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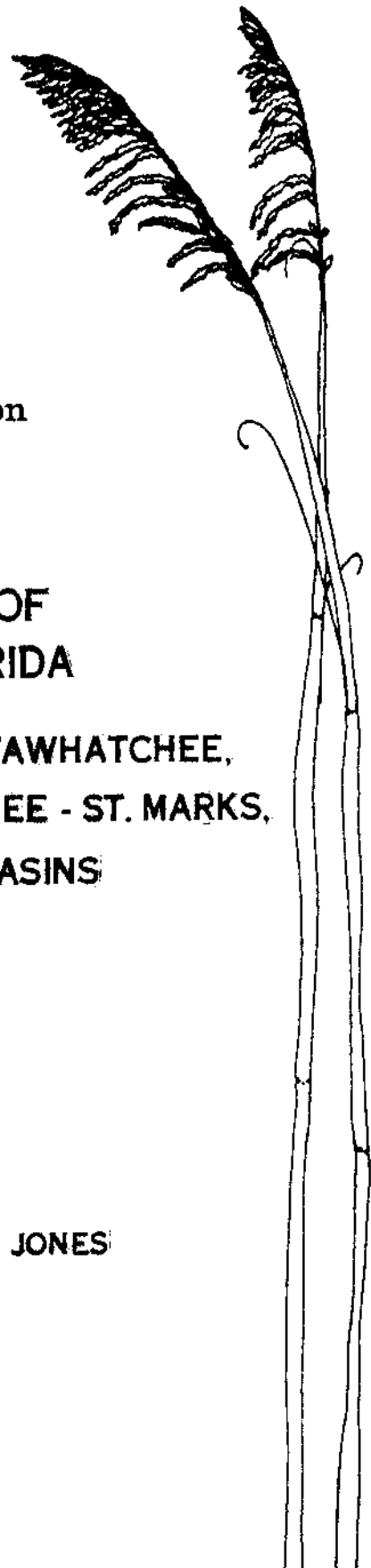
December 1979

State of Florida
Department of
Environmental Regulation

**BIOLOGICAL ASPECTS OF
WATER QUALITY IN FLORIDA**

**PART I: ESCAMBIA - PERDIDO, CHOCTAWHATCHEE,
APALACHICOLA, AUCILLA - OCHLOCKONEE - ST. MARKS,
AND SUWANNEE DRAINAGE BASINS**

**EDITED BY
LANDON T. ROSS AND DOUGLAS A. JONES**



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BIOLOGICAL ASPECTS OF WATER QUALITY
IN FLORIDA

(Part I: Escambia-Perdido, Choctawhatchee,
Apalachicola, Aucilla-Ochlockonee-St. Marks,
and Suwannee Drainage Basins)

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INTRODUCTION

Section 106 of the Clean Water Act of 1972 (PL 92-500) requires each state to monitor the quality of its surface waters. In accordance with this, the Florida Department of Environmental Regulation (FDER) - then the Department of Pollution Control - established the Permanent Network system (PNS), a part of which is the Biological Monitoring Program. The main objectives of the PNS are to measure ambient water quality, to detect trends in water quality, and to determine the general efficacy of pollution abatement programs. It is not a point-source monitoring program focused on specific dischargers or pollutants.

This report has three major goals: 1) to characterize water quality in the monitored waters of Florida; 2) to assess trends in the water quality of Florida, where data are sufficient; and 3) to make available to the public the data collected during the first five years of the PNS Biological Monitoring Program. The large number of data handled in this report makes comprehensive analysis of the data difficult. Present plans are to update this data summary periodically and to focus more on cause and effect relationships as the base grows and as data manipulation becomes less cumbersome.

EXECUTIVE SUMMARY

The intent of this report is to characterize water quality in Florida as expressed by biological indicators monitored by the Department of Environmental Regulation (DER), and to identify changes in water quality which have taken place since these parameters were first monitored. In the sections below, the State has been divided into four geographic areas: northwest, east, west-central, and south. Trends in these regions will be discussed, as will general biological community status in each drainage basin within a region.

The data used in this report were acquired during the first five years (1973-78) of operation of the DER's permanent network monitoring system. Bacteria, algae, and macroinvertebrates were all examined, to varying extents, but the greatest amount of effort was devoted to the latter group of organisms, which are particularly useful in characterizing water quality and in detecting long-term changes. For this reason, the conclusions in the following summary discussion depend, to a considerable degree, upon variations found in three different measures of the quality of the macroinvertebrate community: artificial substrate diversity, natural substrate diversity and the Biotic Index. Of course, all aspects of the biology of the areas studied, including both measured values and observed characteristics, have been utilized in preparing this report.

Included in the report are data pertaining to some 250 monitoring stations, of which about 74 have been studied in considerable detail. Statistical analyses were performed on macroinvertebrate data from the smaller group of stations to determine the amount and type of change which has occurred in the State during the course of our monitoring efforts.

Some cause for optimism, taking the State in its entirety, is apparent upon reviewing the trends which have been determined. Of the 72 stations analyzed in detail, only 14% exhibited a significant downward trend in macroinvertebrate community health. Of the remaining stations, approximately 38% displayed improvement, 41% showed no significant trend, and 8% had conflicting trends in their data.

The northwest region of the State includes the Escambia-Perdido, Choctawhatchee, Apalachicola, Aucilla-Ochlockonee-St. Marks, and Suwannee Drainage Basins. Of the sixteen sampling stations analyzed for trends in the region, eleven displayed significant improvement, four had no trend, and one showed a decline. One or two of the improvements at stations on the Apalachicola River may have been due to changes in sampling strategy rather than water quality changes. Also, a significant decline in Choctawhatchee Bay may have been caused by

increasing development in the Ft. Walton Beach/Destin area. Other changes in the region were not readily correlated with a specific cause.

The Escambia River had good macroinvertebrate diversity in its upper reaches in Florida, but less impressive numbers downstream, due to natural estuarine stresses as well as runoff and industrial wastes. The Yellow, Shoal, and Blackwater Rivers and Coldwater Creek had good or very good macroinvertebrate diversities. East Bay and Escambia Bay had relatively low diversities, due to natural estuarine stresses and to domestic and industrial waste discharges. The Perdido River had a healthy macroinvertebrate community but Perdido Bay's diversity was somewhat low due to various pollution sources in the area.

The tributaries to Choctawhatchee Bay - Holmes Creek, Choctawhatchee River, and Lafayette Creek - had generally good macroinvertebrate diversities. High flow occasionally scoured the stream bed in the Choctawhatchee River, causing lowered diversity. Sampling stations on Choctawhatchee Bay indicated fairly healthy biotic communities, but the area may have been somewhat stressed due to urban development in the vicinity of Ft. Walton Beach. The upper portions of St. Andrews Bay had fairly good diversities, but the lower portions of the bay and nearby coastal areas - Santa Rosa Sound and St. Josephs Bay - had better diversities.

The Apalachicola River, below the Jim Woodruff Dam, and Apalachicola Bay had good diversity, as did Lake Wimico and the Brothers River. The lesser diversity on Lake Seminole and the Chattahoochee River, above the dam, may reflect pollution impacts from Georgia and Alabama. The Chipola River and Juniper Creek evidently had diverse, healthy macroinvertebrate communities. Flow variations had a significant effect on the stream biota in this area and throughout the Florida panhandle.

The St. Marks and Aucilla Rivers appeared to have very healthy macroinvertebrate communities. The Ochlockonee, Econfinia, and Steinhatchee Rivers had generally good macroinvertebrate diversities, but were less impressive than the St. Marks and Aucilla. Conversely, the Fenholloway River biota were severely stressed, primarily due to poorly treated wastes from the Buckeye Cellulose Corporation.

The Suwannee River had good macroinvertebrate diversity along its length. Streambed scouring caused considerable variation in community composition. The Santa Fe River had fairly good diversity in its upper reaches but, nevertheless, improved downstream. This was probably due to clean water inflow from the New River, Olustee Creek, and the Ichetucknee River.

The eastern region includes the Nassau-St. Marys, St. Johns and East Coast Drainage Basins. Twenty sampling stations in this region were analyzed for trends. Six of these showed improvement during the report period, nine had no trend, three displayed a decline, and two had inconclusive data. Two stations on the Oklawaha River may have shown improvement as a result of recolonization of the area following channel dredging. The continuing eutrophication of Lake Apopka was probably reflected in the significant decline at that station. Domestic wastes and urban runoff may have contributed to the slight decline of the macroinvertebrate community on the Indian River near Merritt Island. On the St. Johns River, at Lake Washington, the exotic clam, Corbicula manilensis, may be out-competing other organisms in the community and, thus, causing reduced diversity. Other trends were not attributed to any specific causes at the present level of analysis.

The St. Marys River had good macroinvertebrate diversity, although natural estuarine stresses depressed diversity somewhat in the lower reaches. At the Nassau River sampling station, macroinvertebrates were also subject to estuarine stresses, which made characterization difficult. The Amelia River had some areas of degraded macroinvertebrate communities and high bacteria concentrations due to pollution from Fernandina Beach sewage effluent.

Generally, the upper St. Johns River had fairly healthy macroinvertebrate communities along its length, with diversity slightly higher above the Orlando metropolitan area than below. Bodies of water in the Orlando area which apparently had degraded biotic communities, due to various combinations of domestic and citrus wastes and muck farming, include the Econlockhatchee River, Little Wekiva River, and Lake Jessup.

The Apopka Chain of Lakes showed signs of eutrophy in depressed macroinvertebrate diversities and nuisance growths of various aquatic plants and algae. Muck farming practices and resultant over-enrichment were the primary cause of these problems. The Oklawaha River biota apparently were harmed by dredging for stream channelization through habitat loss and siltation. However, water quality was better downstream from the Silver Run confluence than upstream.

The lower St. Johns River had fairly good macroinvertebrate diversity along its length except for the portion flowing through Jacksonville, which has been severely degraded by domestic and industrial wastes and urban runoff. Just upstream from Jacksonville, Doctors Lake also had low macroinvertebrate diversity, at least partially due to sewage effluent and urban runoff.

Several stations were sampled in the estuarine rivers along the east-central coast of Florida and most had generally good or very good macroinvertebrate diversities. They included the Tolomato, Matanzas, Indian, and Banana Rivers.

In the west-central region, including the Withlacoochee, Tampa Bay, Peace, and Kissimmee Drainage Basins, data from 24 sampling stations were analyzed for possible trends. Of these stations, five exhibited a significant improvement, eleven displayed no trend, four showed a decline, and four had conflicting trend data. An upward trend in Hillsborough Bay macroinvertebrate diversity was not necessarily tied to any pollution abatement measure in a cause and effect relationship, but among possible positive influences were improvements in waste treatment by the Le Gardiner phosphate products plant and a decrease in shell dredging operations in the vicinity of the station during the report period. The effects of nutrient and organic loads from pasture and dairy runoff, as well as streambed dredging, were apparently reflected in declining diversity numbers in Taylor Creek which flows into Lake Okeechobee. Probable explanations for other trends were not readily apparent.

Water quality along the length of the Withlacoochee River appeared to be good according to biological data. Flow variation sometimes has a marked impact on the biota in portions of this river. The Waccasassa River appeared to have fairly good macroinvertebrate diversity for a coastal swamp drainage.

The Homosassa, Weeki Wachee, and Pithlachascotee Rivers had generally good macroinvertebrate diversities based upon the data. Variation occurred, but was probably due to natural effects (e.g., spring water influence, salinity variation). The Hillsborough River had somewhat better water quality in its upper reaches than those areas downstream near Tampa, according to biological data. High total coliform concentrations, due to runoff, were often noted. The South Prong of the Alafia River had a fairly healthy macroinvertebrate community, whereas the North Prong had variable diversity which was generally not as good. Below the confluence of the two forks, the macroinvertebrate community was fairly healthy. Runoff apparently caused high total coliform counts in this river, too. The Manatee River had a fairly good macroinvertebrate diversity. The Tampa Bay system biota were healthiest in undeveloped areas, such as Bishop's Harbor, and most stressed in heavily developed areas, such as Hillsborough Bay. West-central Florida Gulf coastal areas generally had healthy biotic communities.

