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Aquatic Ecology Sampling Report
Levy Nuclear Plant

Prepared for

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1 Introduction

The ecological data presented in this report are the result of an aquatic sampling program conducted by CH2M HILL, under contract to Progress Energy, from October 2007 to November 2008. The purpose of the monitoring program was to collect information to describe the physical, chemical, and biological characteristics of waters potentially influenced by the proposed Levy Nuclear plant (LNP). The study area is shown in Figure 1-1 and includes the Cross Florida Barge Canal (CFBC), nearshore Gulf of Mexico waters, the Crystal River Energy Complex (CREC) discharge, and the Old Withlacoochee River (OWR) segment between Inglis Dam and the CFBC. The data contained in this report will supplement the aquatic ecology information presented previously in the LNP Combined Operating License Application submitted by Progress Energy to the Nuclear Regulatory Commission (NRC) (July 30, 2008) and the LNP Site Certification Application (SCA) submitted to the State of Florida Department of Environmental Protection (FDEP) (June 2, 2008). This Aquatic Ecology Sampling Technical Memorandum will be submitted to the FDEP prior to the Site Certification hearings and will form the basis of aquatic ecology impact assessment testimony. The supplemental information contained in this report will also aid the NRC aquatic scientists developing aquatic impact assessments as part of the federal Environmental Impact Statement (EIS).

2 Methodology

The section provides a brief summary of the data collection methods employed in the field and calculation methods used in the data reduction and interpretation.

2.1 Data Collection

The field and analytical parameters collected and a brief summary of each methodology are provided below. Detailed information on the sampling methodology for each parameter is presented in the Aquatic Sampling Work Plan (CH2M HILL. 2007). A summary of the sampling program and the sampling dates per parameter and site are provided in Tables 2.1-1 through 2.1-6. Sampling locations at each site are provided in Figures 2.1-1, 2.1-2, and 2.1-3.

- Field water quality measurements included salinity, conductivity, dissolved oxygen (DO), pH, temperature, and water clarity. Data were collected at Stations 1 through 7 in the CFBC, Stations CREC-1 through CREC-4 in the CREC discharge, and Stations 8, 9, and 10 in the OWR. Physiochemical parameters were measured using a YSI multiprobe meter. Water clarity was measured using a Secchi disk.
- Analytical water quality parameters included chlorophyll *a*, total suspended solids (TSS), total dissolved solids (TDS), total phosphorous, orthophosphate, nitrate plus nitrite, ammonia, and total Kjeldahl nitrogen (TKN). Water samples were collected using a peristaltic pump and decontaminated tubing. Samples were collected at Stations 1 through 7 in the CFBC, CREC Stations 1 through 4, and Stations 8, 9, and 10 in the OWR.
- Analytical sediment quality parameters included particle size and total organic carbon. Samples were collected at Stations 1 through 7 in the CFBC, Stations CREC-3 and CREC-4 in the CREC discharge vicinity, and Stations 8, 9, and 10 in the OWR. Three replicate sediment samples were collected at each station using a Petite Ponar dredge, which captured approximately the upper 6 inches of the sediment profile.
- Benthic infauna and motile invertebrate samples were collected using four techniques: Ponar dredge, shoreline hand picking, crab traps, and trawls.
  - A petite ponar dredge, measuring six inches square, was used to collect three sediment samples from each station. The collected sediment was field sieved through a 600 micron mesh, and retained organisms were preserved with 10 percent buffered formalin. Benthic infauna samples were collected at Stations 1 through 7 in the CFBC, Stations CREC-3 and CREC-4 in the CREC discharge, and Stations 8, 9, and 10 in the OWR. Taxonomic identification, species abundance counts, and diversity indices were performed by taxonomic specialists at Water and Air Research, Inc., in Gainesville, Florida.
  - Qualitative hand-picked samples of shoreline macroinvertebrates were conducted within the intertidal zone of the CFBC, at Stations 1, 2, and 3. Macroinvertebrates

were picked from various substrates including rocks, mud flats, and oyster beds. Taxonomic identification and species abundance counts were performed by taxonomic specialists at Water and Air Research, Inc., in Gainesville, Florida.

- Motile macroinvertebrates were collected using crab traps and trawls at Stations 1 through 4 in the CFBC and Stations CREC-3 and CREC-4 in the CREC discharge. Crab traps only were deployed at Stations 8, 9, and 10 in the OWR. A total of five baited crab traps were deployed at each station for up to 5-day durations. A 6-foot otter trawl was pulled at 5-minute intervals along the bottom at multiple locations within a 1-mile segment for each CFBC station and within a half-mile radius of CREC Stations 3 and 4.

- The ichthyoplankton and meroplankton community was sampled at Stations 1 through 4 in the CFBC and Stations CREC-3 and CREC-4 in the CREC discharge vicinity. A 330-micron conical plankton net (0.5 meter [m] diameter) equipped with a flowmeter was used in replication to quantify ichthyoplankton, meroplankton, and holoplankton at each station. Duplicate oblique plankton tows were taken during the day and night for a total of 4 plankton samples per station. A tow time of 5 minutes was selected to achieve the desired volume of water sampled. Tow times were divided evenly between surface, mid, and bottom water column depths. Samples were preserved with formalin and submitted to taxonomic specialists at Ecological Associates in Jensen Beach, Florida, for plankton enumeration and identification.

- The fish community was sampled at Stations 1 through 4 in the CFBC, Stations CREC-3 and CREC-4 in the CREC discharge, and Stations 8, 9, and 10 in the OWR. Collection techniques included beach seining, gill netting, trawling, cast netting, and minnow traps. Trawling could not be conducted in the OWR due to the uneven and scoured limestone bottom and narrow stream width. Fish were identified to species, measured and enumerated in the field, and released. Voucher specimens of small or difficult to identify species were retained by preserving in alcohol, while larger or readily identifiable species were documented with photographs. George Burgess of the University of Florida (Gainesville) provided quality control review of the fish species identification.

  - Shoreline fish species were sampled using a ¼-inch mesh, 50-foot seine with a 6- X 6- X 6-foot bag. Duplicate samples were collected at Stations 1, 2, and 3 in the CFBC, and Station CREC 3, which are the only CFBC and CREC stations where shoreline habitat suitable for sampling occurred. Bag seines were not used at the OWR Stations. Samples were collected by anchoring one end of the seine to the shoreline, while the opposite end was drawn by boat back to the shoreline. The net was then retrieved to the shoreline.

  - Trawling was conducted to assess demersal fish species near the bottom of the water column. A 6-foot otter trawl was pulled along the bottom at multiple locations within a 1-mile segment at each CFBC station and within a half-mile radius of CREC Stations 3 and 4. Trawls were conducted for 5 minutes at a speed of typically 2 miles per hour or less.

- Gill nets 75 feet long and 6 feet deep with varying mesh sizes (1 inch to 6 inches) were deployed within a 1-mile area at each station. The smallest mesh end of each gill net was secured at or near the shoreline, stretched perpendicular to the shoreline into deeper water, and anchored. Net soak times were limited by terms of the approved state collector's permits and concerns for netting manatees and therefore did not exceed 2 hours between being deployed and retrieved.
- Cast netting was conducted at various locations within a 1-mile area for each CFBC station and within a half-mile radius of CREC Stations 3 and 4. Cast nets with 6-foot and 7-foot radius and with 5/8 inch and 1 inch mesh sizes were used, and nets were tossed a minimum of 40 times and a maximum of 50 times per station from a boat.
- Ten minnow traps (16- by 9-inch galvanized mesh) were baited and deployed across a 1-mile area for each CFBC station and within a half-mile radius of CREC Stations 3 and 4. Traps were retrieved up to 24 hours after deployment.

2.2 Calculations

Calculations used in the data reduction and interpretation are provided below.

Arithmetic Mean (Average):

$$= \frac{1}{n}\left(x_1 + \ldots + x_n\right)$$

Density:

$$= \left(\frac{Number\ of\ Individuals}{Area\left(m^2\right)}\right)$$

$$= \left(\frac{Number\ of\ Individuals}{Volume\left(100\,m^3\right)}\right)$$

Percent Composition:

$$= \left(\frac{Number\ of\ Individuals\ per\ Species}{Total\ Number\ of\ Collected\ Individuals}\right) \times 100$$

Flowmeter Calculations

Distance:

$$= \frac{\left(End\ Value - Start\ Value\right) \times 26{,}873}{999999}$$

Volume:

$$=\frac{\left(Distance\ \times Diameter\ of\ net\ (0.5\,m)^{2}\times 3.14\right)}{4}$$

Catch per Unit Effort (CPUE)

$$=\left(\frac{Total\ Catch\ (Number\ of\ Individuals)}{Total\ Effort\ Spent\ (time\ or\ number\ of\ efforts)}\right)$$

Shannon Diversity (H′)

$$=\sum_{i=1}^{S} p_i \bullet \ln(p_i)$$

where S = number of species in the sample

p_i = number of individuals of the ith species divided by (N)

N = total number of individuals in the sample.

Pielou's Index of Evenness (J′):

$$=\frac{H'}{\ln(S)}$$

where H′ = Shannon's index

S = Total number of species

Margalef's Index of Richness (d1):

$$=\frac{S-1}{\ln(N)}$$

where S = the total number of taxonomic groups in the sample

N = the total number of individuals per 100 cubic meters (m^3)

Statistical Methods

An Analysis of Variance (ANOVA) was used to examine differences of benthic infauna and zooplankton abundance between the CFBC stations, season and night vs. day effects using the three replicates per station per date as the within station sampling error. Interactions between the main effects were also evaluated. ANOVA is a technique designed to determine whether the mean values of multiple groups are statistically different from one another. The probability that observed differences between the various effects could be due to random variability in the data was calculated and compared to a significance level of 0.05. If the calculated probability for an effect is less than 0.05, that effect is typically deemed significant. The lower the calculated probability, the more significant the effect is based on the ANOVA evaluation. Determining that an effect is significant indicates that not all of the groups considered are equivalent (at least one is different from the others, or perhaps all are different from one another). ANOVA is often applied directly to measured data, but if that data are not normally distributed, the calculated probabilities can be biased. To avoid biased probabilities, a rank transformation was performed on the density data before the ANOVA was performed.

To determine which individual groups were significantly different from one another, a test of contrasts was performed. The *post hoc* test employed for this evaluation was the Tukey comparison ($p < 0.05$). For each constituent, the group with the largest mean value is assigned the letter A. If the mean values of all groups are statistically similar to one another, then they all are assigned the letter A. If the mean value of a group is statistically lower than the one designated as A, then it is designated as a B. If the mean value is statistically lower in another group (than the group assigned a B), then it is assigned the letter C, and so on. If the mean value is not statistically different between two categories (A or B), it is given the designation AB.

3 Results

The section provides the results and evaluation of the data collected at the CFBC, CREC discharge vicinity, and OWR segment. Tables and figures listed in the following sections are provided at the end of this Technical Memorandum. Source data used for calculations, summary tables, and figures are provided in Appendices A, B, and C.

3.1 Cross Florida Barge Canal

3.1.1 Physical Description

The CFBC was authorized in 1942 but was terminated in 1971 after approximately one-third of the canal had been completed. The segment of the CFBC that is associated with the LNP site falls within a completed portion of the canal, extending from Inglis Lock at the western end of Lake Rousseau westward into the Gulf of Mexico. This reach of the CFBC, which was excavated to 16.8 miles, extends from the Inglis Lock into the Gulf of Mexico. The material dredged from the land cut portion was placed on both sides of the canal, while material excavated from the Gulf of Mexico was placed in multiple spoil piles along the south side of the alignment, creating a series of nearshore spoil islands. The CFBC reach also bisects the Withlacoochee River.

Water control structures at the western end of Lake Rousseau include the Inglis Lock, Inglis Dam, and the Inglis Bypass Channel facilities. The dam at the southwestern end of Lake Rousseau controls water flow from the lake into an isolated segment of OWR, which flows into the CFBC downstream of the lock. The bypass channel diverts water from Lake Rousseau, through a canal around the northern side of Inglis Lock, then through a regulated spillway into the original Withlacoochee River, which ultimately connects to the Gulf of Mexico. The Inglis Lock is not operational; however lake water may seep through this structure. An obvious boil of groundwater occurs in the CFBC near the lock, thus freshwater is entering this end of the canal.

The CFBC discharges into the Withlacoochee Bay estuary and the Gulf of Mexico. The influence of freshwater flowing into the bay from various coastal rivers near the project area, such as Crystal River, Withlacoochee River, and Waccasassa River, creates a range of salinities that contribute to various habitat types. The dominant intertidal habitats in the area include brackish marshes, salt marshes, intertidal mud flats, and oyster reefs. Brackish and salt marshes are dominated by smooth cordgrass (*Spartina alterniflora*) and black needlerush (*Juncus romerianus*). Intertidal mud flats lie between low and high tide. Oyster reefs are found primarily outside of river mouths and provide habitat for many other estuarine organisms.

Seagrass beds also represent a significant nearshore habitat. The most common seagrass species includes turtle grass (*Thalassia testudinum*), manatee grass (*Syringodium filiforme*), shoal grass (*Halodule wrightii*), and *Halophila engelmannii* (Mote Marine Laboratory, 1995; this study). Macroalgae, including several species of *Caulerpa*, *Hypnea musciformis*, and *Chondria* *sp.* are also common in the nearshore area. Seagrass beds, and to a lesser extent algal beds, serve to trap and stabilize sediment, contribute to primary productivity and as a food source to herbivores, create large quantities of detritus, and provide a substrate for epiphytic algae.

The CFBC also serves as a recreational area. The FDEP Office of Greenways and Trails maintains the Withlacoochee Bay Trail and Felburn Park, which is located along the southern side of the CFBC. A boat ramp, which is located near the US-19 overpass, provides boating access to the CFBC and the Gulf of Mexico.

3.1.2 Physicochemical Characterization

Aquatic sampling was conducted from October 2007 to November 2008 to characterize the physical community along the length of the CFBC and nearshore areas of the Gulf of Mexico. Sampling included the collection of depth profiles, substrates, and water quality using various sampling techniques. These data are summarized in the following subsections.

Size

The length of the CFBC, extending from the western side of the Inglis Lock structure to its confluence with the Gulf of Mexico, is 7.4 miles. The width of the CFBC is fairly uniform beginning at approximately 1 mile west of the Inglis Lock and extending to the Gulf of Mexico, ranging from 207 to 262 feet. The greatest variation occurs within 1 mile of the Inglis Lock, ranging from 92 feet at the dam to 387 feet approximately 0.5 miles from the dam. The surface acreage of this segment of the barge canal is 226 acres. In addition, the dredged portion of the canal extends the canal 16.8 miles seaward from the lock.

Depth Profile

Cross sectional (4 point) depth profiles of the CFBC were conducted at Stations 1, 2, and 3 in October 2007. Mid-channel canal depths were also measured at 0.5 mile intervals, starting at the Inglis Lock and extending to 8.0 miles below the lock. Mid-channel canal depths ranged from 8.6 to 18.2 feet and averaged 14.7 feet (Figure 3.1.2-1). Depth was typically shallower at the cross-sectional measurement closest to the shorelines, as measured at approximately 50 feet from each shoreline. Mid-channel depth measurements varied from the Inglis Lock to the mouth of the CFBC. Mid-channel depth measurements within 1 mile of the lock averaged 16.2 feet. An average depth of 12.9 feet occurred between 1.5 and 3.5 miles. A trend of increasing depth occurred from 4.0 miles (depth 14.2 feet) to 5.5 miles (depth 18.2 feet), but then decreased slightly between 6 and 8 miles averaging 17.4 feet.

Total Organic Carbon and Particle Size

Sediment samples were collected from four stations in the CFBC (CFBC Stations 1, 2, 3, and 4) during two separate sampling events (October/November 2007 and June 2008). Total organic carbon (TOC) and particle size characteristics were generally consistent between the two sampling events. Three stations were sampled in the dredged canal channel that extends from the CFBC into the nearshore Gulf of Mexico (CFBC Stations 5, 6, and 7) during a single sampling event (October 2007). Sediment data for CFBC sampling events are presented in Appendix A.

Average TOC decreased from the Inglis Lock to the nearshore Gulf of Mexico (Table 3.1.2-1). TOC was higher at stations in the CFBC (CFBC Stations 1, 2, and 3) and was highest at CFBC Station 1 (60,714 milligrams per kilogram [mg/kg]) near the Inglis Lock. The sediment at the

CFBC stations was predominantly silt, ranging from 49.2 to 60.7 percent, and averaging 54.3 percent. Sand in the CFBC sediment averaged 17.1 percent, while clay averaged 28.6 percent.

The nearshore Gulf of Mexico sediment samples (CFBC Stations 4, 5, 6, and 7) were very different from the CFBC sediments. At CFBC Station 4, near the mouth of the CFBC, TOC decreased to 7,417 mg/kg, while farther offshore at CFBC Stations 5, 6, and 7, TOC concentrations decreased further to an average of 4,225 mg/kg. Sand was the dominant particle size at these three stations, ranging from 75.9 to 90.8 percent, and averaging 83.1 percent. Gravel, primarily in the form of shell fragments, ranged from 2.2 to 19.6 percent (11.4 percent average), while lesser amounts of silt (2.2 percent average) and clay (3.4 percent average) were present at these stations.

3.1.3 Water Quality

Field Parameters

Salinity Profile

Salinity data were collected in the CFBC at four stations (CFBC Stations 1, 2, 3, and 4) between October 2007 and November 2008 and at three nearshore Gulf of Mexico stations (CFBC Stations 5, 6, and 7) between October 2007 and December 2007. Average salinity values collected at specific depth intervals of 0.15 (nominal surface), 1.0, 2.0, 3.0, and 4.0 m for the four CFBC stations and three nearshore Gulf of Mexico stations are illustrated in Figure 3.1.2-2. These data are presented in an upstream to downstream order, ranging from CFBC Station 1 (0.5 miles) west of the Inglis Lock to CFBC Station 7, which is located approximately 16 miles west of the Inglis Lock in the nearshore waters of the Gulf of Mexico. Salinity data for CFBC sampling events are presented in Appendix A.

Salinity increased with both distance from the Inglis Lock and with sample interval depth at the four CFBC stations. Salinity was lowest at CFBC Station 1 at the surface (5.75 practical salinity scale [pss] average), increasing at each successive depth to a 16.87 pss average at the 4.0 m depth. Increasing salinity trends at successive sample interval depths were also observed at CFBC Stations 2, 3, and 4. Highest average salinities within the CFBC at each sample depth were measured at CFBC Station 4, in the near-shore Gulf just outside the mouth of the CFBC, ranging from 17.83 pss at the surface to 25.91 pss at 4.0 m.

At the additional Gulf of Mexico stations (CFBC Stations 5, 6, and 7), salinity was generally higher than that in the CFBC and data were less variable. The average of all data measured at the nearshore Gulf of Mexico stations was 30.8 pss with a range of 27.99 pss to 33.09 pss.

The salinities at CFBC stations were typically highest in near-bottom waters on all sampling events, suggesting that a saltwater wedge extends upstream to the Inglis Lock throughout the year. Within the CFBC, surface (0.15 m) salinities were variable, ranging from 0.46 to 28.36 pss. However, near-bottom (4.0 m) salinities within this same time period were higher, ranged from 3.65 to 33.15 pss. In general, the upper 2.0 m of the water column within the CFBC and just outside of its mouth often showed a wide range of salinities among sampling stations and sampling dates; whereas, below 2.0 m, the salinities were generally more stable at all depths, reflecting a general increase in salinity with increased proximity to the Gulf of Mexico.

Variations in salinity among individual sampling events were wide ranging at CFBC Stations 1, 2, and 3 in the CFBC and at Station 4 near the CFBC mouth. This is primarily the result of tidal fluctuations and the variable mixing of fresh and saltwater in the CFBC. Freshwater is released from the dam upstream at Lake Rousseau, through an isolated segment of the Withlacoochee River (the OWR), and into the CFBC about 2.1 km downstream of the Inglis Lock. Some freshwater is also released at the lock, and an unknown number of underwater springs also contribute freshwater to the CFBC.

Temperature Profile

Average temperature values collected at specific depth intervals of 0.15, 1.0, 2.0, 3.0, and 4.0 m for the four CFBC stations and three nearshore Gulf of Mexico stations are illustrated in Figure 3.1.2-3. These data are presented in an upstream to downstream order. Temperature data for CFBC sampling events are presented in Appendix A.

The temperature data reflect expected temporal trends in the CFBC; mid-July 2008 temperatures represented the highest temperatures for all stations, while October 2007 through December 2007 represented the lowest temperatures. In July 2008, surface temperatures for all stations ranged between 30.0 and 33.3 degrees Celsius (°C), while surface temperatures ranged between 15.0 and 28.6°C in October 2007 through December 2007.

Water temperatures measured at CFBC Stations 1, 2, 3, and 4 were generally warmer than CFBC Stations 5, 6, and 7 in the nearshore Gulf of Mexico, regardless of the date sampled. This trend was more clearly defined in the upper water column between the surface and 2.0 m, whereas at 4.0 m the temperature difference was somewhat less distinct (Table 3.1.2-2)

Dissolved Oxygen, pH, and Water Clarity

Average DO values at depth intervals at the CFBC stations (CFBC Stations 1, 2, 3, and 4) and nearshore Gulf of Mexico stations (CFBC Stations 5, 6, and 7) are illustrated in Figure 3.1.2-4. Table 3.1.2-3 summarizes the average results for DO, as well as pH and water clarity (i.e., Secchi depth), at each CFBC station. DO, pH, and water clarity data for CFBC sampling events are presented in Appendix A.

Average DO values for each station and sampling period ranged from a 0.21 to 13.04 milligrams per liter (mg/L). In general, DO concentrations within the CFBC decreased with depth while the DO profile at the nearshore stations was more uniform. CFBC Station 1, located 0.5 miles downstream of the Inglis Lock, had the lowest DO concentrations, with bottom values frequently less than 3.0 mg/L

The pH measurements (Appendix A) showed a general increasing trend from the Inglis Lock to nearshore Gulf of Mexico. The lowest pH value was recorded at CFBC Station 1 (6.94 standard units [SU]) at the 4.0 m depth, while the highest reading was recorded at CFBC Station 4 (8.38 SU) at the 4.0 m depth.

Average water clarity showed an increasing trend from the Inglis Lock to nearshore Gulf of Mexico. The station with the least water clarity, as measured by Secchi disc, was CFBC Station 2 with a value of 1.28 m. The greatest water clarity occurred at Stations 5, 6, and 7 in the Gulf of Mexico, with values ranging from 1.81 to 2.13 m.

Analytical

Water quality analytical samples were collected in the CFBC at four stations (CFBC Stations 1, 2, 3, and 4) on seven sampling events conducted between October 2007 and October 2008. Samples were collected from mid-depth at each station, with the exception of the October 2008 sampling event, during which samples were collected at the surface, mid-depth, and bottom. Three nearshore Gulf of Mexico stations (CFBC Stations 5, 6, and 7) were also sampled on four events conducted between October 2007 and December 2007. All nearshore samples were collected at mid-depth. Analytical water quality data for CFBC sampling events are presented in Appendix A.

Ammonia concentrations ranged from 0.36 mg/L at CFBC Station 1 to concentrations below the detection limit at each station during various sampling events. Ammonia concentrations were highest at all stations within the CFBC during the June 2008 sampling event. (Figure 3.1.2-5). Ammonia was not detected at any of the nearshore Gulf of Mexico stations with the exception of one sample at CFBC Station 5 with a concentration of 0.41 mg/L collected in December 2007 (Figure 3.1.2-6).

Nitrate + nitrite concentrations were generally more variable at the stations within the CFBC compared to the nearshore Gulf of Mexico stations (Figure 3.1.2-7 and Figure 3.1.2-8). Concentrations at the nearshore Gulf of Mexico stations did not exceed 0.28 mg/L and were often below the nitrate + nitrite detection limit (0.25 mg/L). The stations within the CFBC contained concentrations that were slightly higher than the nearshore Gulf of Mexico stations during the same sampling events. Subsequent sampling events within the CFBC measured increased nitrate + nitrite concentrations, with peak concentrations occurring during the late-August 2008 sampling event that occurred following Tropical Storm Faye.

TKN concentrations for the CFBC and nearshore stations are shown in Figures 3.1.2-9 and 3.1.2-10, respectively. The highest TKN concentration (1.80 mg/L) occurred at CFBC Station 3 during the December 2007 sampling event. TKN concentrations were generally higher at the stations within the CFBC compared to the nearshore Gulf of Mexico stations during the same sampling events.

Total nitrogen was generally higher and more variable at the stations in the CFBC compared to the nearshore Gulf of Mexico stations (Figure 3.1.2-11 and Figure 3.1.2-12). The highest Total nitrogen concentration was collected from CFBC Station 3 during the December 2007 sampling event (1.86 mg/L). Concentrations were below Total nitrogen detection limits at each of the nearshore Gulf of Mexico stations during the October 2007 sampling event.

Orthophosphate generally decreased with distance from the Inglis Lock at stations within the CFBC (Figure 3.1.2-13). Concentrations within the CFBC ranged from 0.054 mg/L at CFBC Station 1 to below detection limits at CFBC Stations 2, 3, and 4 during the October 2008 sampling event.

Total phosphorus was higher and more variable at the stations within the CFBC compared to stations in the nearshore Gulf of Mexico (Figure 3.1.2-14 and Figure 3.1.2-15). The highest average concentration (0.29 mg/L) occurred at CFBC Station 2, with the lowest concentration collected at CFBC Station 4 (0.012 mg/L). Concentrations were lower and more stable at the nearshore Gulf of Mexico stations during the same sampling events, with values ranging from 0.016 mg/L to 0.029 mg/L.

Stations within the CFBC contained higher and more variable chlorophyll *a* concentrations than the nearshore Gulf of Mexico stations (Figure 3.1.2-16 and Figure 3.1.2-17). Concentrations generally decreased with distance away from the Inglis Lock, with the highest concentration (55.1 milligrams per cubic meter [mg/m^3]) occurring at CFBC Station 2, 3.5 miles downstream of the Inglis Lock. Concentrations were below chlorophyll *a* detection limits at CFBC Stations 3 and 4 during several sampling events (Appendix A). Chlorophyll *a* concentrations were below 3.2 mg/m^3 at the nearshore Gulf of Mexico stations, with concentrations below chlorophyll *a* detection limits at each station during the October 20007 sampling event.

TDS concentrations were generally lowest at CFBC Stations 1 and 2, ranging from 370 to 24,000 mg/L, and increasing to a high of 33,000 mg/L at CFBC Station 4 and Station 7 (Appendix A). As expected, TDS concentrations, which reflect concentrations of salt, generally increased with proximity to the Gulf of Mexico during concomitant sampling events.

TSS concentrations ranged from below detection limit (5 mg/L) at CFBC Station 1 (September, 2008 sampling event) to 52 mg/L at CFBC Station 3 (Figure 3.1.2-18). In general, stations near the Gulf of Mexico (CFBC Station 3 and 4) and in the nearshore Gulf of Mexico (Figure 3.1.2-19) contained higher TSS concentrations than the stations in the more quiescent waters near the Inglis Lock (CFBC Stations 1 and 2).

3.1.4 Biological Characterization

Aquatic sampling was conducted from October 2007 to October 2008 to characterize the biological community along the length of the CFBC and nearshore areas of the Gulf of Mexico. Sampling included the collection of benthic invertebrates, zooplankton, and fish using various sampling techniques. These data are summarized in the following subsections. Biological data for CFBC sampling events are presented in Appendix A.

3.1.4.1 Benthic Invertebrates

Benthic invertebrate samples were collected using four techniques. A Petite Ponar dredge was used to sample the benthic invertebrates that inhabit the sediment (infauna). Shoreline hand picking was conducted to document benthic invertebrates that are present in the intertidal zone. Crab traps and trawls were used to collect motile benthic macroinvertebrates.

Benthic Infauna

Benthic infauna samples were collected at Stations 1 through 7 in October and December 2007and Stations 1 through 4 in June and October 2008.

The mean abundance for stations sampled ranged from 54 individuals per square meter (ind/m^2) at Station 1 and 14,847 ind/m2 at Station 5 (Table 3.1.3.1-1). Statistically significant differences in benthic infauna abundance were found between sampling stations and season (Tables 3.1.3.1-2 and 3.1.3.1-3). Statistically significant differences between stations were only found between Station 1, which had the lowest mean abundance, and Station 2, which had the highest mean abundance. Abundances were found to be significantly higher in October 2008 than the other sampling events.

The benthic infauna collected were comprised of polychaetes, crustaceans, cnidarians, bivalves, and oligochaetes (Table 3.1.3.1-1 and Figure 3.1.3.1-1). Although a large variety of phyla, classes, orders, and families were collected, Class Polychaeta (Phylum Annelida) dominated the infauna, accounting for about 75 percent of the study mean total and 48 percent of the species. Polychaetes numerically dominated the benthic community at all stations during all events and comprised 62 to 96 percent of the benthic infaunal community. Dominant polychaetes included *Stebliospio sp., Prionospio cristata, Galathowenia oculata,* and *Lumbrineridae sp.* Amphipods (Crustacea), represented by 68 taxa, ranked second in abundance. Amphipods were not collected at Station 1 below the Inglis Lock and were most abundant at Station 5, in the near-shore Gulf of Mexico, where they accounted for almost 18 percent of the benthic community. The most dominant amphipods were *Ampelisca sp., Bemlos sp.,* and *Apocorophium louisianum.* Crustaceans (amphipods and decapods), mollusks (bivalves and gastropods), and cniderians were more abundant in the Gulf of Mexico stations (Stations 5 through 7) than in the CFBC stations (Stations 1 through 4). Nutclams, *Nucula crenulata,* and *Nuculana acuta* were the most abundant of the bivalves collected. *Calyptrea centralis, Crepidula plana,* and *Thala floridana* were the most abundant gastropods.

Diversity statistics were calculated for major taxonomic groups (e.g., phylum, classes, orders, families) using the station means. Diversity, evenness, and richness were highest at stations in the Gulf of Mexico and relatively low at stations near the Inglis Lock (Table 3.1.3.1-4). Station 7, farthest offshore, presented the highest number of major taxonomic groups (20 taxa) and diversity ($H' = 2.14$), and the second highest evenness ($J' = 0.49$) and richness values ($d1 = 2.05$). Stations 4 and 6 both had a total of 19 major taxonomic groups and very similar diversity values. Station 1 presented the lowest number of taxa and density and reflected the poor quality of sediments near the Inglis Lock. Station 2 had the lowest diversity ($H' = 0.31$) and evenness ($J' = 0.10$) values due to a relatively high abundance of 14,015 ind/100 square meters (m^2) strongly dominated by Polychaetes (96 percent of the study mean). Such a high proportion of individuals from one taxonomic group has the effect of depressing diversity indices.

Shoreline Handpicking

Shoreline handpicking was conducted at Stations 1 through 3 along the CFBC in November and December 2007. Invertebrate taxa collected represented three phyla: Annelida, Arthropoda, and Mollusca (Table 3.1.3.1-5).

Station 1 was dominated by False dark mussels (*Mytilopsis leucophaeata*) and barnacles (*Chthamalus fragilis*) in November, and these two species were abundant in December. Oligochaete worms were abundant at Station 1 during both events. Isopods and chironomid midges (*Dicrotendipes lobus*) were abundant in November, and amphipods (*Apocorophium louisianum*) and springtails (Collembola, Hypogastruridae) were abundant in December.

Station 2 was dominated by amphipods (*Melita longisetosa*, Melita sp.) in December, and Olive nerite (*Neritina usnea*) were abundant during both events. Other abundant taxa during at least one event included False dark mussel (*Mytilopsis leucophaeata*), hooked mussel (*Ischadium recurvum*), barnacles (Balanus sp), common mud crab (*Eurypanopeus depressus*), and Atlantic mud crab (*Panopeus herbstii*).

Barnacles were abundant at Station 3 during both events. The invasive green porcelain crab (*Petrolisthes armatus*) and hooked mussel (*Ischadium recurvum*) were abundant at only Station 3 in November. Barnacles (*Chthamalus fragilis*), common mud crab (*Eurypanopeus depressus*), and tanaids (Leptocheliidae) were abundant at Station 3 in December.

Motile Macroinvertebrates

Motile macroinvertebrates were collected using crab traps and trawls at Stations 1 through 4. A total of five baited crab traps were deployed across a 1-mile segment for each station. A 6-foot otter trawl was pulled along the bottom at multiple locations within a 1-mile segment for each station (Stations 1-4). Trawls were conducted for 5 minutes at a speed of typically 2 miles per hour or less.

Trawl

Trawling was conducted to assess demersal macroinvertebrate species near the bottom of the water column at multiple locations within a 1-mile segment at each station. Event 1 was conducted on October 31 and November 1, 2007, Event 2 in December 2008, Event 3 in May 2008, and Event 4 in August 2008.

A total of 55 individuals representing 10 invertebrate species were collected using trawls. Blue crab, with a total CPUE of 9, represented 30 percent of the total catch (Table 3.1.3.1-6). Other relatively abundant species were Atlantic brief squid, comprising 17 percent of the total catch, pink shrimp, comprising 17 percent of the total catch, and mud crab, comprising 16 percent of the total catch. Those species had total CPUEs of 5 each.

Because the number of trawls per station varied, CPUE per station was calculated by number of individuals per trawl for comparison of abundance and composition between station and sampling event (Tables 3.1.3.1-7 through 3.1.3.1-10). The largest total CPUE was 12 invertebrates per trawl in May. The second largest CPUE was 9 in December, followed by a CPUE of 5 in August, and a CPUE of 4 in October.

No motile macroinvertebrates were collected at Station 1 near the Inglis Lock. Station 3 had the highest CPUE with 12 invertebrates per trawl, followed by Stations 4 and 2 with CPUEs of 9 (Table 3.1.3.1-6). Station 4 had the highest number of species, with 7 different species, Station 2 had 4 different species, and 3 different species were recorded at Station 3.

Crab Trap

Ten crab traps (approximately 16 inches by 9 inches) were baited and deployed across a 1-mile segment at each station. Event 1 was conducted in October 2007, Event 2 in December 2007, Event 3 in May 2008, and Event 4 in August 2008.

A total of 123 blue crabs were collected using crab traps. No other invertebrate species were caught in the crab traps (Tables 3.1.3.1-11 through 3.1.3.1-15). The total CPUE was 3 in October and December and 2 in May and August. Station 3 had the highest CPUE with 5, followed by Station 2 with a CPUE of 2, Station 4 with a CPUE of 1, and Station 1 with a CPUE of 0.1. Only 1 blue crab was collected at Station 1 in August, and no crabs were collected during the other sampling events.

3.1.4.2 Zooplankton

Zooplankton in the CFBC were collected at Stations 1 through 4 during 14 sampling events (Table 2.1-1). Zooplankton are the heterotrophic component of the plankton community.

The following subsections provide analyses of the mean abundance averaged over the 14 sampling events: spatial, temporal, and diurnal (day/night) differences in mean abundance and species composition.

Components of the total zooplankton community discussed below include holoplankton, meroplankton, and ichthyoplankton. Holoplankton are those organisms that are planktonic throughout their life histories. Meroplankton is a term that refers to developmental stages (generally eggs and larvae) of organisms that are not planktonic as adults. Ichthyoplankton refers to fish eggs and larvae. Pseudoplankton, organisms that attach to planktonic organisms in the water column, and benthic invertebrates collected were excluded from the calculations.

Total Zooplankton

Total zooplankton generally increased with distance from the Inglis Lock during day and night and was significantly higher in the spring than in summer and fall. Statistically significant differences of total zooplankton abundance were found between sampling stations, season and day versus night (ANOVA, $p < 0.0001$) (Table 3.1.3.2-1). The mean abundance of zooplankton varied between stations in the CFBC, from a maximum of 61,631 ind/100m^3 at Station 4 (night) to a minimum of 5,380 ind/100m^3 at Station 2 (day). The Tukey test indicated that offshore Station 4 was significantly higher than all other stations ($p < 0.05$) (Table 3.1.3.2-2). Station 3 was significantly higher than Station 2, and Station 1, near the Inglis Lock, was significantly lower than all other stations in terms of total zooplankton abundance. The Tukey tests also indicated that night sampling produced significantly higher densities than day sampling, and abundances were significantly higher in the spring than in summer and fall ($p < 0.05$) (Table 3.1.3.2-2).

Holoplankton represented about 60 percent, meroplankton about 38 percent, and ichthyoplankton comprised around 2.5 percent of the total zooplankton community. The taxonomic structure of total zooplankton was characterized by the numerical dominance of Panopeidae (mud) crab larvae and copepods. These two taxa collectively represented from about 65 percent to 88 percent of the mean abundance at each station. Copepods, chaetognath worms, mysids, and cladocerans were collected throughout the study in both day and night sampling and appear to be components of a year-round resident holoplankton community. Meroplankton reflected the year-round prevalence of invertebrate larvae, such as Panopeidae crabs, brachyuran crabs, caridean shrimps, cirripeds (barnacles), and gastropods. Ichthyoplankton were present from all sampling stations and dates, representing about 4 and 2 percent of the total zooplankton in day and night sampling, respectively.

Diversity statistics for total zooplankton were calculated for major taxonomic groups (e.g., classes, orders, families) using the day and night station means. Zooplankton diversity, richness, and evenness were highest at stations closest to the Gulf of Mexico during the day, while at night diversity was highest near the Inglis Lock. Station 3 presented the highest number of taxonomic groups (60 taxa), diversity ($H' = 2.63$), evenness ($J' = 0.45$), and richness values ($d1 = 6.20$) during the day sampling (Table 3.1.3.2-3). Station 4 presented the highest number of taxonomic groups (61 taxa), abundance, and richness ($d1 = 5.44$) among sampling stations at night for total zooplankton (Table 3.1.3.2-4). Although Station 1 had the lowest number of taxa (36 taxa) and mean abundance (22,628 ind/100m^3), Station 1 had the highest diversity ($H' = 1.90$) and evenness ($J = 0.37$). The higher diversity indices at Station 1 resulted from the high proportion of major taxonomic groups relative to the lowest study mean.

Holoplankton

Holoplankton generally increased from the Inglis Lock during the day and night and was higher in the spring than in summer and fall. Statistically significant differences of total holoplankton abundance were found between sampling stations, seasons, and day versus night (ANOVA, $p < 0.0001$) (Table 3.1.3.2-5). The mean abundance of holoplankton varied two orders of magnitude between stations in the CFBC, from a maximum of 49,858 ind/100m^3 at Station 4 (night) to a minimum of 396 ind/100m^3 at Station 2 (day) (Figure 3.1.3.2-1). The Tukey test indicated that Stations 3 and 4 were not significantly different from each other but were significantly higher than Stations 1 and 2 ($p < 0.05$) (Table 3.1.3.2-6). Station 2 was significantly higher than Station 1, and Station 1 was significantly lower than all other stations. The Tukey tests also indicated that night sampling produced significantly higher densities than day sampling, and total holoplankton was significantly greater in the Spring than in summer and fall ($p < 0.05$) (Table 3.1.3.2-6). There was not a statistically significant difference between the summer and fall seasons.

Holoplankton represented between about 7 and 47 percent of the total zooplankton during the day and between about 31 and 83 percent of the total zooplankton during the night. Copepods were the most numerically dominant taxonomic component during the day and night and represented over 90 percent of the total holoplankton in both day and night collections at all stations. Other prominent taxonomic components of the holoplankton in terms of relative abundance were Chaetognath worms, mysids, and cladocerans. Appendicularia and cniderians were collected only during the day, and Euphausids were collected only at night.

Meroplankton

Meroplankton generally decreased from the Inglis Lock during the day, was variable at night, and higher in the spring than in summer and fall. Statistically significant differences of total meroplankton abundance were found between sampling stations and seasons but not between day and night (Table 3.1.3.2-7). The maximum variation of total meroplankton abundance between stations was 4 fold, from 4,553.0 ind/100m^3 at Station 2 (day) to 18,930.1 ind/100m^3 at Station 4 (day) (Figure 3.1.3.2-2). The Tukey test indicated that meroplankton abundance at Station 4 was significantly higher than all other stations ($p < 0.05$) (Table 3.1.3.2-8). Station 3 was significantly higher than Station 1, which was significantly lower than all other stations in terms of meroplankton abundance. Station 2 was not significantly different from Stations 3 or 1. The Tukey test also indicated that abundances were significantly higher in the spring than in summer and fall ($p < 0.05$).

Meroplankton represented between about 49 and to 90 percent of the total zooplankton during the day and 15 to 67 percent of the total zooplankton during the night. Panopeidae crab larvae were the most numerically dominant meroplankton component during both day and night sampling at all stations and accounted for 56 to 84 percent of the total meroplankton during the day and 35 to 88 percent at night (Figures 3.1.3.2-3 and 3.1.3.2-4). Other prominent taxonomic components of the meroplankton in terms of relative abundance were larvae of brachyuran crabs, cirripeds (barnacles), caridean shrimps, and gastropods. Upogebiidae (mud) shrimp and Pinnotheridae (pea) crab larvae were also abundant during the day, and tunicates and Palaemonidae shrimp were abundant at night.

Ichthyoplankton

Ichthyoplankton were most abundant at stations closest to the Gulf of Mexico. The maximum variation of total ichthyoplankton abundance between stations was from 40 ind/100m^3 at Station 1 (day) to 1,475 ind/100 m^3 at Station 4 (day) (Figure 3.1.3.2-5).

Statistically significant differences of egg abundance were not found between sampling stations, seasons, or day versus night (Table 3.1.3.2-9). The maximum variation of egg abundance between stations was from less than 1 ind/100m^3 at Station 2 (night) to 652 ind/100m^3 at Station 4 (day). Engraulidae (anchovy) were the most numerically dominant eggs during both day and night sampling for all stations, and accounted for 97 percent of eggs during the day and about 75 percent of the eggs collected at night. Clupeidae (sardines and menhaden) eggs were collected in low abundances during both day and night at Stations 1, 2, and 3. Egg complexes representing the families of Achiridae, Merlucciidae, Paralichthyidae, Sciaenidae, and Serranidae were collected in low abundances at Stations 3 and 4 during the day, and egg complexes representing the families of Paralichthyidae and Sparidae were collected at night at Station 4.

Fish larvae densities were about 2 times higher than fish egg densities. Larval mean abundance varied between stations from 37 ind/100m^3 at Station 1 (day) to 823 ind/100m^3 at Station 4 (day). Statistically significant differences of larvae abundance were found between sampling stations, seasons, and day versus night (Table 3.1.3.2-10). The Tukey test did not reveal consistent trends with distance from the Inglis Lock but indicated that Station 4 was significantly greater than Station 2 ($p < 0.05$) (Table 3.1.3.2-11). The Tukey tests also indicated that larvae were significantly greater in the spring ($p < 0.05$) (Table 3.1.3.2-11).

Two families collectively accounted for 88 percent of the larvae mean total: Gobiidae and Engraulidae. Gobiidae larvae represented about 78 and 51 percent of the total larvae collected in day and night sampling, respectively. Engraulidae larvae was the second most abundant during both the day and night sampling, accounting for about 14 and 34 percent of the daytime and nighttime larvae mean total, respectively. Larvae of Gobiidae and Engraulidae were collected during all of the sampling events, indicating the presence of year-round resident populations with continuous reproduction in the CFBC and near-shore Gulf of Mexico. Larvae of pelagic fishes, including that of Sciaenidae (croakers and drums), Clupeidae (menhadens), Atherinoformes (silversides), and Gerreidae (mojarras) were also among the most abundant fish larvae from most stations. Larvae of small demersal fishes, including representatives of Blenniidae and Achiridae, were common from most sampling stations.

Fish larvae were mostly collected as post yolk-sac larval stages. Yolk-sac larvae represented 4 percent of the total fish larvae collected in both day and night. Of the identifiable yolk-sac larvae, Engraulidae were the most dominant yolk-sac larvae during the day and night at Stations 2, 3, and 4. Clupeid yolk sac larvae were the most dominant at Station 1 during the day and night. Other yolk-sac larvae taxa collected included Atherinoformes (silversides), Blennidae (blennies), Clupeiformes (anchovies and herrings), Cyprinodontidae (killifishes), and Gobiidae (gobies). Post-flexion larvae represented 96 percent of the total fish larvae collected during the day and night. Members of the family Gobiidae (gobies) were the most dominant post yolk-sac larvae during the day and night at all stations, except Station 1 (Figures 3.1.3.2-6 and 3.1.3.2-7). Engraulidae (anchovy) post yolk-sac larvae were the most abundant at Station 1.

Larvae of commercially or recreationally important fishes including silver perch (*Bairdiella chrysora*), spotted seatrout (*Cynoscion nebulosus*), sand weakfish (*Cynoscion aerenarius*), southern kingfish (*Menticirrhus americanus*), red drum (*Sciaenops ocellatus*), and leatherjacket (*Oligoplites saurus*) were collected in low abundances as post yolk-sac larvae. Post yolk-sac larvae collected in low abundances identified to family with commercial or recreational importance were Carangidae (jacks and pompanos), Haemulidae (grunts), Mullidae (mullets), and Sparidae (breams and porgies).

Diversity statistics for ichthyoplankton were calculated for the lowest practical identification level (i.e., family or species) using the day and night station means. During both day and night, ichthyoplankton density, diversity, and richness were highest at stations closest to the Gulf of Mexico. Station 3 presented the highest number of taxonomic groups (36 taxa), diversity (H′ = 2.33), and richness values (d1 = 5.30) during the day sampling (Table 3.1.3.2-12). Station 4 had the highest mean density and second highest diversity and richness values, and Station 1 had the lowest number of taxonomic groups and abundance during the day. Station 4 presented the highest number of taxonomic groups (46 taxa), diversity (H′ = 2.96), and richness (d1 = 6.63) among sampling stations at night for ichthyoplankton (Table 3.1.3.2-13). Station 3 had the second highest number of taxonomic groups (39 taxa) and richness (d1 = 5.45), and Station 1 had the lowest number of taxa (36 taxa) and richness (J′ = 3.19).

3.1.4.3 Fisheries

Adult and juvenile fish were collected using five different gear types at Stations 1, 2, 3, and 4. Fisheries data were collected using beach seines, otter trawls, gill nets, cast nets, and minnow traps. A total of 4,980 fish representing 80 taxa were collected at the four sampling stations using the five gear types. Because the collection success of the different gear types can vary, fisheries data are presented by gear type, and abundance is discussed as both number of individuals caught and on a CPUE basis. Individual catch records are presented in Appendix A, and summary tables present CPUE data by event and for the entire sampling period (October 2007 to September 2008)

Beach Seine

Shoreline fishes were sampled using a ¼-inch mesh, 50-foot seine with a 6- x 6- x 6-foot bag. Beach seine samples were not collected at Station 4.The limited exposed shoreline at this station consists of salt marsh islands with rough limestone bottoms and oyster reefs precluding the use of a beach seine. Event 1 was conducted in October and November 2007, Event 2 in December 2007, Event 3 in June 2008, and Event 4 in August and September 2008.

A total of 928 individuals representing 24 fish species were collected using beach seines. The largest catches from the four sampling events were a catch of 591 gulf menhaden and 86 bay anchovy caught in June of 2008 and a catch of 57 spotfin mojarra in December 2007, together representing about 80 percent of the total catch. The catch of gulf menhaden, which was not collected in other seine sampling events, accounted for 64 percent of the entire catch for all four sampling events combined. Bay anchovy, which was also caught in small numbers in

December 2007, comprised 10 percent of the entire catch for all events combined. Spotfin mojarra, which dominated the catch in November and December 2007, and in August 2008 accounted for 17 percent of the entire catch for all events combined. Bay anchovy, spotfin mojarra, Atlantic needlefish, and pinfish were the only species caught during each sampling event.

CPUE per station was calculated as the number of individuals per beach seine haul for comparison of abundance and composition between station and sampling event (Tables 3.1.3.3-1 to 3.1.3.3-4). The dominant species were gulf menhaden (297) and bay anchovy (47) in June 2008 representing the highest CPUE, 345 for this technique. The total CPUE for all stations in November 2007 was 26, in December 2007 was 66, and in August 2008 was 28. Spotfin mojarra was the most abundant fish caught in November and December 2007 and in August 2008, with respective CPUEs of 16, 45, and 19. The greatest CPUE in June 2008 was 296 for gulf menhaden.

Station 1 had the highest total CPUE for all events combined, at 391 fish per haul (Table 3.1.3.3-5). Station 2 had a total CPUE of 40, and Station 3 had a total CPUE of 34 for all events combined. Fifteen different species were caught at Station 3, 12 different species were caught at Station 1, and 11 different species were caught at Station 2. The large CPUE for Station 1 reflects the high numbers of gulf menhaden and bay anchovy collected in June 2008. No catch was recorded at Station 1 in November 2007.

Trawl

Trawling was conducted to assess demersal fish species near the bottom of the water column at multiple locations within a 1-mile segment at each station. Event 1 was conducted in October 2007, Event 2 in December 2008, Event 3 in May 2008, and Event 4 in August 2008.

A total of 2,703 individuals representing 38 fish species were collected using trawls. Significant catches of bay anchovy and silver perch were recorded in October and December 2007. Bay anchovy was also the most abundant fish caught in May and August 2008, but fewer individuals were caught during those sampling events. Bay anchovy, with a total CPUE of 918, represented 55 percent of the total catch for all four events combined (Table 3.1.3.3-10). Other relatively abundant species for all four events combined were silver perch, comprising 26 percent of the total catch, and spotfin mojarra, comprising 8 percent of the total catch. Species important in individual events but representing 3 percent or less of the total include pinfish and spot in October 2007 and May 2008, gulf menhaden and hardhead catfish in December 2007, Atlantic croaker in May 2008, and Atlantic bumper and sand seatrout in August 2008.

Because the number of trawls per station varied, CPUE per station was calculated by number of individuals per trawl for comparison of abundance and composition between stations and sampling events (Tables 3.1.3.3-6 to 3.1.3.3-9). The largest total CPUE was 1,001 in October 2007. The second largest CPUE was 504 in December 2007, followed by a CPUE of 142 in August 2008, and a CPUE of 35 in May 2008. The largest catches were as follows: bay anchovy with a CPUE of 670 in October 2007 and a CPUE of 180 in December 2007 and silver perch with a CPUE of 207 in October 2007 and a CPUE of 220 in December 2007. Bay anchovy dominated the other events with a CPUE of 8 in May 2008 and a CPUE of 60 in

August 2008. Spotfin mojarra had a CPUE of 57 in October 2007, 18 in December 2007, and 57 in August 2008.

Station 1 had the lowest CPUE in each sampling event (Tables 3.1.3.3-6 to 3.1.3.3-9) and the lowest total CPUE for all events combined with 6 (Table 3.1.3.3-10). Station 2 had the highest CPUE with 744, followed by Station 3 with a CPUE of 575, and Station 4 with 356. Station 1 also had the lowest number of species, with only five species represented. Station 4 had the highest number of species at 20, and 19 species were recorded at both Stations 2 and 3.

Gill Net

Gill nets 75 feet long and 6 feet deep with varying mesh size panels were deployed within a 1-mile segment at each station. Event 1 was conducted in 2007, Event 2 in December 2007, Event 3 in June 2008, and Event 4 in August 2008.

A total of 161 individuals representing 26 fish species were collected using gill nets. The most abundant species for the four events combined were scaled sardine, comprising 50 percent of the total catch, ladyfish, comprising 14 percent of the total catch, and spotfin mojarra, comprising 13 percent of the total catch (Table 3.1.3.3-15). Spotfin mojarra was the most abundant fish caught in November 2007, scaled sardine was the most abundant in December 2007, and ladyfish dominated the catch in June 2008 and was co-dominate with bonnethead shark and longnose gar in August 2008.

Because the net soak times varied, CPUE per station was calculated as the number of individuals per day for comparison of abundance and composition between stations and sampling events. Station 3 had the highest total CPUE for all sampling events combined with 927 and the highest number of recorded species with 13 (Table 3.1.3.3-15). Station 2 was the next most productive with 11 different species and a total CPUE of 290. Stations 1 and 4 had fewer results. Station 4 had a total CPUE of 96 and 9 different species, and Station 1 had a total CPUE of 79 and 6 different species.

When examined on an event basis, December 2007 recorded the highest CPUE at 1,006, followed by November 2007 with a CPUE of 268, June 2008 with a CPUE of 74, and August 2008 with a CPUE of 43 fish per day (Tables 3.1.3.3-11 to 3.1.3.3-14). During the December 2007 event, the CPUE of scaled sardine was 689 and a CPUE of 125 was recorded for ladyfish. Spotfin mojarra dominated the November 2007 sampling event with a CPUE of 160. The second largest CPUE (34) for the November 2007 event was recorded for ladyfish. The two dominant species in June 2008 were ladyfish, with a CPUE of 24, and gafftopsail catfish, with a CPUE of 17. The two dominant species in August 2008 were bonnethead shark and longnose gar, both with CPUEs of 8.

Cast Net

Cast netting was conducted at various locations within a 1-mile segment at each station. Cast nets with 6-foot and 7-foot radius and with 5/8 inch and 1 inch mesh sizes were used, and nets were thrown a minimum of 40 times and a maximum of 50 times from a boat. Event 1 was conducted from October 29 to November 2, 2007, Event 2 in December 2007, Event 3 in May 2008, and Event 4 in August 2008.

A total of 993 individuals representing 39 different fish species were collected using cast nets. The most abundant species caught was gulf menhaden, with one significant catch of 225 individuals at Station 4 in August 2008, making up most of the total. Gulf menhaden comprised 25 percent of the total catch for all four events combined (Table 3.1.3.3-20). Spotfin mojarra was the most abundant fish in the October 2007 and December 2007 events and comprised 20 percent of the total catch for all events. Other relatively abundant species for all events were white mullet, with 10 percent of the catch, pinfish, with 9 percent of the catch, and striped mullet and scaled sardine, each with 7 percent of the catch. White mullet, pinfish, and striped mullet were the only species caught at every sampling event.

Because the number of casts per station varied, CPUE per station was calculated by number of individuals per 25 casts for comparison of abundance and composition between stations and sampling events. The highest total CPUE was 195 for the December 2007 sampling event followed by August 2008 (total CPUE of 177), October 2007 (total CPUE of 153), and May 2008 (total CPUE of 64) (Tables 3.1.3.3-16 to 3.1.3.3-19). Spotfin mojarra dominated the October 2007 and December 2007 events, with CPUEs of 32 and 81 respectively. During the October 2007 event, other common species were scaled sardine with a CPUE of 27, pinfish with a CPUE of 23, and mullet with a CPUE of 22. In December 2007, white mullet and striped mullet were also abundant, with respective CPUEs of 31 and 22. The May 2008 event results had three species with similar results: white mullet with a CPUE of 16, pinfish with a CPUE of 15, and striped mullet with a CPUE of 13. The CPUE for gulf menhaden in August 2008 was 144.

When comparing CPUE totals by station (Table 3.1.3.3-20), Station 4 had the highest total CPUE for all events combined with 247, followed by Station 3 with a CPUE of 152, Station 1 with a CPUE of 96, and Station 2 with a CPUE of 94. The number of different species caught did not correlate with CPUEs. Station 3 had the greatest number of different species with 22. Station 2 had 21 different species; Station 4 had 19 different species; and Station 1 had 14 different species.

Minnow Trap

Ten minnow traps (approximately 16 inches by 9 inches) were baited and deployed within a 1-mile segment at each station. Event 1 was conducted during October 2007 and November 2007. Event 2 was conducted in December 2007. Event 3 was conducted in May 2008 and June 2008, and Event 4 was conducted in August 2008.

A total of 188 individuals representing 10 fish species were collected using minnow traps. The most abundant species were silver perch, comprising 35 percent of the total catch, and spotfin mojarra, comprising 23 percent of the total catch (Table 3.1.3.3-25). Other relatively abundant species were a species of goby, comprising 13 percent of the total catch, and pinfish and naked goby, each comprising 9 percent of the total catch. Spotfin mojarra was dominant during the November 2007 and August 2008 events and co-dominant with a species of goby in December 2007. Silver perch dominated the May 2008 event, representing the most abundant species caught between October 2007 and September 2008.

Because the trap soak time varied, CPUE per station was calculated by number of individuals per day for comparison of abundance and composition between stations and sampling events. The May 2008 event had the highest CPUE with 10, followed by August 2008 with a CPUE of 5, October/November 2007 with a CPUE of 4, and December 2007 with a CPUE of 1 (Tables 3.1.3.3-21 to 3.1.3.3-24). The highest CPUE for an individual species was 6 for silver perch in May 2008. Spotfin mojarra dominated the August 2008 and October/November 2007 catches with CPUEs of 2.

When comparing CPUE totals by station (Table 3.1.3.3-25), Station 2 had the highest overall total for all sampling events with a CPUE of 9, followed by Station 1 with a CPUE of 5, and Stations 3 and 4 with CPUEs of 3. Similar to the cast net findings, the number of species collected did not necessarily correlate with abundance. Station 2 had the highest number of collected species at 8, followed by Station 4 with 7 different species, Station 3 with 6 species, and Station 1 with 3 species.

3.2 Crystal River Discharge

3.2.1 Physical Description

The CREC consists of five power generating plants (Units 1 through 5), each of which uses water drawn through an intake canal from the Gulf of Mexico to provide process cooling. Unit cooling water is then released into the CREC discharge canal, which flows back into the Gulf of Mexico. Construction at the CREC site began in 1964, with the offshore construction of the intake and discharge canals completed in 1966.

The CREC discharge canal extends west northwest from within the complex for approximately 1.6 miles to the point of discharge (POD) at the Gulf of Mexico shoreline. The discharges of Units 1, 2, and 3 enter the discharge canal near the eastern end. The combined discharge from Units 4 and 5 enters the discharge canal about 1,000 feet further downstream. The intake to the helper cooling towers, which operate to reduce discharge canal water temperature, is located about 1,200 feet downstream of the Units 4 and 5 discharge. Cooled water re-enters the canal over the next 1,600 feet.

Beginning at the POD, the canal extends an additional 1.2 miles into the Gulf of Mexico at a dredged depth of approximately 10 feet. The offshore dredged channel is bordered to the south by a spoil bank.

Sediments in the vicinity of the CREC Discharge: Total Organic Carbon and Particle Size

Sediment samples were collected at two stations in the vicinity of the CREC discharge (CREC Stations 3 and 4) during two sampling events (July 2008 and November 2008). TOC and particle size characteristics varied between the two sampling events. Sediment data for CREC sampling events are presented in Appendix B.

TOC was similar between the two CREC stations with an average TOC of 8,265 mg/kg (Table 3.2.1-1). CREC station sediments were predominantly sand, averaging 77.6 percent. CREC Station 3, located within the CREC discharge canal, had a higher gravel content (5.6 percent) and lower silt content (6.1 percent) in comparison to CREC Station 4 (gravel and silt content of 1.1 and 18.7 percent, respectively), which is located further offshore.

3.2.2 Water Quality

Field Parameters

Field parameters were collected twice from CREC Stations 1 and 2 and nine times from CREC Stations 3 and 4. Sampling occurred just below the surface at the CREC Stations 1 and 2 due to access to the station being limited to shoreline sampling. At CREC Stations 3 and 4, specific depth intervals of 0.15, 1.0, 2.0, 3.0, and 4.0 m were sampled if available. Water quality field parameter data for CREC sampling events are presented in Appendix B.

Salinity Profile

Salinity samples were collected at four stations in and within the vicinity of the CREC discharge canal (CREC Stations 1, 2, 3, and 4). CREC Stations 1 and 2 (downstream of the Units 4/5 Intake and Discharge points) were sampled during two events (September 2008 and November 2008), while CREC Stations 3 and 4 were sampled during four events (April, June, September, and November 2008).

Average salinity values collected at the CREC stations are presented in Figure 3.2.2-1. These data are shown in an upstream to downstream order, ranging from CREC Station 1 to CREC Station 4, which is located in the nearshore waters of the Gulf of Mexico west of the CREC Discharge Canal.

Salinity varied slightly among stations and available sample interval depths in the CREC. Average salinity variation between stations at all sample intervals was less than 3.3 pss. Salinity was lowest at CREC Station 4 at the surface (28.2 pss average), and highest at CREC Station 3 at 3.0 m (31.5 pss). Salinity slightly increased with increasing depth at CREC Stations 3 and 4.

Temperature Profile

Average temperature values collected at the CREC stations are presented in Figure 3.2.2-2. These data are shown in an upstream to downstream order.

Temperature generally decreased with increased distance west of the CREC discharge. The highest sample event temperature was recorded at the surface at CREC Station 1 (37.45°C), nearest the cooling water discharge, during the September 2008 sampling event. Surface sample interval temperature decreased to 30.41°C at Station 4 during the same sampling event. Lowest average temperatures were found at Station 4 at 2.0 m (24.83°C).

Dissolved Oxygen, pH, and Water Clarity

Average DO values at the CREC stations (CREC Stations 1, 2, 3, and 4) are illustrated in Figure 3.2.2-3. In addition, Table 3.2.2-1 summarizes the average results for DO, as well as pH and water clarity (i.e., Secchi depth) at each CREC station. Results were averaged for all available sample depths and all sample dates at each station. No water clarity measurements were taken at CREC Stations 1 and 2 because water quality field parameter data were collected from the canal shoreline.

In general, surface DO concentrations at the CREC decreased from Station 1 to Station 4. Average DO was highest at CREC Station 1 (6.28 mg/L) and decreased to 5.61 mg/L at CREC Station 4. Decreasing DO with depth generally occurred within individual sampling events at CREC Stations 3 and 4, with higher DO concentrations at the surface and lowest concentrations at the bottom.

The range of pH values was similar between CREC Stations (Table 3.2.2-1). Minimum and maximum pH values were both recorded at CREC Station 3 (7.45 and 8.10, respectively).

Water clarity slightly decreased between CREC Station 3 (0.85 m) and CREC Station 4 (0.76 m).

Analytical

Water quality analytical samples were collected at four stations in the CREC vicinity (CREC Stations 1, 2, 3, and 4) during two sampling events (September and November 2008). CREC

Stations 1 and 2 are located within the confined portion of the CREC Discharge Canal; CREC Station 3 is located just beyond the barrier at the end of the confined portion of the CREC Discharge Canal; and CREC Station 4 is located in the nearshore waters of the Gulf of Mexico west of the CREC Discharge Canal. Samples at CREC Stations 1 and 2 were collected just below the surface (0.15 m), and samples at CREC Stations 3 and 4 were collected at mid-depth. Analytical water quality data for CREC sampling events are presented in Appendix B.

