Preassessment Data Report
Mosaic Acidic Process Water Release
Riverview, Florida

November 2005

U.S. Department of Commerce
National Oceanic and Atmospheric Administration

U.S. Department of Interior
U.S. Fish and Wildlife Service

State of Florida Department of Environmental Protection

Environmental Protection Commission of Hillsborough County

Florida Fish and Wildlife Conservation Commission

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1.0 INTRODUCTION

On September 5, 2004, erosion of a phosphogypsum berm atop a phosphpogypsum stack during Hurricane Frances resulted in the release of acidic process water (the "release") from the Mosaic Fertilizer, LLC ("Mosaic", formerly Cargill, Inc.) phosphoric acid/fertilizer production facility in Riverview, Florida (Figure 1). This release began on the morning of September 5, 2004 and was contained and stopped on September 6, 2004. Mosaic estimated a release volume of 65 million gallons. The released process water was acidic and nutrient-enriched and produced areas of depressed pH and elevated levels of nitrogen and phosphorus. These changes caused or contributed to loss or injury of flora and fauna. Natural resources exposed to the released process water include vegetated marshes, benthic invertebrates, water column organisms, wildlife and aquatic flora.

To assess injuries, a preliminary fact-finding exercise was conducted to collect the information necessary to determine whether to pursue restoration planning. This exercise is termed the pre-assessment phase. Authority for the process is provided by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended, 42 U.S.C. § 9601 *et seq.*, the Federal Water Pollution Control Act, 33 U.S.C. § 1251 *et seq.*, and other applicable Federal law including the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Subpart G, 40 C.F.R. Sections 300.600 – 300.615 and the Natural Resource Damage Assessment Regulations, 43 C.F.R. Part 11.

Natural Resource Damage Assessment (NRDA) Trustees in conjunction with local resource management agencies and technical representatives from Mosaic (jointly, the "NRDA working group") initiated ephemeral data collection as part of pre-assessment activities. Natural resource Trustees include the National Oceanic and Atmospheric Administration (NOAA), the Florida Department of Environmental Protection (FDEP), and the Department of Interior, United States Fish and Wildlife Service (DOI/USFWS). Local resource management agencies including the Environmental Protection Commission of Hillsborough County (EPCHC), and the Florida Fish and Wildlife Conservation Commission (FFWCC).

This document constitutes the Pre-Assessment Data Report (PADR). It is a review of pre-assessment information meant to assist the Trustees with an evaluation of the technical adequacy of the information and to determine additional injury assessment needs and restoration planning, if necessary. This document is a summary of pre-assessment activities that took place from September 5, 2004 through April 29, 2005. It is not meant to represent all information and data that could be considered during the damage assessment or restoration planning phase nor is it intended to represent a final interpretation of the information included in this document.

2.0 CHARACTERISTICS OF THE SPILLED PRODUCT

Process water is used and re-circulated throughout the phosphogypsum system as well as mineral processing/ fertilizer production. The water is used for several processes, such as a scrubbing medium for production equipment air pollution control devices, a heat-exchange medium, and as a transport medium. Process water contains approximately 2% phosphoric acid and other compounds including nutrients (nitrogen and phosphorous) and heavy metals. The released process water that spilled into Archie Creek and eventually Hillsborough Bay had previously transported phosphogypsum in a pumpable slurry form from the phosphoric acid production plant to the stack. In the stack, the phosphogypsum is allowed to settle and the water is decanted and re-used.

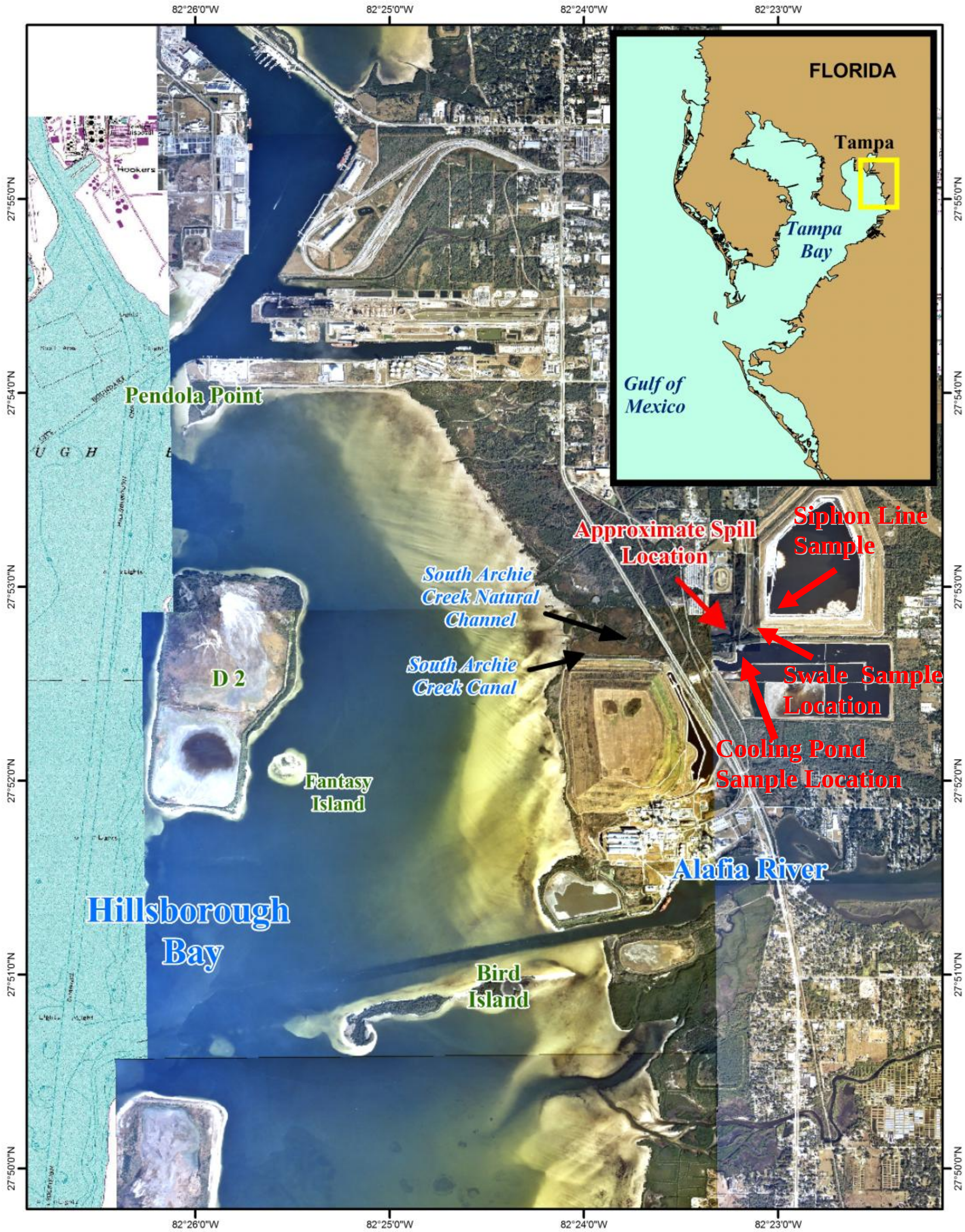


Figure 1. Project Vicinity. (Sample locations are approximate)

During and immediately following the release, water samples were collected from three locations (Figure 1) and analyzed for a number of water quality parameters including pH, metals, nutrients, and other constituents. The three sampling locations were:

- the swale from which the release ultimately occurred, which contained a combination of process water, rainwater and stormwater runoff from the side slopes of the phosphogypsum stack (Table 1a);
- a siphon line within the stack, which contained raw process water (Table 1b); and
- the cooling pond below the stack, which received process water through the siphon line as well as rainwater and stormwater runoff (Appendix 1).

An attempt to neutralize the process water occurred at the point of discharge and within Archie Creek. Two different types of neutralizing media were used: sodium hydroxide and lime. Approximately 738 tons (approximately 180,000 gallons) of 50% solution of sodium hydroxide was used on September 5, 6 and 7 and approximately 105 tons (approximately 26,000 gallons) of lime slurry (90% $Ca(OH)_2$) was used on September 6 and 7. The dates and quantities of neutralizer applied are shown in Appendix 2. Visual observations of Archie Creek after the neutralizing media was used indicated that some of the lime slurry settled in portions of the stream channel and marsh.

Table 1a. Results of Process Water Analysis from Perimeter Swale.

September 8, 2004 17:30

Analyte	Result	Unit
pH	2.264	SU
Temperature	NS	°C
Conductivity	NS	mS/cm
Turbidity	5.77	NTU
%DO	NS	%
DO	NS	mg/L
Fluoride	2620	mg/L
Total Phosphorus	4056	mg/L
Nitrite-Nitrate	2.49	mg/L
Total Nitrogen	345.5	mg/L
Nitrogen Ammonia	355	mg/L
Unionized Ammonia	NS	mg/L
Gross Alpha Particle	3960	pCi/L
Radium 226	TBD	pCi/L
Radium 228	TBD	pCi/L
Arsenic	NS	mg/L
Barium	0.22	mg/L
Cadmium	0.25	mg/L
Chromium	0.89	mg/L
Lead	0.09	mg/L
Mercury	TBD	mg/L
Selenium	NS	mg/L
Silver	0.03	mg/L

Table 1b. Results of Process Water Analysis from Siphon Line.

September 8, 2004; 15:35

COMPONENT	RESULT	UNIT
pH	2.149	SU
Temperature	30.82	°C
Conductivity	19.19	mS/cm
Turbidity	10.3	NTU
%DO	127	%
DO	8.96	mg/L
Fluoride	3560	mg/L
Total Phosphorus	6720	mg/L
Nitrite	<0.02	mg/L
Nitrate	1.9	mg/L
TKN	459	mg/L
Nitrogen Ammonia	424	mg/L
Unionized Ammonia	<0.005	mg/L
Gross Alpha Particle	6010	pCi/L
Radium 226	53.0	pCi/L
Radium 228	2.0	pCi/L
Arsenic	0.53	mg/L
Barium	0.4	mg/L
Cadmium	0.35	mg/L
Chromium	1.1	mg/L
Lead	0.15	mg/L
Mercury	<0.002	mg/L
Selenium	<0.005	mg/L
Silver	0.01	mg/L

3.0 PRE-ASSESMENT DATA COLLECTION EFFORTS

In the first hours and days during and following the spill, several ephemeral data tasks were undertaken by the NRDA working group, including pH measurements in Archie Creek and Hillsborough Bay and crab trap inspections in the bay. On September 8 2004, the NRDA working group began to develop a list of additional ephemeral data collection tasks to be performed. These tasks were designed to help define the extent of injury to the primary areas of concern; water column and benthic organisms, seagrasses, vegetation and wildlife.

3.1 Water Column and Benthos

Water quality effects and associated injury to the biota of Archie Creek and Hillsborough Bay were assessed through a variety of water column and benthic sampling efforts.

Water Quality

Lewis Environmental Services (LES) measured pH and salinity at 7 sites in north and south Archie Creek and several sites in Delaney Creek from September 6 to September 27, 2004 (Figure 2a). Water pH was measured in Archie Creek and throughout Hillsborough Bay on September 6 and 7, 2004 by personnel from the National Oceanic and Atmospheric Administration (NOAA), on September 7 and 8, 2004 by the Florida Department of Environmental Protection (FDEP), and on September 6 to September 29, 2004 by the Environmental Protection Commission of Hillsborough County (EPCHC) (Figure 2b). Mosaic also maintains stream flow monitoring stations, one on Archie Creek North and the other on Archie Creek South, each near Highway 41. Each records pH (Figure 2a). The stream flow gauge on Archie Creek South failed on September 9, 2004.

Water samples for nutrient analyses were collected by EPCHC on September 6, 7, 8, 10, 16 and 29, 2004 at regular monitoring stations in Archie Creek and Hillsborough Bay (Figure 3a). In addition the EPCHC, through its long-term ambient monitoring program, also conducts monthly surface water quality monitoring at 52 stations (Figure 3b) located throughout Tampa Bay. This long-term monitoring program has been in existence since the early 1970s, providing data that can be used to characterize water quality conditions in Hillsborough Bay and other portions of Tampa Bay prior to and following the September 5, 2004 spill.

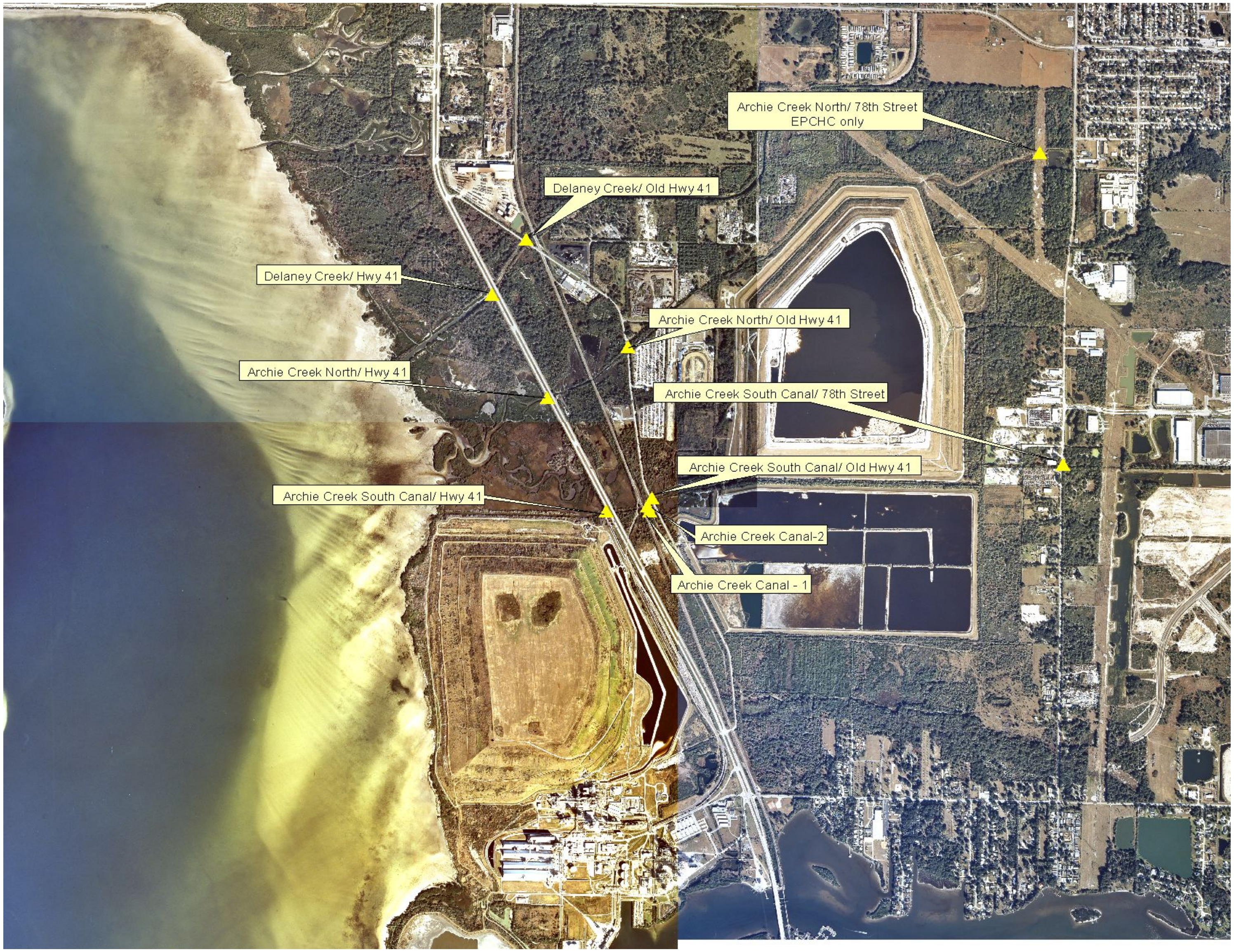


Figure 2a. pH sampling stations in Archie and Delaney Creeks (LES).

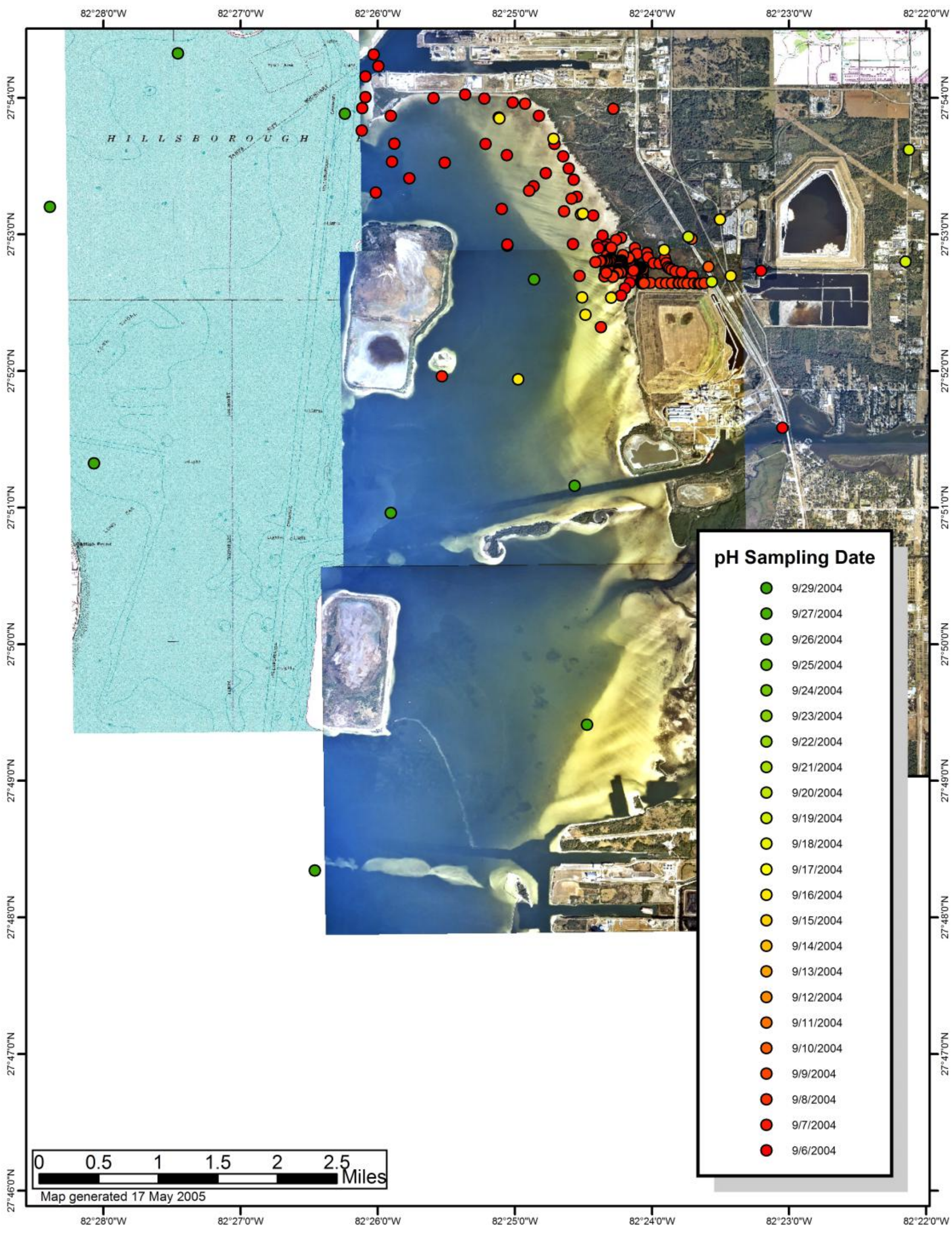


Figure 2b. Locations of pH monitoring in Hillsborough Bay from September 6-29, 2004 (EPCHC, FDEP, NOAA).

Figure 3a. Long-term nutrient monitoring locations in Hillsborough Bay (EPC).

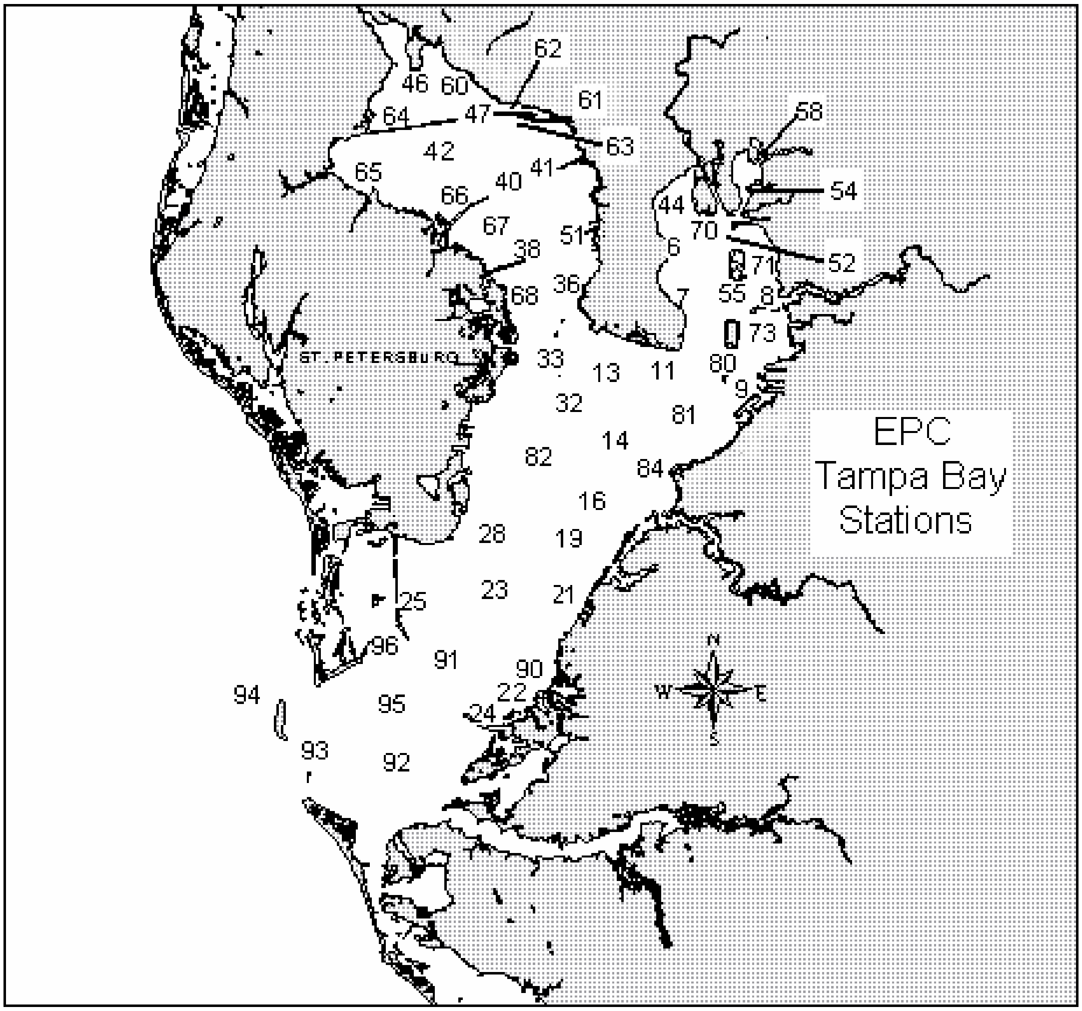


Figure 3b. Long-term nutrient monitoring locations in Tampa Bay (EPC).

Nekton

Shoreline surveys were performed by FFWCC at 14 locations to provide an estimate of the number of dead organisms washed onto the shoreline in the affected area. Surveys were 100 yards long and 10 feet from the shoreline and followed the American Fisheries Society Sourcebook for Investigation and Valuation of Fish Kills (AFS 1993). In addition to counts of organisms along transects, dead organisms found on the beach and in the marsh perpendicular to the transect locations were also quantified by direct counts. Fish counts by species and size class were recorded for both transect and direct counts. Surveys were conducted from Pendola Point to Archie Creek on September 8, 2004 and from Archie Creek to south of the Alafia River on September 9, 2004.

Fish and macroinvertebrate sampling was performed by Mote Marine Lab on September 8 and 9, 2004 by using a standard 20 ft. otter trawl with a 3.8 cm (1.5 in.) mesh net. The trawl mouth was approximately 12.5 ft across the bottom, 9.5 ft across the top and 18 inches high giving an area of 5 sq. meters. Trawl sites were randomly selected in areas of known exposure, areas with no known exposure, and potentially exposed areas based on preliminary data and observations. Mote Marine Laboratory performed twenty10-minute trawls north and south of the Alafia River. Five trawls were conducted in shallow water and five trawls in deep water both north and south of the Alafia River.

Nineteen 5-minute trawls were performed north of the Alafia River and South of Pendola Point by Florida Fish and Wildlife Commission (FWC) using a standard 20 foot otter trawl. Each trawl sample consisted of the biomass collected during 5 minutes at 1.2 knots (0.1 nautical miles). All species of fish and select macroinvertebrates were identified for each sample. Each specimen was identified to the species or species-complex level, measured, and counted. At the time of the trawl sampling, all areas south of the Alafia River were considered to be unexposed since exposed areas were visually obvious in other locations north of Archie Creek and observations of exposure or injury did not extend south to the Alafia River.

Benthos

Since crab traps were in the vicinity at the time of the spill, trap surveys were conducted on September 7 by NOAA and on September 8 and 9, 2004 by personnel from NOAA and Polaris Applied Sciences (Polaris). The trap identifier information was recorded and traps were inspected for live and dead organisms by species to provide evidence regarding the extent of acute toxicity to organisms in the traps at the time of the survey. GPS positions of over 110 crab traps were recorded in Hillsborough Bay.

Benthic samples were collected by FDEP staff on September 10, 2004 in Hillsborough Bay using a petite ponar sediment dredge with a 6 inch mouth. Benthic community analysis can be used to provide data regarding biological effects to benthos and interstitial organisms and serve as a benchmark for future monitoring. Four transects with five sites along each transect were sampled (Transects A-D, Figure 4). One sample was collected per site. Eight samples were sorted for benthic organisms. Benthic samples were also collected by FDEP staff on September 18, 2004 in Hillsborough Bay. Seven additional sites were sampled with three replicates at r

Figure 4. Benthic sampling locations.

each site (Sites Ba, Bb, E,F,G,H,I; Figure 4). None of these samples were sorted quantitatively for organism presence or absence or species composition. Benthic samples were also collected by EPCHC at three sites for which pre-spill data are available (Figure 4).

Sediments

Sediment samples were collected in Archie Creek by FDEP on September 7 and 11, 2004 in areas where the addition or handling of neutralizing agent(s) resulted in settled material. The characterization of this material in sediments was accomplished by submitting samples that were analyzed for constituents suspected to be in either the process water or neutralizing agent. The constituents are listed in Tables 1a, 1b and Appendix 1.

3.2 Seagrasses

In order to estimate the seagrass injury resulting from the release, an estimate was required of the acreage and condition of seagrass prior to the incident as well as after the incident. The City of Tampa Bay Seagrass Group (COTBSG) and Tampa Bay Interagency Seagrass Monitoring Program (TBISP) have done significant work to monitor and evaluate seagrass health and distribution, TBISP uses accepted protocols for this work (Avery and Johansson 2003). However, the exact pre-release extent (or size) and condition (i.e. density) is unknown in areas in the immediate vicinity of the release. For this reason, representatives from NOAA, Mosaic, and Lewis Environmental Services, Inc. (LES) used a combination of photo-interpretation and field evaluation to estimate pre-discharge seagrass bed extent and density.

To evaluate post-discharge conditions, two methods of field inspections (transect monitoring, and haphazard quadrat sampling) were used to estimate the acreage and percent cover of meadows through time. The meadows are identified as Sites 1-4 (Figure 5). Sites 1, 2 and 3 (north to south, respectively) represent seagrass meadows most likely to have been impacted by the discharge (based on field observations and data collected for other habitat injury categories). Site 4, located south of the Alafia River, was chosen as a reference location because the seagrass likely was not affected by the discharge (based on field observations).

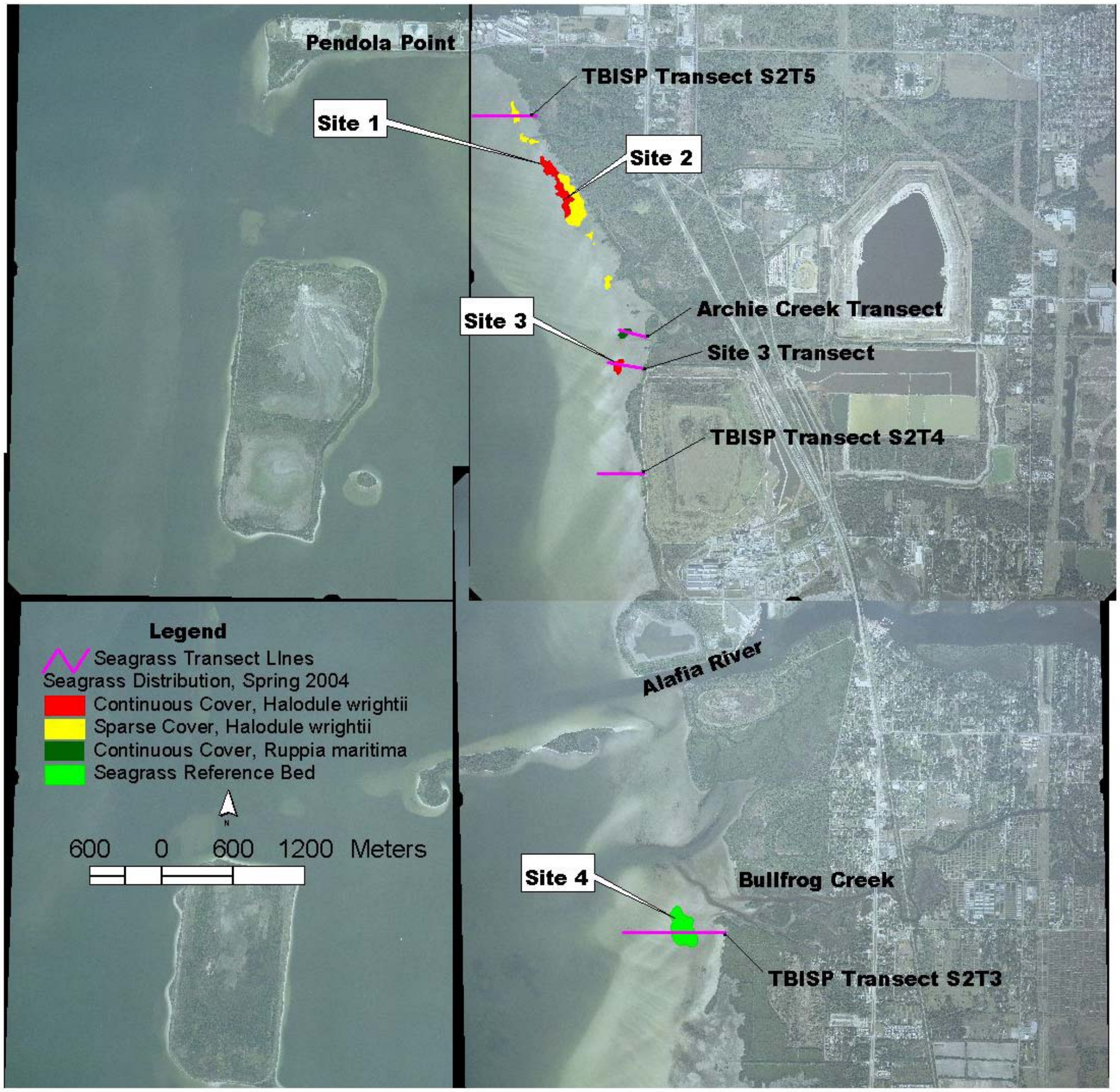


Figure 5. Location of Sites 1-4, the three existing TBISP transects and the two new transects (Archie Creek and Site 3 transects).

Estimate of Pre-discharge Conditions

Photo interpretation

True color and color infra-red aerial photographs were taken of Archie Creek and the impacted areas in Hillsborough Bay periodically from 8 September 2004 until November 11, 2004 (Appendix 3, Table 3). Initial photographs were used to assist with estimates of pre-discharge extent of seagrass meadows and also aided in selecting appropriate sites for on-the-ground data collection (such as transects, quadrats and seagrass bed circumference measurements). Subsequent photographs were used to assess the extent and degree of seagrass meadow injury as well as marsh vegetation injury.

Pre-discharge Extent of Seagrass Meadows: Circumference, Area and Density

On November 16, 2004, LES, and representatives from NOAA and Mosaic surveyed the coast line for seagrass to identify the circumference of seagrass meadows at Sites 1-3. The weather was clear and the exceptionally low winter tide exposed the intertidal zone from the shoreline out approximately 400 meters. The shoreline was surveyed by foot. DGPS (Garmin GPS Map 76) was used to record points with obvious seagrass vegetation. In addition, hand trowels were used to spot check other areas for the existence of rhizomes. If rhizomes were found without above-ground leaves the spot was recorded on the DGPS and designated as part of the pre-discharge extent of seagrass meadows. The points were overlain on Southwest Florida Water Management District 2004 rectified photography obtained with permission from the Southwest Florida Water Management District and Photo Science, Inc., St. Petersburg FL. The circumference and area of seagrass meadows was estimated by constructing polygons around individual seagrass meadows based on the DGPS points, field observations and best professional judgment

LES staff also characterized pre-discharge density of individual seagrass meadows in terms of "continuous and sparse" using Florida FLUCCS code definitions (Florida Department of Transportation 1999). Continuous meadows are defined as evenly distributed vegetation and/or rhizomes within a given area or greater than 25% cover. Sparse meadows are defined as areas with less evenly distributed vegetation and/or rhizomes with large patches of bare sand bottom or having less than 25% cover. Quadrat samples were initially collected from Sites 1, 2, and 3 on September 24, 2004; however, only ten quadrats were sampled and it was unclear if this was enough data to characterize a meadow as "continuous or sparse". Therefore, LES staff sampled more extensively on December 14, 2004 by collecting data from 30 quadrat (0.25m x 0.25m) samples from Sites 1, 2 and 3. Weather conditions deteriorated and did not permit data collection at Site 4. For all thirty quadrats, percent cover of above-ground seagrass, DGPS data and a photograph were recorded. Trowels were also used to examine rhizomes within the quadrats and best professional judgment was used to estimate density. Data were compiled to determine the mean percent cover and determine continuous vs. sparse coverage of each of the areas. DGPS data were overlaid on rectified photography to locate individual quadrats. While this data was collected more than three months after the discharge, it was relied on as the best way to estimate pre-discharge seagrass meadow density in terms of continuous and sparse cover.

Occurrence of Ruppia maritima

Historic observations and anecdotal reports (R. Lewis, W. Avery, pers. comm.) suggest that an ephemeral bed of *Ruppia maritima* (*R. maritima* or widgeon grass) has been present periodically near the mouth of Archie Creek. Like all other seagrass meadows, the exact extent of *R. maritima* at the time of the release is unknown, although after the discharge there was an observation of dying seagrass in this location on September 7, 2004 (J. Buttram, EPCHC). No widgeon grass was observed in the field on any sampling date. The pre-discharge location and area of the widgeon grass meadow was estimated using pre-spill aerial photos. From these estimates, a draft map was constructed by LES and sent to W. Avery of TBISP for review. Based on W. Avery's input, the *R. maratima* meadow was included in the final map of seagrasses likely to exist prior to the release.

Post Discharge Monitoring

Transect Monitoring

LES personnel attempted to observe seagrass beds on 8 September 2004 but the water clarity hindered a successful evaluation of seagrasses. On 23 and 24 September 2004, LES staff met in the field with representatives of the TBISP and used the TBISP procedure to conduct seagrass transect monitoring. The procedure involves setting a linear transect starting at the shoreline and extending out perpendicularly from the shore across existing seagrass meadows. A one square meter quadrat is used at either 25m or 10m intervals along each transect. Seagrass abundance is estimated using the Braun-Blanquet methodology (Appendix 9, Table 1). General observations including water depth, short shoot density (short shoots per 100 cm^2) and the condition of the meadow are recorded. These data were used to assist in the estimate of seagrass stress or mortality.

