rivers was apparent overall (Table 7). This pattern was similar for salinity in the tributaries, where mean water-column salinity tended to be greater in the mainstem rivers compared to the second order tributaries (Tables 5 & 6), and overall very little difference existed between tributaries draining to the Alafia or Little Manatee Rivers (Table 7). Particular to the tidal tributaries draining to the Alafia River, both water-column stratification and bottom dissolved oxygen concentrations were different than the mainstem river (Table 6). Stratification was greater in the mainstem Alafia compared to its second order tributaries, while bottom dissolved oxygen was lower. For all physical parameters except temperature, significant variation existed in the data among the second order tidal tributaries which confounded the detection of differences between the Alafia and Little Manatee River systems (Table 7). Though, for select physical water quality parameters, differences among individual tributaries when compared to the respective mainstem rivers to which they drained were apparent (Tables 5 & 6; Figures A-1 through A-6 & B-1 through B-6).

For physical parameters influencing water clarity, both differences within and between the riverine systems was apparent. For comparisons between the riverine systems, color in the tidal tributaries draining to the Little Manatee River was greater than those tributaries draining to the Alafia River, while turbidity and total suspended solids were greater in the Alafia River tributaries compared to the Little Manatee River's (Table 7; Figures A-7 through A-9 & B-7 through B-9). This pattern was the same within the Alafia River system itself, where color was higher in the mainstem river compared to the tributaries, while turbidity and total suspended solids tended to be greater within the tributaries compared to the mainstem river (Table 6). For the tributaries draining to the Little Manatee River, only turbidity appeared to be greater within the tributaries when compared to the mainstem river (Table 6). Likewise for these parameters, each individual second order tidal tributary showed varying differences when compared to the respective mainstem river to which they drained (Table 7). Regardless of the apparent differences detected within and between systems and due mostly to the relative shallowness of the second order tidal tributaries, secchi disc visibility within the tidal tributaries was almost always to the bottom (Table 5).

3.1.1.2 First Order Tributary Systems (Feather Sound & Terra Ceia Bay)

Depths in the first order tidal tributaries draining to embayments were shallower, in general, than the embayments to which they discharged (Tables 5 & 8). For the Feather Sound system, water-column salinity, stratification, and bottom dissolved oxygen concentration were greater in Feather Sound than within the Grassy Creek tributary (Table 8). For the Terra Ceia Bay system, water-column profiles were not conducted for in-kind sample collections within Terra Ceia Bay precluding specific physical parameter comparisons to the tributaries draining to this bay. Additionally, significant variation in depth and salinities was apparent among the first order tributaries confounding comparisons between tributaries draining to Feather Sound versus those draining to Terra Ceia Bay (Table 7).

For physical parameters influencing water clarity within the first order tributaries, only a difference in total suspended solids was detected between Feather Sound's tributaries versus Terra Ceia Bay's (Table 7). The tributaries draining to Terra Ceia Bay had higher overall TSS than tributaries draining to Feather Sound (Tables 5 & 7; Figure A-9B). Within the Terra Ceia Bay system, color and turbidity were generally greater within the tributaries than within the embayment (Tables 5 & 8; Figures A-7B & A-8B). Within the Feather Sound system, this pattern was similar where color and turbidity was greater within Grassy Creek than within Feather Sound (Tables 5 & 8; Figures A-7B & A-8B). Additionally, TSS tended to be greater, in general, within Feather Sound than within the first order tidal tributaries monitored (Table 8; Figure A-9B). Again, due mostly to the relative shallowness of the tributaries, secchi disc visibility within the tidal tributaries was almost always to the bottom (Table 5; Figure A-2B).

3.1.2 Nutrient Concentrations

Summary graphics of nutrient species' concentrations are contained in Figures A-10 through A-14 for each system and B-10 through B-14 for each system by month.

3.1.2.1 Second Order Tributary Systems (Alafia & Little Manatee River)

There were no overall apparent differences in nutrient concentrations between tributaries draining to the Alafia River versus those that drained to the Little Manatee River (Tables 6 & 9; Figures A-10 through A-14 & B-10 through B-14); however, significant variation in concentrations of both nitrogen and phosphorus species among individual tidal tributaries was observed (Table 7). Total nitrogen concentrations also varied seasonally among the tidal tributaries during 2006 (Table 7; Figures B-10A). Within the Alafia River system, tidal tributaries generally showed greater total nitrogen concentrations than the mainstem river, while dissolved inorganic nitrogen and SRP were generally greater in the mainstem river (Tables 6 & 9). Within the Little Manatee River system, tidal tributaries generally showed greater total nitrogen, total phosphorus, and SRP concentrations than the mainstem river (Tables 6 & 9).

3.1.2.2 First Order Tributary Systems (Feather Sound & Terra Ceia Bay)

There was no overall apparent difference in nitrogen species concentrations between tributaries draining to Feather Sound versus those that drained to Terra Ceia Bay (Tables 8 & 9); however, significant variation in nitrogen species concentrations among individual tidal tributaries was observed (Tables 7 & 9). Total phosphorus and SRP concentrations were greater in the first order tidal tributaries draining to Terra Ceia Bay versus those that drained to Feather Sound (Table 7). Phosphorus species concentrations also varied seasonally among the tidal tributaries during 2006 (Table 7; Figures B-13B & B-14B). Within the Feather Sound system, Grassy Creek had greater concentrations of all nutrient species than the embayment (Tables 7 & 9). Within the Terra Ceia Bay system, Frog and McMullen Creeks showed greater total nitrogen and total phosphorus concentrations than the embayment (Tables 7 & 9).

3.1.3 Water Quality Biological Indicators

Summary graphics of biological indicators are contained in Figures A-15 through A-17 for each system and B-15 through B-17 for each system by month.

3.1.3.1 Second Order Tributary Systems (Alafia & Little Manatee River)

Chlorophyll-a concentrations were generally greater in the second order tributaries draining to the Alafia River versus those that drain to the Little Manatee River and varied seasonally among the second order tidal tributaries during 2006 (Tables 7 & 10). Within the Alafia River system, the tidal tributaries generally had higher chlorophyll-a concentrations than the mainstem river (Tables 6 & 10). Within the Little Manatee River system, there were no apparent differences in chlorophyll-a concentrations between the tributaries and the mainstem river (Tables 6 & 10).

There were no differences detected in bacteria concentrations between the second order tributaries draining to the Alafia River versus those that drain to the Little Manatee River; however, significant variation among the second order tidal tributaries was apparent (Tables 7 & 10). Within both the Alafia and Little Manatee River systems, the tidal tributaries generally had higher fecal coliform concentrations than the respective mainstem rivers to which they drained (Tables 6 & 10). Except for in Rice Creek, enterococci concentrations did not differ within any of the tidal tributaries when compared to their respective mainstem river (Table 6).

3.1.3.2 First Order Tributary Systems (Feather Sound & Terra Ceia Bay)

No differences were detected in chlorophyll-a concentrations between the first order tributaries draining to Feather Sound versus those that drain to Terra Ceia Bay; although, significant variation among and across seasons in the first order tidal tributaries was apparent (Tables 7 & 10). Within both the Feather Sound and Terra Ceia Bay systems, similar chlorophyll-a concentrations within the first order tributaries and the respective embayments to which they drain were observed (Tables 8 & 10).

There were no differences detected in bacteria concentrations between the first order tributaries draining to Feather Sound versus those that drain to Terra Ceia Bay; however, significant variation among the first order tidal tributaries was apparent (Tables 7 & 10). Within the Feather Sound system, the tidal tributaries had significantly higher fecal coliform and enterococci concentrations than the embayment (Tables 8 & 10). For the Terra Ceia Bay system, bacteria analyses were not conducted for in-kind sample collections within Terra Ceia Bay precluding comparisons to the tributaries draining to this bay (Tables 8 & 10).

3.2 BENTHIC MONITORING RESULTS

3.2.1 Physical Benthic Sampling Conditions

3.2.1.1 Second Order Tributary Systems (Alafia & Little Manatee River)

3.2.1.1.1 Benthic Sampling Bottom Water Quality

Due to the small replicate size within individual tributary-season groups (Table 11), the following statistical analysis is focused on seasonal comparisons for all stations rather than between individual creeks or across systems. The median, minimum and maximum of physical benthic conditions for the Alafia and Little Manatee River tidal tributary sites are given in Table 12.

Within the Alafia River system, there were no significant differences in mean sample depth between samples collected during the spring or fall (Figure 5; $p = 0.118$). Within the Little Manatee River System, reference sites in the mainstem river during the fall had deeper sample depths (Table 12; Figure 5) than during the spring ($p = 0.051$), and were deeper than the fall Wildcat Creek samples ($p = 0.032$).

Within the Alafia River system, bottom temperatures (Figure 6) were similar between seasons ($p = 0.629$), while within the Little Manatee River system, lower values were observed during the fall in the mainstem river (Figure 6; $p=0.021$). However, there were no statistical differences between seasons within the individual tidal creeks or between the Little Manatee River reference sites in a given season. For both systems, bottom pH tended to be lower during the fall period (Figure 7; $p<0.001$, respectively).

Within the Alafia River system, bottom salinity was generally lower in the fall, with fall salinities dropping into the freshwater range in Rice Creek and Riverview Park West Creek. The overall seasonal difference was not found to be significantly different (Figure 8; $p = 0.273$) although actual values within individual tributaries exhibited declines over one or more salinity zones (Figure 8). Within the Little Manatee River system, bottom salinities were also significantly lower in the fall at all tidal stream and mainstem river sites (Figure 8; $p < 0.001$), dropping into the tidal freshwater zone in both Curiosity Creek and Wildcat Creek. The Little Manatee River itself went from polyhaline in the spring to oligohaline in the fall (Figure 8). There was no significant difference between the tidal creeks and mainstem Little Manatee River sites within either season.

Within the Alafia River system, bottom dissolved oxygen levels were generally in the intermediate range, with the exception of Rice Creek where dissolved oxygen was relatively high and Dog Leg Creek, where fall values were in the anoxic range. Fall dissolved oxygen levels were lower across all tidal stream sites, but these seasonal differences were not found to be statistically significant (Figure 9; $p = 0.298$). Within the Little Manatee River system, bottom dissolved oxygen did not show any significant differences between seasons ($p = 0.192$), although median values tended to be lower in the fall (Figure 9).

3.2.1.1.2 Benthic Sampling Sediment Quality

For both riverine systems, sediments were generally fine to very fine grained sands (Figure 10). Muddy sediments were found in Riverview Park West Creek and during the fall in Dog Leg

Creek and Question Mark Creek. Seasonal differences in the sediment composition were not significant in either the Alafia (Figure 10; p = 0.370) or Little Manatee River systems (Figure 10; p=0.495). Benthic microalgae chlorophyll-a concentrations were dramatically greater during the spring sampling event than during the fall in both riverine systems (Table 12).

Mainstem Alafia River and its Second Order Tributaries

Baseline metal contaminant levels in the mainstem Alafia River are summarized in Appendix C (Table C-4). Cadmium was particularly high with the minimum value above the TEL and median value above the PEL. Maximum values exceeded TELs for silver, copper and lead and exceeded PELs for cadmium, chromium, nickel and zinc. Mean nickel levels were also above their TEL. Overall cadmium levels were high, but the cadmium to aluminum ratios (Figure 11) indicate that these values are naturally high and not due to anthropogenic sources. Baseline levels of low molecular weight (LMW) PAHs in the Alafia River are presented in Table D-5A. Minimum values for all LMW PAHs were above their respective TELs except for acenaphthylene and phenanthrene, which exceeded their PELs. The maximum values for all high molecular weight (HMW) PAHs were above PELs along with the total HMW PAHs (Table D-5B). The maximum value for total PAHs was above its TEL. Summary statistics for other measured hydrocarbons are presented in Table B-5C. Maximum levels of total PCBs for the Alafia River baseline data exceeded TELs, as did the pesticides p,p’ - DDD, p,p' - DDE, p,p' - DDT, and total DDT (Table D-6A). Maximum values for lindane, dieldrin and total chlordane were above their PELs. Additional pesticides are presented in Tables D-6B and D-6C.

Dog Leg Creek had elevated levels of cadmium (max >TEL) during both the spring and fall (Tables C-5 and C-6 respectively). The fall values for cadmium, chromium, zinc, manganese and selenium were higher, while copper, lead, antimony levels were lower (Table C-6). Low molecular weight PAH levels in Dog Leg Creek were lower in the spring than in the fall, with acenaphthene above its TEL during both seasons, and naphthalene and phenanthrene exceeding TELs in the fall (Tables D-7A and D-7B). High molecular weight PAHs and total PAHs were also higher in the fall. All HMW PAH values were below TELs in the spring, while dibenzo (a, h) anthracene and fluoranthene were above TELs in the fall (Tables D-7C and D-7D). Additional measured hydrocarbons also were higher in the fall relative to the spring (Tables D-7E and D-7F). Pesticides and PCB levels in Dog Leg Creek were all below TELs in both the spring and fall, but generally were higher in the fall (Tables D-8A and D-8B respectively). Other measured pesticides (Tables D-8C-F) followed the same trend with higher measurements in the fall, with the notable exception of heptachlor epoxide which was lower in the fall sample.

Question Mark Creek had TEL exceedances for cadmium in the spring (Table C-7) and for cadmium and chromium in the fall (Table C-8). Fall levels for cadmium, chromium, nickel, zinc, manganese, antimony and selenium were higher, while values for copper and lead decreased. Selenium levels in particular showed evidence of enrichment above background levels (Figure 12). Question Mark Creek had two, LMW PAHs which exceeded TELs in the spring (Table D-9A) and had a general increase in the fall (Table D-9B). There were no TEL exceedances for HMW-PAH’s in the spring (Table D-9C) while all HMW PAHs and total PAHs increased in the fall. Other hydrocarbons also exhibited an increase in the fall (Tables D-9E and D-9F). Pesticides and PCBs had no TEL exceedances in either the spring or fall and no distinctive seasonal trends (Tables D-10 A-F).

For the spring Rice Creek samples, all metal levels were lower than their respective TELs (Table C-9). The fall Rice Creek samples showed increases in cadmium, zinc and selenium and slight decreases for copper, nickel, lead and antimony (Table C-10). Fall cadmium levels exceeded their TEL. Rice Creek had no LMW PAHs above TELs during the spring (Table D-11A) and only one TEL exceedance in the fall (Table D-11B). The HMW PAH dibenzo (a, h) anthracene was above its TEL during both seasons, and there was a slight overall increase in the fall (Tables D-11C and D-11D). Other hydrocarbons tended to have higher values in the fall (Tables D-11E and D-11F), with a strong spike for retene in the fall. There were no TEL exceedances for pesticides and PCBs in either the spring or fall Rice Creek samples (Tables D-12A and D-12B). There were slight increases in the fall levels of total DDT and chlordane. Other pesticides showed higher measurements in the fall vs. spring (Tables D-12C-F), except for heptachlor epoxide.

Riverview Park West Creek had some of the highest levels of metals of all the tidal streams studied and many contaminants were higher than the baseline levels from the Alafia River. Spring samples (Table C-11) had minimum values higher than TELs for cadmium, chromium and zinc and maximum values exceeding TELs for arsenic, nickel, lead and zinc. Arsenic showed evidence of enrichment, as indicated from the arsenic:aluminum ratio (Figure 13). Fall metal values exceeded TELs for cadmium, chromium and zinc (Table C-12). Increases were observed for silver, zinc, antimony and selenium, while arsenic, cadmium, copper and lead levels decreased. Riverview Park West Creek had four, LMW PAHs above TELs in the spring and all but one in the fall (Tables D-13A and D-13B). Total LMW PAHs also exceeded its TEL in the fall. All HMW PAHs and total PAHs exceeded TELs during both spring and fall, and dibenzo (a, h) anthracene exceeded it's PEL in the fall (Tables D-13C and D-13D). Fall HMW PAH levels overall were higher in the fall. Other measured hydrocarbons also were higher in the fall (Tables D-13E and D-13F). Pesticide and PCB levels in the spring showed TEL exceedances for dieldrin, p, p'- DDE and total DDT (Table D-14A) while the fall values above TELs for p, p'-DDE, p, p'-DDT and total DDT. There was also an increase in total chlordane and a decrease in total PCBs in the fall (Table D-14B). Several additional pesticides also showed increases in the fall relative to the spring (Tables D-14 C-F).

Mainstem Little Manatee River and its Second Order Tributaries

Mainstem Little Manatee River baseline levels for metals were generally low (Table C-13). Mean cadmium values were above its TEL, and the maximum value exceeded its PEL. Additionally, the maximum copper value also was above its PEL. Several other metals had maximum levels above their TELs including arsenic, chromium, nickel and zinc. Overall, baseline metal levels in the Little Manatee River were higher than in the tidal tributaries. Overall baseline levels for PAHs in the Little Manatee River were low; however, maximum values for all LMW and HMW PAHs were above their respective TELs (Tables D-15A and D-15B). Maximum values for the pesticides lindane, total chlordane, and all forms of DDT were above TELs (Table D-16A). Summary statistics for additional pesticides measured in the Little Manatee River are presented in tables D-16B&C.

Curiosity Creek spring metal levels were all below TELs (Table C-14). Cadmium (Figure 14) and zinc increased in the fall samples, but most metal levels were lower (Table C-15) with a large drop in antimony. All PAH levels in Curiosity Creek were below TELs during both seasons, and there was no discernable difference between seasons (Tables D-17A-D). Other measured hydrocarbons were also low, with no observed difference between seasons (Tables D-17 E&F). Pesticide and PCB levels in Curiosity Creek were also below TELs with no seasonal differences apparent (Tables D-18 A-F).

Wildcat Creek had no TEL exceedances in the spring (Table C-16). The fall samples showed increases in cadmium and selenium, while most other metals exhibited reduced levels (Table C-17). The Wildcat Creek PAH levels were all below their respective TELs for both sampling seasons and there were no observed seasonal differences (Tables D-19A-F). All pesticides and PCBs were also below TELs during both seasons (Tables D-20A-F). There were also no apparent changes in pesticide levels between seasons.

3.2.1.2 First Order Tributary Systems (Feather Sound & Terra Ceia Bay)

3.2.1.2.1 Benthic Sampling Bottom Water Quality

The median, minimum and maximum values for bottom water quality readings taken during the benthic sampling events in the Feather Sound and Terra Ceia Bay watersheds are given in Table 13.

Within the Feather Sound watershed, sample depths (Figure 15) at embayment sites were significantly deeper than at the Grassy Creek sites for both the spring ($p = 0.009$) and fall ($p < 0.001$). The Feather Sound embayment spring reference sites were shallower than the fall reference sites ($p = 0.031$), but there was no seasonal difference in depth for the Grassy Creek sites ($p = 0.778$). Within the Terra Ceia Bay watershed, the overall sample depth by site and season was shallower in the fall (Figure 15; $p = 0.021$) but highly variable and no pairwise comparisons were found to be significantly different.

Within the Feather Sound watershed, bottom temperatures were significantly higher ($p < 0.001$) in the fall at embayment locations, but lower in Grassy Creek (Figure 16). Grassy Creek tended to have lower bottom temperatures relative to the embayment sites within each season and in particular during the fall sampling period (Table 13; Figure 16). Within the Terra Ceia Bay watershed, bottom temperatures were higher in the fall at the Terra Ceia Bay sites ($p=0.014$), but no seasonal differences were observed within the tidal tributaries (Figure 16).

Within the Feather Sound watershed, bottom pH (Figure 17) values were significantly lower in Grassy Creek relative to the embayment sites within both seasons ($p < 0.001$). The pH in Grassy Creek was significantly lower in the fall, while there was no significant difference between the spring and fall embayment sites ($p = 0.958$). Within the Terra Ceia Bay watershed, bottom pH values in Frog Creek and McMullen Creek were significantly lower than at the Terra Ceia Bay sites in both the fall and spring (Figure 17; $p < 0.001$). There was no seasonal difference in pH within the Terra Ceia Bay tidal tributaries; however, the spring Terra Ceia Bay sites had lower pH values than in the fall ($p = 0.002$).

Salinities tended to fall within the polyhaline range in the Feather Sound sites (Figure 18). Within Grassy Creek, the fall salinity values were significantly lower than the spring ($p < 0.001$). The bottom salinity during the spring was not significantly different between Grassy Creek and the embayment sites ($p = 0.752$), and there was no seasonal difference between the embayment spring and fall samples ($p = 1.000$). For the Terra Ceia Bay watershed, there was a significant drop in salinity in the fall at all sites (Figure 18; $p < 0.001$). The mean salinity in Frog Creek went from polyhaline to oligohaline, salinities dropped from polyhaline to low mesohaline in McMullen Creek and from euhaline to polyhaline in Terra Ceia Bay (Figure 18).

Within the Feather Sound watershed, the bottom dissolved oxygen was lower in Grassy Creek during both the Spring and Fall samples relative to the corresponding embayment sites (Figure 19; $p<0.001$). Median values were within the hypoxic range (Table 13). There was no significant difference in bottom dissolved oxygen between seasons in Grassy Creek ($p=0.888$) or in the embayment sites ($p=0.271$). Within the Terra Ceia Bay watershed, bottom dissolved oxygen levels were generally high at all sites (Table 13; Figure 19) with significant increases in the fall in McMullen Creek ($p = 0.012$) and in Terra Ceia Bay ($p = 0.032$).

3.2.1.2.2 Benthic Sampling Sediment Quality

The sediment composition in Grassy Creek consisted of medium grained sands and there was no significant difference in the %SC between seasons ($p = 1.000$). Percent silt+clay from the spring Feather Sound samples was higher than both the Grassy Creek samples and the fall embayment sites (Figure 20). Within the Terra Ceia Bay watershed, the mean %SC was lower in the fall at Frog Creek and in Terra Ceia Bay and higher in McMullen Creek (Figure 20). However, because the silt-clay measurements at individual sites were highly variable, overall comparisons between sites and seasons were not statistically significant ($p = 0.098$). Like in the riverine systems, benthic microalgae chlorophyll-a concentrations were generally greater during the spring sampling event than during the fall in both the Feather Sound and Terra Ceia Bay tributaries (Table 13).

Feather Sound/Old Tampa Bay and Grassy Creek

Summary statistics for the metals sediment contaminant analysis are shown in Appendix C. Background levels for the Feather Sound/Old Tampa Bay area (Table C-1) were generally low, but maximum values exceeded TELs for silver, arsenic, and copper and PELs for cadmium, chromium, nickel, lead, and zinc. Cadmium was the only metal that had mean values higher than its TEL; however, these levels appear to occur naturally when compared to their ratio with aluminum (Figure 21). Organic sediment contaminants (PAHs, PCBs, pesticides) are summarized in Appendix D. The embayment sites' LMW PAHs (Table D-1A) had several maximum values which exceeded their established TELs, but total LMW PAHs were less than the defined TEL. The mean level for the HMW PAH dibenzo (a,h) anthracene exceeded its TEL, while the maximum value was greater than the PEL. All other HMW PAHs had maximum values exceeding their TEL levels (Table D-1B), but median and mean levels tended to be low. Maximum levels for total HMW PAHs and total PAHs also exceeded TELs, but overall values were low. Other PAHs that were measured but do not have established TELs/PELs are presented in Table D-1C. Table D-2A presents summary data for baseline levels of PCBs and pesticides at the Feather Sound sites. Maximum values for p,p' – DDE, p,p'-DDT and total DDT exceeded their TELs while maximum chlordane was greater than its PEL. Overall median and mean pesticide levels, however, were low. Additional pesticides which were measured but do not have established TEL/PELs are presented in Tables D-2B and D-2C.

Metal levels in Grassy Creek tended to be lower than the embayment baseline levels and below TELs during both spring and fall (Tables C-2 and C-3, respectively). Cadmium was the only metal to exceed its TEL and higher levels were observed in the fall (Figure 21). The LMW PAH levels in Grassy Creek were all below their TELs in the spring (Table D-3A). Levels were slightly higher in the fall, with the maximum acenaphthene value exceeding its TEL (Table D-3B). Overall mean LMW PAHs were well below TELs and comparable to the embayment baseline levels. The HMW PAHs and total PAHs were below TELs for both the spring and fall Grassy Creek sites (Tables D-3C and D-3D) and less than the Feather Sound baseline levels. Data for additional PAHs from Grassy Creek are presented in Tables D-3E and D-3F. PCB and pesticide levels in Grassy Creek were low during both seasons, with all values below TELs (Tables D-4A-F).

Terra Ceia Bay and its First Order Tributaries

The Terra Ceia Bay baseline metals samples had elevated levels of cadmium with the minimum value exceeding the TEL (Table C-18). The maximum measurement of arsenic exceeded its TEL and the maximum zinc value was above its PEL. Overall, however, metal contaminants were fairly low in Terra Ceia Bay. Baseline levels of PAHs in Terra Ceia Bay were low, but maximum values of two LMW PAHs and one HMW PAH were above their respective TELs (Tables D-21 A-C). Pesticides and PCBs were also low overall, (Tables D-22A-C) although the maximum value for total chlordane was above its TEL.

Frog Creek had elevated cadmium levels above its TEL during both the spring and fall (Tables C-19 and C-20). There were increases in the levels of cadmium, copper, nickel, lead, and antimony and decreases in zinc and selenium in the fall samples. The PAHs levels in Frog Creek were below TELs for all LMW and HMW PAHs during both seasons (Tables D-23 A-F). There was a general decrease in PAHs in the fall. Pesticides and PCBs were also below TELs, with decreasing levels during the fall (Tables D-24A-F) in this tributary.

McMullen Creek also exhibited high levels of cadmium above its TEL for both seasons (Tables C-21 and C-22). The fall samples had higher levels of cadmium, chromium, copper, nickel, lead, zinc and tin. McMullen Creek had low level of PAHs, with all spring values for LMW and HMW PAHs below TELs (Tables D-25A&C). Fall PAHs were also low overall, with a single LMW PAH above its TEL (Table D-25B). All HMW PAHs were less than TELs in the fall samples (Table D-25D). Pesticide and PCB levels were all below their TELs and there were no noticeable changes between seasons (Tables D-26A-F) in this tributary.

3.2.2 Benthic Macrofauna

3.2.2.1 Second Order Tributary Systems (Alafia & Little Manatee River)

3.2.2.1.1 Mainstem Alafia River and its Second Order Tributaries

Table 14 summarizes the median, minimum and maximum values for the benthic community measures for the Alafia River watershed system. The number of taxa present was generally lower in the fall (Figure 22), but overall seasonal differences were not significant ($p = 0.115$). Fall abundances were significantly lower (Figure 23; $p = 0.008$) in all tributaries with the exception of Question Mark Creek, which actually showed an increase in the fall. The Shannon-Wiener diversity index was generally lower in the fall except for Dog Leg Creek (Figure 24; $p =0.056$) and the Tampa Bay Benthic Index also was lower in the fall with the exceptions of Rice Creek and Riverview Park West Creek (Figure 25; $p = 0.039$).

The dominant taxa in Alafia River tidal tributaries showed seasonal differences (Table 15). Dog Leg Creek was strongly dominated by tubificid oligochaetes (unidentified Tubificidae and *Limnodrilus hoffmeisteri)* in the spring, while the fall samples only contained three taxa – each accounting for a third of the relative abundance. Question Mark Creek had several of the same taxa dominating in both seasons, with the hydrobiid gastropod *Littoridinops palustris* making up 56% of the abundance in the spring while tubificid oligochaetes accounted for half of the fall abundance. Rice Creek had several low salinity or euryhaline taxa present in both seasons. The spring samples were dominated by the amphipod *Grandidierella bonnieroides* (43% relative abundance) and the invasive freshwater bivalve *Corbicula fluminea*. The fall samples were strongly dominated by *C. fluminea* (56%). Riverview Park West Creek was dominated by tubificid oligochaetes and the hydrobiid *Littoridinops monroensis* (both 23% relative abundance) in the spring and by the hydrobiid *Pyrgophorus platyrachis* in the fall. *Grandidierella bonnieroides* dominated the spring Alafia River reference sites, while the false mussel *Mytilopsis leucophaeata* had the highest abundance in the fall reference samples.

An ANOSIM failed to show significant seasonal differences in the species composition in the individual tidal tributaries due to few replicate samples. However, overall seasonal differences between the spring and fall mainstem Alafia River reference samples were significant ($p=0.025$). Seasonal changes in the benthic community structure were also apparent in the multidimensional scaling analysis (Figure 26).

Results of SIMPER analysis are summarized in Appendix E. Spring mainstem Alafia River samples had an average Bray-Curtis similarity of 29% (Table E-9) which was due to the isopod *Edotia triloba* and amphipod *Grandidierella bonnieroides*. The fall Alafia River samples had an average similarity of 25% (Table E-10) with the false mussel *Mytilopsis leucophaeata* and the polychaete *Stenoninereis martini* contributing to the observed similarity. The spring and fall Alafia River samples were 81% dissimilar (E-11) due primarily to the higher spring abundances of *E. triloba* and *G. bonnieroides*.

Since only a single sample was collected per season in Dog Leg Creek, similarity calculations were not possible by season (Appendix E). The dissimilarity between the spring Dog Leg Creek sample and the spring mainstem Alafia River reference samples was 83% (Table E-12) due to higher abundances of *E. triloba* and *G. bonnieroides* in the mainstem Alafia River and tubificid oligochaetes in Dog Leg Creek. There was 90% dissimilarity between Dog Leg Creek and the Alafia River in the fall (Table E-13) with higher abundances of the polychaete *Mediomastus ambiseta* and the tanaid crustacean *Sinelobus stanfordi* in Dog Leg Creek and *M. leucophaeata* and *S. martini* in the Alafia River. The spring and fall Dog Leg Creek samples were 89% dissimilar due to higher abundances of tubificid oligochaetes and several chironomid taxa in the spring (Table E-14).

There was only a single spring sample from Question Mark Creek so there was no similarity index calculated. The spring Question Mark Creek and spring Alafia River samples were 86% dissimilar with the Alafia River sites having higher abundances of *G. bonnieroides*, *E. triloba* and *M. leucophaeata* while the Question Mark Creek site had higher *Littoridinops palustris* and *S. martini* numbers (Table E-15). The two fall Question Mark Creek samples had a similarity of 0% with no common taxa between them. The fall Question Mark Creek and Alafia River samples were 86% dissimilar with higher abundances of tubificid oligochaetes and the midge larvae *Chironomus* sp. in Question Mark Creek. (Table E-16). There was an 82% dissimilarity between the spring and fall samples within Question Mark Creek with the spring having higher numbers of *S. martini* and *L. palustris* and the fall with greater abundance of tubificid oligochaetes and the invasive freshwater gastropod *Melanoides tuberculata* (Table E-17).

The spring Rice Creek sites had an average similarity of 58% (Table E-18). Contributing taxa included *Corbicula fluminea*, *Grandidierella bonnieroides* and the chironomid *Tanytaisus* sp. The spring Rice Creek and corresponding Alafia River sites were 68% dissimilar with higher abundances of *C. fluminea*, *G. bonnieroides* and the chironomids *Polypedilum scalaneum* and *Tanytaisus* in Rice Creek contributing to the dissimilarity (Table E-19). The fall Rice Creek samples were 36% similar with *C. fluminea*, tubificid oligochaetes, *Pyrgophorus platyrachis* and the polychaete *Laeonereis culveri* contributing to the similarity (Table E-20). There was an 86% dissimilarity with the fall Alafia River sites due to the higher abundance of *C. fluminea* in Rice Creek and of *M. leucophaeta* in the Alafia River (Table E-21). The higher abundance of *G. bonnieroides* and chironomids in the spring resulted in a 73% dissimilarity in the species composition between the spring and fall Rice Creek samples (Table E-22).

The two spring Riverview Park West samples had a Bray-Curtis similarity of 63% (Table E-23). Contributing taxa included *Chironomus* sp., tubificid oligochaetes and *Pyrgophorus platyrachis.* Compared to the spring Alafia River sites, the spring Riverview Park West samples were 71% dissimilar (Table E-24). Higher abundances of the hydrobiid snails *Littoridinops monroensis* and *P. platyrachis* in the Riverview Park West samples and of *G. bonnieroides* and *E. triloba* at the Alafia River sites contributed to the dissimilarity. Also of note, two congeneric hydrobiid snails were important components of the benthic community: *Littoridinops monroensis* at the Riverview Park West sites and *L. palustris* in the Alafia River. There was only a single fall sample collected from Riverview Park West Creek, so similarity was not relevant. Higher abundances of *P. platyrachis,* tubificid oligochaetes and the chironomid *Polypedilum halterale* in the fall Riverview Park West sample contributed to a 77% dissimilarity with the fall Alafia River sites (Table E-25). The spring and fall Riverview Park West samples exhibited a 65% dissimilarity (Table E-26). The higher abundance of *L. monroensis*, *Chironomus* spp. in the spring and of *P. halterale* and *Tanypus neopunctipennis* in the fall contributed to the seasonal dissimilarity.

A BIO-ENV analysis found the best correlation between the physical parameters and benthic community composition in the Alafia River tidal tributaries was with a combination of depth and bottom dissolved oxygen ($\rho_s = 0.536$). Dissolved oxygen had the strongest correlation of any single variable ($\rho_s = 0.518$).

3.2.2.1.2 Mainstem Little Manatee River and its Second Order Tributaries

Summary statistics for the benthic community measures of Little Manatee River sites are presented in Table 14. The number of taxa was lower in the fall in Curiosity Creek (p=0.005) and Wildcat Creek (p=0.015) but no seasonal difference was found in the mainstem Little Manatee River sites (Figure 22). The fall Curiosity Creek samples also had significantly fewer taxa than the fall mainstem river sites (p = 0.026).

Benthic abundance was significantly lower in the fall for Curiosity Creek ($p < 0.001$) and the mainstem Little Manatee River reference sites (Figure 23; p = 0.031). The fall abundance in Curiosity Creek was also lower than in the fall reference samples (p = 0.036). There was no between site or seasonal differences in the Shannon-Wiener diversity index (Figure 24; p = 0.102). The Tampa Bay Benthic Index was lower in the fall in Curiosity Creek and in the mainstem Little Manatee River (Figure 25; $p < 0.001$), as well as in Wildcat Creek (p = 0.049). The fall Wildcat Creek TBBI was higher than at the fall mainstem river sites (p = 0.049).

The dominant taxa based on relative abundance (Table 16) were amphipods in the spring at all three locations, with *Grandidierella bonnieroides* dominating the two tidal tributary assemblages and *Apocorophium louisianum* in the mainstem Little Manatee River. The fall tidal tributary assemblages were dominated by gastropods – unidentified hydrobiids in Curiosity Creek and a related unidentified snail (Superfamily Rissooidea) in Wildcat Creek. The fall mainstem Little Manatee River samples were dominated by *G. bonnieroides*.

An ANOSIM only found significant differences in the species similarity between the fall and spring mainstem Little Manatee River samples (p = 0.015) and between the fall Wildcat Creek and fall Little Manatee River (p = 0.036) sites. However, an MDS analysis (Figure 27) indicated a seasonal difference in species similarity for all sites, most notably for Curiosity Creek.

Results of SIMPER analysis (Appendix E) indicate that the spring Little Manatee River samples had an average similarity of 44% (Table E-27). Several crustacean taxa contributed to this including *G. bonnieroides, A. louisianum* and the isopod *Cyathura polita*. The fall Little Manatee River samples were 38% similar due to *G. bonnieroides*, *Polypedilum scalarum* and tubificid oligochaetes (Table E-28). There was 68% dissimilarity between the spring and fall mainstem Little Manatee River samples due to the higher spring abundances of *A. louisianum*, *G. bonnieroides*, *Ampelisca abdita* and *Edotia triloba* (Table E-29).

There was a 51% similarity among the spring Curiosity Creek samples with *G. bonnieroides*, *A. louisianum* and the bivalve *Polymesoda caroliniana* (Table E-30). There was a 58% dissimilarity between the spring Curiosity Creek and mainstem Little Manatee River reference sites due to higher abundances of *A. louisianum*, the isopod *Uromunna reynoldsi*, and amphipod *Gammarus cf. tigrinus* in Curiosity Creek (Table E-31). The fall Curiosity Creek samples had only a 9% similarity (Table E-32). Unidentified hydrobiid snails contributed 100% to the similarity among the samples. There was 86% dissimilarity between the fall Curiosity Creek and mainstem Little Manatee River samples (Table E-33). Higher abundances of *Mytilopsis leucophaeata*, *G. bonnieroides* and *C. polita* in the Little Manatee River contributed to the observed dissimilarity. The spring and fall Curiosity Creek samples were 94.88% dissimilar due to higher spring abundances of several crustaceans: *G. bonnieroides*, *A. louisianum*, and *U. reynoldsi* (Table E-34).

There was a 56% similarity among the spring Wildcat Creek samples (Table E-35) due to *G. bonnieroides* and burrowing anemones (Actinaria). The spring Wildcat Creek and mainstem Little Manatee River reference samples were 59% dissimilar (Table E-36). Higher abundances of *Apocorophium louisianum* and *Ampelisca abdita* in the Little Manatee River and of *Leptochelia* sp., Actinaria, and the mysid shrimp *Taphromysis bowmani* in Wildcat Creek contributed to the dissimilarity. The fall Wildcat Creek samples were 50% similar due to the presence of the gastropod Rissooidea sp A of EPC and tubificid oligochaetes (Table E-37). The fall Wildcat Creek and mainstem Little Manatee River samples were 74% dissimilar (Table E-38). Higher abundances of Rissooidea and the polychaete *Laeonereis culveri* in Wildcat Creek and *G. bonnieroides* and *C. polita* in the Little Manatee River contributed to the dissimilarity. The spring and fall Wildcat Creek samples had a dissimilarity of 76% (Table E-39). Higher spring abundances of Actinaria, *G. bonnieroides*, *A. louisianum* and *Leptochelia* sp. contributed to the observed seasonal difference.

The BIO-ENV analysis found the best correlation between the physical parameters and species similarity was with the combined factors of bottom dissolved oxygen, bottom salinity and %SC (ρ_s = 0.586). The %SC had the strongest correlation of any single factor (ρ_s = 0.513) for the Little Manatee River system.

3.2.2.2 First Order Tributary Systems (Feather Sound & Terra Ceia Bay)

3.2.2.2.1 Feather Sound/Old Tampa Bay and Grassy Creek

Benthic community measures for the Feather Sound system are summarized in Table 17. The number of benthic taxa present (Figure 28) was significantly lower in the fall Grassy Creek samples relative to the fall samples collected in the embayment (p=0.023). The median value was lower in the fall relative to the spring in both the Grassy Creek and embayment sites, however only the fall Grassy Creek values were significant.

The abundance of benthic organisms in Grassy Creek was higher in the spring (Figure 29; p= 0.006), and there were no significant differences between the tidal tributary and reference embayment sites within a given season (Spring, p = 0.716; Fall, p = 0.984).

There was no significant difference in the Shannon-Wiener diversity index values (Figure 30; p = 0.121), although the Grassy Creek samples tended to be lower, on average, than the reference embayment sites. The fall Grassy Creek Tampa Bay Benthic Index scores (Figure 31) were significantly lower than the corresponding fall reference embayment sites (p = 0.007) and the spring Grassy Creek samples (p = 0.031).

The spring Grassy Creek benthic community was dominated by crustaceans with the tanaid *Leptochelia* sp. accounting for over 28% of the abundance, followed by the amphipod *G.*

bonnieroides (Table 18). The fall Grassy Creek benthic community was largely dominated by annelid worms with the polychaete *Laeonereis culveri* and tubificid oligochaetes accounting for 25% and 16% of the abundance respectively. The Feather Sound / Old Tampa Bay reference samples were dominated by the polychaete worms *Axiothella mucosa* in the spring and *Exogone dispar* in the fall.

Benthic species composition exhibited seasonal changes in both the Grassy Creek and reference embayment sites as shown by distinct groupings in the MDS plot (Figure 32) and ANOSIM analysis ($p = 0.001$). The fall embayment reference sites were more dissimilar relative to the other samples and also showed greater variability in their species composition, due most likely to the larger geographical range of these sites. The spring reference embayment samples were collected in closer proximity to Grassy Creek (within the Feather Sound embayment) while the fall reference sites were more dispersed throughout Old Tampa Bay as part of the EPC's regular annual benthic monitoring program. This may account for the higher similarity between the spring reference samples and spring Grassy Creek samples.

A SIMPER analysis (Appendix E) found that the Feather Sound/Old Tampa Bay spring reference samples (Table E-1) had an average Bray-Curtis similarity of 50% due to the presence of tubificid oligochaetes, *A. mucosa*, *G. bonnieroides*, and the bivalve *Parastarte triquetra.* By contrast, the fall embayment reference samples had an average similarity of 25.38% (Table E-2) with the isopod *Amakusanthura magnifica*, tubificid oligochaetes and the amphipod *Ampelisca holmesi* contributing to the similarity among sites. There was 78% dissimilarity between the spring and fall embayment reference samples (Table E-3) due to higher abundances of *A. mucosa*, *G. bonnieroides* and *P. triquetra* in the spring samples and higher abundances of *E. dispar* and *Glottidia pyramidata* in the fall.

Grassy Creek spring samples had an average similarity of 56% (Table E-4), due to *G. bonnieroides, Leptochelia* sp. *P. triquetra* and the polychaete *Fabricinuda trilobata.* Spring Grassy Creek and embayment reference samples had an average dissimilarity of 65% (Table E-5), with higher abundances of *Leptochelia* sp. in Grassy Creek and the polychaetes *A. mucosa* and *Mediomastus ambiseta* and the tubificid oligochaete *Tubificoides wasselli* in embayment samples contributing to the observed dissimilarity.

Grassy Creek fall samples had an average similarity of 58% (Table E-6) due to tubificid oligochaetes, *P. triquetra*, and the polychaete *Leitoscoloplos* spp. There was 87% dissimilarity with the fall reference samples from Old Tampa Bay (Table E-7). Higher abundances in Grassy Creek of the polychaetes *Leonereis culveri*, *Capitella capitata*, and *Leitoscoloplos* spp. along with the bivalve *P. triquetra* contributed to the observed dissimilarity. There was 58% dissimilarity between the spring and fall Grassy Creek samples (Table E-8) due to the higher abundance of several crustaceans (*Leptochelia* sp., *G. bonnieroides*) in the spring.

A BIO-ENV analysis indicated the combination of depth and bottom temperature as having the strongest influence on the benthic community structure in the Feather Sound system ($\rho_s = 0.812$). Individually, depth had the highest correlation ($\rho_s = 0.735$) followed by bottom temperature ($\rho_s = 0.711$). These results may be due to the deeper station depths of the fall reference sites and seasonal temperature differences.

3.2.2.2.2 Terra Ceia Bay and its First Order Tributaries

Summary statistics for benthic community measures in the Terra Ceia Bay system are presented in Table 17. Species richness tended to be lower in the fall (Figure 28), but seasonal differences within the tidal tributaries were not detected. During the fall season, species richness was lower in both Frog and McMullen Creeks relative to the Terra Ceia Bay reference sites ($p = 0.03$). Benthic abundance was lower in the fall overall ($p = 0.04$), but there was no significant seasonal difference within sites (Figure 29). The fall Shannon-Wiener diversity index (Figure 30) was lower in the tidal tributaries relative to Terra Ceia Bay ($p < 0.001$). The Tampa Bay Benthic Index was not significantly different between sites and seasons ($p = 0.369$), however fall values in the tidal tributaries tended to be lower than in the spring, while the reverse was observed in the Terra Ceia Bay samples (Figure 31).

Dominant taxa shifted seasonally within tidal tributary sites (Table 19). In Frog Creek, the bivalve *P. triquetra* was the most abundant taxa in the spring, while the fall samples were strongly dominated by two congeneric chironomids: *P. halterale* and *P. scalaneum* which together accounted for 70% of the relative abundance. *Grandidierella bonnieroides* was dominant in both the spring McMullen Creek and Terra Ceia Bay samples. Fall McMullen Creek samples were dominated by tubificid oligochaetes and several polychaete taxa, while the fall Terra Ceia Bay reference samples were dominated by the amphipod *Cymadusa compta*, although this species only accounted for 10% of the overall abundance. Also present among the most abundant Terra Ceia Bay fall taxa was the spirorbid polychaete *Pileolaria rosepigmentata* which is commonly found as an epiphyte on seagrass blades.

An ANOSIM failed to detect differences in the species composition between seasons within either tidal tributary or within the Terra Ceia Bay reference sites; although, the MDS analysis indicates some difference between the Terra Ceia Bay and tidal tributary sites and seasonally within the tidal tributaries (Figure 33).

A SIMPER analysis (Appendix E) indicated that the spring Terra Ceia Bay samples had an average Bray-Curtis similarity of 26% with the polychaete *C. capitata*, the bivalve *Mysella planulata* and the sea cucumber *Epitomapta roseola* contributing to the similarity among sites (Table E-40). The fall Terra Ceia Bay samples had an average similarity of 22% due to the presence of tubificid oligochaetes, the gastropod *Prunum apicinum* and the polychaete *Monticellina cf. dorsobranchialis* (Table E-41). There was 84% dissimilarity between the spring and fall embayment samples with higher abundances of *P. triquetra, E. roseola* and *M. planulata* in the spring samples (Table E-42).

The Frog Creek spring samples had a 33% average similarity due to the presence of *L. culveri* and *G. bonnieroides* (Table E-43). There was 79% dissimilarity with the corresponding spring Terra Ceia Bay reference samples (Table E-44). There fall Frog Creek samples an average similarity of 45%. The chironomid *P. scalaneum* and polychaete *L. culveri* contributed to the similarity among sites (Table E-45). The average dissimilarity between the fall Frog Creek and fall reference embayment samples was 95% (Table E-46). The spring and fall Frog Creek samples were 84% dissimilar due to the higher abundance of amphipods (*G. bonnieroides*, *Americorophium ellisi*) in the spring and insect larvae (*P. scalaneum*) in the fall (Table E-47).

The spring McMullen Creek samples had an average similarity of 42% due in part to high abundances of tubificid oligochaetes and the isopod *Cyathura polita* (Table E-48).

A BIO-ENV analysis found the strongest correlation between physical parameters and species composition was with a combination of depth and bottom pH ($\rho_s = 0.785$) for the Terra Ceia Bay system. Single factors with the highest correlations included depth ($\rho_s = 0.747$) and pH ($\rho_s = 0.617$).

3.3 WATERSHED CHARACTERIZATION & MONITORING LINKS

3.3.1 Watershed Metrics

3.3.1.1 Second Order Tributary Systems (Alafia & Little Manatee River)

The basin sizes of the four tidal tributaries draining to the Alafia River ranged from 23 ha for Question Mark Creek to 1,315 ha for Rice Creek (Table 20; Figures 34 – 37). In the Little Manatee River, Wildcat Creek's drainage basin was 926 ha, while Curiosity Creek's was the largest of all the tidal tributaries studied at 5,726 ha (Table 20; Figures 38 – 39). The percentage of impervious surfaces was greater in the Alafia River tributaries in comparison to the Little Manatee River's within both their entire drainage basin and along 100-m corridors of the creeks (Table 20). Percent imperviousness was greatest within Riverview Park West Creek's drainage basin at 16.57% (Table 20). Landscape development intensity indices (LDI) also followed this pattern. For the Alafia River tributaries, LDIs within the drainage basins ranged from 4.9 – 6.2 indicating that most of these creeks systems were transitioning towards urbanized development. The Little Manatee River tributaries' LDIs were both about 3.2 indicating a distinct presence of agricultural land uses within their drainage basins. Comparisons of 100-m corridors with the 100-year flood plains of the creek systems can be seen in Appendix F. Land use overlays for the creek systems can be seen in Appendix G.

3.3.1.2 First Order Tributary Systems (Feather Sound & Terra Ceia Bay)

The basin size of Grassy Creek which drains to Feather Sound was 160 ha and encompassed mostly a network of mosquito ditches (Table 20; Figure 40). In the Terra Ceia Bay system, Frog Creek's drainage basin was 2,357 ha, while McMullen Creek's was 757 ha (Table 20; Figures 41 – 42). The percentage of impervious surfaces was greater in the Terra Ceia Bay tributaries in comparison to Feather Sound's within both their entire drainage basin and along 100-m corridors of the creeks (Table 20). Percent imperviousness was greatest within McMullen Creek's drainage basin at 13.89% (Table 20). Landscape development intensity indices (LDI) also followed this pattern. For the Terra Ceia Bay tributaries, LDIs within the drainage basins ranged from 4.1 – 5.2 indicating that these creek systems were transitioning towards urbanized development. Grassy Creek's LDI was 1.6 within its drainage basin and 1.1 along its corridor indicating that a large portion of this system still remains naturally vegetated primarily as mangrove swamps. Comparisons of 100-m corridors with the 100-year flood plains of the creek systems can be seen in Appendix F. Land use overlays for the creek systems can be seen in Appendix G.

3.3.2 Watershed Links to Monitoring Results

Preliminary analyses indicated that correlations with water and benthic quality metrics improved when LDIs along 100-m corridors of the creek systems were used. Landscape development intensity indices were correlated with a number of metrics that could potentially indicate degradation within the creek systems. A positive correlation existed between LDI and the median observed turbidity, water column dissolved oxygen, total phosphorus, total nitrogen, and chlorophyll-a concentrations in the monitored tributaries during 2006 (Figures 43 – 47). As LDI increased so did these water quality metrics. A positive correlation also existed between LDI and sediment contamination and silt-clay percentage. Again, as LDI increased so did the number of per sample threshold effects level exceedances and the percentage of silt-clay in the monitored tributaries during 2006 (Figures 48 & 49).

For benthic biology collected within the tidal tributaries during 2006, weaker links with LDI were observed. No significant correlations were detected; however, some general patterns were observed. Median species richness and Shannon-Wiener diversity observed in the tidal tributaries during 2006 tended to be lower as LDI increased (Figures 50 & 51). The Tampa Bay Benthic Index was consistent across LDI for the tidal tributaries monitored during 2006 (Figure 52).

4. LITERATURE CITED

AISN Software. 2000. Table Curve 2D v.5.0, SPSS, Chicago, IL.

Brown, M.T. and M.B. Vivas. 2005. Landscape development intensity index. Environmental Monitoring and Assessment 101:289-309.

Buzzelli, C., A.F. Holland, D.M. Sanger, P.C. Conrads. 2007. Hydrographic characterization of two tidal creeks with implications for watershed land use, flushing times, and benthic production. Estuaries and Coasts 30(2):321-330.

Courtney, C.M., S.A. Grabe, D.J. Karlen, R. Brown, and D. Heimbuch. 1995. Laboratory operations manual for a synoptic survey of benthic macroinvertebrates of the Tampa Bay estuaries. Environmental Protection Commission of Hillsborough County. Tampa, FL.

ESRI (Environmental Systems Research Institute), Inc. 2006. ArcGIS 9.2. Redlands, CA.

Estevez, E.D. 2006. Tidal creek condition index for coastal streams in Sarasota County, Florida. Final report prepared for Sarasota County Water Resources by Mote Marine Laboratory. Mote Marine Laboratory Technical Report Number 1131. 127pp.

FDOT (Florida Department of Transportation). 1999. Florida Land Use, Cover and Forms Classification System. Survey and Mapping Office, Geographic Mapping Section. Handbook v.3. 95pp.

Holland, A.F., D.M. Sanger, C.P. Gawle, S.B. Lerberg, M.S. Santiago, G.H.M. Riekerk, L.E. Zimmerman, G.I. Scott. 2004. Linkages between tidal creek ecosystems and the landscape and demographic attributes of their watersheds. Journal of Experimental Marine Biology and Ecology 298:151-178.

Janicki Environmental, Inc. 2005. Development of a benthic index to establish sediment quality targets for the Tampa Bay estuary. Final Report. TBEP Tech. Pub. #01-06.

Krebs, J.M., A.B. Brame, and C.C. McIvor. 2007. Altered mangrove wetlands as habitat for estuarine nekton: Are dredged channels and tidal creeks equivalent? Bulletin of Marine Science 80(3):839-861.

Long, E.R., D.A. Wolfe, R.S. Carr, K.J. Scott, G.A. Thursby, H.L. Windom, R. Lee, F.D. Calder, G.M. Slone, and T. Seal. 1994. Magnitude and Extent of Sediment Toxicity in Tampa Bay, Florida. NOAA Tech. Mem. NOS ORCA 78. NOAA Silver Spring, MD.

Malloy, K.J., Wade, D. Janicki, A. Grabe, S.A., Nijbroek, R. 2007. Development of a benthic index to assess sediment quality in the Tampa Bay Estuary. Marine Pollution Bulletin 54: 22-31.

MacDonald, D.D. 1994. Approach to the assessment of sediment quality in Florida coastal waters. Volume 1 – Development and evaluation of sediment quality assessment guidelines. Prepared for: Florida Department of Environmental Protection. 126pp.

Morrison, G. and R. Boler. 2003. "Water quality in tidal reaches of Hillsborough County rivers and streams" *in* S.F. Treat, ed., Proceedings of the Fourth Tampa Bay Area Scientific Information Symposium, St. Petersburg, FL, pp. 41-58.

Percival, J. B. and Lindsay, P. J. 1997. "Measurement of physical properties of sediments," *in* A. Mudroch, J. M. Azcue and P. Mudroch (eds.), Manual of Physico-chemical Analysis of Aquatic Sediments, Lewis Publ. Boca Raton, pp. 7-46.

PRIMER-E Ltd. 2006. PRIMER v6. Plymouth, U.K.

QAPP (Quality Assurance Project Plan). 2006. Tampa Bay Tidal Tributaries Habitat Assessment: Quality Assurance Project Plan, V. 3.0. Prepared for the Tampa Bay Estuary Program. 89pp.

Schropp, S.J., Lewis, F.G., Windom, H.L., Ryan, J.D., Calder, F.D., Burney, L.C. 1990. Interpretation of metal concentrations in estuarine sediments of Florida using aluminum as a reference element. Estuaries 13: 227-235.

SAS (Statistical Analysis Software) Institute, Inc. 2003. Statistical Analysis Software. Cary, NC.

SWFWMD (Southwest Florida Water Management District). 2004. 2004 Land Use/Cover Classifications. http://www.swfwmd.state.fl.us/data/gis/layer_library/metadata/lu04.html.

SYSTAT Software, Inc. 2004. SYSTAT® 11. Richmond, CA.

SYSTAT Software, Inc. 2006. SigmaPlot 10.0. Richmond CA.

TBEP (Tampa Bay Estuary Program). 1996. Charting the course for Tampa Bay: Comprehensive Conservation and Management Plan. Tampa Bay Estuary Program. St. Petersburg, FL. 151pp.

USGS (United States Geological Society). 2001. 2001 National Land Cover Dataset, Impervious Surface Estimates. http://nationalmap.gov/index.html.

USGS (United States Geological Society). 2007. National Hydrography Dataset. ftp://nhdftp.usgs.gov/SubRegions/High/.

Venice Symposium. 1959. Final Resolution: The Venice System for the Classification of Marine Waters According to Salinity. Archivio di Oceanografia e Limnologia 11 (Suppl): 243-248.

Versar, Inc. 1993. Tampa Bay National Estuary Program Benthic Project Field and Laboratory Methods manual. Technical Document prepared for TBNEP March 1993. 32pp.

Whitney, D.E. and W.M. Darley. 1979. A method for the determination of chlorophyll-a in samples containing degradation products. Limnol. Oceanogr. 24: 183-186.

5. TABLES

Table 1: Monthly tidal tributary water quality monitoring effort during 2006.

System Type	Watershed	Tributary	Month 1	2	3	4	5	6	7	8	9	10	11	12	Subtotal
Minor Second Order Tributaries Discharging to a Major First Order Tributary	Alafia River	Dog Leg Creek	1	1	1	1	1	1	1	1	1	1	1	1	**12**
		Question Mark Creek	1	1	1	1	1	1	1	1	1	1	1	1	**12**
		Rice Creek	1	1	1	1	1	1	1	1	1	1	1	1	**12**
		Riverview Park West Creek	1	1	1	1	1	1	1	1	1	1	1	1	**12**
		Subtotal	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**48**
	Little Manatee River	Curiosity Creek	2	2	2	2	2	2	2	2	2	2	2	2	**24**
		Wildcat Creek	2	2	2	2	2	2	2	2	2	2	2	2	**24**
		Subtotal	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**48**
Minor First Order Tributaries Discharging Directly to Embayments	Feather Sound	Grassy Creek	1	2	2	2	2	2	2	2	2	2	2	2	**23**
		Subtotal	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**23**
	Terra Ceia Bay	Frog Creek	2	2	2	2	2	2	2	2	2	2	2	2	**24**
		McMullen Creek	1	1	1	1	1	1	1	1	1	1	1	1	**12**
		Subtotal	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**36**
														TOTAL	**155**

Table 2: Number of unique water quality monitoring sampling events during 2006 within and in the vicinity of the Tidal Tributary projects' sampling universe. Italicized tributaries indicate priority sample areas for this project.

System Type	Watershed	Tributary	Total Samples
Minor Second Order Tributaries Discharging to a Major First Order Tributary	**Alafia River (a priori more disturbed)**	*Dog Leg Creek*	12
		Question Mark Creek	12
		Rice Creek	16
		Riverview Park West Creek	12
		Mainstem Alafia River	160
	Little Manatee River (a priori less disturbed)	*Curiosity Creek*	28
		Wildcat Creek	28
		Other Monitored Tributaries	7
		Mainstem Little Manatee River	12
Minor First Order Tributaries Discharging Directly to Embayments	**Feather Sound (a priori more disturbed)**	*Grassy Creek*	23
		Other Monitored Tributaries	10
		Adjacent Old Tampa Bay	137
	Terra Ceia Bay (a priori less disturbed)	*Frog Creek*	24
		McMullen Creek	12
		Adjacent Terra Ceia Bay	12

Table 3: Benthic quality monitoring data descriptors and cut-offs.

Depth Ranges	
0-0.5 m	Intertidal
0.5-1.0 m	Shallow subtidal
1.0-2.0 m	Intermediate Subtidal
2.0-4.0 m	Deep Subtidal
> 4 m	Deep
Bottom Dissolved Oxygen	
0-0.5 ppm	Anoxic
0.5 – 2.0 ppm	Hypoxic
2.0-4.0 ppm	Intermediate
> 4.0 ppm	Normoxic
Bottom Salinity	
≤ 0.5 PSU	Tidal Fresh Water
0.5-5.0 PSU	Oligohaline
5.0-10.0 PSU	Low Mesohaline
10.0 -18.0 PSU	High Mesohaline
18.0-30.0 PSU	Polyhaline
≥ 30.0 PSU	Euhaline
Sediment Silt/Clay Types	
< 1.70%	Coarse
1.70-4.51%	Medium
4.51-11.35%	Fine
11.35 – 25.95%	Very Fine
≥ 25.95%	Mud
Tampa Bay Benthic Index	
< 0	Undefined
0	Empty
0 – 73	Degraded
73 - 87	Intermediate
≥ 87	Healthy

Table 4: Landscape Development Intensity Index (LDI) coefficients in relation to Florida Land Use Land Cover Classification Codes (FLUCCSODE) (Adapted from Brown and Vivas 2005).

LDI Coefficient	LDI Description	FLUCCSCODE	FLUCCSCODE Description
1	Natural Land/Open Water	4100	UPLAND CONIFEROUS FOREST
		4110	PINE FLATWOODS
		4120	LONGLEAF PINE - XERIC OAK
		4200	UPLAND HARDWOOD FORESTS - PART 1
		4340	HARDWOOD CONIFER MIXED
		5200	LAKES
		6100	WETLAND HARDWOOD FORESTS
		6110	BAY SWAMPS
		6120	MANGROVE SWAMPS
		6150	STREAM AND LAKE SWAMPS (BOTTOMLAND)
		6200	WETLAND CONIFEROUS FORESTS
		6210	CYPRESS
		6300	WETLAND FORESTED MIXED
		6410	FRESHWATER MARSHES
		6420	SALTWATER MARSHES
		6430	WET PRAIRIES
		6440	EMERGENT AQUATIC VEGETATION
		6530	INTERMITTENT PONDS
		6600	SALT FLATS
1.58	Tree Plantations	2200	TREE CROPS
		4400	TREE PLANTATIONS
1.83	Recreational/Open Space (Low-Intensity)	1800	RECREATIONAL
		1900	OPEN LAND
3.31	Pastureland (Mean-Intensity Index)	3300	MIXED RANGELAND
3.41	Low-Intensity Pasture (with Livestock)	2100	CROPLAND AND PASTURELAND
4.11	General Agriculture (Mean Citrus & Row Crops)	2400	NURSERIES AND VINEYARDS
		2550	TROPICAL FISH FARMS
4.38	Recreational/Open Space (Mean-Intensity Index)	2600	OTHER OPEN LANDS <RURAL>
		3100	HERBACEOUS
		3200	SHRUB AND BRUSHLAND
		7400	DISTURBED LAND
4.54	Row Crops	2140	ROW CROPS
6.79	Single Family Residential (Low-density)	1100	RESIDENTIAL LOW DENSITY < 2 DWELLING UNITS
6.92	Recreational/Open Space (High-Intensity)	1820	GOLF COURSES
7	Agriculture (High-Intensity)	2300	FEEDING OPERATIONS
		2500	SPECIALTY FARMS
7.47	Single Family Residential (Medium-density)	1200	RESIDENTIAL MED DENSITY 2->5 DWELLING UNIT
7.55	Single Family Residential (High-density)	1300	RESIDENTIAL HIGH DENSITY
7.81	Transportation (Low-Intensity)	8100	TRANSPORTATION
8	Commercial (Low-Intensity)	1400	COMMERCIAL AND SERVICES
8.07	Institutional	1700	INSTITUTIONAL
8.32	Industrial	1500	INDUSTRIAL
		1600	EXTRACTIVE
		8200	COMMUNICATIONS
		8300	UTILITIES

Table 5: Summary of physical water quality monitoring results in the Alafia River (AR), Little Manatee River (LMR), Feather Sound (FS), and Terra Ceia Bay (TCB) watersheds during 2006.

Watershed	Tributary or Area	Depth (m)					Mean Water Column Temperature (^oC)					Mean Water Column Salinity (PSU)					Water Column Stratification (Sigma T Difference)					Bottom Dissolved Oxygen (mg/L)				
		N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max
AR	Mainstem Alafia River	153	1.5	0.08	0.1	5.0	23	24.0	0.99	14.4	30.7	23	14.4	1.55	3.6	26.3	23	7.0	0.75	0.6	13.0	23	2.99	0.54	0.07	8.29
	Dog Leg Creek	12	1.2	0.11	0.6	2.0	12	24.2	1.00	18.5	28.9	12	1.7	0.40	0.7	5.1	12	0.8	0.18	0.1	2.1	12	4.32	0.91	0.15	10.16
	Question Mark Creek	12	0.9	0.08	0.6	1.4	12	25.2	1.51	15.2	31.9	12	10.8	1.18	4.5	17.8	12	5.0	1.01	0.7	10.0	12	4.78	0.87	0.14	9.03
	Rice Creek	16	0.4	0.07	0.1	0.9	16	23.0	1.06	14.5	29.0	12	1.4	0.71	0.1	7.3	6	0.3	0.15	0.0	0.9	8	9.17	1.63	5.43	19.73
	Riverview Park West Creek	12	0.6	0.08	0.2	1.0	12	24.6	1.42	15.9	31.7	12	2.7	0.82	0.2	8.2	11	1.3	0.67	0.0	7.8	11	6.20	1.22	2.02	14.58
LMR	Mainstem Little Manatee River	12	2.4	0.16	1.3	3.1	12	24.2	1.54	13.5	31.2	12	14.8	1.66	0.9	23.5	12	0.7	0.22	0.0	1.9	12	5.15	0.52	3.28	8.60
	Curiosity Creek	28	1.1	0.13	0.2	3.2	28	22.7	0.94	12.0	30.2	24	3.6	0.94	0.2	15.3	24	0.3	0.16	0.0	3.8	26	4.77	0.38	0.35	8.07
	Wildcat Creek	28	0.6	0.04	0.2	1.0	28	23.7	0.95	13.0	30.7	24	9.3	1.35	0.3	22.3	21	1.0	0.43	0.0	8.3	21	4.43	0.16	3.43	6.71
	Other Creeks draining to LMR	7	0.2	0.03	0.1	0.3	7	21.2	1.57	15.2	25.9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
FS	Feather Sound/Old Tampa Bay	137	1.5	0.08	0.1	4.0	137	23.9	0.43	11.8	32.9	137	24.5	0.20	19.2	30.7	121	0.1	0.01	0.0	0.9	123	6.85	0.11	3.61	9.68
	Grassy Creek	23	0.5	0.05	0.2	1.0	23	22.8	0.93	16.7	29.9	23	22.4	0.50	17.5	25.2	20	0.0	0.02	0.0	0.4	21	1.91	0.18	0.45	3.88
	Other Creeks draining to FS	10	0.2	0.04	0.0	0.4	10	25.6	1.45	19.5	33.8	10	0.7	0.10	0.3	1.4	.	.	.	.	.	.	.	.	.	.
TCB	Terra Ceia Bay	12	1.9	0.26	0.3	3.0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Frog Creek	22	0.5	0.06	0.1	1.0	24	24.5	0.79	18.0	31.0	24	17.6	1.90	0.5	29.6	6	1.4	1.12	0.0	7.0	22	5.50	0.17	3.20	6.90
	McMullen Creek	11	0.4	0.11	0.1	1.2	12	24.1	1.11	19.0	30.7	12	17.6	2.10	3.2	26.8	3	0.1	0.10	0.0	0.3	11	5.35	0.34	3.00	7.70

Watershed	Tributary or Area	Secchi Depth (m)					Color (PCU)					Turbidity (NTU)					Total Suspended Solids (mg/L)				
		N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max
AR	Mainstem Alafia River	148	0.9	0.05	0.2	2.5	160	51	4	5	200	23	4.3	0.54	1.5	11.5	160	9.1	0.59	1.0	41.0
	Dog Leg Creek	12	0.9	0.07	0.5	1.2	12	23	4	10	54	12	6.3	0.99	2.4	12.5	12	14.2	3.27	3.0	44.0
	Question Mark Creek	12	0.7	0.05	0.4	1	12	28	4	12	63	12	12.4	3.46	3.1	41.2	12	26.1	7.55	3.5	94.5
	Rice Creek	16	0.4	0.06	0.1	0.8	16	44	6	13	94	12	6.3	1.42	1.4	16.4	12	12.8	4.42	1.0	52.0
	Riverview Park West Creek	12	0.4	0.06	0.2	0.7	12	32	6	13	74	12	10.5	2.89	1.6	36.0	12	23.8	6.35	4.0	67.0
LMR	Mainstem Little Manatee River	12	1.4	0.10	0.9	1.9	12	36	8	15	115	12	2.3	0.24	1.7	4.9	12	6.2	0.41	4.0	9.0
	Curiosity Creek	28	0.8	0.07	0.2	1.9	28	54	8	23	149	24	3.3	0.26	2.0	7.0	24	5.1	0.63	2.0	14.0
	Wildcat Creek	27	0.6	0.04	0.2	0.9	28	47	5	19	100	24	3.5	0.23	1.6	5.5	24	9.1	1.01	2.0	24.0
	Other Creeks draining to LMR	7	0.2	0.03	0.1	0.3	7	52	8	32	95	.	.	.	.	.	.	.	.	.	.
FS	Feather Sound/Old Tampa Bay	136	1.3	0.05	0.1	3.1	30	8	1	5	17	137	2.1	0.12	0.6	8.4	117	14.5	1.18	2.0	48.0
	Grassy Creek	23	0.5	0.05	0.2	1	23	22	1	11	35	23	3.5	0.57	1.4	13.2	20	11.0	1.38	5.0	32.0
	Other Creeks draining to FS	.	.	.	.	.	.	.	.	.	.	8	2.7	0.46	1.1	4.9	8	5.3	1.26	1.0	11.0
TCB	Terra Ceia Bay	3	2.0	0.54	1	2.8	11	35	5	16	65	12	2.6	0.40	0.4	5.1	12	37.6	21.50	6.2	272.0
	Frog Creek	24	0.5	0.05	0.1	1	24	99	9	32	200	24	5.2	0.36	1.6	9.5	24	20.6	5.26	4.0	130.0
	McMullen Creek	12	0.4	0.10	0.1	1.2	12	112	13	58	180	12	10.4	3.74	3.3	50.0	12	30.5	14.61	7.6	190.0

Table 6: Results of crossed general linear model testing for general and individual differences between second order tidal tributaries and the mainstem rivers to which they drain (Alafia and Little Manatee River).

Type of Comparison	Comparison	Parameter	General Result	p-value	Question Mark Creek (QC) vs. Alafia River (AR)	p-value	Riverview Park West Creek (RP) vs. Alafia River (AR)	p-value	Rice Creek (RC) vs. Alafia River (AR)	p-value	Dog Leg Creek (DC) vs. Alafia River (AR)	p-value
Within Tributaries vs. Areas to Which they Drain	2nd Order Alafia Tributaries (Question Mark, Riverview Park West, Rice, and Dog Leg Creeks) vs. Mainstem Alafia River	Depth	River>Tributaries	<0.0001	No Difference	0.0761	AR>RP	0.0025	AR>RC	<0.0001	No Difference	>0.1
		Stratification	River>Tributaries	<0.0001	No Difference	>0.1	AR>RP	<0.0001	AR>RC	<0.0001	AR>DC	<0.0001
		Temperature	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1
		Salinity	River>Tributaries	<0.0001	No Difference	>0.1	AR>RP	<0.0001	AR>RC	<0.0001	AR>DC	<0.0001
		Bottom D.O.	Tributaries>River	0.0008	No Difference	>0.1	RP>AR	0.0261	RC>AR	<0.0001	No Difference	>0.1
		Color	River>Tributaries	0.0048	AR>QC	0.0641	No Difference	>0.1	No Difference	>0.1	AR>DC	0.0207
		Turbidity	Tributaries>River	0.0066	QC>AR	0.0026	RP>AR	0.0273	No Difference	>0.1	No Difference	>0.1
		TSS	Tributaries>River	<0.0001	QC>AR	<0.0001	RP>AR	<0.0001	No Difference	>0.1	No Difference	>0.1
		Total Nitrogen	Tributaries>River	0.0004	No Difference	>0.1	RP>AR	<0.0001	RC>AR	0.0808	No Difference	>0.1
		DIN	River>Tributaries	0.077	AR>QC	0.0853	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1
		DON	.	.	.	.	.	.	.	.	.	.
		Total Phosphorus	No Difference	>0.1	No Difference	>0.1	RP>AR	0.0829	RC>AR	0.0003	No Difference	>0.1
		SRP	River>Tributaries	0.0002	No Difference	>0.1	No Difference	0.9989	AR>RC	<0.0001	No Difference	>0.1
		Chlorophyll-a	Tributaries>River	<0.0001	QC>AR	0.0312	RP>AR	0.0002	RC>AR	0.0029	No Difference	>0.1
		Fecal coliform	Tributaries>River	0.096	No Difference	>0.1	No Difference	>0.1	RC>AR	0.0206	No Difference	>0.1
		Enterococci	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1	RC>AR	0.0007	No Difference	>0.1

Type of Comparison	Comparison	Parameter	General Result	p-value	Wildcat Creek (WC) vs. Little Manatee River (LMR)	p-value	Curiosity Creek (CC) vs. Little Manatee River (LMR)	p-value	Other Creeks (OC) vs. Little Manatee River (LMR)	p-value
Within Tributaries vs. Areas to Which they Drain	2nd Order Little Manatee River Tributaries (Wildcat, Curiosity, & Other Creeks Sampled) vs. Mainstem Little Manatee River	Depth	River>Tributaries	<0.0001	LMR>WC	<0.0001	LMR>CC	<0.0001	LMR>OC	<0.0001
		Stratification	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1	.	.
		Temperature	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1
		Salinity	River>Tributaries	<0.0001	LMR>WC	0.0134	LMR>CC	<0.0001	.	.
		Bottom D.O.	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1	.	.
		Color	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1
		Turbidity	Tributaries>River	0.0056	WC>LMR	0.0123	CC>LMR	0.0303	.	.
		TSS	No Difference	>0.1	WC>LMR	0.0502	No Difference	>0.1	.	.
		Total Nitrogen	Tributaries>River	0.0037	No Difference	>0.1	CC>LMR	0.0009	OC>LMR	0.0005
		DIN	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1	OC>LMR	0.006
		DON	.	.	.	.	.	.	.	.
		Total Phosphorus	Tributaries>River	0.0004	No Difference	>0.1	CC>LMR	<0.0001	OC>LMR	0.0845
		SRP	Tributaries>River	0.0014	No Difference	>0.1	CC>LMR	<0.0001	No Difference	>0.1
		Chlorophyll-a	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1
		Fecal coliform	Tributaries>River	0.0059	WC>LMR	0.0458	CC>LMR	0.0331	OC>LMR	0.0297
		Enterococci	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1

Table 7: Results of nested general linear model testing for general differences between second order tidal tributaries draining to the Alafia (a-priori disturbed) and Little Manatee Rivers (a-priori less disturbed) and first order tributaries draining to Feather Sound (a-priori disturbed) and Terra Ceia Bay (a-priori less disturbed).

Type of Comparison	Comparison	Parameter	General Result	p-value	Significant Variation Among Tributaries?	Significant Seasonal Variation?
Between Disturbed vs. Undisturbed Systems	2nd Order Alafia River Tributaries (Question Mark, Riverview Park West, Rice, and Dog Leg Creeks) vs. 2nd Order Little Manatee River Tributaries (Wildcat, Curiosity, & Other Creeks Sampled)	Depth	No Difference	0.6564	Yes (p<0.0001)	No (p=0.93)
		Stratification	No Difference	0.429	Yes (p<0.0001)	Yes (p=0.0448)
		Temperature	No Difference	0.0801	No (p=0.6827)	Yes (p=0.0065)
		Salinity	No Difference	0.5776	Yes (p<0.0001)	No (p=0.3318)
		Bottom D.O.	No Difference	0.3401	Yes (p<0.0015)	Yes (p=0.0146)
		Color	LMR>AR	0.0153	No (p=0.3449)	Yes (p=0.0035)
		Turbidity	AR>LMR	0.0603	Yes (p=0.0355)	Yes (p=0.0017)
		TSS	AR>LMR	0.067	Yes (p=0.0506)	Yes (p=0.0144)
		Total Nitrogen	No Difference	0.1182	Yes (p=0.0442)	Yes (p=0.0230)
		DIN	No Difference	0.8569	Yes (p=0.0005)	No (p=0.5766)
		DON	No Difference	0.7739	No (p=0.1847)	No (p=0.3706)
		Total Phosphorus	No Difference	0.1959	Yes (p<0.0001)	No (p=0.9199)
		SRP	No Difference	0.3902	Yes (p<0.0001)	No (p=0.1131)
		Chlorophyll-a	AR>LMR	0.0013	No (p=0.7625)	Yes (p=0.0007)
		Fecal coliform	No Difference	0.683	Yes (p=0.0078)	No (p=0.1669)
		Enterococci	No Difference	0.5438	Yes (p=0.0187)	No (p=0.8314)
	1st Order Feather Sound Tributaries (Grassy & Other Creeks Sampled) vs. 1st Order Terra Ceia Bay Tributaries (Frog & McMullen Creeks)	Depth	No Difference	0.6103	Yes (p=0.0064)	No (p=0.84)
		Stratification	No Difference	0.7028	No (p=0.1901)	No (p=0.4659)
		Temperature	No Difference	0.9899	No (p=0.1440)	No (p=0.1288)
		Salinity	No Difference	0.6219	Yes (p<0.0001)	Yes (p=0.0481)
		Bottom D.O.	No Difference	0.8358	No (p=0.6376)	No (p=0.0631)
		Color	No Difference	0.1475	No (p=0.2902)	No (p=0.1126)
		Turbidity	No Difference	0.2367	Yes (p=0.0395)	No (p=0.1623)
		TSS	TCB>FS	0.0915	No (p=0.5298)	No (p=0.5412)
		Total Nitrogen	No Difference	0.1053	Yes (p=0.0077)	No (p=0.1650)
		DIN	No Difference	0.5058	Yes (p=0.0087)	No (p=0.5676)
		DON	.	.	.	.
		Total Phosphorus	TCB>FS	0.0473	No (p=0.2521)	Yes (p=0.0381)
		SRP	TCB>FS	0.0288	No (p=0.3250)	Yes (p=0.0526)
		Chlorophyll-a	No Difference	0.6496	Yes (p<0.0001)	Yes (p=0.0926)
		Fecal coliform	No Difference	0.5429	Yes (p=0.0025)	Yes (p=0.0509)
		Enterococci	No Difference	0.5278	Yes (p=0.0007)	No (p=0.9300)

Table 8: Results of crossed general linear model testing for general and individual differences between first order tidal tributaries and the embayments to which they drain (Feather Sound and Terra Ceia Bay).

Type of Comparison	Comparison	Parameter	General Result	p-value	Grassy Creek (GC) vs. Feather Sound (FS)	p-value	Other Creeks (OC) vs. Feather Sound (FS)	p-value
Within Tributaries vs. Areas to Which they Drain	1st Order Tributaries (Grassy & Other Creeks Sampled) vs. Feather Sound/Old Tampa Bay	Depth	Bay>Tributaries	<0.0001	FS>GC	<0.0001	FS>OC	<0.0001
		Stratification	Bay>Tributaries	0.0525	FS>GC	0.0674	.	.
		Temperature	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1
		Salinity	Bay>Tributaries	<0.0001	FS>GC	0.0003	FS>OC	<0.0001
		Bottom D.O.	Bay>Tributaries	<0.0001	FS>GC	<0.0001	.	.
		Color	Tributaries>Bay	<0.0001	GC>FS	<0.0001	.	.
		Turbidity	Tributaries>Bay	<0.0001	GC>FS	0.0003	No Difference	>0.1
		TSS	Bay>Tributaries	0.0341	No Difference	0.4618	FS>OC	0.0638
		Total Nitrogen	Tributaries>Bay	<0.0001	GC>FS	<0.0001	No Difference	>0.1
		DIN	Tributaries>Bay	<0.0001	GC>FS	<0.0001	OC>FS	<0.0001
		DON	.	.	.	.	.	.
		Total Phosphorus	No Difference	>0.1	GC>FS	0.0017	FS>OC	0.0006
		SRP	Tributaries>Bay	0.0194	GC>FS	<0.0001	FS>OC	0.0011
		Chlorophyll-a	No Difference	>0.1	No Difference	>0.1	OC>FS	<0.0001
		Fecal coliform	Tributaries>Bay	<0.0001	GC>FS	0.0005	OC>FS	0.0207
		Enterococci	Tributaries>Bay	<0.0001	GC>FS	<0.0001	OC>FS	0.1025
		Parameter	**General Result**	**p-value**	**Frog Creek (FC) vs. Terra Ceia Bay(TCB)**	**p-value**	**McMullen Creek (MC) vs. Terra Ceia Bay (TCB)**	**p-value**
	1st Order Tributaries (Frog & McMullen Creeks) vs. Terra Ceia Bay	Depth	Bay>Tributaries	<0.0001	TCB>FC	<0.0001	TCB>MC	<0.0001
		Stratification	.	.	.	.	.	.
		Temperature	.	.	.	.	.	.
		Salinity	.	.	.	.	.	.
		Bottom D.O.	.	.	.	.	.	.
		Color	Tributaries>Bay	<0.0001	FC>TCB	<0.0001	MC>TCB	<0.0001
		Turbidity	Tributaries>Bay	0.0553	No Difference	>0.1	MC>TCB	0.0107
		TSS	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1
		Total Nitrogen	Tributaries>Bay	0.0142	FC>TCB	0.0689	MC>TCB	0.0044
		DIN	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1
		DON	.	.	.	.	.	.
		Total Phosphorus	No Difference	>0.1	FC>TCB	0.0854	MC>TCB	0.0341
		SRP	.	.	.	.	.	.
		Chlorophyll-a	No Difference	>0.1	No Difference	>0.1	No Difference	>0.1
		Fecal coliform	.	.	.	.	.	.
		Enterococci	.	.	.	.	.	.

Table 9: Summary of nutrient results in the Alafia River (AR), Little Manatee River (LMR), Feather Sound (FS), and Terra Ceia Bay (TCB) watersheds during 2006.

Watershed	Tributary or Area	Dissolved Inorganic Nitrogen (mg/L)					Dissolved Organic Nitrogen (mg/L)					Total Nitrogen (mg/L)					Soluble Reactive Phosphorus (mg/L)					Total Phosphurus (mg/L)					Dissolved Silica (mg/L)				
		N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max
AR	Mainstem Alafia River	160	0.6	0.03	0.0	1.3	.	.	.	.	.	160	1.5	0.07	0.1	10.0	160	0.6	0.02	0.1	1.3	160	0.77	0.03	0.19	1.50	.	.	.	.	.
	Dog Leg Creek	12	0.7	0.10	0.1	1.1	12	0.5	0.06	0.216	1.06	12	1.7	0.10	1.2	2.5	12	0.5	0.06	0.2	1.0	12	0.81	0.11	0.44	1.96	12	9.2	0.84	0.6	11.7
	Question Mark Creek	12	0.4	0.07	0.0	0.9	12	0.7	0.12	0.4425	1.8605	12	1.9	0.51	1.0	7.4	12	0.6	0.06	0.3	1.1	12	0.92	0.12	0.59	2.08	12	6.1	0.47	4.1	9.2
	Rice Creek	16	0.5	0.06	0.1	1.0	12	0.9	0.21	0.378	2.676	16	2.2	0.55	1.1	8.2	16	0.3	0.06	0.1	0.8	16	0.43	0.10	0.18	1.43	12	7.4	0.51	3.7	9.1
	Riverview Park West Creek	12	0.6	0.09	0.0	1.2	12	0.7	0.13	0.196	1.764	12	3.0	0.68	1.0	8.2	12	0.6	0.05	0.4	1.0	12	1.03	0.12	0.54	2.09	12	8.8	0.76	3.3	12.0
LMR	Mainstem Little Manatee River	12	0.2	0.03	0.0	0.3	.	.	.	.	.	12	0.7	0.08	0.3	1.4	12	0.2	0.02	0.1	0.4	12	0.28	0.03	0.16	0.49	.	.	.	.	.
	Curiosity Creek	28	0.5	0.10	0.0	2.4	24	0.7	0.07	0.34	1.604	28	1.5	0.13	0.6	3.7	28	0.6	0.05	0.2	1.1	28	0.71	0.05	0.29	1.32	24	7.0	0.71	2.0	15.1
	Wildcat Creek	28	0.1	0.01	0.0	0.2	24	0.6	0.05	0.296	1.282	28	0.9	0.06	0.5	1.8	28	0.3	0.01	0.2	0.5	28	0.34	0.02	0.18	0.57	24	5.0	0.62	1.2	11.3
	Other Creeks draining to LMR	7	1.1	0.65	0.0	4.8	.	.	.	.	.	7	1.9	0.53	0.6	4.7	7	0.3	0.07	0.1	0.5	7	0.48	0.11	0.24	0.98	.	.	.	.	.
FS	Feather Sound/Old Tampa Bay	135	0.0	0.00	0.0	0.1	.	.	.	.	.	137	0.4	0.01	0.3	0.9	137	0.1	0.00	0.0	0.2	137	0.14	0.01	0.02	0.37	10	3.1	0.66	0.2	7.0
	Grassy Creek	23	0.1	0.01	0.0	0.2	23	0.6	0.09	0.286	2.541	23	0.7	0.04	0.0	1.0	23	0.1	0.01	0.1	0.2	23	0.19	0.01	0.01	0.30	23	3.9	0.23	2.7	6.5
	Other Creeks draining to FS	8	0.3	0.07	0.1	0.6	.	.	.	.	.	10	0.4	0.00	0.4	0.4	8	0.0	0.01	0.0	0.1	8	0.07	0.01	0.04	0.10	.	.	.	.	.
TCB	Terra Ceia Bay	2	0.1	0.04	0.1	0.1	.	.	.	.	.	7	0.7	0.08	0.4	0.9	.	.	.	.	.	6	0.24	0.04	0.13	0.36	.	.	.	.	.
	Frog Creek	19	0.4	0.06	0.1	1.1	.	.	.	.	.	21	1.1	0.10	0.2	1.8	24	0.3	0.04	0.1	0.7	24	0.39	0.04	0.13	0.88	24	6.9	0.79	0.1	14.0
	McMullen Creek	10	0.2	0.08	0.1	0.9	.	.	.	.	.	11	1.4	0.17	0.6	2.2	12	0.4	0.08	0.1	1.0	12	0.48	0.13	0.12	1.67	12	7.7	1.51	2.5	19.9

Table 10: Summary of biological water quality monitoring results in the Alafia River (AR), Little Manatee River (LMR), Feather Sound (FS), and Terra Ceia Bay (TCB) watersheds during 2006.

Watershed	Tributary or Area	Uncorrected Chlorophyll-a (µg/L)					Corrected Chlorophyll-a (µg/L)					Fecal Coliform Bacteria (# col./100mL)					Enterococci Bacteria (# col./100mL)				
		N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max	N	Mean	Stderr	Min	Max
AR	Mainstem Alafia River	160	27.9	4.02	2.0	315.3	23	49.5	17.77	1.8	313.8	23	222	89	10	1700	23	288	76	10	1700
	Dog Leg Creek	12	56.8	13.66	7.7	147.9	12	48.9	12.19	6.1	137.3	12	505	126	20	1220	12	398	123	20	1200
	Question Mark Creek	12	83.5	42.89	7.0	546.5	12	72.6	36.78	7.1	470.05	12	57	16	20	170	12	113	44	20	560
	Rice Creek	16	94.4	50.67	1.2	650.8	16	88.9	48.69	0.7	614.6	16	701	212	20	3500	16	999	249	60	3600
	Riverview Park West Creek	12	119.1	44.90	1.9	529.5	12	107.6	38.46	1.5	424.6	12	415	122	20	1260	12	322	88	20	980
LMR	Mainstem Little Manatee River	12	3.8	0.50	1.8	7.6	12	3.5	0.66	0.9	8.6	12	82	49	20	600	12	253	164	20	2000
	Curiosity Creek	28	21.1	7.68	0.5	217.1	28	18.8	7.62	0	215.1	28	321	55	20	1100	28	570	107	20	2700
	Wildcat Creek	28	14.7	2.05	0.8	40.4	28	12.8	1.91	0	35.5	28	309	54	20	920	28	536	163	20	4000
	Other Creeks draining to LMR	7	7.4	3.45	1.8	27.4	7	3.7	0.81	0.7	6.3	7	414	110	100	780	7	711	190	100	1400
FS	Feather Sound/Old Tampa Bay	137	7.1	0.81	0.5	65.8	.	.	.	.	.	30	3	1	2	18	30	2	0	2	6
	Grassy Creek	23	4.4	0.47	1.3	10.9	23	3.9	0.43	1.4	10.1	23	137	34	20	580	23	129	23	20	460
	Other Creeks draining to FS	7	26.6	8.13	1.2	58.9	.	.	.	.	.	8	133	69	3	600	8	58	24	4	192
TCB	Terra Ceia Bay	12	5.9	1.76	1.2	20.3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Frog Creek	.	.	.	.	.	22	9.7	1.46	2	29.3	20	59	19	3	310	17	18	6	1	82
	McMullen Creek	.	.	.	.	.	12	10.5	3.01	2.7	40.3	11	650	311	22	3350	9	643	312	18	2500

Table 11: Tidal tributary benthic quality sampling information. EPCHC refers to the collections made by the Environmental Protection Commission of Hillsborough County, while MCEMD refers to collections made by the Manatee County Environmental Management Department.

Alafia River					
Tidal Tributary	**Season**	**Sampling Date**	**Gear**	**Agency**	**n**
Dog Leg Creek	Spring	10 May 2006	Petite Ponar	EPCHC	1
Dog Leg Creek	Fall	27 Sept 2006	Petite Ponar	EPCHC	1
Question Mark Creek	Spring	10 May 2006	Petite Ponar	EPCHC	1
Question Mark Creek	Fall	27 Sept 2006	Petite Ponar	EPCHC	2
Rice Creek	Spring	10 May 2006	Petite Ponar	EPCHC	2
Rice Creek	Fall	27 Sept 2006	Petite Ponar	EPCHC	2
Riverview Park West Creek	Spring	10 May 2006	Petite Ponar	EPCHC	2
Riverview Park West Creek	Fall	27 Sept 2006	Petite Ponar	EPCHC	1
Mainstem Alafia River	Spring	10 May 2006	Petite Ponar	EPCHC	6
Mainstem Alafia River	Fall	14-17 Aug 2006	Young Van Veen	EPCHC	12
Little Manatee River					
Tidal Tributary	**Season**	**Sampling Date**	**Gear**	**Agency**	**N**
Curiosity Creek	Spring	08 May 2006	Petite Ponar	EPCHC	3
Curiosity Creek	Fall	26 Sept 2006	Petite Ponar	EPCHC	3
Wild Cat Creek	Spring	08 May 2006	Petite Ponar	EPCHC	3
Wild Cat Creek	Fall	26 Sept 2006	Petite Ponar	EPCHC	3
Mainstem Little Manatee River	Spring	08 May 2006	Petite Ponar	EPCHC	6
Mainstem Little Manatee River	Fall	21-22 Aug 2006	Young Van Veen	EPCHC	6

Feather Sound / Old Tampa Bay					
Tidal Tributary	**Season**	**Sampling Date**	**Gear**	**Agency**	**n**
Grassy Creek	Spring	11 May 2006	Petite Ponar	EPCHC	6
Grassy Creek	Fall	28 Sept 2006	Petite Ponar	EPCHC	6
Feather Sound/Old Tampa Bay	Spring	11 May 2006	Petite Ponar	EPCHC	6
Feather Sound/Old Tampa Bay	Fall	28 Aug 2006	Young Van Veen	EPCHC	8
Terra Ceia Bay					
Tidal Tributary	**Season**	**Sampling Date**	**Gear**	**Agency**	**N**
Frog Creek	Spring	23 May 2006	Petite Ponar	MCEMD	3
Frog Creek	Fall	28 Sept 2006	Petite Ponar	MCEMD	3
McMullen Creek	Spring	23 May 2006	Petite Ponar	MCEMD	3
McMullen Creek	Fall	28 Sept 2006	Petite Ponar	MCEMD	3
Terra Ceia Bay	Spring	24 May 2006	Petite Ponar	MCEMD	6
Terra Ceia Bay	Fall	21-22 Sept 2006	Young Van Veen	MCEMD	5

Table 12: Summary statistics for bottom water quality and sediment composition for benthic sampling sites in the Alafia and Little Manatee River watersheds. ND = Not detected.