Ammonia concentrations were consistent among all stations for both sampling events (Figure 3.2.2-4). Concentrations were below detection limits at each station during the September 2008 sampling event, and were at 0.15 mg/L at each station during the November 2008 sampling event.

Nitrate + nitrite concentrations were generally consistent among the four stations (Figure 3.2.2-5), with no significant spatial or temporal trends. Concentrations ranged from 0.038 mg/L at CREC Station 4 to 0.011 mg/L at CREC Station 1 (duplicate sample).

TKN concentrations were higher for all stations during the September 2008 sampling event compared to the November 2008 sampling event (Figure 3.2.2-6). The highest TKN concentration (1.70 mg/L) occurred at CREC Station 1 during the September 2008 sampling event, while the lowest occurred at CREC Station 1 during the November 2008 sampling event.

Total nitrogen was highest (1.71 mg/L) and lowest (0.17 mg/L) at CREC Station 1 during the September 2008 and November 2008 sampling events, respectively (Figure 3.2.2-7). Total nitrogen concentrations were higher at all stations in September 2008, with a slightly decreasing trend away from the CREC to the Gulf of Mexico.

Orthophosphate concentrations were highest at CREC Stations 1 and 2 (1.00 mg/L at both stations) during the November 2008 sampling event (Figure 3.2.2-8). All other sample values for each CREC station were below 0.03 mg/L for both sampling events.

Total phosphorus concentrations ranged from 0.10 at CREC Station 2 to 0.02 mg/L at CREC Station 4 (Figure 3.2.2-9). The results did not reflect any significant spatial or temporal total phosphorous trends.

Chlorophyll *a* concentrations at all CREC Stations were below 8.5 mg/m^3 (Figure 3.2.2-10). The greatest value was recorded at CREC Station 4 during the September 2008 sampling event. Concentrations were similar at Stations 1, 2, and 3 during the November 2008 sampling event, and were all greater than Station 4 (Figure 3.2.2-10).

TDS concentrations generally decreased from CREC Station 1 to CREC Station 4 (Appendix B). The highest TDS concentration was collected at CREC Station 1 (28,000 mg/L), with the lowest concentration collected at CREC Station 4 (20,000 mg/L). Since TDS reflects salt concentrations that may be elevated through cooling towers, this trend is not unexpected.

TSS concentrations ranged from 40 mg/L at CREC Stations 1, 3, and 4 (September 2008 sampling event) to 14 mg/L at CREC Station 4 (Figure 3.2.2-11). TSS concentrations generally decreased with distance away from the CREC Unit 4/5 Discharge during the November 2008 sampling event. This trend was not observed during the September 2008 sampling event.

3.2.3 Biological Characterization

Aquatic sampling was conducted from April 2008 to November 2008 to characterize the biological community at the CREC discharge. Sampling included the collection of benthic invertebrates, zooplankton, and fish using various sampling techniques. These data are summarized in the following subsections. Biological data for CREC sampling events are presented in Appendix B.

3.2.3.1 Benthic Invertebrates

Benthic Infauna

Benthic infauna samples were collected at Stations 3 and 4 in July and November 2008 using the methodology described in Section 2.

Station mean abundances were 12,041 ind/m^2 at Station 3 and 9,192 ind/m^2 at Station 4 (Table 3.2.3.1-1). A higher total density was collected during April at Station 3 (14,395 ind/m^2) as compared to the sampling in November (9,688 ind/m^2) (Table 3.2.3.1-2). The opposite was true at Station 4, with a higher total density in November (10,405 ind/m^2) than April (7,980 ind/m^2) primarily due to increased abundances of polychaetes and gastropods in November (Table 3.2.3.1-3).

The benthic infauna of the CREC discharge was comprised of polychaetes, oligochaetes bivalves, crustaceans, gastropods, and cnidarians (Table 3.2.3.1-1 and Figure 3.2.3.1-1). Polychaetes (Phylum Annelida) dominated the infauna, comprising 85 percent of the study mean total and approximately 40 percent of the species. Polychaetes dominated the benthic community at both stations during both events and accounted for 77 (Station 4) to 91 percent (Station 3) of the station means (Tables 3.2.3.1-2 and 3.2.3.1-3). Dominant polychaetes included *Mediomastus* sp., *Mediomastus californiensis*, *Fabricinuda trilobata*, *Monticellina dorsobranchialis*, and *Lumbrineris verrilli*. Oligochaetes ranked second, accounting for 3.3 percent of the mean abundance. Polychaete density generally decreased and oligochaete density increased with distance from the CREC discharge. Bivalves represented 3.2 percent of the overall mean abundance (Table 3.2.3.1-1). The most dominant bivalves were individuals identified to Family Tellinidae and *Nuculana acuta*. Amphipods were slightly more abundant at Station 3 than at Station 4. Mollusks (bivalves and gastropods) and decapods were more abundant at Station 4 outside the CREC discharge canal than in the CREC discharge canal (Station 3). Cniderians were collected at much higher densities at Station 3 than at Station 4.

Diversity statistics were calculated for major taxonomic groups (e.g., phylum, classes, orders, families) using the station means. Station 4, located farthest offshore, had the highest number of major taxonomic groups (17 taxa), diversity (H′ = 1.42), evenness (J′ = 0.35), and richness values (d1 = 1.75) (Table 3.2.3.1-4). The relatively low diversity indices from Station 3 resulted from the dominance of polychaetes (91 percent of the station mean density). Such high proportion of individuals from one taxonomic group has the effect of depressing diversity indices.

Motile Macroinvertebrates

Motile macroinvertebrates were collected using crab traps and trawls at Stations 3 and 4. A total of five baited crab traps were deployed within a half-mile radius of each station. A 6-foot otter trawl was pulled along the bottom at multiple locations within a half-mile radius of each station. Trawls were conducted for 5 minutes at a speed typically of 2 miles per hour or less.

Trawl

Trawling was conducted to assess demersal fish species near the bottom of the water column at multiple locations within a half-mile radius of each station. Event 1 was conducted in April 2008, Event 2 in June 2008, Event 3 in August, 2008, and Event 4 in November 2008.

A total of 72 individuals representing 21 invertebrate species were collected using trawls. Yellowline arrow crab, with a total CPUE of 7, represented 19 percent of the total catch (Table 3.2.3.1-5). Other relatively abundant species were pink shrimp, comprising 15 percent of the total catch, and mud crab, comprising 10 percent of the total. Those species had total CPUEs of 6 and 4, respectively.

Because the number of trawls per station varied, CPUE per station was calculated as the number of individuals per trawl for comparison of abundance and composition between station and sampling event (Tables 3.2.3.1-6 through 3.2.3.1-9). The largest total CPUE was 19 invertebrates per trawl in November 2008. The second largest CPUE was 8 in August 2008, followed by a CPUE of 6 in June 2008, and a CPUE of 5 in April 2008.

Station 4 had the higher total CPUE with 31 invertebrates per trawl, whereas Station 3 had a total CPUE of 6. Station 4 also had a higher number of species, with 20, compared to six different species at Station 3.

Crab Trap

Ten crab traps (approximately 16 inches by 9 inches) were baited and deployed within a half-mile radius of each station. Event 1 was conducted in April 2008, Event 2 in June 2008, Event 3 in September 2008, and Event 4 in November 2008.

A total of 66 Florida stone crabs, 16 blue crabs, and 2 crown conch (84 invertebrates total) were collected using crab traps. The Florida stone crab was 84 percent of the total catch, and blue crabs were 15 percent (Table 3.2.3.1-10). The total CPUE was 3 in September 2008 and 1 in June 2008, November 2008, and April 2008 (Table 3.2.3.1-11 through 3.2.3.1-14). Station 3 had the higher total CPUE with 4, whereas Station 4 had a total CPUE of 2. All three species were caught at Station 3 while Florida stone crab and blue crab were caught at Station 4.

3.2.3.2 Zooplankton

Zooplankton in the CREC was collected at Stations 3 and 4 during four sampling events (Table 2.1-3). Zooplankton are the heterotrophic component of the plankton community. The following subsections provide analyses of the mean abundance, averaged over the four sampling events, and spatial, temporal, and diurnal (day/night) differences in mean abundance and species composition. Components of the total zooplankton community discussed below include holoplankton, meroplankton, and ichthyoplankton.

Total Zooplankton

Total zooplankton mean abundance ranged from 20,132 ind/100m^3 (Station 3, night) to 89,743 ind/100m^3 (Station 4, day). Holoplankton represented about 32 percent, meroplankton about 67 percent, and ichthyoplankton comprised around 1 percent of the total zooplankton community. The taxonomic structure of zooplankton was characterized by the numerical dominance of Panopeidae (mud) crab larvae and copepods. These two taxa represented from 57 percent (Station 3, day) to 66 percent (Station 3, night) of the station mean zooplankton. Copepods, chaetognath worms, and mysids were collected throughout the study from most stations in day and night sampling and appear to be permanent components of a year-round resident holoplankton community. Meroplankton exhibited the year-round prevalence of invertebrate larvae, such as Panopeidae crabs, brachyuran crabs, Upogebiidae (mud) shrimps, caridean shrimps, and gastropods. Ichthyoplankton were present from all sampling stations and dates, representing 0.4 and 2.8 percent of the total zooplankton in day and night sampling, respectively.

Diversity statistics for total zooplankton were calculated for major taxonomic groups (e.g., classes, orders, families) using the day and night station means. Total zooplankton diversity, evenness, and richness were highest at Station 3 during the day but were highest at Station 4 during the night (Tables 3.2.3.2-1 and 3.2.3.2-2).

Holoplankton

Holoplankton generally increased with distance from the CREC discharge and ranged from 6,370 ind/100m^3 at Station 3 (night) to 23,734 ind/100m^3 at Station 4 (night) (Figure 3.2.3.2-1). Holoplankton abundance was highest in spring, followed by summer and fall (Figures 3.2.3.2-2 and 3.2.3.2-3).

Holoplankton represented between about 24 and 28 percent of the total zooplankton during the day and between about 32 and 49 percent of the total zooplankton during the night. Copepods were the most numerically dominant taxonomic component during the day and night sampling and represented 64 to 92 percent of the total holoplankton. Chaetognath worms were also abundant in both day and night samples, comprising 30 to 12 percent of the total holoplankton mean, respectively. Appendicularia were collected in low abundance during the day and mysids and Euphausids were abundant at night.

Meroplankton

Meroplankton generally increased with distance from the CREC discharge. The maximum variation of total meroplankton abundance ranged from 13,505 ind/100m^3 at Station 3 (night) to 68,087 ind/100m^3 at Station 4 (day) (Figure 3.2.3.2-4). Meroplankton abundance was highest in spring, followed by summer, and fall (Figures 3.2.3.2-2 and 3.2.3.2-3).

Meroplankton represented 71 to 76 percent of the total zooplankton during the day and 47 to 67 percent of the total zooplankton during the night. Panopeidae crab larvae were the most numerically dominant taxonomic component during the day and night sampling at both stations, representing 47 to 61 percent of the total meroplankton during the day and 39 to 56 percent of the mean total meroplankton at night (Figures 3.2.3.2-5 and 3.2.3.2-6). Other prominent taxonomic components of the meroplankton in terms of relative abundance were larvae of brachyuran crabs, Upogebiidae (mud) shrimps, caridean shrimps, and gastropods. Of the prominent meroplankton taxa, abundances were higher at Station 4, except Brachyurans, which were collected in higher abundances at Station 3.

Ichthyoplankton

Ichthyoplankton increased with distance from the CREC discharge. The maximum variation of total ichthyoplankton abundance ranged from 91 ind/100m^3 at Station 3 (day) to 1,638 ind/100m^3 at Station 4 (night) (Figure 3.2.3.2-7). Ichthyoplankton abundance was highest in spring, followed by summer and fall (Figures 3.2.3.2-2 and 3.2.3.2-3).

The mean abundance of fish eggs varied from 15 ind/100m^3 at Station 3 (day) to 1,224 ind/100m^3 at Station 4 (night). Engraulidae (anchovy) were the most numerically dominant eggs during the day and night sampling for both stations, accounting for 84 percent of the daytime egg mean and 94 percent of the nighttime egg mean (Figures 3.2.3.2-8 and 3.2.3.2-9). Engraulid eggs represented 59 percent of the total (day and night) ichthyoplankton mean. Egg complexes representing the families of Carangidae, Haemulidae, Merlucciidae, Paralichthyidae, Sciaenidae, and Serranidae were collected in low abundances at both stations during the day. Clupeidae (sardines and menhaden) eggs were collected in low abundances only at Station 3 during the day.

The mean abundance of fish larvae ranged from 76 ind/100m^3 at Station 3 (day) to 414 ind/100m^3 at Station 4 (night). Two families collectively accounted for 80 percent of the larvae study mean total: Gobiidae and Engraulidae. Gobiidae larvae represented 40 to 48 percent of the larvae mean total in day and night sampling, respectively. Engraulidae larvae was the second most abundant during both the day and night sampling, accounting for 44 and 31 percent of the total larvae mean, respectively. Larvae of Gobiidae and Engraulidae were collected during all of the sampling events, indicating that these are year-round resident populations with continuous reproduction in the near-shore Gulf of Mexico. Larvae of pelagic fishes, including that of Sciaenidae (croakers and drums), Clupeidae (sardines and menhadens), Atherinopsidae (neotropical silversides), and Gerreidae (mojarras) were also collected from both stations. Larvae of small demersal fishes, including representatives of Blenniidae and Achiridae, were common from both sampling stations.

Fish larvae were mostly collected as post larval stages. Post yolk-sac larvae represented 82 and 99 percent of the total fish larvae collected during the day and night, respectively. Members of the family Gobiidae were the most dominant post yolk-sac larvae during the day at Station 3 and night at Station 4 (Figures 3.2.3.2-8 and 3.2.3.2-9). A total of 6 species of gobies were collected as post yolk-sac larvae, including Green goby (*Microgobius thalassinus*), code goby (*Gobiosoma robustrum*), clown goby (*Microgobius gulosus*), naked goby (*Gobiosoma bosc*), frillfin goby (*Bathygobius soporator*), and darter goby (*Ctenogobius boleosoma*). Engraulidae post yolk-sac larvae, including bay anchovy (*Anchoa mitchilli*), were the most dominant during the night at Station 3 and during the day at Station 4. Yolk-sac larvae represented 19 and 1 percent of the total fish larvae collected in day and night, respectively. Engraulidae (anchovy) were the most dominant of the identifiable yolk-sac larvae during the day and night at all stations. The only other identifiable yolk-sac larvae taxa collected was Atherinopsidae (neotropical silversides) at Station 4 during the day.

Larvae of commercially or recreationally important fishes including silver perch (*Bairdiella chrysora*), red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), and southern kingfish (*Menticirrhus americanus*) were collected in low abundances as post yolk-sac larvae.

Diversity statistics for ichthyoplankton were calculated for the lowest practical identification level (i.e., family or species) using the day and night station means. Ichthyoplankton abundance and richness were higher farther offshore (Station 4), but diversity and evenness were highest in the CREC discharge canal (Station 3) (Tables 3.2.3.2-3 and 3.2.3.2-4). The lower diversity indices at Station 4 during the day and night resulted from the highest mean abundances strongly dominated by Engraulid eggs and larvae.

3.2.3.3 Fisheries

Adult and juvenile fish were collected using five different gear types at CREC Stations 3 and 4. Fisheries data were collected using beach seines, otter trawls, gill nets, cast nets, and minnow traps. A total of 1,290 fish representing 63 different species were collected at the two sampling stations during 4 events. Because the collection success of the different gear types can vary, fisheries data are presented by gear type and abundance is discussed as both number of individuals caught and on a CPUE basis. Individual catch records are presented in Appendix B, and summary tables present CPUE data by event and for the entire sampling period (April 2008 to November 2008).

Beach Seine

Shoreline fishes were sampled using a ¼-inch mesh, 50-foot seine with a 6- X 6- X 6-foot bag. Beach seine samples were collected only at CREC Station 3 due to the availability of shoreline. Event 1 was conducted in May 2008, Event 2 in July 2008, Event 3 in August and September 2008, and Event 4 in November 2008.

A total of 664 individuals representing 13 fish species were collected at CREC Station 3 using beach seines. Four of these species were killifishes (goldspotted, longnose, gulf, and marsh), two were mojarras (spotfin and tidewater), and two were needlefishes (redfin and Atlantic). Other species caught included tidewater silversides, sheepshead minnows, white mullet, leatherjacket, and halfbeaks. The killifishes accounted for about 60 percent of the total catch, and the mojarras counted for 18 percent (Table 3.2.3.3-5). The tidewater silversides and sheepshead minnows were also relatively abundant, at 13 and 6 percent respectively. The dominant species collected were typical inhabitants of coastal salt marshes.

CPUE per station was calculated by the number of individuals per beach seine haul for comparison of abundance and composition between station and sampling event (Tables 3.2.3.3-1 to 3.2.3.3-5). The total CPUE increased from 49 in May 2008 to 85 in July 2008, 91 in August 2008, and 104 in November 2008. No single species dominated the sampling events over the entire sampling year, but each event had one or two dominant species. In May 2008, the goldspotted killifish was the most abundant species caught, with a CPUE of 38. The longnose killifish (CPUE 37) and tidewater mojarra (CPUE 24) were the dominant species caught in July 2008, the tidewater silverside (CPUE 35) was the most abundant species caught in August 2008, and the goldspotted killifish (CPUE 96) was the most abundant species caught in November 2008.

Trawl

Trawling was conducted to assess demersal fish species near the bottom of the water column. Trawling was conducted at CREC Stations 3 and 4 within a half-mile radius of each station. Event 1 was conducted in April 2008, Event 2 in June 2008, Event 3 in August 2008, and Event 4 in November 2008.

A total of 391 individuals representing 20 fish species were collected using trawls. Silver perch, pinfish, and pigfish were the only species present in every sampling event, and silver perch and pinfish were consistently among the most abundant species sampled, except in

November 2008, which was dominated by spotfin mojarra (Table 3.2.3.3-10). Silver perch comprised 37 percent of the total catch for all four events combined, and pinfish comprised 17 percent of the total catch. Spotfin mojarra, although only present in two of the sampling events and only dominant in November 2008, comprised 25 percent of the total catch. Pigfish and Atlantic bumper comprised an additional 6 percent each.

Because the number of trawls per station varied, CPUE per station was calculated by number of individuals per trawl for comparison of abundance and composition between station and sampling events (Tables 3.2.3.3-6 to 3.2.3.3.-9). The highest total CPUE was 99 in August 2008. The next highest CPUE was in November 2008 at 48, followed by 34 in April 2008, and 17 in June 2008. Pinfish was the most abundant species caught in April 2008, with a CPUE of 21. Silver perch was the most abundant species caught in June 2008 and August 2008, with CPUEs of 8 and 59, respectively. The most abundant species caught in November 2008 was the spotfin mojarra, with a CPUE of 45.

Across all sampling events, Station 4 had a greater abundance of total species caught, as well as a greater variety of species in every event (Table 3.2.3.3-10). The total CPUE for all four events for Station 3 was 11, and for Station 4 was 187. The total CPUE at Station 3 declined from 6 during April 2008 to 3 in June 2008 and 2 in August 2008 and declined further to 0.5 in November 2008. The total CPUE at Station 4 showed no discernible trend, and was 97 in August 2008, 48 in November 2008, 28 in April 2008, and 15 in June 2008. Seven different species were caught at Station 3, while 16 different species were caught at Station 4.

Gill Net

Gill nets 75 feet long and 6 feet deep with varying mesh sizes were deployed within a half-mile radius of CREC Stations 3 and 4. Event 1 was conducted on May 2008, Event 2 in June 2008, Event 3 in August and again on September 2008, and Event 4 in November 2008.

A total of 107 individuals representing 24 fish species were collected using gill nets. Gill nets had a varied catch success between events. The most abundant species was yellowfin menhaden with 18 percent of the total catch for all four events combined, but that species was only caught in November 2008 (Table 3.2.3.3-15). Black drum was the next most abundant fish caught, with 12 percent of the total catch for all events. Other abundant species were Atlantic thread herring, pinfish, and spinner shark, with total approximate CPUEs of 10, 9, and 9, respectively.

Because the net soak times varied, CPUE per station was calculated by number of individuals per day for comparison of abundance and composition between station and sampling event (Tables 3.2.3.3-11 to 3.2.3.3-14). Total CPUE was relatively low in May 2008 at 20, no catch was obtained in June 2008, and total CPUE increased dramatically to 91 in August 2008 and 206 in November 2008. The most abundant species in May 2008 was hardhead catfish, with a CPUE of 7, and this species had 7 percent of the total catch for all events. The most abundant species in August 2008 was black drum with a CPUE of 33, and yellowfin menhaden was dominant in November 2008 with a CPUE of 58.

Station 4 had a total CPUE of 214 for all events, and Station 3 had a total CPUE of 104 (Table 3.2.3.3-15). The results for the first three events were comparable between the stations, but in November 2008 Station 4 had a much larger total CPUE than Station 3 (Tables 3.2.3.3-11 to

3.2.3.3-14). In November, total CPUE was 48 at Station 3 and 158 at Station 4. The difference was due mostly to the catch of yellowfin menhaden. Except in May, Station 4 consistently had a larger number of species than Station 3. A total of 23 different species were caught at Station 4, and nine different species were caught at Station 3.

Cast Net

Cast netting was conducted at various locations within a half-mile radius of CREC Stations 3 and 4. Cast nets with 6-foot and 7-foot radii and with 5/8 inch- and 1-inch mesh sizes were used, and nets were thrown a minimum of 40 times and a maximum of 50 times from a boat. Event 1 was conducted in April 2008, Event 2 in June 2008, Event 3 in August 2008, and Event 4 in November 2008.

A total of 87 individuals representing 18 fish species were collected using cast nets. White mullet and striped mullet were consistently the most abundant species caught. Striped mullet was caught during all events and accounted for 35 percent of the total catch (Table 3.2.3.3-20). White mullet were collected during all events except August 2008, and accounted for 24 percent of the total catch for all events.

Because the number of casts per station varied, CPUE per station was calculated by number of individuals per 25 casts for comparison of abundance and composition between station and sampling event (Tables 3.2.3.3-16 to 3.2.3.3-19). Total CPUE for each event was similar for the first three sampling events, with values of 12 in April 2008, June 2008, and August 2008. Total CPUE declined to 7 in November 2008. The most abundant species caught in April 2008 was white mullet with a CPUE of 7. The most abundant species caught in June 2008, August 2008, and November 2008 was striped mullet, with approximate CPUEs of 3, 6, and 2, respectively.

Station 3 CPUE totaled 26 for all four events and Station 4 had a total CPUE of 16 (Table 3.2.3.3-20). A total of nine different species were caught at Station 3, and 14 different species were caught at Station 4.

Mullet, which are readily observed at the surface, were more easily targeted by cast nets than other species. Other species caught by cast net with a CPUE of 2 or greater in any single event were Atlantic bumper, blue runner, and Atlantic silverstripe halfbeak (Tables 3.2.3.3-16 to 3.2.3.3-19).

Minnow Trap

Ten minnow traps (approximately 16 inches by 9 inches) were baited and deployed within a half-mile radius of CREC Stations 3 and 4. A total of 27 individuals representing eight fish species were collected using minnow traps. Event 1 was conducted in May 2008, Event 2 in June 2008, Event 3 in September 2008, and Event 4 in November 2008.

Few individuals and species were caught using minnow traps during the sampling events. Pinfish was the most common fish caught and was 39 percent of the total catch across all four events (Table 3.2.3.3-25). Pigfish was the second most abundant fish caught, with 23 percent of the total catch.

Because the trap soak time varied, CPUE per station was calculated by number of individuals per day for comparison of abundance and composition between station and sampling event (Tables 3.2.3.3-21 to 3.2.3.3-24). The highest total CPUE during all of the sampling events was 1 in May 2008 and June 2008, reflecting the consistently low number of individuals caught by this gear type. Species specific to the minnow trap sampling technique at CREC sampling stations were a species of goby, Florida blenny, and naked goby.

3.3 Old Withlacoochee River Segment

3.3.1 Physical Description

The OWR segment is a natural, meandering stream approximately 66- to 98-feet wide with deeper water at the outside bends of each meander and shallow waters on the inside bends. Flow and velocity are highly variable, with dry weather flows resulting in slowly flowing water and wet weather flows resulting in releases over the Inglis Dam causing strong flows. The bottom of the channel is periodically scoured by the higher flows, and the center of the channel is mostly scoured down to the bedrock. Sediment, mostly sand mixed with organic materials, lines the edges of the scoured channel. Submerged aquatic vegetation (SAV) was sparsely present on the margins of the stream channel in the upper portion of the OWR.

Total Organic Carbon and Particle Size

Sediment samples were collected at three stations (CFBC Stations 8, 9, and 10) in the OWR between the CFBC and Inglis Dam. CFBC Station 8 is located near the confluence of the OWR with the CFBC, CFBC Station 9 is located mid-way along the OWR, and CFBC Station 10 is located below the Inglis Dam (Figure 2-3). Physical sediment data were collected from these stations during a single sampling event (June/July, 2008). The presence of limestone near the sediment surface prevented replicate sample collection in the center of the channel at CFBC Station 9. TOC and particle size characteristics were variable among replicates at each station, covering a wide range of values. Sediment data for the OWR sampling event are presented in Appendix C.

TOC was comparable among the three stations with an average of 38,633 mg/kg (Table 3.3.1-1). Average TOC at the three OWR stations was somewhat lower than the three stations in the CFBC (CFBC Stations 1, 2, and 3). Particle size characteristics at CFBC Station 8 nearest the confluence of the OWR with the CFBC were similar to those of CFBC Stations 1, 2, and 3. Sand content at CFBC Station 8 was the lowest of the three OWR stations (38.9 percent) and had the highest silt content (42.6 percent). Sand content increased away from the confluence at CFBC Station 9 (61.3 percent) and at CFBC Station 10 (70.1 percent) as silt content generally decreased (14.6 and 22.7 percent, respectively).

3.3.2 Water Quality

Field parameters and analytical water quality samples were collected from three stations in the OWR (CFBC Stations 8, 9, and 10) during two sampling events (June 2008 and August 2008). The August 2008 event occurred shortly after Tropical Storm Faye passed through Central Florida resulting in the Inglis Damn spillway being opened to relieve floodwaters. Data collected and samples taken during the August 2008 event occurred while the OWR was above typical stage.

Field Parameters

Salinity Profile

Average salinity values collected at specific depth intervals of 0.15, 1.0, 2.0, and 3.0 m for the three OWR stations are illustrated in Figure 3.3.2-1. These data are presented in a downstream to upstream order, ranging from CFBC Station 8 near the confluence of OWR with the CFBC, to CFBC Station 10, which is located below the Inglis Dam. Salinity data for OWR sampling events are presented in Appendix C.

Salinity in the OWR was generally lower (Table 3.3.2-1) than the salinity measured in the CFBC (CFBC Stations 1, 2, 3, and 4). Freshwater conditions (0.15 pss average) existed at both CFBC Station 9 and CFBC Station 10 during the June event, with more saline conditions at CFBC Station 8 nearest the CFBC confluence (4 pss average). A salt wedge was present at the 2.0- and 3.0-m sample intervals during the June 2008 event at CFBC Station 8, with salinity ranging from about 10 to 12 pss. Freshwater conditions (0.16 pss) existed at all three OWR stations during the August 2008 event due to high volume releases from the Inglis Dam.

Temperature Profile

Vertical profiles of average water temperature at the three OWR stations (CFBC Stations 8, 9, and 10) show little variation with depth (Figure 3.3.2-2). Water temperature slightly decreased with increasing depth. Average temperature variation between stations was less than 1°C (Table 3.3.2-2). Average water temperature across all stations was highest during the June 2008 event. Temperature data for OWR sampling events are presented in Appendix C.

Dissolved Oxygen, pH, and Water Clarity

Average DO values at the OWR stations (CFBC Stations 8, 9, and 10) are illustrated in Figure 3.3.2-3. In addition, Table 3.3.2-3 summarizes the results for DO, as well as pH and water clarity (i.e., Secchi depth), at each OWR station. DO, pH, and water clarity data for OWR sampling events are presented in Appendix C.

DO varied little between stations but varied significantly between sampling event. Average DO ranged from a 4.13 mg/L at CFBC Station 8 in June 2008 to 8.86 mg/L at CFBC Station 8 in August 2008. Higher DO in August 2008 can be attributed to the high volume releases from the Inglis Dam. In general, DO concentrations were highest near the water surface and lowest at the bottom of the water column. Average DO was highest at CFBC Station 9. A low DO value of 1.93 mg/L was recorded at CFBC Station 8 during the June 2008 sampling event at the 2.0-m depth.

The pH results were similar along the OWR. Values generally decreased slightly with increasing depth, but little variation between stations (< 1.0 SU) was observed.

Water clarity generally increased with distance from the Inglis Dam. The highest water clarity occurred at CFBC Station 8 (1.52 m), with the lowest water clarity occurring at CFBC Station 10 (1.05 m).

Analytical

Water quality analytical samples were collected in the OWR at three stations (CFBC Stations 8, 9, and 10) during two sampling events (June and August, 2008). CFBC Station 8 is located near the confluence of OWR with the CFBC; CFBC Station 9 is located mid-way along the

OWR; and CFBC Station 10 is located below the Inglis Dam. All samples were collected at the mid-depth of each station.

Ammonia concentrations were generally similar at all OWR stations for both sampling events (Figure 3.3.2-4). Concentrations ranged from 0.07 mg/L at CFBC Station 8 during the June, 2008 sampling event to 0.022 mg/L at CFBC Station 10 during the August, 2008 sampling event.

Nitrate + nitrite concentrations were generally consistent among the three stations ranging from 0.027 to 0.032 mg/L (Figure 3.3.2-5) except at CFBC Station 10 during the August, 2008 sampling event (.0001 mg/L). Concentrations showed no trend downstream from the Inglis Damn among stations.

The highest TKN concentration (1.50 mg/L) occurred at CFBC Station 1 during the August, 2008 sampling event, while the lowest occurred at CFBC Station 9 during the June, 2008 sampling event (Figure 3.3.2-6). Highest concentrations on both sampling events occurred at Station 8. TKN concentrations at each station were higher in August 2008 than in June 2008.

Total nitrogen was highest (1.82 mg/L) at CFBC Station 8 and lowest (0.59 mg/L) at CFBC Station 9 during the August, 2008 and June, 2008 sampling events, respectively (Figure 3.3.2-7). Total nitrogen showed a decreasing trend downstream from the Inglis damn during both sampling events.

Total phosphorus concentrations were generally low at each of the OWR stations. Concentrations ranged from 0.029 mg/L at CFBC Station 10 to 0.013 mg/L at CFBC Station 8 (Figure 3.3.2-8). Concentrations showed no trend downstream from the Inglis Damn among stations.

Chlorophyll a concentrations measured in June 2008 and August 2008 ranged between 41.6 mg/m^3 at CFBC Station 10 and 27.9 mg/m^3 at CFBC Station 8 (Figure 3.3.2-9). Chlorophyll levels were higher during the June 2008 at all stations. Concentrations showed no trend downstream from the Inglis Damn among stations.

Overall mid-depth TDS values were low, ranging from a high at CFBC Station 8 (640 mg/L), to a low at CFBC Station 9 (100 mg/L) (Appendix C). The highest concentration was recorded at Station 8 during the June 2008 sampling event. TDS values showed no trend downstream from the Inglis Damn among stations.

TSS concentrations in OWR were low and did not exceeded 4 mg/L during the June 2008 and August 2008 sampling events (Figure 3.3.2-10). No spatial or temporal trends were noted for TSS at the OWR stations.

3.3.3 Biological Characterization

Aquatic sampling was conducted from May 2008 to July 2008 to characterize the biological community along the OWR. Sampling included the collection of benthic invertebrates and fish using various sampling techniques. These data are summarized in the following subsections. Biological data for the OWR sampling event are presented in Appendix C.

3.3.3.1 Benthic Invertebrate

Benthic invertebrate samples were collected using a Petite Ponar dredge and crab traps.

Benthic Infauna

One set of triplicate macroinvertebrate samples was collected at each of OWR Stations 8, 9, and 10 during June-July 2008.

The benthic infauna collected at the three stations included both marine and freshwater taxa (Table 3.3.3.1-1 and 3.3.3.1-2, Figure 3.3.3.1-1). Samples collected in the upper reach of the OWR at Station 10 were dominated by freshwater oligochaete worms and dipteran larvae and contained isopods and caddisflies (Trichoptera). Station 10 had the highest number of taxa (44) and density (25,158 ind/m^2). Oligochaete and dipteran worms accounted for 88 percent of the infauna collected at Station 10. Station 9 had few taxa (13) and the lowest density (3,028 ind/m^2), characteristics typical of areas with more variable salinity levels. Station 8, the station closest to the higher salinity waters of the CFBC, had a higher density (6,932 ind/m^2) than Station 9 due to relatively high numbers of a few euryhaline species of dipteran midges. Stations 8 and 9 both presented relatively high numbers of marine polychaete worms and bivalves.

The presence of certain taxonomic groups demonstrates the affect of salinity on the benthic infauna composition from OWR Station 8, upstream to Station 10 (Table 3.3.3.1-2). The freshwater amphipod (*Hyalella azteca*), the entire complex of freshwater oligochate worms, and the freshwater caddisfly (*Oectis inconspicua*) were only collected at Station 10 in the upper freshwater reaches of the OWR. The number of dipteran midge species groups collected at Station 10 far exceeded the number of species groups of dipterans collected at Stations 8 and 9. The false dark mussel (*Mytilopsis leucophaeata*), which typically inhabits more brackish water habitats, was collected at Stations 8 and 9, but not at Station 10.

Motile Invertebrates

Crab Traps

Crab trap efforts at the OWR Stations 8, 9, and 10 produced very few motile invertebrates. Only one blue crab was collected (from Station 10).

3.3.3.2 Fisheries

Adult and juvenile fish were collected using four different gear types at OWR Stations 8, 9, and 10. Fisheries data were collected using beach seines, gill nets, cast nets, and minnow traps during one event (May 2008 to June 2008). Because the collection success of the different gear types can vary, fisheries data are presented by gear type, and abundance is discussed as both number of individuals caught and on a CPUE basis. Individual catch records are presented in Appendix C, and summary tables present CPUE data for the entire sampling period (May 2008 to June 2008).

Across all fish sampling techniques, the fish collected in the upper reaches of the OWR near the Inglis Dam (Station 10) are known to prefer freshwater conditions and to be regularly collected in freshwater settings. The fish collected in the lower reaches of the OWR near its junction with the CFBC (Station 8) are known to be euryhaline and to be regularly collected in waters with higher salinities. The lower numbers of fish and number of fish species collected at the transition mid-reaches of the OWR (Station 9) reflect the variable nature of salinity levels in this stream reach.

Beach Seine

A total of 60 individuals representing 9 fish taxa were collected using beach seines. CPUE per station was calculated by the number of individuals per beach seine haul for comparison of abundance and composition between stations. Station 10 had the highest CPUE with 23 individuals, followed by Station 8 with 6 individuals (Table 3.3.3.2-1). Station 10 had the highest number of species (7). Only two fish were collected in the two beach seines conducted at Station 9, for a CPUE of 1. Seminole killifish was the most dominant taxa, accounting for 33 percent of the CPUE for all three stations. All 20 Seminole killifish were collected at Station 10. Largemouth bass were only collected at Stations 9 and 10 and comprised 30 percent of the total CPUE. The fish collected at Station 10 near the Inglis Dam (Seminole killifish, largemouth bass, inland silversides, an unidentified sunfish species [poor condition], mosquito fish, and sailfin molly) are known to prefer fresh water conditions. Only one largemouth bass was collected at the transition station (Station 9), and the fish collected in the lower OWR channel near the CFBC (inland silverside, mojarras, and pinfish) have been commonly collected in more saline waters in the CFBC and near shore Gulf waters.

Cast Net

A total of 19 individuals representing 11 fish taxa were collected using cast nets. CPUE per station was calculated by number of individuals per 25 casts for comparison of abundance and composition between stations. Station 8 had a total CPUE of 4 and six different species. Station 10 also had a total CPUE of 4 and five different fish species. Station 9 had a total CPUE of 2 and two different species. Bay anchovy and tidewater mojarra were the dominant species overall at OWR stations, each comprising 16 percent of the total catch. The fish collected using cast nets at Station 10 in the upper reaches of the OWR (catfish species, Florida gar, Seminole killifish, red ear sunfish, and sailfin armored catfish) are known to prefer freshwater conditions. Fish collected at Stations 8 and 9 (Bay anchovy, Tidewater mojarra, Sheepshead, Pinfish, and Scaled sardine) have been commonly collected in more saline waters in the CFBC and near shore Gulf.

Minnow Trap

A total of 104 individuals representing 5 fish species were collected using minnow traps. Since the trap soak time varied, CPUE per station was calculated by number of individuals per day for comparison of abundance and composition between stations. Station CPUE ranged from 0 to 10 individuals per day (Table 3.3.3.2-3). Station 10 had the highest CPUE (10) and number of species (3). Station 9 had the second highest CPUE with 0.4 individual, represented by 2 fish species. No fish were collected at Station 8 in minnow traps. The Bluefin killifish was the most dominant species, accounting for 93 percent of the total CPUE and collected only at Station 10. The fish collected using minnow traps at Station 10 (Bluefin killifish, Swamp darter, and sunfish species) are known to prefer freshwater conditions. The largemouth bass and redbreast sunfish collected at Station 9 are known to prefer freshwater conditions, possibly reflecting the variable salinity values at this transition station and with no fish collected in the minnow traps in the lower portion of the OWR.

4 Threatened and Endangered Species

The potential for federally and state-listed species to occur at the three sampled areas (CFBC, CREC discharge area, and the OWR remnant segment) was evaluated using published species lists, online database searches, and field observations. Aquatic habitats within the vicinity of the proposed project site were also evaluated with emphasis on natural communities known to support federally or state-listed species.

Most federally listed wildlife species are protected under the auspices of the U.S. Fish and Wildlife Service (USFWS). The Florida Fish and Wildlife Conservation Commission (FWC) maintains jurisdiction over most state-listed fish and wildlife species. In addition to regulatory agencies, the Florida Natural Areas Inventory (FNAI), with funds from the FDEP, maintains a database of information on federally and state-listed plant and animal species and their habitats. This database, supplemented by agency information, served as the basis for the list of protected species and habitats that potentially occur in the study area.

Eight federally listed threatened or endangered aquatic species were either directly observed or identified from the published listings as having the potential to occur in the vicinity of the project site (Table 4-1) (Florida Fish and Wildlife Conservation Commission, 2007). Nine State of Florida listed endangered, threatened, or species of special concern were either observed or identified as having the potential to occur in the vicinity of the project site. No federally or state-listed species that are currently proposed for listing were found to have the potential to occur within the project vicinity.

Of the federal and state endangered, threatened, or species of concern, West Indian manatee, American alligator, and sea turtles were observed in the project area (Tables 4-2 and 4-3). No Gulf sturgeon (*Acipenser oxyrinchus desotoi*) or smalltooth sawfish (*Pristis pectinata*) were collected or observed during the sampling period. Manatees were observed almost year round along the entire length of the CFBC and CREC discharge canal. Manatees were common in the CREC discharge near Station 3 in November 2008. Manatees were also observed in May 2008, June 2008, and July 2008 in the saline and freshwater reaches of the OWR segment. Alligator observations were limited to one occasion at night in the CFBC and OWR segments. Sea turtle observations were brief, with only a head visible above the water surface, so species could not be identified. These brief encounters occurred in September 2007, October 2007, and December 2007 at CFBC Station 7 in the Gulf of Mexico and in August 2008 and November 2008 in the CREC.

5 References

CH2M HILL. 2007. "COLA Aquatic Sampling Workplan for Levy County Site" Progress Energy Florida (338884-WKPL-003). Revision 0. September 5.

Florida Fish and Wildlife Conservation Commission. 2007. "Florida's Endangered Species, Threatened Species, and Species of Special Concern."

Mote Marine Laboratory. 1995. "1995 Summary Report for: Crystal River 3 Year NPDES Monitoring Project."

Table 2.1-1
Summary of Aquatic Ecology Sampling in the Cross Florida Barge Canal, Stations 1 through 7

Parameter	Methods	No. of Sampling Events	No. of Stations	No. Samples at Each Station	Total Samples
Water Quality, Field – Multiple Parameters	YSI multiprobe meter	5 to 37*	7	Sampled at 1 meter depth intervals; varies by station	159
Water Quality, Analytical – Multiple Parameters	Peristaltic pump and tubing	4 to 8*	7	1 to 3	181
Sediment Grain Size and TOC	Petite Ponar Grab	2 for Sta. 1,2,3,4 1 for Sta. 5,6,7	7	3	33
Benthic Infauna	Petite Ponar Grab	4 for Sta. 1,2,3,4 2 for Sta. 5,6,7	7	3	66
Shoreline Macroinvertebrates	Hand picking	2	3	2 replicate samples	12
Motile Megabenthic Invertebrates	Trawl	4	4	2 replicate trawls	32
	Crab Traps	4	4	1 set (5 traps)	16 sets (80 traps)
Zooplankton	330 micron mesh plankton net tows	14	4	2 duplicate tows (2 day and 2 night)	224
Adult Fish	Beach Seine	4	3	2 hauls	24
	Trawls	4	4	2 duplicate trawls	32
	Gill Net	4	4	1 set (3 net sizes)	16 sets (48 deployments)
	Cast Net	4	4	~40 (various net sizes)	~640
	Minnow Traps	4	4	1 set (10 traps)	16 sets (160 traps)
Threatened and Endangered Species Survey	Head Count	Continuous	N/A	1	N/A

* Varied depending on station

Table 2.1-2 (Sheet 1 of 4)
Sampling Dates per Parameter in the Cross Florida Barge Canal

	Station						
Parameter	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Water Quality, Field	10/16/07	10/16/07	10/16/07	10/16/07	10/16/07	10/16/07	10/16/07
	10/18/07	10/18/07	10/18/07	10/18/07	11/15/07	11/15/07	11/15/07
	10/19/07	10/19/07	10/19/07	10/19/07	11/19/07	11/19/07	11/19/07
	11/15/07	11/15/07	11/15/07	11/15/07	12/5/07	12/5/07	12/5/07
	11/19/07	11/19/07	11/19/07	11/19/07	12/12/07	12/12/07	12/12/07
	12/5/07	12/5/07	12/5/07	12/5/07			
	12/7/07	12/7/07	12/7/07	12/7/07			
	12/12/07	12/12/07	12/10/07	12/10/07			
	4/11/08	4/11/08	12/12/07	12/12/07			
	4/12/08	4/12/08	4/11/08	4/11/08			
	4/21/08	4/21/08	4/12/08	4/12/08			
	4/22/08	4/22/08	4/21/08	4/21/08			
	5/7/08	5/7/08	4/22/08	5/7/08			
	5/8/08	5/8/08	5/7/08	5/22/08			
	5/22/08	5/22/08	5/22/08	5/23/08			
	5/23/08	5/23/08	5/23/08	6/4/08			
	6/4/08	6/4/08	6/4/08				
	6/5/08	6/5/08	6/5/08				

Table 2.1-2 (Sheet 2 of 4)
Sampling Dates per Parameter in the Cross Florida Barge Canal

	Station						
Parameter	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Water Quality, Field (cont.)	6/20/08	6/20/08	6/20/08	6/20/08			
	6/25/08	6/25/08	6/21/08	6/21/08			
	7/21/08	7/21/08	6/25/08	6/25/08			
	7/22/08	7/22/08	7/21/08	7/21/08			
	8/6/08	8/6/08	7/22/08	7/22/08			
	8/7/08	8/7/08	8/6/08	8/6/08			
	8/27/08	8/27/08	8/7/08	8/7/08			
	9/3/08	9/3/08	8/27/08	8/27/08			
	9/4/08	9/4/08	9/3/08	9/3/08			
	9/15/08	9/15/08	9/4/08	9/4/08			
	10/23/08	10/16/08	9/15/08	9/15/08			
	10/28/08	10/23/08	10/16/08	10/23/08			
	10/29/08	10/28/08	10/23/08	10/28/08			
	11/13/08	11/13/08	10/28/08	11/13/08			
	11/14/08	11/14/08	11/13/08				

Table 2.1-2 (Sheet 3 of 4)
Sampling Dates per Parameter in the Cross Florida Barge Canal

	Station						
Parameter	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Water Quality, Analytical	10/16/07	10/16/07	10/16/07	10/16/07	10/16/07	10/16/07	10/16/07
	11/19/07	11/19/07	11/19/07	11/19/07	11/19/07	11/19/07	11/19/07
	12/5/07	12/5/07	12/5/07	12/5/07	12/5/07	12/5/07	12/5/07
	12/12/07	12/12/07	12/10/07	12/10/07	12/12/07	12/12/07	12/12/07
	6/25/07	6/25/07	12/12/07	12/12/07			
	8/27/08	8/27/08	6/25/07	6/25/07			
	10/23/08	10/23/08	8/27/08	8/27/08			
			10/23/08	10/23/08			
Grain Size and TOC	10/12/07	10/12/07	10/12/07	10/12/07	10/11/07	10/11/07	10/11/07
	6/19/08	6/19/08	6/19/08	6/20/08			
Benthic Infauna	10/12/07	10/12/07	10/12/07	10/12/07	10/11/07	10/11/07	10/11/07
	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07	12/6/07
	6/19/08	6/19/08	6/19/08	6/20/08	--	--	--
	10/31/08	10/31/08	10/31/08	10/31/08	--	--	--
Shoreline Macroinvertebrates	11/2/07	11/2/07	11/2/07	--	--	--	--
	12/11/07	12/11/07	12/11/07	--	--	--	--

Table 2.1-2 (Sheet 4 of 4)
Sampling Dates per Parameter in the Cross Florida Barge Canal

Parameter	Station 1	2	3	4	5	6	7
Motile Invertebrates	10/29 - 11/7/07	10/29 - 11/7/07	10/29 - 11/7/07	10/29 - 11/7/07	--	--	--
Beach seine Otter trawl	12/3 - 12/12/07	12/3 - 12/12/07	12/3 - 12/12/07	12/3 - 12/12/07	--	--	--
Gill net	5/12 - 6/19/08	8/25 - 9/5/08	8/25 - 9/5/08	8/25 - 9/5/08	--	--	--
Cast net Minnow trap	8/25 - 9/5/08	8/25 - 9/5/08	8/25 - 9/5/08	8/25 - 9/5/08	--	--	--
Zooplankton	10/18/07	10/18/07	10/18/07	10/18/07	--	--	--
	12/7/07	12/7/07	12/7/07	12/7/07	--	--	--
	4/11/08	4/11/08	4/11/08	4/11/08	--	--	--
	4/21/08	4/21/08	4/21/08	4/21/08	--	--	--
	5/7/08	5/7/08	5/7/08	5/7/08	--	--	--
	5/22/08	5/22/08	5/22/08	5/22/08	--	--	--
	6/4/08	6/4/08	6/4/08	6/4/08	--	--	--
	6/20/08	6/20/08	6/20/08	6/20/08	--	--	--
	7/21/08	7/21/08	7/21/08	7/21/08	--	--	--
	8/6/08	8/6/08	8/6/08	8/6/08	--	--	--
	9/3/08	9/3/08	9/3/08	9/3/08	--	--	--
	9/15/08	9/15/08	9/15/08	9/15/08	--	--	--
	10/28/08	10/28/08	10/28/08	10/28/08	--	--	--
	11/13/08	11/13/08	11/13/08	11/13/08	--	--	--

Table 2.1-3
Summary of Aquatic Ecology Sampling in the Crystal River Energy Complex, Stations CREC1 through 4

Parameter	Methods	No. of Sampling Events	No. of Stations	No. Samples at Each Station	Total Samples
Water Quality, Field – Multiple Parameters	YSI multiprobe meter	2 for Sta. CREC 1,2 9 for Sta. CREC 3,4	4	Sampled at 1 meter depth intervals; varies by station	22
Water Quality, Analytical – Multiple Parameters	Peristaltic pump and tubing	2	4	1	8
Sediment Grain Size and TOC	Petite Ponar Grab	2	2	3	12
Benthic Infauna	Petite Ponar Grab	2	2	3	12
Motile Megabenthic Invertebrates	Trawl	4	2	2 replicate trawls	16
	Crab Traps	4	2	1 set (5 traps)	8 sets (40 traps)
Zooplankton	330 micron mesh plankton net tows	4	2	2 duplicate tows (2 day and 2 night)	32
Adult Fish	Beach Seine	4	1	2 hauls	8
	Trawls	4	2	2 duplicate trawls	16
	Gill Net	4	2	1 set (3 net sizes)	8 sets (24 deployments)
	Cast Net	4	2	~40 (various net sizes)	~320
	Minnow Traps	4	2	1 set (10 traps)	8 sets (80 traps)
Threatened and Endangered Species Survey	Head Count	Continuous	N/A	1	N/A

Table 2.1-4
Sampling Dates per Parameter in the Crystal River Energy Complex Discharge

	Station			
Parameter	**1**	**2**	**3**	**4**
Water Quality, Field	9/2/08	9/2/08	4/22/08	4/22/08
	11/17/08	11/17/08	6/19/08	6/19/08
			9/2/08	9/2/08
			9/3/08	9/3/08
			11/13/08	9/4/08
				11/13/08
Water Quality, Analytical	9/2/08	9/2/08	9/2/08	9/2/08
	11/17/08	11/17/08	11/17/08	11/17/08
Grain Size and TOC			7/22/08	7/22/08
			11/14/08	11/13/08
Benthic Infauna			7/22/08	7/22/08
			11/14/08	11/13/08
Motile Invertebrates Beach seine Otter trawl Gill net Cast net Minnow trap			4/17 - 5/2/08 6/10 - 6/13/08 8/28 - 9/5/08 11/10 - 11/14/08	4/17 - 5/2/08 6/10 - 6/13/08 8/28 - 9/5/08 11/10 - 11/14/08
Icthyo- and meroplankton [h]			4/22/08 6/19/08 9/3/08 11/13/08	4/22/08 6/19/08 9/3/08 11/13/08

Table 2.1-5
Summary of Aquatic Ecology Sampling in the Old Withlacoochee River, Stations 8, 9, and 10

Parameter	Methods	No. of Sampling Events	No. of Stations	No. Samples at Each Station	Total Samples
Water Quality, Field – Multiple Parameters	YSI multiprobe meter	2 for Sta. 9 4 for Sta. 8 and 10	3	Sampled at 1 meter depth intervals; varies by station	10
Water Quality, Analytical – Multiple Parameters	Peristaltic pump and tubing	2	3	1	6
Sediment Grain Size and TOC	Petite Ponar Grab	1	3	3	9
Benthic Infauna	Petite Ponar Grab	1	3	3 at Sta 8 2 at Sta 9 and 10	7
Motile Megabenthic Invertebrates	Crab Traps	1	3	1 set (5 traps)	3 sets (15 traps)
Adult Fish	Beach Seine	1	3	2 hauls	6
	Gill Net	1	3	1 set (3 net sizes)	3 sets (9 deployments)
	Cast Net	1	3	~40 (various net sizes)	~120
	Minnow Traps	1	3	1 set (10 traps)	3 sets (30 traps)
Threatened and Endangered Species Survey	Head Count	Continuous	N/A	1	N/A

Table 2.1-6
Sampling Dates per Parameter in the Old Withlacoochee River Segment

	Station		
Parameter	**8**	**9**	**10**
Water Quality, Field	6/4/08 6/25/08 8/27/08	6/25/08 8/27/08	6/4/08 6/25/08 8/27/08
Water Quality, Analytical	6/25/08 8/27/08	6/25/08 8/27/08	6/25/08 8/27/08
Grain Size and TOC	7/9/08	6/20/08	6/20/08
Benthic Infauna	7/9/08	6/20/08	6/20/08
Motile Invertebrates Beach seine Gill net Cast net Minnow trap	5/27 - 6/20/08	5/27 - 6/20/08	5/27 - 6/20/08

Table 3.1.2-1
Summary of Sediment Characteristics in the CFBC and Nearshore Gulf of Mexico

Station	Description	TOC (mg/kg) [Range]	Particle Size (percent) [Range]			
			Gravel	Sand	Silt	Clay
CFBC 1	0.5 mi. west of Inglis Lock in CFBC	60,714 [51,000 - 70,000]	0.0 [0.0 - 0.1]	26.9 [17.9 - 45.5]	49.2 [35.0 - 59.7]	23.8 [11.1 - 35.0]
CFBC 2	3.5 mi. west of Inglis Lock in CFBC	48,714 [39,000 - 64,000]	0.2 [0.0 - 1.2]	6.5 [0.6 - 16.5]	60.7 [51.3 - 71.9]	32.7 [16.3 - 47.1]
CFBC 3	7.0 mi. west of Inglis Lock in CFBC	45,286 [35,000 - 59,000]	0.1 [0.0 - 0.6]	17.8 [4.8 - 26.2]	53.0 [42.6 - 62.9]	29.2 [16.6 - 45.6]
CFBC 4	0.5 mi. west of CFBC mouth	7,417 [1,700 - 18,000]	1.3 [0.0 - 3.0]	86.4 [73.9 - 93.2]	5.2 [1.3 - 11.5]	7.2 [1.6 - 11.7]
CFBC 5	3 mi. west of CFBC mouth	3,575 [3,100 - 4,800]	12.3 [3.3 - 19.2]	82.6 [76.3 - 91.2]	1.7 [1.4 - 2.0]	3.4 [2.8 - 4.1]
CFBC 6	5 mi. west of CFBC mouth	4,567 [3,700 - 5,500]	2.2 [0.1 - 6.1]	90.8 [89.2 - 92.1]	2.9 [2.2 - 4.3]	4.1 [2.5 - 5.6]
CFBC 7	7 mi. west of CFBC mouth	4,533 [3,700 - 5,400]	19.6 [5.9 - 43.7]	75.9 [51.9 - 89.7]	1.9 [1.4 - 2.4]	2.6 [2.0 - 3.0]

Notes:

All results are an average of three station replicates as well as TOC field duplicates during two sampling events at Stations 1, 2, 3, and 4 and one sampling event at Stations 5, 6, and 7.

Particle size distribution for each station may not equal 100 percent due to rounding.