Three existing TBISP transects are located in the general area of the discharge from near Pendola Point (north of Site 1) to Bullfrog Creek (near Site 4). The approximate location of the three transects S2T3, S2T4 and S2T5 are shown in Figure 5 and referred to as "TBISP transects". The TBISP program has been collecting data on these transects for eight years. While the TBISP data was not directly relied upon for this pre-assessment damage report, it may be useful in the future to help determine recovery rates of injured seagrass meadows. On 23 September 2004, LES staff, in conjunction with COTBSG, established two additional transects at the request of the Trustees: Archie Creek Transect, and Site 3 Transect, which bisects Site 3 (Figure 5). These two transects were used as an additional method of evaluating seagrass cover through time and were monitored quarterly by LES staff only. The Archie Creek transect is located beginning at the shore of the large mangrove island located at the mouth where Archie Creek South Canal and Archie Creek South Natural enter the bay. This transect extends westward 200 meters. Site 3 Transect is 400 meters in length and located just off shore of the northwest corner of the "closed stack" just to the south of the Archie Creek Transect (Figure 5). TBISP data is not included in this report.

Quadrat Sampling

To determine the extent and degree of injured seagrass, as well as potential recovery through time, LES established a quadrat sampling protocol. Density of above-ground seagrass was recorded from ten haphazardly placed quadrats at each site. On 24 September 2004, data was collected from only Sites 1, 2 and 4 (Appendix 9, Table 4). Site 3 was added after this sampling date. Data was collected from all four sites on 29 April 2005. While quadrat sampling conducted on 14 December 2004 (described above) was more extensive, with 30 quadrats per site, it was also useful in monitoring Continuous vs. sparse and percent cover of seagrass at that time.

Site 4, the reference meadow south of the Alafia River, was not surveyed on December 14, 2004, as data collection priority was focused on determining density in impacted areas located at Sites 1-3 and weather conditions deteriorated throughout the day. However, percent cover was measured on September 24, 2004 and April 29, 2005 to provide a comparison through time with meadows near the discharge site .

3.3 Vegetation

Low altitude high-resolution true color and color infrared photographs of the assessment area were taken on numerous dates to capture initial vegetation injury and potential delayed effects (Appendix 3).

Permanent vegetation quadrats were established to monitor vegetation impact and recovery. Nine one-meter square quadrats were established in each major representative habitat including mangroves, palustrine and estuarine marsh. Reference locations were established (north of Archie Creek North) by selecting locations with existing vegetation similar to injured areas, yet outside the visibly injured locations, such as in areas with live crabs and snails. Each corner of the quadrat was marked with permanent PVC pipe and the quadrat was photographed. Species, percent cover, general plant vigor and height were recorded for vegetation within each quadrat (Appendix 10). Quadrat data were collected September, 2004 through April 2005.

Vegetation transects were established following the methods described in the 'Proposed Ephemeral Data Collection Protocols for Documenting and Monitoring Vegetation Impacts,'NRDA Working Group, Version 2, September 20, 2004. Fifteen (15) transects were established in visibly stressed and un-stressed plant communities based on data from the first two overflights.

Figure 7. Vegetation transect locations.

Transects were oriented across tidal streams or at right angles to shorelines if established at shoreline locations. In tidal stream locations the transects were established to traverse the sampled vegetation from a "top of bank" position in the vegetation on one side of a tidal stream, across the tidal stream, and extending into the vegetation on the other side of the tidal stream. At each site a tape measure was stretched the length of the transect, and uniquely numbered stakes were installed on the centerline at approximately 10 meter intervals, depending on the vegetation community. Transect end points and quadrat locations were recorded using a Garmin Map 76 GPS. A profile of the vegetation touched by the transect line and lying 1 meter on each side was recorded in the field to be transferred during data analysis to a CAD drawing.

Vegetation parameters recorded within each quadrat included: 1) plant species by ground cover, shrub layer and canopy strata, 2) plant communities, 3) percent cover estimated visually, 4) the estimated percent of live and dead stems by species, and 5) a characterization of any stress symptoms and type of stressor visible (i.e., chlorotic leaves, leaf deformities, wilting, insect damage, etc.). For mangrove trees where only lower portions of the tree showed leaf stress and loss, percent above-ground leaf mortality was recorded. At ten (10) haphazardly located points within the quadrat, the maximum height of vegetation was recorded by species.

The aerial photos described above were used to determine the extent and degree of injury to other vegetation in the affected area such as marshes and mangroves. Representatives from FDEP and LES conducted sampling and field observations of vegetation at defined transects in the affected area on October 6 - 14, 2004. These data were used to confirm observations of affected vegetation using the aerial photos and supported the use of the aerial photos to determine the extent and degree of the injury.

3.4 Wildlife

Reconnaissance surveys of vegetation and stranded aquatic organisms included observations of injured or potentially injured wildlife. Site visits during pH monitoring and vegetation sampling also included observations for the presence or absence of injured wildlife.

4.0 RESULTS

4.1 Water Column and Benthos

Water Quality

Water quality could primarily be affected by acidity and the addition of major constituents in the release water such as nutrients.

Water pH data from Hillsborough Bay on September 6, 2005 were interpolated to isobars of reduced pH in the Bay (Figure 8). (The pH results on subsequent days were spatially insufficient to allow interpolation to isobars.) Hillsborough Bay pH levels in the vicinity of the mouth of Archie Creek returned to normal in several days. Reduced pH values were observed in Archie Creek by FDEP through September 10, 2004.

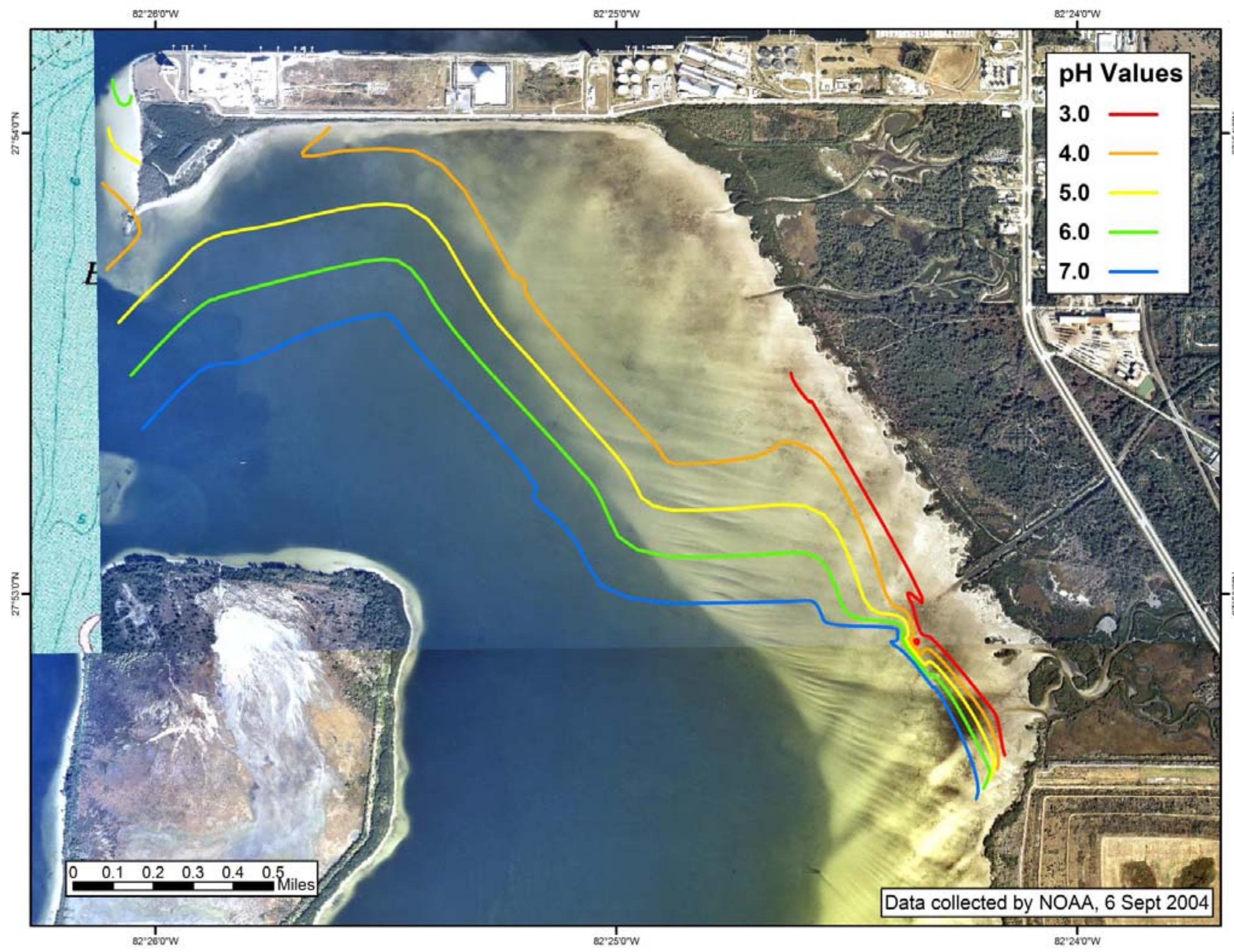


Figure 8. pH value interpolation (September 6, 2004).

The flow gauge on Archie Creek that operated up until September 9, 2004 showed decreased pH and increased stream stage near the time of the release (Figure 9a). Raw data are contained in Appendix 4.

In addition to its acidity, the released process water also contained the macronutrients phosphorus and nitrogen as well as other elements which entered Archie Creek and, ultimately, Tampa Bay. Summaries of water quality analyses from samples collected immediately following the spill are summarized in Appendix 5.

Nitrogen availability can be a limiting factor for phytoplankton growth in Tampa Bay. Excessive phytoplankton growth affects the oxygen dynamics of the estuary, impacting habitat values for fish, benthos, and aquatic plants. It also reduces water clarity and limits the amount of sunlight that is available to support the growth of seagrasses. Because seagrasses provide critically important habitat for many fish and shellfish species, they have been selected by the Tampa Bay Estuary Program as a key indicator of the environmental "health" of Tampa Bay. Nutrinets from the process water release as well as nutrients from other sources, such as failed lift stations, contributed to an increase in the nutrient load to Tampa Bay.

The phosphogypsum process water that was released on September 5 - 6, 2004 contained a substantial amount of ammonia nitrogen, a form of dissolved inorganic nitrogen (DIN) that is readily available to phytoplankton. Based on the nutrient content in the samples collected during the release (swale and siphon line Tables 1a, 1b) and the estimated volume of the spill as estimated by Mosaic, 65 million gallons, the additional phosphorus load contributed to the bay by the release ranged between 1,100 and 1,823 tons while the additional nitrogen load is estimated between 94 and 125 tons. The amount of nitrogen present in the released process water was substantially higher than the total daily nitrogen load (4 tons/day) that is expected to be discharged to all of Hillsborough Bay, from all sources, under the EPA Total Maximum Daily Load (TMDL) regulations. Although there were other sources of nutrient input, such as failed lift stations and runoff, during the passing of the storm, these additional sources have not yet been fully examined. Concentrations of nitrogen, phosphorus, and chlorophyll-a (and indicator of phytoplankton biomass) in Hillsborough Bay and Middle Tampa Bay, during the months preceding and following September 5-6 release , are summarized in Figures 10a – 10d.

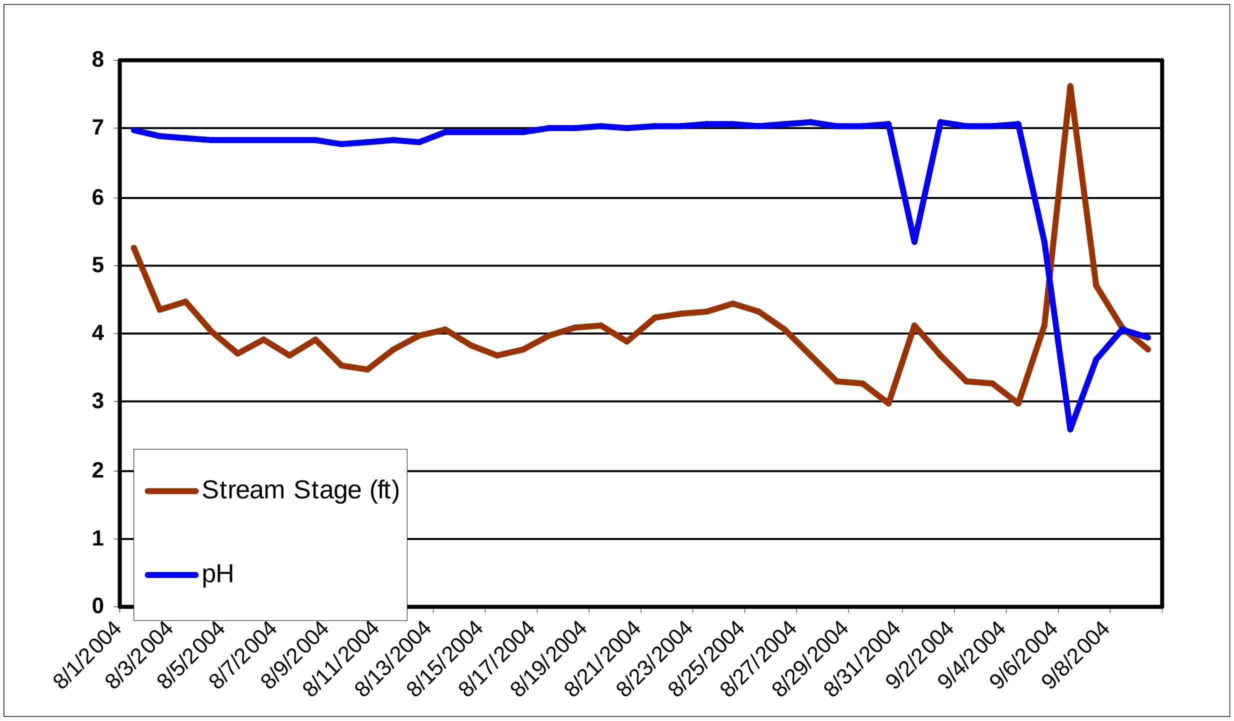


Figure 9a. Stream stage and pH in Archie Creek through September 8, 2004.

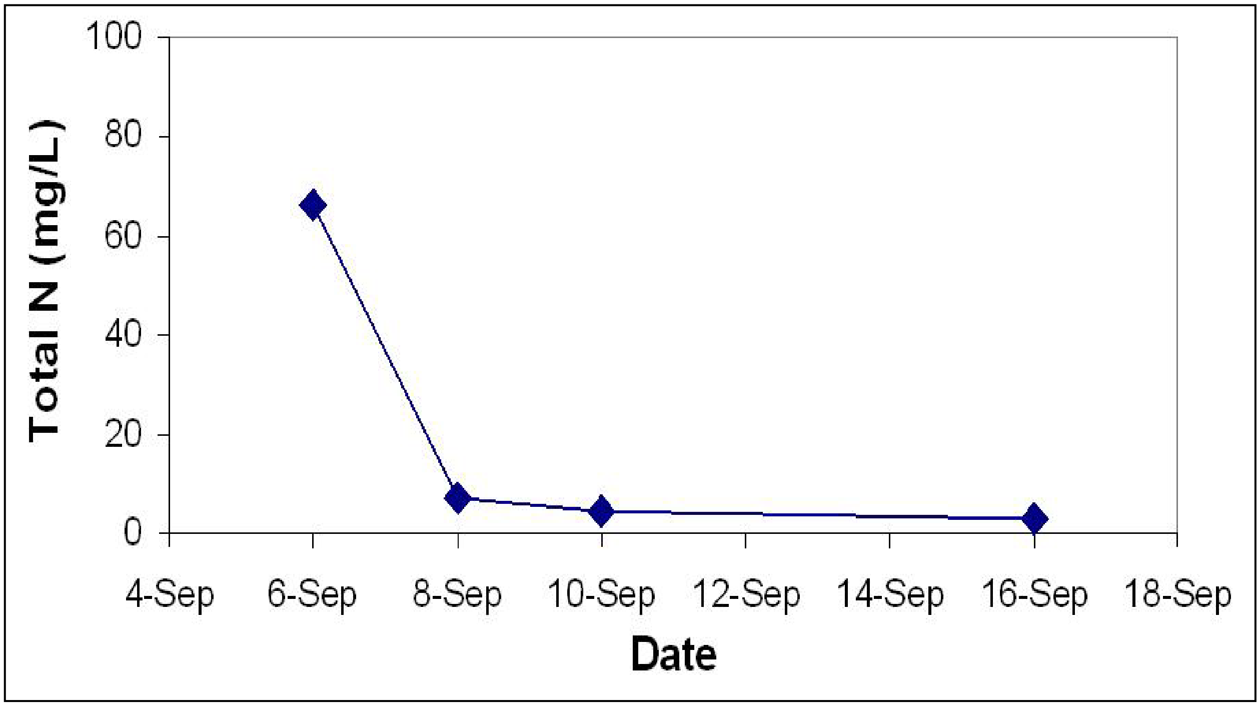
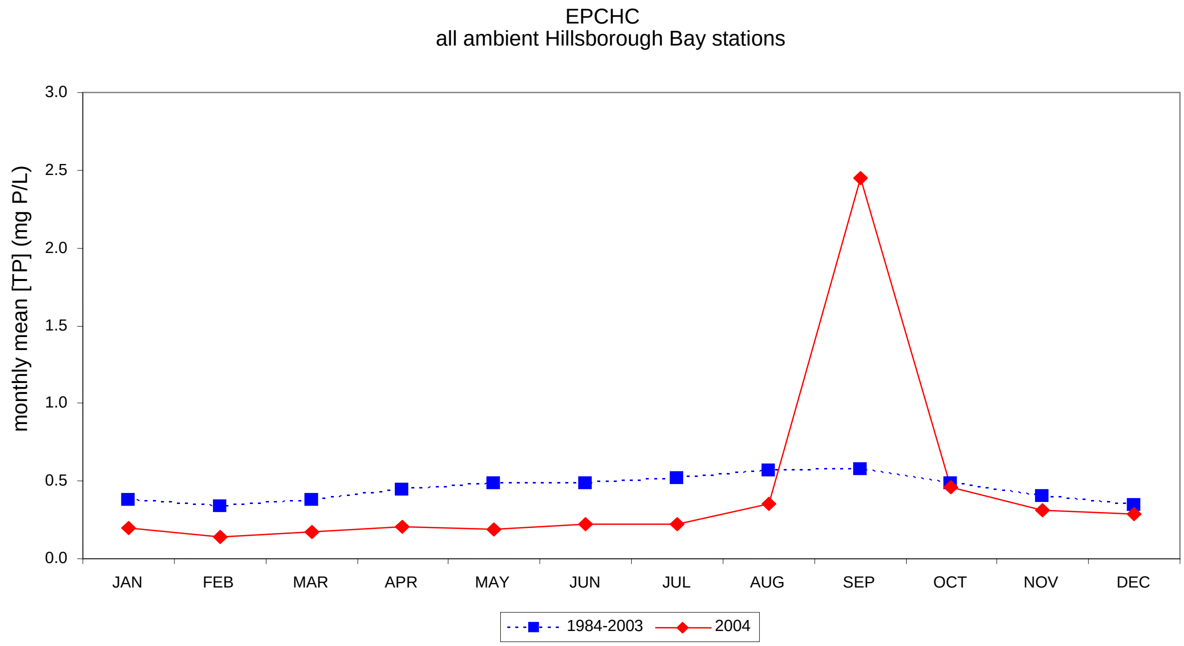


Figure 9b. Total nitrogen levels in South Archie Creek following the process water discharge.



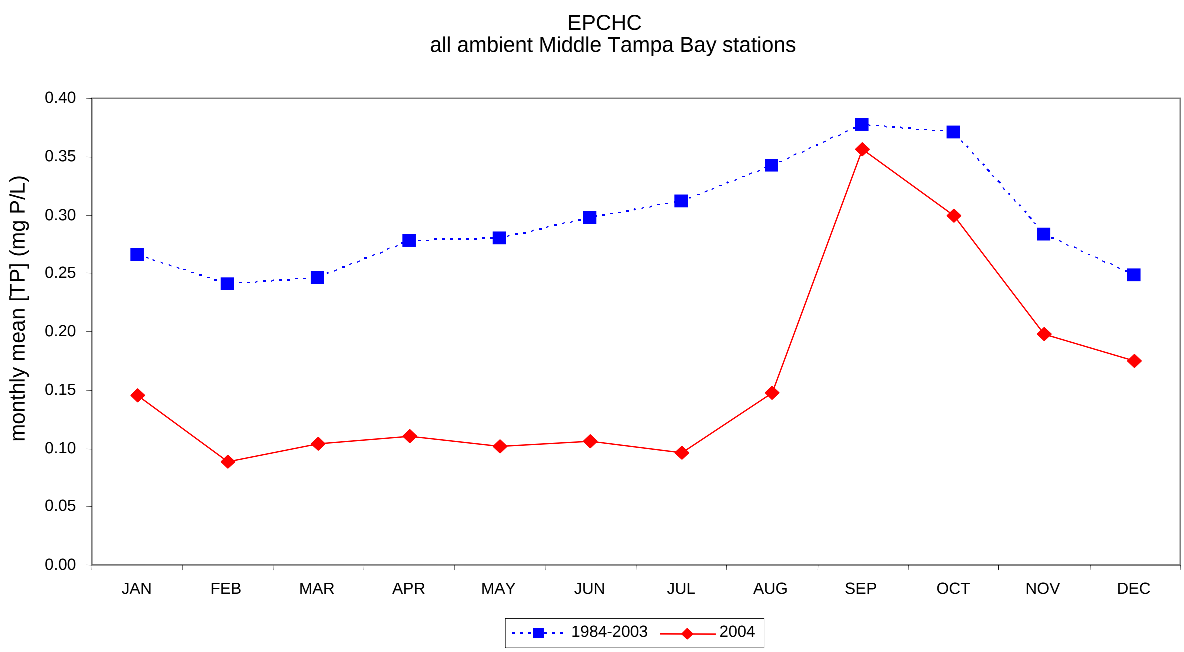
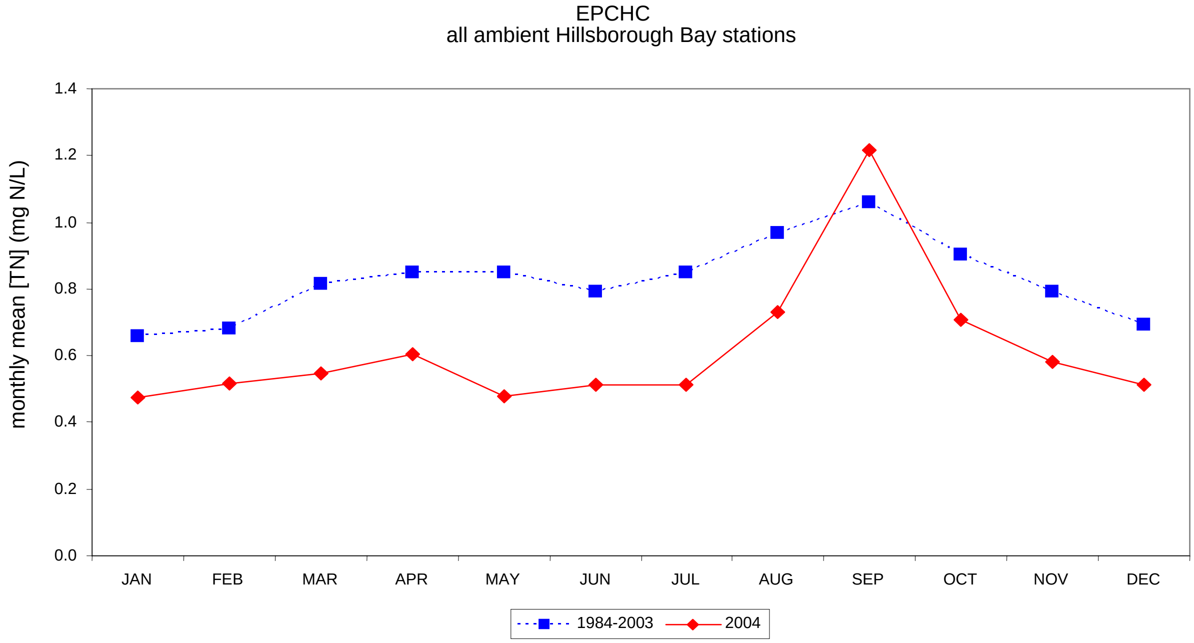


Fig. 10a. Monthly mean total phosphorus (TP) concentrations at all EPCHC ambient monitoring stations in Hillsborough Bay and Middle Tampa Bay during 2004 and the 20-year period extending between 1984 and 2003.



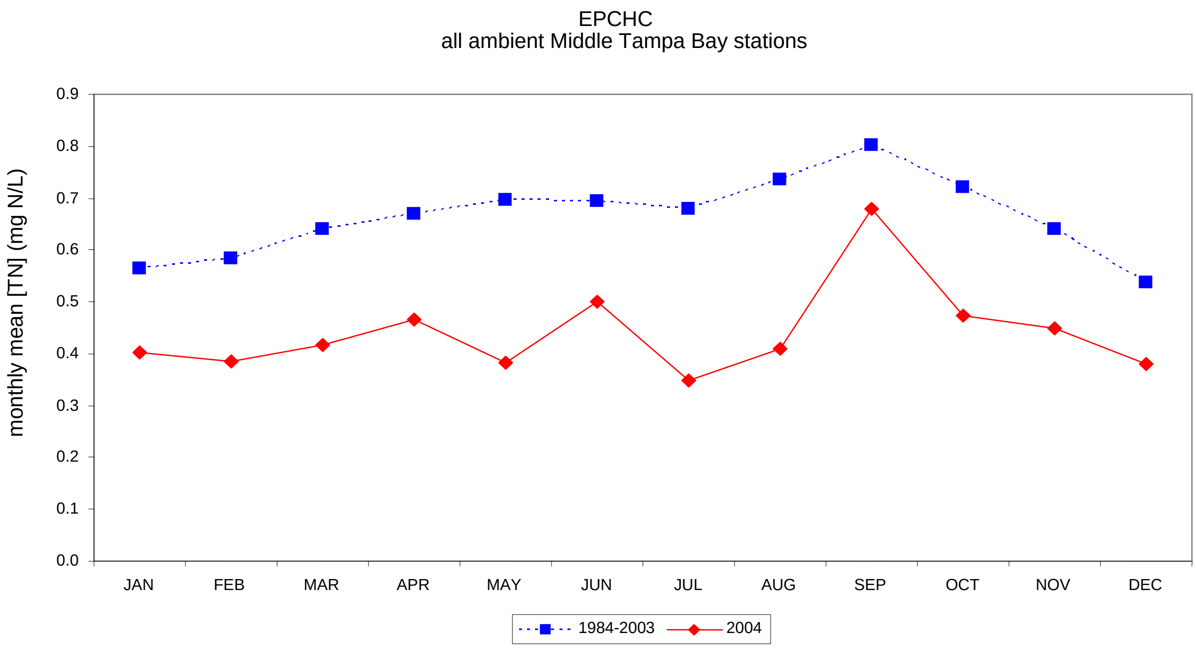
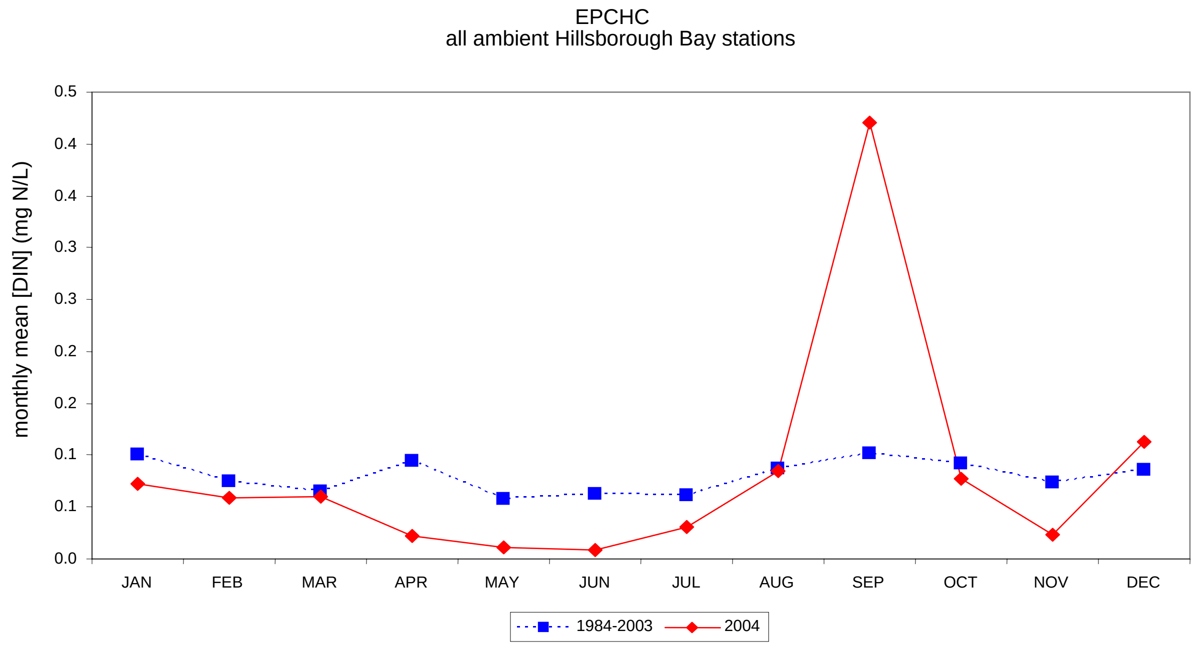


Fig. 10b. Monthly mean total nitrogen (TN) concentrations at all EPCHC ambient monitoring stations in Hillsborough Bay and Middle Tampa Bay during 2004 and the 20-year period extending between 1984 and 2003.



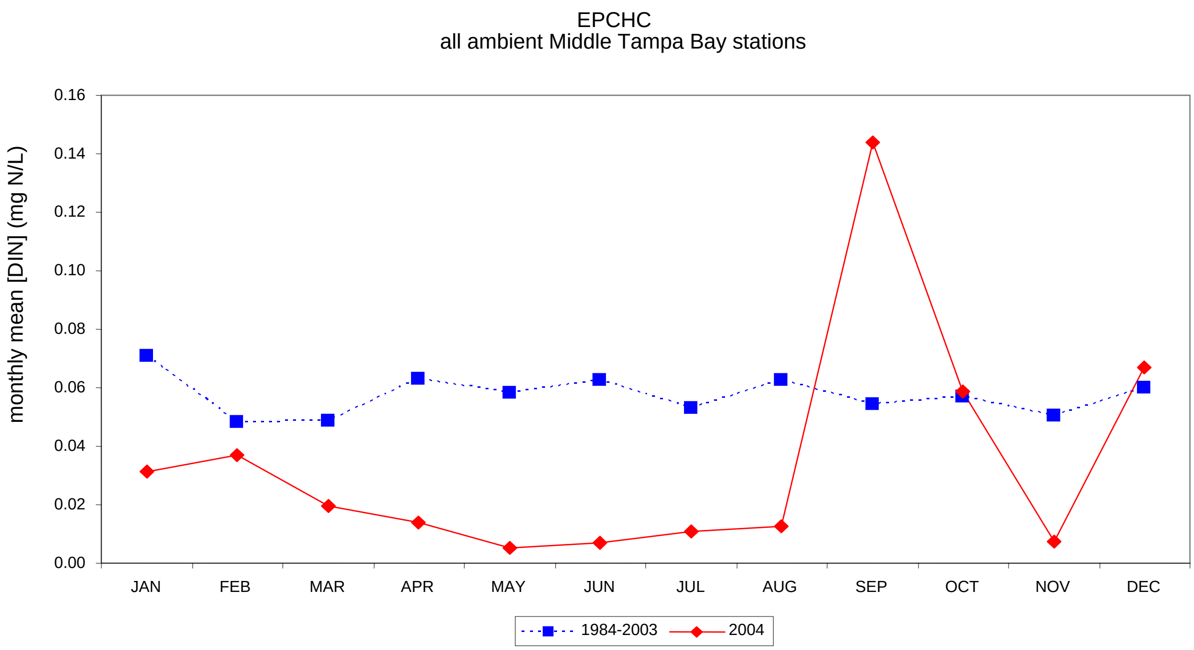
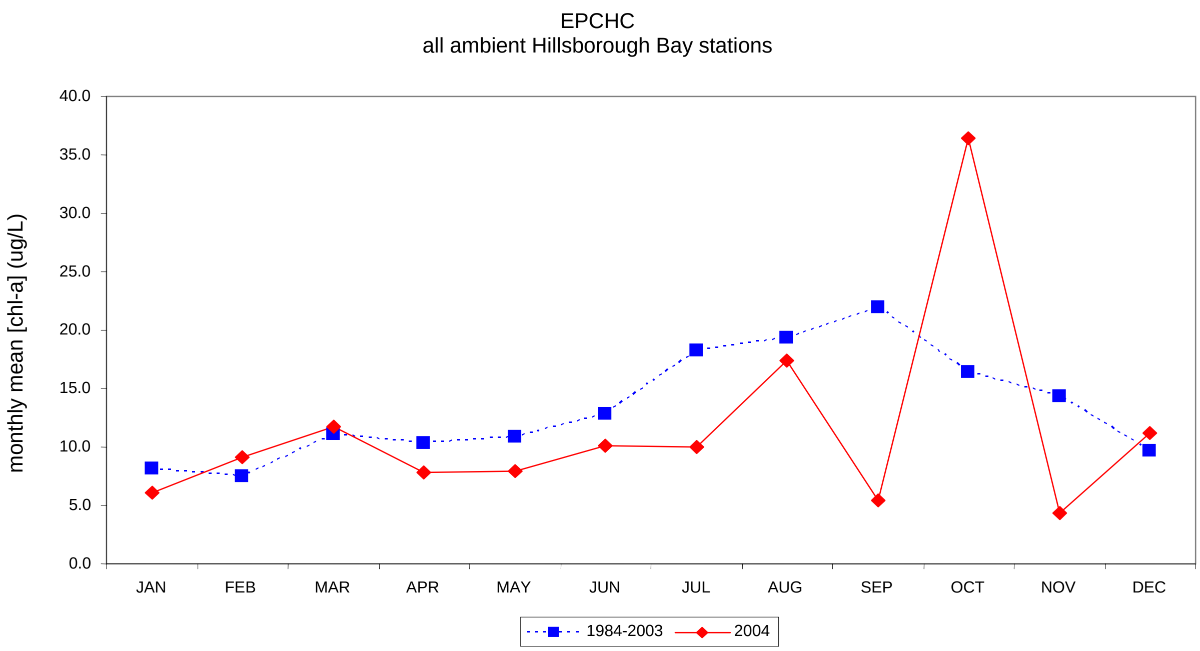


Fig. 10c. Monthly mean dissolved inorganic nitrogen (DIN) concentrations at all EPCHC ambient monitoring stations in Hillsborough Bay and Middle Tampa Bay during 2004 and the 20-year period extending between 1984 and 2003.