In the upper portion of the Peace River Sub-basin, the Polk County lakes which were sampled, as a group, had fair macroinvertebrate diversity. Most of these had been exposed to domestic and/or citrus processing wastes. Biological data from sampling stations on the Peace River and several of its tributaries - Little Payne Creek, Payne Creek, Troublesome Creek, Charlie Creek, Joshua Creek, Horse Creek and

Shell Creek - reflected water quality that generally was in the range of good to very good. The Myakka River also was found to have very good macroinvertebrate diversity. Charlotte Harbor and Matlacha Pass had good diversities, and Pine Island Sound was in even better condition, probably due to greater Gulf influences.

In the upper and middle parts of the Kissimmee Drainage Basin, several of the lakes monitored had good or very good macroinvertebrate diversities. These included Lakes Butler, Marion (Polk County), Hatchineha, Weohyakapka, Arbuckle, East Lake Tohopekaliga, and Crooked Lake. Lakes Tohopekaliga, Kissimmee, and Reedy had biotic communities which were degraded to various degrees. The contributing influences included domestic and citrus processing wastes and pasture runoff. The Kissimmee River, which is extensively channelized, had good macroinvertebrate diversity but Biotic Index numbers were low, indicating low-dissolved oxygen problems. This pattern was evident in many canals in south Florida. Generally, the tributaries to the Kissimmee River and Lake Okeechobee - Carter Creek, Arbuckle Creek, and Fisheating Creek - had good or very good diversities. An exception to this was Taylor Creek, which is channelized and receives nutrient and highly organic runoff.

The southern region of the state consists of only the Lower Florida Drainage Basin. Of the fourteen trend analysis stations, six showed improvement, six had no trend, and two exhibited a significant decline. A decline in macroinvertebrate diversity at the sampling station at the lower end of Miami Canal was probably due to the cumulative effects of agricultural runoff and sewage effluent. A significant improvement in the diversity in north Biscayne Bay was apparently related to discontinuation of a sewage outfall there in the late-1960's. Other changes were not directly related to specific causes.

Macroinvertebrate diversity in Lake Okeechobee ranged from fair to good at the three stations sampled. Generally, the channelized portion of the Caloosahatchee River and all of the water management canals monitored in south Florida - Miami, North New River, Hillsborough, West Palm Beach, St. Lucie, and Tamiami Canals - exhibited the canal pattern described above in reference to the Kissimmee River. Macroinvertebrate diversity was good but Biotic Index numbers indicated stressed biota due to oxygen deficiencies. Most of the marine influenced stations monitored in south Florida had very good or excellent diversities. These included Indian River, Loxahatchee River, Jupiter Sound, Lake Boca Raton, Biscayne Bay, Florida Bay, Chokoloskee Bay and the Straits of Florida. Relatively degraded biota were found at stations on Estero Bay, Naples Bay, and the New River. Runoff and other urban stresses may have influenced these stations.

METHODS

General

A comprehensive discussion of the utility of biological data in water pollution control programs is beyond the scope of this document. The texts of Hynes (1970) and Warren (1971) contain extensive treatments of the subject. Physico-chemical analyses of water quality provide instantaneous measurements of single parameters in the system. Numerous analyses are required to characterize the water quality of a water body. Conversely, biological data average the combined effects of the variations in these factors over time. Furthermore, biological monitoring is focused directly on the aquatic communities which the pollution control statutes were enacted to protect.

The analyses included in the PNS Biological Monitoring Program involve benthic and littoral macroinvertebrates, phytoplankton, periphyton, macrophytes, total and fecal coliforms, and sediment grain size and percent organic content. The methods are based, primarily, on those suggested by the Environmental Protection Agency guidelines for Section 106 monitoring. Each method provides valuable information regarding a segment of the aquatic community.

An idealized comprehensive monitoring program would sample an array of ecological factors not included here. However, the methods used by the Department must be the most cost- and time-effective available and some compromises must be accepted. Therefore, the majority of the program's effort is concentrated on the most useful analyses - those for macroinvertebrates. These organisms (mainly worms, insects, and mollusks), although inconspicuous to a casual observer, are relatively large and long-lived and tend to remain in a localized area during their lifetimes. Fish are larger and more visible, but their mobility precludes definite knowledge of the environmental factors to which they have been exposed. Because the macroinvertebrates are much less mobile, the numbers and kinds of these animals living in an area will reflect the variations in water quality conditions during the preceding months.

Macroinvertebrate data may be analyzed by using qualitative or quantitative methods. The qualitative method used by the FDER is based on the Biotic Index of Beck (1969). The method is applicable to freshwaters of Florida, primarily the flowing ones, for detecting organic pollution and concomitant oxygen deficiencies. Macroinvertebrates are collected and categorized as intolerant (Class I) or moderately tolerant (Class II) of organic pollution. In 1977, the Florida Index was created when the Class I and Class II indicator organism lists were modified and expanded. (The term "Biotic Index", as used in this report, includes the Florida Index.) Each Class I species present is scored two points, while Class II forms are scored one point each. The points are then totaled. A value ranging from 0 to 80 or more is possible. Generally, values of 0 to 10 indicate organic pollution and low-dissolved oxygen problems, values of 10 to 20 indicate potential problems and values greater than 20 suggest the absence of organic pollution.

Due to the qualitative sampling method and the variety of stream and lake types in the state, comparisons between stations are not advisable and the Index should be considered better as an indicator of the presence of organic pollution (low values) than the absence of it (high values).

The quantitative methods used by the FDER are primarily indicators of community structure. The samples are collected using either artificial substrates of constant surface area or natural substrates obtained by using a standard sized dredge. The organisms collected are identified to, or at least sorted to, species and counted. These tallies are used to calculate the Shannon-Weaver diversity index (see below), a widely used indicator of community health and stability. In streams, values of less than 1.0 indicate poor community health; values of 1.0-3.0 indicate a fair to good community status; and values greater than 3.0 reflect a stable and diverse community (Wilhm and Dorris, 1968). Natural effects may cause lakes to have slightly lower values and marine areas to have higher values.

Station locations for water quality analysis sampling are located for maximum information yield from minimum effort. Variables affecting station location include the type of water body, the degree of development in the area, and the objectives of the program. All types of flowing and standing freshwaters and marine/estuarine waters are sampled in this program. In each of these categories of water bodies, variations in depth, flow rate, and sediment type can have marked impacts on sampling success and on the biota themselves. Therefore, care must be taken to avoid false impressions about water quality caused by natural variables. Finally, it is important to have continuous monitoring data from unpolluted representative stations for a variety of water body types to properly evaluate the impacts of pollutants on the various ecosystem types in the state.

There are approximately 250 stations included in the monitoring program. Approximately 75 of these are primary stations which are sampled for all analyses listed below at varying frequencies. The approximately 175 secondary stations are sampled only for macroinvertebrates, once per year. An example of the annual sampling scheduled is included (Table 1). Each year seasonal coverage is rotated.

Macroinvertebrates - General

Macroinvertebrates acceptable for this monitoring program are those retained by a U.S. Standard No. 30 sieve, excluding Cladocera, Copepoda, Ostracoda, Nematoda and Foraminifera. Also, insect pupae are not identified or counted for inclusion in monitoring reports. Colonial invertebrates are counted as colonial units according to the analyst's judgement. Individuals within a colony are not counted.

Table 1.

PARAMETER SAMPLING SCHEDULE: FY 79-80

Parameters	Primary Biological Stations			Secondary Stations
	Freshwater	Marine	Lakes	
Macroinvertebrates (Artificial Substrates)	Summer Winter	None	None	once annually*
Macroinvertebrates (Natural Substrates)	Summer, Fall Winter, Spring	Summer, Fall Winter, Spring	Fall Spring	once annually*
Macroinvertebrates (Qualitative)	Fall Spring	None	None	once annually*
Periphyton (Artificial Substrates)	Winter	Winter	Winter	
Plankton	None	Fall	Fall Spring	
Macrophytes (Areal Coverage)		Once Annually		
Bottom Sediments		Once Annually		
Fish and Clam Tissue (Toxicity)		Once Annually		

* Secondary Biological stations will be sampled once a year for one macroinvertebrate parameter - the choices listed above. The method used should be the one which will be most valuable in evaluating the body of water and should remain consistent at each station from year to year.

Macroinvertebrates - Artificial Substrates

Artificial substrates are put in place four weeks before other samples are taken. This is done early enough to ensure that recovery is during the appropriate quarter. Three EPA-modified Hester-Dendy artificial substrates are used at each station, suspended at mid-depth or at 1 meter, whichever is less. When retrieved, care is taken to avoid dislodging any organisms. Each substrate is placed in a separate container.

Macroinvertebrates are removed from the first substrate and counted. If the count is greater than 200, the remaining samples are discarded. Counts and identifications for each substrate are treated as a replicate and a composite is calculated from the totals. All composites include both numbers of organisms tallied and concentrations per square meter. The surface area of a metric EPA-modified Hester-Dendy artificial substrate is 0.126m^2 (Large disc diameter = 75mm).

Macroinvertebrates - Natural Substrates

A single grab sample is taken using either an Ekman dredge (soft substrates) or a Petite Ponar dredge (hard substrates), sieved (U.S. Standard No. 30) in the field, and an estimate made of the number of macroinvertebrates collected. If there are more than 200, the grab constitutes that station's sample. If the estimate is between 15 and 200, two more grabs are taken and treated as replicates. If less than 15 macroinvertebrates are collected in the first grab, additional grabs are taken until at least 15 organisms have accumulated to form the first replicate. Two more replicates are then collected, consisting of the same number of grabs as the first.

Identifications and counts are handled similarly to those for artificial substrates. The internal measurements of the dredge actually used for sampling is determined to establish the surface areas sampled per grab (approx. 0.024m^2).

Macroinvertebrates - Qualitative

This method is limited to the rivers and streams of Florida. Collection is primarily by D-frame nets although other apparatus, such as dredges, Surber samplers and corers, may be used. All habitats at a station are sampled, including submerged vegetation, hard substrates of all types (including internal examination of wood fragments or pieces of clay), and all sediment types. Field sorting is usually required to determine when sampling is complete. Sampling is usually adequate if no new species are found after about 10 minutes of sampling. Two to six hours may ultimately be required to fully cover a station.

The macroinvertebrates collected are identified, but not counted, and reported along with the Florida Index classes to which they belong. Classes I and II organisms, acceptable as of 19 April 1977,

are listed in Table 2. Taxa listed to species in the table must be identified to species to be used for calculation of the Florida Index. Taxa listed to genera should at least be sorted into species to calculate the index properly ($F.I. = (No. \text{ of spp. in Class I} \times 2) + (No. \text{ of spp. in Class II})$).

Periphyton

Samples are collected by suspending eight 25 x 75 mm microscope slides vertically approximately 15 cm from the surface for two weeks before other samples are taken. Four of the slides are used for identification and counts and four for biomass measurements.

Counts - Four slides are scraped with a razor blade and rubber spatula and the scrapings dispersed in a known volume (usually 10-100 ml) of distilled water. Preservation, if required, is with 5% buffered formalin. Samples are not stirred in a blender as suggested in the EPA's "Biological Field and Laboratory Methods", 1973, as this breaks up filaments and colonies.

Counts are made using the Sedgwick-Rafter strip count method. Unit counts, not cell counts, are made and reported for the following groups: coccoid blue-greens, filamentous blue-greens, coccoid greens, filamentous greens, green flagellates, other pigmented flagellates, centric diatoms, pennate diatoms and total live algae. Dead diatom frustules are not counted.