CFBC = Cross Florida Barge Canal
mg/kg = milligram per kilogram
mi. = mile

TOC = Total Organic Carbon

Table 3.1.2-2
Summary of Average Temperature Data in the CFBC and Nearshore Gulf of Mexico During Three Individual Sampling Events

Date	10/16/2007					11/15/2007					12/12/2007				
Depth (m)	**0.15**	**1.0**	**2.0**	**3.0**	**4.0**	**0.15**	**1.0**	**2.0**	**3.0**	**4.0**	**0.15**	**1.0**	**2.0**	**3.0**	**4.0**
Average CFBC Station Temp. (°C)	26.70	26.33	25.66	25.48	25.41	21.50	21.12	20.27	19.73	19.68	21.72	21.28	20.98	20.92	20.88
Average Nearshore Gulf of Mexico Station Temp. (°C)	25.22	25.18	25.04	25.14	25.18	19.44	19.19	19.09	18.95	18.96	21.00	20.75	20.60	20.43	20.42

Notes:

°C = degrees Celsius
CFBC = Cross Florida Barge Canal
m = meter

Table 3.1.2-3
Summary of Dissolved Oxygen, pH, and Water Clarity Data in the CFBC and Nearshore Gulf of Mexico

Station ID	Description	Average DO (mg/L) [Range]	pH Range (SU)	Average Secchi depth (m) [Range]
CFBC 1	0.5 mi. west of Inglis Lock	5.15 [0.21 - 13.04]	6.63 - 8.63	1.29 [0.94 - 1.60]
CFBC 2	3.5 mi. west of Inglis Lock	5.82 [0.42 - 11.71]	7.04 - 8.88	1.28 [0.47 - 1.94]
CFBC 3	7.0 mi. west of Inglis Lock	5.79 [1.09 - 9.04]	7.12 - 8.35	1.30 [0.92 - 1.63]
CFBC 4	0.5 mi. west of CFBC mouth	6.11 [3.46 - 11.98]	7.20 - 8.43	1.32 [0.83 - 1.68]
CFBC 5	3 mi. west of CFBC mouth	6.61 [4.10 - 9.00]	7.98 - 8.12	1.81 [1.26 - 2.67]
CFBC 6	5 mi. west of CFBC mouth	6.81 [4.20 - 8.90]	7.96 - 8.50	2.01 [1.49 - 2.68]
CFBC 7	7 mi. west of CFBC mouth	6.57 [4.39 - 8.02]	7.86 - 8.46	2.13 [1.49 - 2.73]

Notes:

CFBC = Cross Florida Barge Canal
m = meter
mi. = mile
mg/L = milligram per liter
SU = standard unit

Table 3.1.3.1-1
CFBC Benthic Infauna Study Mean Density and Composition per Station

	Mean Abundance (Number of Individuals per m^2)								
Major Taxon	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Mean Total	Percent Composition
Polychaeta	43	13,455	5,134	6,336	10,506	3,954	6,666	46,095	74.7
Amphipoda	0	380	18	657	2,598	603	502	4,758	7.7
Oligochaeta	0	7	1,353	671	65	330	309	2,734	4.4
Bivalvia	0	43	50	377	352	294	581	1,697	2.8
Cnidaria	0	4	7	32	50	7	1,349	1,450	2.3
Decapoda	4	43	83	68	388	165	215	965	1.6
Cumacea	0	47	416	97	43	136	50	789	1.3
Gastropoda	7	36	22	176	158	29	230	657	1.1
Nemertea	0	0	50	129	158	86	215	639	1.0
Isopoda	0	0	0	14	237	36	316	603	1.0
Phoronida	0	0	0	301	0	0	0	301	0.5
Echinodermata	0	0	14	79	57	57	86	294	0.5
Tanaidacea	0	0	0	65	136	7	65	273	0.4
Sipuncula	0	0	0	11	14	14	57	97	0.2
Polyplacophora	0	0	0	0	50	0	22	72	0.1
Mysida	0	0	7	22	0	7	14	50	0.1
Chaetognatha	0	0	0	0	7	14	22	43	0.1
Porifera	0	0	0	0	14	7	14	36	0.1
Platyhelminthes	0	0	0	25	7	0	0	32	0.1
Aplacophora	0	0	0	22	0	0	7	29	<0.1
Cephalochordata	0	0	0	0	0	22	7	29	<0.1
Brachiopoda	0	0	0	0	7	14	0	22	<0.1
Annelida	0	0	0	0	0	7	0	7	<0.1
Arachnida	0	0	0	0	0	0	7	7	<0.1
Sessilia	0	0	0	7	0	0	0	7	<0.1
Diptera	0	0	0	4	0	0	0	4	<0.1
Total	**54**	**14,015**	**7,154**	**9,092**	**14,847**	**5,791**	**10,735**	**61,688**	**100**

Table 3.1.3.1-2
CFBC Benthic ANOVA Results

Effect	Rank Transformed Results
Main Effects Only	
Station	0.0185
Event	0.0079
Interaction Effects Included	
Station	0.0068
Event	0.0082
Station*Event	0.6309

Note

Nonsignificant cases are shaded gray

Table 3.1.3.1-3
CFBC Tukey Groupings for Benthic Infauna Densities

Effect	Group	Rank Transformed Results
Station	1	B
	2	A
	3	AB
	4	AB
	5	AB
	6	AB
	7	AB
Event	1	B
	2	B
	3	B
	4	A

Table 3.1.3.1-4
Abundance and Diversity Statistics of Major Benthic Infauna Taxonomic Groups in the CFBC

Statistic	Station						
	1	2	3	4	5	6	7
Major Taxa	3	8	11	19	18	19	20
Mean Abundance (ind/m2)	54	14,015	7,154	9,092	14,847	5,791	10,735
Shannon Diversity (H'log2)	0.91	0.31	1.30	1.83	1.54	1.84	2.14
Pielou's Evenness J'	0.57	0.10	0.37	0.43	0.37	0.43	0.49
Margalef's Richness (d1)	0.50	0.73	1.13	1.97	1.77	2.08	2.05

Table 3.1.3.1-5 (Sheet 1 of 2)
CFBC Motile Invertebrate Organisms per Station for the Shoreline Handpicked Samples

Phylum	Subphylum	Class	Order	Family	Organism Name	01D	01E	02D	02E	03D	03E	Comments
Annelida		Polychaeta		Capitellidae	Capitella capitata						X	
Annelida		Polychaeta		Capitellidae	Mediomastus sp.					X		
Annelida		Polychaeta	Aciculata	Nereididae	Laeonereis culveri		X	X				
Annelida		Polychaeta	Aciculata	Nereididae	Neanthes succinea	X	X	X		X	X	
Annelida		Polychaeta	Aciculata	Nereididae	Platynereis dumerilii	X	X					
Annelida		Polychaeta	Aciculata	Phyllodocidae	Phyllodoce sp.				X	X	X	
Annelida		Polychaeta	Canalipalpata	Sebellidae	Sabellidae (Ipil)		X					
Annelida		Polychaeta	Canalipalpata	Spionidae	Boccardiella sp.		X		X	X		
Annelida		Polychaeta	Canalipalpata	Spionidae	Dipolydora socialis					X		
Annelida		Polychaeta	Canalipalpata	Spionidae	Dipolydora sp.						X	
Annelida		Polychaeta	Canalipalpata	Spionidae	Dipolydora sp. A					X		
Annelida		Polychaeta	Canalipalpata	Spionidae	Streblospio sp.		X			X	X	
Annelida		Oligochaeta	Haplotaxida	Tubificidae	Paranais litoralis	X						
Annelida		Oligochaeta	Haplotaxida	Tubificidae	Monopylephorus rubroniveus			X	X		X	
Annelida		Oligochaeta	Haplotaxida	Tubificidae	Tubificidae (Ipil)		X			X		Abundant at 01E.
Arthropoda	Crustacea	Malacostraca	Isopoda	Sphaeromatidae	Cassidinidea ovalis	X	X		X			
Arthropoda	Crustacea	Malacostraca	Isopoda	Cirolanidae	Cirolana parva	X	X	X	X			Abundant at 01D.
Arthropoda	Crustacea	Malacostraca	Isopoda	Ligiidae	Ligia exotica						X	
Arthropoda	Crustacea	Malacostraca	Amphipoda	Talitridae	Talitridae (Ipil)		X		X			
Arthropoda	Crustacea	Malacostraca	Amphipoda	Corophiidae	Apocorophium louisianum	X	X		X			
Arthropoda	Crustacea	Malacostraca	Amphipoda	Melitidae	Melita sp.				X	X	X	Abundant at 03D.
Arthropoda	Crustacea	Malacostraca	Decapoda	Sesarmidae	Armases cinereum	X	X	X	X	X		
Arthropoda	Crustacea	Malacostraca	Decapoda	Xanthidae	Panopeus herbstii			X	X	X	X	Abundant at 02E, 03D, 03E.
Arthropoda	Crustacea	Malacostraca	Decapoda	Xanthidae	Panopeus obesa					X	X	
Arthropoda	Crustacea	Malacostraca	Decapoda	Porcellanidae	Petrolisthes armatus					X	X	Abundant at 03D.
Arthropoda	Crustacea	Malacostraca	Decapoda	Grapsidae	Sesarma reticulatum			X				
Arthropoda	Crustacea	Malacostraca	Decapoda	Ocypodidae	Uca sp.		X	X	X	X	X	

Table 3.1.3.1-5 (Sheet 2 of 2)
CFBC Motile Invertebrate Organisms per Station for the Shoreline Handpicked Samples

Phylum	Subphylum	Class	Order	Family	Organism Name	01D	01E	02D	02E	03D	03E	Comments
Arthropoda	Crustacea	Malacostraca	Decapoda	Xanthidae	Rhithropanopeus harrisii	X	X	X	X	X	X	
Arthropoda	Crustacea	Malacostraca	Decapoda	Tanaidacea	Apseudomorpha (Ipil)					X		
Arthropoda	Crustacea	Malacostraca	Decapoda	Tanaidacea	Leptocheliidae (Ipil)				X	X		
Arthropoda	Crustacea	Malacostraca	Sessilia		Balanus sp.			X	X	X	X	Abundant at 02E, 03D, 03E.
Arthropoda	Crustacea	Malacostraca	Sessilia		Chthamalus fragilis	X	X	X	X	X	X	Abundant at 01D, 02E; Dominant at 01E.
Arthropoda	Chelicerata	Arachnida	Oribatida		Oribatida (Ipil)		X					
Arthropoda		Insecta	Diptera	Chironomidae	Clunio sp.					X		
Arthropoda		Insecta	Diptera	Chironomidae	Dicrotendipes lobus	X	X	X	X			Abundant at 01E, 02E.
Arthropoda		Insecta	Collembola	Hypogastruridae	Anurida maritima	X	X		X			
Mollusca		Gastropoda	Neotaenioglossa	Hydrobiidae	Hydrobiidae (Ipil)		X					
Mollusca		Gastropoda	Neotaenioglossa	Thiaridae	Melanoides turricula		X					
Mollusca		Gastropoda	Neritopsina	Neritidae	Neritina usnea	X	X	X	X			Abundant at 02D, 02E.
Mollusca		Bivalvia	Ostreoida	Anomiidae	Anomia simplex					X		
Mollusca		Bivalvia	Mytiloida	Mytilidae	Brachidontes exustus	X	X	X	X	X	X	Abundant at 02D.
Mollusca		Bivalvia	Veneroida	Crassatellidae	Crassinella sp.			X				
Mollusca		Bivalvia	Ostreoida	Ostreidae	Crassostrea virginica					X	X	
Mollusca		Bivalvia	Mytiloida	Mytilidae	Geukensia demissa				X			
Mollusca		Bivalvia	Mytiloida	Mytilidae	Ischadium recurvum				X	X	X	Abundant at 03D.
Mollusca		Bivalvia	Veneroida	Dreissenidae	Mytilopsis leucophaeata	X	X	X	X	X		Dominant at 01D, 01E; Abundant at 02D, 02E.
Mollusca		Bivalvia	Myoida	Myidae	Sphenia antillensis					X		

Notes:

"D" and E" = replicate station samples
Abundant = more than 10
Dominant = more than 100

Table 3.1.3.1-6
Motile Invertebrate Trawl CPUE Spatial and Temporal Variation in the CFBC

Common Name	Station 2				Station 3				Station 4				CPUE Total	Percent Composition
	10/31/07	12/4/07	5/14/08	8/25/08	10/31/07	12/4/07	5/14/08	8/25/08	10/31/07	12/4/07	5/14/08	8/25/08		
Blue Crab	1.0	1.0	2.5				4.0						8.5	29.5
Atlantic Brief Squid					0.5	4.0		0.5					5.0	17.4
Pink shrimp	1.0		0.5			0.5	2.0				0.3	0.5	4.8	16.7
Mud crab			1.0									3.5	4.5	15.6
Long-clawed Hermit Crab										2.0			2.0	6.9
Jellyfish			1.5										1.5	5.2
Decorator Crab									1.0				1.0	3.5
Flat-clawed Hermit Crab										0.5			0.5	1.7
Hermit Crab - No Common Name										0.5			0.5	1.7
Ragged Sea Hare										0.5			0.5	1.7
Total CPUE	**2.0**	**1.0**	**5.5**	**0.0**	**0.5**	**4.5**	**6.0**	**0.5**	**1.0**	**3.5**	**0.3**	**4.0**	**28.8**	**100.0**

Table 3.1.3.1-7
Motile Invertebrate Trawl CPUE for CFBC Event 1 (10/31/2007 – 11/1/2007)

Common Name	Species Name	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Atlantic Brief Squid	*Lolliguncula brevis*		0.5		0.5	14.3
Blue Crab	*Callinectes sapidus*	1.0			1.0	28.6
Pink shrimp	*Farfantepenaeus duorarum*	1.0			1.0	28.6
Decorator Crab	*Stenocionops furcata*			1.0	1.0	28.6
Total		**2.0**	**0.5**	**1.0**	**3.5**	**100.0**

Table 3.1.3.1-8
Motile Invertebrate Trawl CPUE for CFBC Event 2 (12/4/2007 – 12/11/2007)

Common Name	Species Name	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Atlantic Brief Squid	*Lolliguncula brevis*		4.0		4.0	44.4
Long-clawed Hermit Crab	*Pagurus longicarpus*			2.0	2.0	22.2
Blue Crab	*Callinectes sapidus*	1.0			1.0	11.1
Pink shrimp	*Farfantepenaeus duorarum*		0.5		0.5	5.6
Flat-clawed Hermit Crab	*Pagurus pollicaris*			0.5	0.5	5.6
No Common Name	*Pagurus annulipes*			0.5	0.5	5.6
Ragged Sea Hare	*Bursatella leachii*			0.5	0.5	5.6
Total		**1.0**	**4.5**	**3.5**	**9.0**	**100.0**

Table 3.1.3.1-9
Motile Invertebrate Trawl CPUE for CFBC Event 3 (5/14/2008 – 5/15/2008)

Common Name	Species Name	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Blue Crab	*Callinectes sapidus*	2.5	4.0		6.5	54.9
Pink shrimp	*Farfantepenaeus duorarum*	0.5	2.0	0.3	2.8	23.9
Jellyfish	*Cyaneidae*	1.5			1.5	12.7
Mud crab	*Panopeidae*	1.0			1.0	8.5
Total		**5.5**	**6.0**	**0.3**	**11.8**	**100.0**

Table 3.1.3.1-10
Motile Invertebrate Trawl CPUE for CFBC Event 4 (8/25/2008 – 8/26/2008)

Common Name	Species Name	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Mud crab	*Panopeidae*			3.5	3.5	77.8
Atlantic brief squid	*Lolliguncula brevis*		0.5		0.5	11.1
Pink shrimp	*Farfantepenaeus duorarum*			0.5	0.5	11.1
Total		**0.0**	**0.5**	**4.0**	**4.5**	**100.0**

Table 3.1.3.1-11
Motile Invertebrate Crab Trap CPUE Spatial and Temporal Variation in the CFBC

Common Name	Station 1				Station 2				Station 3				Station 4				CPUE Total	Percent Composition
	11/1/07	12/8/07	5/15/08	8/29/08	11/1/07	12/8/07	5/15/08	8/29/08	11/1/07	12/8/07	5/15/08	8/29/08	11/1/07	12/8/07	5/15/08	8/29/08		
Blue Crab				0.1	1.1	1.1	0.5	0.6	1.3	1.3	1.1	1.2	0.3	0.3	0.2	0.05	9.2	100.0
Total	**0**	**0**	**0**	**0.1**	**1.1**	**1.1**	**0.5**	**0.6**	**1.3**	**1.3**	**1.1**	**1.2**	**0.3**	**0.3**	**0.2**	**0.05**	**9.2**	**100.0**

Table 3.1.3.1-12
Motile Invertebrate Crab Trap CPUE for CFBC Event 1 (10/31/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Blue Crab	*Callinectes sapidus*		1.1	1.3	0.3	2.7	100.0
Total		**0.0**	**1.1**	**1.3**	**0.3**	**2.7**	**100.0**

Table 3.1.3.1-13
Motile Invertebrate Crab Trap CPUE for CFBC Event 2 (12/7/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Blue Crab	*Callinectes sapidus*		1.1	1.3	0.3	2.7	100.0
Total		**0.0**	**1.1**	**1.3**	**0.3**	**2.7**	**100.0**

Table 3.1.3.1-14
Motile Invertebrate Crab Trap CPUE for CFBC Event 3 (5/15/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Blue Crab	*Callinectes sapidus*		0.5	1.1	0.2	1.8	100.0
Total		**0.0**	**0.5**	**1.1**	**0.2**	**1.8**	**100.0**

Table 3.1.3.1-15
Motile Invertebrate Crab Trap CPUE for CFBC Event 4 (8/29/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Blue crab	*Callinectes sapidus*	0.1	0.6	1.2	0.0	1.8	100.0
Total		**0.1**	**0.6**	**1.2**	**0.0**	**1.8**	**100.0**

Table 3.1.3.2-1
CFBC Zooplankton ANOVA Results

Effect	Rank Transformed Results
Main Effects Only	
Station	<0.0001
Season	<0.0001
Day/Night	<0.0001
Interaction Effects Included	
Station	<0.0001
Season	<0.0001
Day/Night	<0.0001
Station*Season	<0.0001
Station*Day/Night	0.6922
Season*Day/Night	0.0175

Note:

Nonsignificant cases are shaded gray

Table 3.1.3.2-2
Tukey Groupings for CFBC Zooplankton Densities

Effect	Group	Rank Transformed Results
Station	1	D
	2	C
	3	B
	4	A
Season	Spring	A
	Summer	B
	Fall	C
Day/Night	Day	B
	Night	A

Table 3.1.3.2-3
Daytime Mean Abundance and Diversity Statistics for Major Taxonomic Zooplankton Groups in the CFBC

Statistic	Study Mean			
	1	2	3	4
Taxa	32	40	60	56
Mean Density (#/100m3)	6,505.23	5,380.38	13,521.87	38,521.37
Shannon Diversity (H'log2)	1.59	1.73	2.63	2.61
Pielou's Evenness J'	0.32	0.32	0.45	0.45
Margalef's Richness (d1)	3.53	4.54	6.20	5.21

Table 3.1.3.2-4
Nighttime Mean Abundance and Diversity Statistics for Major Taxonomic Zooplankton Groups in the CFBC

Statistic	Study Mean			
	1	2	3	4
Taxa	36	47	48	61
Mean Density (#/100m3)	22,628.21	28,091.67	45,556.06	61,630.70
Shannon Diversity (H'log2)	1.90	1.70	1.34	1.58
Pielou's Evenness J'	0.37	0.30	0.24	0.27
Margalef's Richness (d1)	3.49	4.49	4.38	5.44

Table 3.1.3.2-5
CFBC Holoplankton ANOVA Results

Effect	Rank Transformed Results
Main Effects Only	
Station	<0.0001
Season	<0.0001
Day/Night	<0.0001
Interaction Effects Included	
Station	<0.0001
Season	<0.0001
Day/Night	<0.0001
Station*Season	0.2778
Station*Day/Night	0.5280
Season*Day/Night	0.3873

Note

Nonsignificant cases are shaded gray

Table 3.1.3.2-6
Tukey Groupings for CFBC Holoplankton Densities

Effect	Group	Rank Transformed Results
Station	1	C
	2	B
	3	A
	4	A
Season	Spring	A
	Summer	B
	Fall	B
Sampling Period	Day	B
	Night	A

Table 3.1.3.2-7
CFBC Meroplankton ANOVA Results

Effect	Rank Transformed Results
Main Effects Only	
Station	<0.0001
Season	<0.0001
Day/Night	0.1035
Interaction Effects Included	
Station	<0.0001
Season	<0.0001
Day/Night	0.1920
Station*Season	0.0328
Station*Day/Night	0.2469
Season*Day/Night	0.4830

Note

Nonsignificant cases are shaded gray

Table 3.1.3.2-8
Tukey Groupings for CFBC Meroplankton Densities

Effect	Group	Rank Transformed Results
Station	1	C
	2	BC
	3	B
	4	A
Season	Spring	A
	Summer	B
	Fall	C
Day/Night	Day	A
	Night	A

Table 3.1.3.2-9
CFBC Fish Egg ANOVA Results

Effect	Rank Transformed Results
Main Effects Only	
Station	0.3823
Season	0.0845
Day/Night	0.8669
Interaction Effects Included	
Station	0.1938
Season	0.0945
Day/Night	0.9675
Station*Season	0.0020
Station*Day/Night	0.0807
Season*Day/Night	0.4631

Note:

Nonsignificant cases are shaded gray

Table 3.1.3.2-10
CFBC Fish Larvae ANOVA Results

Effect	Rank Transformed Results
Main Effects Only	
Station	0.0014
Season	<0.0001
Day/Night	0.0060
Interaction Effects Included	
Station	0.0454
Season	<0.0001
Day/Night	<0.0001
Station*Season	0.0529
Station*Day/Night	0.0007
Season*Day/Night	0.0565

Note

Nonsignificant cases are shaded gray

Table 3.1.3.2-11
Tukey Groupings for CFBC Fish Larvae Densities

Effect	Group	Rank Transformed Results
Station	1	AB
	2	B
	3	AB
	4	A
Season	Spring	A
	Summer	B
	Fall	C
Day/Night	Day	A
	Night	A

Table 3.1.3.2-12
Daytime Mean Abundance and Diversity Statistics for Ichthyoplankton in the CFBC

Statistic	Study Mean			
	1	2	3	4
Taxa	17	24	36	35
Mean Density (#/100m3)	40.19	430.92	740.34	1,475.28
Shannon Diversity (H'log2)	2.10	1.79	2.33	2.22
Pielou's Evenness J'	0.51	0.39	0.45	0.43
Margalef's Richness (d1)	4.33	3.79	5.30	4.66

Table 3.1.3.2-13
Nighttime Mean Abundance and Diversity Statistics for Ichthyoplankton in the CFBC

Statistic	Study Mean			
	1	2	3	4
Taxa	21	34	39	46
Mean Density (#/100m3)	523.31	458.26	1,062.67	888.47
Shannon Diversity (H'log2)	2.51	2.78	2.50	2.96
Pielou's Evenness J'	0.57	0.55	0.47	0.54
Margalef's Richness (d1)	3.19	5.39	5.45	6.63

Table 3.1.3.3-1
Fisheries Beach Seine CPUE for CFBC Event 1 (10/30/2007 – 11/7/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	CPUE Total	Percent Composition
Spotfin Mojarra	*Eucinostomus argenteus*		14.0	2.0	16.0	61.5
Bay Anchovy	*Anchoa mitchilli*			3.0	3.0	11.5
Pinfish	*Lagodon rhomboides*		1.5	1.0	2.5	9.6
Atlantic Needlefish	*Strongylura marina*			2.0	2.0	7.7
Ladyfish	*Elops saurus*		0.5	1.0	1.5	5.8
Gray Snapper	*Lutjanus griseus*		0.5		0.5	1.9
Red Drum	*Sciaenops ocellatus*		0.5		0.5	1.9
Total		**0.0**	**17.0**	**9.0**	**26.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-2
Fisheries Beach Seine CPUE for CFBC Event 2 (12/4/2007 – 12/12/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	CPUE Total	Percent Composition
Spotfin Mojarra	*Eucinostomus argenteus*	28.5	1.0	15.0	44.5	67.9
Scaled Sardine	*Harengula jaguana*		9.0	0.5	9.5	14.5
Atlantic needlefish	*Strongylura marina*	2.0		0.5	2.5	3.8
Gray Snapper	*Lutjanus griseus*		2.0		2.0	3.1
Goby	Gobiidae		0.5	1.0	1.5	2.3
Atlantic threadfin	*Polydactylus octonemus*			1.0	1.0	1.5
Bay Anchovy	*Anchoa mitchilli*		1.0		1.0	1.5
Silver Perch	*Bairdiella chrysoura*			1.0	1.0	1.5
Florida Blenny	*Chasmodes saburrae*			0.5	0.5	0.8
Gulf Menhaden	*Brevoortia patronus*		0.5		0.5	0.8
Pinfish	*Lagodon rhomboides*			0.5	0.5	0.8
Skilletfish	*Gobiesox strumosus*			0.5	0.5	0.8
Striped Anchovy	*Anchoa hepsetus*		0.5		0.5	0.8
Total		**30.5**	**14.5**	**20.5**	**65.5**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-3
Fisheries Beach Seine CPUE for CFBC Event 3 (6/18/2008 – 6/19/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	CPUE Total	Percent Composition
Gulf Menhaden	*Brevoortia patronus*	296.0			296.0	86.0
Bay anchovy	*Anchoa mitchilli*	43.0			43.0	12.5
Redfin needlefish	*Strongylura notata*			2.0	2.0	0.6
Pinfish	*Lagodon rhomboides*	0.5	0.5		1.0	0.3
Sheepshead minnow	*Cyprinodon variegatus*	1.0			1.0	0.3
Striped Anchovy	*Anchoa hepsetus*	1.0			1.0	0.3
Gray Snapper	*Lutjanus griseus*	0.5			0.5	0.1
Spotfin Mojarra	*Eucinostomus argenteus*	0.5			0.5	0.1
Total		**342.5**	**0.5**	**2.0**	**345.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-4
Fisheries Beach Seine CPUE for CFBC Event 4 (8/26/2008 – 9/5/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	CPUE Total	Percent Composition
Spotfin Mojarra	*Eucinostomus argenteus*	12.5	6.0	0.5	19.0	67.9
Sheepshead minnow	*Cyprinodon variegatus*	2.5			2.5	8.9
Pinfish	*Lagodon rhomboides*		1.5		1.5	5.4
Atlantic needlefish	*Strongylura marina*		0.5	0.5	1.0	3.6
Goldspotted killifish	*Floridichthys carpio*	1.0			1.0	3.6
Gulf flounder	*Paralichthys albigutta*			0.5	0.5	1.8
Gulf killifish	*Fundulus grandis*	0.5			0.5	1.8
Leatherjacket	*Oligoplites saurus*			0.5	0.5	1.8
Longnose killifish	*Fundulus similis*	0.5			0.5	1.8
Pigfish	*Orthopristis chrysoptera*			0.5	0.5	1.8
Sunfish	*Lepomis sp.*	0.5			0.5	1.8
Total		**17.5**	**8.0**	**2.5**	**28.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-5 (Sheet 1 of 2)
Fisheries Beach Seine CPUE Spatial and Temporal Variation in the CFBC

Common Name	Station 1				Station 2				Station 3				CPUE Total	Percent Composition
	10/30/ 2007	12/4/ 2007	6/18/ 2008	8/26/ 2008	10/30/ 2007	12/4/ 2007	6/18/ 2008	8/26/ 2008	10/30/ 2007	12/4/ 2007	6/18/ 2008	8/26/ 2008		
Gulf Menhaden			296.0			0.5							296.5	63.8
Spotfin Mojarra		28.5	0.5	12.5	14.0	1.0		6.0	2.0	15.0		0.5	80.0	17.2
Bay anchovy			43.0			1.0			3.0				47.0	10.1
Scaled Sardine						9.0				0.5			9.5	2.0
Pinfish			0.5		1.5		0.5	1.5	1.0	0.5			5.5	1.2
Atlantic needlefish		2.0						0.5	2.0	0.5		0.5	5.5	1.2
Sheepshead minnow			1.0	2.5									3.5	0.8
Gray Snapper			0.5		0.5	2.0							3.0	0.6
Redfin needlefish											2.0		2.0	0.4
Striped anchovy			1.0			0.5							1.5	0.3
Goby						0.5				1.0			1.5	0.3
Ladyfish					0.5				1.0				1.5	0.3
Atlantic threadfin										1.0			1.0	0.2
Goldspotted killifish				1.0									1.0	0.2
Silver Perch										1.0			1.0	0.2
Florida Blenny										0.5			0.5	0.1
Gulf flounder												0.5	0.5	0.1
Gulf killifish				0.5									0.5	0.1
Leatherjacket												0.5	0.5	0.1
Longnose killifish				0.5									0.5	0.1
Pigfish												0.5	0.5	0.1

Table 3.1.3.3-5 (Sheet 1 of 2)
Fisheries Beach Seine CPUE Spatial and Temporal Variation in the CFBC

Common Name	Station 1				Station 2				Station 3				CPUE Total	Percent Composition
	10/30/ 2007	12/4/ 2007	6/18/ 2008	8/26/ 2008	10/30/ 2007	12/4/ 2007	6/18/ 2008	8/26/ 2008	10/30/ 2007	12/4/ 2007	6/18/ 2008	8/26/ 2008		
Red Drum					0.5								0.5	0.1
Skilletfish										0.5			0.5	0.1
Sunfish				0.5									0.5	0.1
Total CPUE	**0.0**	**30.5**	**342.5**	**17.5**	**17.0**	**14.5**	**0.5**	**8.0**	**9.0**	**20.5**	**2.0**	**2.5**	**464.5**	**100.0**
Station Total	**390.5**				**40.0**				**34.0**					

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-6
Fisheries Trawl CPUE for CFBC Event 1 (10/31/2007 – 11/1/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Bay Anchovy	*Anchoa mitchilli*	1.0	336.0	332.0	1.0	670.0	66.9
Silver Perch	*Bairdiella chrysoura*			3.0	204.0	207.0	20.7
Spotfin Mojarra	*Eucinostomus argenteus*	1.0	56.0			57.0	5.7
Pinfish	*Lagodon rhomboides*		22.0			22.0	2.2
Spot	*Leiostomus xanthurus*				13.0	13.0	1.3
Sand Seatrout	*Cynoscion arenarius*		6.0		6.0	12.0	1.2
Atlantic Bumper	*Chloroscombrus chrysurus*		6.0			6.0	0.6
Gray Snapper	*Lutjanus griseus*	1.0	1.0	0.5		2.5	0.2
Hardhead Catfish	*Arius felis*		1.0		1.0	2.0	0.2
Ladyfish	*Elops saurus*				2.0	2.0	0.2
Southern Kingfish	*Menticirrhus americanus*				2.0	2.0	0.2
Fringed Flounder	*Etropus crossotus*				1.0	1.0	0.1
Least Puffer	*Sphoeroides parvus*		1.0			1.0	0.1
Pigfish	*Orthopristis chrysoptera*				1.0	1.0	0.1
Atlantic spadefish	*Chaetodipterus faber*			0.5		0.5	0.0
Lane Snapper	*Lutjanus synagris*			0.5		0.5	0.0
Spanish Mackerel	*Scomberomorus maculatus*			0.5		0.5	0.0
Black Drum	*Pogonias cromis*	0.5				0.5	0.0
Sheepshead	*Archosargus probatocephalus*	0.5				0.5	0.0
Total		**3.5**	**429.0**	**337.0**	**231.0**	**1001.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-7
Fisheries Trawl CPUE for CFBC Event 2 (12/4/2007 – 12/12/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Silver Perch	*Bairdiella chrysoura*		15.0	190.0	14.5	219.5	43.6
Bay Anchovy	*Anchoa mitchilli*		169.0	11.0		180.0	35.7
Gulf Menhaden	*Brevoortia patronus*		32.0	1.5		33.5	6.7
Hardhead catfish	*Arius felis*			6.0	15.5	21.5	4.3
Spotfin Mojarra	*Eucinostomus argenteus*	0.5	1.0	11.5	4.5	17.5	3.5
Sand Seatrout	*Cynoscion†arenarius*		0.5	6.5	2.0	9.0	1.8
Black Drum	*Pogonias cromis*	1.5	3.0			4.5	0.9
Southern Kingfish	*Menticirrhus americanus*			0.5	2.0	2.5	0.5
Polka-dot Batfish	*Ogcocephalus cubifrons*				2.0	2.0	0.4
Pigfish	*Orthopristis chrysoptera*				1.5	1.5	0.3
Pinfish	*Lagodon rhomboides*				1.5	1.5	0.3
Fringed flounder	*Etropus crossotus*			0.5	1.0	1.5	0.3
Spot	*Leiostomus xanthurus*				1.5	1.5	0.3
Gray Snapper	*Lutjanus griseus*		1.0			1.0	0.2
Smooth Butterfly Ray	*Gymnura micrura*			1.0		1.0	0.2
Striped Anchovy	*Anchoa hepsetus*		1.0			1.0	0.2
Southern flounder	*Paralichthys lethostigma*				1.0	1.0	0.2
Atlantic croaker	*Micropogonias undulatus*				0.5	0.5	0.1
Black Cheek Tonguefish	*Symphurus plagiusa*			0.5		0.5	0.1
Gafftopsail Catfish	*Bagre marinus*			0.5		0.5	0.1
Grunt	Haemulidae				0.5	0.5	0.1
Lookdown	*Selene vomer*			0.5		0.5	0.1
Barred searobin	*Prionotus martis*				0.5	0.5	0.1
Scaled Sardine	*Harengula jaguana*		0.5			0.5	0.1
Total		**2.0**	**223.0**	**230.0**	**48.5**	**503.5**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-8
Fisheries Trawl CPUE for CFBC Event 3 (5/14/2008 – 5/15/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Bay Anchovy	*Anchoa mitchilli*		6.0		2.0	8.0	23.2
Spot	*Leiostomus xanthurus*		7.0	0.5		7.5	21.7
Pinfish	*Lagodon rhomboides*		5.0			5.0	14.5
Atlantic croaker	*Micropogonias undulatus*		4.0			4.0	11.6
Silver Perch	*Bairdiella chrysoura*			3.0	0.3	3.3	9.7
Sand Seatrout	*Cynoscion arenarius*		1.5	0.5		2.0	5.8
Black Drum	*Pogonias cromis*		1.0			1.0	2.9
Hardhead catfish	*Arius felis*		1.0			1.0	2.9
Atlantic Stingray	*Dasyatis sabina*		0.5			0.5	1.4
Gulf Flounder	*Paralichthys albigutta*		0.5			0.5	1.4
Gulf Toadfish	*Opsanus beta*			0.5		0.5	1.4
Yellowfin Menhaden	*Brevoortia smithi*		0.5			0.5	1.4
Bighead Searobin	*Prionotus tribulus*				0.3	0.3	1.0
Ocellated Flounder	*Ancylopsetta quadrocellata*				0.3	0.3	1.0
Total		**0.0**	**27.0**	**4.5**	**3.0**	**34.5**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-9
Fisheries Trawl CPUE for CFBC Event 4 (8/25/2008 – 8/26/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Bay anchovy	*Anchoa mitchilli*		0.5	1.0	58.5	60.0	42.4
Spotfin Mojarra	*Eucinostomus argenteus*		56.5			56.5	39.9
Atlantic bumper	*Chloroscombrus chrysurus*			2.0	10.0	12.0	8.5
Sand seatrout	*Cynoscion arenarius*		6.5		1.0	7.5	5.3
Silver perch	*Bairdiella chrysoura*			0.5	3.0	3.5	2.5
Atlantic spadefish	*Chaetodipterus faber*				1.0	1.0	0.7
Hardhead catfish	*Arius felis*		0.5			0.5	0.4
Sunfish	*Lepomis sp.*		0.5			0.5	0.4
Total		**0.0**	**64.5**	**3.5**	**73.5**	**141.5**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-10 (Sheet 1 of 2)
Fisheries Trawl CPUE Spatial and Temporal Variation in the CFBC

Common Name	Station 1				Station 2				Station 3				Station 4				CPUE Total	Percent Composition
	10/31/ 2007	12/4/ 2007	5/14/ 2008	8/25/ 2008	10/31/ 2007	12/4/ 2007	5/14/ 2008	8/25/ 2008	10/31/ 2007	12/4/ 2007	5/14/ 2008	8/25/ 2008	10/31/ 2007	12/4/ 2007	5/14/ 2008	8/25/ 2008		
Bay anchovy	1.0				336.0	169.0	6.0	0.5	332.0	11.0		1.0	1.0		2.0	58.5	918.0	54.6
Silver perch						15.0			3.0	190.0	3.0	0.5	204.0	14.5	0.3	3.0	433.3	25.8
Spotfin Mojarra	1.0	0.5			56.0	1.0		56.5		11.5				4.5			131.0	7.8
Gulf Menhaden						32.0				1.5							33.5	2.0
Sand seatrout					6.0	0.5	1.5	6.5		6.5	0.5		6.0	2.0		1.0	30.5	1.8
Pinfish					22.0		5.0							1.5			28.5	1.7
Hardhead catfish					1.0		1.0	0.5		6.0			1.0	15.5			25.0	1.5
Spot							7.0				0.5		13.0	1.5			22.0	1.3
Atlantic bumper					6.0							2.0				10.0	18.0	1.1
Black Drum	0.5	1.5				3.0	1.0										6.0	0.4
Atlantic croaker							4.0							0.5			4.5	0.3
Southern Kingfish										0.5			2.0	2.0			4.5	0.3
Gray Snapper	1.0				1.0	1.0			0.5								3.5	0.2
Pigfish													1.0	1.5			2.5	0.1
Fringed flounder										0.5			1.0	1.0			2.5	0.1
Ladyfish													2.0				2.0	0.1
Polka-dot Batfish														2.0			2.0	0.1
Atlantic spadefish									0.5							1.0	1.5	0.1
Southern flounder														1.0			1.0	0.1
Least Puffer					1.0												1.0	0.1
Smooth Butterfly Ray										1.0							1.0	0.1
Striped Anchovy						1.0											1.0	0.1
Lane Snapper									0.5								0.5	0.0
Spanish Mackerel									0.5								0.5	0.0
Atlantic Stingray							0.5										0.5	0.0
Black Cheek Tonguefish										0.5							0.5	0.0
Gafftopsail Catfish										0.5							0.5	0.0
Grunt														0.5			0.5	0.0

Table 3.1.3.3-10 (Sheet 2 of 2)
Fisheries Trawl CPUE Spatial and Temporal Variation in the CFBC

Common Name	Station 1				Station 2				Station 3				Station 4					
	10/31/ 2007	12/4/ 2007	5/14/ 2008	8/25/ 2008	10/31/ 2007	12/4/ 2007	5/14/ 2008	8/25/ 2008	10/31/ 2007	12/4/ 2007	5/14/ 2008	8/25/ 2008	10/31/ 2007	12/4/ 2007	5/14/ 2008	8/25/ 2008	CPUE Total	Percent Composition
Gulf Flounder							0.5										0.5	0.0
Gulf Toadfish											0.5						0.5	0.0
Lookdown										0.5							0.5	0.0
Barred searobin														0.5			0.5	0.0
Scaled Sardine						0.5											0.5	0.0
Sheepshead	0.5																0.5	0.0
Sunfish								0.5									0.5	0.0
Yellowfin Menhaden							0.5										0.5	0.0
Bighead Searobin															0.3		0.3	0.0
Ocellated Flounder															0.3		0.3	0.0
Total CPUE	**4.0**	**2.0**	**0.0**	**0.0**	**429.0**	**223.0**	**27.0**	**64.5**	**337.0**	**230.0**	**4.5**	**3.5**	**231.0**	**48.5**	**2.9**	**73.5**	**1680**	**100.0**
Station Total	**6.0**				**743.5**				**575.0**				**355.9**					

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-11
Fisheries Gill Net CPUE for CFBC Event 1 (11/1/2007 – 11/7/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Spotfin Mojarra	*Eucinostomus argenteus*	21.8	138.0			159.8	59.5
Ladyfish	*Elops saurus*	13.1	11.5	4.4	5.1	34.1	12.7
Bull Shark	*Carcharhinus leucas*		22.9			22.9	8.5
Spanish Mackerel	*Scomberomorus maculatus*				15.3	15.3	5.7
Gulf Menhaden	*Brevoortia patronus*		11.5			11.5	4.3
Southern Stingray	*Dasyatis americana*				5.1	5.1	1.9
Gray Snapper	*Lutjanus griseus*	4.4				4.4	1.6
Crevalle Jack	*Caranx hippos*		3.8			3.8	1.4
Gafftopsail Catfish	*Bagre marinus*		3.8			3.8	1.4
Gizzard Shad	*Dorosoma cepedianum*		3.8			3.8	1.4
Sheepshead	*Archosargus probatocephalus*		3.8			3.8	1.4
Total		**39.3**	**199.2**	**4.4**	**25.5**	**268.4**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-12
Fisheries Gill Net CPUE for CFBC Event 2 (12/3/2007 – 12/11/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Scaled Sardine	*Harengula jaguana*			689.0		689.0	68.5
Ladyfish	*Elops saurus*		18.2	107.0		125.2	12.4
Longnose Gar	*Lepisosteus osseus*			15.3	30.0	45.3	4.5
Common Snook	*Centropomus undecimalis*		36.5			36.5	3.6
Crevalle jack	*Caranx hippos*		18.2			18.2	1.8
Florida pompano	*Trachinotus carolinus*			15.3		15.3	1.5
Gulf Menhaden	*Brevoortia patronus*			15.3		15.3	1.5
Hardhead catfish	*Arius felis*			15.3		15.3	1.5
Spanish Mackerel	*Scomberomorus maculatus*			15.3		15.3	1.5
Spanish Sardine	*Sardinella aurita*			15.3		15.3	1.5
Spotfin Mojarra	*Eucinostomus argenteus*			15.3		15.3	1.5
Total		**0.0**	**72.9**	**903.1**	**30.0**	**1006.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-13
Fisheries Gill Net CPUE for CFBC Event 3 (6/6/2008 – 6/17/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Ladyfish	*Elops saurus*	20.0			4.0	24.0	32.6
Gafftopsail catfish	*Bagre marinus*	8.0	4.6	4.0		16.5	22.5
Black Drum	*Pogonias cromis*		4.6			4.6	6.2
Striped Mullet	*Mugil cephalus*		4.6			4.6	6.2
Longnose gar	*Lepisosteus osseus*	4.0				4.0	5.4
Cownose ray	*Rhinoptera bonasus*			4.0		4.0	5.4
Hardhead catfish	*Arius felis*			4.0		4.0	5.4
Harvestfish	*Peprilus alepidotus*			4.0		4.0	5.4
Atlantic Stingray	*Dasyatis sabina*				4.0	4.0	5.4
Spot	*Leiostomus xanthurus*				4.0	4.0	5.4
Total		**32.0**	**13.7**	**15.9**	**11.9**	**73.5**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-14
Fisheries Gill Net CPUE for CFBC Event 4 (8/25/2008 – 8/28/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Bonnethead shark	*Sphyrna tiburo*				8.0	8.0	18.5
Longnose gar	*Lepisosteus osseus*	4.0			4.0	8.0	18.4
Ladyfish	*Elops saurus*		3.7		4.0	7.7	17.8
Gulf Menhaden	*Brevoortia patronus*				4.0	4.0	9.3
Hardhead catfish	*Arius felis*				4.0	4.0	9.3
Spanish mackerel	*Scomberomorus maculatus*				4.0	4.0	9.3
Largemouth bass	*Micropterus salmoides*	4.0				4.0	9.1
Whitefin sharksucker	*Echeneis neucratoides*			3.7		3.7	8.4
Total		**7.9**	**3.7**	**3.7**	**28.0**	**43.2**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-15
Fisheries Gill Net CPUE Spatial and Temporal Variation in the CFBC

Common Name	Station 1				Station 2				Station 3				Station 4				CPUE Total	Percent Composition
	11/2/2007	12/5/2007	6/6/2008	8/25/2008	11/2/2007	12/5/2007	6/6/2008	8/25/2008	11/2/2007	12/5/2007	6/6/2008	8/25/2008	11/2/2007	12/5/2007	6/6/2008	8/25/2008		
Scaled Sardine										689.0							689.0	49.5
Ladyfish	13.1		20.0		11.5	18.2		3.7	4.4	107.0			5.1		4.0	4.0	191.0	13.7
Spotfin Mojarra	21.8				138.0					15.3							175.1	12.6
Longnose gar			4.0	4.0						15.3				30.0		4.0	57.3	4.1
Common Snook						36.5											36.5	2.6
Spanish mackerel										15.3			15.3			4.0	34.6	2.5
Gulf Menhaden					11.5					15.3						4.0	30.8	2.2
Hardhead catfish										15.3	4.0					4.0	23.3	1.7
Bull Shark					22.9												22.9	1.6
Crevalle Jack					3.8	18.2											22.0	1.6
Gafftopsail Catfish			8.0		3.8		4.6				4.0						20.4	1.5
Florida pompano										15.3							15.3	1.1
Spanish Sardine										15.3							15.3	1.1
Bonnethead shark																8.0	8.0	0.6
Southern Stingray													5.1				5.1	0.4
Black Drum							4.6										4.6	0.3
Striped Mullet							4.6										4.6	0.3
Gray Snapper	4.4																4.4	0.3
Atlantic Stingray															4.0		4.0	0.3
Cownose ray											4.0						4.0	0.3
Harvestfish											4.0						4.0	0.3
Largemouth bass				4.0													4.0	0.3
Spot															4.0		4.0	0.3
Gizzard Shad					3.8												3.8	0.3
Sheepshead					3.8												3.8	0.3
Whitefin sharksucker												3.7					3.7	0.3
CPUE Total	**39.3**	**0.0**	**32.0**	**8.0**	**199.1**	**72.9**	**13.8**	**3.7**	**4.4**	**903.1**	**16.0**	**3.7**	**25.5**	**30.0**	**12.0**	**28.0**	**1391.5**	**100.0**
Station Total	**79.3**				**289.5**				**927.2**				**95.5**					

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-16
Fisheries Cast Net CPUE for CFBC Event 1 (10/29/2007 – 11/2/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Spotfin Mojarra	*Eucinostomus argenteus*	9.0	12.1	10.4	0.6	32.1	21.0
Scaled Sardine	*Harengula jaguana*	15.4		0.6	10.6	26.6	17.4
Pinfish	*Lagodon rhomboides*	5.1	3.0	15.2		23.4	15.2
Mullet	*Mugil sp.*		3.9	18.3		22.2	14.5
Bay Anchovy	*Anchoa mitchilli*		7.8	3.1	0.6	11.4	7.5
Gray Snapper	*Lutjanus griseus*	2.6	4.3	1.8		8.7	5.7
Ladyfish	*Elops saurus*	0.6	2.2	3.1		5.9	3.8
Striped Mullet	*Mugil cephalus*	4.5				4.5	2.9
White Mullet	*Mugil curema*	3.2	0.9			4.1	2.7
Atlantic Needlefish	*Strongylura marina*	0.6		1.8		2.5	1.6
Spot	*Leiostomus xanthurus*		1.3			1.3	0.8
Atlantic Thread Herring	*Opisthonema oglinum*				1.3	1.3	0.8
Grunt	Haemulidae			1.2		1.2	0.8
Pigfish	*Orthopristis chrysoptera*			1.2		1.2	0.8
Striped Anchovy	*Anchoa hepsetus*			1.2		1.2	0.8
Sheepshead	*Archosargus probatocephalus*		0.9			0.9	0.6
Red Drum	*Sciaenops ocellatus*	0.6				0.6	0.4
Black Drum	*Pogonias cromis*				0.6	0.6	0.4
Inshore Lizardfish	*Synodus foetens*				0.6	0.6	0.4
Puffers	*Sphoeroides sp.*				0.6	0.6	0.4
Southern Stingray	*Dasyatis americana*				0.6	0.6	0.4
Whitefin Sharksucker	*Echeneis neucratoides*				0.6	0.6	0.4
Herring sp.	*Clupeidae*			0.6		0.6	0.4
Common Snook	*Centropomus undecimalis*		0.4			0.4	0.3
Total		**41.7**	**36.7**	**58.5**	**16.2**	**153.1**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-17
Fisheries Cast Net CPUE for CFBC Event 2 (12/3/2007 – 12/11/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Spotfin Mojarra	*Eucinostomus argenteus*	31.9	4.4	30.0	14.4	80.7	41.3
White Mullet	*Mugil curema †††*	1.9	7.5	1.9	20.0	31.3	16.0
Striped Mullet	*Mugil cephalus*		2.5	4.4	15.0	21.9	11.2
Scaled Sardine	*Harengula jaguana*		13.8		2.5	16.3	8.4
Pinfish	*Lagodon rhomboides*	0.6	1.3	5.0	5.0	11.9	6.1
Ladyfish	*Elops saurus*		1.9	5.6		7.5	3.8
Gray Snapper	*Lutjanus griseus*		1.3	4.4		5.6	2.9
Bay Anchovy	*Anchoa mitchilli*			3.1		3.1	1.6
Gulf Menhaden	*Brevoortia patronus*		3.1			3.1	1.6
Hardhead catfish	*Arius felis*		0.6	1.9		2.5	1.3
Silver Perch	*Bairdiella chrysoura*		0.6	1.9		2.5	1.3
Yellowfin Menhaden	*Brevoortia smithi*			1.9		1.9	1.0
Atlantic croaker	*Micropogonias undulatus*			1.3		1.3	0.6
Bull Shark	*Carcharhinus leucas*		1.3			1.3	0.6
Sand Seatrout	*Cynoscion†arenarius*			1.3		1.3	0.6
Striped Anchovy	*Anchoa hepsetus*		0.6	0.6		1.3	0.6
Atlantic needlefish	*Strongylura marina*		0.6			0.6	0.3
Red Drum	*Sciaenops ocellatus*	0.6				0.6	0.3
Sheepshead	*Archosargus probatocephalus*		0.6			0.6	0.3
Total		**35.0**	**40.1**	**63.2**	**56.9**	**195.2**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-18
Fisheries Cast Net CPUE for CFBC Event 3 (5/12/2008 – 5/14/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
White Mullet	*Mugil curema*		6.5	5.5	4.1	16.1	25.2
Pinfish	*Lagodon rhomboides*	0.5	2.0	6.5	6.1	15.1	23.7
Striped Mullet	*Mugil cephalus*		0.5	8.5	3.6	12.6	19.7
Bay anchovy	*Anchoa mitchilli*	6.0				6.0	9.4
Tidewater mojarra	*Eucinostomus harengulus*			3.0		3.0	4.7
Atlantic needlefish	*Strongylura marina*	1.0			1.5	2.5	4.0
Herring sp.	*Clupeidae*	2.0				2.0	3.1
Black Drum	*Pogonias cromis*		1.5			1.5	2.4
Common mojarra	*Eucinostomus gula*		0.5	1.0		1.5	2.4
Gray Snapper	*Lutjanus griseus*			1.0		1.0	1.6
Spotfin mojarra	*Eucinostomus argentus*				0.5	0.5	0.8
Pigfish	*Orthopristis chrysoptera*				0.5	0.5	0.8
Common Snook	*Centropomus undecimalis*		0.5			0.5	0.8
Ladyfish	*Elops saurus*		0.5			0.5	0.8
Skilletfish	*Gobiesox strumosus*		0.5			0.5	0.8
Total		**9.5**	**12.5**	**25.5**	**16.3**	**63.8**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-19
Fisheries Cast Net CPUE for CFBC Event 4 (8/25/2008 – 8/29/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Gulf Menhaden	*Brevoortia patronus*			3.1	141.0	144.1	81.6
White mullet	*Mugil curema*				6.9	6.9	3.9
Spotfin Mojarra	*Eucinostomus argenteus*	3.1		0.6	1.9	5.6	3.2
Goldspotted killifish	*Floridichthys carpio*	3.1				3.1	1.8
Pinfish	*Lagodon rhomboides*	1.3	1.3		0.6	3.1	1.8
Striped mullet	*Mugil cephalus*	0.6			2.5	3.1	1.8
Atlantic bumper	*Chloroscombrus chrysurus*				2.5	2.5	1.4
Sheepshead	*Archosargus probatocephalus*	0.6	1.3			1.9	1.1
Redfin needlefish	*Strongylura notata*	1.3				1.3	0.7
Skilletfish	*Gobiesox strumosus*		1.3			1.3	0.7
Black drum	*Pogonias cromis*		0.6			0.6	0.4
Crested blenny	*Hypleurochilus germinatus*				0.6	0.6	0.4
Hardhead catfish	*Arius felis*			0.6		0.6	0.4
Ladyfish	*Elops saurus*				0.6	0.6	0.4
Leatherjacket	*Oligoplites saurus*				0.6	0.6	0.4
Pigfish	*Orthopristis chrysoptera*				0.6	0.6	0.4
Total		**10.0**	**4.4**	**4.4**	**157.9**	**176.7**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-20 (Sheet 1 of 2)
Fisheries Cast Net CPUE Spatial and Temporal Variation in the CFBC

Common Name	Station 1				Station 2				Station 3				Station 4				CPUE Total	Percent Composition
	10/30/ 2007	12/4/ 2007	5/12/ 2008	8/25/ 2008	10/30/ 2007	12/4/ 2007	5/12/ 2008	8/25/ 2008	10/30/ 2007	12/4/ 2007	5/12/ 2008	8/25/ 2008	10/30/ 2007	12/4/ 2007	5/12/ 2008	8/25/ 2008		
Gulf Menhaden						3.1						3.1				141.0	147.2	25.0
Spotfin Mojarra	9.0	31.9		3.1	12.1	4.4			10.4	30		0.6	0.6	14.4	0.5	1.9	118.9	20.2
White Mullet	3.2	1.9			0.9	7.5	6.5			1.9	5.5			20.0	4.1	6.9	58.4	9.9
Pinfish	5.1	0.6	0.5	1.3	3.0	1.3	2.0	1.3	15.2	5.0	6.5			5.0	6.1	0.6	53.5	9.1
Scaled Sardine	15.4					13.8			0.6				10.6	2.5			42.9	7.3
Striped Mullet	4.5			0.6		2.5	0.5			4.4	8.5			15	3.6	2.5	42.1	7.2
Mullet					3.9				18.3								22.2	3.8
Bay Anchovy			6.0		7.8				3.1	3.1							20.0	3.4
Gray Snapper	2.6				4.3	1.3			1.8	4.4	1.0		0.6				16.0	2.7
Ladyfish	0.6				2.2	1.9	0.5		3.1	5.6						0.6	14.5	2.5
Atlantic needlefish	0.6		1.0			0.6			1.8						1.5		5.5	0.9
Sheepshead				0.6	0.9	0.6		1.3									3.4	0.6
Goldspotted killifish				3.1													3.1	0.5
Hardhead catfish						0.6				1.9		0.6					3.1	0.5
Tidewater mojarra											3.0						3.0	0.5
Black drum							1.5	0.6					0.6				2.7	0.5
Herring sp.			2.0						0.6								2.6	0.4
Atlantic bumper																2.5	2.5	0.4
Silver Perch						0.6				1.9							2.5	0.4
Striped Anchovy						0.6			1.2	0.6							2.4	0.4
Pigfish									1.2						0.5	0.6	2.3	0.4
Yellowfin Menhaden										1.9							1.9	0.3
Skilletfish							0.5	1.3									1.8	0.3
Common mojarra							0.5				1.0						1.5	0.3
Atlantic croaker										1.3							1.3	0.2
Atlantic Thread Herring													1.3				1.3	0.2
Bull Shark						1.3											1.3	0.2
Redfin needlefish				1.3													1.3	0.2
Sand Seatrout										1.3							1.3	0.2

Table 3.1.3.3-20 (Sheet 2 of 2)
Fisheries Cast Net CPUE Spatial and Temporal Variation in the CFBC

Common Name	Station 1				Station 2				Station 3				Station 4				CPUE Total	Percent Composition
	10/30/ 2007	12/4/ 2007	5/12/ 2008	8/25/ 2008	10/30/ 2007	12/4/ 2007	5/12/ 2008	8/25/ 2008	10/30/ 2007	12/4/ 2007	5/12/ 2008	8/25/ 2008	10/30/ 2007	12/4/ 2007	5/12/ 2008	8/25/ 2008		
Spot					1.3												1.3	0.2
Grunt									1.2								1.2	0.2
Red Drum	0.6	0.6															1.2	0.2
Common Snook					0.4		0.5										0.9	0.2
Crested blenny																0.6	0.6	0.1
Inshore Lizardfish													0.6				0.6	0.1
Leatherjacket																0.6	0.6	0.1
Puffers													0.6				0.6	0.1
Southern Stingray													0.6				0.6	0.1
Whitefin Sharksucker													0.6				0.6	0.1
CPUE Total	**41.6**	**35.0**	**9.5**	**10.0**	**36.8**	**40.1**	**12.5**	**4.5**	**58.5**	**63.3**	**25.5**	**4.3**	**16.1**	**56.9**	**16.3**	**157.8**	**588.7**	**100.0**
Station Total	**96.1**				**93.9**				**151.6**				**247.1**					

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-21
Fisheries Minnow Trap CPUE for CFBC Event 1 (10/29/2007 – 11/7/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Spotfin Mojarra	*Eucinostomus argenteus*	1.6	0.3			1.9	50.4
Goby	Gobiidae		0.5	0.2	0.4	1.1	28.7
Pinfish	*Lagodon rhomboides*				0.4	0.4	10.1
Naked Goby	*Gobiosoma bosc*		0.1	0.1		0.2	5.4
Skilletfish	*Gobiesox strumosus*			0.1		0.1	2.8
Silver Perch	*Bairdiella chrysoura*		0.1			0.1	2.6
Total		**1.6**	**1.0**	**0.4**	**0.8**	**3.7**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-22
Fisheries Minnow Trap CPUE for CFBC Event 2 (12/3/2007 – 12/12/2007)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Goby	Gobiidae		0.5			0.5	48.9
Spotfin Mojarra	*Eucinostomus argenteus*	0.4	0.1			0.5	46.4
Gulf Toadfish	*Opsanus beta*				0.0	0.0	4.7
Total		**0.4**	**0.6**	**0.0**	**0.0**	**1.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-23
Fisheries Minnow Trap CPUE for CFBC Event 3 (5/12/2008 – 6/18/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Silver Perch	*Bairdiella chrysoura*		6.1		0.1	6.2	61.9
Pinfish	*Lagodon rhomboides*			1.3		1.3	13.3
Pigfish	*Orthopristis chrysoptera*		0.2	0.3	0.5	1.0	10.0
Goby	Gobiidae		0.1	0.3	0.5	0.9	8.7
Code goby	*Gobiosoma robustum*		0.2		0.1	0.3	2.9
Gulf Toadfish	*Opsanus beta*			0.1	0.1	0.2	2.1
Skilletfish	*Gobiesox strumosus*		0.1			0.1	1.0
Total		**0.0**	**6.7**	**2.1**	**1.3**	**10.1**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-24
Fisheries Minnow Trap CPUE for CFBC Event 4 (8/26/2008 – 8/29/2008)

Common Name	Species Name	Station 1	Station 2	Station 3	Station 4	CPUE Total	Percent Composition
Spotfin Mojarra	*Eucinostomus argenteus*	1.8	0.2			2.1	45.0
Naked goby	*Gobiosoma bosc*	0.4	0.6	0.5		1.5	32.5
Silver perch	*Bairdiella chrysoura*				0.5	0.5	10.0
Bluegill	*Lepomis macrochirus*	0.3			0.1	0.4	8.0
Gulf toadfish	*Opsanus beta*		0.1			0.1	2.6
Pinfish	*Lagodon rhomboides*				0.1	0.1	2.0
Total		**2.5**	**1.0**	**0.5**	**0.6**	**4.6**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.1.3.3-25
Fisheries Minnow Trap CPUE Spatial and Temporal Variation in the CFBC

Common Name	Station 1				Station 2				Station 3				Station 4				CPUE Totals	Percent Composition
	10/30/ 2007	12/5/ 2007	5/14/ 2008	8/26/ 2008	10/30/ 2007	12/5/ 2007	5/14/ 2008	8/26/ 2008	10/30/ 2007	12/5/ 2007	5/14/ 2008	8/26/ 2008	10/30/ 2007	12/5/ 2007	5/14/ 2008	8/26/ 2008		
Silver perch					0.1		6.1								0.1	0.5	6.8	35.0
Spotfin Mojarra	1.6	0.4		1.8	0.3	0.1		0.2									4.4	22.6
Goby					0.5	0.5	0.1		0.2		0.3		0.4		0.5		2.5	12.9
Pinfish											1.3		0.4			0.1	1.8	9.3
Naked goby				0.4	0.1			0.6	0.1			0.5					1.7	8.7
Pigfish							0.2				0.3				0.5		1.0	5.1
Bluegill				0.3												0.1	0.4	2.1
Gulf toadfish								0.1			0.1			<0.1	0.1		0.3	1.8
Code goby							0.2								0.1		0.3	1.5
Skilletfish							0.1		0.1								0.2	1.0
CPUE Total	**1.6**	**0.4**	**0.0**	**2.5**	**1.0**	**0.6**	**6.7**	**0.9**	**0.4**	**0.0**	**2.0**	**0.5**	**0.8**	**<0.1**	**1.3**	**0.7**	**19.4**	**100**
Station Total	**4.5**				**9.2**				**2.9**				**2.8**					

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.1-1
Summary of Sediment Characteristics at CREC Stations

Station	Description	TOC (mg/kg) [Range]	Particle Size (percent) [Range]			
			Gravel	Sand	Silt	Clay
CREC 3	1.4 mi. west of Unit 4/5 Discharge	6,643 [1,900 - 12,000]	5.6 [0.0 - 31.9]	83.8 [59.8 - 96.9]	6.1 [0.7 - 11.7]	4.6 [2.3 - 8.4]
CREC 4	2.8 mi. west of Unit 4/5 Discharge	9,886 [2,700 - 15,000]	1.1 [0.0 - 4.6]	71.3 [57.9 - 77.8]	18.7 [12.5 - 32.0]	8.9 [7.1 - 10.5]

Notes:

All results are an average of three station replicates as well as TOC field duplicates during two sampling events.

Particle size distribution for each station may not equal 100 percent due to rounding.

CREC = Crystal River Energy Complex
mg/kg = milligram per kilogram
mi. = mile

TOC = Total Organic Carbon

Table 3.2.2-1
Summary of Dissolved Oxygen, pH, and Water Clarity at CREC Stations

Station ID	Description	Average DO (mg/L) [Range]	pH Range (SU)	Average Secchi depth (m) [Range]
CREC 1	Inside CREC, nearest to Units 4/5 Intake and Discharge	6.28 [5.14 - 7.41]	7.71 - 7.97	N/A
CREC 2	Near west end of helper cooling tower bank	6.09 [4.81 - 7.37]	7.83 - 8.06	N/A
CREC 3	Outside of CREC in dredged portion of discharge canal	5.05 [1.10 - 7.37]	7.45 - 8.10	0.85
CREC 4	Nearshore Gulf of Mexico west CREC discharge canal	5.61 [2.07 - 8.07]	7.60 - 8.01	0.76

Notes:

Water clarity measurements were not taken at CREC Stations 1 and 2 because data were collected from the canal shoreline.

Water clarity measurements were collected at CREC Stations 3 and 4 during a single sampling event.