System	n	Depth (meters)			Temperature (^{o}C)			pH			Salinity (PSU)			D.O. (mg/L)			Silt/Clay (%)			Benthic Chlorophyll-a (µg/L)		
		Median	Min	Max	Median	Min	Max	Median	Min	Max	Median	Min	Max	Median	Min	Max	Median	Min	Mac	Median	Min	Max
Mainstem Alafia River (Spring)	6	1	0.8	2.3	27.76	26.85	28.62	7.78	7.64	7.89	8.84	5.68	17.28	2.87	1.26	5.98	9.9	7.5	23.4	.	.	.
Mainstem Alafia River (Fall)	12	1.8	1.1	3.3	25.87	25.7	31.49	7.1	6.86	7.23	0.1	0.09	22.68	4.85	0.08	5.1	8.5	0.7	82.4	.	.	.
Dog Leg Creek (Spring)	1	1.2	1.2	1.2	27.02	27.02	27.02	7.42	7.42	7.42	5.83	5.83	5.83	2.44	2.44	2.44	17	17	17	473.01	473.01	473.01
Dog Leg Creek (Fall)	1	1.4	1.4	1.4	25.46	25.46	25.46	7.07	7.07	7.07	2.89	2.89	2.89	0.15	0.15	0.15	27.4	27.4	27.4	38.61	38.61	38.61
Question Mark Creek (Spring)	1	0.6	0.6	0.6	26.89	26.89	26.89	7.85	7.85	7.85	12.72	12.72	12.72	2.55	2.55	2.55	14.8	14.8	14.8	ND	ND	ND
Question Mark Creek (Fall)	2	0.8	0.5	1.1	28.4	28.16	28.63	7.25	7.23	7.26	7.17	2.05	12.28	2.17	0.18	4.15	40	18.5	61.4	13.62	ND	26.24
Rice Creek (Spring)	2	0.8	0.7	0.9	28.11	27.81	28.4	8.1	7.83	8.36	7.21	7.01	7.4	7.92	6.15	9.68	1.1	0.7	1.4	612.98	122.28	1103.69
Rice Creek (Fall)	2	0.4	0.3	0.4	24.41	24.41	24.41	6.84	6.82	6.85	0.12	0.12	0.12	6.15	6.05	6.25	2.1	1.3	2.8	.	.	.
Riverview Park Creek (Spring)	2	1.1	1	1.2	28.48	28.4	28.55	7.71	7.67	7.75	8.91	8.81	9	3.92	3.1	4.73	40.1	33.3	46.8	1145.52	96.53	2194.51
Riverview Park Creek (Fall)	1	0.4	0.4	0.4	26.49	26.49	26.49	7.03	7.03	7.03	0.23	0.23	0.23	2.02	2.02	2.02	42.6	42.6	42.6	.	.	.

System	n	Depth (meters)			Temperature (^{o}C)			pH			Salinity (PSU)			D.O. (mg/L)			Silt/Clay (%)			Benthic Chlorophyll-a (µg/L)		
		Median	Min	Max	Median	Min	Max	Median	Min	Max	Median	Min	Max	Median	Min	Max	Median	Min	Mac	Median	Min	Max
Mainstem Little Manatee River (Spring)	6	1	0.8	1.2	28.64	27.59	29.79	7.62	7.28	7.92	19.49	15.18	21.57	4.79	3.41	6.23	4.5	1.4	22.2	.	.	.
Mainstem Little Manatee River (Fall)	6	2.1	0.9	4.3	26.39	25.64	29.66	6.87	6.68	7.01	0.16	0.13	8.2	4.17	0.23	4.36	2.8	1.4	17	.	.	.
Curiosity Creek (Spring)	3	0.8	0.7	2.5	28.07	26.36	28.11	7.36	7.33	7.39	15.12	9.55	15.45	4.32	4.24	4.47	2	1.4	4.7	228.46	209.15	572.76
Curiosity Creek (Fall)	3	0.9	0.7	1.2	26.01	25.94	26.07	6.71	6.69	6.75	0.21	0.2	0.22	3.35	3.17	3.49	0	0	0	19.31	ND	19.31
Wildcat Creek (Spring)	3	0.7	0.6	0.9	29.08	28.47	29.36	7.46	7.22	7.57	20.73	18.51	21.22	4.67	4.54	5.08	3	2.1	5	102.97	51.48	601.72
Wildcat Mark Creek (Fall)	3	0.4	0.4	0.9	28.09	27.36	28.2	6.82	6.78	6.92	0.32	0.29	0.4	4.07	3.63	4.09	1.5	1.4	2.1	38.61	ND	54.7

Table 13: Summary statistics for bottom water quality and sediment composition for benthic sampling sites in the Feather Sound and Terra Ceia Bay watersheds. ND = Not detected.

System	n	Depth (meters) Median		Temperature (^{o}C) Median		pH Median		Salinity (PSU) Median		D.O. (mg/L) Median		Silt/Clay (%) Median		Benthic Chlorophyll-a (µg/L) Median	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Mac	Min	Max
Feather Sound / Old Tampa Bay (Spring)	6	1.1		27.82		8.13		25.19		5.56		8.3		.	
		0.7	1.3	27.58	27.92	7.94	8.15	24.96	25.4	4.63	6.14	3.5	11.6	.	.
Feather Sound / Old Tampa Bay (Fall)	8	4.4		29.87		8.15		25.65		5.16		2.1		.	
		0.8	5.5	29.12	29.95	7.97	8.18	23.34	26.25	3.32	6.01	1.5	7.2	.	.
Grassy Creek (Spring)	3	0.4		26.1		7.32		24.84		1.21		3.3		667.69	
		0.3	0.9	26.04	26.43	7.27	7.42	24.42	25.18	1.09	2.51	2.1	5	257.42	1061.86
Grassy Creek (Fall)	3	0.3		24.97		7.07		17.55		1.57		2.6		33.79	
		0.2	0.5	24.79	25.37	7	7.1	17.41	17.82	1.31	2.13	1.5	7.3	ND	57.92

System	n	Depth (meters) Median		Temperature (^{o}C) Median		pH Median		Salinity (PSU) Median		D.O. (mg/L) Median		Silt/Clay (%) Median		Benthic Chlorophyll-a (µg/L) Median	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Mac	Min	Max
Terra Ceia Bay (Spring)	6	1.2		27		7.9		32		4.7		17.1		.	
		0.6	2.4	24	27	7.4	7.9	32	32.7	4.1	5	2	40.2	.	.
Terra Ceia Bay (Fall)	5	1		28.26		8.21		22.9		6.69		3.8		.	
		0.7	3	27.15	29.32	8.15	8.21	21.8	26.7	5.53	7.82	1.5	6.6	.	.
Frog Creek (Spring)	3	0.4		27		7.3		29.6		5.2		13.1		286	
		0.2	0.6	27	28	7.3	7.5	19.5	31.2	5	5.6	2.6	23.1	264	847
Frog Creek (Fall)	3	0.1		26.8		7.2		0.6		5.9		1.5		196	
		0.1	0.1	26.7	27.4	7	7.7	0.5	3.7	5.4	8.3	1.5	4	134	300
McMullen Creek (Spring)	3	0.5		27		7.3		28.6		4.5		4.4		641	
		0.2	0.5	27	27	7.3	7.5	23.5	30.9	2.55	5.3	2.7	4.5	618.5	920
McMullen Mark Creek (Fall)	3	0.1		26.6		7.2		6.7		6.8		9.8		192	
		0.1	0.1	26.5	27.8	6.9	7.35	4	10.2	6.8	7	6.5	13.7	160	307

Table 14: Summary statistics for benthic community indices for benthic sampling sites in the Alafia and Little Manatee River watersheds.

System	n	Number of taxa Median		Number per m^2 Median		Diversity (H') Median		Evenness (J') Median		TBBI Median	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Mainstem Alafia River (Spring)	6	20		29004		1.96		0.68		81.73	
		3	31	860	87333	0.85	2.51	0.56	0.82	66.64	84.05
Mainstem Alafia River (Fall)	12	9		4650		1.39		0.61		67.30	
		1	27	50	21700	0.00	1.99	0.47	0.90	60.52	71.37
Dog Leg Creek (Spring)	1	11		10492		0.54		0.22		73.26	
		-	-	-	-	-	-	-	-	-	-
Dog Leg Creek (Fall)	1	3		129		1.10		1.00		Undefined	
		-	-	-	-	-	-	-	-	-	-
Question Mark Creek (Spring)	1	10		4730		1.30		0.57		76.77	
		-	-	-	-	-	-	-	-	-	-
Question Mark Creek (Fall)	2	9		12470		0.76		0.53		41.52	
		0	18	0	24940	0.00	1.52	-	0.53	0.00	83.03
Rice Creek (Spring)	2	23		26919		1.98		0.65		80.54	
		18	28	15738	38099	1.80	2.17	0.54	0.75	78.51	82.56
Rice Creek (Fall)	2	23		10277		1.75		0.55		84.77	
		10	36	9589	10965	0.74	2.77	0.32	0.77	78.70	90.84
Riverview Park Creek (Spring)	2	15		27198		1.72		0.64		79.10	
		13	17	26058	28337	1.61	1.83	0.63	0.65	78.00	80.19
Riverview Park Creek (Fall)	1	12		5590		1.32		0.53		80.89	
		-	-	-	-	-	-	-	-	-	-

System	n	Number of taxa Median		Number per m^2 Median		Diversity (H') Median		Evenness (J') Median		TBBI Median	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Mainstem Little Manatee River (Spring)	6	19.5		25328		1.32		0.47		86.04	
		11	21	5848	122637	0.78	1.87	0.26	0.71	78.59	87.14
Mainstem Little Manatee River (Fall)	6	19		4525		2.11		0.75		70.06	
		2	23	100	8525	0.56	2.37	0.68	0.81	63.17	72.74
Curiosity Creek (Spring)	3	21		58566		1.25		0.43		86.99	
		19	26	40936	60931	1.20	1.68	0.40	0.52	82.01	89.11
Curiosity Creek (Fall)	3	3		172		1.04		0.95		60.96	
		2	5	172	258	0.56	1.56	0.81	0.97	60.26	63.97
Wildcat Creek (Spring)	3	25		27176		1.93		0.63		86.49	
		21	31	18450	48807	1.71	2.21	0.50	0.69	86.19	89.52
Wildcat Creek (Fall)	3	10		2408		1.26		0.78		79.36	
		4	14	1763	7740	1.14	1.79	0.48	0.82	70.85	82.97

Table 15: Alafia River tidal tributary benthic relative abundance.

Dog Leg Creek (Spring)		Dog Leg Creek (Fall)		Question Mark Creek (Spring)		Question Mark Creek (Fall)		Rice Creek (Spring)		Rice Creek (Fall)	
Taxa	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**
TUBIFICIDAE	89.34	*Mediomastus ambiseta;* TUBIFICIDAE; *Sinelobus stanfordi*	33.33	*Littoridinops palustris*	56.36	TUBIFICIDAE	50.69	*Grandidierella bonnieroides*	43.37	*Corbicula fluminea*	56.07
Limnodrilus hoffmeisteri	4.51			*Stenoninereis martini*	22.73	*Chironomus* sp.	22.07	*Corbicula fluminea*	12.86	TUBIFICIDAE	8.58
Tanytarsus sp.	1.64			TUBIFICIDAE	11.82	*Littoridinops Palustris*	10.69	TUBIFICIDAE	11.98	*Pyrgophorus platyrachis*	7.11
Tanypus neopunctipennis	1.23			*Melanoides tuberculata*; *Mytilopsis leucophaeata*; *Tanypus clavatus*	1.82	*Melanoides tuberculata*	6.55	*Tanytarsus* sp.	9.27	*Dubiraphia* sp.	3.97
Procladius (Holotanypus) sp.	0.82			ACTINARIA*; Laeonereis culveri; Mediomastus ambiseta; Tubificoides wasselli*	0.91	*Mytilopsis leucophaeata*	3.97	*Polypedilum scalaneum* group	5.03	*Laeonereis culveri*	3.77

Riverview Park West Creek (Spring)		Riverview Park West Creek (Fall)		Mainstem Alafia River (Spring)		Mainstem Alafia River (Fall)	
Taxa	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**
TUBIFICIDAE*; Littoridinops monroensis*	23.00	*Pyrgophorus platyrachis*	54.62	*Grandidierella bonnieroides*	33.04	*Mytilopsis leucophaeata*	35.77
Laeonereis culveri	18.42	TUBIFICIDAE	28.46	*Edotia triloba*	10.29	*Streblospio spp.*	17.11
Chironomus sp.	14.62	*Polypedilum halterale* group	6.15	*Mytilopsis leucophaeata*	8.22	*Pyrgophorus platyrachis*	12.17
Pyrgophorus platyrachis	9.01	*Procladius (Holotanypus)* sp.	3.08	*Dicrotendipes* sp.	5.79	TUBIFICIDAE	7.88
Grandidierella bonnieroides	5.93	*Tanypus neopunctipennis*; *Dero nivea*	1.54	*Ampelisca abdita*	5.62	*Almyracuma proximoculi*	6.20

Table 16: Little Manatee River tidal tributary benthic relative abundance.

Curiosity Creek (Spring)		**Curiosity Creek (Fall)**		**Wildcat Creek (Spring)**		**Wildcat Creek (Fall)**		**Mainstem Little Manatee River (Spring)**		**Mainstem Little Manatee River (Fall)**	
Taxa	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**
Grandidierella bonnieroides	30.74	HYDROBIIDAE	28.57	*Grandidierella bonnieroides*	46.04	RISSOOIDEA sp. A of EPC	61.73	*Apocorophium louisianum*	65.11	*Grandidierella bonnieroides*	29.68
Uromunna reynoldsi	24.31	TUBIFICIDAE; *Cyathura polita*	14.29	ACTINARIA	13.75	TUBIFICIDAE	10.11	*Grandidierella bonnieroides*	17.98	TUBIFICIDAE	12.88
Apocorophium louisianum	21.09			RISSOOIDEA sp. A of EPC	6.42	*Laeonereis culveri*	7.22	*Cyathura polita*	4.58	*Polypedilum scalaneum* group	10.41
Gammarus cf. tigrinus	8.42	*Amphiporus bioculatus; Corbicula fluminea; Cryptochironomus* sp.; *Polypedilum* sp.: *Polypedilum scalaneum* group: *Gammarus palustris*	7.14	*Leptochelia* sp.	4.92	*Mytilopsis leucophaeata*	4.33	*Ampelisca abdita*	1.75	*Cyathura polita*	9.95
Cyathura polita	3.48			*Apocorophium louisianum*	4.78	*Almyracuma proximoculi; Grandidierella bonnieroides*	3.25	ACTINARIA	1.23	*Tubificoides motei*	7.76

Table 17: Summary statistics for benthic community indices for benthic sampling sites in the Feather Sound and Terra Ceia Bay watersheds.

System	n	Number of taxa Median Min	Max	Number per m^2 Median Min	Max	Diversity (H') Median Min	Max	Evenness (J') Median Min	Max	TBBI Median Min	Max
Feather Sound / Old Tampa Bay (Spring)	6	49		51042		2.70		0.70		77.50	
		22	57	9546	80324	2.07	3.05	0.58	0.77	59.28	90.97
Feather Sound / Old Tampa Bay (Fall)	8	35		12689		2.38		0.65		87.63	
		27	68	3975	70251	1.36	3.08	0.34	0.81	77.15	93.47
Grassy Creek (Spring)	6	40		83076		2.16		0.59		88.02	
		25	44	11825	185373	1.83	2.54	0.50	0.73	67.29	90.55
Grassy Creek (Fall)	6	23		12578		2.09		0.65		71.06	
		17	29	8643	15824	1.48	2.50	0.52	0.80	60.42	77.46

System	n	Number of taxa Median Min	Max	Number per m^2 Median Min	Max	Diversity (H') Median Min	Max	Evenness (J') Median Min	Max	TBBI Median Min	Max
Terra Ceia Bay (Spring)	6	31		12599		2.25		0.68		63.50	
		15	42	2193	57706	1.72	2.79	0.50	0.90	35.90	86.12
Terra Ceia Bay (Fall)	5	29		4800		2.96		0.85		86.22	
		21	67	1100	8426	2.47	3.40	0.71	0.92	51.42	94.58
Frog Creek (Spring)	3	15		15351		2.18		0.69		82.57	
		15	46	8041	43817	1.86	2.64	0.69	0.80	49.57	83.26
Frog Creek (Fall)	3	9		1979		1.43		0.70		78.35	
		6	10	1290	5074	1.25	1.66	0.62	0.76	40.75	79.21
McMullen Creek (Spring)	3	15		16426		1.85		0.79		65.54	
		10	24	1849	71724	1.27	2.15	0.40	0.81	65.40	81.51
McMullen Creek (Fall)	3	8		2021		1.70		0.80		55.73	
		6	10	430	2236	1.36	1.84	0.65	0.95	36.46	65.70

Table 18: Feather Sound / Old Tampa Bay tidal tributary benthic relative abundance.

Grassy Creek (Spring)		Grassy Creek (Fall)		Feather Sound / Old Tampa Bay (Spring)		Feather Sound / Old Tampa Bay (Fall)	
Taxa	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**
Leptochelia sp.	28.78	*Laeonereis culveri*	24.54	*Axiothella mucosa*	15.21	*Exogone dispar*	36.57
Grandidierella bonnieroides	16.31	TUBIFICIDAE	15.68	*Parastarte triquetra*	8.36	*Rudilemboides naglei*	9.53
Parastarte triquetra	15.75	*Parastarte triquetra*	10.81	*Tubificoides wasselli*	7.46	*Fabricinuda trilobata*	5.38
Fabricinuda trilobata	8.54	*Stenoninereis martini*	10.53	*Ampelisca holmesi*	6.85	*Mysella planulata*	4.81
Ampelisca abdita	4.25	*Leitoscoloplos* spp.	6.41	*Fabricinuda trilobata*	5.66	*Glottidia pyramidata*	3.02

Table 19: Terra Ceia Bay tidal tributary benthic relative abundance.

Frog Creek (Spring)		Frog Creek (Fall)		McMullen Creek (Spring)		McMullen Creek (Fall)		Terra Ceia Bay (Spring)		Terra Ceia Bay (Fall)	
Taxa	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**	**Taxa**	**%**
Parastarte triquetra	20.86	*Polypedilum halterale* group	40.20	*Grandidierella bonnieroides*	58.29	TUBIFICIDAE	33.94	*Grandidierella bonnieroides*	26.07	*Cymadusa compta*	10.00
Laeonereis culveri	14.20	*Polypedilum scalaneum* group	29.89	*Leptochela* sp.	7.88	*Streblospio* spp.	15.60	*Leptochelia* sp.	9.84	TUBIFICIDAE	8.92
Grandidierella bonnieroides	10.62	*Laeonereis culveri*	7.22	*Laeonereis culveri*	6.59	*Laeonereis culveri*	14.68	*Exogone dispar*	7.15	*Pileolaria rosepigmentata*	7.20
Americorophium ellisi	6.14	*Cryptochironomus* sp.	4.12	*Parastarte triquetra*	4.68	*Chironomus* sp.	7.34	*Parastarte triquetra*	6.70	*Xenanthura brevitelson*	4.73
Pyrgophorus platyrachis	4.73	HYDROBIIDAE	3.61	*Cyathura polita*	4.63	*Capitella capitata* complex	4.59	*Fabricinuda trilobata*	6.51	*Tubificoides wasselli*	4.52

Table 20: Summary of watershed metrics for the tidal tributaries draining to the Alafia and Little Manatee Rivers, Feather Sound, and Terra Ceia Bay.

System Type	Watershed	Tributary	Basin Size (ha)	% Impervious Cover (USGS 2001)		Landscape Development Intensity Indices (SWFWMD 2004)	
				Basin (%)	100-m Stream Corridor (%)	Basin (Indices)	100-m Stream Corridor (Indices)
Minor Second Order Tributaries Discharging to a Major First Order Tributary	**Alafia River**	*Dog Leg Creek*	35.5	2.55	2.13	6.04	3.05
		Question Mark Creek	23.2	7.04	2.35	5.68	3.96
		Rice Creek	1315.4	9.81	6.9	4.91	3.72
		Riverview Park West Creek	68.2	16.57	6.93	6.22	6.43
	Little Manatee River	*Curiosity Creek*	5725.9	0.9	0.58	3.19	3.01
		Wildcat Creek	926.3	1.89	0.83	3.2	2.48
Minor First Order Tributaries Discharging Directly to Embayments	**Feather Sound**	*Grassy Creek*	159.9	4.24	1.18	1.62	1.08
	Terra Ceia Bay	*Frog Creek*	2357.2	6.65	3.12	4.11	3.31
		McMullen Creek	757.5	13.89	9.12	5.16	4.79

6. FIGURES

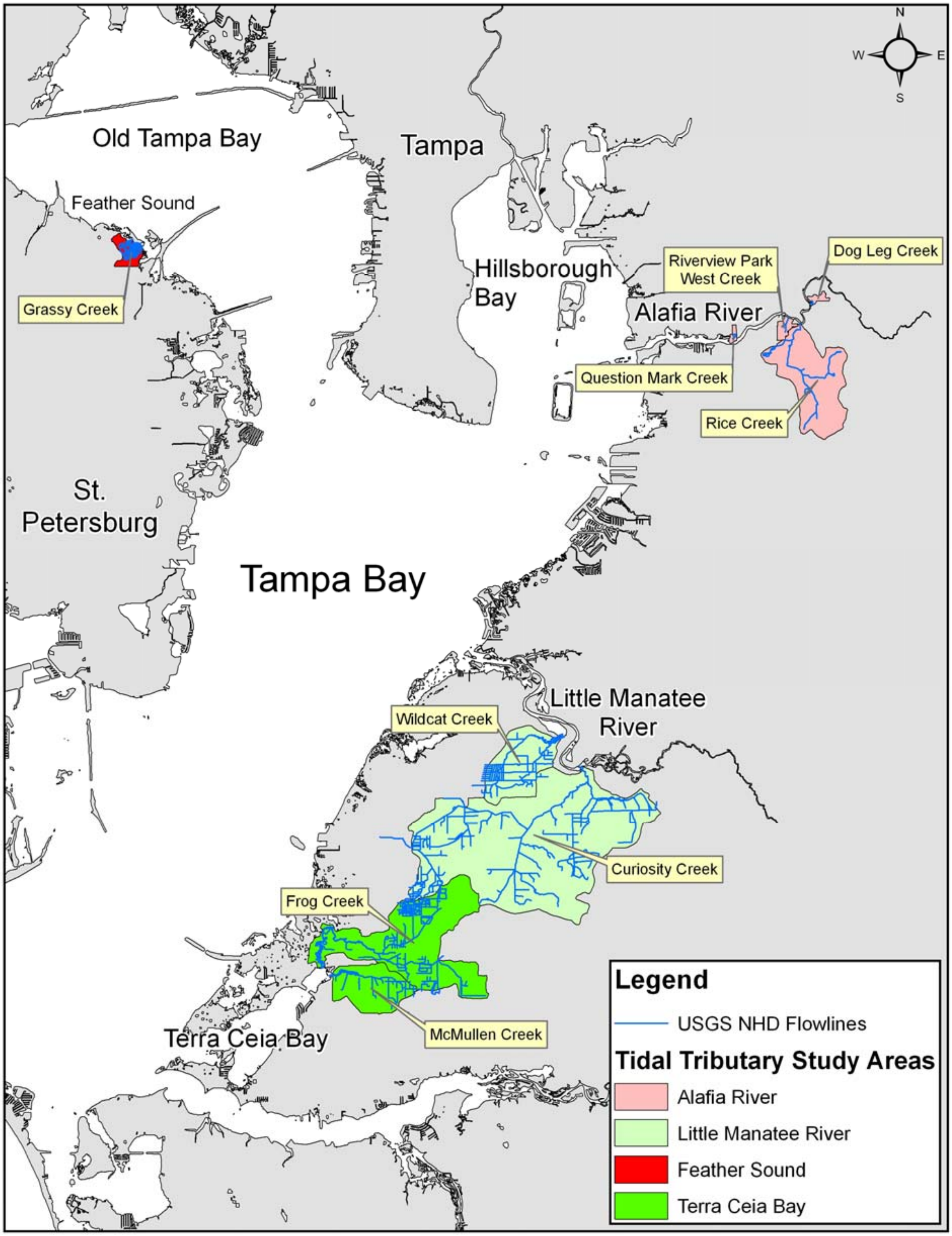


Figure 1: Overview map showing the location of the select tidal tributary study areas. The tributaries draining to Feather Sound and Terra Ceia Bay were considered first order tributaries. The tributaries draining to the Alafia and Little Manatee Rivers were considered second order tributaries. Tributaries in the Alafia River and Feather Sound watersheds were considered a priori more disturbed.

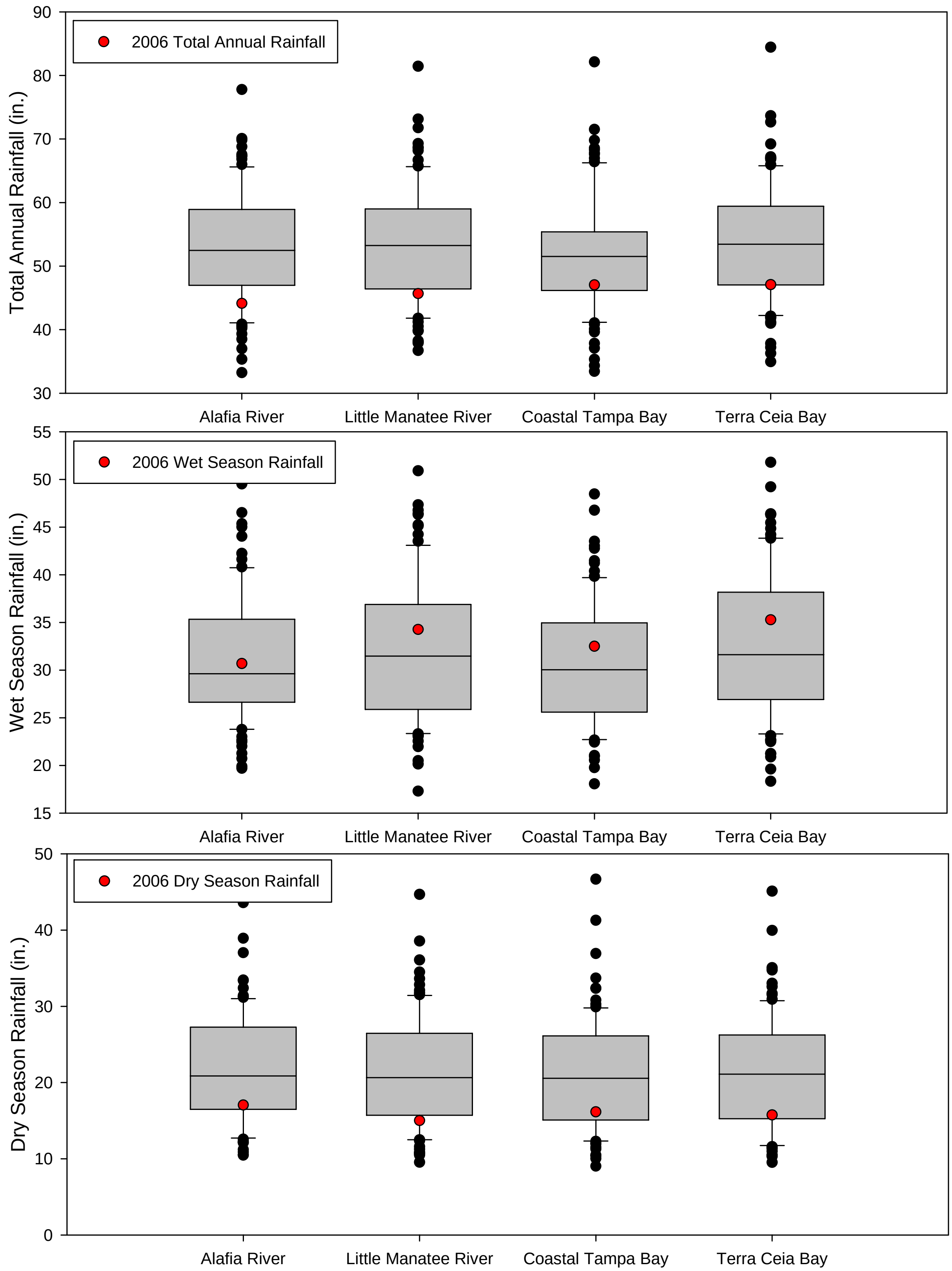


Figure 2: Total annual, wet season, and dry season rainfall conditions in the tidal tributary watersheds over the period of record (1915-2006) and during 2006 (Adapted from SWFWMD 2007).

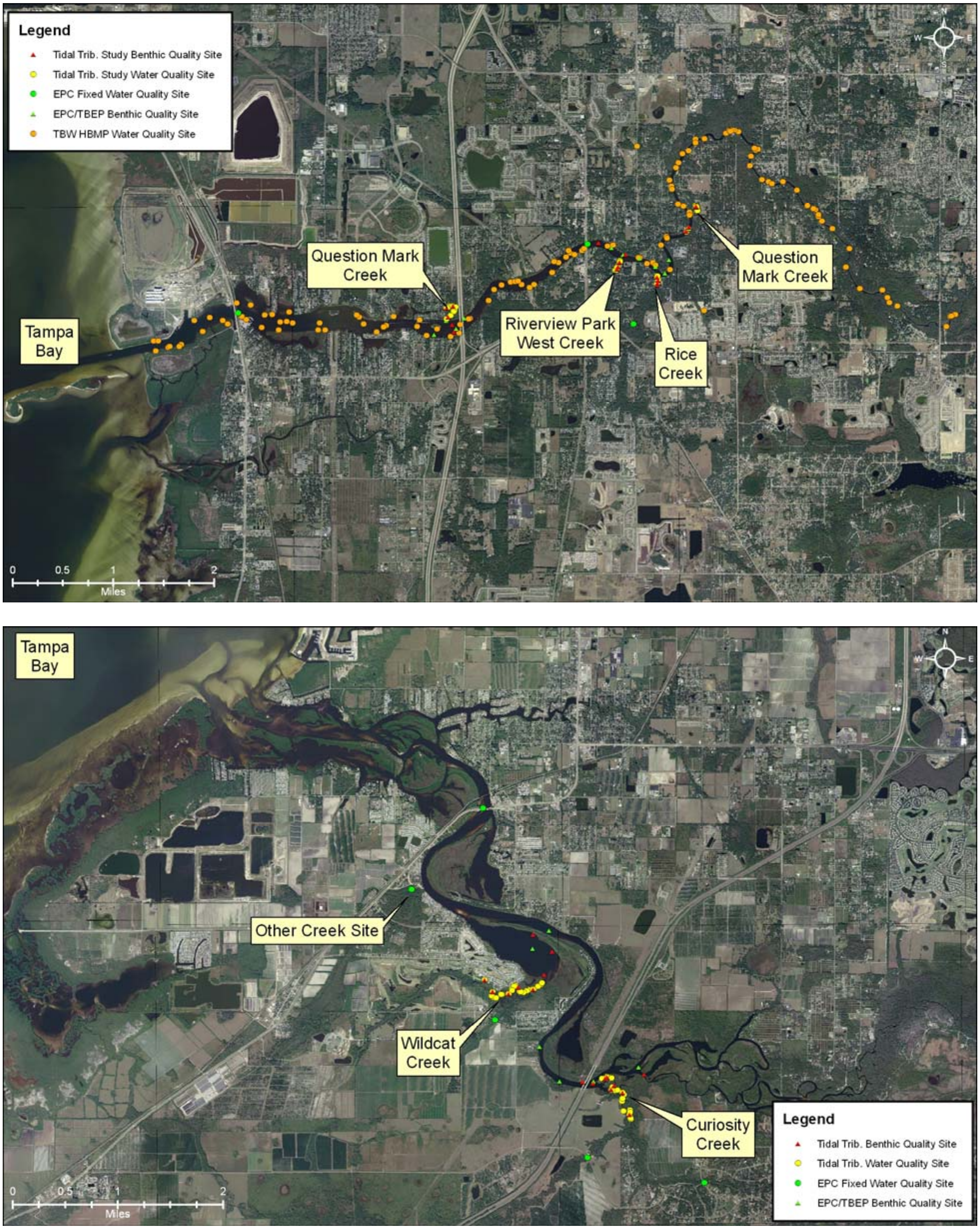


Figure 3: Aerial maps showing sample sites in the Alafia (top, a priori disturbed) and Little Manatee (bottom, a priori less disturbed) Rivers. Water quality (yellow circle) and benthic quality (red triangle) sites monitored in 2006 for the tidal tributary study are depicted. Also depicted are additional monitoring sites adjacent to the tributary study areas.

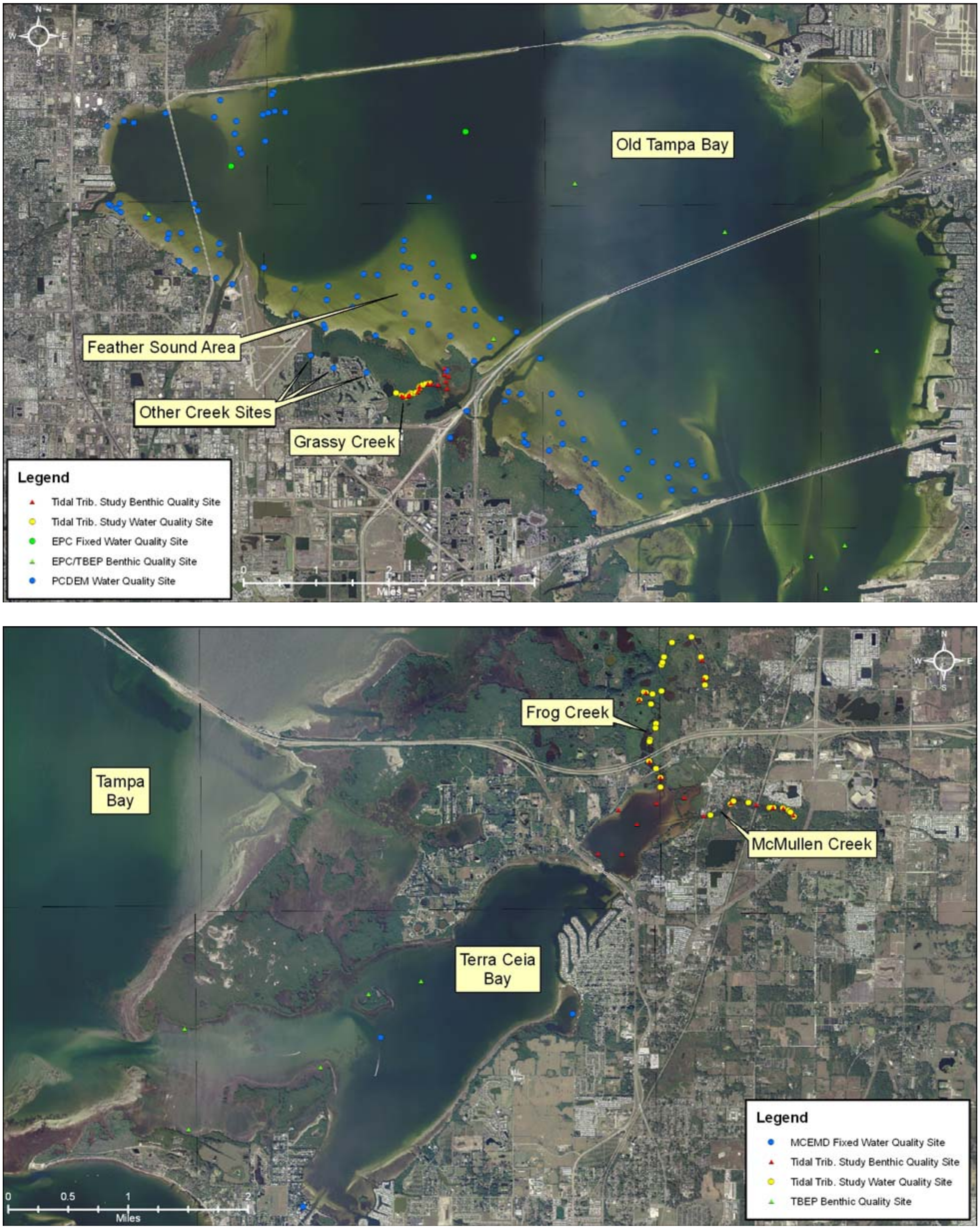
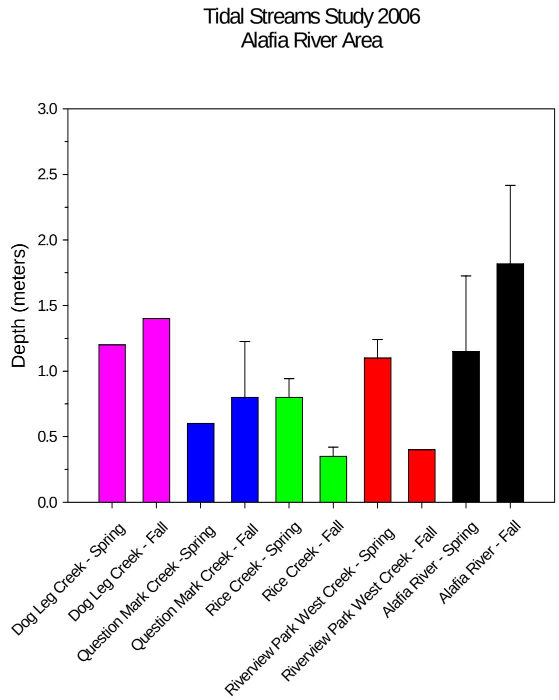


Figure 4: Aerial maps showing sample sites in Feather Sound (top, a priori disturbed) and Terra Ceia Bay (bottom, a priori less disturbed). Water quality (yellow circle) and benthic quality (red triangle) sites monitored in 2006 for the tidal tributary study are depicted. Also depicted are additional monitoring sites adjacent to the tributary study areas.



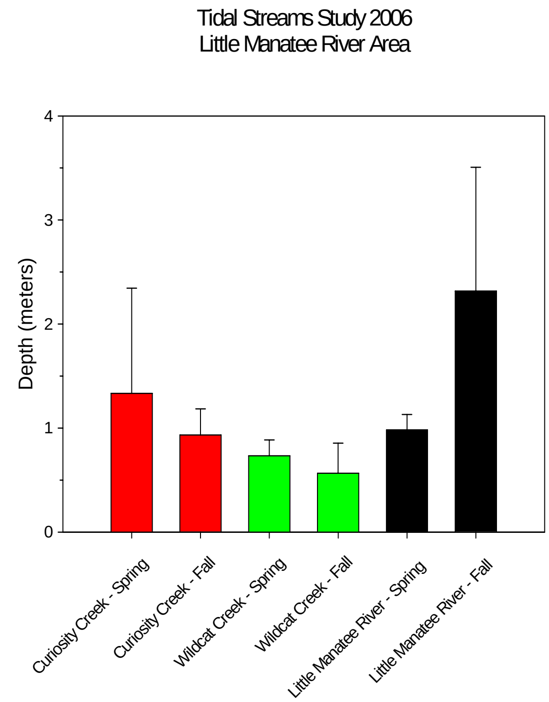
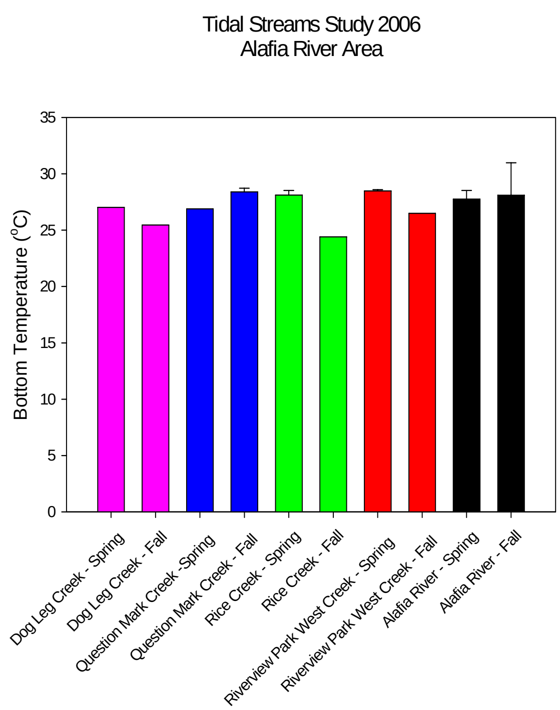


Figure 5: Alafia River and Little Manatee River tidal tributary benthic sample depths.



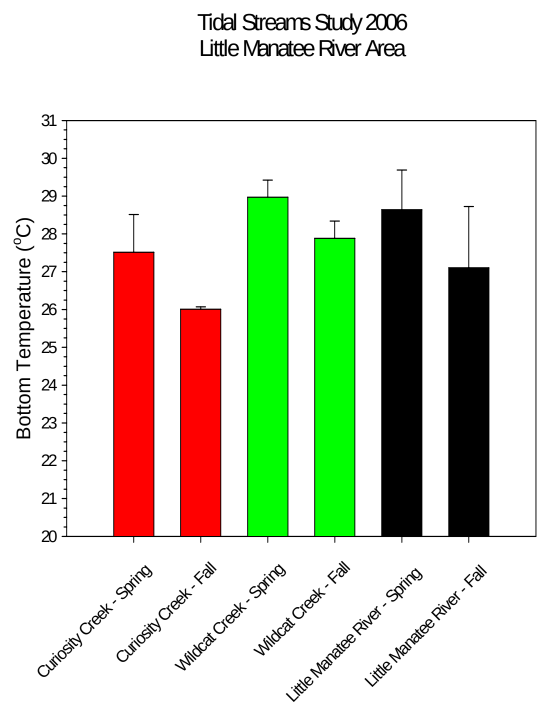
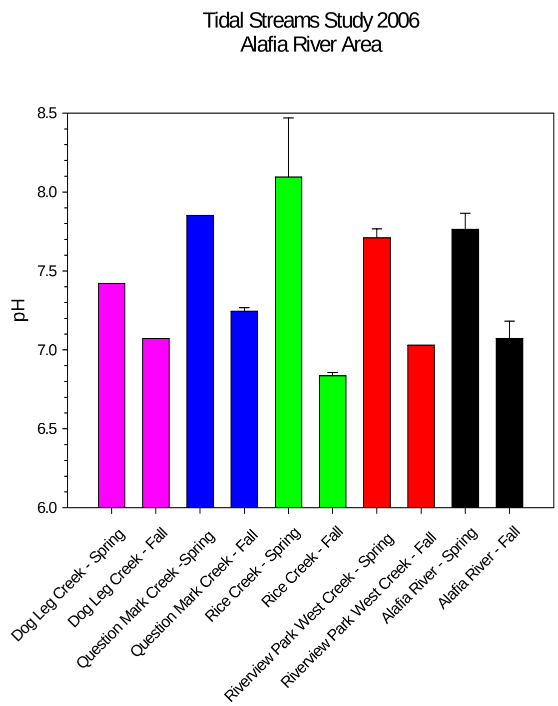


Figure 6: Alafia River and Little Manatee River tidal tributary benthic sampling bottom temperatures.



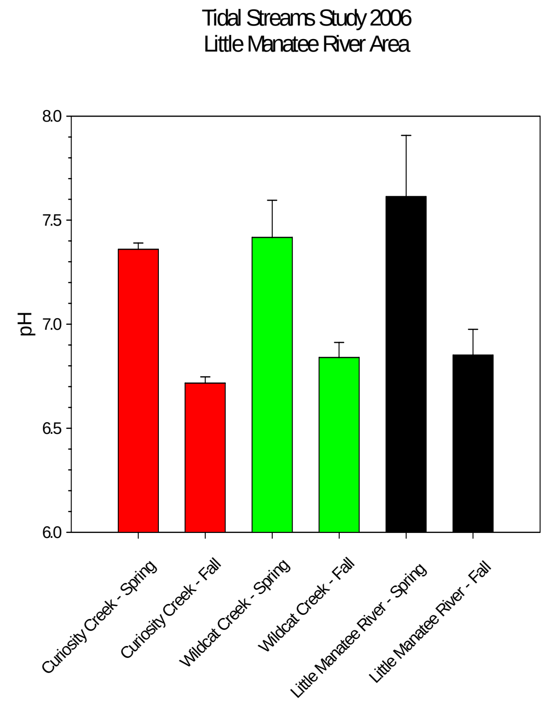
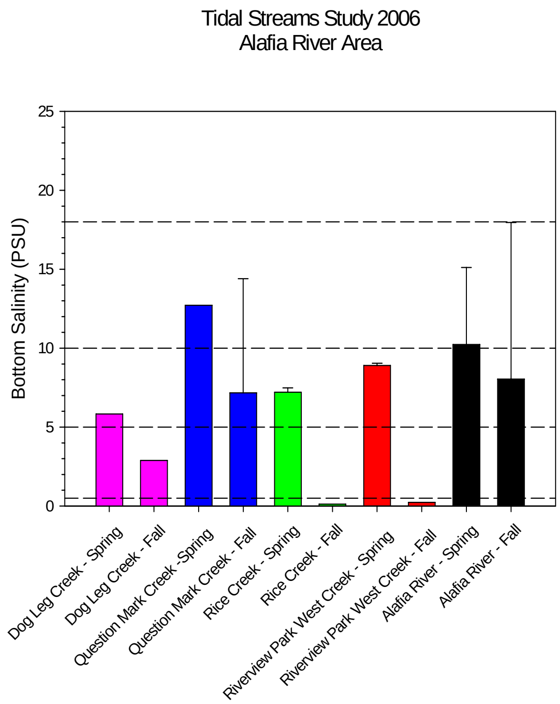


Figure 7: Alafia River and Little Manatee River tidal tributary benthic sampling bottom pH.



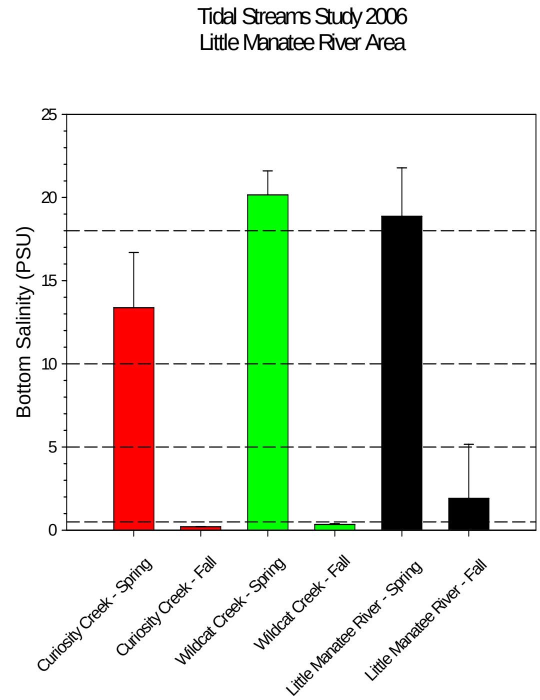


Figure 8: Alafia River and Little Manatee River tidal tributary benthic sampling bottom salinity.

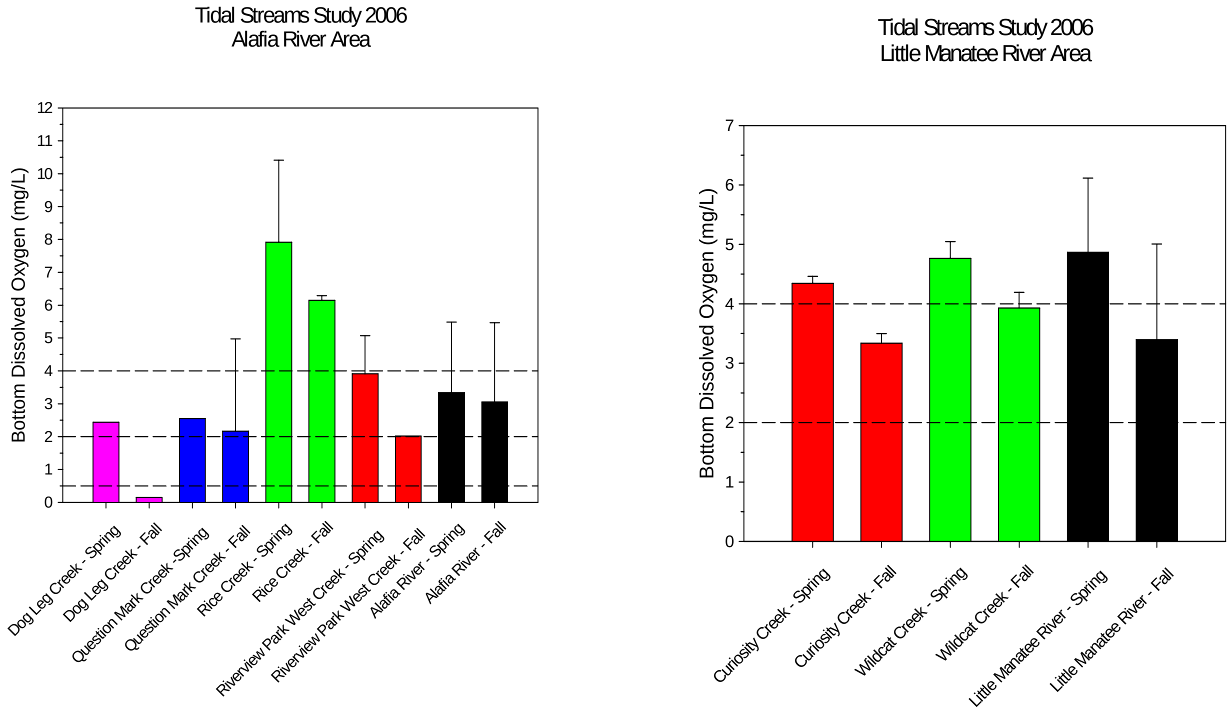


Figure 9: Alafia River and Little Manatee River tidal tributary benthic sampling bottom dissolved oxygen.

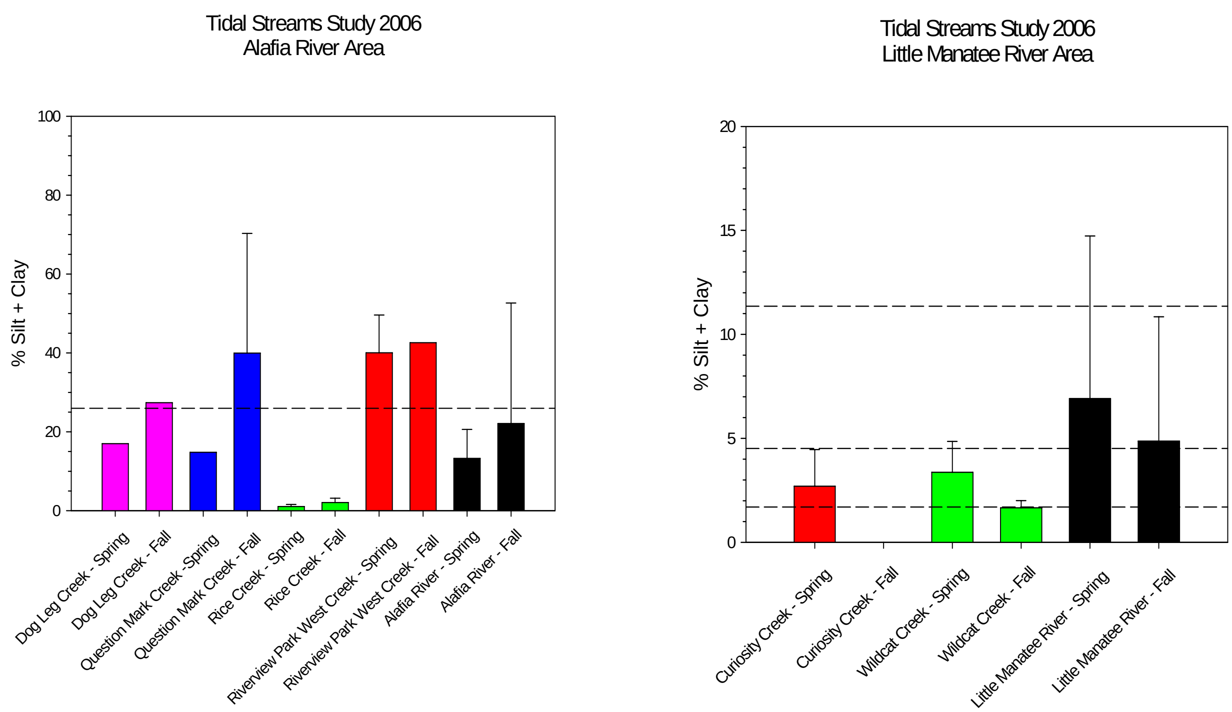


Figure 10: Alafia River and Little Manatee River tidal tributary benthic sampling sediment composition (% silt + clay).

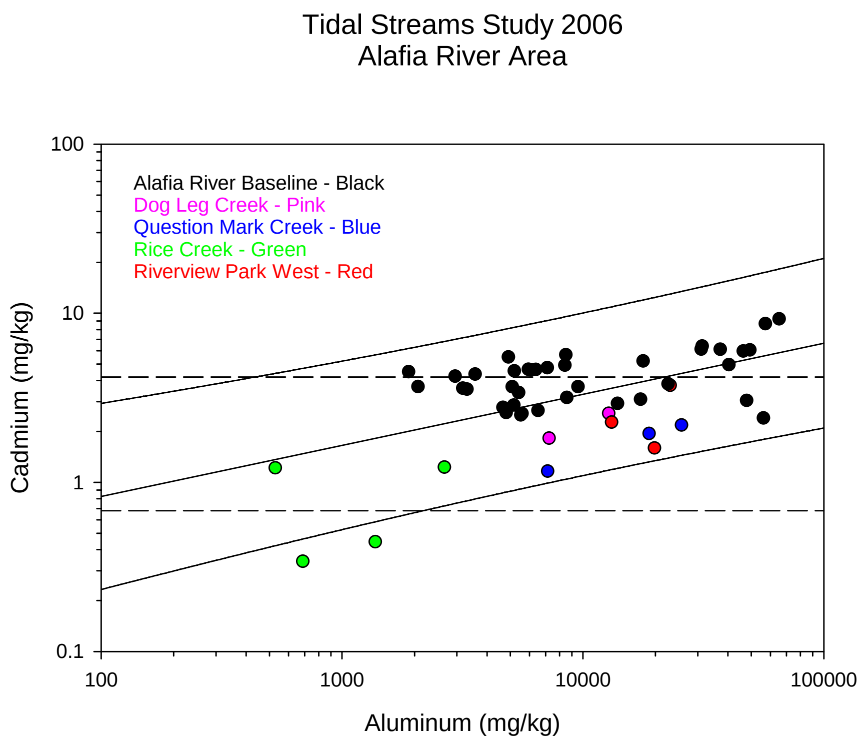


Figure 11: Alafia River area tidal tributary Cd: Al regression with 95% prediction intervals. Dash lines represent TEL (lower) and PEL (upper) for Cd.

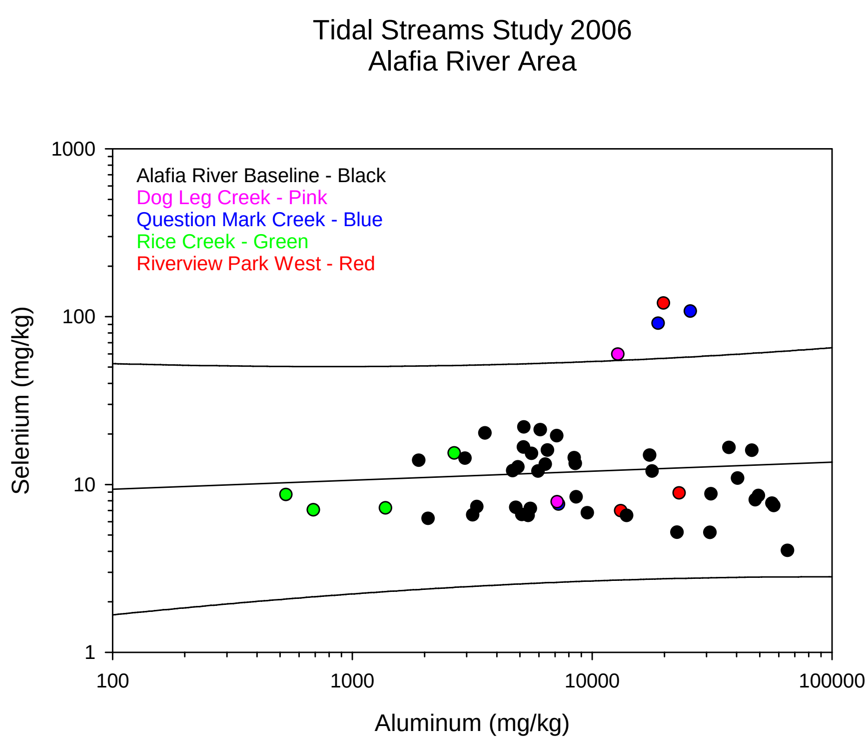


Figure 12: Alafia River area tidal tributary Se:Al regression with 95% prediction intervals.

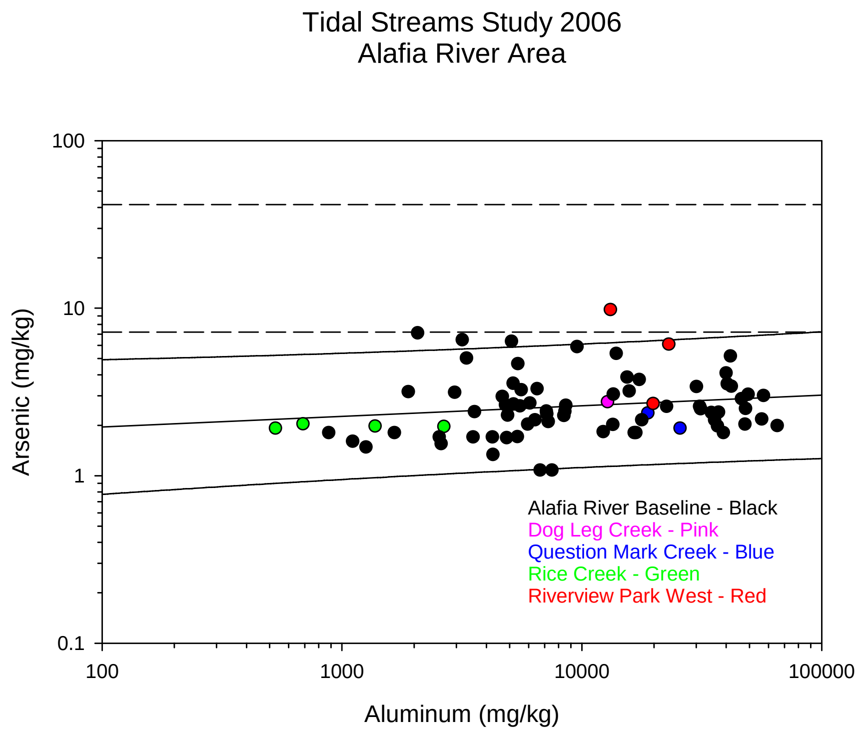


Figure 13: Alafia River area tidal tributary As: Al regression with 95% prediction intervals. Dash lines represent TEL (lower) and PEL (upper) for As.

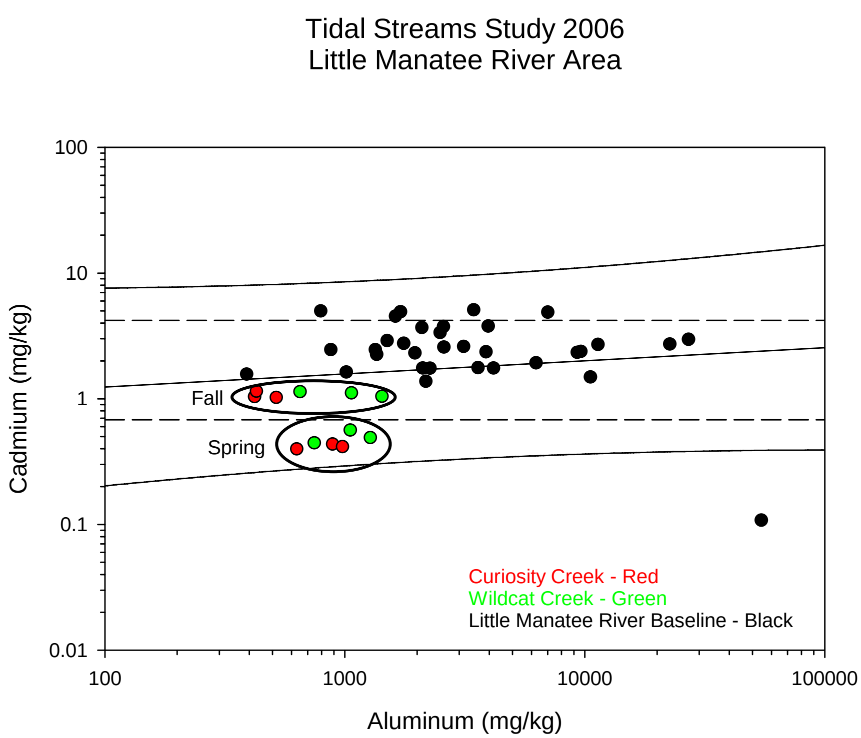
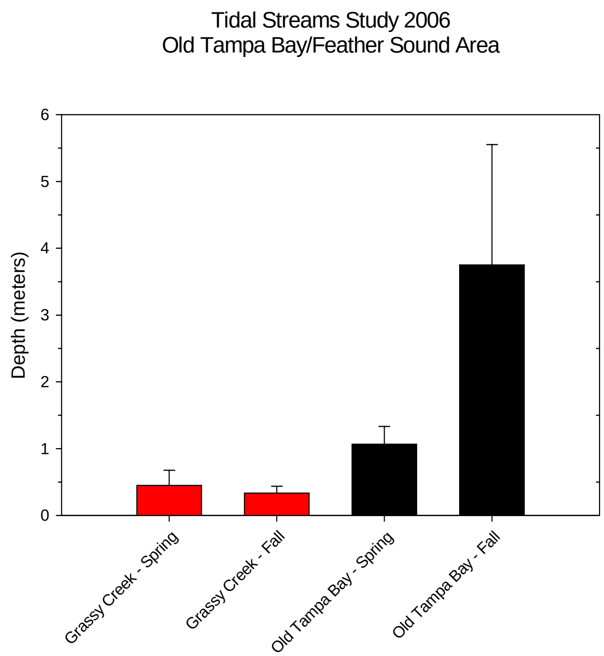


Figure 14: Little Manatee River area tidal tributary Cd:Al regression with 95% prediction intervals. Dash lines represent TEL (lower) and PEL (upper) for Cd.



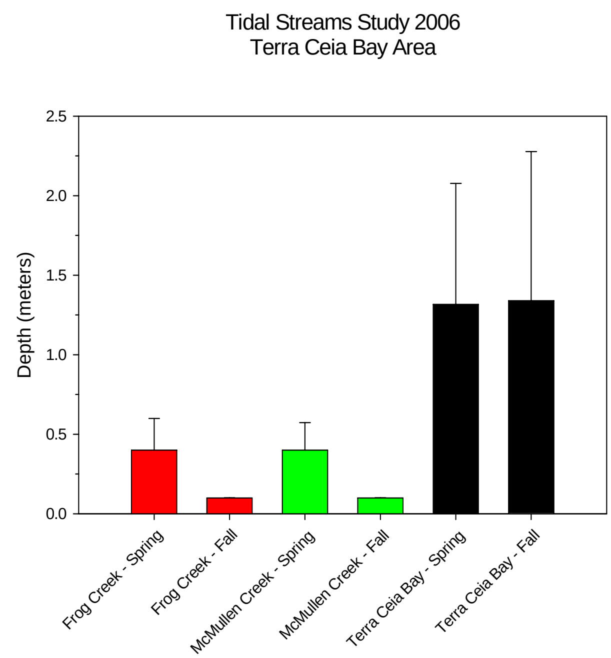
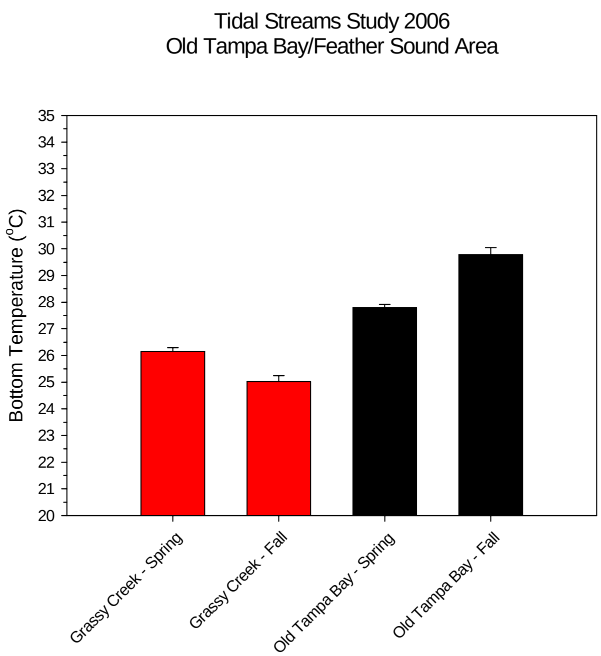


Figure 15: Feather Sound/Old Tampa Bay and Terra Ceia Bay tidal tributary benthic sampling depths.



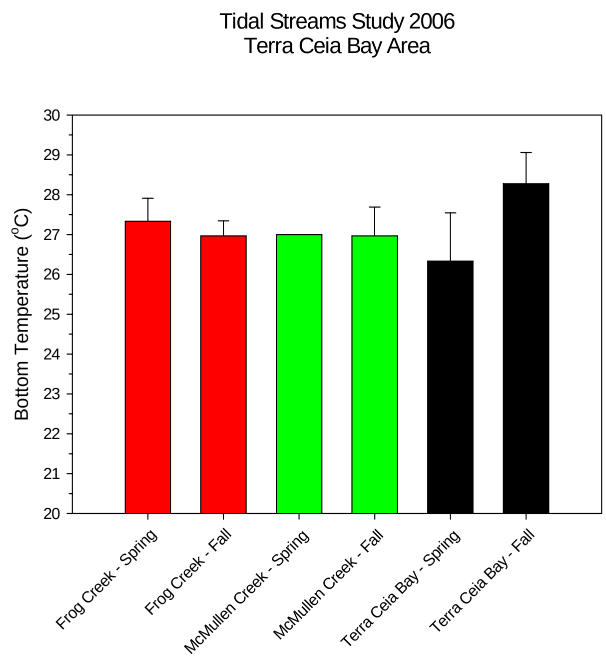


Figure 16: Feather Sound/Old Tampa Bay and Terra Ceia Bay tidal tributary benthic bottom temperature.

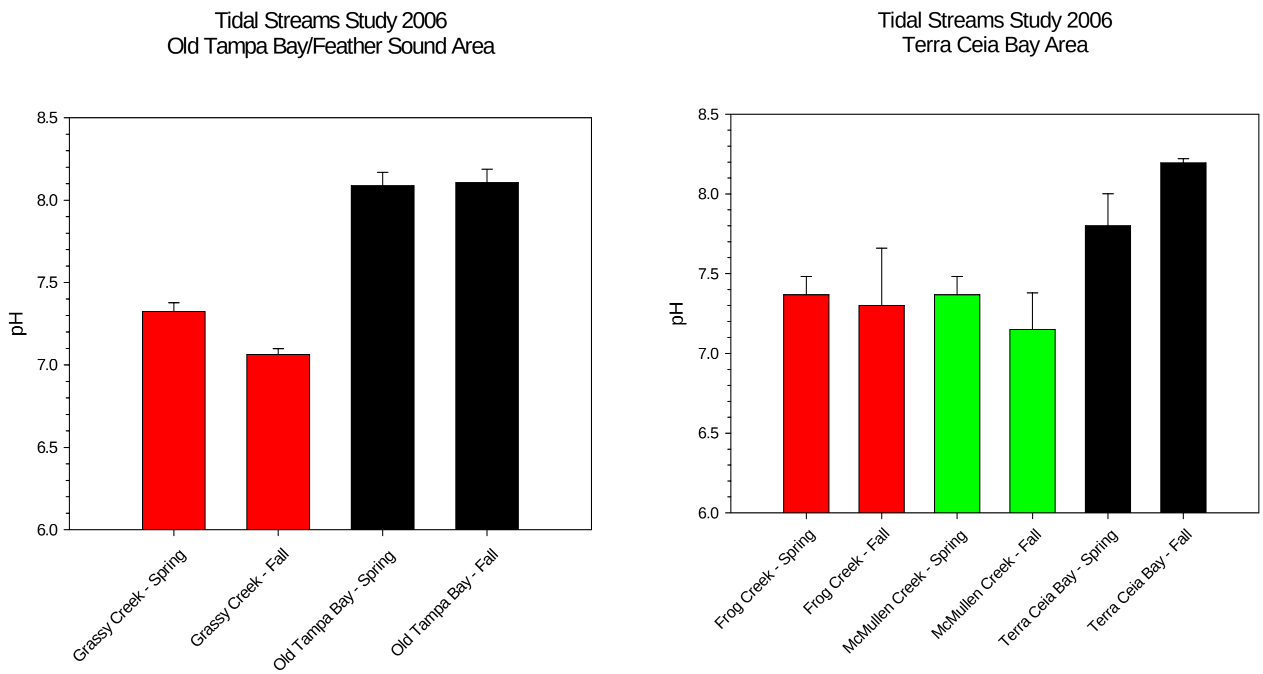


Figure 17: Feather Sound/Old Tampa Bay and Terra Ceia Bay tidal tributary benthic bottom pH.

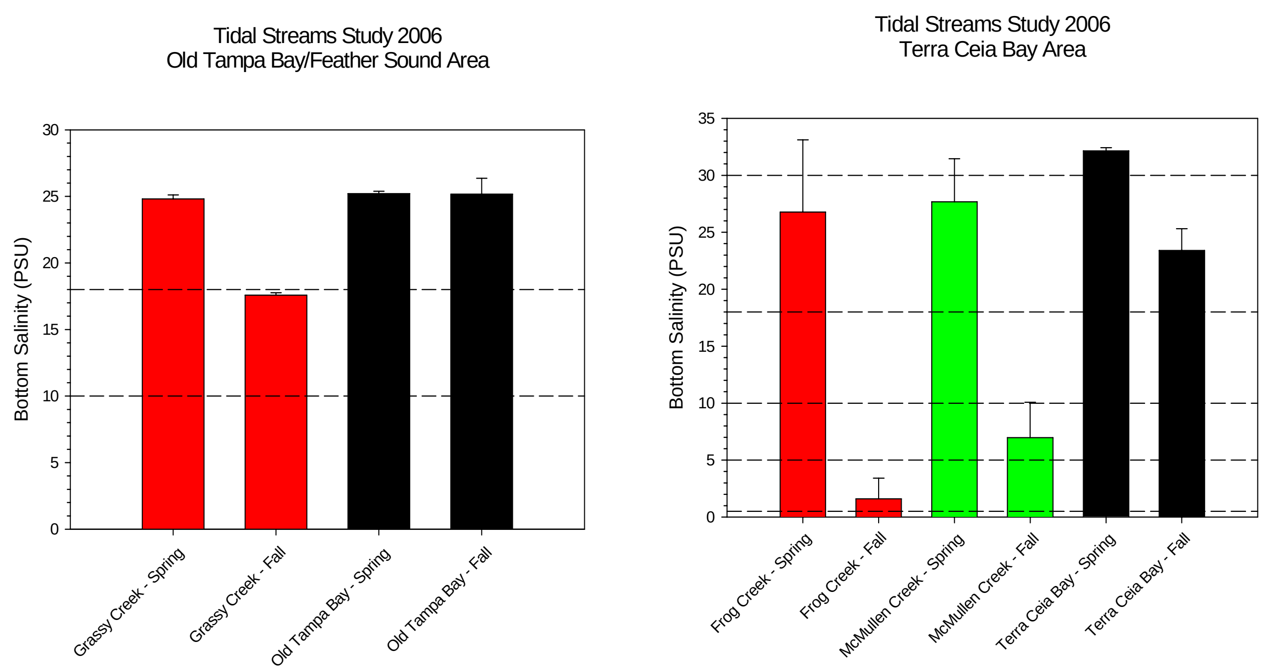


Figure 18: Feather Sound/Old Tampa Bay and Terra Ceia Bay tidal tributary benthic bottom salinity.

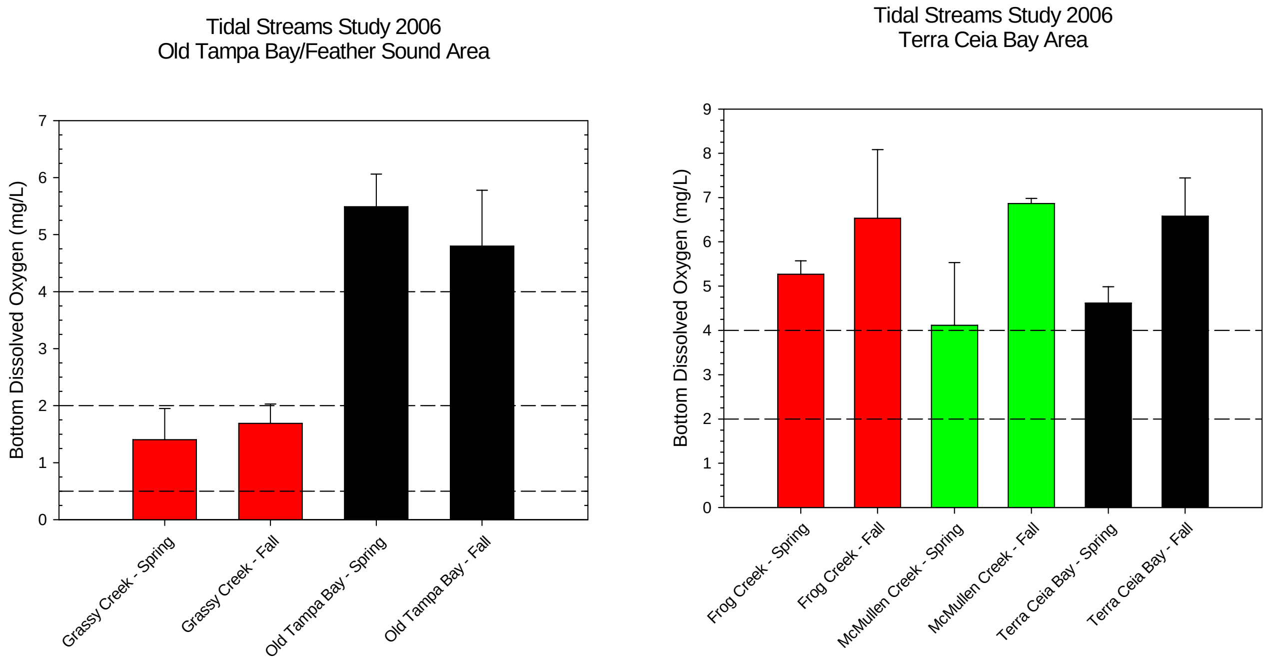


Figure 19: Feather Sound/Old Tampa Bay and Terra Ceia Bay tidal tributary benthic bottom dissolved oxygen.

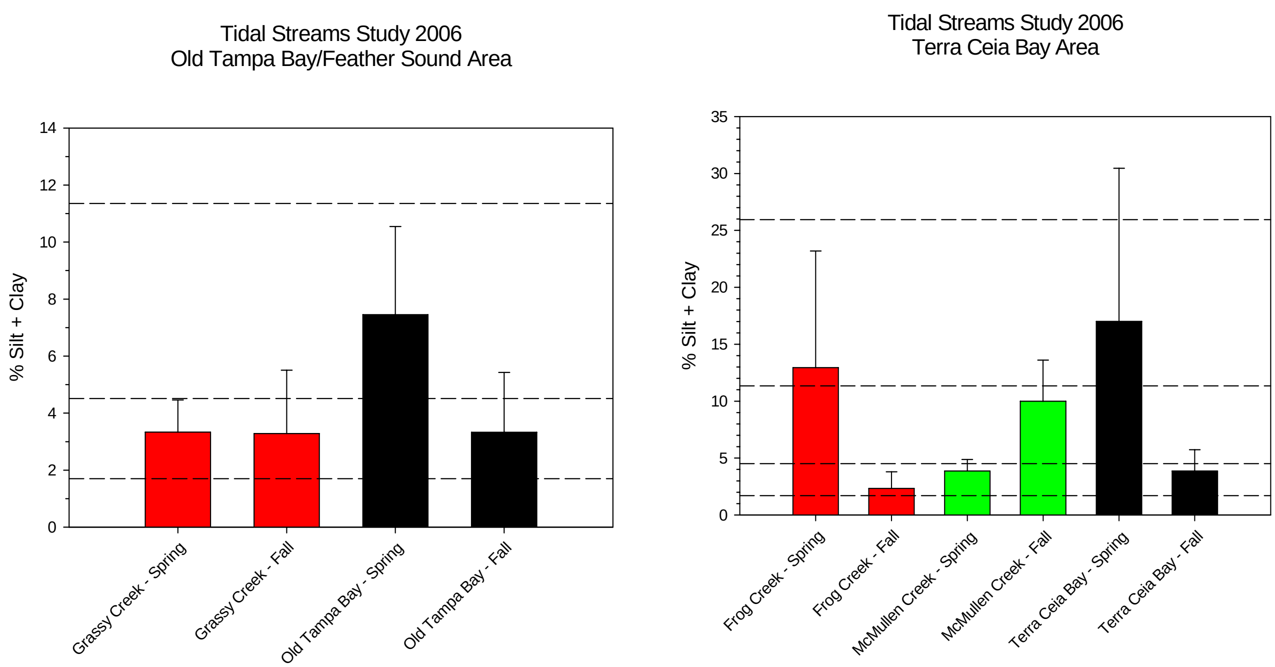


Figure 20: Feather Sound/Old Tampa Bay and Terra Ceia Bay tidal tributary benthic sediment composition (% silt+clay).

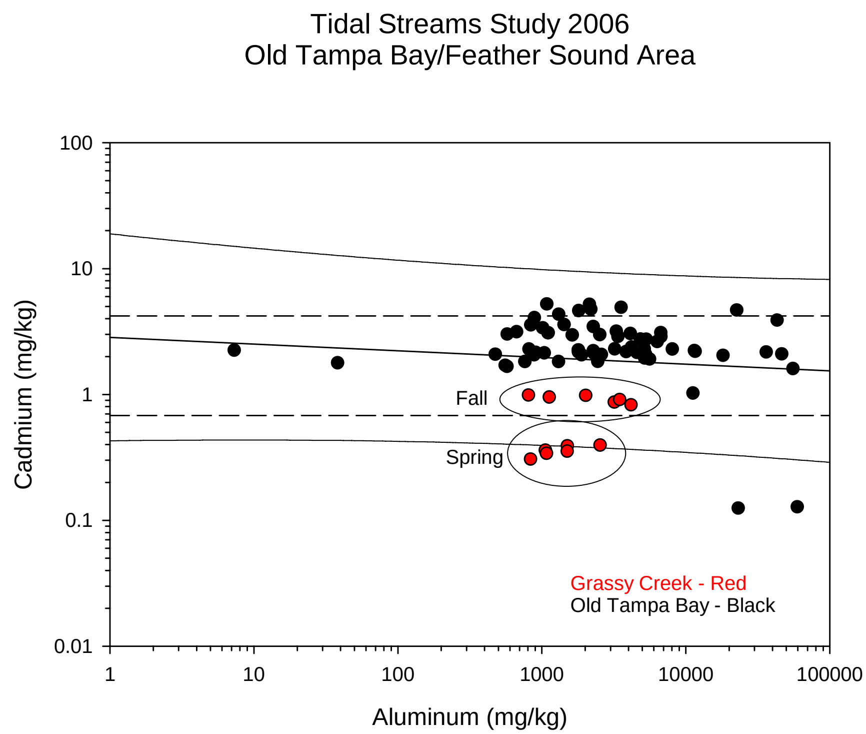


Figure 21: Grassy Creek and Feather Sound/Old Tampa Bay Cd:Al regression with 95% prediction intervals. Dash lines represent TEL (lower) and PEL (upper) for Cd.

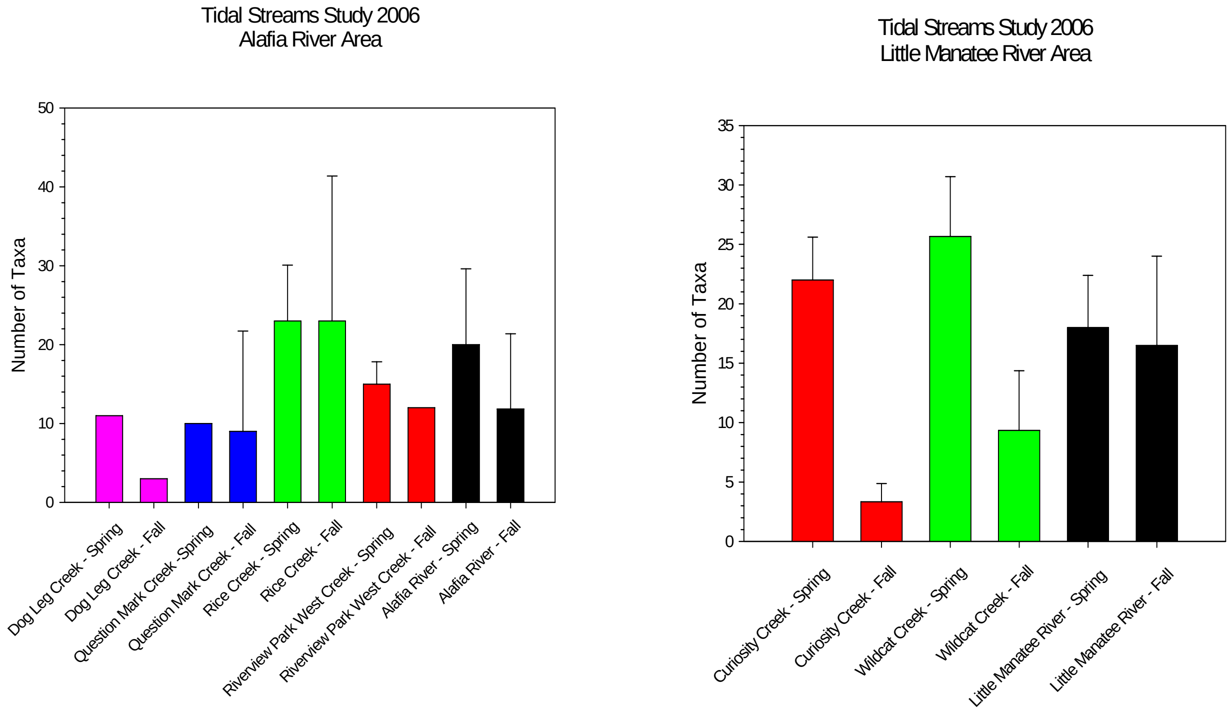


Figure 22: Alafia River and Little Manatee River tidal tributary benthic species richness.

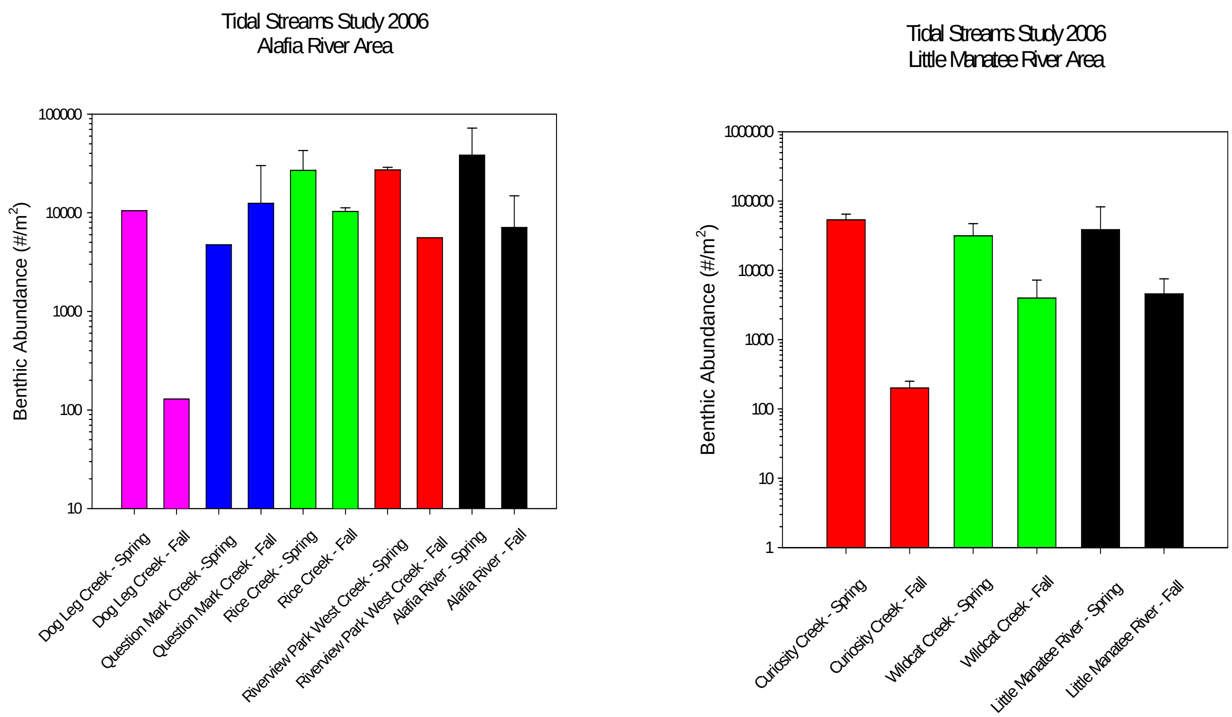


Figure 23: Alafia River and Little Manatee River tidal tributary benthic abundance.

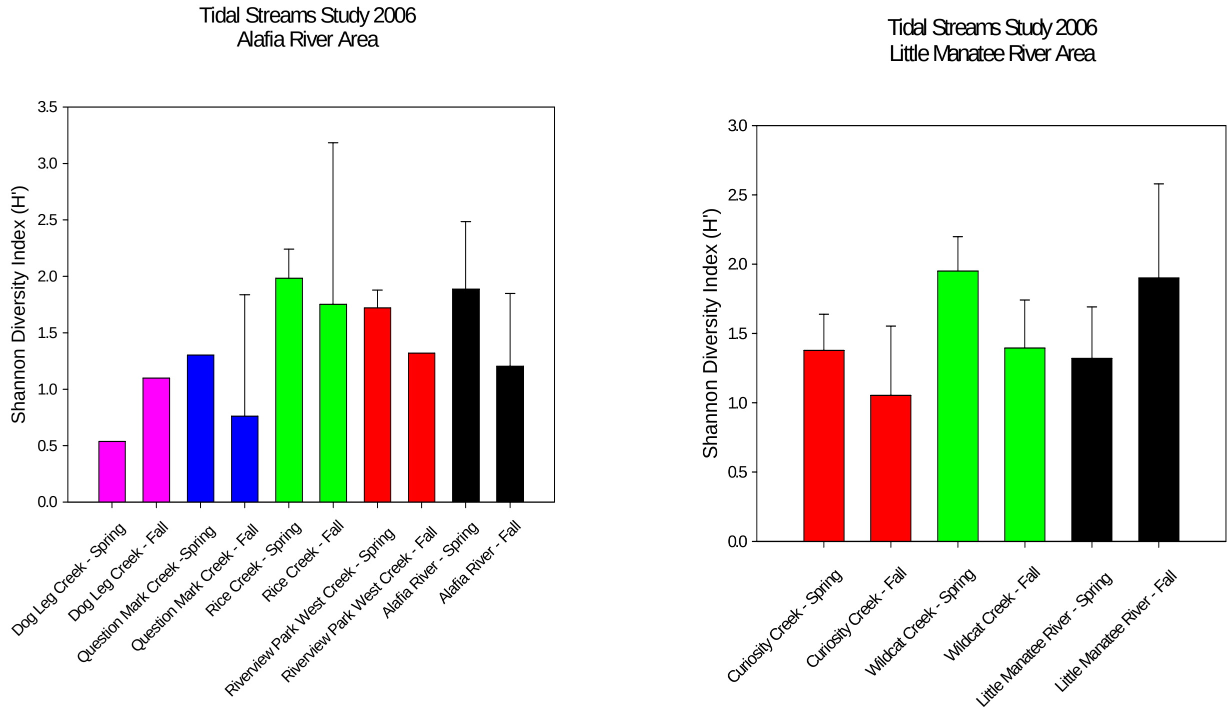


Figure 24: Alafia River and Little Manatee River tidal tributary benthic diversity.

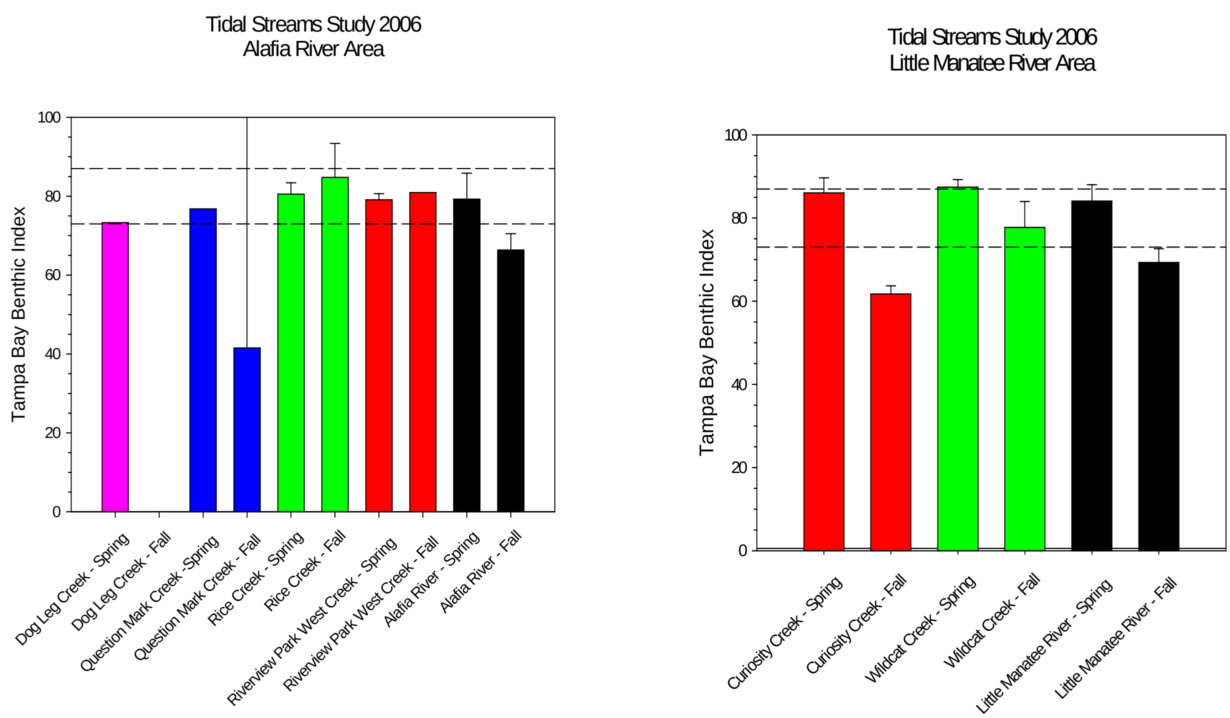


Figure 25: Alafia River and Little Manatee River tidal tributary: Tampa Bay Benthic Index. Dash lines indicate cut-offs for Healthy (>87) and Degraded (<73) index scores.