In the Cyanophyta, all non-filamentous genera are reported as coccoid. This includes non-filamentous colonies. In the Chlorophyta, genera that are not filamentous or flagellate are reported as coccoid. Counts are made and reported for all replicates, and on a separate composite sheet, in units per square centimeter.

Biomass - Four slides are scraped and the scraping suspended in the same manner as for counts. The sample is washed several times by centrifugation or settling to reduce interference by dissolved solids. After washing, it is concentrated by centrifugation or settling. To determine dry weight the concentrated sample is placed in a tared crucible and dried to a constant weight (approx. 24 hours) at 105°C. The crucible is then placed in a muffle furnace at 550°C for one hour, cooled, rewet with distilled water, and dried again at 105°C to obtain ash weight. The biomass (ash-free weight) of the sample is obtained by subtracting ash weight from dry weight and is reported in grams per square centimeter of substrate scraped.

Table 2

FLORIDA INDEXCLASS I

Plecoptera (all)
Stenonema exiguum
Stenonema smithae
Agrion (all species)
Argia (all species, approx. 8)
Boyeria (all species)
Hetaerina americana
Hetaerina titia
Macromia (all species)
Progomphus (all species)
Corydalis cornutus

Brachycentrus (all species)
Chimarra spp. (all species)
Hydropsyche (all species)
Hydroptila (all species)
Macronemum carolina
Oxyethira (all species)
Polycentropus (all species)

Simuliidae (all)*
Ablabesmyia aspera
Ablabesmyia mallochii
Ablabesmyia ornata
Ablabesmyia tarella = A. auriensis
Brillia par
Corynoneura (all species)
Cricotopus bicinctus

Eukiefferiella coerulescens
Eukiefferiella (all species)
Labrundinia floridana
Labrundinia johannseni
Labrundinia neopilosella
Labrundinia pilosella
Labrundinia virescens
Pentaneura inculta

Polypedilum fallax
Psectrocladius (all species)
Rheocricotopus robacki
Rheotanytarsus exiguus
Stenochironomus (all species)
Stictochironomus devinctus
Thienemanniella (all species)
Goniobasis (all species)

Class II

Asellus (all species)
Gammaridae (all species)
Palaemonetes paludosus
Gomphus (all species)
Neurocordulia (all species)
Stenonema integrum
Stenacron interpunctatum
Tricorythodes albilineatus
Cheumatopsyche (all species)
Leptocella (all species) = Nectopsyche
Oecetis (all species)

Ablabesmyia parajanta = A. janta
Ablabesmyia peleensis
Clinotanytus (all species)
Cricotopus (all species ex. C. bininctus)
Endochironomus nigricans
Larsia lurida
Polypedilum halterale
Polypedilum illinoense
Procladius (all species)

*Genera of these larvae may be difficult to identify.

Phytoplankton

Phytoplankton samples are collected only from marine/estuarine areas and lakes and not from streams, canals, or other flowing freshwaters.

A grab sample is taken from just below the water's surface (usually 0.3 - 0.5m) using a clean collecting device which has been rinsed (including drainage tube) with water from the same station. The sample bottle is cleaned with a laboratory detergent and rinsed thoroughly after each use. Generally, a 500 ml sample is ample, and dilutions may be appropriate for very dense phytoplankton populations.

If "live" analysis is planned, the sample bottle is kept away from light and thermal or physical shocks. There are several acceptable preservation methods (e.g. formalin, Lugol's solution, merthiolate) for algae. If formalin is used, it is neutralized to avoid cytolysis or morphological distortion.

Phytoplankton counts are done using the Sedgwick-Rafter strip count method. Unit counts, not cell counts, are used and reported to the same groups as for periphyton. Counts are reported in units per cubic centimeter. If sample concentration is appropriate this is done by sedimentation and/or centrifugation as described in "Standard Methods".

Macrophytes

This is not intended to be a comprehensive study of plant communities, but rather a rough map or chart depicting major species composition and areal coverage of the aquatic and wetland plants in the immediate vicinity of the sampling station.

Generally, in rivers, streams, etc., the area covered reaches about 100 meters upstream and downstream from the station. In lakes and marine/estuarine locations, an area extending 100 meters from the point on shore that is nearest to the station is sufficient. In lakes and marine/estuarine areas of less than 4 hectares, or 250 meters in diameter, the entire shoreline is mapped.

The types of communities recorded include immergent, emergent, floating, marsh and flood plain. The depth of some marsh communities may be estimated by stepping-off distances. Estimates for near shore communities may be made by using boat length as a unit of measure. Species which are not easily recognizable are recorded as "sp. 1" etc., with samples taken back to the laboratory for identification. Immergent vegetation in unclear waters are sampled with a device such as an Ekman dredge.

Sediment

Generally, an Ekman dredge is used to sample soft substrates and a Petite Ponar dredge for hard substrates. If the dredge does not close completely, and small particles are lost upon retrieval, the sample is discarded and another one taken. Triplicate samples are taken and results averaged to constitute a composite.

If a relatively undisturbed sample is obviously stratified, aliquots are taken from both layers and the two processed and reported separately. This is only done in exceptional cases; that is, a thin organic layer over an otherwise homogeneous sand bottom does not qualify. In such a case, a comment on the data sheet suffices.

Before removing an aliquot for analysis, the replicate is thoroughly mixed by hand to eliminate bias due to settling during transport to the laboratory. Periodically, a second aliquot from a replicate sample is processed to determine the efficacy of this mixing.

Laboratory Procedures

I. Particle Size

- a) The sample aliquots are spread evenly in drying pans and oven dried to constant weight (usually 12-24 hours).
- b) A convenient (for calculation purposes) amount of the dry sediment is accurately weighted out - not less than 25 grams. The remainder of the aliquot is saved for (II) below.
- c) Every 25 g. of sample is dispersed with 250 ml of distilled water and 10 ml of aqueous sodium hexametaphosphate (NaPO_3)₆ also known as Graham's Salt (6.2g/l). The sediment-dispersant mixture is agitated with a glass rod for 10-15 minutes, left overnight, and restirred before continuing the analysis (12-15 hr. later).
- d) The restirred sediment is washed onto a 62 μ (U.S. Standard No. 230) sieve positioned in a white enamel pan or basin containing enough water to cover the sieve surface. Silts and clays wash through as the sieve is agitated.
- e) The sieve and retained sands are oven dried at 105°C.
- f) After drying, any remaining silt-clay particles are eliminated by gentle shaking and brushing. The remaining sands fraction is weighted so that the silt clay percentage can be computed as described below.

- g) The entire sands fraction is washed through the nested graded sieves (see below for sizes).
- h) When washing is complete, the sediments and sieve are oven dried at 105°C, restacked and dry-sieved to ensure complete separation of any aggregates formed during wet-sieving.
- i) Each sieve is cleaned thoroughly and the trappings weighted.
- j) The sediment composition is computed (as % of dry weight) as follows:
 - 1) Silt-clay component = total sediment dry weight minus washed sands component (materials retained on the No. 230 sieve, following step f) dry weight - reported as < 63 μ .

The summated sand fractions' weights are compared to the splitting weight following step d. If there is a significant difference between the two, the summated value will generally provide the more accurate value for use in calculations.

- 2) Sand components = weight of material retained on nested sieves expressed as percentage of total dry weight.

2.0 mm - material retained on # 10 sieve
 0.5 - 2.0 mm = material retained on #35 sieve
 0.125 - 0.5 mm = material retained on #120 sieve
 0.063 - 0.125 mm = material retained on #230 sieve

II. Organic Fraction

- a) Another aliquot of not less than 25 g is weighted out and Placed in a tared crucible.
- b) The crucible is placed in a muffle furnace at 550°C for 4 hours.
- c) The crucible is removed, cooled and rewet with distilled water.
- d) The crucible is oven dried at 105°C and weighted again:

$$\frac{\text{Initial weight} - \text{final weight}}{\text{initial weight}} \times 100 = \% \text{ organics}$$

Bacteria

I. Sample Collection and Handling.

Detailed instructions on this subject are available on pages 875 through 1004 of Standard Methods for the Examination of Water and Wastewater, 14th Edition, (APNA, 1976).

- 1) Samples are maintained in wet ice while in transport. Once in the laboratory they are immediately processed. If a delay in processing cannot be avoided, samples are stored in refrigerators at 4°C. Samples are not frozen since freezing and subsequent thawing destroys the bacteria. In the case of delayed processing the storage period never exceeds eight hours from the time the sample was taken, at 4°C in the dark.

II. General Laboratory Practices.

Incubators (low and high temperature types) and water bath temperatures are checked and recorded daily. Water baths are cleaned periodically (depending on usage). Distilled water is preferred in these baths in order to prevent the accumulation of salt compounds (scale). Autoclaves are checked periodically for proper performance using spore strips. Autoclave tape is used at all times. pH meters are periodically checked with stock buffer. Temperature compensations are checked each time the meter is used.

Membrane filters used are 47 mm in diameter, 0.45 micron pore size and non-gas sterilized if possible. The petri dishes used are 50 x 12 mm in size. Pyrex or stainless steel filtration units are individually wrapped and sterilized. It is recommended that these units be kept under ultraviolet light between sample runs (if such uv units are available).

Dehydrated media are used routinely. If pre-prepared, the media is checked for the correct chemical reaction prior to usage (e.g., lactose fermentation by a confirmed E. coli species). All out-dated media are discarded. Buffered water or peptone dilution water is used whenever sample dilution is needed. Tap or plain distilled water is not used under any circumstances.

Buffered water is prepared using Potassium dihydrogen phosphate (KH_2PO_4) and distilled deionized water. pH is adjusted to 7.2 using 1.N (NaOH) and the buffer autoclaved for 15 minutes. Peptone dilution water is a sterile 0.5% peptone solution in distilled deionized water.

III. Bacterial Indicators

The Coliform Group

These are the aerobic and facultative anaerobic Gram-negative, nonspore-forming rod-shaped bacteria. They are lactose fermentors that produce gas within 48 hours at 35°C using the multiple tube fermentation method (MPN). If the membrane filter technique is used, the coliform group is then defined in the same fashion except that they produce dark colonies with a metallic sheen within 24 hours on an Endo type medium that contains lactose.

The Membrane Filter Method for Total Coliform

The single step direct technique, M-Endo broth or agar method, is followed. See pages 928-935 of Standard Methods for the Examination of Water and Wastewater, 14th Edition. General laboratory procedures for sample filtration, culture media and filter preparation are found on page 937-939. The following points are observed.

1. Sample volume selection, dilution and measurement are performed according to Standard Methods.
2. A minimum of three different volumes of each sample are analyzed.
3. Calculation of the coliform density is done according to Standard Methods pages 923-926.
4. Verification of the total coliform procedure can be done by colony description and Gram-Staining. If the laboratory is well equipped for determinative bacteriology, the colonies may be verified further by sugar fermentations.

The Membrane Filter Method For Fecal Coliforms

The procedures are described in Standard Methods on pages 928-948. The fecal coliform density is calculated from the quantities that produce 20-60 colony counts. Computations are then completed as in Section 909 A.6 of Standard Methods. Fecal coliform verification is a two step process. First, a presumptive colony is inoculated into lauryl tryptose broth. Second, upon gas production within 24 hours, a transfer to EC broth is made. After transfer, gas formation in 24 hours constitutes a confirmed fecal coliform.

Gram staining is also done for organism morphology and staining characteristics.

Calculation of the Indicator Densities from Membrane Filter Tests

The membrane bearing the acceptable number of colonies is selected. Colonies are counted and the density is computed according to the following formula.

$$\frac{\text{Number of indicator organisms}}{100 \text{ ml}} = \frac{\text{No. of indicator colonies}}{\text{Volume (ml) of sample filtered}} \times 100$$

Trends

To determine whether or not significant trends occur in the macro-invertebrate indicators used at primary stations, data for each of the methods employed - natural substrate diversity, artificial substrate diversity and Biotic Index - are plotted against time in a linear regression performed by computer analysis using the Statistical Package for the Social Sciences (SPSS). The sign of the slope of the regression line (i.e. positive or negative), the standard error of the slope, and the significance of the slope, are used to do this. If the regression line has a slope other than zero, the standard error can not change the sign of the slope, and the significance of the slope is ≤ 0.02 ($\geq 80\%$ confidence), then the trend, whatever the direction, is considered significant.