CREC = Crystal River Energy Complex
m = meter
mi. = mile
mg/L = milligram per liter
SU = standard unit

Table 3.2.3.1-1
CREC Benthic Infauna Mean Density and Composition per Station

Major Taxon	Mean Density (Number of Individuals per m^2) Station 3	Station 4	Mean Total	Percent Composition
Polychaeta	10,986	7,090	18,076	85.1
Oligochaeta	201	509	710	3.3
Bivalvia	50	639	689	3.2
Amphipoda	244	222	466	2.2
Gastropoda	151	301	452	2.1
Decapoda	22	144	165	0.8
Cnidaria	129	7	136	0.6
Tanaidacea	100	0	100	0.5
Nemertea	50	43	93	0.4
Echinodermata	22	57	79	0.4
Mysida	7	65	72	0.3
Sipuncula	36	29	65	0.3
Isopoda	14	29	43	0.2
Porifera	22	7	29	0.1
Cumacea	0	22	22	0.1
Platyhelminthes	0	14	14	0.1
Chaetognatha	7	0	7	0.0
Hemiptera	0	7	7	0.0
Phoronida	0	7	7	0.0
Total	**12,041**	**9,192**	**21,234**	**100.0**

Table 3.2.3.1-2
CREC Benthic Infauna Composition and Abundance at Station 3 per Sampling Event

Major Taxon	April	November	Study Mean	Percent Composition
Amphipoda	115	373	244	2.0
Bivalvia	14	86	50	0.4
Chaetognatha	14	0	7	0.1
Cnidaria	258	0	129	1.1
Decapoda	29	14	22	0.2
Echinodermata	0	43	22	0.2
Gastropoda	172	129	151	1.3
Isopoda	0	29	14	0.1
Mysida	0	14	7	0.1
Nemertea	72	29	50	0.4
Oligochaeta	115	287	201	1.7
Polychaeta	13,462	8,511	10,986	91.2
Porifera	43	0	22	0.2
Sipuncula	72	0	36	0.3
Tanaidacea	29	172	100	0.8
Total	**14,395**	**9,688**	**12,041**	**100.00**

Table 3.2.3.1-3
CREC Benthic Infauna Composition and Abundance at Station 4 per Sampling Event

Major Taxon	April	November	Study Mean	Percent Composition
Amphipoda	201	244	222	2.4
Bivalvia	775	502	639	6.9
Cnidaria	14	0	7	0.1
Cumacea	0	43	22	0.2
Decapoda	244	43	144	1.6
Echinodermata	57	57	57	0.6
Gastropoda	115	488	301	3.3
Hemiptera	14	0	7	0.1
Isopoda	14	43	29	0.3
Mysida	43	86	65	0.7
Nemertea	57	29	43	0.5
Oligochaeta	1,019	0	509	5.5
Phoronida	14	0	7	0.1
Platyhelminthes	29	0	14	0.2
Polychaeta	5,339	8,841	7,090	77.1
Porifera	14	0	7	0.1
Sipuncula	29	29	29	0.3
Total	**7,980**	**10,405**	**9,192**	**100.00**

Table 3.2.3.1-4
Abundance and Diversity Statistics of Major Benthic Infauna Taxonomic Groups at CREC Stations

Statistic	Station	
	3	4
Major Taxa	15	17
Mean Density (ind/m2)	12,041	9,192
Shannon Diversity (H'log2)	0.70	1.42
Pielou's Evenness J'	0.18	0.35
Margalef's Richness (d1)	1.49	1.75

Table 3.2.3.1-5
Motile Invertebrate Trawl CPUE Spatial and Temporal Variation at CREC Stations

Common Name	Station 3				Station 4				CPUE Total	Percent Composition
	4/17/08	6/12/08	8/28/08	11/12/08	4/17/08	6/12/08	8/28/08	11/12/08		
Yellowline arrow crab							2.0	5.0	7.0	19
Pink shrimp					0.5		1.5	3.5	5.5	14.9
Mud crab		3.0					0.5		3.5	9.5
Atlantic brief squid	1.0						1.0	1.0	3.0	8.2
Speck-claw decorator crab				0.5				2.0	2.5	6.8
Florida stone crab								2.0	2.0	5.4
Spider crab		0.5			0.5	1.0			2.0	5.4
Common eastern nassa							1.5		1.5	4.1
Hippolyte shrimp					0.5			1.0	1.5	4.1
Palaemonid shrimp					0.5			1.0	1.5	4.1
Portunid crab								1.5	1.5	4.1
Right-handed hermit crab					1.0				1.0	2.7
Iridescent swim crab		0.5							0.5	1.4
Lined seahorse								0.5	0.5	1.4
Pear whelk							0.5		0.5	1.4
Portly spider crab						0.5			0.5	1.4
Snapping shrimp							0.5		0.5	1.4
Sphaeromatid isopod					0.5				0.5	1.4
Uncounted gastropods					0.5				0.5	1.4
Unspecified snapping shrimp								0.5	0.5	1.4
Sargassum swimming crab			0.3						0.3	0.8
Total CPUE	**1.0**	**4.0**	**0.3**	**0.5**	**4.0**	**1.5**	**7.5**	**18.0**	**36.8**	**100.0**

Table 3.2.3.1-6
Motile Invertebrate Trawl CPUE at CREC Stations Event 1 (4/17/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Atlantic brief squid	*Lolliguncula brevis*	1.0		1.0	20.0
Right-handed hermit crab	*Paguridae*		1.0	1.0	20.0
Hippolyte shrimp	*Hippolyte sp.*		0.5	0.5	10.0
Palaemonid shrimp	*Palaemonidae*		0.5	0.5	10.0
Pink shrimp	*Farfantepenaeus duorarum*		0.5	0.5	10.0
Sphaeromatid isopod	*Paracerceis caudata*		0.5	0.5	10.0
Spider crab	*Metoporhaphis sp.*		0.5	0.5	10.0
Total		**1.0**	**4.0**	**5.0**	**100.0**

Table 3.2.3.1-7
Motile Invertebrate Trawl CPUE at CREC Stations Event 2 (6/12/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Mud crab	*Panopeidae*	3.0		3.0	54.5
Spider crab	*Metoporhaphis sp.*	0.5	1.0	1.5	27.3
Iridescent swim crab	*Portunus gibbesii*	0.5		0.5	9.1
Portly spider crab	*Libinia emarginata*		0.5	0.5	9.1
Total		**4.0**	**1.5**	**5.5**	**100.0**

Table 3.2.3.1-8
Motile Invertebrate Trawl CPUE at CREC Stations Event 3 (8/28/2008 – 8/29/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Yellowline arrow crab	*Stenorhynchus seticornis*		2.0	2.0	25.5
Pink shrimp	*Farfantepenaeus duorarum*		1.5	1.5	19.1
Common eastern nassa	*Nassarius vibex*		1.5	1.5	19.1
Atlantic brief squid	*Lolliguncula brevis*		1.0	1.0	12.8
Mud crab	*Panopeidae*		0.5	0.5	6.4
Pear whelk	*Busycon spiratum*		0.5	0.5	6.4
Snapping shrimp	*Alpheus heterochaelis*		0.5	0.5	6.4
Sargassum swimming crab	*Portunus sayi*	0.3		0.3	4.3
Total		**0.3**	**7.5**	**7.8**	**100.0**

Table 3.2.3.1-9
Motile Invertebrate Trawl CPUE at CREC Stations Event 4 (11/11/2008 – 11/12/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Yellowline arrow crab	*Stenorhynchus seticornis*		5.0	5.0	27.0
Pink shrimp	*Farfantepenaeus duorarum*		3.5	3.5	18.9
Speck-claw decorator crab	*Microphrys bicornutus*	0.5	2.0	2.5	13.5
Florida stone crab	*Menippe mercenaria*		2.0	2.0	10.8
Portunid crab	*Portunus sp.*		1.5	1.5	8.1
Atlantic brief squid	*Lolliguncula brevis*		1.0	1.0	5.4
Hippolyte shrimp	*Hippolyte sp.*		1.0	1.0	5.4
Palaemonid shrimp	*Palaemonidae*		1.0	1.0	5.4
Lined seahorse	*Hippocampus erectus*		0.5	0.5	2.7
Unspecified snapping shrimp	*Alpheus sp.*		0.5	0.5	2.7
Total		**0.5**	**18.0**	**18.5**	**100.0**

Table 3.2.3.1-10
Motile Invertebrate Crab Trap CPUE Spatial and Temporal Variation at CREC Stations

Common Name	Station 3				Station 4				CPUE Total	Percent Composition
	4/23/08	6/14/08	9/6/08	11/15/08	4/23/08	6/14/08	9/6/08	11/15/08		
Florida stone crab	0.2	0.9	2.0	0.5	0.2	0.5	0.5	0.4	5.2	83.9
Blue Crab			0.1	0.3	0.4	0.1			0.9	14.5
Crown conch	0.1								0.1	1.6
Total	**0.3**	**0.9**	**2.1**	**0.8**	**0.6**	**0.6**	**0.5**	**0.4**	**6.2**	**100.0**

Table 3.2.3.1-11
Motile Invertebrate Crab Trap CPUE at CREC Stations Event 1 (4/23/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Blue crab	*Callinectes sapidus*		0.4	0.4	47.5
Florida stone crab	*Menippe mercenaria*	**0.2**	**0.2**	0.3	42.0
Crown conch	*Melongena corona*	**0.1**		0.1	10.5
Total		**0.2**	**0.5**	**0.7**	**100.0**

Table 3.2.3.1-12
Motile Invertebrate Crab Trap CPUE at CREC Stations Event 2 (6/14/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Florida stone crab	*Menippe mercenaria*	0.9	0.5	1.4	95.5
Blue crab	*Callinectes sapidus*		0.1	0.1	4.5
Total		**0.9**	**0.5**	**1.4**	**100.0**

Table 3.2.3.1-13
Motile Invertebrate Crab Trap CPUE at CREC Stations Event 3 (9/6/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Florida stone crab	*Menippe mercenaria*	2.0	0.5	2.5	100.0
Blue crab	*Callinectes sapidus*	0.1		0.1	5.0
Total		**2.0**	**0.5**	**2.5**	**100.0**

Table 3.2.3.1-14
Motile Invertebrate Crab Trap CPUE at CREC Stations Event 4 (11/15/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Florida stone crab	*Menippe mercenaria*	0.5	0.4	0.9	75.1
Blue crab	*Callinectes sapidus*	0.3		0.3	24.9
Total		**0.8**	**0.4**	**1.3**	**100.0**

Table 3.2.3.2-1
Daytime Density and Diversity Statistics of Major Taxonomic Zooplankton Groups at CREC Stations

Statistic	Station	
	3	4
Taxa	40	38
Mean Density (ind/100m3)	23,851	89,743
Shannon Diversity (H'log2)	2.69	2.47
Pielou's Evenness J'	0.50	0.47
Margalef's Richness (d1)	3.87	3.24

Table 3.2.3.2-2
Nighttime Density and Diversity Statistics of Major Taxonomic Zooplankton Groups at CREC Stations

Statistic	Station	
	3	4
Taxa	37	46
Mean Density (ind/100m3)	20,132	48,034
Shannon Diversity (H'log2)	2.63	2.79
Pielou's Evenness J'	0.50	0.51
Margalef's Richness (d1)	3.63	4.17

Table 3.2.3.2-3
Daytime Density and Diversity Statistics of Ichthyoplankton at CREC Stations

Statistic	Station	
	3	4
Taxa	16	21
Mean Density (ind/100m3)	91	351
Shannon Diversity (H'log2)	2.70	1.70
Pielou's Evenness J'	0.68	0.39
Margalef's Richness (d1)	3.32	3.41

Table 3.2.3.2-4
Nighttime Density and Diversity Statistics of Ichthyoplankton at CREC Stations

Statistic	Station	
	3	4
Taxa	18	27
Mean Density (ind/100m3)	257	1,639
Shannon Diversity (H'log2)	2.43	1.55
Pielou's Evenness J'	0.58	0.33
Margalef's Richness (d1)	3.06	3.51

Table 3.2.3.3-1
Fisheries Beach Seine CPUE at CREC Stations Event 1 (5/3/2008)

Common Name	Species Name	Station 3	CPUE Total	Percent Composition
Goldspotted killifish	*Floridichthys carpio*	37.5	37.5	76.5
Tidewater mojarra	*Eucinostomus harengulus*	7.0	7.0	14.3
Longnose killifish	*Fundulus similis*	4.0	4.0	8.2
Marsh killifish	*Fundulus confluentus*	0.5	0.5	1.0
Total		**49.0**	**49.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-2
Fisheries Beach Seine CPUE at CREC Stations Event 2 (7/24/2008)

Common Name	Species Name	Station 3	CPUE Total	Percent Composition
Longnose killifish	*Fundulus similis*	37.0	37.0	43.5
Tidewater mojarra	*Eucinostomus harengulus*	24.0	24.0	28.2
Goldspotted killifish	*Floridichthys carpio*	14.0	14.0	16.5
Tidewater silverside	*Menidia peninsulae*	7.0	7.0	8.2
Gulf killifish	*Fundulus grandis*	2.0	2.0	2.4
Leatherjacket	*Oligoplites saurus*	1.0	1.0	1.2
Total		**85.0**	**85.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-3
Fisheries Beach Seine CPUE at CREC Stations Event 3 (8/25/2008)

Common Name	Species Name	Station 3	CPUE Total	Percent Composition
Tidewater silverside	*Menidia peninsulae*	35.3	35.3	38.7
Spotfin Mojarra	*Eucinostomus argenteus*	23.3	23.3	25.5
Sheepshead minnow	*Cyprinodon variegatus*	20.0	20.0	21.9
White mullet	*Mugil curema*	5.0	5.0	5.5
Longnose killifish	*Fundulus similis*	3.0	3.0	3.3
Goldspotted killifish	*Floridichthys carpio*	1.3	1.3	1.5
Halfbeak	*Hemiramphus sp.*	1.0	1.0	1.1
Leatherjacket	*Oligoplites saurus*	1.0	1.0	1.1
Atlantic needlefish	*Strongylura marina*	0.7	0.7	0.7
Redfin needlefish	*Strongylura notata*	0.7	0.7	0.7
Total		**91.3**	**91.3**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-4
Fisheries Beach Seine CPUE at CREC Stations Event 4 (11/12/2008)

Common Name	Species Name	Station 3	CPUE Total	Percent Composition
Goldspotted killifish	*Floridichthys carpio*	96.0	96.0	92.8
Spotfin Mojarra	*Eucinostomus argenteus*	5.0	5.0	4.8
Gulf killifish	*Fundulus grandis*	1.0	1.0	1.0
Longnose killifish	*Fundulus similis*	0.5	0.5	0.5
Redfin needlefish	*Strongylura notata*	0.5	0.5	0.5
White mullet	*Mugil curema*	0.5	0.5	0.5
Total		**103.5**	**103.5**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-5
Fisheries Beach Seine CPUE Spatial and Temporal Variation at CREC Station 3

Common Name	Station 3				CPUE Total	Percent Composition
	5/3/2008	7/24/2008	8/5/2008	11/12/2008		
Goldspotted killifish	37.5	14.0	1.3	96	148.8	45.3
Longnose killifish	4.0	37.0	3.0	0.5	44.5	13.5
Tidewater silverside		7.0	35.3		42.3	12.9
Tidewater mojarra	7.0	24.0			31.0	9.4
Spotfin Mojarra			23.3	5.0	28.3	8.6
Sheepshead minnow			20.0		20.0	6.1
White mullet			5.0	0.5	5.5	1.7
Gulf killifish		2.0		1.0	3.0	0.9
Leatherjacket		1.0	1.0		2.0	0.6
Redfin needlefish			0.7	0.5	1.2	0.4
Halfbeak			1.0		1.0	0.3
Atlantic needlefish			0.7		0.7	0.2
Marsh killifish	0.5				0.5	0.2
Total	**49.0**	**85.0**	**91.3**	**103.5**	**328.8**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-6
Fisheries Trawl CPUE at CREC Stations Event 1 (4/18/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Pinfish	*Lagodon rhomboides*		20.5	20.5	60.3
Silver perch	*Bairdiella chrysoura*		5.5	5.5	16.2
Hardhead catfish	*Arius felis*	4.0		4.0	11.8
Lane snapper	*Lutjanus synagris*	2.0		2.0	5.9
Pigfish	*Orthopristis chrysoptera*		0.5	0.5	1.5
Plainhead filefish	*Monacanthus hispidus*		0.5	0.5	1.5
Polka-dot batfish	*Ogcocephalus cubifrons*		0.5	0.5	1.5
Scrawled cowfish	*Lactophrys quadricornis*		0.5	0.5	1.5
Total		**6.0**	**28.0**	**34.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-7
Fisheries Trawl CPUE at CREC Stations Event 2 (6/11/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Silver perch	*Bairdiella chrysoura*	0.5	7.0	7.5	44.1
Pinfish	*Lagodon rhomboides*		4.5	4.5	26.5
Pigfish	*Orthopristis chrysoptera*	1.5	1.5	3.0	17.6
Spot	*Leiostomus xanthurus*		1.5	1.5	8.8
Gray snapper	*Lutjanus griseus*	0.5		0.5	2.9
Total		**2.5**	**14.5**	**17.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-8
Fisheries Trawl CPUE at CREC Stations Event 3 (8/27/2008 – 8/28/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Silver perch	*Bairdiella chrysoura*		59.0	59.0	59.3
Atlantic bumper	*Chloroscombrus chrysurus*		12.5	12.5	12.7
Pigfish	*Orthopristis chrysoptera*		7.5	7.5	7.6
Pinfish	*Lagodon rhomboides*		7.0	7.0	7.1
Spotfin mojarra	*Eucinostomus argenteus*	1.0	4.5	5.5	5.6
Sand seatrout	*Cynoscion arenarius*		2.0	2.0	2.0
Spotted seatrout	*Cynoscion nebulosus*		1.5	1.5	1.5
Atlantic croaker	*Micropogonias undulatus*		1.0	1.0	1.0
Atlantic spadefish	*Chaetodipterus faber*		0.5	0.5	0.5
Bay anchovy	*Anchoa mitchilli*		0.5	0.5	0.5
Gulf flounder	*Paralichthys albigutta*		0.5	0.5	0.5
Lookdown	*Selene vomer*		0.5	0.5	0.5
Gray snapper	*Lutjanus griseus*	0.3		0.3	0.3
Hardhead catfish	*Arius felis*	0.3		0.3	0.3
Total		**1.7**	**97.0**	**98.7**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-9
Fisheries Trawl CPUE at CREC Stations Event 4 (11/11/2008 – 11/12/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Spotfin Mojarra	*Eucinostomus argenteus*		44.5	44.5	92.7
Pinfish	*Lagodon rhomboides*		1.5	1.5	3.1
Silver perch	*Bairdiella chrysoura*		1.0	1.0	2.1
Common snook	*Centropomus undecimalis*	0.5		0.5	1.0
Pigfish	*Orthopristis chrysoptera*		0.5	0.5	1.0
Total		**0.5**	**47.5**	**48.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-10 (Sheet 1 of 2)
Fisheries Trawl CPUE Spatial and Temporal Variation at CREC Stations

Common Name	Station 3				Station 4				CPUE Total	Percent Composition
	4/18/2008	6/11/2008	8/27/2008	11/11/2008	4/18/2008	6/11/2008	8/27/2008	11/11/2008		
Silver perch		0.5			5.5	7.0	59.0	1.0	73.0	36.9
Spotfin Mojarra			1.0				4.5	44.5	50.0	25.3
Pinfish					20.5	4.5	7.0	1.5	33.5	16.9
Atlantic bumper							12.5		12.5	6.3
Pigfish		1.5			0.5	1.5	7.5	0.5	11.5	5.8
Hardhead catfish	4.0		0.3						4.3	2.2
Lane snapper	2.0								2.0	1.0
Sand seatrout							2.0		2.0	1.0
Spot						1.5			1.5	0.8
Spotted seatrout							1.5		1.5	0.8
Atlantic croaker							1.0		1.0	0.5
Gray snapper		0.5	0.3						0.8	0.4
Atlantic spadefish							0.5		0.5	0.3
Bay anchovy							0.5		0.5	0.3
Gulf flounder							0.5		0.5	0.3
Lookdown							0.5		0.5	0.3
Plainhead filefish					0.5				0.5	0.3

Table 3.2.3.3-10 (Sheet 2 of 2)
Fisheries Trawl CPUE Spatial and Temporal Variation at CREC Stations

Common Name	Station 3				Station 4				CPUE Total	Percent Composition
	4/18/2008	6/11/2008	8/27/2008	11/11/2008	4/18/2008	6/11/2008	8/27/2008	11/11/2008		
Polka-dot batfish					0.5				0.5	0.3
Scrawled cowfish					0.5				0.5	0.3
Common snook				0.5					0.5	0.3
Total	6.0	2.5	1.7	0.5	28.0	14.5	97.0	47.5	197.7	100.0
Station Total	**10.7**				**187.0**					

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-11
Fisheries Gill Net CPUE at CREC Stations Event 1 (5/2/2008 – 5/3/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Hardhead catfish	*Arius felis*	3.3	3.4	6.7	33.6
Gafftopsail catfish	*Bagre marinus*		3.4	3.4	17.2
Atlantic spadefish	*Chaetodipterus faber*	3.3		3.3	16.4
Black drum	*Pogonias cromis*	3.3		3.3	16.4
Bull shark	*Carcharhinus leucas*	3.3		3.3	16.4
Total		**13.1**	**6.9**	**20.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-12
Fisheries Gill Net CPUE at CREC Stations Event 2 (6/11/2008 – 6/14/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
No catch		0.0	0.0	0.0	0.0

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-13
Fisheries Gill Net CPUE at CREC Stations Event 3 (8/27/2008 – 8/28/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Black drum	*Pogonias cromis*	31.8	1.4	33.2	36.3
Hardhead catfish	*Arius felis*		14.0	14.0	15.3
Pinfish	*Lagodon rhomboides*	3.5	4.2	7.7	8.5
Sheepshead	*Archosargus probatocephalus*	7.1		7.1	7.7
Blacktip shark	*Carcharhinus limbatus*		5.6	5.6	6.1
Gafftopsail catfish	*Bagre marinus*		5.6	5.6	6.1
Cownose ray	*Rhinoptera bonasus*		4.2	4.2	4.6
Atlantic thread herring	*Opisthonema oglinum*		2.8	2.8	3.1
Atlantic spadefish	*Chaetodipterus faber*		1.4	1.4	1.5
Atlantic stingray	*Dasyatis sabina*		1.4	1.4	1.5
Crevalle jack	*Caranx hippos*		1.4	1.4	1.5
Longnose gar	*Lepisosteus osseus*		1.4	1.4	1.5
Red drum	*Sciaenops ocellatus*		1.4	1.4	1.5
Southern stingray	*Dasyatis americana*		1.4	1.4	1.5
Spanish mackerel	*Scomberomorus maculatus*		1.4	1.4	1.5
Spotted eagle ray	*Aetobatus narinari*		1.4	1.4	1.5
Total		**42.4**	**49.1**	**91.4**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-14
Fisheries Gill Net CPUE at CREC Stations Event 4 (11/13/2008 – 11/14/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Yellowfin menhaden	*Brevoortia smithi*		58.3	58.3	28.3
Spinner shark	*Carcharhinus brevipinna*	24.0	3.4	27.4	13.3
Atlantic thread herring	*Opisthonema oglinum*		27.4	27.4	13.3
Pinfish	*Lagodon rhomboides*		20.6	20.6	10.0
Spotted eagle ray	*Aetobatus narinari*	12.0		12.0	5.8
Blacktip shark	*Carcharhinus limbatus*		10.3	10.3	5.0
Spanish mackerel	*Scomberomorus maculatus*		10.3	10.3	5.0
Atlantic spadefish	*Chaetodipterus faber*	6.0	3.4	9.4	4.6
Silver perch	*Bairdiella chrysoura*		6.9	6.9	3.3
Spotted seatrout	*Cynoscion nebulosus*		6.9	6.9	3.3
Atlantic stingray	*Dasyatis sabina*	6.0		6.0	2.9
Bonnethead shark	*Sphyrna tiburo*		3.4	3.4	1.7
Ladyfish	*Elops saurus*		3.4	3.4	1.7
Puffers	*Sphoeroides sp.*		3.4	3.4	1.7
Total		**48.0**	**157.8**	**205.8**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-15 (Sheet 1 of 2)
Fisheries Gill Net CPUE Spatial and Temporal Variation at CREC Stations

Common Name	Station 3				Station 4				CPUE Total	Percent Composition
	5/2/2008	6/11/2008	8/5/2008	11/13/2008	5/2/2008	6/11/2008	8/5/2008	11/13/2008		
Yellowfin menhaden								58.3	58.3	18.4
Black drum	3.3		31.8				1.4		36.5	11.5
Atlantic thread herring							2.8	27.4	30.2	9.5
Pinfish			3.5				4.2	20.6	28.3	8.9
Spinner shark				24.0				3.4	27.4	8.6
Hardhead catfish	3.3				3.4		14.0		20.7	6.5
Blacktip shark							5.6	10.3	15.9	5.0
Atlantic spadefish	3.3			6.0			1.4	3.4	14.1	4.4
Spotted eagle ray				12.0			1.4		13.4	4.2
Spanish mackerel							1.4	10.3	11.7	3.7
Gafftopsail catfish					3.4		5.6		9.1	2.9
Atlantic stingray				6.0			1.4		7.4	2.3
Sheepshead			7.1						7.1	2.2
Silver perch								6.9	6.9	2.2
Spotted seatrout								6.9	6.9	2.2
Cownose ray							4.2		4.2	1.3
Bonnethead shark								3.4	3.4	1.1

Table 3.2.3.3-15 (Sheet 2 of 2)
Fisheries Gill Net CPUE Spatial and Temporal Variation at CREC Stations

Common Name	Station 3				Station 4					
	5/2/2008	6/11/2008	8/5/2008	11/13/2008	5/2/2008	6/11/2008	8/5/2008	11/13/2008	CPUE Total	Percent Composition
Ladyfish								3.4	3.4	1.1
Puffers								3.4	3.4	1.1
Bull shark	3.3								3.3	1.0
Crevalle jack							1.4		1.4	0.4
Longnose gar							1.4		1.4	0.4
Red drum							1.4		1.4	0.4
Southern stingray							1.4		1.4	0.4
Total	**13.1**	**0.0**	**42.4**	**48.0**	**6.9**	**0.0**	**49.1**	**157.7**	**317.1**	**100.0**
Station Total	**103.5**				**213.6**					

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-16
Fisheries Cast Net CPUE at CREC Stations Event 1 (4/19/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
White mullet	*Mugil curema*	6.9		6.9	55.9
Striped mullet	*Mugil cephalus*	3.1	0.9	4.0	32.8
Atlantic needlefish	*Strongylura marina*		0.5	0.5	3.7
Sheepshead	*Archosargus probatocephalus*		0.5	0.5	3.7
Striped burrfish	*Chilomycterus schoepfi*		0.5	0.5	3.7
Total		**10.0**	**2.3**	**12.3**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-17
Fisheries Cast Net CPUE at CREC Stations Event 2 (6/11/2008 – 6/14/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Striped mullet	*Mugil cephalus*	1.5	1.5	3.0	26.1
Atlantic bumper	*Chloroscombrus chrysurus*		2.0	2.0	17.4
Blue runner	*Caranx crysos*		2.0	2.0	17.4
White mullet	*Mugil curema*	1.0	0.5	1.5	13.0
Gray snapper	*Lutjanus griseus*	0.5	0.5	1.0	8.7
Black drum	*Pogonias cromis*	0.5		0.5	4.3
Pigfish	*Orthopristis chrysoptera*		0.5	0.5	4.3
Sheepshead	*Archosargus probatocephalus*	0.5		0.5	4.3
Spanish mackerel	*Scomberomorus maculatus*		0.5	0.5	4.3
Total		**4.0**	**7.5**	**11.5**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-18
Fisheries Cast Net CPUE at CREC Stations Event 3 (8/27/2008 – 8/28/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Striped mullet	*Mugil cephalus*	4.5	1.0	5.5	47.8
Atlantic silverstripe halfbeak	*Hyporhamphos unifasciatus*	3.5		3.5	30.4
Common mojarra	*Eucinostomus gula*		0.5	0.5	4.3
Gray snapper	*Lutjanus griseus*		0.5	0.5	4.3
Pinfish	*Lagodon rhomboides*	0.5		0.5	4.3
Sheepshead	*Archosargus probatocephalus*		0.5	0.5	4.3
Polka-dot batfish	*Ogcocephalus cubifrons*		0.5	0.5	4.3
Total		**8.5**	**3.0**	**11.5**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-19
Fisheries Cast Net CPUE at CREC Stations Event 4 (11/12/2008 – 11/14/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Striped mullet	*Mugil cephalus*	1.0	1.0	2.0	29.6
White mullet	*Mugil curema †††*	1.8		1.8	25.9
Pinfish	*Lagodon rhomboides*		1.5	1.5	22.2
Spotfin Mojarra	*Eucinostomus argenteus*		1.0	1.0	14.8
Crevalle jack	*Caranx hippos*	0.3		0.3	3.7
Red drum	*Sciaenops ocellatus*	0.3		0.3	3.7
Total		**3.3**	**3.5**	**6.8**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-20
Fisheries Cast Net CPUE Spatial and Temporal Variation at CREC Stations

Common Name	Station 3 4/19/2008	Station 3 6/12/2008	Station 3 8/27/2008	Station 3 11/13/2008	Station 4 4/19/2008	Station 4 6/12/2008	Station 4 8/27/2008	Station 4 11/13/2008	CPUE Total	Percent Composition
Striped mullet	3.1	1.5	4.5	1	0.9	1.5	1.0	1	14.5	34.5
White mullet	6.9	1.0		1.8		0.5			10.2	24.1
Atlantic silverstripe halfbeak			3.5						3.5	8.3
Atlantic bumper						2.0			2.0	4.7
Blue runner						2.0			2.0	4.7
Pinfish			0.5					1.5	2.0	4.7
Gray snapper		0.5				0.5	0.5		1.5	3.6
Sheepshead		0.5			0.5		0.5		1.5	3.4
Spotfin mojarra								1.0	1.0	2.4
Black drum		0.5							0.5	1.2
Common mojarra							0.5		0.5	1.2
Pigfish						0.5			0.5	1.2
Spanish mackerel						0.5			0.5	1.2
Polka-dot batfish							0.5		0.5	1.2
Atlantic needlefish					0.5				0.5	1.1
Striped burrfish					0.5				0.5	1.1
Crevalle jack				0.3					0.3	0.7
Red drum				0.3					0.3	0.7
Total	**10.0**	**4.0**	**8.5**	**3.4**	**2.3**	**7.5**	**3.0**	**3.5**	**42.2**	**100.0**
Station Total		**25.9**				**16.3**				

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-21
Fisheries Minnow Trap CPUE at CREC Stations Event 1 (5/3/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Pinfish	*Lagodon rhomboides*		0.4	0.4	50.0
Pigfish	*Orthopristis chrysoptera*		0.3	0.3	29.5
Gulf toadfish	*Opsanus beta*		0.1	0.1	10.2
Silver perch	*Bairdiella chrysoura*		0.1	0.1	10.2
Total		**0.0**	**0.9**	**0.9**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-22
Fisheries Minnow Trap CPUE at CREC Stations Event 2 (6/12/2008 – 6/13/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Pinfish	*Lagodon rhomboides*		0.6	0.6	53.8
Pigfish	*Orthopristis chrysoptera*		0.4	0.4	31.1
Florida blenny	*Chasmodes saburrae*		0.1	0.1	7.6
Silver perch	*Bairdiella chrysoura*		0.1	0.1	7.6
Total		**0.0**	**1.2**	**1.2**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-23
Fisheries Minnow Trap CPUE at CREC Stations Event 3 (9/4/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Naked goby	*Gobiosoma bosc*	0.1		0.1	100.0
Total		**0.1**	**0.0**	**0.1**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-24
Fisheries Minnow Trap CPUE at CREC Stations Event 4 (11/12/2008 – 11/13/2008)

Common Name	Species Name	Station 3	Station 4	CPUE Total	Percent Composition
Goby	Gobiidae		0.4	0.4	68.1
Spotfin Mojarra	*Eucinostomus argenteus*	0.2		0.2	31.9
Total		**0.2**	**0.4**	**0.6**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.2.3.3-25
Fisheries Minnow Trap CPUE Spatial and Temporal Variation at CREC Stations

Common Name	Station 3				Station 4				CPUE Total	Percent Composition
	5/3/2008	6/12/2008	9/4/2008	11/12/2008	5/3/2008	6/12/2008	9/4/2008	11/12/2008		
Pinfish					0.4	0.6			1.1	38.5
Pigfish					0.3	0.4			0.6	22.5
Goby								0.4	0.4	14.3
Spotfin Mojarra				0.2					0.2	7.1
Silver perch					0.1	0.1			0.2	6.4
Naked goby			0.1						0.1	4.8
Florida blenny						0.1			0.1	3.3
Gulf toadfish					0.1				0.1	3.1
Total	**0.0**	**0.0**	**0.1**	**0.2**	**0.9**	**1.2**	**0.0**	**0.4**	**2.8**	**100.0**
Station Total		**0.3**				**2.5**				

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.3.1-1
Summary of Sediment Characteristics at OWR Stations

Station	Description	TOC (mg/kg) [Range]	Particle Size (percent) [Range]			
			Gravel	Sand	Silt	Clay
CFBC 8	Near the confluence of CFBC and OWR	32,900 [9,700 - 54,000]	17.9 [12.9 - 20.5]	38.9 [24.4 - 58.9]	42.6 [27.9 - 52.7]	0.9 [0.0 - 2.5]
CFBC 9	Mid-way along the OWR	54,000 [45,000 - 63,000]	20.8 [6.9 - 34.6]	61.3 [53.4 - 69.2]	14.6 [8.9 - 20.3]	3.5 [3.3 - 3.6]
CFBC 10	Below the Inglis Dam	29,000 [16,000 - 40,000]	6.3 [2.3 - 9.4]	70.1 [51.3 - 80.2]	22.7 [10.1 - 44.5]	0.8 [0.2 - 1.8]

Notes:

All results are an average of three station replicates as well as TOC field duplicates during one sampling event. Two replicate samples were collected at Station CFBC 9.

Particle size distribution for each station may not equal 100 percent due to rounding.

CFBC = Cross Florida Barge Canal
mg/kg = milligram per kilogram
mi. = mile

TOC = Total Organic Carbon

Table 3.3.2-1
Summary of Average Salinity at OWR Stations

Station ID	Description	Average Station Salinity (pss) [Range]		
		June, 2008 Event	August, 2008 Event	Overall Average
CFBC 8	Near confluence of CFBC and OWR	4.02 [0.16 - 12.25]	0.16 [0.16 - 0.16]	2.92 [0.16 - 12.25]
CFBC 9	Mid-way along the OWR	0.15 [0.15 - 0.15]	0.16 [0.16 - 0.16]	0.16 [0.15 - 0.16]
CFBC 10	Below Inglis Dam	0.15 [0.14 - 0.16]	0.16 [0.16 - 0.16]	0.15 [0.14 - 0.16]

Notes:

pss = practical salinity scale
CFBC = Cross Florida Barge Canal
mi. = mile

Table 3.3.2-2
Summary of Average Temperature at OWR Stations

Station ID	Description	Average Station Temperature (°C) [Range]		
		June, 2008 Event	August, 2008 Event	Overall Average
CFBC 8	Near confluence of CFBC and OWR	28.93 [28.52 - 29.32]	28.05 [28.04 - 28.05]	28.68 [28.04 - 29.32]
CFBC 9	Mid-way along the OWR	28.98 [28.97 - 28.98]	28.01 [27.98 - 28.04]	28.33 [27.98 - 28.98]
CFBC 10	Below Inglis Dam	28.43 [28.13 - 29.42]	27.84 [27.73 - 27.97]	28.27 [27.73 - 29.42]

Notes:

°C = degrees Celsius
CFBC = Cross Florida Barge Canal
mi. = mile

Table 3.3.2-3
Summary of Dissolved Oxygen, pH, and Water Clarity at OWR Stations

Station ID	Description	Average DO (mg/L) [Range]	pH Range (SU)	Average Secchi depth (m) [Range]
CFBC 8	Near confluence of CFBC and OWR	5.48 [1.93 - 8.96]	7.20 - 8.42	1.52 [1.18 - 1.84]
CFBC 9	Mid-way along the OWR	7.39 [4.35 - 8.87]	7.71 - 8.41	1.48 [1.32 - 1.64]
CFBC 10	Below Inglis Dam	4.87 [2.51 - 8.79]	7.56 - 8.34	1.05 [0.91 - 1.18]

Notes:

CFBC = Cross Florida Barge Canal
m = meter
mi. = mile
mg/L = milligram per liter
SU = standard unit

Table 3.3.3.1
OWR Benthic Infauna Abundance (Number per m2) of Major Taxa per Station

Major Taxon	Station 8	Station 9	Station 10	Total	Percent Composition
Oligochaeta			20,007	20,007	52.5
Diptera	5,009	531	4,736	10,276	27.0
Polychaeta	1,105	1,005	172	2,282	6.0
Amphipoda	115	301	1,579	1,995	5.2
Bivalvia	631	603	388	1,622	4.3
Gastropoda	57	531	144	732	1.9
Hirudinea	14		531	545	1.4
Isopoda			517	517	1.4
Trichoptera			86	86	0.2
Nemertea		57		57	0.2
Total	**6,932**	**3,028**	**28,158**	**38,119**	**100.0**

Table 3.3.3.1-2 (Sheet 1 of 2)
OWR Benthic Infauna Abundance per Species

Major Taxon	Organism Name	Number per m^2 Station 8	Station 9	Station10
Amphipoda	Amphipoda (LPIL)	57		
Amphipoda	Aoridae (LPIL)	57		
Amphipoda	Gammarus cf. Tigrinus lecroy		301	
Amphipoda	Gammarus sp.			14
Amphipoda	Hyalella azteca complex lecroy			1564
Bivalvia	Corbicula fluminea			201
Bivalvia	Mytilopsis leucophaeata	631	603	57
Bivalvia	Pisidiidae (LPIL)			129
Diptera	Chironomidae (LPIL)			100
Diptera	Chironomidae pupae (LPIL)			57
Diptera	Chironomus decorus group epler			273
Diptera	Chironomus sp.	4664	416	100
Diptera	Cladopelma sp.			86
Diptera	Cladotanytarsus sp.			43
Diptera	Claxdotanytarsus sp. A epler			172
Diptera	Cryptochironomus sp.			43
Diptera	Cryptotendipes sp.			57
Diptera	Dicrotendipes modestus			1679
Diptera	Dicrotendipes sp.	57		57
Diptera	Diptera (LPIL)			100
Diptera	Polypedilum halterale group epler			129
Diptera	Procladius (holotanypus) sp.	57		86
Diptera	Procladius bellus var. 2 epler			57
Diptera	Procladius sp.		57	
Diptera	Pseudochironomus sp.		57	789
Diptera	Tanytarsini (LPIL)			57
Diptera	Tanytarsus sp.	230		215
Diptera	Tanytarsus sp. G epler			574
Diptera	Tanytarsus sp. K epler			29
Diptera	Tanytarsus sp. L epler			29

Table 3.3.3.1-2 (Sheet 2 of 2)
OWR Benthic Infauna Abundance per Species

Major Taxon	Organism Name	Number per m^2 Station 8	Station 9	Station10
Gastropoda	Cf. Pyrgophorus platyrachis			14
Gastropoda	Gastropoda (LPIL)			57
Gastropoda	Hydrobiidae (LPIL)		158	
Gastropoda	Pyrgophorus platyrachis	57	373	72
Hirudinea	Gloiobdella elongata			344
Hirudinea	Helobdella stagnalis	14		187
Isopoda	Caecidotea sp.			517
Nemertea	Nemertea (LPIL)		57	
Oligochaeta	Aulodrilus pigueti			115
Oligochaeta	Bratislavia unidentata			287
Oligochaeta	Dero digitata complex			230
Oligochaeta	Dero sp.			100
Oligochaeta	Ilyodrilus templetoni			215
Oligochaeta	Limnodrilus hoffmeisteri			344
Oligochaeta	Tubificoid naididae imm sp. A (LPIL)			15844
Oligochaeta	Tubificoid naididae imm sp. B (LPIL)			2870
Polychaeta	Boccardiella sp.		201	86
Polychaeta	Hobsonia florida	115	172	86
Polychaeta	Laeonereis culveri	344	502	
Polychaeta	Lumbrineris sp.		72	
Polychaeta	Steninonereis martini	646	57	
Trichoptera	Oecetis inconspicua complex pescador			57
Trichoptera	Trichoptera (pupae)			29
Total		**6,932**	**3,028**	**28,158**
Number of Taxa		**12**	**13**	**44**

Table 3.3.3.2-1
Fisheries Beach Seine CPUE for OWR

Common Name	Species Name	Station 8	Station 9	Station 10	CPUE Total	Percent Composition
Seminole killifish	*Fundulus seminolis*			10.0	10.0	33.3
Largemouth bass	*Micropterus salmoides*		1.0	8.0	9.0	30.0
Inland silverside	*Menidia beryllina*	3.5		2.0	5.5	18.3
Spotfin mojarra	*Eucinostomus argenteus*	2.0			2.0	6.7
Sunfish	*Lepomis sp.*			1.0	1.0	3.3
Golden shiner	*Notemigonus crysoleucas*			1.0	1.0	3.3
Mosquitofish	*Gambusia affinis*			0.5	0.5	1.7
Pinfish	*Lagodon rhomboides*	0.5			0.5	1.7
Sailfin molly	*Poecilia latipinna*			0.5	0.5	1.7
Total		**6.0**	**1.0**	**23.0**	**30.0**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.3.3.2-2
Fisheries Cast Net Sampling CPUE or OWR

Common Name	Species Name	Station 8	Station 9	Station 10	CPUE Total	Percent Composition
Bay anchovy	*Anchoa mitchilli*	0.5	1.0		1.5	15.8
Tidewater mojarra	*Eucinostomus harengulus*	1.5			1.5	15.8
Catfish	*Ameiurus sp.*			1.0	1.0	10.5
Florida gar	*Lepisosteus platyrhinchus*			1.0	1.0	10.5
Seminole killifish	*Fundulus seminolis*			1.0	1.0	10.5
Sheepshead	*Archosargus probatocephalus*	0.5	0.5		1.0	10.5
Redear sunfish	*Lepomis microlophus*			0.5	0.5	5.3
Sailfin armored catfish	*Pterygoplichthys sp.*			0.5	0.5	5.3
Largemouth bass	*Micropterus salmoides*	0.5			0.5	5.3
Pinfish	*Lagodon rhomboides*	0.5			0.5	5.3
Scaled sardine	*Harengula jaguana*	0.5			0.5	5.3
Total		**4.0**	**1.5**	**4.0**	**9.5**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 3.3.3.2-3
Fisheries Minnow Trap CPUE for OWR

Common Name	Species Name	Station 8	Station 9	Station 10	CPUE Total	Percent Composition
Bluefin Killifish	*Lucania goodie*			9.5	9.5	93.1
Largemouth bass	*Micropterus salmoides*		0.3		0.3	2.9
Swamp darter	*Etheostoma fusiforme*			0.2	0.2	2.0
Redbreast sunfish	*Lepomis auritus*		0.1		0.1	1.0
Sunfish	*Lepomis sp.*			0.1	0.1	1.0
Total		**0.0**	**0.4**	**9.8**	**10.2**	**100.0**

Note:

CPUE Total reflects the sum of composite efforts.

Table 4-1
Federally and State-Listed Threatened and Endangered Aquatic Species that have the Potential to Occur in the Vicinity of the LNP Site

Common Name	Scientific Name	Federal Status	State Status
Mammals			
West Indian manatee	*Trichechus manatus*	LE	LE
Reptiles			
American alligator[a]	*Alligator mississippiensis*	Treated as Threatened[a]	LS
Loggerhead sea turtle	*Caretta caretta*	LT	LT
Green sea turtle	*Chelonia mydas*	LE	LE
Leatherback sea turtle	*Dermochelys coriacea*	LE	LE
Hawksbill sea turtle	*Eretmochelys imbricata*	LE	LE
Kemp's Ridley sea turtle	*Lepidochelys.kempii*	LE	LE
Suwannee Cooter	*Pseudemys concinna suwanniensis*	N	LS
Fish			
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	LT	LS
Smalltooth sawfish	*Pristis pectinata*	LE	N

Notes:

a) The American alligator's federal status is "Treated as Threatened" by the USFWS due to the close resemblance to the American crocodile.

N = Not Listed
LE = Listed Endangered
LS = Listed State Species of Special Concern
LT = Listed Threatened
USFWS = U.S. Fish and Wildlife Service

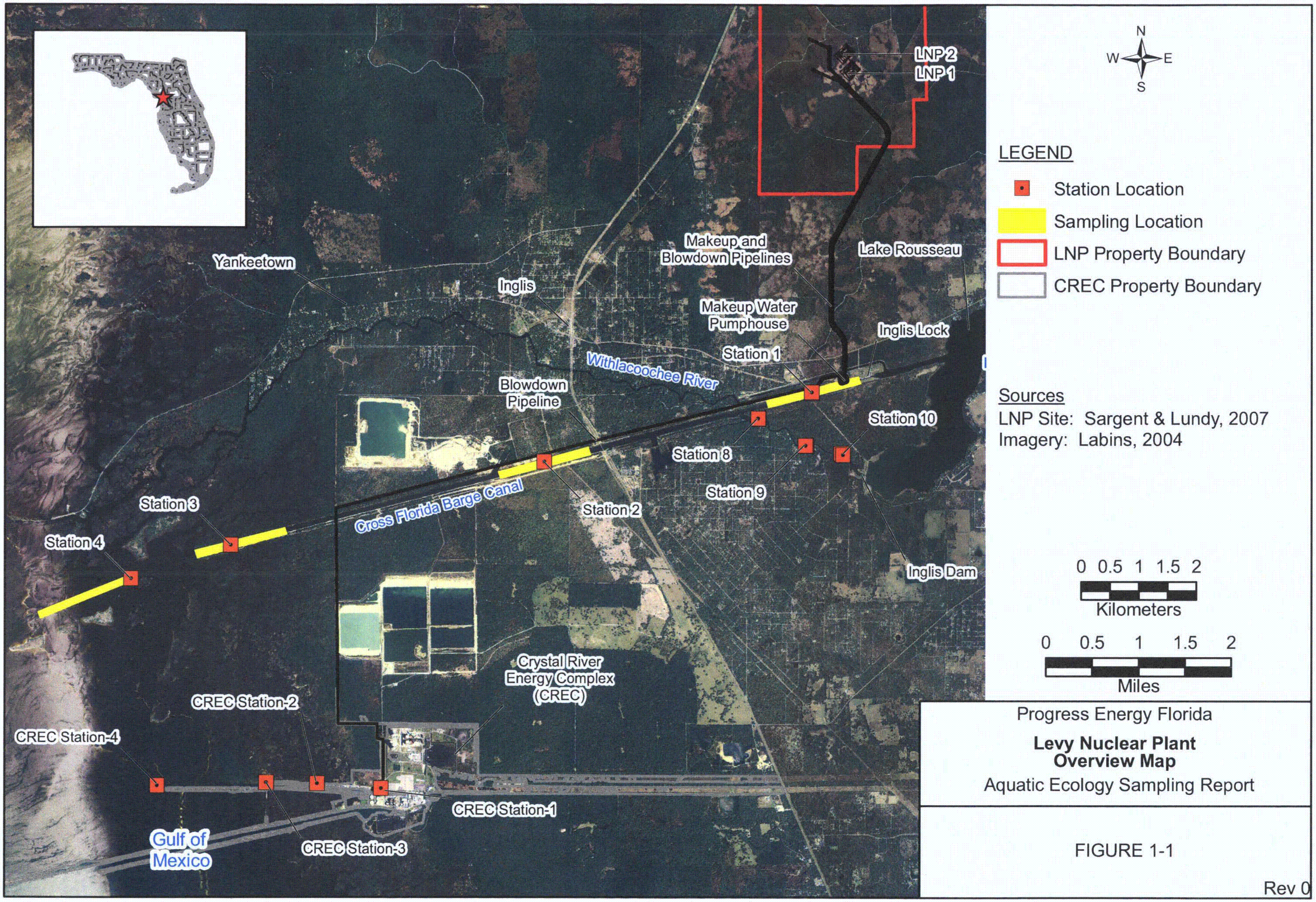
Source: Florida Fish and Wildlife Conservation Commission. 2007. "Florida's Endangered Species, Threatened Species, and Species of Special Concern."

Table 4-2
Federally and State Threatened and Endangered Aquatic Species Observations in the Cross Florida Barge Canal

Common Name	Scientific Name	Date	Location	Notes
West Indian manatee	*Trichechus manatus*	5/8/2007	Immediately downstream of the Inglis Lock	3 manatees (age indeterminate)
		10/16/2007	Near Station 3	One manatee (age indeterminate)
		11/13/2007	Near Station 4	1 adult manatee during an aerial survey
		12/4/2007	Southwest of Station 4 in the shallows	1 manatee (age indeterminate)
		5/1/2008	Near Station 2	1 adult manatee
		5/7/2008	Near Station 4	2 manatee, 1 adult and 1 juveniles
		5/27/2008	Near Station 1	6 manatee, 2 adults 4 juveniles
		6/18/2008	Near Station 4	2 juveniles swimming along shoreline
		7/21/2008	Near Station 2	1 adult manatee
		10/28/2008	Near Station 4	1 manatee (age indeterminate) swimming upstream with floating marker attached
American alligator	*Alligator mississippiensis*	10/16/2007	Near Station 2	1 adult alligator on the CFBC bank
		10/16/2007	Near Station 1	1 alligator (age indeterminate)
		10/16/2007	Near Station 3	1 alligator (age indeterminate)
Sea turtles	Not Identified to species	September, October and December 2007	Near Station 7	Five (5) brief encounters between October and December 2007. Age and species indeterminate

Table 4-3
Federally and State Threatened and Endangered Aquatic Species Observations in the Crystal River Energy Discharge

Common Name	Scientific Name	Date	Location	Notes
West Indian manatee	*Trichechus manatus*	9/3/2008	Near Station 3	1 adult manatee swimming east in discharge canal toward plant
		4/17/2008	Near Station 3	Approximately 12 adult manatee swimming in discharge canal and adjacent shallows
		4/18/2008	Near Station 3	Approximately 10 manatee swimming in discharge canal. At least one mother and juvenile
		5/1/2008	Near Station 3	Approximately 6 adult manatee swimming in discharge canal
		5/2/2008	Near Station 3	Approximately 6 adult manatee swimming in discharge canal
		7/23/2008	Near Station 3	1 manatee (age indeterminate)
		11/10 – 11/17/2008	Near Stations 1, 2, and 3	Approximately 15-20 manatee observed each day in the discharge canal (inside and outside floating barrier) and in shallows near canal
Sea turtles	Not Identified to species	8/27/08	Near Station 4	Sea turtle observed at surface
		11/12/2008	Near Station 3	Sea turtle observed at surface



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Levy Nuclear Plant Overview Map

Aquatic Ecology Sampling Report

FIGURE 1-1

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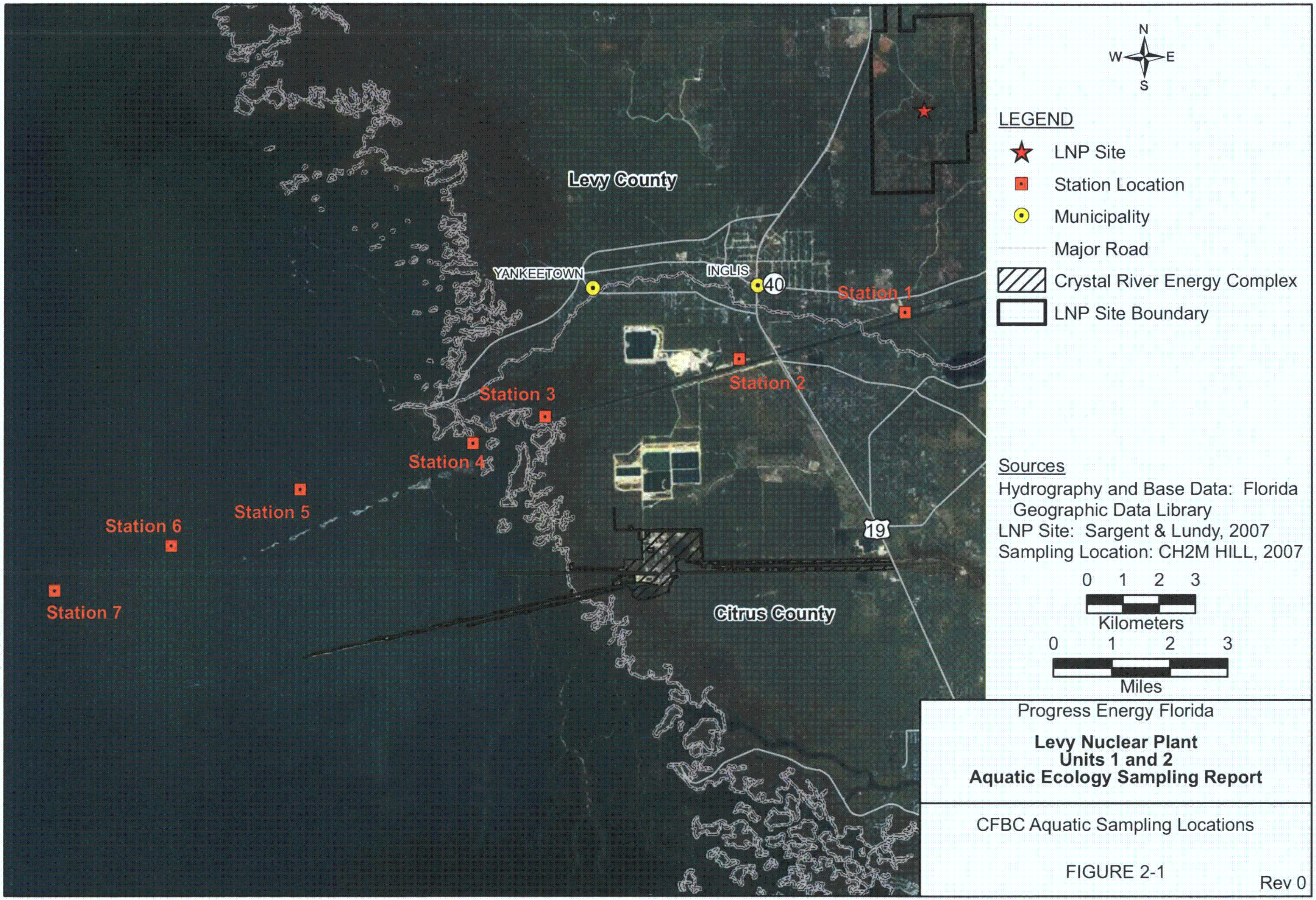

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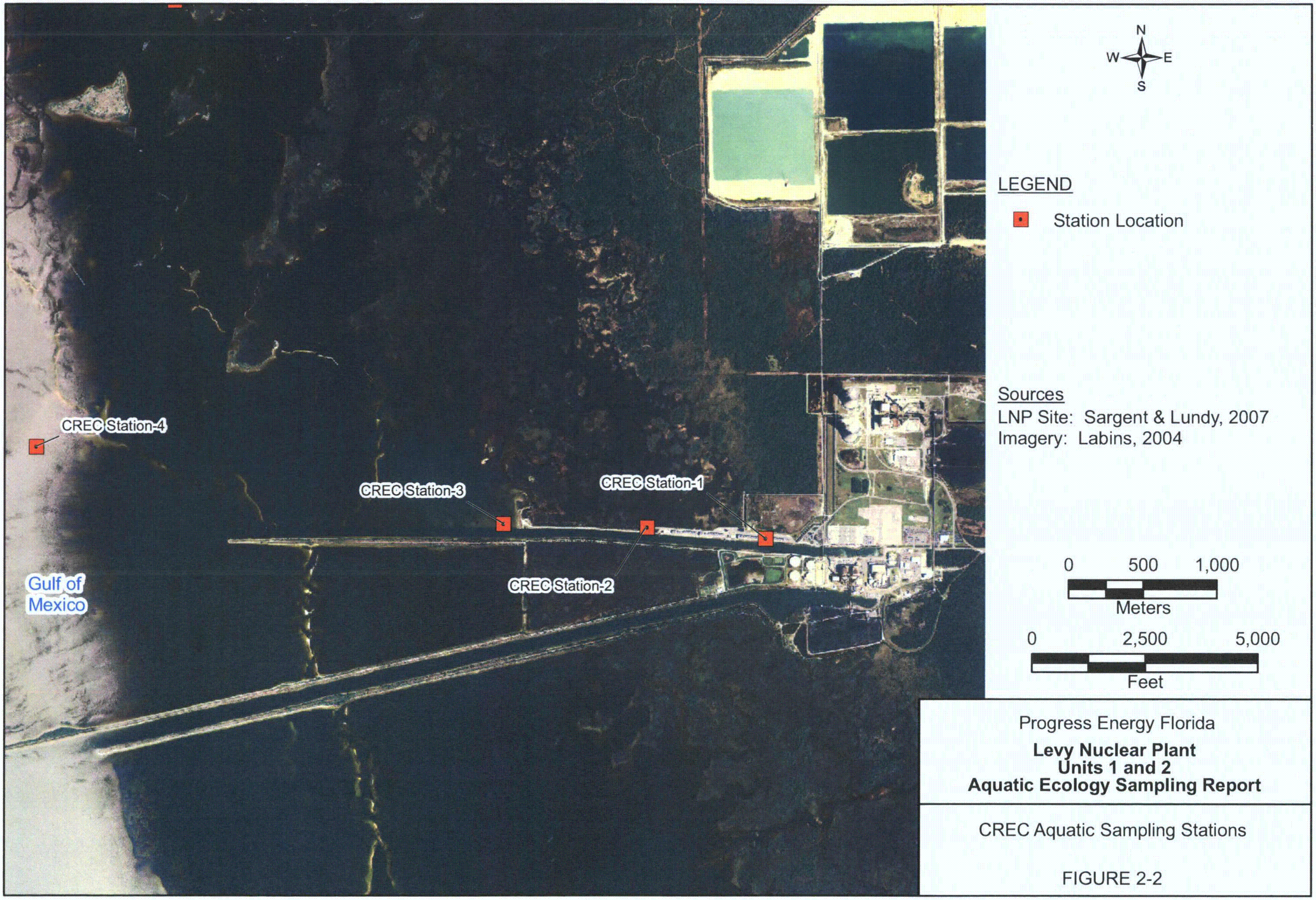

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Aquatic Ecology Sampling Report

CREC Aquatic Sampling Stations

FIGURE 2-2

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LEGEND

Station Location

Sources
LNP Site: Sargent & Lundy, 2007
Imagery: Labins, 2004

0 250 500
Meters

0 1,000 2,000
Feet

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Units 1 and 2
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OWR Aquatic Sampling Stations

FIGURE 2-3

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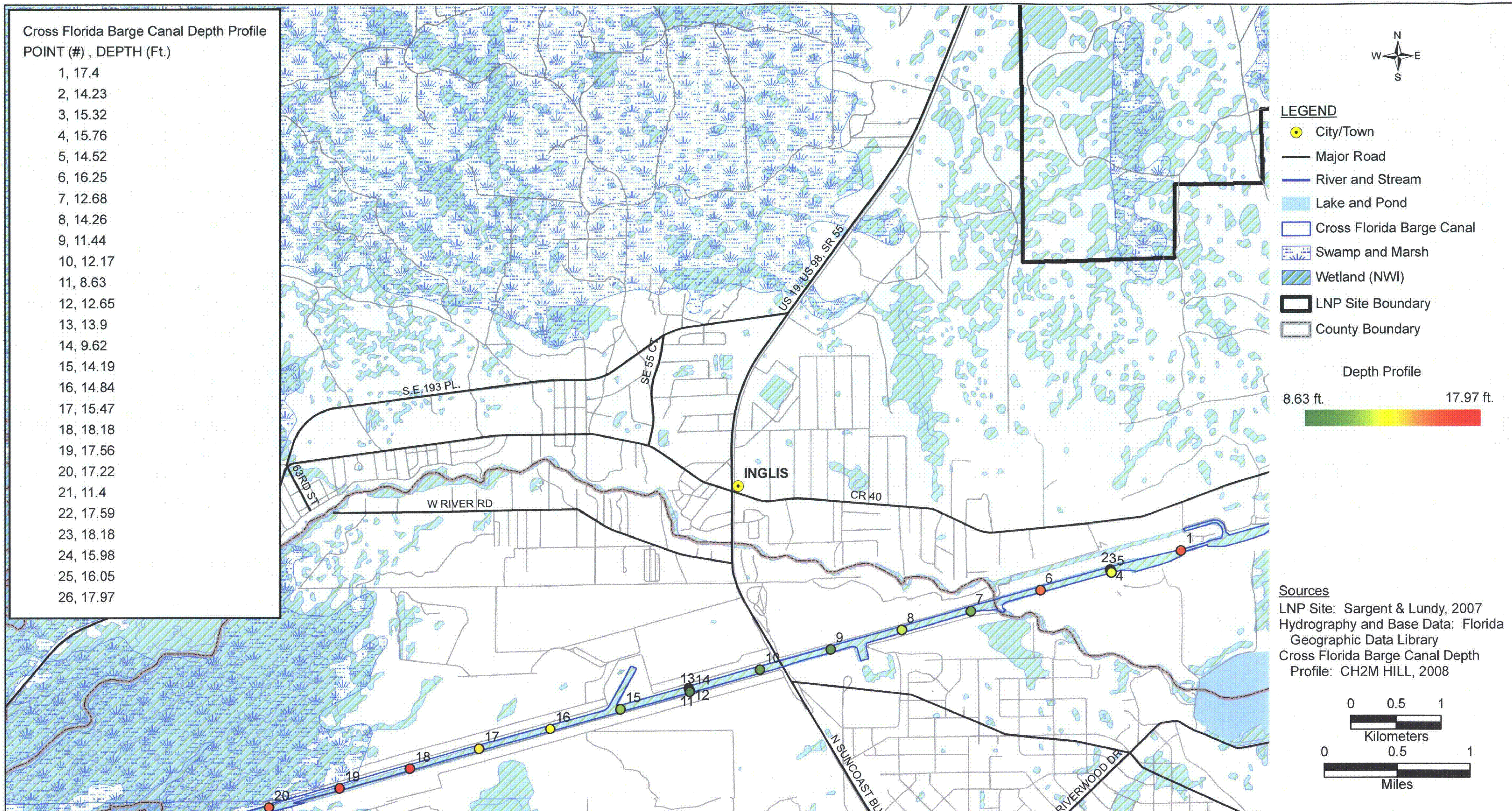

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

CFBC Depth Profile

FIGURE 3.1.2-1

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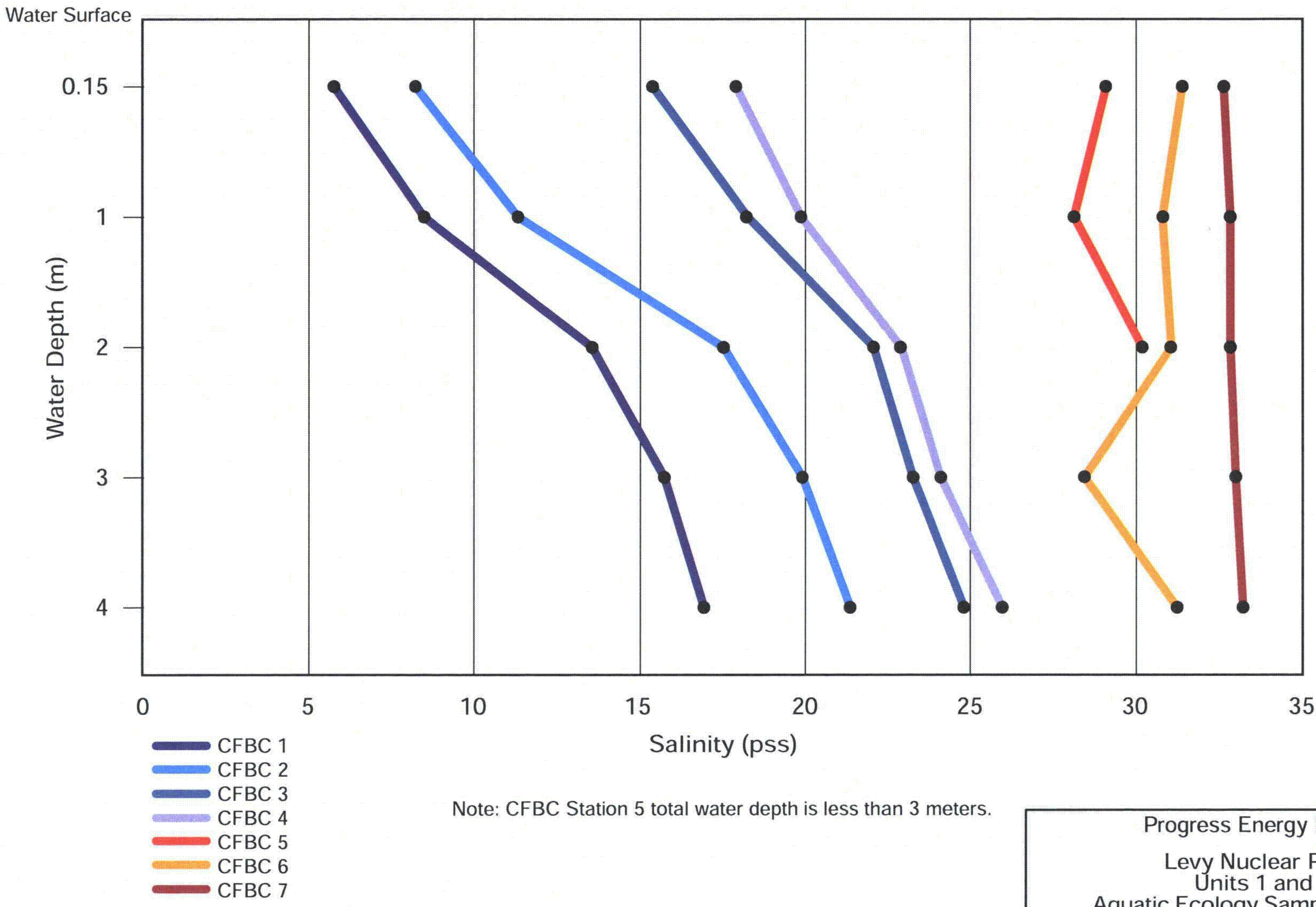

Note: CFBC Station 5 total water depth is less than 3 meters.