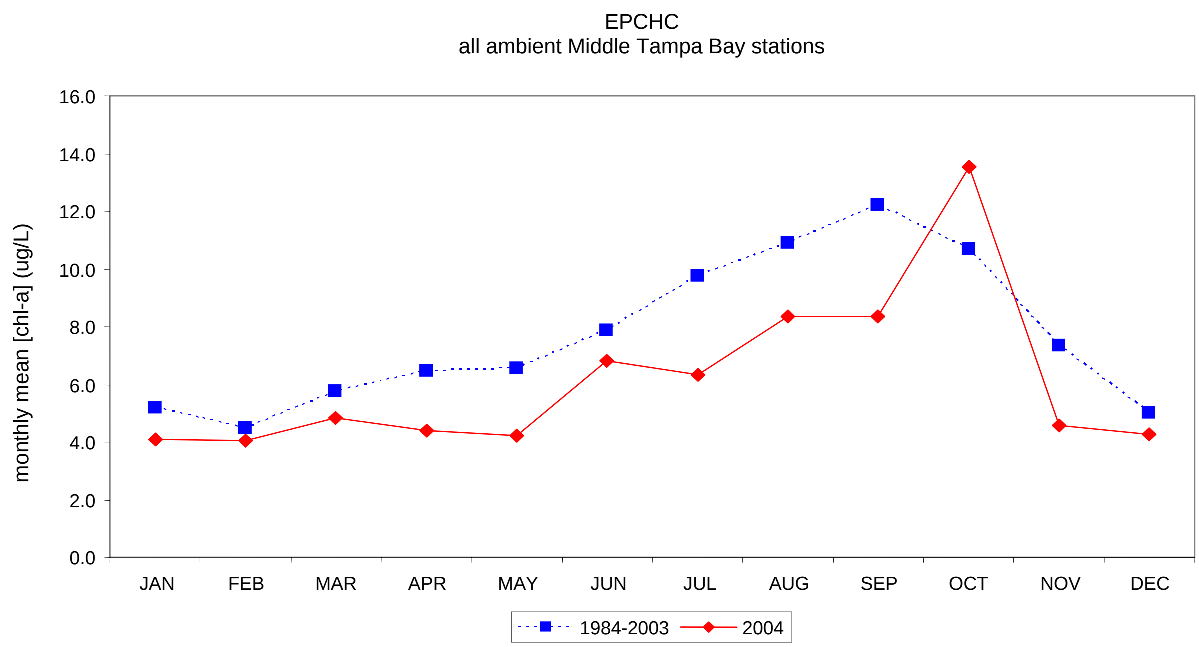


Fig. 10d. Monthly mean chlorophyll-a concentrations at all EPCHC ambient monitoring stations in Hillsborough Bay and Middle Tampa Bay during 2004 and the 20-year period extending between 1984 and 2003.

Nekton

All species captured were identified in each trawl sample. Fish and elasmobranches commonly encountered include silverside (*Menidia menidia*), sand trout (*Cynoscion* sp.), spadefish (*Chaetodipterus faber)*, blue gill (*Lepomis* sp.), scaled sardine (*Harengula jaguana)*, Mojarra (*Cichasoma* sp.), stingray (*Dasyatis* sp), croaker (*Micropogonias* sp.), menhaden (*Brevoortia tyrannus*), sea robin (*Dactyloptena* sp.), hog choaker (*Trinectes maculatus*), and white grunt (*Haemulon plumieri)*. Invertebrate organisms commonly encountered include brown shrimp (*Farfantepenaeus aztecus)*, pinkspotted shrimp *(Farfantepenaeus braziliensis)*, pink shrimp *(Farfantepenaeus duorarum)*, white shrimp *(Litopenaeus setiferus)*, roughneck shrimp *(Rimapenaeus constrictus)*, blue crab (*Callinectes sapidus)*, lesser blue crab *(Callinectes similes)*, stone crab*(Menippe spp.)*, horseshoe crab (*Limulus polyphemus)*, and the cannonball jelly *(Stomolophus meleagris)*.

The total species, organisms and biomass for each trawl performed by Mote Marine Laboratory was normalized to the length of the trawl (i.e. species per km, etc.). The location and the number of organisms captured live per kilometer in each trawl performed by Mote Marine Laboratory are shown in Figure 11. The number of species and the total biomass per kilometer in each trawl are shown in Figure 12 and Figure 13. The location and the number of organisms per kilometer in each trawl performed by FWC are shown in Figure 14. The number of species in each trawl conducted by FWC is shown in Figure 15. Raw data for all trawls are contained in Appendix 6.

Shoreline survey data from sampled transects was extrapolated to overall estimates of dead marine organisms using AFS Guidelines. The total number of estimated dead fish in transects and shoreline surveys is 7,387 (Appendix 6). The size class distribution is shown in Appendix 6. The survey ID number and number of fish counted at each transect location are show in Figure 16.

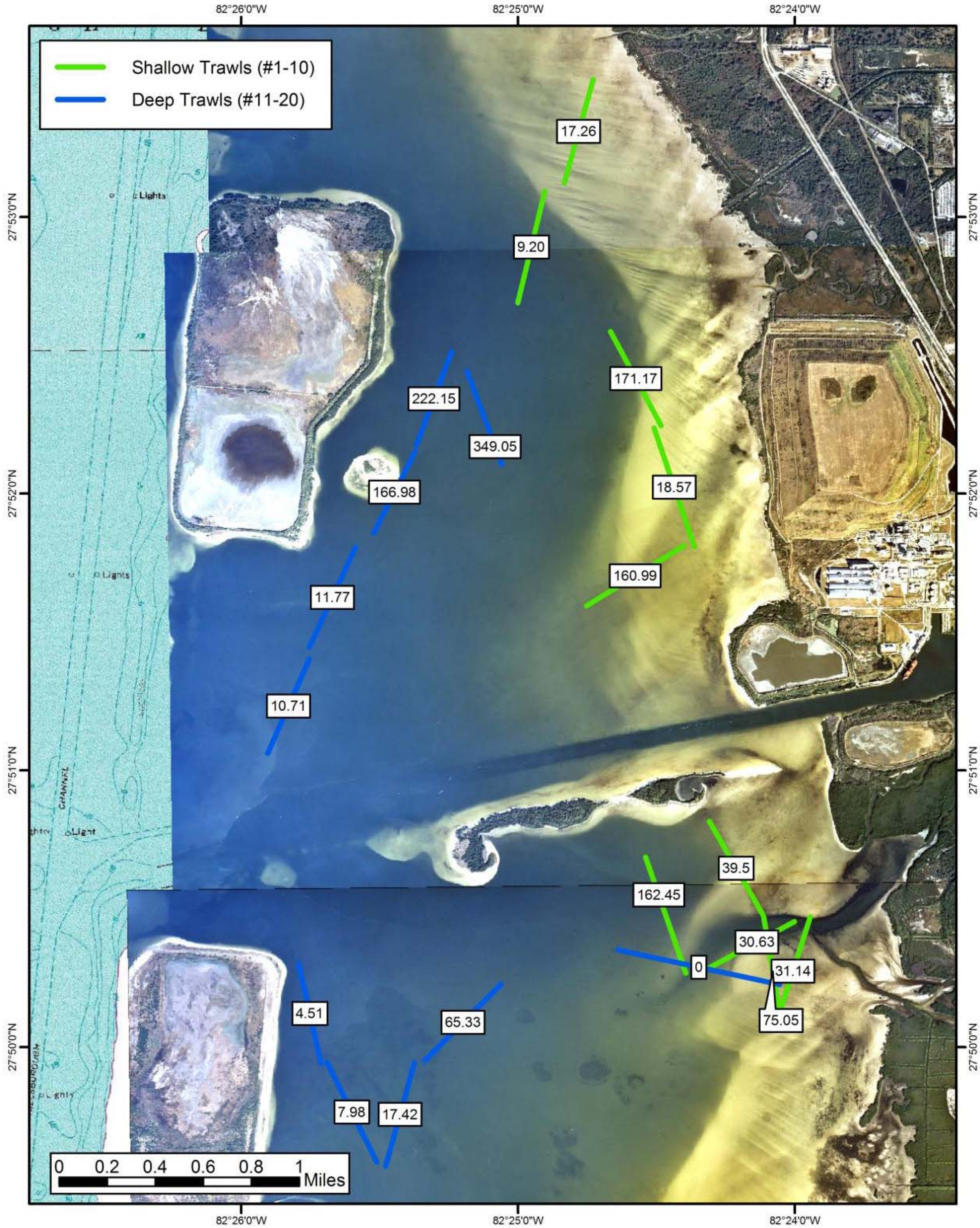


Figure 11. Number of live organisms per kilometer in each trawl performed by Mote Marine Laboratory on 10 September 2004.

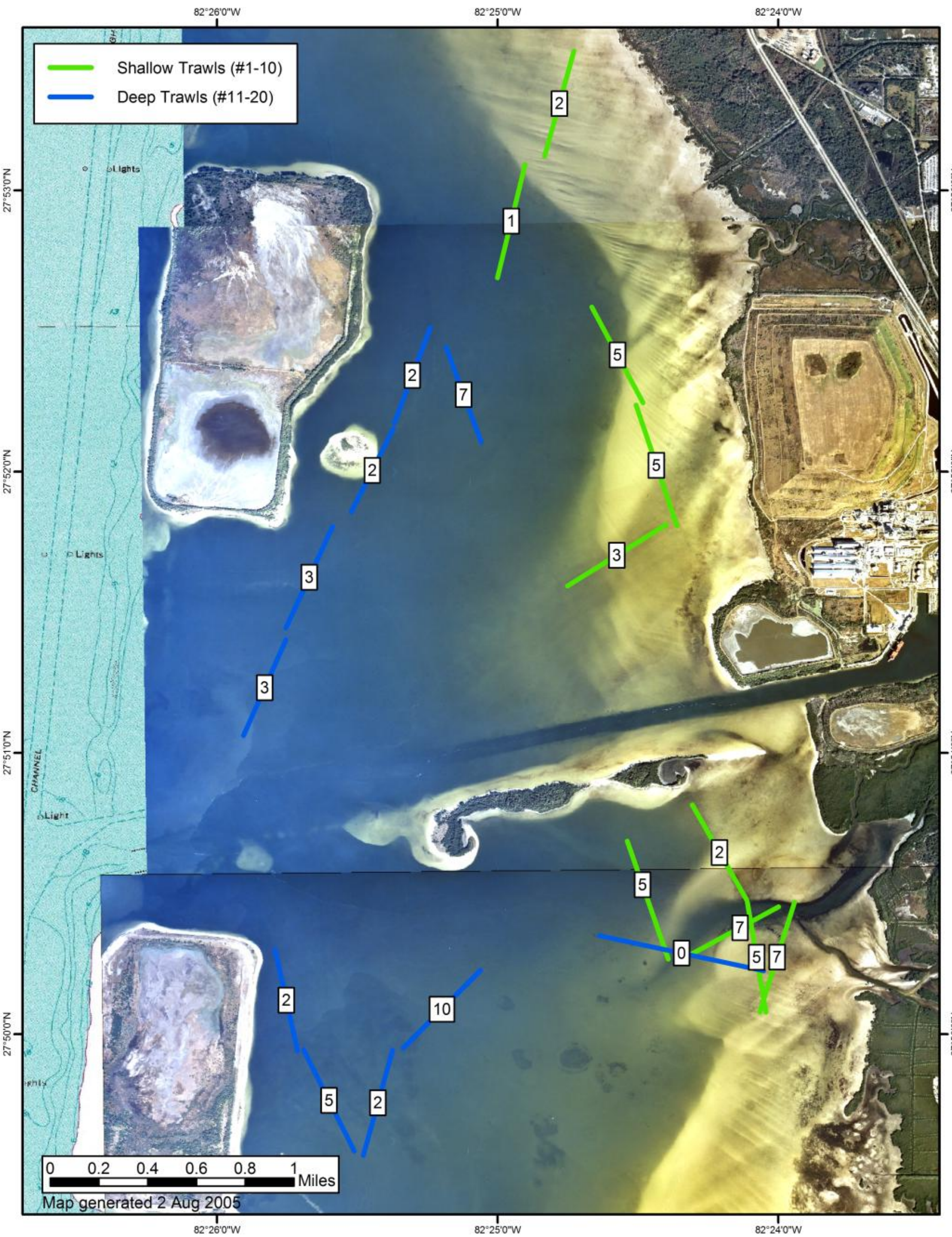


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Figure 12. Number of species in each trawl performed by Mote Marine Laboratory on 10 September 2004.

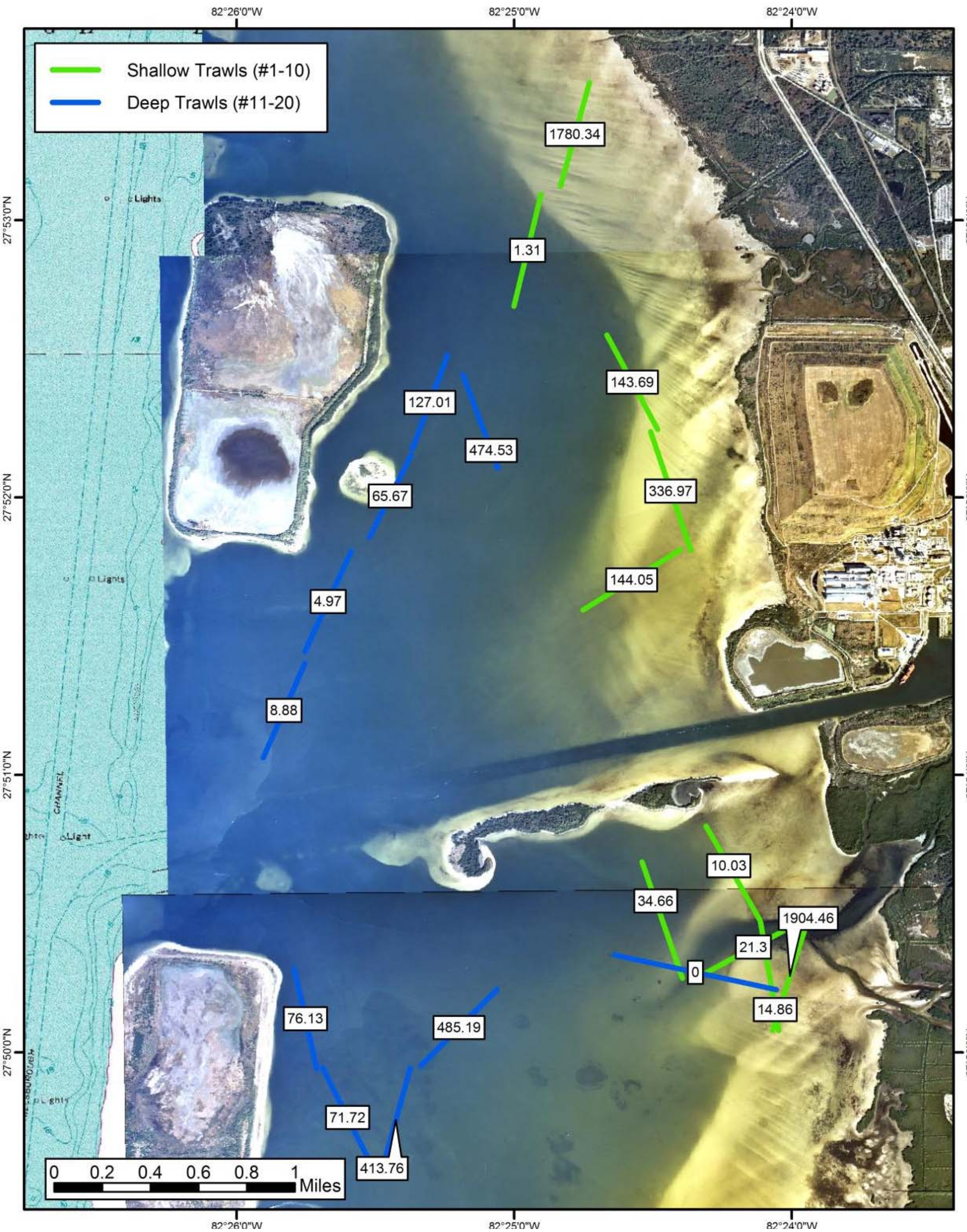

Figure 13. Biomass (g) per kilometer in each trawl performed by Mote Marine Laboratory on 10 September 2004.

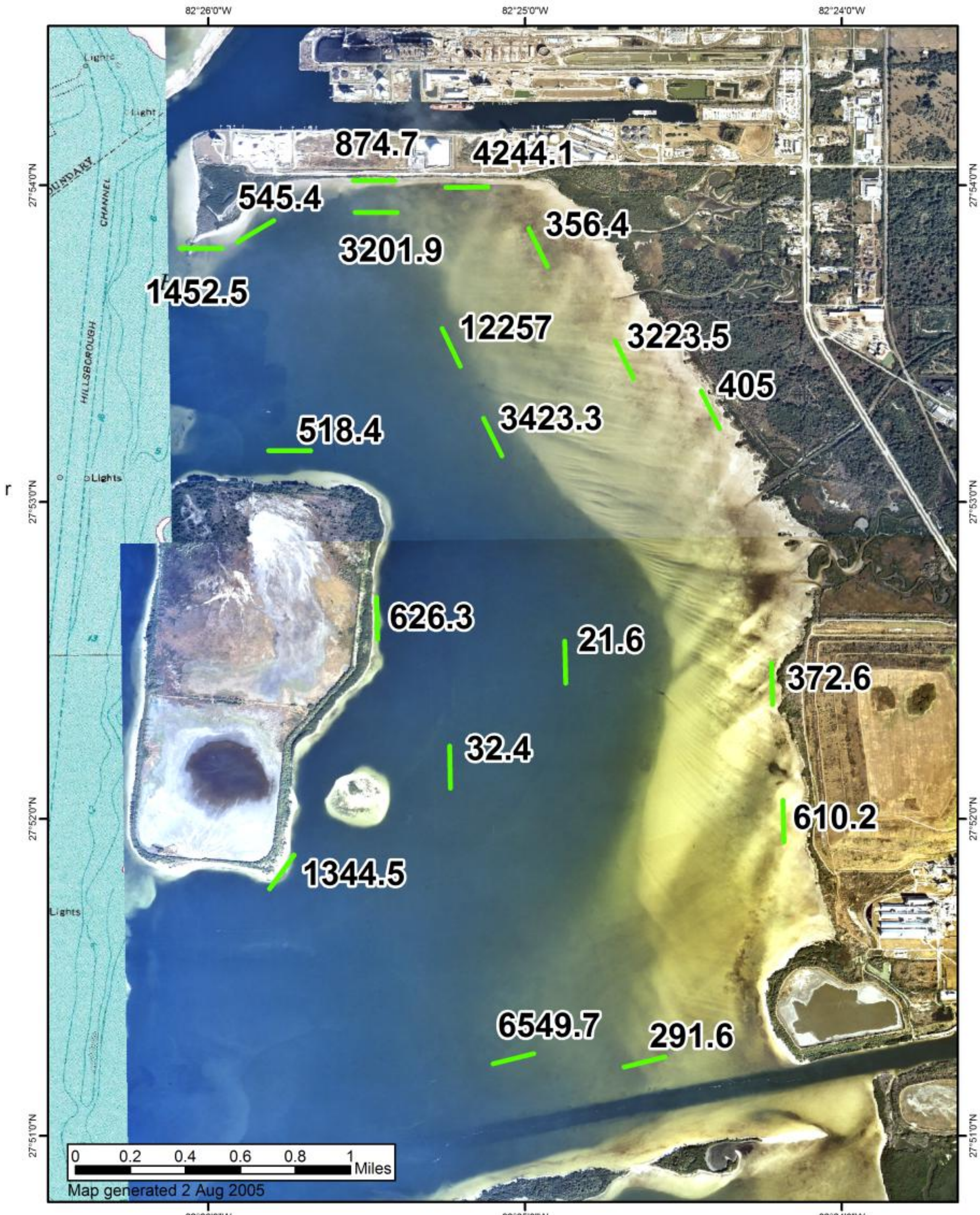

Figure 14. Number of live organisms per kilometer in each trawl performed by FWC.

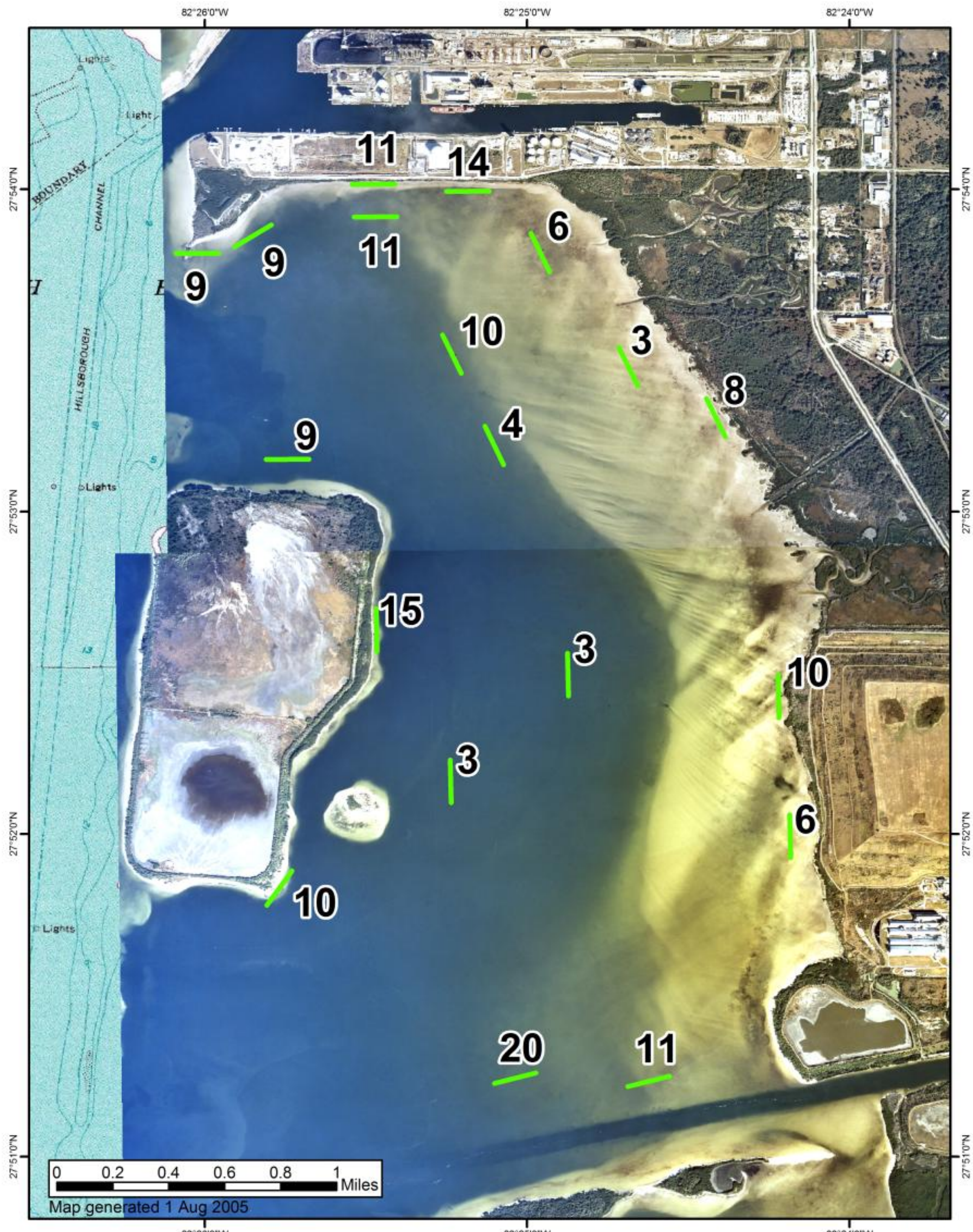

Figure 15. Number of species in each trawl performed by FWC.

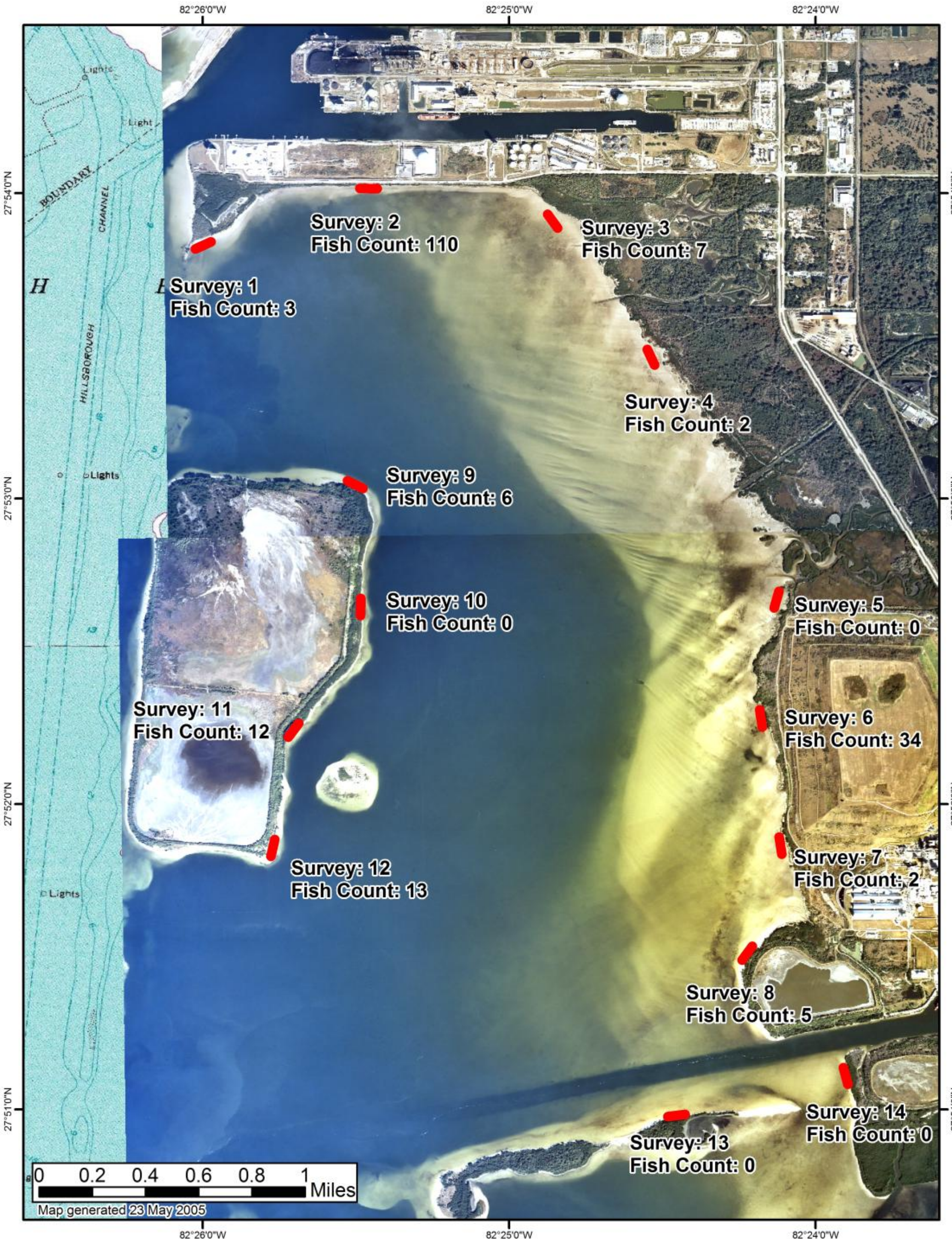

Figure 16. Shoreline transect count results (Survey ID number and number of fish counted).
Note: Many small organisms were not specifically enumerated (see Appendix 6).

Benthos

The location and percentage of live and dead crabs identified in the crab trap survey following the incident are shown in Figure 17. The majority of traps had either all live organisms or all dead organisms. Data gaps include sparse trap sampling opportunities in some areas immediately offshore Archie Creek. Crab survey data are contained in Appendix 7.

Figure 17. Crab trap survey locations showing traps with all live, all dead, or live and dead crabs.

Benthic samples for macroinvertbrate analysis were collected on September 10 and September 18, 2004 by FDEP. Some samples from September 10, 2004 were sorted qualitatively. Benthic sample data are contained in Appendix 7.

Benthic samples for macroinvertbrate analysis were also collected by EPCHC at three sites near Archie Creek, before and after the spill. The analysis of benthic species abundance, richness, evenness and diversity is presented in Table 4. The organism abundance data is included in Appendix 7.

Table 4. Comparison of abundance, richness, evenness and diversity at benthic sampling stations.

PRE-SPILL	**Site 27 (96HB27)**	**Site 8 (04HB08)**	**Site 11 (04HB11)**	**Mean**
Abundance	166	165	183	171
Species Richness (S)	15	24	22	20
Shannon Wiener Diversity Index (H')	2.0491	2.1401	2.4079	2.1990
Evenness (J')	0.3963	0.4139	0.46569	0.4253
POST-SPILL	**Site 27 (04CG9627)**	**Site 8 (04CG0008)**	**Site 11 (04CG0011)**	**Mean**
Abundance	2	309	415	242
Species Richness (S)	2	17	24	14.3333
Shannon Wiener Diversity Index (H')	0.69315	1.879	2.1796	1.5839
Evenness (J')	0.13406	0.3634	0.42155	0.3063

Note: Stations 27 (96HB27 and 04CG9627) in Archie Creek

<u>Sediments</u>

The settled material collected from salt marsh sediments near the locations where neutralizing agents were added north of Archie Creek canal contained relatively large amounts of sodium, potassium, magnesium and calcium. All sample results are contained in Appendix 8.

4.2 Seagrasses

Pre-discharge Extent of Seagrass Meadows: Circumference, Area, and Density

On November 16, 2004, LES and representatives from NOAA and Mosaic made observations of seagrass. From these observations, LES estimated the circumference of seagrass meadows using methods described above at Sites 1-3. Polygons based on the DGPS data (Garmin Map 76) were then constructed and mapped using a GIS (Figure 18).

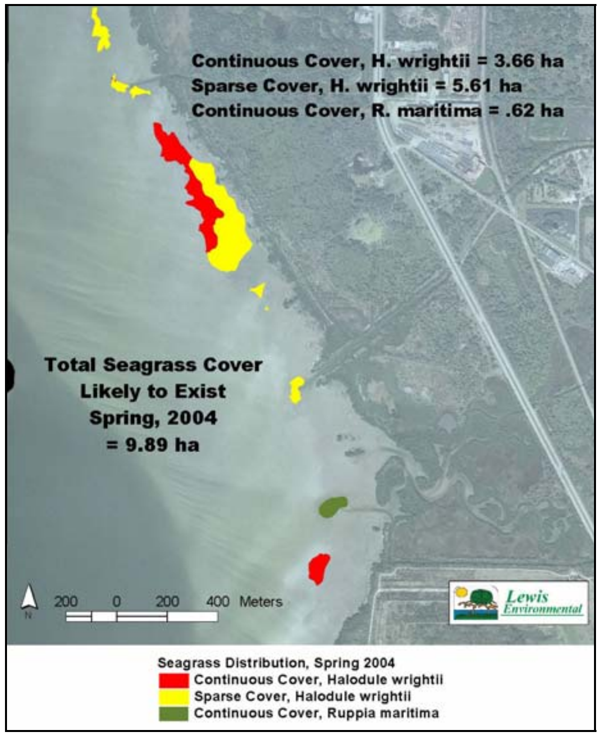

Figure 18. Seagrass meadows likely to exist north of Alafia River prior to September 2004.

Based on quadrat sampling December 14, 2004 (Appendix 9, Table 2), Site 1 was identified as a continuous seagrass meadow with 51.4% mean cover. Site 2 was identified as a sparse bed with 7.5% mean cover. Site 3 was identified as a continuous meadow with 57.0% mean cover (Figure 18). A total of 3.66 ha of continuous cover seagrass meadow was estimated to exist prior to the release. A total of 5.61 ha of sparse cover seagrass meadow was estimated to exist prior to the release. A total of 0.62 ha of continuous cover widgeon grass estimated to exist before the release, for a total combined area of 9.89 ha.

Post Discharge Monitoring

Post release monitoring and general field observations show that a total of 8.73ha of seagrass meadow indicated signs of stress. Therefore, an estimated 1.16 ha (9.89 ha pre-release – 8.73 ha stress post release = 1.16 ha lost) of meadows were presumed to exist at some point before the release, but evidence of these meadows (i.e., leaves or rhizomes) could not be identified during post release surveys (Figure 19).

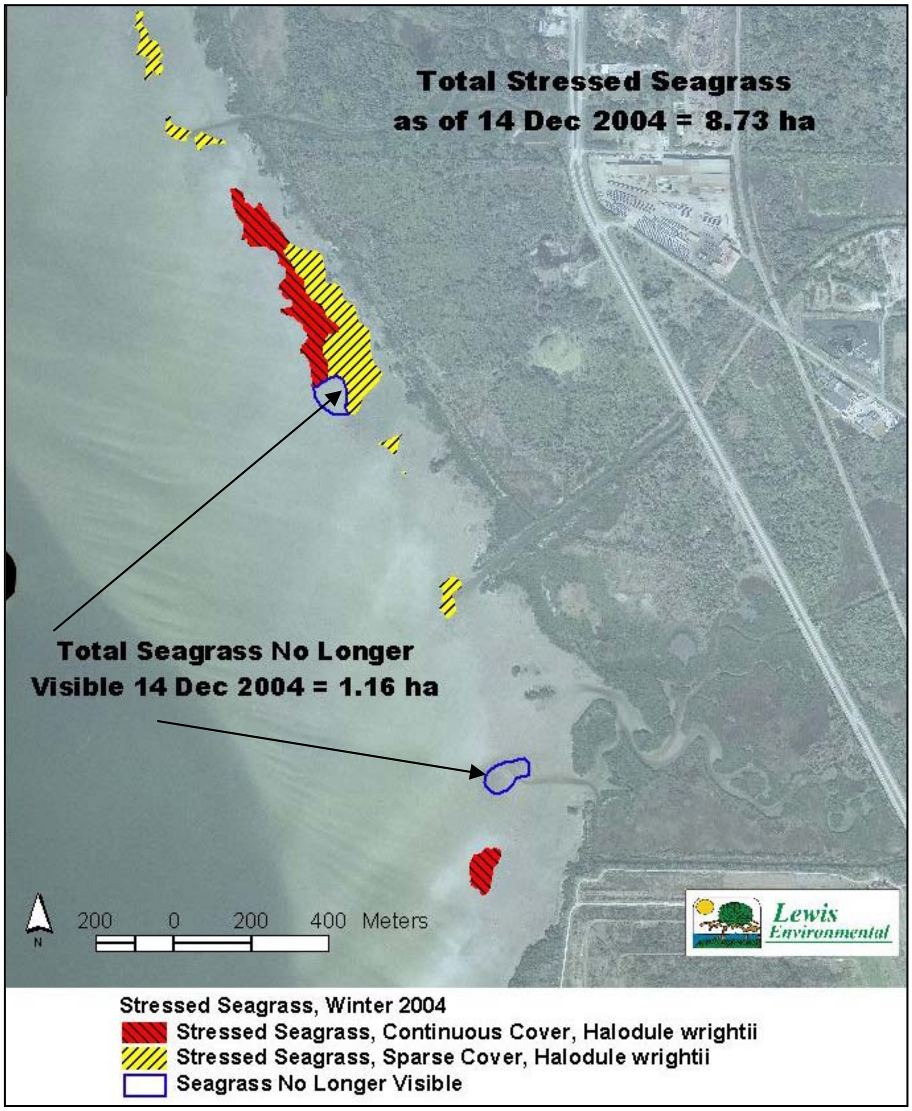

Figure 19. Total area of stressed seagrass meadows.

Transect Monitoring

Results from Site 3 Transect showed 2.33% cover, equivalent to the Braun-Blanquet cover class of 0, and Braun-Blanquet descriptor of "rare" (Appendix 9, Table 3). No seagrasses have been observed along the Archie Creek transect during routine sampling (Appendix 9, Table 3) as of April 2005.

Quadrat Sampling

Results for mean percent cover of seagrass at Sites 1-4 collected on 24 September 2004, 14 December 2004 and 29 April 2005 are listed in Table 5 and graphically depicted in Figure 20.