Four examples follow:

Slope	Standard Error	Significance	Comment
+0.010	± 0.005	0.05	Significant Improvement
-0.015	± 0.009	0.08	Significant Decline
+0.012	± 0.010	0.21	Not Significant
-0.018	± 0.019	0.19	Not Significant

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ESCAMBIA-PERDIDO DRAINAGE BASIN

The Escambia-Perdido drainage basin includes approximately 2600 square miles of the western Florida panhandle. Alabama bounds the basin on the north and west. Five rivers in the basin originate in Alabama and flow through estuaries to the Gulf of Mexico. Also, a sizable coastal area drains directly to Pensacola Bay, East Bay and Santa Rosa Sound. Four sub-basins are recognized in this area.

The main drainage in the basin is the Escambia River, which flows from Alabama to Escambia Bay. The Blackwater River flows southward through Florida from Alabama to Blackwater Bay. The Yellow River flows southward from Alabama and is augmented by the Shoal River five miles south of Crestview from whence it flows southwestward to Blackwater Bay. The Intra-coastal Waterway runs westward from Pensacola Bay to Perdido Bay. The Perdido River and Perdido Bay form the western boundary of Florida.

Perdido River Sub-Basin

Station 33.01.0001, Perdido River above the confluence with Brushy Creek was sampled qualitatively annually during the last three years of the report period for calculation of the Biotic Index. Each time the index indicated an absence of low dissolved oxygen problems. However, both total and fecal coliform standards for Class III waters were exceeded occasionally, especially in recent years. This was probably due to agricultural runoff.

All of the macroinvertebrate data at Station 33.01.0003, Perdido River at SR 184, indicate a significant improvement in that community during the report period. Zero diversity numbers in 1974 and 1975 for natural substrate samples were suspected of biasing this estimate of improvement, but re-analyzing the data without those values still resulted in an apparently significant increase in diversity. The zero diversities in question were calculated from samples taken in the river channel where shifting sand provides very little habitat for benthic organisms. Consequently, sampling sites were moved out of the main channel to find consistent habitat. It is notable that in the shifting sand, a rare species of mayfly larva was collected. Dolania americana had previously been reported only from the Savannah and Blackwater Rivers.

The bacteria data at this station indicate soil runoff as their source since fecal coliform counts associated with warm-blooded animals (e.g., domestic waste, pasture) were low although total coliforms were high.

Although the natural substrate macroinvertebrate diversity at station 33.01.00C6 in Perdido Bay near Paradise Beach showed some significant improvement during the report period, the diversity index values were still somewhat low for a Florida estuary. The improvement may be particularly attributable to somewhat better waste treatment by a nearby paper mill. Conversely, total coliform counts showed an increase toward the end of the report period, perhaps reflecting the increased residential development and associated runoff in the area.

Escambia River Sub-Basin

Five stations were monitored in this sub-basin which includes the Escambia River, East Bay, Escambia Bay, Pensacola Bay and Santa Rosa Sound. Station 33.02.0001, Escambia River at SR 4 near Century, showed significant improvement in all macroinvertebrate measures during the report period. Zero natural substrate diversities due to irregular sampling techniques in 1975-76 were suspected of affecting that trend; so a linear regression was run without those data. The trend was not notably changed. The diversities and Biotic Index at this station indicate a fairly healthy, stable macroinvertebrate community. Also of interest, the clam Fusconaia succissa was reported for the first time since the nineteenth century. However, the combination of very high total coliform and low fecal coliform counts suggests a probable marked impact from a large paper mill upstream.

Escambia River at Upper Bluffs, 33.02.0009, had good macroinvertebrate diversities and high Biotic Index numbers. Water quality appeared to be good at this station and a significant upward trend in artificial substrate macroinvertebrate diversity may indicate continued improvement. Occasionally high bacteria counts were apparently related to runoff. Interestingly, during low flow the Escambia Bay salt wedge sometimes reaches this station and estuarine forms have been collected (i.e., crustaceans Macrobrachium sp., Cassidinisca lunifrons).

Station 33.02.0019, Escambia River at US 90, reflects salt wedge influence in the variety of macroinvertebrate types collected there (i.e., freshwater and estuarine). However, this salinity range also makes this a stressful habitat type and consequently diversity was normally lower than in an entirely freshwater or entirely marine site. In addition to the natural stress of an estuarine location, thermal

effluents, oil and grease spills, polychlorinated biphenyls (PCB's) in the sediment may have acted to lower macroinvertebrate diversities. More intensive work would be necessary to clarify the status of the macroinvertebrate community at this station. Occasionally high total coliform counts are apparently due to runoff.

Station 33.02.0011 in Escambia Bay failed to show any significant change during the study period with macroinvertebrate diversities ranging from near zero to 3.3. The apparent instability of the community may be a result of the sensitivity of the estuarine environment and the variable stresses induced by industrial dischargers in the area.

The Pensacola Bay station, 33.02.0023, near Gulf Islands National Seashore, is a well flushed, marine-influenced station with a fairly stable macroinvertebrate community. Two anomalies in the diversity data disputed this subjective assessment. Upon closer inspection of the raw data, apparent explanations were found. In one case, sampling followed an extremely harsh cold front which apparently caused fish and invertebrate kills. The water temperature on the sampling date had warmed to 7.5°C. In the other case, the organism tally was dominated by the barnacle Balanus eburneus apparently clustering on shell fragments brought up with the dredge.

Blackwater River Sub-Basin

This sub-basin includes Big Coldwater Creek, Blackwater River, Blackwater Bay, and parts of East Bay and Santa Rosa Sound. The Big Coldwater Creek station (33.03.0029) had a high Biotic Index indicating an absence of a notable organic pollution source.

Station 33.03.0001, Blackwater River at SR 4, exhibited high macroinvertebrate diversities for both types of quantitative samples analyzed and high Biotic Index values for qualitative samples. A significant improvement was noted for natural substrate diversity and the Biotic Index. The natural substrate trend held up even when zero diversities suspected of being due to 1974-75 sampling technique (i.e., grabs from mid-channel shifting sand) rather than pollution effects were removed from regression data. The apparent improvement is unexplained. Periphyton substrates dominated by diatoms and the presence of many species of stonefly larvae also suggest that this is generally a clean, fast-flowing stream. Occasional high total and fecal counts probably were related to pasture and other agricultural runoff. These numbers sometimes exceeded Class III standards.

The East Bay station (33.03.0C30) is estuarine in character as evidenced by the presence of many typically estuarine invertebrates and occasional collection of freshwater forms (e.g., Cryptochironomus fulvus, a dipteran). Macroinvertebrate diversity was generally only fair during the report period, typically with low numbers of species collected per sample.

This is perhaps indicative of the salinity, siltation and other stresses of an estuary and the relatively few numbers of species which are adapted to them. Total coliform counts were frequently in excess of the Class II standard. The Milton sewage treatment plant may be contributing to this problem along with runoff from the surrounding area.

Yellow-Shoal River Sub-Basin

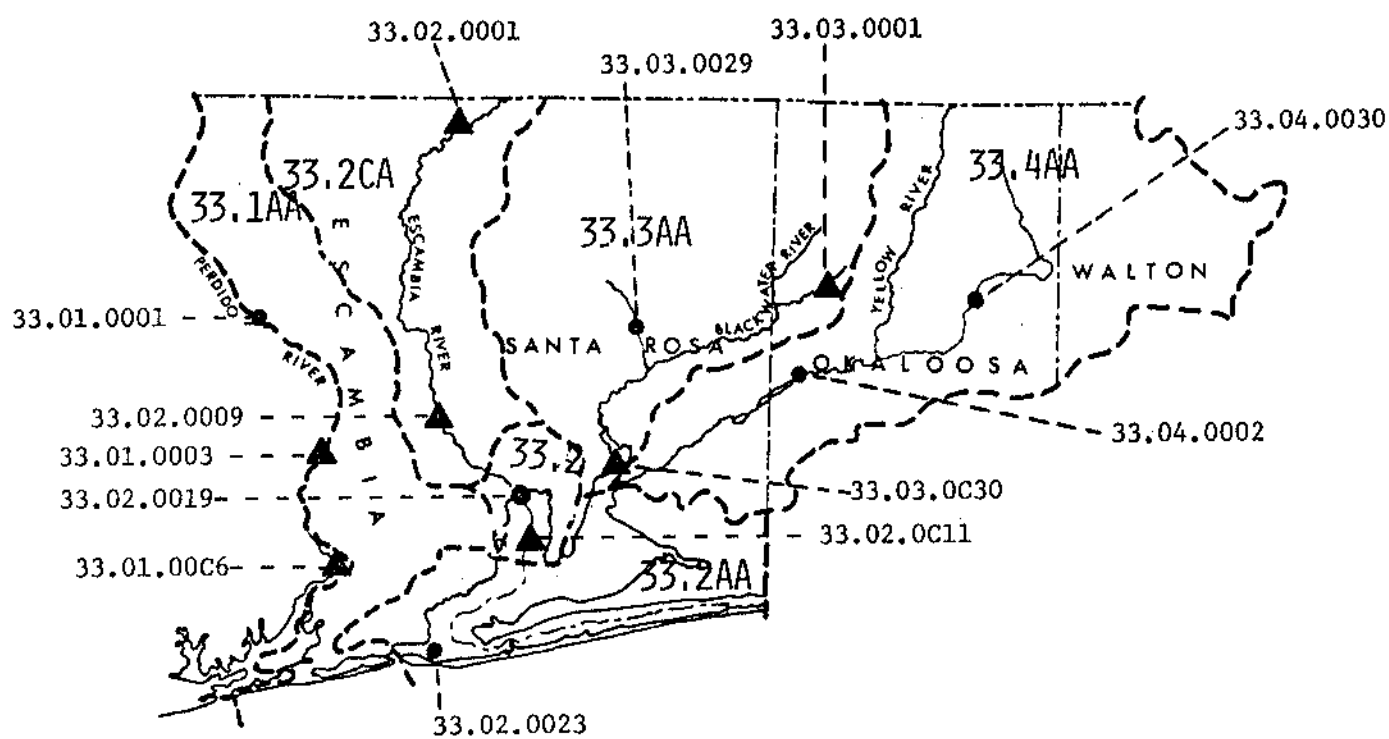
Both the Yellow River station (33.04.0002) and the Shoal River station (33.04.0030) apparently have healthy macroinvertebrate communities and show no signs of dissolved oxygen deficiencies. At the former station, Hydroperla cf. fugitans, an apparently new stonefly species, was collected. Occasionally high total coliform counts from the Shoal River station are probably related to agricultural runoff while higher fecal coliform counts from the Yellow River station indicate that the Crestview sewage treatment plant may be contributing to the bacteria counts there.

Summary

The Perdido River exhibited good water quality with occasionally high bacteria levels probably associated with runoff. Perdido Bay macroinvertebrate diversity was rather low and bacteria counts on the increase, probably due to development of the area. The Escambia Sub-basin can probably be characterized as having fairly good water quality in the river's upper reaches in Florida with degradation occurring as it flows southward into the Pensacola area where industrial discharges and a strong salt wedge cause reduced macroinvertebrate diversities. The Blackwater River and the Yellow-Shoal River Sub-basins both had good stream macroinvertebrate communities and perhaps some bacteria problems associated with sewage treatment.

The overall trend for the Escambia-Perdido Basin appeared to be upward except for Escambia Bay which showed no significant change. No trend analysis was attempted for the Yellow-Shoal River Sub-basin due to limited data.