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Average Salinity (pss) at CFBC Stations

FIGURE 3.1.2-2

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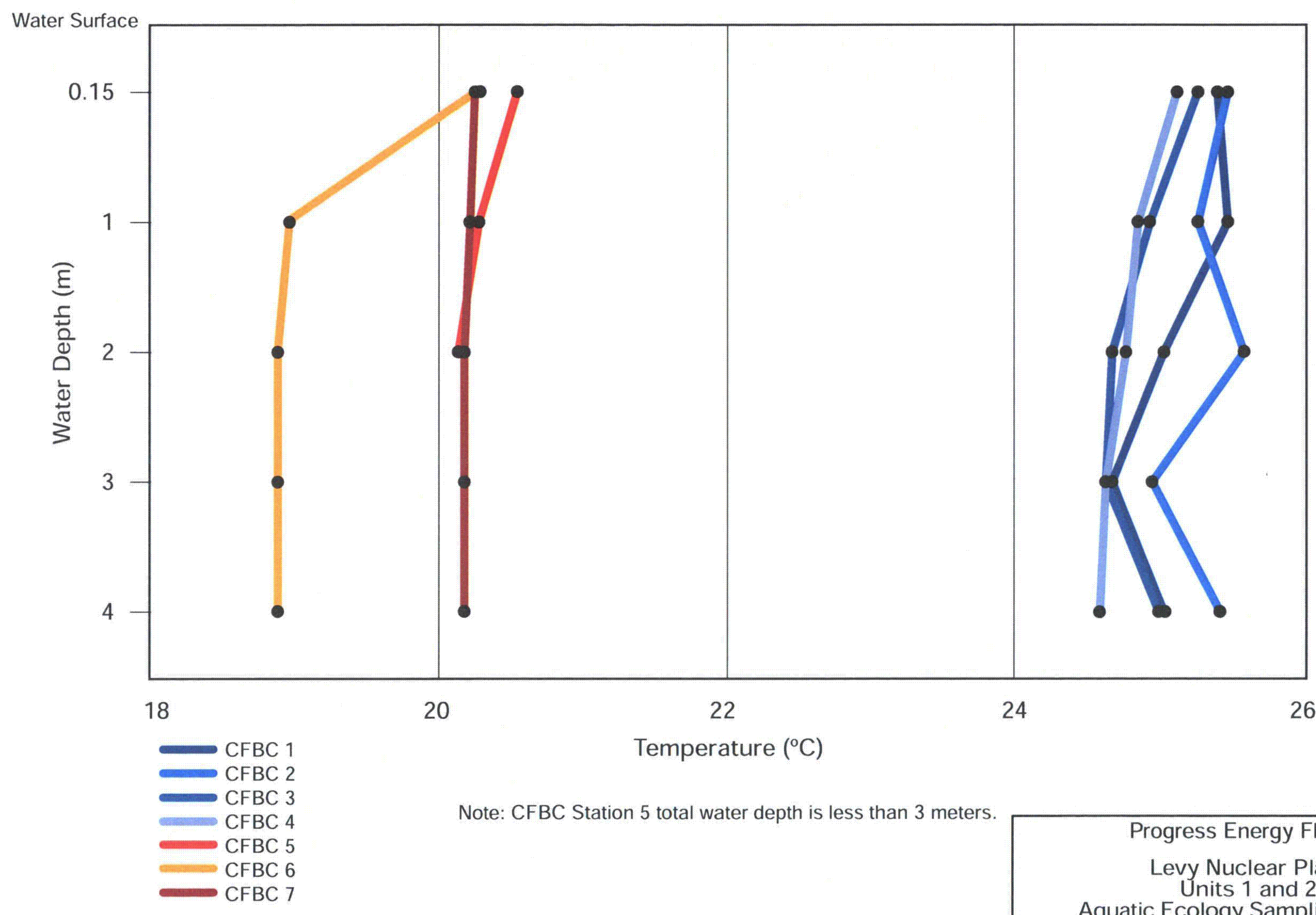

Note: CFBC Station 5 total water depth is less than 3 meters.

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Average Temperature (°C) at CFBC Stations

FIGURE 3.1.2-3

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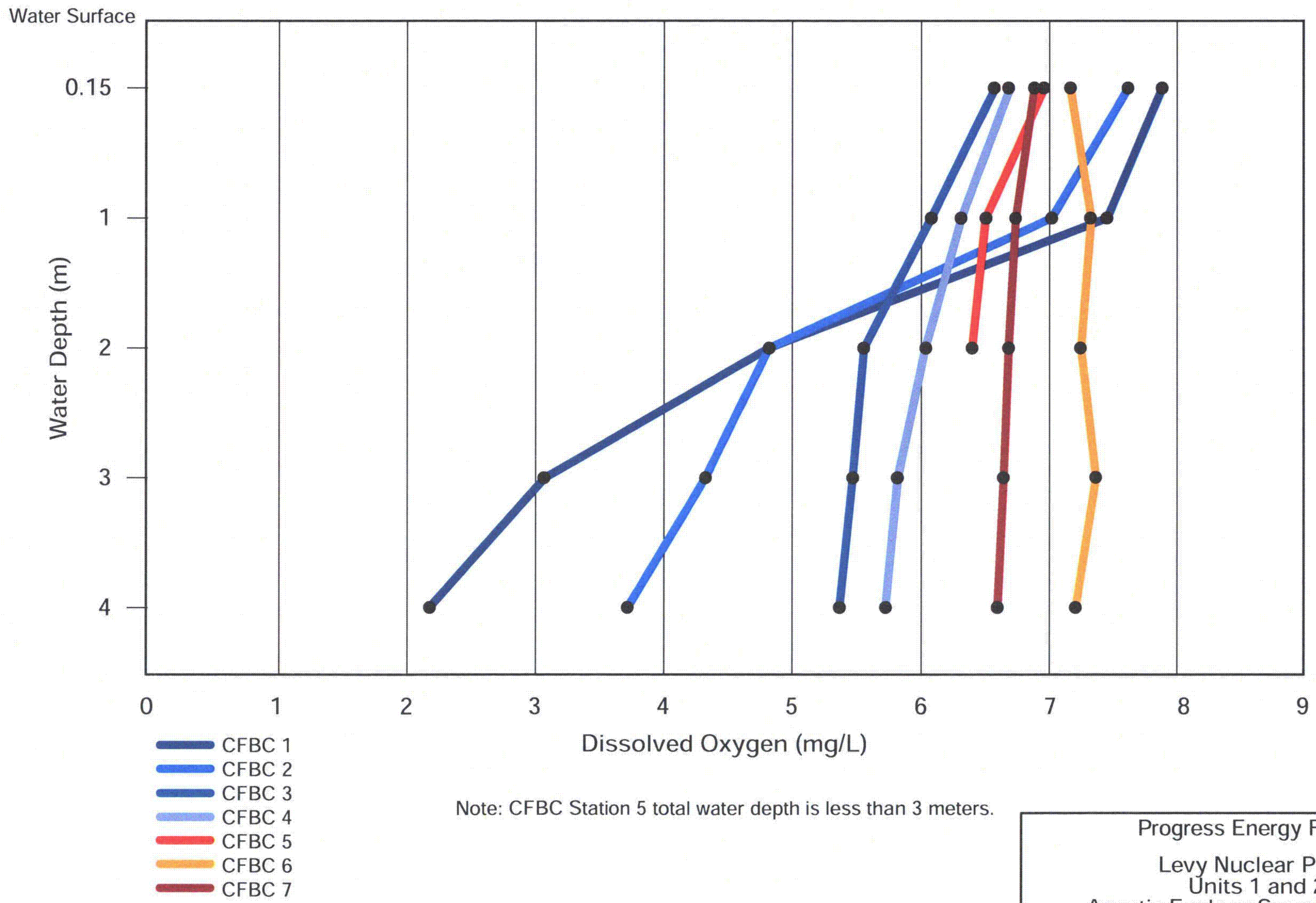

Note: CFBC Station 5 total water depth is less than 3 meters.

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Average Dissolved Oxygen (mg/L)
at CFBC Stations

FIGURE 3.1.2-4

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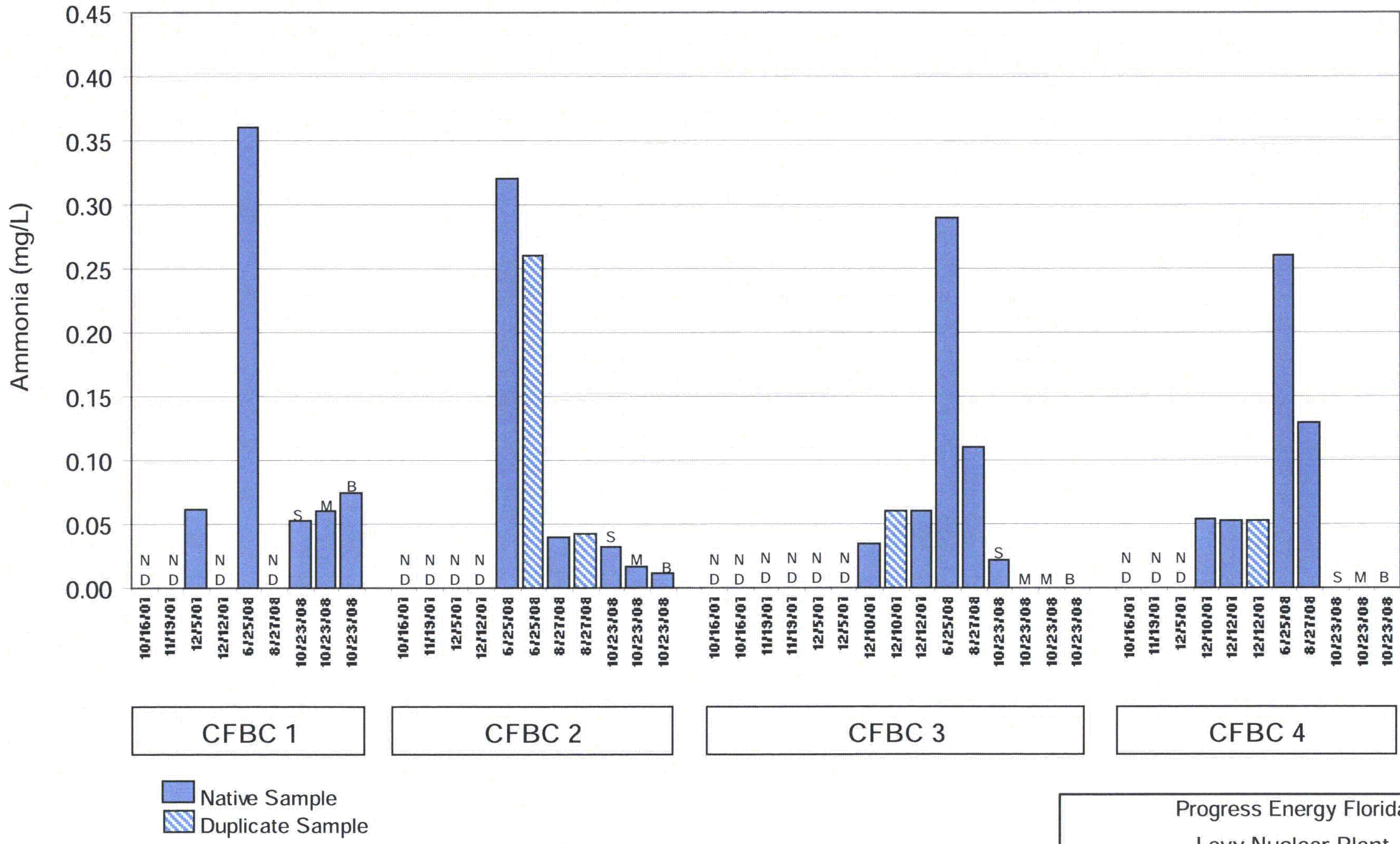

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Levy Nuclear Plant
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Ammonia (mg/L) at CFBC Stations

FIGURE 3.1.2-5

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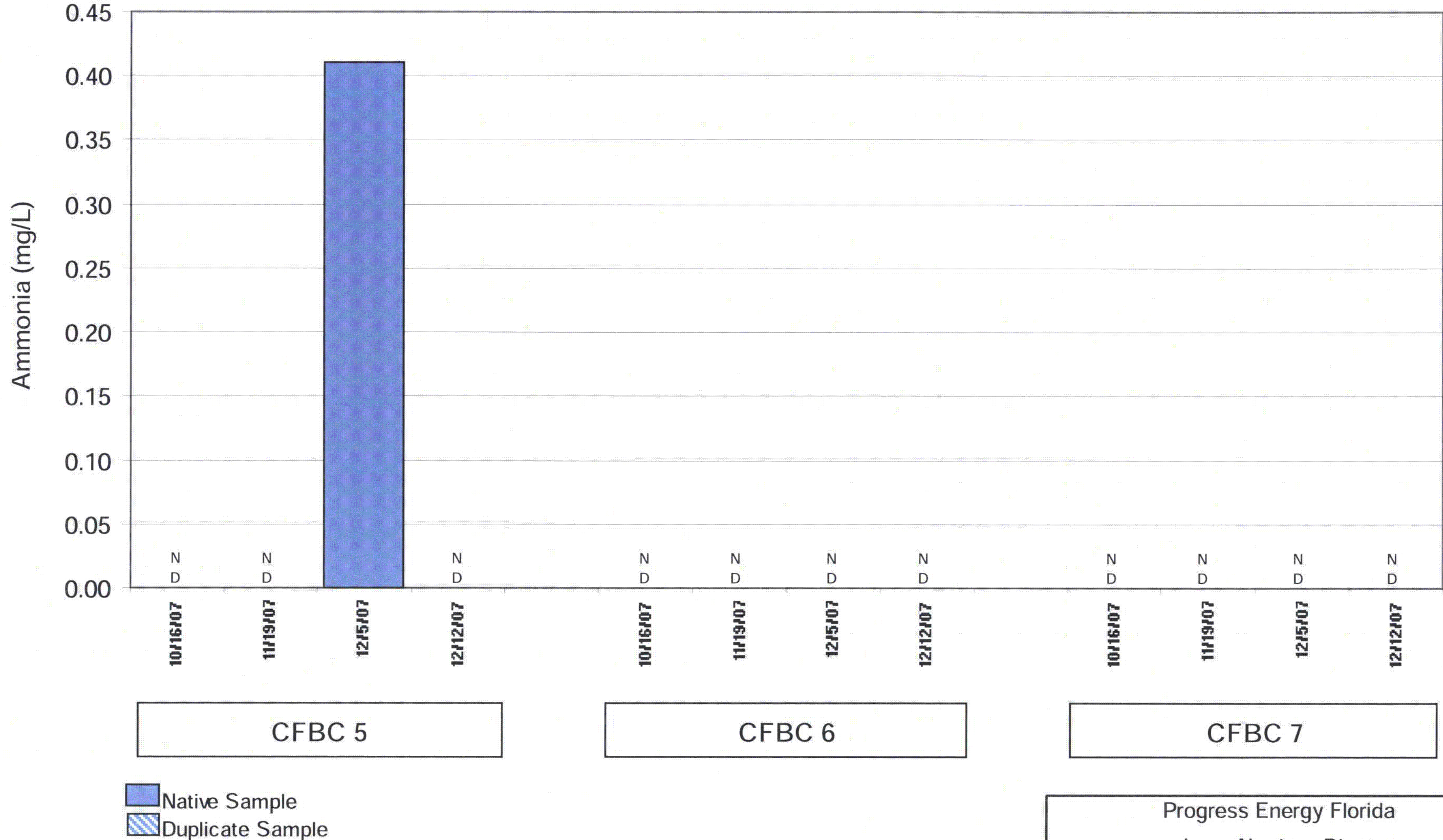

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Levy Nuclear Plant
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Ammonia (mg/L) Offshore of the CFBC

FIGURE 3.1.2-6

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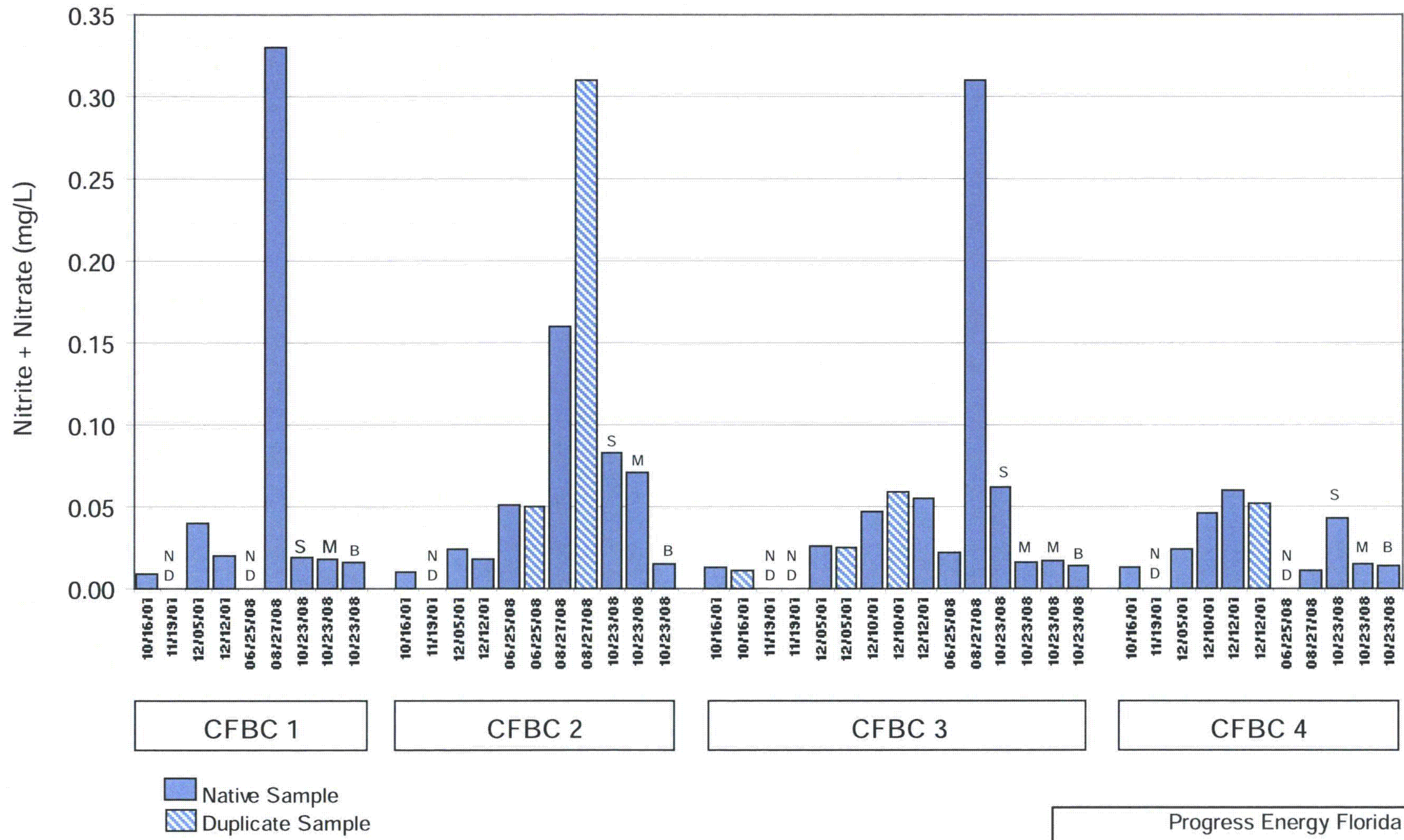

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Nitrite + Nitrate Nitrogen (mg/L) at
CFBC Stations
FIGURE 3.1.2-7

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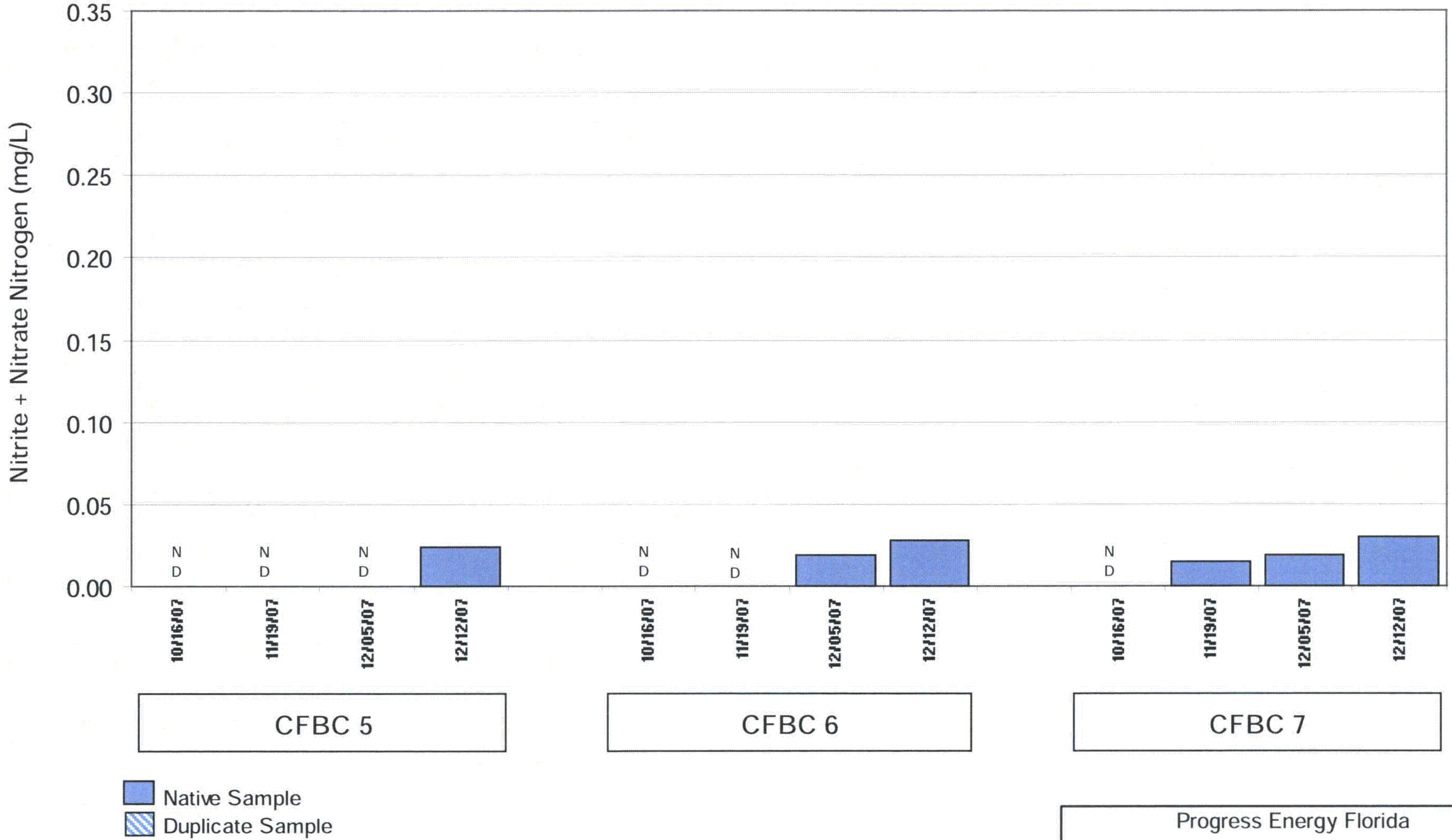

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Levy Nuclear Plant
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Nitrite + Nitrate Nitrogen (mg/L)
Offshore of the CFBC
FIGURE 3.1.2-8

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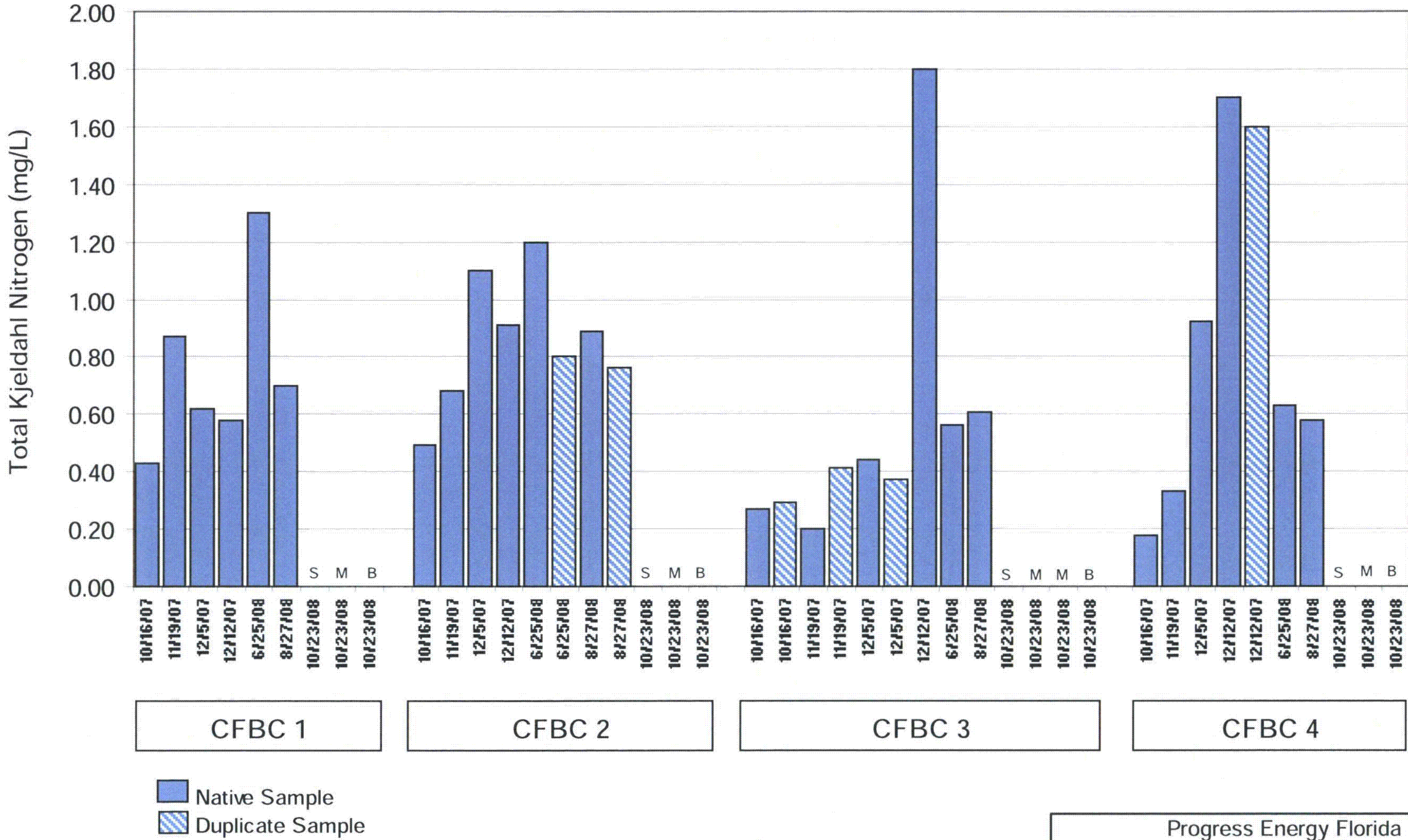

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Levy Nuclear Plant
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Total Kjeldahl Nitrogen (mg/L) at
CFBC Stations

FIGURE 3.1.2-9

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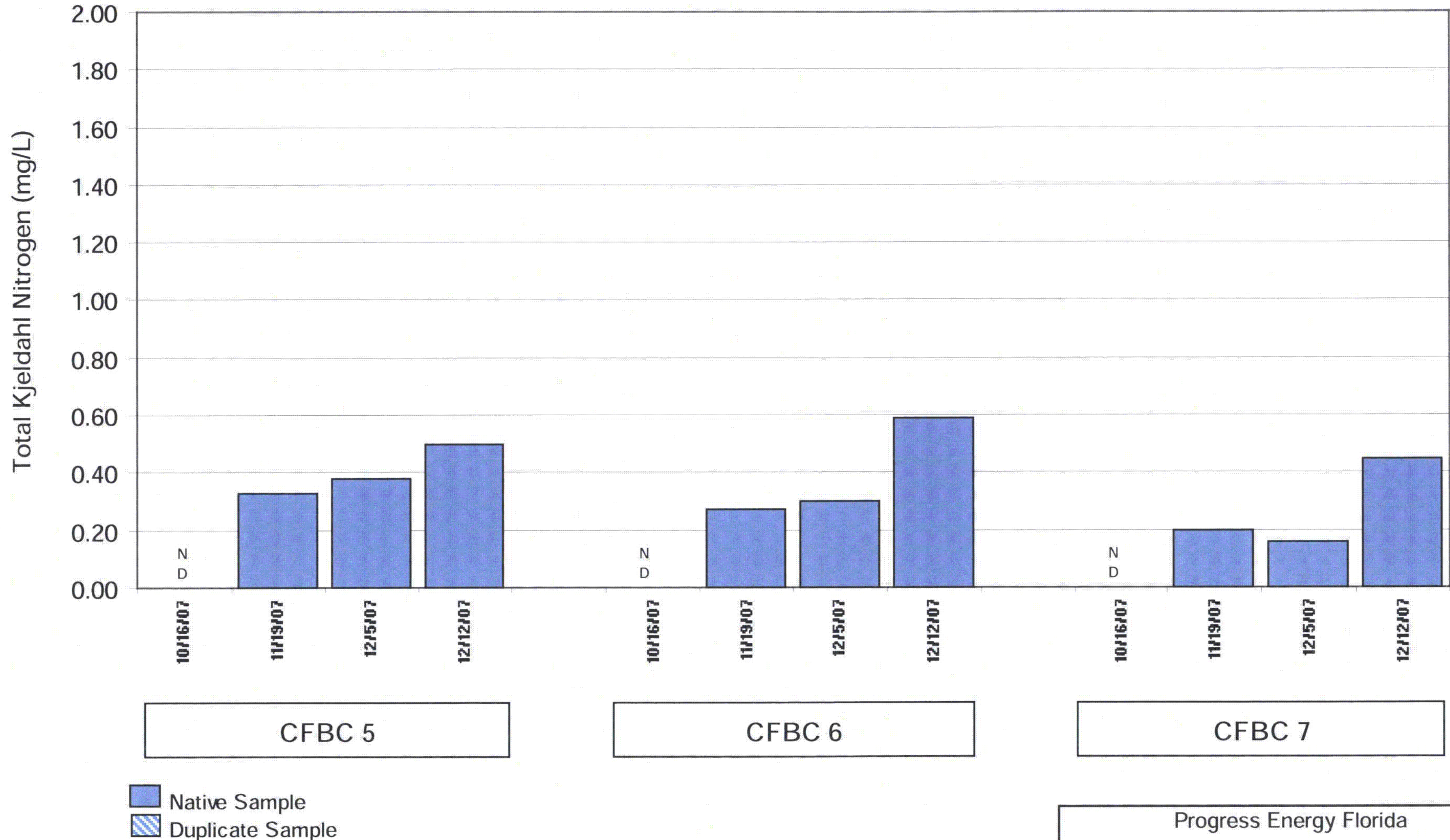

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Total Kjeldahl Nitrogen (mg/L)
Offshore of the CFBC

FIGURE 3.1.2-10

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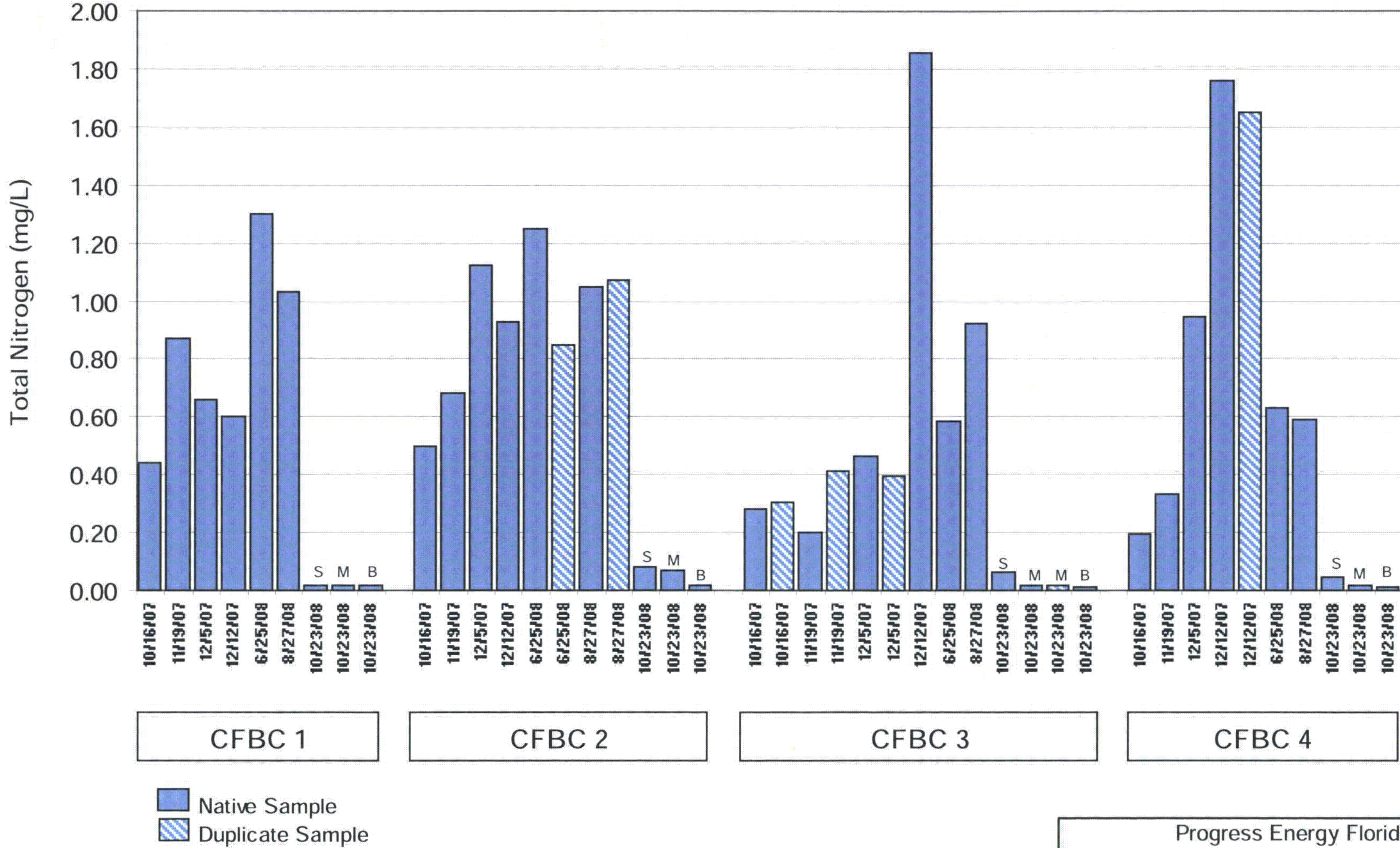

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample

ND = Not Detected, below method detection limit or reporting limit

Note: All other samples taken at mid depth unless otherwise noted.

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Units 1 and 2
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Total Nitrogen (mg/L) at CFBC Stations

FIGURE 3.1.2-11

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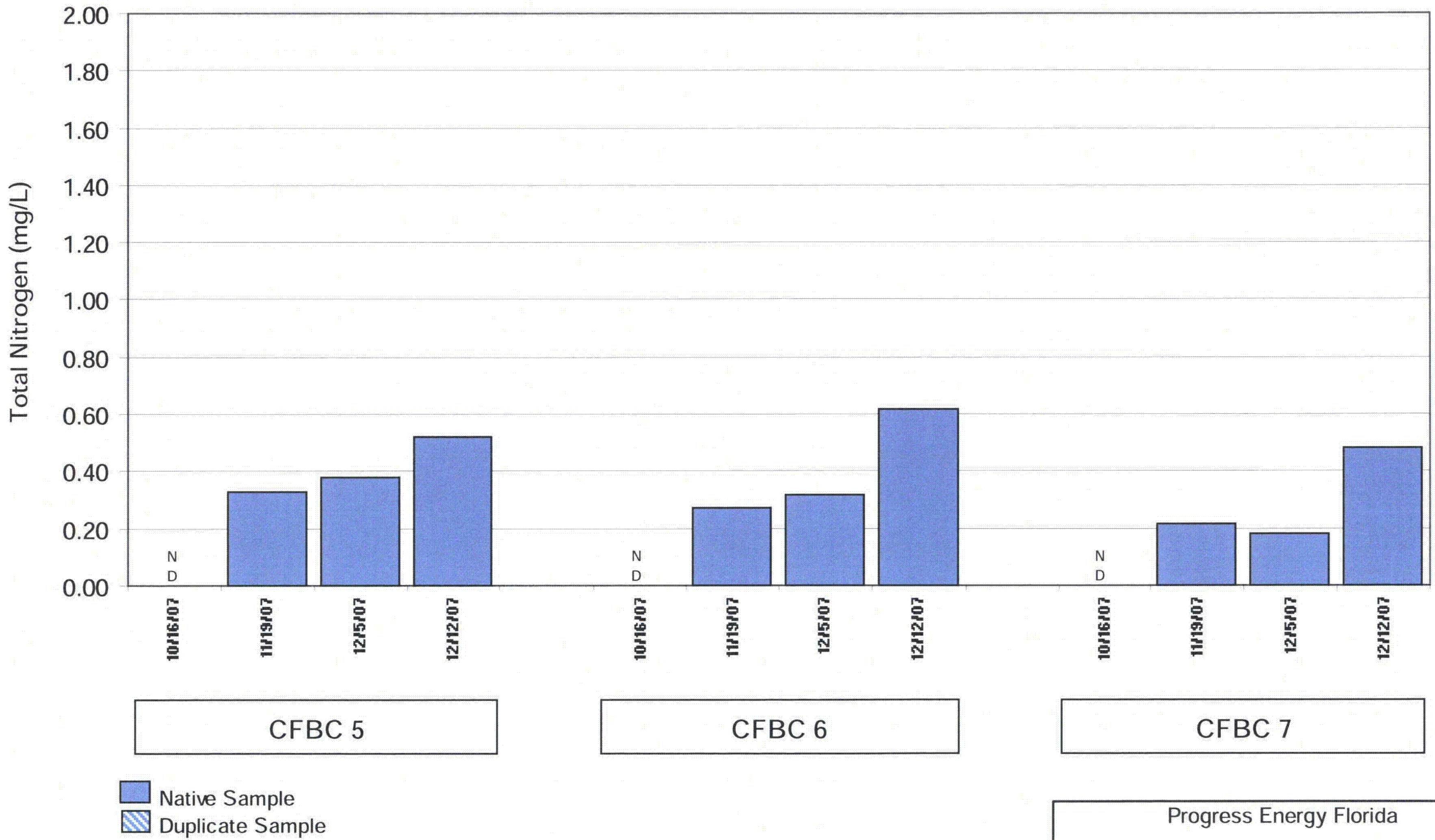

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Units 1 and 2
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Total Nitrogen (mg/L) Offshore of the CFBC

FIGURE 3.1.2-12

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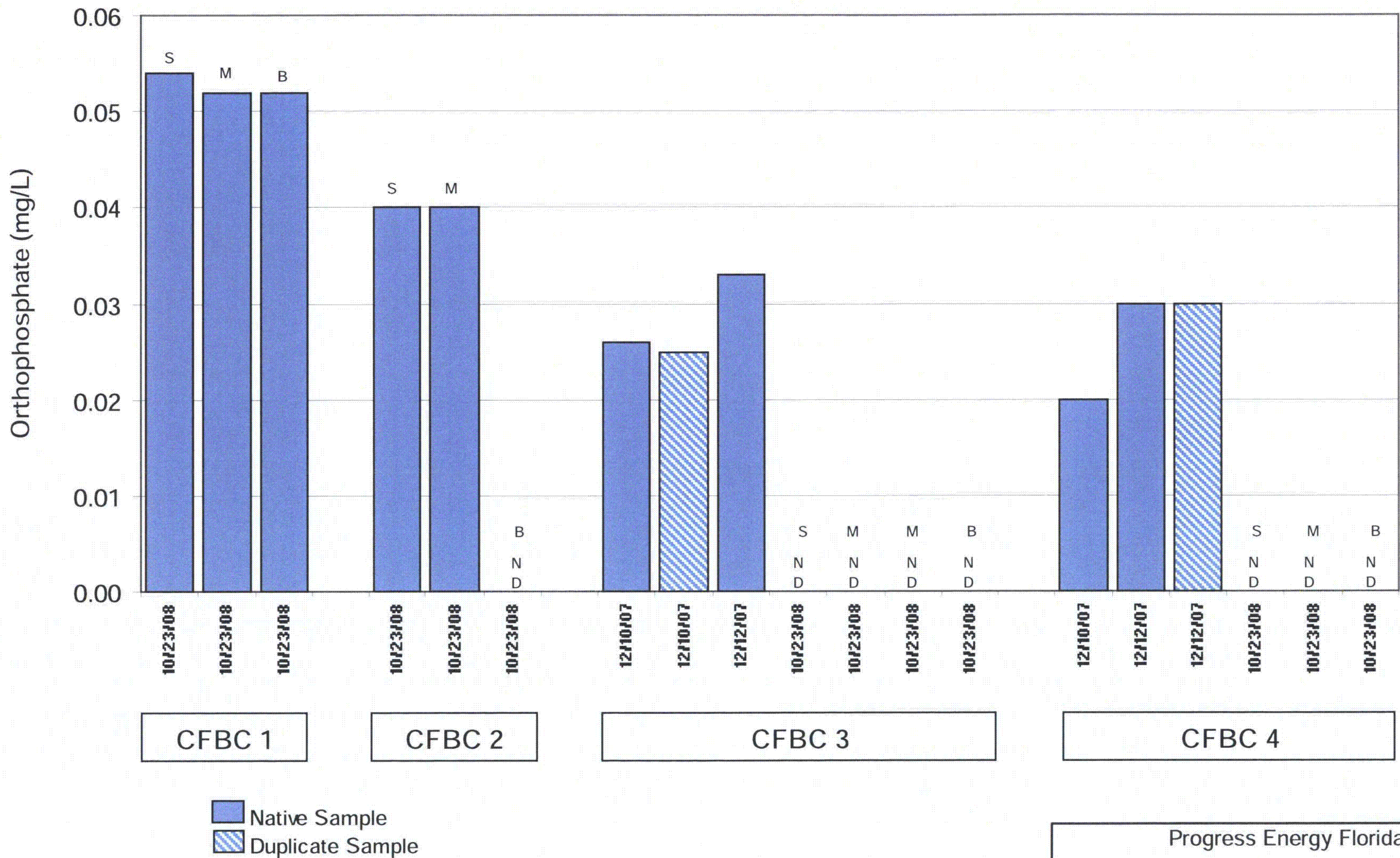

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Orthophosphate (mg/L) at CFBC Stations FIGURE 3.1.2-13 Rev 0

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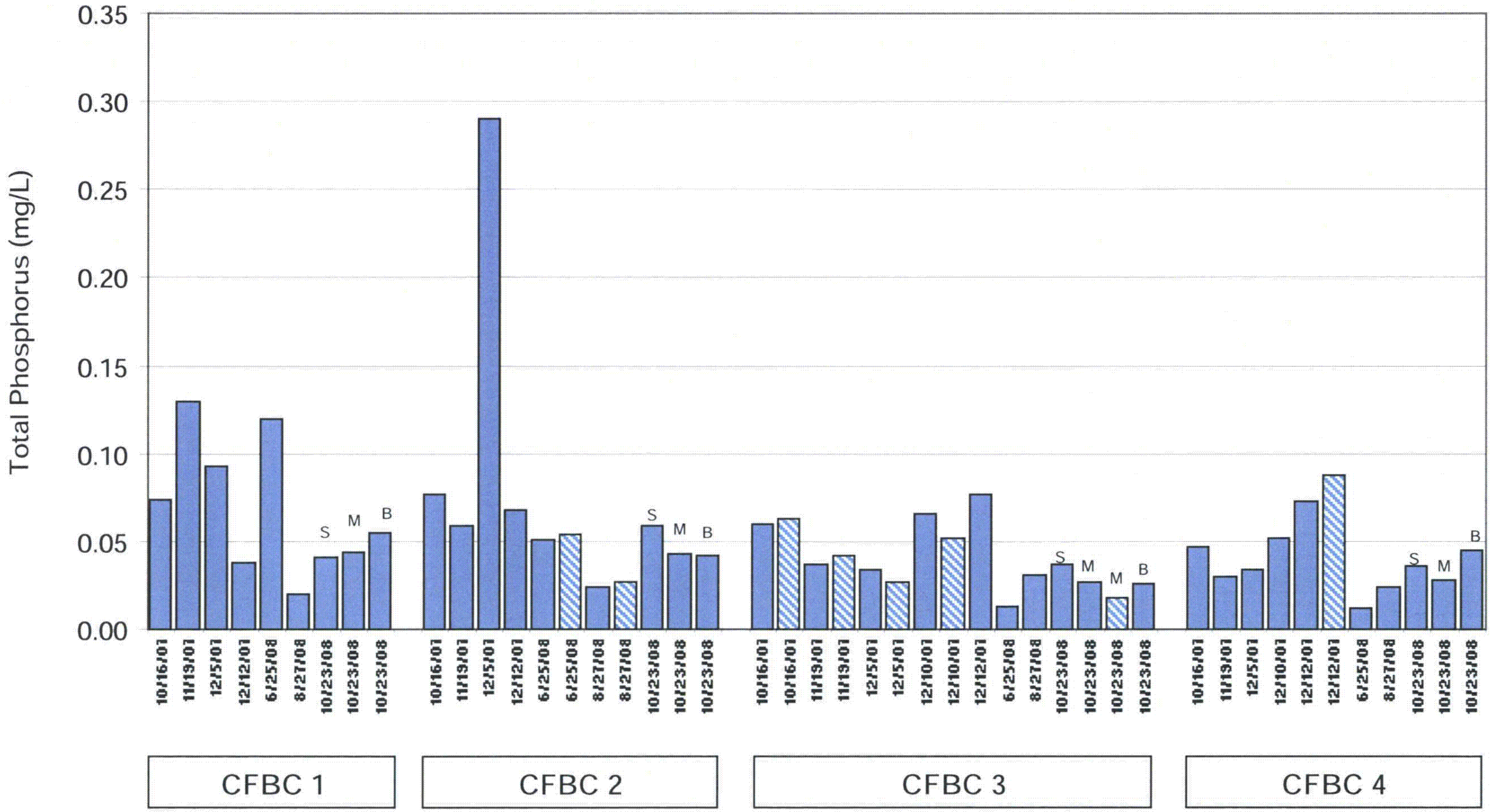

Native Sample
Duplicate Sample

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Units 1 and 2
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Total Phosphorus (mg/L) at CFBC Stations

FIGURE 3.1.2-14

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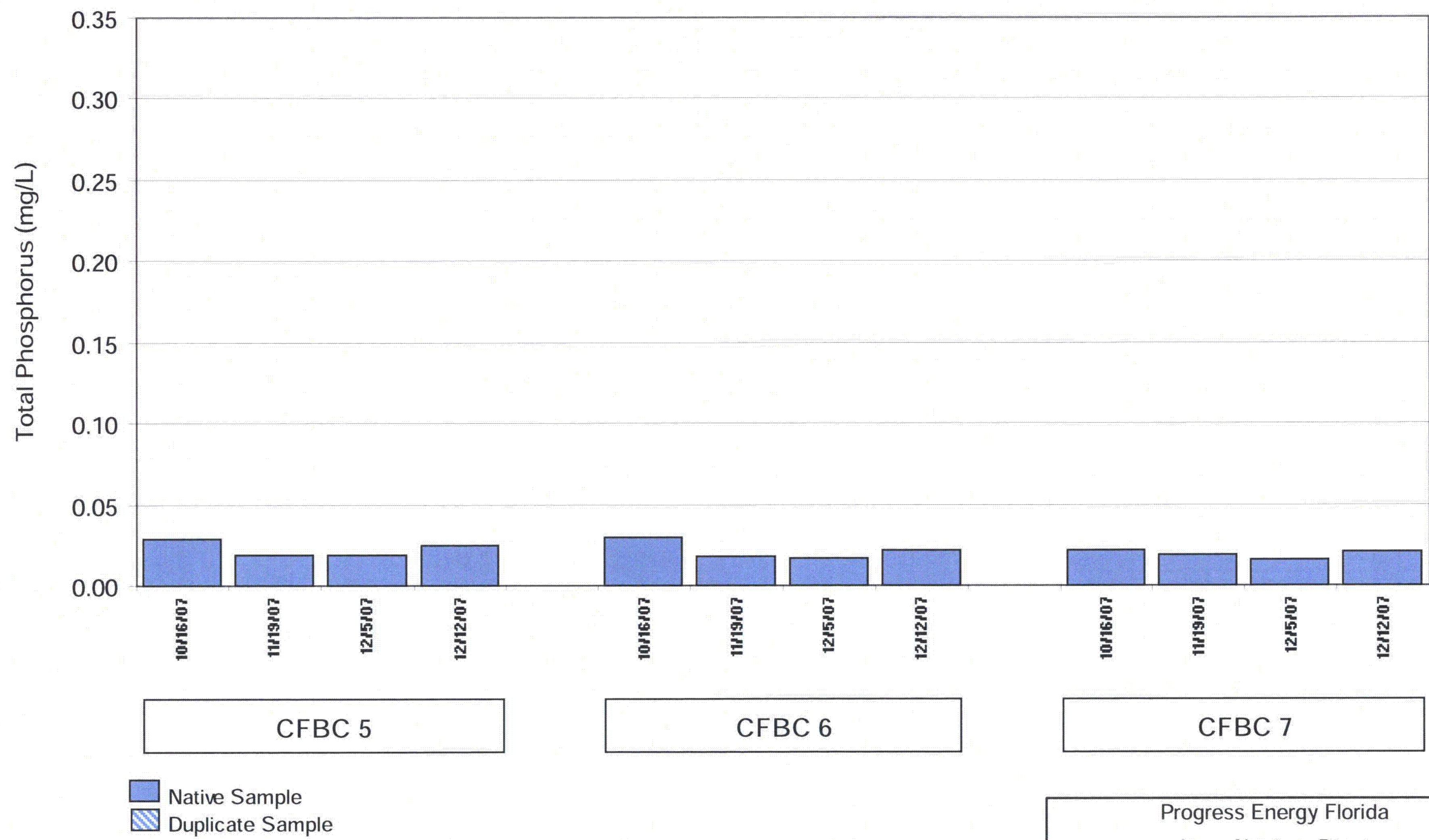

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Units 1 and 2
Aquatic Ecology Sampling Report

Total Phosphorus (mg/L) Offshore of the CFBC

FIGURE 3.1.2-15

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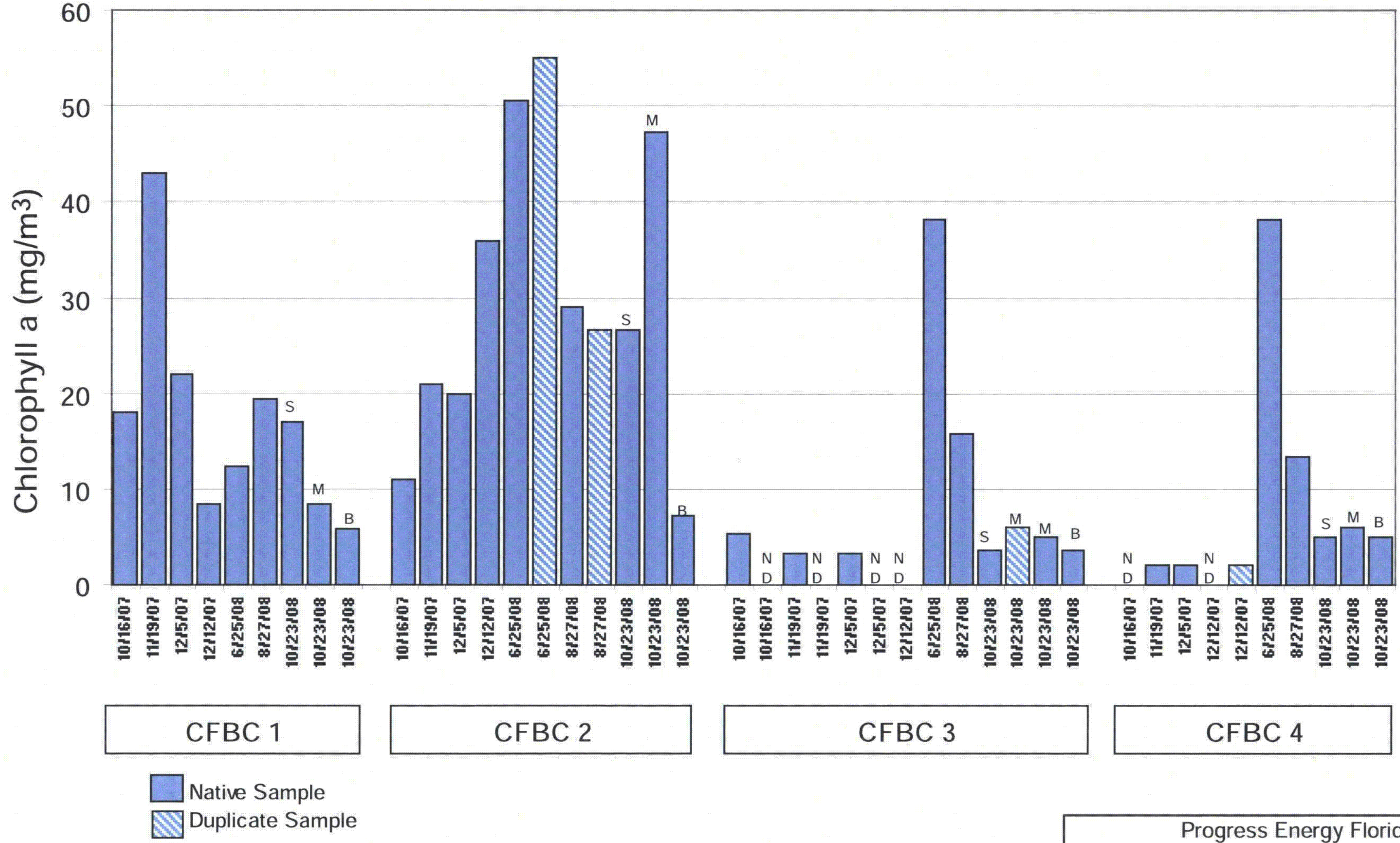

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Units 1 and 2
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Chlorophyll a (mg/m^3) at CFBC Stations

FIGURE 3.1.2-16

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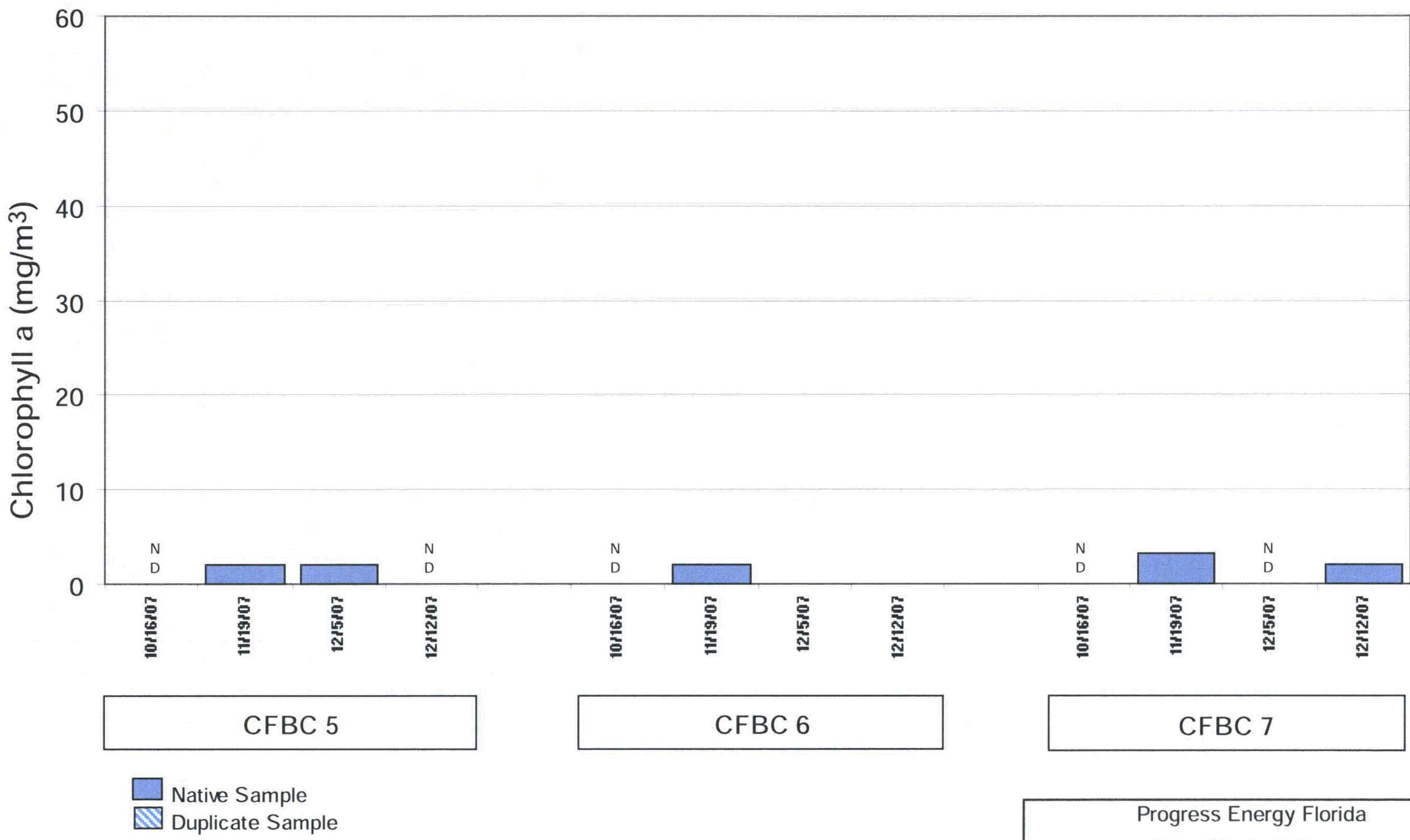

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Chlorophyll a (mg/m^3) Offshore of the CFBC

FIGURE 3.1.2-17

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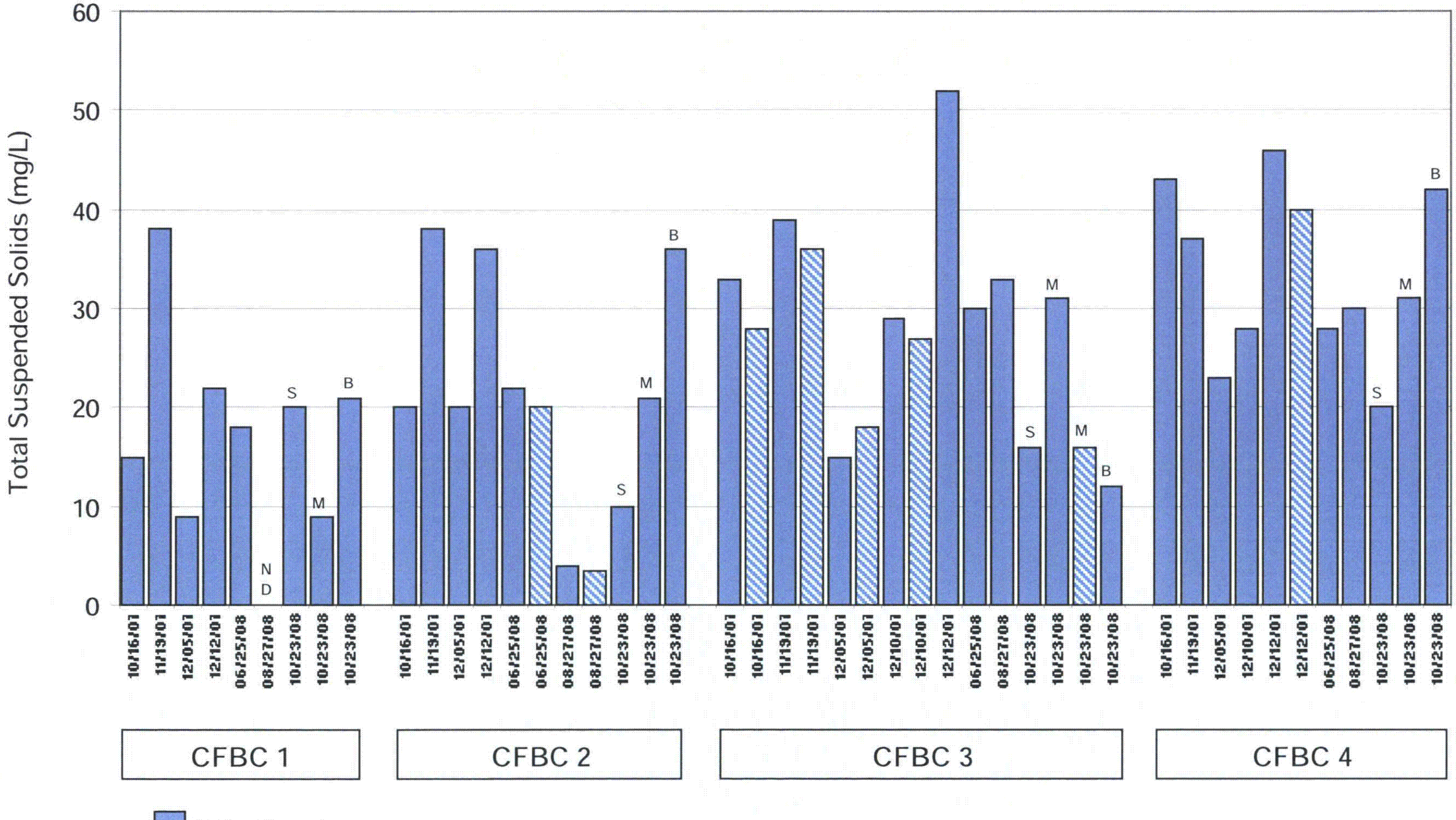

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Total Suspended Solids (mg/L) at
CFBC Stations

FIGURE 3.1.2-18

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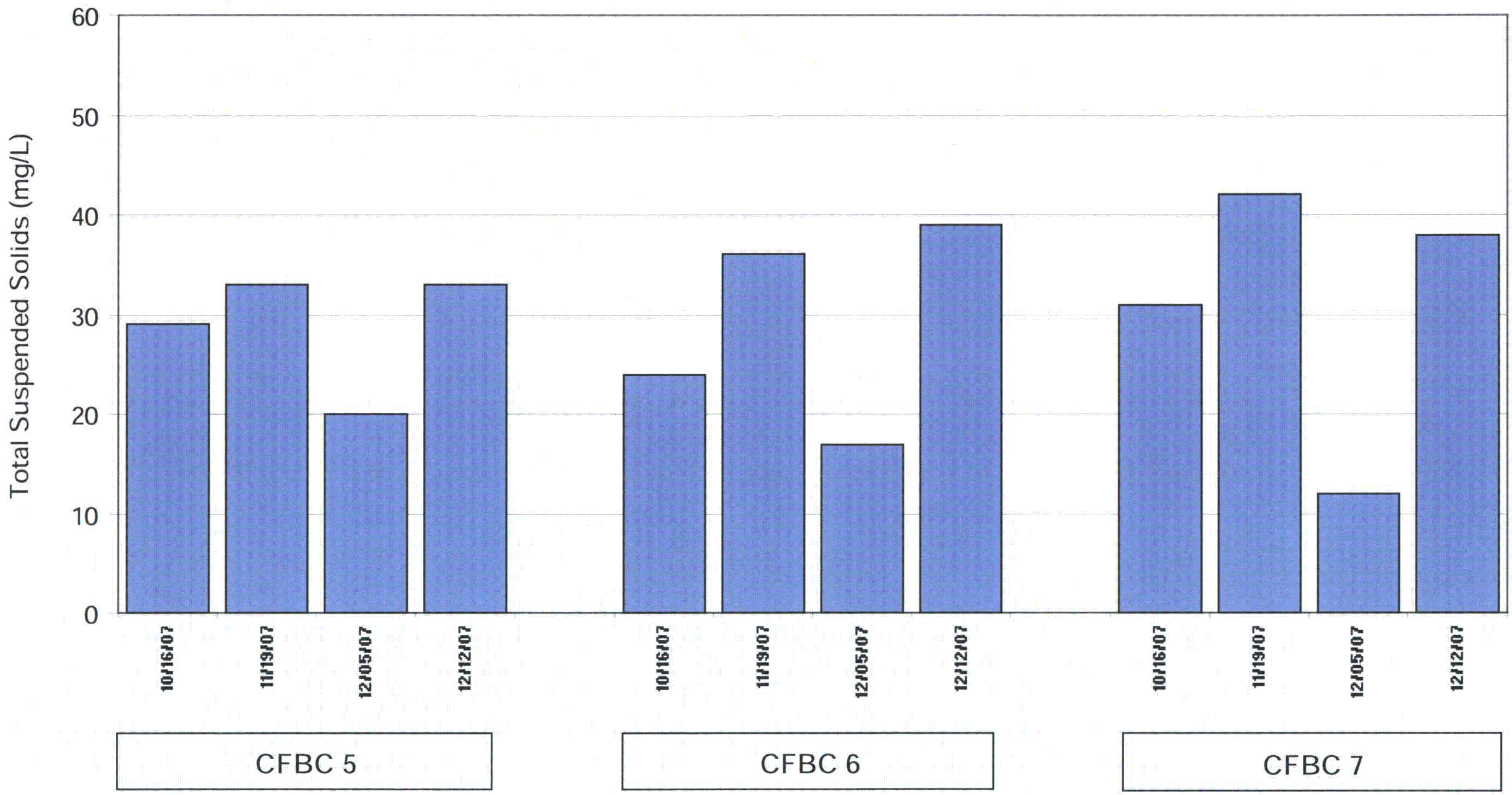

Native Sample
Duplicate Sample

S = Near Surface Sample, M = Mid Depth Sample, B = Near Bottom Sample
ND = Not Detected, below method detection limit or reporting limit
Note: All other samples taken at mid depth unless otherwise noted.