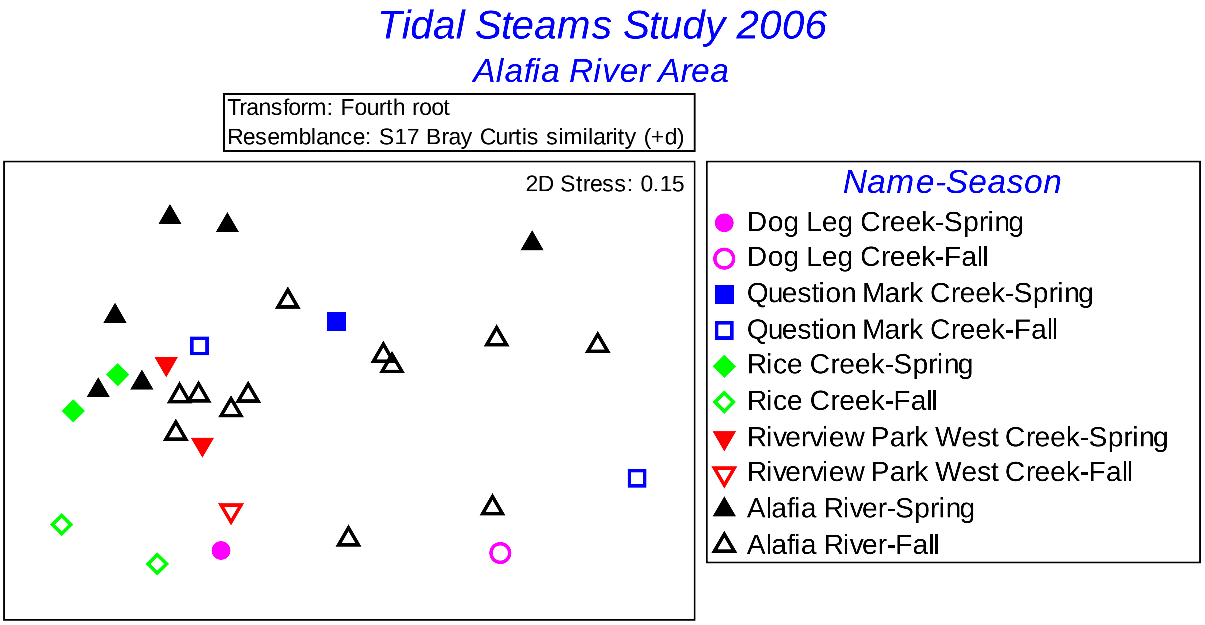


Figure 26: Alafia River Tidal Tributary Non-Metric Multi-Dimensional Scaling (MDS) plot of benthic assemblage similarity (Zero-corrected Bray-Curtis similarity on forth root transformed abundance).

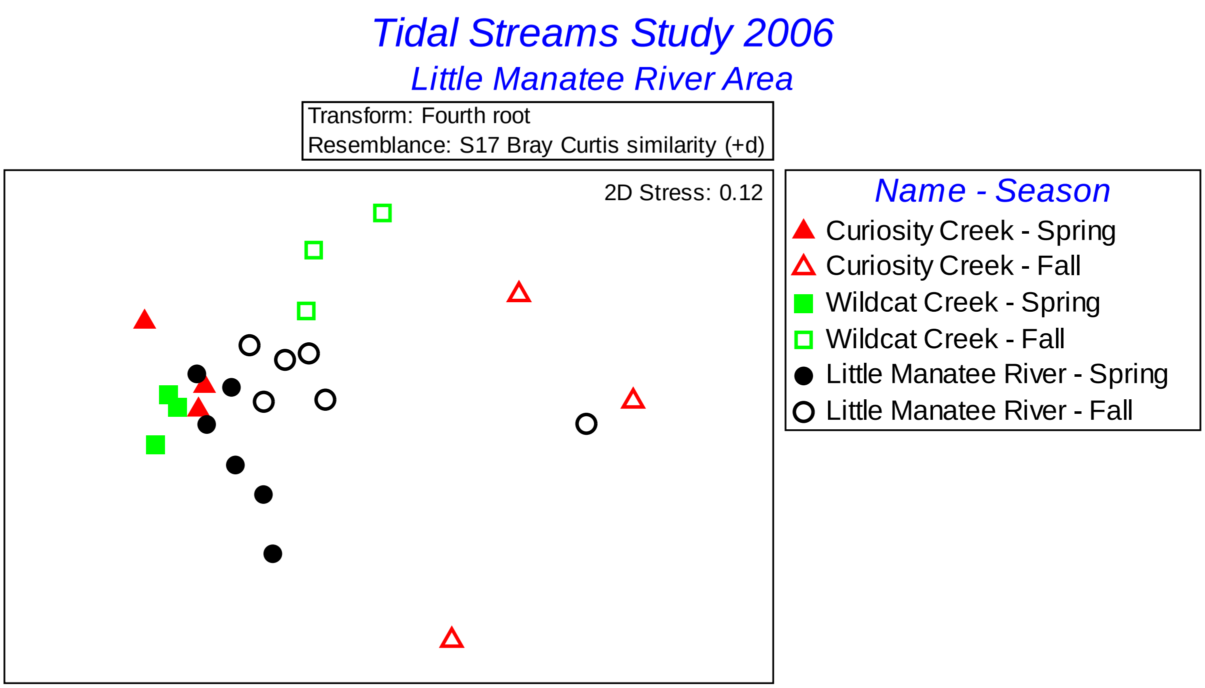


Figure 27: Little Manatee River Tidal Tributary Non-Metric Multi-Dimensional Scaling (MDS) plot of benthic assemblage similarity (Zero-corrected Bray-Curtis similarity on forth root transformed abundance).

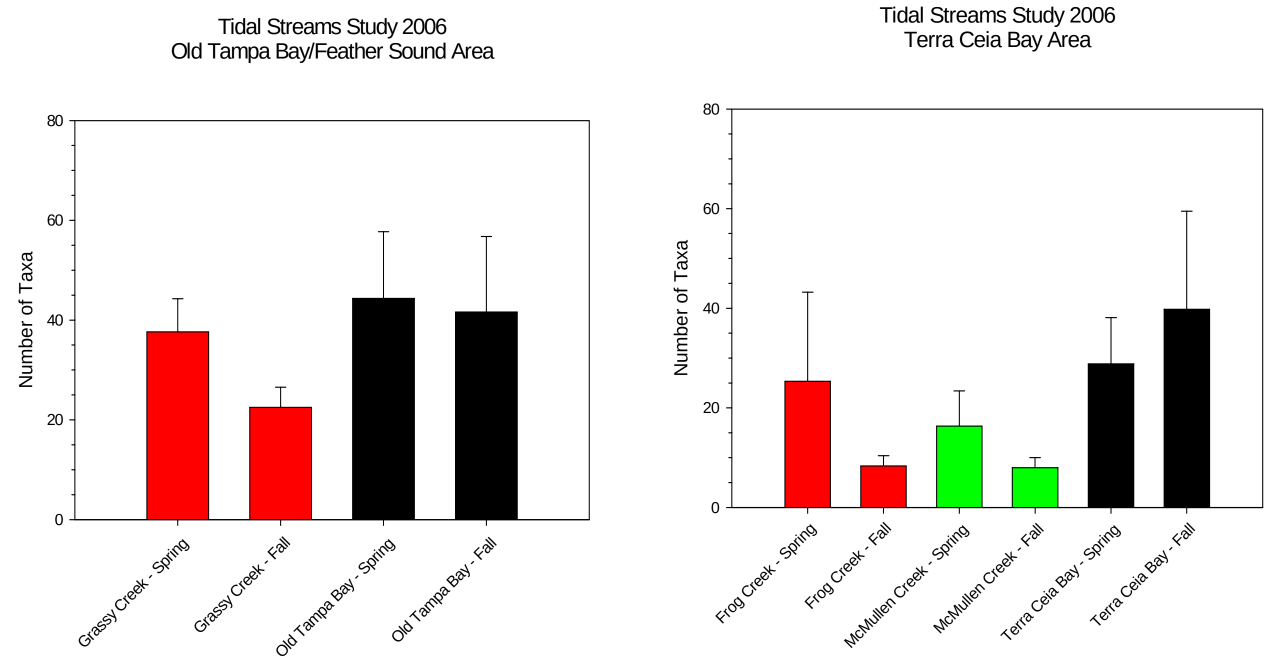


Figure 28: Feather Sound/Old Tampa Bay and Terra Ceia Bay tidal tributary benthic species richness.

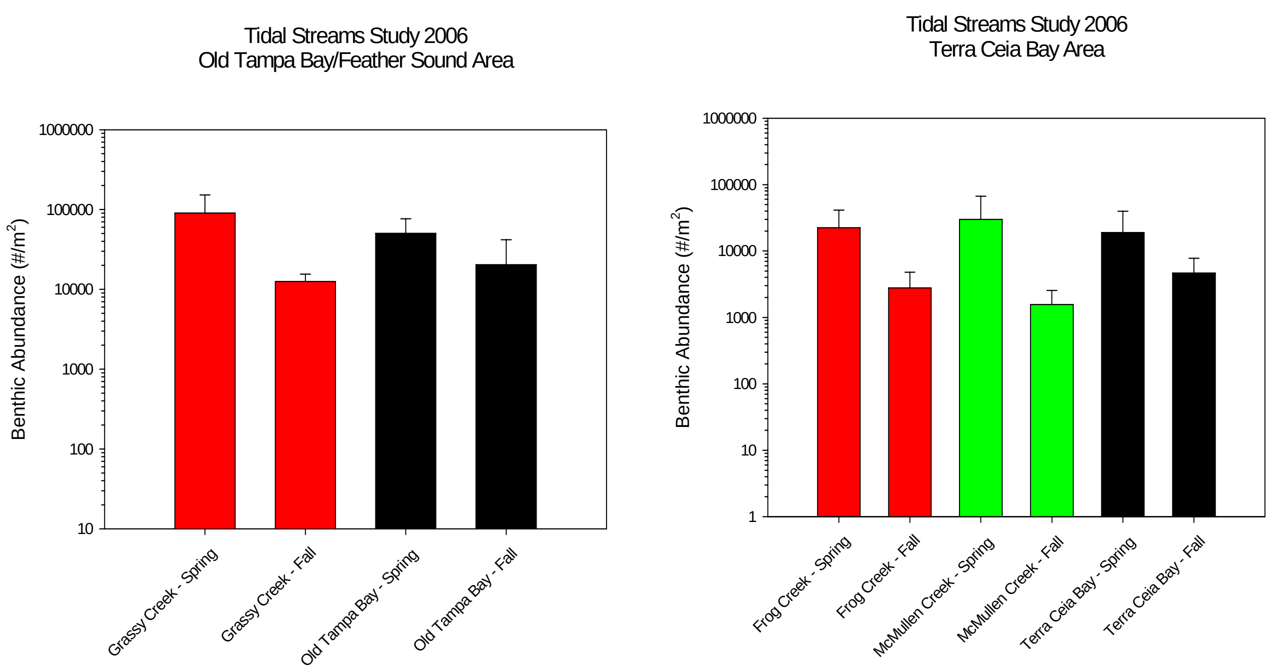


Figure 29: Feather Sound/Old Tampa Bay and Terra Ceia Bay tidal tributary benthic abundance.

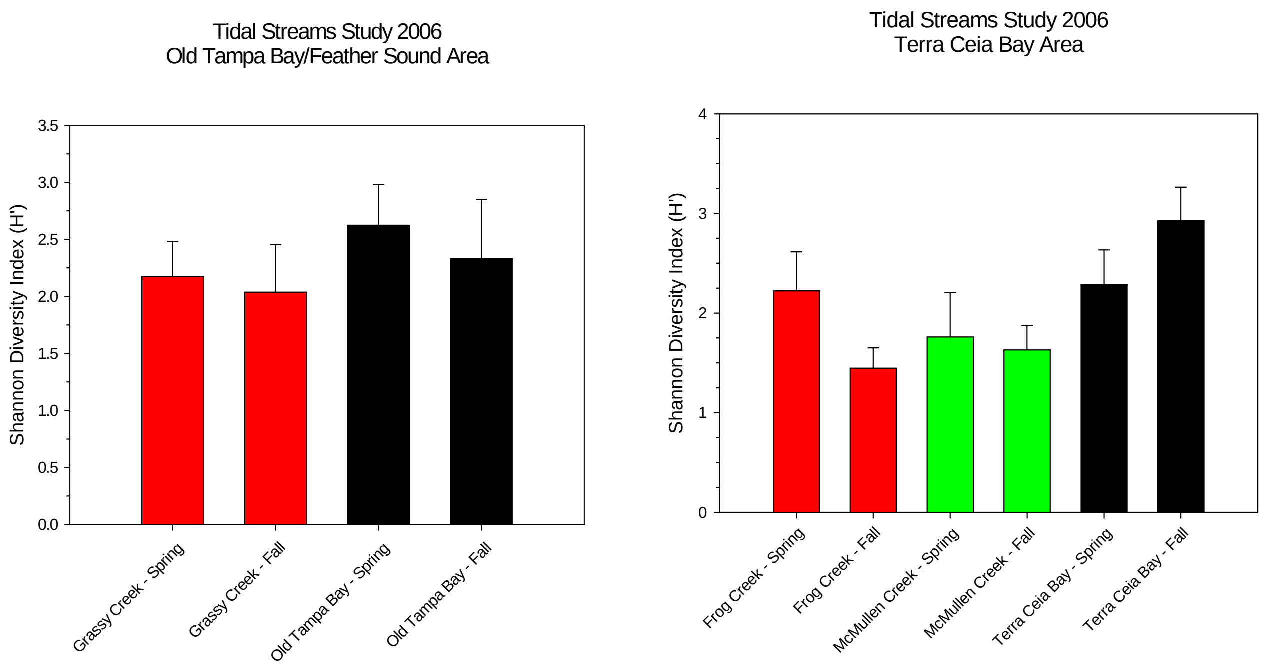


Figure 30: Feather Sound/Old Tampa Bay and Terra Ceia Bay tidal tributary benthic diversity.

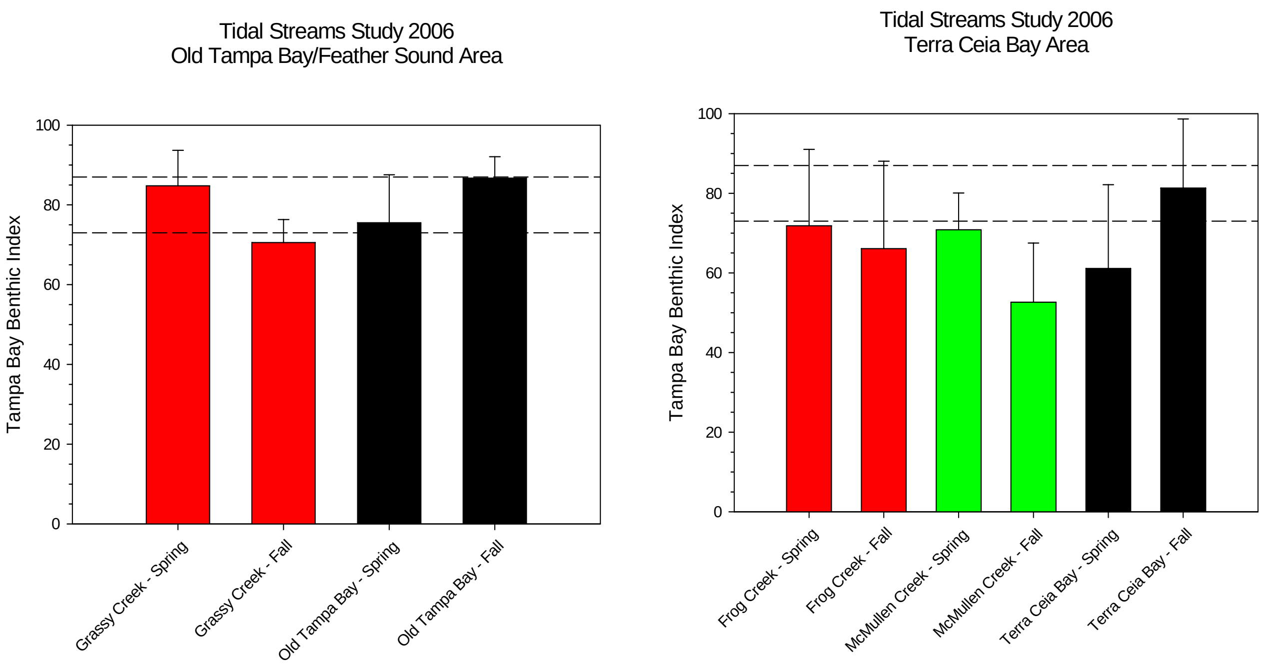


Figure 31: Feather Sound/Old Tampa Bay and Terra Ceia Bay tidal tributary, Tampa Bay Benthic Index. Dash lines indicate cut-offs for Healthy (>87) and Degraded (<73) index scores.

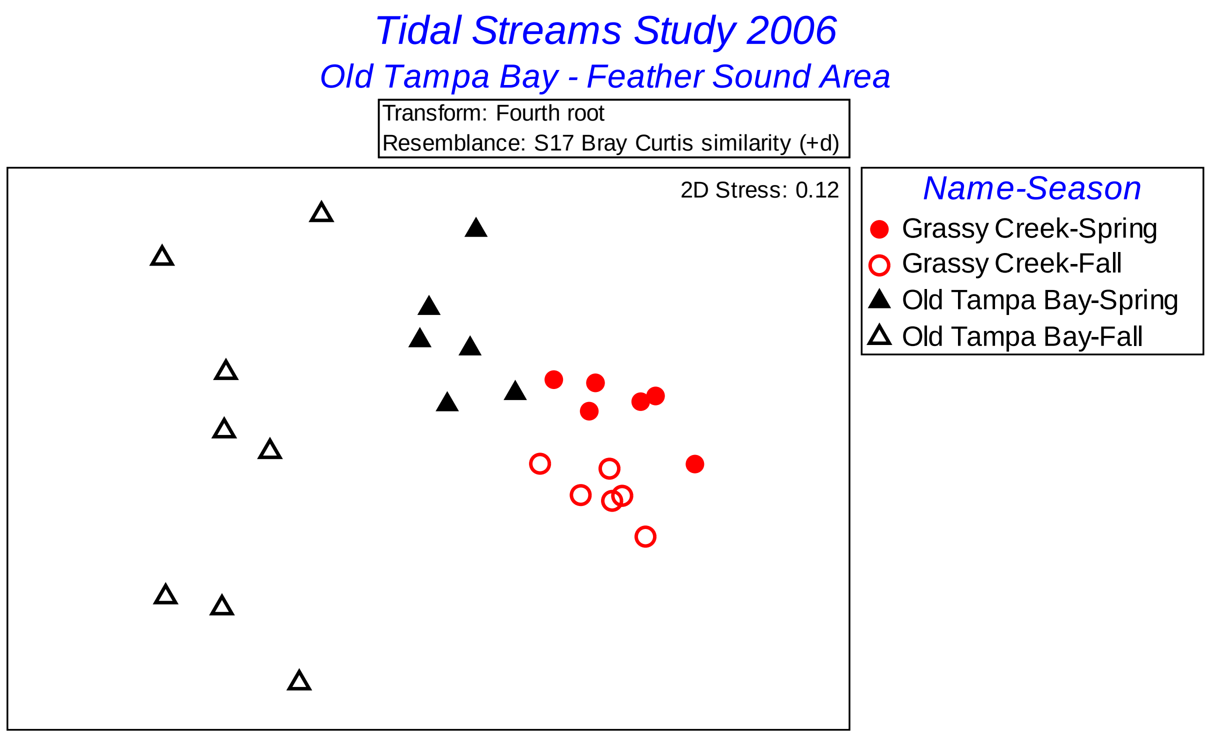


Figure 32: Grassy Creek and Feather Sound/Old Tampa Bay Non-Metric Multi-Dimensional Scaling (MDS) plot of benthic assemblage similarity (Zero-corrected Bray-Curtis similarity on forth root transformed abundance).

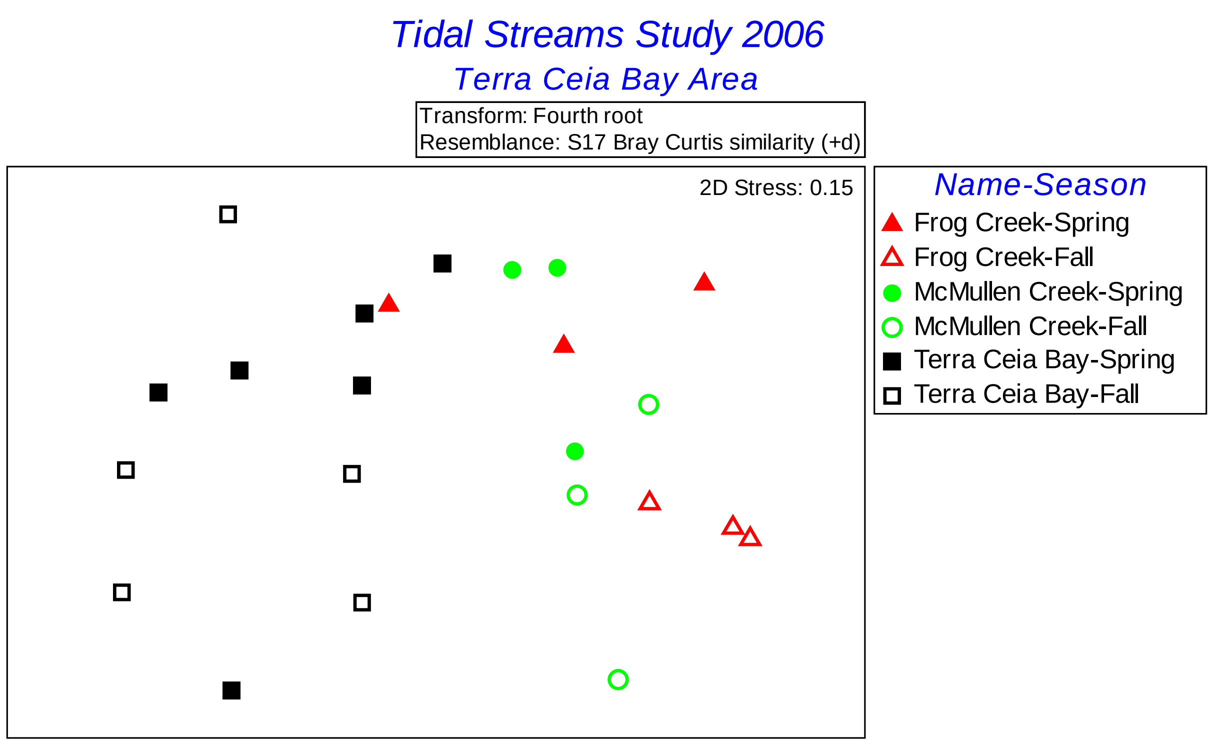


Figure 33: Terra Ceia Bay Tidal Tributary: Non-Metric Multi-Dimensional Scaling (MDS) plot of benthic assemblage similarity (Zero-corrected Bray-Curtis similarity on forth root transformed abundance).

Figure 34: Aerial map showing Question Mark Creek's drainage basin.

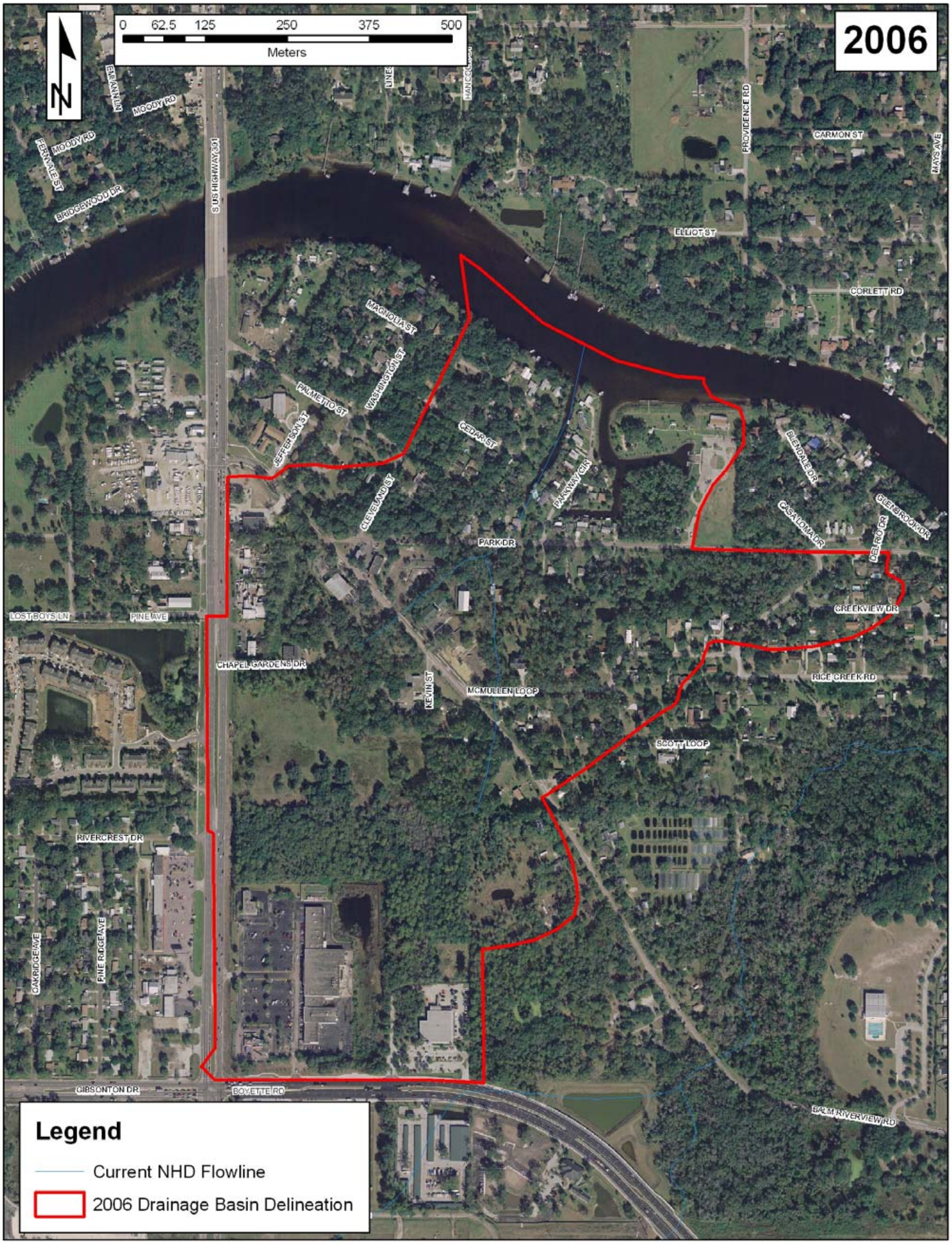


Figure 35: Aerial map showing Riverview Park West Creek's drainage basin.

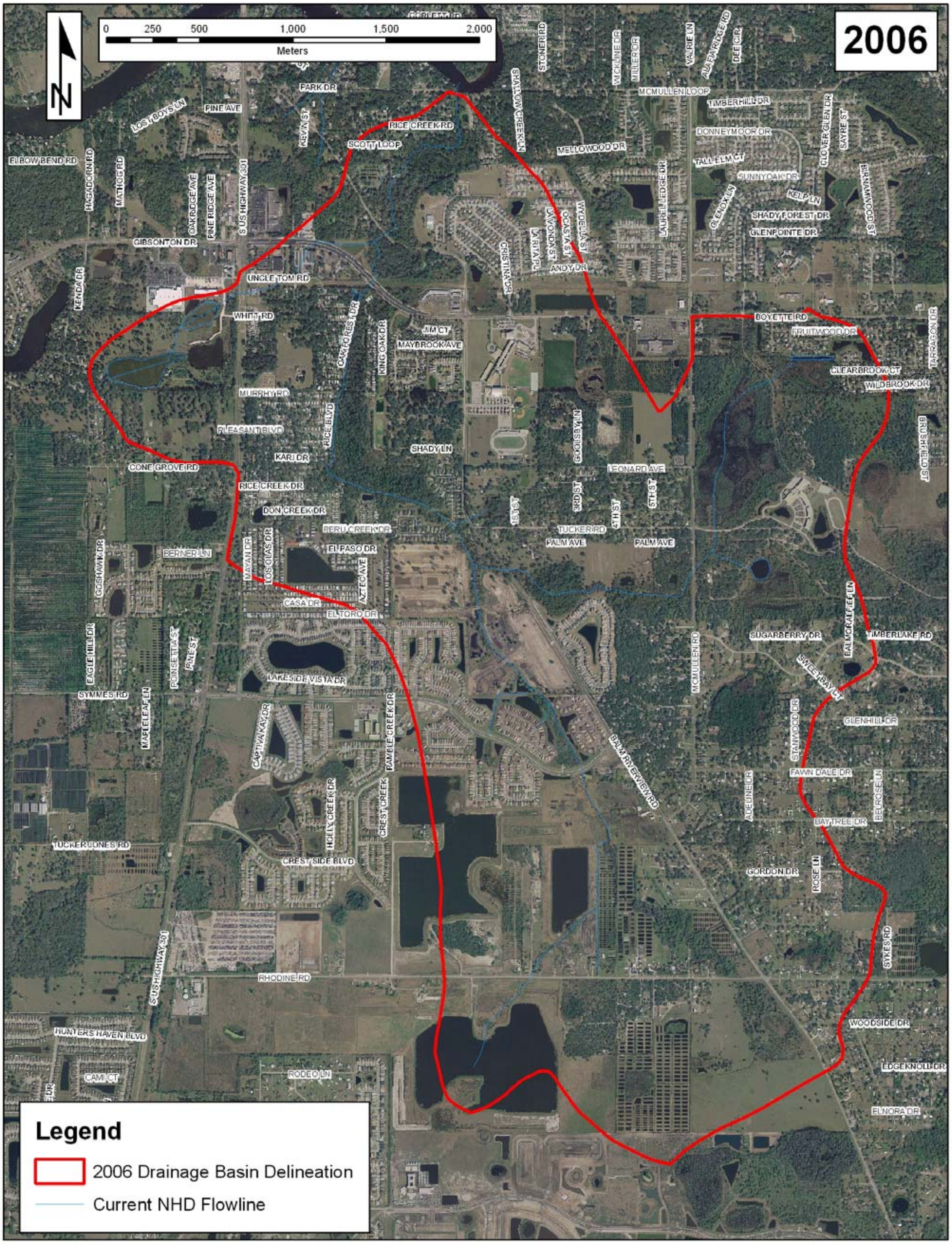


Figure 36: Aerial map showing Rice Creek's drainage basin.

Figure 37: Aerial map showing Dog Leg Creek's drainage basin.

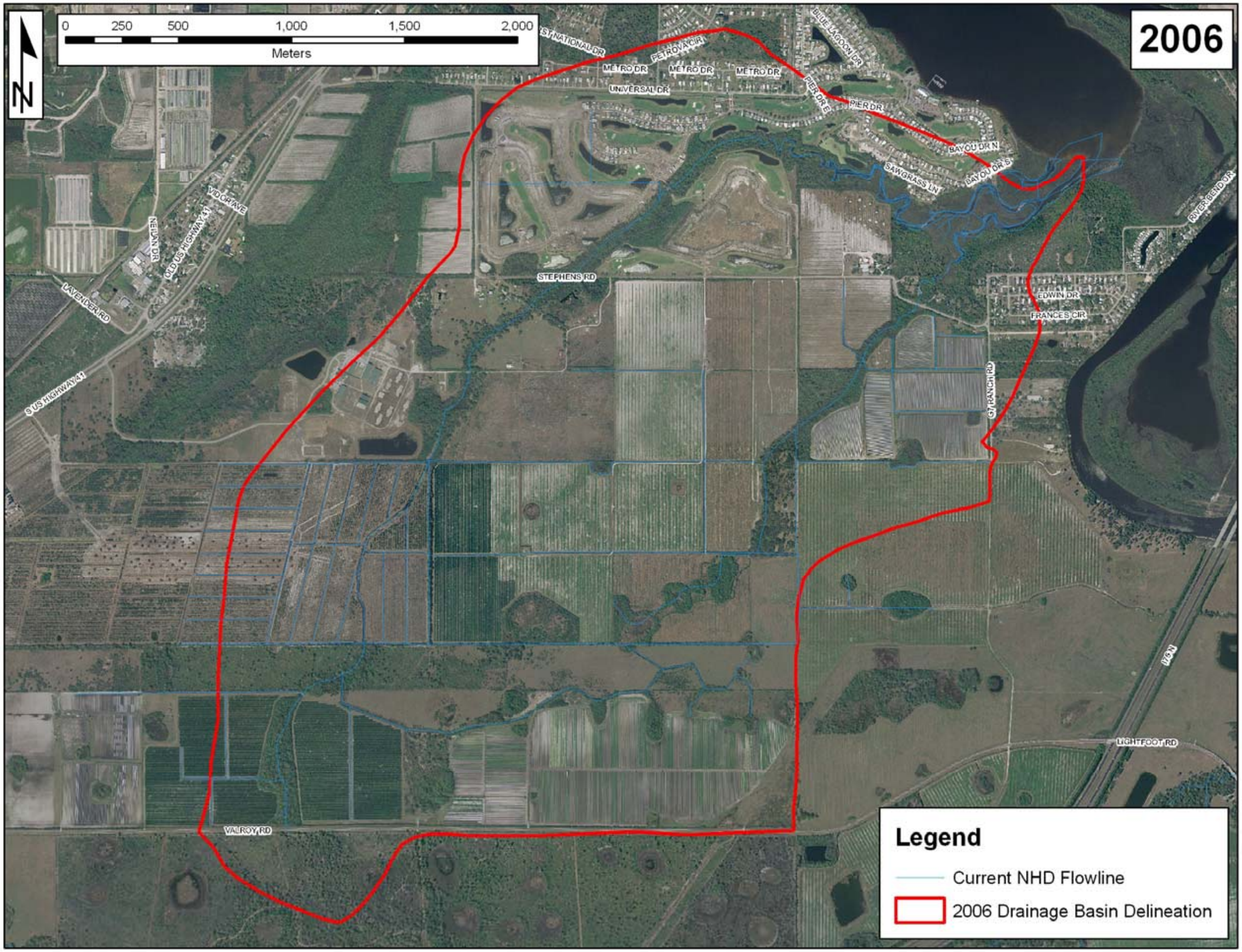


Figure 38: Aerial map showing Wildcat Creek's drainage basin.

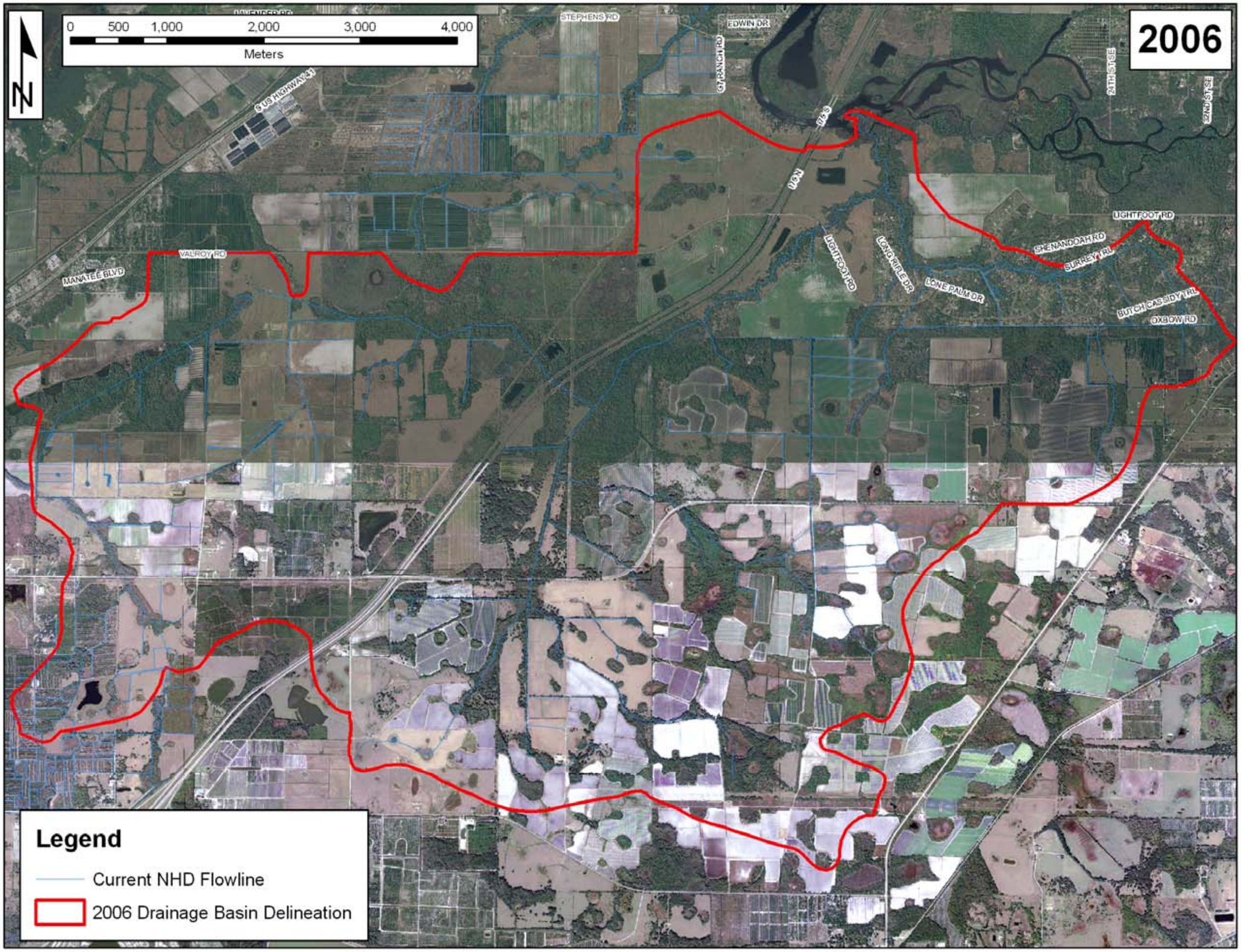


Figure 39: Aerial map showing Curiosity Creek's drainage basin.

Figure 40: Aerial map showing Grassy Creek's drainage basin.

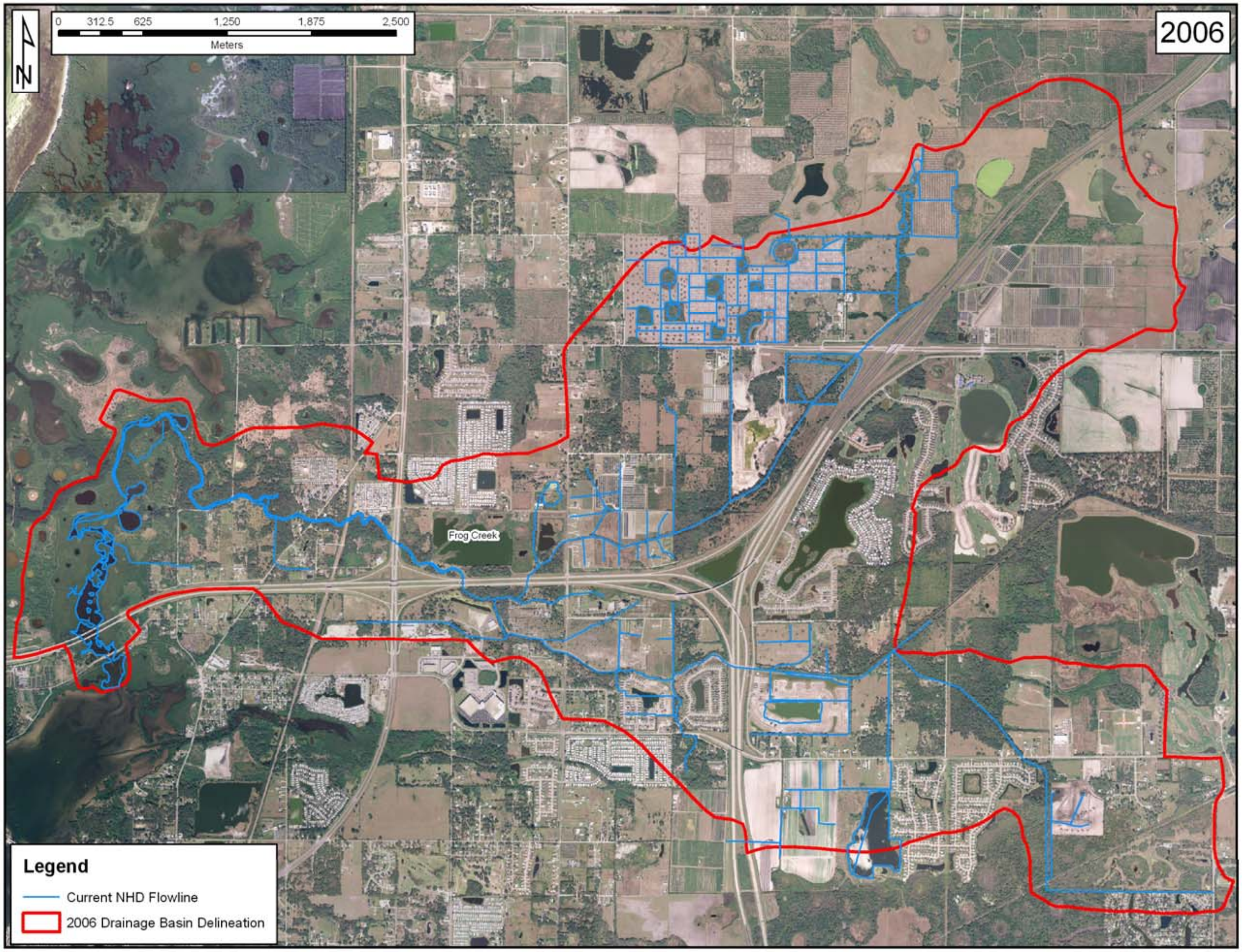


Figure 41: Aerial map showing Frog Creek's drainage basin.

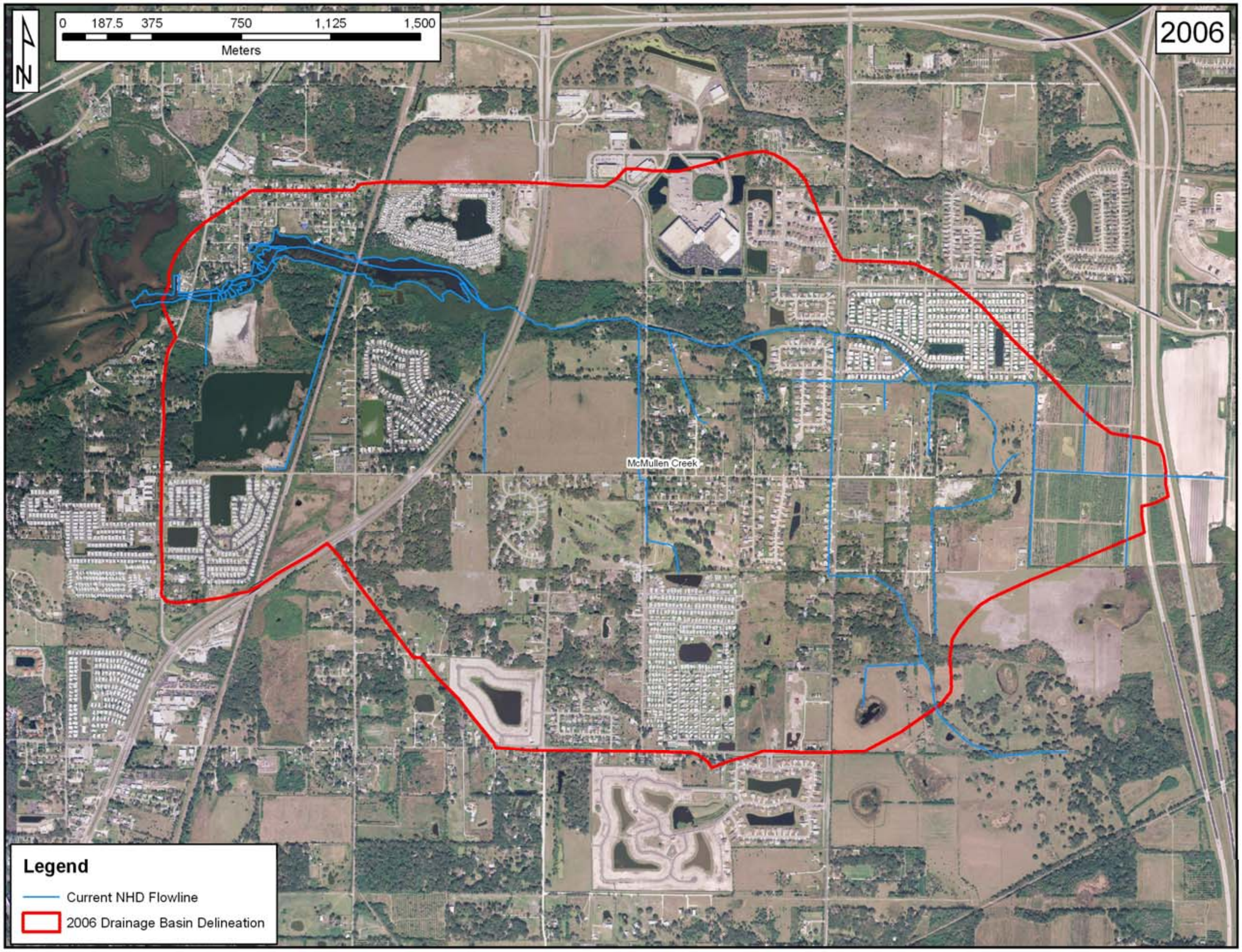


Figure 42: Aerial map showing McMullen Creek's drainage basin.

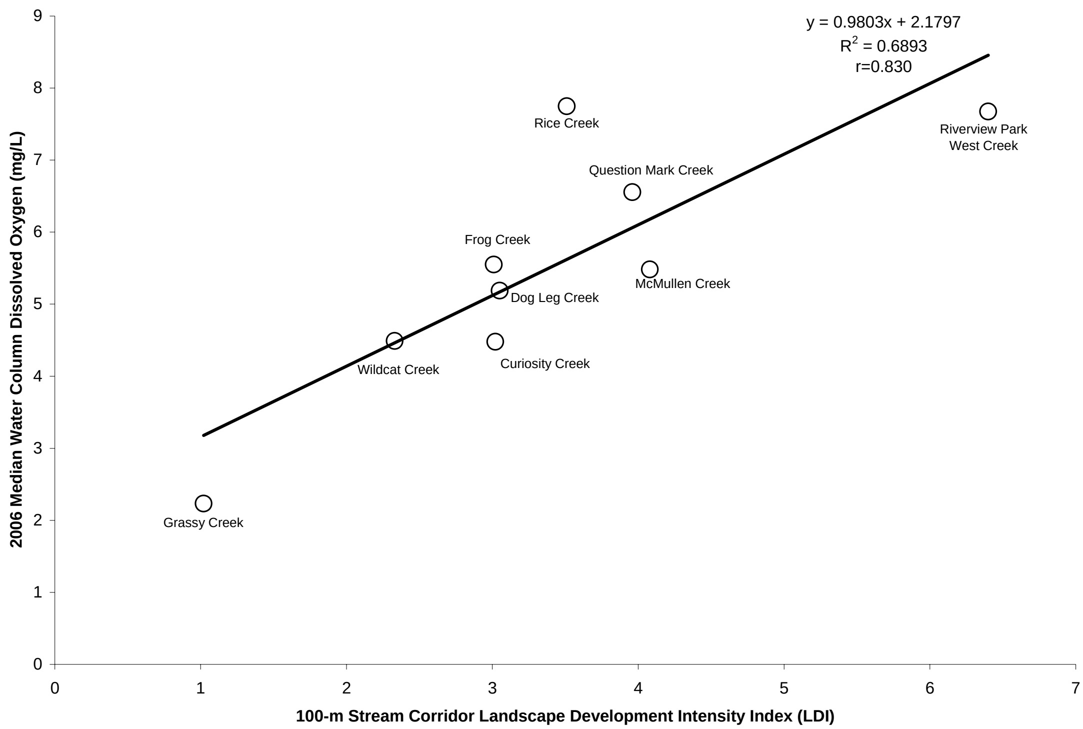


Figure 43: Linear relationship of 100-m corridor landscape development intensity indices (LDI) derived from 2004 SWFWMD land use/land cover information and median observed water column dissolved oxygen concentrations (mg/L) in the select tidal tributaries during 2006.

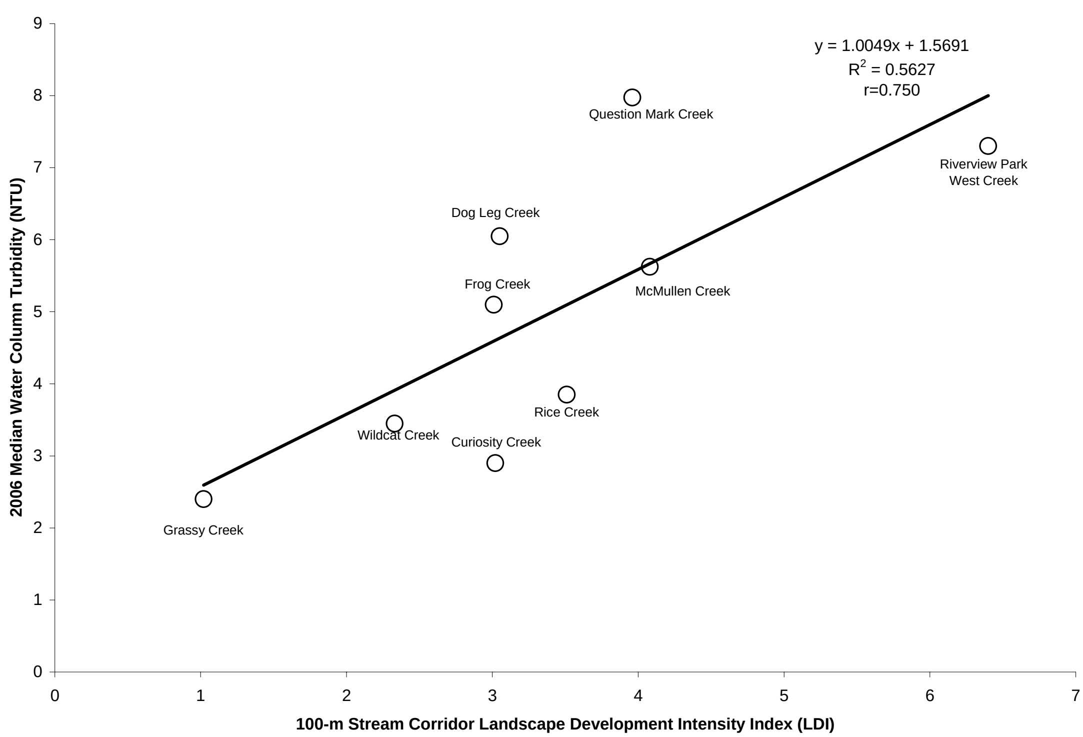


Figure 44: Linear relationship of 100-m corridor landscape development intensity indices (LDI) derived from 2004 SWFWMD land use/land cover information and median observed water column turbidity (NTU) in the select tidal tributaries during 2006.

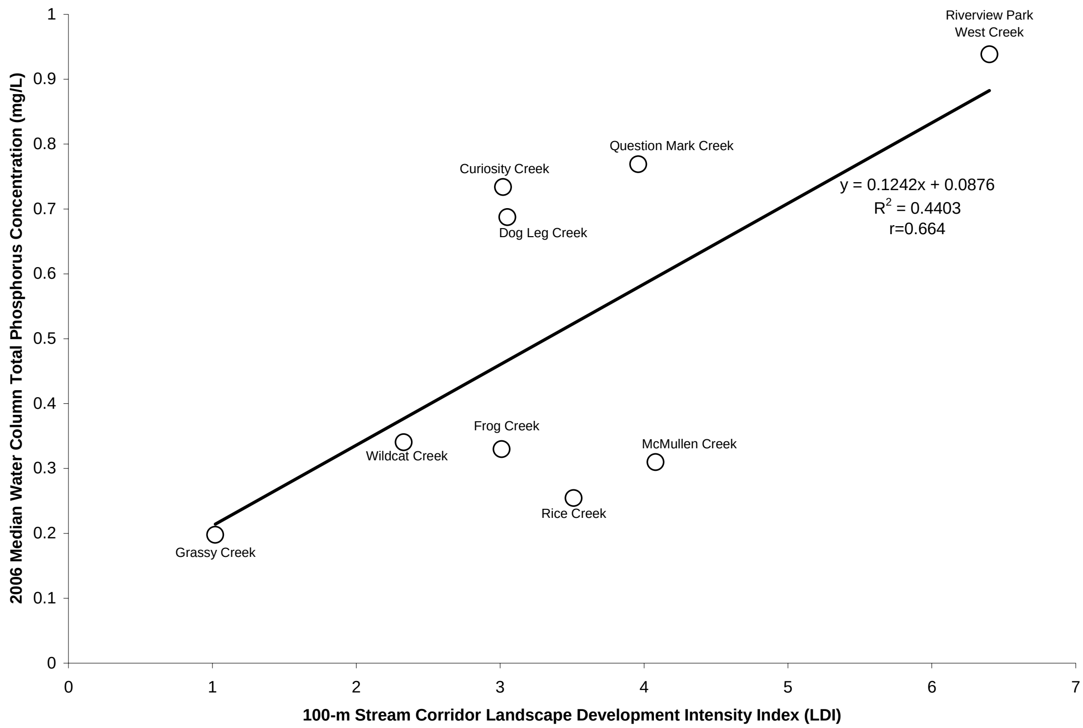


Figure 45: Linear relationship of 100-m corridor landscape development intensity indices (LDI) derived from 2004 SWFWMD land use/land cover information and median observed water column total phosphorus concentrations (mg/L) in the select tidal tributaries during 2006.

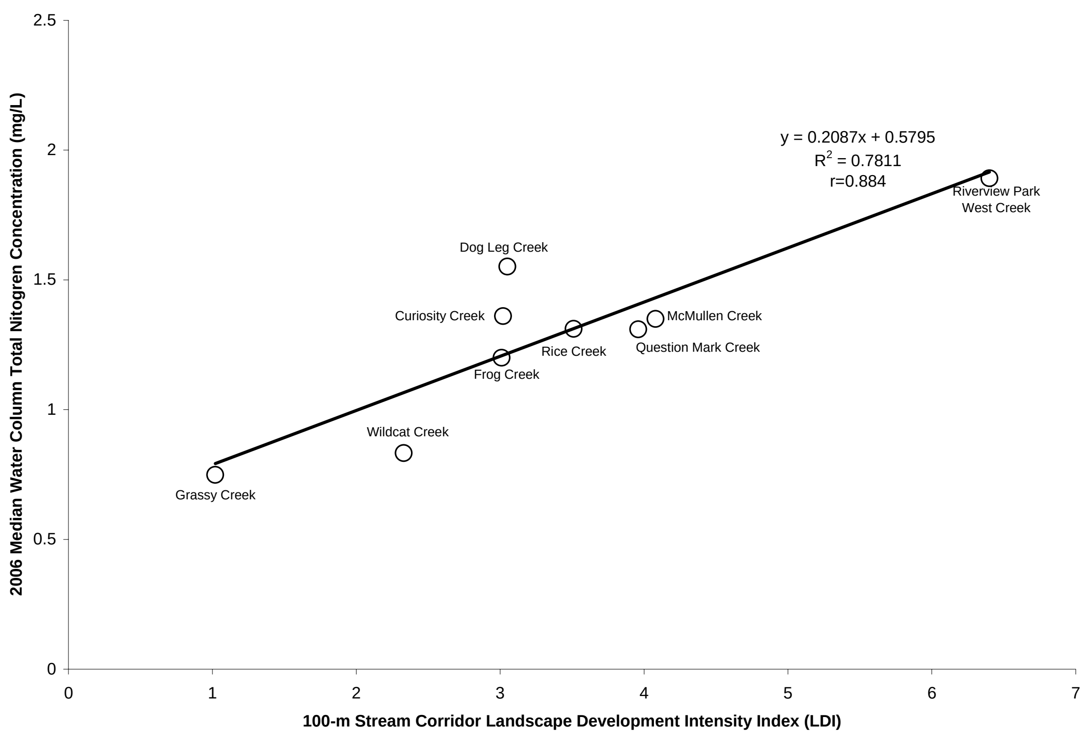


Figure 46: Linear relationship of 100-m corridor landscape development intensity indices (LDI) derived from 2004 SWFWMD land use/land cover information and median observed water column total nitrogen concentrations (mg/L) in the select tidal tributaries during 2006.

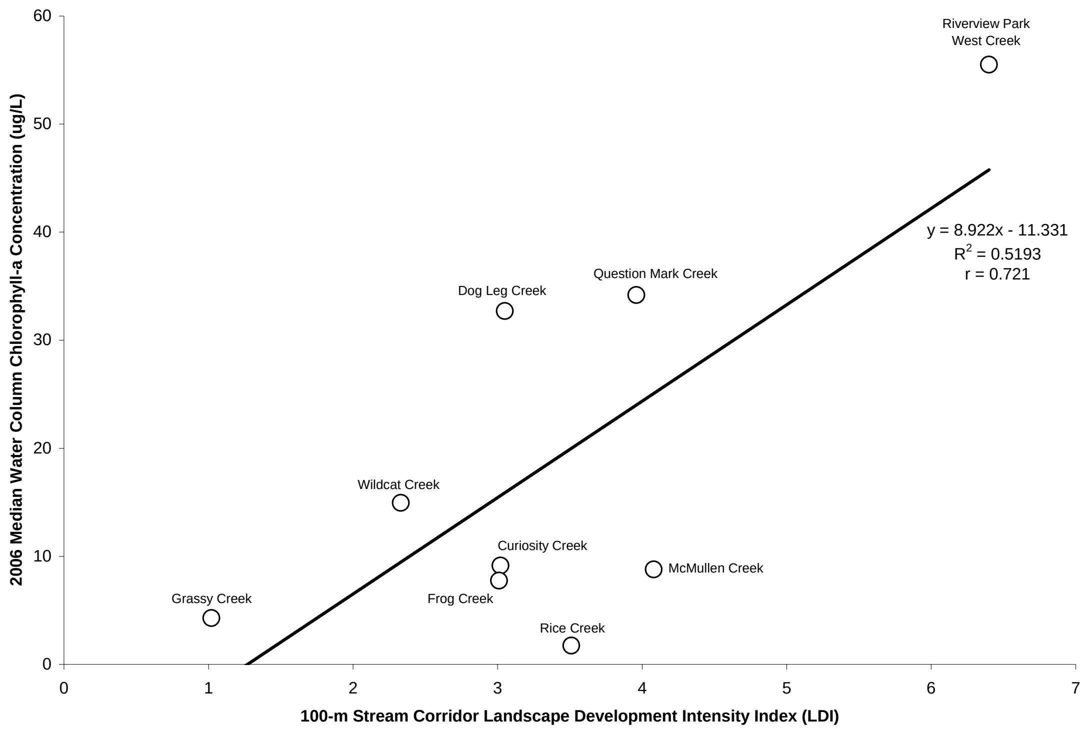


Figure 47: Linear relationship of 100-m corridor landscape development intensity indices (LDI) derived from 2004 SWFWMD land use/land cover information and median observed water column chlorophyll-a concentrations (µg/L) in the select tidal tributaries during 2006.

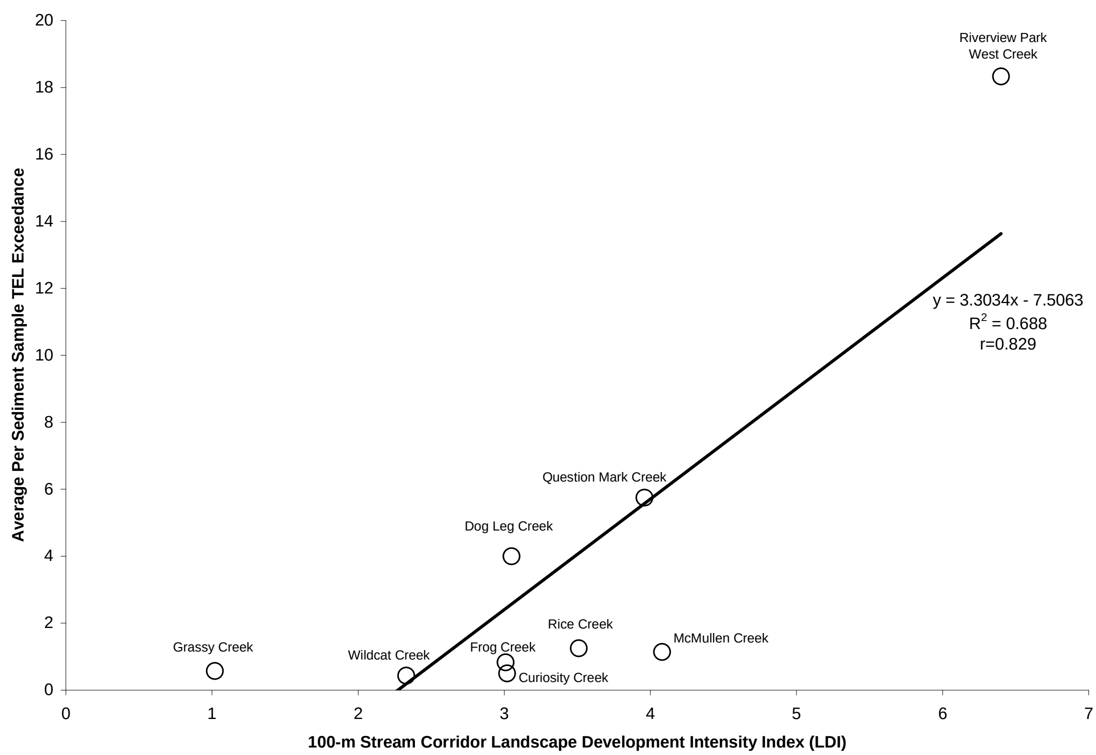


Figure 48: Linear relationship of 100-m corridor landscape development intensity indices (LDI) derived from 2004 SWFWMD land use/land cover information and average per sediment sample threshold effects level exceedances in the select tidal tributaries during 2006.

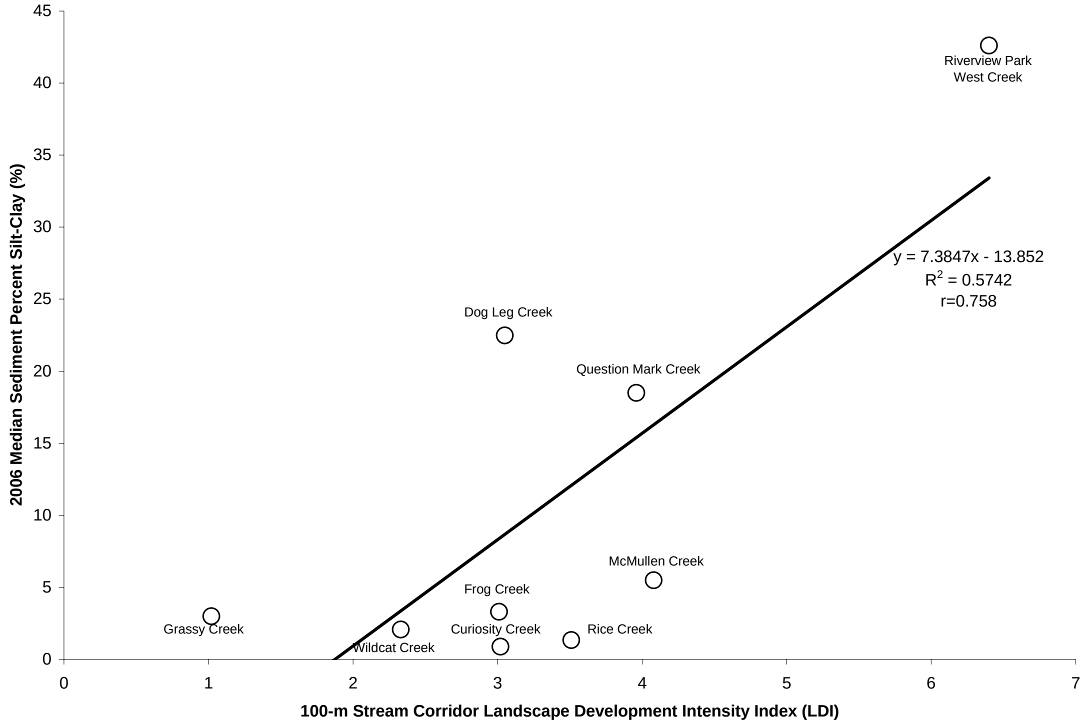


Figure 49: Linear relationship of 100-m corridor landscape development intensity indices (LDI) derived from 2004 SWFWMD land use/land cover information and median observed benthic silt-clay percentage in the select tidal tributaries during 2006.

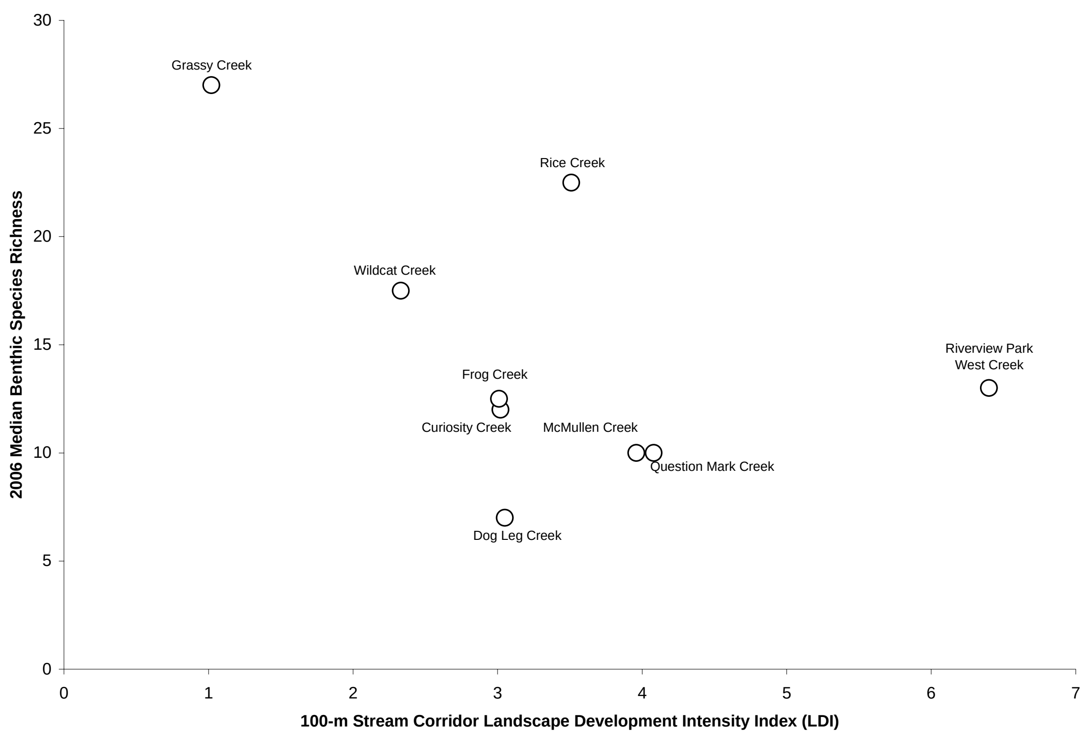


Figure 50: Relationship of 100-m corridor landscape development intensity indices (LDI) derived from 2004 SWFWMD land use/land cover information and median observed benthic species richness in the select tidal tributaries during 2006.

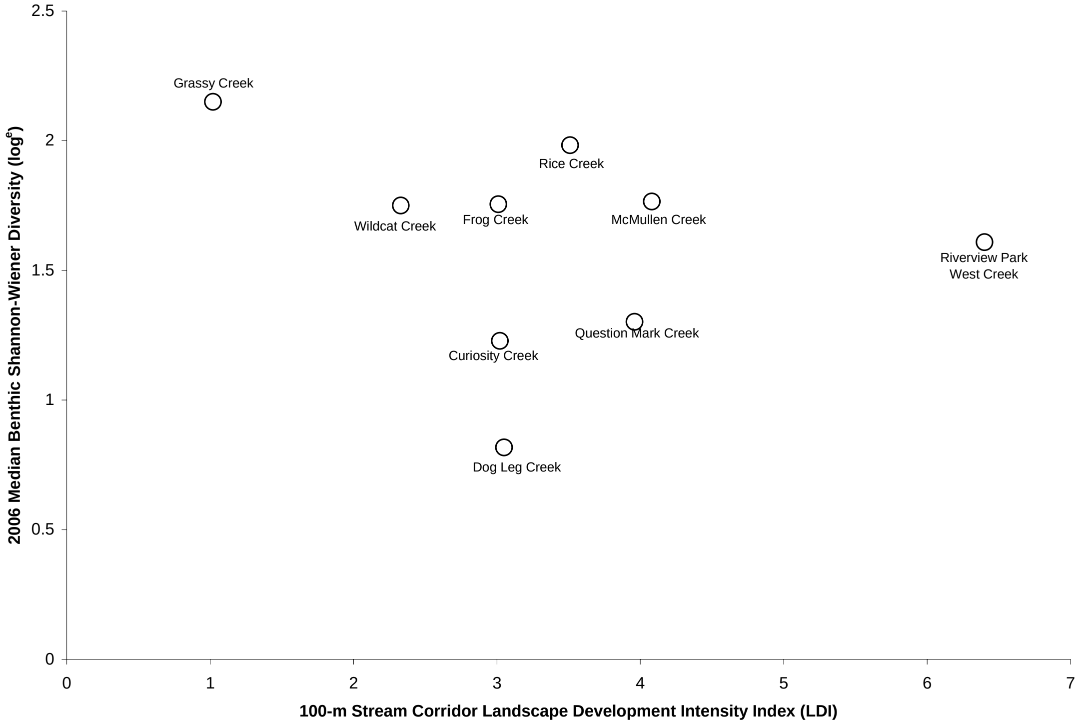


Figure 51: Relationship of 100-m corridor landscape development intensity indices (LDI) derived from 2004 SWFWMD land use/land cover information and median observed benthic Shannon-Wiener diversity (H' as log^e) in the select tidal tributaries during 2006.

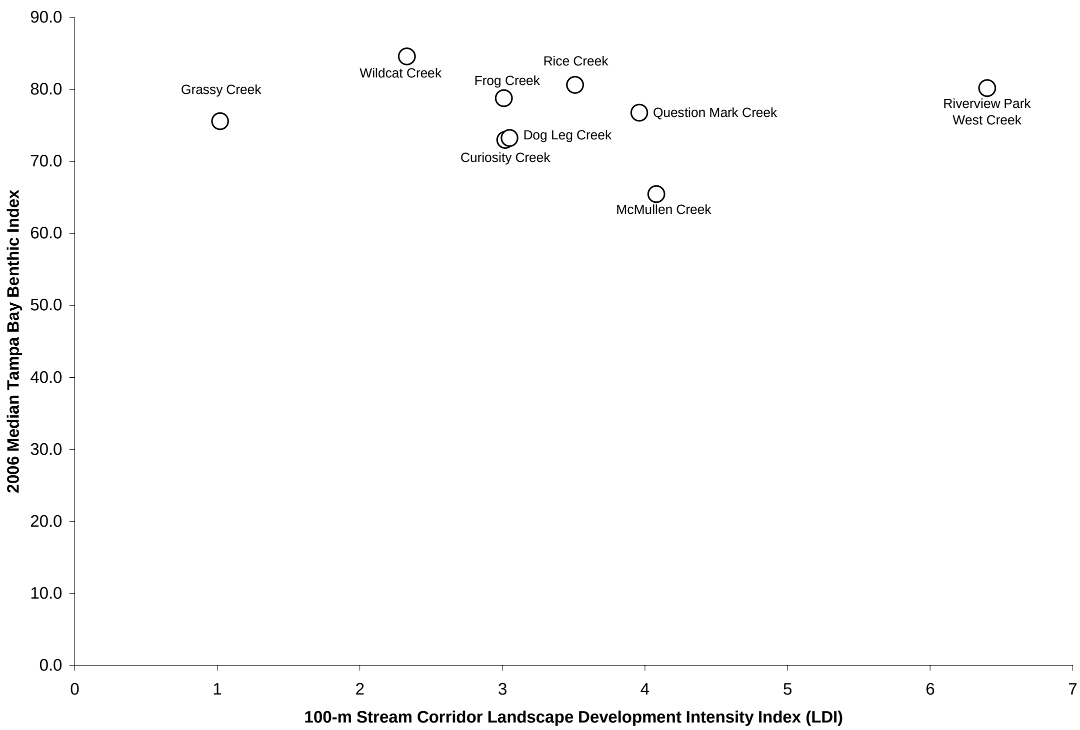


Figure 52: Relationship of 100-m corridor landscape development intensity indices (LDI) derived from 2004 SWFWMD land use/land cover information and median observed Tampa Bay Benthic Index in the select tidal tributaries during 2006.

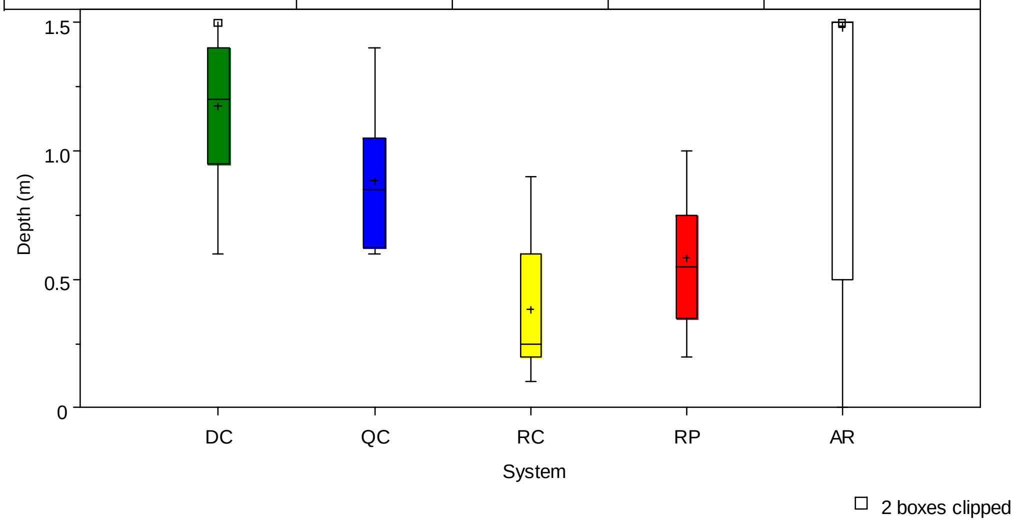
APPENDIX A:

Box Plots of Water Quality Parameters within Tidal Tributary Watersheds

Watershed=Alafia River

Statistics by System

N	12	12	16	12	153
Mean	1.175	0.883333	0.38125	0.583333	1.481699
Q2	1.2	0.85	0.25	0.55	1.5
Min	0.6	0.6	0.1	0.2	0
Max	1.5	1.4	0.9	1	1.5



Watershed=Little Manatee River

Statistics by System

N	28	7	28	12
Mean	1.096429	0.25	0.578571	1.5
Q2	0.9	0.25	0.55	1.5
Min	0.2	0.25	0.25	1.3
Max	3.2	0.3	1	1.5

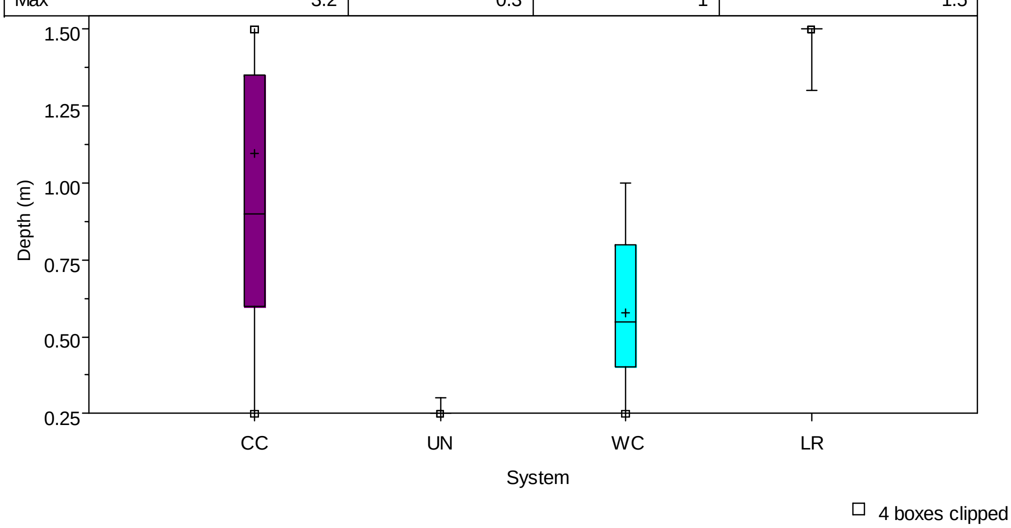
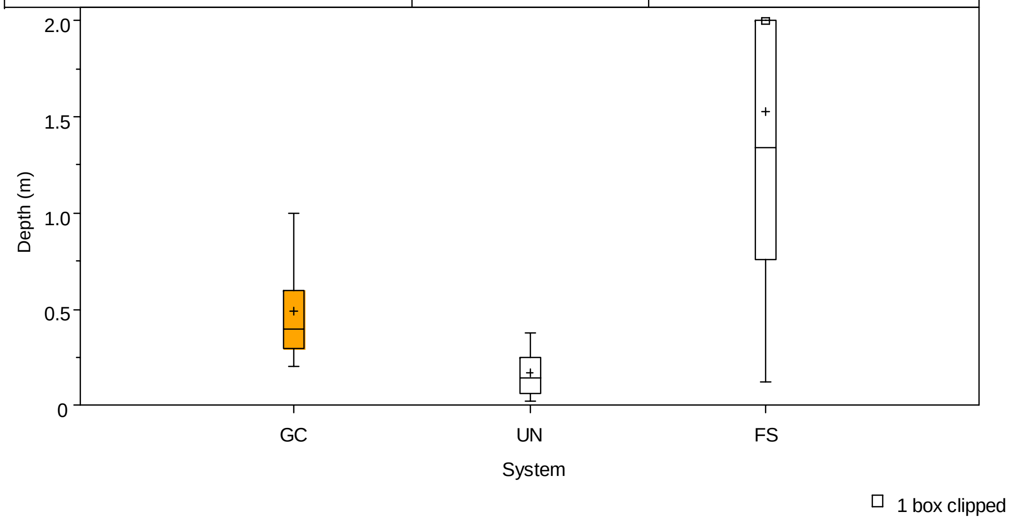


Figure A-1A: Box plots depicting total depth (m) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	23	10	137
Mean	0.491304	0.17	1.527226
Q2	0.4	0.14	1.34
Min	0.2	0.02	0.12
Max	1	0.38	2



Watershed=Terra Ceia Bay

Statistics by System			
N	24	12	12
Mean	0.470833	0.383333	1.875
Q2	0.45	0.2	2
Min	0.1	0.1	0.3
Max	1	1.2	2

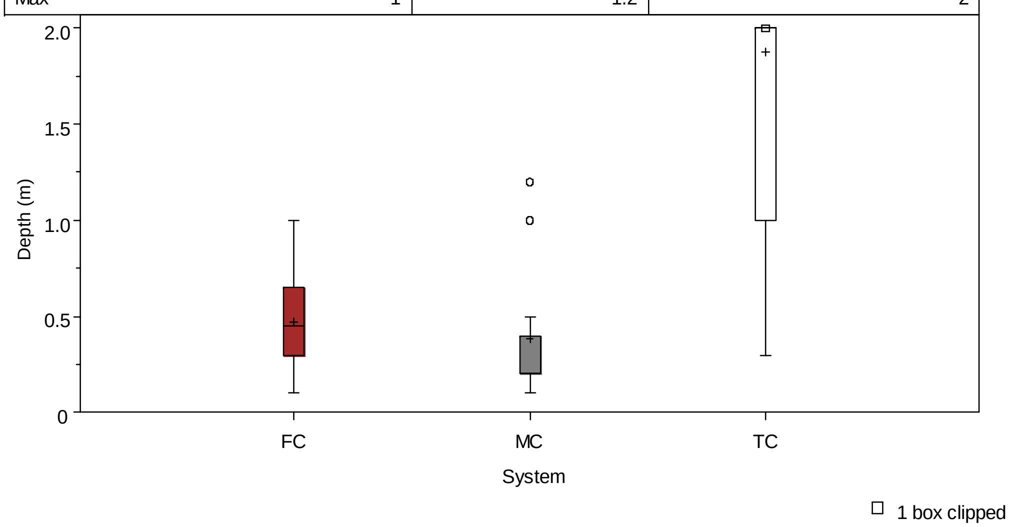
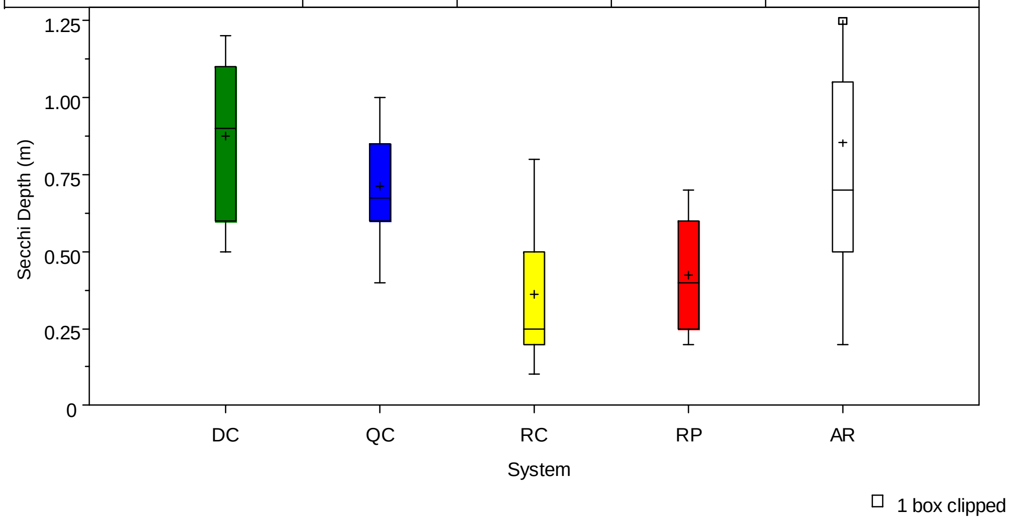


Figure A-1B: Box plots depicting total depth (m) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System

N	12	12	16	12	148
Mean	0.875	0.7125	0.3625	0.425	0.853378
Q2	0.9	0.675	0.25	0.4	0.7
Min	0.5	0.4	0.1	0.2	0.2
Max	1.2	1	0.8	0.7	2.5



Watershed=Little Manatee River

Statistics by System

N	28	7	27	12
Mean	0.757143	0.171429	0.551852	1.2
Q2	0.75	0.2	0.5	1.2
Min	0.2	0.1	0.2	0.9
Max	1.9	0.3	0.9	1.2

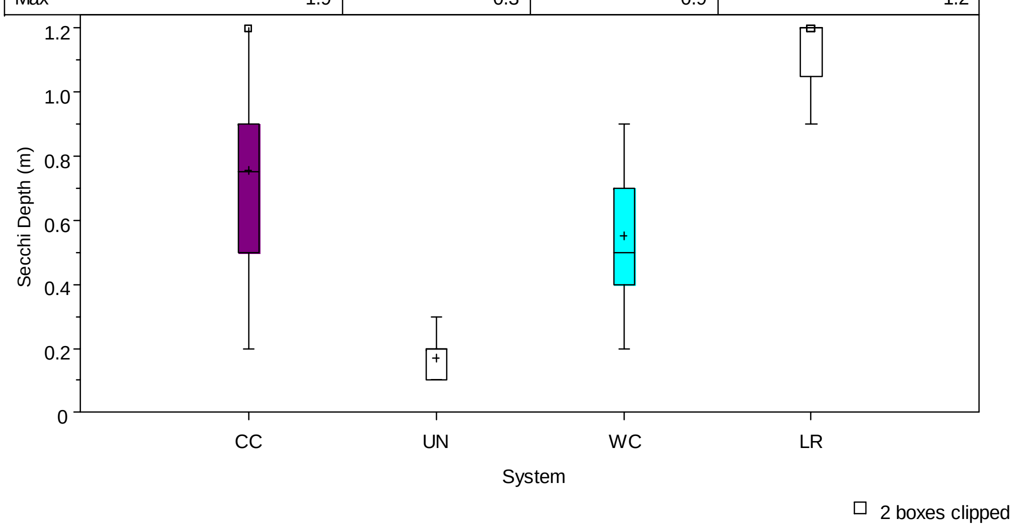
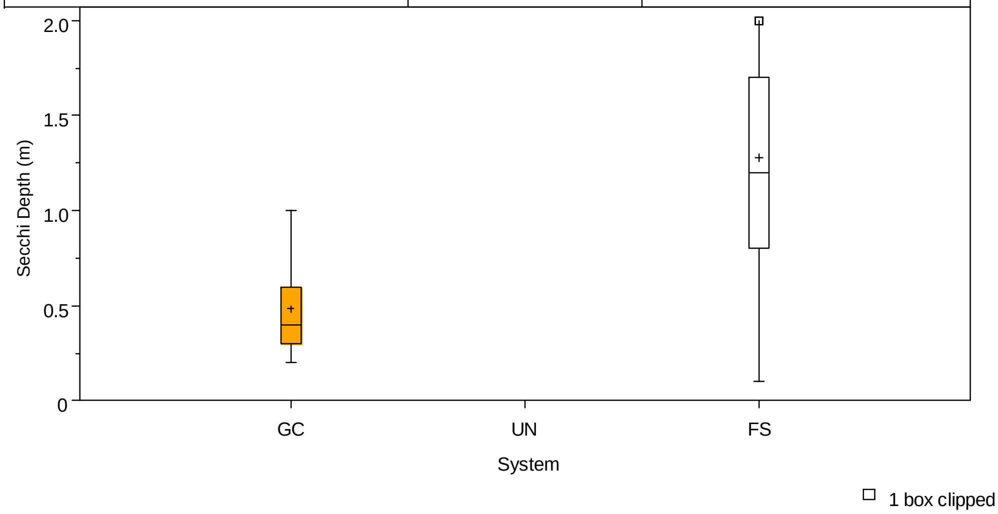


Figure A-2A: Box plots depicting secchi depth (m) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System

N	23	0	136
Mean	0.482609	.	1.278015
Q2	0.4	.	1.2
Min	0.2	.	0.1
Max	1	.	3.1



Watershed=Terra Ceia Bay

Statistics by System

N	24	12	3
Mean	0.466667	0.383333	2.033333
Q2	0.4	0.2	2.3
Min	0.1	0.1	1
Max	1	1.2	2.5

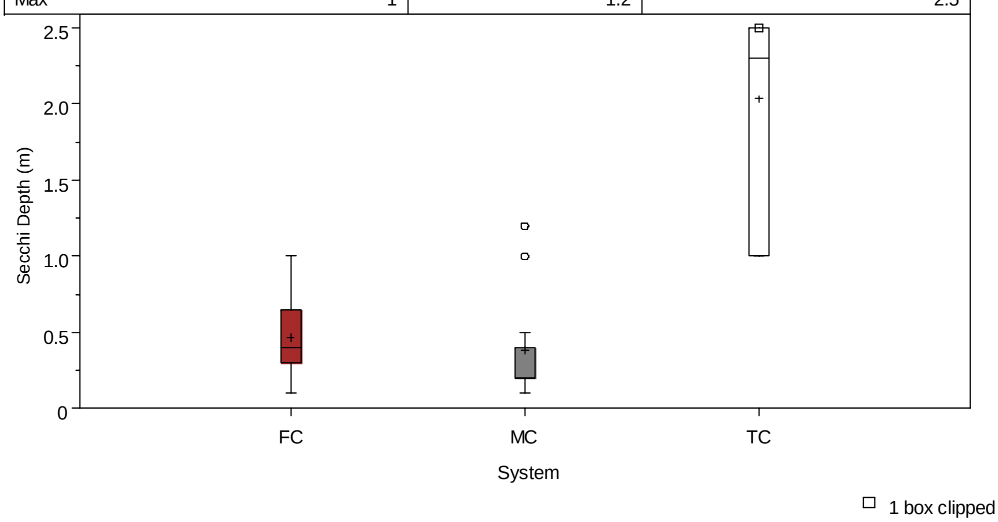
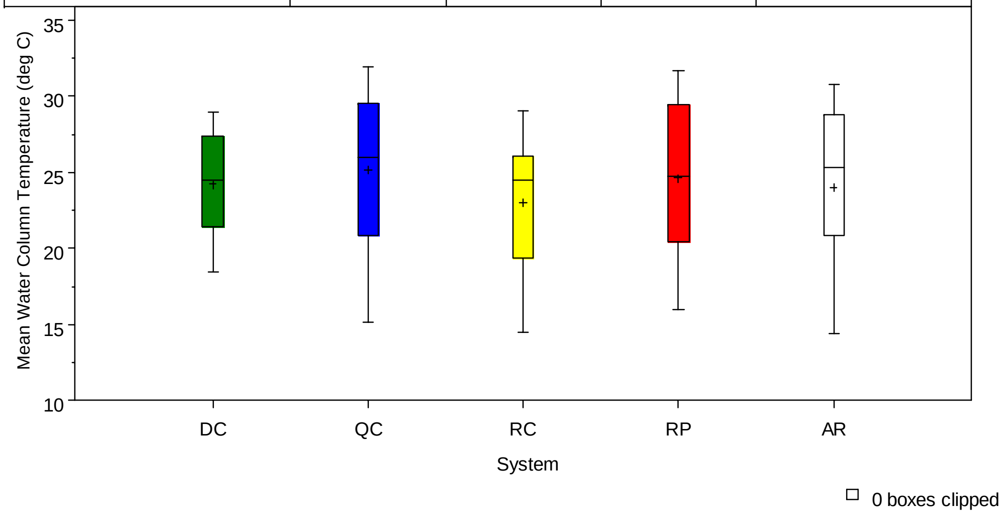


Figure A-2B: Box plots depicting secchi depth (m) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System					
N	12	12	16	12	23
Mean	24.20556	25.15819	23.0051	24.61639	23.9887
Q2	24.50833	25.96583	24.51333	24.745	25.32667
Min	18.45	15.16167	14.51	15.94	14.36667
Max	28.92333	31.88833	29.02	31.68	30.73667



Watershed=Little Manatee River

Statistics by System				
N	28	7	28	12
Mean	22.7247	21.23429	23.73321	24.24806
Q2	22.08	21.48	22.815	24.515
Min	12.03667	15.23	13.02	13.50667
Max	30.18667	25.86	30.71333	31.16667

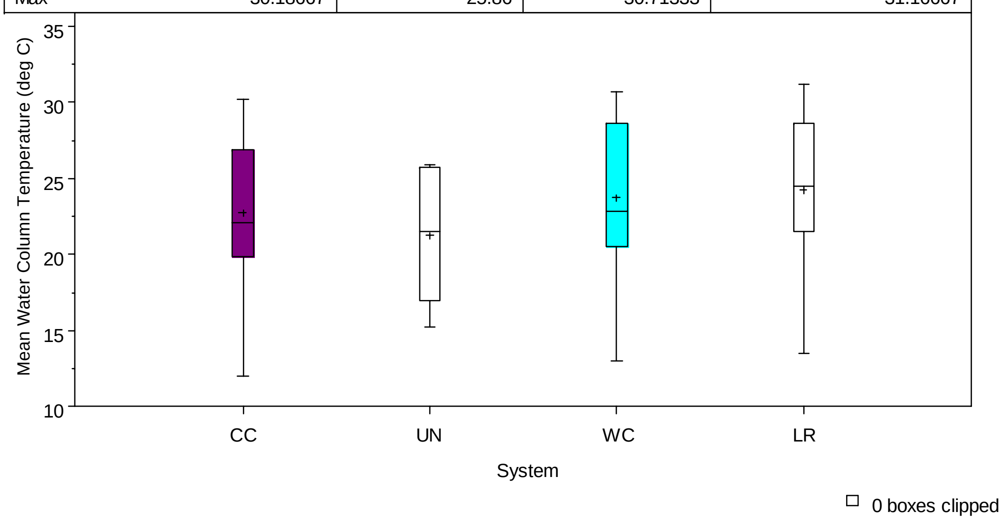
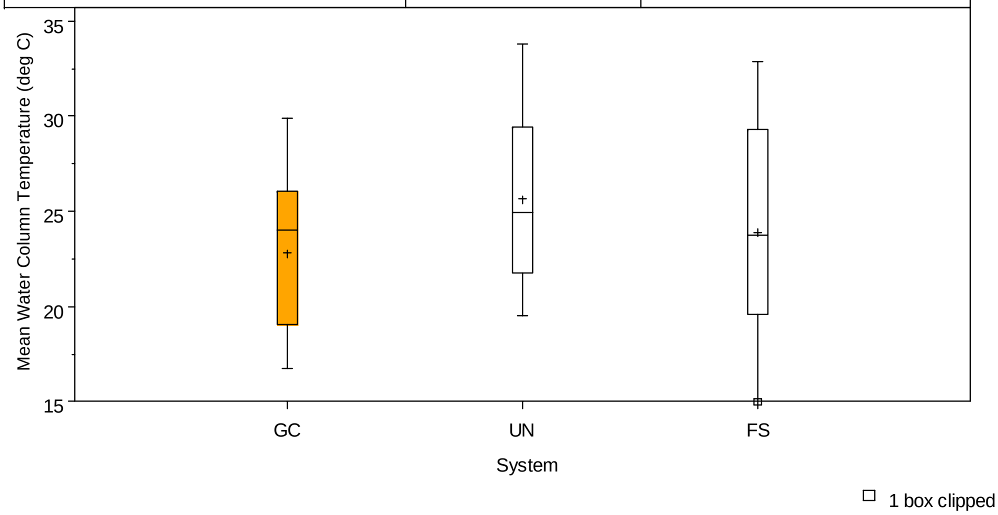


Figure A-3A: Box plots depicting mean water column temperature (°C) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	23	10	137
Mean	22.79428	25.635	23.89246
Q2	24.03667	24.94	23.77
Min	16.74	19.53	15
Max	29.92	33.77	32.88



Watershed=Terra Ceia Bay

Statistics by System			
N	24	12	0
Mean	24.45694	24.11944	.
Q2	24	23.5	.
Min	18	19	.
Max	31	30.66667	.