ESCAMBIA - PERDIDO RIVER BASIN



Plecoptera (cont.)

Pteronarcys dorsata

Odonata

Argia sp.
Boyeria vinosa
Brachycentrus sp.
Chimarra sp.
Enallagma traviatum
Gomphus sp.
G. plagiatus
Neureclipsis sp.
Perithemis seminole
Progomphus obscura
Pycnopsyche sp.
Hydropsyche sp.
Macromia illinoiensis

Ephemeroptera

Baetis australis
B. intercalaris
B. spinosus
Baetisca becki
B. rogersi
Ephemerella deficiens
E. choctawhatchee
E. trilineata
Isonychia sp.
Leptophlebia intermidius
Paraleptophebia volitans
Pseudocloeon bimaculatus
Siphloplecton speciosum
Stenonema exiguum
S. integrum
Stenacron interpunctatum
S. smithae
Tricorythodes albilineatus

Trichoptera

Athripsodes sp.
Brachycentrus sp.
Chimarra sp.
Hydroptila sp.
Hydropsyche sp.
Pycnopsyche sp.

Megaloptera

Chauliodes sp.
Corydalis cornutus

Diptera

Atherix variegata
Conchapelopia sp.
Corynoneura sp.
Cricotopus sp.
C. remus
Cryptochironomus fulvus
Eukiefferiella sp.
Micropsectra sp.
Microtendipes sp.
Orthocladius annectens
Polypedilum convictum
P. halterale
P. illinoense
Rheocricotopus sp.
Rheotanytarsus sp.
Stenochironomus sp.
Stilobezzia sp.
Symbiocladius sp.
Tanytarsus sp.
Thienemaniella spp.
Tribelos sp.
Trissocladius sp.
 unident. ceratopogonid
 unident. orthocladian
 unident. simuliid spp.

Coleoptera

Dineutus sp.
Dubiraphia sp.
Stenelmis sp.
 unident. hydrophilid

DATA SUMMARY: Perdido River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Stq.					
34.01.0001	18 Aug 74											540		
	15 Sep 74											2		
	20 Oct 74											920		
	17 Nov 74											79		
	19 Jan 75											0.3		
	23 Feb 75											130		
	16 Mar 75											1		
	20 Apr 75											240		
	18 May 75											540		
	15 Jun 75											240		
	17 Aug 75											540		
	19 Oct 75											1600		

See Methods for explanation of table.

DATA SUMMARY: Perdido River

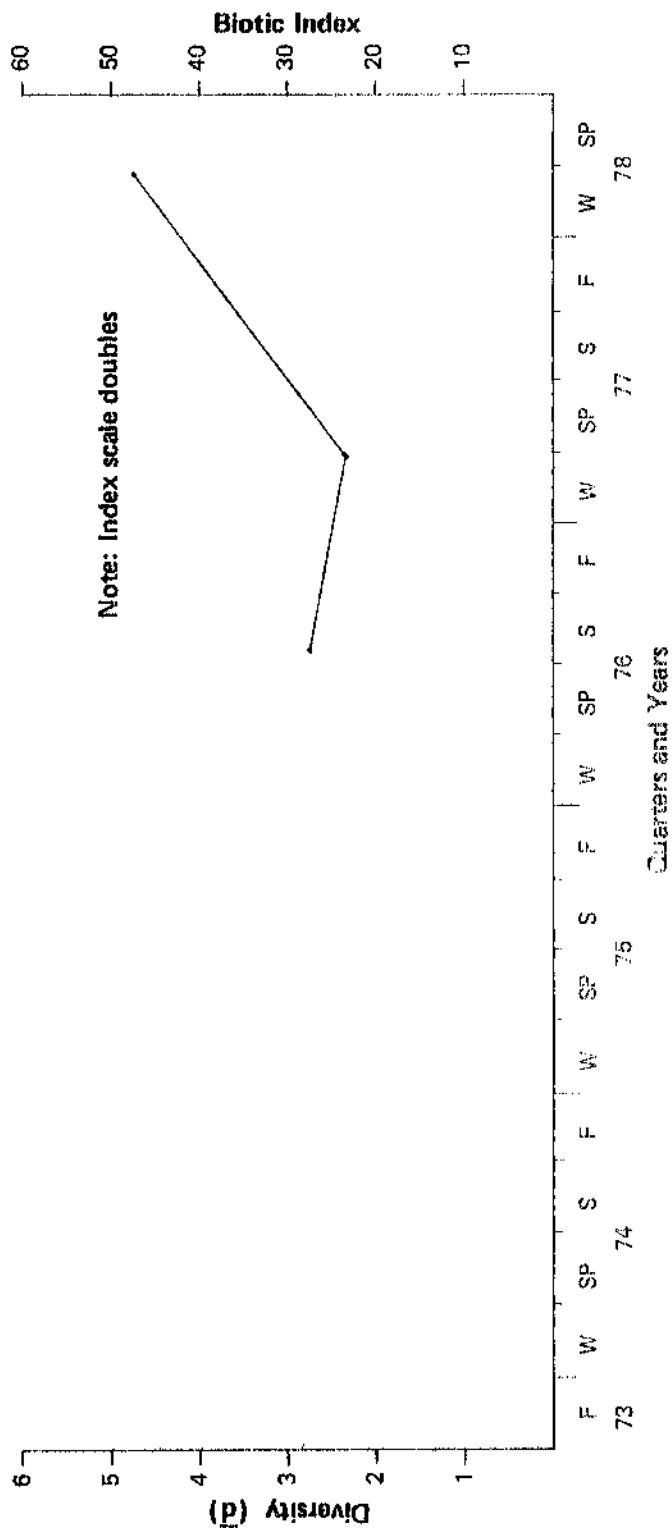
Station Number	Date	Macroinvertebrates								Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate				Artificial Substrate							Total	Fecal		
		Diversity		Redundancy		Diversity		Redundancy								
		Diversity	Redundancy	Diversity	Redundancy	Diversity	Redundancy	Diversity	Redundancy							
34-01-0001	21 Dec 75												240			
	18 Mar 76												49	49		
	20 Jun 76												22400	22		
	30 Jun 76									28	40		22400	79		
	5 Sep 76												2400	1600		
	6 Mar 77												1300	1300		
	8 Mar 77									24	32		22400	22400		
	5 Jun 77												49	8		Florida Index
	1 Mar 78									48	46		2300	2300		
5 Mar 78												790	49			

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.01.0001
 BODY OF WATER: PERDIDO RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 _____ BIOTIC INDEX (= FLORIDA INDEX)



Station No. 33.01.0003 Body of Water Perdido River

Location at Muscogee Bridge, Hwy. #184

County Escambia

Type Body of Water river Classification III

Sources of Pollution Tenneco in Alabama, I-10 runoff, Alabama agricultural and domestic runoff

Nearby Land Use forest

Sampling Frequency quarterly Depth 1.75 - 2.5 m

Bottom Type sand, gravel, mud, detritus % Volatile Solids 0.1

Aquatic Plants: Submerged Zizaniopsis miliacea, Orontium aquaticum, Fontinalis flaccida, Batrachospermum sp., Cladophora sp., Fontinalis filiformis, Eurhynchium tiparioides, Chiloscyphus polyanthus, Chphaloziella sp.

EMERGENT: Nuphar sp., Panicum sp., Nymphoides peltatum, Micranthemum umbrosum

Macroinvertebrates:

Platyhelminthes

unident. sp.

Annelida

Oligochaeta

5 unident. spp.

Hirudinea

Helobdella stagnalis
unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Amphipoda

Crangonyx sp.

Gammarus sp.

Hyalella azteca

Decapoda

Palaemonetes kadiakensis
unident. astacid

Insecta

Plecoptera

Acroneuria abnormis
A. mela/arenosa
Isoperla bilineata
I. dicala
Helopicus subvarians
Leuctra sp.
Neoperla clymene
Nemocapnia carolina
Paragnetina fumosa
Perlesta placida
Perlinella drymo
P. ephyre
P. fumipennis
Pteronarcys dorsata
P. pictetii
Taeniopteryx lita

Odonata

Anomalagrion hastatum
Argia apicalis
A. cf. sedula
A. moesta
A. translata
A. maculatum
Boyeria vinosa
Dromogomphus spinosus
Enallagma spp.
E. triviatum
Gomphus spp.
G. pallidus
Hagenius brevistylus
Ischnura sp.
Lestes sp.
Libellula sp.
Macromia sp.
M. illinoiensis
Neurocordulia sp.
Progomphus obscurus
Perithemis seminole
Somatochlora sp.

Ephemeroptera

Baetis australis
B. intercalaris
B. spiethi
B. spinosus
Baetisca sp.
B. becki

Ephemeroptera (cont.)

Baetisca rogersi
Caenis sp.
C. hilaris
Centroptilum hobbsi
C. viridocularis
Dolania americana
Ephemerella choctawhatchee
E. deficiens
E. hirsata
E. trilineata
Habrophlebiodes brunneipennis
Heptagenia flavescens
Hexagenia bilineata
H. munda marlandica
Isonychia sp.
Leptophlebia intermedius
Paraleptophlebia volitans
Pseudiron cf. meridionalis
Pseudocloeon bimaculatus
P. punctiventris
Siphloplectron sp.
S. speciosum
Stenacron interpunctatum
S. floridense
Stenonema exiguum
S. integrum
S. smithae
Tricorythodes albilineatus

Hemiptera

Notonecta sp.

Trichoptera

Athripsodes sp.
Brachycentrus sp.
Cheumatopsyche sp.
Chimarra sp.
3 Hydropsyche spp.
Hydroptila sp.
Lepidostoma sp.
Leptocella pavida
L. sp.
Lype sp.
Macronemum carolina
Neureclipsis sp.
Nyctiophylax sp.
Oecetis cinerascens
Polycentropus sp.
cf. Psilotreta sp.
Psychomyia sp.
Pycnopsyche sp.

Trichoptera (cont.)

Triaenodes sp.

Megaloptera

Corydalis cornutus

Lepidoptera

Parargyractis sp.

Diptera

Ablabesmyia aspera

A. auriensis

A. janta

A. tarella

A. mallochi

A. ornata

Atherix variegata

Brillia sp.

B. par

Cardiocladius sp.

Chaoborus sp.

Chironomus sp.

Coelotanypus sp.

Conchapelopia sp.

Cricotopus spp.

C. remus

Cryptochironomus fulvus

Cladotanytarsus sp.

Cryptochironomus vulneratus

Cryptotendipes cf. corynoneura

Endochironomus nigricans

Eukiefferiella sp.

E. cerulescens sp.

Harnischia sp.

Heterotrissocladius sp.

Limnophyes sp.

Microtendipes sp.

Microcricotopus sp.

Monopelopia sp.

Nanocladius sp.

Orthocladius annectens

Palpomyia sp.

Parachironomus pectinatellae

Parachironomus sp.

Paracladopeima sp.

Paratendipes connectens

Polypedilum illinoense

P. convictum

P. fallax

P. halterale

Diptera (cont.)

Psectrocladius vernalis

P. sp.

Pseudochironomus sp.

Rheotanytarsus sp.

Rheocricotopus sp.

2 Simulium spp.

Stenochironomus sp.

Stilobezzia sp.

Sympotthastia sp.

Tabanus sp.

Tanytarsus sp.

Trissocladius sp.

2 Thienemaniella spp.

Tribelos jucundus

T. fuscicornis

unident. ceratopogonid

unident. chironomid

2 unident. tipulid spp.

Coleoptera

Ancyronyx variegata

Dineutus sp.

Dubiraphia sp.

Gyrinus sp.

Macronychus glabratus

Optioservus sp.

2 Stenelmis spp.

unident. elmids

Arachnida

Torrenticolia sp.

Lebertia (Pilolebertia) sp.

Mollusca

Gastropoda

Ferrissia sp.