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Units 1 and 2
Aquatic Ecology Sampling Report

Total Suspended Solids (mg/L)
Offshore of the CFBC

FIGURE 3.1.2-19

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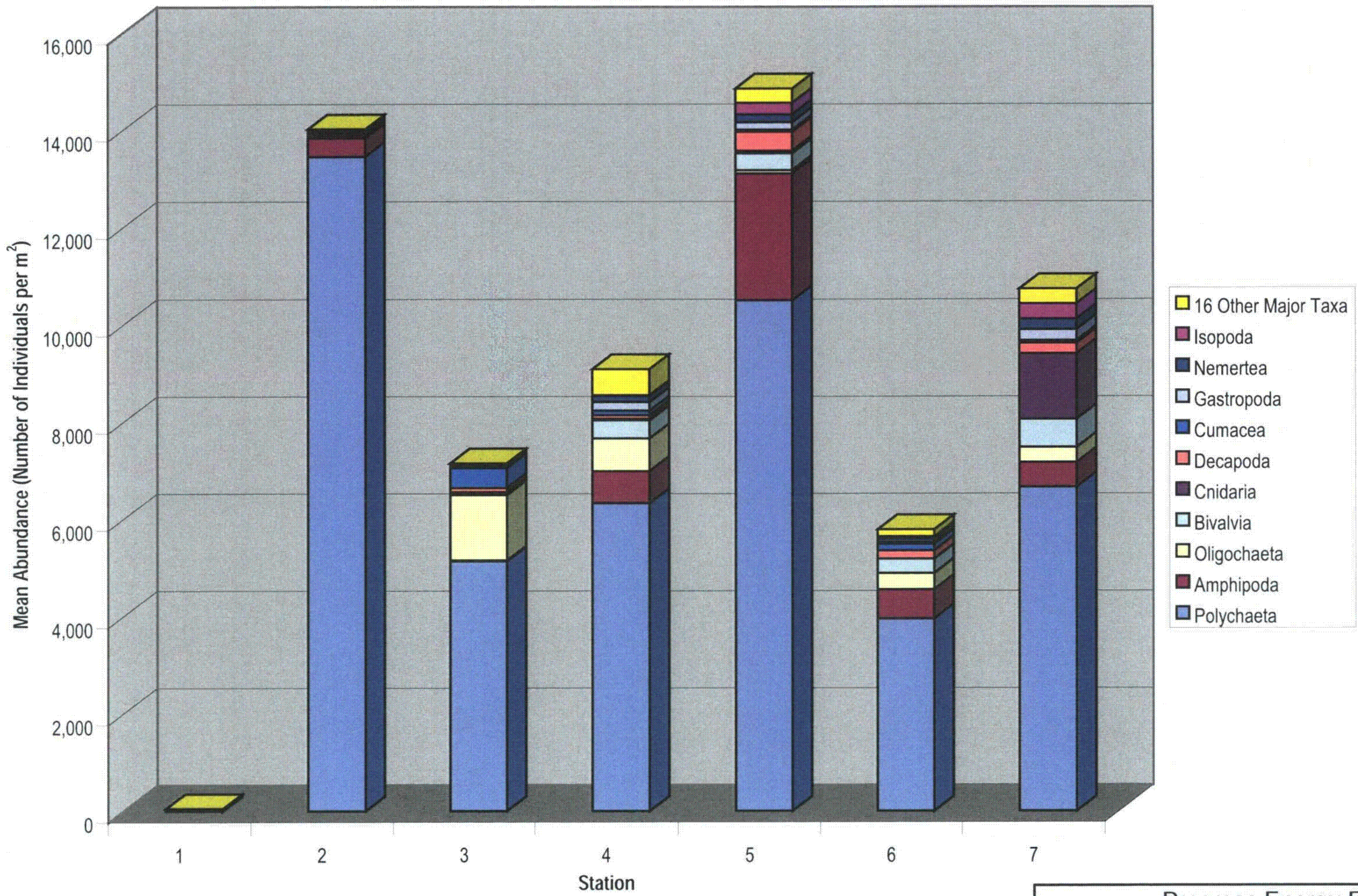

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Benthic Infauna Mean Abundance and Composition at Stations in the CFBC

FIGURE 3.1.3.1-1

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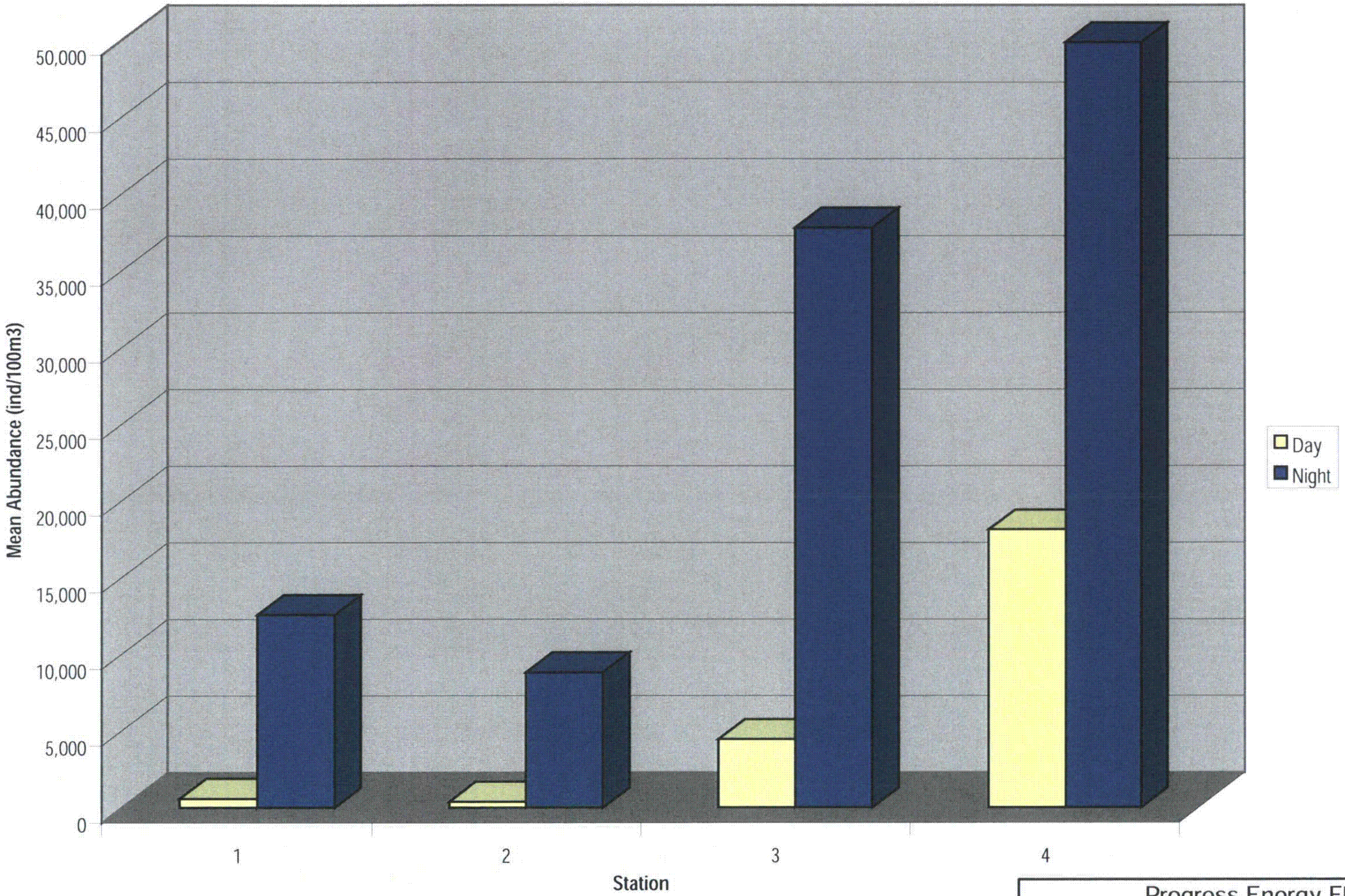

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Holoplankton Diurnal Variation in the CFBC

FIGURE 3.1.3.2-1

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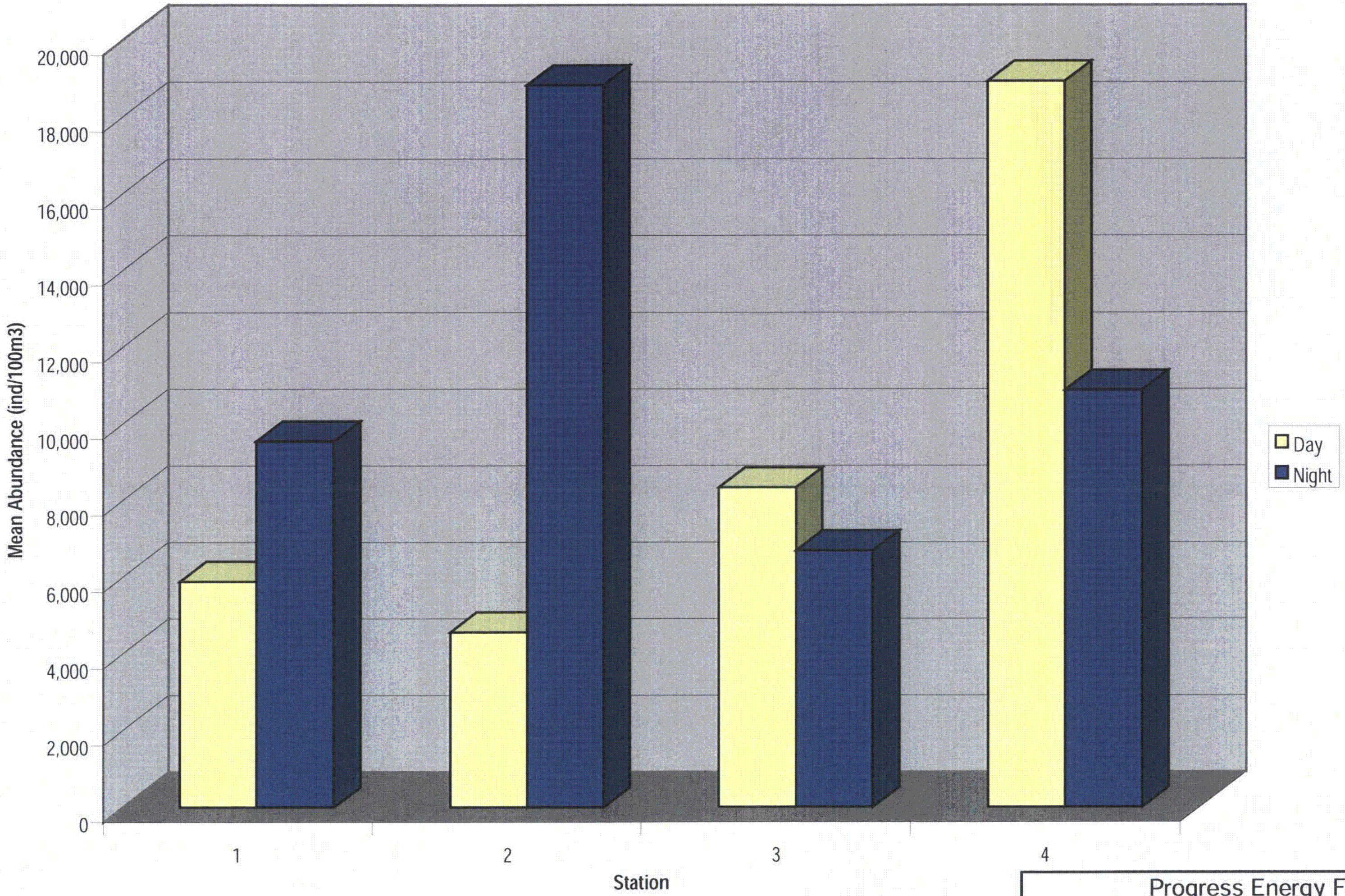

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Aquatic Ecology Sampling Report

Meroplankton Diurnal Variation in the CFBC

FIGURE 3.1.3.2-2

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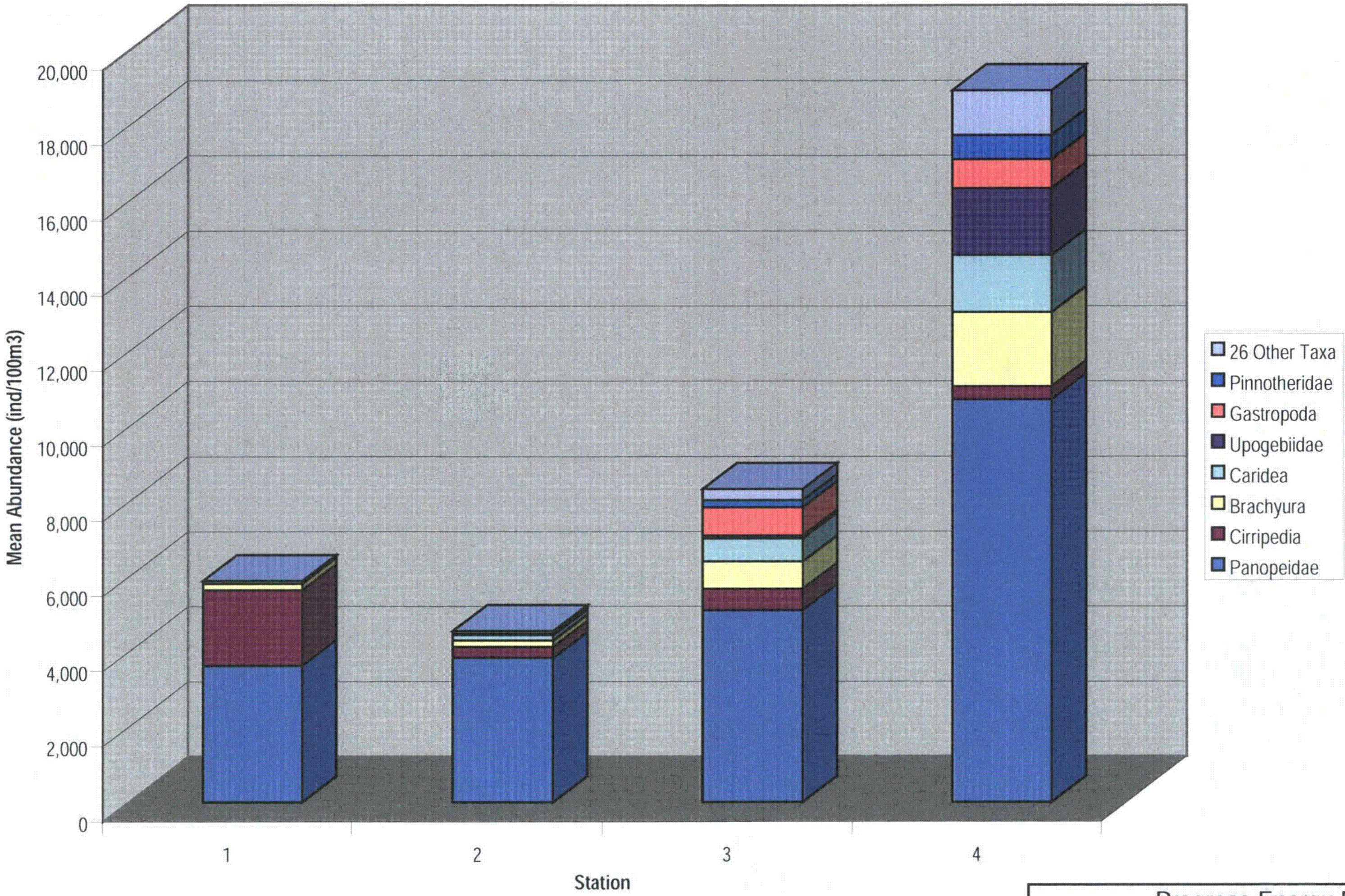

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Daytime Meroplankton Mean Abundance and Composition for Stations in the CFBC

FIGURE 3.1.3.2-3

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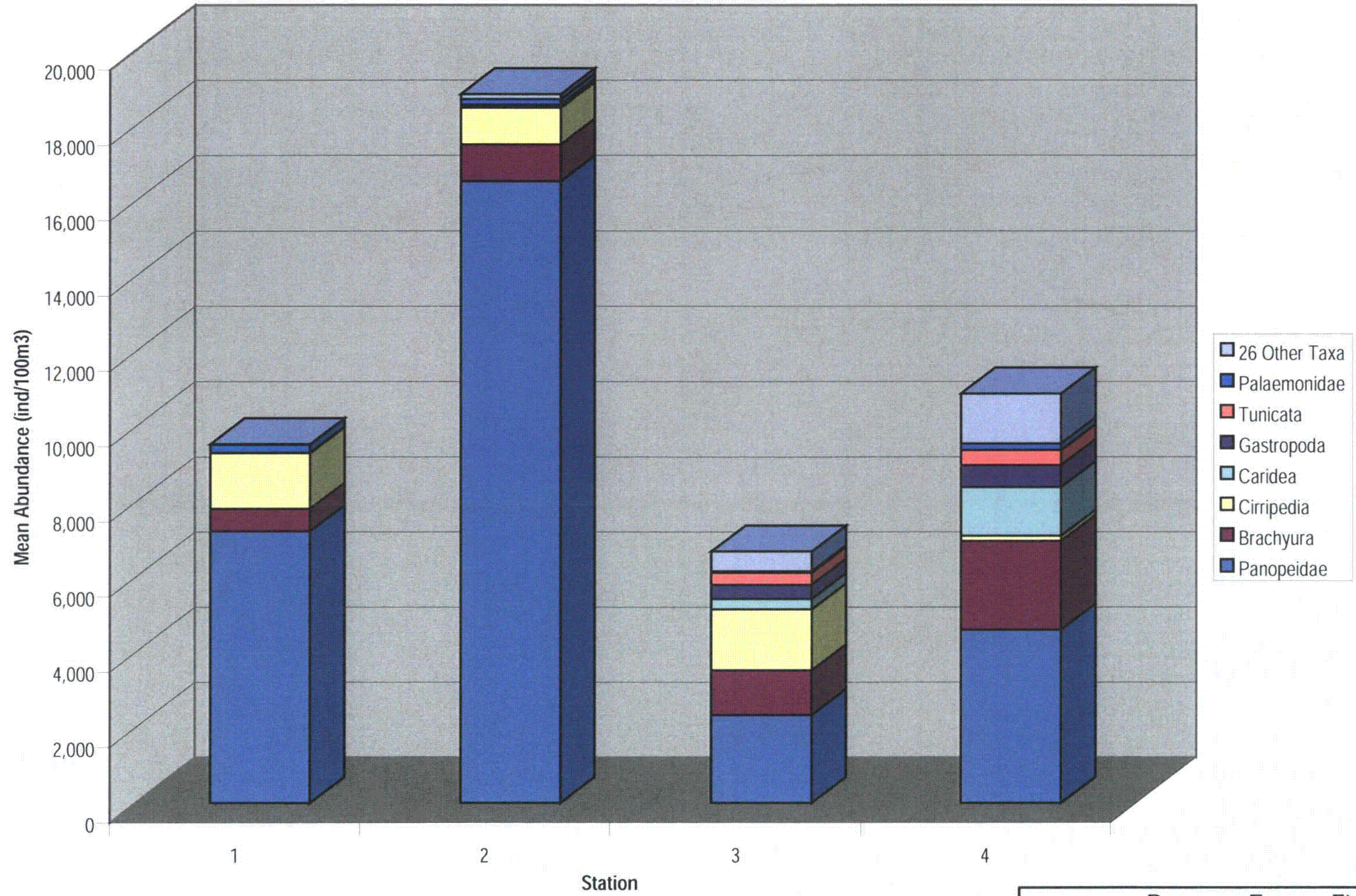

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Nighttime Meroplankton Mean Abundance and Composition for Stations in the CFBC

FIGURE 3.1.3.2-4

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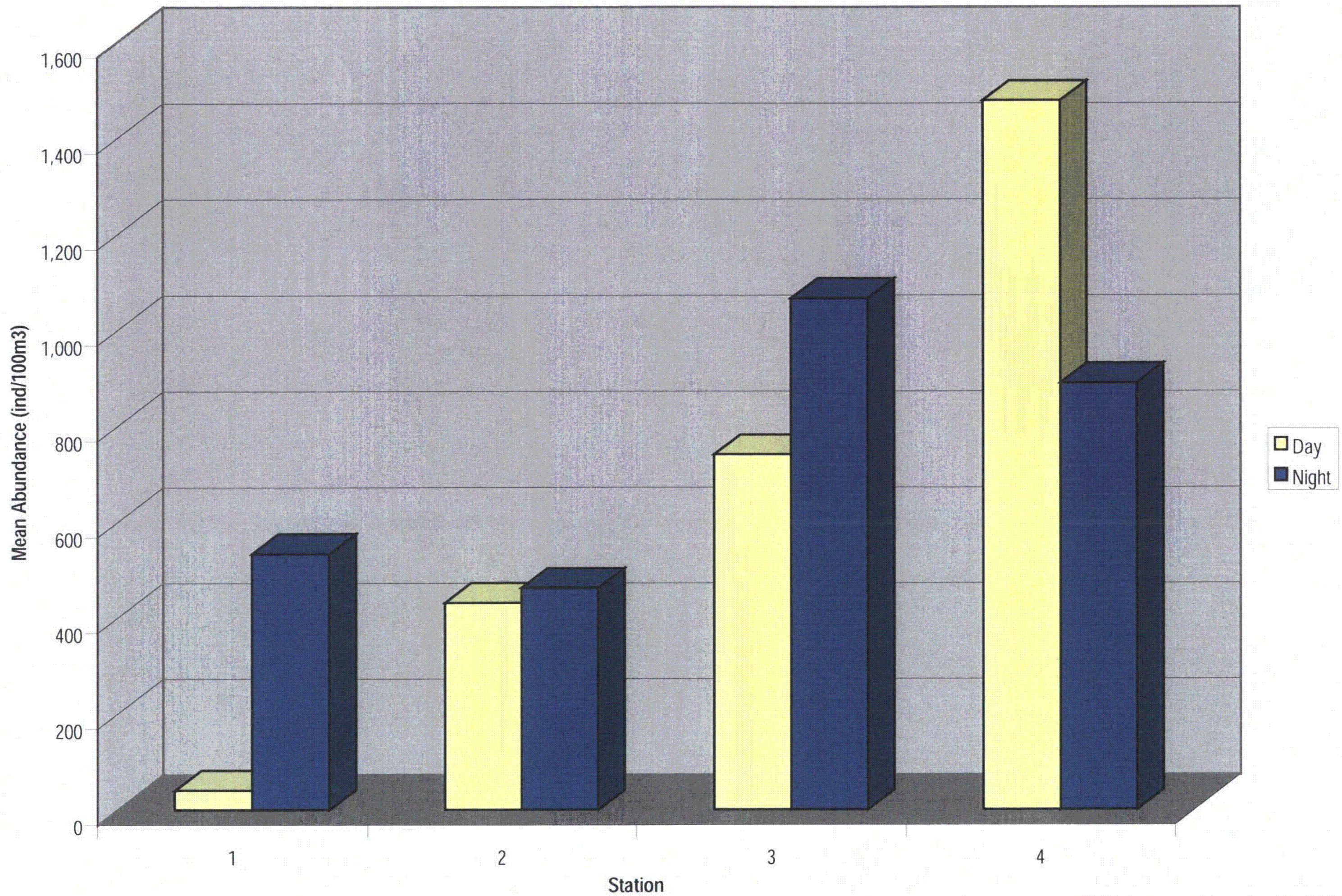

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Ichthyoplankton Diurnal Variation in the CFBC

FIGURE 3.1.3.2-5

Rev 0

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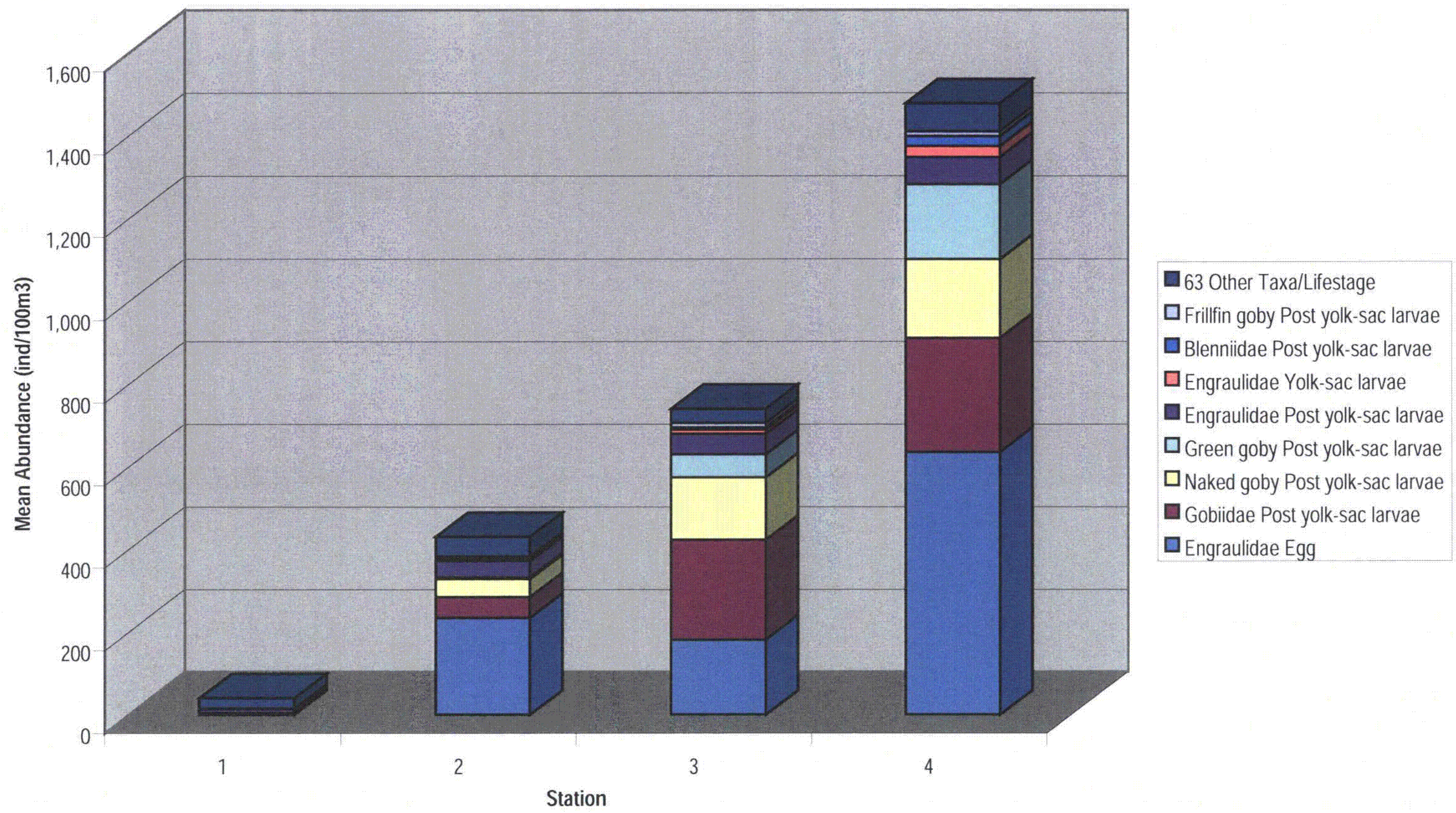

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Daytime Ichthyoplankton Mean Abundance and Composition for Stations in the CFBC

FIGURE 3.1.3.2-6

Rev 0

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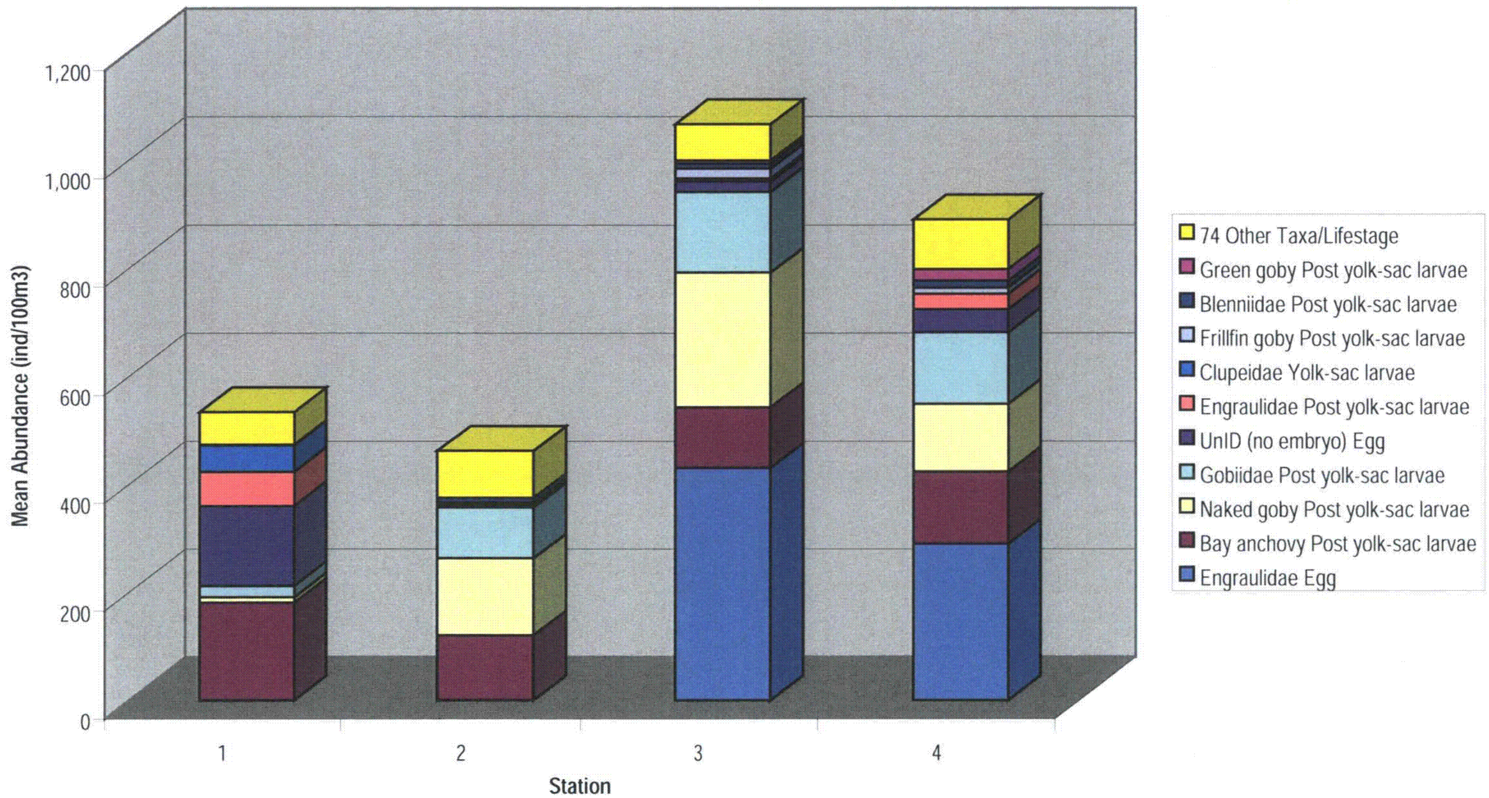

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Nighttime Ichthyoplankton Mean Abundance and Composition for Stations in the CFBC

FIGURE 3.1.3.2-7

Rev 0

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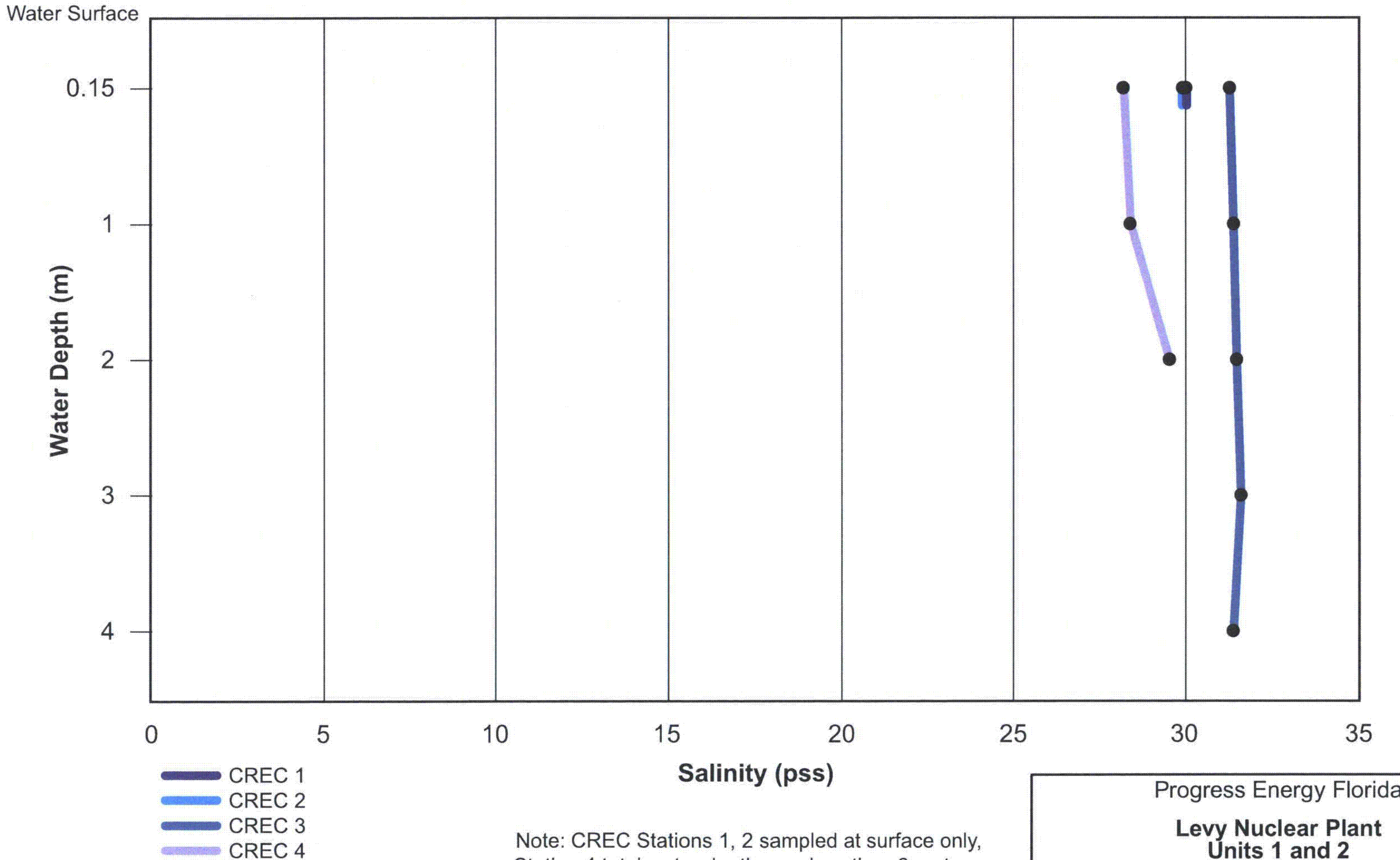

Note: CREC Stations 1, 2 sampled at surface only,
Station 4 total water depths are less than 3 meters.

Progress Energy Florida **Levy Nuclear Plant Units 1 and 2 Aquatic Ecology Sampling Report**
Average Salinity (pss) at CREC Stations FIGURE 3.2.2-1 Rev 0

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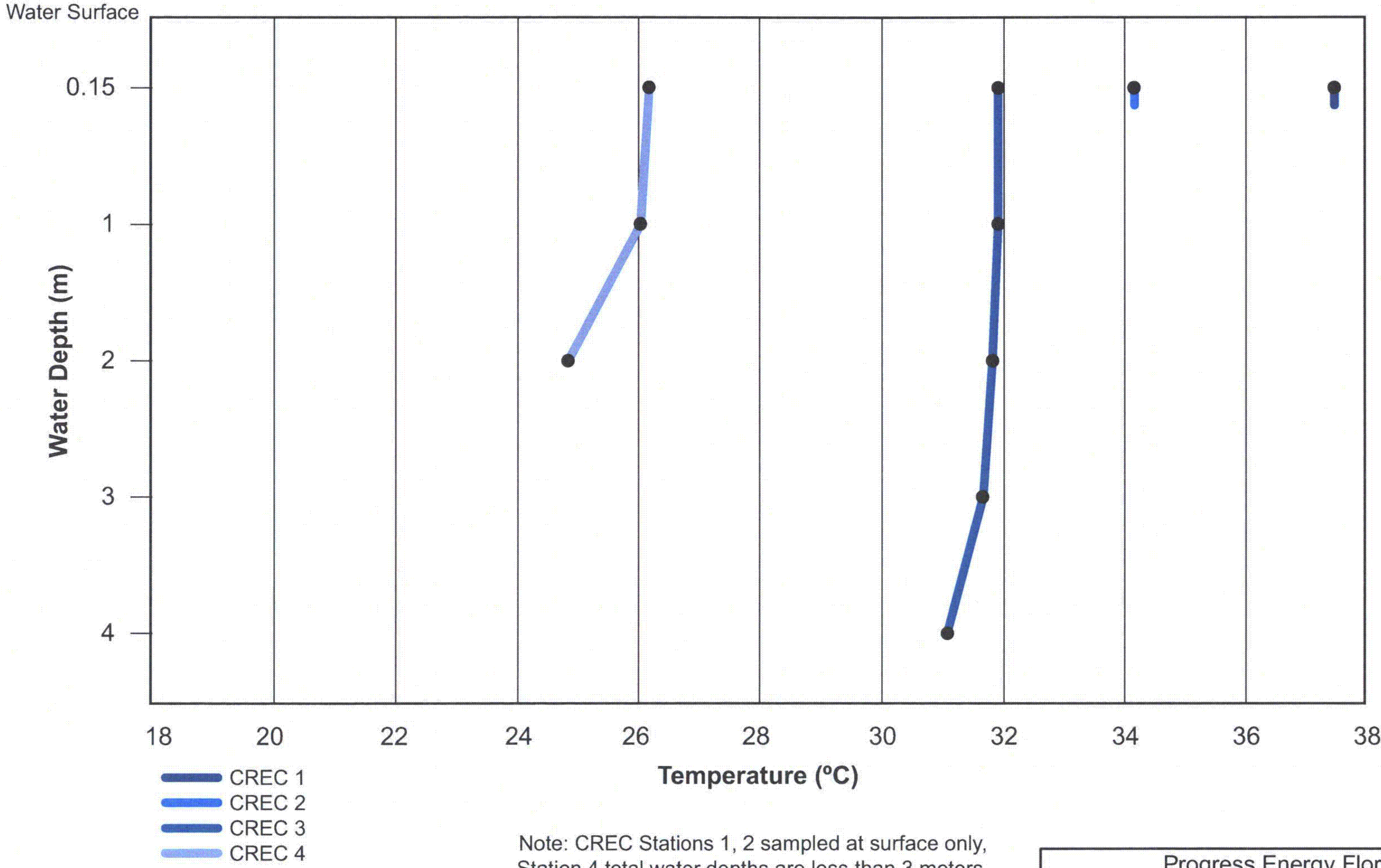

Note: CREC Stations 1, 2 sampled at surface only,
Station 4 total water depths are less than 3 meters.

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Average Temperature (°C) at CREC Stations

FIGURE 3.2.2-2

Rev 0

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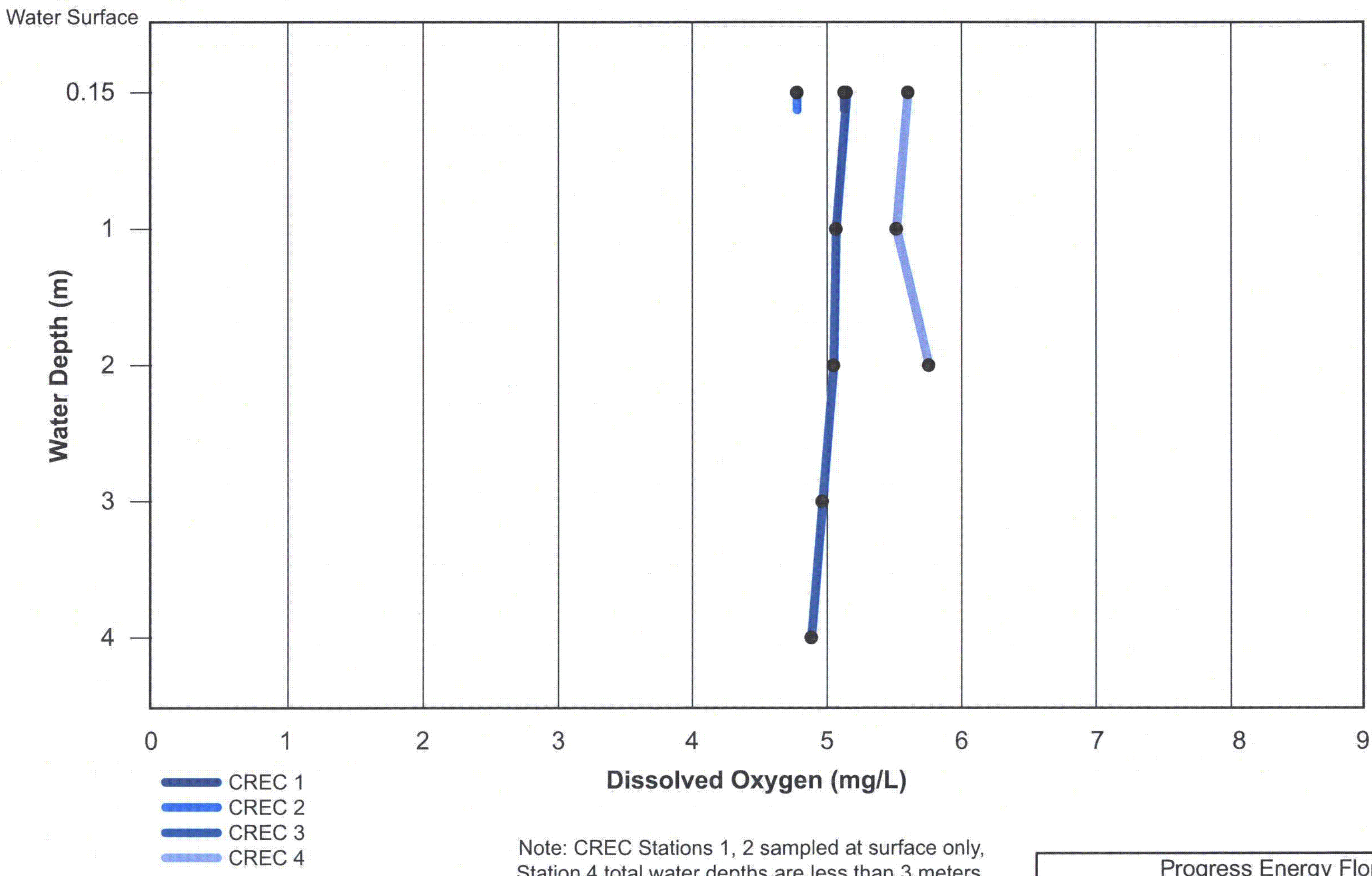

Note: CREC Stations 1, 2 sampled at surface only,
Station 4 total water depths are less than 3 meters.

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Average Dissolved Oxygen (mg/L)
at CREC Stations

FIGURE 3.2.2-3

Rev 0

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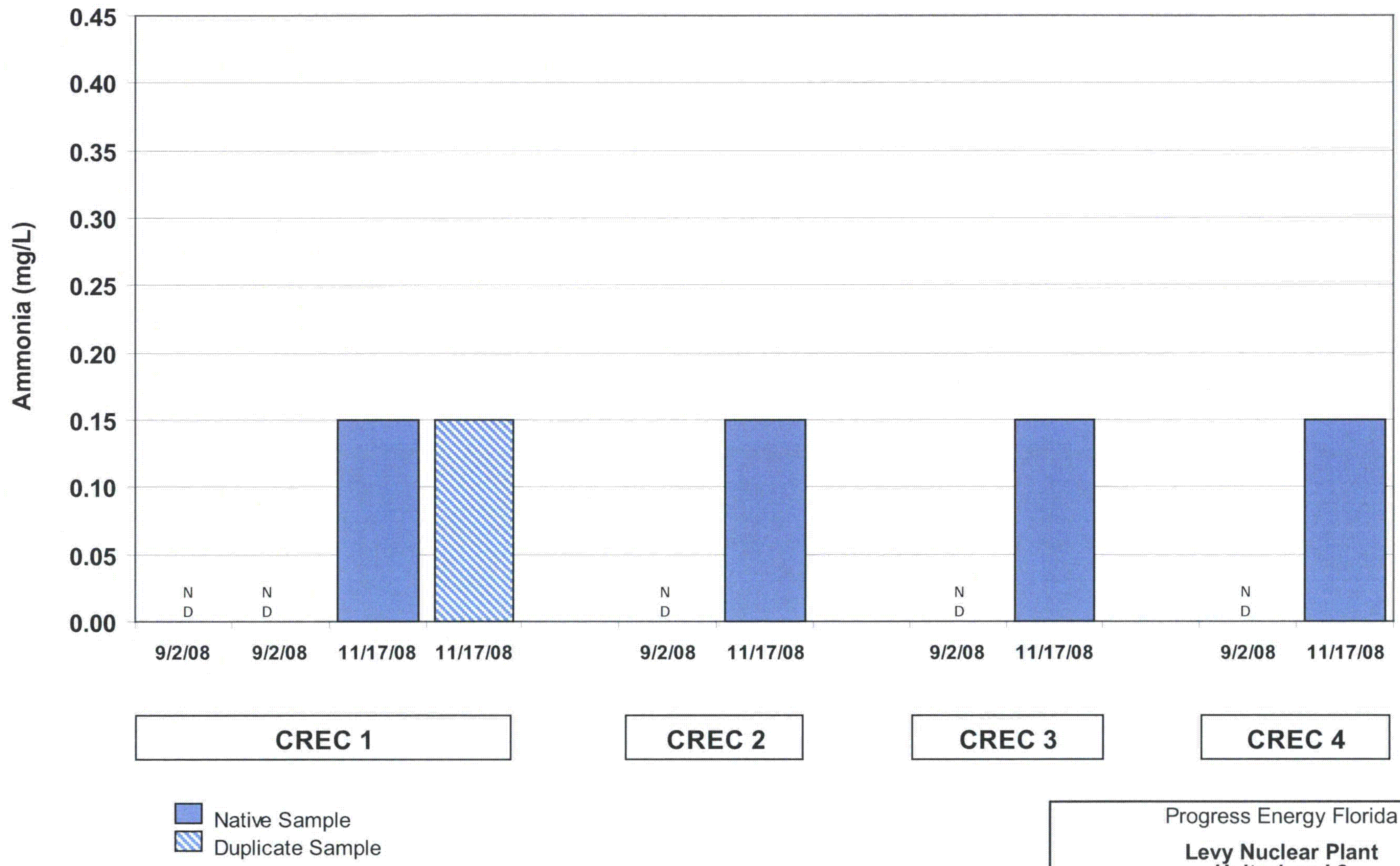

Note: All samples taken at mid depth unless otherwise noted.
ND = Not Detected, below method detection limit or reporting limit

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Ammonia (mg/L) at CREC Stations

FIGURE 3.2.2-4

Rev 0

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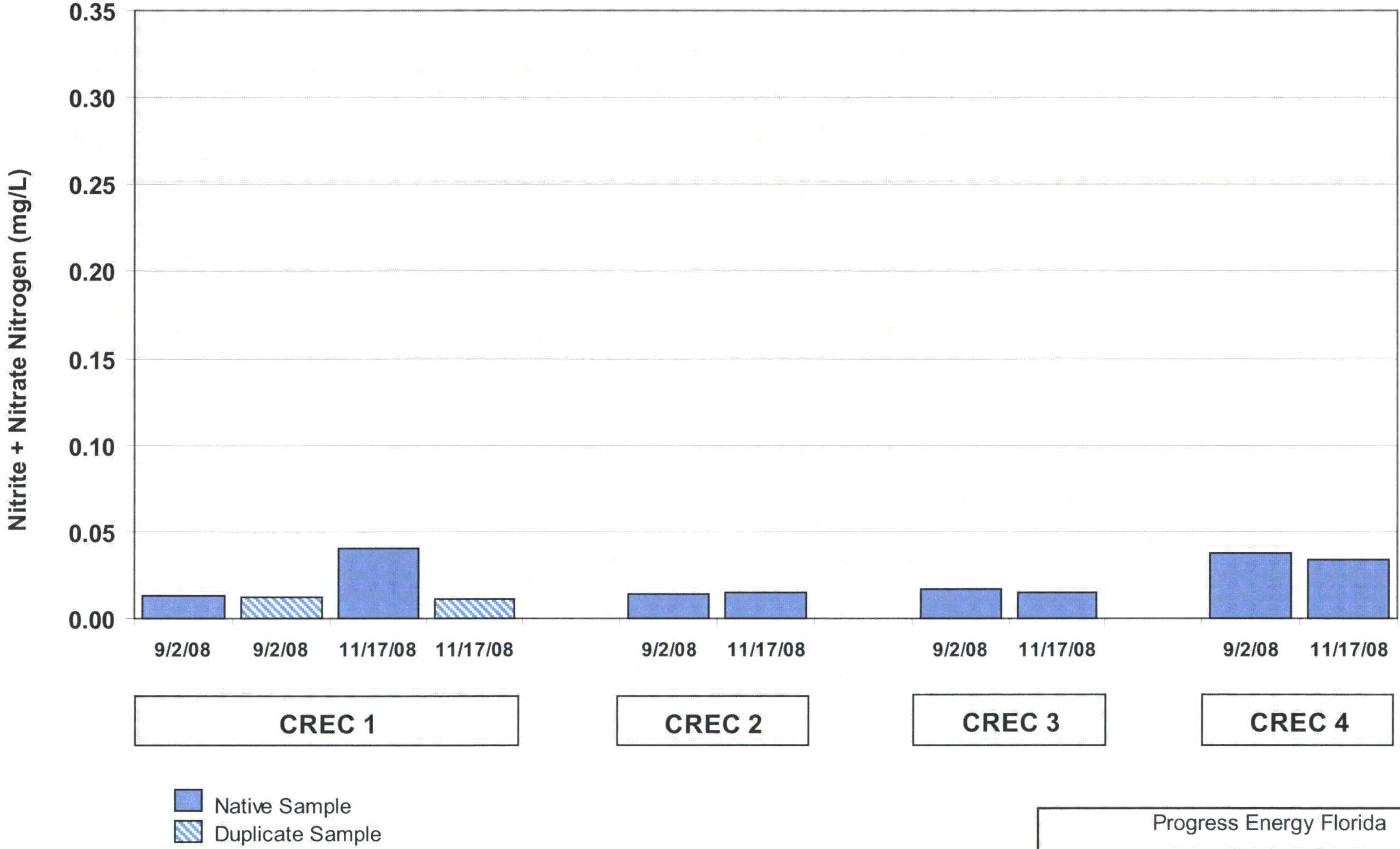

Note: All samples taken at mid depth unless otherwise noted.
ND = Not Detected, below method detection limit or reporting limit

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Nitrite + Nitrate Nitrogen (mg/L) at CREC Stations

FIGURE 3.2.2-5

Rev 1

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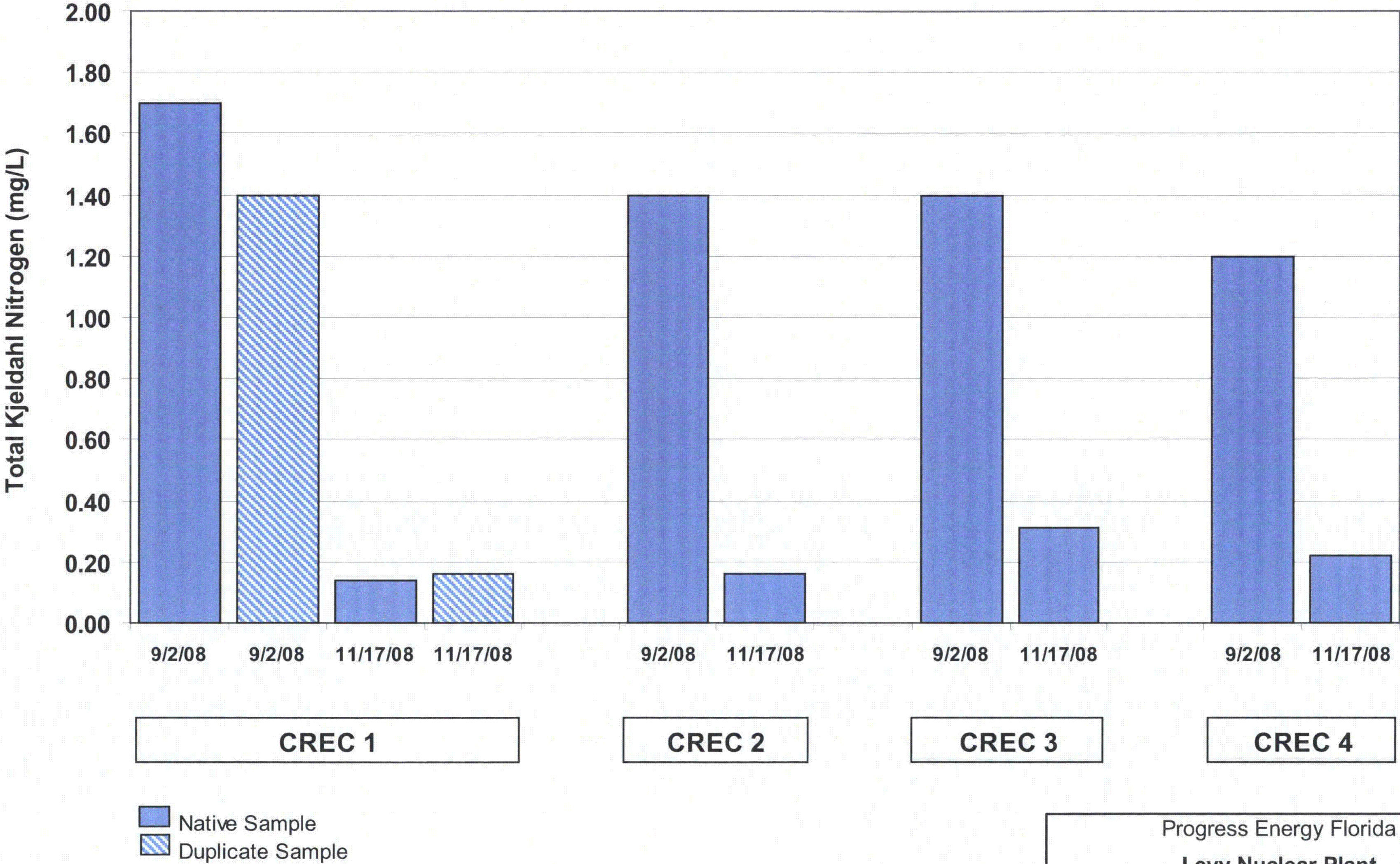
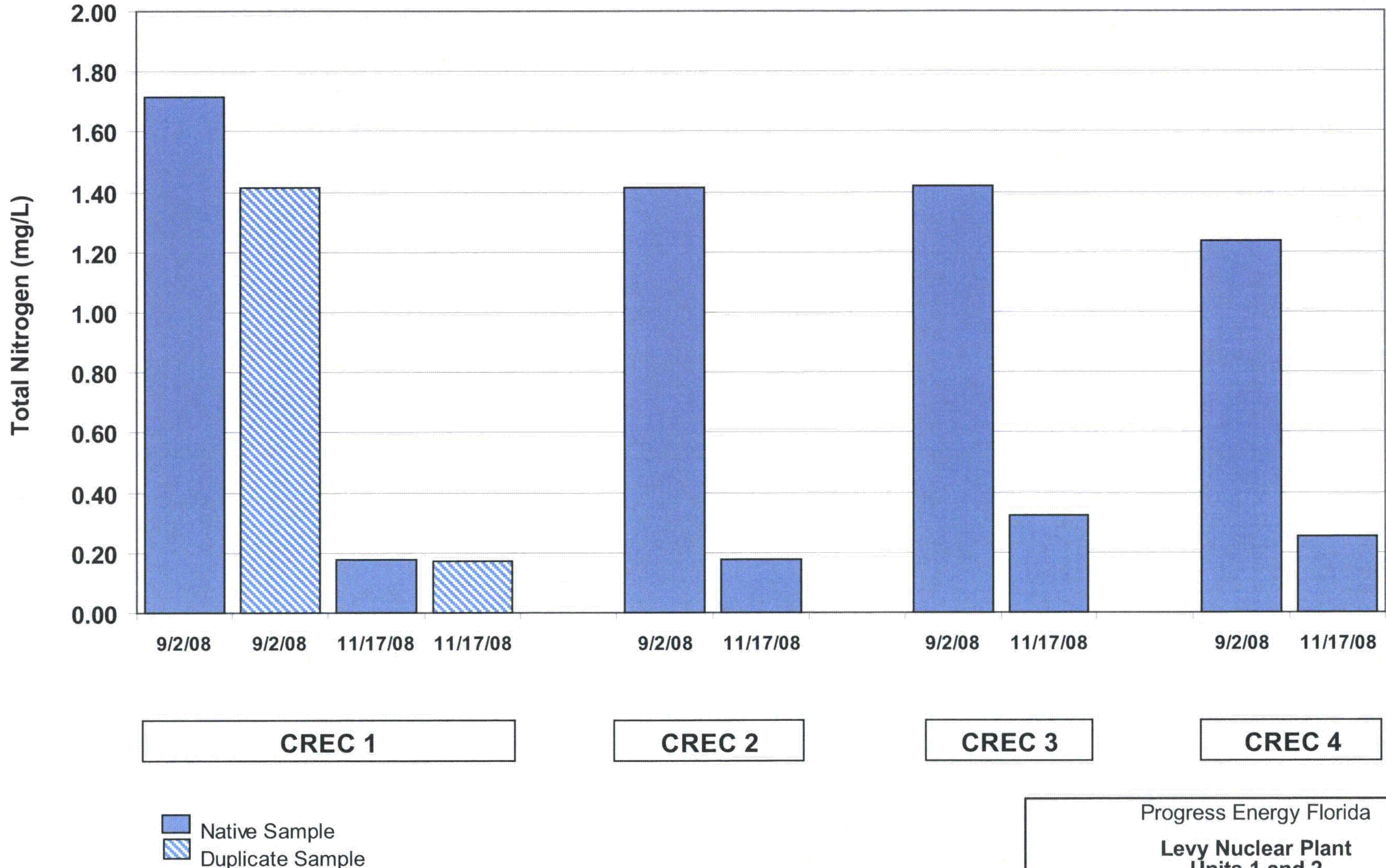


Note: All samples taken at mid depth unless otherwise noted.
ND = Not Detected, below method detection limit or reporting limit

Progress Energy Florida **Levy Nuclear Plant Units 1 and 2 Aquatic Ecology Sampling Report**
Total Kjeldahl Nitrogen (mg/L) at CREC Stations FIGURE 3.2.2-6 Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2337\3.2.2-6.pdf Date: 1/21/2009; Tech: HRobertson



Note: All samples taken at mid depth unless otherwise noted.
ND = Not Detected, below method detection limit or reporting limit

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Total Nitrogen (mg/L) at CREC Stations