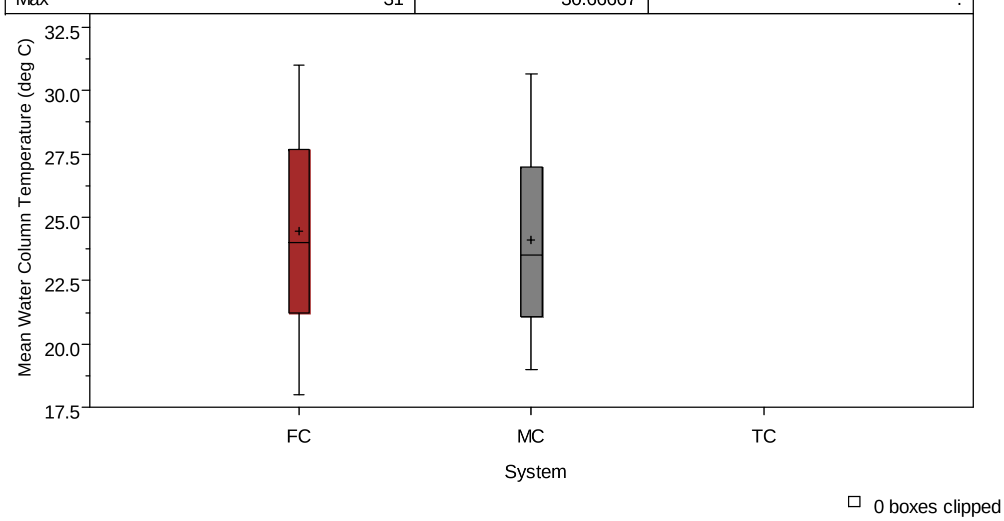
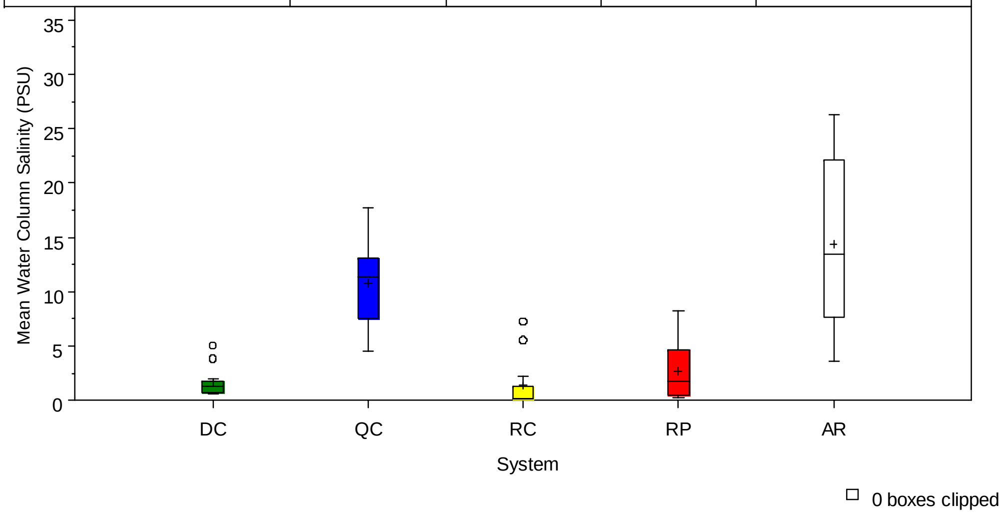


Figure A-3B: Box plots depicting mean water column temperature (^{o}C) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System					
N	12	12	12	12	23
Mean	1.719167	10.82	1.406528	2.7425	14.38261
Q2	1.318333	11.355	0.2075	1.725	13.43333
Min	0.663333	4.51	0.12	0.23	3.6
Max	5.1	17.75833	7.31	8.216667	26.26667



Watershed=Little Manatee River

Statistics by System				
N	24	0	24	12
Mean	3.571944	.	9.256389	14.79444
Q2	1.056667	.	8.673333	15.1
Min	0.206667	.	0.286667	0.9
Max	15.32	.	22.34333	23.46667

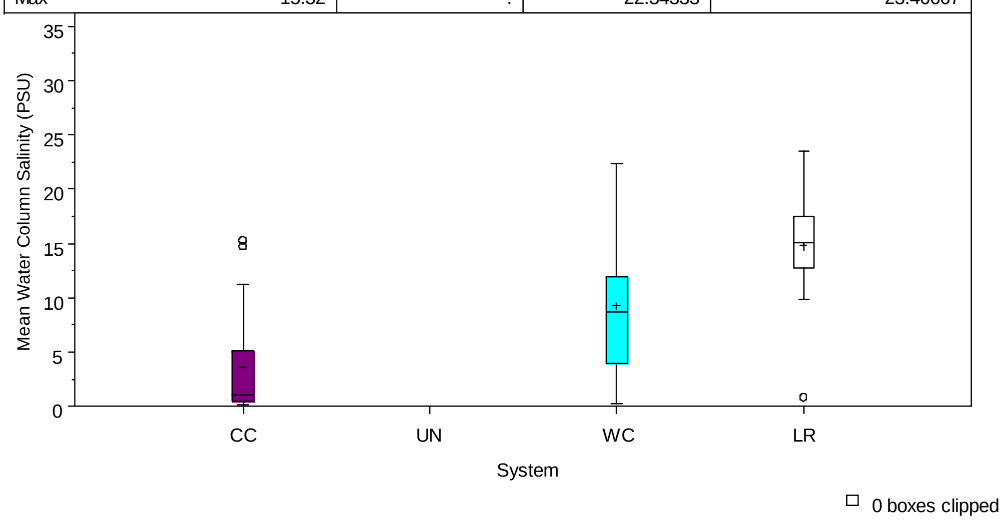
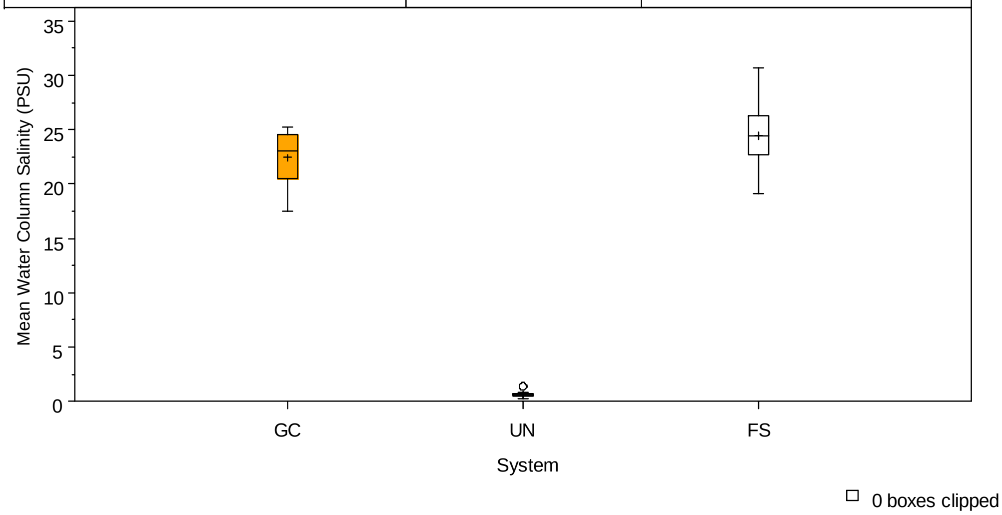


Figure A-4A: Box plots depicting mean water column salinity (PSU) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	23	10	137
Mean	22.44522	0.68	24.45813
Q2	23.06	0.66	24.46667
Min	17.47	0.3	19.165
Max	25.23333	1.43	30.73333



Watershed=Terra Ceia Bay

Statistics by System			
N	24	12	0
Mean	17.58819	17.56944	.
Q2	20.1	17.65	.
Min	0.5	3.2	.
Max	29.6	26.8	.

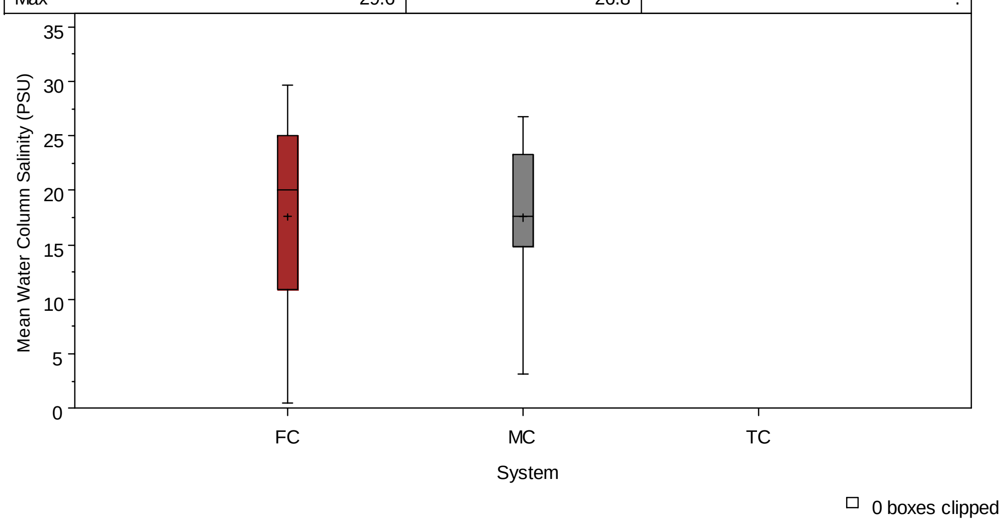
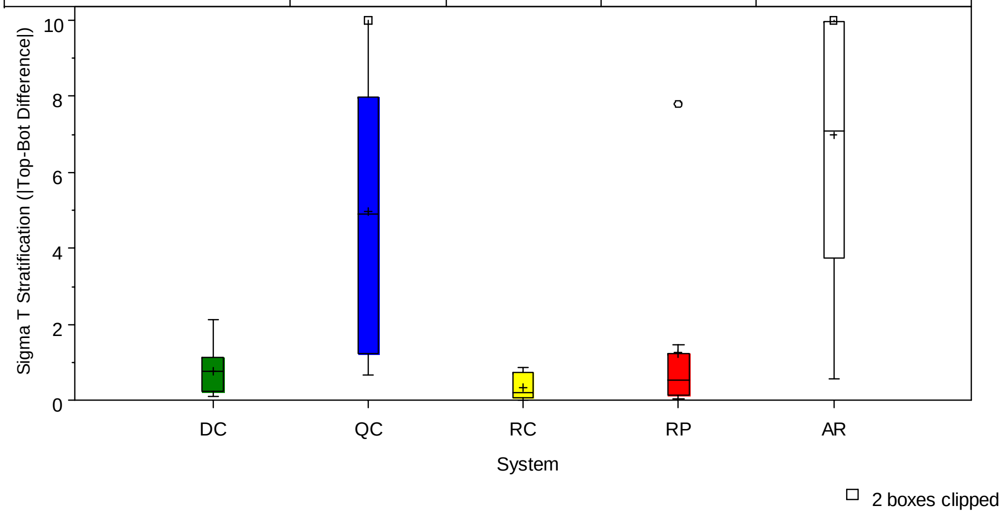


Figure A-4B: Box plots depicting mean water column salinity (PSU) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System

N	12	12	6	11	23
Mean	0.781706	4.983441	0.348024	1.253435	6.98012
Q2	0.755862	4.915278	0.195891	0.532841	7.087625
Min	0.118979	0.660959	0	0.046179	0.589131
Max	2.132692	10	0.88522	7.799094	10



Watershed=Little Manatee River

Statistics by System

N	24	0	21	12
Mean	0.298233	.	0.958324	0.681503
Q2	0.036747	.	0.201433	0.311292
Min	0	.	0.015276	0.008478
Max	3.810828	.	8.338841	1.943429

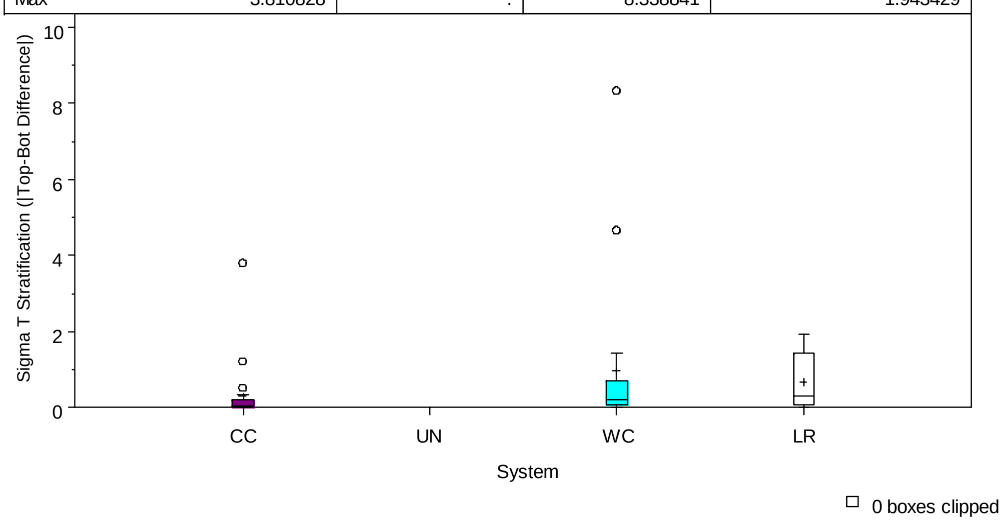
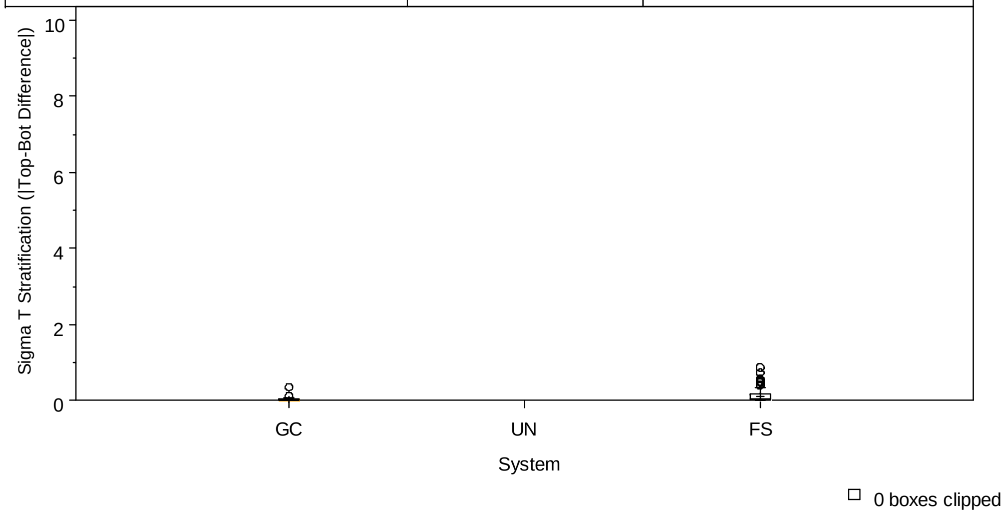


Figure A-5A: Box plots depicting water column stratification (Sigma T Surface-Bot. Difference) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System

N	20	0	121
Mean	0.039683	.	0.111741
Q2	0.00741	.	0.033305
Min	0	.	0
Max	0.35986	.	0.879186



Watershed=Terra Ceia Bay

Statistics by System

N	6	3	0
Mean	1.357618	0.143895	.
Q2	0.291284	0.099936	.
Min	0	0	.
Max	6.957738	0.331749	.

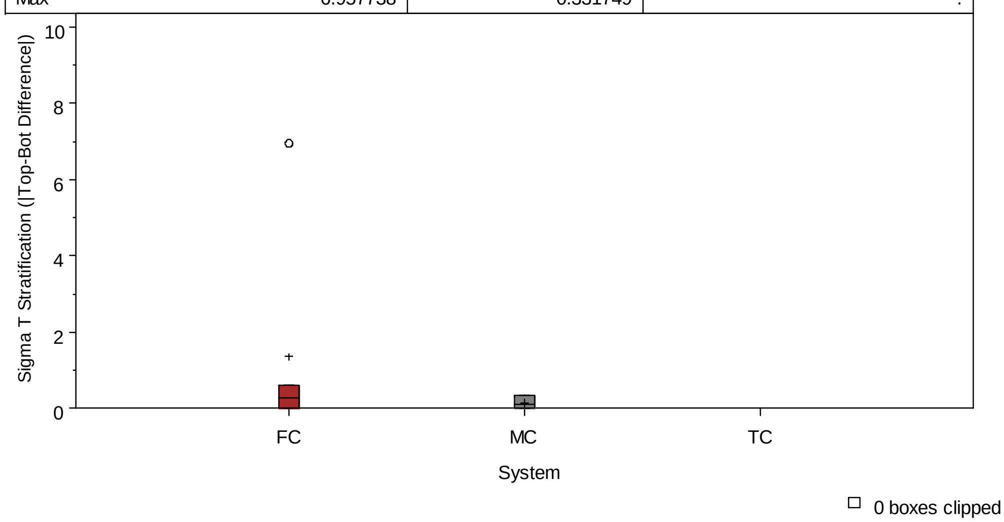
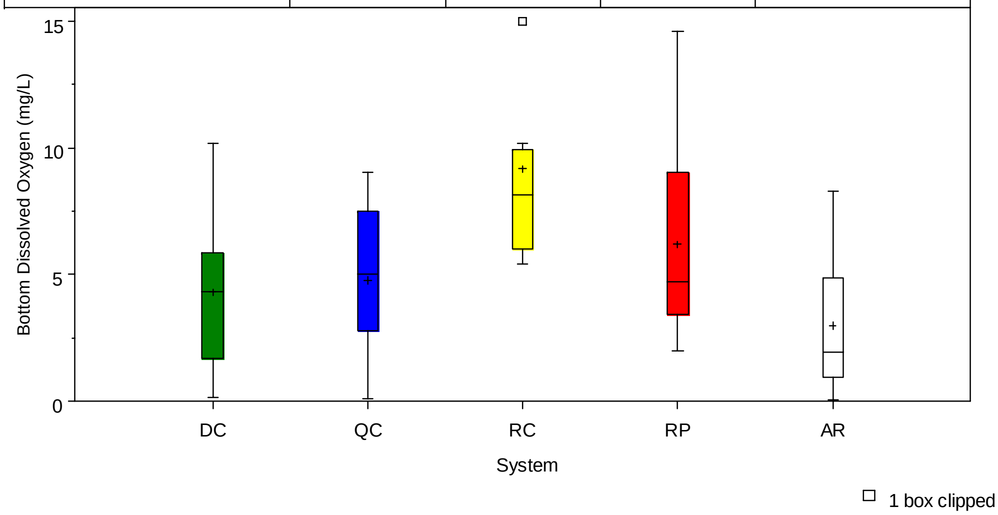


Figure A-5B: Box plots depicting water column stratification (Sigma T Surface-Bot. Difference) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System

N	12	12	8	11	23
Mean	4.323333	4.783333	9.16875	6.197273	2.992609
Q2	4.34	5.0225	8.14	4.73	1.97
Min	0.15	0.14	5.43	2.02	0.07
Max	10.16	9.025	19.73	14.58	8.29



Watershed=Little Manatee River

Statistics by System

N	26	0	21	12
Mean	4.765	.	4.434762	5.145
Q2	4.34	.	4.37	4.435
Min	0.35	.	3.43	3.28
Max	8.07	.	6.71	8.6

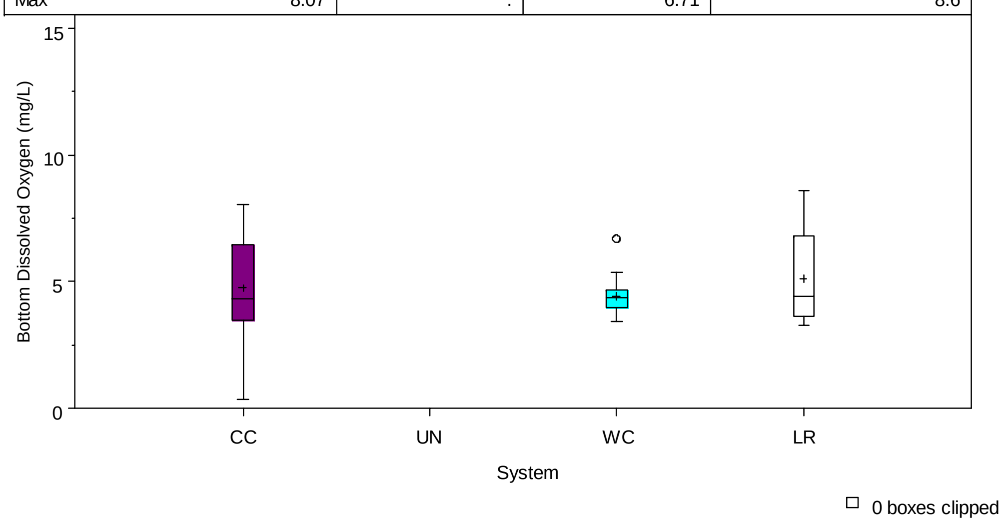
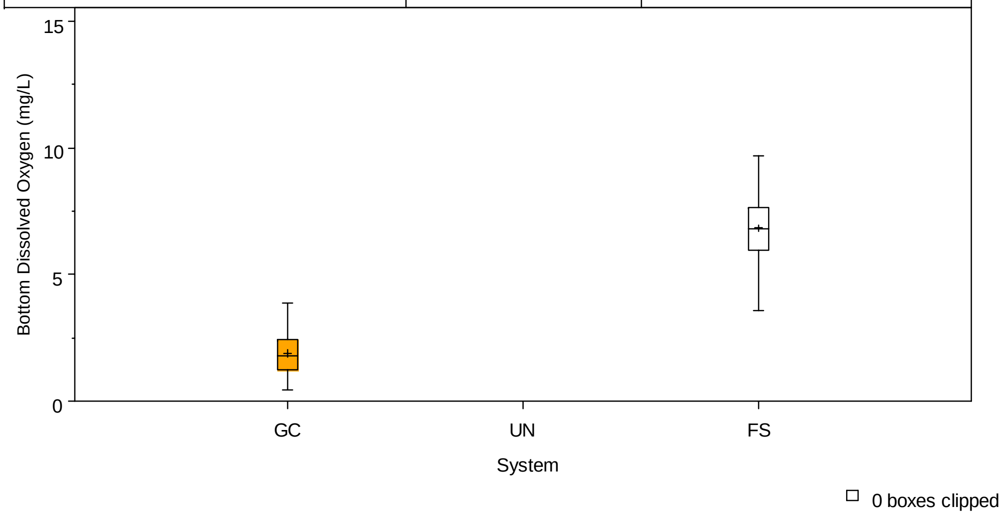


Figure A-6A: Box plots depicting bottom dissolved oxygen concentrations (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	21	0	123
Mean	1.907619	.	6.849919
Q2	1.82	.	6.83
Min	0.45	.	3.61
Max	3.88	.	9.68



Watershed=Terra Ceia Bay

Statistics by System			
N	22	11	0
Mean	5.504545	5.354545	.
Q2	5.55	5.5	.
Min	3.2	3	.
Max	6.9	7.7	.

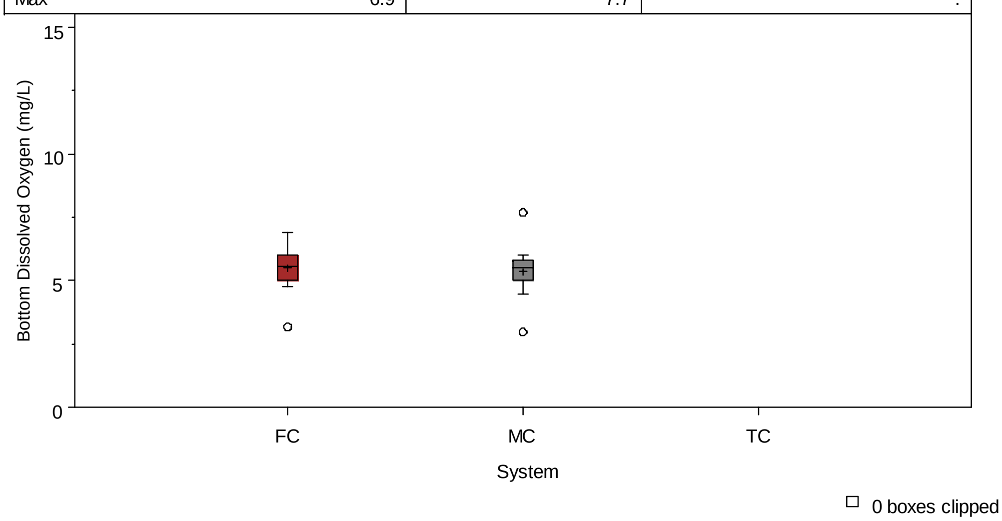
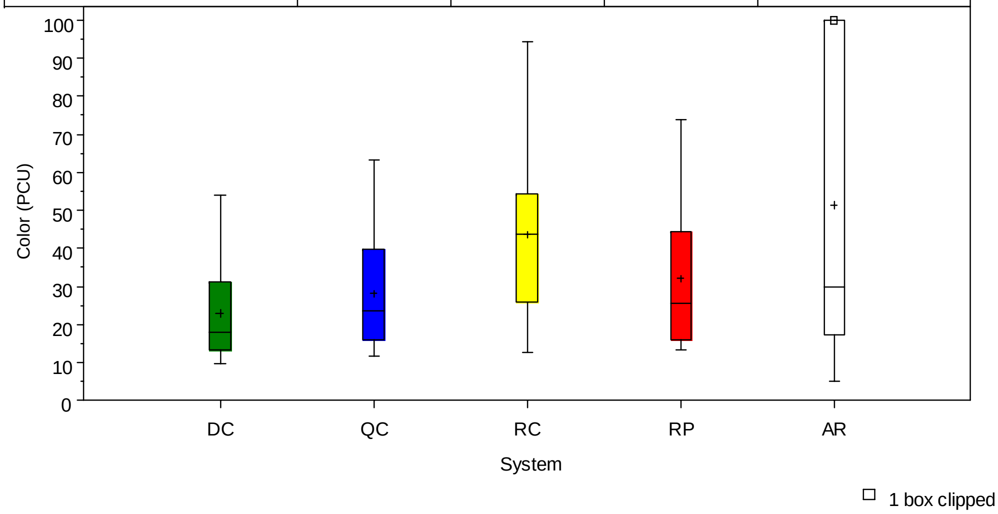


Figure A-6B: Box plots depicting bottom dissolved oxygen concentrations (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System

N	12	12	16	12	160
Mean	23.05	28.08333	43.7	32.04167	51.43875
Q2	18	23.7	43.7	25.65	30
Min	9.7	11.6	12.8	13.2	5
Max	54.1	63.25	94.4	73.9	100



Watershed=Little Manatee River

Statistics by System

N	28	7	28	12
Mean	53.88571	52.08571	47.2	35.95833
Q2	30.25	47.7	35.3	28.1
Min	22.7	32.3	18.9	14.6
Max	149.4	94.6	100	115.1

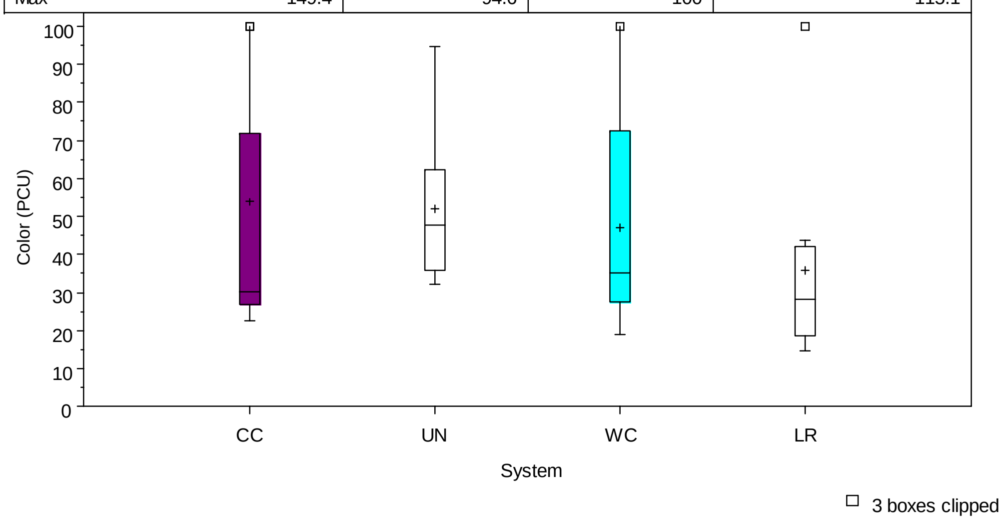
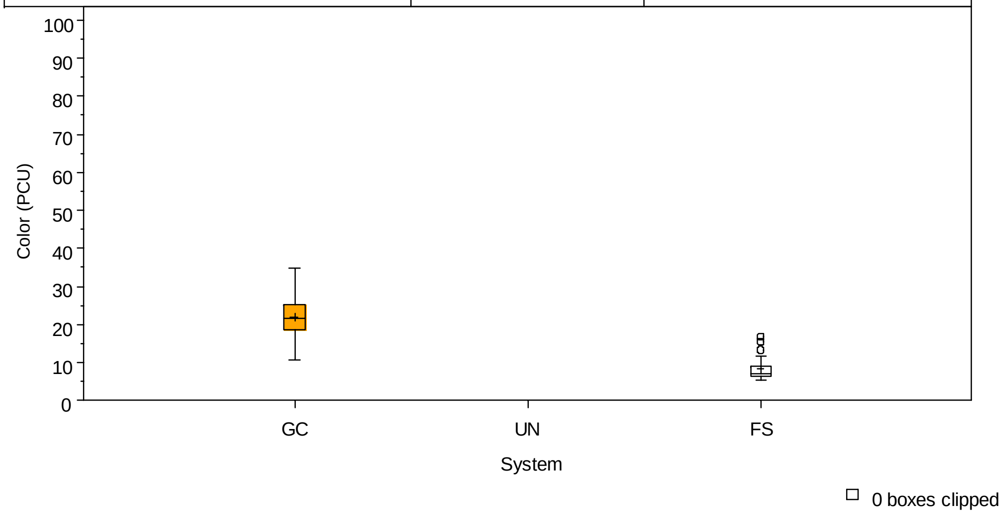


Figure A-7A: Box plots depicting color (Pt.-Co. Units) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	23	0	30
Mean	21.91304	.	8.206667
Q2	21.6	.	7.15
Min	10.7	.	5.4
Max	34.9	.	16.9



Watershed=Terra Ceia Bay

Statistics by System			
N	24	12	11
Mean	99.22917	112.0417	35.45455
Q2	90	98.75	28
Min	32	58	16
Max	200	180	65

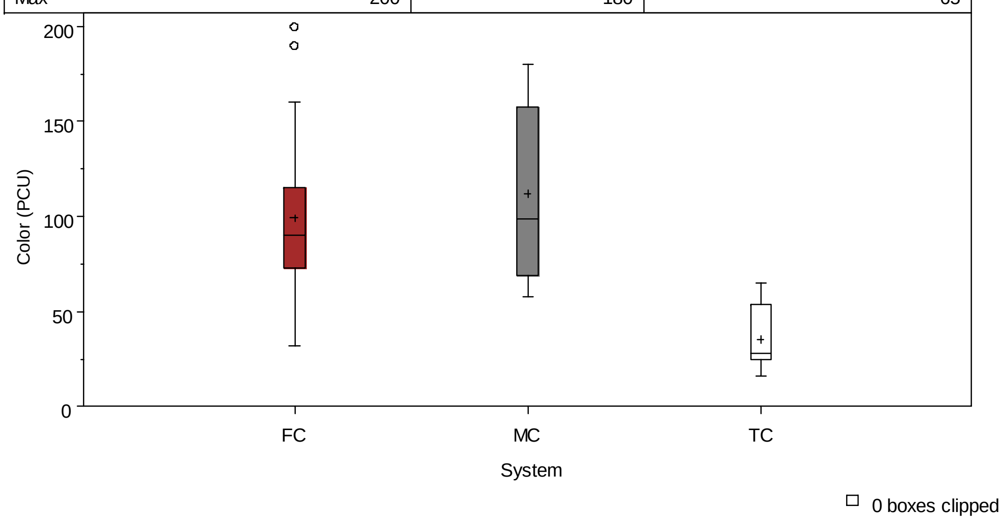
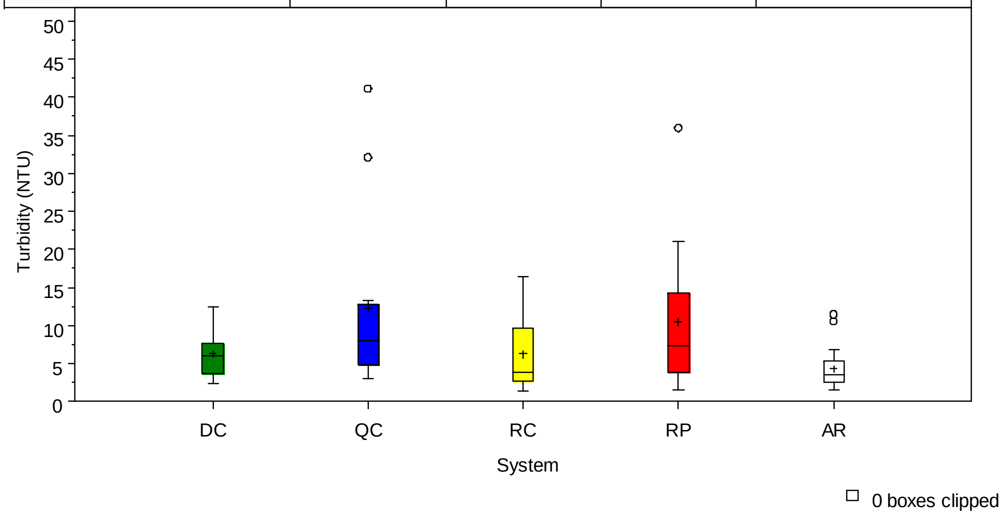


Figure A-7B: Box plots depicting color (Pt.-Co. Units) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System					
N	12	12	12	12	23
Mean	6.275	12.3625	6.258333	10.525	4.291304
Q2	6.05	7.975	3.85	7.3	3.6
Min	2.4	3.1	1.4	1.6	1.5
Max	12.5	41.15	16.4	36	11.5



Watershed=Little Manatee River

Statistics by System				
N	24	0	24	12
Mean	3.314583	.	3.458333	2.316667
Q2	2.9	.	3.45	2.15
Min	2	.	1.6	1.7
Max	7	.	5.5	4.9

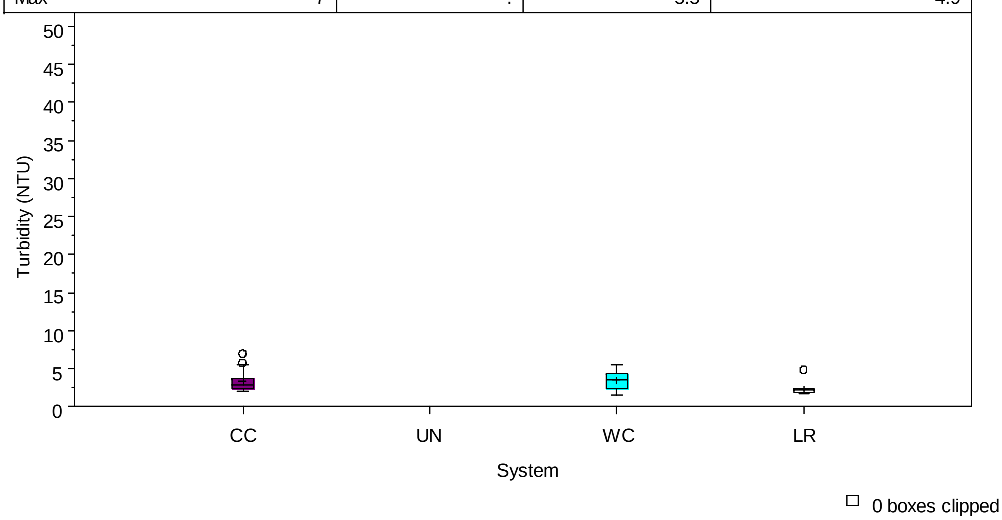
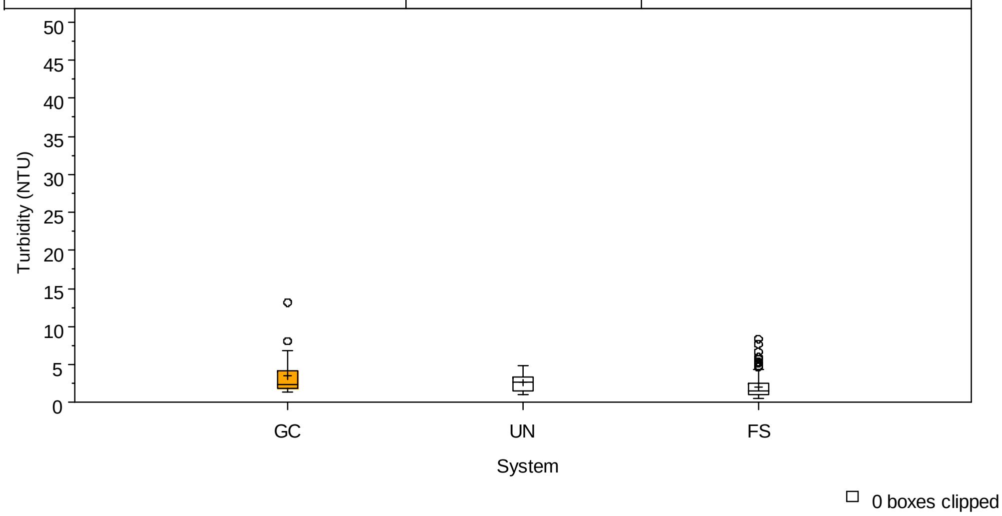


Figure A-8A: Box plots depicting turbidity (NTU) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System

N	23	8	137
Mean	3.521739	2.65	2.059124
Q2	2.4	2.65	1.6
Min	1.4	1.1	0.6
Max	13.2	4.9	8.4



Watershed=Terra Ceia Bay

Statistics by System

N	24	12	12
Mean	5.152083	10.38333	2.611667
Q2	5.1	5.625	2.8
Min	1.6	3.3	0.44
Max	9.5	50	5.1

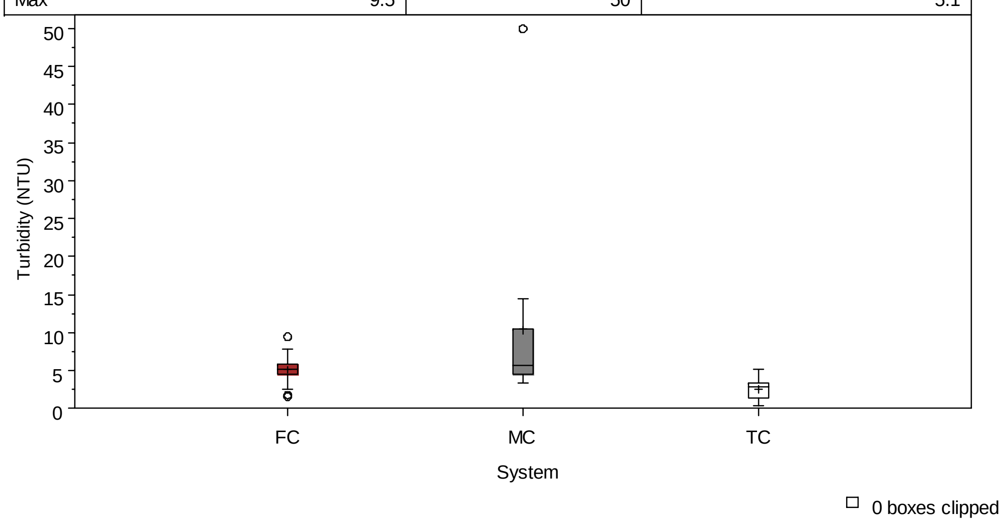
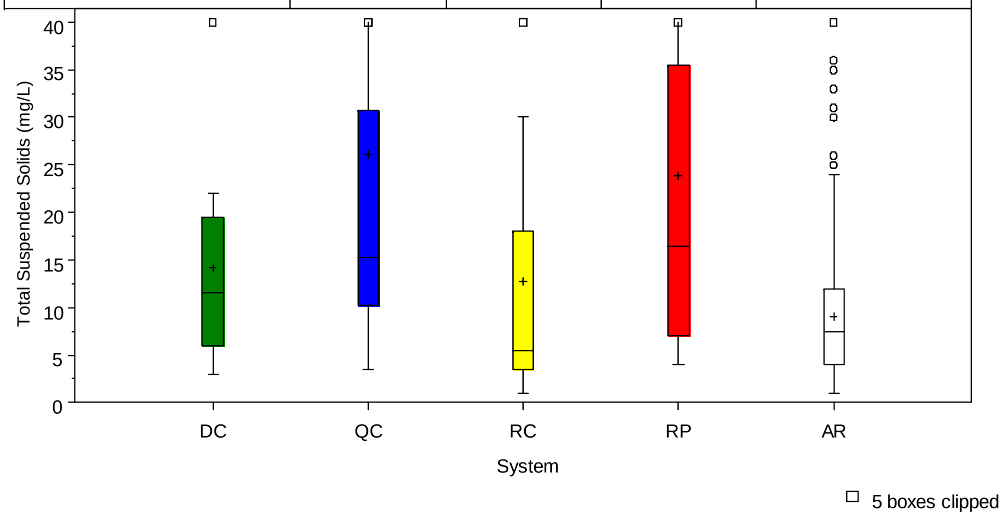


Figure A-8B: Box plots depicting turbidity (NTU) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System					
N	12	12	12	12	160
Mean	14.16667	26.08333	12.75	23.83333	9.065625
Q2	11.5	15.25	5.5	16.5	7.5
Min	3	3.5	1	4	1
Max	44	94.5	52	40	41



Watershed=Little Manatee River

Statistics by System				
N	24	0	24	12
Mean	5.0625	.	9.083333	6.166667
Q2	4	.	9	6
Min	2	.	2	4
Max	14	.	24	9

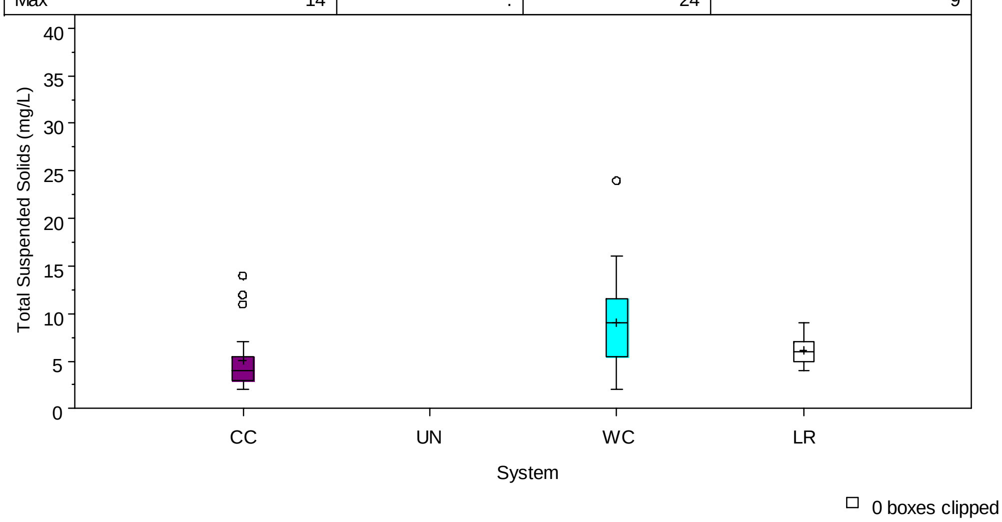
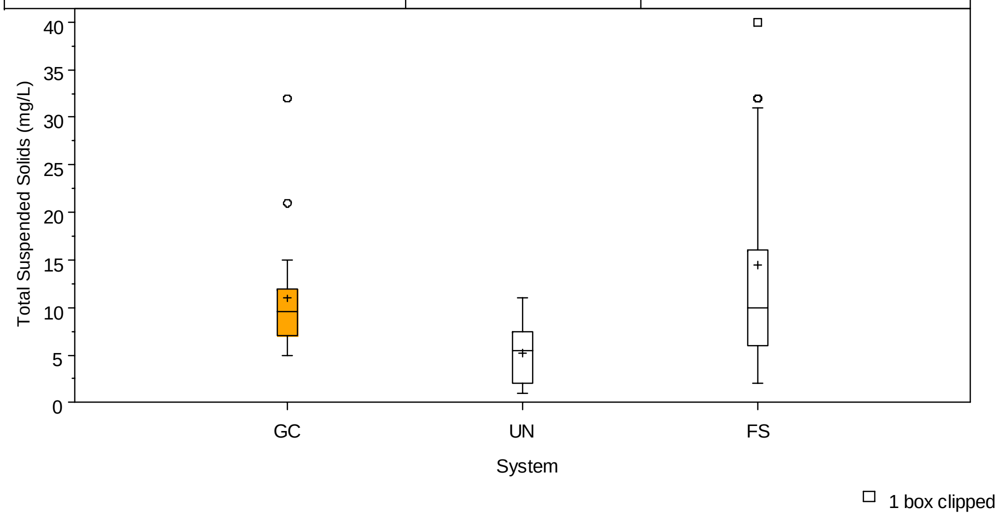


Figure A-9A: Box plots depicting total suspended solids (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	20	8	117
Mean	11	5.25	14.51282
Q2	9.5	5.5	10
Min	5	1	2
Max	32	11	48



Watershed=Terra Ceia Bay

Statistics by System			
N	24	12	12
Mean	20.625	30.49167	37.56667
Q2	13	15.45	14.8
Min	4	7.6	6.2
Max	130	190	272

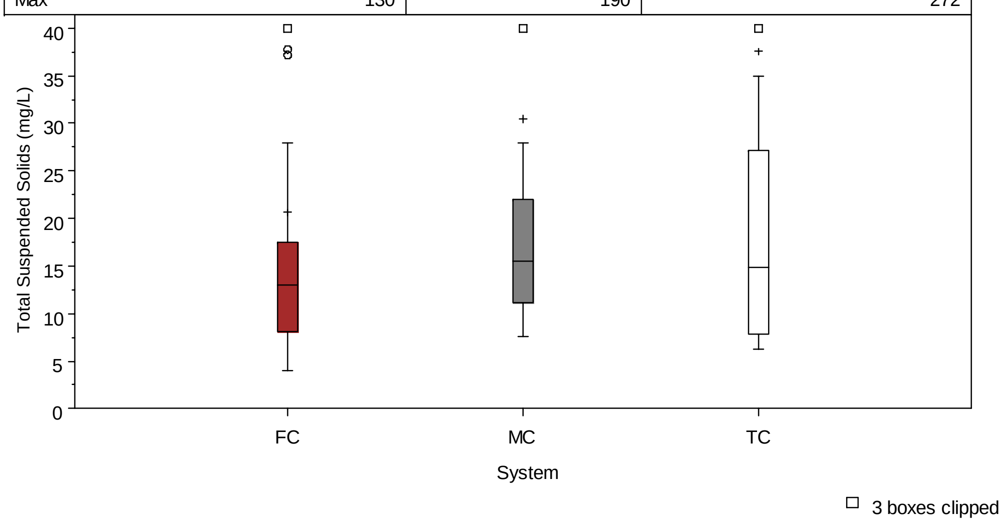
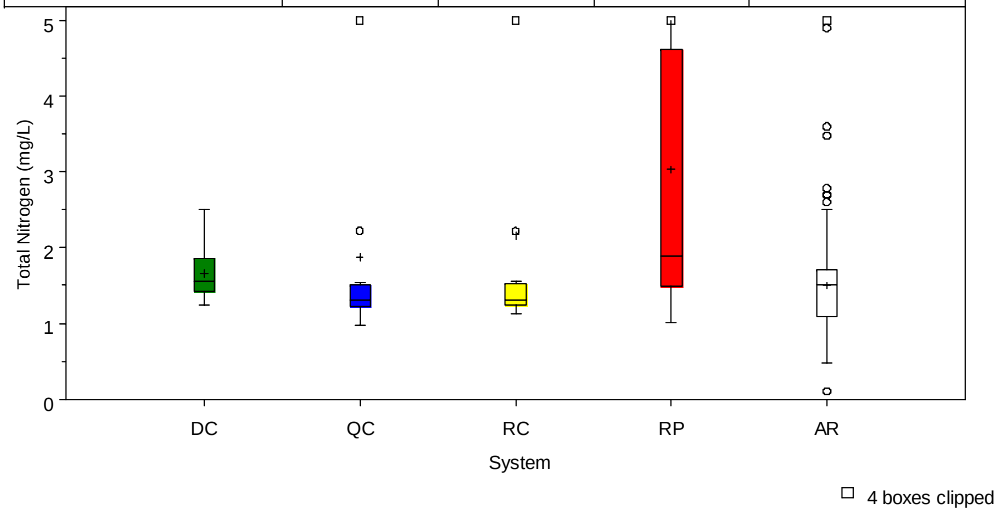


Figure A-9B: Box plots depicting total suspended solids (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System

N	12	12	16	12	160
Mean	1.660167	1.87575	2.165063	3.029333	1.502475
Q2	1.5515	1.30975	1.3115	1.8915	1.5
Min	1.235	0.976	1.13	1.002	0.109
Max	2.505	7.351	8.159	5	10



Watershed=Little Manatee River

Statistics by System

N	28	7	28	12
Mean	1.528982	1.903143	0.921696	0.6995
Q2	1.3605	1.66	0.833	0.6485
Min	0.6175	0.649	0.5395	0.28
Max	3.702	4.72	1.764	1.365

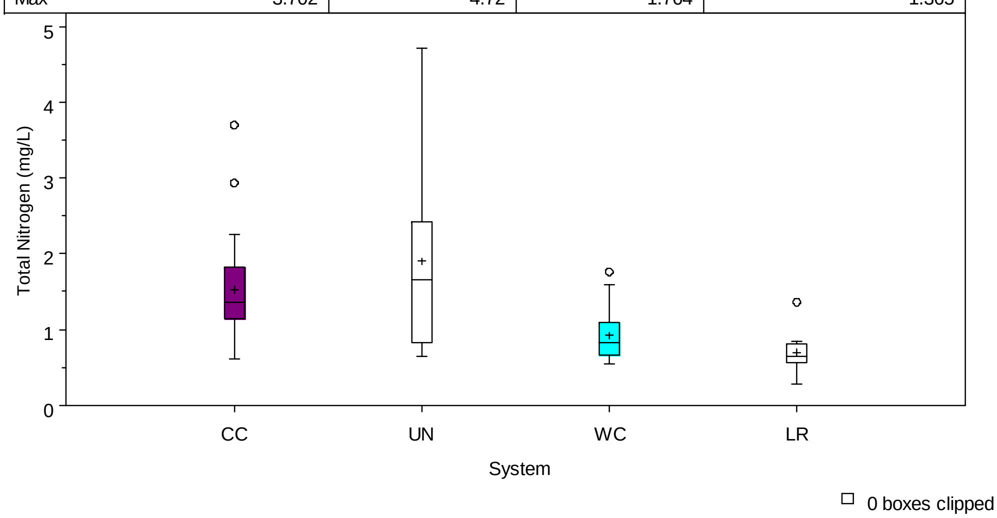
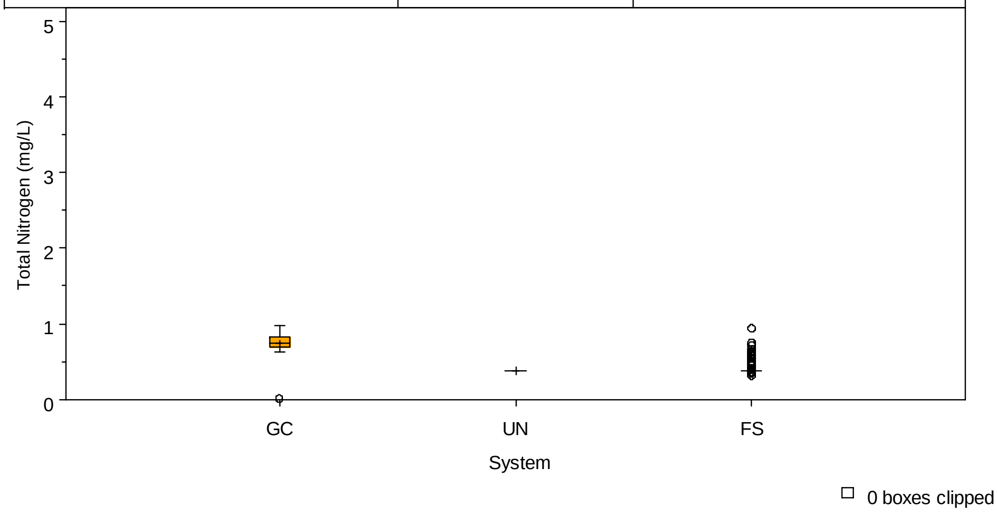


Figure A-10A: Box plots depicting total nitrogen (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	23	10	137
Mean	0.741761	0.38	0.411686
Q2	0.749	0.38	0.38
Min	0.014	0.38	0.32
Max	0.97	0.38	0.944



Watershed=Terra Ceia Bay

Statistics by System			
N	21	11	7
Mean	1.064286	1.350455	0.682857
Q2	1.2	1.35	0.66
Min	0.18	0.605	0.37
Max	1.76	2.18	0.93

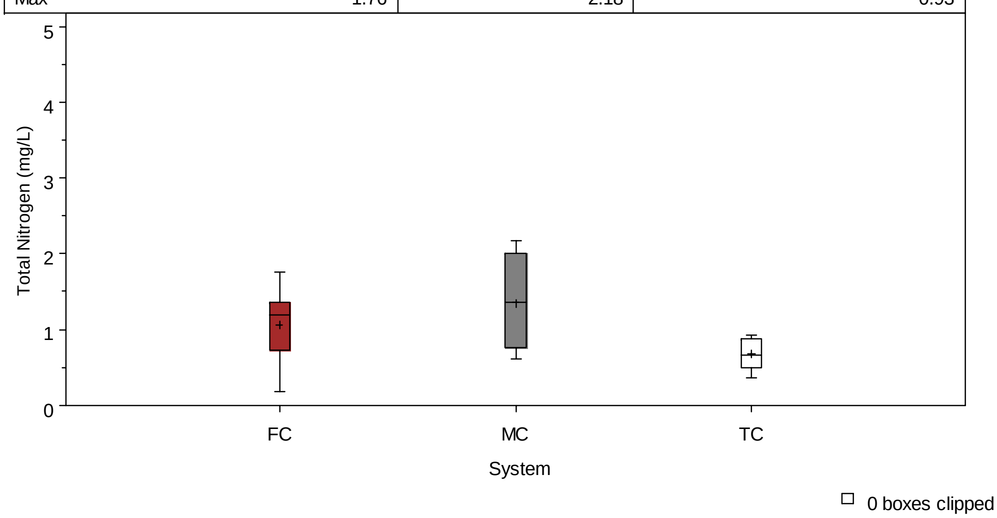
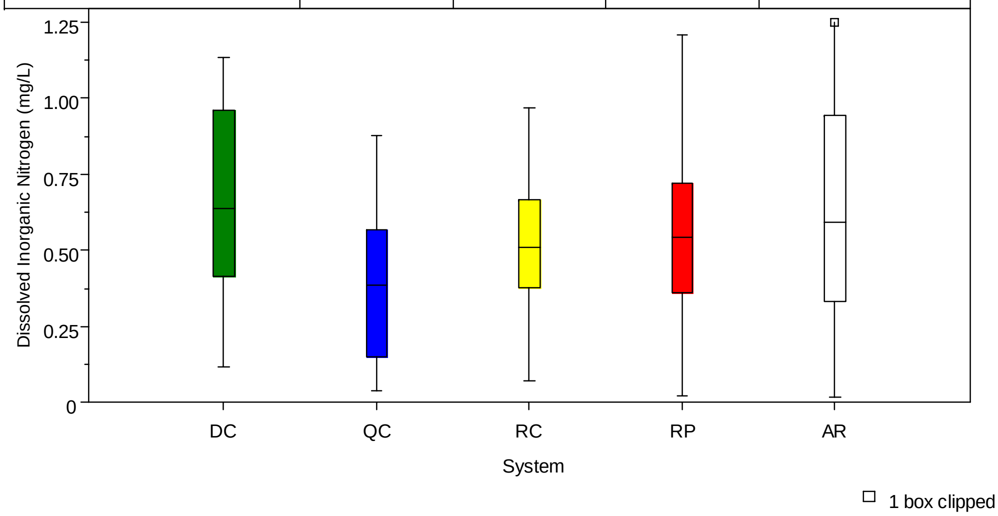


Figure A-10B: Box plots depicting total nitrogen (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System					
N	12	12	16	12	160
Mean	0.658	0.376	0.521094	0.562667	0.6233
Q2	0.6385	0.3875	0.5105	0.543	0.5935
Min	0.116	0.0405	0.073	0.021	0.018
Max	1.132	0.8785	0.967	1.206	1.25



Watershed=Little Manatee River

Statistics by System				
N	28	7	28	12
Mean	0.542054	1.088929	0.096536	0.152917
Q2	0.366	0.275	0.0725	0.135
Min	0.033	0.049	0.008	0.03
Max	2.377	4.821	0.247	0.343

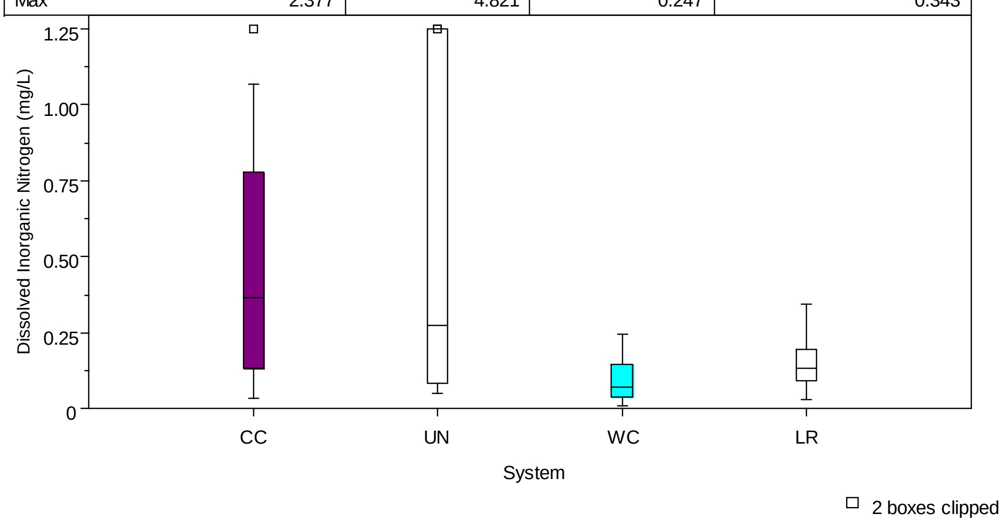
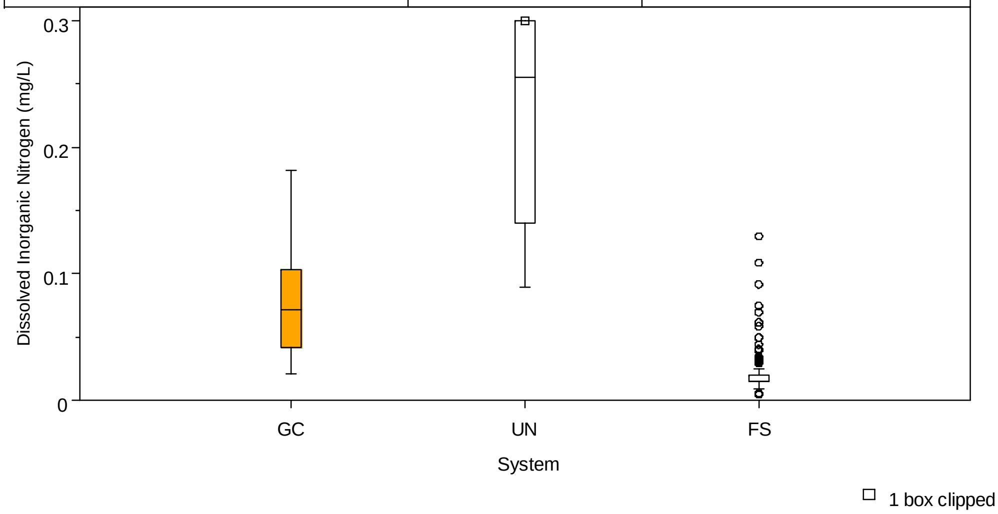


Figure A-11A: Box plots depicting dissolved inorganic nitrogen (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	23	8	135
Mean	0.07763	0.29875	0.022352
Q2	0.072	0.255	0.015
Min	0.021	0.09	0.005
Max	0.182	0.3	0.13



Watershed=Terra Ceia Bay

Statistics by System			
N	19	10	2
Mean	0.362368	0.22	0.095
Q2	0.26	0.1425	0.095
Min	0.09	0.06	0.06
Max	1.1	0.86	0.13

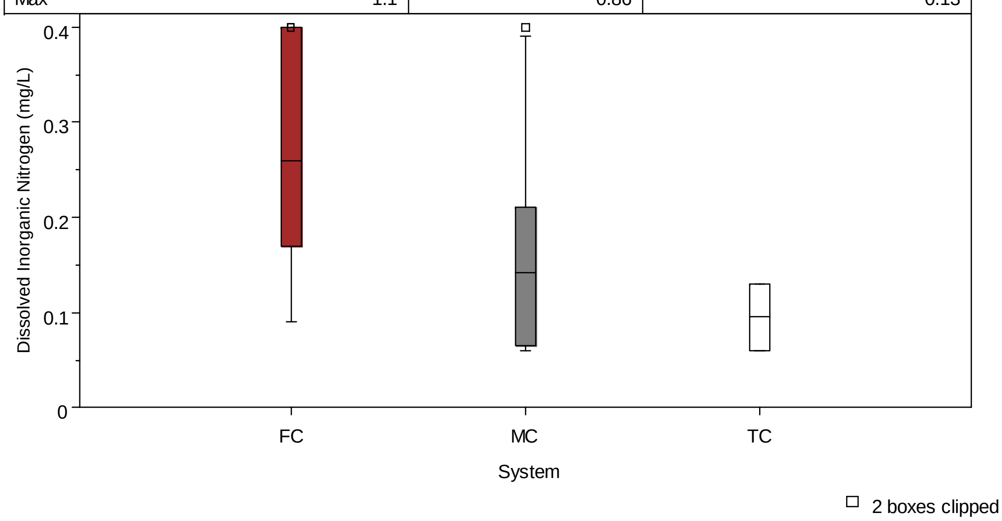
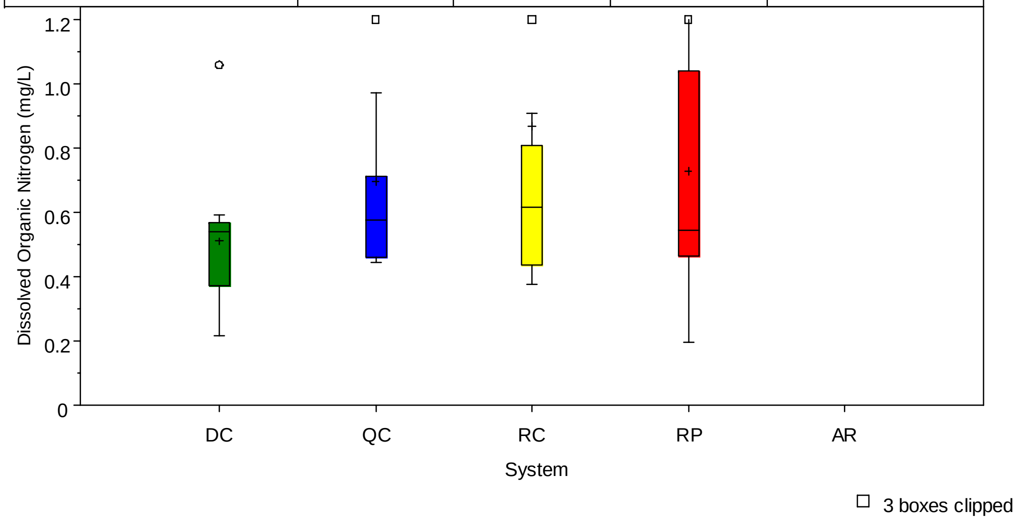


Figure A-11B: Box plots depicting dissolved inorganic nitrogen (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System

N	12	12	12	12	0
Mean	0.511417	0.696333	0.86925	0.729583	.
Q2	0.5395	0.57675	0.615	0.546	.
Min	0.216	0.4425	0.378	0.196	.
Max	1.06	1.8605	2.676	1.2	.



Watershed=Little Manatee River

Statistics by System

N	24	0	24	0
Mean	0.738896	.	0.597625	.
Q2	0.6565	.	0.52	.
Min	0.34	.	0.296	.
Max	1.604	.	1	.

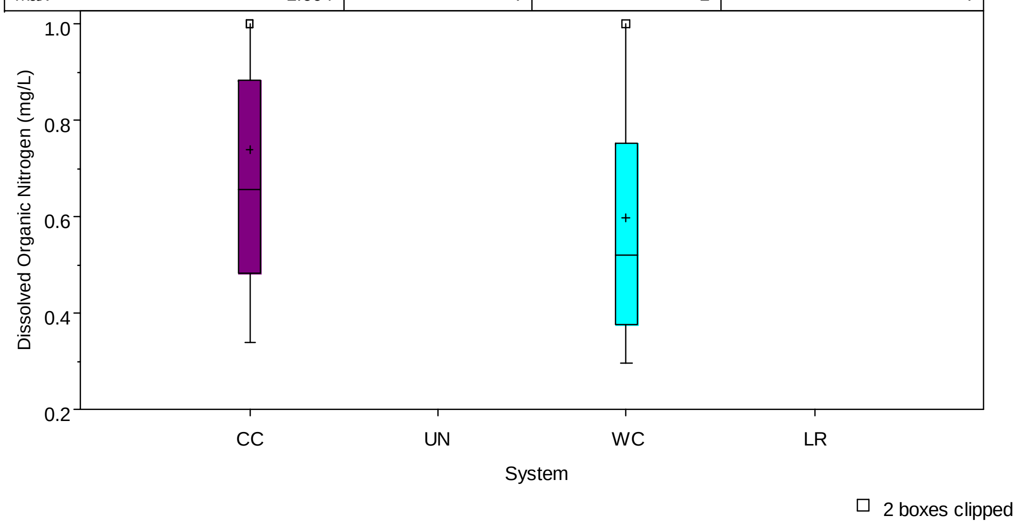


Figure A-12A: Box plots depicting dissolved organic nitrogen (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	23	0	0
Mean	0.591478	.	.
Q2	0.523	.	.
Min	0.286	.	.
Max	2.541	.	.

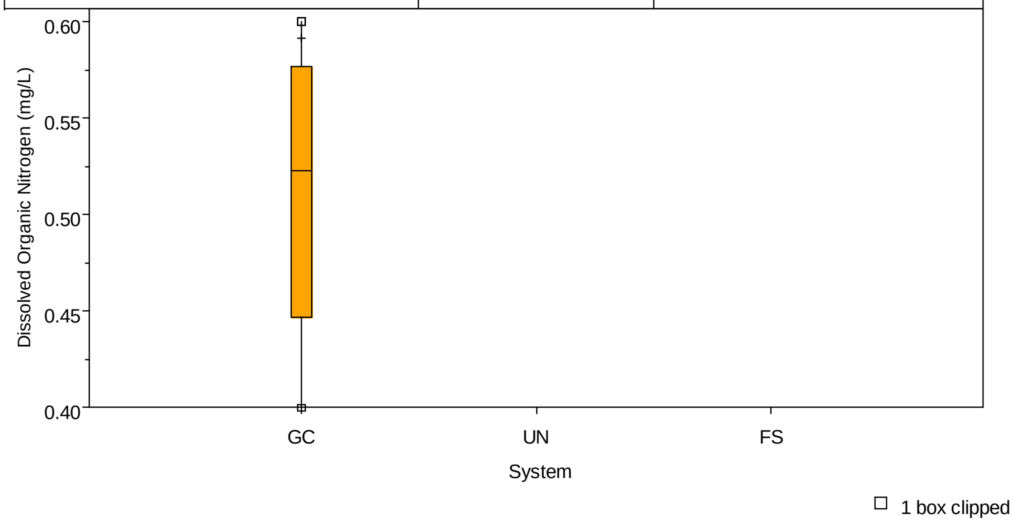
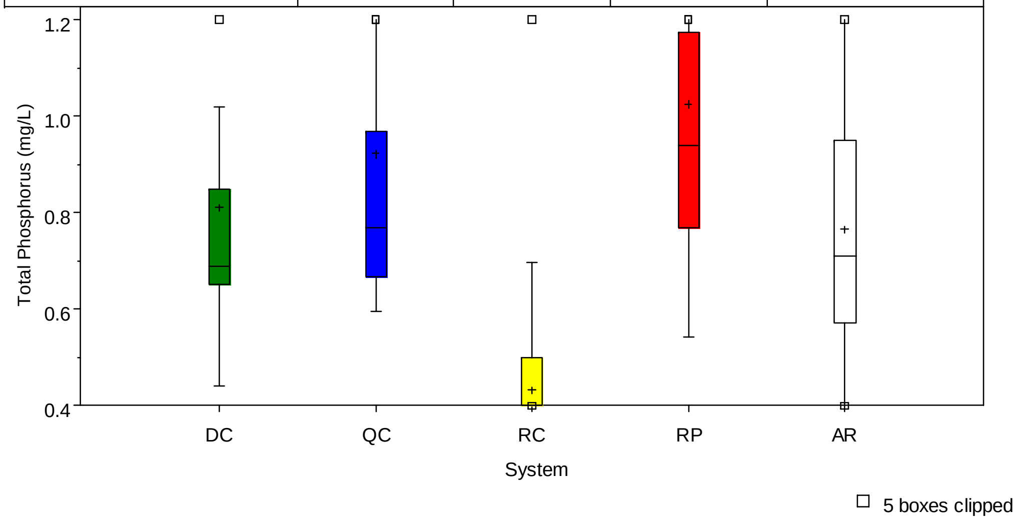


Figure A-12B: Box plots depicting dissolved organic nitrogen (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System

N	12	12	16	12	160
Mean	0.81025	0.9215	0.4315	1.02525	0.765206
Q2	0.6875	0.769	0.4	0.9385	0.71
Min	0.439	0.594	0.181	0.541	0.4
Max	1.957	2.0795	1.43	2.087	1.2



Watershed=Little Manatee River

Statistics by System

N	28	7	28	12
Mean	0.706839	0.482714	0.342321	0.2755
Q2	0.73375	0.303	0.3405	0.263
Min	0.292	0.241	0.184	0.163
Max	0.8	0.8	0.568	0.488

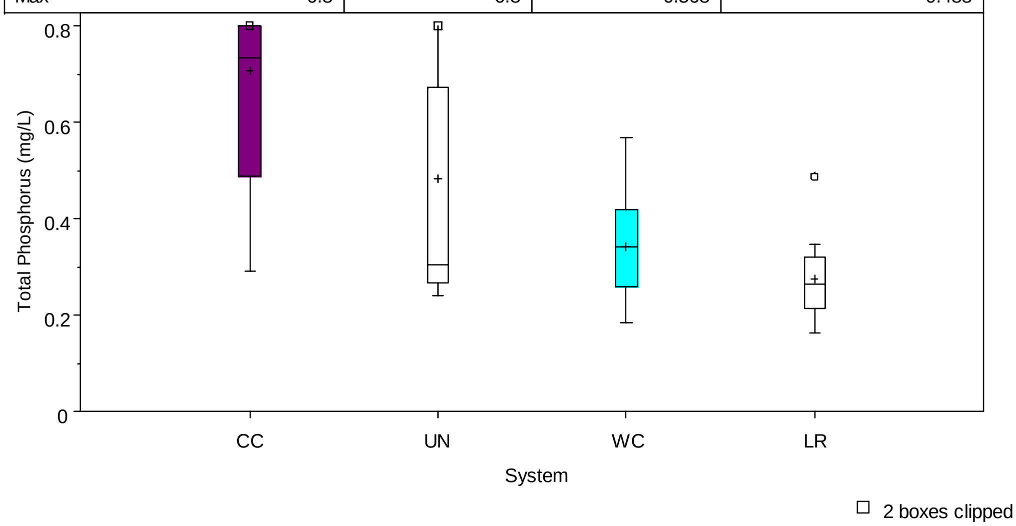
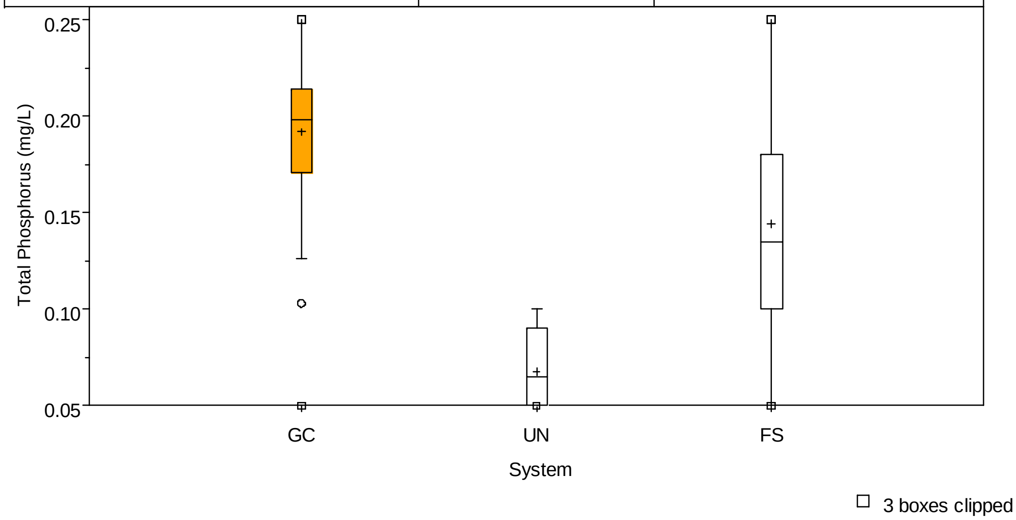


Figure A-13A: Box plots depicting total phosphorus (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System

N	23	8	137
Mean	0.191913	0.0675	0.144131
Q2	0.198	0.065	0.135
Min	0.011	0.05	0.02
Max	0.299	0.1	0.37



Watershed=Terra Ceia Bay

Statistics by System

N	24	12	6
Mean	0.394375	0.477083	0.236667
Q2	0.33	0.31	0.22
Min	0.13	0.12	0.13
Max	0.88	1.67	0.36

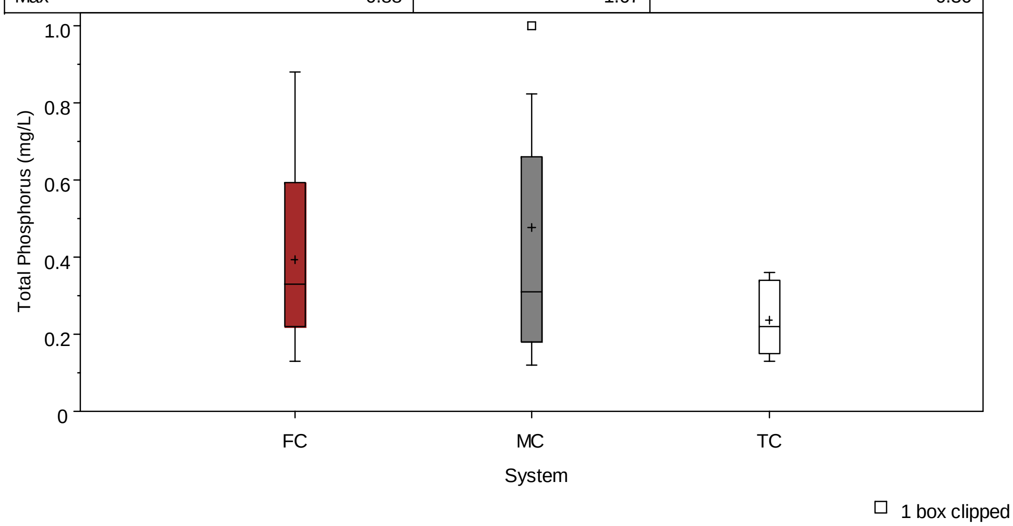
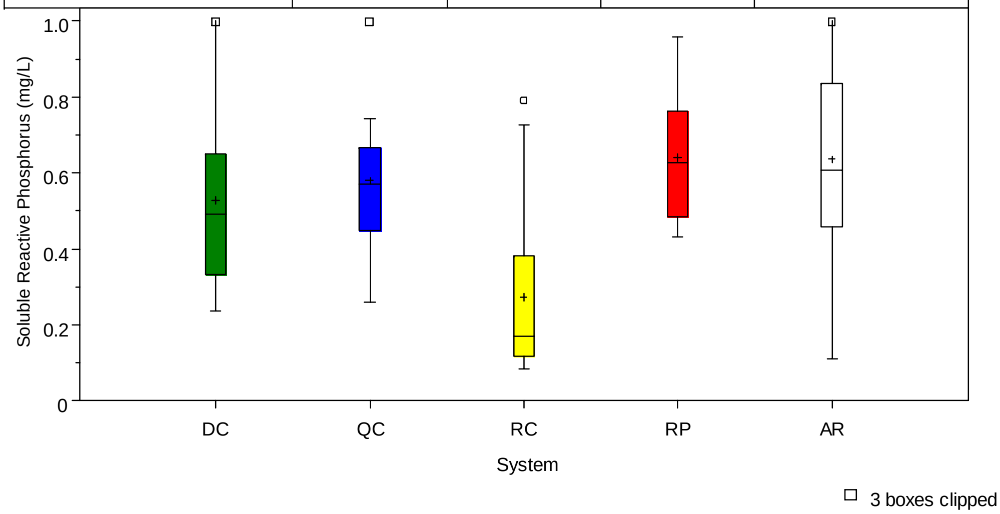


Figure A-13B: Box plots depicting total phosphorus (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System

N	12	12	16	12	160
Mean	0.5295	0.580542	0.273	0.642	0.636006
Q2	0.49	0.57	0.17	0.6265	0.607
Min	0.236	0.26	0.085	0.431	0.11
Max	1	1.0835	0.792	0.96	1



Watershed=Little Manatee River

Statistics by System

N	28	7	28	12
Mean	0.551196	0.319286	0.262214	0.220333
Q2	0.537	0.266	0.2425	0.209
Min	0.15	0.072	0.16	0.13
Max	0.6	0.525	0.455	0.388

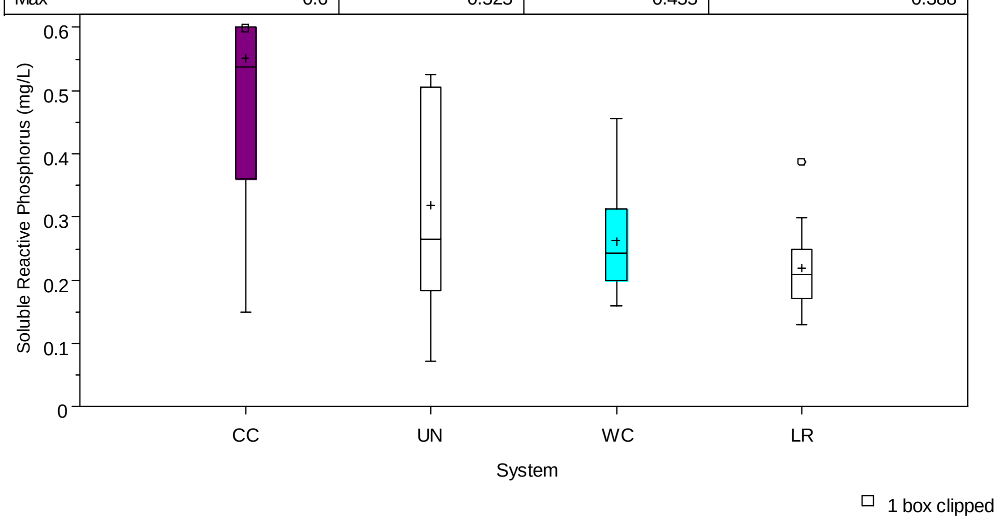
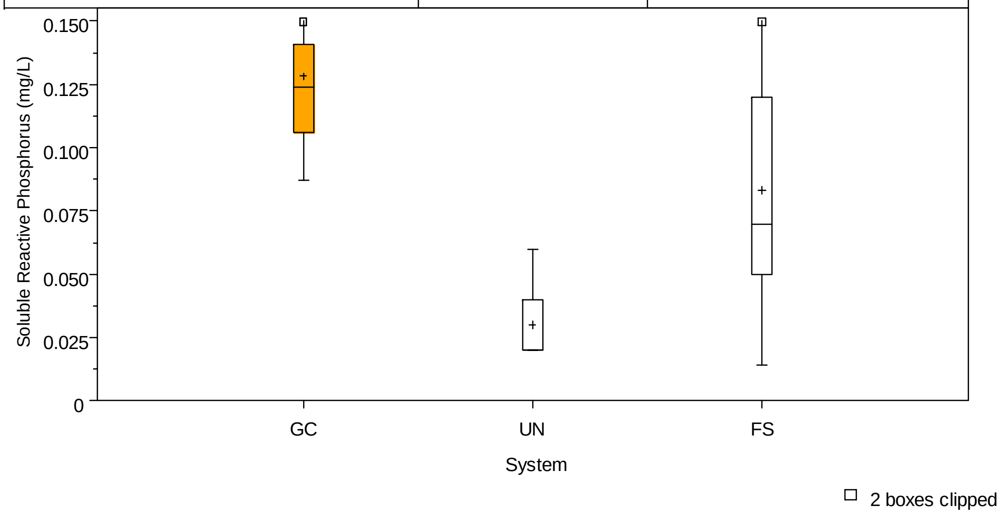


Figure A-14A: Box plots depicting soluble reactive phosphorus (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	23	8	137
Mean	0.128261	0.03	0.083226
Q2	0.124	0.02	0.07
Min	0.087	0.02	0.014
Max	0.23	0.06	0.15



Watershed=Terra Ceia Bay

Statistics by System			
N	24	12	0
Mean	0.3225	0.350417	.
Q2	0.2675	0.24	.
Min	0.1	0.08	.
Max	0.66	0.8	.

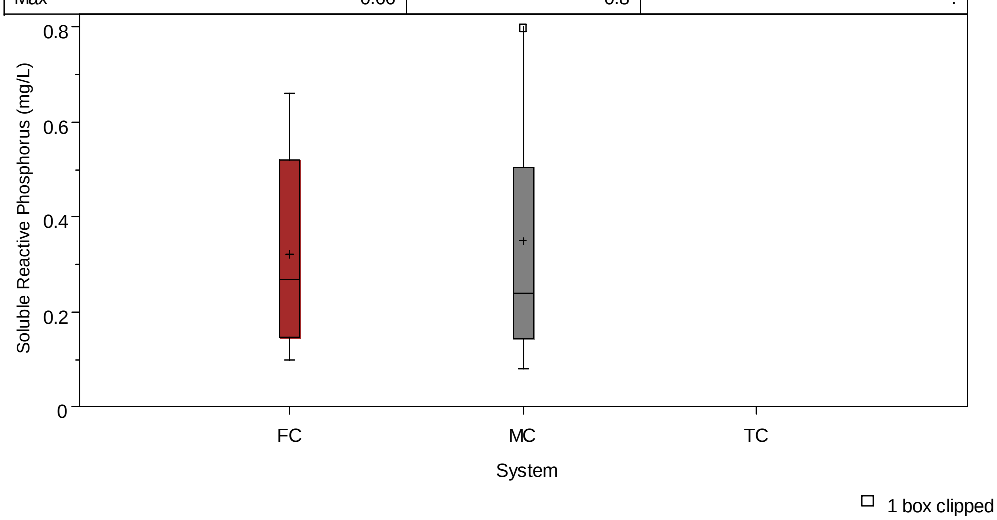
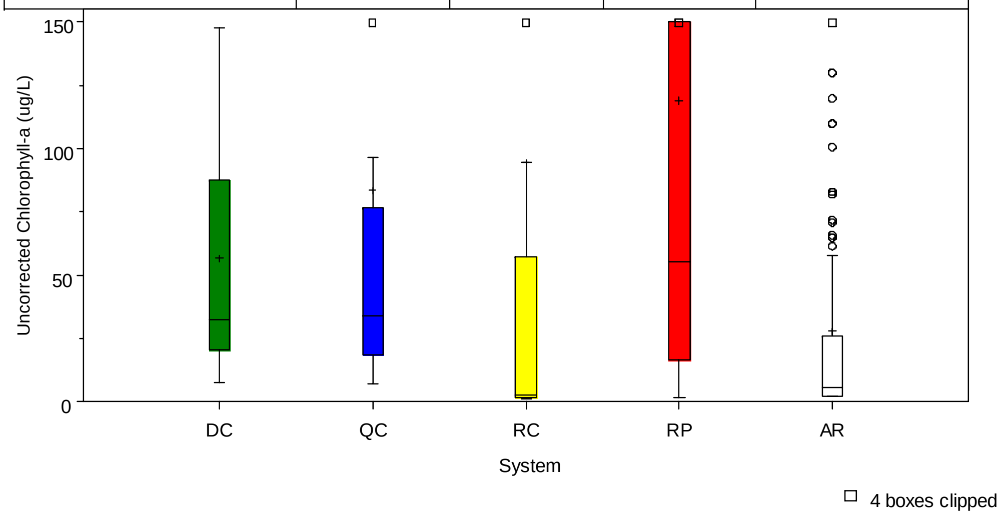


Figure A-14B: Box plots depicting soluble reactive phosphorus (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System

	DC	QC	RC	RP	AR
N	12	12	16	12	160
Mean	56.78333	83.53333	94.43125	119.0667	27.87937
Q2	32.7	34.175	2.5	55.5	5.9
Min	7.7	6.95	1.2	1.9	2
Max	147.9	546.5	650.8	529.5	315.3



Watershed=Little Manatee River

Statistics by System

	CC	UN	WC	LR
N	28	7	28	12
Mean	20	7.385714	14.7	3.758333
Q2	9.15	3.7	13.6	3.55
Min	0.5	1.8	0.8	1.8
Max	217.1	27.4	40.4	7.6

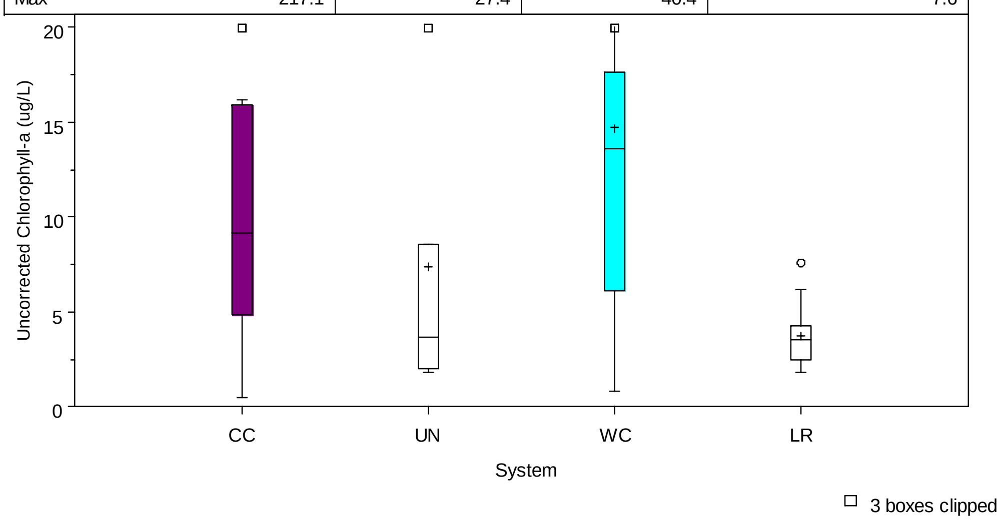
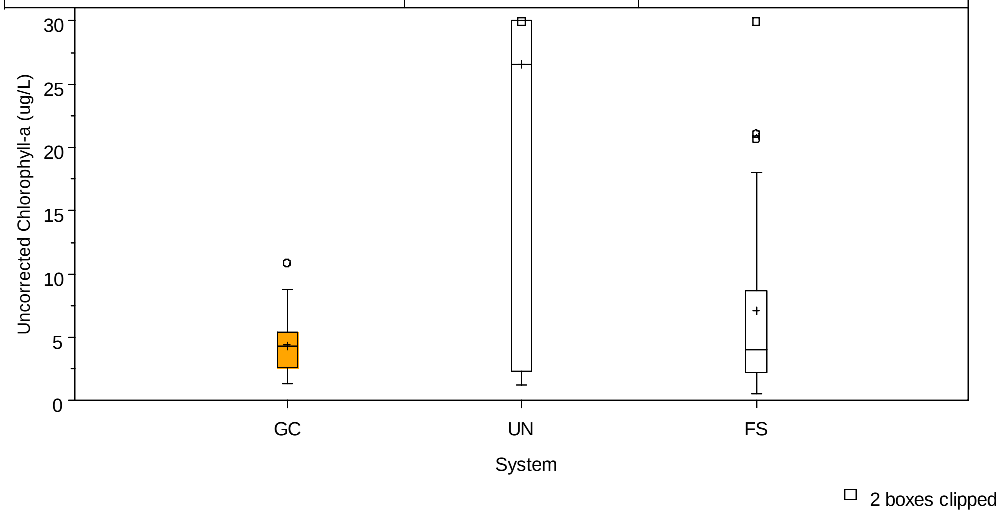


Figure A-15A: Box plots depicting uncorrected chlorophyll-a (μg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System

N	23	7	137
Mean	4.369565	26.61429	7.113869
Q2	4.3	26.6	4
Min	1.3	1.2	0.5
Max	10.9	30	65.8



Watershed=Terra Ceia Bay

Statistics by System

N	22	12	12
Mean	9.690909	10.45667	5.85
Q2	7.75	7.2	3.45
Min	2	2.7	1.2
Max	29.3	40.3	20.3

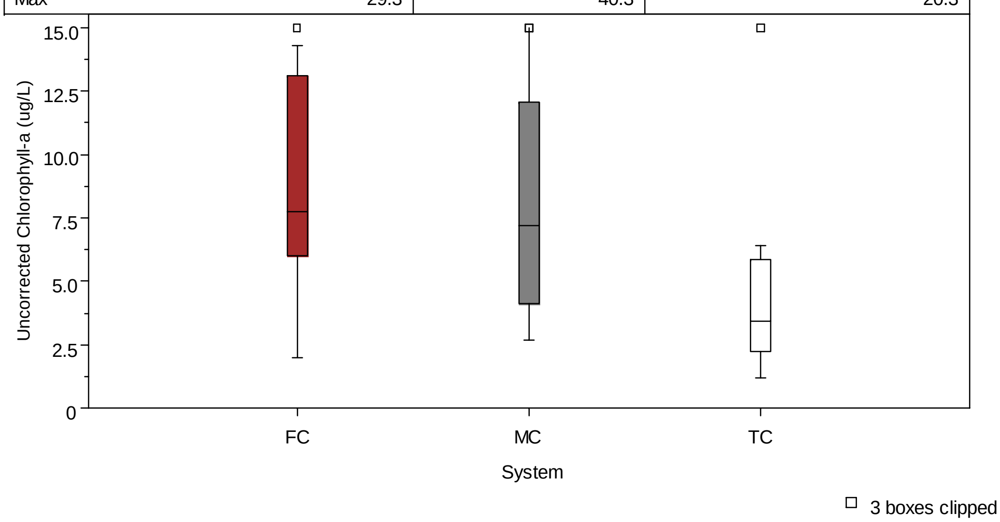
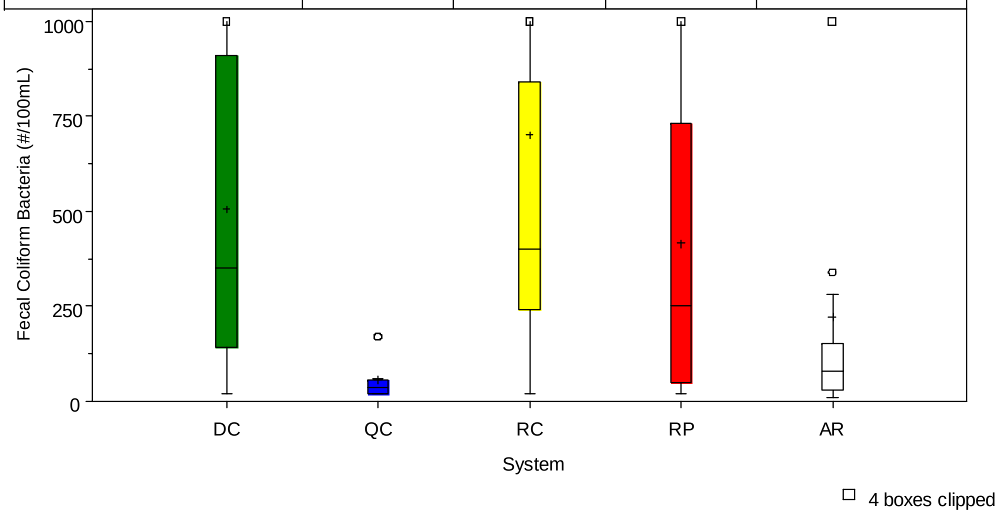


Figure A-15B: Box plots depicting uncorrected chlorophyll-a (µg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay. Values for FC and MC represent corrected chlorophyll-a concentrations.