DATA SUMMARY: Perdido River

Station Number	Date	MacroInvertebrates								Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate				Artificial Substrate						Total	Fecal		
		Diversity		Redundancy	#Spp.	Diversity		Redundancy	#Spp.						
		Diversity	Redundancy			Diversity	Redundancy								
46 34.01.0003	9 Jul 73											1600			
	1 Oct 73											1600			
	6 Nov 73											LT 2			
	29 Nov 73	1.000+ 0.000				2						1063			
	5 Feb 74											920			
	4 Mar 74	0.000			1.521±0.154	0.479±0.056	0		9			8			
	1 Apr 74											790			
	24 Apr 74	3.027±0.417	1.000±0.108			9							920		
	27 May 74												GT2400		
	5 Jun 74														
	8 Jul 74											540			

See Methods for explanation of table.

DATA SUMMARY: Fordice River

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Perdido River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate		Artificial Substrate											
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.						
48 35.01.0003	25 Feb 75											Total	Fecal		
	3 Mar 75											920			
	7 Apr 75											130			
	6 May 75											79			
	20 May 75	0.000		0	3.000±0.533	0.600±0.137	10					712400			
	12 Jun 75											540			
	7 Jul 75											3300			
	21 Aug 75											712400			
	29 Sept 75	3.182±0.345	0.167±0.066	14									240		
	27 Oct 75												350		
	20 Nov 75												170		
	10 Dec 75														

See Methods for explanation of table.

DATA SUMMARY: Perdido River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
49														
33,01,0003	12 Jan 76										32400			
	14 Jan 76	4.26 ± 0.253	0.076 ± 0.022	28			37	48		Coc Gr 420 Fll Gr 7 Pen Dia 6026 Total 6453	32400	130		
	11 Feb 76										350	8		
	16 Feb 76										79	13		
	18 Mar 76										240	11		
	31 Mar 76	3.865 ± 0.311	0.100 ± 0.030	19							540	540		
	15 Apr 76										540	127		
	18 May 76										1600	49		
	4 Jun 76										1600	22		
	14 Jul 76										540	350		

See Methods for explanation of table.

DATA SUMMARY: Perdido River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
33.01.0003	4 Aug 76											330	2	
	24 Aug 76	3.949±0.139	0.067±0.008	44				65	88			1600	5	
	20 Sep 76											920	22	
	5 Oct 76											130	5	
	8 Nov 76	4.161±0.139	0.067±0.008	42	4.049±0.250	0.115±0.031	32			Coc BG 18375 Fll BG 0 Coc Gr 2000 Fll Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 0 Pen Dia 1950 Total 22325				
	8 Dec 76											540	79	
	20 Jan 77											240	23	
	16 Feb 77	4.445±0.323	0.121±0.034	15				48	64			GT2400	GT2400	

See Methods for explanation of table.

DATA SUMMARY: Perdido River

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Perdido River

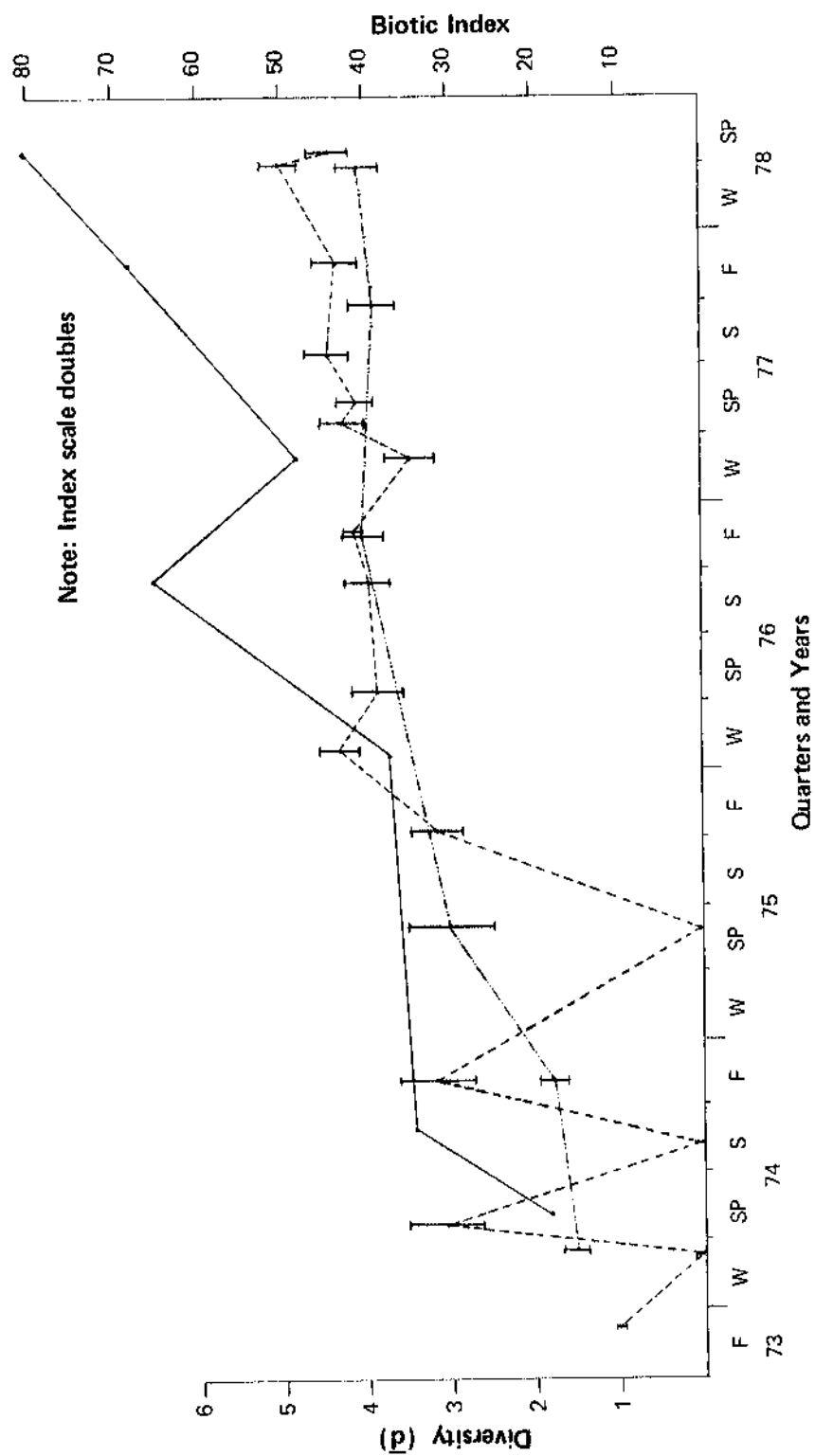
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
33.01-0003	31 Aug 77 (cont.)													
	2 Nov 77	4.367±0.108	0.108±0.023	40				68	96			490	14	
	6 Dec 77											490	23	
	9 Jan 78											4900	2300	
	7 Feb 78											130	13	
	17 Mar 78	5.007±0.216	0.051±0.010	44	4.080±0.254	0.090±0.023						7900	1300	
	5 Apr 78	4.410±0.256	0.094±0.021	38				80	85			130	2	
	1 May 78											79	33	
	7 Jun 78											7900	49	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.01.0003
BODY OF WATER: PERDIDO RIVER

--- NATURAL SUBSTRATE DIVERSITY
- - - - ARTIFICIAL SUBSTRATE DIVERSITY
— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 33.01.00C6 Body of Water Perdido Bay
 Location 1/4 mile off Paradise Beach toward channel
 County Escambia
 Type Body of Water estuary/bay Classification III
 Sources of Pollution St. Regis Paper Co., Bayou Marcus Creek STPs,
Saufley Field, Ala., Tenneco, Bay Minette STP
 Nearby Land Use housing, timber
 Sampling Frequency quarterly Depth 1 - 4.8 m
 Bottom Type organic muck, shell % Volatile Solids 16.7
 Aquatic Plants: Submerged Polysiphonia sp., Gracilariopsis sp.
 Emergent Spartina sp., Phragmites communis, Juncus
roemerianus, Spartina patens, Spartina alterniflora, Taxodium ascendens, Nymphaea
odorata, Cladium jamaicensis, Sagittaria lancifolia, Gleditsia aquatica
Macroinvertebrates:

Platyhelminthes

Turbellaria
 unident. sp.

Rhynchocoela

Tetrastemma sp.
cf. Carinoma tremephorus

Annelida

Oligochaeta
 unident. phreodrilid

Hirudinea

unident. ichthyobdellid
 unident. rhyncobdellid

Polychaeta

Capitella capitata
Eteone heteropoda
Glycera dibranchiata
Haploscoloplos sp.
H. foliosus
cf. Haploscoloplos fragilis
cf. Hypaniola sp.
Laeonereis culveri
Lumbrineris sp.

Polychaeta (cont.)

Lumbrineris coccinea
Nereis sp.
N. pelagica occidentalis
N. succinea
Pectinaria gouldii
Polydora ligni
P. websterii
Prionospio sp.
Sabellides oculata
Scoloplos rubra
S. cf. rubra
 unident. cirratulid
 unident. maldanid
 unident. opheliid

Arthropoda

Crustacea

Amphipoda

Acanthohaustorius intermedius
Corophium louisianum
C. cf. volutator
Elasmopus laevis
Gammarus sp.
Grandidierella bonnieroides
Haustorius sp.
Hyalella sp.
Microdeutopus gryllotalpa
Monoculodes edwardsi
Mucrogammarus macromucronatus
 unident. stenothoid sp.

Decapoda

Callinectes sapidus
Eurypanopeus depressus
Hippolyte pleurocantha
Palaemonetes sp.
Penaeus setiferus
Palaemonetes pubio

Mysidacea

Bowmaniella dissimilis
Mysidopsis bigelowi

Cirripedia

Balanus eburneus
B. improvisus

Cumacea

Almyracuma proximoculi
Oxyurostylis smithi

Tanaidacea

Leptochelia dubia

Insecta

Ephemeroptera

Caenis sp.

Trichoptera

unident. sp.

Diptera

Cryptochironomus fulvus

Chironomus sp.

Polypedilum halterale

Tanytarsus sp.

Coleoptera

unident. sp.

Mollusca

Gastropoda

Odostoma cf. gibbosa

Pyramidella fusca

Pelecypoda

Brachidontes recurvis

Crassostrea virginica

Rangia cuneata

Tellina lineata

T. sybaritica

T. texana

Chordata

Cephalochordata

Branchiostoma caribaeum

DATA SUMMARY: Perdido Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
33-01-0006	10 Oct 73											49		
57	3 Dec 73	2.081±0.515	0.350±0.169	6								38		
	29 Jan 74						1					372400		
	12 Feb 74				0.000									
	4 Mar 74	1.838±0.534	0.388±0.249	5								5		
	14 Mar 74											540		
	2 Apr 74	1.053±0.250	0.723±0.091	8								33		
	30 Apr 74													
	14 Jul 74	1.294±0.377	0.516±0.178	5								130		
	27 Aug 74											172		
	18 Sep 74													
	20 Sep 74	0.948±0.072	0.072±0.097	2										

See Methods for explanation of table.

DATA SUMMARY: Perdido Bay

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Perido Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
11.01.00076	23 Aug 75										130			
59	29 Sep 75	0.000		0							79			
	28 Oct 75									Gr Flag 3 Pen Dia 4 Pen Dia 3 Total 10				
	6 Nov 75													
	20 Nov 75										79			
	9 Dec 75										130			
	15 Jan 76										350	130		
	22 Jan 76	2.183±0.250	0.195±0.080	7							79	8		
	16 Feb 76									130	LT2			
	18 Mar 76									49	LT2			
	7 Apr 76									79	13			

See Methods for explanation of table.