Raw data from the three sample dates are presented in Appendix 9, Table 1 and Table 2. *Halodule wrightii* was the only seagrass species observed in any of the locations surveyed.

Table 5. Mean cover (%) of *Halodule wrightii* at Sites 1, 2, and 3 (impacted) and Site 4 (reference) near Archie Creek, Hillsborough Bay, Florida.

	Site 1	Site 2	Site 3	Site 4
Date	Mean	Mean	Mean	Mean
9/24/2004	44.0	51.0		64.0
12/14/2004	51.4	7.5	54.4	
4/29/2005	45.5	29.2	54.5	70.5

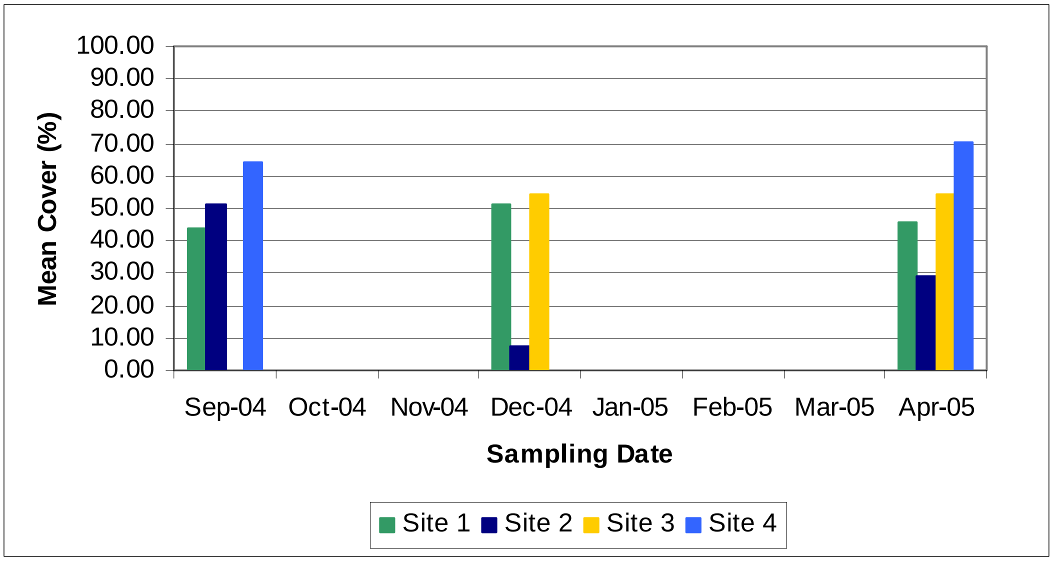

Figure 20. Mean cover (%) of *Halodule wrightii* at Sites 1, 2, and 3 (impacted) and Site 4 (reference) near Archie Creek, Hillsborough Bay, Florida.

4.3 Vegetation

Vegetation habitat types identified from aerial photographs and verified by vegetation transect and quadrat data are illustrated in Figure 21. Degrees of effect from the process water release were categorized for each habitat in terms of projected recovery. Mangroves occur at various life stages and recovery is affected by both the magnitude of impact and life stage. For species that were dead, recovery is assumed based on the time for the species to grow to pre-spill dimensions. This time is expected to vary for ground cover, shrub, and canopy species. For other species with partial impact, recovery is assumed based on results of monitoring re-growth in year and professional judgment. Expected recovery times for each habitat are shown in Figure 22 and Table 6. Vegetation Transect data is contained in Appendix 10.

Table 6. Habitat types affected and projected recovery times.

Habitat Type	Projected Recovery Time	Affected Acres
Mangrove	<2 years	53.59
Mangrove	2-4 years	10.09
Mangrove	4-10 years	13.7
Mangrove	> 10 years	1.02
Mangrove Sum		78.38
Spartina Marsh	<2 years	9.11
Spartina Marsh	2-3 years	33.18
Spartina Marsh	3-4 years	3.73
Spartina Marsh Sum		46.02
Black Rush Marsh	<2 years	6.88
Black Rush Marsh	2-4 years	2.76
Black Rush Marsh Sum		9.64
High Marsh	2-3 years	1.7

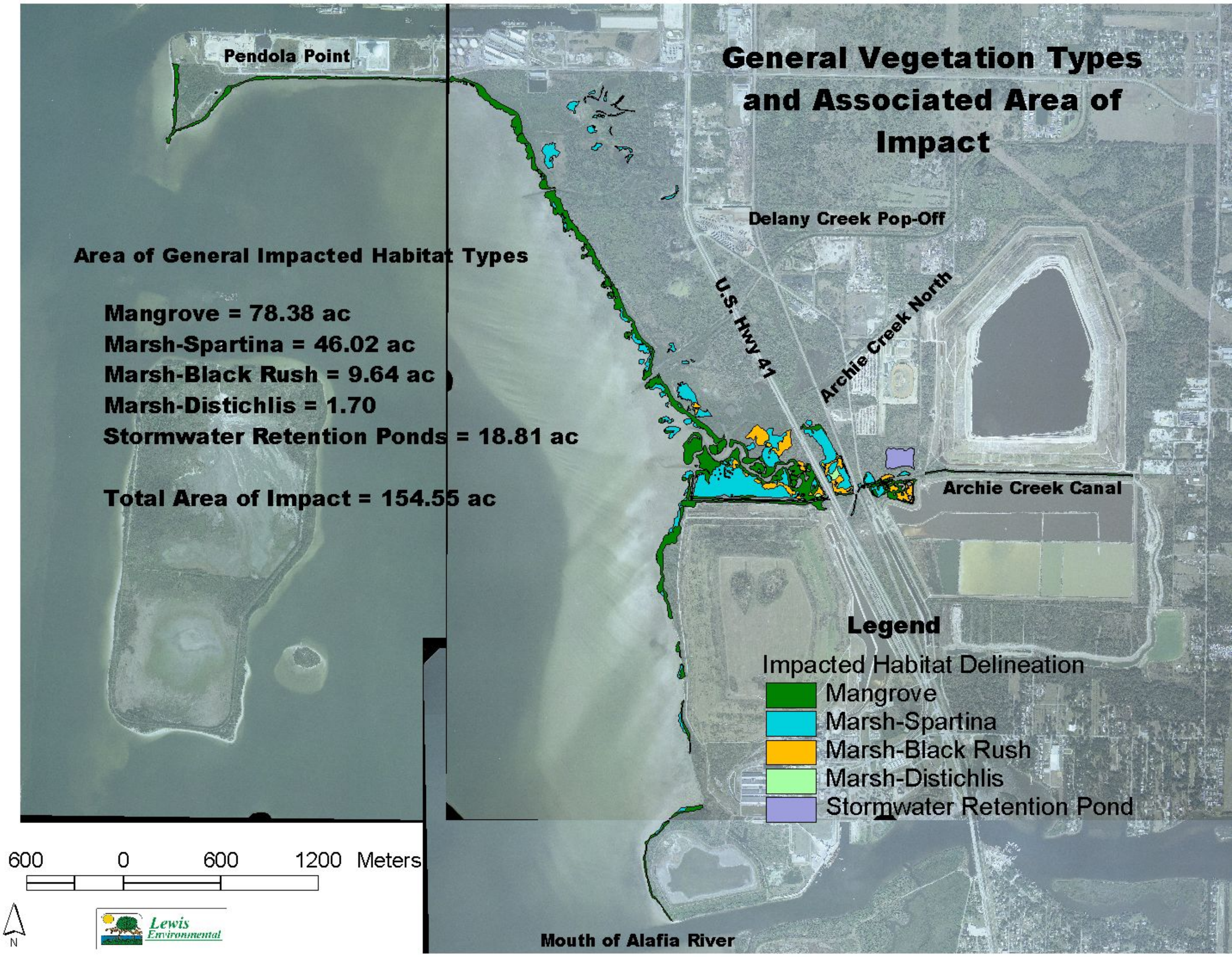

Figure 21. General vegetation community types in the affected area.

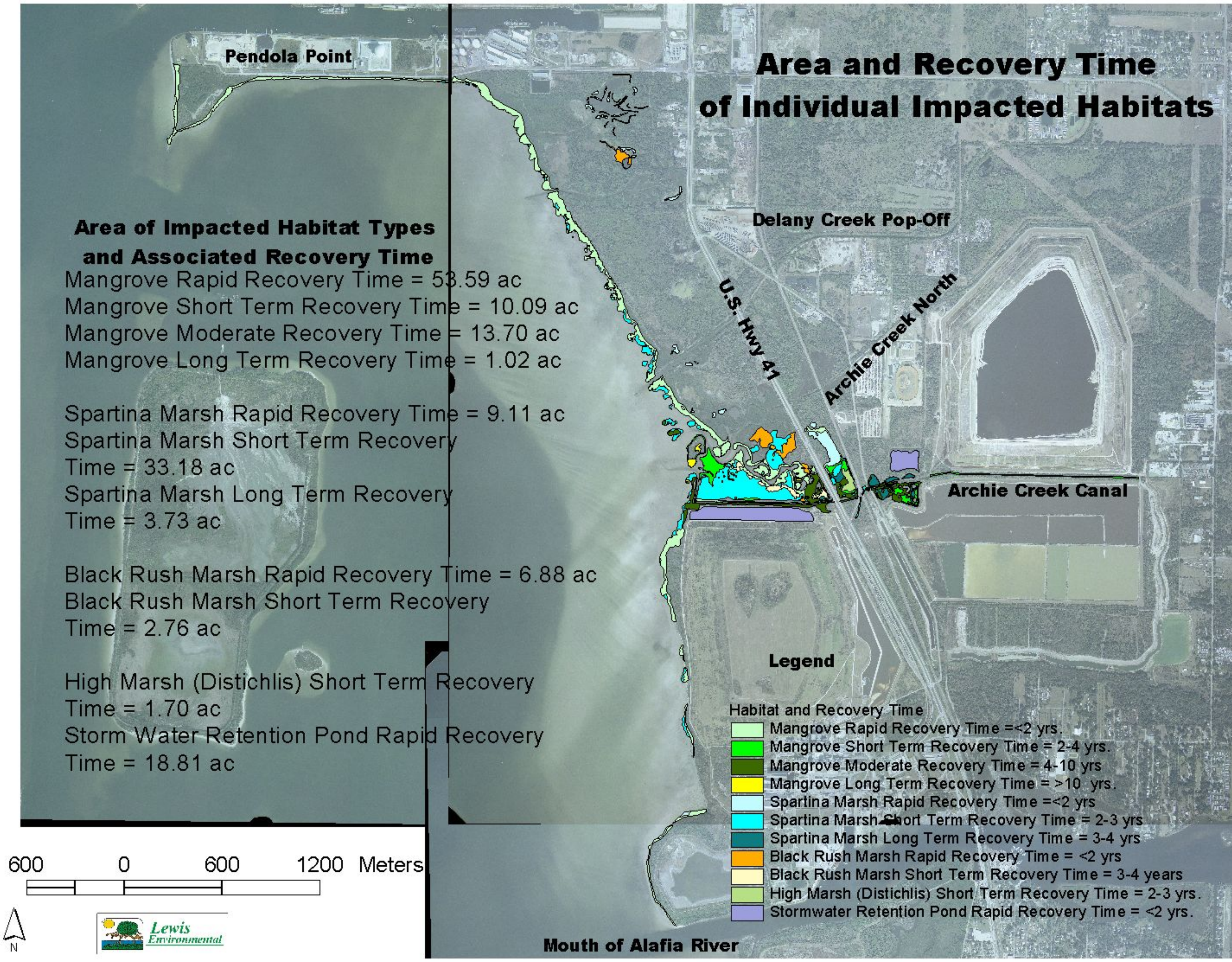

Figure 22. Estimated magnitude of injury for each habitat expressed as time to recovery.

4.4 Wildlife

No observations of dead or injured birds, reptiles, or mammals were reported

REFERENCES

American Fisheries Society. 1993. Sourcebook for Investigation and Valuation of Fish Kills Southwick Associates, 151 pages.

Avery, W., and R. Johansson. 2003. Data summary form the Tampa Bay Interagency Seagrass Monitoring Program through the year 2002. Report submitted to the Tampa Bay Estuary Program.

Lewis, R. R., M. J. Durako, M.D. Moffler and R. C. Phillips. 1985. Seagrass meadows of Tampa Bay. Pp.210-246 in S. F. Treat, J. L. Simon, R. R. Lewis III and R. L. Whitman, Jr. (eds.), Proceedings, Tampa Bay Area Scientific Information Symposium [May 1982].Burgess Publishing Co., Minneapolis. 663 pp.

Lewis Environmental Services. Proposed Ephemeral Data Collection Protocols for Documenting and Monitoring Vegetation Impacts. Version 2, September 20, 2004

APPENDIX 1

Cooling Pond Water Analytical Results

Appendix 1. Cooling Pond Water Sample Analytical Results.

September 8, 2004, 15:28.

COMPONENT	RESULT	REMARK	UNITS
Mercury	0.1	U	ug/L
Silver	0.24	I	ug/L
Radium 226-Counting Error	0.3		pCi/L
Radium 226	3.6		pCi/L
Radium 228-Counting Error	0.6		pCi/L
Radium 228	0.9	U	pCi/L
NO2NO3-N	1.2		mg N/L
Chromium	1.22E+03		ug/L
Manganese	1.22E+04		ug/L
Calcium	1.23E+03		mg/L
Boron	1.34E+03		ug/L
Nickel	1.41E+03		ug/L
Sodium	1.77E+03		mg/L
Tin	120	U	ug/L
Alpha-Counting Error	126.8		pCi/L
Alpha, Total	3370		pCi/L
Selenium	14	U	ug/L
Magnesium	179		mg/L
Barium	187		ug/L
Titanium	2.17E+03		ug/L
Strontium	2.76E+04		ug/L
Vanadium	2.91E+03		ug/L
Lead	206		ug/L
Molybdenum	24		ug/L
Potassium	284		mg/L
Fluoride	3.30E+03		mg F/L
Zinc	3.85E+03		ug/L
Copper	330		ug/L
Cobalt	370		ug/L
Cadmium	418		ug/L
Kjeldahl Nitrogen	430		mg N/L
Beryllium	44		ug/L
Ammonia-N	450		mg N/L
Total-P	5.30E+03		mg P/L
Thallium	54.2		ug/L
O-Phosphate-P	6.00E+03		mg P/L
Arsenic	639		ug/L
Aluminum	7.00E+04		ug/L
Iron	7.90E+04		ug/L
Antimony	77		ug/L
Organic Carbon	95		mg C/L

APPENDIX 2

Application of Basic Neutralizer

Appendix 2. Application of Basic Neutralizer.

Product	Date	NaOH (%)	Company	Gross Weight (lbs)	Tare Weight (lbs)	Net Weight (lbs)
Sodium Hydroxide	9/5/2004	50	Brenntag	79480	30740	48740
		50	Brenntag	87500	30880	56620
		50	Brenntag	73280	30120	43160
		50	Brenntag	75420	30780	44640
		50	Brenntag	77400	31180	46220
		50	Brenntag	80260	30760	49500
		50	Brenntag	73560	30820	42740
		50	Brenntag	81000	31200	49800
	9/6/2004	50	KA Steel	76340	27200	49140
		50	KA Steel	79300	29260	50040
		50	KA Steel	76380	27200	49180
		50	KA Steel	76380	28420	47960
		50	KA Steel	75600	27180	48420
		50	KA Steel	76660	28400	48260
		50	KA Steel	78860	29260	49600
		50	KA Steel	78640	27900	50740
		50	KA Steel	78700	27340	51360
		50	KA Steel	78740	28400	50340
		50	KA Steel	77640	27900	49740
		50	KA Steel	76680	31140	45540
		50	KA Steel	87800	27900	59900
		50	KA Steel	83860	30500	53360
		50	KA Steel	83860	30500	53360
		50	KA Steel	79400	31140	48260
		50	KA Steel	80280	31440	48840
		50	KA Steel	78240	31400	46840
Lime Slurry		90% $Ca(OH)_2$	Chem-Lime	70980	32480	38500
		90% $Ca(OH)_2$	Chem-Lime	74800	37280	37520
		90% $Ca(OH)_2$	Chem-Lime	77100	30320	46780
	9/7/2004	90% $Ca(OH)_2$	Chem-Lime	78080	28700	49380
		90% $Ca(OH)_2$	Chem-Lime	77100	38280	38820
Sodium Hydroxide		50	KA Steel	79340	27340	52000
		50	KA Steel	69140	27000	42140
		50	KA Steel	76700	27000	49700
		50	KA Steel	80540	30500	50040
Total Weight (lbs)						1,687,180

APPENDIX 3

Aerial Photograph Dates and Locations

Aerial Photograph Log

Date	Altitude	True Color (number of images)	Infrared (number of images)	Notes	Figure #
08 Sept 2004	1000’	44	0	Initial flight of impacted area	1
11 Sept 2004	7500’	4	4	Second flight of impacted area	2,3
30 Sept 2004	7500’	11	10	Third flight of impacted area	4,5
13 Oct 2004	7500’	14	14	Fourth flight of impacted area and extended areas of possible impact	6,7
06 Nov 2004	7500’	14	4	Fifth flight of impacted area	8,9
11 Nov 2004	8500’	47	0	Shoreline/seagrass flight in conjunction with TBEP	10

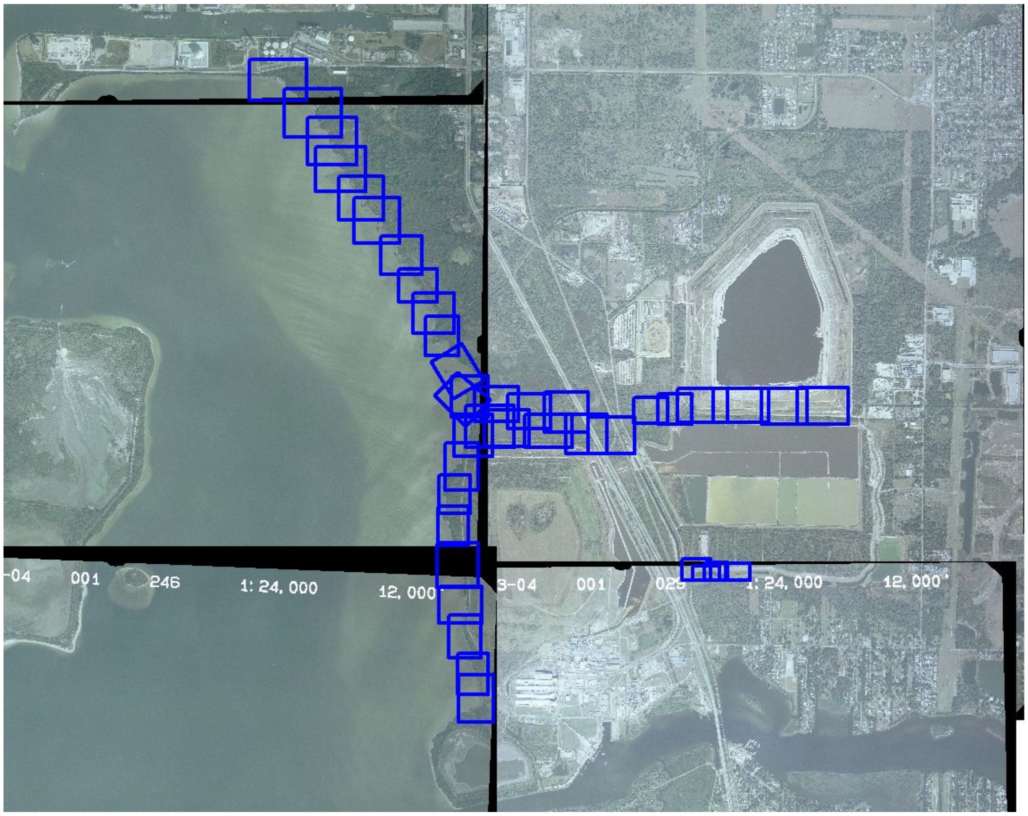

Figure 1. September 8, 2004, Initial flight of impacted area, 44 true color images.

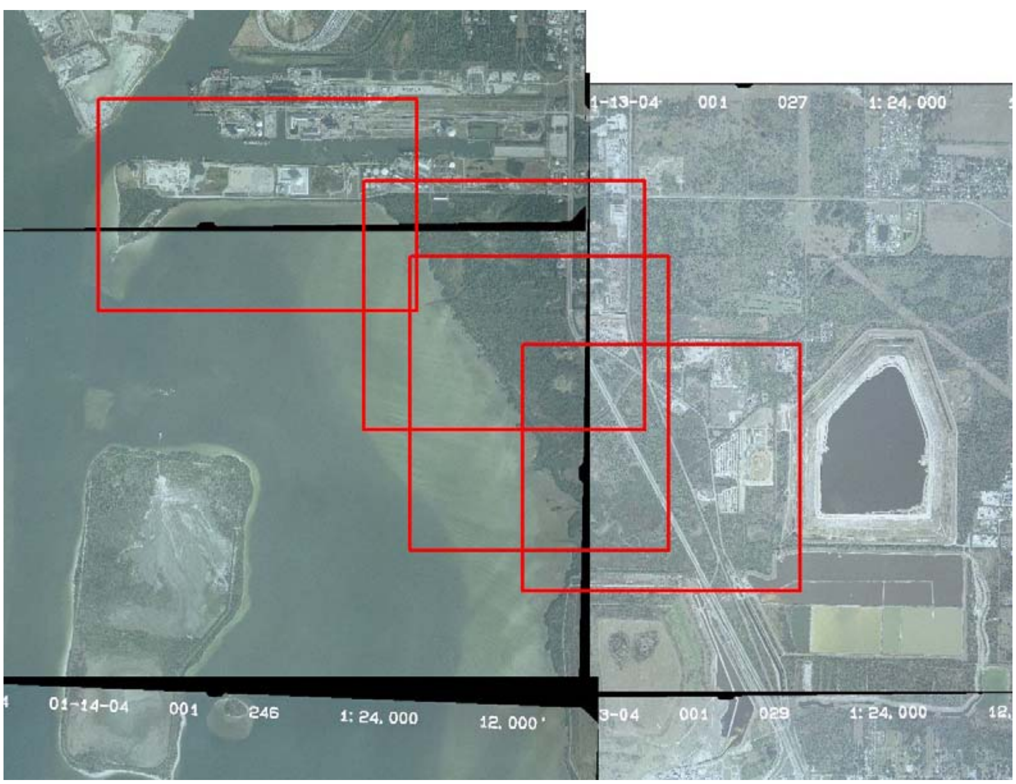

Figure 2. September 11 2004, Second flight, 4 true color images.

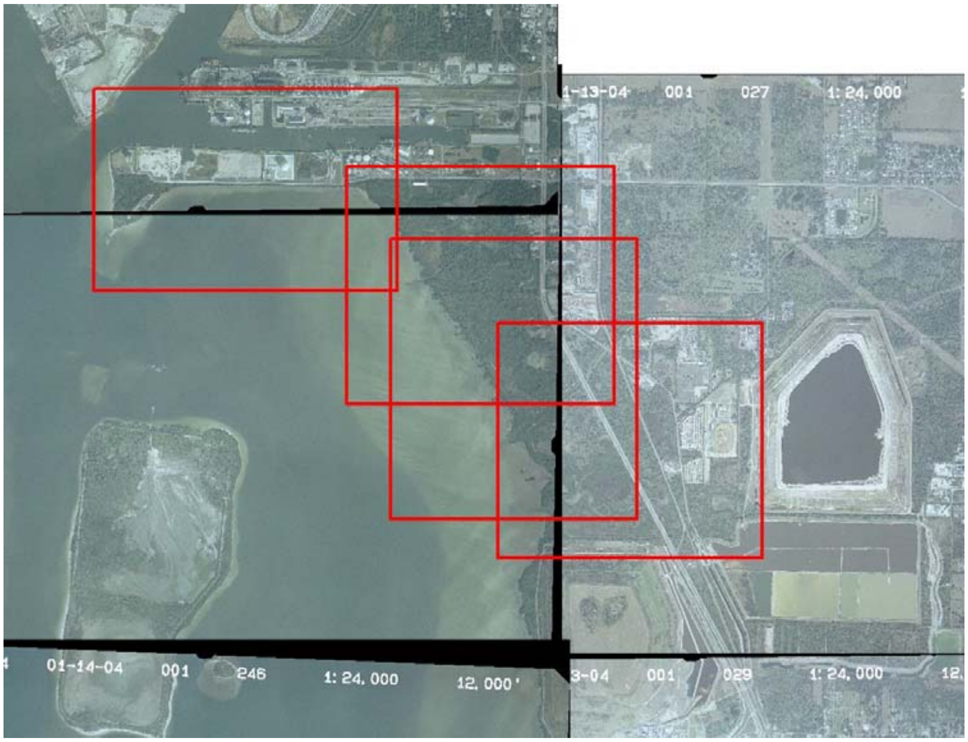

Figure 3. September 11 2004, Second flight, 4 true infrared images.

Figure 4. September 30, 2004, third flight, 11 true color images.

Figure 5. September 30, 2004, third flight, 10 infrared images.

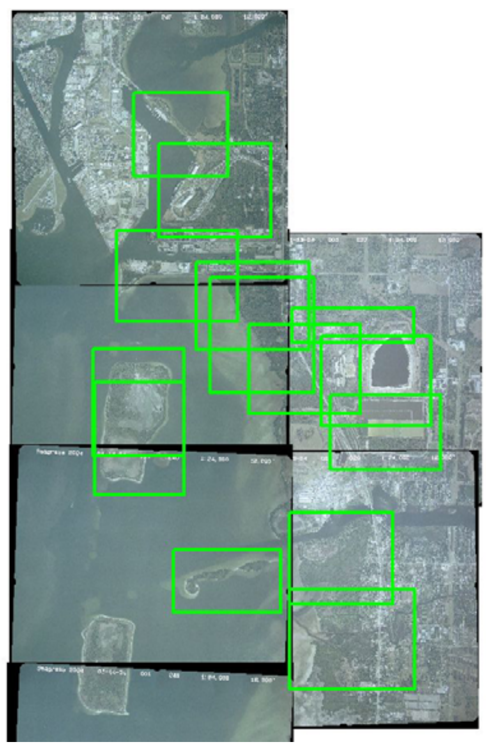

Figure 6. October 13, 2004, third flight, 14 true color images.

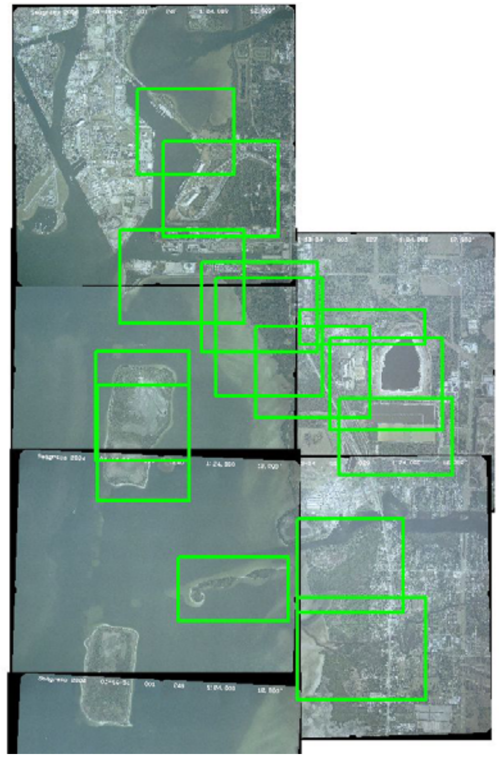

Figure 7. October 13, 2004, third flight, 14 infrared images.

Figure 8. November 6, 2004, fifth flight, 14 true color images.

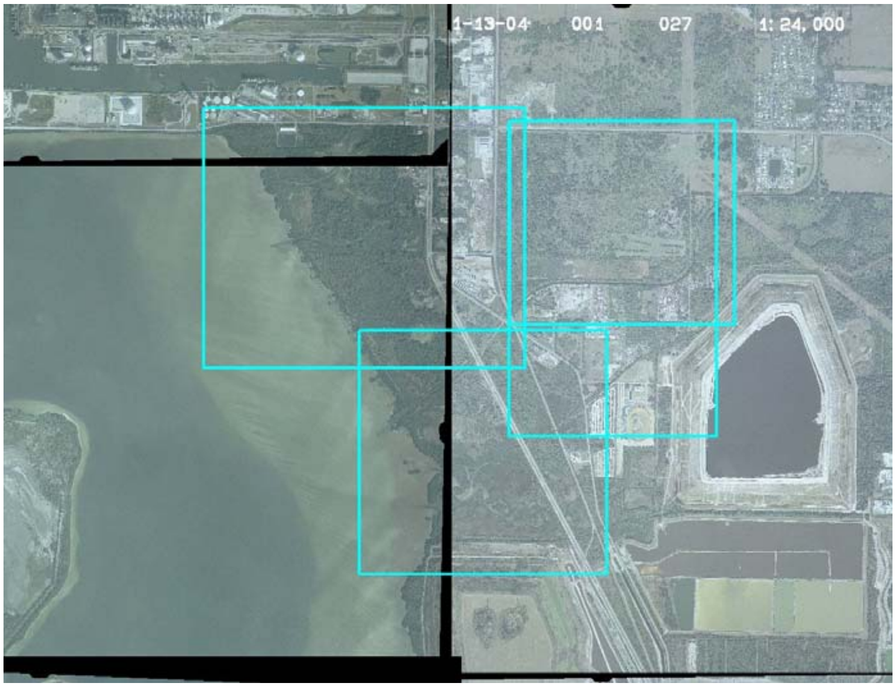

Figure 9. November 6, 2004, Fifth flight, 4 infrared images.

Figure 10. November 11, 2004, Shoreline and seagrass flight, 47 true color images.

APPENDIX 4

pH Monitoring Results

pH Average						
ORGANIZATION	LAT	LONG	DATE	TIME	pH AVG	TYPE
NOAA	27.878120	-82.402470	6-Sep-04	15:50	2.59	BAY
NOAA	27.879090	-82.402830	6-Sep-04	15:54	2.47	BAY
NOAA	27.881620	-82.405840	6-Sep-04	15:58	2.60	BAY
NOAA	27.883080	-82.405990	6-Sep-04	16:02	2.89	BAY
NOAA	27.885520	-82.407140	6-Sep-04	16:04	3.46	BAY
NOAA	27.887800	-82.409130	6-Sep-04	16:06	4.41	BAY
NOAA	27.889900	-82.409510	6-Sep-04	16:08	3.01	BAY
NOAA	27.891270	-82.410090	6-Sep-04	16:10	2.94	BAY
NOAA	27.892730	-82.410790	6-Sep-04	16:13	3.21	BAY
NOAA	27.894260	-82.411840	6-Sep-04	16:14	3.46	BAY
NOAA	27.890700	-82.412900	6-Sep-04	16:15	3.42	BAY
NOAA	27.897670	-82.413730	6-Sep-04	16:18	3.30	BAY
NOAA	27.899290	-82.416920	6-Sep-04	16:20	3.37	BAY
NOAA	27.899780	-82.420360	6-Sep-04	16:22	3.39	BAY
NOAA	27.900270	-82.422710	6-Sep-04	16:24	3.61	BAY
NOAA	27.899840	-82.426550	6-Sep-04	16:25	3.78	BAY
NOAA	27.897670	-82.431720	6-Sep-04	16:28	4.01	BAY
NOAA	27.894290	-82.431310	6-Sep-04	16:33	5.46	BAY
NOAA	27.892100	-82.431590	6-Sep-04	16:34	6.83	BAY
NOAA	27.888320	-82.433550	6-Sep-04	16:36	7.51	BAY
NOAA	27.890050	-82.429490	6-Sep-04	16:38	7.67	BAY
NOAA	27.891960	-82.425190	6-Sep-04		7.75	BAY
NOAA	27.894240	-82.420230	6-Sep-04		3.87	BAY
NOAA	27.892880	-82.417620	6-Sep-04		3.21	BAY
NOAA	27.889090	-82.414380	6-Sep-04		3.37	BAY
NOAA	27.886330	-82.418240	6-Sep-04		6.81	BAY
NOAA	27.881870	-82.417580	6-Sep-04	16:53	7.46	BAY
NOAA	27.882000	-82.417580	6-Sep-04		7.53	BAY
NOAA	27.882060	-82.409600	6-Sep-04		7.60	BAY
NOAA	27.881990	-82.406620	6-Sep-04		7.64	BAY
NOAA	27.882000	-82.405330	6-Sep-04	17:00	2.73	BAY
NOAA	27.881720	-82.405710	6-Sep-04		3.07	BAY
NOAA	27.881560	-82.406470	6-Sep-04		6.85	BAY
NOAA	27.879780	-82.405170	6-Sep-04		7.38	BAY
NOAA	27.877320	-82.402690	6-Sep-04		3.10	BAY
NOAA	27.876660	-82.403270	6-Sep-04	17:10	6.61	BAY
NOAA	27.875790	-82.403760	6-Sep-04	17:12	7.36	BAY
NOAA	27.895870	-82.435260	6-Sep-04	17:20	3.58	BAY
NOAA	27.898620	-82.435210	6-Sep-04		4.08	BAY
NOAA	27.899960	-82.434810	6-Sep-04	17:24	5.65	BAY
NOAA	27.902450	-82.434810	6-Sep-04		6.31	BAY
NOAA	27.903700	-82.433230	6-Sep-04	17:27	6.75	BAY
NOAA	27.905150	-82.433820	6-Sep-04		6.74	BAY

pH Average						
ORGANIZATION	LAT	LONG	DATE	TIME	pH AVG	TYPE
NOAA	Archie Creek Center Channel		7-Sep-04	0:00	3.19	
NOAA	Ammonia pipeline - Pond North of Archie Creek		7-Sep-04		4.50	
NOAA	27.881578	-82.402075	7-Sep-04	0:00	6.52	
NOAA	27.878818	-82.405640	7-Sep-04	0:00	6.85	
NOAA	27.878818	-82.405640	7-Sep-04	0:00	6.34	
NOAA	27.886052	-82.410673	7-Sep-04	0:00	6.30	
NOAA	27.899160	-82.415413	7-Sep-04	0:00	6.24	
FDEP	27.878111	-82.405778	7-Sep-04		7.47	
FDEP	27.878639	-82.405444	7-Sep-04		7.48	
FDEP	27.879222	-82.404806	7-Sep-04		7.43	
FDEP	27.879306	-82.404556	7-Sep-04		7.40	
FDEP	27.879500	-82.404944	7-Sep-04		7.60	
FDEP	27.879583	-82.403833	7-Sep-04		4.58	
FDEP	27.879639	-82.403722	7-Sep-04		3.73	
FDEP	27.879722	-82.403556	7-Sep-04	14:40	3.61	
FDEP	27.879833	-82.403444	7-Sep-04		3.65	
FDEP	27.880111	-82.402861	7-Sep-04		6.40	
FDEP	27.880222	-82.402722	7-Sep-04		6.12	
FDEP	27.880250	-82.402639	7-Sep-04		6.09	
FDEP	27.880417	-82.402278	7-Sep-04		6.08	
FDEP	27.880861	-82.401806	7-Sep-04		6.08	
FDEP	27.880972	-82.400583	7-Sep-04		6.11	
FDEP	27.880444	-82.400472	7-Sep-04	14:50	6.09	
FDEP	27.879722	-82.399778	7-Sep-04		6.02	
FDEP	27.879694	-82.399083	7-Sep-04		6.00	
FDEP	27.880306	-82.398417	7-Sep-04		6.23	
FDEP	27.879750	-82.398250	7-Sep-04		6.18	
FDEP	27.879250	-82.398056	7-Sep-04		5.96	
FDEP	27.879083	-82.397861	7-Sep-04		6.40	
FDEP	27.878944	-82.397583	7-Sep-04		6.43	
FDEP	27.878750	-82.397139	7-Sep-04		6.51	
FDEP	27.878667	-82.396361	7-Sep-04		6.61	
FDEP	27.878167	-82.395056	7-Sep-04	15:24	9.59	
FDEP	27.882833	-82.403750	7-Sep-04	15:54	6.36	
FDEP	27.882556	-82.404333	7-Sep-04		6.19	
FDEP	27.881500	-82.405167	7-Sep-04		6.36	
FDEP	27.881278	-82.405139	7-Sep-04		3.83	
FDEP	27.881194	-82.405111	7-Sep-04		3.78	
FDEP	27.881083	-82.405083	7-Sep-04		3.75	
FDEP	27.880861	-82.405139	7-Sep-04		3.69	
FDEP	27.880722	-82.405250	7-Sep-04		3.60	