Watershed=Alafia River

Statistics by System

N	12	12	16	12	23
Mean	505	56.66667	701.25	415	222.1739
Q2	350	35	400	250	80
Min	20	20	20	20	10
Max	1000	170	3500	1000	1700



Watershed=Little Manatee River

Statistics by System

N	28	7	28	12
Mean	321.0714	414.2857	308.5714	81.66667
Q2	270	400	290	20
Min	20	100	20	20
Max	1100	780	800	600

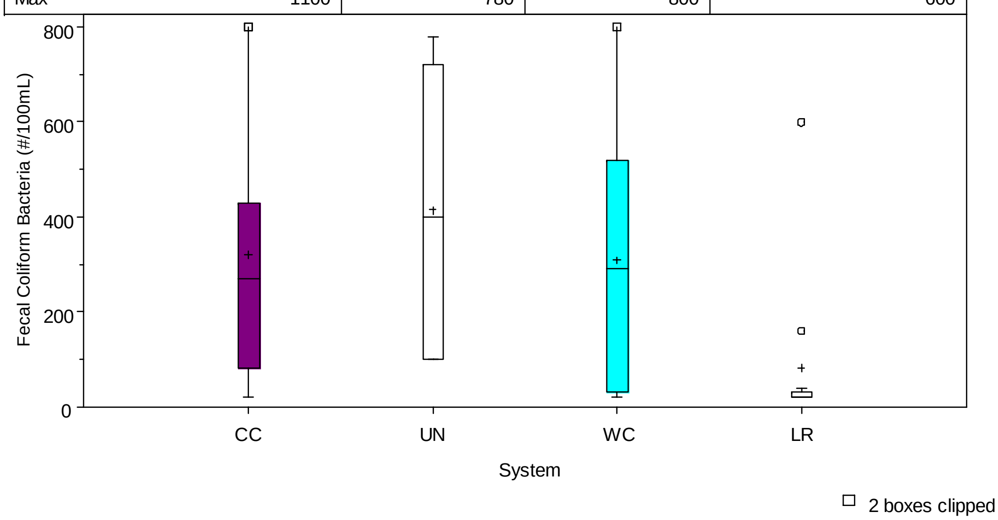
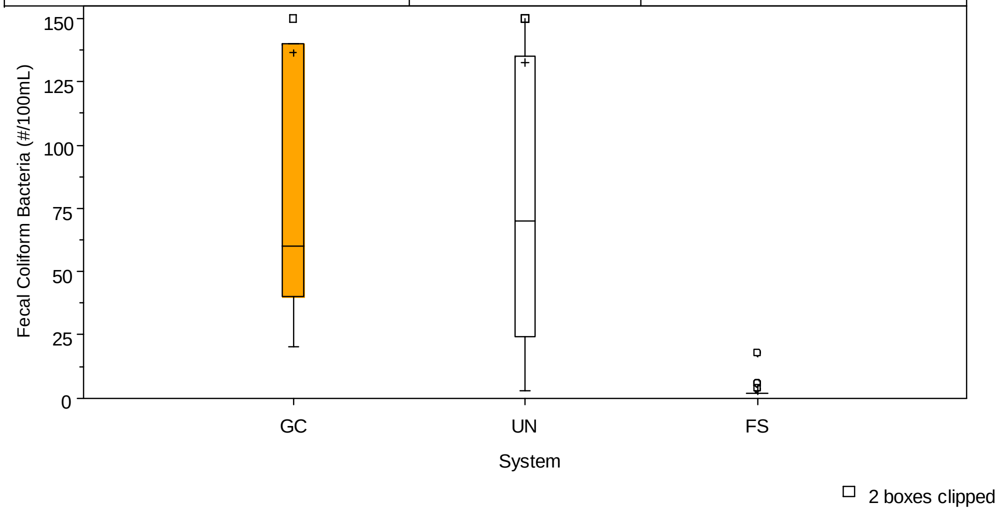


Figure A-16A: Box plots depicting fecal coliform (# of col./100mL) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	23	8	30
Mean	136.5217	132.625	2.866667
Q2	60	70	2
Min	20	3	2
Max	580	600	18



Watershed=Terra Ceia Bay

Statistics by System			
N	20	11	0
Mean	58.5	500	.
Q2	24.5	275	.
Min	3	22	.
Max	310	3350	.

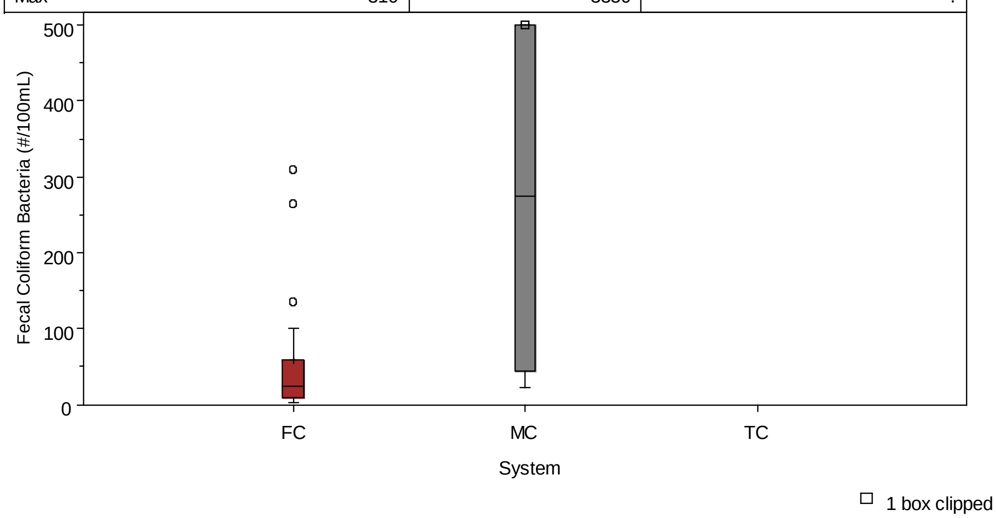
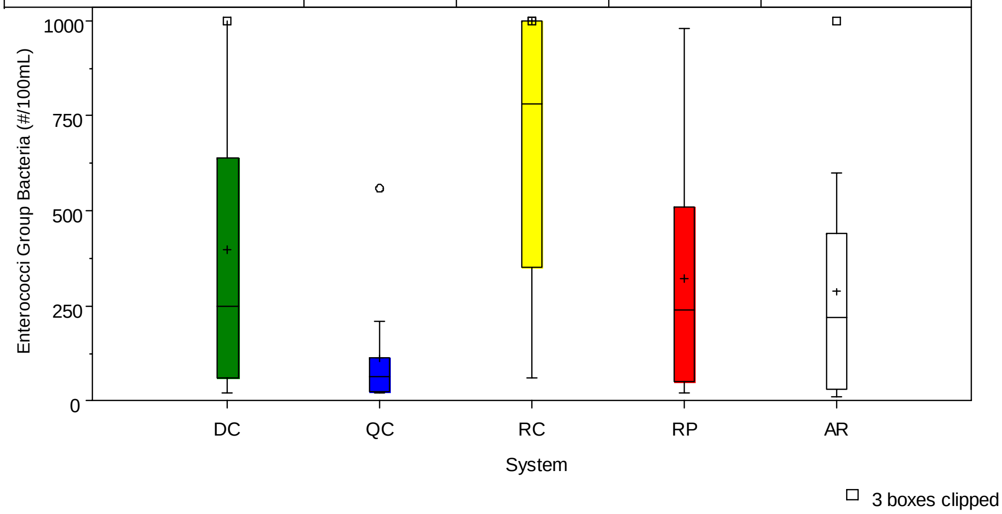


Figure A-16B: Box plots depicting fecal coliform (# of col./100mL) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

Watershed=Alafia River

Statistics by System					
N	12	12	16	12	23
Mean	398.3333	112.5	998.75	321.6667	287.8261
Q2	250	65	780	240	220
Min	20	20	60	20	10
Max	1000	560	3600	980	1700



Watershed=Little Manatee River

Statistics by System				
N	28	7	28	12
Mean	569.6429	711.4286	536.4286	253.3333
Q2	460	700	210	20
Min	20	100	20	20
Max	2700	1250	4000	2000

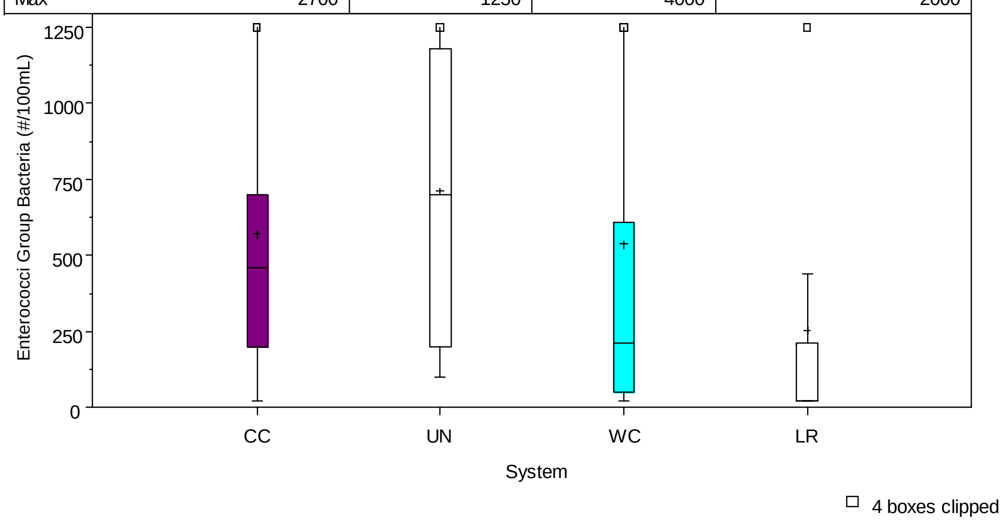
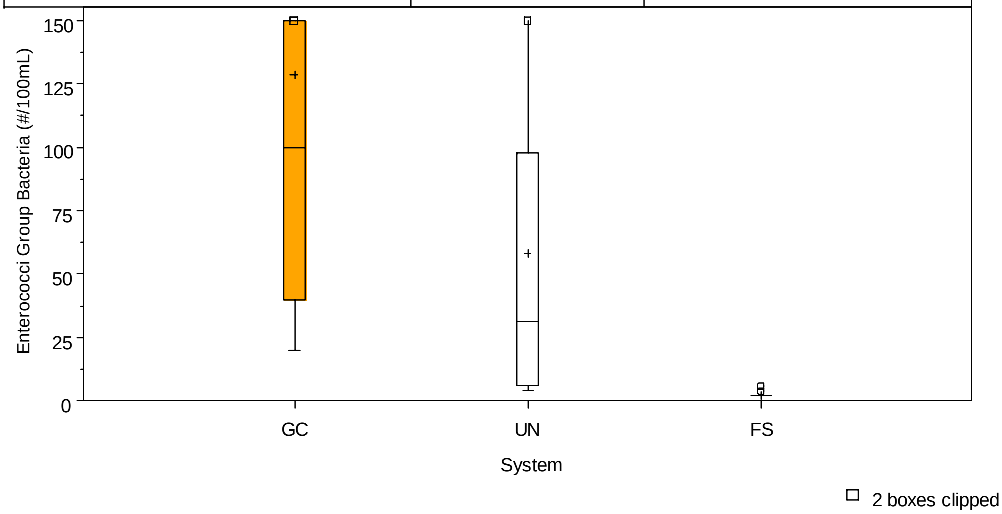


Figure A-17A: Box plots depicting enterococci group bacteria (# of col./100mL) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

Watershed=Feather Sound

Statistics by System			
N	23	8	30
Mean	128.6957	58.375	2.2
Q2	100	31.5	2
Min	20	4	2
Max	460	150	6



Watershed=Terra Ceia Bay

Statistics by System			
N	17	9	0
Mean	17.79412	150	.
Q2	9	150	.
Min	1	17.5	.
Max	82	2500	.

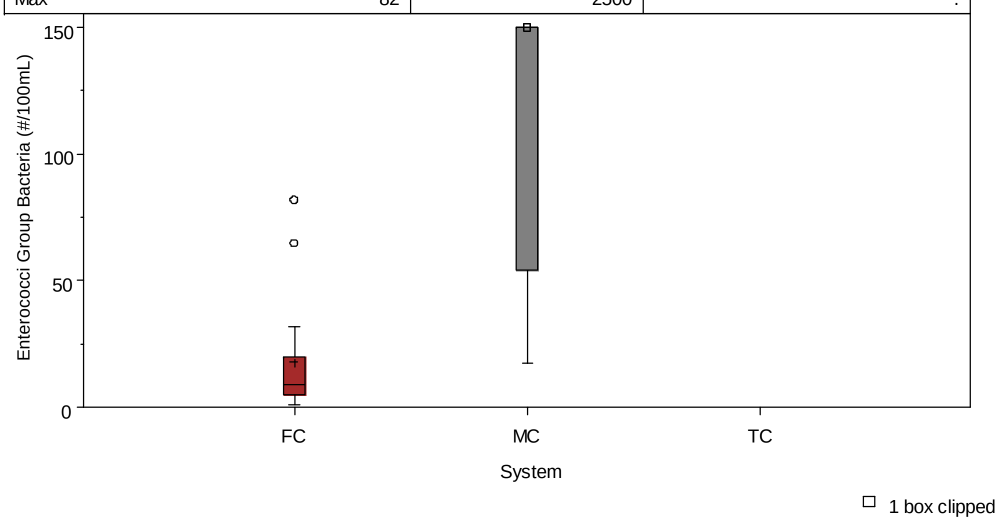


Figure A-17B: Box plots depicting enterococci group bacteria (# of col./100mL) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

APPENDIX B:

Monthly Scatter Plots of Water Quality Parameters within Tidal Tributary Watersheds

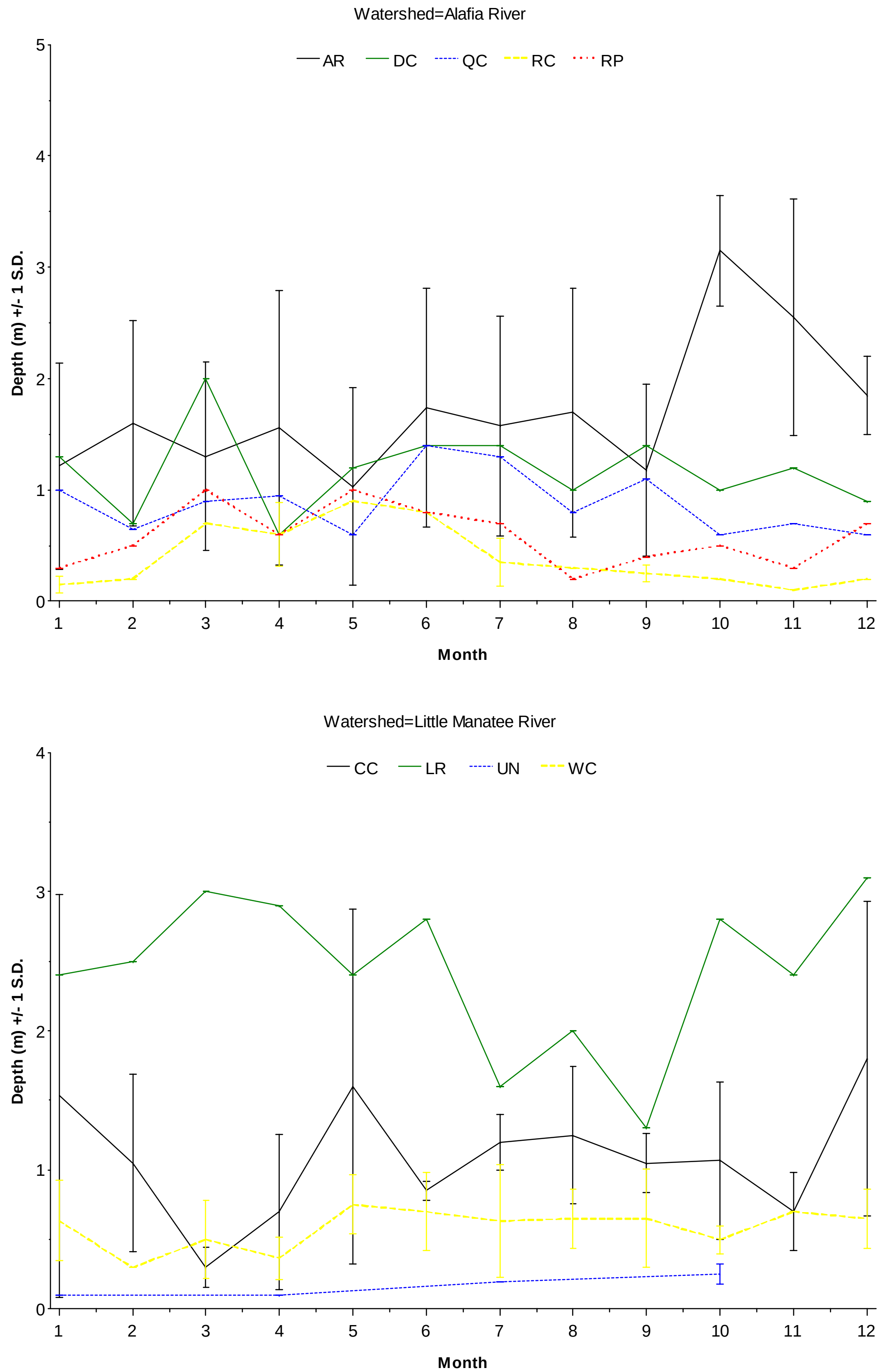


Figure B-1A: Monthly plots depicting total depth (m) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

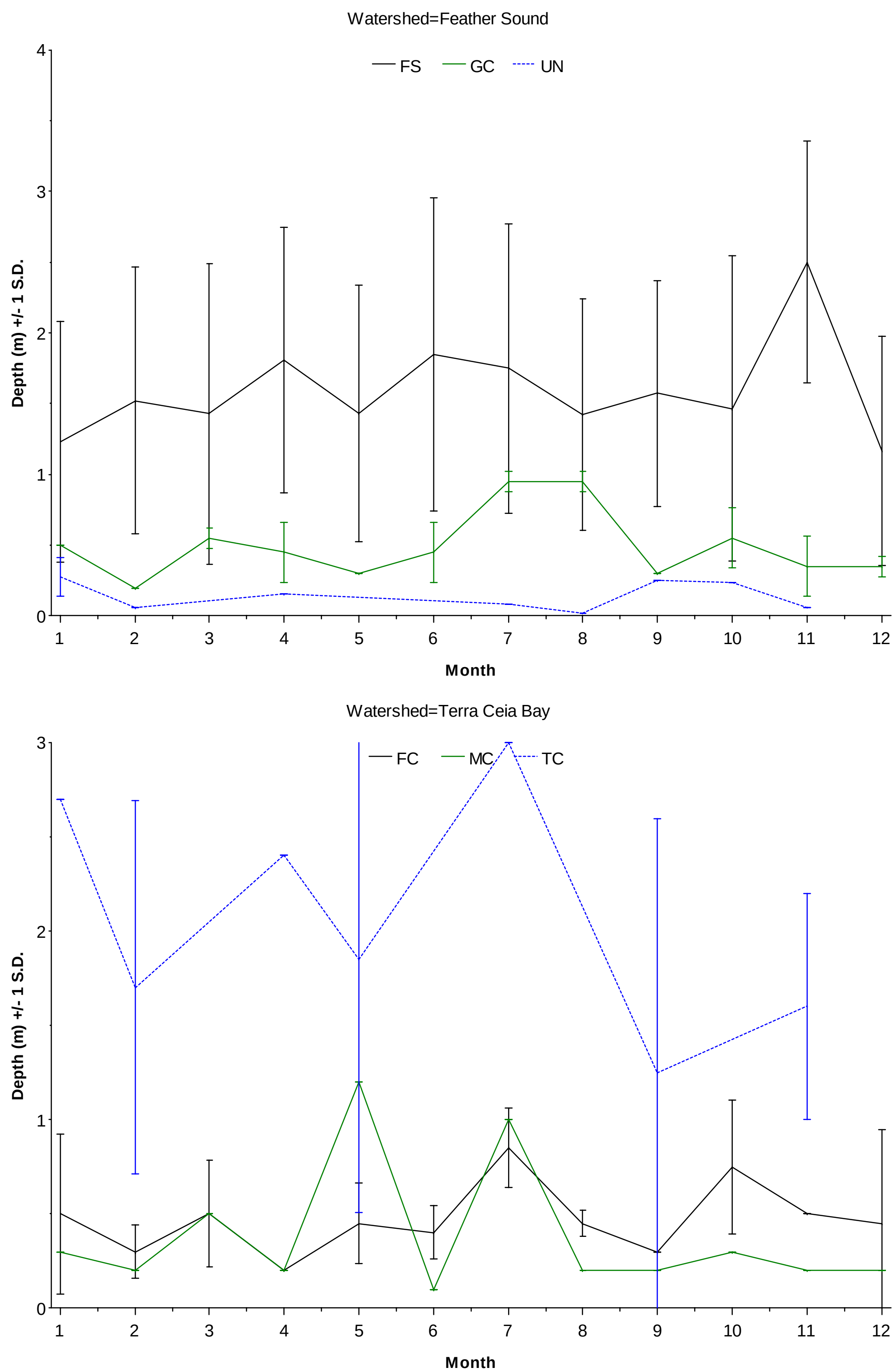
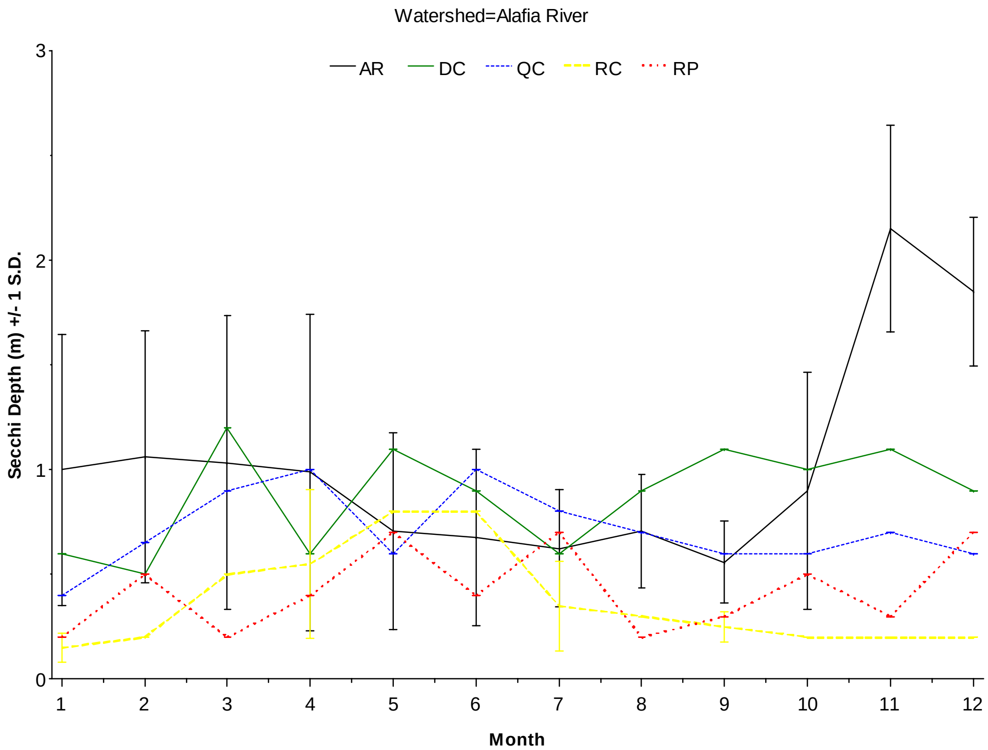


Figure B-1B: Monthly plots depicting total depth (m) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.



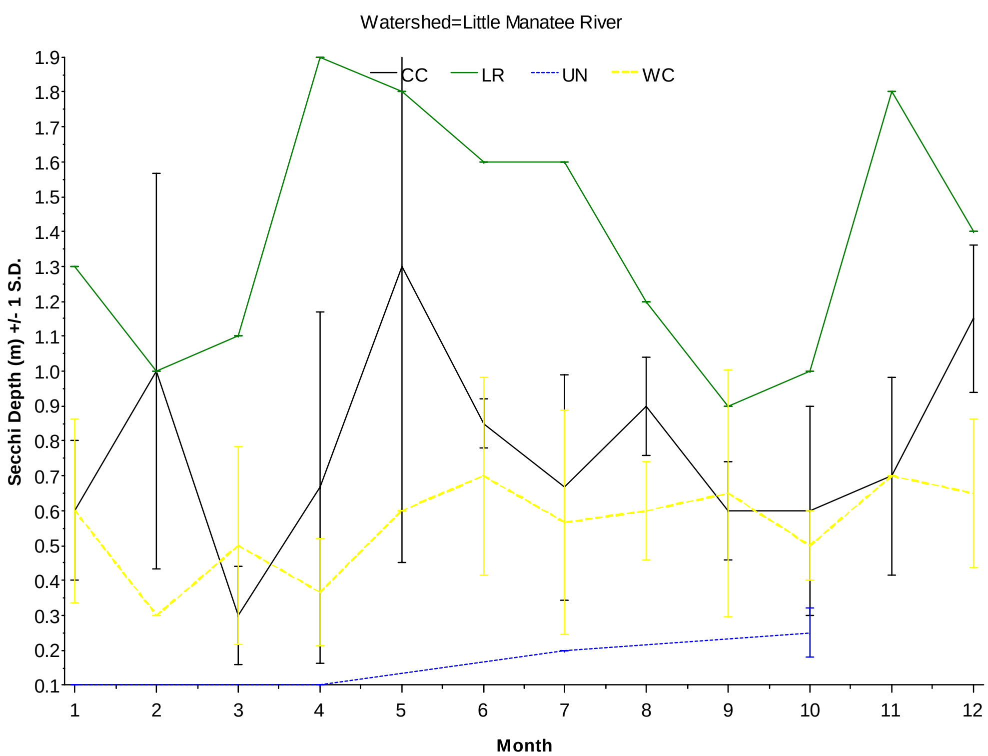
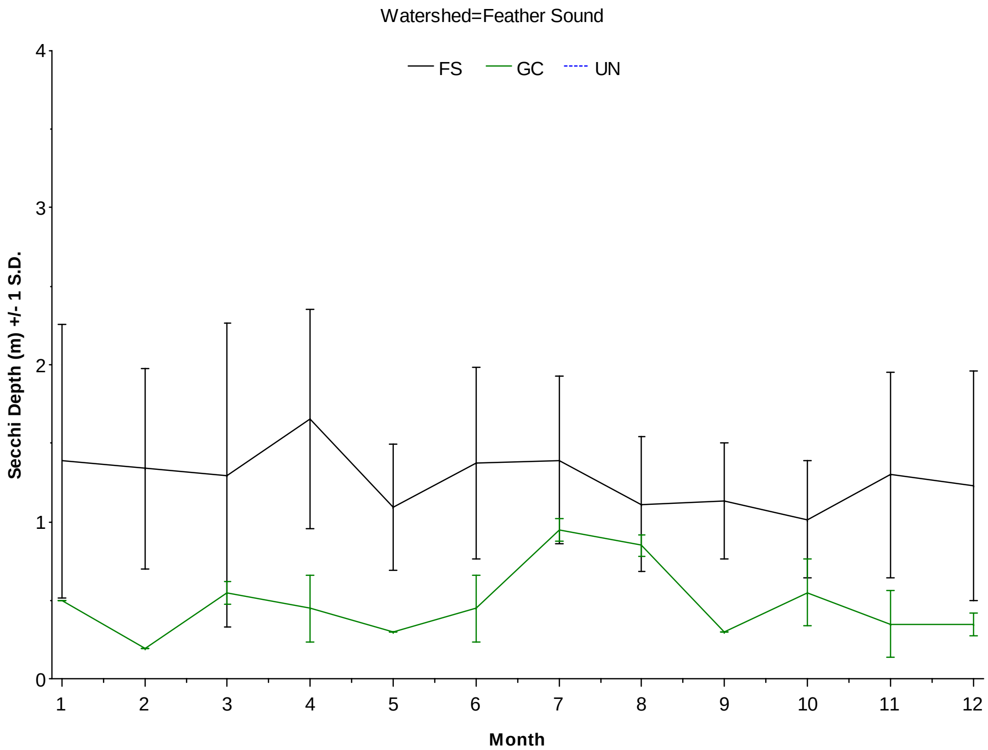


Figure B-2A: Monthly plots depicting secchi depth (m) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.



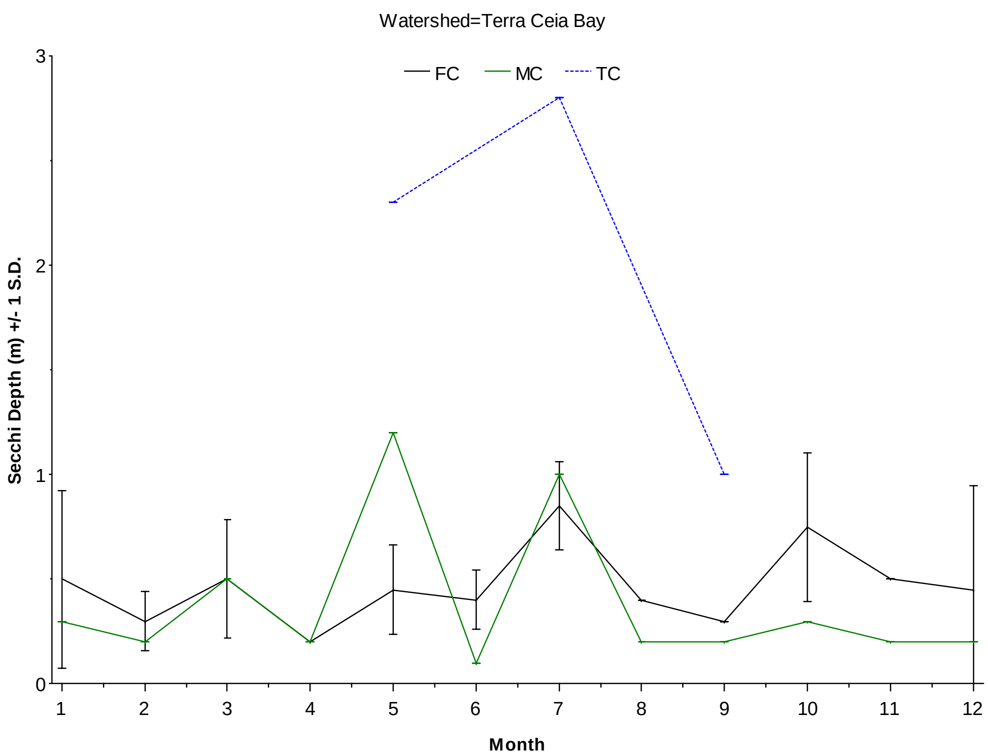


Figure B-2B: Monthly plots depicting secchi depth (m) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

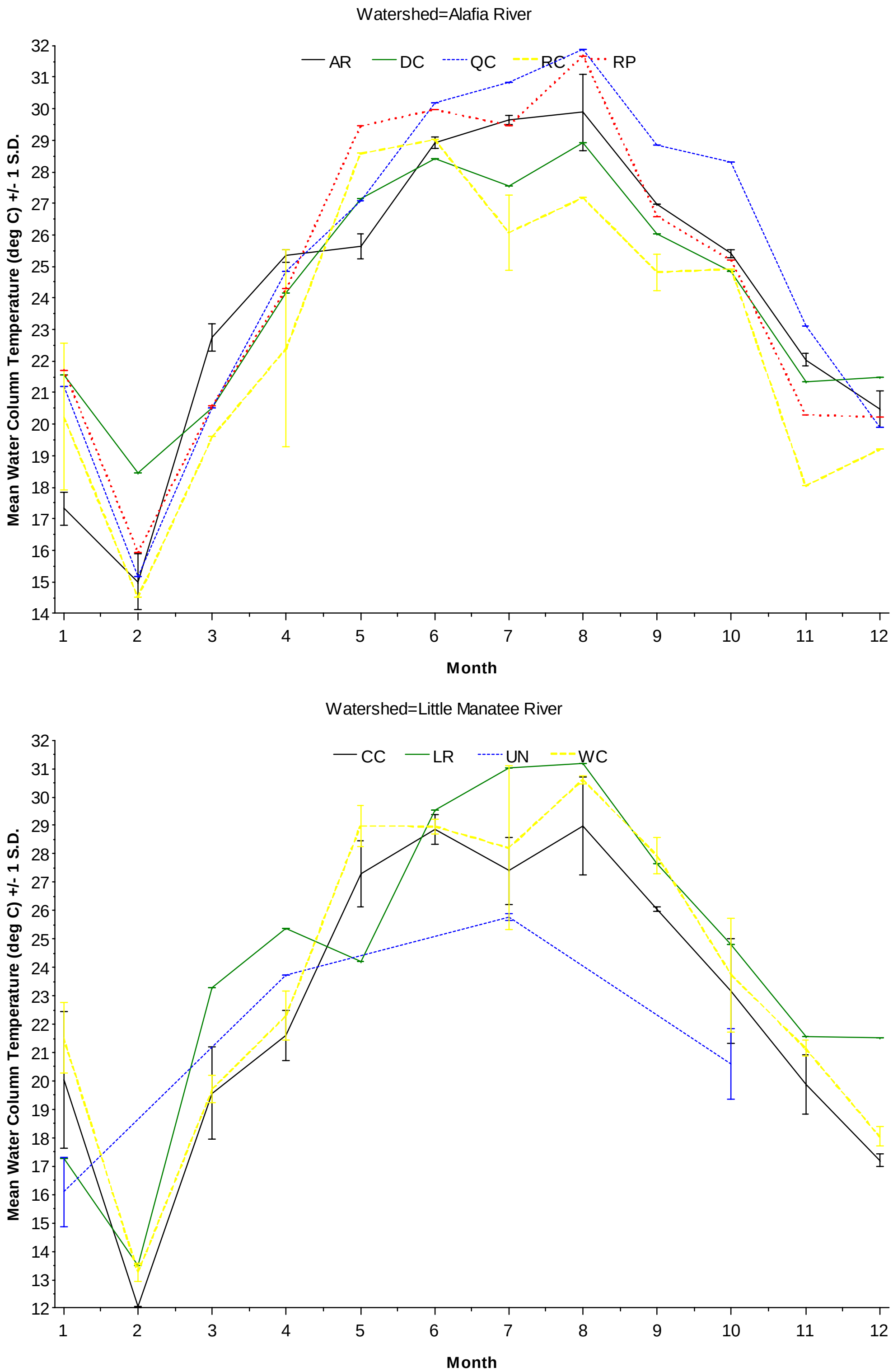
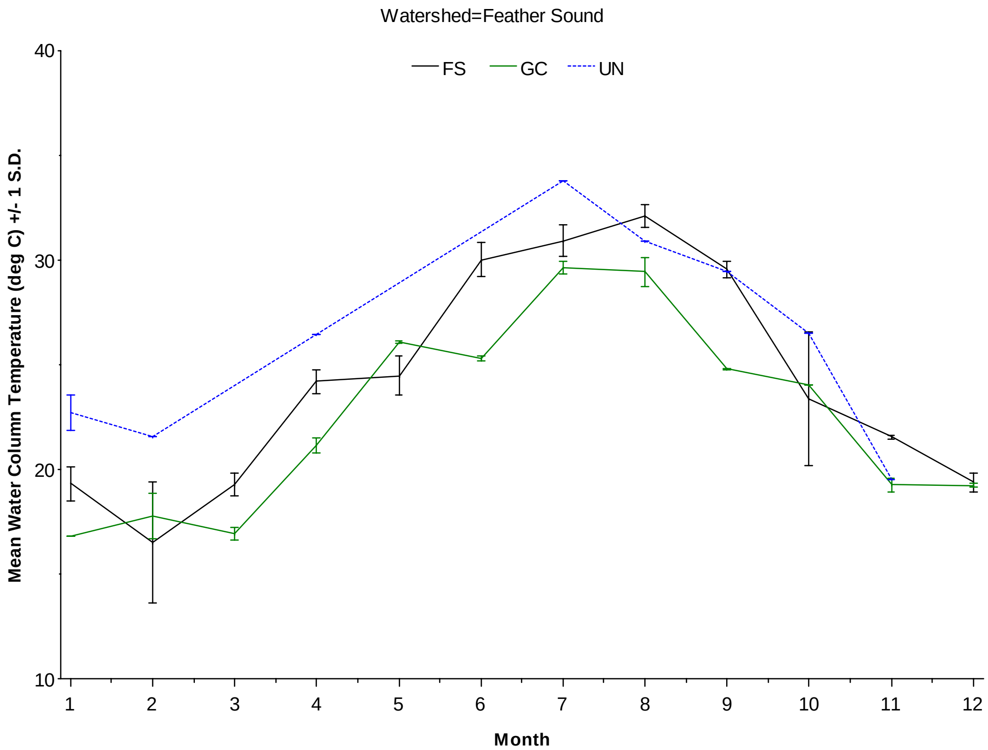


Figure B-3A: Monthly plots depicting mean water column temperature (^{o}C) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.



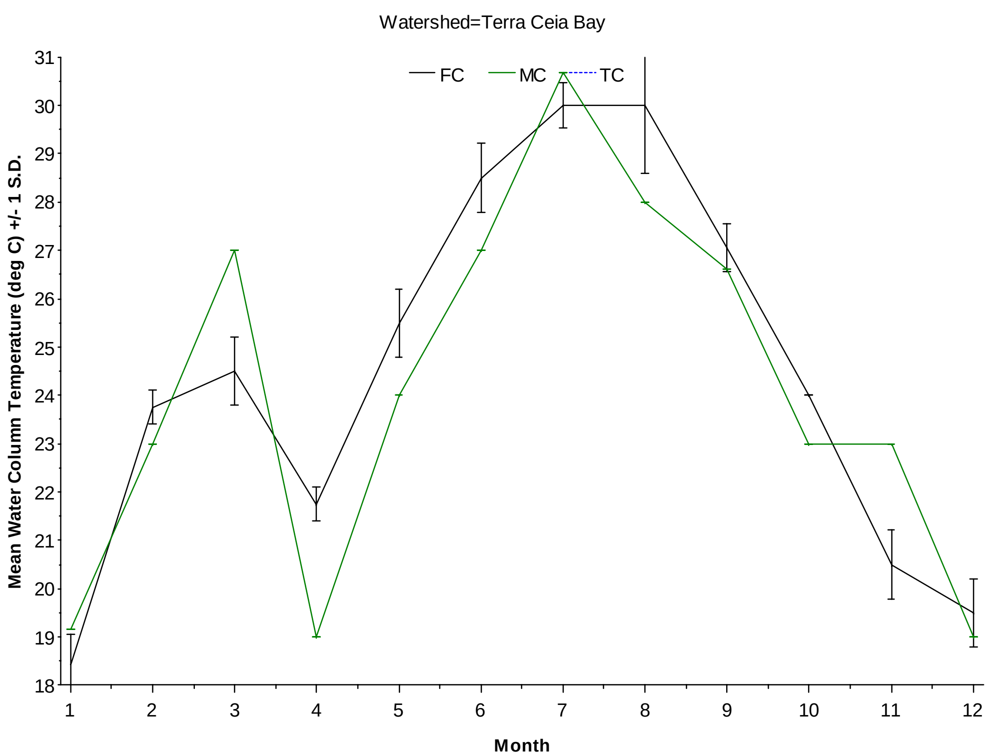
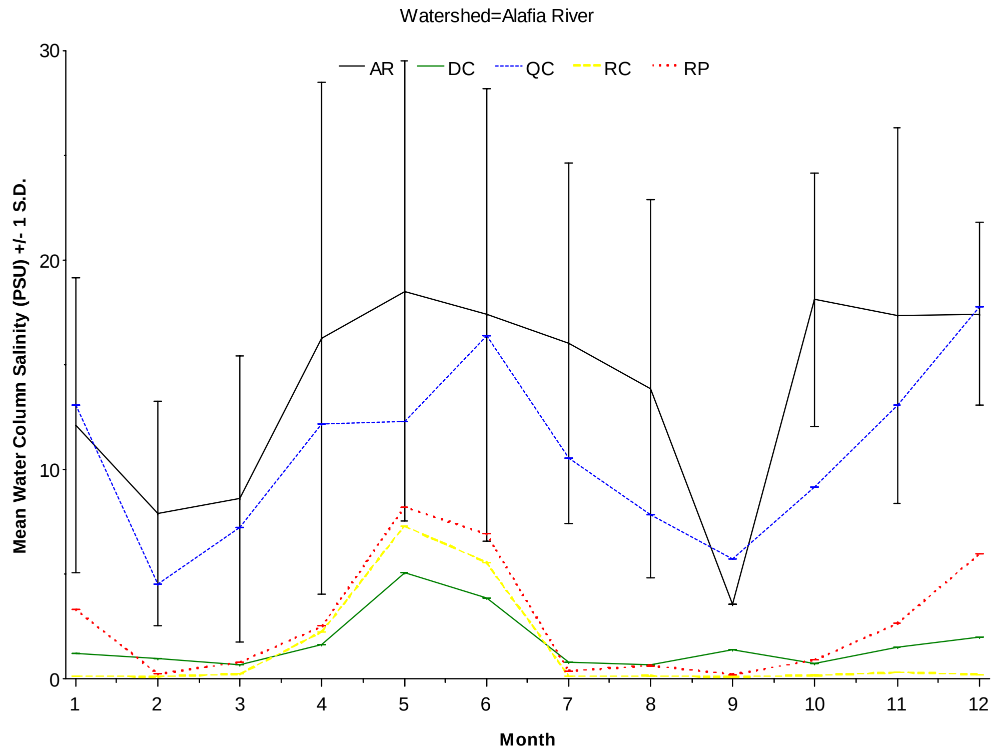


Figure B-3B: Monthly plots depicting mean water column temperature (^{o}C) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.



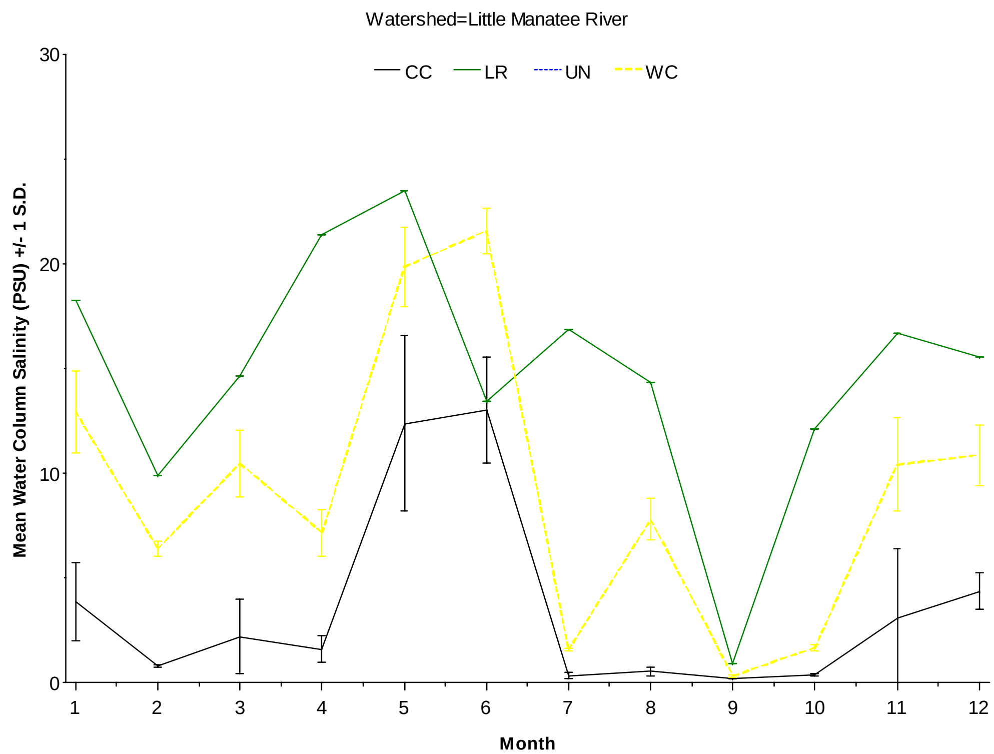


Figure B-4A: Monthly plots depicting mean water column salinity (PSU) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

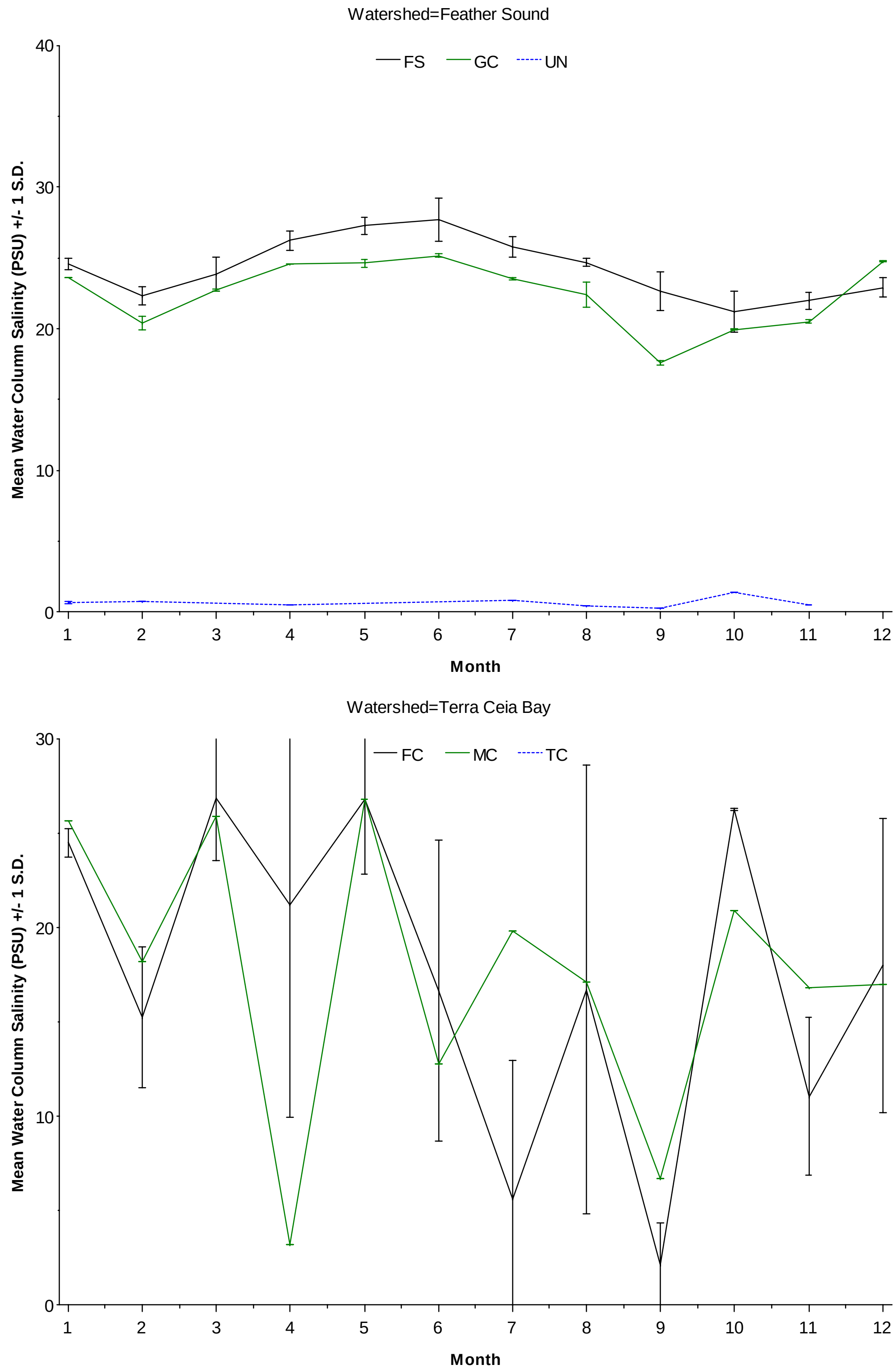
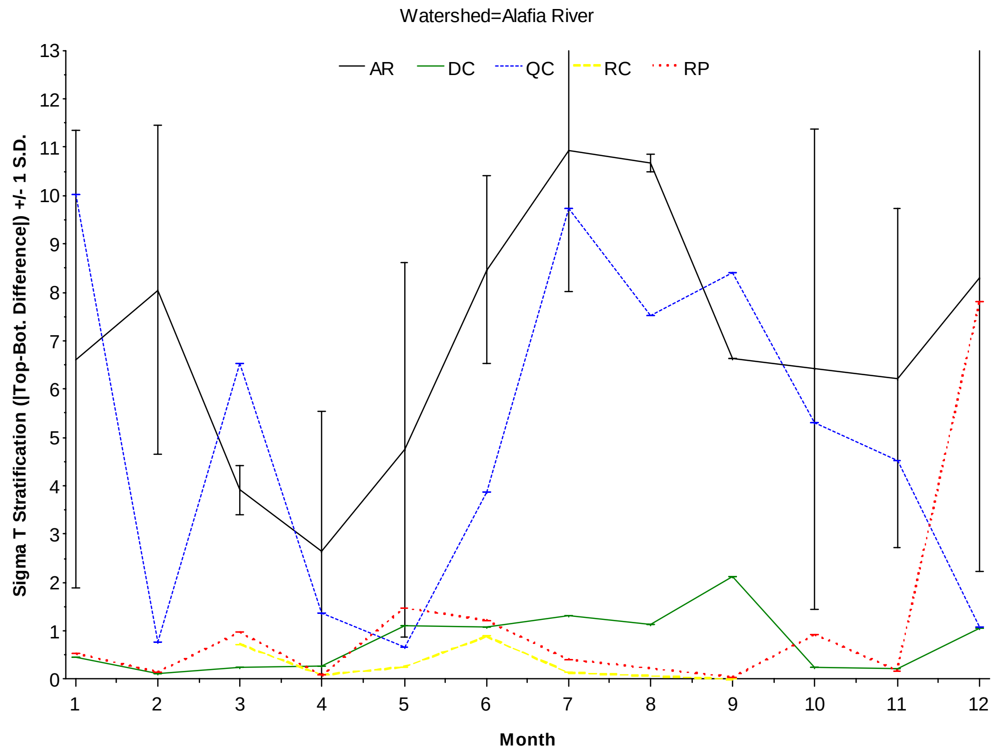


Figure B-4B: Monthly plots depicting mean water column salinity (PSU) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.



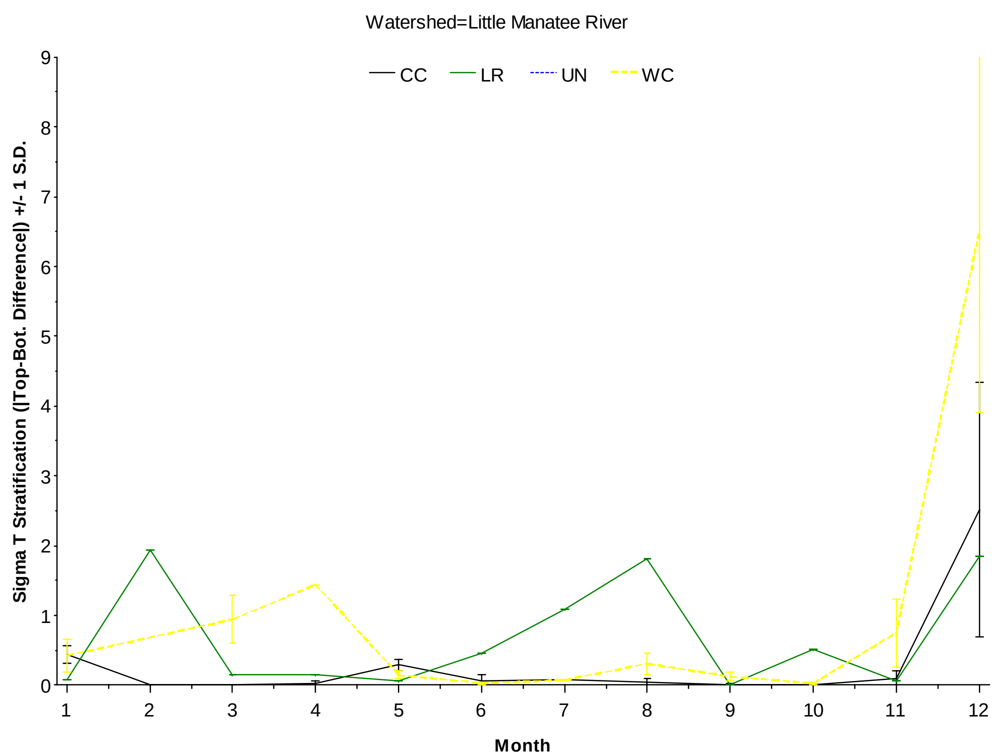
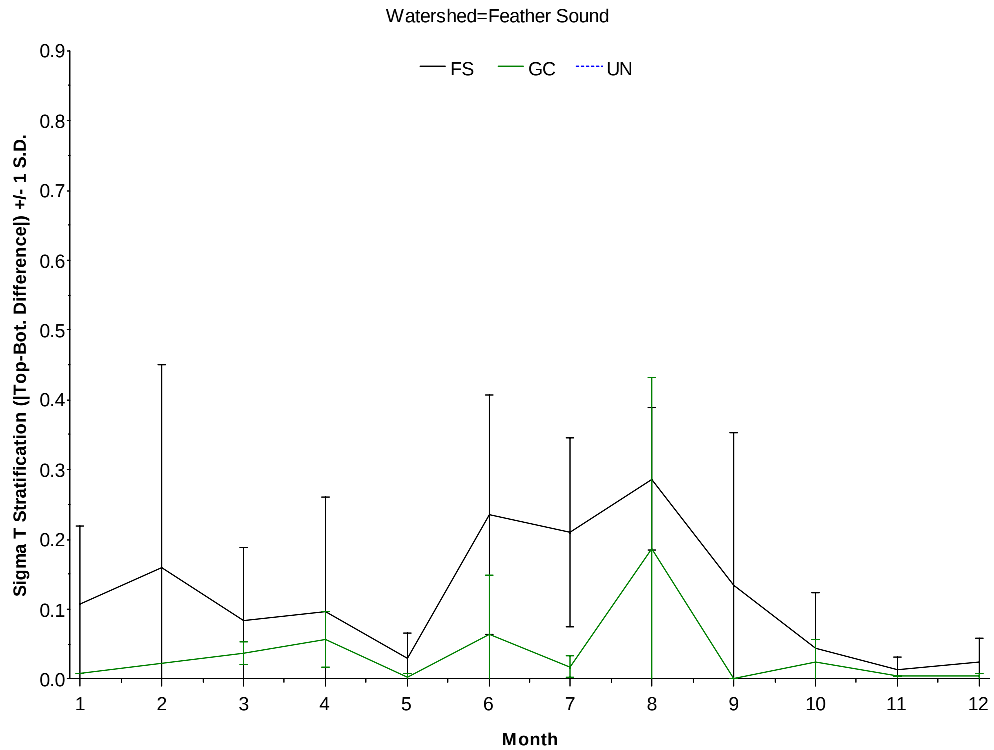


Figure B-5A: Monthly plots depicting water column stratification (Sigma T Surface-Bot. Difference) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.



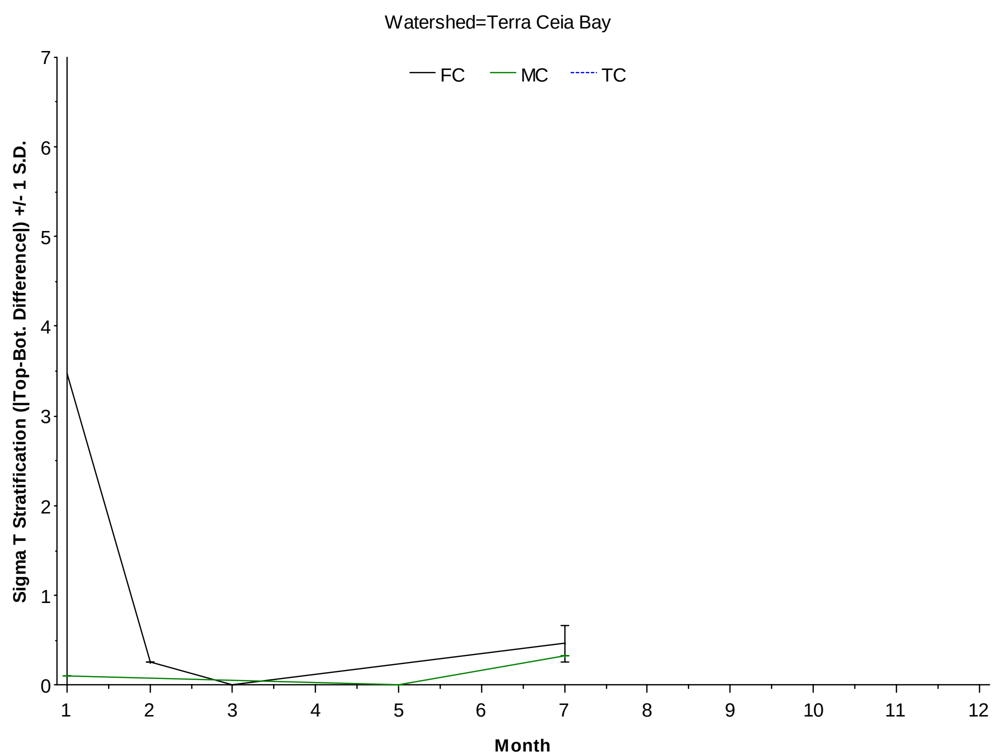
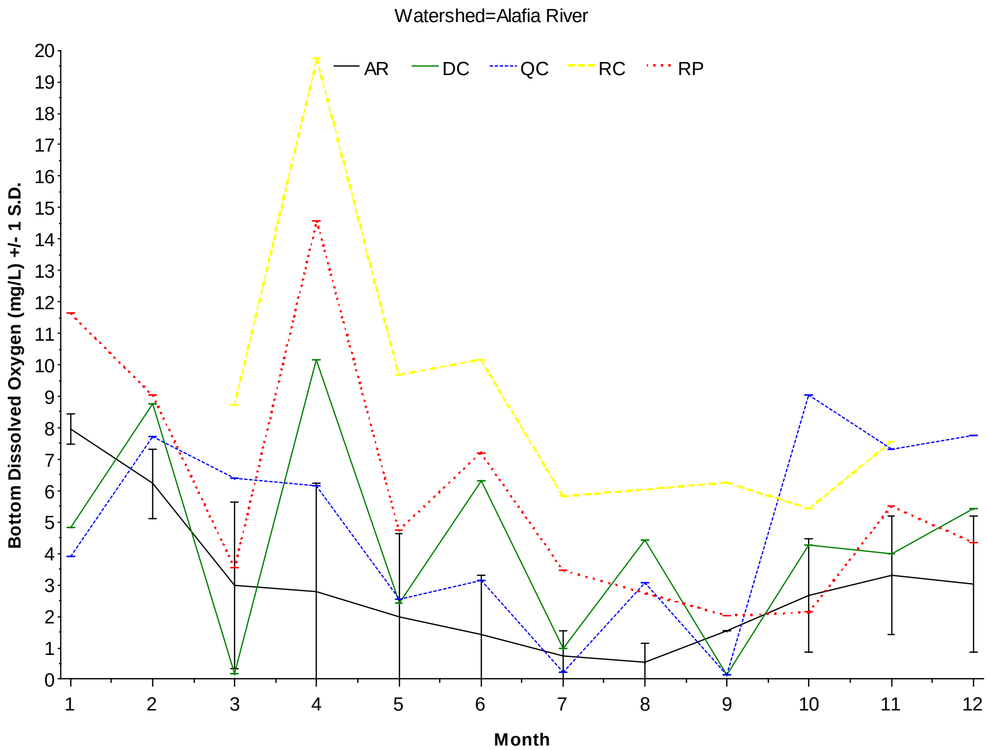


Figure B-5B: Monthly plots depicting water column stratification (Sigma T Surface-Bot. Difference) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.



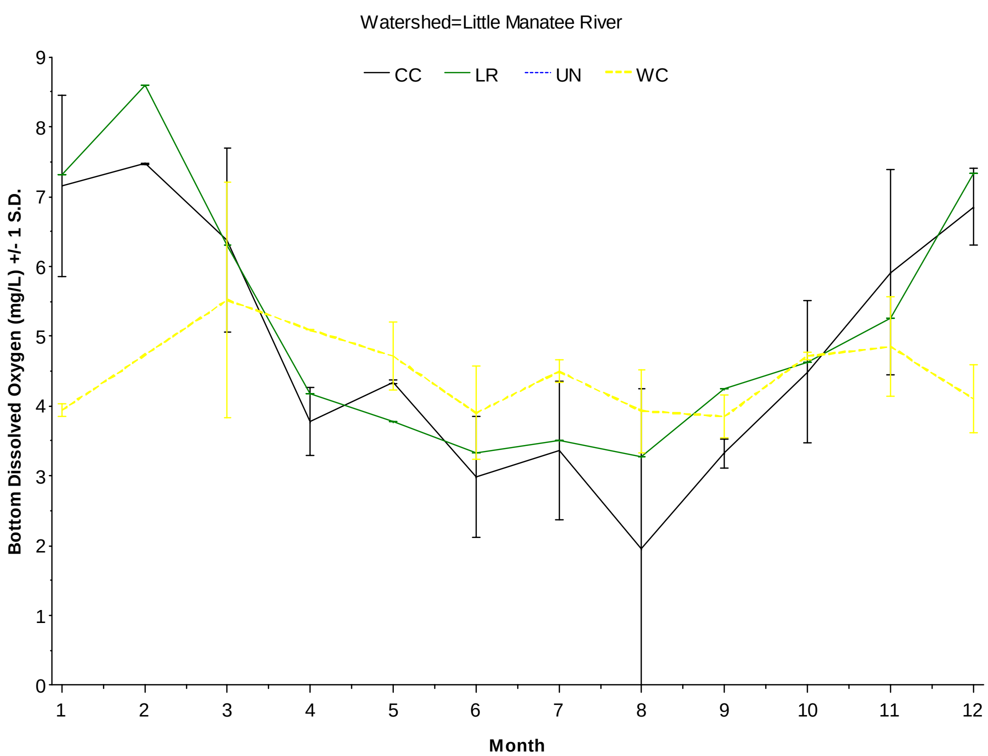
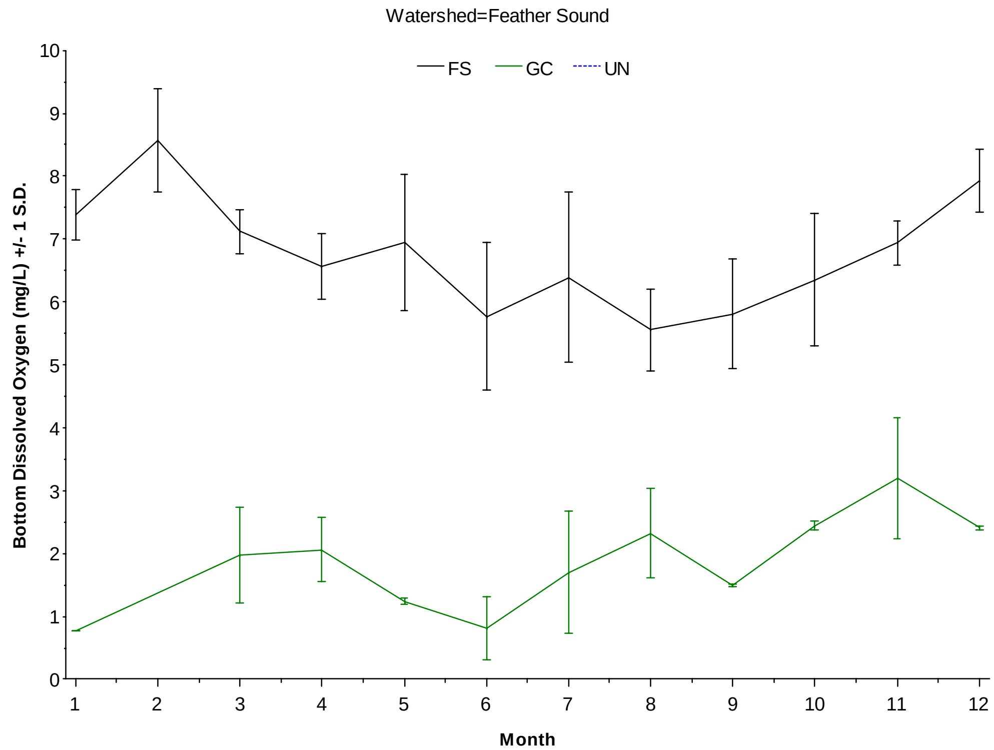


Figure B-6A: Monthly plots depicting bottom dissolved oxygen concentrations (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.



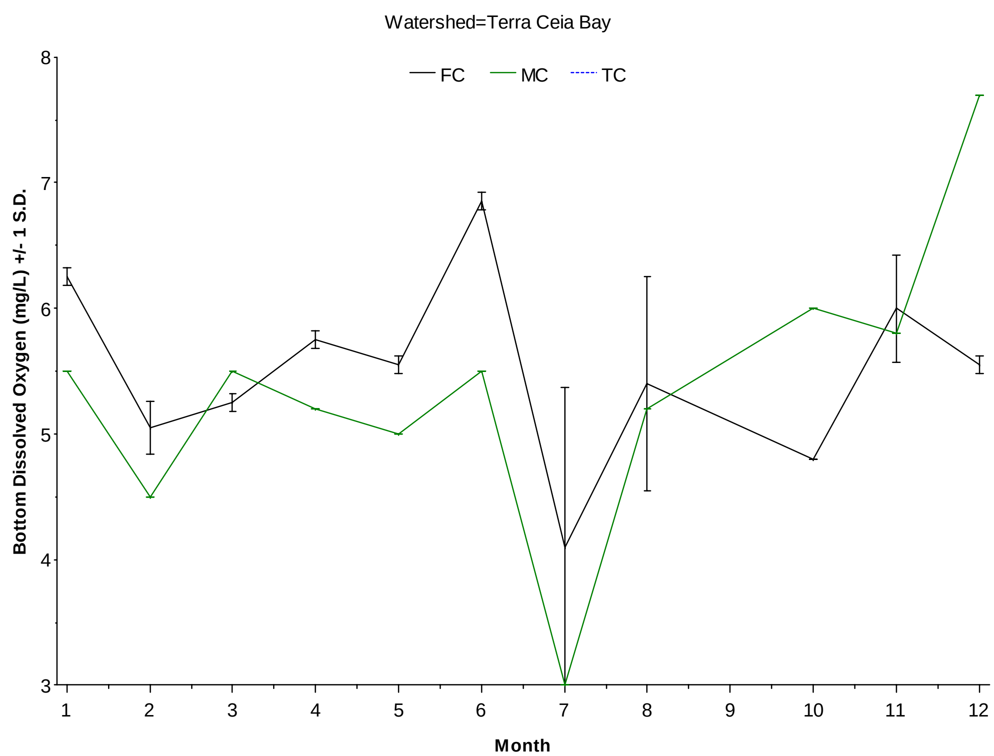


Figure B-6B: Monthly plots depicting bottom dissolved oxygen concentrations (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

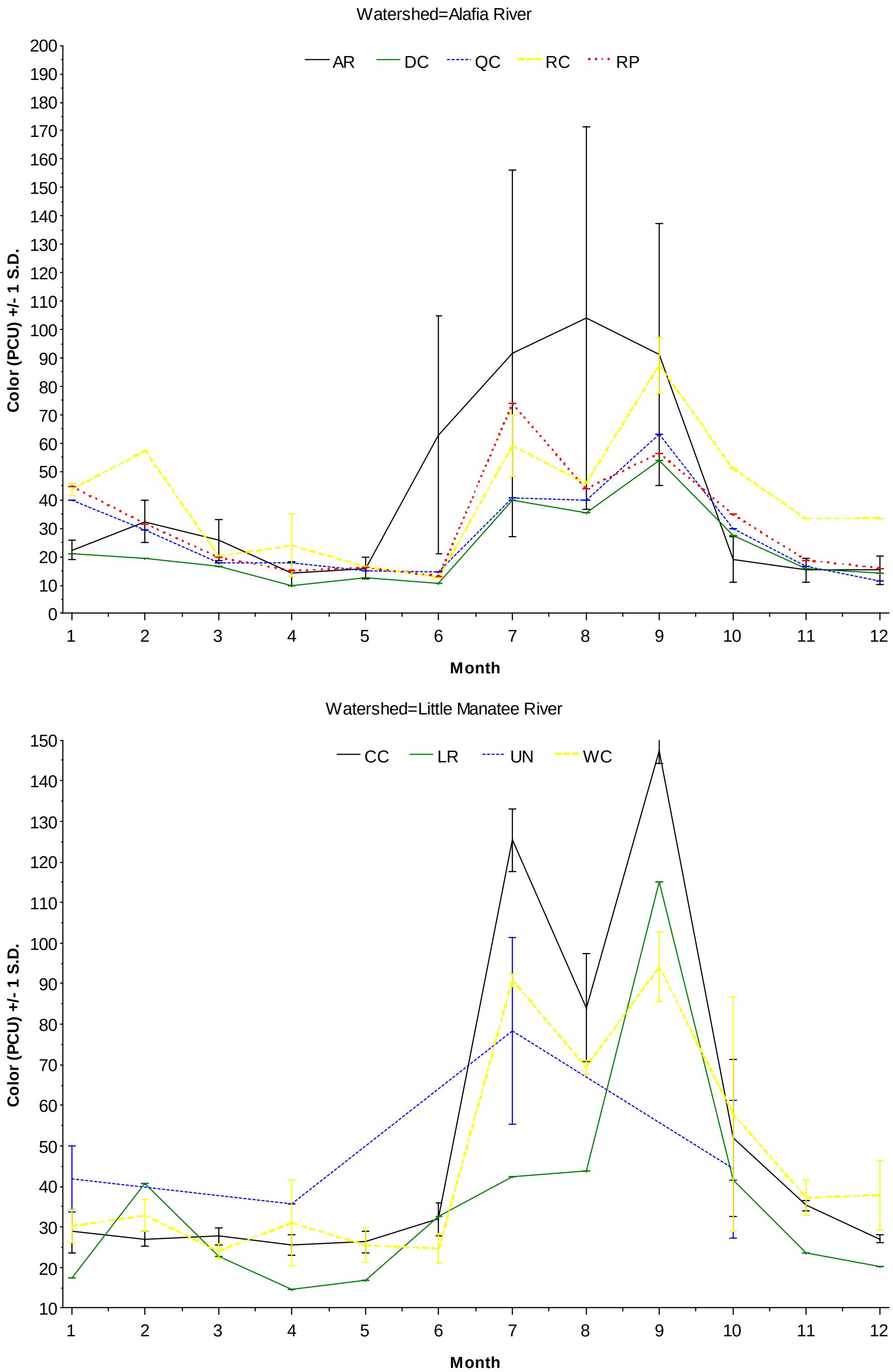


Figure B-7A: Monthly plots depicting color (Pt.-Co. Units) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

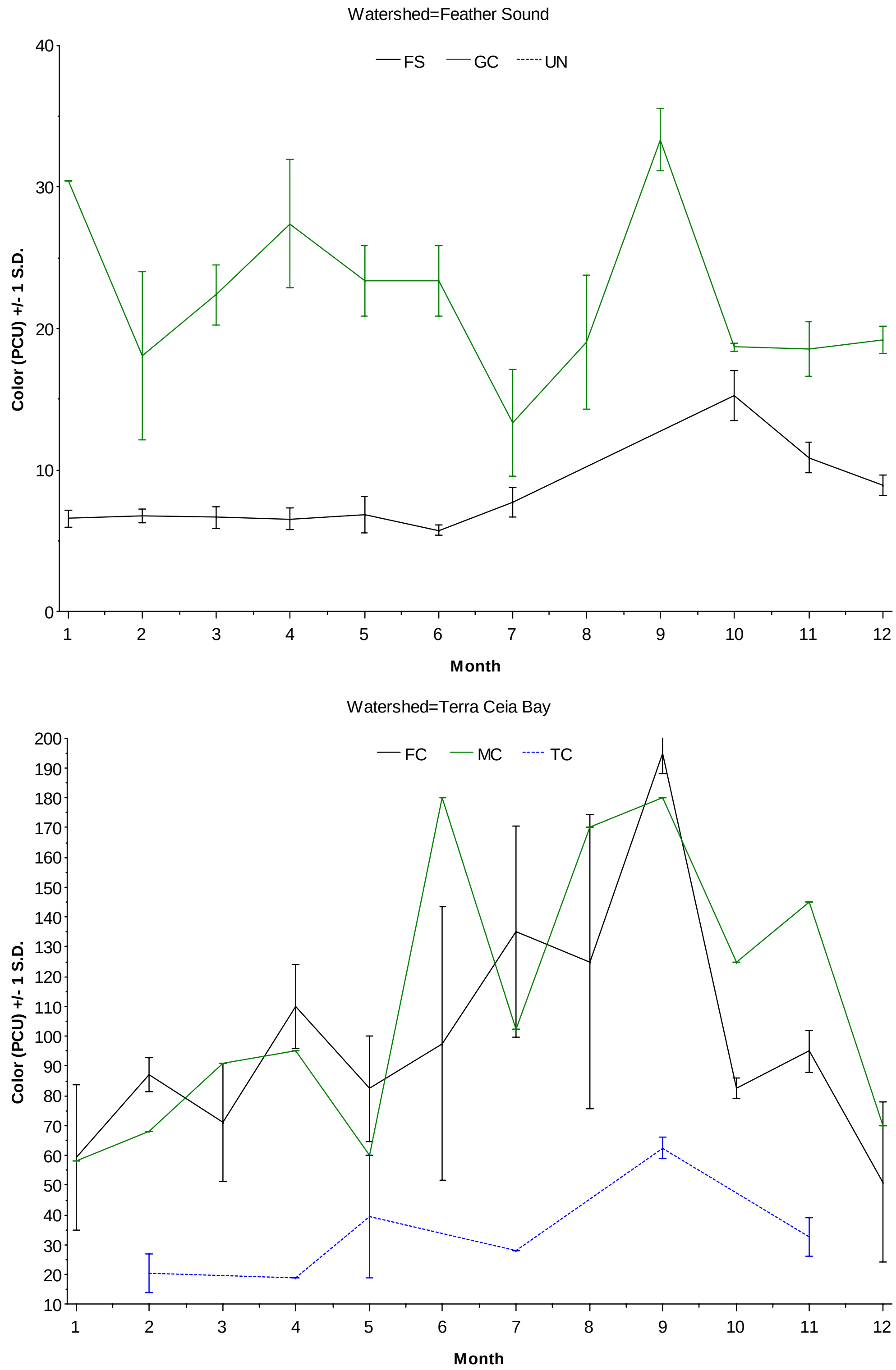


Figure B-7B: Monthly plots depicting color (Pt.-Co. Units) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

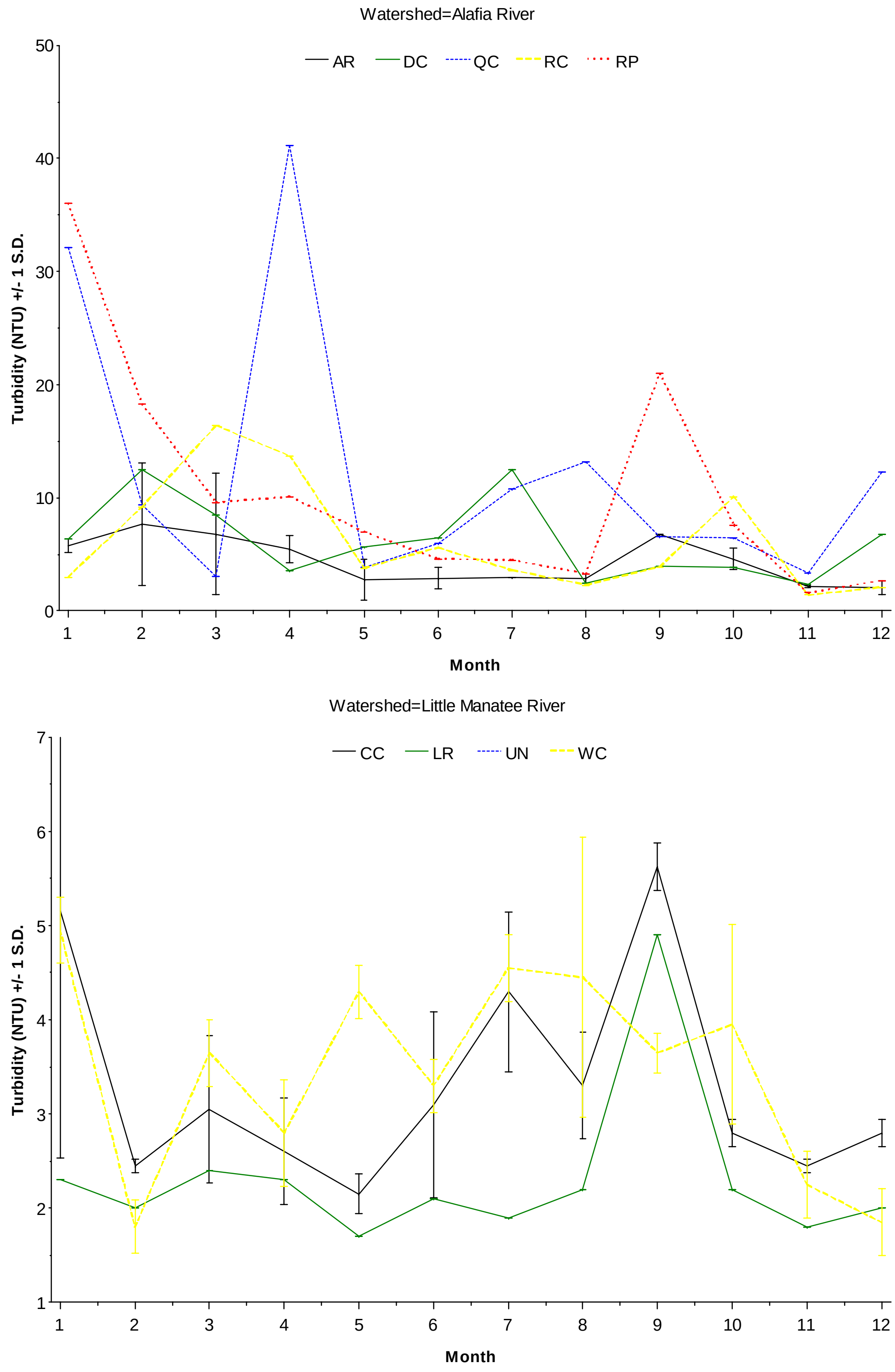
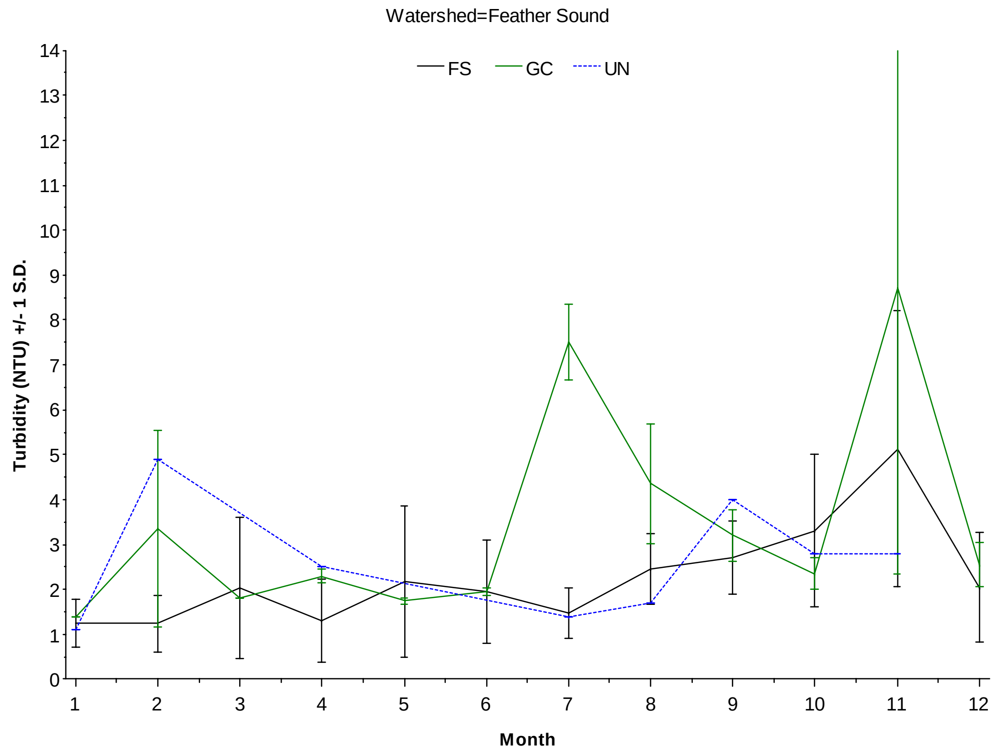


Figure B-8A: Monthly plots depicting turbidity (NTU) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.



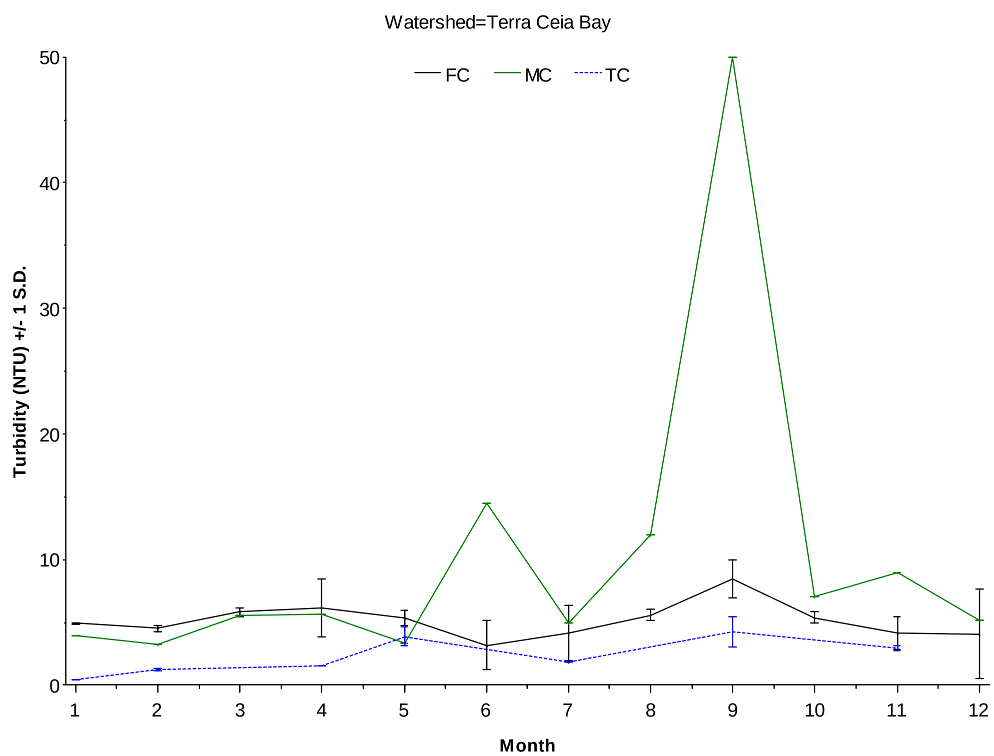


Figure B-8B: Monthly plots depicting turbidity (NTU) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

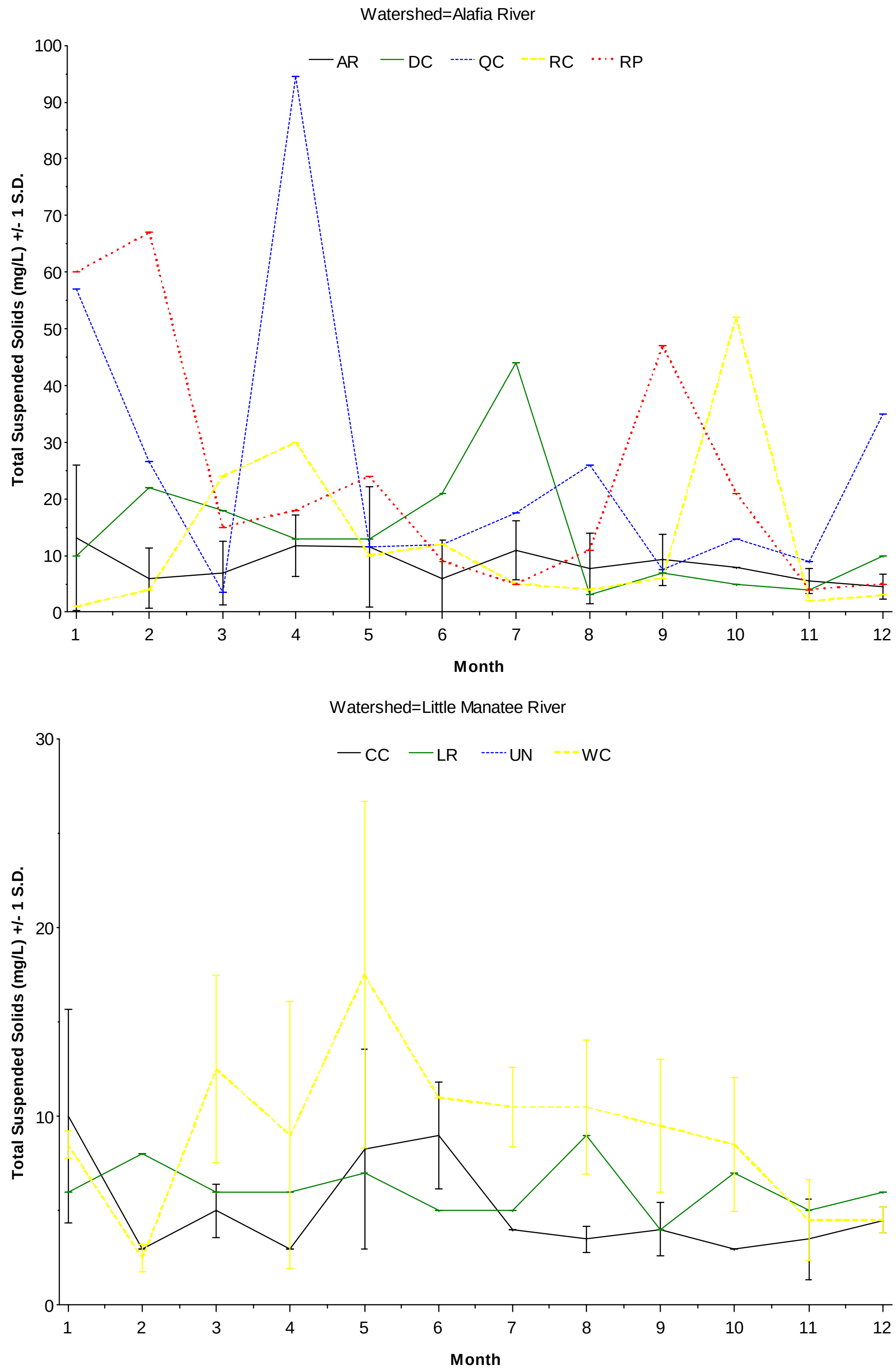
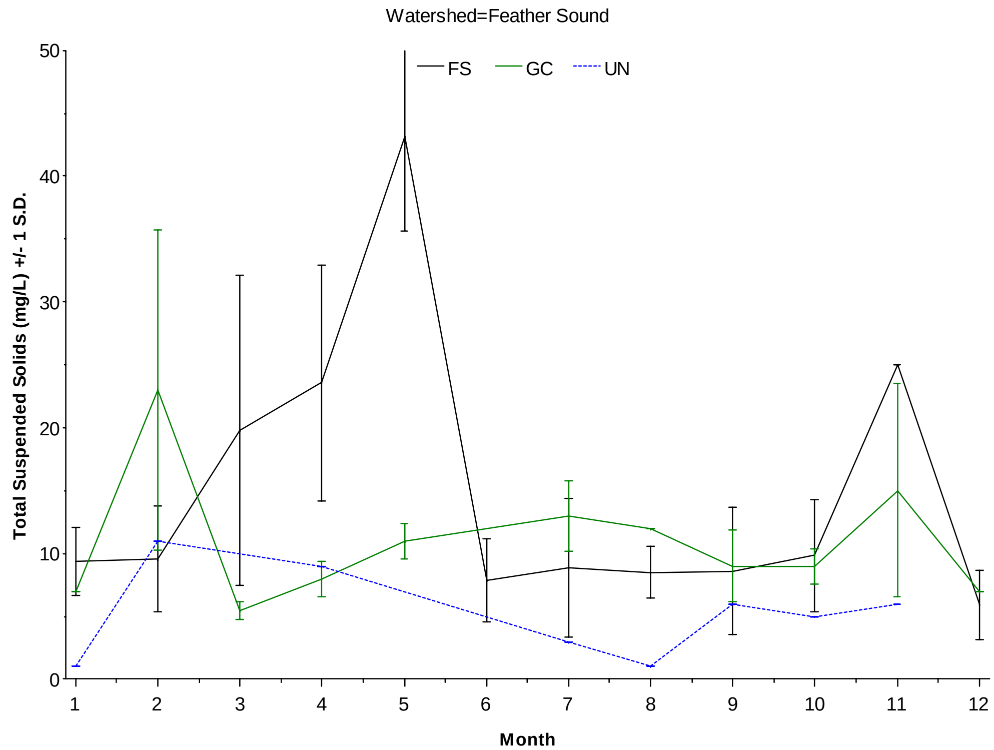


Figure B-9A: Monthly plots depicting total suspended solids (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.