FIGURE 3.2.2-7

Rev 0

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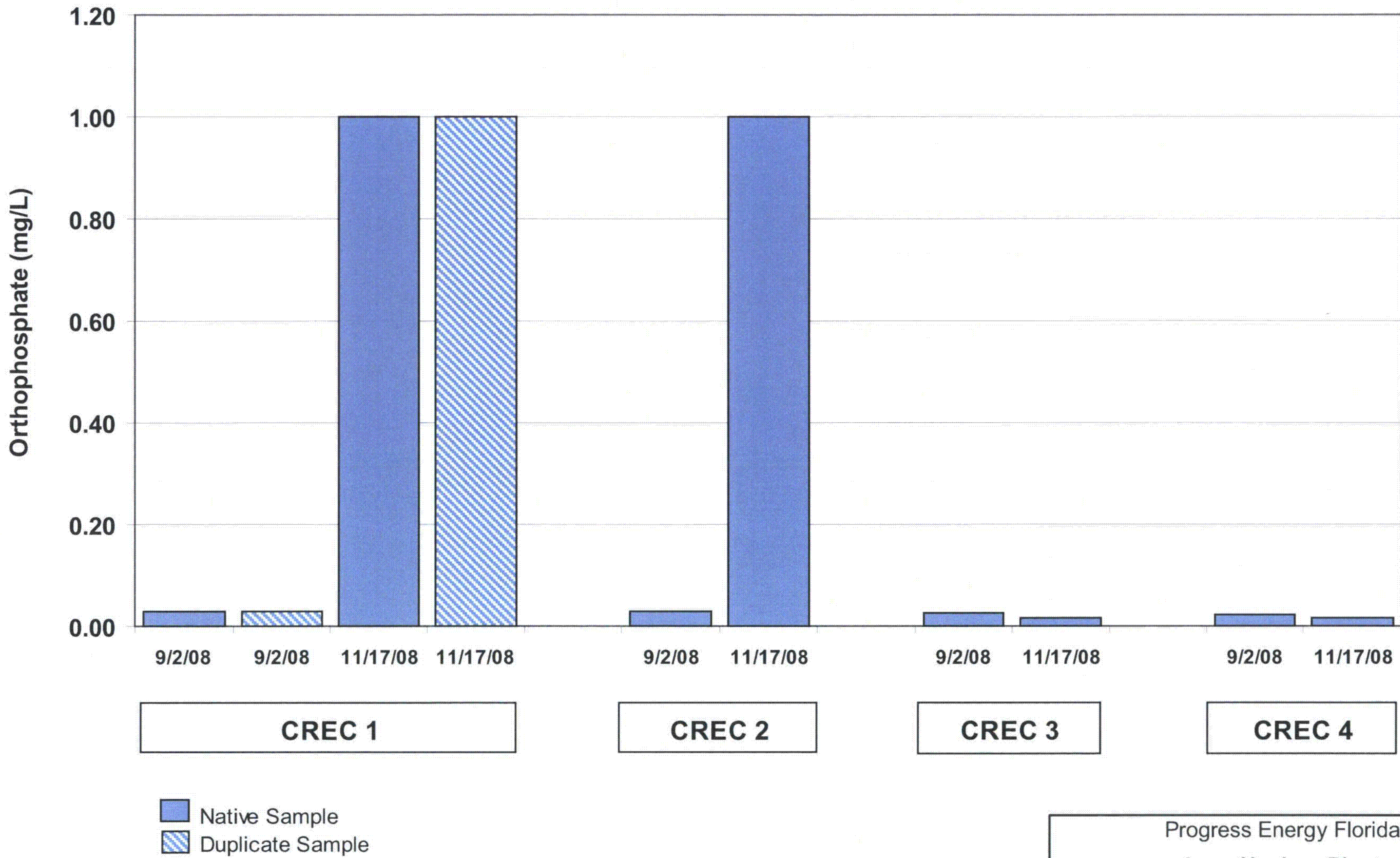
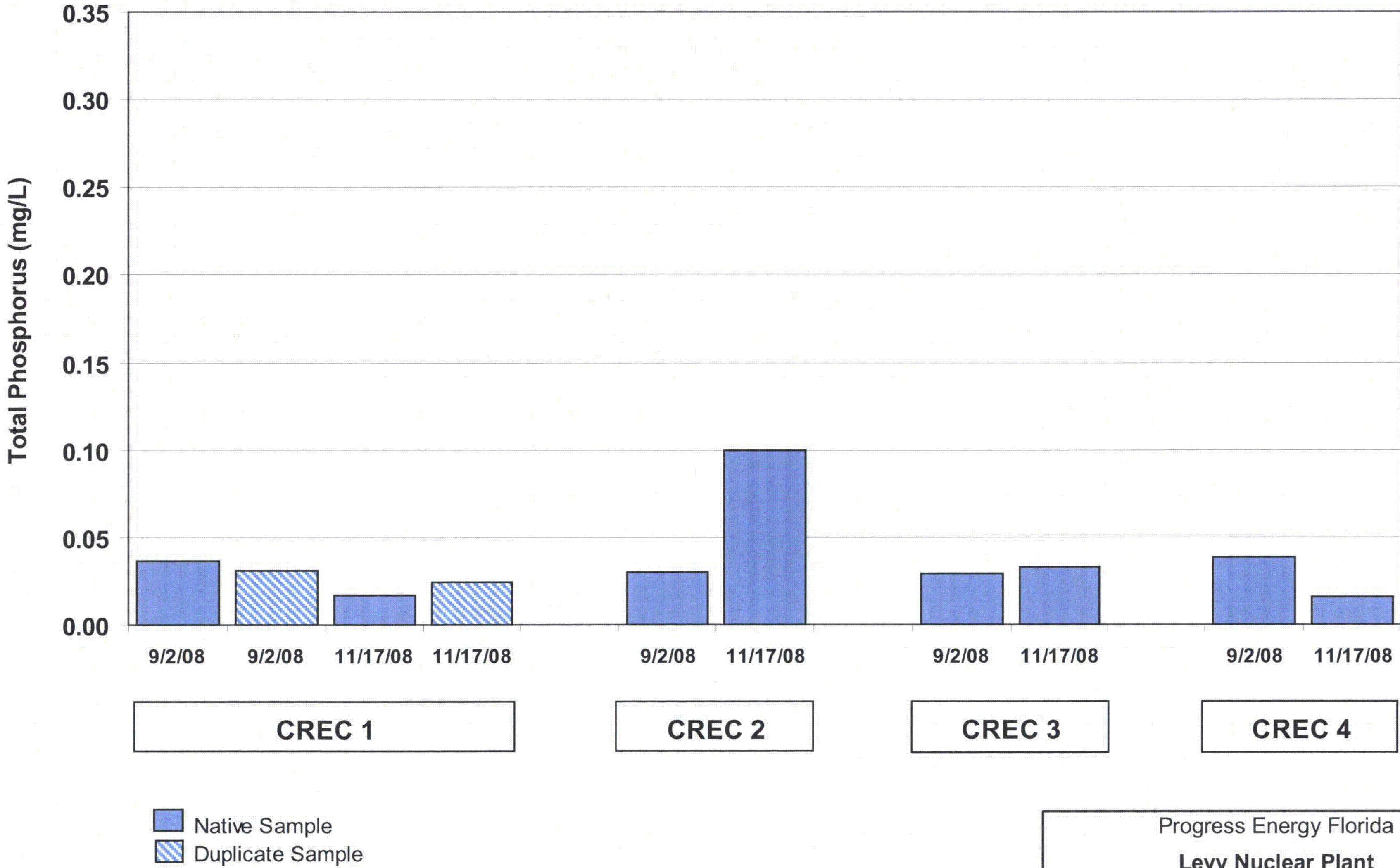


Note: All samples taken at mid depth unless otherwise noted.
ND = Not Detected, below method detection limit or reporting limit

Progress Energy Florida **Levy Nuclear Plant Units 1 and 2 Aquatic Ecology Sampling Report**
Orthophosphate (mg/L) at CREC Stations FIGURE 3.2.2-8 Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2337\3.2.2-8.pdf Date: 1/21/2009; Tech: HRobertson



Note: All samples taken at mid depth unless otherwise noted.
ND = Not Detected, below method detection limit or reporting limit

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Total Phosphorus (mg/L) at CREC Stations

FIGURE 3.2.2-9

Rev 0

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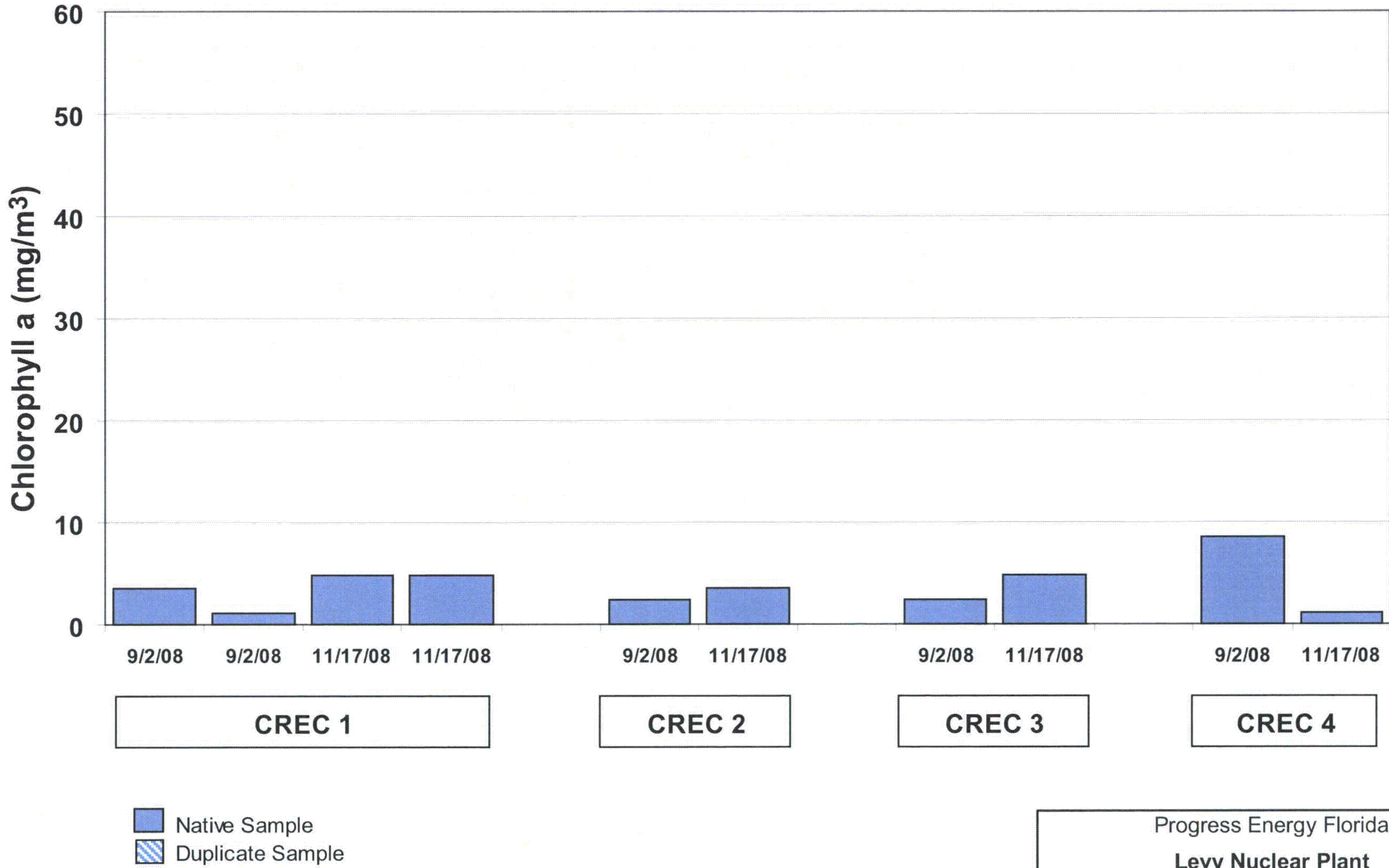

Note: All samples taken at mid depth unless otherwise noted.
ND = Not Detected, below method detection limit or reporting limit

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Chlorophyll a (mg/m^3) at CREC Stations

FIGURE 3.2.2-10

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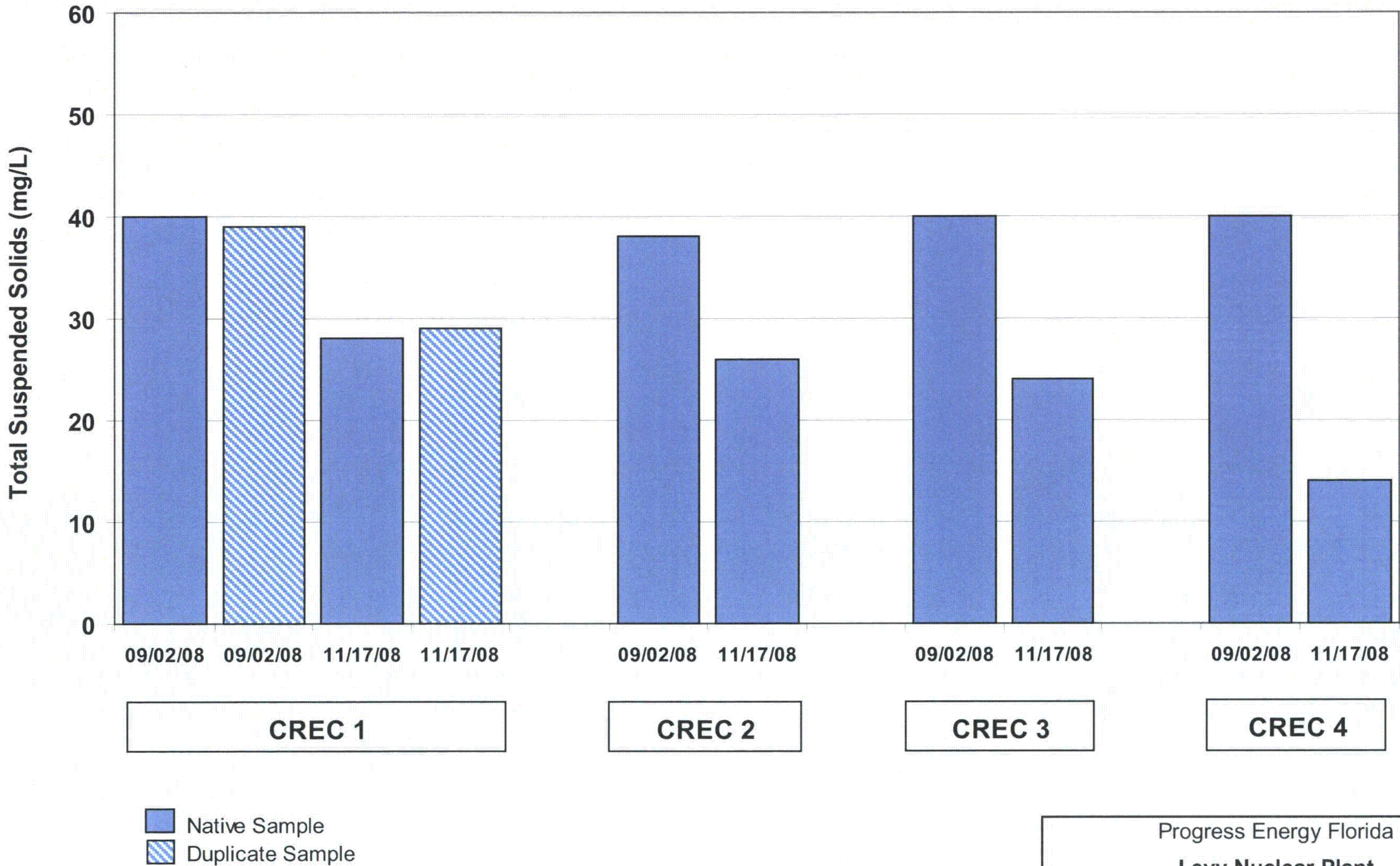
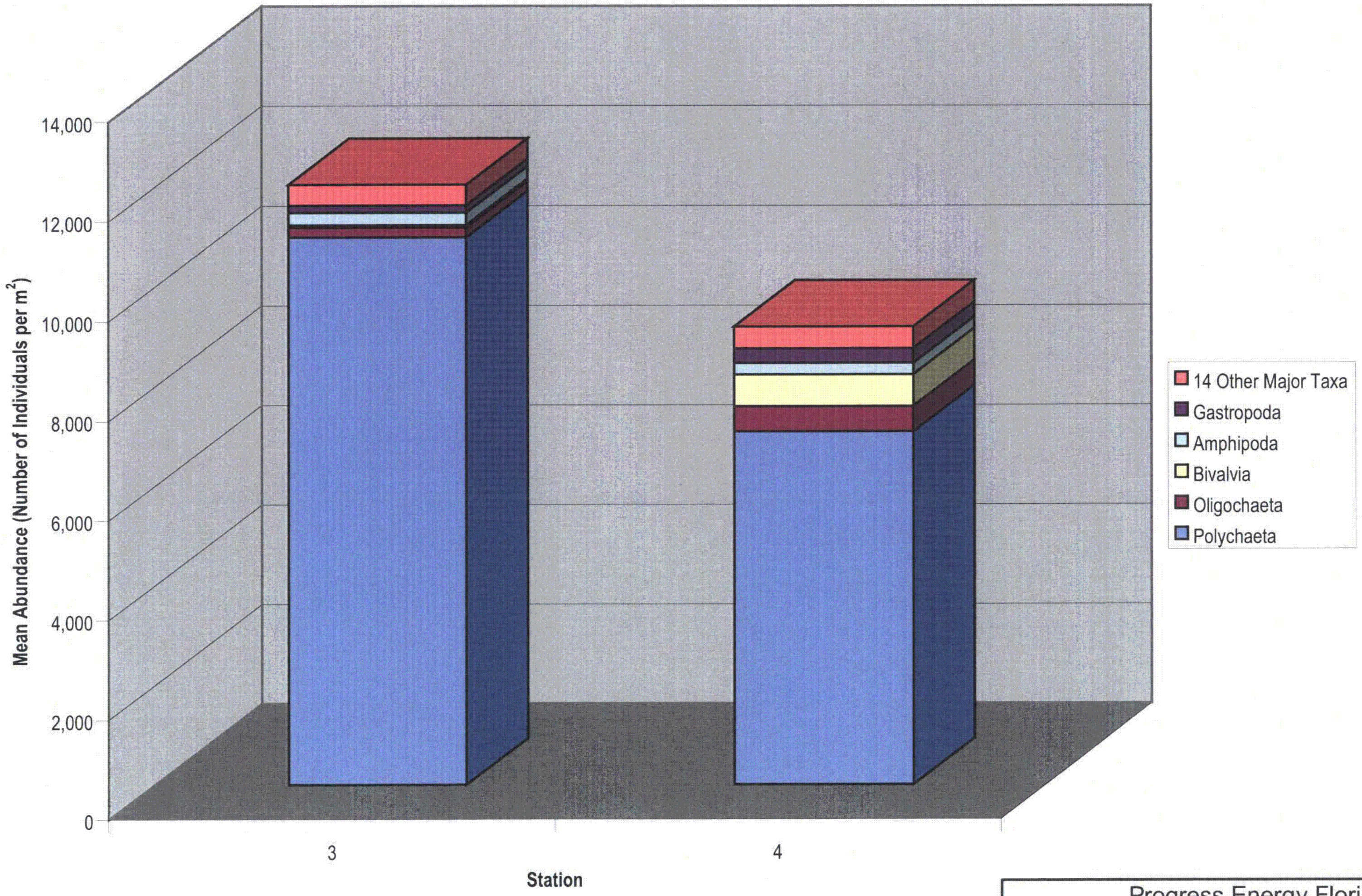


Note: All samples taken at mid depth unless otherwise noted.
ND = Not Detected, below method detection limit or reporting limit

Progress Energy Florida **Levy Nuclear Plant** **Units 1 and 2** **Aquatic Ecology Sampling Report**
Total Suspended Solids (mg/L) at CREC Stations FIGURE 3.2.2-11 Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2337\3.2.2-11.pdf Date: 1/21/2009; Tech: HRobertson



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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

CREC Benthic Infauna Mean Abundance and Composition per Station

FIGURE 3.2.3.1-1

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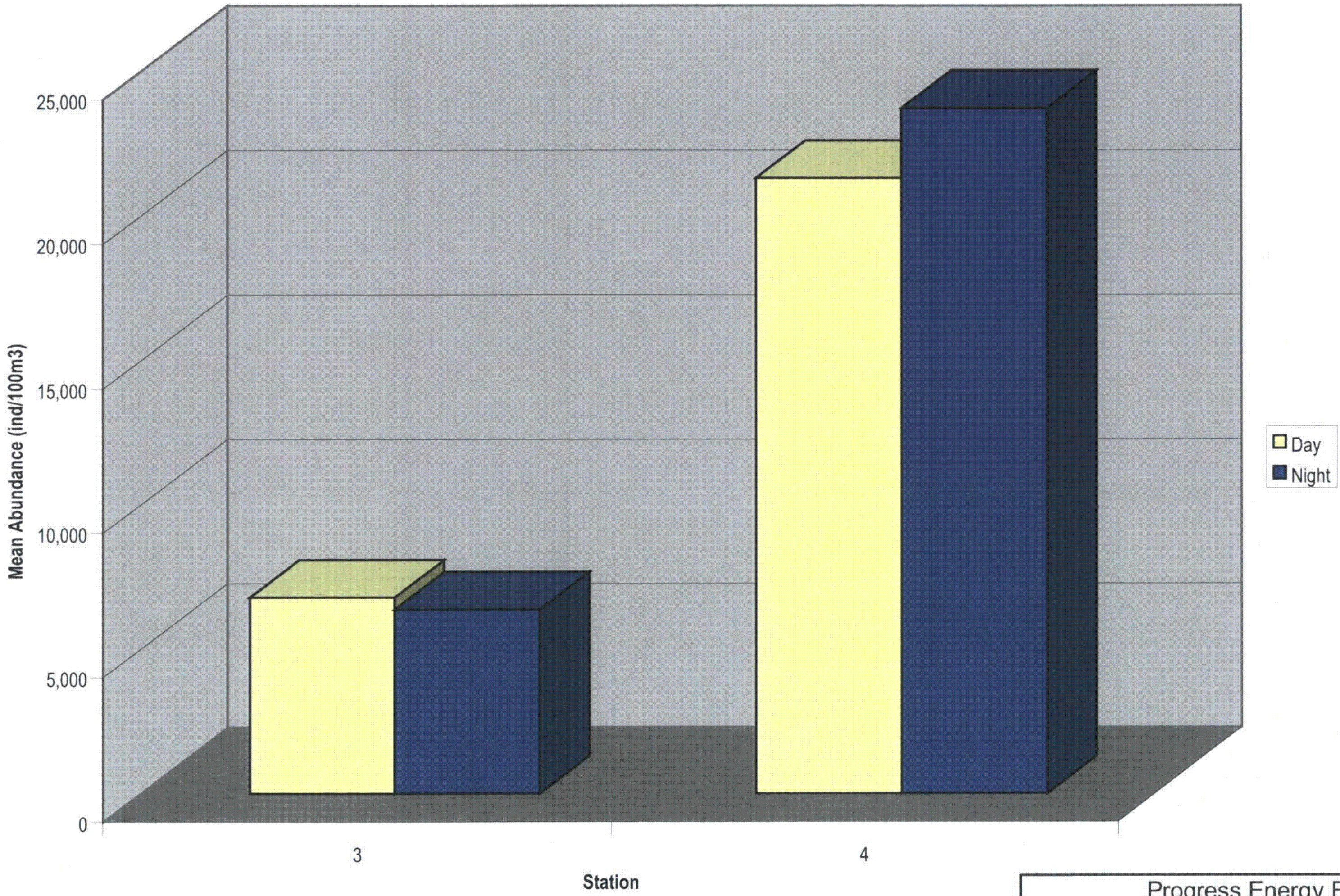

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Holoplankton Diurnal Variation at Stations in the CREC

FIGURE 3.2.3.2-1

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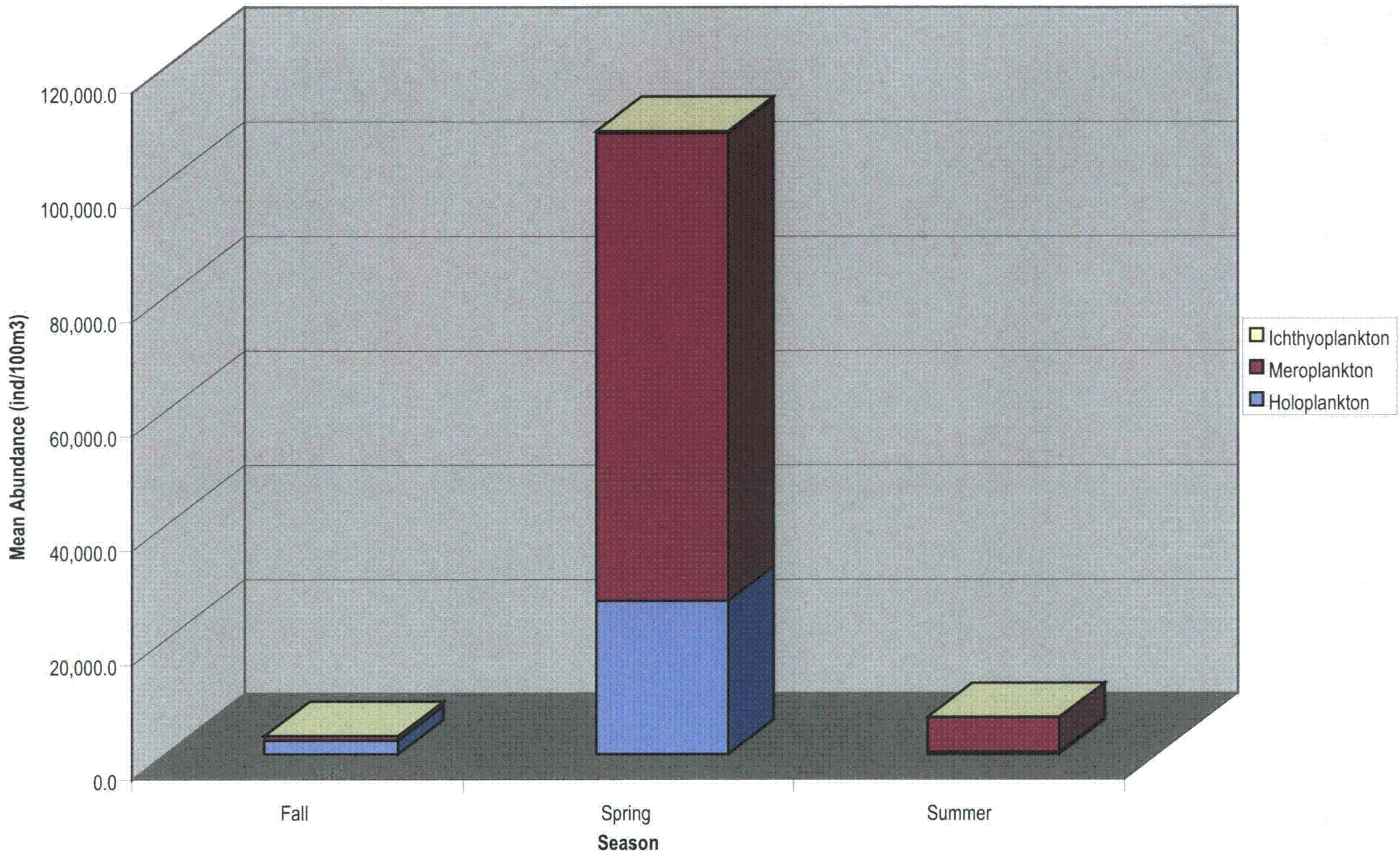

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Daytime Temporal Variation in the CREC

FIGURE 3.2.3.2-2

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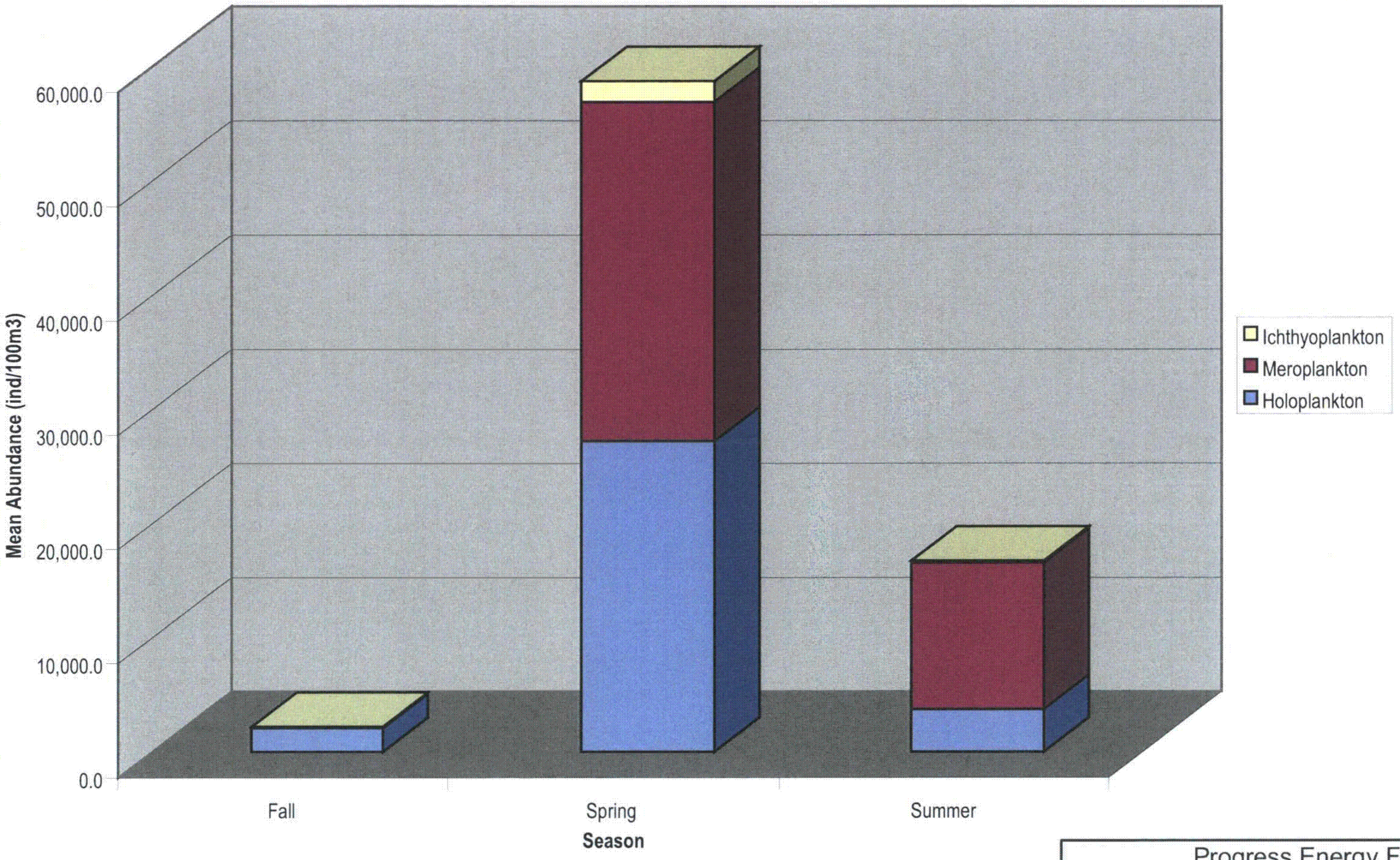

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Nighttime Temporal Variation in the CREC

FIGURE 3.2.3.2-3

Rev 0

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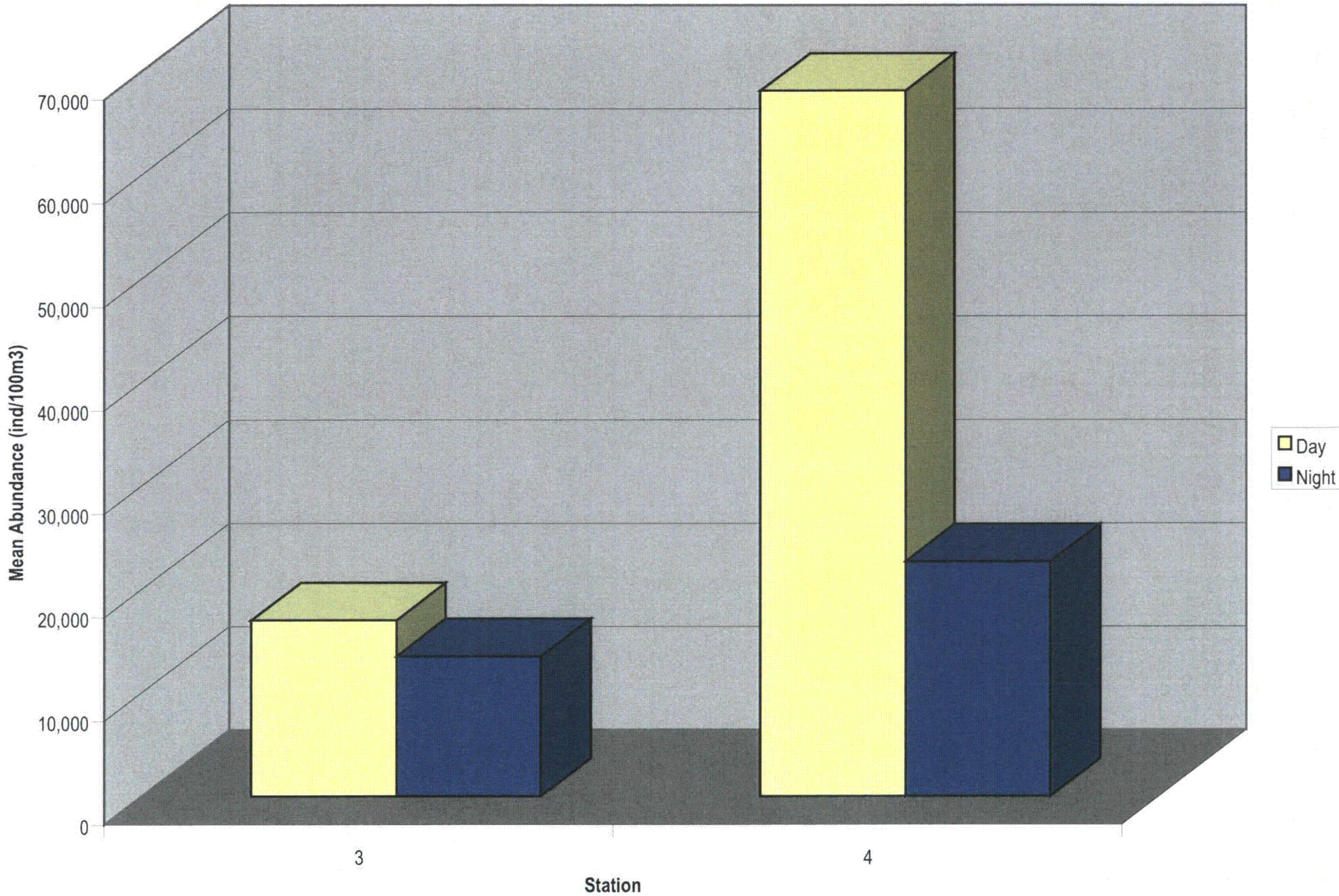

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Meroplankton Diurnal Variation at Stations in the CREC

FIGURE 3.2.3.2-4

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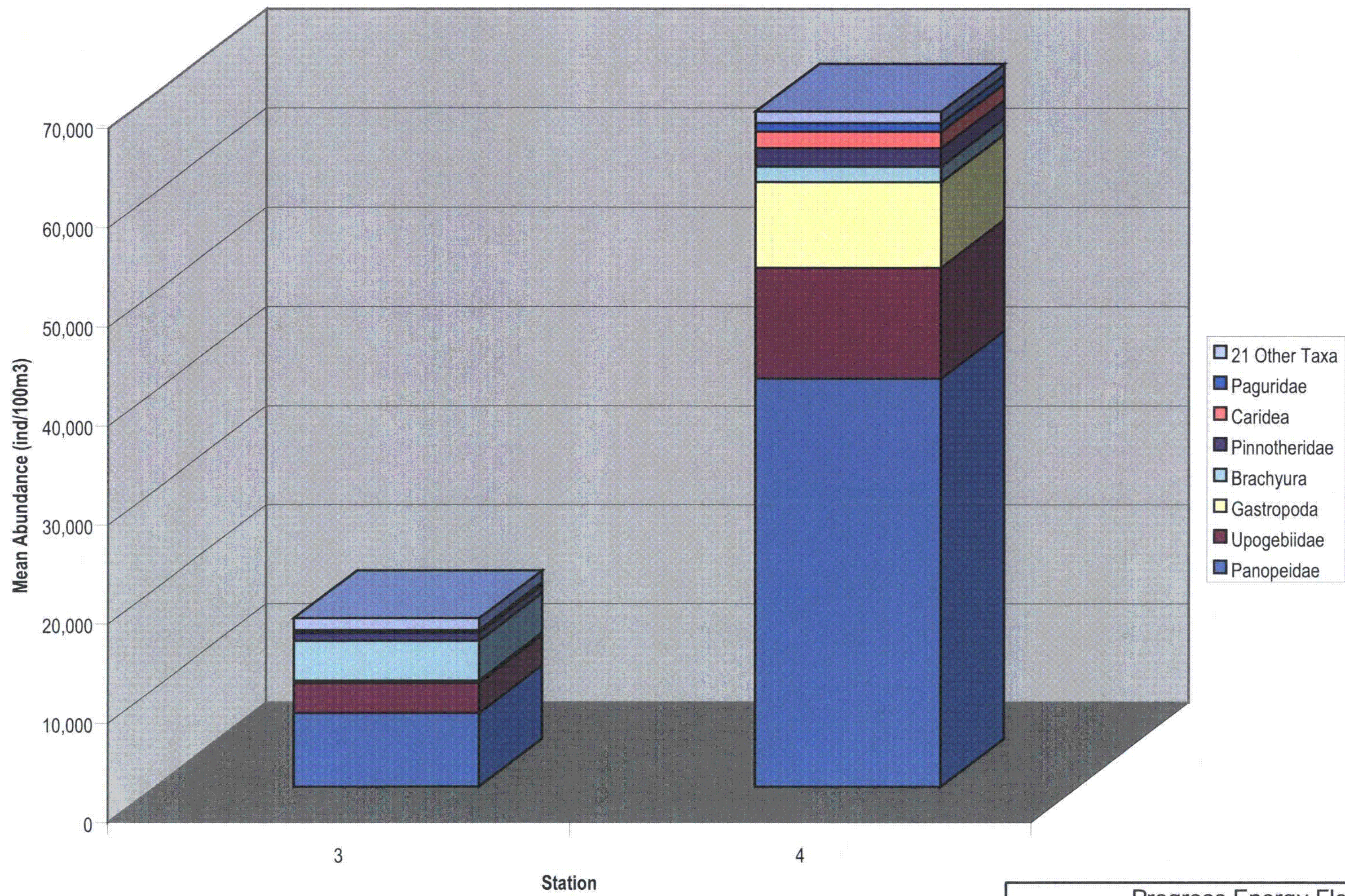

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Daytime Meroplankton Mean Abundance and Composition for Stations in the CREC

FIGURE 3.2.3.2-5

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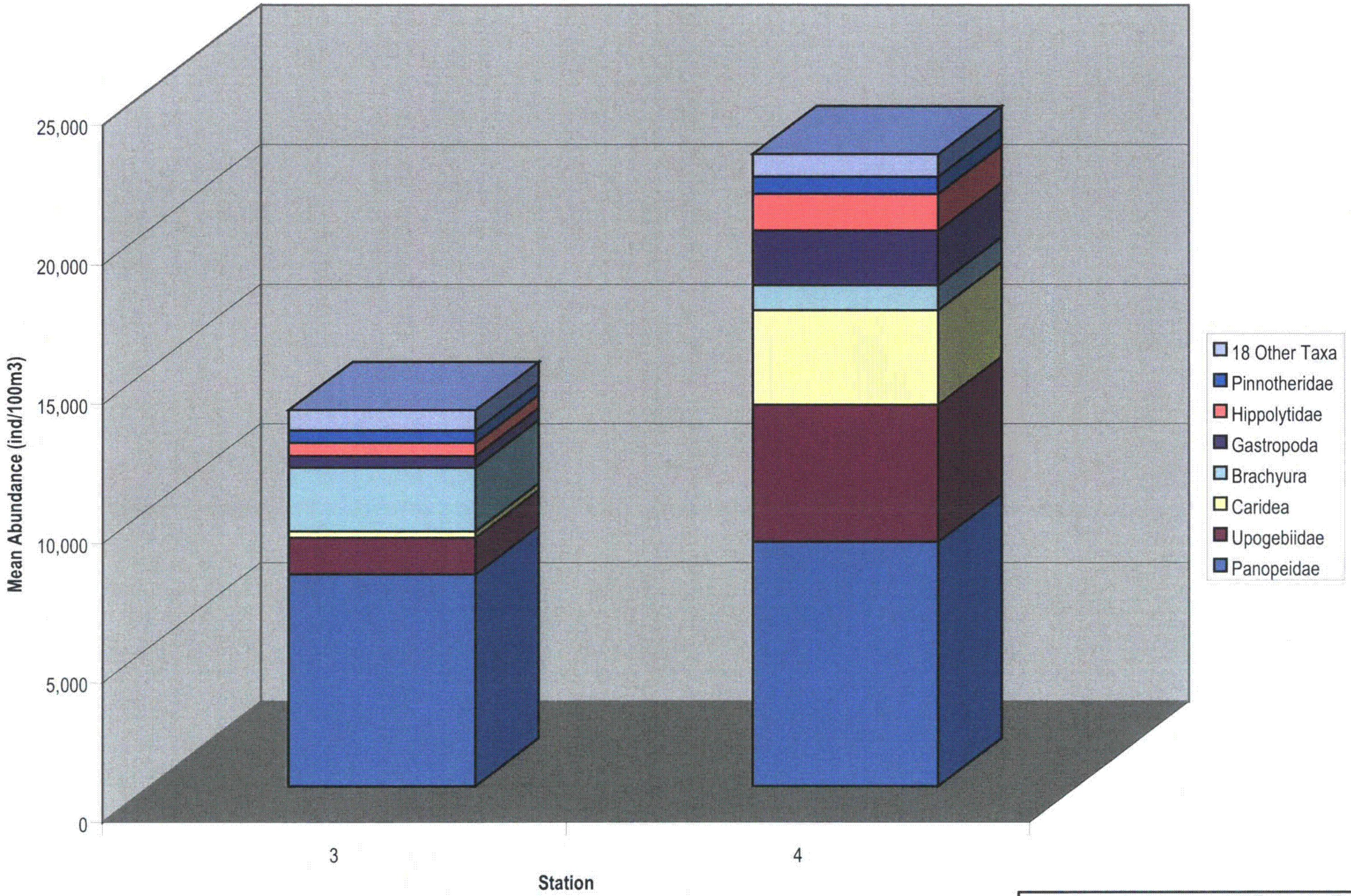

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Nighttime Meroplankton Mean Abundance and Composition for Stations in the CREC

FIGURE 3.2.3.2-6

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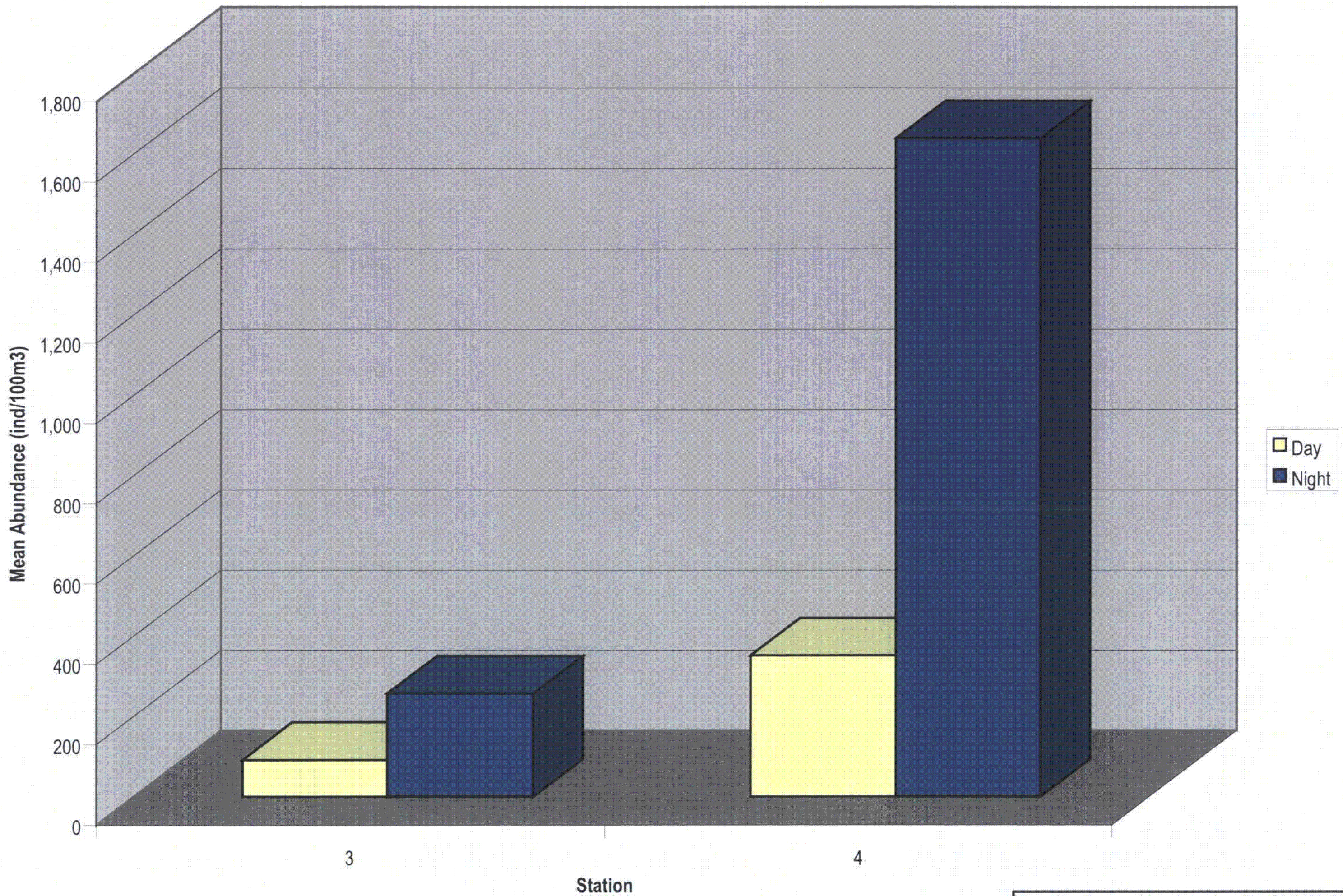

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Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Ichthyoplankton Diurnal Variation at Stations in the CREC

FIGURE 3.2.3.2-7

Rev 0

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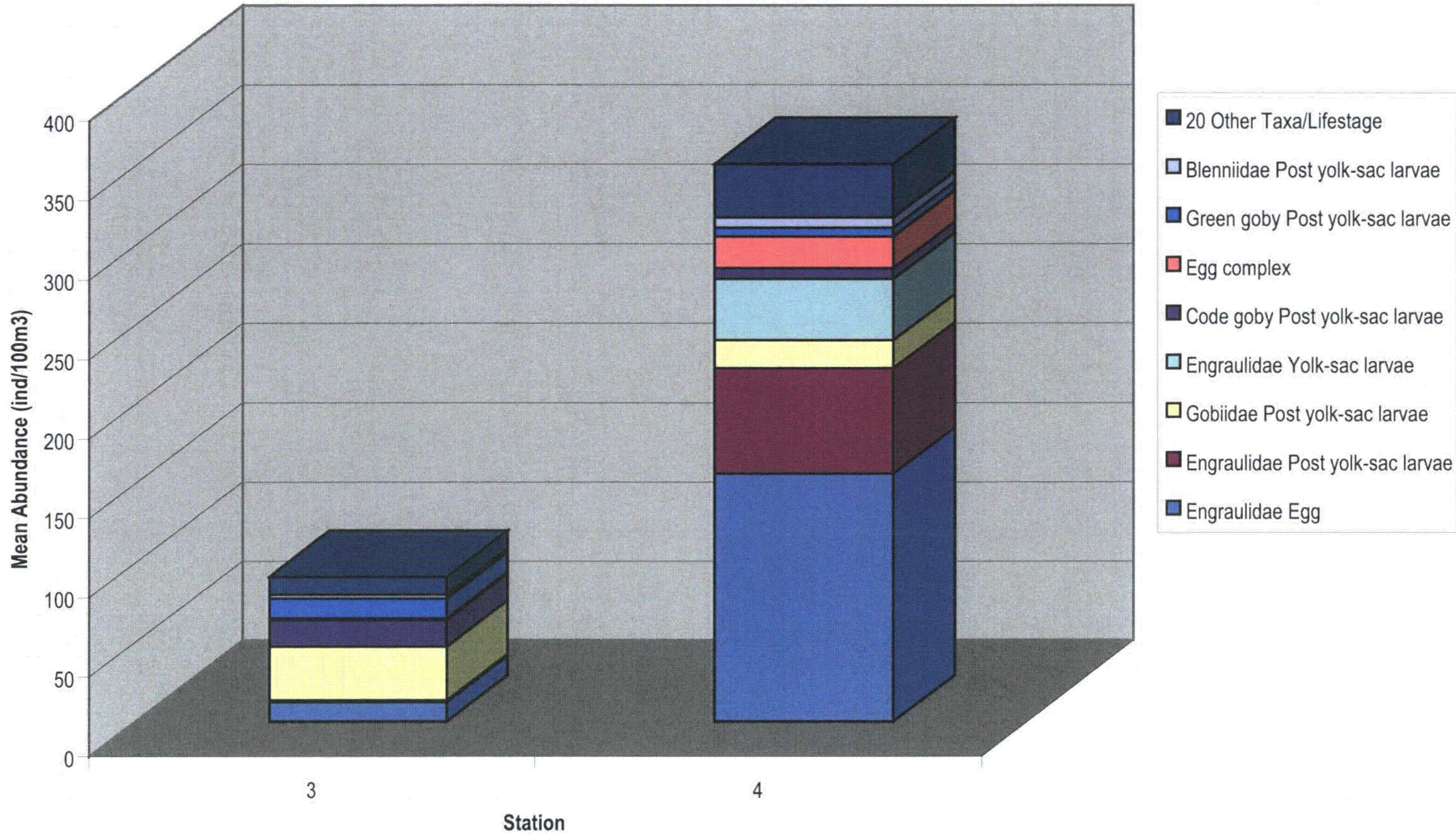

Egg complex of Carangidae/ Haemulidae/ Merlucciidae/ Paralichthyidae/ Sciaenidae/ Serranidae families

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Daytime Ichthyoplankton Mean Abundance and Composition for Stations in the CREC

FIGURE 3.2.3.2-8

Rev 0

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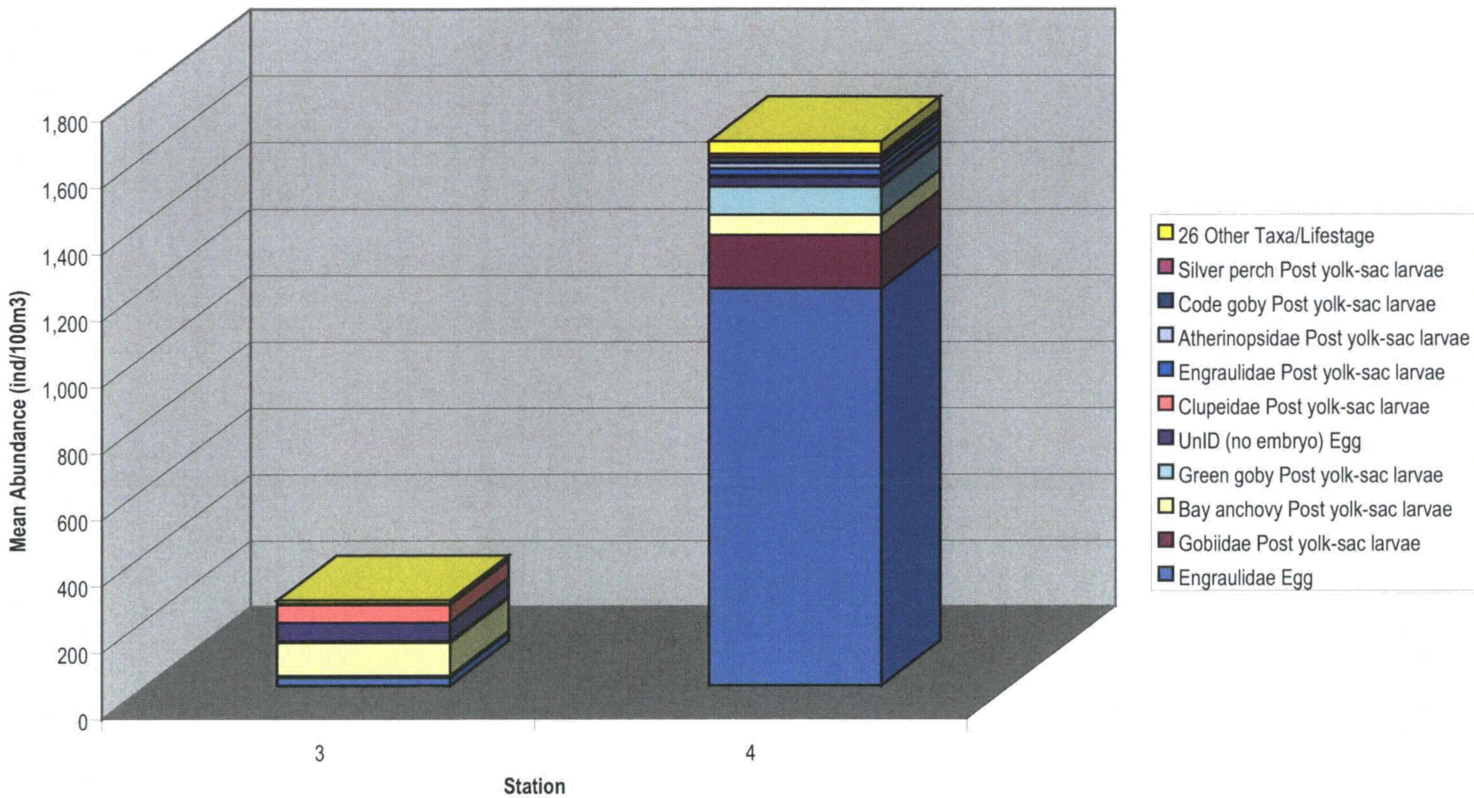

Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Nighttime Ichthyoplankton Mean Abundance and Composition for Stations in the CREC

FIGURE 3.2.3.2-9

Rev 0

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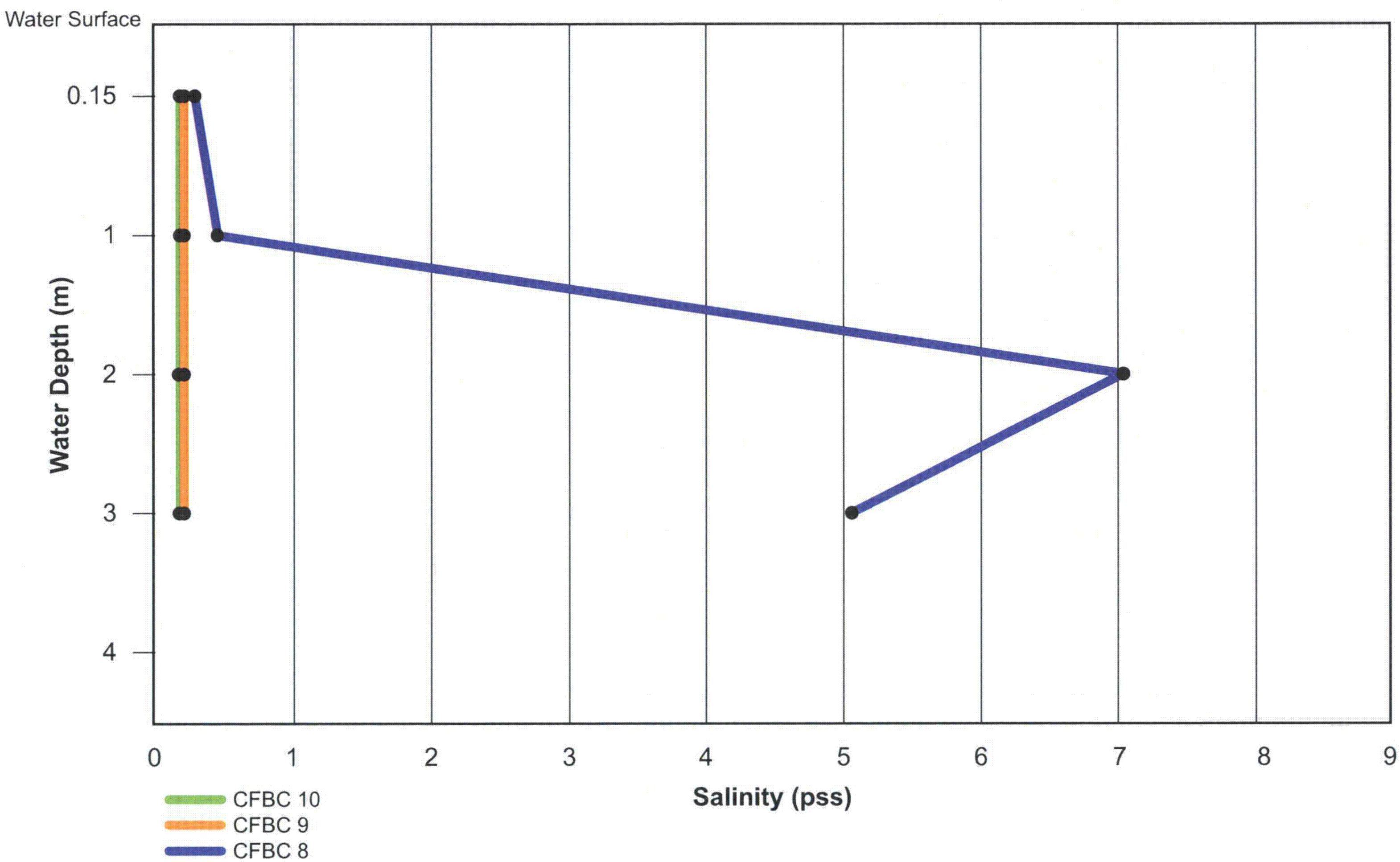
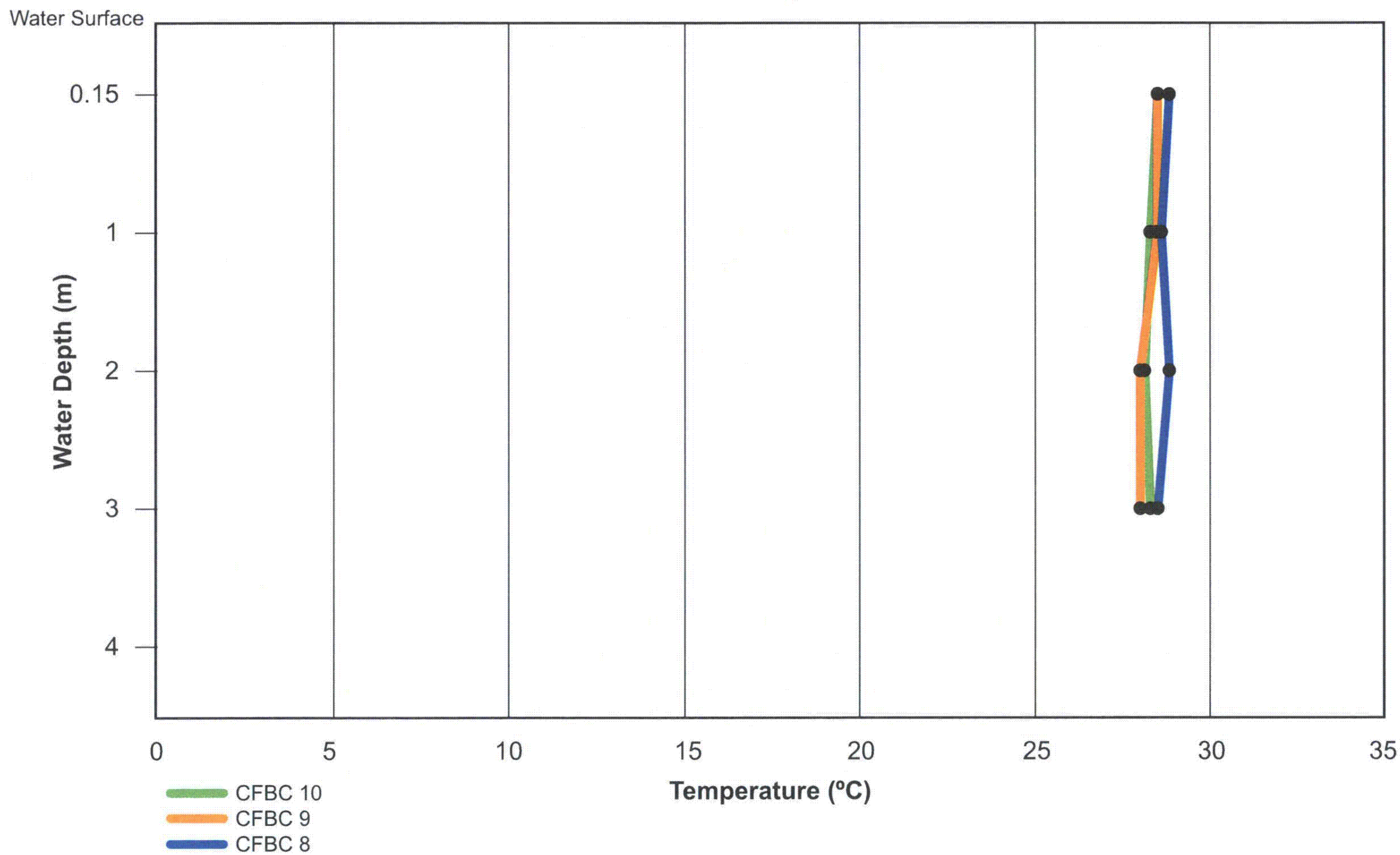


Note: CFBC Stations 8, 9, and 10 total water depths are less than 4 meters.