pH Average						
ORGANIZATION	LAT	LONG	DATE	TIME	pH AVG	TYPE
FDEP	27.880667	-82.405444	7-Sep-04	16:00	4.16	
FDEP	27.881639	-82.404917	7-Sep-04		6.18	
FDEP	27.880333	-82.404972	7-Sep-04		3.59	
FDEP	27.880278	-82.405028	7-Sep-04		3.75	
FDEP	27.880222	-82.405056	7-Sep-04		3.87	
FDEP	27.880083	-82.404944	7-Sep-04		3.95	
FDEP	27.879944	-82.405139	7-Sep-04		4.53	
FDEP	27.879944	-82.405417	7-Sep-04		6.65	
FDEP	27.879972	-82.405556	7-Sep-04		6.95	
FDEP	27.880000	-82.405806	7-Sep-04		7.15	
FDEP	27.880028	-82.406111	7-Sep-04		7.29	
FDEP	27.879972	-82.406278	7-Sep-04		7.34	
FDEP	27.879861	-82.406861	7-Sep-04		7.43	
FDEP	27.878944	-82.401194	8-Sep-04		3.45	
FDEP	27.878833	-82.401111	8-Sep-04		3.44	
FDEP	27.878750	-82.401111	8-Sep-04		3.43	
FDEP	27.878667	-82.401111	8-Sep-04	12:06	3.43	
FDEP	27.878306	-82.401139	8-Sep-04		3.42	
FDEP	27.878056	-82.401167	8-Sep-04		3.42	
FDEP	27.877917	-82.401167	8-Sep-04		3.42	
FDEP	27.877722	-82.401167	8-Sep-04		3.42	
FDEP	27.877472	-82.401250	8-Sep-04		3.42	
FDEP	27.877278	-82.401222	8-Sep-04		3.41	
FDEP	27.877306	-82.401028	8-Sep-04		3.41	
FDEP	27.877333	-82.400889	8-Sep-04		3.41	
FDEP	27.877333	-82.400361	8-Sep-04		3.41	
FDEP	27.877333	-82.400194	8-Sep-04		3.40	
FDEP	27.877306	-82.398972	8-Sep-04		3.39	
FDEP	27.877306	-82.398278	8-Sep-04		3.38	
FDEP	27.877306	-82.397556	8-Sep-04		3.37	
FDEP	27.877278	-82.396778	8-Sep-04	12:18	3.38	
FDEP	27.877278	-82.396778	8-Sep-04	12:18	3.37	
FDEP	27.877306	-82.396694	8-Sep-04		3.35	
FDEP	27.877306	-82.396194	8-Sep-04		3.36	
FDEP	27.877278	-82.395694	8-Sep-04		3.36	
FDEP	27.877278	-82.394889	8-Sep-04		3.35	
FDEP	27.877250	-82.394333	8-Sep-04		3.34	
FDEP	27.877250	-82.394111	8-Sep-04		3.33	
FDEP	27.877306	-82.393639	8-Sep-04		3.32	
FDEP	27.878972	-82.401111	8-Sep-04	13:23	3.46	
FDEP	27.879000	-82.401111	8-Sep-04		3.61	
FDEP	27.879167	-82.401361	8-Sep-04		3.47	
FDEP	27.879222	-82.401417	8-Sep-04		5.58	
FDEP	27.879222	-82.401500	8-Sep-04		5.84	
FDEP	27.879167	-82.401528	8-Sep-04		5.98	

pH Average						
ORGANIZATION	LAT	LONG	DATE	TIME	pH AVG	TYPE
FDEP	27.879139	-82.401583	8-Sep-04		3.66	
FDEP	27.879111	-82.401583	8-Sep-04		3.46	
FDEP	27.879111	-82.401667	8-Sep-04	13:26	3.42	
FDEP	27.879139	-82.401833	8-Sep-04		3.42	
FDEP	27.879167	-82.401917	8-Sep-04		3.45	
FDEP	27.879222	-82.402028	8-Sep-04		3.47	
FDEP	27.879222	-82.402056	8-Sep-04		3.57	
FDEP	27.879278	-82.402167	8-Sep-04	13:28	3.60	
FDEP	27.879389	-82.402306	8-Sep-04		3.65	
FDEP	27.879417	-82.402306	8-Sep-04		3.88	
FDEP	27.879444	-82.402306	8-Sep-04	13:30	3.98	
FDEP	27.879472	-82.402333	8-Sep-04		3.85	
FDEP	27.879472	-82.402333	8-Sep-04		3.92	
FDEP	27.879500	-82.402306	8-Sep-04		4.59	
FDEP	27.879528	-82.402306	8-Sep-04		4.75	
FDEP	27.879611	-82.402306	8-Sep-04		6.02	
FDEP	27.879722	-82.402444	8-Sep-04		6.14	
FDEP	27.879750	-82.402500	8-Sep-04		6.20	
FDEP	27.879806	-82.402583	8-Sep-04		6.24	
FDEP	27.879833	-82.402611	8-Sep-04		6.25	
FDEP	27.880028	-82.402667	8-Sep-04		6.27	
FDEP	27.880278	-82.402778	8-Sep-04	13:38	6.30	
FDEP	27.880361	-82.402806	8-Sep-04		6.30	
FDEP	27.880722	-82.403528	8-Sep-04		6.28	
FDEP	27.880056	-82.403667	8-Sep-04		3.76	
FDEP	27.880028	-82.403667	8-Sep-04		3.73	
FDEP	27.879972	-82.403694	8-Sep-04		3.70	
FDEP	27.879944	-82.403722	8-Sep-04		3.68	
FDEP	27.879889	-82.403722	8-Sep-04		3.66	
FDEP	27.879778	-82.403778	8-Sep-04		3.67	
FDEP	27.879722	-82.403806	8-Sep-04		3.68	
FDEP	27.879667	-82.403833	8-Sep-04		3.62	
FDEP	27.879611	-82.403861	8-Sep-04		3.57	
FDEP	27.879556	-82.403917	8-Sep-04		3.52	
FDEP	27.879500	-82.403944	8-Sep-04		3.49	
FDEP	27.879444	-82.403972	8-Sep-04		3.44	
FDEP	27.879389	-82.403972	8-Sep-04		3.42	
FDEP	27.879278	-82.404000	8-Sep-04		3.40	
FDEP	27.879028	-82.404000	8-Sep-04	13:44	3.44	
FDEP	27.878917	-82.404028	8-Sep-04		3.45	
FDEP	27.878833	-82.404028	8-Sep-04		3.60	
FDEP	27.878806	-82.404028	8-Sep-04		3.70	
FDEP	27.878694	-82.403972	8-Sep-04		3.64	
FDEP	27.878667	-82.403778	8-Sep-04		3.72	
FDEP	27.878667	-82.403667	8-Sep-04		3.84	

pH Average						
ORGANIZATION	LAT	LONG	DATE	TIME	pH AVG	TYPE
FDEP	27.878556	-82.403722	8-Sep-04		5.29	
FDEP	27.878611	-82.403778	8-Sep-04		5.27	
FDEP	27.878528	-82.404139	8-Sep-04		6.12	
FDEP	27.878167	-82.404694	8-Sep-04		6.87	
FDEP	27.878056	-82.404750	8-Sep-04		6.94	
Lewis Env.	27.87813889	-82.39033333	6-Sep-04	3:20	2.80	
Lewis Env.	27.87813889	-82.39033333	7-Sep-04	12:12	3.90	
Lewis Env.	27.87813889	-82.39033333	7-Sep-04	3:42	5.10	
Lewis Env.	27.87813889	-82.39033333	8-Sep-04	9:39	6.40	
Lewis Env.	27.87813889	-82.39033333	8-Sep-04	2:43	6.30	
Lewis Env.	27.87813889	-82.39033333	9-Sep-04	11:15	6.10	
Lewis Env.	27.87813889	-82.39033333	9-Sep-04	3:45	6.30	
Lewis Env.	27.87813889	-82.39033333	10-Sep-04	10:44	6.40	
Lewis Env.	27.87813889	-82.39033333	10-Sep-04	4:41	6.40	
Lewis Env.	27.87813889	-82.39033333	11-Sep-04	12:50	6.90	
Lewis Env.	27.87813889	-82.39033333	11-Sep-04	5:30	6.40	
Lewis Env.	27.87813889	-82.39033333	12-Sep-04	11:35	6.40	
Lewis Env.	27.87813889	-82.39033333	13-Sep-04	12:07	6.90	
Lewis Env.	27.87813889	-82.39033333	14-Sep-04	12:45	5.90	
Lewis Env.	27.87813889	-82.39033333	15-Sep-04	4:47	7.10	
Lewis Env.	27.87813889	-82.39033333	16-Sep-04	7:11	7.10	
Lewis Env.	27.87813889	-82.39033333	17-Sep-04	5:33	7.00	
Lewis Env.	27.87813889	-82.39033333	18-Sep-04	4:00	7.30	
Lewis Env.	27.87813889	-82.39033333	19-Sep-04	11:38	7.00	
Lewis Env.	27.87813889	-82.39033333	20-Sep-04	10:38	6.90	
Lewis Env.	27.87813889	-82.39033333	21-Sep-04	0.12	7.00	
Lewis Env.	27.87813889	-82.39033333	22-Sep-04	0.20	7.00	
Lewis Env.	27.87813889	-82.39033333	23-Sep-04	0.26	6.90	
Lewis Env.	27.87813889	-82.39033333	24-Sep-04	No Data		
Lewis Env.	27.87813889	-82.39033333	25-Sep-04	0.44	7.00	
Lewis Env.	27.87813889	-82.39033333	26-Sep-04	No Data		
Lewis Env.	27.87813889	-82.39033333	27-Sep-04	0.42	7.00	
Lewis Env.	27.88511111	-82.39169444	6-Sep-04	3:39	5.60	
Lewis Env.	27.88511111	-82.39169444	7-Sep-04	12:05	6.40	
Lewis Env.	27.88511111	-82.39169444	7-Sep-04	3:39	6.60	
Lewis Env.	27.88511111	-82.39169444	8-Sep-04	9:50	6.60	
Lewis Env.	27.88511111	-82.39169444	8-Sep-04	3:00	6.40	
Lewis Env.	27.88511111	-82.39169444	9-Sep-04	11:45	6.60	
Lewis Env.	27.88511111	-82.39169444	9-Sep-04	3:48	6.30	
Lewis Env.	27.88511111	-82.39169444	10-Sep-04	10:50	6.50	
Lewis Env.	27.88511111	-82.39169444	10-Sep-04	4:45	6.60	
Lewis Env.	27.88511111	-82.39169444	11-Sep-04	12:53	6.90	
Lewis Env.	27.88511111	-82.39169444	11-Sep-04	5:37	6.70	
Lewis Env.	27.88511111	-82.39169444	12-Sep-04	11:43	6.90	
Lewis Env.	27.88511111	-82.39169444	13-Sep-04	11:49	7.40	

pH Average						
ORGANIZATION	LAT	LONG	DATE	TIME	pH AVG	TYPE
Lewis Env.	27.88511111	-82.39169444	14-Sep-04	1:00	6.90	
Lewis Env.	27.88511111	-82.39169444	15-Sep-04	4:50	7.20	
Lewis Env.	27.88511111	-82.39169444	16-Sep-04	7:15	7.20	
Lewis Env.	27.88511111	-82.39169444	17-Sep-04	5:45	7.20	
Lewis Env.	27.88511111	-82.39169444	18-Sep-04	4:04	7.40	
Lewis Env.	27.88511111	-82.39169444	19-Sep-04	12:04	7.40	
Lewis Env.	27.88511111	-82.39169444	20-Sep-04	10:41	7.40	
Lewis Env.	27.88511111	-82.39169444	21-Sep-04	2:58	7.30	
Lewis Env.	27.88511111	-82.39169444	22-Sep-04	4:53	7.40	
Lewis Env.	27.88511111	-82.39169444	23-Sep-04	6:19	7.30	
Lewis Env.	27.88511111	-82.39169444	24-Sep-04	No Data		
Lewis Env.	27.88511111	-82.39169444	25-Sep-04	10:34	7.30	
Lewis Env.	27.88511111	-82.39169444	26-Sep-04	No Data		
Lewis Env.	27.88511111	-82.39169444	27-Sep-04	10:10	6.80	
Lewis Env.	27.89002778	-82.39705556	6-Sep-04	3:50	6.30	
Lewis Env.	27.89002778	-82.39705556	7-Sep-04	11:50	6.60	
Lewis Env.	27.89002778	-82.39705556	7-Sep-04	3:36	6.90	
Lewis Env.	27.89002778	-82.39705556	8-Sep-04	9:56	6.70	
Lewis Env.	27.89002778	-82.39705556	8-Sep-04	3:05	6.40	
Lewis Env.	27.89002778	-82.39705556	9-Sep-04	11:50	6.90	
Lewis Env.	27.89002778	-82.39705556	9-Sep-04	4:00	7.10	
Lewis Env.	27.89002778	-82.39705556	10-Sep-04	10:55	6.80	
Lewis Env.	27.89002778	-82.39705556	10-Sep-04	4:48	6.70	
Lewis Env.	27.89002778	-82.39705556	11-Sep-04	12:57	6.90	
Lewis Env.	27.89002778	-82.39705556	11-Sep-04	5:43	6.90	
Lewis Env.	27.89002778	-82.39705556	12-Sep-04	11:47	6.90	
Lewis Env.	27.89002778	-82.39705556	13-Sep-04	11:55	7.40	
Lewis Env.	27.89002778	-82.39705556	14-Sep-04	1:05	7.10	
Lewis Env.	27.89002778	-82.39705556	15-Sep-04	5:00	7.60	
Lewis Env.	27.89002778	-82.39705556	16-Sep-04	7:21	7.20	
Lewis Env.	27.89002778	-82.39705556	17-Sep-04	5:55	7.30	
Lewis Env.	27.89002778	-82.39705556	18-Sep-04	4:10	7.40	
Lewis Env.	27.89002778	-82.39705556	19-Sep-04	12:10	7.40	
Lewis Env.	27.89002778	-82.39705556	20-Sep-04	10:46	7.00	
Lewis Env.	27.89002778	-82.39705556	21-Sep-04	3:03	7.40	
Lewis Env.	27.89002778	-82.39705556	22-Sep-04	5:00	7.40	
Lewis Env.	27.89002778	-82.39705556	23-Sep-04	6:26	7.30	
Lewis Env.	27.89002778	-82.39705556	24-Sep-04	No Data		
Lewis Env.	27.89002778	-82.39705556	25-Sep-04	10:39	7.30	
Lewis Env.	27.89002778	-82.39705556	26-Sep-04	No Data		
Lewis Env.	27.89002778	-82.39705556	27-Sep-04	10:12	7.00	
Lewis Env.	27.8875	-82.39880556	6-Sep-04	4:14	6.90	
Lewis Env.	27.8875	-82.39880556	7-Sep-04	11:45	5.20	
Lewis Env.	27.8875	-82.39880556	7-Sep-04	3:33	6.40	
Lewis Env.	27.8875	-82.39880556	8-Sep-04	No Data		

pH Average						
ORGANIZATION	LAT	LONG	DATE	TIME	pH AVG	TYPE
Lewis Env.	27.8875	-82.39880556	8-Sep-04	3:10	6.70	
Lewis Env.	27.8875	-82.39880556	9-Sep-04	11:58	6.70	
Lewis Env.	27.8875	-82.39880556	9-Sep-04	4:10	6.90	
Lewis Env.	27.8875	-82.39880556	10-Sep-04	11:00	6.70	
Lewis Env.	27.8875	-82.39880556	10-Sep-04	4:57	7.00	
Lewis Env.	27.8875	-82.39880556	11-Sep-04	12:03	6.90	
Lewis Env.	27.8875	-82.39880556	11-Sep-04	5:50	6.90	
Lewis Env.	27.8875	-82.39880556	12-Sep-04	11:50	6.90	
Lewis Env.	27.8875	-82.39880556	13-Sep-04	11:30	7.40	
Lewis Env.	27.8875	-82.39880556	14-Sep-04	1:12	7.10	
Lewis Env.	27.8875	-82.39880556	15-Sep-04	5:05	7.60	
Lewis Env.	27.8875	-82.39880556	16-Sep-04	7:27	7.20	
Lewis Env.	27.8875	-82.39880556	17-Sep-04	6:01	7.40	
Lewis Env.	27.8875	-82.39880556	18-Sep-04	4:15	7.50	
Lewis Env.	27.8875	-82.39880556	19-Sep-04	12:15	7.40	
Lewis Env.	27.8875	-82.39880556	20-Sep-04	10:57	7.30	
Lewis Env.	27.8875	-82.39880556	21-Sep-04	3:10	7.30	
Lewis Env.	27.8875	-82.39880556	22-Sep-04	5:07	7.30	
Lewis Env.	27.8875	-82.39880556	23-Sep-04	6:34	7.30	
Lewis Env.	27.8875	-82.39880556	24-Sep-04	No Data		
Lewis Env.	27.8875	-82.39880556	25-Sep-04	10:43	7.30	
Lewis Env.	27.8875	-82.39880556	26-Sep-04	No Data		
Lewis Env.	27.8875	-82.39880556	27-Sep-04	10:16	7.00	
Lewis Env.	27.88272222	-82.39586111	6-Sep-04	4:16	6.70	
Lewis Env.	27.88272222	-82.39586111	7-Sep-04	11:35	5.70	
Lewis Env.	27.88272222	-82.39586111	7-Sep-04	3:31	5.70	
Lewis Env.	27.88272222	-82.39586111	8-Sep-04	No Data		
Lewis Env.	27.88272222	-82.39586111	8-Sep-04	3:15	6.60	
Lewis Env.	27.88272222	-82.39586111	9-Sep-04	12:05	6.80	
Lewis Env.	27.88272222	-82.39586111	9-Sep-04	4:14	6.80	
Lewis Env.	27.88272222	-82.39586111	10-Sep-04	11:07	6.70	
Lewis Env.	27.88272222	-82.39586111	10-Sep-04	5:03	6.90	
Lewis Env.	27.88272222	-82.39586111	11-Sep-04	12:10	7.10	
Lewis Env.	27.88272222	-82.39586111	11-Sep-04	5:57	6.90	
Lewis Env.	27.88272222	-82.39586111	12-Sep-04	11:58	7.10	
Lewis Env.	27.88272222	-82.39586111	13-Sep-04	11:38	7.40	
Lewis Env.	27.88272222	-82.39586111	14-Sep-04	1:17	7.00	
Lewis Env.	27.88272222	-82.39586111	15-Sep-04	5:12	7.40	
Lewis Env.	27.88272222	-82.39586111	16-Sep-04	7:35	7.20	
Lewis Env.	27.88272222	-82.39586111	17-Sep-04	6:07	7.30	
Lewis Env.	27.88272222	-82.39586111	18-Sep-04	4:21	7.60	
Lewis Env.	27.88272222	-82.39586111	19-Sep-04	12:22	7.40	
Lewis Env.	27.88272222	-82.39586111	20-Sep-04	11:02	7.40	
Lewis Env.	27.88272222	-82.39586111	21-Sep-04	3:16	7.30	
Lewis Env.	27.88272222	-82.39586111	22-Sep-04	5:12	7.30	

pH Average						
ORGANIZATION	LAT	LONG	DATE	TIME	pH AVG	TYPE
Lewis Env.	27.88272222	-82.39586111	23-Sep-04	6:41	7.40	
Lewis Env.	27.88272222	-82.39586111	24-Sep-04	No Data		
Lewis Env.	27.88272222	-82.39586111	25-Sep-04	10:56	7.40	
Lewis Env.	27.88272222	-82.39586111	26-Sep-04	No Data		
Lewis Env.	27.88272222	-82.39586111	27-Sep-04	10:30	7.00	
Lewis Env.	27.87752778	-82.39272222	6-Sep-04	4:23	4.70	
Lewis Env.	27.87752778	-82.39272222	7-Sep-04	11:26	3.70	
Lewis Env.	27.87752778	-82.39272222	7-Sep-04	3:29	3.80	
Lewis Env.	27.87752778	-82.39272222	8-Sep-04	No Data		
Lewis Env.	27.87752778	-82.39272222	8-Sep-04	3:20	3.60	
Lewis Env.	27.87752778	-82.39272222	9-Sep-04	12:12	4.20	
Lewis Env.	27.87752778	-82.39272222	9-Sep-04	4:20	3.80	
Lewis Env.	27.87752778	-82.39272222	10-Sep-04	11:10	6.30	
Lewis Env.	27.87752778	-82.39272222	10-Sep-04	5:10	5.40	
Lewis Env.	27.87752778	-82.39272222	11-Sep-04	12:12	5.30	
Lewis Env.	27.87752778	-82.39272222	11-Sep-04	6:05	5.40	
Lewis Env.	27.87752778	-82.39272222	12-Sep-04	12:03	5.70	
Lewis Env.	27.87752778	-82.39272222	13-Sep-04	12:03	5.70	
Lewis Env.	27.87752778	-82.39272222	14-Sep-04	11:45	5.80	
Lewis Env.	27.87752778	-82.39272222	15-Sep-04	1:20	6.40	
Lewis Env.	27.87752778	-82.39272222	16-Sep-04	5:20	7.40	
Lewis Env.	27.87752778	-82.39272222	17-Sep-04	7.42	7.00	
Lewis Env.	27.87752778	-82.39272222	18-Sep-04	4:28	7.00	
Lewis Env.	27.87752778	-82.39272222	19-Sep-04	1:57	7.10	
Lewis Env.	27.87752778	-82.39272222	20-Sep-04	11:07	7.00	
Lewis Env.	27.87752778	-82.39272222	21-Sep-04	3:20	7.00	
Lewis Env.	27.87752778	-82.39272222	22-Sep-04	5:21	7.10	
Lewis Env.	27.87752778	-82.39272222	23-Sep-04	6:50	7.10	
Lewis Env.	27.87752778	-82.39272222	24-Sep-04	No Data		
Lewis Env.	27.87752778	-82.39272222	25-Sep-04	11:07	7.10	
Lewis Env.	27.87752778	-82.39272222	26-Sep-04	No Data		
Lewis Env.	27.87752778	-82.39272222	27-Sep-04	10:34	6.60	
Lewis Env.	27.87991667	-82.36902778	6-Sep-04	6:10	7.10	
Lewis Env.	27.87991667	-82.36902778	7-Sep-04	12:27	6.10	
Lewis Env.	27.87991667	-82.36902778	7-Sep-04	3:16	6.40	
Lewis Env.	27.87991667	-82.36902778	8-Sep-04	9:23	6.70	
Lewis Env.	27.87991667	-82.36902778	8-Sep-04	2:35	6.50	
Lewis Env.	27.87991667	-82.36902778	9-Sep-04	12:12	6.90	
Lewis Env.	27.87991667	-82.36902778	9-Sep-04	3:20	6.70	
Lewis Env.	27.87991667	-82.36902778	10-Sep-04	10:35	6.40	
Lewis Env.	27.87991667	-82.36902778	10-Sep-04	5:20	6.40	
Lewis Env.	27.87991667	-82.36902778	11-Sep-04	12:35	6.60	
Lewis Env.	27.87991667	-82.36902778	11-Sep-04	6:20	6.70	
Lewis Env.	27.87991667	-82.36902778	12-Sep-04	11:25	6.70	
Lewis Env.	27.87991667	-82.36902778	13-Sep-04	11:10	6.80	

pH Average						
ORGANIZATION	LAT	LONG	DATE	TIME	pH AVG	TYPE
Lewis Env.	27.87991667	-82.36902778	14-Sep-04	1:30	7.00	
Lewis Env.	27.87991667	-82.36902778	15-Sep-04	4:35	6.90	
Lewis Env.	27.87991667	-82.36902778	16-Sep-04	6:45	6.90	
Lewis Env.	27.87991667	-82.36902778	17-Sep-04	6:45	7.20	
Lewis Env.	27.87991667	-82.36902778	18-Sep-04	4:47	6.90	
Lewis Env.	27.87991667	-82.36902778	19-Sep-04	11:20	7.40	
Lewis Env.	27.87991667	-82.36902778	20-Sep-04	11:20	7.20	
Lewis Env.	27.87991667	-82.36902778	21-Sep-04	3:32	7.20	
Lewis Env.	27.87991667	-82.36902778	22-Sep-04	5:43	7.10	
Lewis Env.	27.87991667	-82.36902778	23-Sep-04	7:10	7.10	
Lewis Env.	27.87991667	-82.36902778	24-Sep-04	No Data		
Lewis Env.	27.87991667	-82.36902778	25-Sep-04	11:21	7.00	
Lewis Env.	27.87991667	-82.36902778	26-Sep-04	No Data		
Lewis Env.	27.87991667	-82.36902778	27-Sep-04	10:43	6.90	
Lewis Env.	Archie Creek 1		17-Sep-04	5:25	6.70	
Lewis Env.	Archie Creek 1		18-Sep-04	3:58	7.10	
Lewis Env.	Archie Creek 1		19-Sep-04	11:30	7.10	
Lewis Env.	Archie Creek 1		20-Sep-04	10:27	7.00	
Lewis Env.	Archie Creek 1		21-Sep-04	2:49	6.70	
Lewis Env.	Archie Creek 2		22-Sep-04	4:46	6.90	
Lewis Env.	Archie Creek 3		23-Sep-04	6:04	6.90	
Lewis Env.	Archie Creek 4		24-Sep-04	No Data		
Lewis Env.	Archie Creek 5		25-Sep-04	10:20	7.00	
Lewis Env.	Archie Creek 6		26-Sep-04	No Data		
Lewis Env.	Archie Creek 7		27-Sep-04	10:00	7.00	
Lewis Env.	Archie Creek 2		17-Sep-04	5:30	6.60	
Lewis Env.	Archie Creek 2		18-Sep-04	3:50	7.00	
Lewis Env.	Archie Creek 2		19-Sep-04	11:35	7.00	
Lewis Env.	Archie Creek 2		20-Sep-04	10:35	7.00	
Lewis Env.	Archie Creek 2		21-Sep-04	2:53	6.20	
Lewis Env.	Archie Creek 3		22-Sep-04	4:43	6.90	
Lewis Env.	Archie Creek 4		23-Sep-04	6:08	6.90	
Lewis Env.	Archie Creek 5		24-Sep-04	No Data		
Lewis Env.	Archie Creek 6		25-Sep-04	10:23	7.00	
Lewis Env.	Archie Creek 7		26-Sep-04	No Data		
Lewis Env.	Archie Creek 8		27-Sep-04	10:04	7.00	

Archie Creek Gauge Data prior to the spill

Date	Stage_MAX	PH_AVG
17-Aug	3.963	6.995
18-Aug	4.097	7
19-Aug	4.124	7.03
20-Aug	3.875	7.01
21-Aug	4.241	7.05
22-Aug	4.297	7.05
23-Aug	4.309	7.08
24-Aug	4.424	7.06
25-Aug	4.32	7.05
26-Aug	4.071	7.06
27-Aug	3.667	7.09
28-Aug	3.308	7.05
29-Aug	3.278	7.04
30-Aug	2.988	7.06
31-Aug	4.113	5.332
1-Sep	3.667	7.09
2-Sep	3.308	7.05
3-Sep	3.278	7.04
4-Sep	2.988	7.06
5-Sep	4.113	5.332
6-Sep	7.61	2.586
7-Sep	4.708	3.633
8-Sep	4.084	4.063
9-Sep	3.756	3.955

APPENDIX 5

EPC Nutrient Data and pH Data

Station ID	Location	Date	Ammonia N (mg/L)	Total Kjeldahl N (mg/L)	Nitrates / Nitrites (mg/L)	Total N (mg/L)	P ORTHO	Total P (mg/L)	Total CHL (ug/L)	pH	Salinity (pss)	Latitude (DD)	Longitude (DD)
7	Hillsborough_Bay	29-Sep-04	0.11	0.50	0.171	0.67		0.49	7.10	7.70	14.70	27.8554	-82.4678
7	Hills. Bay MacDill Channel	10 yr Sept avg	0.02	0.82	0.01	0.85	0.28	0.47	23.01	8.04	22.31	27.8589	-82.4686
8	Hillsborough_Bay	7-Sep-04	0.14	1.59	0.10	1.69		0.35		7.20	8.90	27.8526	-82.4094
8	Hillsborough_Bay	29-Sep-04	0.06	0.38	0.105	0.49		0.56	4.80	7.00	5.50	27.8526	-82.4094
8	Hills. Bay Cargill	10 yr Sept avg	0.03	1.13	0.09	1.22	0.35	0.51	70.06	8.11	19.96	27.8524	-82.4093
52	Hillsborough_Bay	29-Sep-04	0.24	1.06	0.179	1.24		0.91	9.60	7.50	7.40	27.8979	-82.4373
52	Hills. Bay Pendola Pt	10 yr Sept avg	0.06	0.96	0.01	1.02	0.26	0.38	30.45	8.00	22.07	27.8970	-82.4382
55	Hillsborough_Bay	7-Sep-04	0.16	1.58	0.06	1.64		0.31		7.80	17.00	27.8493	-82.4317
55	Hillsborough_Bay	29-Sep-04	0.09	0.42	0.111	0.53		0.27	6.90	7.80	17.70	27.8493	-82.4317
55	Hills. Bay Marker 22	10 yr Sept avg	0.02	0.91	0.02	1.04	0.28	0.40	27.89	8.24	22.28	27.8493	-82.4314
71	Hillsborough_Bay	7-Sep-04	0.17	0.86	0.06	0.92		0.25		7.50	11.20	27.8778	-82.4143
71	Hillsborough_Bay	29-Sep-04	0.16	0.82	0.127	0.95		0.33	5.40	7.40	7.40	27.8778	-82.4143
71	Hills. Bay Archie Ck	10 yr Sept avg	0.02	1.01	0.01	0.98	0.31	0.44	33.76	8.21	23.00	27.8765	-82.4138
73	Hillsborough_Bay	29-Sep-04	0.08	0.28	0.082	0.36		0.29	2.00	7.90	17.80	27.8235	-82.4079
73	Hills. Bay Marker A	10 yr Sept avg	0.02	0.92	0.01	0.96	0.27	0.37	24.07	8.18	23.39	27.8281	-82.4131
74	Alafia R @ US 41	10 yr Sept avg	0.09	1.09	0.44	1.56	0.82	1.07	15.21	7.43	10.54	27.8590	-82.3830
AR-1	Alafia_River	6-Sep-04	0.10	1.20	0.15	1.35		1.30		6.90	0.17	27.8597	-82.3841
HB-10	Hillsborough_Bay	16-Sep-04	0.66	1.46	0.06	1.52		1.10		7.56	1.84	27.8949	-82.4120
HB-12	Archie_Creek	16-Sep-04	0.82	2.49	0.08	2.57		3.26				27.8813	-82.3985
HB-16	Hillsborough_Bay	16-Sep-04	0.27	0.87	0.12	0.99		1.16				27.8756	-82.4085
HB-18	Hillsborough_Bay	16-Sep-04	0.26	0.93	0.13	1.06		0.82		7.69	13.78	27.8656	-82.4163
NAC-1	North_Archie_Creek	10-Sep-04	0.41	1.79	0.07	1.86		4.69		6.20		27.8830	-82.3956
NAC-1	North_Archie_Creek	16-Sep-04	0.21	1.27	0.21	1.48		1.16				27.8830	-82.3956
NAC-2	North_Archie_Creek	8-Sep-04	0.02	0.74	0.03	0.76		0.70		6.40		27.8936	-82.3687
NAC-2	North_Archie_Creek	10-Sep-04	0.04	1.58	0.04	1.62		0.47		6.40		27.8936	-82.3687
NAC-2	North_Archie_Creek	16-Sep-04	0.17	0.90	0.07	0.97		0.55		6.80		27.8936	-82.3687
SAC-1	Archie_Creek	8-Sep-04	6.42	7.45	0.08	7.53		101.58		3.50		27.8773	-82.4009
SAC-2	Archie_Creek	6-Sep-04	50.00	66.00	0.19	66.19		1000.00		3.20	1.84	27.8775	-82.3927
SAC-2	Archie_Creek	8-Sep-04	6.73	7.17	0.06	7.23		92.05		3.50		27.8775	-82.3927
SAC-2	Archie_Creek	10-Sep-04	1.79	4.32	0.07	4.39		16.70		5.80		27.8775	-82.3927
SAC-2	Archie_Creek	16-Sep-04	2.20	2.95	0.12	3.07		14.94				27.8775	-82.3927
SAC-3	Archie_Creek	6-Sep-04	25.00	25.00	0.10	25.10		260.00		2.30	1.50	27.8788	-82.3867
SAC-4	Archie_Creek	6-Sep-04	0.15	1.30	0.03	1.33		0.39		6.40	0.07	27.8799	-82.3692
SAC-4	Archie_Creek	8-Sep-04	0.10	1.74	0.04	1.78		1.61		6.50		27.8799	-82.3692
SAC-4	Archie_Creek	10-Sep-04	0.10	1.60	0.06	1.66		0.31		6.50		27.8799	-82.3692
SAC-4	Archie_Creek	16-Sep-04	0.26	1.30	0.13	1.43		0.39		6.60		27.8799	-82.3692

APPENDIX 6

Mote Marine Laboratory & FWC Trawl Data

Shoreline Surveys

Mote Marine Trawl Data - 1 through 5 shallow north of Alafia, 6 through 10 shallow south of Alafia, 11-15 deeper south of Alafia, and 16-20 deeper north of Alafia.