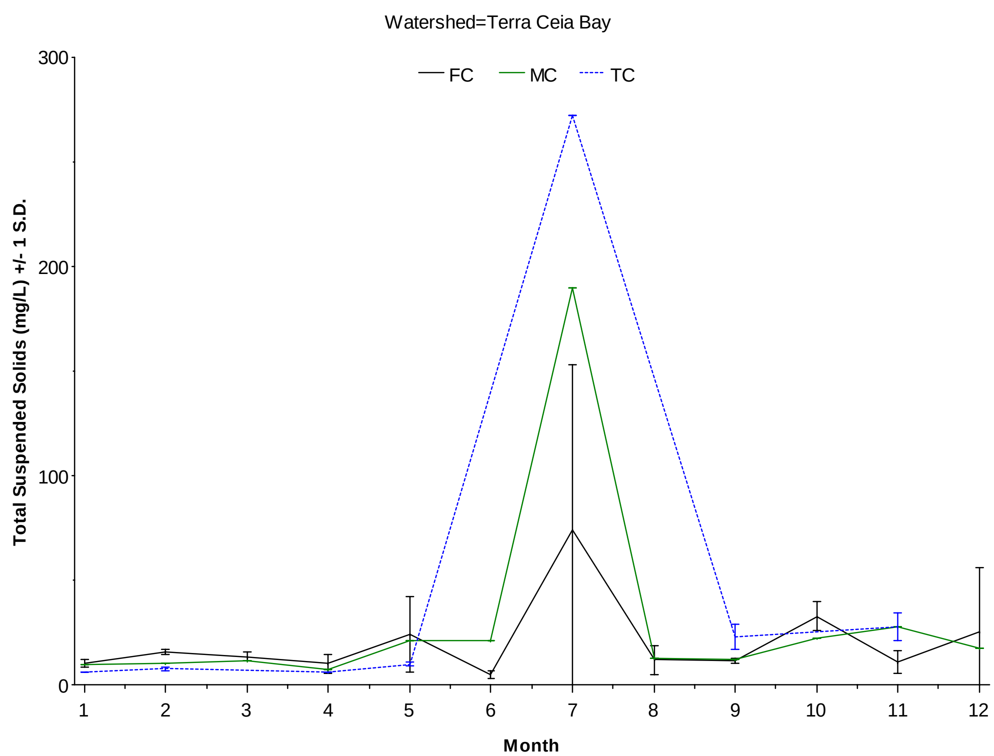
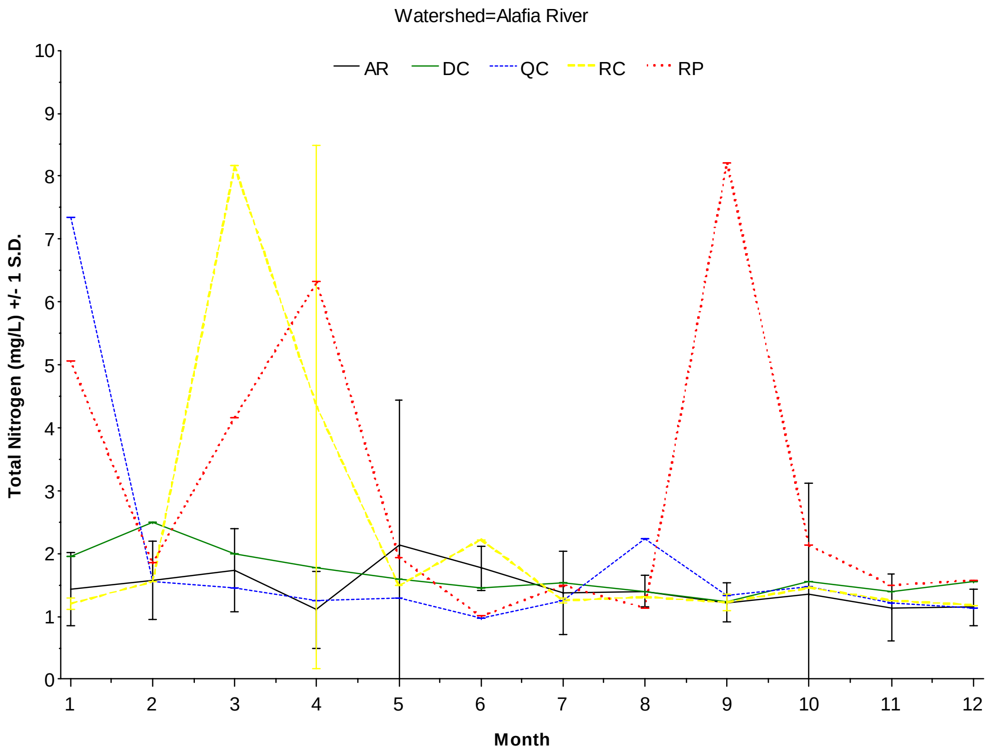


Figure B-9B: Monthly plots depicting total suspended solids (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.



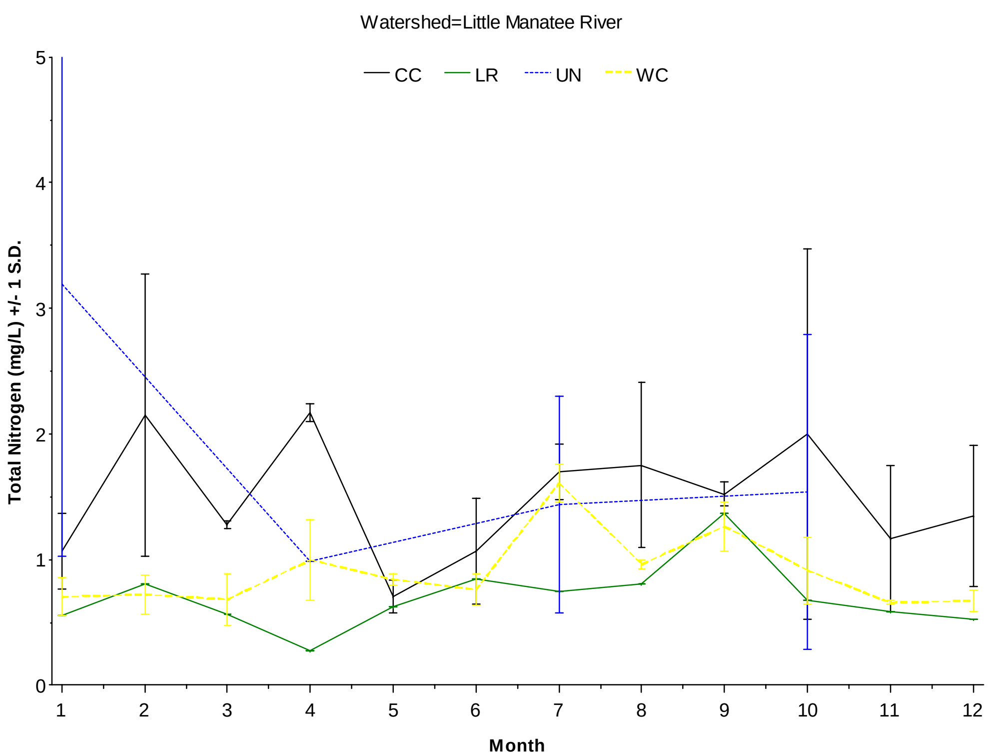
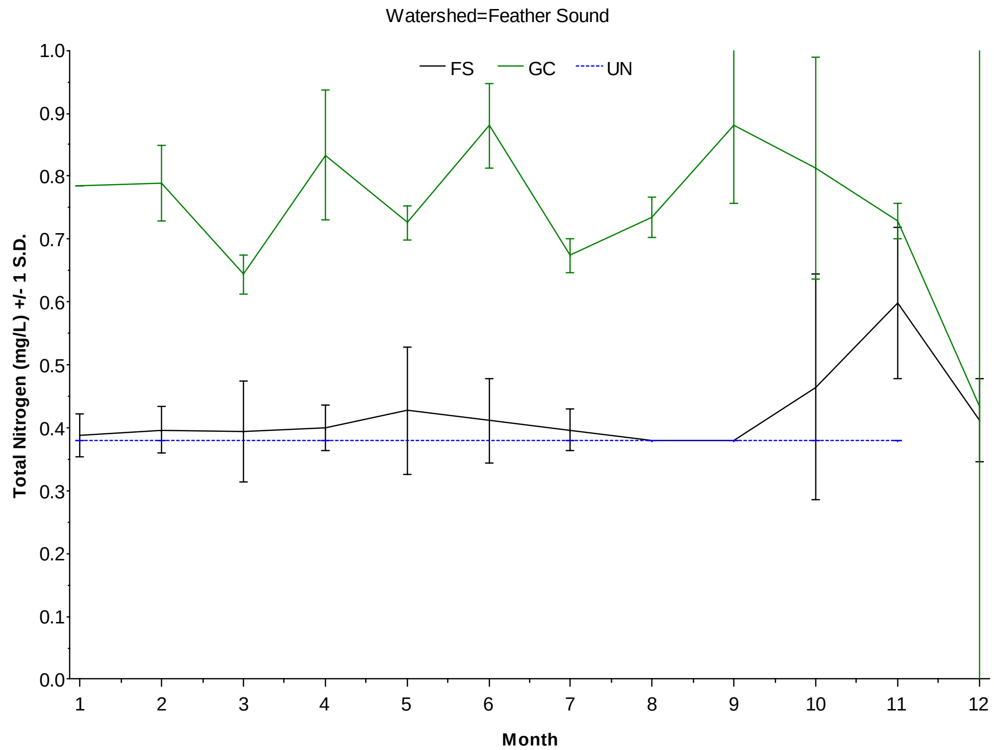


Figure B-10A: Monthly plots depicting total nitrogen (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.



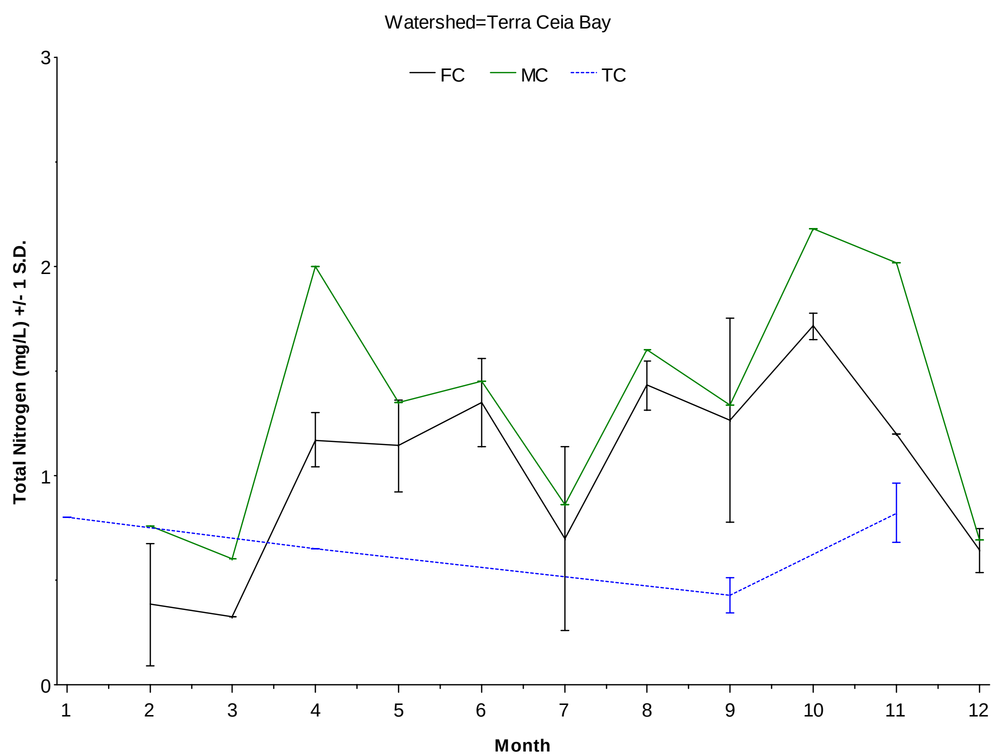


Figure B-10B: Monthly plots depicting total nitrogen (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

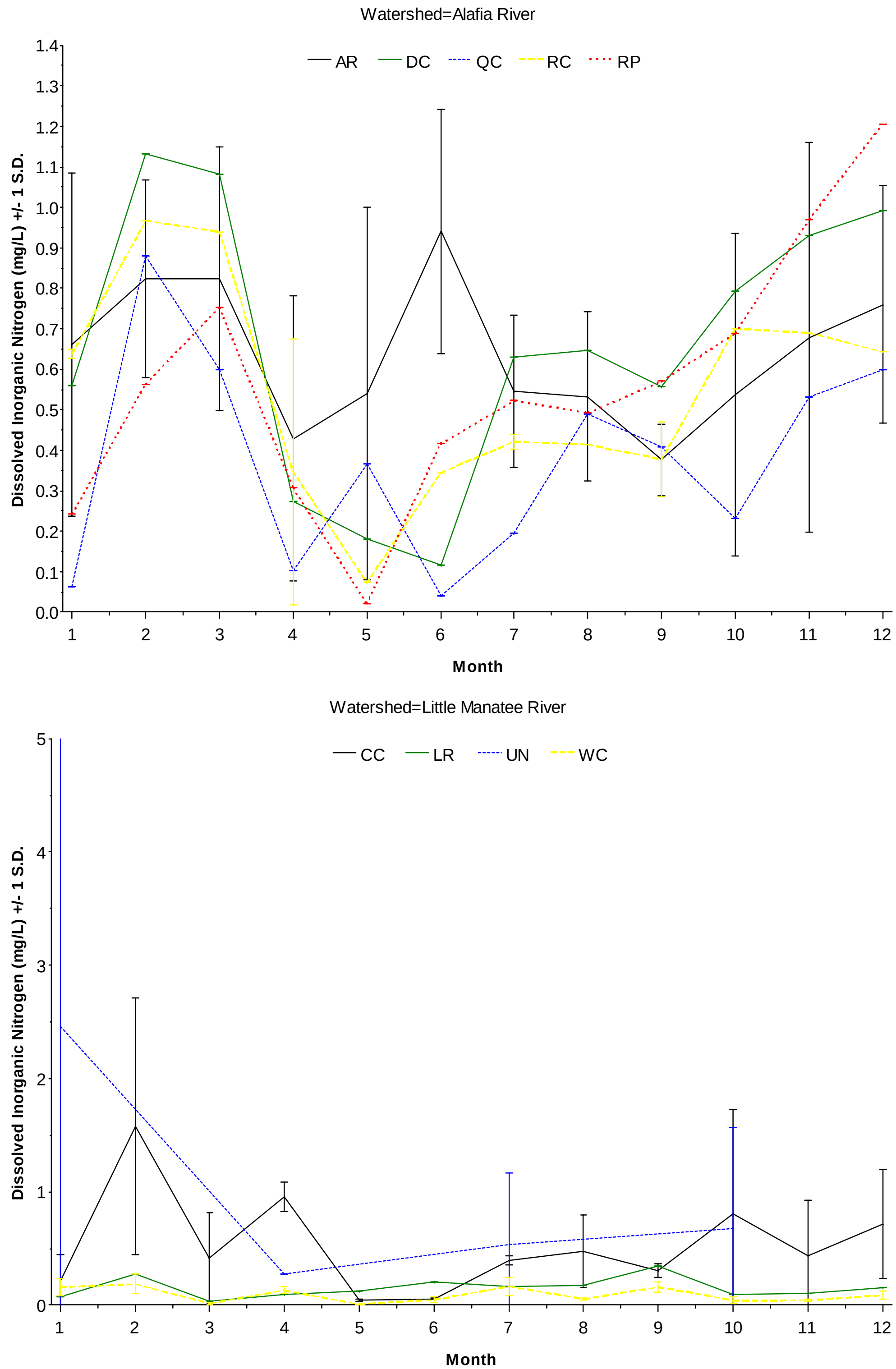


Figure B-11A: Monthly plots depicting dissolved inorganic nitrogen (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

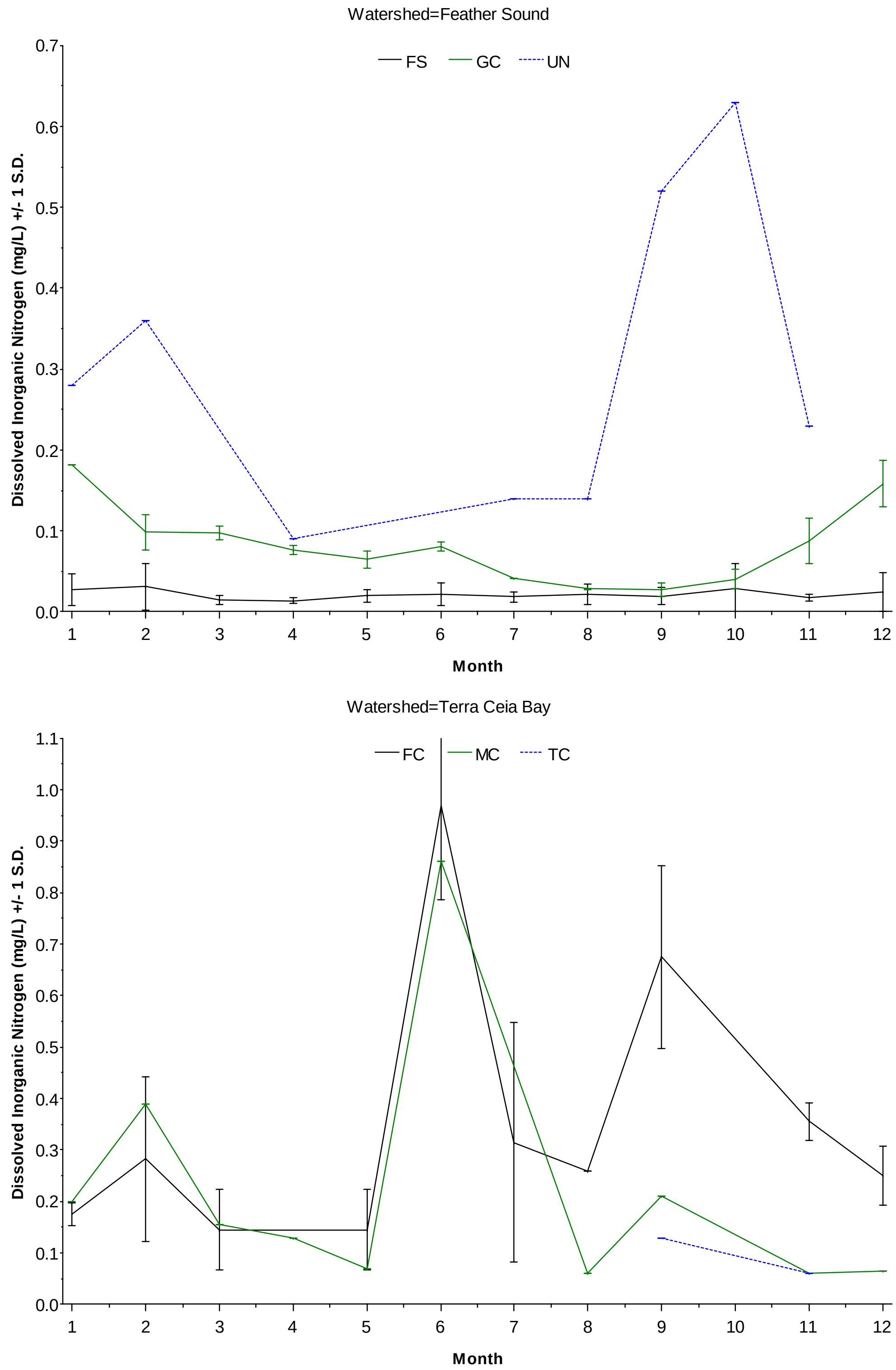


Figure B-11B: Monthly plots depicting dissolved inorganic nitrogen (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

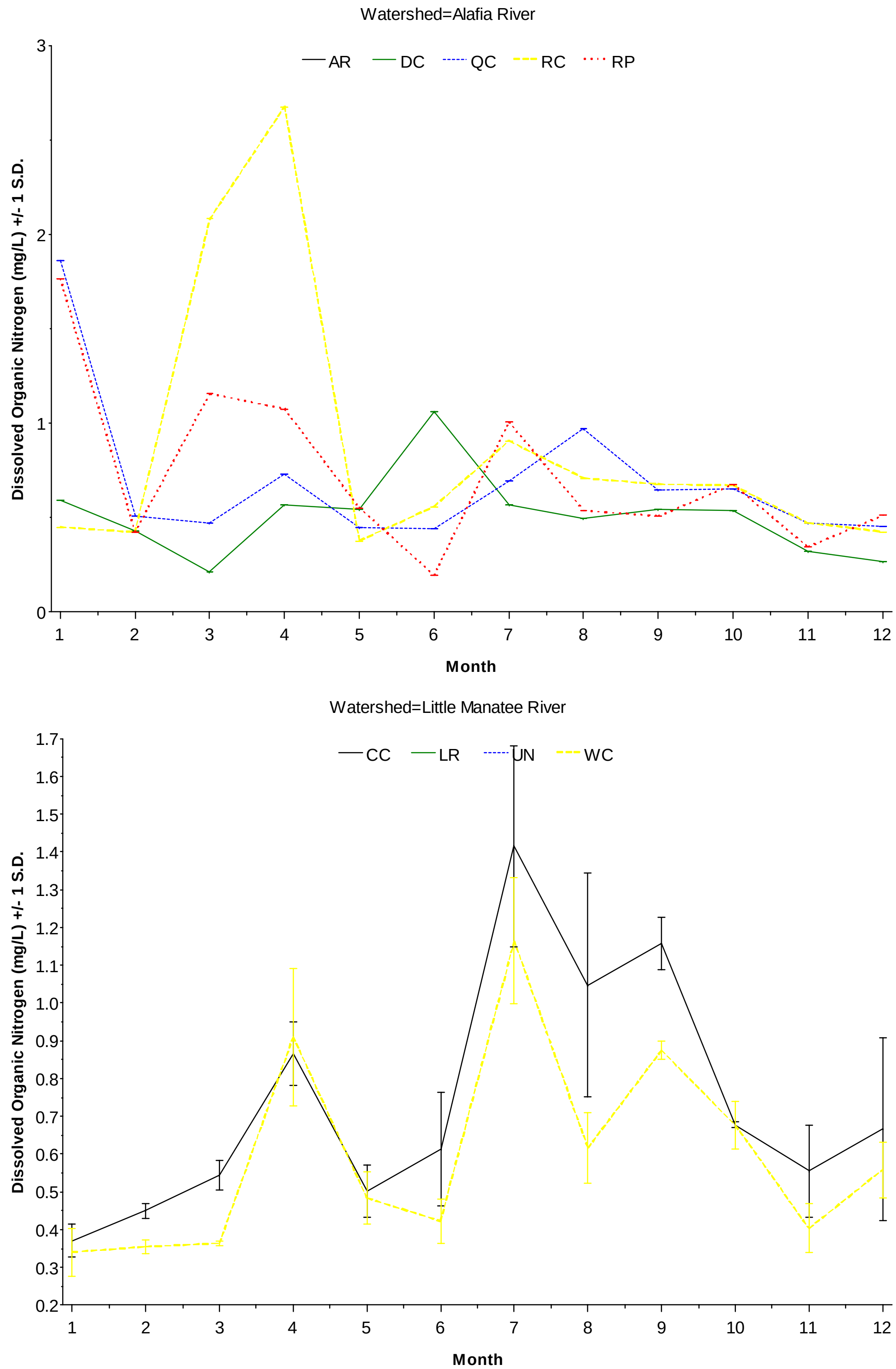


Figure B-12A: Monthly plots depicting dissolved organic nitrogen (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

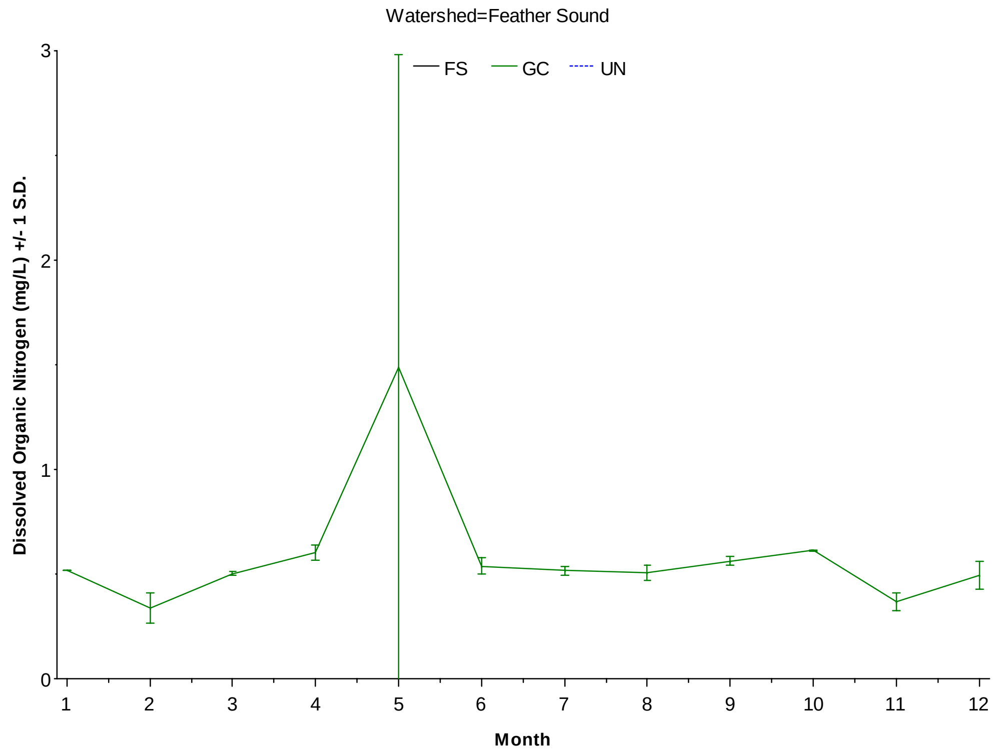
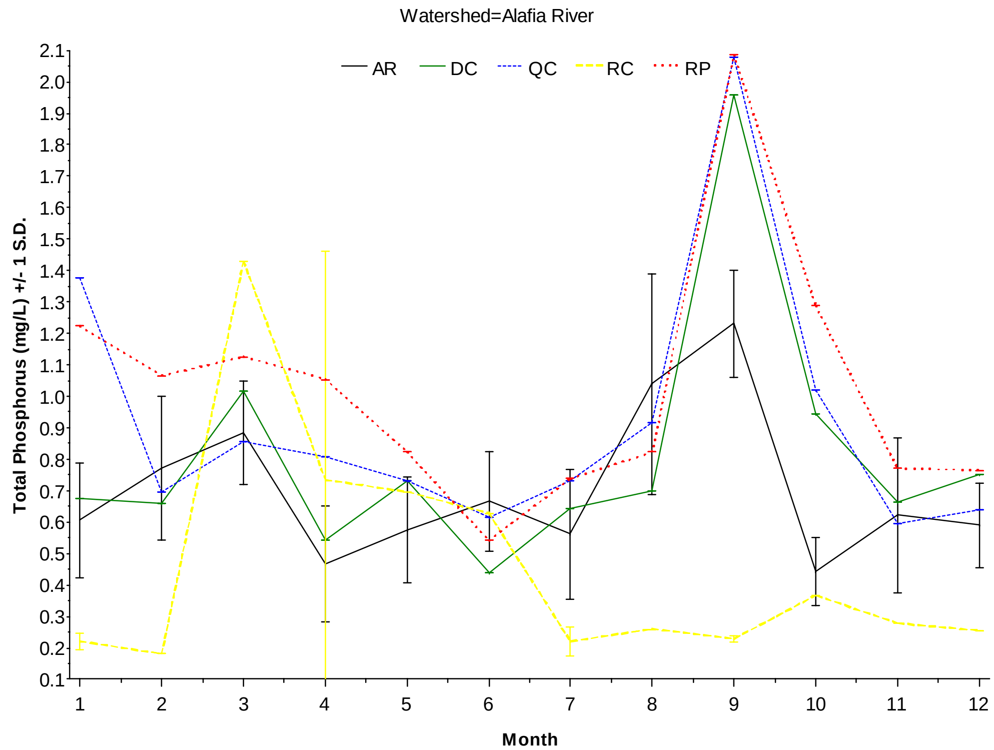


Figure B-12B: Monthly plots depicting dissolved organic nitrogen (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.



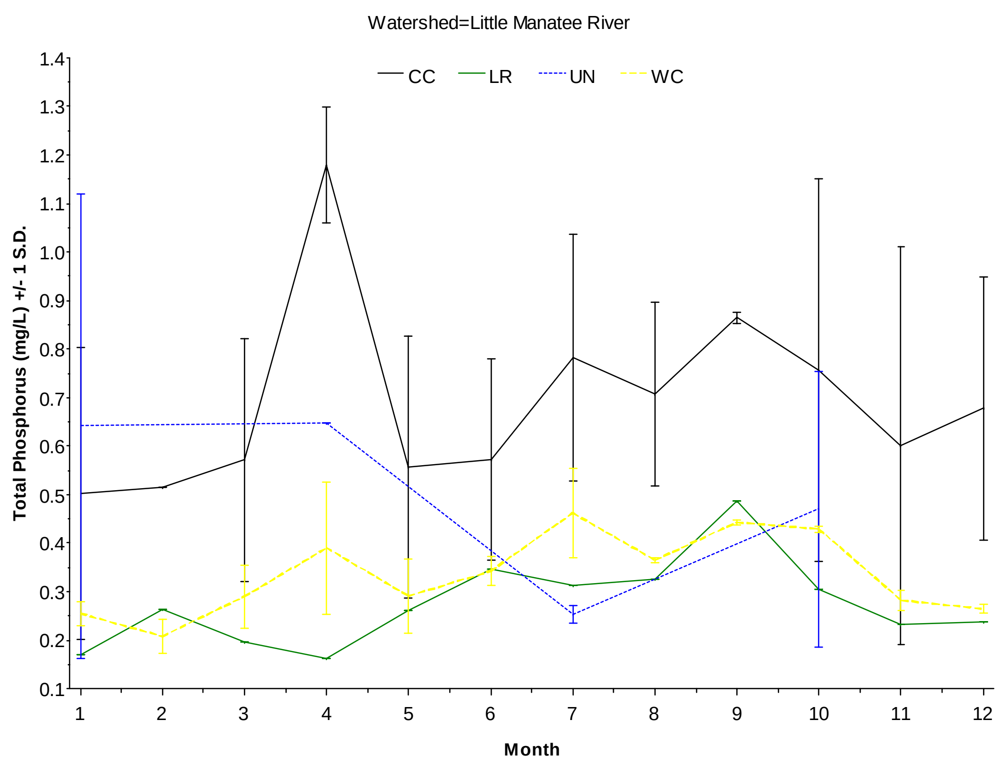
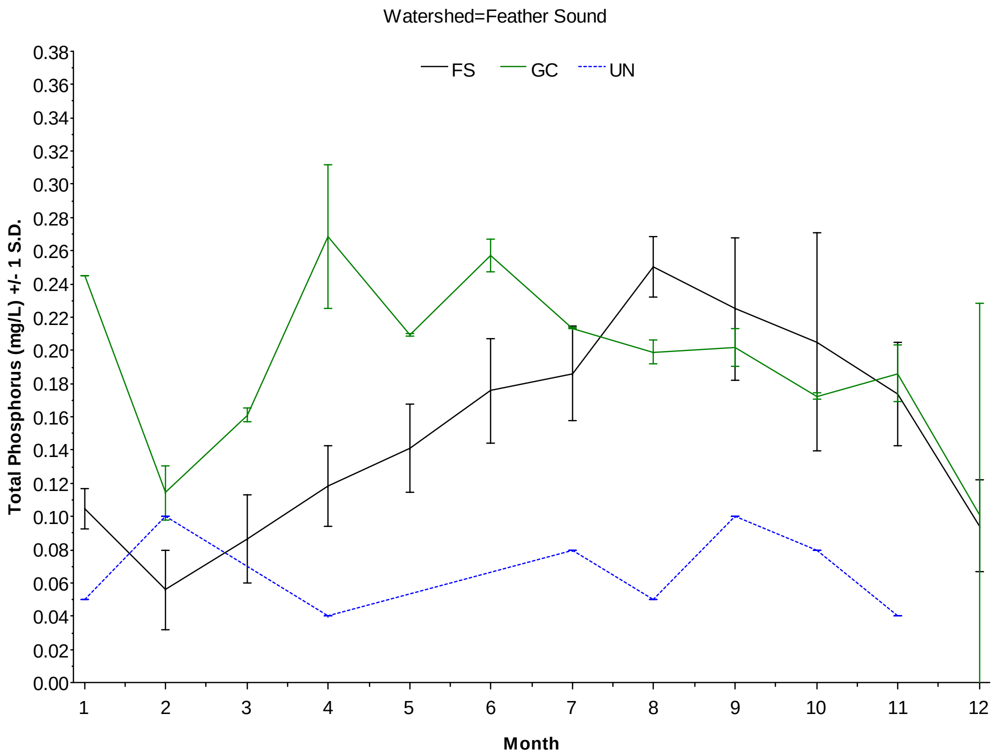


Figure B-13A: Monthly plots depicting total phosphorus (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.



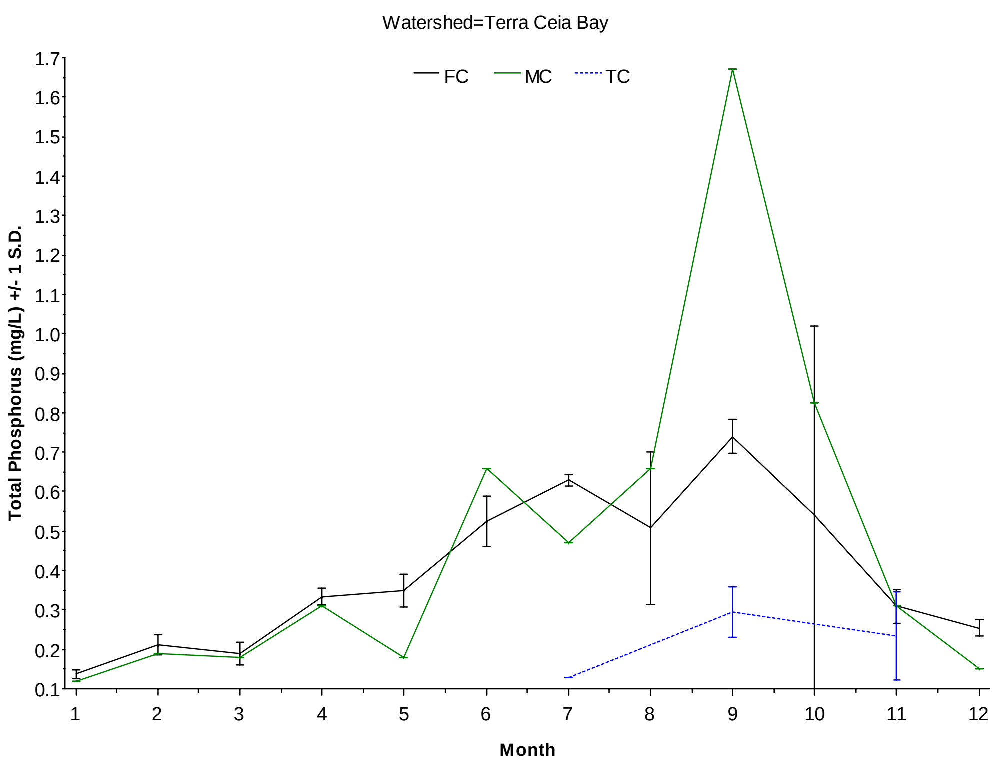


Figure B-13B: Monthly plots depicting total phosphorus (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

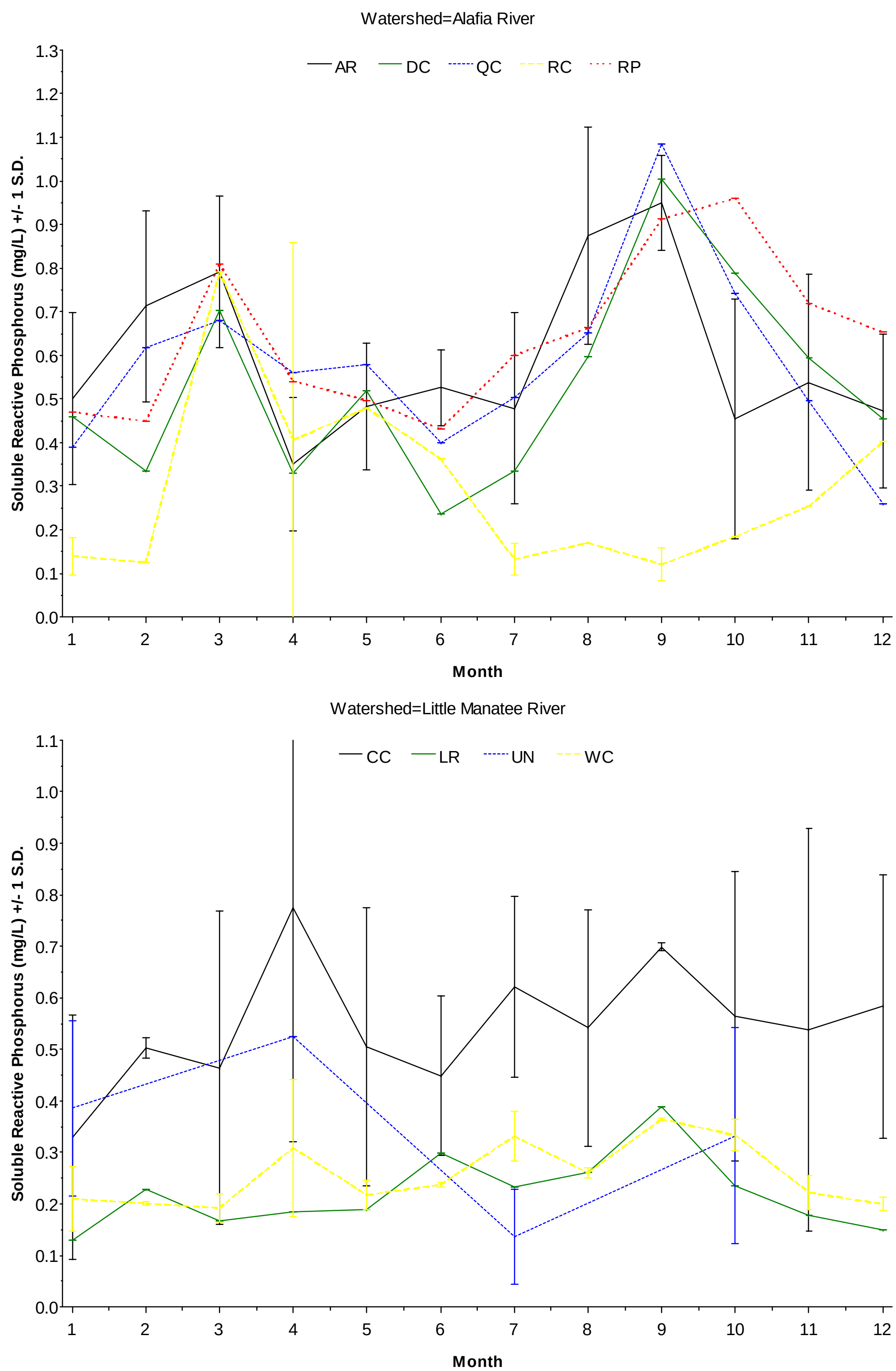


Figure B-14A: Monthly plots depicting soluble reactive phosphorus (mg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

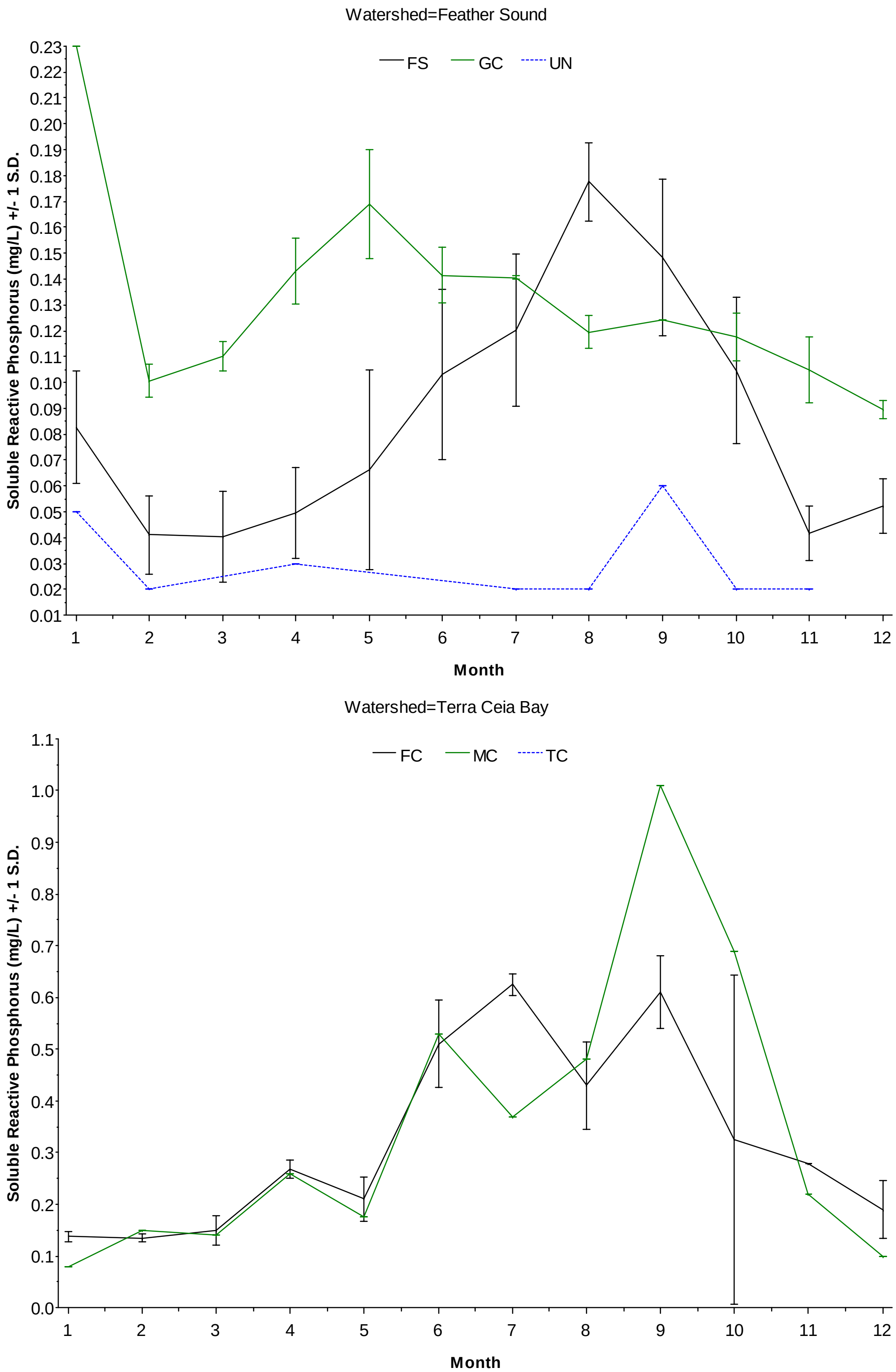


Figure B-14B: Monthly plots depicting soluble phosphorus (mg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

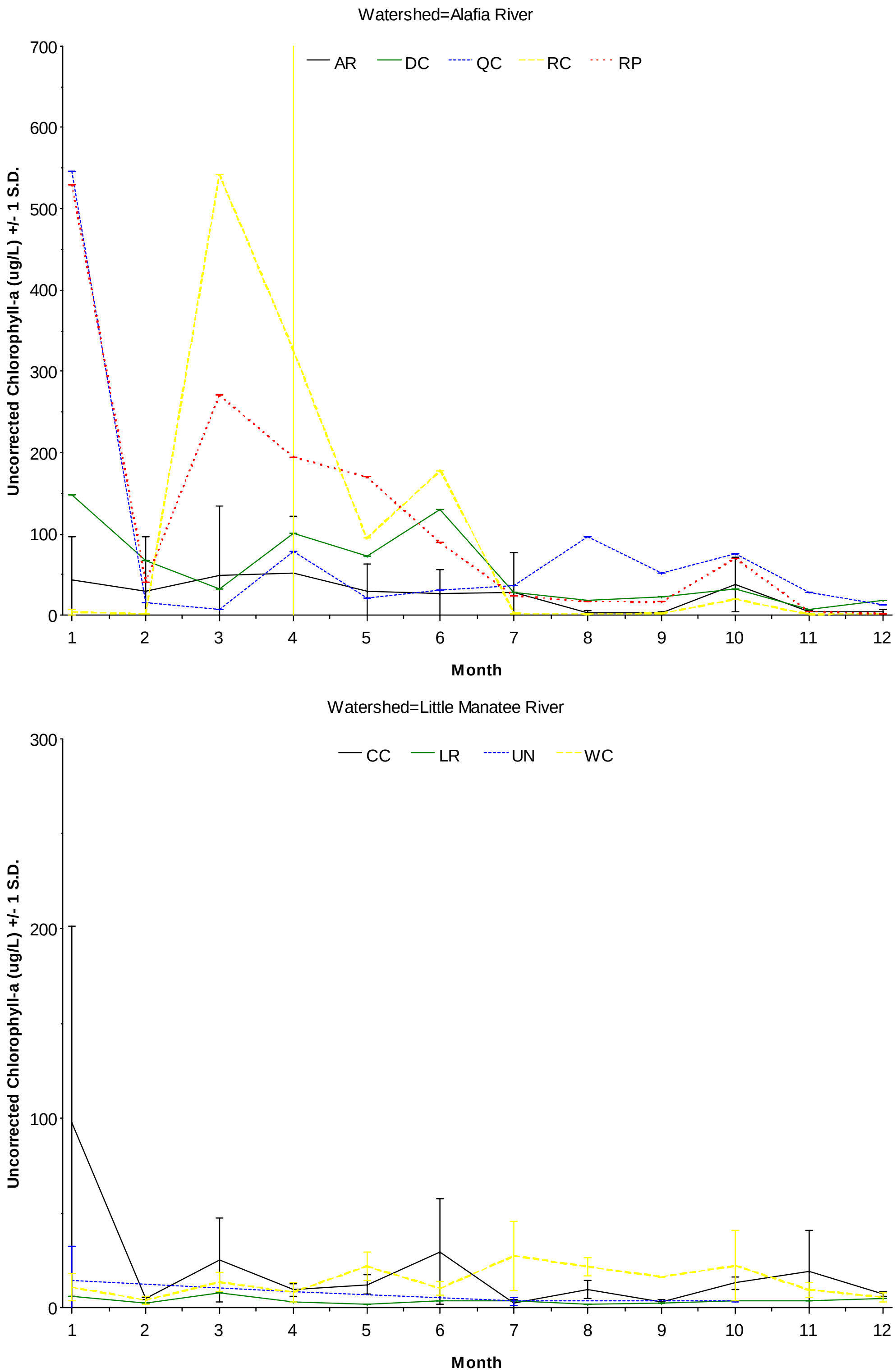


Figure B-15A: Monthly plots depicting uncorrected chlorophyll-a (μg/L) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

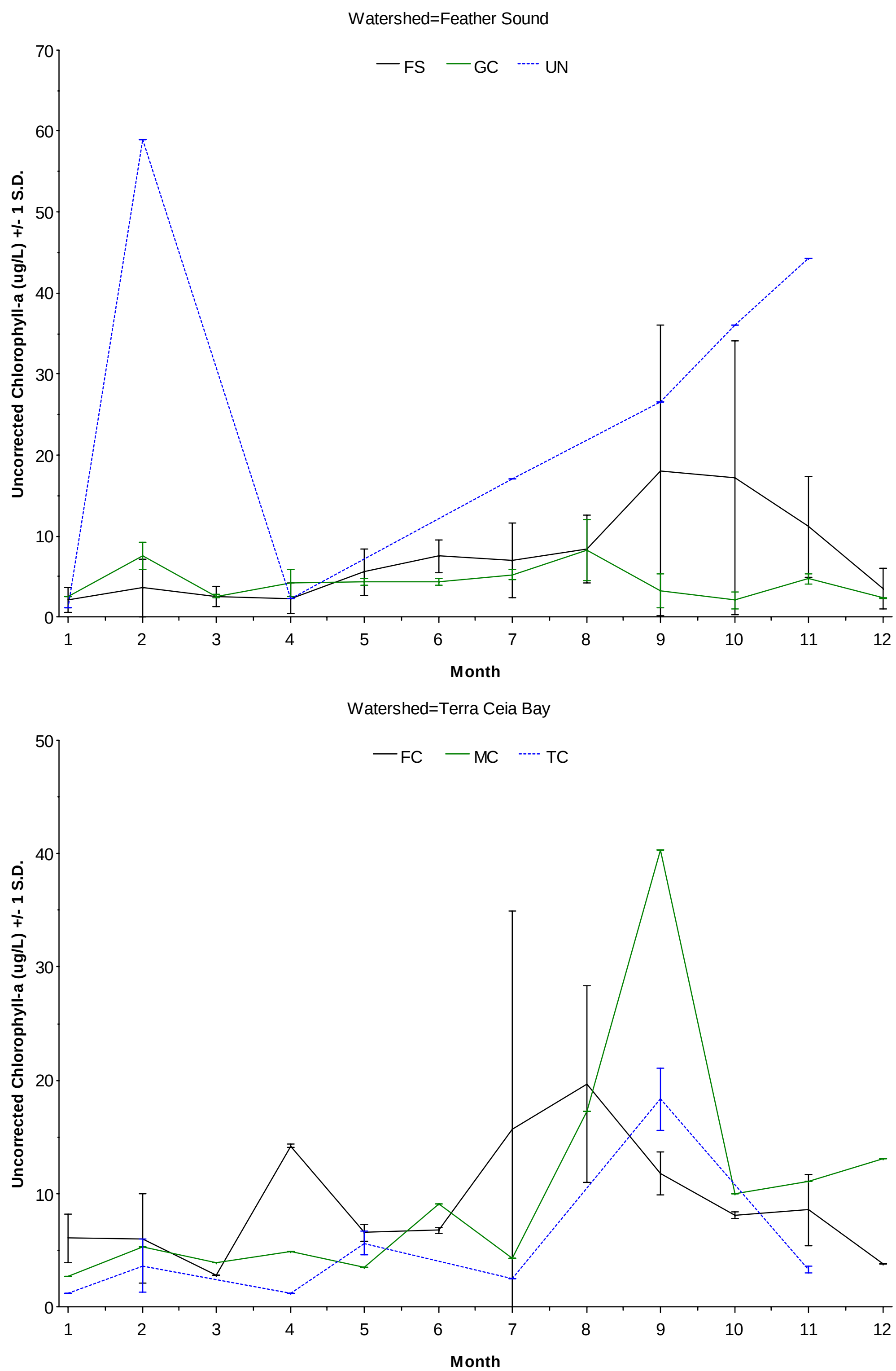


Figure B-15B: Monthly plots depicting uncorrected chlorophyll-a (μg/L) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay. Values for FC and MC represent corrected chlorophyll-a concentrations.

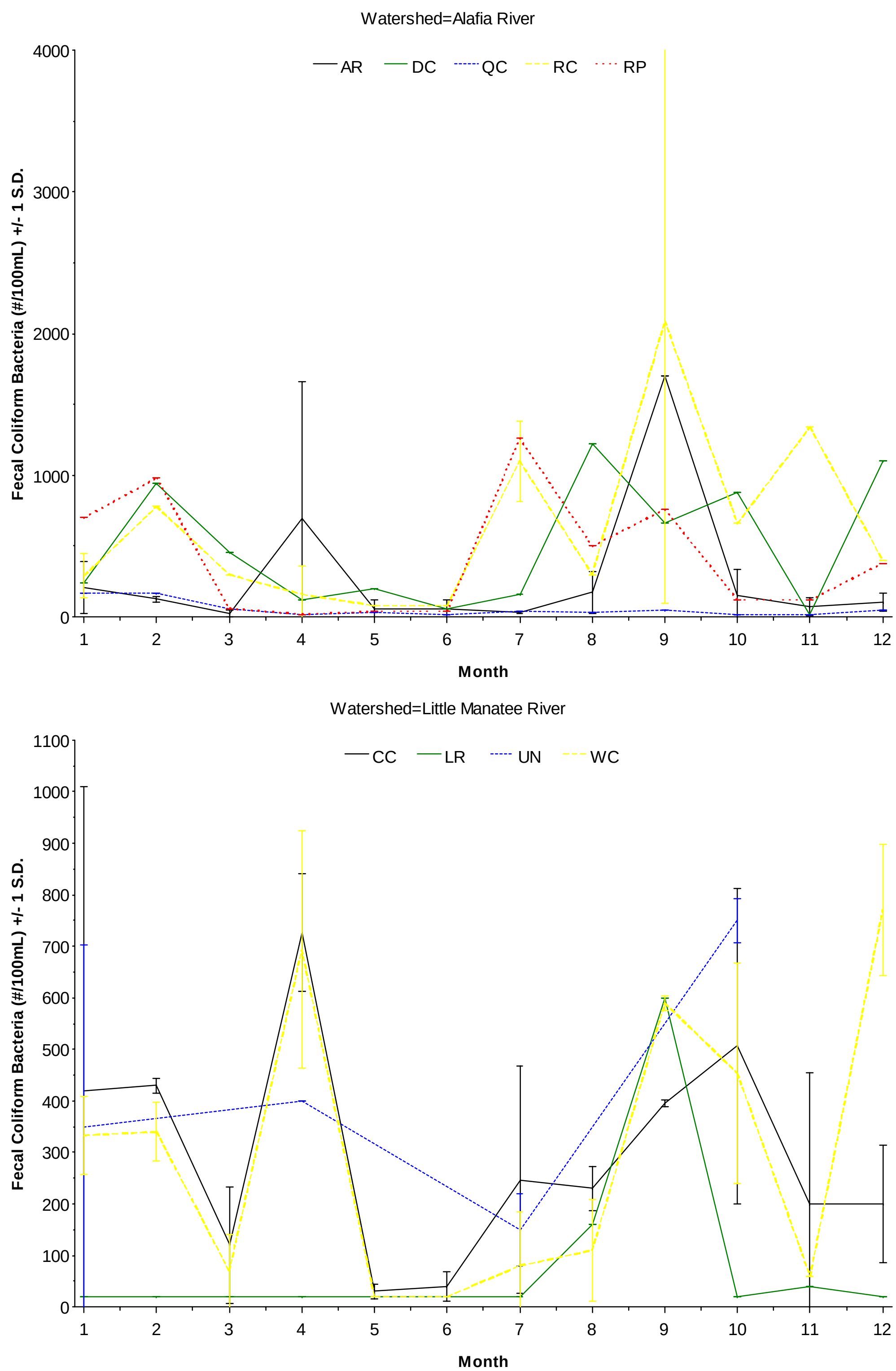


Figure B-16A: Monthly plots depicting fecal coliform bacteria (# of col./100mL) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.

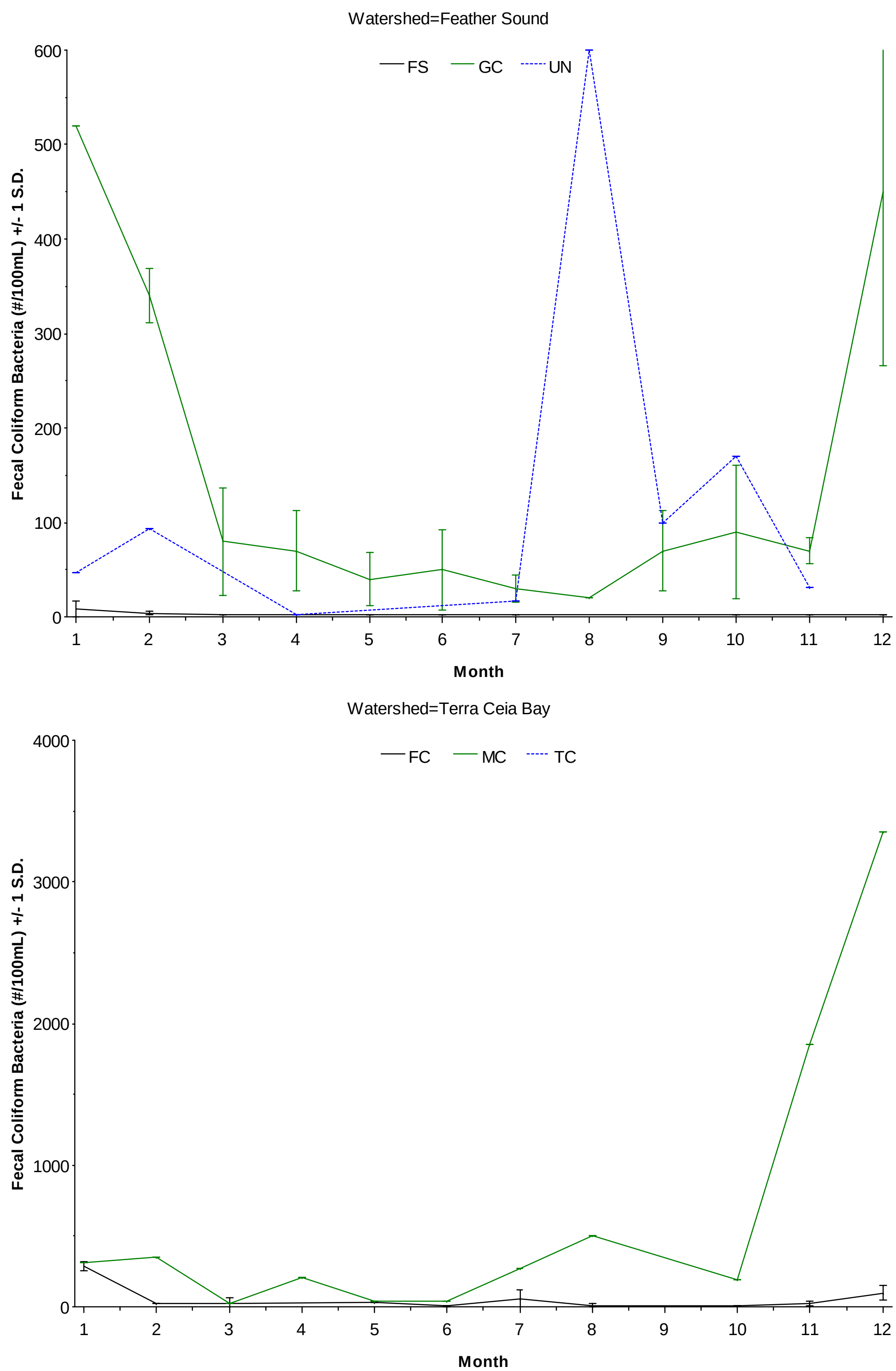


Figure B-16B: Monthly plots depicting fecal coliform bacteria (# of col./100mL) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

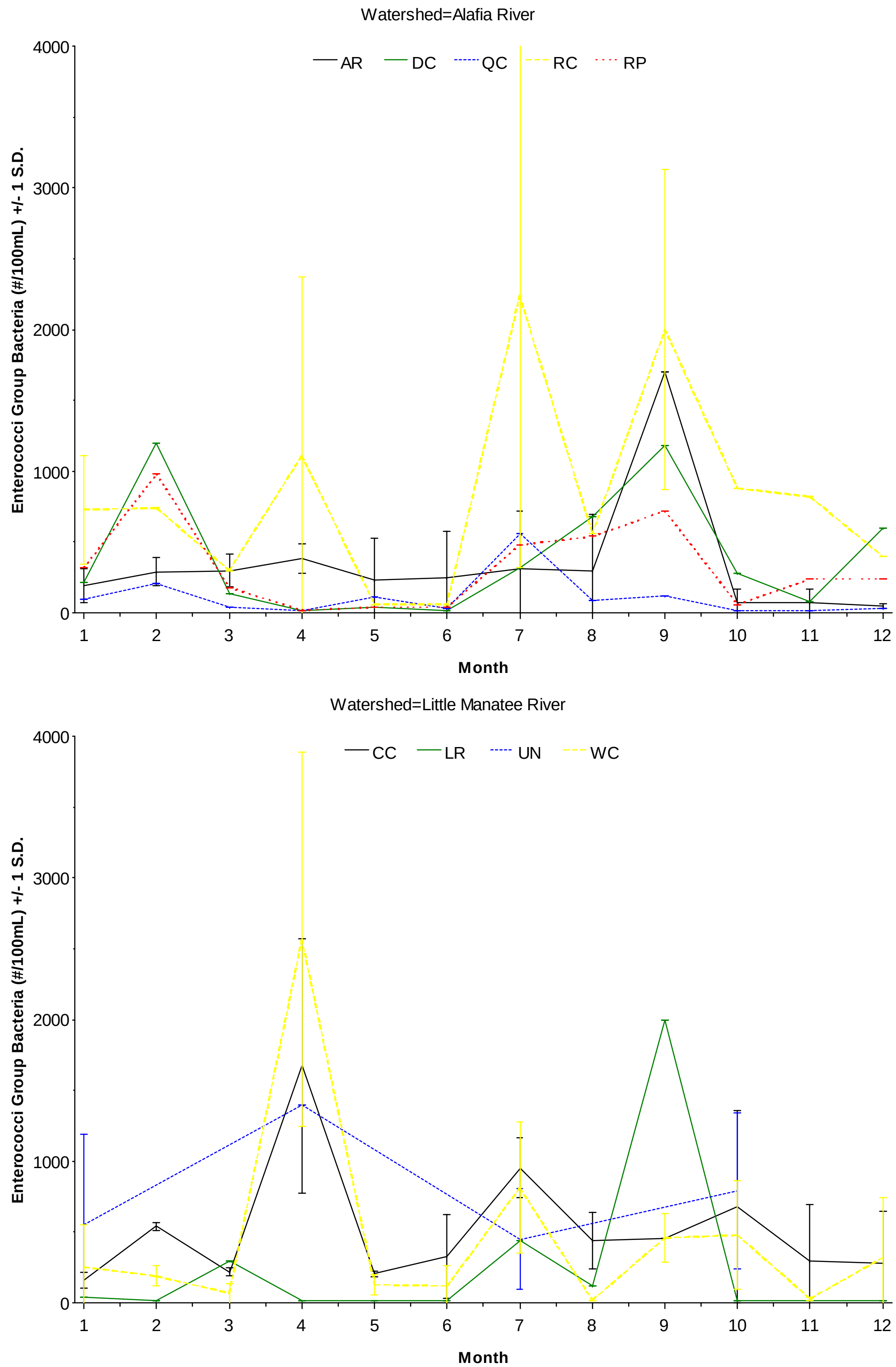
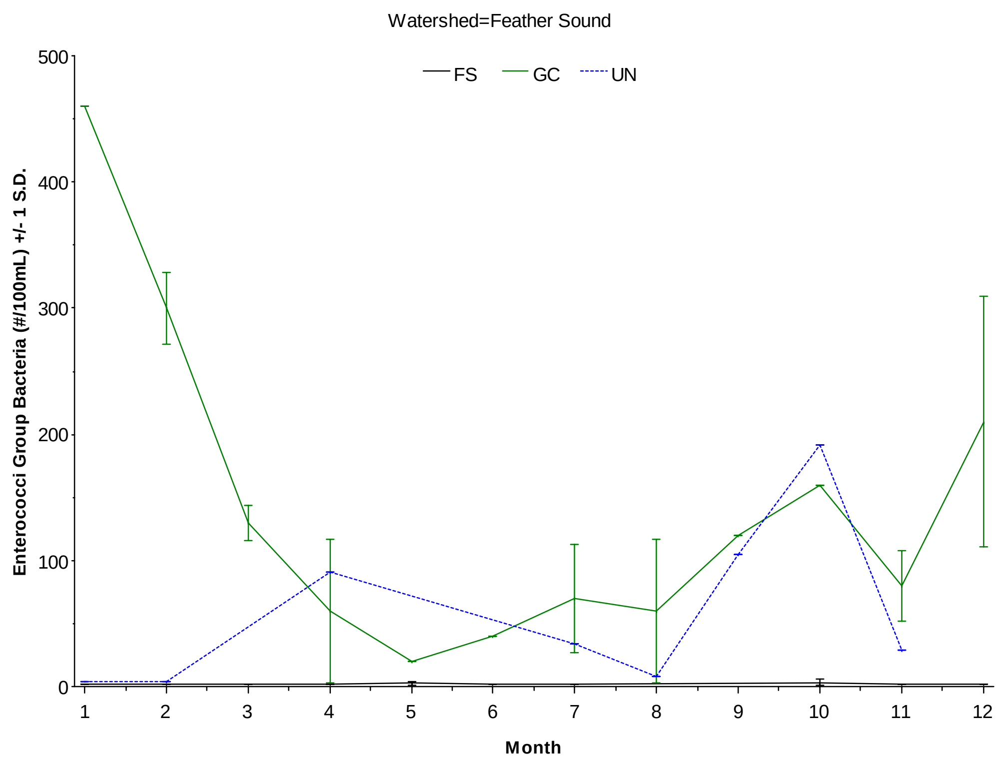


Figure B-17A: Monthly plots depicting enterococci group bacteria (# of col./100mL) of water quality monitoring samples of tributaries draining to the Alafia and Little Manatee River. DC=Dog Leg Creek, QC=Question Mark Creek, RC=Rice Creek, RP=Riverview Park West Creek, AR=Mainstem Alafia River, CC=Curiosity Creek, UN=Other creeks sampled in the Little Manatee River, WC=Wildcat Creek, LR=Mainstem Little Manatee River.



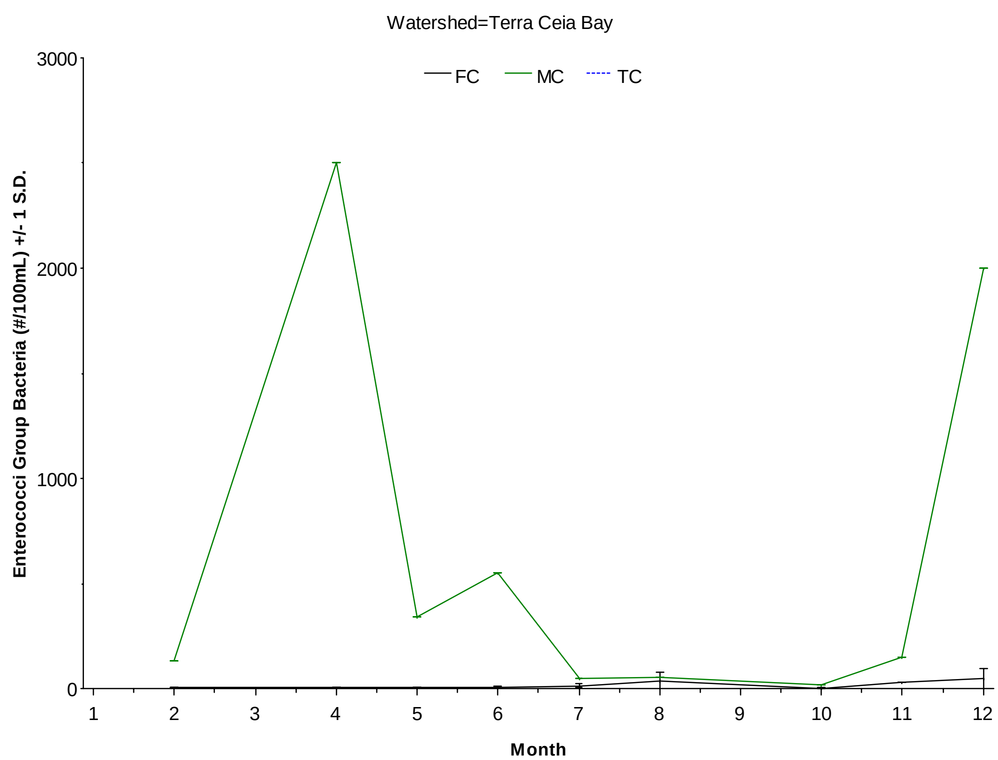


Figure B-17B: Monthly plots depicting enterococci group bacteria (# of col./100mL) of water quality monitoring samples of tributaries draining to Feather Sound and Terra Ceia Bay. GC=Grassy Creek, UN=Other creeks sampled in the Feather Sound area, FS=Feather Sound area, FC=Frog Creek, MC=McMullen Creek, TC=Terra Ceia Bay.

APPENDIX C:

Sediment Contaminant Summary Tables - Metals

Table C - 1. Feather Sound/Old Tampa Bay – Baseline

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
N	168	186	63	186	186	186	186	186	97	97	97	186
Minimum	0.00	0.10	0.13	0.80	0.29	0.60	0.70	1.00	0.34	0.01	0.01	0.00
Maximum	0.86	28.87	5.23	279.84	41.64	69.31	265.60	420.99	104.78	77.08	39.42	20.62
Median	0.17	1.81	2.29	8.36	1.96	4.19	3.86	7.00	10.00	13.46	4.45	1.60
Mean	0.23	2.81	2.65	19.97	3.60	7.04	9.50	18.89	15.41	19.73	8.81	3.77
SD	0.18	2.77	1.06	34.58	6.04	8.94	23.93	45.75	19.00	21.82	10.51	5.66

Table C - 2. Grassy Creek – Spring

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
N	6	6	6	6	6	6	6	6	6	6	6	6
Minimum	0.50	1.98	0.31	5.30	0.38	2.94	7.05	2.68	2.66	28.53	6.67	1.09
Maximum	0.53	2.11	0.40	12.28	1.41	5.31	9.44	10.04	5.11	31.38	7.87	1.16
Median	0.52	2.07	0.36	6.34	0.72	3.22	8.17	3.58	3.59	29.36	7.24	1.14
Mean	0.51	2.05	0.36	7.12	0.73	3.51	8.19	4.44	3.74	29.61	7.29	1.13
SD	0.01	0.05	0.03	2.63	0.37	0.89	0.85	2.79	0.96	1.02	0.42	0.03

Table C - 3. Grassy Creek – Fall

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	6	6	6	6	6	6	6	6	6	6	6	6
Minimum	0.49	1.95	0.83	2.04	0.35	0.70	3.02	2.43	2.02	4.97	9.96	1.07
Maximum	0.55	2.21	0.99	8.79	0.40	1.39	5.03	9.34	7.47	6.00	22.90	1.21
Median	0.51	2.05	0.93	6.04	0.37	0.93	4.25	4.50	4.25	5.25	19.16	1.13
Mean	0.52	2.06	0.92	5.66	0.37	1.00	4.06	5.41	4.41	5.37	17.43	1.13
SD	0.02	0.09	0.07	2.95	0.02	0.32	0.86	2.72	2.04	0.39	5.49	0.05

Table C - 4. Mainstem Alafia River – Baseline

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
N	57	67	38	67	67	67	67	67	38	38	38	67
Minimum	0.08	1.08	2.40	0.73	0.40	1.27	1.30	2.43	3.03	10.24	4.05	0.60
Maximum	1.25	7.12	9.27	187.18	44.13	57.40	106.70	311.00	161.45	50.23	22.01	16.03
Median	0.32	2.51	4.31	23.09	9.82	13.89	15.32	25.10	25.87	20.02	11.45	1.63
Mean	0.42	2.82	4.40	51.06	13.83	16.04	27.14	55.65	40.79	25.60	11.38	3.22
SD	0.30	1.31	1.61	53.01	12.47	11.42	27.79	63.02	35.57	13.86	4.93	4.12

Table C - 5. Dog Leg Creek – Spring

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
N	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	0.53	2.11	1.83	23.39	4.62	7.05	11.39	27.85	25.43	28.11	7.63	1.16
Maximum	0.53	2.11	1.83	23.39	4.62	7.05	11.39	27.85	25.43	28.11	7.63	1.16
Median	0.53	2.11	1.83	23.39	4.62	7.05	11.39	27.85	25.43	28.11	7.63	1.16
Mean	0.53	2.11	1.83	23.39	4.62	7.05	11.39	27.85	25.43	28.11	7.63	1.16
SD	.	.	.	.	.	.	.	.	.	.	.	.

Table C - 6. Dog Leg Creek – Fall

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	0.69	2.76	2.56	34.07	0.50	6.70	2.05	46.45	35.65	21.16	59.80	1.52
Maximum	0.69	2.76	2.56	34.07	0.50	6.70	2.05	46.45	35.65	21.16	59.80	1.52
Median	0.69	2.76	2.56	34.07	0.50	6.70	2.05	46.45	35.65	21.16	59.80	1.52
Mean	0.69	2.76	2.56	34.07	0.50	6.70	2.05	46.45	35.65	21.16	59.80	1.52
SD	.	.	.	.	.	.	.	.	.	.	.	.

Table C - 7. Question Mark Creek – Spring

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
N	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	0.59	2.34	1.16	21.12	6.35	6.87	13.01	53.68	25.58	28.46	7.88	1.29
Maximum	0.59	2.34	1.16	21.12	6.35	6.87	13.01	53.68	25.58	28.46	7.88	1.29
Median	0.59	2.34	1.16	21.12	6.35	6.87	13.01	53.68	25.58	28.46	7.88	1.29
Mean	0.59	2.34	1.16	21.12	6.35	6.87	13.01	53.68	25.58	28.46	7.88	1.29
SD	.	.	.	.	.	.	.	.	.	.	.	.

Table C - 8. Question Mark Creek – Fall

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	0.48	1.92	1.95	50.92	0.35	8.36	3.08	68.43	45.99	31.77	91.38	1.06
Maximum	0.59	2.37	2.18	67.40	0.43	11.80	4.44	117.04	61.60	39.20	107.93	1.30
Median	0.54	2.14	2.06	59.16	0.39	10.08	3.76	92.73	53.80	35.49	99.66	1.18
Mean	0.54	2.14	2.06	59.16	0.39	10.08	3.76	92.73	53.80	35.49	99.66	1.18
SD	0.08	0.32	0.17	11.66	0.06	2.43	0.96	34.37	11.04	5.26	11.70	0.17

Table C - 9. Rice Creek – Spring

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	0.50	1.98	0.34	3.72	0.37	2.42	6.95	3.43	4.11	25.87	7.06	1.09
Maximum	0.51	2.04	0.45	6.54	0.73	2.80	8.66	7.41	10.22	27.53	7.25	1.12
Median	0.50	2.01	0.39	5.13	0.55	2.61	7.80	5.42	7.17	26.70	7.16	1.11
Mean	0.50	2.01	0.39	5.13	0.55	2.61	7.80	5.42	7.17	26.70	7.16	1.11
SD	0.01	0.04	0.07	1.99	0.26	0.27	1.21	2.82	4.33	1.17	0.14	0.02

Table C - 10. Rice Creek – Fall

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	0.48	1.92	1.22	0.96	0.35	0.69	3.45	4.11	3.79	4.90	8.70	1.06
Maximum	0.49	1.97	1.23	5.94	0.35	0.71	3.99	17.30	13.36	5.02	15.39	1.08
Median	0.49	1.94	1.23	3.45	0.35	0.70	3.72	10.71	8.58	4.96	12.05	1.07
Mean	0.49	1.94	1.23	3.45	0.35	0.70	3.72	10.71	8.58	4.96	12.05	1.07
SD	0.01	0.03	0.01	3.52	0.01	0.01	0.38	9.32	6.77	0.09	4.73	0.02

Table C - 11. Riverview Park West Creek – Spring

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
N	2	2	2	2	2	2	2	2	2	2	2	2
Minimum	0.51	6.10	2.27	55.81	22.36	10.15	18.92	81.32	36.49	25.35	6.98	1.30
Maximum	0.59	9.81	3.74	77.52	33.66	17.74	38.04	155.27	66.83	26.76	8.90	1.49
Median	0.55	7.95	3.01	66.66	28.01	13.95	28.48	118.29	51.66	26.06	7.94	1.39
Mean	0.55	7.95	3.01	66.66	28.01	13.95	28.48	118.29	51.66	26.06	7.94	1.39
SD	0.06	2.62	1.05	15.36	7.99	5.37	13.52	52.29	21.45	1.00	1.35	0.13

Table C - 12. Riverview Park West Creek – Fall

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	1	1	1	1	1	1	1	1	1	1	1	1
Minimum	0.67	2.70	1.60	73.58	17.35	11.84	5.93	186.37	61.30	39.93	120.38	1.48
Maximum	0.67	2.70	1.60	73.58	17.35	11.84	5.93	186.37	61.30	39.93	120.38	1.48
Median	0.67	2.70	1.60	73.58	17.35	11.84	5.93	186.37	61.30	39.93	120.38	1.48
Mean	0.67	2.70	1.60	73.58	17.35	11.84	5.93	186.37	61.30	39.93	120.38	1.48
SD	.	.	.	.	.	.	.	.	.	.	.	.

Table C - 13. Mainstem Little Manatee River – Baseline

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
N	46	56	33	56	56	56	56	56	33	33	33	56
Minimum	0.08	0.78	0.11	0.81	0.40	0.64	1.04	1.98	1.32	11.26	1.24	0.05
Maximum	2.63	8.04	5.10	101.70	297.94	22.33	55.19	205.61	96.05	57.80	19.98	21.11
Median	0.15	2.29	2.46	7.22	6.00	5.67	5.79	7.70	10.68	29.75	14.55	1.16
Mean	0.30	2.69	2.73	11.34	18.45	8.19	8.77	17.11	16.27	29.57	12.05	3.14
SD	0.41	1.65	1.19	16.98	48.71	6.54	8.87	36.63	19.44	15.23	6.10	5.49

Table C - 14. Curiosity Creek – Spring

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	0.49	1.96	0.40	4.04	1.20	2.74	7.15	2.25	4.40	28.31	7.67	1.08
Maximum	0.51	2.05	0.44	5.26	2.89	3.07	8.79	3.67	6.13	31.15	8.14	1.13
Median	0.50	1.98	0.42	4.12	1.35	2.94	7.24	2.91	6.00	28.93	8.05	1.09
Mean	0.50	2.00	0.42	4.47	1.81	2.92	7.72	2.95	5.51	29.47	7.95	1.10
SD	0.01	0.04	0.02	0.68	0.93	0.17	0.92	0.71	0.97	1.50	0.25	0.02

Table C - 15. Curiosity Creek – Fall

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	0.47	1.87	1.02	0.94	0.34	0.67	3.44	2.68	2.84	4.77	8.25	1.03
Maximum	0.51	2.03	1.15	1.02	0.37	0.73	4.48	8.28	5.71	5.18	8.95	1.12
Median	0.48	1.93	1.04	0.97	0.35	0.70	3.44	3.53	3.30	4.93	8.37	1.06
Mean	0.49	1.94	1.07	0.97	0.35	0.70	3.79	4.83	3.95	4.96	8.52	1.07
SD	0.02	0.08	0.07	0.04	0.02	0.03	0.60	3.02	1.54	0.21	0.37	0.04

Table C - 16. Wildcat Creek – Spring

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
N	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	0.49	1.98	0.45	5.35	2.07	3.16	8.37	3.83	7.81	27.93	6.98	1.09
Maximum	0.50	2.00	0.56	6.89	5.30	3.66	9.78	8.87	11.40	28.19	7.64	5.76
Median	0.50	2.00	0.49	5.39	2.32	3.25	8.63	3.97	10.47	28.14	7.48	1.10
Mean	0.50	1.99	0.50	5.87	3.23	3.36	8.93	5.56	9.89	28.09	7.37	2.65
SD	0.00	0.02	0.06	0.88	1.79	0.26	0.75	2.87	1.86	0.14	0.35	2.69

Table C - 17. Wildcat Creek – Fall

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	0.50	2.02	1.05	2.14	0.36	0.73	3.09	4.83	5.16	5.14	10.90	1.11
Maximum	0.53	2.11	1.14	2.81	0.38	0.76	3.28	7.94	8.65	5.37	12.32	1.16
Median	0.53	2.10	1.11	2.22	0.38	0.76	3.23	7.18	7.15	5.36	11.75	1.16
Mean	0.52	2.07	1.10	2.39	0.37	0.75	3.20	6.65	6.99	5.29	11.66	1.14
SD	0.01	0.05	0.05	0.36	0.01	0.02	0.10	1.62	1.75	0.13	0.71	0.03

Table C - 18. Terra Ceia Bay – Baseline

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
N	46	46	15	46	46	46	46	46	15	15	15	46
Minimum	0.08	1.05	1.41	1.99	0.74	0.82	0.56	3.00	1.78	11.23	1.27	0.60
Maximum	0.60	9.86	3.07	30.54	17.55	11.67	21.47	354.60	68.24	46.09	15.00	24.64
Median	0.13	2.62	2.35	10.10	2.31	4.82	5.22	5.96	20.13	29.81	4.66	1.92
Mean	0.19	3.10	2.40	10.91	3.10	5.16	7.54	38.30	31.94	26.47	5.41	4.85
SD	0.13	1.93	0.42	5.77	2.95	3.41	6.54	85.06	24.51	14.45	4.30	7.62

Table C - 19. Frog Creek – Spring

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	0.51	2.04	0.66	3.30	0.37	0.77	1.88	8.56	16.12	5.45	14.06	1.12
Maximum	0.60	2.41	1.00	16.40	0.43	1.92	2.72	17.94	40.87	13.27	36.81	1.33
Median	0.53	2.14	0.69	13.35	0.39	1.42	2.44	16.45	39.10	12.19	32.19	1.18
Mean	0.55	2.20	0.78	11.02	0.40	1.37	2.35	14.32	32.03	10.30	27.69	1.21
SD	0.05	0.19	0.19	6.86	0.04	0.58	0.43	5.04	13.80	4.24	12.03	0.11

Table C - 20. Frog Creek – Fall

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	0.49	1.95	1.44	7.31	1.04	3.74	4.67	3.90	24.64	29.50	10.53	1.07
Maximum	0.54	2.14	1.75	10.61	2.92	4.17	6.09	5.67	32.75	33.26	12.08	1.18
Median	0.52	2.06	1.56	8.79	1.63	4.01	5.49	5.33	30.80	30.37	10.61	1.13
Mean	0.51	2.05	1.59	8.90	1.86	3.98	5.42	4.97	29.40	31.04	11.07	1.13
SD	0.02	0.09	0.16	1.66	0.96	0.22	0.71	0.94	4.24	1.97	0.87	0.05

Table C - 21. McMullen Creek – Spring

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
N	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	0.52	2.09	0.95	3.05	0.38	0.75	2.48	6.77	6.81	5.33	12.74	1.15
Maximum	0.53	2.12	1.06	4.61	0.38	0.76	2.59	9.09	23.79	5.40	14.51	1.17
Median	0.53	2.12	0.99	3.91	0.38	0.76	2.52	7.29	9.37	5.40	13.49	1.16
Mean	0.53	2.11	1.00	3.86	0.38	0.76	2.53	7.72	13.32	5.38	13.58	1.16
SD	0.00	0.02	0.06	0.78	0.00	0.01	0.06	1.22	9.16	0.04	0.89	0.01

Table C - 22. McMullen Creek – Fall

mg/kg	AG	AS	CD	CR	CU	NI	PB	ZN	MN	SB	SE	SN
TEL	**0.73**	**7.20**	**0.68**	**52.30**	**18.70**	**15.90**	**30.20**	**124.00**	**-**	**-**	**-**	**-**
PEL	**1.77**	**41.60**	**4.20**	**160.00**	**108.00**	**42.80**	**112.00**	**271.00**	**-**	**-**	**-**	**-**
n	3	3	3	3	3	3	3	3	3	3	3	3
Minimum	0.52	2.07	1.19	6.98	2.62	4.14	3.32	5.97	8.48	31.67	10.91	1.14
Maximum	0.57	2.28	1.58	17.28	16.62	6.11	6.83	22.50	21.90	36.40	12.09	1.25
Median	0.55	2.18	1.53	14.43	10.58	5.88	4.86	15.44	15.78	34.38	11.98	1.20
Mean	0.54	2.18	1.43	12.90	9.94	5.38	5.00	14.64	15.38	34.15	11.66	1.20
SD	0.03	0.11	0.21	5.32	7.03	1.08	1.76	8.29	6.72	2.37	0.65	0.06

APPENDIX D:

Sediment Contaminant Summary Tables - Organics

Table D-1A. Feather Sound/Old Tampa Bay – Baseline Low Molecular Weight PAHs

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	147	147	147	147	147	147	147
Minimum	0.01	0.00	0.00	0.00	0.00	0.18	0.19
Maximum	15.66	13.40	15.50	8.53	18.00	120.43	146.98
Median	3.00	3.00	3.00	3.00	2.13	3.00	17.00
Mean	3.50	3.44	3.06	3.44	2.94	7.99	24.37
SD	2.70	2.63	2.43	2.23	2.05	17.44	22.93

Table D- 1B. Feather Sound/Old Tampa Bay – Baseline High Molecular Weight and Total PAH's

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	147	147	133	147	147	147	147	147
Min.	0.00	0.00	1.49	0.00	0.00	0.00	0.02	0.21
Max.	228.57	395.07	503.96	267.40	591.56	568.90	2406.61	2553.59
Median	3.00	3.00	3.00	3.00	3.00	3.00	18.00	35.00
Mean	9.66	13.62	16.81	7.20	19.12	20.65	86.06	110.42
SD	29.21	46.73	61.79	26.61	72.90	74.39	304.98	323.39

Table D- 1C. Feather Sound/Old Tampa Bay Baseline Other PAHs

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	147	147	147	121	33	33
Min.	0.00	0.00	0.00	2.06	0.98	1.02
Max.	649.19	592.10	434.50	409.97	30.58	188.56
Median	4.00	2.90	2.00	3.00	5.13	3.40
Mean	20.29	15.92	11.92	12.38	5.42	17.62
SD	72.43	60.24	48.95	41.21	6.16	36.08

Table D- 2A. Feather Sound/Old Tampa Bay – Baseline PCBs and Pesticides

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
N	132	147	147	147	147	147	147	147
Minimum	0.45	0.01	0.01	0.02	0.02	0.02	0.08	0.03
Maximum	20.70	0.23	0.60	1.00	24.30	1.90	26.23	135.10
Median	2.70	0.08	0.07	0.04	0.10	0.10	0.23	0.20
Mean	4.51	0.08	0.08	0.09	0.32	0.15	0.57	1.21
SD	4.28	0.05	0.07	0.13	2.06	0.24	2.24	11.13

Table D- 2B. Feather Sound/Old Tampa Bay – Baseline Pesticides (no TEL/PELs).

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
N	147	132	132	147	147	132	147	132	132
Minimum	0.01	0.02	0.01	0.02	0.01	0.01	0.02	0.03	0.02
Maximum	0.18	0.40	2.50	0.23	1.60	0.50	2.64	1.60	1.50
Median	0.05	0.10	0.10	0.18	0.05	0.10	0.04	0.05	0.20
Mean	0.07	0.09	0.10	0.13	0.09	0.08	0.12	0.13	0.16
SD	0.05	0.06	0.22	0.07	0.16	0.06	0.31	0.24	0.16

Table D- 2C. Feather Sound/Old Tampa Bay – Baseline Pesticides (no TEL/PELs).