DATA SUMMARY: Perdido Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
33.01.0006 60	18 May 76	1.310±0.230 1.868±0.231	0.195±0.080 0.228±0.075	7 6						Coc BG 147 Fil BG 1503 Coc Gr 103 Fil Gr 310 Gr Flag 1447 Other Flag 0 Cen Dia 0 Pen Dia 1320 Total 42508	350	LT2	Nat Substrate 0.5 meters 2.5 meters	
	17 Jun 76										13	LT2		
	20 Jul 76										LT2	LT2		
	24 Aug 76	2.100±0.167	0.260±0.050	10							13	LT2		
	20 Sep 76										5	LT2		
	27 Oct 76										350	33		
	2 Nov 76										230	23		
	8 Dec 76	2.668±0.189	0.096±0.030	9						Coc BG 11525	23	LT2		

See Methods for explanation of table.

DATA SUMMARY: Perdido Bay

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate						
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.				
33-01-0006 61	8 Dec 76 (cont.)							Coc Gr 4900 Gr Flag 125 Other Flag 300 Pen Dia 750 Total 17600			
	12 Jan 77								GP2400	13	
	1 Feb 77								49	13	
	9 Mar 77								910	22	
	25 Apr 77	2.276±0.180 1.752±0.140	0.221±0.039 0.160±0.051	11 4					1600	920	Nat. Substrat 0.5 meters 2.5 meters
	5 May 77								33	2	
	22 Jun 77	0.619±0.341 1.392±0.211	0.562±0.384 0.135±0.113	2 3					790	70	Nat. Substrat 2.0 meters 2.5-1.0 meters
	12 Jul 77								5	172	Florida Index

See Methods for explanation of table.

DATA SUMMARY: Perdido Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
33.01.0006	15 Dec 77									Coc BG 94897 Fil BG 129 Cen Dia 5039 Pen Dia 295220 Total 395285	130	33		
62	23 Jan 78										49	172		
	9 Feb 78	2.124±0.187	0.210±0.052	8							490	110		
	16 Mar 78										2300	33		
	19 Apr 78	2.312±0.495	0.391±0.161	9						Coc BG 25885 Fil BG 175 Coc Gr 0 Fil Gr 0 Gr Flag 200 Other Flag 0 Cen Dia 20 Pen Dia 1092 Total 27372	130	49		

See Methods for explanation of table.

DATA SUMMARY: Verdido Bay

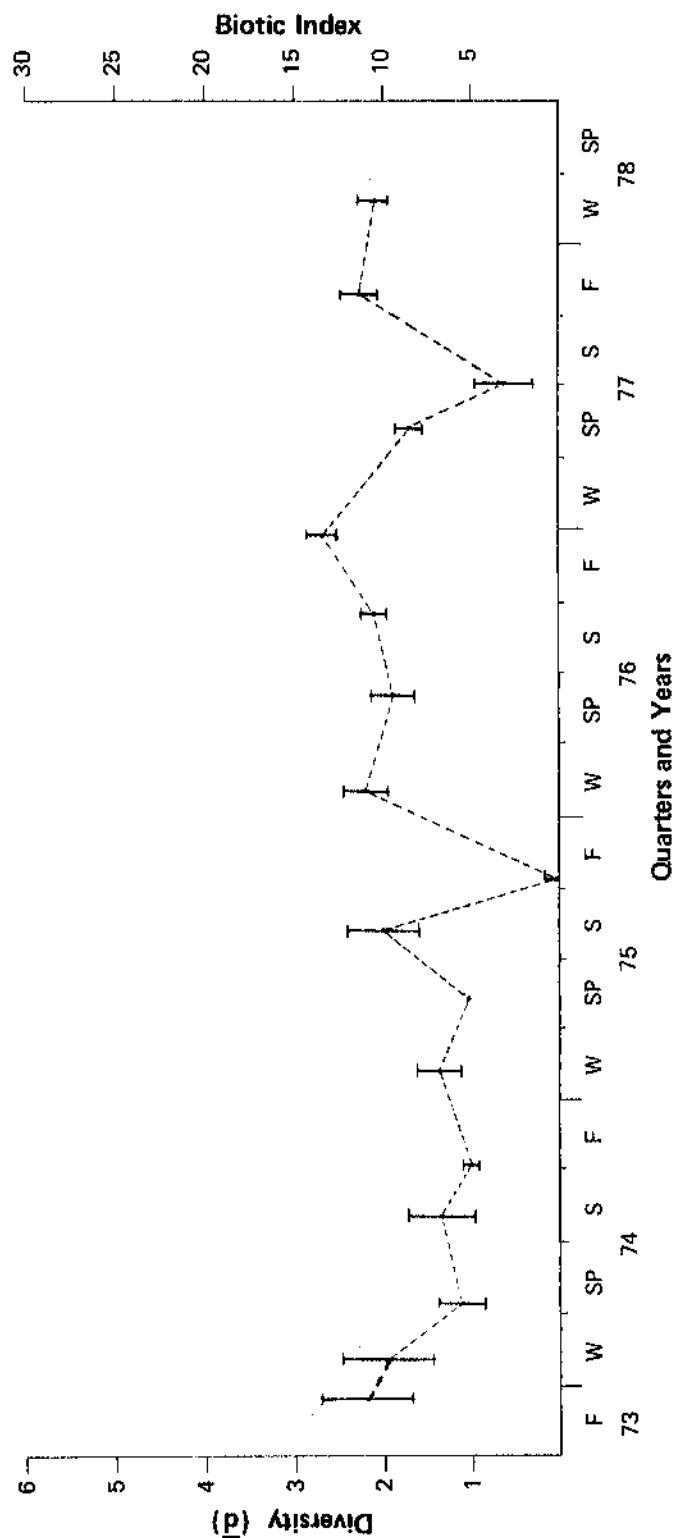
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
44.01.GUC6	4 May 75										1300	790	
	02 Jun 75										33	LT2	
63													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.01.00C6
 BODY OF WATER: PERDIDO BAY

--- NATURAL SUBSTRATE DIVERSITY
 -.-.- ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 33.02.0001 Body of Water Escambia River
 Location near Century, Hwy. #4, 100 yds above SR 4
 County Escambia
 Type Body of Water river Classification III
 Sources of Pollution Conecuh River drainage, Container Corp. plant, Brewton STP,
Flomaton, gravel washing
 Nearby Land Use timber, agriculture, papermill, urban
 Sampling Frequency quarterly Depth 1 - 5 m
 Bottom Type sand, gravel, mud, leaf detritus Volatile Solids 0.1 - 10
 Aquatic Plants: Submerged Fontinalis sp., Stigeoclonium lubricum, Jungermannia
pumila, Eurhynchium riparioides Emergent Salix sp., Ludwigia repens, Taxodium distichum

Macroinvertebrates:

Annelida

Oligochaeta
 unident. spp.

Hirudinea
 unident. sp.

Arthropoda

Crustacea
 Isopoda
 Asellus sp.

 Amphipoda
 Hyalella azteca

 Decapoda
 Palaemonetes kadiakensis
 unident. astacid

Insecta

 Plecoptera
 Acroneuria mela/arenosa
 A. abnormis
 Nemocapnia carolina
 Perlina ephyre
 Helopicus subvarians

Station No. 33.02.0001 Body of Water Escambia River
 Location near Century, Hwy. #4, 100 yds above SR 4
 County Escambia
 Type Body of Water river Classification III
 Sources of Pollution Conecuh River drainage, Container Corp. plant, Brewton STP,
Flomaton, gravel washing
 Nearby Land Use timber, agriculture, papermill, urban
 Sampling Frequency quarterly Depth 1 - 5 m
 Bottom Type sand, gravel, mud, leaf detritus Volatile Solids 0.1 - 10
 Aquatic Plants: Submerged Fontinalis sp., Stigeoclonium lubricum, Jungermannia
pumila, Eurhynchium riparioides Emergent Salix sp., Ludwigia repens, Taxodium distichum

Macroinvertebrates:

Annelida

Oligochaeta
 unident. spp.

Hirudinea
 unident. sp.

Arthropoda

Crustacea
 Isopoda
 Asellus sp.

 Amphipoda
 Hyalella azteca

 Decapoda
 Palaemonetes kadiakensis
 unident. astacid

Insecta

 Plecoptera
 Acroneuria mela/arenosa
 A. abnormis
 Nemocapnia carolina
 Perlina ephyre
 Helopicus subvarians

Ephemeroptera (cont.)

Neoephemera sp.
Paraleptophlebia sp.
Pseudocloeon bimaculatus
P. punctiventris
Pseudiron sp.
Siphloplecton speciosum
Stenonema sp.
S. exiguum
S. integrum
Stenacron interpunctatum
S. smithae
Tricorythodes albilineatus

Hemiptera

Benacus cf. griseus
Callicorixa sp. A - Young

Trichoptera

Athripsodes sp.
Brachycentrus sp.
Cheumatopsyche sp.
Chimarra sp.
Cyrnellus sp.
Hydropsyche spp.
Hydroptila sp.
Leptocella sp.
L. pavida
Lypes sp.
Neureclipsis sp.
Oecetis sp.
O. cinerascens
Macronemum carolina
Polycentropus sp.
Pycnopsyche sp.
Triaenodes sp.

Megaloptera

Corydalus cornutus

Lepidoptera

unident. sp.

Diptera

Ablabesmyia auriensis
A. parajanta
A. peleensis
Atherix variegatas
Atrichopogon sp.
Bezzia sp.
Cardiocladius obscurus

Diptera (cont.)

Chaoborus sp.
Chironomus attenuatus
Cladotanytarsus sp.
Clinotanypus sp.
Conchapelopia sp.
Corynoneura sp.
Cricotopus spp.
C. bicinctus
C. remus
Cryptochironomus blarina
C. fulvus
Epoicocladius sp.
Eukiefferiella sp.
Harnischia sp.
Heterotrissocladius sp.
Larsia sp.
Limnophora sp.
Macropelopia sp.
Nanocladius sp.
Nilotanypus sp.
Nilothauma bicornis
Palpomyia tibialis
Paracladopelma sp.
Paratendipes cf. connectens
Parachironomus demeijerei
Pentaneura sp.
Phaenopsectra flavipes
Polypedilum convictum
P. fallax
P. halterale
P. illinoense
Procladius sp.
Psectrocladius sp.
Pseudochironomus sp.
Rheocricotopus sp.
Orthocladius annectens
Rheotanytarsus sp.
Simulium spp.
Stenochironomus sp.
Stictochironomus devinctus
Sympotthastia sp.
Tanytarsus sp.
Tanypus sp.
Thienemanniella sp.
Tribelos fuscicornis
T. jucundus
Trissocladius sp.
Zavrelia sp.
Demicryptochironomus sp.
 cf. Hemerodromia sp.

Diptera (cont.)

unident. ceratopogonid spp.
unident. chironomid
unident. diamesinine
unident. orthocladian

Coleoptera

Ancyronyx variegatus
Dineutus sp.
Macronychus glabratus
Stenelmis sp.
S. fuscata
unident. dytiscid
unident. gyrid
unident. sp.
unident. helodid
unident. hydrophilid
unident. hydroporine

Arachnida

Acarina

Lebertia (Pilolebertia) sp.
Torrenticola sp.

Mollusca

Gastropoda

Campeloma sp.
Ferrissia sp.
Goniobasis sp.
unident. sp.