no = not observed.
Min and max lengths are TL
All crab measurements were carapace widths

trawl #	date	distance (miles)	distance (meters)	depth (m)	sal (ppt)	Temp C	pH	Species	Number	Batch weight (g)	Max length (TL)	Min length (TL)
1	9/10/2004	0.468	753.1711	1	no	no	no	Horseshoe crab	8	1340	140	50
1	9/10/2004	0.468	753.1711	1	no	no	no	Silverside	5	0.9	37	23
2	9/10/2004	0.473	761.2178	2.2	no	no	no	Silverside	7	1	32	20
3	9/10/2004	0.432	695.2349	2	no	no	no	Sand trout	1	74.7	200	
3	9/10/2004	0.432	695.2349	2	no	no	no	Silverside	115	12	31	21
3	9/10/2004	0.432	695.2349	2	no	no	no	Sand dollar	1	12.5	6.9	
3	9/10/2004	0.432	695.2349	2	no	no	no	Panaeid shrimp	1	0.2		
3	9/10/2004	0.432	695.2349	2	no	no	no	Mud crab - Panopeus sp.	1	0.5	12	
4	9/10/2004	0.435	700.0629	1	no	no	no	Blue crab	1	149	150	
4	9/10/2004	0.435	700.0629	1	no	no	no	Spadefish	1	67.6	12.7	
4	9/10/2004	0.435	700.0629	1	no	no	no	Horseshoe crab	2	17	50	20
4	9/10/2004	0.435	700.0629	1	no	no	no	Blue gill	1	1.3	50	
4	9/10/2004	0.435	700.0629	1	no	no	no	Silverside	8	1	35	25
5	9/10/2004	0.44	708.1096	1.8	4.62	26.94	8.1	Scaled sardine	2	53	13.4	13.4
5	9/10/2004	0.44	708.1096	1.8	4.62	26.94	8.1	Silverside	110	34	102	26
5	9/10/2004	0.44	708.1096	1.8	4.62	26.94	8.1	Horseshoe crab	2	15	40	20
6	9/10/2004	0.409	658.2201	1	3.7	26.88	7.95	Mud crab - Panopeus sp.	24	6.4	10	5
6	9/10/2004	0.409	658.2201	1	3.7	26.88	7.95	Silverside	2	0.2	30	
7	9/10/2004	0.414	666.2668	1	11.19	27.98	7.94	Mud crab - Panopeus sp.	9	1.6	12	5
7	9/10/2004	0.414	666.2668	1	11.19	27.98	7.94	Mojarra	4	4.1	50	39
7	9/10/2004	0.414	666.2668	1	11.19	27.98	7.94	Cerithium sp.	5	0.4		
7	9/10/2004	0.414	666.2668	1	11.19	27.98	7.94	Panaeid shrimp	3	0.1		
7	9/10/2004	0.414	666.2668	1	11.19	27.98	7.94	Silverside	29	3.7	40	29
8	9/10/2004	0.419	674.3135	0.4	2.61	27.09	7.99	Blue crab	2	275	162	158

trawl #	date	distance (miles)	distance (meters)	depth (m)	sal (ppt)	Temp C	pH	Species	Number	Batch weight (g)	Max length (TL)	Min length (TL)
8	9/10/2004	0.419	674.3135	0.4	2.61	27.09	7.99	stingray - Dasyatis sp.	1	600	272	
8	9/10/2004	0.419	674.3135	0.4	2.61	27.09	7.99	catfish	1	400	294	
8	9/10/2004	0.419	674.3135	0.4	2.61	27.09	7.99	Blenny sp.	1	3.3	62	
8	9/10/2004	0.419	674.3135	0.4	2.61	27.09	7.99	Panaeid shrimp	4	2.4		
8	9/10/2004	0.419	674.3135	0.4	2.61	27.09	7.99	Mud crab - Panopeus sp.	10	0.8	12	5
8	9/10/2004	0.419	674.3135	0.4	2.61	27.09	7.99	Mojarra	2	2.7	65	40
9	9/10/2004	0.426	685.5788	2	14.09	28.36	7.48	Croaker	4	7.9	80	51
9	9/10/2004	0.426	685.5788	2	14.09	28.36	7.48	Menhaden	1	1.4	51	
9	9/10/2004	0.426	685.5788	2	14.09	28.36	7.48	Silverside	2	0.2	33	31
9	9/10/2004	0.426	685.5788	2	14.09	28.36	7.48	Mojarra	8	2.4	62	43
9	9/10/2004	0.426	685.5788	2	14.09	28.36	7.48	grass shrimp - Palaemonetes sp.	2	<1		
9	9/10/2004	0.426	685.5788	2	14.09	28.36	7.48	Panaeid shrimp	2	<1		
9	9/10/2004	0.426	685.5788	2	14.09	28.36	7.48	Mud crab - Panopeus sp.	2	<1	9	5
10	9/10/2004	0.459	738.6871	no	2.54	27.48	7.56	Sand dollar	1	1.6	63	
10	9/10/2004	0.459	738.6871	no	2.54	27.48	7.56	Mojarra	4	6	57	51
10	9/10/2004	0.459	738.6871	no	2.54	27.48	7.56	Silverside	113	16.2	45	25
10	9/10/2004	0.459	738.6871	no	2.54	27.48	7.56	Mud crab - Panopeus sp.	1	<1	11	
10	9/10/2004	0.459	738.6871	no	2.54	27.48	7.56	Hermit crab	1	<1	12	
11	9/10/2004	0.454	730.6404	2.5	15.32	28.34	7.42	none				
12	9/10/2004	0.428	688.7975	3	15.96	27.87	7.65	Catfish	3	10.7	113	111
12	9/10/2004	0.428	688.7975	3	15.96	27.87	7.65	Mojarra	28	72.1	86	52
12	9/10/2004	0.428	688.7975	3	15.96	27.87	7.65	Smooth butterfly stingray	1	225	179	
12	9/10/2004	0.428	688.7975	3	15.96	27.87	7.65	spadefish	2	11.6	88	64
12	9/10/2004	0.428	688.7975	3	15.96	27.87	7.65	Sand dollar	1	4.2	51	
12	9/10/2004	0.428	688.7975	3	15.96	27.87	7.65	Panfish	1	6.8	111	
12	9/10/2004	0.428	688.7975	3	15.96	27.87	7.65	Atlantic bumper	1	1	69	
12	9/10/2004	0.428	688.7975	3	15.96	27.87	7.65	Panaeid shrimp	4	1		
12	9/10/2004	0.428	688.7975	3	15.96	27.87	7.65	Silverside	3	<1	34	33
12	9/10/2004	0.428	688.7975	3	15.96	27.87	7.65	Sea robin	1	<1	35	
13	9/10/2004	0.428	688.7975	3	15.76	27.79	7.74	Spadefish	11	157	91	52

trawl #	date	distance (miles)	distance (meters)	depth (m)	sal (ppt)	Temp C	pH	Species	Number	Batch weight (g)	Max length (TL)	Min length (TL)
13	9/10/2004	0.428	688.7975	3	15.76	27.79	7.74	Sand trout	1	128	219	
14	9/10/2004	0.467	751.5618	3.5	9	27.4	7.64	Spadefish	1	10	68	
14	9/10/2004	0.467	751.5618	3.5	9	27.4	7.64	Mojarra	1	8	83	69
14	9/10/2004	0.467	751.5618	3.5	9	27.4	7.64	Hog choaker	2	14	78	20
14	9/10/2004	0.467	751.5618	3.5	9	27.4	7.64	Callinectes sp. (juvenile)	1	21	20	
14	9/10/2004	0.467	751.5618	3.5	9	27.4	7.64	Silverside	1	<1	45	
15	9/10/2004	0.413	664.6574	no	6.57	27.29	7.49	White grunt	1	49.7	153	
15	9/10/2004	0.413	664.6574	no	6.57	27.29	7.49	Silverside	2	<1	45	43
16	9/10/2004	0.406	653.392	3	5.64	27.62	7.49	Sand trout	1	4	88	
16	9/10/2004	0.406	653.392	3	5.64	27.62	7.49	Atlantic bumper	1	<1	40	
16	9/10/2004	0.406	653.392	3	5.64	27.62	7.49	Silverside	5	<1	48	
17	9/10/2004	0.475	764.4365	3.5	6.15	27.61	7.41	Croaker	1	<1	48	
17	9/10/2004	0.475	764.4365	3.5	6.15	27.61	7.41	Silverside	7	<1	49	33
17	9/10/2004	0.475	764.4365	3.5	6.15	27.61	7.41	Hermit crab	1	2		
18	9/10/2004	0.387	622.8146	3.8	12.62	27.65	7.2	Panaeid shrimp	4	<1		
18	9/10/2004	0.387	622.8146	3.8	12.62	27.65	7.2	Silverside	100	40	70	28
19	9/10/2004	0.386	621.2052	3.5	8.5	27.62	7.22	Scaled sardine	3	22.9	94	
19	9/10/2004	0.386	621.2052	3.5	8.5	27.62	7.22	Silverside	135	56	65	27
20	9/10/2004	0.413	664.6574	3.2	12.26	27.63	7.25	Sand trout	1	69.6	118	
20	9/10/2004	0.413	664.6574	3.2	12.26	27.63	7.25	Scaled sardine	6	26	95	51
20	9/10/2004	0.413	664.6574	3.2	12.26	27.63	7.25	Croaker	37	60	95	70
20	9/10/2004	0.413	664.6574	3.2	12.26	27.63	7.25	Panaeid shrimp	7	<1		
20	9/10/2004	0.413	664.6574	3.2	12.26	27.63	7.25	Silversides	160	118	90	10
20	9/10/2004	0.413	664.6574	3.2	12.26	27.63	7.25	Atlantic bumper	1	<1	34	
20	9/10/2004	0.413	664.6574	3.2	12.26	27.63	7.25	Mojarra	20	40	63	32

FWC Trawl Data

Trawl_num	LONG	LAT	Species	Organisms	Species/km	Organisms/km
TBK040901031..L	-82.431617	27.897233	9	101	48.6	545.4
TBK040901041..L	-82.433567	27.896650	9	269	48.6	1452.5
TBK040901051..L	-82.424350	27.898583	11	593	59.4	3201.9
TBK040901061..L	-82.424517	27.900317	11	162	59.4	874.7
TBK040901091..L	-82.420350	27.891450	11	2270	59.4	12257.0
TBK040901101..L	-82.415833	27.896883	6	66	32.4	356.4
TBK040901111..L	-82.411533	27.890983	3	597	16.2	3223.5
TBK040901121..L	-82.418217	27.886667	4	634	21.6	3423.3
TBK040902031..L	-82.403500	27.873800	10	69	54.0	372.6
TBK040902041..L	-82.403067	27.866200	6	113	32.4	610.2
TBK040902081..L	-82.406717	27.888400	8	75	43.2	405.0
TBK040902091..L	-82.419633	27.899967	15	786	81.0	4244.1
TBK040902111..L	-82.424567	27.877000	15	116	81.0	626.3
TBK040902141..L	-82.429417	27.863900	10	249	54.0	1344.5
TBK040902171..L	-82.417517	27.854050	20	1213	108.0	6549.7
TBK040902181..L	-82.410067	27.853900	11	54	59.4	291.6
TBK040902191..L	-82.420517	27.869283	3	6	16.2	32.4
TBK040902201..L	-82.414467	27.875017	3	4	16.2	21.6
TBK040902211..L	-82.428850	27.886050	9	96	48.6	518.4

F WC Detailed Trawl Data

Bio Reference	Species Record Id	NODCCODE	Spp_code	Number
TBK040901031..L	1	8747020202	A. mitchilli	60
TBK040901031..L	2	8835390102	E. gula	12
TBK040901031..L	3	8835390100	Eucinostomus spp.	8
TBK040901031..L	4	8777180202	A. felis	1
TBK040901031..L	5	8835280501	O. saurus	1
TBK040901031..L	6	5802010101	L. polyphemus	13
TBK040901031..L	7	8835440102	C. nebulosus	1
TBK040901031..L	8	5802010101	L. polyphemus	1
TBK040901031..L	9	8835390102	E. gula	4
				101
TBK040901041..L	1	8804040205	F. majalis	38
TBK040901041..L	2	8835390203	D. plumieri	1
TBK040901041..L	3	8804040207	F. grandis	2
TBK040901041..L	4	8805020300	Menidia spp.	33
TBK040901041..L	5	8747020202	A. mitchilli	186
TBK040901041..L	6	8804040501	F. carpio	5
TBK040901041..L	7	8835280501	O. saurus	1
TBK040901041..L	8	8835390100	Eucinostomus spp.	2
TBK040901041..L	9	8804040301	L. parva	1
				269
TBK040901051..L	1	8777180202	A. felis	5
TBK040901051..L	2	8835440401	L. xanthurus	1
TBK040901051..L	3	5802010101	L. polyphemus	2
TBK040901051..L	4	8747020202	A. mitchilli	565
TBK040901051..L	5	6177010102	F. duorarum	2
TBK040901051..L	6	5802010101	L. polyphemus	8
TBK040901051..L	7	8858010101	T. maculatus	1
TBK040901051..L	8	5802010101	L. polyphemus	3
TBK040901051..L	9	8777180202	A. felis	1
TBK040901051..L	10	8835440106	C. arenarius	4
TBK040901051..L	11	8747010803	H. jaguana	1
				593
TBK040901061..L	1	8804040205	F. majalis	70
TBK040901061..L	2	8804080201	P. latipinna	1
TBK040901061..L	3	8777300301	H. littorale	1
TBK040901061..L	4	8804040207	F. grandis	38
TBK040901061..L	5	8804040501	F. carpio	12
TBK040901061..L	6	8804040101	C. variegatus	14
TBK040901061..L	7	8804040401	A. xenica	21
TBK040901061..L	8	8804040801	J. floridae	1

Bio Reference	Species Record Id	NODCCODE	Spp_code	Number
TBK040901061..L	9	5802010101	L. polyphemus	1
TBK040901061..L	10	8747020202	A. mitchilli	1
TBK040901061..L	11	8804040301	L. parva	2
				162
TBK040901091..L	1	8747020202	A. mitchilli	2235
TBK040901091..L	2	8777180101	B. marinus	1
TBK040901091..L	3	8777180202	A. felis	2
TBK040901091..L	4	5802010101	L. polyphemus	1
TBK040901091..L	5	6189010301	C. sapidus	1
TBK040901091..L	6	8835390102	E. gula	2
TBK040901091..L	7	8835440106	C. arenarius	15
TBK040901091..L	8	8835440106	C. arenarius	10
TBK040901091..L	9	8858010202	A. lineatus	1
TBK040901091..L	10	8835440601	M. americanus	1
TBK040901091..L	11	8835390100	Eucinostomus spp.	1
				2270
TBK040901101..L	1	8777180202	A. felis	4
TBK040901101..L	2	8835440801	P. cromis	1
TBK040901101..L	3	5802010101	L. polyphemus	3
TBK040901101..L	4	8747020202	A. mitchilli	56
TBK040901101..L	5	8804040301	L. parva	1
TBK040901101..L	6	8804040207	F. grandis	1
				66
TBK040901111..L	1	8835390203	D. plumieri	2
TBK040901111..L	2	8747020202	A. mitchilli	593
TBK040901111..L	3	8835280501	O. saurus	2
TBK040901121..L	1	8777180202	A. felis	3
TBK040901121..L	2	8777180101	B. marinus	1
TBK040901121..L	3	5802010101	L. polyphemus	1
TBK040901121..L	4	8747020202	A. mitchilli	32
				634
TBK040902031..L	1	8858010202	A. lineatus	1
TBK040902031..L	2	8836010101	M. cephalus	1
TBK040902031..L	3	8835390110	E. harengulus	10
TBK040902031..L	4	8835390100	Eucinostomus spp.	21
TBK040902031..L	5	8835390102	E. gula	23
TBK040902031..L	6	8805020300	Menidia spp.	2
TBK040902031..L	7	8835440102	C. nebulosus	2
TBK040902031..L	8	8835280501	O. saurus	1
TBK040902031..L	9	8747020202	A. mitchilli	7
TBK040902031..L	10	6177010102	F. duorarum	1
				69

Bio Reference	Species Record Id	NODCCODE	Spp_code	Number
TBK040902041..L	1	8805020300	Menidia spp.	30
TBK040902041..L	2	8835390102	E. gula	28
TBK040902041..L	3	8835390100	Eucinostomus spp.	48
TBK040902041..L	4	8747010803	H. jaguana	5
TBK040902041..L	5	8835280501	O. saurus	1
TBK040902041..L	6	8847010903	B. soporator	1
				113
TBK040902081..L	1	8835440102	C. nebulosus	1
TBK040902081..L	2	8835390203	D. plumieri	10
TBK040902081..L	3	5802010101	L. polyphemus	1
TBK040902081..L	4	8805020300	Menidia spp.	52
TBK040902081..L	5	8747010803	H. jaguana	3
TBK040902081..L	6	8835390100	Eucinostomus spp.	4
TBK040902081..L	7	8835390110	E. harengulus	3
TBK040902081..L	8	8835390102	E. gula	1
				75
TBK040902091..L	1	8835440102	C. nebulosus	2
TBK040902091..L	2	8805020300	Menidia spp.	163
TBK040902091..L	3	8747020202	A. mitchilli	337
TBK040902091..L	4	8805020201	M. martinica	1
TBK040902091..L	5	8804040205	F. majalis	57
TBK040902091..L	6	8804040205	F. majalis	6
TBK040902091..L	7	8804040101	C. variegatus	6
TBK040902091..L	8	8835280501	O. saurus	7
TBK040902091..L	9	8835390203	D. plumieri	7
TBK040902091..L	10	8804040501	F. carpio	1
TBK040902091..L	11	8747010803	H. jaguana	85
TBK040902091..L	12	8835390110	E. harengulus	6
TBK040902091..L	13	8835390102	E. gula	58
TBK040902091..L	14	8804040207	F. grandis	3
TBK040902091..L	15	8835390100	Eucinostomus spp.	47
				786
TBK040902111..L	1	8858020101	S. plagiusa	2
TBK040902111..L	2	8803020202	S. notata	11
TBK040902111..L	3	8836010101	M. cephalus	2
TBK040902111..L	4	8835390100	Eucinostomus spp.	28
TBK040902111..L	5	8835390102	E. gula	7
TBK040902111..L	6	8747010803	H. jaguana	22
TBK040902111..L	7	8835280501	O. saurus	3
TBK040902111..L	8	8835390110	E. harengulus	3
TBK040902111..L	9	8858010202	A. lineatus	6
TBK040902111..L	10	8835440102	C. nebulosus	2

Bio Reference	Species Record Id	NODCCODE	Spp_code	Number
TBK040902111..L	11	8747020202	A. mitchilli	3
TBK040902111..L	12	8847010701	M. gulosus	3
TBK040902111..L	13	8847010600	Gobiosoma spp.	2
TBK040902111..L	14	6177010102	F. duorarum	21
TBK040902111..L	15	6189010301	C. sapidus	1
				116
TBK040902141..L	1	8835280902	T. falcatus	2
TBK040902141..L	2	8803020202	S. notata	3
TBK040902141..L	3	8805020300	Menidia spp.	61
TBK040902141..L	4	8747020202	A. mitchilli	20
TBK040902141..L	5	8835390102	E. gula	23
TBK040902141..L	6	8835390100	Eucinostomus spp.	5
TBK040902141..L	7	8835280501	O. saurus	1
TBK040902141..L	8	8747010803	H. jaguana	123
TBK040902141..L	9	8747010400	Brevoortia spp.	1
TBK040902141..L	10	8747010803	H. jaguana	10
				249
TBK040902171..L	1	8777180202	A. felis	2
TBK040902171..L	2	8747020202	A. mitchilli	838
TBK040902171..L	3	8777180101	B. marinus	67
TBK040902171..L	4	8835440106	C. arenarius	133
TBK040902171..L	5	8835440102	C. nebulosus	1
TBK040902171..L	6	8747020201	A. hepsetus	1
TBK040902171..L	7	8713050105	D. sabina	1
TBK040902171..L	8	8777180101	B. marinus	1
TBK040902171..L	9	8835440601	M. americanus	11
TBK040902171..L	10	8835520101	C. faber	1
TBK040902171..L	11	6177010102	F. duorarum	106
TBK040902171..L	12	8835390102	E. gula	10
TBK040902171..L	13	8835390100	Eucinostomus spp.	2
TBK040902171..L	14	8858010202	A. lineatus	5
TBK040902171..L	15	8858010101	T. maculatus	2
TBK040902171..L	16	8835440106	C. arenarius	20
TBK040902171..L	17	8858020101	S. plagiusa	6
TBK040902171..L	18	8835280401	C. chrysurus	1
TBK040902171..L	19	8826020103	P. scitulus	4
TBK040902171..L	20	6189010301	C. sapidus	1
				1213
TBK040902181..L	1	8747010400	Brevoortia spp.	1
TBK040902181..L	2	6177010102	F. duorarum	4
TBK040902181..L	3	8858010101	T. maculatus	3
TBK040902181..L	4	8747010803	H. jaguana	7

Bio Reference	Species Record Id	NODCCODE	Spp_code	Number
TBK040902181..L	5	8835390102	E. gula	21
TBK040902181..L	6	8747020202	A. mitchilli	5
TBK040902181..L	7	8858010202	A. lineatus	3
TBK040902181..L	8	8835160504	L. macrochirus	2
TBK040902181..L	9	8835390100	Eucinostomus spp.	5
TBK040902181..L	10	8820020113	S. scovelli	1
TBK040902181..L	11	8835440106	C. arenarius	2
				54
TBK040902191..L	1	8747020202	A. mitchilli	3
TBK040902191..L	2	8835390102	E. gula	1
TBK040902191..L	3	6177010102	F. duorarum	2
				6
TBK040902201..L	1	8747020202	A. mitchilli	1
TBK040902201..L	2	6177010102	F. duorarum	2
TBK040902201..L	3	8835440106	C. arenarius	1
				4
TBK040902211..L	1	8713050202	G. micrura	1
TBK040902211..L	2	6177010102	F. duorarum	47
TBK040902211..L	3	8835390102	E. gula	6
TBK040902211..L	4	8835440601	M. americanus	2
TBK040902211..L	5	8747020202	A. mitchilli	31
TBK040902211..L	6	8826020103	P. scitulus	1
TBK040902211..L	7	8858010202	A. lineatus	1
TBK040902211..L	8	8835440106	C. arenarius	4
TBK040902211..L	9	8835390100	Eucinostomus spp.	3
				96

Shoreline Survey Data Collection Locations

Day One
Pendola Point S to Archie Creek

Transect #	Lat	Long
1	27 53.809	82 26.023
2	27 54.019	82 25.496
3	27 53.898	82 24.909
4	27 53.454	82 24.909

Day Two
Archie Creek S to Alafia River

Transect #	Lat	Long
5	27 52.700	82 24.113
6	27 52.315	82 24.180
7	27 51.889	82 24.113
8	27 51.534	82 24.205

Day Two
Fantasy Island

Transect #	Lat	Long
9	27 53.031	82 25.487
10	27 52.616	82 25.484
11	27 52.225	82 25.724
12	27 51.818	82 25.777

Day Two
Bird Island & S of Alafia River

Transect #	Lat	Long
13	27 50.975	82 24.481
14	27 51.141	82 32.905

Shoreline Sampling Results by Size Class

Summary of Day One Sampling

Size Class (Total Length mm)	Shoreline Transects 1	2	3	4	Total
0 - 100 mm	1	103	2	0	106
100 - 200 mm	0	1	2	0	3
200 - 300 mm	2	5	3	2	12
300 mm & up	0	1	0	0	1
	3	110	7	2	122

Expansion Factor =	5913.6/400 =	14.8
Total number of dead fish	122* 14.8 =	1805
Size Class 1	106 * 14.8 =	1568
Size Class 2	3 * 14.8 =	44
Size Class 3	12 * 14.8 =	177
Size Class 4	1 *14.8 =	14

Direct counts conducted on the beach and mangrove area adjacent to transect area

Transect #1

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Horseshoe crab	1	0	0	0	1		
Hardhead catfish	0	0	1	0	1		
Atlantic Stingray	0	0	2	0	2		
	1	0	3	0	4	14.8	4*14.8= 59

Transect #2

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Horseshoe crab	6	21	5		32		
Hardhead catfish			1	9	10		
Atlantic Stingray		17	30		47		
Stone Crab	14				14		
Striped Killifish	4				4		
Gulf Killifish	1				1		
Blue crab		8			8		
Striped mojarra		5	1		6		
Snook				2	2		
Plecostomus			2	1	3		
Striped mullet				29	29		
Ladyfish				2	2		
	25	51	39	43	158	14.8	158*14.8= 2338

*-- 1,000's of dead fiddler crabs were seen in the surrounding marsh and mangroves but not quantified

Transect #3

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Horseshoe crab	26	20	22	20	68		
Hardhead catfish			2		2		
Atlantic Stingray		1	20		21		
Blue crab		3	2		5		
Striped mullet		4			4		
	26	28	46	20	100	14.8	100*14.8= 1480

*-- Hundreds of small (juvenile) horseshoe crabs were seen in the surrounding marsh and mangroves but not quantified

Transect #4

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Horseshoe crab	3				3		
Hardhead catfish				1	1		
Atlantic Stingray			9		9		
Blue crab	2	2	1	1	4		
Striped mullet			4		4		
Striped Killifish	4				4		
Gulf Killifish	1				1		
Silverside	5				5		
Sheepshead minnow		1			1		
Striped mojarra		8	3		11		
Striped mullet		6	4	10	20		
	15	17	17	12	63	14.8	63*14.8= 932

Day Two Archie Creek S to the mouth of Alafia River

Size Class (Total Length mm)	Shoreline Transects 1	2	3	4	Total
0 - 100 mm	0	10	0	0	10
100 - 200 mm	0	3	0	4	7
200 - 300 mm	0	19	2	1	22
300 mm & up	0	2	0	0	2
	0	34	2	5	41

Expansion Factor =	3080/400 =	7.7
Total number of dead fish	41* 7.7 =	315
Size Class 1	0 * 7.7 =	0
Size Class 2	34 * 7.7 =	261
Size Class 3	2 * 7.7 =	15
Size Class 4	5 * 7.7 =	38

Direct counts conducted on the beach and mangrove area adjacent to transect area

Transect #1

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Horseshoe crab	1	10	1	0	12		
Atlantic Stingray	0	1	2	0	3		
Stone crab	2	0	0	0	2		
	3	11	3	0	17	7.7	17*7.7= 130

Transect #2

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Atlantic Stingray	0	0	2	0	2	7.7	2*7.7= 15

Transect #3

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Atlantic Stingray	0	0	2	0	2	7.7	2*7.7= 15

Transect #4

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Horseshoe crab	1	10	0	0	11	7.7	11*7.7= 84

Day Two Bird Island & S of Alafia

Size Class (Total Length mm)	1	2	Total
0 - 100 mm	0	0	0
100 - 200 mm	3	0	3
200 - 300 mm	3	0	3
300 mm & up	0	0	0
	6	0	6

Expansion Factor =	1760/400 =	4.4
Total number of dead fish	6* 4.4 =	26
Size Class 1	0 * 4.4 =	0
Size Class 2	3 * 4.4 =	13
Size Class 3	3 * 4.4 =	13
Size Class 4	0 * 4.4 =	0

Direct counts conducted on the beach and mangrove area adjacent to transect area

Transect #1

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Horseshoe crab	0	10	1	0	11	4.4	11*4.4= 48

Transect #2

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Horseshoe crab	0	0	1	0	1	4.4	4.4*1= 4

Day Two Fantasy Island

Size Class (Total Length mm)	Shoreline Transects 1	2	3	4	Total
0 - 100 mm	2	9	0	0	11
100 - 200 mm	0	2	0	0	2
200 - 300 mm	10	1	0	0	11
300 mm & up	0	1	0	0	1
	12	13	0	0	25

Expansion Factor =	1760/400 =	4.4
Total number of dead fish	25* 4.4 =	110
Size Class 1	12 * 4.4 =	52
Size Class 2	13 * 4.4 =	57
Size Class 3	0 * 4.4 =	0
Size Class 4	0 * 4.4 =	0

Direct counts conducted on the beach and mangrove area adjacent to transect area

Transect #1

Species	Size Class 1	2	3	4	Total	Expansion Factor	
Horseshoe crab	0	0	5	0	5		
Atlantic Stingray	0	0	1	0	1		
	0	0	6	0	6	4.4	6*4.4= 26

Transect #2

Species	Size Class 1	2	3	4	Total

Transect #3

Species	Size Class 1	2	3	4	Total

Transect #4

Species	Size Class 1	2	3	4	Total

Total number of dead fish estimated by using AFS guidelines

1805 + 315 + 110 + 26= **2256**

Species found within shoreline transects
American stingray
Horseshoe crab
Blue
crab
White catfish
Hardhead catfish
Fiddler crabs
Cownose ray
Silver perch
Striped mojarra
Stone crab

Total number of dead fish counted on beaches
59+2338+1480+932+130+15+15+84+48+4+26=
5131

Total number of estimated dead fish

2256 + 5131=
7387

APPENDIX 7

Benthic Sample Information

Benthic samples collected by FDEP staff on September 10, 2004 in Hillsborough Bay.

Four transects with five sites on each transect were sampled. One benthic sample was collected at each site. Weather Conditions: At noon - Winds out of the ESE at 3.5 mph, 86.0 deg F, scattered clouds, brown/tannic water color.

Site	Date	Lat_dd	Lat_mm	Lat_ss	Long_dd	Long_mm	Long_ss	Total Depth (m)
1A	09/10/04	27	53	54.2	82	24	46.3	0.4
2A	09/10/04	27	53	55.0	82	24	54.8	0.8
3A	09/10/04	27	53	55.7	82	25	5.8	1.0
4A	09/10/04	27	53	52.3	82	25	48.1	1.5
5A	09/10/04	27	53	48.9	82	26	1.3	1.0
1B	09/10/04	27	53	17.9	82	24	23.1	0.2
2B	09/10/04	27	53	15.9	82	24	32.5	1.0
3B	09/10/04	27	53	13.7	82	24	46.1	1.0
4B	09/10/04	27	53	9.1	82	25	0.4	2.0
5B	09/10/04	27	53	3.8	82	25	32.0	1.5
1C	09/10/04	27	52	29.7	82	24	11.7	0.2
2C	09/10/04	27	52	29.7	82	24	17.4	0.7
3C	09/10/04	27	52	26.6	82	24	33.7	1.7
4C	09/10/04	27	52	27.5	82	25	14.7	3.0
5C	09/10/04	27	52	20.5	82	25	36.8	0.5
1D	09/10/04	27	50	43.4	82	23	49.7	0.5
2D	09/10/04	27	50	44.1	82	24	2.7	1.0
3D	09/10/04	27	50	41.6	82	24	16.2	1.0
4D	09/10/04	27	50	43.7	82	24	45.9	1.5
5D	09/10/04	27	50	43.0	82	25	4.9	1.0

Benthic samples collected by FDEP staff on September 19, 2004 in Hillsborough Bay.

Seven sites were sampled with three replicates collected per site.
Weather Conditions: At noon - calm, 87.8 deg F, clear skies.

Site	Date	Lat_dd	Lat_mm	Lat_ss	Long_dd	Long_mm	Long_ss
Ba	09/18/04	27	52	43.2	82	24	18.1
Bb	09/18/04	27	52	42.2	82	24	22.3
E	09/18/04	27	53	8.7	82	24	38.1
F	09/18/04	27	53	5.2	82	24	50.1
G	09/18/04	27	53	35.2	82	24	53.4
H	09/18/04	27	52	19.5	82	24	18.9
I	09/18/04	27	51	40.0	82	24	7.2

Qualitative observations from FDEP benthic samples.

Site	Date	Total Depth (m)	Comments	Sorted
1A	09/10/04	0.4	No live animals found. A lot of algal, leaf, worm tube debris.	Y
2A	09/10/04	0.8	Several worms, mainly nereids, spionids and capitellids. 2 bivalves (*Parastarte triquetra*), several paper mussels (*Amygdalum papyrium*), 2 isopods (*Xenanthra brevitelson*)	Y
3A	09/10/04	1.0	.	N
4A	09/10/04	1.5	.	N
5A	09/10/04	1.0	.	N
1B	09/10/04	0.2	A few polychaete worms, mostly nereids, capitellids and spionids. 1 Parastarte bivalve. No crustacean or snails.	Y
2B	09/10/04	1.0	Sandy; Polychaete worms, mostly nereids, capitellids and spionids. 1 amphipod (*Ampelisca*), some isopods (*X. brevitelson*), 1 bivalve (*P. triquetra*). No snails.	Y
3B	09/10/04	1.0	Sandy; mollusc clumped and slimy	N
4B	09/10/04	2.0	Sandy silt; 3 mollusc bodies extruded	N
5B	09/10/04	1.5	Sandy	N
1C	09/10/04	0.2	Silty sand, organics; Polychaete worms, mostly nereids, capitellids and spionids, 1 paper mussel (*A. papyrium*), 2 isopods (*X. brevitelson*). No amphipods, snails.	Y
2C	09/10/04	0.7	Silty sand, some organics; Polychaete worms, mostly nereids, capitellids and spionids. A lot of amphipods, mainly Ampelisca, isopods (*X. brevitelson. Cyathura polita*), paper mussels (*A. papyrium*), clams (mostly *P. triquetra*). 1 live snail (*Acteocina canaliculata*)	Y
3C	09/10/04	1.7	silty sand; some mulluscs extruded	N
4C	09/10/04	3.0	Clayey silt, some shell	N
5C	09/10/04	0.5	Sandy-shell	N
1D	09/10/04	0.5	Polychaete worms, mostly nereids, and spionids and others. A lot of amphipods (*Ampelisca, corophiids, Grandidierella bonnierodes*). A lot of paper mussels (*A. papyrium*), small Parastarte clams and a few others. No snails.	Y
2D	09/10/04	1.0	Sandy silt; lots of amphipods & polychaete; no snails, paper mussels	Y
3D	09/10/04	1.0	Sandy silt; ulva, black flecks in sediment	N
4D	09/10/04	1.5	Silty clay and shell; live amphipods	N
5D	09/10/04	1.0	Silty clay and shell	N

Benthic organisms at sites near Archie Creek, collected pre and post spill by EPC.