Progress Energy Florida **Levy Nuclear Plant Units 1 and 2 Aquatic Ecology Sampling Report**
Average Salinity (pss) at OWR Stations FIGURE 3.3.2-1 Rev 0

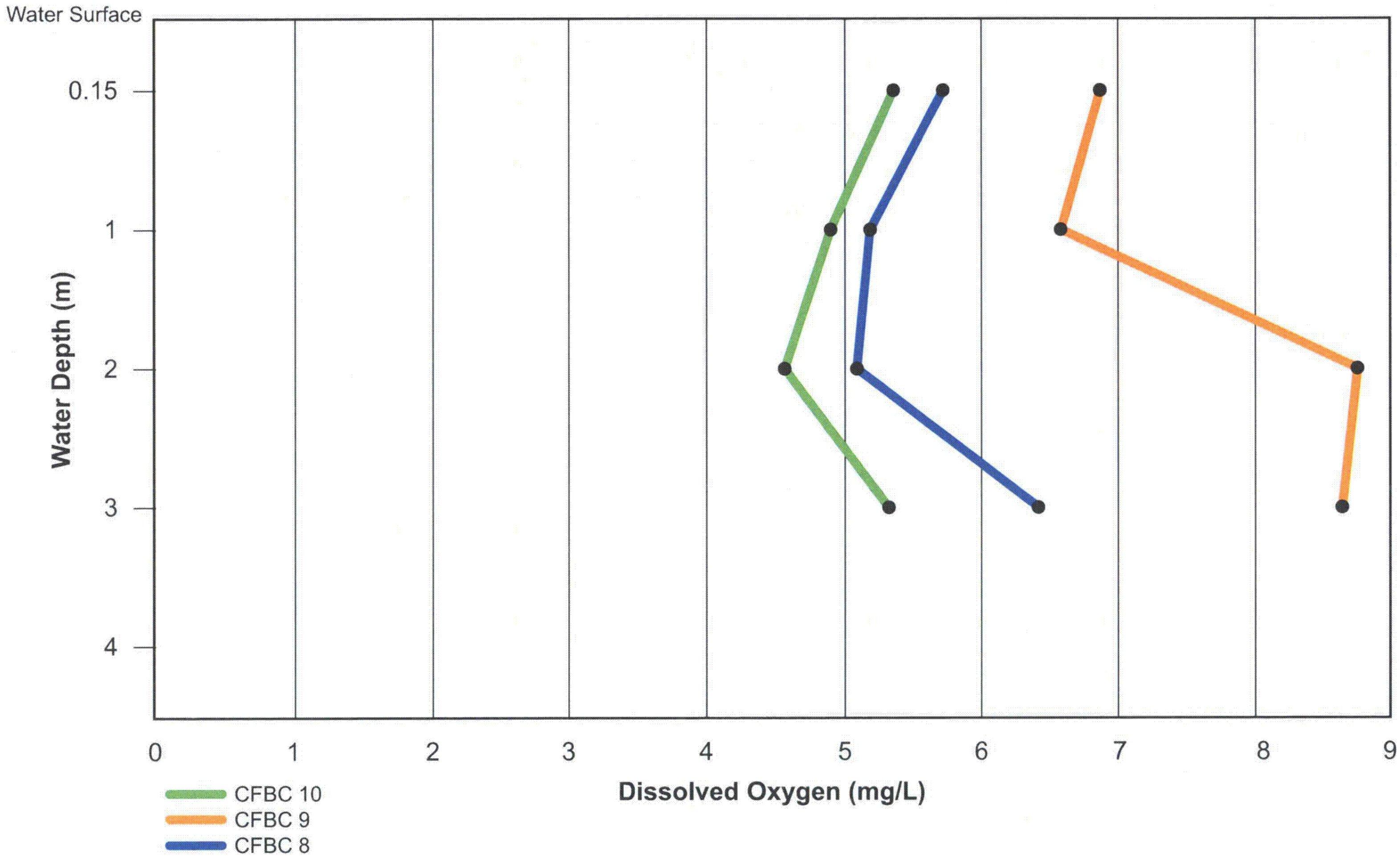
\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2339\3.3.2-1.pdf Date: 1/22/2009; Tech: HRobertson



Note: CFBC Stations 8, 9, and 10 total water depths are less than 4 meters.

Progress Energy Florida **Levy Nuclear Plant Units 1 and 2 Aquatic Ecology Sampling Report**
Average Temperature (°C) at OWR Stations FIGURE 3.3.2-2 Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2339\3.3.2-2.pdf Date: 1/22/2009; Tech: HRobertson



Note: CFBC Stations 8, 9, and 10 total water depths are less than 4 meters.

Progress Energy Florida

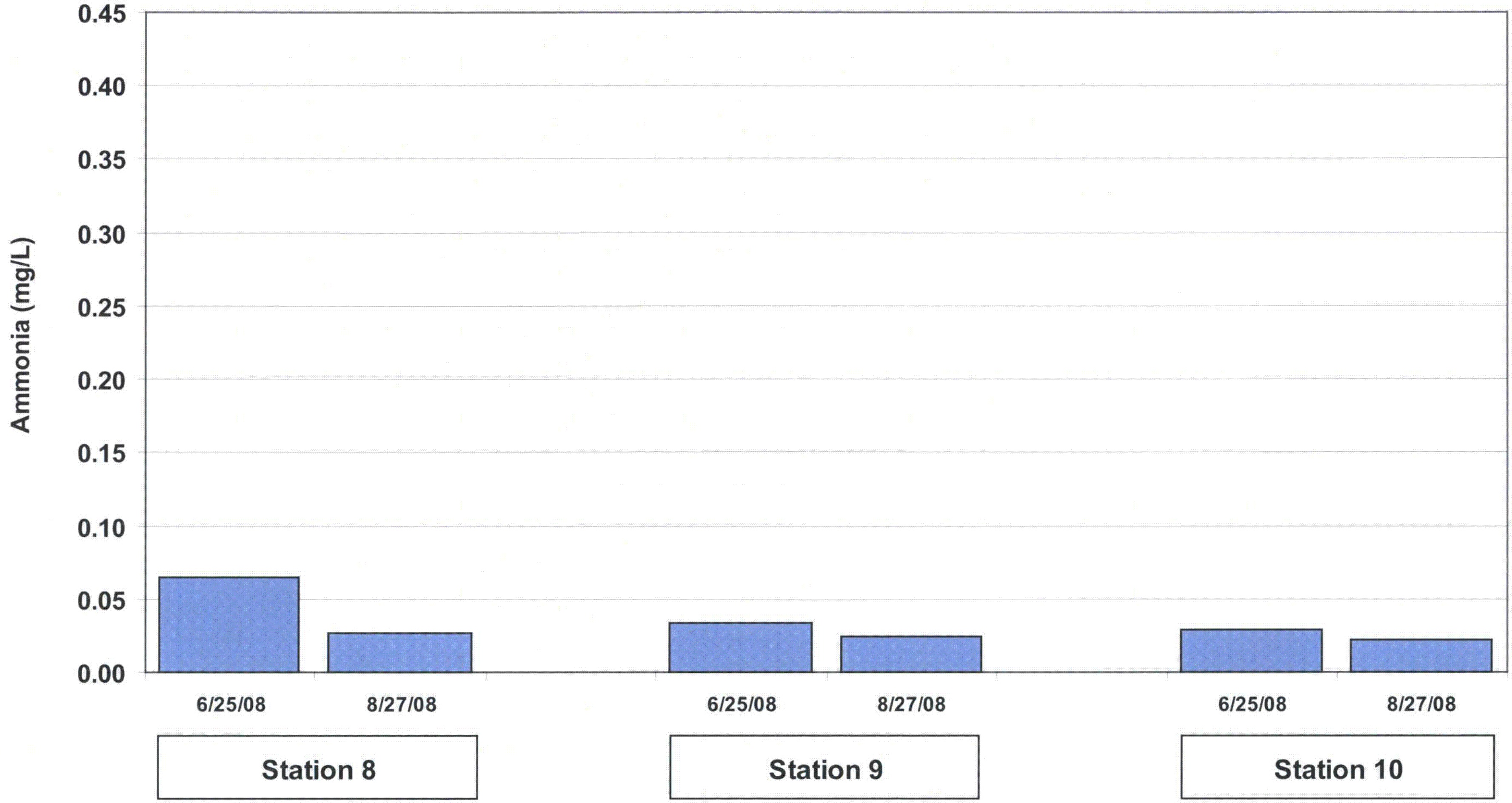
Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Average Dissolved Oxygen (mg/L)
at OWR Stations

FIGURE 3.3.2-3

Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2339\3.3.2-3.pdf Date: 1/22/2009; Tech: HRobertson



Note: All samples taken at mid depth unless otherwise noted.

Progress Energy Florida

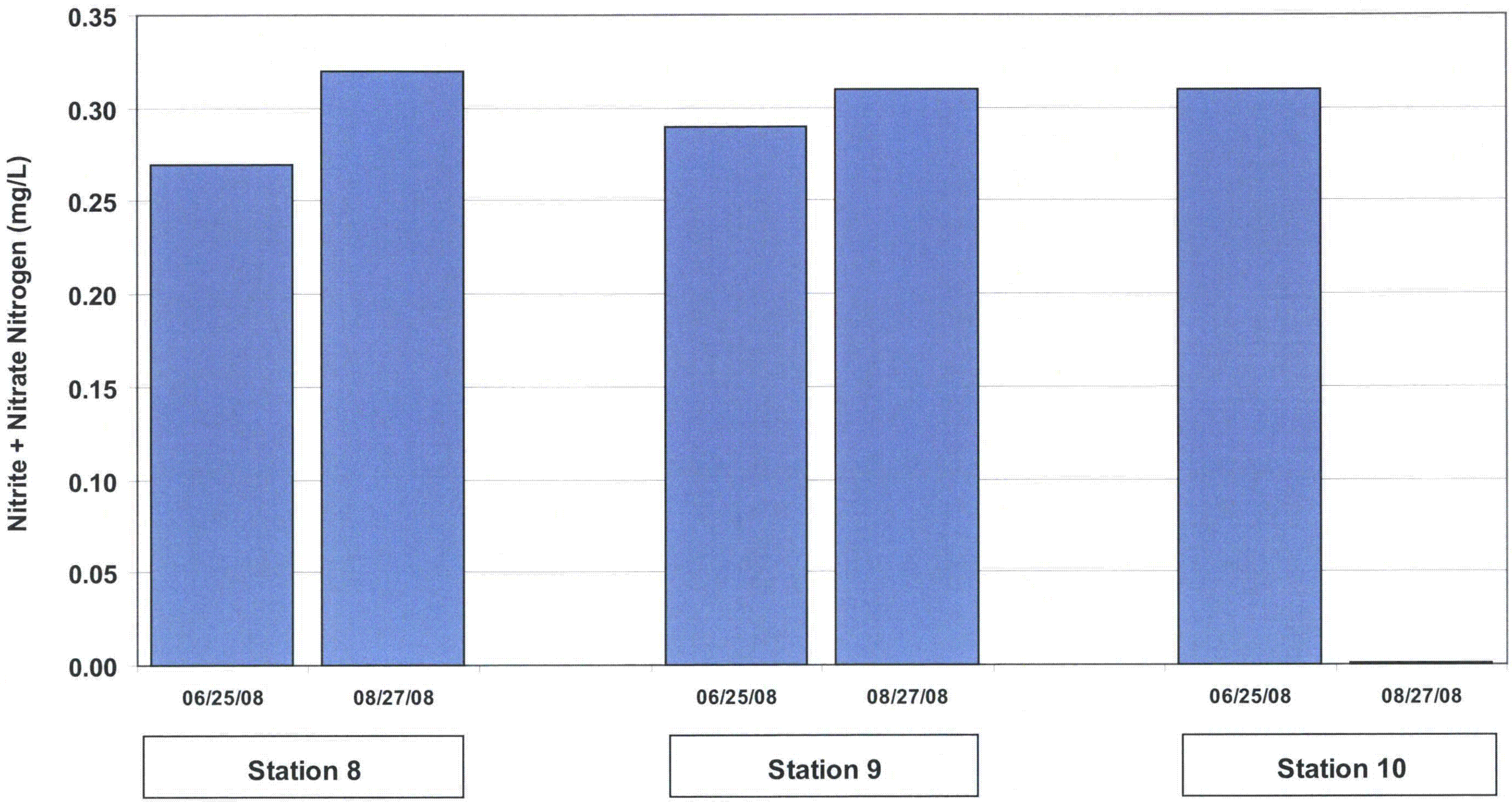
Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Ammonia (mg/L) at OWR Stations

FIGURE 3.3.2-4

Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2337\3.3.2-4.pdf Date: 1/21/2009; Tech: HRobertson



Note: All samples taken at mid depth unless otherwise noted.

Progress Energy Florida

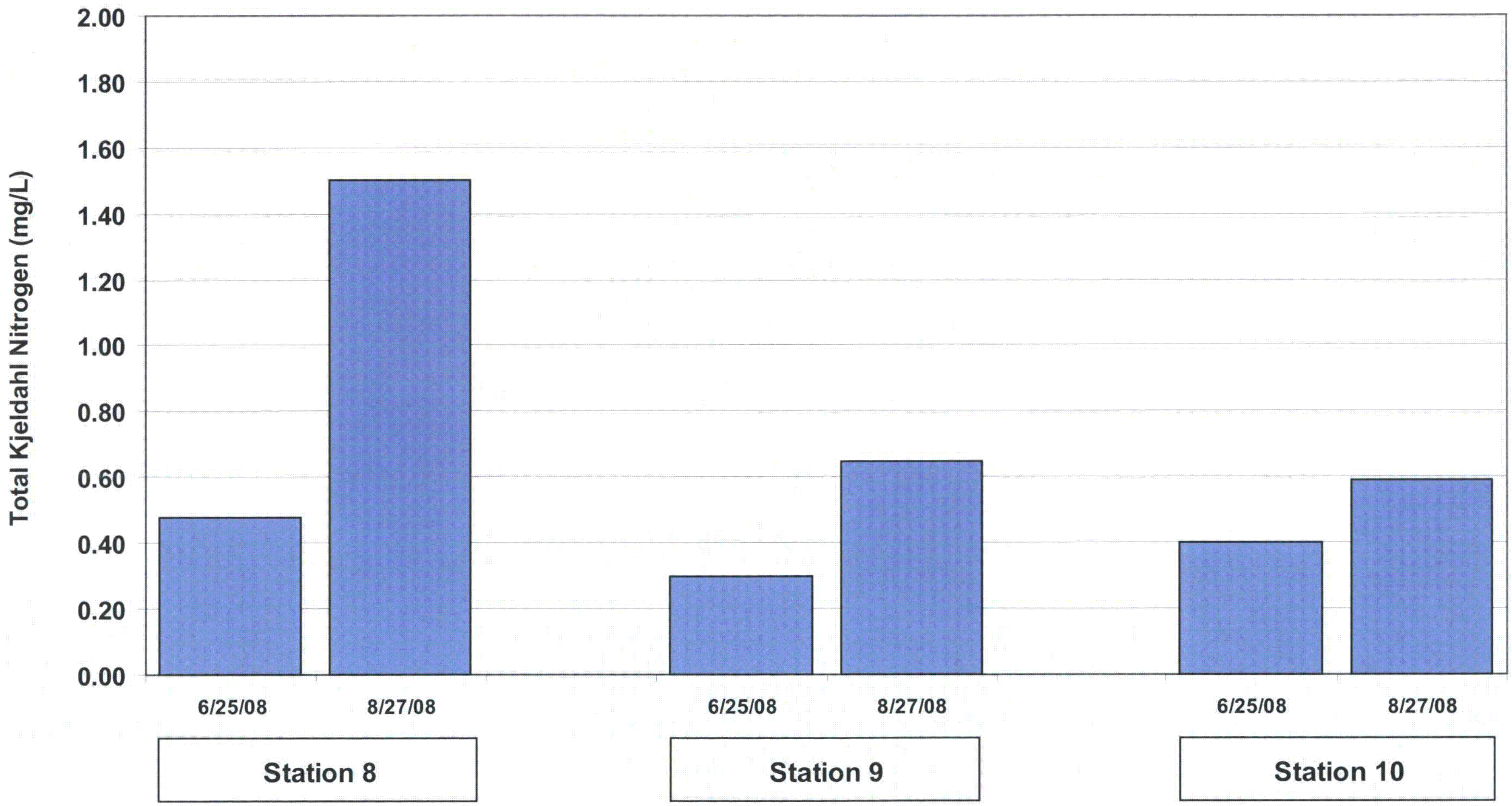
Levy Nuclear Plant
Units 1 and 2
Aquatic Ecology Sampling Report

Nitrite + Nitrate Nitrogen (mg/L) at OWR Stations

FIGURE 3.3.2-5

Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2343\3.3.2-5.pdf Date: 1/21/2009; Tech: HRobertson



Note: All samples taken at mid depth unless otherwise noted.

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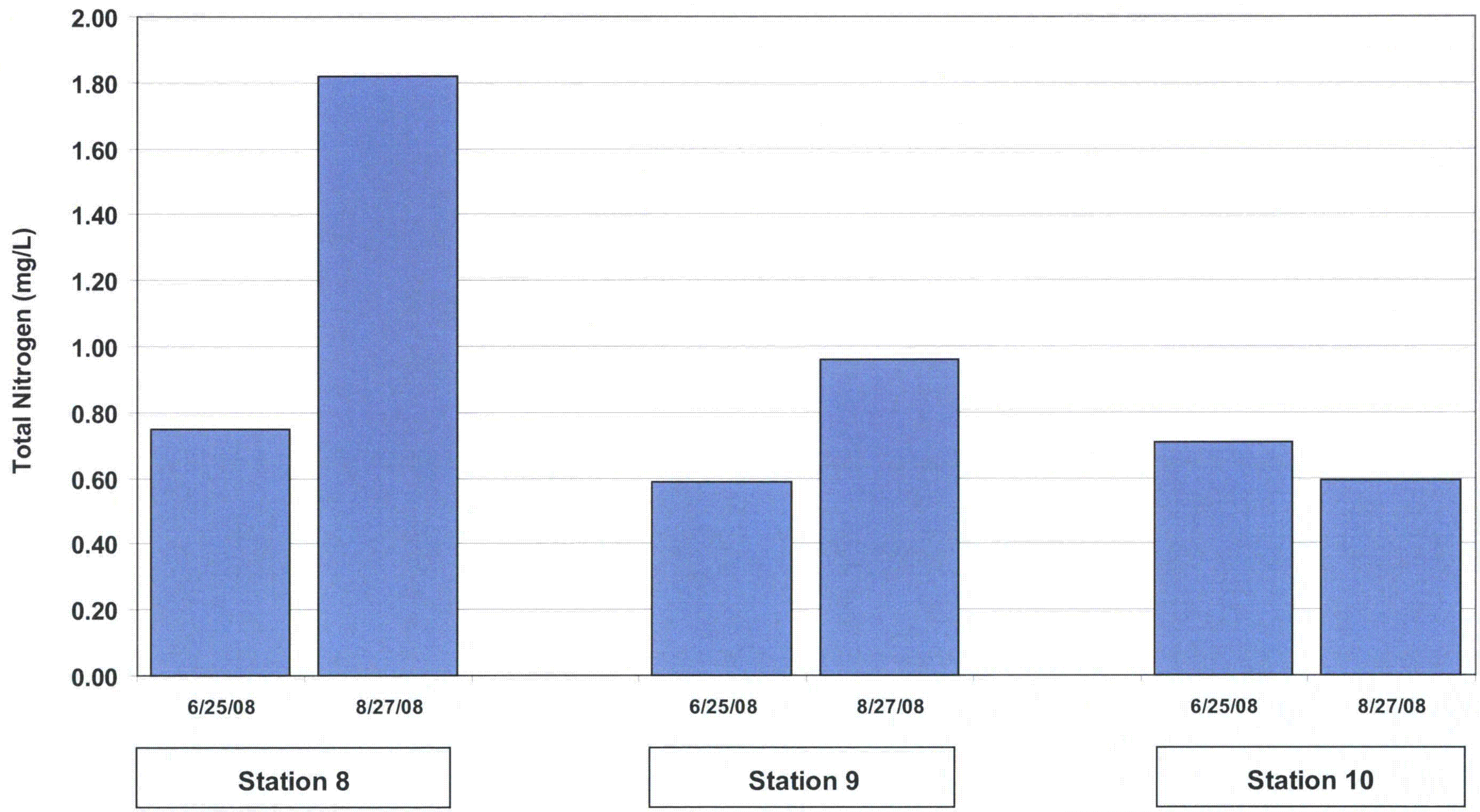
Units 1 and 2
Aquatic Ecology Sampling Report

Total Kjeldahl Nitrogen (mg/L) At OWR Stations

FIGURE 3.3.2-6

Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2337\3.3.2-6.pdf Date: 1/21/2009; Tech: HRobertson



Note: All samples taken at mid depth unless otherwise noted.

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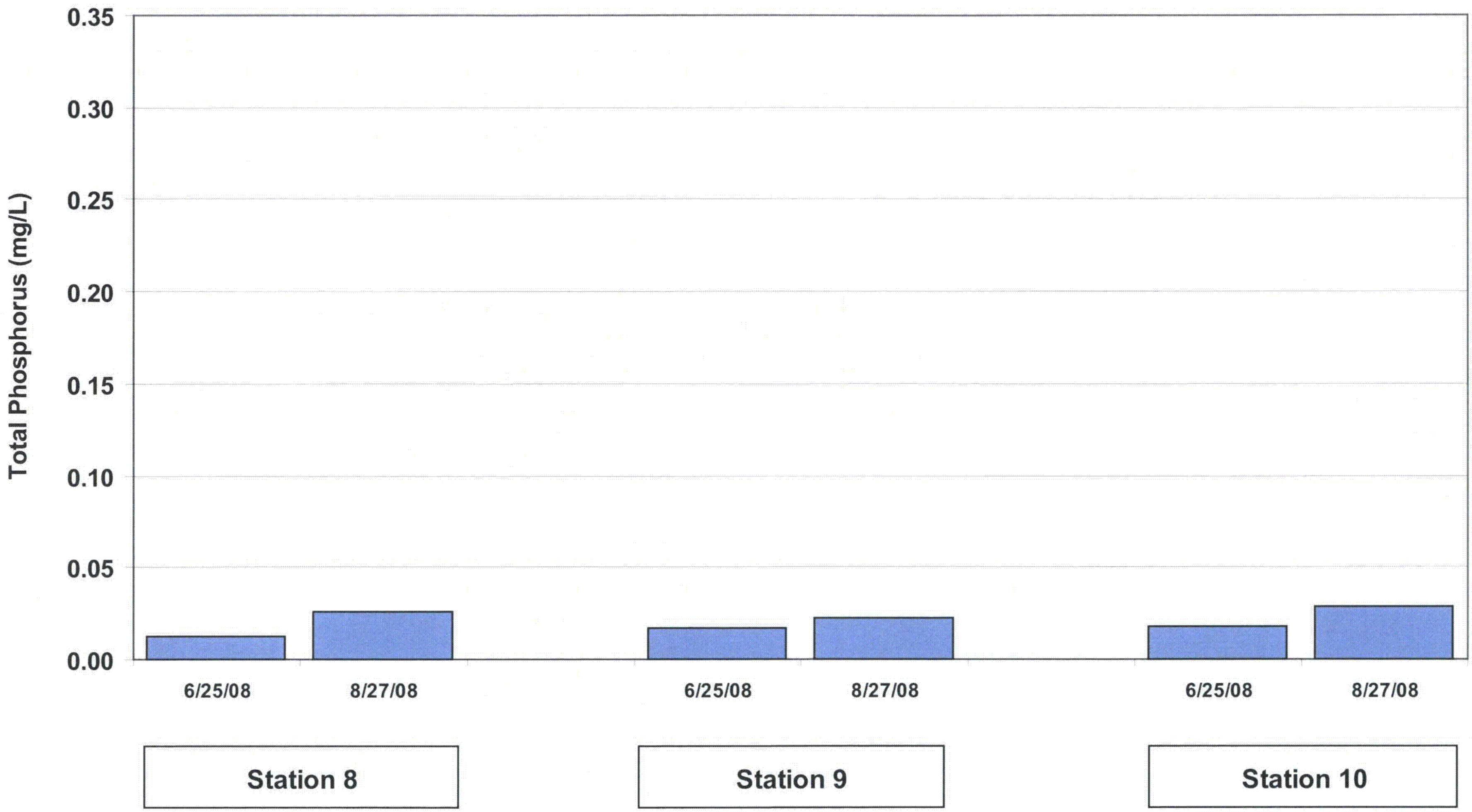
Units 1 and 2
Aquatic Ecology Sampling Report

Total Nitrogen (mg/L) at OWR Stations

FIGURE 3.3.2-7

Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2337\3.3.2-7.pdf Date: 1/21/2009; Tech: HRobertson



Note: All samples taken at mid depth unless otherwise noted.

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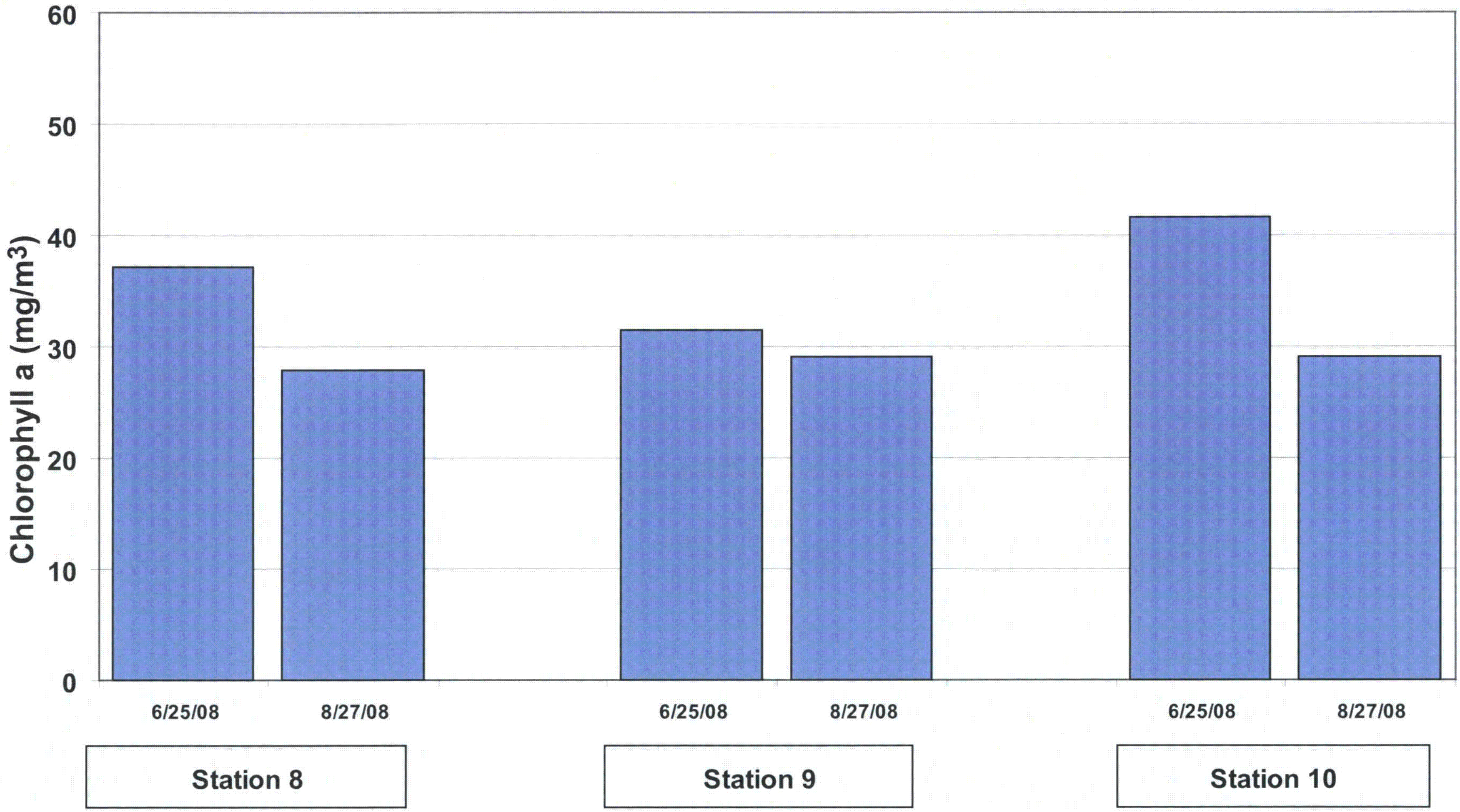
Aquatic Ecology Sampling Report

Total Phosphorus (mg/L) at OWR Stations

FIGURE 3.3.2-8

Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2337\3.3.2-8.pdf Date: 1/21/2009; Tech: HRobertson



Note: All samples taken at mid depth unless otherwise noted.

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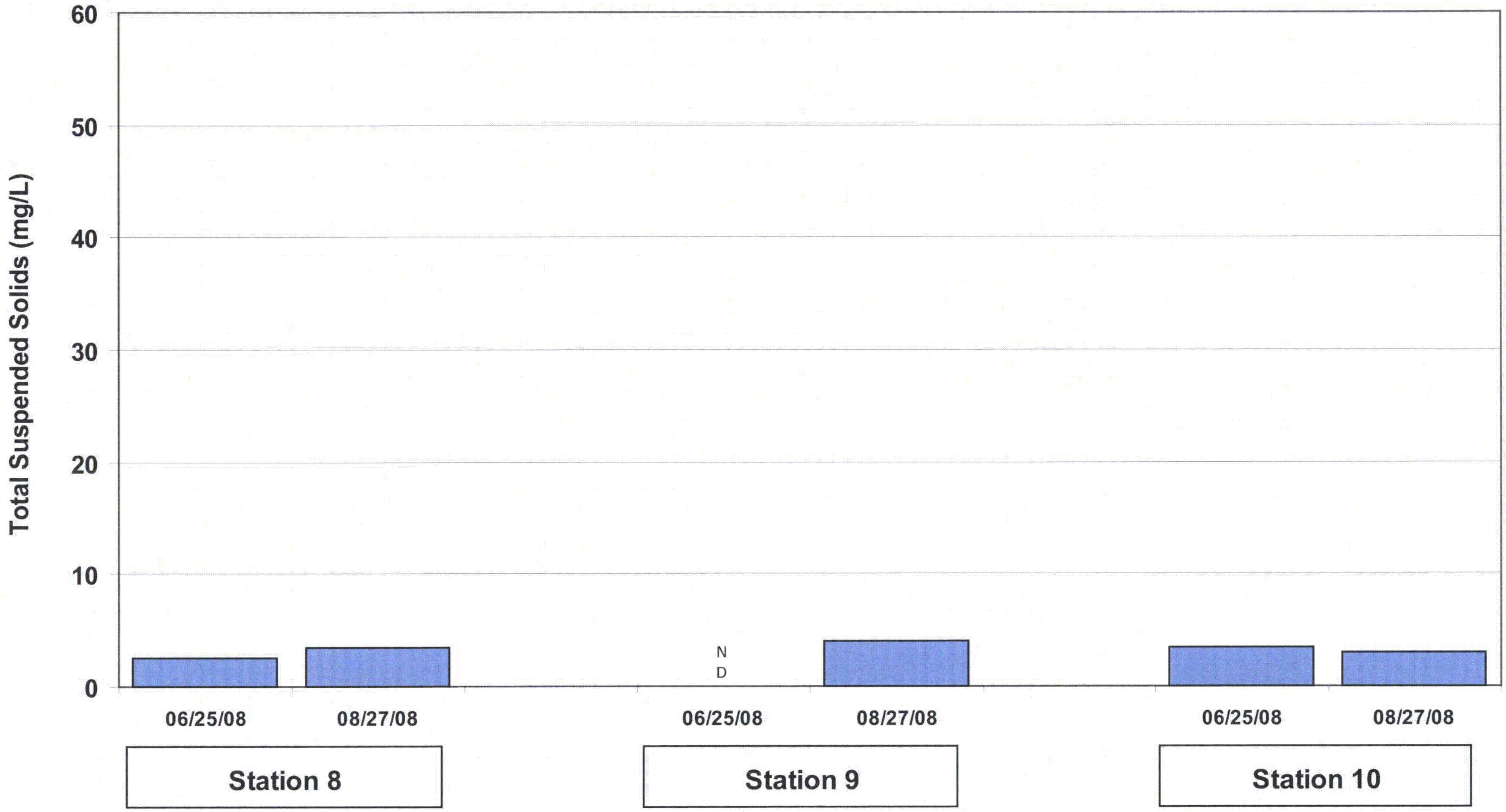
Units 1 and 2
Aquatic Ecology Sampling Report

Chlorophyll a (mg/m^3) at OWR Stations

FIGURE 3.3.2-9

Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2342\3.3.2-9.pdf Date: 1/22/2009; Tech: HRobertson



Note: All samples taken at mid depth unless otherwise noted.
ND = Not Detected, below method detection limit or reporting limit

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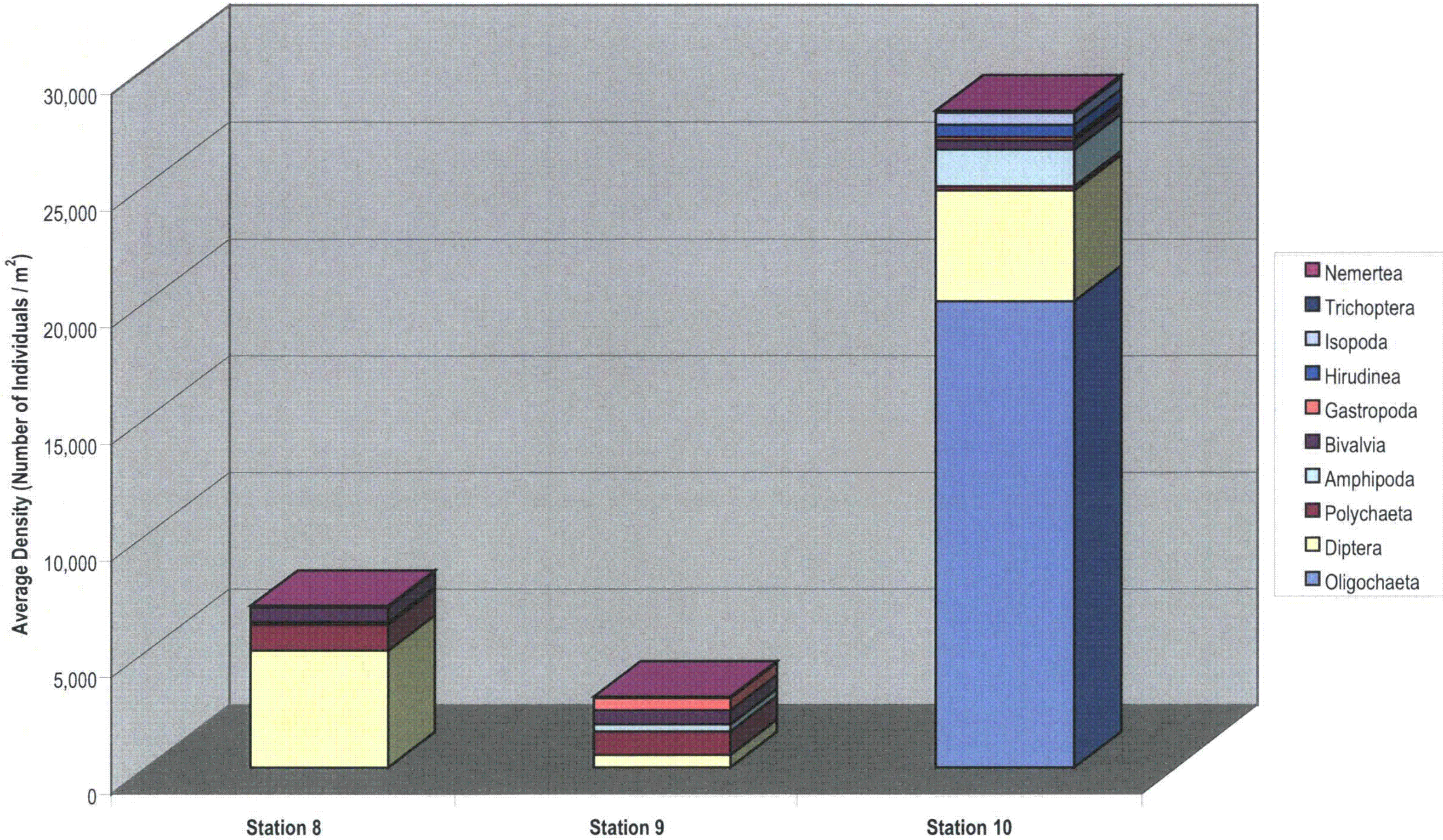
Units 1 and 2
Aquatic Ecology Sampling Report

Total Suspended Solids (mg/L) at OWR Stations

FIGURE 3.3.2-10

Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2337\3.3.2-10.pdf Date: 1/21/2009; Tech: HRobertson



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Aquatic Ecology Sampling Report

Benthic Infauna Abundance in the OWR

FIGURE 3.3.3.1-1

Rev 0

\\Odin\Groups\Publications\~JMS-2008\Progress_Energy\MR-2325\3.3.3.1-1.pdf Date: 1/15/2009; Tech: HRobertson

Appendix A
Cross Florida Barge Canal Analytical and Biological Source Data

A-1
CFBC Sediment Chemistry Data

A-1 Cross Florida Barge Canal Sediment Data

Site	Station	Replicate	Date	Note	Parameter	Value	Qualifier	Units
CFBC	CFBC-01A	1	10/12/07 15:10		Total Organic Carbon	65000	=	mg/Kg
CFBC	CFBC-01A	1	10/12/07 15:10		GRAVEL	0	=	%
CFBC	CFBC-01A	1	10/12/07 15:10		COARSE SAND	0.1	=	%
CFBC	CFBC-01A	1	10/12/07 15:10		MEDIUM SAND	5.5	=	%
CFBC	CFBC-01A	1	10/12/07 15:10		FINE SAND	19.5	=	%
CFBC	CFBC-01A	1	10/12/07 15:10		SILT	59.1	=	%
CFBC	CFBC-01A	1	10/12/07 15:10		CLAY	15.7	=	%
CFBC	CFBC-01A	1	06/19/08 14:40		Total Organic Carbon	66000	J	mg/Kg
CFBC	CFBC-01A	1	06/19/08 14:40		GRAVEL	0	=	%
CFBC	CFBC-01A	1	06/19/08 14:40		COARSE SAND	0	=	%
CFBC	CFBC-01A	1	06/19/08 14:40		MEDIUM SAND	0	=	%
CFBC	CFBC-01A	1	06/19/08 14:40		FINE SAND	17.9	=	%
CFBC	CFBC-01A	1	06/19/08 14:40		SILT	47	=	%
CFBC	CFBC-01A	1	06/19/08 14:40		CLAY	35	=	%
CFBC	CFBC-01B	2	10/12/07 15:28		Total Organic Carbon	70000	=	mg/Kg
CFBC	CFBC-01B	2	10/12/07 15:28		GRAVEL	0	=	%
CFBC	CFBC-01B	2	10/12/07 15:28		COARSE SAND	0.1	=	%
CFBC	CFBC-01B	2	10/12/07 15:28		MEDIUM SAND	5.7	=	%
CFBC	CFBC-01B	2	10/12/07 15:28		FINE SAND	12.9	=	%
CFBC	CFBC-01B	2	10/12/07 15:28		SILT	59.7	=	%
CFBC	CFBC-01B	2	10/12/07 15:28		CLAY	21.6	=	%
CFBC	CFBC-01B	2	06/19/08 14:00		Total Organic Carbon	61000	=	mg/Kg
CFBC	CFBC-01B	2	06/19/08 14:00		GRAVEL	0	=	%
CFBC	CFBC-01B	2	06/19/08 14:00		COARSE SAND	0	=	%
CFBC	CFBC-01B	2	06/19/08 14:00		MEDIUM SAND	0	=	%
CFBC	CFBC-01B	2	06/19/08 14:00		FINE SAND	19.5	=	%
CFBC	CFBC-01B	2	06/19/08 14:00		SILT	45.7	=	%
CFBC	CFBC-01B	2	06/19/08 14:00		CLAY	34.8	=	%
CFBC	CFBC-01B	2	06/19/08 14:00	Field Dup	Total Organic Carbon	53000	=	mg/Kg
CFBC	CFBC-01B	2	06/19/08 14:00	Field Dup	GRAVEL	0.1	=	%
CFBC	CFBC-01B	2	06/19/08 14:00	Field Dup	COARSE SAND	0.3	=	%
CFBC	CFBC-01B	2	06/19/08 14:00	Field Dup	MEDIUM SAND	2.4	=	%
CFBC	CFBC-01B	2	06/19/08 14:00	Field Dup	FINE SAND	23.4	=	%
CFBC	CFBC-01B	2	06/19/08 14:00	Field Dup	SILT	54.8	=	%
CFBC	CFBC-01B	2	06/19/08 14:00	Field Dup	CLAY	19.1	=	%
CFBC	CFBC-01C	3	10/12/07 16:00		Total Organic Carbon	59000	=	mg/Kg
CFBC	CFBC-01C	3	10/12/07 16:00		GRAVEL	0	=	%
CFBC	CFBC-01C	3	10/12/07 16:00		COARSE SAND	0.1	=	%
CFBC	CFBC-01C	3	10/12/07 16:00		MEDIUM SAND	6	=	%
CFBC	CFBC-01C	3	10/12/07 16:00		FINE SAND	39.4	=	%
CFBC	CFBC-01C	3	10/12/07 16:00		SILT	43.3	=	%
CFBC	CFBC-01C	3	10/12/07 16:00		CLAY	11.1	=	%
CFBC	CFBC-01C	3	06/19/08 15:00		Total Organic Carbon	51000	=	mg/Kg
CFBC	CFBC-01C	3	06/19/08 15:00		GRAVEL	0	=	%
CFBC	CFBC-01C	3	06/19/08 15:00		COARSE SAND	0	=	%
CFBC	CFBC-01C	3	06/19/08 15:00		MEDIUM SAND	0	=	%
CFBC	CFBC-01C	3	06/19/08 15:00		FINE SAND	35.5	=	%
CFBC	CFBC-01C	3	06/19/08 15:00		SILT	35	=	%
CFBC	CFBC-01C	3	06/19/08 15:00		CLAY	29.5	=	%

A-1 Cross Florida Barge Canal Sediment Data

Site	Station	Replicate	Date	Note	Parameter	Value	Qualifier	Units
CFBC	CFBC-02A	1	10/12/07 13:50		Total Organic Carbon	54000	=	mg/Kg
CFBC	CFBC-02A	1	10/12/07 13:50		GRAVEL	0	=	%
CFBC	CFBC-02A	1	10/12/07 13:50		COARSE SAND	0.1	=	%
CFBC	CFBC-02A	1	10/12/07 13:50		MEDIUM SAND	5.3	=	%
CFBC	CFBC-02A	1	10/12/07 13:50		FINE SAND	0.9	=	%
CFBC	CFBC-02A	1	10/12/07 13:50		SILT	71.9	=	%
CFBC	CFBC-02A	1	10/12/07 13:50		CLAY	21.9	=	%
CFBC	CFBC-02A	1	06/19/08 15:30		Total Organic Carbon	45000	=	mg/Kg
CFBC	CFBC-02A	1	06/19/08 15:30		GRAVEL	0	=	%
CFBC	CFBC-02A	1	06/19/08 15:30		COARSE SAND	0.1	=	%
CFBC	CFBC-02A	1	06/19/08 15:30		MEDIUM SAND	0	=	%
CFBC	CFBC-02A	1	06/19/08 15:30		FINE SAND	1.5	=	%
CFBC	CFBC-02A	1	06/19/08 15:30		SILT	51.3	=	%
CFBC	CFBC-02A	1	06/19/08 15:30		CLAY	47.1	=	%
CFBC	CFBC-02B	2	10/12/07 14:12		Total Organic Carbon	39000	=	mg/Kg
CFBC	CFBC-02B	2	10/12/07 14:12		GRAVEL	0	=	%
CFBC	CFBC-02B	2	10/12/07 14:12		COARSE SAND	0.2	=	%
CFBC	CFBC-02B	2	10/12/07 14:12		MEDIUM SAND	13.6	=	%
CFBC	CFBC-02B	2	10/12/07 14:12		FINE SAND	2.7	=	%
CFBC	CFBC-02B	2	10/12/07 14:12		SILT	58	=	%
CFBC	CFBC-02B	2	10/12/07 14:12		CLAY	25.6	=	%
CFBC	CFBC-02B	2	06/19/08 15:50		Total Organic Carbon	44000	=	mg/Kg
CFBC	CFBC-02B	2	06/19/08 15:50		GRAVEL	0	=	%
CFBC	CFBC-02B	2	06/19/08 15:50		COARSE SAND	0	=	%
CFBC	CFBC-02B	2	06/19/08 15:50		MEDIUM SAND	0.1	=	%
CFBC	CFBC-02B	2	06/19/08 15:50		FINE SAND	1.6	=	%
CFBC	CFBC-02B	2	06/19/08 15:50		SILT	54.5	=	%
CFBC	CFBC-02B	2	06/19/08 15:50		CLAY	43.8	=	%
CFBC	CFBC-02B	2	06/19/08 15:50	Field Dup	Total Organic Carbon	40000	=	mg/Kg
CFBC	CFBC-02B	2	06/19/08 15:50	Field Dup	GRAVEL	0.4	=	%
CFBC	CFBC-02B	2	06/19/08 15:50	Field Dup	COARSE SAND	0.1	=	%
CFBC	CFBC-02B	2	06/19/08 15:50	Field Dup	MEDIUM SAND	4.2	=	%
CFBC	CFBC-02B	2	06/19/08 15:50	Field Dup	FINE SAND	7.5	=	%
CFBC	CFBC-02B	2	06/19/08 15:50	Field Dup	SILT	60.7	=	%
CFBC	CFBC-02B	2	06/19/08 15:50	Field Dup	CLAY	27.1	=	%
CFBC	CFBC-02C	3	10/12/07 14:30		Total Organic Carbon	64000	=	mg/Kg
CFBC	CFBC-02C	3	10/12/07 14:30		GRAVEL	0	=	%
CFBC	CFBC-02C	3	10/12/07 14:30		COARSE SAND	0.2	=	%
CFBC	CFBC-02C	3	10/12/07 14:30		MEDIUM SAND	4.1	=	%
CFBC	CFBC-02C	3	10/12/07 14:30		FINE SAND	2.4	=	%
CFBC	CFBC-02C	3	10/12/07 14:30		SILT	77	=	%
CFBC	CFBC-02C	3	10/12/07 14:30		CLAY	16.3	=	%
CFBC	CFBC-02C	3	06/19/08 15:15		Total Organic Carbon	55000	=	mg/Kg
CFBC	CFBC-02C	3	06/19/08 15:15		GRAVEL	1.2	=	%
CFBC	CFBC-02C	3	06/19/08 15:15		COARSE SAND	0.1	=	%
CFBC	CFBC-02C	3	06/19/08 15:15		MEDIUM SAND	0	=	%
CFBC	CFBC-02C	3	06/19/08 15:15		FINE SAND	0.5	=	%
CFBC	CFBC-02C	3	06/19/08 15:15		SILT	51.3	=	%
CFBC	CFBC-02C	3	06/19/08 15:15		CLAY	46.9	=	%

A-1 Cross Florida Barge Canal Sediment Data

Site	Station	Replicate	Date	Note	Parameter	Value	Qualifier	Units
CFBC	CFBC-03A	1	10/12/07 12:35		Total Organic Carbon	38000	=	mg/Kg
CFBC	CFBC-03A	1	10/12/07 12:35		GRAVEL	0.6	=	%
CFBC	CFBC-03A	1	10/12/07 12:35		COARSE SAND	0.1	=	%
CFBC	CFBC-03A	1	10/12/07 12:35		MEDIUM SAND	7	=	%
CFBC	CFBC-03A	1	10/12/07 12:35		FINE SAND	16	=	%
CFBC	CFBC-03A	1	10/12/07 12:35		SILT	57.6	=	%
CFBC	CFBC-03A	1	10/12/07 12:35		CLAY	18.7	=	%
CFBC	CFBC-03A	1	10/12/07 12:35	Field Dup	Total Organic Carbon	48000	=	mg/Kg
CFBC	CFBC-03A	1	06/19/08 16:55		Total Organic Carbon	46000	=	mg/Kg
CFBC	CFBC-03A	1	06/19/08 16:55		GRAVEL	0	=	%
CFBC	CFBC-03A	1	06/19/08 16:55		COARSE SAND	0	=	%
CFBC	CFBC-03A	1	06/19/08 16:55		MEDIUM SAND	0	=	%
CFBC	CFBC-03A	1	06/19/08 16:55		FINE SAND	4.8	=	%
CFBC	CFBC-03A	1	06/19/08 16:55		SILT	49.6	=	%
CFBC	CFBC-03A	1	06/19/08 16:55		CLAY	45.6	=	%
CFBC	CFBC-03B	2	10/12/07 13:00		Total Organic Carbon	59000	=	mg/Kg
CFBC	CFBC-03B	2	10/12/07 13:00		GRAVEL	0	=	%
CFBC	CFBC-03B	2	10/12/07 13:00		COARSE SAND	0.1	=	%
CFBC	CFBC-03B	2	10/12/07 13:00		MEDIUM SAND	7.9	=	%
CFBC	CFBC-03B	2	10/12/07 13:00		FINE SAND	11.3	=	%
CFBC	CFBC-03B	2	10/12/07 13:00		SILT	62.9	=	%
CFBC	CFBC-03B	2	10/12/07 13:00		CLAY	17.8	=	%
CFBC	CFBC-03B	2	06/19/08 17:15		Total Organic Carbon	41000	=	mg/Kg
CFBC	CFBC-03B	2	06/19/08 17:15		GRAVEL	0	=	%
CFBC	CFBC-03B	2	06/19/08 17:15		COARSE SAND	1	=	%
CFBC	CFBC-03B	2	06/19/08 17:15		MEDIUM SAND	0.6	=	%
CFBC	CFBC-03B	2	06/19/08 17:15		FINE SAND	12.3	=	%
CFBC	CFBC-03B	2	06/19/08 17:15		SILT	47.9	=	%
CFBC	CFBC-03B	2	06/19/08 17:15		CLAY	38.3	=	%
CFBC	CFBC-03C	3	10/12/07 13:20		Total Organic Carbon	50000	=	mg/Kg
CFBC	CFBC-03C	3	10/12/07 13:20		GRAVEL	0	=	%
CFBC	CFBC-03C	3	10/12/07 13:20		COARSE SAND	0.1	=	%
CFBC	CFBC-03C	3	10/12/07 13:20		MEDIUM SAND	6.7	=	%
CFBC	CFBC-03C	3	10/12/07 13:20		FINE SAND	19.4	=	%
CFBC	CFBC-03C	3	10/12/07 13:20		SILT	57.1	=	%
CFBC	CFBC-03C	3	10/12/07 13:20		CLAY	16.6	=	%
CFBC	CFBC-03C	3	06/19/08 17:45		Total Organic Carbon	35000	=	mg/Kg
CFBC	CFBC-03C	3	06/19/08 17:45		GRAVEL	0	=	%
CFBC	CFBC-03C	3	06/19/08 17:45		COARSE SAND	0.3	=	%
CFBC	CFBC-03C	3	06/19/08 17:45		MEDIUM SAND	0.9	=	%
CFBC	CFBC-03C	3	06/19/08 17:45		FINE SAND	18.3	=	%
CFBC	CFBC-03C	3	06/19/08 17:45		SILT	42.6	=	%
CFBC	CFBC-03C	3	06/19/08 17:45		CLAY	38	=	%
CFBC	CFBC-04A	1	10/12/07 10:58		Total Organic Carbon	4100	=	mg/Kg
CFBC	CFBC-04A	1	10/12/07 10:58		GRAVEL	1.6	=	%
CFBC	CFBC-04A	1	10/12/07 10:58		COARSE SAND	0.7	=	%
CFBC	CFBC-04A	1	10/12/07 10:58		MEDIUM SAND	1.3	=	%
CFBC	CFBC-04A	1	10/12/07 10:58		FINE SAND	91.2	=	%
CFBC	CFBC-04A	1	10/12/07 10:58		SILT	3.6	=	%
CFBC	CFBC-04A	1	10/12/07 10:58		CLAY	1.6	=	%

A-1 Cross Florida Barge Canal Sediment Data

Site	Station	Replicate	Date	Note	Parameter	Value	Qualifier	Units
CFBC	CFBC-04A	1	06/20/08 09:45		Total Organic Carbon	1700	=	mg/Kg
CFBC	CFBC-04A	1	06/20/08 09:45		GRAVEL	2.7	=	%
CFBC	CFBC-04A	1	06/20/08 09:45		COARSE SAND	1.5	=	%
CFBC	CFBC-04A	1	06/20/08 09:45		MEDIUM SAND	2.5	=	%
CFBC	CFBC-04A	1	06/20/08 09:45		FINE SAND	86.7	=	%
CFBC	CFBC-04A	1	06/20/08 09:45		SILT	1.3	=	%
CFBC	CFBC-04A	1	06/20/08 09:45		CLAY	5.4	=	%
CFBC	CFBC-04B	2	10/12/07 10:30		Total Organic Carbon	7300	=	mg/Kg
CFBC	CFBC-04B	2	10/12/07 10:30		GRAVEL	0	=	%
CFBC	CFBC-04B	2	10/12/07 10:30		COARSE SAND	0.2	=	%
CFBC	CFBC-04B	2	10/12/07 10:30		MEDIUM SAND	5.1	=	%
CFBC	CFBC-04B	2	10/12/07 10:30		FINE SAND	81.6	=	%
CFBC	CFBC-04B	2	10/12/07 10:30		SILT	6.3	=	%
CFBC	CFBC-04B	2	10/12/07 10:30		CLAY	6.7	=	%
CFBC	CFBC-04B	2	06/20/08 10:30		Total Organic Carbon	7000	=	mg/Kg
CFBC	CFBC-04B	2	06/20/08 10:30		GRAVEL	0.1	=	%
CFBC	CFBC-04B	2	06/20/08 10:30		COARSE SAND	0.2	=	%
CFBC	CFBC-04B	2	06/20/08 10:30		MEDIUM SAND	2.2	=	%
CFBC	CFBC-04B	2	06/20/08 10:30		FINE SAND	84.2	=	%
CFBC	CFBC-04B	2	06/20/08 10:30		SILT	4.9	=	%
CFBC	CFBC-04B	2	06/20/08 10:30		CLAY	8.4	=	%
CFBC	CFBC-04C	3	10/12/07 11:24		Total Organic Carbon	18000	=	mg/Kg
CFBC	CFBC-04C	3	10/12/07 11:24		GRAVEL	3	=	%
CFBC	CFBC-04C	3	10/12/07 11:24		COARSE SAND	1	=	%
CFBC	CFBC-04C	3	10/12/07 11:24		MEDIUM SAND	2.9	=	%
CFBC	CFBC-04C	3	10/12/07 11:24		FINE SAND	70	=	%
CFBC	CFBC-04C	3	10/12/07 11:24		SILT	11.5	=	%
CFBC	CFBC-04C	3	10/12/07 11:24		CLAY	11.7	=	%
CFBC	CFBC-04C	3	06/20/08 11:00		Total Organic Carbon	6400	=	mg/Kg
CFBC	CFBC-04C	3	06/20/08 11:00		GRAVEL	0.4	=	%
CFBC	CFBC-04C	3	06/20/08 11:00		COARSE SAND	0.2	=	%
CFBC	CFBC-04C	3	06/20/08 11:00		MEDIUM SAND	2.5	=	%
CFBC	CFBC-04C	3	06/20/08 11:00		FINE SAND	84.2	=	%
CFBC	CFBC-04C	3	06/20/08 11:00		SILT	3.6	=	%
CFBC	CFBC-04C	3	06/20/08 11:00		CLAY	9.1	=	%
CFBC	CFBC-05A	1	10/11/07 16:25		Total Organic Carbon	3100	=	mg/Kg
CFBC	CFBC-05A	1	10/11/07 16:25		GRAVEL	19.2	=	%
CFBC	CFBC-05A	1	10/11/07 16:25		COARSE SAND	14.2	=	%
CFBC	CFBC-05A	1	10/11/07 16:25		MEDIUM SAND	18.5	=	%
CFBC	CFBC-05A	1	10/11/07 16:25		FINE SAND	43.6	=	%
CFBC	CFBC-05A	1	10/11/07 16:25		SILT	1.7	=	%
CFBC	CFBC-05A	1	10/11/07 16:25		CLAY	2.8	=	%
CFBC	CFBC-05B	2	10/11/07 16:50		Total Organic Carbon	4800	=	mg/Kg
CFBC	CFBC-05B	2	10/11/07 16:50		GRAVEL	3.3	=	%
CFBC	CFBC-05B	2	10/11/07 16:50		COARSE SAND	8	=	%
CFBC	CFBC-05B	2	10/11/07 16:50		MEDIUM SAND	9.3	=	%
CFBC	CFBC-05B	2	10/11/07 16:50		FINE SAND	73.9	=	%
CFBC	CFBC-05B	2	10/11/07 16:50		SILT	1.4	=	%
CFBC	CFBC-05B	2	10/11/07 16:50		CLAY	4.1	=	%

A-1 Cross Florida Barge Canal Sediment Data

Site	Station	Replicate	Date	Note	Parameter	Value	Qualifier	Units
CFBC	CFBC-05C	3	10/11/07 17:15		Total Organic Carbon	3200	=	mg/Kg
CFBC	CFBC-05C	3	10/11/07 17:15	Field Dup	Total Organic Carbon	3200	=	mg/Kg
CFBC	CFBC-05C	3	10/11/07 17:15		GRAVEL	14.3	=	%
CFBC	CFBC-05C	3	10/11/07 17:15		COARSE SAND	11.3	=	%
CFBC	CFBC-05C	3	10/11/07 17:15		MEDIUM SAND	24.4	=	%
CFBC	CFBC-05C	3	10/11/07 17:15		FINE SAND	44.6	=	%
CFBC	CFBC-05C	3	10/11/07 17:15		SILT	2	=	%
CFBC	CFBC-05C	3	10/11/07 17:15		CLAY	3.4	=	%
CFBC	CFBC-06A	1	10/11/07 15:15		Total Organic Carbon	3700	=	mg/Kg
CFBC	CFBC-06A	1	10/11/07 15:15		GRAVEL	0.5	=	%
CFBC	CFBC-06A	1	10/11/07 15:15		COARSE SAND	2.2	=	%
CFBC	CFBC-06A	1	10/11/07 15:15		MEDIUM SAND	33.2	=	%
CFBC	CFBC-06A	1	10/11/07 15:15		FINE SAND	55.6	=	%
CFBC	CFBC-06A	1	10/11/07 15:15		SILT	4.3	=	%
CFBC	CFBC-06A	1	10/11/07 15:15		CLAY	4.2	=	%
CFBC	CFBC-06B	2	10/11/07 15:28		Total Organic Carbon	4500	=	mg/Kg
CFBC	CFBC-06B	2	10/11/07 15:28		GRAVEL	6.1	=	%
CFBC	CFBC-06B	2	10/11/07 15:28		COARSE SAND	16	=	%
CFBC	CFBC-06B	2	10/11/07 15:28		MEDIUM SAND	29.3	=	%
CFBC	CFBC-06B	2	10/11/07 15:28		FINE SAND	43.9	=	%
CFBC	CFBC-06B	2	10/11/07 15:28		SILT	2.3	=	%
CFBC	CFBC-06B	2	10/11/07 15:28		CLAY	2.5	=	%
CFBC	CFBC-06C	3	10/11/07 15:49		Total Organic Carbon	5500	=	mg/Kg
CFBC	CFBC-06C	3	10/11/07 15:49		GRAVEL	0.1	=	%
CFBC	CFBC-06C	3	10/11/07 15:49		COARSE SAND	0.8	=	%
CFBC	CFBC-06C	3	10/11/07 15:49		MEDIUM SAND	18.6	=	%
CFBC	CFBC-06C	3	10/11/07 15:49		FINE SAND	72.7	=	%
CFBC	CFBC-06C	3	10/11/07 15:49		SILT	2.2	=	%
CFBC	CFBC-06C	3	10/11/07 15:49		CLAY	5.6	=	%
CFBC	CFBC-07A	1	10/11/07 12:35		Total Organic Carbon	4500	=	mg/Kg
CFBC	CFBC-07A	1	10/11/07 12:35		GRAVEL	9.3	=	%
CFBC	CFBC-07A	1	10/11/07 12:35		COARSE SAND	27.4	=	%
CFBC	CFBC-07A	1	10/11/07 12:35		MEDIUM SAND	26.5	=	%
CFBC	CFBC-07A	1	10/11/07 12:35		FINE SAND	32.2	=	%
CFBC	CFBC-07A	1	10/11/07 12:35		SILT	1.8	=	%
CFBC	CFBC-07A	1	10/11/07 12:35		CLAY	2.8	=	%
CFBC	CFBC-07B	2	10/11/07 14:05		Total Organic Carbon	5400	=	mg/Kg
CFBC	CFBC-07B	2	10/11/07 14:05		GRAVEL	5.9	=	%
CFBC	CFBC-07B	2	10/11/07 14:05		COARSE SAND	22.9	=	%
CFBC	CFBC-07B	2	10/11/07 14:05		MEDIUM SAND	32.7	=	%
CFBC	CFBC-07B	2	10/11/07 14:05		FINE SAND	34.1	=	%
CFBC	CFBC-07B	2	10/11/07 14:05		SILT	2.4	=	%
CFBC	CFBC-07B	2	10/11/07 14:05		CLAY	2	=	%
CFBC	CFBC-07C	3	10/11/07 14:35		Total Organic Carbon	3700	J	mg/Kg
CFBC	CFBC-07C	3	10/11/07 14:35		GRAVEL	43.7	=	%
CFBC	CFBC-07C	3	10/11/07 14:35		COARSE SAND	9.2	=	%
CFBC	CFBC-07C	3	10/11/07 14:35		MEDIUM SAND	15.7	=	%
CFBC	CFBC-07C	3	10/11/07 14:35		FINE SAND	27	=	%
CFBC	CFBC-07C	3	10/11/07 14:35		SILT	1.4	=	%
CFBC	CFBC-07C	3	10/11/07 14:35		CLAY	3	=	%