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	147	110	110	132	132	132	147
Minimum	0.02	0.01	0.02	0.02	0.03	0.03	0.02
Maximum	0.80	1.48	2.00	1.50	0.96	2.04	0.39
Median	0.10	0.05	0.06	0.10	0.05	0.10	0.10
Mean	0.10	0.11	0.13	0.25	0.17	0.11	0.10
SD	0.09	0.24	0.25	0.22	0.16	0.20	0.07

Table D- 3A. Grassy Creek Low Molecular Weight PAHs – Spring

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	6	6	6	6	6	6	6
Minimum	2.91	2.82	3.21	3.26	2.96	2.85	18.01
Maximum	2.91	2.82	3.21	3.26	2.96	7.31	22.48
Median	2.91	2.82	3.21	3.26	2.96	4.02	19.19
Mean	2.91	2.82	3.21	3.26	2.96	4.59	19.76
SD	0.00	0.00	0.00	0.00	0.00	2.03	2.03

Table D- 3B. Grassy Creek Low Molecular Weight PAHs – Fall

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
n	6	6	6	6	6	6	6
Minimum	2.91	2.82	3.21	3.26	2.96	11.58	26.78
Maximum	6.89	2.82	3.21	4.68	7.65	30.24	55.13
Median	3.31	2.82	3.21	3.26	2.96	12.63	27.92
Mean	4.19	2.82	3.21	3.67	4.01	17.37	35.27
SD	1.72	0.00	0.00	0.65	1.89	8.29	12.38

Table D- 3C. Grassy Creek High Molecular Weight and Total PAHs – Spring

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
N	6	6	6	6	6	6	6	6
Min.	3.51	3.70	1.61	0.47	3.29	4.15	16.73	34.74
Max.	3.51	3.70	5.66	0.47	7.83	7.28	27.90	49.58
Median	3.51	3.70	1.61	0.47	4.09	4.15	17.53	36.72
Mean	3.51	3.70	2.29	0.47	5.04	5.10	20.10	39.86
SD	0.00	0.00	1.65	0.00	2.00	1.48	4.67	6.48

Table D- 3D. Grassy Creek High Molecular Weight and Total PAHs – Fall

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	6	6	6	6	6	6	6	6
Min.	3.51	3.70	1.61	0.47	3.39	4.15	16.83	44.13
Max.	6.11	6.72	9.34	0.47	16.88	10.78	47.27	102.40
Median	3.56	3.70	1.61	0.47	5.93	4.15	19.42	46.79
Mean	4.05	4.20	3.80	0.47	8.40	6.07	27.00	62.27
SD	1.03	1.24	3.47	0.00	5.66	3.03	13.60	25.92

Table D- 3E. Grassy Creek Additional PAHs – Spring

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	6	6	6	6	6	6
Min.	3.46	4.48	2.62	1.87	1.58	3.48
Max.	6.07	4.48	8.09	10.52	1.58	3.48
Median	3.46	4.48	2.62	1.87	1.58	3.48
Mean	4.31	4.48	3.53	4.06	1.58	3.48
SD	1.32	0.00	2.23	3.63	0.00	0.00

Table D- 3F. Grassy Creek Additional PAHs – Fall

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	6	6	6	6	6	6
Min.	3.46	4.48	2.62	1.87	1.58	3.48
Max.	11.85	6.82	7.90	5.75	1.58	3.48
Median	4.51	4.48	2.62	1.87	1.58	3.48
Mean	6.29	4.87	3.50	3.13	1.58	3.48
SD	3.71	0.96	2.16	1.95	0.00	0.00

Table D- 4A. Grassy Creek PCBs and Pesticides – Spring

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
N	6	6	6	6	6	6	6	6
Minimum	0.51	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Maximum	0.83	0.15	0.01	0.03	0.07	0.06	0.16	0.15
Median	0.77	0.12	0.01	0.03	0.07	0.06	0.16	0.07
Mean	0.70	0.10	0.01	0.03	0.07	0.06	0.16	0.08
SD	0.14	0.05	0.00	0.00	0.00	0.00	0.00	0.05

Table D- 4B. Grassy Creek PCBs and Pesticides – Fall

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
N	6	6	6	6	6	6	6	6
Minimum	0.50	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Maximum	1.31	0.12	0.01	0.03	0.07	0.06	0.16	0.17
Median	0.51	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Mean	0.64	0.04	0.01	0.03	0.07	0.06	0.16	0.05
SD	0.33	0.04	0.00	0.00	0.00	0.00	0.00	0.06

Table D-4C. Grassy Creek Pesticides (no TEL/PELs) – Spring

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
N	6	6	6	6	6	6	6	6	6
Minimum	0.01	0.10	0.06	0.01	0.02	0.03	0.03	0.03	0.04
Maximum	0.07	0.10	0.06	0.04	0.02	0.06	0.03	0.03	0.10
Median	0.04	0.10	0.06	0.01	0.02	0.03	0.03	0.03	0.04
Mean	0.04	0.10	0.06	0.02	0.02	0.03	0.03	0.03	0.05
SD	0.03	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.02

Table D-4D. Grassy Creek Pesticides (no TEL/PELs) – Fall

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	6	6	6	6	6	6	6	6	6
Minimum	0.01	0.10	0.06	0.01	0.02	0.03	0.03	0.03	0.04
Maximum	0.16	0.55	0.06	0.01	0.02	0.03	0.03	0.03	0.22
Median	0.01	0.24	0.06	0.01	0.02	0.03	0.03	0.03	0.04
Mean	0.04	0.29	0.06	0.01	0.02	0.03	0.03	0.03	0.07
SD	0.06	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.07

Table D-4E. Grassy Creek Pesticides (no TEL/PELs) – Spring

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	6	6	6	6	6	6	6
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.09	0.06	0.09	0.02	0.03	0.72	0.02
Median	0.01	0.02	0.04	0.02	0.03	0.34	0.02
Mean	0.03	0.03	0.05	0.02	0.03	0.36	0.02
SD	0.03	0.02	0.03	0.00	0.00	0.33	0.00

Table D-4F. Grassy Creek Pesticides (no TEL/PELs) – Fall

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	6	6	6	6	6	6	6
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.01	0.02	0.15	0.60	0.03	0.12	0.02
Median	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Mean	0.01	0.02	0.04	0.11	0.03	0.05	0.02
SD	0.00	0.00	0.06	0.24	0.00	0.04	0.00

Table D-5A. Mainstem Alafia River – Baseline Low Molecular Weight PAHs.

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
n	67	67	67	67	67	67	67
Minimum	1.08	0.66	1.12	1.12	1.42	1.10	6.55
Maximum	27.40	194.07	90.11	31.67	49.00	642.02	1026.96
Median	3.00	3.00	3.00	3.00	4.00	18.94	40.00
Mean	5.97	6.33	7.30	4.92	8.91	41.67	75.10
SD	5.93	23.41	13.43	5.08	11.37	90.58	138.50

Table D-5B. Mainstem Alafia River – Baseline High Molecular Weight and Total PAHs.

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	67	67	67	67	67	67	67	67
Min.	0.68	1.69	1.49	1.12	0.99	2.40	11.02	17.57
Max.	1340.13	1569.31	1653.39	672.33	1749.07	2485.13	9469.36	10496.32
Median	22.80	30.00	31.70	3.00	50.09	46.40	186.58	213.45
Mean	49.50	65.24	70.49	22.36	95.53	107.56	410.68	485.77
SD	164.79	197.17	206.47	85.36	231.83	309.88	1184.54	1317.02

Table D-5C. Mainstem Alafia River – Baseline Other PAHs (no TEL/PELs).

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	67	67	67	57	28	28
Min.	0.61	2.00	1.00	2.06	0.98	1.02
Max.	1732.04	748.93	981.51	852.54	424.77	180.21
Median	45.20	27.00	23.00	29.00	19.17	12.55
Mean	102.02	57.55	49.37	51.90	42.85	19.67
SD	260.06	124.24	126.68	120.06	81.07	35.38

Table D-6A. Mainstem Alafia River – Baseline PCBs and Pesticides.

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
N	67	67	67	67	67	67	67	67
Minimum	0.63	0.01	0.01	0.02	0.02	0.03	0.08	0.03
Maximum	67.60	2.80	14.22	1.90	2.80	2.10	6.02	5.70
Median	6.20	0.04	0.07	0.07	0.10	0.10	0.49	0.30
Mean	8.19	0.15	0.28	0.25	0.28	0.24	0.77	0.54
SD	9.73	0.39	1.73	0.40	0.51	0.38	0.92	0.88

Table D-6B. Mainstem Alafia River – Baseline Pesticides (no TEL/PELs).

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
N	67	67	67	67	67	67	67	67	67
Minimum	0.01	0.02	0.01	0.02	0.01	0.02	0.02	0.03	0.02
Maximum	0.33	2.88	1.40	1.66	1.97	14.22	0.40	1.80	31.78
Median	0.05	0.10	0.09	0.14	0.06	0.10	0.04	0.09	0.20
Mean	0.08	0.13	0.11	0.16	0.28	0.41	0.06	0.27	0.84
SD	0.07	0.35	0.20	0.22	0.50	1.89	0.06	0.38	4.01

Table D-6C. Mainstem Alafia River – Baseline Pesticides (no TEL/PELs).

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	67	62	62	67	67	67	67
Minimum	0.02	0.01	0.02	0.02	0.03	0.03	0.02
Maximum	8.33	2.70	1.70	4.38	0.30	3.09	7.78
Median	0.09	0.10	0.06	0.08	0.05	0.10	0.10
Mean	0.23	0.26	0.19	0.28	0.12	0.24	0.37
SD	1.01	0.44	0.30	0.57	0.11	0.44	1.17

Table D-7A. Dog Leg Creek Low Molecular Weight PAHs – Spring.

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	1	1	1	1	1	1	1
Minimum	9.43	2.82	3.21	3.93	11.46	43.20	74.06
Maximum	9.43	2.82	3.21	3.93	11.46	43.20	74.06
Median	9.43	2.82	3.21	3.93	11.46	43.20	74.06
Mean	9.43	2.82	3.21	3.93	11.46	43.20	74.06
SD	.	.	.	.	.	.	.

Table D-7B. Dog Leg Creek Low Molecular Weight PAHs – Fall.

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	1	1	1	1	1	1	1
Minimum	33.07	3.59	12.20	19.37	42.79	157.20	268.22
Maximum	33.07	3.59	12.20	19.37	42.79	157.20	268.22
Median	33.07	3.59	12.20	19.37	42.79	157.20	268.22
Mean	33.07	3.59	12.20	19.37	42.79	157.20	268.22
SD	.	.	.	.	.	.	.

Table D-7C. Dog Leg Creek High Molecular Weight and Total PAHs – Spring

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
N	1	1	1	1	1	1	1	1
Min.	19.65	22.01	29.08	0.47	41.66	39.30	152.18	226.25
Max.	19.65	22.01	29.08	0.47	41.66	39.30	152.18	226.25
Median	19.65	22.01	29.08	0.47	41.66	39.30	152.18	226.25
Mean	19.65	22.01	29.08	0.47	41.66	39.30	152.18	226.25
SD	.	.	.	.	.	.	.	.

Table D-7D. Dog Leg Creek High Molecular Weight and Total PAHs – Fall

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
N	1	1	1	1	1	1	1	1
Min.	65.29	68.88	88.97	17.22	148.53	142.79	531.68	799.90
Max.	65.29	68.88	88.97	17.22	148.53	142.79	531.68	799.90
Median	65.29	68.88	88.97	17.22	148.53	142.79	531.68	799.90
Mean	65.29	68.88	88.97	17.22	148.53	142.79	531.68	799.90
SD	.	.	.	.	.	.	.	.

Table D-7E. Dog Leg Creek Other PAHs (no TEL/PELs) – Spring

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	1	1	1	1	1	1
Min.	34.59	22.80	29.87	31.44	25.15	20.44
Max.	34.59	22.80	29.87	31.44	25.15	20.44
Median	34.59	22.80	29.87	31.44	25.15	20.44
Mean	34.59	22.80	29.87	31.44	25.15	20.44
SD	.	.	.	.	.	.

Table D-7F. Dog Leg Creek Other PAHs (no TEL/PELs) – Fall

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	1	1	1	1	1	1
Min.	112.65	75.34	46.64	48.79	67.45	39.46
Max.	112.65	75.34	46.64	48.79	67.45	39.46
Median	112.65	75.34	46.64	48.79	67.45	39.46
Mean	112.65	75.34	46.64	48.79	67.45	39.46
SD	.	.	.	.	.	.

Table D-8A. Dog Leg Creek PCBs and Pesticides – Spring

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	1	1	1	1	1	1	1	1
Minimum	0.58	0.02	0.09	0.03	0.23	0.14	0.39	0.14
Maximum	0.58	0.02	0.09	0.03	0.23	0.14	0.39	0.14
Median	0.58	0.02	0.09	0.03	0.23	0.14	0.39	0.14
Mean	0.58	0.02	0.09	0.03	0.23	0.14	0.39	0.14
SD	.	.	.	.	.	.	.	.

Table D-8B. Dog Leg Creek PCBs and Pesticides – Fall

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	1	1	1	1	1	1	1	1
Minimum	1.84	0.02	0.03	0.03	0.72	0.35	1.09	0.50
Maximum	1.84	0.02	0.03	0.03	0.72	0.35	1.09	0.50
Median	1.84	0.02	0.03	0.03	0.72	0.35	1.09	0.50
Mean	1.84	0.02	0.03	0.03	0.72	0.35	1.09	0.50
SD	.	.	.	.	.	.	.	.

Table D-8C. Dog Leg Creek – Spring

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
N	1	1	1	1	1	1	1	1	1
Minimum	0.03	0.71	0.06	0.01	0.02	0.03	0.03	0.03	1.74
Maximum	0.03	0.71	0.06	0.01	0.02	0.03	0.03	0.03	1.74
Median	0.03	0.71	0.06	0.01	0.02	0.03	0.03	0.03	1.74
Mean	0.03	0.71	0.06	0.01	0.02	0.03	0.03	0.03	1.74
SD	.	.	.	.	.	.	.	.	.

Table D-8D. Dog Leg Creek – Fall

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
N	1	1	1	1	1	1	1	1	1
Minimum	0.10	0.10	0.06	0.09	0.25	3.85	0.49	0.20	5.22
Maximum	0.10	0.10	0.06	0.09	0.25	3.85	0.49	0.20	5.22
Median	0.10	0.10	0.06	0.09	0.25	3.85	0.49	0.20	5.22
Mean	0.10	0.10	0.06	0.09	0.25	3.85	0.49	0.20	5.22
SD	.	.	.	.	.	.	.	.	.

Table D-8E. Dog Leg Creek – Spring

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
N	1	1	1	1	1	1	1
Minimum	0.01	0.13	0.01	0.02	0.17	0.03	0.02
Maximum	0.01	0.13	0.01	0.02	0.17	0.03	0.02
Median	0.01	0.13	0.01	0.02	0.17	0.03	0.02
Mean	0.01	0.13	0.01	0.02	0.17	0.03	0.02
SD	.	.	.	.	.	.	.

Table D-8F. Dog Leg Creek – Fall

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	1	1	1	1	1	1	1
Minimum	0.01	0.46	0.04	0.02	0.03	3.24	0.54
Maximum	0.01	0.46	0.04	0.02	0.03	3.24	0.54
Median	0.01	0.46	0.04	0.02	0.03	3.24	0.54
Mean	0.01	0.46	0.04	0.02	0.03	3.24	0.54
SD	.	.	.	.	.	.	.

Table D-9A. Question Mark Creek – Spring

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	1	1	1	1	1	1	1
Minimum	9.39	4.70	51.65	3.26	11.40	53.96	134.36
Maximum	9.39	4.70	51.65	3.26	11.40	53.96	134.36
Median	9.39	4.70	51.65	3.26	11.40	53.96	134.36
Mean	9.39	4.70	51.65	3.26	11.40	53.96	134.36
SD	.	.	.	.	.	.	.

Table D-9B. Question Mark Creek – Fall

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	2	2	2	2	2	2	2
Minimum	15.55	4.25	9.27	9.66	20.98	63.63	124.13
Maximum	15.68	6.79	10.18	11.54	21.64	88.52	153.56
Median	15.62	5.52	9.72	10.60	21.31	76.08	138.84
Mean	15.62	5.52	9.72	10.60	21.31	76.08	138.84
SD	0.09	1.79	0.64	1.33	0.47	17.60	20.81

Table D-9C. Question Mark Creek – Spring

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
N	1	1	1	1	1	1	1	1
Min.	42.26	51.65	54.00	0.47	68.09	93.92	310.40	444.76
Max.	42.26	51.65	54.00	0.47	68.09	93.92	310.40	444.76
Median	42.26	51.65	54.00	0.47	68.09	93.92	310.40	444.76
Mean	42.26	51.65	54.00	0.47	68.09	93.92	310.40	444.76
SD	.	.	.	.	.	.	.	.

Table D-9D. Question Mark Creek – Fall

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	2	2	2	2	2	2	2	2
Min.	57.17	86.14	81.89	22.79	129.78	115.49	493.25	617.38
Max.	69.89	111.96	103.13	39.35	147.92	156.74	628.98	782.54
Median	63.53	99.05	92.51	31.07	138.85	136.11	561.12	699.96
Mean	63.53	99.05	92.51	31.07	138.85	136.11	561.12	699.96
SD	9.00	18.26	15.03	11.71	12.82	29.17	95.98	116.79

Table D-9E. Question Mark Creek – Spring

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	1	1	1	1	1	1
Min.	61.05	42.26	61.05	75.13	25.83	49.31
Max.	61.05	42.26	61.05	75.13	25.83	49.31
Median	61.05	42.26	61.05	75.13	25.83	49.31
Mean	61.05	42.26	61.05	75.13	25.83	49.31
SD	.	.	.	.	.	.

Table D-9F. Question Mark Creek – Fall

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	2	2	2	2	2	2
Min.	129.01	84.20	56.78	67.98	44.10	33.99
Max.	163.52	131.63	85.49	117.38	60.26	88.21
Median	146.27	107.92	71.14	92.68	52.18	61.10
Mean	146.27	107.92	71.14	92.68	52.18	61.10
SD	24.40	33.54	20.30	34.93	11.42	38.34

Table D-10A. Question Mark Creek – Spring

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
N	1	1	1	1	1	1	1	1
Minimum	1.53	0.02	0.08	0.03	0.36	0.06	0.45	0.28
Maximum	1.53	0.02	0.08	0.03	0.36	0.06	0.45	0.28
Median	1.53	0.02	0.08	0.03	0.36	0.06	0.45	0.28
Mean	1.53	0.02	0.08	0.03	0.36	0.06	0.45	0.28
SD	.	.	.	.	.	.	.	.

Table D-10B. Question Mark Creek – Fall

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	2	2	2	2	2	2	2	2
Minimum	0.87	0.02	0.12	0.03	0.79	0.06	0.88	0.14
Maximum	1.33	0.02	0.12	0.06	0.81	0.06	0.93	0.21
Median	1.10	0.02	0.12	0.05	0.80	0.06	0.91	0.18
Mean	1.10	0.02	0.12	0.05	0.80	0.06	0.91	0.18
SD	0.33	0.00	0.00	0.03	0.01	0.00	0.04	0.05

Table D-10C. Question Mark Creek – Spring

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
N	1	1	1	1	1	1	1	1	1
Minimum	0.01	0.10	0.06	0.01	0.02	0.03	0.32	0.03	0.51
Maximum	0.01	0.10	0.06	0.01	0.02	0.03	0.32	0.03	0.51
Median	0.01	0.10	0.06	0.01	0.02	0.03	0.32	0.03	0.51
Mean	0.01	0.10	0.06	0.01	0.02	0.03	0.32	0.03	0.51
SD	.	.	.	.	.	.	.	.	.

Table D-10D. Question Mark Creek – Fall

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	2	2	2	2	2	2	2	2	2
Minimum	0.01	0.10	0.06	0.01	0.02	0.11	0.03	0.03	0.50
Maximum	3.15	0.10	0.06	0.01	0.08	0.74	0.03	0.17	0.68
Median	1.58	0.10	0.06	0.01	0.05	0.42	0.03	0.10	0.59
Mean	1.58	0.10	0.06	0.01	0.05	0.42	0.03	0.10	0.59
SD	2.22	0.00	0.00	0.00	0.04	0.44	0.00	0.10	0.13

Table D-10E. Question Mark Creek – Spring

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	1	1	1	1	1	1	1
Minimum	0.01	0.02	0.26	0.02	0.03	0.03	0.16
Maximum	0.01	0.02	0.26	0.02	0.03	0.03	0.16
Median	0.01	0.02	0.26	0.02	0.03	0.03	0.16
Mean	0.01	0.02	0.26	0.02	0.03	0.03	0.16
SD	.	.	.	.	.	.	.

Table D-10F. Question Mark Creek – Fall

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	2	2	2	2	2	2	2
Minimum	0.01	0.13	0.01	0.02	0.03	0.03	0.08
Maximum	0.01	0.18	0.03	0.02	0.03	0.03	0.51
Median	0.01	0.16	0.02	0.02	0.03	0.03	0.29
Mean	0.01	0.16	0.02	0.02	0.03	0.03	0.29
SD	0.00	0.03	0.02	0.00	0.00	0.00	0.31

Table D-11A. Rice Creek – Spring

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	2	2	2	2	2	2	2
Minimum	2.91	2.82	3.21	3.26	2.96	2.85	18.01
Maximum	2.91	2.82	4.80	3.26	2.96	36.35	53.10
Median	2.91	2.82	4.00	3.26	2.96	19.60	35.56
Mean	2.91	2.82	4.00	3.26	2.96	19.60	35.56
SD	0.00	0.00	1.12	0.00	0.00	23.69	24.81

Table D-11B. Rice Creek – Fall

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	2	2	2	2	2	2	2
Minimum	2.91	2.82	3.21	3.26	2.96	19.49	34.66
Maximum	9.83	2.82	5.78	7.95	11.36	82.85	120.59
Median	6.37	2.82	4.50	5.60	7.16	51.17	77.62
Mean	6.37	2.82	4.50	5.60	7.16	51.17	77.62
SD	4.89	0.00	1.82	3.32	5.94	44.80	60.76

Table D-11C. Rice Creek – Spring

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
N	2	2	2	2	2	2	2	2
Min.	4.01	3.70	1.61	0.47	3.50	5.01	18.30	36.31
Max.	34.31	43.90	46.48	15.49	73.41	67.88	281.47	334.57
Median	19.16	23.80	24.05	7.98	38.46	36.44	149.88	185.44
Mean	19.16	23.80	24.05	7.98	38.46	36.44	149.88	185.44
SD	21.43	28.43	31.73	10.62	49.43	44.46	186.10	210.90

Table D-11D. Rice Creek – Fall

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	2	2	2	2	2	2	2	2
Min.	5.73	7.05	5.73	0.47	11.02	10.14	40.13	74.79
Max.	39.74	58.53	69.36	17.34	111.99	95.74	392.69	513.28
Median	22.73	32.79	37.55	8.91	61.50	52.94	216.41	294.04
Mean	22.73	32.79	37.55	8.91	61.50	52.94	216.41	294.04
SD	24.05	36.40	45.00	11.93	71.40	60.53	249.30	310.06

Table D-11E. Rice Creek – Spring

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	2	2	2	2	2	2
Min.	3.46	4.48	2.62	1.87	1.58	3.48
Max.	43.53	35.78	29.51	33.20	13.65	17.34
Median	23.50	20.13	16.07	17.54	7.61	10.41
Mean	23.50	20.13	16.07	17.54	7.61	10.41
SD	28.34	22.14	19.02	22.15	8.54	9.80

Table D-11F. Rice Creek – Fall

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	2	2	2	2	2	2
Min.	5.73	4.48	2.62	1.87	1.58	3.48
Max.	84.54	54.91	40.46	44.07	1033.06	19.87
Median	45.13	29.70	21.54	22.97	517.32	11.68
Mean	45.13	29.70	21.54	22.97	517.32	11.68
SD	55.73	35.66	26.76	29.84	729.37	11.59

Table D-12A. Rice Creek – Spring

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	2	2	2	2	2	2	2	2
Minimum	0.51	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Maximum	0.56	0.11	0.01	0.03	0.16	0.06	0.26	0.05
Median	0.53	0.07	0.01	0.03	0.12	0.06	0.21	0.04
Mean	0.53	0.07	0.01	0.03	0.12	0.06	0.21	0.04
SD	0.04	0.07	0.00	0.00	0.07	0.00	0.07	0.01

Table D-12B. Rice Creek – Fall

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
N	2	2	2	2	2	2	2	2
Minimum	0.51	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Maximum	0.55	0.02	0.07	0.10	0.28	0.06	0.44	0.23
Median	0.53	0.02	0.04	0.06	0.17	0.06	0.30	0.13
Mean	0.53	0.02	0.04	0.06	0.17	0.06	0.30	0.13
SD	0.03	0.00	0.04	0.05	0.15	0.00	0.20	0.14

Table D-12C. Rice Creek – Spring

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
N	2	2	2	2	2	2	2	2	2
Minimum	0.01	0.10	0.06	0.01	0.02	0.03	0.03	0.03	0.04
Maximum	0.01	0.10	0.06	0.01	0.02	0.03	0.03	0.03	0.04
Median	0.01	0.10	0.06	0.01	0.02	0.03	0.03	0.03	0.04
Mean	0.01	0.10	0.06	0.01	0.02	0.03	0.03	0.03	0.04
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table D-12D. Rice Creek – Fall

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	2	2	2	2	2	2	2	2	2
Minimum	0.01	0.10	0.06	0.01	0.02	0.07	0.03	0.03	0.04
Maximum	0.05	0.10	0.06	0.01	0.02	1.52	0.03	0.03	0.39
Median	0.03	0.10	0.06	0.01	0.02	0.79	0.03	0.03	0.22
Mean	0.03	0.10	0.06	0.01	0.02	0.79	0.03	0.03	0.22
SD	0.02	0.00	0.00	0.00	0.00	1.03	0.00	0.00	0.25

Table D-12E. Rice Creek – Spring

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	2	2	2	2	2	2	2
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.13	0.02	0.03	0.02	0.09	0.03	0.02
Median	0.07	0.02	0.02	0.02	0.06	0.03	0.02
Mean	0.07	0.02	0.02	0.02	0.06	0.03	0.02
SD	0.08	0.00	0.01	0.00	0.04	0.00	0.00

Table D-12F. Rice Creek – Fall

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	2	2	2	2	2	2	2
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.10	0.22	0.01	0.23	0.03	0.03	0.04
Median	0.06	0.12	0.01	0.12	0.03	0.03	0.03
Mean	0.06	0.12	0.01	0.12	0.03	0.03	0.03
SD	0.06	0.14	0.00	0.15	0.00	0.00	0.02

Table D-13A. Riverview Park West Creek – Spring

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	2	2	2	2	2	2	2
Minimum	19.11	9.55	16.09	11.57	24.47	105.73	186.52
Maximum	25.88	17.97	31.63	20.85	52.67	157.20	306.19
Median	22.49	13.76	23.86	16.21	38.57	131.46	246.35
Mean	22.49	13.76	23.86	16.21	38.57	131.46	246.35
SD	4.79	5.95	10.99	6.56	19.94	36.39	84.62

Table D-13B. Riverview Park West Creek – Fall

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	1	1	1	1	1	1	1
Minimum	65.22	68.36	102.02	48.38	1.06	335.03	620.06
Maximum	65.22	68.36	102.02	48.38	1.06	335.03	620.06
Median	65.22	68.36	102.02	48.38	1.06	335.03	620.06
Mean	65.22	68.36	102.02	48.38	1.06	335.03	620.06
SD	.	.	.	.	.	.	.

Table D-13C. Riverview Park West Creek – Spring

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	2	2	2	2	2	2	2	2
Min.	139.29	195.11	189.08	69.90	230.82	288.14	1112.34	1298.86
Max.	275.32	356.55	334.98	121.49	388.18	569.33	2045.84	2352.03
Median	207.31	275.83	262.03	95.69	309.50	428.74	1579.09	1825.44
Mean	207.31	275.83	262.03	95.69	309.50	428.74	1579.09	1825.44
SD	96.18	114.15	103.17	36.48	111.27	198.83	660.08	744.70

Table D-13D. Riverview Park West Creek – Fall

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	1	1	1	1	1	1	1	1
Min.	539.53	686.77	538.48	200.88	827.70	816.13	3609.48	4229.54
Max.	539.53	686.77	538.48	200.88	827.70	816.13	3609.48	4229.54
Median	539.53	686.77	538.48	200.88	827.70	816.13	3609.48	4229.54
Mean	539.53	686.77	538.48	200.88	827.70	816.13	3609.48	4229.54
SD	.	.	.	.	.	.	.	.

Table D-13E. Riverview Park West Creek – Spring

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	2	2	2	2	2	2
Min.	231.82	160.92	158.91	198.63	136.28	119.68
Max.	387.46	325.64	260.22	309.10	176.12	182.59
Median	309.64	243.28	209.56	253.87	156.20	151.14
Mean	309.64	243.28	209.56	253.87	156.20	151.14
SD	110.05	116.48	71.64	78.12	28.17	44.48

Table D-13F. Riverview Park West Creek – Fall

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	1	1	1	1	1	1
Min.	878.18	576.34	383.88	430.15	167.22	181.95
Max.	878.18	576.34	383.88	430.15	167.22	181.95
Median	878.18	576.34	383.88	430.15	167.22	181.95
Mean	878.18	576.34	383.88	430.15	167.22	181.95
SD	.	.	.	.	.	.

Table D-14A. Riverview Park West Creek – Spring

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	2	2	2	2	2	2	2	2
Minimum	2.71	0.02	0.10	0.38	1.46	0.06	2.03	0.14
Maximum	7.44	0.02	1.05	0.51	3.05	0.65	4.08	0.32
Median	5.08	0.02	0.57	0.44	2.25	0.36	3.05	0.23
Mean	5.08	0.02	0.57	0.44	2.25	0.36	3.05	0.23
SD	3.34	0.00	0.67	0.09	1.12	0.42	1.45	0.13

Table D-14B. Riverview Park West Creek – Fall

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	1	1	1	1	1	1	1	1
Minimum	1.41	0.02	0.38	0.41	2.99	1.48	4.88	1.72
Maximum	1.41	0.02	0.38	0.41	2.99	1.48	4.88	1.72
Median	1.41	0.02	0.38	0.41	2.99	1.48	4.88	1.72
Mean	1.41	0.02	0.38	0.41	2.99	1.48	4.88	1.72
SD	.	.	.	.	.	.	.	.

Table D-14C. Riverview Park West Creek – Spring

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
N	2	2	2	2	2	2	2	2	2
Minimum	0.01	0.10	0.06	0.01	0.02	0.03	0.03	0.03	0.04
Maximum	0.01	0.10	0.06	0.01	0.10	0.03	0.03	0.03	0.04
Median	0.01	0.10	0.06	0.01	0.06	0.03	0.03	0.03	0.04
Mean	0.01	0.10	0.06	0.01	0.06	0.03	0.03	0.03	0.04
SD	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00

Table D-14D. Riverview Park West Creek – Fall

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	1	1	1	1	1	1	1	1	1
Minimum	0.01	0.10	0.06	0.01	0.02	0.85	0.03	0.03	0.04
Maximum	0.01	0.10	0.06	0.01	0.02	0.85	0.03	0.03	0.04
Median	0.01	0.10	0.06	0.01	0.02	0.85	0.03	0.03	0.04
Mean	0.01	0.10	0.06	0.01	0.02	0.85	0.03	0.03	0.04
SD	.	.	.	.	.	.	.	.	.

Table D-14E. Riverview Park West Creek – Spring

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	2	2	2	2	2	2	2
Minimum	0.01	0.13	0.01	0.02	0.03	0.03	0.34
Maximum	0.01	0.31	0.01	0.02	0.03	0.03	0.45
Median	0.01	0.22	0.01	0.02	0.03	0.03	0.40
Mean	0.01	0.22	0.01	0.02	0.03	0.03	0.40
SD	0.00	0.13	0.00	0.00	0.00	0.00	0.07

Table D-14F. Riverview Park West Creek – Fall

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	1	1	1	1	1	1	1
Minimum	0.13	1.01	0.71	0.02	0.03	3.47	0.64
Maximum	0.13	1.01	0.71	0.02	0.03	3.47	0.64
Median	0.13	1.01	0.71	0.02	0.03	3.47	0.64
Mean	0.13	1.01	0.71	0.02	0.03	3.47	0.64
SD	.	.	.	.	.	.	.

Table D-15A. Mainstem Little Manatee River – Baseline

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	88.9	128	245	144	391	544	1440.00
n	56	56	56	56	56	56	56
Minimum	1.51	0.66	1.12	1.12	2.00	1.10	12.20
Maximum	37.00	9.00	62.00	42.00	59.57	219.00	359.00
Median	3.60	2.80	3.00	3.28	4.60	5.26	29.43
Mean	5.75	3.45	5.56	5.02	7.71	18.29	45.78
SD	6.00	2.44	10.64	5.60	10.21	33.51	52.94

Table D-15B. Mainstem Little Manatee River – Baseline

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	56	56	56	56	56	56	56	56
Min.	0.68	1.69	1.49	1.12	0.99	2.40	11.02	23.80
Max.	173.00	169.00	282.00	31.00	373.00	273.00	1272.00	1370.00
Median	4.00	5.00	4.00	3.00	5.60	5.60	26.00	66.00
Mean	13.53	13.38	16.07	5.22	29.72	26.73	104.65	150.42
SD	28.50	25.77	41.19	5.65	69.71	53.89	217.54	257.50

Table D-15C. Mainstem Little Manatee River – Baseline

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	56	56	56	51	28	28
Min.	0.61	2.00	1.00	2.06	0.98	1.02
Max.	214.00	129.00	95.00	94.00	127.25	43.23
Median	4.00	5.00	2.50	3.40	6.24	3.40
Mean	17.69	11.91	9.70	10.36	15.70	7.50
SD	34.72	21.06	17.15	17.81	28.25	9.87

Table D-16A. Mainstem Little Manatee River – Baseline

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	56	56	56	56	56	56	56	56
Minimum	0.45	0.01	0.01	0.02	0.02	0.02	0.08	0.03
Maximum	15.70	0.50	0.68	5.41	34.99	1.46	39.31	7.77
Median	2.70	0.05	0.05	0.08	0.10	0.10	0.32	0.10
Mean	3.21	0.07	0.08	0.30	1.23	0.21	1.73	0.48
SD	2.74	0.08	0.11	0.85	5.21	0.26	6.07	1.14

Table D-16B. Little Manatee River – Baseline

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	56	56	56	56	56	56	56	56	56
Minimum	0.01	0.02	0.01	0.02	0.01	0.01	0.02	0.03	0.02
Maximum	0.17	0.19	1.30	0.23	2.53	4.67	0.33	1.46	0.97
Median	0.05	0.10	0.09	0.10	0.06	0.10	0.05	0.07	0.07
Mean	0.08	0.10	0.13	0.12	0.18	0.33	0.06	0.14	0.15
SD	0.06	0.06	0.22	0.08	0.36	0.71	0.05	0.22	0.17

Table D-16C. Little Manatee River – Baseline

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	56	56	56	56	56	56	56
Minimum	0.02	0.01	0.02	0.02	0.03	0.03	0.02
Maximum	0.61	3.50	4.27	0.60	0.58	0.71	5.55
Median	0.08	0.05	0.06	0.08	0.04	0.07	0.08
Mean	0.08	0.20	0.28	0.18	0.11	0.13	0.21
SD	0.09	0.50	0.74	0.20	0.12	0.13	0.74

Table D-17A. Curiosity Creek – Spring

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	3	3	3	3	3	3	3
Minimum	2.91	2.82	3.21	3.26	2.96	4.89	20.05
Maximum	2.91	2.82	3.21	3.26	2.96	7.77	22.94
Median	2.91	2.82	3.21	3.26	2.96	5.73	20.89
Mean	2.91	2.82	3.21	3.26	2.96	6.13	21.29
SD	0.00	0.00	0.00	0.00	0.00	1.48	1.48

Table D-17B. Curiosity Creek – Fall

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
n	3	3	3	3	3	3	3
Minimum	3.11	2.82	3.21	3.26	2.96	7.11	22.48
Maximum	4.42	2.82	3.21	3.26	5.94	15.65	35.30
Median	3.16	2.82	3.21	3.26	2.96	11.20	26.62
Mean	3.56	2.82	3.21	3.26	3.96	11.32	28.13
SD	0.74	0.00	0.00	0.00	1.72	4.27	6.54

Table D-17C. Curiosity Creek – Spring

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	3	3	3	3	3	3	3	3
Min.	3.51	3.70	1.61	0.47	3.64	4.15	17.08	37.97
Max.	3.51	3.70	1.61	0.47	5.52	4.15	18.96	41.29
Median	3.51	3.70	1.61	0.47	4.91	4.15	18.36	39.01
Mean	3.51	3.70	1.61	0.47	4.69	4.15	18.13	39.43
SD	0.00	0.00	0.00	0.00	0.96	0.00	0.96	1.70

Table D-17D. Curiosity Creek – Fall

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	3	3	3	3	3	3	3	3
Min.	3.51	3.70	1.61	0.47	3.64	4.15	17.08	39.56
Max.	3.51	3.70	1.61	0.47	3.64	4.15	17.08	52.38
Median	3.51	3.70	1.61	0.47	3.64	4.15	17.08	43.70
Mean	3.51	3.70	1.61	0.47	3.64	4.15	17.08	45.21
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.54

Table D-17E. Curiosity Creek – Spring

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	3	3	3	3	3	3
Min.	3.46	4.48	2.62	1.87	1.58	3.48
Max.	3.46	4.48	2.62	1.87	1.58	3.48
Median	3.46	4.48	2.62	1.87	1.58	3.48
Mean	3.46	4.48	2.62	1.87	1.58	3.48
SD	0.00	0.00	0.00	0.00	0.00	0.00

Table D-17F. Curiosity Creek – Fall

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	3	3	3	3	3	3
Min.	3.46	4.48	2.62	1.87	1.58	3.48
Max.	3.46	4.48	2.62	1.87	1.58	3.48
Median	3.46	4.48	2.62	1.87	1.58	3.48
Mean	3.46	4.48	2.62	1.87	1.58	3.48
SD	0.00	0.00	0.00	0.00	0.00	0.00

Table D-18A. Curiosity Creek – Spring

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	3	3	3	3	3	3	3	3
Minimum	0.51	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Maximum	0.72	0.02	0.01	0.07	0.07	0.06	0.20	0.04
Median	0.51	0.02	0.01	0.06	0.07	0.06	0.19	0.03
Mean	0.58	0.02	0.01	0.05	0.07	0.06	0.18	0.03
SD	0.12	0.00	0.00	0.02	0.00	0.00	0.02	0.01

Table D-18B. Curiosity Creek – Fall

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	3	3	3	3	3	3	3	3
Minimum	0.46	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Maximum	0.51	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Median	0.51	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Mean	0.49	0.02	0.01	0.03	0.07	0.06	0.16	0.03
SD	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table D-18C. Curiosity Creek – Spring

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	3	3	3	3	3	3	3	3	3
Minimum	0.01	0.10	0.06	0.01	0.02	0.77	0.03	0.03	0.24
Maximum	0.03	0.10	0.06	0.01	0.02	1.14	0.03	0.03	0.41
Median	0.01	0.10	0.06	0.01	0.02	0.96	0.03	0.03	0.39
Mean	0.02	0.10	0.06	0.01	0.02	0.96	0.03	0.03	0.35
SD	0.01	0.00	0.00	0.00	0.00	0.19	0.00	0.00	0.10

Table D-18D. Curiosity Creek – Fall

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	3	3	3	3	3	3	3	3	3
Minimum	0.01	0.10	0.06	0.01	0.02	0.16	0.03	0.03	0.04
Maximum	0.01	0.10	0.06	0.01	0.13	0.36	0.03	0.03	0.04
Median	0.01	0.10	0.06	0.01	0.06	0.21	0.03	0.03	0.04
Mean	0.01	0.10	0.06	0.01	0.07	0.24	0.03	0.03	0.04
SD	0.00	0.00	0.00	0.00	0.06	0.11	0.00	0.00	0.00

Table D-18E. Curiosity Creek – Spring

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	3	3	3	3	3	3	3
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.01	0.02	0.03	0.02	0.11	0.03	0.02
Median	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Mean	0.01	0.02	0.02	0.02	0.06	0.03	0.02
SD	0.00	0.00	0.01	0.00	0.05	0.00	0.00

Table D-18F. Curiosity Creek – Fall

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	3	3	3	3	3	3	3
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Median	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Mean	0.01	0.02	0.01	0.02	0.03	0.03	0.02
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table D-19A. Wildcat Creek – Spring

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
n	3	3	3	3	3	3	3
Minimum	2.91	2.82	3.21	3.26	2.96	2.85	18.01
Maximum	2.91	2.82	3.21	3.26	2.96	11.09	26.25
Median	2.91	2.82	3.21	3.26	2.96	10.02	25.18
Mean	2.91	2.82	3.21	3.26	2.96	7.98	23.15
SD	0.00	0.00	0.00	0.00	0.00	4.48	4.48

Table D-19B. Wildcat Creek – Fall

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
n	3	3	3	3	3	3	3
Minimum	2.91	2.82	3.21	3.26	2.96	9.37	24.54
Maximum	3.43	2.82	3.21	3.26	2.96	16.65	32.34
Median	3.35	2.82	3.21	3.26	2.96	15.73	31.34
Mean	3.23	2.82	3.21	3.26	2.96	13.92	29.40
SD	0.28	0.00	0.00	0.00	0.00	3.97	4.24

Table D-19C. Wildcat Creek – Spring

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	3	3	3	3	3	3	3	3
Min.	3.51	3.70	1.61	0.47	3.64	4.15	17.08	35.09
Max.	3.82	3.70	1.61	0.47	7.00	7.32	23.91	49.09
Median	3.51	3.70	1.61	0.47	4.49	4.15	17.93	44.18
Mean	3.61	3.70	1.61	0.47	5.04	5.21	19.64	42.79
SD	0.18	0.00	0.00	0.00	1.75	1.83	3.72	7.10

Table D-19D. Wildcat Creek – Fall

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	3	3	3	3	3	3	3	3
Min.	3.51	3.70	1.61	0.47	3.64	4.15	17.08	41.62
Max.	3.51	3.70	1.61	0.47	4.35	4.15	17.79	49.57
Median	3.51	3.70	1.61	0.47	3.79	4.15	17.23	49.13
Mean	3.51	3.70	1.61	0.47	3.93	4.15	17.37	46.77
SD	0.00	0.00	0.00	0.00	0.37	0.00	0.37	4.47

Table D-19E. Wildcat Creek – Spring

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	3	3	3	3	3	3
Min.	3.46	4.48	2.62	1.87	1.58	3.48
Max.	3.46	4.48	2.62	1.87	8.91	3.48
Median	3.46	4.48	2.62	1.87	1.58	3.48
Mean	3.46	4.48	2.62	1.87	4.02	3.48
SD	0.00	0.00	0.00	0.00	4.23	0.00

Table D-19F. Wildcat Creek – Fall

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	3	3	3	3	3	3
Min.	3.46	4.48	2.62	1.87	1.58	3.48
Max.	3.46	4.48	2.62	1.87	6.53	3.48
Median	3.46	4.48	2.62	1.87	1.58	3.48
Mean	3.46	4.48	2.62	1.87	3.23	3.48
SD	0.00	0.00	0.00	0.00	2.86	0.00

Table D-20A. Wildcat Creek – Spring

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	3	3	3	3	3	3	3	3
Minimum	0.54	0.02	0.01	0.03	0.07	0.06	0.16	0.05
Maximum	0.72	0.06	0.09	0.21	0.13	0.06	0.41	0.55
Median	0.58	0.02	0.01	0.12	0.07	0.06	0.25	0.13
Mean	0.61	0.03	0.04	0.12	0.09	0.06	0.27	0.24
SD	0.10	0.03	0.05	0.09	0.04	0.00	0.13	0.27

Table D-20B. Wildcat Creek – Fall

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	3	3	3	3	3	3	3	3
Minimum	0.68	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Maximum	0.88	0.07	0.01	0.08	0.07	0.06	0.21	0.42
Median	0.72	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Mean	0.76	0.04	0.01	0.05	0.07	0.06	0.18	0.16
SD	0.11	0.03	0.00	0.03	0.00	0.00	0.03	0.23

Table D-20C. Wildcat Creek – Spring

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	3	3	3	3	3	3	3	3	3
Minimum	0.01	0.10	0.06	0.01	0.06	0.15	0.03	0.03	0.04
Maximum	0.01	0.10	0.06	0.01	0.23	1.85	0.03	0.03	0.13
Median	0.01	0.10	0.06	0.01	0.16	0.96	0.03	0.03	0.04
Mean	0.01	0.10	0.06	0.01	0.15	0.99	0.03	0.03	0.07
SD	0.00	0.00	0.00	0.00	0.09	0.85	0.00	0.00	0.05

Table D-20D. Wildcat Creek – Fall

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	3	3	3	3	3	3	3	3	3
Minimum	0.01	0.40	0.06	0.01	0.02	0.54	0.03	0.03	0.04
Maximum	0.01	0.89	0.06	0.11	0.28	0.96	0.03	0.03	0.19
Median	0.01	0.47	0.06	0.01	0.02	0.59	0.03	0.03	0.13
Mean	0.01	0.58	0.06	0.04	0.11	0.70	0.03	0.03	0.12
SD	0.00	0.27	0.00	0.06	0.15	0.23	0.00	0.00	0.07

Table D-20E. Wildcat Creek – Spring

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	3	3	3	3	3	3	3
Minimum	0.01	0.02	0.04	0.02	0.03	0.03	0.02
Maximum	0.01	0.26	0.29	0.02	0.03	0.03	0.10
Median	0.01	0.05	0.08	0.02	0.03	0.03	0.04
Mean	0.01	0.11	0.14	0.02	0.03	0.03	0.05
SD	0.00	0.13	0.13	0.00	0.00	0.00	0.05

Table D-20F. Wildcat Creek – Fall

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	3	3	3	3	3	3	3
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.01	0.02	0.41	0.33	0.03	0.03	0.02
Median	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Mean	0.01	0.02	0.14	0.12	0.03	0.03	0.02
SD	0.00	0.00	0.23	0.18	0.00	0.00	0.00

Table D-21A. Terra Ceia Bay – Baseline

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
n	31	31	31	31	31	31	31
Minimum	1.08	0.66	1.12	1.12	1.42	1.10	11.43
Maximum	9.00	9.00	6.31	8.00	5.80	13.72	40.00
Median	3.00	2.80	2.00	4.00	4.00	5.00	20.00
Mean	4.24	4.17	3.01	4.34	3.69	4.46	23.90
SD	2.91	3.05	1.82	2.36	1.10	3.26	10.73

Table D-21B. Terra Ceia Bay – Baseline

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	31	31	31	31	31	31	31	31
Min.	1.68	2.00	1.70	1.12	1.53	2.40	11.60	23.80
Max.	18.99	22.26	18.87	10.65	31.07	26.23	119.73	138.45
Median	3.52	3.36	3.00	3.00	3.00	3.00	18.00	38.00
Mean	4.84	5.27	4.17	3.43	5.40	5.26	28.37	52.27
SD	4.52	4.46	3.60	2.65	5.77	4.79	23.22	27.09

Table D-21C. Terra Ceia Bay – Baseline

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	31	31	31	24	9	9
Min.	2.00	2.90	1.00	2.76	0.98	2.44
Max.	40.65	9.68	19.36	16.94	16.45	25.21
Median	3.00	4.00	2.00	4.00	5.60	6.29
Mean	6.16	4.61	3.55	5.37	5.58	11.01
SD	7.97	1.88	4.58	3.88	4.90	10.76

Table D-22A. Terra Ceia Bay – Baseline

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	21.60	0.32	0.72	1.2	2.1	1.2	3.89	2.30
PEL	189.00	0.99	4.30	7.8	37.4	4.8	51.70	4.80
n	31	31	31	31	31	31	31	31
Minimum	0.45	0.01	0.02	0.02	0.02	0.03	0.08	0.03
Maximum	6.00	0.17	0.12	0.26	0.53	0.21	0.82	2.42
Median	2.70	0.04	0.04	0.04	0.03	0.10	0.17	0.08
Mean	2.59	0.04	0.04	0.06	0.09	0.10	0.26	0.19
SD	1.13	0.03	0.02	0.05	0.14	0.07	0.18	0.42

Table D-22B. Terra Ceia Bay – Baseline

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	31	31	31	31	31	31	31	31	31
Minimum	0.01	0.02	0.01	0.02	0.02	0.01	0.02	0.03	0.02
Maximum	0.52	0.42	0.10	0.49	0.49	0.59	0.08	0.46	0.40
Median	0.02	0.08	0.02	0.05	0.05	0.03	0.05	0.08	0.07
Mean	0.09	0.08	0.05	0.10	0.08	0.07	0.05	0.12	0.12
SD	0.11	0.08	0.04	0.10	0.09	0.11	0.02	0.12	0.12

Table D-22C. Terra Ceia Bay – Baseline

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	31	31	31	31	31	31	31
Minimum	0.02	0.01	0.02	0.02	0.03	0.03	0.02
Maximum	0.30	0.08	2.34	0.60	0.11	0.32	0.29
Median	0.06	0.04	0.05	0.07	0.04	0.04	0.03
Mean	0.07	0.04	0.16	0.12	0.04	0.08	0.08
SD	0.06	0.02	0.42	0.16	0.02	0.07	0.08

Table D-23A. Frog Creek – Spring

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
n	3	3	3	3	3	3	3
Minimum	2.91	2.82	3.21	3.26	2.96	24.14	42.82
Maximum	5.81	2.82	3.21	3.26	4.85	36.90	52.07
Median	4.78	2.82	3.21	3.26	4.61	29.34	49.29
Mean	4.50	2.82	3.21	3.26	4.14	30.13	48.06
SD	1.47	0.00	0.00	0.00	1.03	6.42	4.74

Table D-23B. Frog Creek – Fall

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
n	3	3	3	3	3	3	3
Minimum	2.91	2.82	3.21	3.26	2.96	10.14	25.78
Maximum	3.38	2.82	3.21	3.26	2.96	13.71	28.88
Median	2.91	2.82	3.21	3.26	2.96	11.67	26.84
Mean	3.07	2.82	3.21	3.26	2.96	11.84	27.16
SD	0.27	0.00	0.00	0.00	0.00	1.79	1.58

Table D-23C. Frog Creek – Spring

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	3	3	3	3	3	3	3	3
Min.	6.35	7.69	8.37	0.47	16.04	10.81	50.60	93.43
Max.	23.02	29.86	39.82	0.47	70.61	51.95	215.74	267.80
Median	6.62	8.72	9.02	0.47	17.43	11.03	52.42	101.71
Mean	12.00	15.42	19.07	0.47	34.70	24.60	106.26	154.31
SD	9.55	12.52	17.97	0.00	31.12	23.69	94.82	98.37

Table D-23D. Frog Creek – Fall

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	3	3	3	3	3	3	3	3
Min.	3.51	3.70	1.61	0.47	3.64	4.15	17.08	43.41
Max.	3.51	3.70	1.61	0.47	8.66	5.27	23.23	52.11
Median	3.51	3.70	1.61	0.47	4.19	4.15	17.63	43.92
Mean	3.51	3.70	1.61	0.47	5.50	4.53	19.31	46.48
SD	0.00	0.00	0.00	0.00	2.76	0.65	3.40	4.88

Table D-23E. Frog Creek – Spring

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	3	3	3	3	3	3
Min.	10.36	8.72	6.97	7.67	1.58	3.48
Max.	34.84	29.24	17.42	19.60	1.58	3.48
Median	12.90	10.36	7.02	7.69	1.58	3.48
Mean	19.37	16.11	10.47	11.65	1.58	3.48
SD	13.46	11.40	6.02	6.88	0.00	0.00

Table D-23F. Frog Creek – Fall

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	3	3	3	3	3	3
Min.	3.46	4.48	2.62	1.87	1.58	3.48
Max.	3.46	4.48	2.62	1.87	1.58	3.48
Median	3.46	4.48	2.62	1.87	1.58	3.48
Mean	3.46	4.48	2.62	1.87	1.58	3.48
SD	0.00	0.00	0.00	0.00	0.00	0.00

Table D-24A. Frog Creek – Spring

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	3	3	3	3	3	3	3	3
Minimum	0.51	0.02	0.01	0.03	0.07	0.06	0.22	0.03
Maximum	0.67	0.06	0.04	0.18	1.20	0.06	1.45	0.10
Median	0.51	0.04	0.01	0.09	0.14	0.06	0.23	0.05
Mean	0.56	0.04	0.02	0.10	0.47	0.06	0.63	0.06
SD	0.10	0.02	0.01	0.08	0.64	0.00	0.70	0.04

Table D-24B. Frog Creek – Fall

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	3	3	3	3	3	3	3	3
Minimum	0.49	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Maximum	0.73	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Median	0.51	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Mean	0.57	0.02	0.01	0.03	0.07	0.06	0.16	0.03
SD	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table D-24C. Frog Creek – Spring

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	3	3	3	3	3	3	3	3	3
Minimum	0.01	0.10	0.06	0.01	0.02	0.03	0.13	0.03	0.04
Maximum	0.01	0.73	0.06	0.01	0.02	1.03	0.21	0.03	0.04
Median	0.01	0.63	0.06	0.01	0.02	0.30	0.17	0.03	0.04
Mean	0.01	0.49	0.06	0.01	0.02	0.45	0.17	0.03	0.04
SD	0.00	0.34	0.00	0.00	0.00	0.52	0.04	0.00	0.00

Table D-24D. Frog Creek – Fall

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
N	3	3	3	3	3	3	3	3	3
Minimum	0.01	0.10	0.06	0.01	0.02	0.03	0.03	0.03	0.04
Maximum	0.01	0.10	0.06	0.01	0.02	0.26	0.03	0.03	0.04
Median	0.01	0.10	0.06	0.01	0.02	0.25	0.03	0.03	0.04
Mean	0.01	0.10	0.06	0.01	0.02	0.18	0.03	0.03	0.04
SD	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00

Table D-24E. Frog Creek – Spring

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
N	3	3	3	3	3	3	3
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.01	0.09	0.01	0.02	0.03	0.03	0.02
Median	0.01	0.04	0.01	0.02	0.03	0.03	0.02
Mean	0.01	0.05	0.01	0.02	0.03	0.03	0.02
SD	0.00	0.04	0.00	0.00	0.00	0.00	0.00

Table D-24F. Frog Creek – Fall

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	3	3	3	3	3	3	3
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.01	0.02	0.01	0.09	0.03	0.03	0.02
Median	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Mean	0.01	0.02	0.01	0.04	0.03	0.03	0.02
SD	0.00	0.00	0.00	0.04	0.00	0.00	0.00

Table D-25A. McMullen Creek – Spring

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
N	3	3	3	3	3	3	3
Minimum	2.91	2.82	3.21	3.26	2.96	12.89	28.06
Maximum	2.91	2.82	3.21	3.26	2.96	24.95	40.11
Median	2.91	2.82	3.21	3.26	2.96	16.56	31.73
Mean	2.91	2.82	3.21	3.26	2.96	18.13	33.30
SD	0.00	0.00	0.00	0.00	0.00	6.18	6.18

Table D-25B. McMullen Creek – Fall

µg/kg	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Total LMW PAHs
TEL	**6.7**	**5.9**	**46.9**	**21.2**	**34.6**	**86.7**	**312.00**
PEL	**88.9**	**128**	**245**	**144**	**391**	**544**	**1440.00**
n	3	3	3	3	3	3	3
Minimum	2.91	2.82	3.21	3.26	2.96	15.07	30.23
Maximum	6.96	2.82	4.30	5.03	6.18	36.74	61.60
Median	3.74	2.82	3.87	3.26	2.96	34.92	52.01
Mean	4.54	2.82	3.79	3.85	4.04	28.91	47.95
SD	2.14	0.00	0.55	1.02	1.86	12.02	16.07

Table D-25C. McMullen Creek – Spring

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
N	3	3	3	3	3	3	3	3
Min.	4.79	7.18	6.56	0.47	13.13	8.20	42.61	71.26
Max.	23.34	24.00	42.74	0.47	75.29	57.54	223.39	263.50
Median	5.18	7.94	8.20	0.47	14.36	9.33	43.20	74.34
Mean	11.10	13.04	19.17	0.47	34.26	25.02	103.07	136.37
SD	10.60	9.50	20.43	0.00	35.54	28.17	104.20	110.11

Table D-25D. McMullen Creek – Fall

µg/kg	Benz(a) anthracene	Benzo(a) pyrene	Chrysene	Dibenzo(a,h) anthracene	Fluoranthene	Pyrene	Total HMW PAHs	TOTAL PAHs
TEL	**74.8**	**88.8**	**108**	**6.2**	**113**	**153**	**655.00**	**1680.00**
PEL	**693**	**763**	**846**	**135**	**1490**	**1400**	**6680.00**	**16800.00**
n	3	3	3	3	3	3	3	3
Min.	11.37	9.69	20.63	0.47	58.53	37.06	137.75	167.98
Max.	29.78	51.06	42.58	0.47	86.01	52.90	251.62	303.63
Median	28.81	40.85	39.84	0.47	68.07	47.19	236.41	298.01
Mean	23.32	33.87	34.35	0.47	70.87	45.71	208.59	256.54
SD	10.36	21.55	11.96	0.00	13.95	8.02	61.82	76.74

Table D-25E. McMullen Creek – Spring

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
N	3	3	3	3	3	3
Min.	9.67	7.18	2.62	6.15	1.58	3.48
Max.	36.17	38.14	15.78	16.77	1.58	6.58
Median	10.60	8.29	2.62	6.56	1.58	3.48
Mean	18.81	17.87	7.01	9.83	1.58	4.51
SD	15.04	17.56	7.60	6.02	0.00	1.79

Table D-25F. McMullen Creek – Fall

µg/kg	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1) pyrene	Benzo(g,h,i) perylene	Retene	Coronene
n	3	3	3	3	3	3
Min.	21.48	14.74	10.11	9.69	1.58	3.48
Max.	71.17	39.45	42.16	41.39	1.58	30.17
Median	52.90	36.12	38.27	36.98	1.58	18.92
Mean	48.51	30.10	30.18	29.35	1.58	17.52
SD	25.13	13.41	17.49	17.17	0.00	13.40

Table D-26A. McMullen Creek – Spring

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	3	3	3	3	3	3	3	3
Minimum	0.51	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Maximum	0.51	0.12	0.01	0.35	0.77	0.06	1.17	0.03
Median	0.51	0.02	0.01	0.03	0.16	0.06	0.26	0.03
Mean	0.51	0.05	0.01	0.13	0.33	0.06	0.53	0.03
SD	0.00	0.06	0.00	0.18	0.38	0.00	0.56	0.00

Table D-26B. McMullen Creek – Fall

µg/kg	Total PCBs	Lindane	Dieldrin	DDD	DDE	DDT	Total DDT	Total Chlordane
TEL	**21.60**	**0.32**	**0.72**	**1.2**	**2.1**	**1.2**	**3.89**	**2.30**
PEL	**189.00**	**0.99**	**4.30**	**7.8**	**37.4**	**4.8**	**51.70**	**4.80**
n	3	3	3	3	3	3	3	3
Minimum	0.55	0.02	0.01	0.03	0.07	0.06	0.16	0.03
Maximum	1.59	0.02	0.01	0.12	0.07	0.06	0.25	0.07
Median	0.63	0.02	0.01	0.03	0.07	0.06	0.16	0.06
Mean	0.92	0.02	0.01	0.06	0.07	0.06	0.19	0.05
SD	0.58	0.00	0.00	0.05	0.00	0.00	0.05	0.02

Table D-26C. McMullen Creek – Spring

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	3	3	3	3	3	3	3	3	3
Minimum	0.01	0.10	0.06	0.01	0.02	0.03	0.14	0.03	0.04
Maximum	0.01	0.10	0.06	0.01	0.02	0.03	0.16	0.03	0.04
Median	0.01	0.10	0.06	0.01	0.02	0.03	0.14	0.03	0.04
Mean	0.01	0.10	0.06	0.01	0.02	0.03	0.15	0.03	0.04
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00

Table D-26D. McMullen Creek – Fall

µg/kg	Alpha – BHC	Beta-BHC	Delta-BHC	Endosulfan 1	Endosulfan 2	Endosulfate	Endrin	Endrin aldehyde	Endrin ketone
n	3	3	3	3	3	3	3	3	3
Minimum	0.01	0.44	0.06	0.01	0.02	0.03	0.03	0.03	0.04
Maximum	0.04	0.49	0.06	0.14	0.02	0.10	0.03	0.03	0.04
Median	0.01	0.48	0.06	0.01	0.02	0.07	0.03	0.03	0.04
Mean	0.02	0.47	0.06	0.05	0.02	0.07	0.03	0.03	0.04
SD	0.02	0.02	0.00	0.07	0.00	0.04	0.00	0.00	0.00

Table D-26E. McMullen Creek – Spring

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
N	3	3	3	3	3	3	3
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Median	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Mean	0.01	0.02	0.01	0.02	0.03	0.03	0.02
SD	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table D-26F. McMullen Creek – Fall

µg/kg	Aldrin	Alpha-Chlordane	Gamma-Chlordane	Heptachlor	Heptachlor Epoxide	Methoxychlor	Mirex
n	3	3	3	3	3	3	3
Minimum	0.01	0.02	0.01	0.02	0.03	0.03	0.02
Maximum	0.30	0.06	0.01	0.02	0.03	0.03	0.02
Median	0.01	0.05	0.01	0.02	0.03	0.03	0.02
Mean	0.11	0.04	0.01	0.02	0.03	0.03	0.02
SD	0.17	0.02	0.00	0.00	0.00	0.00	0.00

APPENDIX E:

Benthic SIMPER Analysis Results

Feather Sound / Old Tampa Bay Area
SIMPER Analysis

Table E-1: Feather Sound / Old Tampa Bay Spring sample biota similarity.

Group OTB-Spring **Average similarity: 50.01**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
TUBIFICIDAE	7.05	3.35	7.99	6.71	6.71
Axiothella mucosa	8.36	3.32	4.27	6.64	13.35
Grandidierella bonnieroides	6.69	3.17	4.79	6.35	19.69
Parastarte triquetra	6.79	2.61	4.19	5.22	24.91
Grubeosyllis nitidula	5.63	2.45	2.82	4.89	29.81
Mediomastus ambiseta	5.81	2.35	3.31	4.69	34.50
Aricidea philbinae	5.11	2.10	7.45	4.19	38.69
Tubificoides wasselli	5.76	2.00	2.76	4.00	42.69
Erichsonella attenuata	4.53	1.74	3.75	3.48	46.17
Harrieta faxoni	4.97	1.66	1.16	3.31	49.48
Mediomastus sp.	4.22	1.65	4.26	3.30	52.78
Tubificoides brownae	3.55	1.52	6.78	3.05	55.83
Paracaprella tenuis	3.84	1.42	1.25	2.84	58.67
Kinbergonuphis simoni	4.73	1.32	1.27	2.65	61.31
Ampelisca holmesi	5.16	1.27	1.04	2.55	63.86
Zygonemertes virescens	3.05	1.22	1.25	2.43	66.29
Ampelisca abdita	3.42	1.19	1.33	2.37	68.66
Cymadusa compta	4.13	1.18	1.26	2.36	71.03
Capitella capitata complex	4.23	1.15	1.14	2.29	73.32
Streblospio spp.	4.45	1.00	0.79	2.01	75.33
Fabricinuda trilobata	4.84	0.99	0.78	1.97	77.30
Shoemakerella cubensis	3.92	0.73	0.48	1.45	78.75
Polydora cornuta	3.07	0.70	0.78	1.41	80.16
Prionospio heterobranchia	2.88	0.70	0.79	1.39	81.55
Aricidea taylori	2.86	0.66	0.74	1.33	82.88
Amphiporus bioculatus	2.40	0.66	0.78	1.31	84.19
Glycinde solitaria	2.51	0.64	0.77	1.28	85.48
Epitomapta roseola	2.51	0.61	0.79	1.21	86.69
Rudilemboides naglei	3.17	0.52	0.46	1.03	87.72
Scolelepis texana	1.79	0.49	0.78	0.98	88.70
Laeonereis culveri	2.20	0.34	0.48	0.68	89.39
Mysella planulata	2.03	0.33	0.48	0.66	90.04

Table E-2: Feather Sound / Old Tampa Bay Fall sample biota similarity.

Group OTB-Fall **Average similarity: 25.38**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Amakusanthura magnifica	3.83	2.49	3.32	9.82	9.82
TUBIFICIDAE	3.76	2.24	1.56	8.82	18.65
Ampelisca holmesi	3.71	2.01	1.40	7.94	26.58
Glottidia pyramidata	2.98	1.07	0.66	4.22	30.81
Mysella planulata	3.10	1.05	0.62	4.15	34.96
Rudilemboides naglei	3.83	0.99	0.69	3.90	38.86
Axiothella mucosa	2.34	0.76	0.71	3.00	41.86
Metharpinia floridana	2.67	0.75	0.68	2.94	44.80
Prionospio heterobranchia	2.31	0.71	0.72	2.81	47.61
Amphiporus bioculatus	1.71	0.69	0.70	2.72	50.33
Podarkeopsis levifuscina	1.92	0.68	0.72	2.70	53.03
Shoemakerella cubensis	2.31	0.68	0.69	2.69	55.71
Oxyurostylis smithi	2.06	0.67	0.66	2.63	58.34
Prunum apicinum	1.86	0.66	0.71	2.62	60.96
Exogone dispar	4.10	0.56	0.41	2.20	63.17
Armandia maculata	2.27	0.51	0.50	2.01	65.17
Tubificoides wasselli	1.98	0.47	0.49	1.84	67.01
Eudevenopus honduranus	1.79	0.46	0.50	1.81	68.82
Prionospio perkinsi	1.88	0.45	0.50	1.78	70.59
Mediomastus sp.	2.23	0.45	0.51	1.77	72.36
Aricidea philbinae	1.55	0.38	0.49	1.49	73.85
Rhithropanopeus harrisii	1.40	0.37	0.50	1.46	75.31
Pinnixa spp.	1.41	0.35	0.49	1.37	76.68
ACTINARIA	1.76	0.34	0.50	1.34	78.02
Leitoscoloplos spp.	1.12	0.31	0.51	1.21	79.23
Notomastus hemipodus	1.49	0.28	0.34	1.12	80.35
Fabricinuda trilobata	2.35	0.25	0.30	0.97	81.33
Branchiostoma floridae	1.71	0.25	0.31	0.97	82.30
Synelmis ewingi	1.64	0.23	0.31	0.92	83.22
Phyllodoce arenae	1.31	0.21	0.34	0.84	84.06
Cymadusa compta	1.17	0.21	0.34	0.84	84.89
Ampelisca abdita	1.03	0.21	0.34	0.81	85.70
Magelona pettiboneae	0.95	0.19	0.33	0.74	86.44
Balanus sp.	1.27	0.19	0.33	0.74	87.18
Pectinaria gouldii	1.08	0.19	0.34	0.74	87.92
Olivella pusilla	0.89	0.19	0.33	0.73	88.65
Cerapus tubularis	1.51	0.19	0.33	0.73	89.38
Gibberosus cf. myersi	1.03	0.16	0.34	0.62	90.00

Table E-3: Feather Sound / Old Tampa Bay Spring and Fall sample biota dissimilarity.

Groups OTB-Spring & OTB-Fall **Average dissimilarity = 78.13**						
	Group OTB-S	**Group OTB-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Parastarte triquetra	6.79	0.50	1.89	2.42	2.42	2.42
Grandidierella bonnieroides	6.69	0.88	1.83	2.41	2.35	4.76
Axiothella mucosa	8.36	2.34	1.81	2.11	2.32	7.08
Mediomastus ambiseta	5.81	0.00	1.78	2.85	2.27	9.36
Grubeosyllis nitidula	5.63	0.66	1.57	2.08	2.01	11.37
Harrieta faxoni	4.97	0.28	1.48	1.64	1.90	13.27
Fabricinuda trilobata	4.84	2.35	1.31	1.23	1.68	14.95

Streblospio spp.	4.45	0.00	1.29	1.20	1.66	16.60
Tubificoides wasselli	5.76	1.98	1.27	1.45	1.62	18.23
Kinbergonuphis simoni	4.73	0.60	1.27	1.72	1.62	19.85
Erichsonella attenuata	4.53	0.40	1.23	2.31	1.58	21.43
Shoemakerella cubensis	3.92	2.31	1.22	1.28	1.56	22.99
Rudilemboides naglei	3.17	3.83	1.18	1.15	1.52	24.51
Ampelisca holmesi	5.16	3.71	1.17	1.17	1.49	26.00
Capitella capitata complex	4.23	0.56	1.15	1.37	1.48	27.48
Exogone dispar	0.00	4.10	1.13	0.74	1.44	28.92
Paracaprella tenuis	3.84	0.47	1.09	1.52	1.39	30.32
Aricidea philbinae	5.11	1.55	1.09	1.80	1.39	31.71
Glottidia pyramidata	0.00	2.98	1.00	0.98	1.28	33.00
Cymadusa compta	4.13	1.17	0.98	1.63	1.26	34.26
Tubificoides brownae	3.55	0.28	0.97	2.93	1.25	35.50
Mysella planulata	2.03	3.10	0.97	0.94	1.25	36.75
TUBIFICIDAE	7.05	3.76	0.96	2.07	1.23	37.98
Amakusanthura magnifica	1.32	3.83	0.94	1.46	1.20	39.19
Mediomastus sp.	4.22	2.23	0.93	1.44	1.20	40.38
Polydora cornuta	3.07	0.63	0.91	1.27	1.16	41.55
Aricidea taylori	2.86	0.00	0.87	1.23	1.11	42.66
Zygonemertes virescens	3.05	0.73	0.84	1.38	1.07	43.73
Ampelisca abdita	3.42	1.03	0.83	1.56	1.06	44.79
Metharpinia floridana	0.00	2.67	0.78	1.04	1.00	45.79
Epitomapta roseola	2.51	0.00	0.75	1.31	0.96	46.75
Prionospio heterobranchia	2.88	2.31	0.74	1.27	0.94	47.69
Oxyurostylis smithi	1.88	2.06	0.70	1.06	0.89	48.59
Glycinde solitaria	2.51	0.75	0.68	1.24	0.88	49.46
Laeonereis culveri	2.20	0.00	0.66	0.90	0.84	50.31

Table E-4: Grassy Creek Spring sample biota similarity.

Group GC-Spring **Average similarity: 55.75**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	9.83	4.19	3.95	7.52	7.52
Leptochelia sp.	10.58	4.16	3.09	7.47	14.99
Parastarte triquetra	9.13	3.73	5.31	6.70	21.69
Fabricinuda trilobata	8.33	3.57	5.47	6.41	28.10
Leitoscoloplos spp.	6.49	2.70	2.63	4.84	32.94
Edotia triloba	5.11	2.60	5.84	4.67	37.61
Laeonereis culveri	5.18	2.56	11.67	4.59	42.20
Capitella capitata complex	5.70	2.52	12.13	4.52	46.72
Cyathura polita	5.62	2.50	3.80	4.48	51.19
Grubeosyllis nitidula	4.72	2.04	5.20	3.66	54.85
ACTINARIA	4.25	1.91	6.24	3.43	58.28
Tubificoides brownae	3.94	1.90	4.31	3.42	61.69
TUBIFICIDAE	5.51	1.86	1.28	3.34	65.03
Almyracuma proximoculi	4.08	1.86	5.02	3.33	68.36
Zygonemertes virescens	3.83	1.78	7.84	3.20	71.56
Xenanthura brevitelson	3.92	1.32	1.31	2.36	73.92
Streblospio spp.	4.25	1.28	1.19	2.30	76.22
Leptochelia (Hargeria) rapax	3.95	1.25	1.25	2.24	78.46
Acteocina canaliculata	3.23	1.13	1.30	2.02	80.48
Gammarus mucronatus	3.52	0.89	0.78	1.60	82.08
Syllides cf. fulvus	3.26	0.89	0.79	1.59	83.66
Eteone heteropoda	2.86	0.83	0.78	1.48	85.14

Apocorophium louisianum	3.60	0.71	0.48	1.27	86.41
Paracaprella tenuis	2.70	0.71	0.79	1.27	87.68
Ampelisca abdita	4.33	0.68	0.47	1.21	88.89
Hobsonia florida	2.64	0.64	0.76	1.15	90.04

Table E-5: Feather Sound / Old Tampa Bay and Grassy Creek Spring sample biota dissimilarity.

Groups OTB-S & GC-S **Average dissimilarity = 65.35**						
	Group OTB-S	**Group GC-S**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Leptochelia sp.	1.27	10.58	2.47	1.96	3.78	3.78
Axiothella mucosa	8.36	0.74	2.01	2.68	3.07	6.85
Mediomastus ambiseta	5.81	0.67	1.42	2.14	2.17	9.02
Tubificoides wasselli	5.76	0.43	1.41	1.79	2.16	11.18
Fabricinuda trilobata	4.84	8.33	1.39	1.16	2.13	13.31
Harrieta faxoni	4.97	0.00	1.35	1.68	2.07	15.38
Aricidea philbinae	5.11	0.00	1.35	4.43	2.06	17.45
Leitoscoloplos spp.	1.95	6.49	1.31	1.69	2.00	19.45
Ampelisca holmesi	5.16	1.58	1.25	1.13	1.91	21.36
Cyathura polita	1.60	5.62	1.19	1.58	1.83	23.19
Kinbergonuphis simoni	4.73	0.00	1.19	1.80	1.83	25.01
Edotia triloba	1.03	5.11	1.17	1.92	1.78	26.80
Ampelisca abdita	3.42	4.33	1.15	1.52	1.76	28.56
Mediomastus sp.	4.22	0.00	1.12	2.93	1.72	30.28
Almyracuma proximoculi	0.00	4.08	1.11	3.16	1.70	31.98
Shoemakerella cubensis	3.92	0.00	1.08	0.95	1.66	33.63
Erichsonella attenuata	4.53	0.56	1.08	2.07	1.65	35.28
Parastarte triquetra	6.79	9.13	1.04	1.14	1.59	36.87
Apocorophium louisianum	0.00	3.60	1.03	0.93	1.58	38.45
Grandidierella bonnieroides	6.69	9.83	1.02	1.57	1.57	40.01
Streblospio spp.	4.45	4.25	1.01	1.24	1.54	41.55
Cymadusa compta	4.13	0.43	0.96	1.75	1.47	43.03
Leptochelia (Hargeria) rapax	0.43	3.95	0.95	1.59	1.46	44.49
Laeonereis culveri	2.20	5.18	0.94	1.56	1.44	45.93
Xenanthura brevitelson	1.30	3.92	0.88	1.40	1.35	47.28
Capitella capitata complex	4.23	5.70	0.85	1.10	1.29	48.57
Rudilemboides naglei	3.17	0.00	0.84	0.89	1.29	49.86
Gammarus mucronatus	1.46	3.52	0.84	1.24	1.28	51.15

Table E-6: Grassy Creek Fall sample biota similarity.

Group GC-F **Average similarity: 57.60**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
TUBIFICIDAE	6.33	6.37	6.11	11.06	11.06
Parastarte triquetra	5.46	5.03	3.28	8.73	19.79
Leitoscoloplos spp.	5.03	4.96	6.99	8.61	28.40
Capitella capitata complex	4.66	4.60	8.71	7.98	36.38
Laeonereis culveri	5.75	4.42	2.32	7.67	44.05
Grandidierella bonnieroides	4.22	4.24	4.47	7.36	51.41
ACTINARIA	3.99	3.95	7.60	6.85	58.26
Fabricinuda trilobata	3.86	3.03	1.34	5.26	63.52
Xenanthura brevitelson	3.30	2.37	1.25	4.11	67.63
Marphysa cf. sanguinea	2.43	2.13	1.36	3.71	71.34
Acteocina canaliculata	2.67	2.03	1.31	3.53	74.87
Eteone heteropoda	2.66	2.00	1.33	3.47	78.34

Almyracuma proximoculi	2.90	1.78	0.78	3.10	81.44
Tubificoides brownae	2.98	1.72	0.79	2.98	84.42
Stenoninereis martini	3.34	1.59	0.78	2.76	87.18
Streblospio spp.	1.88	1.12	0.79	1.94	89.12
Ophryotrocha sp. A of EPC	1.87	0.81	0.48	1.40	90.52

Table E-7: Feather Sound / Old Tampa Bay and Grassy Creek Fall sample biota dissimilarity.

Groups GC-Fall & OTB-Fall
Average dissimilarity = 87.49

	Group GC-F	**Group OTB-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Laeonereis culveri	5.75	0.00	2.60	1.92	2.98	2.98
Parastarte triquetra	5.46	0.50	2.25	2.22	2.57	5.55
Capitella capitata complex	4.66	0.56	1.88	2.57	2.14	7.69
Leitoscoloplos spp.	5.03	1.12	1.84	2.05	2.10	9.80
Amakusanthura magnifica	0.00	3.83	1.74	3.67	1.99	11.78
Fabricinuda trilobata	3.86	2.35	1.69	1.80	1.93	13.71
Grandidierella bonnieroides	4.22	0.88	1.63	1.75	1.86	15.57
Ampelisca holmesi	0.56	3.71	1.60	1.49	1.83	17.40
Mysella planulata	0.00	3.10	1.57	0.96	1.80	19.19
Stenoninereis martini	3.34	0.00	1.57	0.96	1.80	20.99
Exogone dispar	0.00	4.10	1.54	0.76	1.77	22.75
Rudilemboides naglei	0.00	3.83	1.53	1.09	1.75	24.50
Xenanthura brevitelson	3.30	0.00	1.49	1.71	1.70	26.20
Glottidia pyramidata	0.00	2.98	1.48	1.02	1.69	27.90
ACTINARIA	3.99	1.76	1.34	1.72	1.53	29.43
Almyracuma proximoculi	2.90	0.28	1.32	1.25	1.51	30.93
Tubificoides brownae	2.98	0.28	1.30	1.33	1.49	32.42
TUBIFICIDAE	6.33	3.76	1.17	1.34	1.33	33.76
Marphysa cf. sanguinea	2.43	0.00	1.13	1.95	1.29	35.05
Acteocina canaliculata	2.67	0.28	1.13	1.64	1.29	36.34
Metharpinia floridana	0.00	2.67	1.10	1.07	1.26	37.60
Axiothella mucosa	0.00	2.34	1.01	1.22	1.16	38.75
Shoemakerella cubensis	0.00	2.31	1.01	1.07	1.15	39.90
Eteone heteropoda	2.66	0.61	1.00	1.50	1.15	41.05
Oxyurostylis smithi	0.00	2.06	0.95	1.02	1.08	42.13
Tubificoides wasselli	0.67	1.98	0.94	1.00	1.07	43.20
Armandia maculata	0.00	2.27	0.92	0.96	1.05	44.25
Prionospio heterobranchia	1.28	2.31	0.88	1.27	1.00	45.26
Amnicola	1.89	0.00	0.88	0.92	1.00	46.26
Ophryotrocha sp. A of EPC	1.87	0.00	0.86	0.94	0.98	47.25
Podarkeopsis levifuscina	0.00	1.92	0.85	1.18	0.97	48.22
Streblospio spp.	1.88	0.00	0.85	1.28	0.97	49.19
Prionospio perkinsi	0.00	1.88	0.83	0.95	0.95	50.14

Table E-8: Grassy Creek Spring and Fall sample biota dissimilarity.

Groups GC-Spring & GC-Fall **Average dissimilarity = 58.18**						
	Group GC-S	**Group GC-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Leptochelia sp.	10.58	0.43	3.68	2.69	6.33	6.33
Grandidierella bonnieroides	9.83	4.22	1.95	1.88	3.36	9.69
Fabricinuda trilobata	8.33	3.86	1.68	1.44	2.88	12.57
Edotia triloba	5.11	0.85	1.60	2.88	2.75	15.32
Grubeosyllis nitidula	4.72	0.60	1.54	2.54	2.64	17.96
Cyathura polita	5.62	1.63	1.49	1.84	2.57	20.53
Ampelisca abdita	4.33	0.00	1.47	0.95	2.53	23.05
Stenoninereis martini	2.46	3.34	1.45	1.21	2.49	25.55
Parastarte triquetra	9.13	5.46	1.45	1.35	2.49	28.04
Apocorophium louisianum	3.60	0.00	1.44	0.97	2.47	30.51
Zygonemertes virescens	3.83	0.00	1.41	6.87	2.43	32.94
Leptochelia (Hargeria) rapax	3.95	0.00	1.36	1.83	2.34	35.28
Gammarus mucronatus	3.52	0.00	1.19	1.35	2.04	37.32
Streblospio spp.	4.25	1.88	1.14	1.39	1.95	39.28
Syllides cf. fulvus	3.26	0.00	1.11	1.39	1.90	41.18
TUBIFICIDAE	5.51	6.33	1.06	0.89	1.82	43.00
RISSOOIDEA sp. A of EPC	2.76	0.00	1.01	0.91	1.73	44.73
Leitoscoloplos spp.	6.49	5.03	0.98	1.97	1.69	46.42
Laeonereis culveri	5.18	5.75	0.93	1.31	1.61	48.03
Paracaprella tenuis	2.70	0.00	0.92	1.37	1.59	49.62
Hobsonia florida	2.64	0.00	0.92	1.29	1.58	51.19

SIMPER Analysis – Alafia River Area

Table E-9: Mainstem Alafia River Spring sample biota similarity.

Group AR-Spring **Average similarity: 29.19**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Edotia triloba	6.37	4.60	3.55	15.77	15.77
Grandidierella bonnieroides	7.93	4.18	1.18	14.32	30.09
TUBIFICIDAE	4.68	3.12	1.31	10.70	40.79
Laeonereis culveri	3.43	1.98	1.32	6.78	47.57
Mytilopsis leucophaeata	4.88	1.75	0.70	5.99	53.57
Littoridinops palustris	3.89	1.60	0.77	5.47	59.03
Cyathura polita	3.53	1.45	0.74	4.99	64.02
Apocorophium louisianum	3.22	1.20	0.70	4.12	68.14
Chironomus sp.	3.38	0.96	0.48	3.29	71.42
Dicrotendipes sp.	3.47	0.81	0.48	2.76	74.19
Tanytarsus sp.	3.15	0.80	0.45	2.74	76.92
Tanytarsus sp. G (of Epler, 2001)	2.97	0.74	0.47	2.53	79.45
Procladius (Holotanypus) sp.	2.86	0.70	0.46	2.39	81.85
Polydora cornuta	2.19	0.52	0.47	1.77	83.61
ACTINARIA	1.44	0.50	0.47	1.72	85.33
CERATOPOGONIDAE (HELEIDAE)	1.62	0.47	0.48	1.62	86.95
CHIRONOMINAE	1.70	0.45	0.47	1.56	88.51
Stenoninereis martini	1.28	0.45	0.26	1.53	90.04

Table E-10: Mainstem Alafia River Fall sample biota similarity.

Group AR-Fall **Average similarity: 24.53**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Mytilopsis leucophaeata	4.91	5.23	0.96	21.31	21.31
Stenoninereis martini	2.25	4.52	0.54	18.44	39.75
TUBIFICIDAE	3.36	4.32	0.80	17.63	57.38
Chironomus sp.	1.97	1.87	0.54	7.62	65.00
Pyrgophorus platyrachis	2.89	1.51	0.51	6.17	71.17
Streblospio spp.	2.14	1.30	0.35	5.30	76.47
Procladius (Holotanypus) sp.	2.15	1.18	0.53	4.83	81.30
Tanytarsus sp. G (of Epler, 2001)	1.55	0.64	0.41	2.59	83.89
Polypedilum halterale grp.	1.50	0.60	0.42	2.45	86.35
Laeonereis culveri	1.50	0.60	0.41	2.45	88.80
Cyathura polita	1.19	0.46	0.42	1.89	90.69

Table E-11: Mainstem Alafia River Spring and Fall sample biota dissimilarity.

Groups AR-Spring & AR-Fall **Average dissimilarity = 80.82**						
	Group AR-S	**Group AR-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Edotia triloba	6.37	0.00	5.34	1.64	6.60	6.60
Grandidierella bonnieroides	7.93	0.81	5.15	1.47	6.38	12.98
Mytilopsis leucophaeata	4.88	4.91	3.71	1.04	4.59	17.57
Streblospio spp.	2.48	2.14	2.85	0.80	3.53	21.10
TUBIFICIDAE	4.68	3.36	2.77	0.80	3.42	24.52
Chironomus sp.	3.38	1.97	2.67	1.03	3.30	27.82
Littoridinops palustris	3.89	0.68	2.62	1.16	3.24	31.06
Stenoninereis martini	1.28	2.25	2.46	0.55	3.05	34.11
Cyathura polita	3.53	1.19	2.37	1.10	2.93	37.04

HYDROBIIDAE	0.72	0.84	2.35	0.39	2.91	39.94
Pyrgophorus platyrachis	2.02	2.89	2.35	0.92	2.90	42.85
Apocorophium louisianum	3.22	0.00	2.33	0.99	2.88	45.73
Procladius (Holotanypus) sp.	2.86	2.15	2.24	1.00	2.77	48.50
Tanytarsus sp. G (of Epler, 2001)	2.97	1.55	2.08	1.01	2.58	51.08

Group DC-S
Less than 2 samples in group

Table E-12: Mainstem Alafia River and Dog Leg Creek Spring sample biota dissimilarity.

Groups AR-Spring & DC-Spring **Average dissimilarity = 83.13**						
	Group AR-S	**Group DC-S**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
TUBIFICIDAE	4.68	9.84	5.51	0.82	6.62	6.62
Grandidierella bonnieroides	7.93	0.00	5.21	1.51	6.26	12.89
Edotia triloba	6.37	0.00	4.76	2.62	5.73	18.62
Limnodrilus hoffmeisteri	0.00	4.66	4.08	1.63	4.91	23.52
Tanypus neopunctipennis	0.00	3.37	2.95	1.63	3.54	27.07
Mytilopsis leucophaeata	4.88	0.00	2.93	1.13	3.53	30.60
Tanytarsus sp.	3.15	3.62	2.90	1.29	3.49	34.09
Dicrotendipes sp.	3.47	2.56	2.74	1.83	3.29	37.38
Littoridinops palustris	3.89	0.00	2.59	1.15	3.11	40.49
Procladius (Holotanypus) sp.	2.86	3.05	2.56	1.40	3.08	43.57
Pyrgophorus platyrachis	2.02	2.56	2.43	1.88	2.93	46.50
Cyathura polita	3.53	0.00	2.37	1.07	2.85	49.34
Apocorophium louisianum	3.22	0.00	2.25	0.97	2.71	52.05

Group DC-F
Less than 2 samples in group

Table E-13: Mainstem Alafia River and Dog Leg Creek Fall sample biota dissimilarity.

Groups DC-Fall & AR-Fall **Average dissimilarity = 89.90**						
	Group DC-F	**Group AR-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Mediomastus ambiseta	2.56	0.00	9.49	1.16	10.55	10.55
Sinelobus stanfordi	2.56	0.00	9.49	1.16	10.55	21.11
Mytilopsis leucophaeata	0.00	4.91	8.64	1.38	9.61	30.71
Stenoninereis martini	0.00	2.25	7.45	0.87	8.29	39.00
TUBIFICIDAE	2.56	3.36	7.06	0.98	7.86	46.86
Streblospio spp.	0.00	2.14	4.79	0.66	5.33	52.18

Table E-14: Dog Leg Creek Spring and Fall sample biota dissimilarity.

Groups DC-Spring & DC-Fall **Average dissimilarity = 89.24**						
	Group DC-S	**Group DC-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
TUBIFICIDAE	9.84	2.56	15.30	Undefined!	17.14	17.14
Limnodrilus hoffmeisteri	4.66	0.00	9.80	Undefined!	10.98	28.12
Tanytarsus sp.	3.62	0.00	7.61	Undefined!	8.53	36.65
Tanypus neopunctipennis	3.37	0.00	7.08	Undefined!	7.94	44.59
Procladius (Holotanypus) sp.	3.05	0.00	6.40	Undefined!	7.17	51.76

Group QC-S
Less than 2 samples in group

Table E-15: Mainstem Alafia River and Question Mark Creek Spring sample biota dissimilarity.

Groups AR-Spring & QC-Spring **Average dissimilarity = 78.51**						
	Group AR-S	**Group QC-S**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	7.93	0.00	5.31	1.51	6.76	6.76
Edotia triloba	6.37	0.00	4.89	2.62	6.22	12.98
Littoridinops palustris	3.89	7.19	4.36	0.84	5.55	18.53
Mytilopsis leucophaeata	4.88	3.05	3.19	1.58	4.06	22.59
Stenoninereis martini	1.28	5.73	3.14	4.03	4.00	26.59
Melanoides tuberculata	0.00	3.05	2.75	1.57	3.50	30.09
Tanypus clavatus	0.00	3.05	2.75	1.57	3.50	33.60
Cyathura polita	3.53	0.00	2.41	1.06	3.07	36.67
Mediomastus ambiseta	0.00	2.56	2.31	1.57	2.95	39.62
Tubificoides wasselli	0.00	2.56	2.31	1.57	2.95	42.56
Apocorophium louisianum	3.22	0.00	2.30	0.97	2.93	45.49
TUBIFICIDAE	4.68	4.86	2.09	0.54	2.67	48.16
Chironomus sp.	3.38	0.00	2.08	0.87	2.64	50.80

Group QC-F
All the similarities are zero

Table E-16: Mainstem Alafia River and Question Mark Creek Fall sample biota dissimilarity.

Groups QC-Fall & AR-Fall **Average dissimilarity = 86.02**						
	Group QC-F	**Group AR-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
TUBIFICIDAE	5.30	3.36	10.90	0.55	12.68	12.68
Stenoninereis martini	0.00	2.25	9.13	0.43	10.61	23.29
Mytilopsis leucophaeata	2.80	4.91	6.87	0.92	7.99	31.28
Chironomus sp.	4.31	1.97	6.39	0.91	7.42	38.70
Streblospio spp.	1.28	2.14	4.17	0.61	4.85	43.56
Procladius (Holotanypus) sp.	1.81	2.15	3.64	0.61	4.23	47.78
Pyrgophorus platyrachis	0.00	2.89	3.47	0.73	4.03	51.81

Table E-17: Question Mark Creek Spring and Fall sample biota dissimilarity.

Groups QC-Spring & QC-Fall **Average dissimilarity = 82.01**						
	Group QC-S	**Group QC-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Stenoninereis martini	5.73	0.00	10.19	1.38	12.43	12.43
Littoridinops palustris	7.19	3.59	9.67	0.71	11.79	24.22
TUBIFICIDAE	4.86	5.30	9.04	1.58	11.02	35.25
Melanoides tuberculata	3.05	3.18	5.54	1.47	6.75	42.00
Tanypus clavatus	3.05	0.00	5.42	1.38	6.61	48.61
Mytilopsis leucophaeata	3.05	2.80	5.21	1.23	6.36	54.97

Table E-18: Rice Creek Spring sample biota similarity.

Group RC-Spring **Average similarity: 57.82**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Corbicula fluminea	7.67	7.33	#######	12.68	12.68
Grandidierella bonnieroides	9.70	7.23	#######	12.51	25.19

Tanytarsus sp.	6.92	5.89	#######	10.18	35.37
TUBIFICIDAE	7.23	5.79	#######	10.02	45.39
Polypedilum scalaneum group	5.97	5.17	#######	8.94	54.33
Laeonereis culveri	5.47	4.79	#######	8.28	62.61
Dicrotendipes sp.	4.16	3.87	#######	6.70	69.31
Procladius (Holotanypus) sp.	4.09	3.50	#######	6.05	75.36
Almyracuma proximoculi	3.44	2.94	#######	5.09	80.45
Cryptochironomus sp.	3.53	2.94	#######	5.09	85.54
Polypedilum sp.	3.05	2.94	#######	5.09	90.63

Table E-19: Mainstem Alafia River and Rice Creek Spring sample biota dissimilarity.

Groups AR-Spring & RC-Spring
Average dissimilarity = 67.70

	Group AR-S	Group RC-S				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Corbicula fluminea	0.43	7.67	3.96	2.41	5.85	5.85
Polypedilum scalaneum group	0.51	5.97	2.93	2.34	4.33	10.18
Grandidierella bonnieroides	7.93	9.70	2.73	0.97	4.04	14.21
Tanytarsus sp.	3.15	6.92	2.59	1.05	3.82	18.04
Edotia triloba	6.37	1.81	2.44	1.48	3.60	21.64
Mytilopsis leucophaeata	4.88	2.00	2.07	1.36	3.06	24.70
Cryptochironomus sp.	0.00	3.53	1.93	2.25	2.86	27.56
Dicrotendipes sp.	3.47	4.16	1.92	1.50	2.84	30.40
Cladotanytarsus sp.	0.00	3.33	1.82	2.44	2.68	33.08
Procladius (Holotanypus) sp.	2.86	4.09	1.72	1.51	2.54	35.62
Almyracuma proximoculi	0.79	3.44	1.69	2.18	2.49	38.11
Cyathura polita	3.53	0.00	1.67	1.13	2.46	40.57
Dicrotendipes modestus	0.87	2.80	1.65	0.86	2.44	43.02
Chironomus sp.	3.38	2.15	1.65	1.19	2.44	45.46
TUBIFICIDAE	4.68	7.23	1.65	0.74	2.44	47.90
Littoridinops palustris	3.89	1.81	1.64	1.13	2.42	50.31

Table E-20: Rice Creek Fall sample biota similarity.