Pre-Spill

NODCCODE	NAME	96HB27	04HB08	04HB11
370100000000	HYDROZOA	0	0	0
374000000100	Anthozoa sp. A	0	0	0
376000000000	Thenaria	5	0	0
376000000005	Thenaria E	0	0	0
390100000099	Turbellaria A	0	0	0
390603070100	Eustylochus meridianalis	0	0	0
430000008300	Nemertea U	0	0	0
430000008800	Nemertea Q	0	0	0
430000009000	Nemertea P	0	0	0
430000009400	Nemertea F	0	0	0
430000009700	Nemertea K	0	0	0
430000009900	Nemertea A	0	0	0
430110010000	Archinemertea sp.	0	0	0
430110010100	Archinemertea sp. A (of EPC)	0	0	0
430201010400	Tubulanus pellucidus	0	0	0
430302020900	Cerebratulus lacteus	0	0	0
430605011000	Amphiporus bioculatus	0	0	0
500102260300	Malmgreniella taylori	0	0	0
500108030200	Bhawania heteroseta	0	0	0
500110049800	Paramphinome B	0	0	0
500113020700	Eteone heteropoda	0	0	0
500113070100	Nereiphylla castanea	0	0	0
500113080300	Paranaitis gardineri	0	0	0
500113141000	Phyllodoce arenae	0	1	0
500121010800	Gyptis crypta	0	0	0
500121070100	Parahesione luteola	0	0	0
500121150200	Ophiodromus obscura	0	0	0
500121190200	Podarkeopsis levifuscina	0	0	0
500122010300	Ancistrosyllis jonesi	0	0	0
500122020100	Sigambra tentaculata	0	1	0
500122020400	Sigambra bassi	0	0	0
500122040100	Cabira incerta	0	0	0
500124000000	NEREIDIDAE	0	0	0
500124030900	Nereis succinea	0	0	0
500124041400	Nereis falsa	0	0	0
500124080100	Laeonereis culveri	10	1	23
500124120100	Stenoninereis martini	30	0	0
500127010400	Glycera americana	0	0	0
500128010400	Glycinde solitaria	0	0	0
500129012000	Onuphis A	0	0	0
500129020100	Diopatra cuprea	0	0	0
500129150100	Kinbergonuphis simoni	0	1	0
500133010900	Drilonereis E	0	0	0
5001360504CF	Dorvillea cf. rudolphi	0	0	0
500140010400	Leitoscoloplos robustus	3	0	8
500140030700	Scoloplos rubra	0	0	0
500140030900	Scoloplos texana	0	0	0
500140160000	Leitoscoloplos sp.	0	1	0
500140160300	Leitoscoloplos fragilis	0	0	0

NODCCODE	NAME	96HB27	04HB08	04HB11
500141000000	PARAONIDAE	1	0	0
500141022100	Aricidea philbinae	0	2	0
500141022200	Aricidea taylori	0	0	0
500143041100	Polydora cornuta	0	0	0
500143050300	Prionospio heterobranchia	0	0	0
500143050700	Apoprionospio pygmaea	0	0	0
500143051700	Prionospio perkinsi	0	0	0
500143170100	Paraprionospio pinnata	0	0	0
500143180100	Streblospio spp.	0	0	39
500143200600	Scolelepis texana	0	0	0
500143270600	Carazziella hobsonae	0	0	0
500144010600	Magelona pettiboneae	0	0	0
500150031000	Monticellina dorsobranchialis	0	0	0
500150069800	Cirriformia cf. sp. B of Wolf,1984	0	0	0
500150069900	Cirriformia A	0	0	0
500160010100	Capitella capitata complex	16	3	2
500160020100	Heteromastus filiformis	0	0	0
500160030700	Notomastus hemipodus	0	0	0
500160031000	Notomastus americanus	0	0	0
500160040000	Mediomastus sp.	0	0	0
500160040100	Mediomastus ambiseta	0	0	0
500160040200	Mediomastus californiensis	0	0	0
500160070100	Capitella jonesi	19	0	0
500163010300	Sabaco americanus	0	0	0
500166030200	Pectinaria gouldii	0	1	1
500167030900	Hobsonia florida	0	0	0
500902000000	TUBIFICIDAE	58	0	0
500902020800	Tubificoides motei	0	0	2
500902090100	Tubificoides brownae	0	0	0
510000000000	GASTROPODA	0	0	0
510313000000	HYDROBIIDAE	8	0	0
510320060300	Sayella fusca	0	0	0
510320060600	Sayella hemphillii	0	0	0
510336030100	Caecum pulchellum	0	0	0
510336031500	Caecum strigosum	0	0	0
510346013000	Bittiolum varium	0	0	23
510350011000	Epitonium angulatum	0	0	0
510376020400	Tectonatica pusilla	0	0	0
510503020700	Astyris lunata	0	2	4
510508010200	Nassarius vibex	0	0	1
510510011000	Olivella pusilla	0	0	0
510510020100	Oliva sayana	0	0	0
510515021400	Prunum apicinum	0	0	0
510602180800	Pyrgocythara plicosa	0	1	0
510801010000	Odostomia spp.	0	0	0
510801014000	Sayella laevigata	0	0	0
510801021300	Turbonilla cf conradi	0	0	0
510801023200	Turbonilla (Pyrigiscus) sp.	0	0	0
510801050100	Eulimastoma sp.	0	0	0
510801070200	Eulimella smithii	0	0	0
511001040300	Rictaxis punctostriatus	0	0	0
511004010300	Acteocina canaliculata	4	10	3
511012010400	Haminoea succinea	0	3	0
550000000000	BIVALVIA	0	0	0

NODCCODE	NAME	96HB27	04HB08	04HB11
550701100100	Amygdalum papyrium	0	42	0
551505010300	Diplodonta semiaspera	0	0	0
551510011000	Mysella planulata	0	6	4
551522040100	Laevicardium mortoni	0	0	0
551525030100	Mulinia lateralis	0	18	6
551528010100	Ervilia concentrica	0	0	0
551531012000	Macoma tenta	0	0	0
551531012100	Macoma constricta	1	0	0
551531020000	Tellina sp.	0	0	0
551531020700	Tellina iris	0	0	0
551531020800	Tellina lineata	0	0	0
551531020900	Tellina cf. versicolor	0	0	0
551531021400	Tellina tampaensis	0	0	0
551533020100	Tagelus plebeius	0	0	0
551533020200	Tagelus divisus	0	0	0
551535020100	Abra aequalis	0	0	0
551547000000	VENERIDAE	0	1	0
551547230100	Anomalocardia auberiana	0	0	0
551547280100	Parastarte triquetra	3	1	2
551701040300	Sphenia antillensis	0	0	0
551702020100	Corbula contracta	0	0	0
613000000000	Cirripedia	0	0	3
615301210000	Mysidopsis spp.	0	0	0
615301260700	Bowmaniella dissimilis	0	0	1
615303150300	Americamysis stucki	0	0	0
615405080000	Oxyurostylis spp.	0	1	0
615405089800	Oxyurostylis smithi	0	0	0
615408020100	Almyracuma proximoculi	1	0	1
6154090202CF	Cyclaspis cf. varians	0	2	0
616001020100	Cyathura polita	6	0	0
616001070100	Xenanthura brevitelson	0	55	23
616001200100	Amakusanthura magnifica	0	0	0
616202070300	Edotia triloba	0	0	0
616902010000	Ampelisca spp.	0	1	1
616902010800	Ampelisca abdita	0	6	29
616902010900	Ampelisca vadorum	0	0	0
616902011000	Ampelisca verrilli	0	0	0
616902012300	Ampelisca holmesi	0	2	3
616904020100	Cymadusa compta	0	0	0
6169060404CF	Paramicrodeutopus cf. myersi	0	0	0
616906120100	Rudilemboides naglei	0	0	0
616910010100	Batea catharinensis	0	0	0
616915010200	Cerapus sp. C (="tubularis")	0	0	0
616915030200	Erichthonius brasiliensis	0	0	0
616915090100	Grandidierella bonnieroides	0	0	3
616921070900	Gammarus mucronatus	0	0	1
616933030100	Listriella barnardi	0	0	0
616942210100	Eudevenopus honduranus	0	0	0
617101070000	Caprella sp.	0	0	0
617101090100	Paracaprella tenuis	0	0	0
617905020100	Leptochela serratorbita	0	0	0
617917030100	Ambidexter symmetricus	0	0	0
618306025100	Pagurus maclaughlinae	1	0	0
618902080000	Panopeus sp.	0	0	0

NODCCODE	NAME	96HB27	04HB08	04HB11
618906040000	Pinnixa spp.	0	0	0
618906040500	Pinnixa chaetopterana	0	0	0
6189060413CF	Pinnixa cf. pearsei	0	0	0
618906050100	Pinnixa D	0	0	0
770001020000	Phoronis sp.	0	0	0
770001020300	Phoronis ?architecta	0	0	0
800201010100	Glottidia pyramidata	0	3	0
812000000000	OPHIUROIDEA	0	0	0
812902020100	Hemipholis elongata	0	0	0
812903060000	Ophiophragmus sp.	0	0	0
812903060600	Ophiophragmus filograneus	0	0	0
812903090400	Amphioplus thrombodes	0	0	0
812903120100	Amphipholis atra	0	0	0
815504010100	Mellita tenuis	0	0	0
817801009500	Synaptidae A	0	0	0
817801030000	Epitomapta roseola	0	0	0
820100000000	ENTEROPNEUSTA	0	0	0
820100000002	Enteropneusta B	0	0	0
850001010000	Branchiostoma floridae	0	0	0

Post-Spill

NODCCODE	NAME	04CG9627	04CG0008	04CG0011
370100000000	HYDROZOA	0	0	0
374000000100	Anthozoa sp. A	0	0	0
376000000000	Thenaria	0	0	0
376000000005	Thenaria E	0	0	0
390100000099	Turbellaria A	0	0	0
390603070100	Eustylochus meridianalis	0	0	0
430000008300	Nemertea U	0	0	0
430000008800	Nemertea Q	0	0	0
430000009000	Nemertea P	0	0	0
430000009400	Nemertea F	0	0	0
430000009700	Nemertea K	0	0	0
430000009900	Nemertea A	0	0	0
430110010000	Archinemertea sp.	0	0	2
430110010100	Archinemertea sp. A (of EPC)	0	0	0
430201010400	Tubulanus pellucidus	0	0	0
430302020900	Cerebratulus lacteus	0	1	0
430605011000	Amphiporus bioculatus	0	0	0
500102260300	Malmgreniella taylori	0	0	0
500108030200	Bhawania heteroseta	0	0	0
500110049800	Paramphinome B	0	0	0
500113020700	Eteone heteropoda	0	4	4
500113070100	Nereiphylla castanea	0	0	0
500113080300	Paranaitis gardineri	0	0	0
500113141000	Phyllodoce arenae	0	0	0
500121010800	Gyptis crypta	0	0	0
500121070100	Parahesione luteola	0	0	0
500121150200	Ophiodromus obscura	0	0	0
500121190200	Podarkeopsis levifuscina	0	0	0
500122010300	Ancistrosyllis jonesi	0	0	0
500122020100	Sigambra tentaculata	0	0	0
500122020400	Sigambra bassi	0	0	0

NODCCODE	NAME	04CG9627	04CG0008	04CG0011
500122040100	Cabira incerta	0	0	0
500124000000	NEREIDIDAE	0	0	0
500124030900	Nereis succinea	0	1	0
500124041400	Nereis falsa	0	0	0
500124080100	Laeonereis culveri	0	99	67
500124120100	Stenoninereis martini	1	0	0
500127010400	Glycera americana	0	0	0
500128010400	Glycinde solitaria	0	0	0
500129012000	Onuphis A	0	0	0
500129020100	Diopatra cuprea	0	0	0
500129150100	Kinbergonuphis simoni	0	0	0
500133010900	Drilonereis E	0	0	0
5001360504CF	Dorvillea cf. rudolphi	0	0	0
500140010400	Leitoscoloplos robustus	0	4	5
500140030700	Scoloplos rubra	0	0	0
500140030900	Scoloplos texana	0	0	0
500140160000	Leitoscoloplos sp.	0	0	0
500140160300	Leitoscoloplos fragilis	0	0	0
500141000000	PARAONIDAE	0	0	0
500141022100	Aricidea philbinae	0	5	24
500141022200	Aricidea taylori	0	0	0
500143041100	Polydora cornuta	0	0	0
500143050300	Prionospio heterobranchia	0	0	0
500143050700	Apoprionospio pygmaea	0	0	0
500143051700	Prionospio perkinsi	0	0	0
500143170100	Paraprionospio pinnata	0	0	0
500143180100	Streblospio spp.	0	48	42
500143200600	Scolelepis texana	0	0	0
500143270600	Carazziella hobsonae	0	0	0
500144010600	Magelona pettiboneae	0	0	0
500150031000	Monticellina dorsobranchialis	0	0	0
500150069800	Cirriformia cf. sp. B of Wolf,1984	0	0	0
500150069900	Cirriformia A	0	0	0
500160010100	Capitella capitata complex	0	44	27
500160020100	Heteromastus filiformis	1	0	0
500160030700	Notomastus hemipodus	0	0	0
500160031000	Notomastus americanus	0	0	0
500160040000	Mediomastus sp.	0	0	0
500160040100	Mediomastus ambiseta	0	0	0
500160040200	Mediomastus californiensis	0	0	0
500160070100	Capitella jonesi	0	0	0
500163010300	Sabaco americanus	0	0	0
500166030200	Pectinaria gouldii	0	0	1
500167030900	Hobsonia florida	0	2	3
500902000000	TUBIFICIDAE	0	0	0
500902020800	Tubificoides motei	0	0	1
500902090100	Tubificoides brownae	0	0	0
510000000000	GASTROPODA	0	0	1
510313000000	HYDROBIIDAE	0	0	0
510320060300	Sayella fusca	0	0	0
510320060600	Sayella hemphillii	0	0	1
510336030100	Caecum pulchellum	0	0	0
510336031500	Caecum strigosum	0	0	0
510346013000	Bittiolum varium	0	0	0

NODCCODE	NAME	04CG9627	04CG0008	04CG0011
510350011000	Epitonium angulatum	0	0	0
510376020400	Tectonatica pusilla	0	0	0
510503020700	Astyris lunata	0	0	0
510508010200	Nassarius vibex	0	0	0
510510011000	Olivella pusilla	0	0	0
510510020100	Oliva sayana	0	0	0
510515021400	Prunum apicinum	0	0	0
510602180800	Pyrgocythara plicosa	0	0	0
510801010000	Odostomia spp.	0	0	1
510801014000	Sayella laevigata	0	0	0
510801021300	Turbonilla cf conradi	0	0	0
510801023200	Turbonilla (Pyrigiscus) sp.	0	0	0
510801050100	Eulimastoma sp.	0	0	0
510801070200	Eulimella smithii	0	0	0
511001040300	Rictaxis punctostriatus	0	0	0
511004010300	Acteocina canaliculata	0	0	14
511012010400	Haminoea succinea	0	0	0
550000000000	BIVALVIA	0	0	0
550701100100	Amygdalum papyrium	0	58	153
551505010300	Diplodonta semiaspera	0	0	0
551510011000	Mysella planulata	0	0	0
551522040100	Laevicardium mortoni	0	0	0
551525030100	Mulinia lateralis	0	1	0
551528010100	Ervilia concentrica	0	0	0
551531012000	Macoma tenta	0	0	0
551531012100	Macoma constricta	0	1	1
551531020000	Tellina sp.	0	0	0
551531020700	Tellina iris	0	0	0
551531020800	Tellina lineata	0	0	0
551531020900	Tellina cf. versicolor	0	0	0
551531021400	Tellina tampaensis	0	0	0
551533020100	Tagelus plebeius	0	0	3
551533020200	Tagelus divisus	0	0	0
551535020100	Abra aequalis	0	0	0
551547000000	VENERIDAE	0	0	0
551547230100	Anomalocardia auberiana	0	0	0
551547280100	Parastarte triquetra	0	0	0
551701040300	Sphenia antillensis	0	0	0
551702020100	Corbula contracta	0	0	0
613000000000	Cirripedia	0	0	0
615301210000	Mysidopsis spp.	0	0	0
615301260700	Bowmaniella dissimilis	0	1	0
615303150300	Americamysis stucki	0	0	0
615405080000	Oxyurostylis spp.	0	0	0
615405089800	Oxyurostylis smithi	0	0	0
615408020100	Almyracuma proximoculi	0	0	0
6154090202CF	Cyclaspis cf. varians	0	1	0
616001020100	Cyathura polita	0	0	1
616001070100	Xenanthura brevitelson	0	35	14
616001200100	Amakusanthura magnifica	0	0	0
616202070300	Edotia triloba	0	0	0
616902010000	Ampelisca spp.	0	3	2
616902010800	Ampelisca abdita	0	0	8
616902010900	Ampelisca vadorum	0	0	0

NODCCODE	NAME	04CG9627	04CG0008	04CG0011
616902011000	Ampelisca verrilli	0	0	4
616902012300	Ampelisca holmesi	0	0	21
616904020100	Cymadusa compta	0	0	0
6169060404CF	Paramicrodeutopus cf. myersi	0	0	0
616906120100	Rudilemboides naglei	0	0	0
616910010100	Batea catharinensis	0	0	0
616915010200	Cerapus sp. C (="tubularis")	0	0	0
616915030200	Erichthonius brasiliensis	0	0	0
616915090100	Grandidierella bonnieroides	0	1	15
616921070900	Gammarus mucronatus	0	0	0
616933030100	Listriella barnardi	0	0	0
616942210100	Eudevenopus honduranus	0	0	0
617101070000	Caprella sp.	0	0	0
617101090100	Paracaprella tenuis	0	0	0
617905020100	Leptochela serratorbita	0	0	0
617917030100	Ambidexter symmetricus	0	0	0
618306025100	Pagurus maclaughlinae	0	0	0
618902080000	Panopeus sp.	0	0	0
618906040000	Pinnixa spp.	0	0	0
618906040500	Pinnixa chaetopterana	0	0	0
6189060413CF	Pinnixa cf. pearsei	0	0	0
618906050100	Pinnixa D	0	0	0
770001020000	Phoronis sp.	0	0	0
770001020300	Phoronis ?architecta	0	0	0
800201010100	Glottidia pyramidata	0	0	0
812000000000	OPHIUROIDEA	0	0	0
812902020100	Hemipholis elongata	0	0	0
812903060000	Ophiophragmus sp.	0	0	0
812903060600	Ophiophragmus filograneus	0	0	0
812903090400	Amphioplus thrombodes	0	0	0
812903120100	Amphipholis atra	0	0	0
815504010100	Mellita tenuis	0	0	0
817801009500	Synaptidae A	0	0	0
817801030000	Epitomapta roseola	0	0	0
820100000000	ENTEROPNEUSTA	0	0	0
820100000002	Enteropneusta B	0	0	0
850001010000	Branchiostoma floridae	0	0	0

APPENDIX 8

Archie Creek Sediment Sample Results

Sediment sample of white precipitate in salt marsh north of Archie Creek.
Collected September 8, 2004.

COMPONENT	RESULT	UNITS
Aluminum	1.54E+04	mg/Kg
Antimony	4.5	mg/Kg
Arsenic	7.8	mg/Kg
Arsenic	13	ug/L
Barium	66.5	mg/Kg
Barium	150	ug/L
Beryllium	2.6	mg/Kg
Cadmium	24.4	mg/Kg
Cadmium	0.5	ug/L
Calcium	2.72E+05	mg/Kg
Calcium	42	mg/L
Chromium	113	mg/Kg
Chromium	3	ug/L
Cobalt	11.8	mg/Kg
Copper	25.6	mg/Kg
Iron	1.35E+04	mg/Kg
Lead	32.7	mg/Kg
Lead	12	ug/L
Magnesium	1.19E+04	mg/Kg
Magnesium	11.7	mg/L
Manganese	513	mg/Kg
Mercury	0.15	mg/Kg
Mercury	0.1	ug/L
Nickel	37	mg/Kg
Potassium	2.42E+03	mg/Kg
Sediment % Organic	11	% dry wt
Sediment Particle Size, %, <0.063 mm	57.8	% vol <2mm
Sediment Particle Size, %, >2.0 mm	1	%tot drywt
Sediment Particle Size, %, 0.063-0.125mm	23.4	% vol <2mm
Sediment Particle Size, %, 0.125-0.25 mm	13.2	% vol <2mm
Sediment Particle Size, %, 0.25-0.5 mm	4.19	% vol <2mm
Sediment Particle Size, %, 0.5-2.0 mm	1.4	% vol <2mm
Selenium	5	mg/Kg
Selenium	8	ug/L
Silver	0.69	mg/Kg
Silver	1.6	ug/L
Sodium	3.37E+04	mg/Kg
Strontium	2.10E+03	mg/Kg
Thallium	19	mg/Kg
Vanadium	174	mg/Kg
Zinc	180	mg/Kg

Sediment sample results collected September 11, 2004**.**

LOCATION	COMPONENT	RESULT	UNITS
Archie Creek East of Old 41	Arsenic	1.5	mg/Kg
Archie Creek East of Old 41	Barium	17.9	mg/Kg
Archie Creek East of Old 41	Cadmium	0.83	mg/Kg
Archie Creek East of Old 41	Calcium	6.42E+03	mg/Kg
Archie Creek East of Old 41	Chromium	18.4	mg/Kg
Archie Creek East of Old 41	Lead	5.6	mg/Kg
Archie Creek East of Old 41	Magnesium	1.21E+03	mg/Kg
Archie Creek East of Old 41	Mercury	0.018	mg/Kg
Archie Creek East of Old 41	Sediment % Organic	No Result	% dry wt
Archie Creek East of Old 41	Sediment Particle Size, %, <0.063 mm	18.6	% vol <2mm
Archie Creek East of Old 41	Sediment Particle Size, %, >2.0 mm	1	%tot drywt
Archie Creek East of Old 41	Sediment Particle Size, %, 0.063-0.125mm	11.7	% vol <2mm
Archie Creek East of Old 41	Sediment Particle Size, %, 0.125-0.25 mm	34.6	% vol <2mm
Archie Creek East of Old 41	Sediment Particle Size, %, 0.25-0.5 mm	24.8	% vol <2mm
Archie Creek East of Old 41	Sediment Particle Size, %, 0.5-2.0 mm	10.3	% vol <2mm
Archie Creek East of Old 41	Selenium	0.68	mg/Kg
Archie Creek East of Old 41	Silver	0.17	mg/Kg
Delaney Creek @ Old 41	Arsenic	1.3	mg/Kg
Delaney Creek @ Old 41	Barium	16.3	mg/Kg
Delaney Creek @ Old 41	Cadmium	0.25	mg/Kg
Delaney Creek @ Old 41	Calcium	2.22E+04	mg/Kg
Delaney Creek @ Old 41	Chromium	10.4	mg/Kg
Delaney Creek @ Old 41	Lead	36.5	mg/Kg
Delaney Creek @ Old 41	Magnesium	825	mg/Kg
Delaney Creek @ Old 41	Mercury	0.025	mg/Kg
Delaney Creek @ Old 41	Sediment % Organic	No Result	% dry wt
Delaney Creek @ Old 41	Sediment Particle Size, %, <0.063 mm	10.4	% vol <2mm
Delaney Creek @ Old 41	Sediment Particle Size, %, >2.0 mm	1.3	%tot drywt
Delaney Creek @ Old 41	Sediment Particle Size, %, 0.063-0.125mm	8.46	% vol <2mm
Delaney Creek @ Old 41	Sediment Particle Size, %, 0.125-0.25 mm	33.6	% vol <2mm
Delaney Creek @ Old 41	Sediment Particle Size, %, 0.25-0.5 mm	30	% vol <2mm
Delaney Creek @ Old 41	Sediment Particle Size, %, 0.5-2.0 mm	17.5	% vol <2mm
Delaney Creek @ Old 41	Selenium	0.69	mg/Kg
Delaney Creek @ Old 41	Silver	0.17	mg/Kg

LOCATION	COMPONENT	RESULT	UNITS
Delaney Creek @ 41	Arsenic	2.6	mg/Kg
Delaney Creek @ 41	Barium	41.2	mg/Kg
Delaney Creek @ 41	Cadmium	0.89	mg/Kg
Delaney Creek @ 41	Calcium	4.35E+04	mg/Kg
Delaney Creek @ 41	Chromium	41.1	mg/Kg
Delaney Creek @ 41	Lead	32	mg/Kg
Delaney Creek @ 41	Magnesium	3.96E+03	mg/Kg
Delaney Creek @ 41	Mercury	0.055	mg/Kg
Delaney Creek @ 41	Sediment % Organic	No Result	% dry wt
Delaney Creek @ 41	Sediment Particle Size, %, <0.063 mm	40	% vol <2mm
Delaney Creek @ 41	Sediment Particle Size, %, >2.0 mm	14	%tot drywt
Delaney Creek @ 41	Sediment Particle Size, %, 0.063-0.125mm	7.96	% vol <2mm
Delaney Creek @ 41	Sediment Particle Size, %, 0.125-0.25 mm	19.4	% vol <2mm
Delaney Creek @ 41	Sediment Particle Size, %, 0.25-0.5 mm	13.7	% vol <2mm
Delaney Creek @ 41	Sediment Particle Size, %, 0.5-2.0 mm	19	% vol <2mm
Delaney Creek @ 41	Selenium	0.65	mg/Kg
Delaney Creek @ 41	Silver	0.33	mg/Kg
North Archie Creek @ 41	Arsenic	0.62	mg/Kg
North Archie Creek @ 41	Barium	7.8	mg/Kg
North Archie Creek @ 41	Cadmium	0.46	mg/Kg
North Archie Creek @ 41	Calcium	9.45E+03	mg/Kg
North Archie Creek @ 41	Chromium	8.83	mg/Kg
North Archie Creek @ 41	Lead	2.5	mg/Kg
North Archie Creek @ 41	Magnesium	417	mg/Kg
North Archie Creek @ 41	Mercury	0.0067	mg/Kg
North Archie Creek @ 41	Sediment % Organic	No Result	% dry wt
North Archie Creek @ 41	Sediment Particle Size, %, <0.063 mm	3.06	% vol <2mm
North Archie Creek @ 41	Sediment Particle Size, %, >2.0 mm	1	%tot drywt
North Archie Creek @ 41	Sediment Particle Size, %, 0.063-0.125mm	3.4	% vol <2mm
North Archie Creek @ 41	Sediment Particle Size, %, 0.125-0.25 mm	36.6	% vol <2mm
North Archie Creek @ 41	Sediment Particle Size, %, 0.25-0.5 mm	46.8	% vol <2mm
North Archie Creek @ 41	Sediment Particle Size, %, 0.5-2.0 mm	10.1	% vol <2mm
North Archie Creek @ 41	Selenium	0.7	mg/Kg
North Archie Creek @ 41	Silver	0.1	mg/Kg
Archie Canal @ 41	Arsenic	2.4	mg/Kg
Archie Canal @ 41	Barium	17.7	mg/Kg
Archie Canal @ 41	Cadmium	2.7	mg/Kg
Archie Canal @ 41	Calcium	4.62E+04	mg/Kg
Archie Canal @ 41	Chromium	24.3	mg/Kg
Archie Canal @ 41	Lead	5.8	mg/Kg
Archie Canal @ 41	Magnesium	2.15E+03	mg/Kg
Archie Canal @ 41	Mercury	0.018	mg/Kg

LOCATION	COMPONENT	RESULT	UNITS
Archie Canal @ 41	Sediment % Organic	No Result	% dry wt
Archie Canal @ 41	Sediment Particle Size, %, <0.063 mm	25.7	% vol <2mm
Archie Canal @ 41	Sediment Particle Size, %, >2.0 mm	1.1	%tot drywt
Archie Canal @ 41	Sediment Particle Size, %, 0.063-0.125mm	12.5	% vol <2mm
Archie Canal @ 41	Sediment Particle Size, %, 0.125-0.25 mm	36.9	% vol <2mm
Archie Canal @ 41	Sediment Particle Size, %, 0.25-0.5 mm	15.6	% vol <2mm
Archie Canal @ 41	Sediment Particle Size, %, 0.5-2.0 mm	9.37	% vol <2mm
Archie Canal @ 41	Selenium	0.7	mg/Kg
Archie Canal @ 41	Silver	0.26	mg/Kg
Archie Canal @ Old 41	Arsenic	19.3	mg/Kg
Archie Canal @ Old 41	Barium	202	mg/Kg
Archie Canal @ Old 41	Cadmium	0.38	mg/Kg
Archie Canal @ Old 41	Calcium	4.10E+05	mg/Kg
Archie Canal @ Old 41	Chromium	1.34E+03	mg/Kg
Archie Canal @ Old 41	Lead	15.5	mg/Kg
Archie Canal @ Old 41	Magnesium	3.62E+04	mg/Kg
Archie Canal @ Old 41	Mercury	0.023	mg/Kg
Archie Canal @ Old 41	Sediment % Organic	No Result	% dry wt
Archie Canal @ Old 41	Sediment Particle Size, %, <0.063 mm	49.9	% vol <2mm
Archie Canal @ Old 41	Sediment Particle Size, %, >2.0 mm	No Result	%tot drywt
Archie Canal @ Old 41	Sediment Particle Size, %, 0.063-0.125mm	13.7	% vol <2mm
Archie Canal @ Old 41	Sediment Particle Size, %, 0.125-0.25 mm	11.7	% vol <2mm
Archie Canal @ Old 41	Sediment Particle Size, %, 0.25-0.5 mm	10.2	% vol <2mm
Archie Canal @ Old 41	Sediment Particle Size, %, 0.5-2.0 mm	14.5	% vol <2mm
Archie Canal @ Old 41	Selenium	1.8	mg/Kg
Archie Canal @ Old 41	Silver	2.5	mg/Kg
Archie Creek ~114m SW of US 41	Mercury	0.37	mg/Kg
Archie Creek ~114m SW of US 41	Cadmium	0.87	ug/L
Archie Creek ~114m SW of US 41	Silver	1.6	ug/L
Archie Creek ~114m SW of US 41	Selenium	1.8	mg/Kg
Archie Creek ~114m SW of US 41	Silver	1.9	mg/Kg
Archie Creek ~114m SW of US 41	Chromium	106	mg/Kg
Archie Creek ~114m SW of US 41	Arsenic	11.7	mg/Kg
Archie Creek ~114m SW of US 41	Lead	12	ug/L
Archie Creek ~114m SW of US 41	Calcium	12.1	mg/L
Archie Creek ~114m SW of US 41	Sediment Particle Size, %, 0.25-0.5 mm	12.5	% vol <2mm
Archie Creek ~114m SW of US 41	Chromium	14	ug/L
Archie Creek ~114m SW of US 41	Magnesium	15.5	mg/L
Archie Creek ~114m SW of US 41	Sediment Particle Size, %, 0.063-0.125mm	16	% vol <2mm
Archie Creek ~114m SW of US 41	Sediment Particle Size, %, 0.5-2.0 mm	16	% vol <2mm
Archie Creek ~114m SW of US 41	Sediment Particle Size, %, 0.125-0.25 mm	16.2	% vol <2mm
Archie Creek ~114m SW of US 41	Barium	330	ug/L
Archie Creek ~114m SW of US 41	Sediment Particle Size, %, <0.063 mm	39.3	% vol <2mm

LOCATION	COMPONENT	RESULT	UNITS
Archie Creek ~114m SW of US 41	Calcium	4.26E+04	mg/Kg
Archie Creek ~114m SW of US 41	Lead	64.8	mg/Kg
Archie Creek ~114m SW of US 41	Selenium	8	ug/L
Archie Creek ~114m SW of US 41	Arsenic	9	ug/L
Archie Creek ~114m SW of US 41	Cadmium	9.3	mg/Kg
Archie Creek ~114m SW of US 41	Magnesium	9.44E+03	mg/Kg
Archie Creek ~114m SW of US 41	Barium	91.9	mg/Kg
Archie Creek ~114m SW of US 41	Sediment % Organic	No Result	% dry wt
Archie Creek ~114m SW of US 41	Sediment Particle Size, %, >2.0 mm	No Result	%tot drywt

APPENDIX 9

Seagrass Transect and Quadrat Data

Table 1. Cover class, percent cover range, and descriptor according to the Braun-Blanquet method used in monitoring the two seagrass transects.

Cover Class	% Cover Range	Descriptor
0	<1%	Rare
1	1-10%	Scattered
2	11-25%	Numerous
3	26-50%	Abundant
4	51-75%	Co-dominant
5	>75%	Dominant

Table 2. December 14, 2004 seagrass survey data results for three impacted locations (Sites 1, 2, and 3) to determine density at each site (continuous *vs*. sparse).

		Site 1		Site 2		Site 3		Site 4 (control)	
	Quadrat	% Cover	Species	% Cover	Species	% Cover	Species	% Cover	Species
12/14/2005	1	36		18		53			
12/14/2005	2	43		0		40		No Data	
12/14/2005	3	95		3		80			
12/14/2005	4	43		18		74			
12/14/2005	5	71		21		100			
12/14/2005	6	53		1		100			
12/14/2005	7	9		3		20			
12/14/2005	8	67		6		100			
12/14/2005	9	100		5		80			
12/14/2005	10	100		0		90			
12/14/2005	11	3		6		26			
12/14/2005	12	31		28		100			
12/14/2005	13	57		15		100			
12/14/2005	14	91		0		99			
12/14/2005	15	97		12		95			
12/14/2005	16	31		13		97			
12/14/2005	17	61		0		80			
12/14/2005	18	98		0		8			
12/14/2005	19	100		1		0			
12/14/2005	20	50		0		0			
12/14/2005	21	98		0		100			
12/14/2005	22	0		0		22			
12/14/2005	23	20		8		56			
12/14/2005	24	8		0		55			
12/14/2005	25	52		27		1			
12/14/2005	26	14		3		0			
12/14/2005	27	13		0		31			
12/14/2005	28	28		8		19			
12/14/2005	29	8		14		5			
12/14/2005	30	66		14		0			
Mean		51.4		7.5		57.0			

Table 3. Data compiled from sampling the two seagrass transects. One meter quadrats were placed at either 25 m or 50 m intervals and percent cover was determined using the Braun-Blanquet method.

Date	Distance (m)	% Cover Seagrass	Species	Braun-Blanquet Conversion	Sediment	Depth (cm)	Notes
Site 3 Transect (NW Corner of Old Stack)							
9/23/2004	25	0		0	mud	46	
9/23/2004	50	0		0	sand	61	
9/23/2004	75	7		1	sand	61	
9/23/2004	100	0		0	sand	61	
9/23/2004	125	0		0	sand	69	
9/23/2004	150	0		0	sand	91	
9/23/2004	175	0		0	sand	76	
9/23/2004	200	30	*H. wrightii*	3	sand	91	3 short shoots per 10 cm^{-2}
9/23/2004	250	3	*H. wrightii*	1	sand	91	
9/23/2004	300	0		0	sand	91	
9/23/2004	350	0		0	sand	91	
9/23/2004	400	0		0	sand	102	
4/29/2005	25	0		0	sand	71	
4/29/2005	50	0		0	sand	71	
4/29/2005	75	0		0	sand	76	
4/29/2005	100	0		0	sand	76	
4/29/2005	125	0		0	sand	76	
4/29/2005	150	0		0	sand	76	
4/29/2005	175	0		0	sand	76	
4/29/2005	200	0		0	sand	76	
4/29/2005	250	<1	*H. wrightii*	0	sand	76	
4/29/2005	300	7	*H. wrightii*	1	sand	76	8 short shoots per 10 cm^{-2} and average length of stems is 2 cm.
	350	0		0	sand	76	
	400	0		0	sand	76	

Table 3, cont'd. Data compiled from sampling the two seagrass transects. One meter quadrats were placed at either 25 m or 50 m intervals and percent cover was determined using the Braun-Blanquet method.

Date	Distance (m)	% Cover Seagrass	Species	Braun-Blanquet Conversion	Sediment	Depth (cm)	Notes
Archie Creek Transect (Mouth of Archie Creek Canal)							
9/23/2004	25	0			mud	15	
9/23/2004	50	0			mud	76	
9/23/2004	75	0			mud	71	
9/23/2004	100	0			mud	76	
9/23/2004	125	0			mud	79	
9/23/2004	150	0			mud	79	
9/23/2004	175	0			mud	79	
9/23/2004	200	0			mud	81	Black fine sediment
4/29/2005	25	0			sand/mud	76	
4/29/2005	50	0			sand/mud	76	
4/29/2005	75	0			sand/mud	76	
4/29/2005	100	0			sand/mud	76	
4/29/2005	125	0			sand/mud	76	
4/29/2005	150	0			sand/mud	76	
4/29/2005	175	0			sand/mud	76	
4/29/2005	200	0			sand/mud	76	

Table 4. Data complied from seagrass quadrat sampling at the four site locations. Quarter meter quadrats were haphazardly located and percent cover by species was determined. Note 12/14/04 the first ten (10) samples were recorded for this table. Table 2 shows all samples taken for 12/14/04.

		Site 1		Site 2		Site 3		Site 4 (control)	
	Quadrat	% Cover	Species	% Cover	Species	% Cover	Species	% Cover	Species
9/24/2005	1	30	*H. wrightii*	60	*H. wrightii*	No data		90	*H. wrightii*
9/24/2005	2	30	*H. wrightii*	40	*H. wrightii*			10	*H. wrightii*
9/24/2005	3	100	*H. wrightii*	20	*H. wrightii*			100	*H. wrightii*
9/24/2005	4	30	*H. wrightii*	20	*H. wrightii*			90	*H. wrightii*
9/24/2005	5	95	*H. wrightii*	90	*H. wrightii*			30	*H. wrightii*
9/24/2005	6	40	*H. wrightii*	50	*H. wrightii*			100	*H. wrightii*
9/24/2005	7	9	*H. wrightii*	75	*H. wrightii*			100	*H. wrightii*
9/24/2005	8	6	*H. wrightii*	95	*H. wrightii*			0	*H. wrightii*
9/24/2005	9	95	*H. wrightii*	30	*H. wrightii*			25	*H. wrightii*
9/24/2005	10	5	*H. wrightii*	30	*H. wrightii*			95	*H. wrightii*
Mean		44.0		51.0				64.0	
12/14/2004	1	36	*H. wrightii*	18	*H. wrightii*				
12/14/2004	2	43	*H. wrightii*	0		53	*H. wrightii*	No Data	
12/14/2004	3	95	*H. wrightii*	3	*H. wrightii*	40	*H. wrightii*		
12/14/2004	4	43	*H. wrightii*	18	*H. wrightii*	80	*H. wrightii*		
12/14/2004	5	71	*H. wrightii*	21	*H. wrightii*	74	*H. wrightii*		
12/14/2004	6	53	*H. wrightii*	1	*H. wrightii*	100	*H. wrightii*		
12/14/2004	7	9	*H. wrightii*	3	*H. wrightii*	100	*H. wrightii*		
12/14/2004	8	67	*H. wrightii*	6	*H. wrightii*	20	*H. wrightii*		
12/14/2004	9	100	*H. wrightii*	5	*H. wrightii*	100	*H. wrightii*		
12/14/2004	10	100	*H. wrightii*	0		80	*H. wrightii*		
Mean		61.7		7.5		64.7			
4/29/2005	1	40	*H. wrightii*	100	*H. wrightii*	70	*H. wrightii*	100	*H. wrightii*
4/29/2005	2	35	*H. wrightii*	80	*H. wrightii*	2	*H. wrightii*	100	*H. wrightii*
4/29/2005	3	80	*H. wrightii*	100	*H. wrightii*	20	*H. wrightii*	50	*H. wrightii*
4/29/2005	4	20	*H. wrightii*	0		100	*H. wrightii*	60	*H. wrightii*
4/29/2005	5	0		100	*H. wrightii*	60	*H. wrightii*	100	*H. wrightii*
4/29/2005	6	15	*H. wrightii*	35	*H. wrightii*	50	*H. wrightii*	40	*H. wrightii*
4/29/2005	7	0		100	*H. wrightii*	90	*H. wrightii*	30	*H. wrightii*
4/29/2005	8	2	*H. wrightii*	100	*H. wrightii*	80	*H. wrightii*	100	*H. wrightii*
4/29/2005	9	70	*H. wrightii*	45	*H. wrightii*	100	*H. wrightii*	100	*H. wrightii*
4/29/2005	10	45	*H. wrightii*	90	*H. wrightii*	0		90	*H. wrightii*
Mean		30.7		75.0		57.2		77.0	

APPENDIX 10

Vegetation Transect Data

Descriptions of Vegetation Sampling Quadrats

Mangrove Quadrats

M-1 (Impacted Mangrove)

- The quadrat is located approximately 10 m southeast of the intersection of South Archie Creek and Old Highway 41. The vegetation consists of a canopy of 100% white mangroves *(Laguncularia racemosa)* approximately 150 cm tall with a density of 30 stems m^{-2}, with approximately 10% *Batis maritima* in the herbaceous understory. The substrate is firm mud.