Group RC-Fall
Average similarity: 36.37

Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Corbicula fluminea	8.37	8.35	#######	22.97	22.97
TUBIFICIDAE	5.26	5.34	#######	14.68	37.65
Pyrgophorus platyrachis	5.08	5.34	#######	14.68	52.32
Laeonereis culveri	4.41	5.01	#######	13.78	66.11
Melanoides tuberculata	2.56	3.08	#######	8.47	74.58
Ablabesmyia sp.	3.61	3.08	#######	8.47	83.05
NAIDIDAE	2.80	3.08	#######	8.47	91.53

Table E-21: Mainstem Alafia River and Rice Creek Fall sample biota dissimilarity.

Groups RC-Fall & AR-Fall
Average dissimilarity = 86.11

	Group RC-F	Group AR-F				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Corbicula fluminea	8.37	0.00	9.03	1.42	10.49	10.49
Mytilopsis leucophaeata	0.00	4.91	3.86	1.33	4.49	14.98
Pyrgophorus platyrachis	5.08	2.89	3.78	1.26	4.38	19.36
Laeonereis culveri	4.41	1.50	3.58	1.02	4.16	23.52
Ablabesmyia sp.	3.61	0.00	3.24	2.72	3.76	27.29
Dero (Aulophorus) flabelliger	3.36	0.00	3.09	2.50	3.59	30.87

NAIDIDAE	2.80	0.00	2.93	1.56	3.41	34.28
Melanoides tuberculata	2.56	0.00	2.59	1.73	3.01	37.29
TUBIFICIDAE	5.26	3.36	2.57	0.89	2.99	40.28
Paracladopelma sp.	1.81	0.00	2.55	0.85	2.96	43.23
Cryptochironomus sp.	1.69	0.00	2.37	0.85	2.75	45.99
Stenoninereis martini	0.00	2.25	2.22	1.03	2.58	48.57
Streblospio spp.	0.00	2.14	1.96	0.63	2.27	50.84

Table E-22: Rice Creek Spring and Fall sample biota dissimilarity.

Groups RC-Spring & RC-Fall **Average dissimilarity = 73.44**						
	Gr. RC-S	**Gr. RC-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	9.70	0.00	5.41	3.47	7.37	7.37
Tanytarsus sp.	6.92	0.00	4.03	2.51	5.49	12.86
Polypedilum scalaneum group	5.97	0.00	3.38	3.74	4.61	17.46
Dicrotendipes sp.	4.16	0.00	2.40	3.00	3.26	20.73
Pyrgophorus platyrachis	1.69	5.08	1.98	1.40	2.70	23.43
Almyracuma proximoculi	3.44	0.00	1.94	3.76	2.65	26.08
Cladotanytarsus sp.	3.33	0.00	1.93	2.69	2.63	28.71
Ablabesmyia sp.	0.00	3.61	1.93	6.45	2.63	31.34
Dero (Aulophorus) flabelliger	0.00	3.36	1.82	7.16	2.48	33.83
Dicrotendipes modestus	2.80	0.00	1.81	0.82	2.46	36.29
Polypedilum sp.	3.05	0.00	1.75	3.23	2.38	38.67
Procladius (Holotanypus) sp.	4.09	1.52	1.64	1.18	2.23	40.90
NAIDIDAE	0.00	2.80	1.64	2.53	2.23	43.14
Cladotanytarsus cf daviesi	2.48	0.00	1.60	0.82	2.18	45.31
CERATOPOGONIDAE (HELEIDAE)	2.80	0.00	1.59	3.69	2.17	47.48
Melanoides tuberculata	0.00	2.56	1.47	3.23	2.00	49.48
Polypedilum halterale grp.	2.71	2.00	1.44	0.98	1.96	51.45

Table E-23: Riverview Park West Creek Spring sample biota similarity.

Group RPW-Spring **Average similarity: 62.68**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Chironomus sp.	7.90	10.03	#######	16.00	16.00
TUBIFICIDAE	8.62	9.89	#######	15.77	31.77
Pyrgophorus platyrachis	7.01	8.92	#######	14.23	46.00
Littoridinops monroensis	8.35	8.76	#######	13.98	59.99
Laeonereis culveri	7.77	7.85	#######	12.52	72.51
Tanytarsus sp.	4.51	5.60	#######	8.93	81.44
Grandidierella bonnieroides	5.27	4.09	#######	6.53	87.97
Procladius (Holotanypus) sp.	3.05	4.09	#######	6.53	94.51

Table E-24: Mainstem Alafia River and Riverview Park West Creek Spring sample biota dissimilarity.

Groups AR-Spring & RPW-Spring **Average dissimilarity = 70.66**						
	Group AR-S	**Group RP-S**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Littoridinops monroensis	0.00	8.35	5.30	2.30	7.50	7.50
Pyrgophorus platyrachis	2.02	7.01	3.46	1.26	4.90	12.40
Chironomus sp.	3.38	7.90	3.41	0.99	4.82	17.23
Laeonereis culveri	3.43	7.77	3.25	0.97	4.61	21.83
Grandidierella bonnieroides	7.93	5.27	3.18	1.35	4.50	26.33
TUBIFICIDAE	4.68	8.62	3.07	0.86	4.34	30.67

Edotia triloba	6.37	1.52	2.85	1.61	4.04	34.71
Mytilopsis leucophaeata	4.88	4.20	2.51	1.56	3.56	38.27
Tanytarsus sp.	3.15	4.51	2.32	1.36	3.29	41.55
Littoridinops palustris	3.89	0.00	2.10	1.19	2.97	44.53
Cyathura polita	3.53	0.00	1.92	1.13	2.71	47.24
Dicrotendipes sp.	3.47	1.52	1.89	1.21	2.67	49.91
Procladius (Holotanypus) sp.	2.86	3.05	1.87	1.85	2.64	52.55

Group RPW-Fall
Less than 2 samples in group

Table E-25: Mainstem Alafia River and Riverview Park West Creek Fall sample biota dissimilarity.

Groups RPW-Fall & AR-Fall **Average dissimilarity = 76.82**						
	Group RPW-F	**Group AR-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Pyrgophorus platyrachis	7.43	2.89	7.53	1.17	9.81	9.81
TUBIFICIDAE	6.32	3.36	5.14	1.09	6.69	16.50
Polypedilum halterale grp.	4.31	1.50	4.65	1.23	6.05	22.55
Mytilopsis leucophaeata	2.56	4.91	4.17	2.38	5.43	27.98
Tanypus neopunctipennis	3.05	0.00	4.14	2.42	5.39	33.37
Dero nivea	3.05	0.00	4.14	2.42	5.39	38.77
Procladius (Holotanypus) sp.	3.62	2.15	3.66	1.26	4.76	43.52
Tanypus sp.	2.56	0.00	3.48	2.42	4.53	48.06
Tubulanus pellucidus	2.56	0.00	3.48	2.42	4.53	52.59

Table E-26: Riverview Park West Creek Spring and Fall sample biota dissimilarity.

Groups RPW-S & RPW-F **Average dissimilarity = 65.40**						
	Group RP-S	**Group RW-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Littoridinops monroensis	8.35	0.00	7.04	4.33	10.76	10.76
Chironomus sp.	7.90	0.00	6.77	6.22	10.35	21.11
Laeonereis culveri	7.77	0.00	6.73	2.34	10.29	31.40
Grandidierella bonnieroides	5.27	0.00	4.39	1.90	6.71	38.11
Tanytarsus sp.	4.51	0.00	3.87	5.26	5.92	44.03
Polypedilum halterale grp.	0.00	4.31	3.68	12.25	5.62	49.65
Tanypus neopunctipennis	0.00	3.05	2.60	12.25	3.98	53.62

Little Manatee River
SIMPER Analysis

Table E-27: Mainstem Little Manatee River Spring sample biota similarity.

Group LMR-Spring **Average similarity: 43.76**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	8.77	10.21	4.62	23.32	23.32
Cyathura polita	6.09	6.77	6.41	15.46	38.78
Apocorophium louisianum	8.08	3.88	0.73	8.86	47.65
Laeonereis culveri	3.62	2.74	1.34	6.27	53.91
Mytilopsis leucophaeata	3.17	2.49	1.35	5.70	59.61
Edotia triloba	2.99	2.36	1.21	5.39	65.00
Ampelisca abdita	3.23	2.28	0.67	5.21	70.21
TUBIFICIDAE	2.29	1.50	0.75	3.43	73.64
Streblospio spp.	2.12	1.35	0.48	3.08	76.71
ACTINARIA	2.35	1.21	0.46	2.76	79.47
Polypedilum scalaneum group	2.35	0.92	0.48	2.09	81.56
Amphiporus bioculatus	1.28	0.90	0.48	2.06	83.62
Cryptochironomus sp.	2.02	0.80	0.48	1.83	85.45
Hourstonius laguna	2.04	0.78	0.48	1.79	87.24
Hobsonia florida	1.86	0.76	0.48	1.73	88.96
Rangia cuneata	1.28	0.70	0.48	1.59	90.56

Table E-28: Mainstem Little Manatee River Fall sample biota similarity.

Group LMR-Fall					
Average similarity: 37.64					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	5.06	5.35	1.31	14.21	14.21
Polypedilum scalaneum group	4.02	4.54	1.36	12.05	26.26
TUBIFICIDAE	4.07	4.26	1.35	11.31	37.57
Cyathura polita	3.76	3.89	1.20	10.32	47.89
Mytilopsis leucophaeata	2.91	3.76	1.14	9.99	57.87
Tubificoides motei	2.97	2.10	0.77	5.58	63.46
Tubificoides brownae	2.74	2.04	0.79	5.42	68.88
Corbicula fluminea	2.27	1.75	0.74	4.65	73.53
Gammarus cf. tigrinus	1.82	1.44	0.78	3.81	77.34
ARCHINEMERTEA sp. A of EPC	1.75	1.43	0.78	3.81	81.15
Laeonereis culveri	1.74	1.29	0.79	3.43	84.58
Apocorophium louisianum	1.96	0.83	0.47	2.21	86.79
Polymesoda caroliniana	1.31	0.74	0.48	1.97	88.76
Coelotanypus sp.	1.41	0.72	0.48	1.92	90.68

Table E-29: Mainstem Little Manatee River Spring and Fall sample biota dissimilarity.

Groups LMR-Spring & LMR-Fall **Average dissimilarity = 68.36**						
	Group LMR-S	**Group LMR-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Apocorophium louisianum	8.08	1.96	5.28	1.26	7.72	7.72
Grandidierella bonnieroides	8.77	5.06	3.58	0.92	5.24	12.96
Ampelisca abdita	3.23	0.00	2.98	0.98	4.36	17.33
Edotia triloba	2.99	0.00	2.31	1.45	3.37	20.70
ACTINARIA	2.35	0.00	2.30	0.78	3.37	24.07
Cyathura polita	6.09	3.76	2.29	0.88	3.35	27.42
Polypedilum scalaneum group	2.35	4.02	2.14	1.09	3.13	30.55

TUBIFICIDAE	2.29	4.07	2.05	1.21	2.99	33.54
Tubificoides brownae	1.74	2.74	2.00	1.22	2.93	36.47
Laeonereis culveri	3.62	1.74	2.00	1.30	2.92	39.40
Tubificoides motei	0.51	2.97	1.99	1.27	2.91	42.30
Streblospio spp.	2.12	0.58	1.95	0.89	2.85	45.15
Gammarus cf. tigrinus	1.12	1.82	1.67	1.23	2.45	47.60
Corbicula fluminea	0.43	2.27	1.59	1.21	2.33	49.93
Cryptochironomus sp.	2.02	1.05	1.48	1.06	2.16	52.10

Table E-30: Curiosity Creek Spring sample biota similarity.

Group CC-Spring **Average similarity: 50.56**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	10.63	8.55	3.65	16.91	16.91
Apocorophium louisianum	9.25	6.93	2.13	13.70	30.62
Polymesoda caroliniana	5.42	4.65	11.40	9.19	39.81
Uromunna reynoldsi	7.59	4.11	8.69	8.12	47.93
Littoridinops monroensis	5.11	3.53	2.19	6.98	54.91
Mytilopsis leucophaeata	3.61	3.41	6.91	6.73	61.65
Euplana gracilis	3.65	2.85	5.36	5.64	67.28
Laeonereis culveri	3.74	2.67	9.33	5.28	72.56
Gammarus cf. tigrinus	5.36	1.67	0.58	3.30	75.86
Cyathura polita	4.52	1.63	0.58	3.22	79.08
TUBIFICIDAE	3.81	1.39	0.58	2.74	81.83
Edotia triloba	3.37	1.25	0.58	2.48	84.31
Cryptochironomus sp.	2.48	1.13	0.58	2.24	86.55
Polypedilum scalaneum group	2.77	0.95	0.58	1.88	88.43
Americamysis almyra	1.71	0.94	0.58	1.85	90.28

Table E-31: Mainstem Little Manatee River and Curiosity Creek Spring sample biota dissimilarity.

Groups CC-Spring & LMR-Spring **Average dissimilarity = 57.84**						
	Group CC-S	**Group LMR-S**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Apocorophium louisianum	9.25	8.08	3.67	1.38	6.35	6.35
Uromunna reynoldsi	7.59	1.50	3.63	1.14	6.27	12.62
Gammarus cf. tigrinus	5.36	1.12	2.91	1.11	5.04	17.66
Littoridinops monroensis	5.11	0.00	2.87	2.53	4.96	22.62
Polymesoda caroliniana	5.42	1.87	2.17	1.61	3.75	26.36
Ampelisca abdita	0.00	3.23	2.00	1.11	3.45	29.81
Cyathura polita	4.52	6.09	1.81	1.30	3.14	32.95
TUBIFICIDAE	3.81	2.29	1.76	1.33	3.05	36.00
Grandidierella bonnieroides	10.63	8.77	1.74	1.71	3.01	39.01
Euplana gracilis	3.65	1.93	1.56	1.54	2.70	41.71
ACTINARIA	0.00	2.35	1.51	0.85	2.61	44.33
Taphromysis bowmani	2.96	0.43	1.51	1.16	2.60	46.93
Edotia triloba	3.37	2.99	1.49	1.26	2.57	49.51
Polypedilum scalaneum group	2.77	2.35	1.44	1.25	2.48	51.99

Table E-32: Curiosity Creek Fall sample biota similarity.

Group CC-Fall **Average similarity: 8.88**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
HYDROBIIDAE	1.98	8.88	0.58	100.00	100.00

Table E-33: Mainstem Little Manatee River and Curiosity Creek Fall sample biota dissimilarity.

Groups CC-Fall & LMR-Fall **Average dissimilarity = 86.03**						
	Group CC-F	**Group LMR-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Mytilopsis leucophaeata	0.00	2.91	6.78	0.92	7.88	7.88
Grandidierella bonnieroides	0.00	5.06	6.78	1.95	7.88	15.76
Cyathura polita	1.02	3.76	5.30	1.02	6.17	21.92
Polypedilum scalaneum group	0.85	4.02	5.22	1.61	6.07	27.99
TUBIFICIDAE	1.02	4.07	5.20	1.35	6.04	34.03
Corbicula fluminea	0.85	2.27	3.83	0.73	4.45	38.48
Tubificoides motei	0.00	2.97	3.72	1.33	4.33	42.81
HYDROBIIDAE	1.98	0.82	3.62	0.86	4.21	47.02
Tubificoides brownae	0.00	2.74	3.46	1.35	4.02	51.04

Table E-34: Curiosity Creek Spring and Fall sample biota dissimilarity.

Groups CC-Spring & CC-Fall **Average dissimilarity = 94.88**						
	Group CC-S	**Group CC-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	10.63	0.00	9.59	4.21	10.10	10.10
Apocorophium louisianum	9.25	0.00	8.34	2.83	8.80	18.90
Uromunna reynoldsi	7.59	0.00	7.06	1.45	7.45	26.34
Polymesoda caroliniana	5.42	0.00	4.85	23.74	5.11	31.45
Gammarus cf. tigrinus	5.36	0.00	4.79	1.07	5.05	36.50
Littoridinops monroensis	5.11	0.00	4.57	2.60	4.81	41.32
Cyathura polita	4.52	1.02	3.59	1.46	3.78	45.10
Euplana gracilis	3.65	0.00	3.36	2.90	3.54	48.64
Mytilopsis leucophaeata	3.61	0.00	3.32	5.45	3.50	52.14

Table E-35: Wildcat Creek Spring sample biota similarity.

Group WC-Spring **Average similarity: 56.10**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	10.37	7.75	6.05	13.81	13.81
ACTINARIA	8.04	6.88	10.02	12.27	26.08
Apocorophium louisianum	5.86	4.44	2.88	7.91	33.99
Leptochelia sp.	5.75	4.12	7.37	7.34	41.33
Edotia triloba	5.37	3.93	5.38	7.01	48.34
Laeonereis culveri	4.57	3.84	5.23	6.84	55.18
Polydora cornuta	4.68	3.54	4.80	6.31	61.49
TUBIFICIDAE	4.34	3.50	9.10	6.25	67.74
Taphromysis bowmani	4.25	3.43	11.00	6.11	73.84
Cyathura polita	4.35	3.00	2.72	5.34	79.19
Polymesoda caroliniana	3.18	2.54	7.66	4.53	83.72
Dicrotendipes sp.	2.99	2.45	10.03	4.37	88.09
Almyracuma proximoculi	3.00	1.27	0.58	2.26	90.35

Table E-36: Mainstem Little Manatee River and Wildcat Creek Spring sample biota dissimilarity.

Groups LMR-Spring & WC-Spring **Average dissimilarity = 58.50**						
	Group LMR-S	**Group WC-S**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Apocorophium louisianum	8.08	5.86	3.34	1.99	5.71	5.71

Leptochelia sp.	0.00	5.75	3.06	4.54	5.22	10.94
ACTINARIA	2.35	8.04	2.94	2.25	5.03	15.96
Taphromysis bowmani	0.43	4.25	2.08	2.80	3.55	19.51
Polydora cornuta	1.02	4.68	2.03	1.87	3.47	22.98
Ampelisca abdita	3.23	0.00	1.89	1.11	3.23	26.21
Dicrotendipes sp.	0.00	2.99	1.61	6.46	2.75	28.96
Almyracuma proximoculi	0.51	3.00	1.51	1.31	2.58	31.54
Littoridinops palustris	0.43	2.40	1.45	0.75	2.47	34.01
Uromunna reynoldsi	1.50	3.17	1.44	1.34	2.46	36.47
Edotia triloba	2.99	5.37	1.41	1.27	2.41	38.88
RISSOOIDEA sp. A of EPC	0.00	2.94	1.40	0.68	2.39	41.27
Grandidierella bonnieroides	8.77	10.37	1.36	1.40	2.33	43.59
Mytilopsis leucophaeata	3.17	2.76	1.27	1.32	2.18	45.77
Dipolydora socialis	0.43	2.11	1.26	0.76	2.16	47.92
Streblospio spp.	2.12	0.85	1.22	1.06	2.09	50.01

Table E-37: Wildcat Creek Fall sample biota similarity.

Group WC-Fall **Average similarity: 49.83**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
RISSOOIDEA sp. A of EPC	6.56	16.15	4.36	32.41	32.41
TUBIFICIDAE	4.33	11.33	3.48	22.74	55.15
Laeonereis culveri	3.97	10.36	3.37	20.80	75.95
Mytilopsis leucophaeata	2.60	2.54	0.58	5.09	81.04
Almyracuma proximoculi	2.46	2.54	0.58	5.09	86.13
Pisidium punctiferum	2.40	2.54	0.58	5.09	91.22

Table E-38: Mainstem Little Manatee River and Wildcat Creek Fall sample biota dissimilarity.

Groups WC-Fall & LMR-Fall **Average dissimilarity = 73.78**						
	Group WC-F	**Group LMR-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
RISSOOIDEA sp. A of EPC	6.56	0.00	8.32	1.75	11.28	11.28
Grandidierella bonnieroides	2.29	5.06	4.16	1.34	5.64	16.92
Laeonereis culveri	3.97	1.74	3.66	0.79	4.96	21.87
Cyathura polita	0.85	3.76	3.51	1.50	4.75	26.62
Polypedilum scalaneum group	1.98	4.02	3.35	1.26	4.54	31.17
TUBIFICIDAE	4.33	4.07	2.91	0.56	3.95	35.11
Tubificoides motei	0.00	2.97	2.85	1.29	3.87	38.98
Mytilopsis leucophaeata	2.60	2.91	2.69	0.85	3.65	42.63
Pisidium punctiferum	2.40	0.00	2.68	1.08	3.64	46.27
Tubificoides brownae	0.00	2.74	2.64	1.31	3.58	49.85
Almyracuma proximoculi	2.46	0.75	2.60	1.06	3.53	53.37

Table E-39: Wildcat Creek Spring and Fall sample biota dissimilarity.

Groups WC-Spring & WC-Fall **Average dissimilarity = 76.21**						
	Group WC-S	**Group WC-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
ACTINARIA	8.04	0.00	5.63	5.03	7.39	7.39
Grandidierella bonnieroides	10.37	2.29	5.60	2.57	7.34	14.74
Apocorophium louisianum	5.86	0.00	4.19	2.91	5.49	20.23
Leptochelia sp.	5.75	0.00	3.92	5.10	5.14	25.37
RISSOOIDEA sp. A of EPC	2.94	6.56	3.68	1.96	4.83	30.20

Edotia triloba	5.37	0.00	3.68	4.95	4.83	35.03
Polydora cornuta	4.68	0.00	3.24	4.13	4.25	39.27
Taphromysis bowmani	4.25	0.00	2.97	4.32	3.90	43.17
Cyathura polita	4.35	0.85	2.49	1.69	3.27	46.44
Polymesoda caroliniana	3.18	0.00	2.21	5.04	2.90	49.34
Uromunna reynoldsi	3.17	0.00	2.11	1.31	2.77	52.11

Terra Ceia Bay Tidal Tributaries
SIMPER Analysis

Table E-40: Terra Ceia Bay Spring sample biota similarity.

Group TCB-Spring **Average similarity: 26.47**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Capitella capitata complex	4.22	3.40	4.05	12.83	12.83
Mysella planulata	3.96	3.14	2.73	11.88	24.71
Epitomapta roseola	3.60	1.69	1.26	6.38	31.09
Parastarte triquetra	3.71	1.41	0.69	5.31	36.40
Prionospio heterobranchia	2.68	1.29	0.78	4.88	41.28
Mediomastus sp.	3.05	1.28	0.74	4.82	46.10
Acteocina canaliculata	2.85	1.22	0.76	4.61	50.70
Mediomastus ambiseta	2.82	1.21	0.76	4.59	55.29
Glycinde solitaria	2.15	1.21	0.76	4.56	59.85
TUBIFICIDAE	2.75	0.74	0.48	2.78	62.63
Xenanthura brevitelson	2.06	0.72	0.47	2.73	65.36
Tubificoides brownae	2.23	0.62	0.48	2.36	67.72
Fabricinuda trilobata	2.73	0.61	0.48	2.29	70.02
Leitoscoloplos spp.	2.10	0.58	0.48	2.18	72.20
Ampelisca vadorum	1.63	0.54	0.46	2.05	74.25
Tagelus divisus	1.54	0.53	0.47	1.99	76.24
Cyathura polita	1.96	0.53	0.48	1.99	78.23
Leptochelia sp.	2.77	0.50	0.48	1.89	80.12
Eteone heteropoda	1.52	0.50	0.48	1.88	82.00
Aricidea taylori	1.54	0.43	0.48	1.64	83.64
Monticellina dorsobranchialis	1.99	0.43	0.48	1.62	85.26
Rictaxis punctostriatus	1.28	0.39	0.48	1.49	86.75
Laeonereis culveri	1.48	0.27	0.26	1.03	87.77
Armandia maculata	1.27	0.22	0.26	0.83	88.60
Sabaco americanus	1.23	0.21	0.26	0.80	89.40
Tharyx acutus	1.54	0.21	0.26	0.79	90.19

Table E-41: Terra Ceia Bay Fall sample biota similarity.

Group TCB-Fall **Average similarity: 21.80**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
TUBIFICIDAE	3.66	2.47	2.70	11.34	11.34
Prunum apicinum	2.74	2.27	3.50	10.41	21.75
Monticellina dorsobranchialis	2.70	1.52	1.03	6.96	28.70
Tubificoides wasselli	2.95	1.49	1.09	6.83	35.53
Capitella capitata complex	2.32	1.40	1.05	6.43	41.97
Dipolydora socialis	2.20	1.21	1.06	5.56	47.53
Cymadusa compta	2.71	1.01	0.59	4.62	52.15
Podarkeopsis levifuscina	1.82	0.78	0.61	3.60	55.74
Conus stearnsi	1.61	0.74	0.60	3.39	59.13
Phascolion cryptum	1.80	0.74	0.59	3.39	62.52
Exogone dispar	1.48	0.70	0.60	3.21	65.73
Nassarius vibex	1.84	0.62	0.61	2.85	68.58
Gibberula lavalleenana	1.65	0.56	0.60	2.56	71.13
Amakusanthura magnifica	1.87	0.53	0.59	2.42	73.55
Tubificoides brownae	1.70	0.52	0.60	2.40	75.95
Ophiodromus obscura	1.43	0.47	0.61	2.16	78.11
Aricidea taylori	1.80	0.47	0.61	2.16	80.28

Bulla striata	1.16	0.37	0.32	1.71	81.99
Pilsbryspira leucosyoma	0.98	0.31	0.32	1.44	83.43
Paraprionospio pinnata	1.43	0.29	0.32	1.35	84.78
Acteocina canaliculata	1.59	0.25	0.32	1.13	85.91
Jaspidella blanesi	1.50	0.25	0.32	1.13	87.04
Kinbergonuphis simoni	1.23	0.22	0.32	1.03	88.07
Elasmopus levis	1.12	0.19	0.32	0.89	88.96
Spiochaetopterus costarum	1.20	0.19	0.32	0.86	89.82
Mysella planulata	1.04	0.19	0.32	0.86	90.68

Table E-42: Terra Ceia Bay Spring and Fall sample biota dissimilarity.

Groups TCB-Spring & TCB-Fall
Average dissimilarity = 84.41

	Group TCB-S	**Group TCB-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Parastarte triquetra	3.71	0.45	1.68	1.09	1.99	1.99
Epitomapta roseola	3.60	0.00	1.64	1.28	1.94	3.93
Mysella planulata	3.96	1.04	1.50	1.44	1.78	5.71
TUBIFICIDAE	2.75	3.66	1.48	1.53	1.75	7.47
Mediomastus sp.	3.05	0.00	1.45	1.11	1.72	9.18
Mediomastus ambiseta	2.82	0.45	1.29	1.17	1.52	10.71
Exogone dispar	2.18	1.48	1.27	1.03	1.51	12.21
Fabricinuda trilobata	2.73	0.77	1.24	0.89	1.46	13.68
Cymadusa compta	0.60	2.71	1.23	1.11	1.46	15.14
Grandidierella bonnieroides	2.75	0.53	1.23	0.62	1.46	16.60
Acteocina canaliculata	2.85	1.59	1.21	1.18	1.44	18.04
Tubificoides wasselli	1.30	2.95	1.20	1.28	1.43	19.46
Leptochelia sp.	2.77	0.45	1.19	0.79	1.41	20.87
Xenanthura brevitelson	2.06	1.15	1.19	0.97	1.41	22.28
Prunum apicinum	0.43	2.74	1.16	2.02	1.38	23.66
Monticellina dorsobranchialis	1.99	2.70	1.15	1.22	1.36	25.02
Prionospio heterobranchia	2.68	1.33	1.11	1.11	1.31	26.33
Tubificoides brownae	2.23	1.70	1.07	1.05	1.27	27.60
Glycinde solitaria	2.15	0.45	1.05	1.16	1.24	28.84
Dipolydora socialis	0.00	2.20	1.02	1.62	1.21	30.05
Capitella capitata complex	4.22	2.32	0.99	1.22	1.17	31.23
Leitoscoloplos spp.	2.10	1.04	0.96	1.10	1.14	32.37
Cyathura polita	1.96	0.00	0.91	0.90	1.08	33.45
Aricidea taylori	1.54	1.80	0.89	1.03	1.06	34.50
Phascolion cryptum	0.43	1.80	0.86	1.12	1.02	35.53
Podarkeopsis levifuscina	0.43	1.82	0.85	1.09	1.01	36.54
Nassarius vibex	0.00	1.84	0.83	1.07	0.98	37.52
Conus stearnsi	0.00	1.61	0.82	1.09	0.98	38.49
Laeonereis culveri	1.48	0.53	0.82	0.81	0.97	39.46
Ampelisca vadorum	1.63	0.00	0.81	0.87	0.96	40.42
Tagelus divisus	1.54	0.00	0.80	0.81	0.95	41.37
Amakusanthura magnifica	0.00	1.87	0.78	1.06	0.93	42.30
Gibberula lavalleenana	0.00	1.65	0.75	1.04	0.89	43.18
Eteone heteropoda	1.52	0.00	0.75	0.89	0.89	44.07
Carazziella hobsonae	0.76	0.70	0.73	0.61	0.87	44.93
Heteromastus filiformis	1.27	0.67	0.72	0.80	0.85	45.79
Jaspidella blanesi	0.00	1.50	0.71	0.77	0.85	46.63
Bulla striata	0.00	1.16	0.70	0.74	0.83	47.46
Ampelisca holmesi	1.06	0.85	0.69	0.76	0.82	48.28
Spiochaetopterus costarum	0.43	1.20	0.68	0.80	0.81	49.08

Paraprionospio pinnata	0.00	1.43	0.67	0.76	0.80	49.88
Tharyx acutus	1.54	0.00	0.64	0.67	0.76	50.64
Ophiodromus obscura	0.93	1.43	0.64	1.10	0.76	51.40

Table E-43: Frog Creek Spring sample biota similarity.

Group FC-Spring **Average similarity: 33.42**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Laeonereis culveri	7.36	6.79	2.05	20.30	20.30
Grandidierella bonnieroides	6.70	5.87	2.39	17.58	37.88
Streblospio spp.	3.95	3.49	2.57	10.43	48.31
Edotia triloba	3.99	3.32	2.94	9.94	58.25
Americorophium ellisi	4.22	2.47	0.58	7.38	65.63
Pyrgophorus platyrachis	3.87	2.14	0.58	6.42	72.05
Stenoninereis martini	2.60	1.52	0.58	4.54	76.58
Heteromastus filiformis	4.09	1.45	0.58	4.34	80.92
Cyathura polita	3.55	1.23	0.58	3.69	84.61
TUBIFICIDAE	3.33	1.06	0.58	3.16	87.77
Capitella capitata complex	2.67	1.02	0.58	3.04	90.81

Table E-44: Terra Ceia Bay and Frog Creek Spring sample biota dissimilarity.

Groups FC-Spring & TCB-Spring **Average dissimilarity = 79.34**						
	Group FC-S	**Group TCB-S**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Laeonereis culveri	7.36	1.48	3.10	1.70	3.91	3.91
Grandidierella bonnieroides	6.70	2.75	3.02	2.64	3.81	7.71
Americorophium ellisi	4.22	0.00	2.53	1.21	3.19	10.90
Pyrgophorus platyrachis	3.87	0.00	2.32	1.18	2.92	13.82
Parastarte triquetra	3.63	3.71	2.18	1.33	2.75	16.58
Heteromastus filiformis	4.09	1.27	1.76	1.19	2.22	18.79
Mysella planulata	1.34	3.96	1.70	1.36	2.14	20.94
Acteocina canaliculata	2.50	2.85	1.57	1.39	1.98	22.92
Leptochelia sp.	2.45	2.77	1.56	1.00	1.96	24.88
Epitomapta roseola	1.39	3.60	1.55	1.12	1.95	26.83
Edotia triloba	3.99	0.93	1.55	1.63	1.95	28.78
Ampelisca abdita	3.75	1.19	1.52	1.29	1.92	30.70
Streblospio spp.	3.95	1.07	1.48	1.47	1.86	32.56
Stenoninereis martini	2.60	0.60	1.47	1.11	1.85	34.41
Cyathura polita	3.55	1.96	1.47	1.25	1.85	36.26
TUBIFICIDAE	3.33	2.75	1.45	1.13	1.83	38.09
Mediomastus sp.	0.85	3.05	1.41	1.05	1.78	39.86
Mediomastus ambiseta	0.00	2.82	1.39	1.19	1.75	41.62
Hobsonia florida	3.25	1.36	1.32	1.34	1.67	43.28
Fabricinuda trilobata	0.00	2.73	1.24	0.82	1.56	44.85
Halmyrapseudes bahamensis	2.96	0.00	1.22	1.28	1.54	46.39
Tubificoides brownae	1.59	2.23	1.20	1.02	1.51	47.90
Prionospio heterobranchia	1.39	2.68	1.19	1.11	1.50	49.40
Monticellina dorsobranchialis	1.83	1.99	1.11	1.03	1.40	50.80

Table E-45: Frog Creek Fall sample biota similarity.

Group FC-Fall **Average similarity: 44.52**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Polypedilum scalaneum group	5.37	17.82	6.27	40.03	40.03
Laeonereis culveri	3.68	11.04	11.51	24.80	64.83
Polypedilum halterale grp.	4.00	4.47	0.58	10.03	74.86
HYDROBIIDAE	2.19	3.37	0.58	7.57	82.43
Cryptochironomus sp.	2.35	2.92	0.58	6.55	88.98
TUBIFICIDAE	1.87	2.45	0.58	5.51	94.49

Table E-46: Terra Ceia Bay and Frog Creek Fall sample biota dissimilarity.

Groups FC-Fall & TCB-Fall **Average dissimilarity = 94.99**						
	Group FC-F	**Group TCB-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Polypedilum scalaneum group	5.37	0.00	4.26	2.78	4.49	4.49
Polypedilum halterale grp.	4.00	0.00	3.02	1.14	3.18	7.67
Laeonereis culveri	3.68	0.53	2.45	1.84	2.58	10.25
Tubificoides wasselli	0.00	2.95	2.11	1.53	2.22	12.46
Prunum apicinum	0.00	2.74	2.09	3.33	2.20	14.66
Cymadusa compta	0.00	2.71	2.03	1.13	2.14	16.80
Monticellina dorsobranchialis	0.00	2.70	1.93	1.45	2.03	18.83
HYDROBIIDAE	2.19	0.00	1.80	1.13	1.89	20.72
Cryptochironomus sp.	2.35	0.00	1.78	1.18	1.88	22.59
TUBIFICIDAE	1.87	3.66	1.63	1.08	1.72	24.31
Mytilopsis leucophaeata	2.13	0.00	1.61	1.15	1.69	26.00
Dipolydora socialis	0.00	2.20	1.60	1.59	1.68	27.69
Capitella capitata complex	0.85	2.32	1.46	1.06	1.54	29.23
Phascolion cryptum	0.00	1.80	1.43	1.16	1.51	30.73
Podarkeopsis levifuscina	0.00	1.82	1.42	1.06	1.50	32.23
Conus stearnsi	0.00	1.61	1.35	1.06	1.42	33.65
Exogone dispar	0.00	1.48	1.32	0.96	1.39	35.03
Nassarius vibex	0.00	1.84	1.29	1.01	1.36	36.39
Aricidea taylori	0.00	1.80	1.21	0.83	1.28	37.67
Bulla striata	0.00	1.16	1.21	0.75	1.27	38.94
Heteromastus filiformis	1.21	0.67	1.20	0.73	1.27	40.20
Gibberula lavalleenana	0.00	1.65	1.18	0.96	1.24	41.45
Amakusanthura magnifica	0.00	1.87	1.14	1.05	1.20	42.65
Jaspidella blanesi	0.00	1.50	1.14	0.78	1.20	43.85
Acteocina canaliculata	0.00	1.59	1.08	0.79	1.14	44.98
Tubificoides brownae	0.00	1.70	1.07	0.98	1.13	46.12
Streblospio spp.	1.21	0.00	1.04	0.62	1.10	47.21
Paraprionospio pinnata	0.00	1.43	1.04	0.74	1.10	48.31
Pilsbryspira leucosyoma	0.00	0.98	0.99	0.78	1.04	49.35
Xenanthura brevitelson	0.00	1.15	0.98	0.48	1.03	50.38

Table E-47: Frog Creek Fall sample biota dissimilarity.

Groups FC-Spring & FC-Fall **Average dissimilarity = 84.01**						
	Group FC-S	**Group FC-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	6.70	0.00	5.30	3.98	6.31	6.31
Polypedilum scalaneum group	0.00	5.37	4.49	2.74	5.34	11.65
Americorophium ellisi	4.22	0.00	4.35	1.26	5.18	16.83
Pyrgophorus platyrachis	3.87	1.34	3.34	1.07	3.97	20.80
Laeonereis culveri	7.36	3.68	3.28	1.84	3.90	24.70
Edotia triloba	3.99	0.00	3.18	3.33	3.78	28.48
Polypedilum halterale grp.	0.00	4.00	3.17	1.12	3.77	32.25
Heteromastus filiformis	4.09	1.21	2.78	1.29	3.31	35.56
Stenoninereis martini	2.60	0.00	2.72	1.22	3.24	38.80
Cyathura polita	3.55	0.00	2.57	1.14	3.06	41.86
Ampelisca abdita	3.75	0.00	2.48	1.28	2.95	44.81
Streblospio spp.	3.95	1.21	2.13	1.41	2.54	47.35
TUBIFICIDAE	3.33	1.87	2.03	1.45	2.42	49.77
Hobsonia florida	3.25	0.00	2.00	1.32	2.38	52.16

Table E-48: McMullen Creek Spring sample biota similarity.

Group MC-Spring **Average similarity: 42.07**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
TUBIFICIDAE	5.24	6.98	3.49	16.60	16.60
Cyathura polita	5.65	6.05	5.49	14.38	30.98
Laeonereis culveri	5.85	5.49	3.89	13.06	44.04
Almyracuma proximoculi	3.99	4.93	3.60	11.73	55.76
Heteromastus filiformis	4.96	4.82	3.25	11.46	67.22
Grandidierella bonnieroides	7.30	2.41	0.58	5.73	72.95
Leptochelia sp.	3.03	1.88	0.58	4.47	77.41
Leitoscoloplos spp.	3.31	1.54	0.58	3.66	81.07
Parastarte triquetra	4.06	1.49	0.58	3.55	84.63
Capitella capitata complex	2.03	1.34	0.58	3.18	87.81
Edotia triloba	2.80	1.17	0.58	2.78	90.59

Table E-49: Terra Ceia Bay and McMullen Creek Spring sample biota dissimilarity.

Groups MC-Spring & TCB-Spring **Average dissimilarity = 81.04**						
	Group MC-S	**Group TCB-S**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	7.30	2.75	3.67	1.26	4.52	4.52
Laeonereis culveri	5.85	1.48	2.66	1.79	3.29	7.81
Almyracuma proximoculi	3.99	0.00	2.45	2.12	3.02	10.83
Mysella planulata	0.00	3.96	2.37	2.07	2.93	13.75
Heteromastus filiformis	4.96	1.27	2.28	1.74	2.82	16.57
Cyathura polita	5.65	1.96	2.27	1.59	2.80	19.37
Parastarte triquetra	4.06	3.71	2.07	1.17	2.55	21.92
TUBIFICIDAE	5.24	2.75	2.04	1.12	2.51	24.43
Leptochelia sp.	3.03	2.77	1.99	1.21	2.46	26.89
Epitomapta roseola	0.00	3.60	1.94	1.29	2.39	29.28
Mediomastus sp.	0.00	3.05	1.75	1.09	2.15	31.44
Mediomastus ambiseta	0.00	2.82	1.62	1.23	2.00	33.44
Acteocina canaliculata	0.00	2.85	1.56	1.21	1.92	35.35

Leitoscoloplos spp.	3.31	2.10	1.55	1.06	1.92	37.27
Prionospio heterobranchia	0.00	2.68	1.48	1.27	1.83	39.10
Fabricinuda trilobata	0.00	2.73	1.42	0.84	1.76	40.86
Americorophium ellisi	2.44	0.00	1.40	0.66	1.73	42.59
Leptochela sp.	3.06	0.00	1.40	0.67	1.72	44.31
Glycinde solitaria	0.00	2.15	1.36	1.23	1.68	45.99
Edotia triloba	2.80	0.93	1.32	1.27	1.63	47.62
Ampelisca abdita	2.68	1.19	1.32	1.20	1.62	49.25
Capitella capitata complex	2.03	4.22	1.31	1.42	1.62	50.87

Table E-50: McMullen Creek Fall sample biota similarity.

Group MC-Fall **Average similarity: 31.93**					
Species	**Av.Abund**	**Av.Sim**	**Sim/SD**	**Contrib%**	**Cum.%**
Chironomus sp.	3.15	10.46	4.01	32.77	32.77
Capitella capitata complex	2.14	4.43	0.58	13.87	46.64
TUBIFICIDAE	3.31	4.06	0.58	12.70	59.34
Laeonereis culveri	2.80	3.84	0.58	12.01	71.35
Almyracuma proximoculi	1.71	3.72	0.58	11.66	83.01
Streblospio spp.	2.56	2.71	0.58	8.49	91.51

Table E-51: Terra Ceia Bay and McMullen Creek Fall sample biota dissimilarity.

Groups MC-Fall & TCB-Fall **Average dissimilarity = 93.09**						
	Group MC-F	**Group TCB-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Chironomus sp.	3.15	0.00	2.58	2.41	2.78	2.78
Tubificoides wasselli	0.00	2.95	2.16	1.52	2.33	5.10
Prunum apicinum	0.00	2.74	2.15	3.23	2.31	7.41
TUBIFICIDAE	3.31	3.66	2.13	1.36	2.28	9.69
Cymadusa compta	0.00	2.71	2.09	1.13	2.25	11.94
Laeonereis culveri	2.80	0.53	2.05	1.18	2.21	14.15
Streblospio spp.	2.56	0.00	1.99	1.06	2.14	16.28
Monticellina dorsobranchialis	0.00	2.70	1.98	1.44	2.13	18.41
Dipolydora socialis	0.00	2.20	1.64	1.58	1.77	20.18
Phascolion cryptum	0.00	1.80	1.48	1.16	1.59	21.76
HYDROBIIDAE	1.87	0.00	1.47	1.16	1.57	23.34
Podarkeopsis levifuscina	0.00	1.82	1.46	1.05	1.57	24.91
Almyracuma proximoculi	1.71	0.00	1.45	1.15	1.56	26.46
Conus stearnsi	0.00	1.61	1.39	1.06	1.49	27.96
Exogone dispar	0.00	1.48	1.36	0.95	1.46	29.42
Nassarius vibex	0.00	1.84	1.32	1.01	1.42	30.84
Bulla striata	0.00	1.16	1.25	0.74	1.35	32.19
Aricidea taylori	0.00	1.80	1.24	0.82	1.33	33.52
Capitella capitata complex	2.14	2.32	1.24	0.93	1.33	34.85
Gibberula lavalleenana	0.00	1.65	1.22	0.95	1.31	36.16
Jaspidella blanesi	0.00	1.50	1.18	0.77	1.26	37.42
Amakusanthura magnifica	0.00	1.87	1.17	1.04	1.25	38.68
Heteromastus filiformis	1.21	0.67	1.14	0.75	1.23	39.91
Acteocina canaliculata	0.00	1.59	1.11	0.79	1.19	41.10
Tubificoides brownae	0.00	1.70	1.10	0.98	1.18	42.28
Paraprionospio pinnata	0.00	1.43	1.07	0.74	1.15	43.43
Pilsbryspira leucosyoma	0.00	0.98	1.02	0.78	1.10	44.53
Xenanthura brevitelson	0.00	1.15	1.01	0.48	1.08	45.61
Pyrgophorus platyrachis	1.12	0.00	1.01	0.62	1.08	46.69

Spiochaetopterus costarum	0.00	1.20	0.97	0.66	1.05	47.73
Stenoninereis martini	1.21	0.00	0.97	0.63	1.04	48.77
Macoma constricta	1.21	0.00	0.92	0.63	0.99	49.76
Kinbergonuphis simoni	0.00	1.23	0.89	0.77	0.96	50.72

Table E-52: McMullen Creek Spring and Fall sample biota dissimilarity.

Groups MC-Spring & MC-Fall **Average dissimilarity = 75.49**						
	Group MC-S	**Group MC-F**				
Species	**Av.Abund**	**Av.Abund**	**Av.Diss**	**Diss/SD**	**Contrib%**	**Cum.%**
Grandidierella bonnieroides	7.30	0.00	5.76	1.25	7.63	7.63
Cyathura polita	5.65	0.00	5.75	6.31	7.62	15.26
Heteromastus filiformis	4.96	1.21	4.01	2.21	5.32	20.57
Leptochelia sp.	3.03	0.00	3.71	1.30	4.91	25.49
Laeonereis culveri	5.85	2.80	3.70	1.47	4.90	30.39
Chironomus sp.	0.00	3.15	3.54	2.23	4.69	35.08
Parastarte triquetra	4.06	1.02	3.22	1.42	4.26	39.34
TUBIFICIDAE	5.24	3.31	2.98	0.95	3.95	43.29
Leitoscoloplos spp.	3.31	0.00	2.85	1.19	3.77	47.06
Almyracuma proximoculi	3.99	1.71	2.66	1.26	3.53	50.58

APPENDIX F:

Comparison of 100-year Flood Plains and 100-m Tidal Tributary Corridors

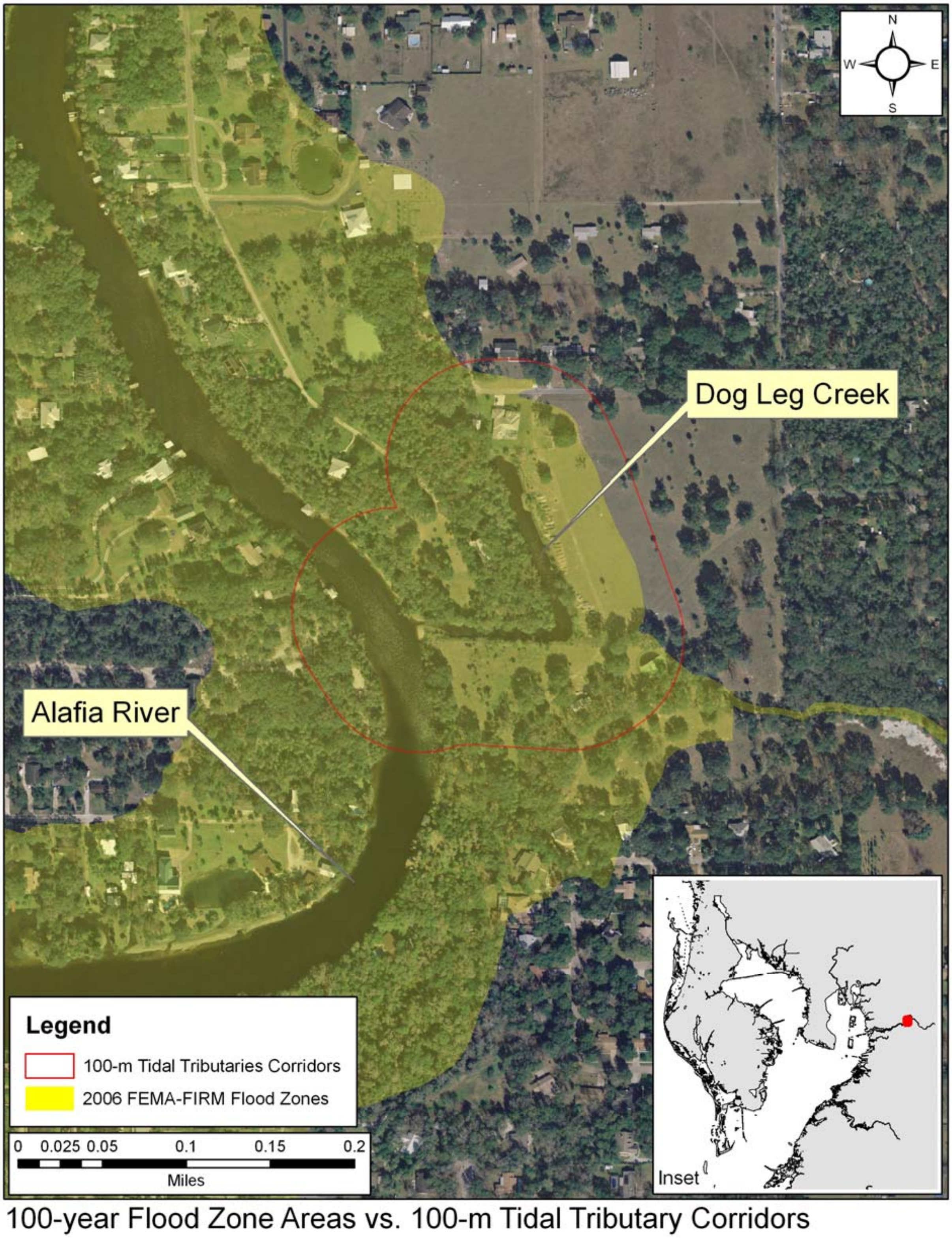


Figure F-1: Comparison of the 100-m corridor of Dog Leg Creek with the existing Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) 100-year flood zones.

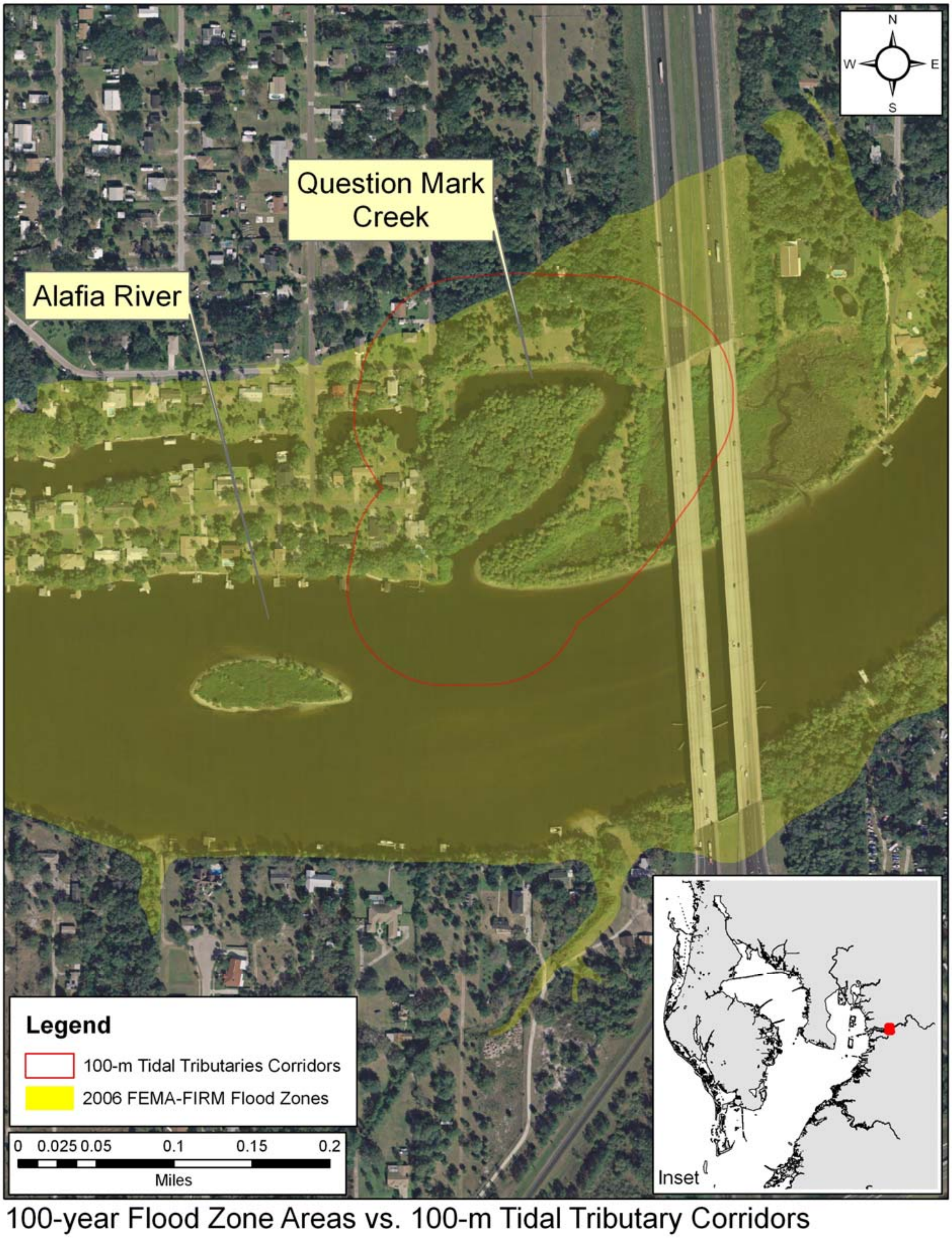


Figure F-2: Comparison of the 100-m corridor of Question Mark Creek with the existing Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) 100-year flood zones.

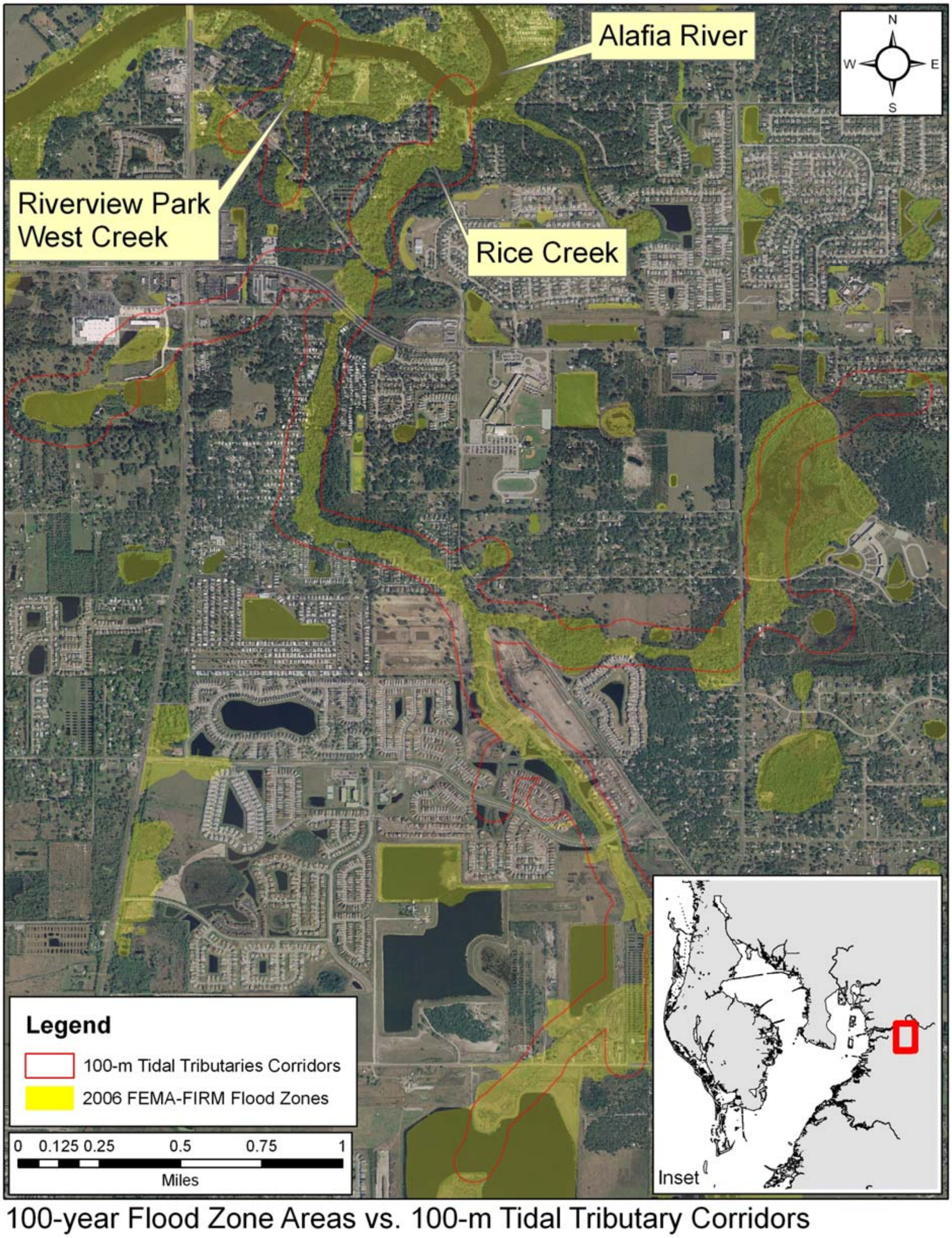


Figure F-3: Comparison of the 100-m corridor of Rice and Riverview Park West Creeks with the existing Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) 100-year flood zones.

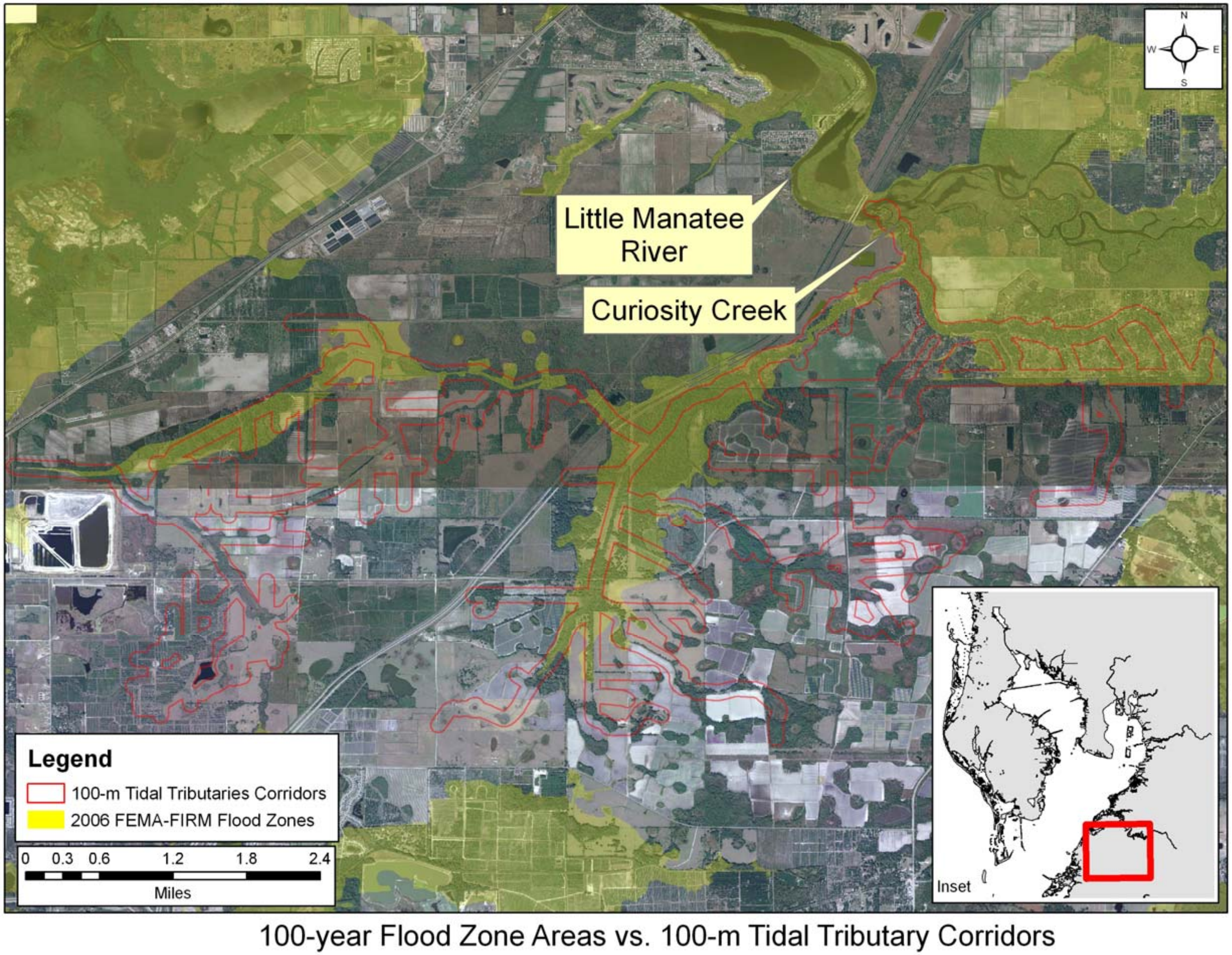
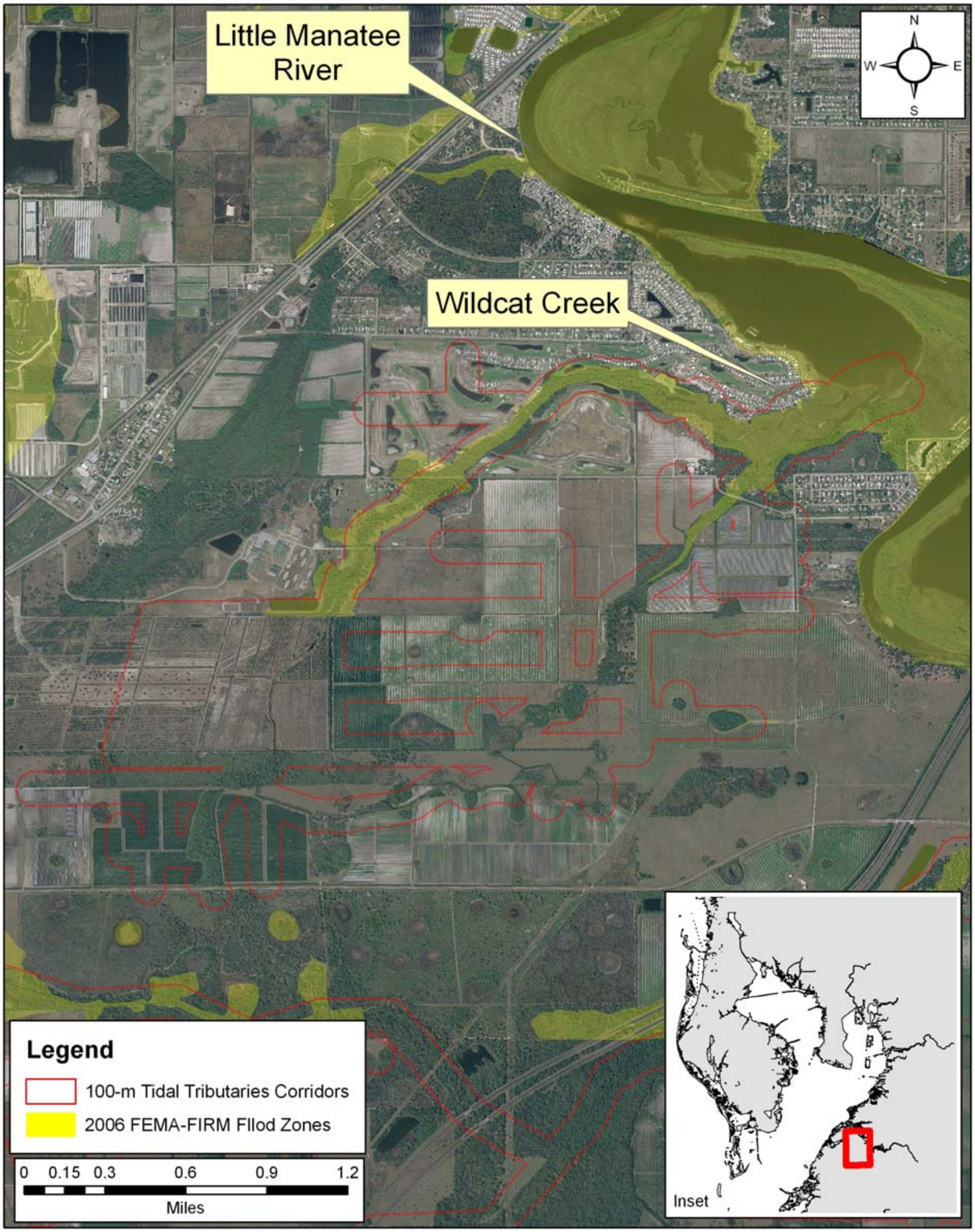


Figure F-4: Comparison of the 100-m corridor of Curiosity Creek with the existing Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) 100-year flood zones.



100-year Flood Zone Areas vs. 100-m Tidal Tributary Corridors

Figure F-5: Comparison of the 100-m corridor of Wildcat Creek with the existing Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) 100-year flood zones.

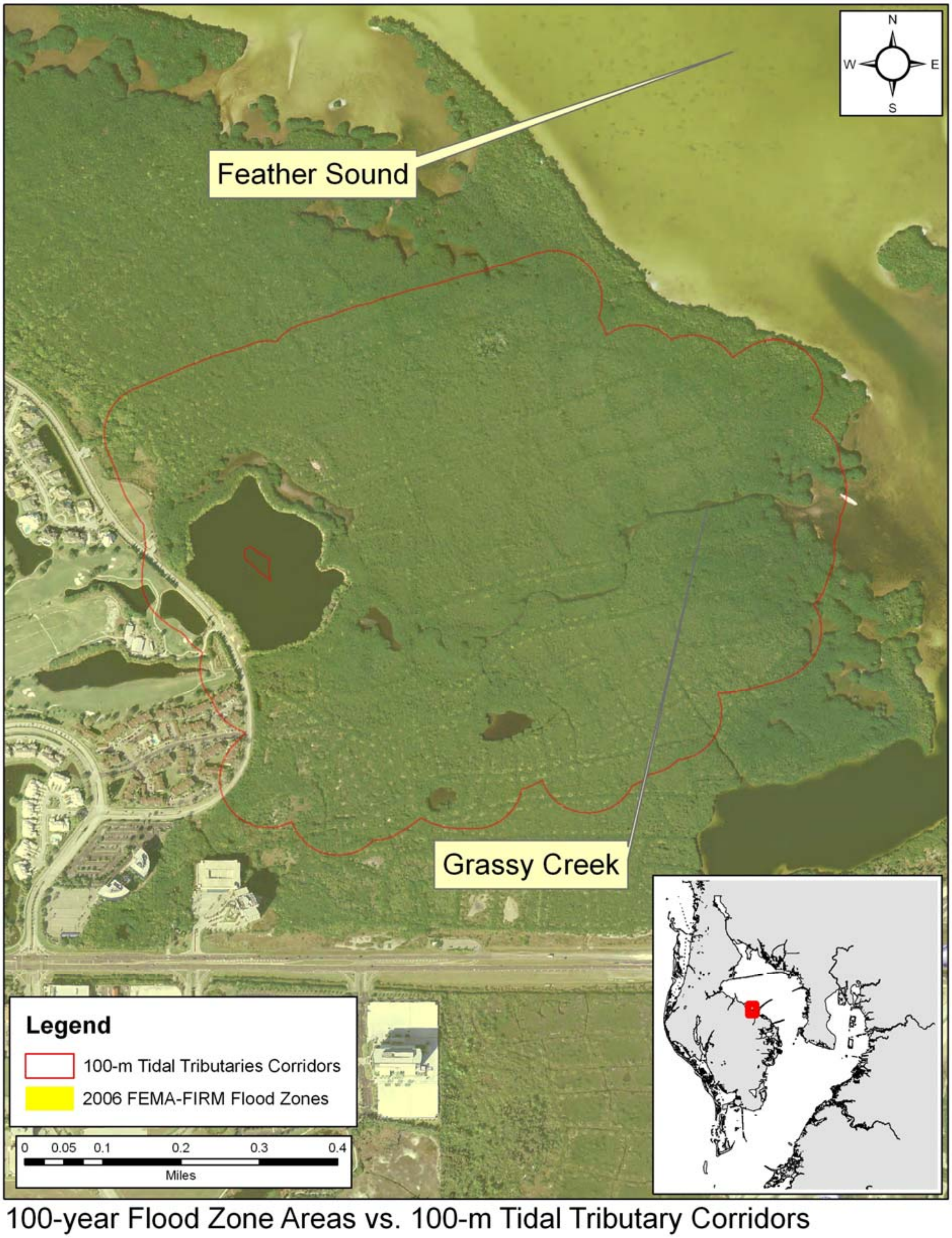


Figure F-6: Comparison of the 100-m corridor of Grassy Creek with the existing Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) 100-year flood zones (entire map area).

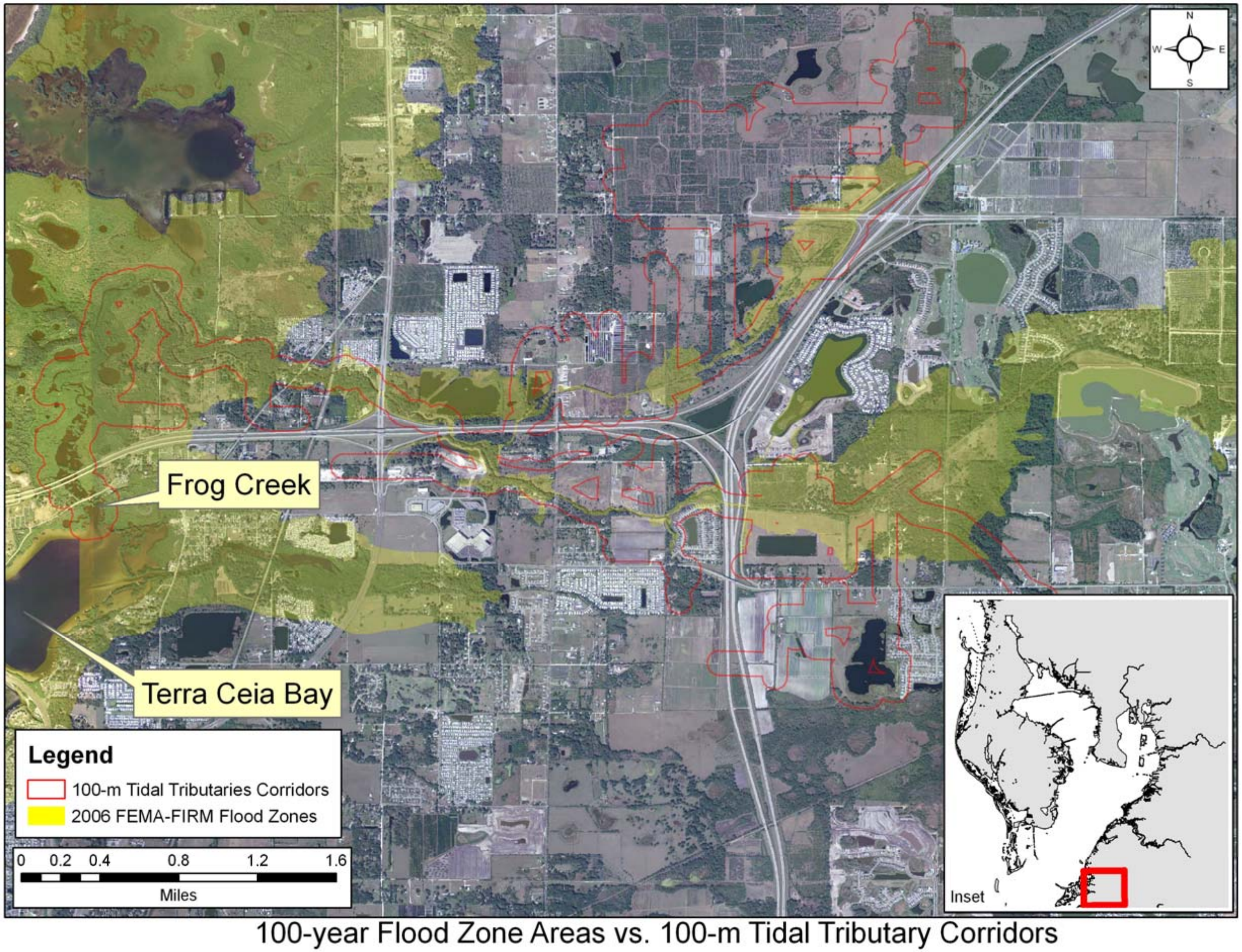


Figure F-7: Comparison of the 100-m corridor of Frog Creek with the existing Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) 100-year flood zones (entire map area).

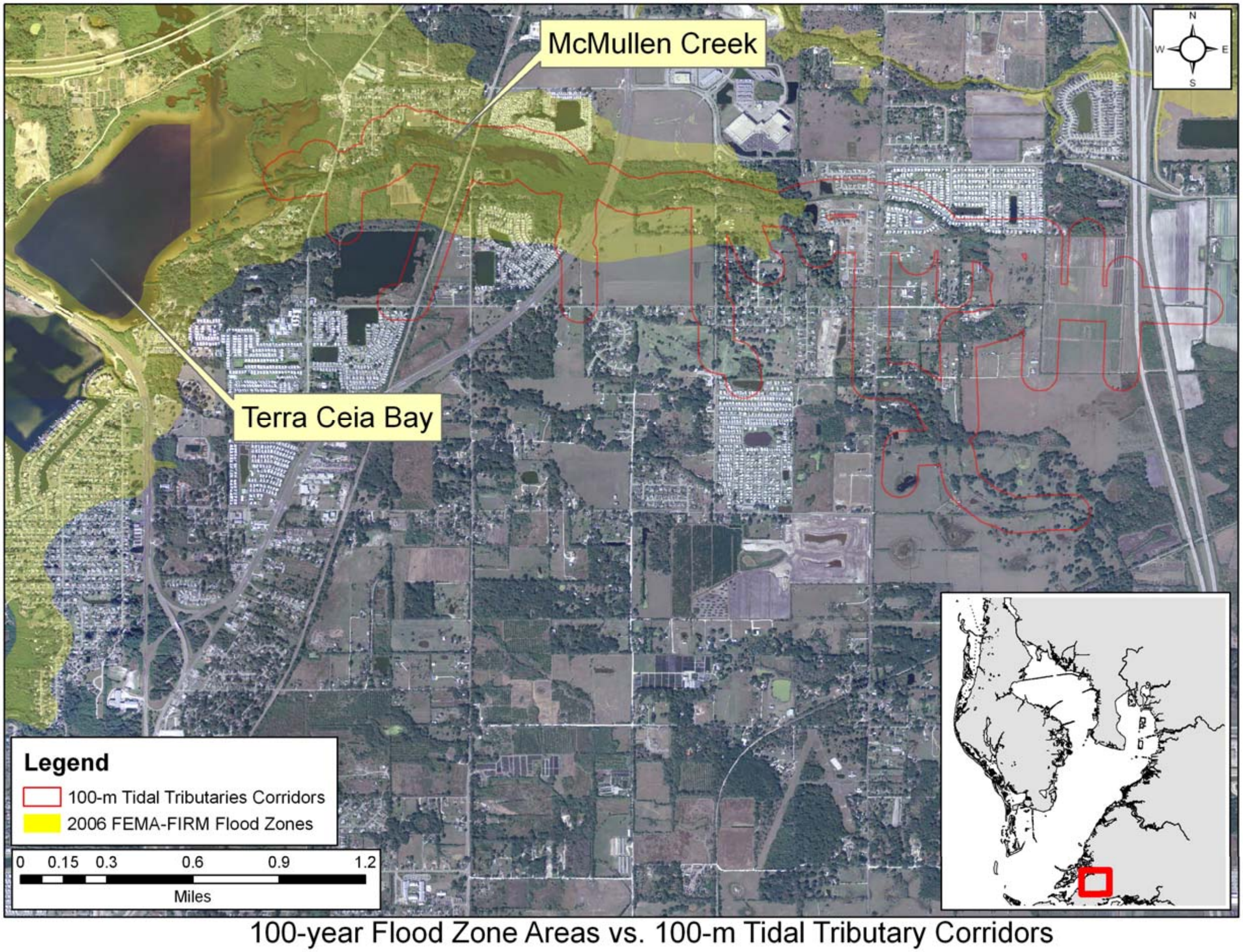


Figure F-8: Comparison of the 100-m corridor of McMullen Creek with the existing Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map (FIRM) 100-year flood zones (entire map area).

APPENDIX G:

Land Use within the Tidal Tributary Watersheds

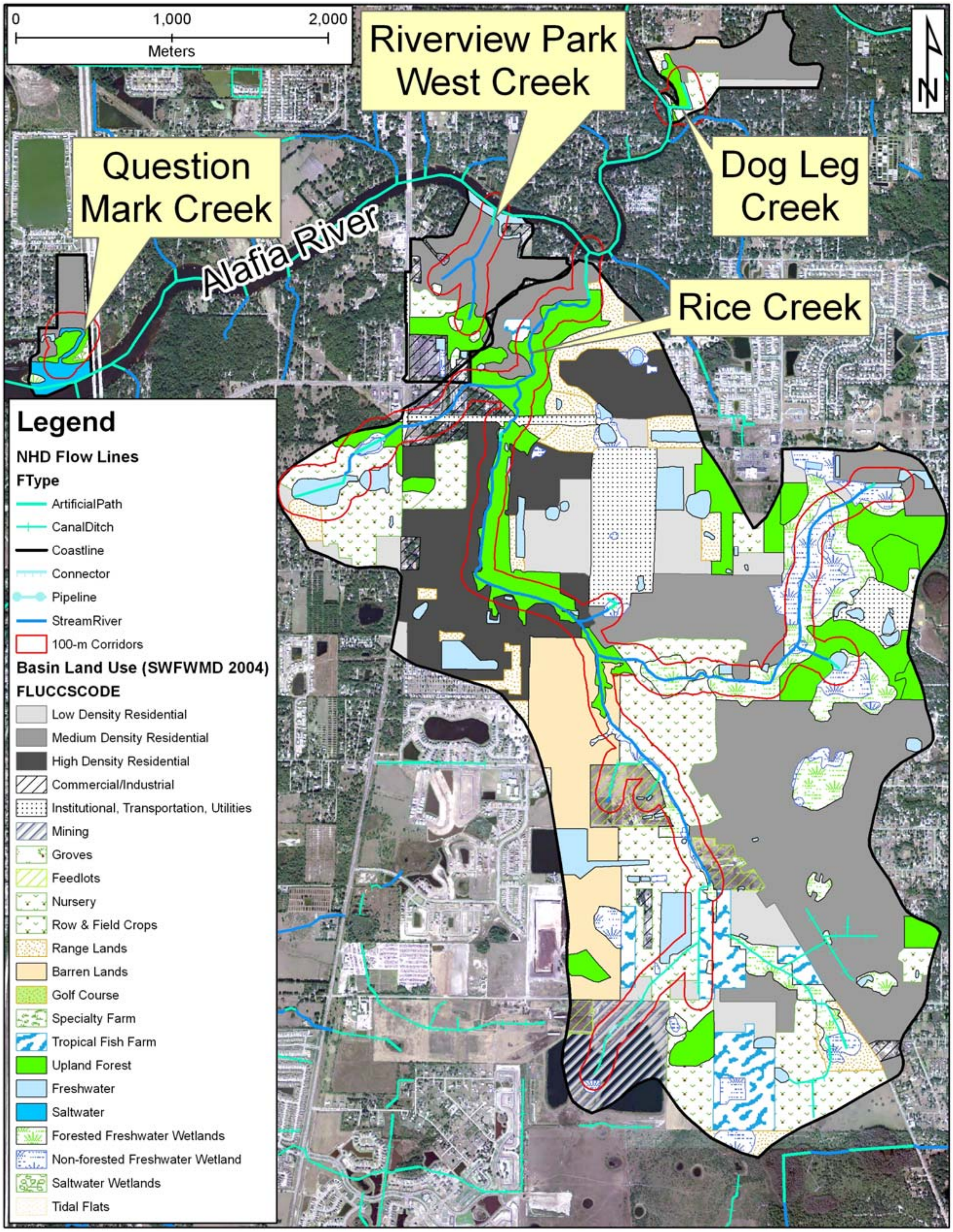


Figure G-1: General 2004 SWFWMD land use/land cover in the Alafia River tidal tributary basins.

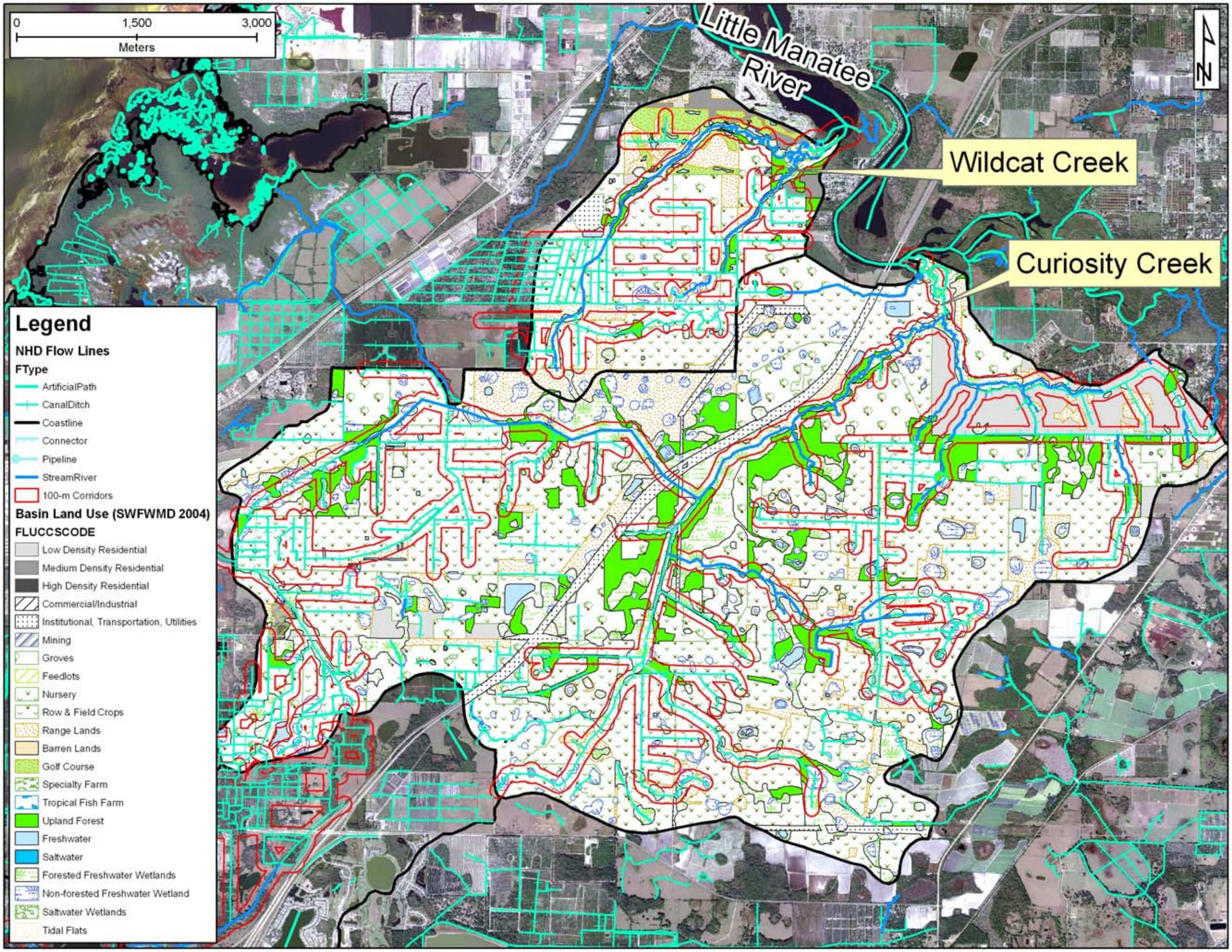


Figure G-2: General 2004 SWFWMD land use/land cover in the Little Manatee River tidal tributary basins.

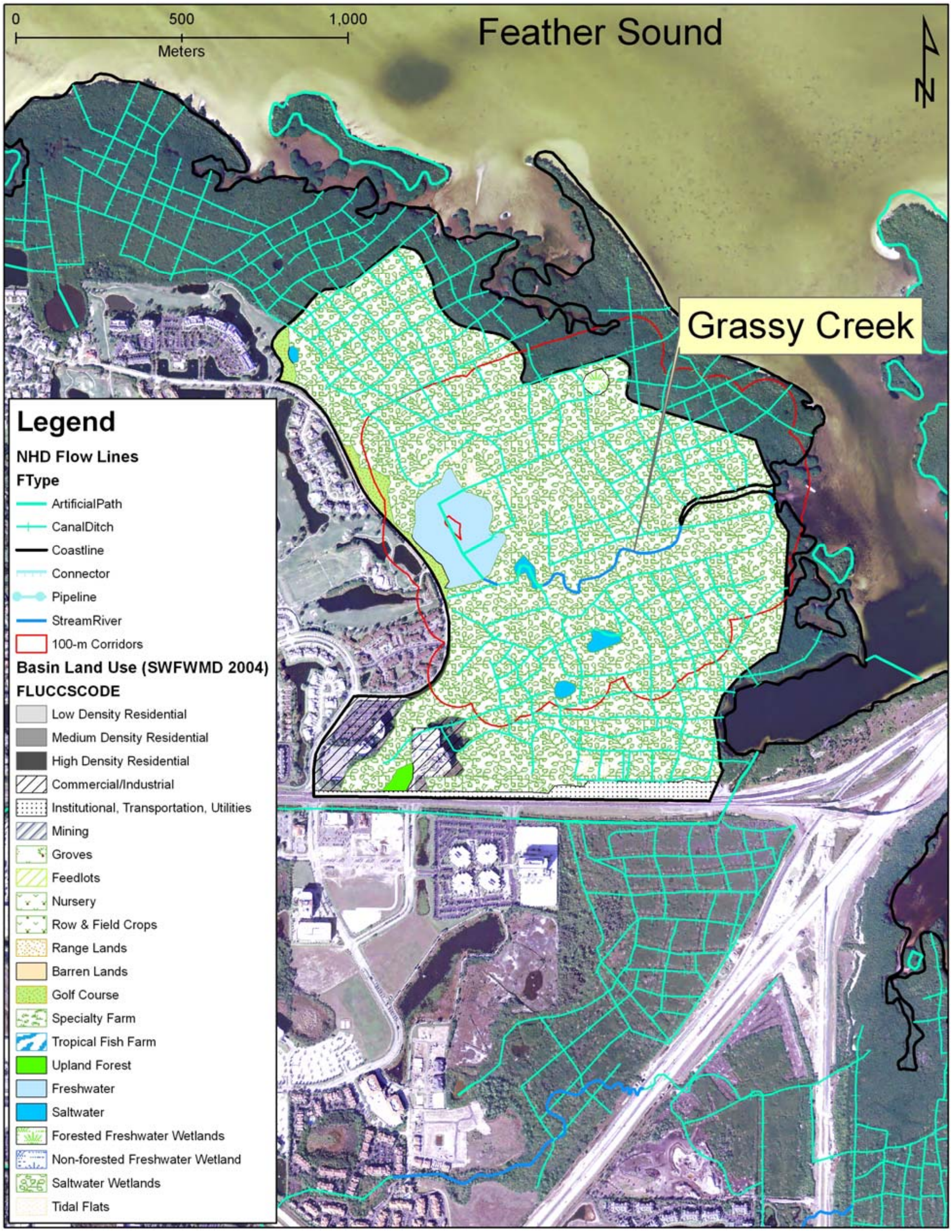


Figure G-3: General 2004 SWFWMD land use/land cover in the Feather Sound tidal tributary basins.

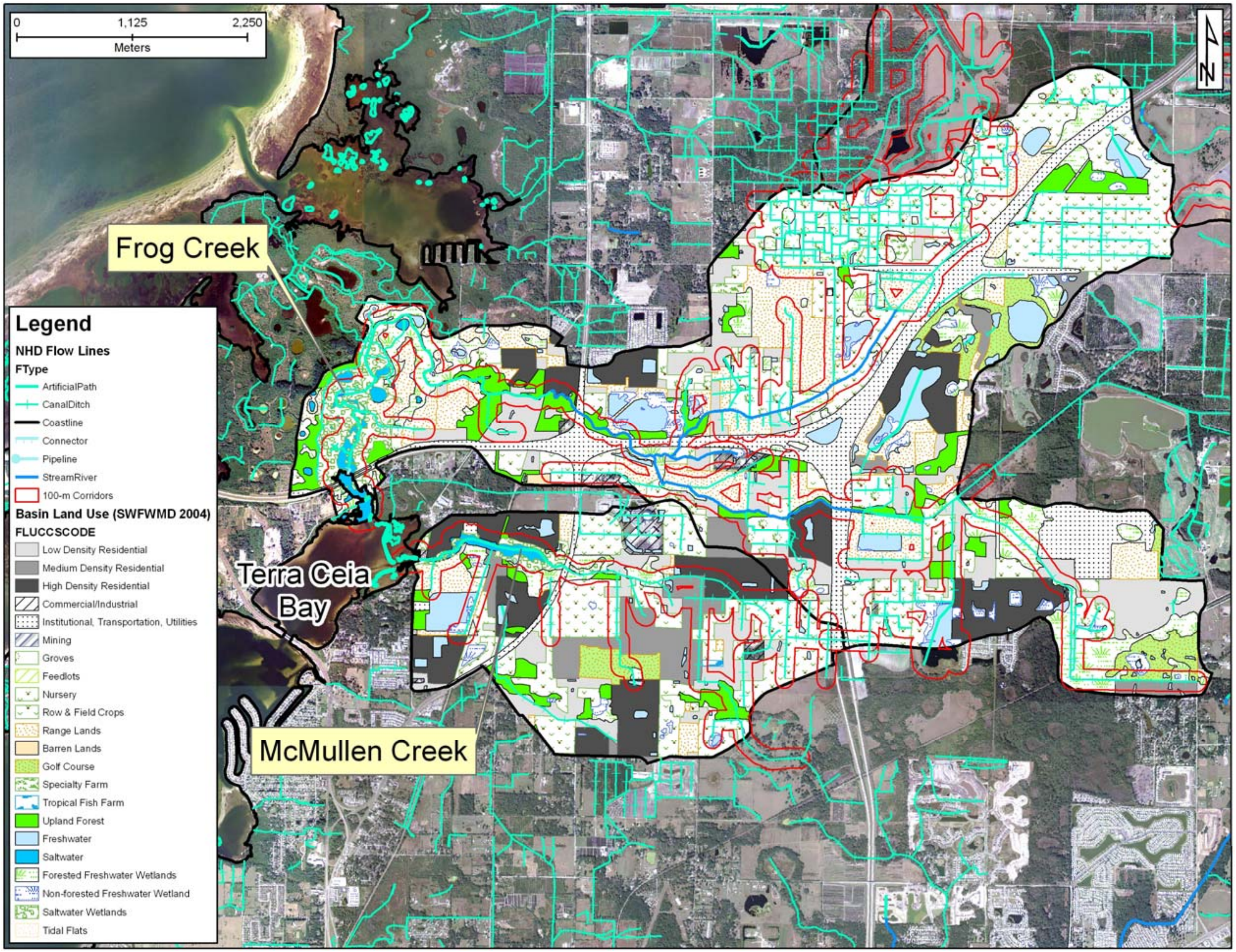


Figure G-4: General 2004 SWFWMD land use/land cover in the Terra Ceia Bay tidal tributary basins.