M-2 (Impacted Mangrove)

- The quadrat is located on the northwest side of the *Spartina alterniflora* and mangrove marsh northeast of the intersection of Archie Creek South and Old Highway 41. The vegetation consists of a canopy of 100% white mangroves approximately 140 cm tall with a density of 48 stems m^{-2}, with no herbaceous understory. The substrate is soft mud.

M-3 (Un-impacted Mangrove)

- The quadrat is located along the north shoreline of Archie Creek North. The vegetation consists of a canopy of 100% white mangroves approximately 175 cm tall, with a density of approximately 40 stems m^{-2}, among a generally mixed forest of white and black *(Avicennia germinans)* mangroves, with no herbaceous understory. The substrate is deep mucky mud.

M-4 (Un-impacted Mangrove)

- The quadrat is located north of Archie Creek North. The vegetation consists of a tall forest canopy of 100% white mangroves with a density of 12 stems m^{-2}, averaging 412 cm in height, and a herbaceous understory of sparse *Bacopa monnieri*. The substrate is deep mud.

M-5 (Impacted Mangrove)

- The quadrat is located along the north edge of Archie Creek Canal below a steep dredge spoil slope. The vegetation consists of a canopy of 100% white mangroves approximately 200 cm tall, with no herbaceous understory. The substrate is sandy mud.

M-6 (Impacted Mangrove)

- The quadrat is located on the island at the mouth of Archie Creek Canal. The vegetation consists of a canopy of 100% multi-branched large black mangroves (seven trees) approximately 500 cm tall, with no herbaceous understory. The substrate is firm sandy mud.

M-7 (Impacted Mangrove)

- The quadrat is located along the shoreline of Hillsborough Bay, south of the Delaney Creek pop-off. The vegetation consists of a canopy of 100% multi-branched black mangroves (two trees) approximately 400 cm tall, with no herbaceous understory. The substrate is mucky.

M-8 (Un-Impacted Mangrove)

- The quadrat is located along the north shoreline of Delaney Creek pop-off. The vegetation consists of a canopy of 100% multi-branched black mangroves approximately 200 cm tall, with no herbaceous understory. The substrate is firm sandy muck.

M-9 (Impacted Mangrove)

- The quadrat is located along the shoreline of Hillsborough Bay, north of Delaney Creek pop-off. The vegetation consists of a canopy of 100% multi-branched black mangroves approximately 250 cm tall, with no herbaceous understory. The substrate is very soft muck.

Marsh Quadrats

MS-1 (Impacted Marsh)

- The quadrat is located in a marsh northeast of the intersection of Archie Creek South and Old Highway 41. The vegetation consists of 100% herbaceous cover as a stand of *Spartina alterniflora*, with a soft mucky substrate. The *Spartina* is approximately 60 cm mean height.

MS-2 (Impacted Marsh)

- The quadrat is located north of Archie Creek Canal. The vegetation consists of high marsh grasses and forbs with 100% cover composed of 85% mixed *Distichlis spicata* and *Sporobolus virginicus*, 10% *Juncus roemerianus*, and including 15% white mangrove saplings. The substrate is firm and slightly mucky.

MS-3 (Un-impacted Marsh)

- The quadrat is located north of Archie Creek North in dense, undisturbed high marsh. The vegetation consists of 90% total herbaceous cover dominated by 8% *J. roemerianus* approximately 110 cm and 82% mixed high marsh grasses *(D. spicata and S. virginicus)*, with a few white mangrove seedlings. The substrate is firm sandy mud.

MS-4 (Un-impacted Marsh)

- The quadrat is located in dense, undisturbed high marsh north of Archie Creek North. The vegetation consists of 100% herbaceous cover including approximately 30% mixed *D. spicata* and 70% *J. roemerianus* (50-100 cm in height), with 30% shrub cover consisting of a few white mangrove saplings to 40 cm in height. The substrate is firm mud.

MS-5 (Impacted Marsh)

- The quadrat is located on the western side of the large marsh north of the “Old Stack” and Archie Creek Canal. The vegetation consists of approximately 80% *S. alterniflora*, averaging 16 cm tall. The substrate is firm mud.

MS-6 (Impacted Marsh)

- The quadrat is located on the eastern end of the large marsh north of the “Old Stack” and Archie Creek Canal. The vegetation consists of 90% *J. roemerianus* approximately 100 cm in height. The substrate is firm mud.

MS-7 (Impacted Marsh)

- The quadrat is located north of Archie Creek South in high marsh. The vegetation consists of 80% total herbaceous cover dominated by 100% *J. roemerianus* approximately 60 cm in height. The substrate is firm sandy mud.

MS-8 (Un-impacted Marsh)

- The quadrat is located adjacent to a saltern in high marsh north of Archie Creek South. The vegetation consists of 70% total herbaceous cover including mixed 70% *D. spicata* and 30% *S. virginicus* (50 cm in height). The substrate is firm sand.

Date	Quadrat	Total % Cover	Total % Cover Canopy	Total % Cover Shrub	Total % Cover Groundcover	Mean Height (cm)	# Mangrove Seedlings
9/13/2004	M1	100	100	0	0	150.0	0
10/21/2004	M1	25	25	0	0	150.0	0
11/13/2004	M1	25	25	0	2	150.0	100
2/2/2005	M1	25	25	0	2	150.0	400
9/13/2004	M2	100	100	0	0	140.0	0
10/21/2004	M2	25	25	0	0	140.0	0
11/13/2004	M2	15	15	0	0	140.0	0
2/2/2005	M2	0	0	0	0	0.0	20
9/19/2004	M3	100	100	0	0	175.0	0
11/13/2004	M3	100	100	0	0	175.0	0
2/2/2005	M3	100	100	0	0	175.0	0
9/19/2004	M4	100	100	0	5	412.0	0
10/21/2004	M4	100	100	0	5	412.0	12
11/13/2004	M4	100	100	0	5	412.0	300
2/2/2005	M4	100	100	0	10	412.0	200
11/13/2004	M5	100	100	0	0	200.0	12
2/2/2005	M5	25	25	25	0	200.0	39
11/13/2004	M6	100	100	0	0	500.0	0
2/2/2005	M6	90	90	0	0	500.0	1
11/13/2004	M7	100	100	0	0	400.0	0
2/2/2005	M7	100	100	1	0	400.0	0
11/13/2004	M8	100	100	0	0	200.0	0
2/2/2005	M8	100	100	0	0	200.0	0
11/13/2004	M9	100	100	0	0	250.0	0
2/2/2005	M9	100	100	0	0	250.0	0
9/19/2004	MS1	60	0	60	0	60.0	0
10/21/2004	MS1	0	0	0	0	0.0	0
11/13/2004	MS1	0	0	0	0	0.0	0
2/2/2005	MS1	0	0	0	0	0.0	0
9/19/2004	MS2	100	0	15	85	42.0	0
10/21/2004	MS2	95	0	10	85	42.0	0
11/13/2004	MS2	95	0	10	85	42.0	0
2/2/2005	MS2	100	0	25	75	42.0	78
9/19/2004	MS3	90	0	0	90	110.0	0
10/21/2004	MS3	90	0	0	90	110.0	0
11/13/2004	MS3	90	0	0	90	110.0	0
2/2/2005	MS3	85	0	0	85	110.0	13
9/19/2004	MS4	100	0	30	70	75.0	0
9/24/2004	MS4	100	0	30	70	75.0	0
10/21/2004	MS4	100	0	30	70	75.0	0
11/13/2004	MS4	100	0	30	70	75.0	0
2/2/2005	MS4	100	0	30	70	75.0	0
11/13/2004	MS5	0	0	0	0	0.0	0
2/2/2004	MS5	0	0	0	0	0.0	0
11/13/2004	MS6	90	0	0	90	100.0	0
2/2/2004	MS6	90	0	0	90	100.0	0
11/13/2004	MS7	80	0	0	80	60.0	0
2/2/2004	MS7	80	0	0	80	60.0	0
11/13/2004	MS8	70	0	0	70	50.0	0
2/2/2004	MS8	70	0	0	70	50.0	0

<u>Location of Vegetation Quadrats</u>

Date	Transect	Quadrat	Total Cover %	% Cover by species	Species	% leaves never dropped	% defoliated not dead	% defoliated presumed dead	% initial cover loss	Regrowth % leaf	Regrowth % culms	Height Trees (est'd ft)	DBH Trees (cm)	GPS	T0 Damage Assessment - 10/12/04 & later	T3 Damage Assessment - 12/01/04 & later
10/13/2004	1	1	100	100	Av ge	100	0	0	0			5	5.08	014		
10/13/2004	1	1A	100	100	Av ge	100	0	0	0			5	5.08	014		
10/13/2004	1	2	0	0	Nostoc	0	0	0	0					015	saltern	
10/13/2004	1	2A	0	0	Nostoc	0	0	0	0					015	saltern	
10/13/2004	1	3	80	80	Ba ma	100	0	0	0					016	saltern edge	
10/13/2004	1	3A	65	65	Ba ma	100	0	0	0					016		
10/13/2004	1	4	95	95	Av ge	100	0	0	0					017		
10/13/2004	1	4	95	95	Ba ma	100	0	0	0					017		
10/13/2004	1	4A	95	95	Av ge	100	0	0	0					017		
10/13/2004	1	4A	95	95	Ba ma	100	0	0	0					017		
10/13/2004	2	1	60	60	Av ge	0	100	0	100					018		
10/13/2004	2	1A	55	55	Av ge	0	100	0	100					018		
10/13/2004	2	2	0	0	sand	0	0	0	0					019		
10/13/2004	2	2A	0	0	sand	0	0	0	0					019		
10/13/2004	2	3	0	0	sand	0	0	0	0					020		
10/13/2004	2	3A	30	30	Av ge	0	100	0	100					020		
10/13/2004	2	4	25	25	Sp al	0	100	0	100					021		
10/13/2004	2	4A	45	45	Sp al	0	100	0	100					021		
10/13/2004	2	5	20	20	Sp al	0	100	0	100					022		
10/13/2004	2	5A	50	50	Sp al	0	0	0	100					022		
10/13/2004	2	6	0	0	sand	0	100	0	0					023		
10/13/2004	2	6A	5	5	Av ge	0	0	0	100					023		
10/13/2004	2	7	0	0	sand	0	100	0	0					024		
10/13/2004	2	7A	25	25	Av ge	0	100	0	100					024		
10/13/2004	2	8	70	70	Sp al	0	100	0	100					025		
10/13/2004	2	8A	5	5	Sp al	0	100	0	100					025	new growth common	
10/13/2004	2	9	30	30	Sp al	0	100	0	100					026	new growth abundant	
10/13/2004	2	9A	30	30	Sp al	0	100	0	100					026		
10/13/2004	3	1	100	100	Sp al	100	100	0	5					027		
10/13/2004	3	1A	100	100	Sp al	100	100	0	5					027		
10/13/2004	3	2	0	0	sand	0	0	0	0					028		
10/13/2004	3	2A	0	0	sand	0	0	0	0					028		
10/13/2004	3	3	100	100	Av ge	80	20	0	20					029		
10/13/2004	3	3A	100	100	Av ge	80	20	0	20					029		
10/13/2004	3	4	15	15	Ba ma	0	100	0	100					030		
10/13/2004	3	4A	21	21	Ba ma	0	100	0	100					030		
10/13/2004	3	4A	21	21	Av ge	0	100	0	100					030		
10/13/2004	3	5	40	40	Av ge	0	100	0	100			4		031		
10/13/2004	3	5A	70	70	Av ge	100	0	0	0			20		031		
10/13/2004	3	6	100	100	Av ge	100	0	0	0					032		
10/13/2004	3	6A	100	100	Av ge	100	0	0	100					032		
10/13/2004	4	1	35	34	Sp al	0	100	0	100					067		
10/13/2004	4	1	35	1	La ra	0	0	0	100					067		
10/13/2004	4	1A	46	45	Sp al	0	100	0	100					067		

Mosaic Vegetation Transects

Date	Transect	Quadrat	Total Cover %	% Cover by species	Species	% leaves never dropped	% defoliated not dead	% defoliated presumed dead	% initial cover loss	Regrowth % leaf	Regrowth % culms	Height Trees (est'd ft)	DBH Trees (cm)	GPS	T0 Damage Assessment - 10/12/04 & later	T3 Damage Assessment - 12/01/04 & later
10/13/2004	4	1A	46	1	La ra	0	0	0	100					067		
10/13/2004	4	2	86	85	Sp al	0	100	0	100					068		
10/13/2004	4	2	86	1	La ra	0	100	0	100					068		
10/13/2004	4	2A	76	75	Sp al	0	100	0	100					068		
10/13/2004	4	2A	76	1	La ra	0	100	0	100					068		
10/13/2004	4	3	20	15	Sp al	0	100	0	100					069		
10/13/2004	4	3	20	5	La ra	0	100	0	100					069		
10/13/2004	4	3A	30	27	Sp al	0	100	0	100					069		
10/13/2004	4	3A	30	3	La ra	0	100	0	100					069		
10/13/2004	4	4	77	75	Sp al	0	100	0	100					070		
10/13/2004	4	4	77	2	La ra	0	100	0	100					070		
10/13/2004	4	4A	77	75	Sp al	0	100	0	100					070		
10/13/2004	4	4A	77	2	La ra	0	100	0	100					070		
10/13/2004	4	5	80	77	Sp al	0	98	2	100					071		
10/13/2004	4	5	80	1	Rh ma	0	98	2	100					071		
10/13/2004	4	5	80	2	La ra	0	98	2	100					071		
10/13/2004	4	5A	80	78	Sp al	0	100	0	100					071		
10/13/2004	4	5A	80	2	La ra	0	100	0	100					071		
10/13/2004	4	6	20	5	Av ge	0	100	0	100					072		
10/13/2004	4	6	20	1	La ra	0	100	0	100					072		
10/13/2004	4	6	20	14	Sp al	0	100	0	100					072		
10/13/2004	4	6A	20	5	Av ge	0	100	0	100					072		
10/13/2004	4	6A	20	1	Sp al	0	100	0	100					072		
10/13/2004	4	6A	20	14	La ra	0	100	0	100					073		
10/13/2004	4	7	70	50	Sp al	0	100	0	100					073		
10/13/2004	4	7	70	10	Rh ma	0	100	0	100					073		
10/13/2004	4	7	70	10	Av ge	0	100	0	100					073		
10/13/2004	4	7A	55	35	Sp al	0	100	0	100					073		
10/13/2004	4	7A	55	5	La ra	0	100	0	100					073		
10/13/2004	4	7A	55	15	Av ge	0	100	0	100					073		
10/13/2004	4	8	25	24	Sp al	0	100	0	100					074		
10/13/2004	4	8	25	1	La ra	0	100	0	100					074		
10/13/2004	4	8A	25	40	Sp al	0	100	0	100					074		
10/22/2004	5	1	15	15	Sp al	0	100	0	100					075		
10/22/2004	5	1A	10	10	Sp al	0	100	0	100					075		
10/22/2004	5	2	40	40	Sp al	0	100	0	100					076		
10/22/2004	5	2A	40	40	Sp al	0	100	0	100					076		
10/22/2004	5	3	45	44	Sp al	0	100	0	100					077		
10/22/2004	5	3	45	1	Av ge	0	100	0	100					077		
10/22/2004	5	3A	35	35	Sp al	0	100	0	100					077		
10/22/2004	5	4	100	50	Av ge	0	100	0	100					078		
10/22/2004	5	4	100	50	La ra	0	100	0	100					078		
10/22/2004	5	4A	100	50	Av ge	0	100	0	100					078		
10/22/2004	5	4A	100	50	La ra	0	100	0	100					078		

Date	Transect	Quadrat	Total Cover %	% Cover by species	Species	% leaves never dropped	% defoliated not dead	% defoliated presumed dead	% initial cover loss	Regrowth % leaf	Regrowth % culms	Height Trees (est'd ft)	DBH Trees (cm)	GPS	T0 Damage Assessment - 10/12/04 & later	T3 Damage Assessment - 12/01/04 & later
10/22/2004	6	1	2	1	Av ge	0	0	100	100			15		079		
10/22/2004	6	1	2	1	La ra	0	0	0	100			15		079		
10/22/2004	6	1A	5	5	Av ge	0	0	100	100			15		079		
10/22/2004	6	2	15	15	Av ge	0	0	100	100			15		080		
10/22/2004	6	2A	75	75	La ra	0	100	0	100			15	3.67	080		
10/22/2004	6	3	100	100	La ra	0	100	0	100			15	6.37	081		
10/22/2004	6	3A	100	100	La ra	0	100	0	100			15	6.79	081		
10/22/2004	6	4	100	100	La ra	0	100	0	100			15	3.25	082		
10/22/2004	6	4A	100	100	La ra	0	100	0	100			15	3.5	082		
10/22/2004	6	5	100	100	La ra	0	100	0	100			15	6.93	083		
10/22/2004	6	5A	100	100	La ra	0	100	0	100			15	1.08	083		
10/22/2004	6	6	100	100	La ra	0	100	0	100			15	0.95	084		
10/22/2004	6	6A	100	100	La ra	100	100	0	100			15		084		
10/14/2004	7	1	100	100	Di sp	100	0	0	0					039		
10/14/2004	7	1A	100	100	Di sp	100	0	0	0					039		
10/14/2004	7	2	100	100	Di sp	100	0	0	0					040		
10/14/2004	7	2A	100	100	Di sp	100	0	0	0					040		
10/14/2004	7	3	100	100	Ju ro	100	0	0	0					041		
10/14/2004	7	3A	100	100	Ju ro	100	0	0	0					041		
10/14/2004	7	4	100	100	Ju ro	100	0	0	0					042		
10/14/2004	7	4A	100	100	Ju ro	100	0	0	0					042		
10/14/2004	7	5	100	100	Ju ro	100	0	0	0					043		
10/14/2004	7	5A	100	100	Ju ro	100	0	0	0					043		
10/14/2004	7	6	100	100	Ju ro	100	0	0	0					044		
10/14/2004	7	6A	100	98	Ju ro	100	0	0	0					044	numerous La ra seedlings 3-6 inches tall under Ju ro	
10/14/2004	7	6A	100	2	La ra	100	0	0	0					044		
10/14/2004	7	7	85	80	Ju ro	100	0	0	0					045		
10/14/2004	7	7	85	5	La ra	100	0	0	0					045		
10/14/2004	7	7A	40	20	La ra	100	0	0	0					045		
10/14/2004	7	7A	40	20	Ju ro	100	0	0	0					045	thick mud with numerouse dead Spartina culms, not from discharge, prob. seasonal.	
10/14/2004	8	1	100	95	La ra	100	0	0	0			8	1.27	047	measured to the s; thick deep mud within transect	
10/14/2004	8	1	100	5	Ju ro	100	0	0	0					047		
10/14/2004	8	1A	100	100	La ra	100	0	0	0			8	1.27	047		
10/14/2004	8	2	100	80	La ra	100	0	0	0			8	1.27	048		
10/14/2004	8	2A	100	100	La ra	100	0	0	0			8	1.27	048		
10/14/2004	8	3	100	100	La ra	100	0	0	0			8	1.27	049		
10/14/2004	8	3A	100	100	La ra	100	0	0	0			8	1.27	049		
10/14/2004	8	4	100	15	Av ge	100	0	0	0			8	1.27	050		

Date	Transect	Quadrat	Total Cover %	% Cover by species	Species	% leaves never dropped	% defoliated not dead	% defoliated presumed dead	% initial cover loss	Regrowth % leaf	Regrowth % culms	Height Trees (est'd ft)	DBH Trees (cm)	GPS	T0 Damage Assessment - 10/12/04 & later	T3 Damage Assessment - 12/01/04 & later
10/14/2004	8	4	100	85	La ra	100	0	0	0			8	1.27	050		
10/14/2004	8	4A	100	100	La ra	100	0	0	0			8	1.27	050		
10/14/2004	8	5	100	100	La ra	100	0	0	0			8	1.27	051		
10/14/2004	8	5A	95	100	La ra	100	0	0	0			8	1.27	051	numerous seedlings 4-6" tall	
10/13/2004	9	1	95	95	La ra	10	90		90					033		
10/13/2004	9	1	95	5	Sp al	10	90		90					033		
10/13/2004	9	1A	100	95	La ra	10	90		90					033		
10/13/2004	9	1A	100	5	Sp al	10	90		90					033		
10/13/2004	9	2	100	100	Ju ro	50	20		30					034		
10/13/2004	9	2A	100	100	Ju ro	50	20		30					034		
10/13/2004	9	3	100	60	Ju ro	20	50		80					035		
10/13/2004	9	3	100	40	Sp al	20	50		80					035		
10/13/2004	9	3A	100	70	Ju ro	30	70		70					035		
10/13/2004	9	3A	100	30	Sp al	30	70		70					035		
10/13/2004	9	4	95	95	Sp al	0	100		100					036		
10/13/2004	9	4A	80	95	Sp al	0	100		100					036		
10/13/2004	9	5	80	60	Di sp	0	100		100					037		
10/13/2004	9	5	100	20	Sp al	0	100		100					037		
10/13/2004	9	5A	100	50	Di sp	0	100		100					037		
10/13/2004	9	5A	100	50	Sp al	0	100		100					037		
10/13/2004	9	6	100	no data	no data	no data	no data	no data	no data	no data	no data	no data	no data	038	canal spoil with Lantana camara, Opuntia stricta, Eupatorium capillifolium, Foresteria floridana, grass (no ID).	
10/12/2004	10	1	25	25	Sp al	0	100	0	100					001		
10/12/2004	10	1A	25	25	Sp al	0	100	0	100					001		
10/12/2004	10	2	100	100	Di sp	1	100	0	100					002		
10/12/2004	10	2A	100	100	Di sp	1	100	0	100					002		
10/12/2004	10	3	100	100	Di sp	0	100	0	100					003		
10/12/2004	10	3A	100	100	Di sp	0	100	0	100					003		
10/12/2004	10	4	100	100	Di sp	1	100	0	100					004		
10/12/2004	10	4A	100	100	Di sp	1	100	0	100					004		
10/12/2004	10	5	100	100	Di sp	1	100	0	100					005		
10/12/2004	10	5A	100	100	Di sp	1	100	0	100					005		
10/12/2004	10	6	100	100	Di sp	0	100	0	100					006		
10/12/2004	10	6A	100	100	Di sp	0	100	0	100					006		
10/12/2004	10	7	100	100	Di sp	0	100	0	100					007		
10/12/2004	10	7A	100	100	Di sp	0	100	0	100					007		
10/12/2004	10	8	35	35	Di sp	0	100	0	100					008		
10/12/2004	10	8A	35	35	Di sp	0	100	0	100					008		
10/12/2004	10	9	100	100	Ju ro	5	100	0	95					009		

Date	Transect	Quadrat	Total Cover %	% Cover by species	Species	% leaves never dropped	% defoliated not dead	% defoliated presumed dead	% initial cover loss	Regrowth % leaf	Regrowth % culms	Height Trees (est'd ft)	DBH Trees (cm)	GPS	T0 Damage Assessment - 10/12/04 & later	T3 Damage Assessment - 12/01/04 & later
10/12/2004	10	9A	100	100	Ju ro	5	100	0	95					009		
10/12/2004	10	10	100	15	Ju ro	10	90	10	90					010		
10/12/2004	10	10	100	85	Di sp	10	90	10	90					010		
10/12/2004	10	10A	100	15	Ju ro	10	90	10	90					010		
10/12/2004	10	10A	100	85	Di sp	10	90	10	90					010		
10/12/2004	10	11	100	100	Sp al	0	100	0	100					011		
10/12/2004	10	11A	100	100	Sp al	0	100	0	100					011		
10/12/2004	10	12	95	90	La ra	0	100	0	100					012		
10/12/2004	10	12	95	5	Sp al	0	100	0	100					012		
10/12/2004	10	12A	95	90	La ra	0	100	0	100					012		
10/12/2004	10	12A	95	5	Sp al	0	100	0	100					012		
10/12/2004	10	13	100	100	Di sp	25	95	25	75					013	Numerous dead La ra seedling 6-12" tall, w 4-8 leaf pairs, heavily covered w grey powder	
10/12/2004	10	13A	100	100	Di sp	25	95	25	75					013		
10/18/2004	11	1	100	100	La ra	0	100	0	100					060	numerous new crop of La ra seedlings 4-6" tall, vigorous, lightly covered w grey powder	
10/18/2004	11	1A	100	100	La ra	0	100	0	100					060		
10/18/2004	11	2	100	78	Di sp	0	100	0	100					061	common La ra seedlings in s half of quadrat, mixed with sparse pneumatophores	
10/18/2004	11	2	100	22	La ra	0	100	0	100					061		
10/18/2004	11	2A	50	50	La ra	0	100	0	100					061		
10/18/2004	11	3	100	100	Di sp	0	100	0	100					062		
10/18/2004	11	3A	100	100	Di sp	0	100	0	100					062		
10/18/2004	11	4	100	70	La ra	0	100	0	100					063		
10/18/2004	11	4	100	30	Di sp	0	100	0	100					063		
10/18/2004	11	4A	100	30	La ra	0	100	0	100					063		
10/18/2004	11	4A	100	20	Sp al	0	100	0	100					063		
10/18/2004	11	4A	100	50	Di sp	0	100	0	100					063		
10/18/2004	11	5	50	35	Di sp	0	100	0	100					064		
10/18/2004	11	5	50	15	La ra	0	100	0	100					064		
10/18/2004	11	5A	100	100	La ra	0	100	0	100					064	uncommon pneumatophores, uncommon La ra seedlings	
10/18/2004	11	6	100	100	La ra	0	100	0	100			8	1.27	065		
10/18/2004	11	6A	100	100	La ra	0	100	0	100			8	1.27	065	do not enter quadrat, unsafe, soft mucky mud, grey powder on veg to 25 cm	

Date	Transect	Quadrat	Total Cover %	% Cover by species	Species	% leaves never dropped	% defoliated not dead	% defoliated presumed dead	% initial cover loss	Regrowth % leaf	Regrowth % culms	Height Trees (est'd ft)	DBH Trees (cm)	GPS	T0 Damage Assessment - 10/12/04 & later	T3 Damage Assessment - 12/01/04 & later
10/18/2004	12	1	100	100	La ra	100	100	0	100			8	1.27	052	seedlings covered with grey powder	
10/18/2004	12	1A	100	100	La ra	100	100	0	100			8	1.27	052	seedlings covered with grey powder	
10/18/2004	12	1B	100	100	La ra	10	90	0	90			8	1.27	059	seedlings covered with grey powder	
10/18/2004	12	1C	100	100	La ra	10	90	0	90			8	1.27	059	seedlings covered with grey powder	
10/18/2004	12	2	100	70	La ra	100	100	0	100			8	1.27	053	seedlings covered with grey powder	
10/18/2004	12	2	100	10	Di sp	100	100	0	100					053	seedlings covered with grey powder	
10/18/2004	12	2A	80	65	La ra	0	90	10	100			8	1.27	053		
10/18/2004	12	2A	80	1	Av ge	0	90	10	100			8	1.27	053		
10/18/2004	12	2A	80	14	Di sp	0	90	10	100					053		
10/18/2004	12	3	100	100	Di sp	0	100	0	100					054		
10/18/2004	12	3A	100	85	Di sp	0	100	0	100					054		
10/18/2004	12	3A	100	15	La ra	0	100	0	100					054		
10/18/2004	12	4	100	100	Di sp	0	100	0	100					055		
10/18/2004	12	4A	100	100	Di sp	0	100	0	100					055		
10/18/2004	12	5	100	100	Di sp	0	100	0	100					056		
10/18/2004	12	5A	100	100	Di sp	0	100	0	100					056		
10/18/2004	12	6	100	100	Di sp	0	100	0	100					057		
10/18/2004	12	6A	100	100	Di sp	0	100	0	100					057		
10/18/2004	12	7	100	100	Di sp	0	100	0	100					058		
10/18/2004	12	7A	100	100	Di sp	0	100	0	100					058		
10/12/2004	13	1	70	30	La ra	60	15	0	15		30		1.27	01		
10/12/2004	13	1	70	40	Sc te	0	0	100	100		0			01		
10/12/2004	13	1A	70	30	La ra	60	15	0	15		30		1.27	01		
10/12/2004	13	1A	70	40	Sc te	0	0	100	100		0			01		
10/12/2004	13	2	55	55	La ra	5	10	40	100		30		1.27	02		
10/12/2004	13	2A	55	55	La ra	5	10	40	100		30		1.27	02		
10/12/2004	13	3	100	70	La ra	30	40	0	95		30		1.27	03		
10/12/2004	13	3	100	3	Ba ma	50	100	50	100		20			03		
10/12/2004	13	3	100	30	Ju ro	10	100	0	100		20			03		
10/12/2004	13	3A	100	70	La ra	30	40	0	95		30		1.27	03		
10/12/2004	13	3A	100	3	Ba ma	50	100	50	100		20			03		
10/12/2004	13	3A	100	30	Ju ro	10	100	0	100		20			03		
10/12/2004	13	4	100	100	La ra	0	100	50	100		20		1.27	04		
10/12/2004	13	4A	100	100	La ra	0	100	50	100		20		1.27	04		
10/12/2004	13	5	100	100	La ra	100	50	0	100		10		1.27	05		
10/12/2004	13	5A	100	100	La ra	100	50	0	100		10		1.27	05		
10/12/2004	13	6	100	70	Sp al	100	100	0	100		0			06		

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Date	Transect	Quadrat	Total Cover %	% Cover by species	Species	% leaves never dropped	% defoliated not dead	% defoliated presumed dead	% initial cover loss	Regrowth % leaf	Regrowth % culms	Height Trees (est'd ft)	DBH Trees (cm)	GPS	T0 Damage Assessment - 10/12/04 & later	T3 Damage Assessment - 12/01/04 & later
10/12/2004	13	6	100	30	La ra	0	100	0	100		0		1.27	06		
10/12/2004	13	6A	100	70	Sp al	100	100	0	100		0			06		
10/12/2004	13	6A	100	30	La ra	0	100	0	100		0		1.27	06		
10/12/2004	13	7	80	40	Sp al	0	80	0	100		0			07		
10/12/2004	13	7	80	40	La ra	0	80	0	100		0		1.27	07		
10/12/2004	13	7A	80	40	Sp al	0	80	0	100		0			07		
10/12/2004	13	7A	80	40	La ra	0	80	0	100		0		1.27	07		
10/12/2004	13	8	50	50	Sp al	0	100	0	100		0			08		
10/12/2004	13	8A	50	50	Sp al	0	100	0	100		0			08		
10/12/2004	13	9	100	100	La ra	0	100	0	100		25		1.27	09		
10/12/2004	13	9A	100	100	La ra	0	100	0	100		25		1.27	09		
10/12/2004	13	10	100	50	Ju ro	0	20	0	100		0			10		
10/12/2004	13	10	100	20	Ba ha	0	20	0	100		0			10		
10/12/2004	13	10	100	5	Vi ro	0	20	0	100		0			10		
10/12/2004	13	10	100	10	Spor. sp	0	20	0	100		0			10		
10/12/2004	13	10A	100	50	Ju ro	0	20	0	100		0			10		
10/12/2004	13	10A	100	20	Ba ha	0	20	0	100		0			10		
10/12/2004	13	10A	100	5	Vi ro	0	20	0	100		0			10		
10/12/2004	13	10A	100	10	Spor. sp	0	20	0	100		0			10		
10/12/2004	13	11	63	15	Qu la	10	38	0	95		0			11		
10/12/2004	13	11	63	25	Vi ro	10	38	0	95		0			11		
10/12/2004	13	11	63	3	Se re	10	38	0	95		0			11	95% dieback - exhibited after 6 weeks	
10/12/2004	13	11	63	20	Spor. sp	10	38	0	95		0			11		
10/12/2004	13	11A	63	15	Qu la	10	38	0	95		0			11		
10/12/2004	13	11A	63	25	Vi ro	10	38	0	95		0			11		
10/12/2004	13	11A	63	3	Se re	10	38	0	95		0			11		
10/12/2004	13	11A	63	20	Spor. sp	10	38	0	95		0			11		
10/22/2004	14	1	85	85	Sp al	0	100	0	100		50			085		
10/22/2004	14	1A	90	90	Sp al	0	100	0	100		50			085		
10/22/2004	14	2	80	80	Sp al	0	100	0	100		50			086		
10/22/2004	14	2A	80	80	Sp al	0	100	0	100		50			086		
10/22/2004	14	3	0	0	mud	0	100	0	0		50			087		
10/22/2004	14	3A	1	1	Sp al	0	100	0	100		50			087		
10/22/2004	14	4	75	75	Sp al	0	100	0	100		50			088		
10/22/2004	14	4A	100	100	Sp al	0	100	0	100		50			088		
10/22/2004	14	5	10	10	Sp al	0	100	100	100		50			089		
10/22/2004	14	5A	25	25	Sp al	0	100	0	100		50			089		
10/22/2004	14	6	25	25	Sp al	0	100	0	100		50			090		
10/22/2004	14	6A	35	35	Sp al	0	100	0	100		50			090		
10/22/2004	15	1	35	35	Sp al	0	0	100	100		50			091		
10/22/2004	15	1A	35	35	Sp al	0	0	100	100		50			091		
10/22/2004	15	2	0	0	sand	0	0	0	0					092		

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10/22/2004	15	2A	0	0	sand	0	0	0	0					092		
10/22/2004	15	3	100	100	La ra	0	0	0	0					093		
10/22/2004	15	3A	100	100	La ra	0	0	0	0					093		

Avicennia germinans	Nostoc	Nostoc-type surface algal mat	sand	sand substrate
Batis maritima	Qu la	Quercus laurifolia	mud	mud substrate
Baccharis halimifolia	Rh ma	Rhizophora mangle		
Distichlis spicata	Sc te	Schinus terebinthifolius		
Juncus roemerianus	Sp al	Spartina alterniflora		
Laguncularia racemosa	Vi ro	Vitus rotundifolia		

GPS notation: Transect 13 is the only one we used the gps 3 on and I recorded its numbers with two digits (01-13) All the rest were taken with the map76 and all of those numbers are three digits (001-093).