Pelecypoda

Corbicula manilensis
Musculium sp.
Physa sp.
Pisidium sp.
Elliptio crassidens
Anodonata suborbiculata
Fusconaia succissa

DATA SUMMARY: Escambia River

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		Total	Fecal							
		Diversity	Redundancy	#Spp.	Diversity			Redundancy	#Spp.			BI	#Spp.	
33-02-0001	22 Oct 73											1600		
	29 Oct 73											1600		
	6 Nov 73											372400		
	19 Nov 73	2.000±0.000					4					372400		
	27 Nov 73											372400		
	10 Dec 73											372400		
	17 Dec 73											350		
	2 Jan 74											372400		
	22 Jan 74											2400		
	26 Jan 74											372400		
	5 Feb 74											920		
	18 Feb 74											372400		

See Methods for explanation of table.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
33.02.0001 72	24 Feb 74											ST2400	Qual- littoral	
	4 Mar 74	0.000		1							1600			
	11 Mar 74										ST2400			
	19 Mar 74										ST2400			
	25 Apr 74	1.922±0.429		4				16	32					
	25 May 74										ST2400			
	27 May 74										ST2400			
	3 Jun 74										ST2400			
	10 Jun 74										ST2400			
	17 Jun 74										ST2400			
	25 Jun 74										ST2400			
	8 Jul 74										ST2400			

See Methods for explanation of table.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments	
		Natural Substrate		Artificial Substrate		#Spp.	Redundancy						
		Diversity	Redundancy	#Spp.	Diversity								Redundancy
33-02-00001	15 Jul 74										GT2400	Littoral	
	22 Jul 74										1600		
	29 Jul 74										GT2400		
	8 Aug 74	3.975 $\pm$ 0.277	0.094 $\pm$ 0.025	19				29	31		1600		
	12 Aug 74										GT2400		
	19 Aug 74										0.2		
	26 Aug 74										GT2400		
	3 Sep 74										GT2400		
	29 Oct 74										GT2400		
	4 Nov 74	0.000									GT2400		
	9 Dec 74										5		
	13 Jan 75										1600		

See Methods for explanation of table.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates							Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate								Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.						
74 33,02,0001	10 Feb 75												1600		
	25 Feb 75												540		
	3 Mar 75												372400		
	26 Mar 75												2		
	7 Apr 75												920		
	20 May 75												1600		
	12 Jun 75												372400		
	20 Jun 75	3.148 $\pm$ 0.389	0.170 $\pm$ 0.062	12	2.242 $\pm$ 0.313	0.332 $\pm$ 0.075	13						372400		
	7 Jul 75												372400		
	23 Jul 75												372400		
	21 Aug 75												372400		
	30 Sep 75												920		

See Methods for explanation of table.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
33.02.0001	14 Oct 75	1.496 $\pm$ 0.389	0.524 $\pm$ 0.169	6						GT2400		
	4 Mar 76	2.540 $\pm$ 0.393	0.167 $\pm$ 0.095	7	0.824 $\pm$ 0.137	0.820 $\pm$ 0.040	16			540	45	
	22 Apr 76	2.640 $\pm$ 0.512 0.470 $\pm$ 0.600	0.341 $\pm$ 0.117 0.999 $\pm$ 0.600	10 2						GT2300	22	Plat. Sub. monitoring site construction site
	14 Sep 76	3.285 $\pm$ 0.357	0.161 $\pm$ 0.057	15						240	13	
	3 Nov 76	3.422 $\pm$ 0.281	0.109 $\pm$ 0.040	16	3.779 $\pm$ 0.203	0.132 $\pm$ 0.025	35			930	130	
	15 Dec 76									GT2400	540	
	26 Jan 77									GT2400	35	
	14 Feb 77	2.648 $\pm$ 0.286	0.151 $\pm$ 0.048	10						GT2400	23	

See Methods for explanation of table.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	RI	#Spp.					
31.02.0001 76	6 Apr 77	2.251±0.626	0.151±0.048	10								23000	790	
	4 May 77	2.647±0.176	0.308±0.037	30								622400	49	
	7 Jun 77										Coc BG 1305 Fil BG 239 Coc Gr 58 Fil Gr 32 Pen Dia 22506 Total 24153			Florida Index
	7 Jul 77	2.546±0.328	0.259±0.069	13								1300		
	9 Aug 77											490	5	
	8 Sep 77											2300	490	
	22 Sep 77											5400	49	Art Sub. 1.0 meter 0.5 meter

See Methods for explanation of table.

DATA SUMMARY: Escambia River

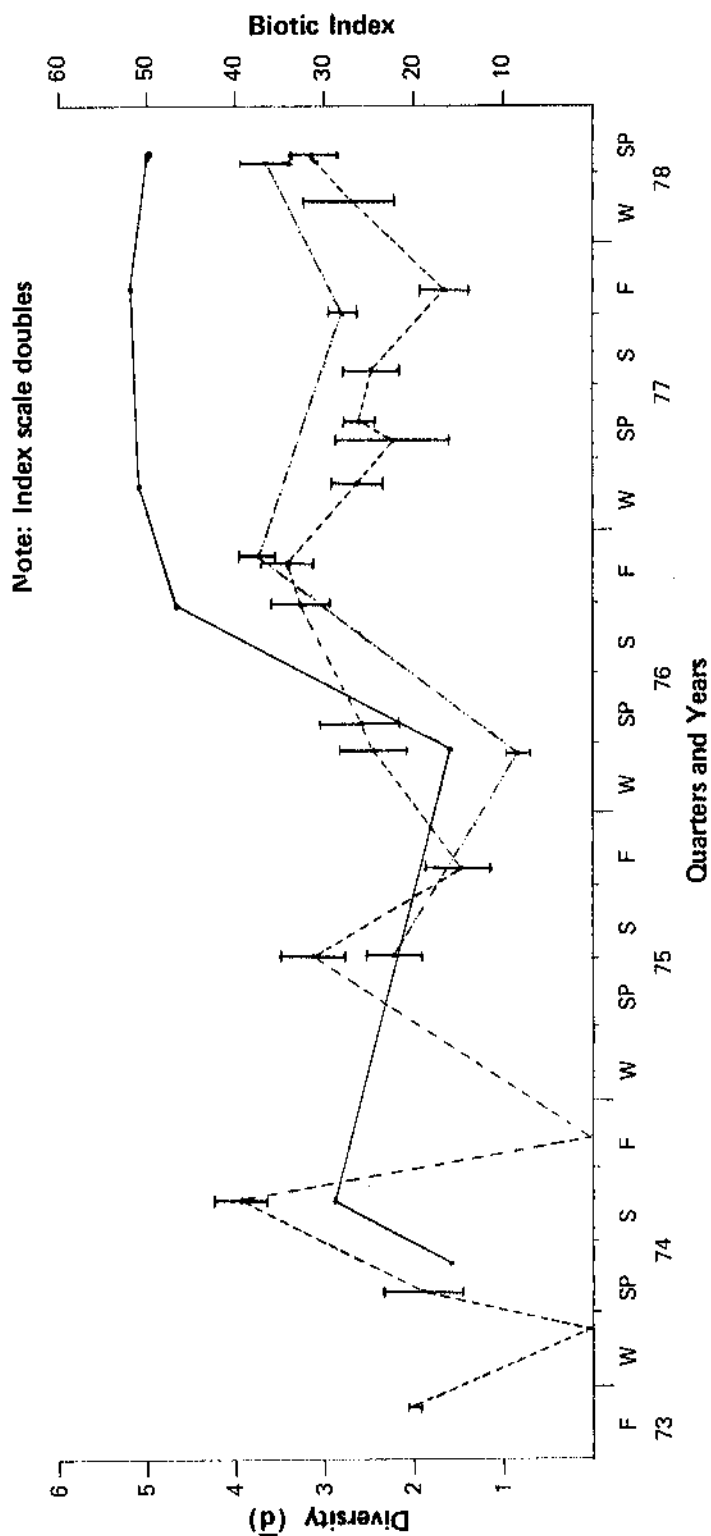
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
33.02.0001	20 Oct 77	1.700±0.270	0.613±0.076	20			52	60		Coc BG 17410 Fil BG 1357 Coc Gr 323 Fil Gr 291 Pen Dia 102487 Total 121868	130	7		
	1 Dec 77										160000	790		
	9 Jan 78										4900	790		
	14 Feb 78	2.775±0.515	0.426±0.110	15							790	230		
	16 Mar 78										3300	3300		
	28 Mar 78				3.652±0.289	0.115±0.036	20							
	10 Apr 78	3.163±0.259	0.127±0.041	15			50	61			2300	330		
	1 May 78										672400	1600		
	7 Jun 78										2300	49		

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.02.0001
 BODY OF WATER: ESCAMBIA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 -.-.- ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 33.02.0009 Body of Water Escambia River
 Location 1000 yards south of Spanish Mill Creek
 County Escambia
 Type Body of Water river Classification III
 Sources of Pollution agricultural runoff, domestic and industrial wastes
 Nearby Land Use forest
 Sampling Frequency quarterly Depth 1 - 4 m
 Bottom Type sand, mud, leaf, detritus % Volatile Solids _____
 Aquatic Plants: Submerged Fontinalis filiformis
 Emergent Panicum sp., Nuphar sp., Typha sp., Cladium sp.,
Planera aquatica, Forestiera acuminata, Taxodium distichum, Saururus cernuus, Zizaniopsis
 Macroinvertebrates: miliacea, Pontederia cordata

Platyhelminthes

Turbellaria
 unident. sp.

Annelida

Oligochaeta
 unident. spp.

Hirudinea

unident. spp.

Arthropoda

Crustacea

Isopoda

Asellus sp.
Lirceus sp.
 cf. Cassidinisca lunifrons

Amphipoda

Crangonyx sp.
Gammarus spp.
Hyalella azteca

Decapoda

Macrobrachium sp.
Palaemonetes sp.
P. paludosus
 unident. astacid

Mysidacea

Taphromysis louisianae
unident. mysid

Insecta

Plecoptera

Hydroperla fugitans
Isoperla bilineata
I. dicala
I. clio
Leuctra sp.
Neoperla clymene
Perlesta placida
Paragnetina kansensis
Perlinella drymo
P. ephyre
Taeniopteryx lita

Odonata

Anomalagrion hastatum
Argia sp.
A. fumipennis
A. moesta putrida
A. sedula
A. cf. tibialis
A. translata
Boyeria vinosa
Coryphaeschna sp.
Didymops transversa
Enallagma sp.
Gomphus spp.
Hetaerina titia
Ischnura sp.
I. credula
I. posita
Libellula sp.
Macromia sp.
M. illinoiensis
Neurocordulia sp.

Ephemeroptera

Baetis australis
B. ephippiatus
B. intercalaris
B. spinosus
Brachycerus sp.
Caenis diminuta
C. hilaris
Centroptilum viridocularis
Ephemerella sp.
E. choctawhatchee
E. trilineata

Ephemeroptera (cont.)

Heptagenia sp.
H. flavescens
Hexagenia munda marilandica
Isonychia spp.
Pseudocloeon parvulum
Siphloplecton speciosum
Stenonema exiguum
S. integrum
Stanacron interpunctatum
S. smithae
Tricorythodes albilineatus

Hemiptera

Hesperocorixa sp.
Hydrometra sp.
Mesovelis sp.
Trepobates sp.

Trichoptera

Athripsodes sp.
Cheumatopsyche sp.
Chimarra sp.
Cynellus sp.
Hydropsyche sp.
Hydroptila sp.
Leptocella spp.
Oecetis sp.
Oxyethira sp.
Macronemum sp.
Neureclipsis sp.
Nyctiophylax sp.
Polycentropus sp.
Pycnopsyche sp.
Phylocentropus sp.
Triantodes sp.

Megaloptera

Corydalus cornutus
Sialis sp.

Diptera

Ablabesmyia aspera
A. auriensis
A. janta
A. mallochi
A. parajanta
A. tarellia
A. peleensis
Brillia sp.
B. par
Chaoborus sp.

Diptera (cont.)

Chironomus sp.
Coelotanypus sp.
C. concinnus
C. scapularis
C. tricolor
Cardiocladius obscurus
Conchapelopia sp.
Corynoneura sp.
Cricotopus sp.
C. bicinctus
C. remus
Cryptochironomus blarina
C. fulvus
Demicryptochironomus sp.
Dicrotendipes lobus
D. modestus
D. neomodestus
Eukiefferiella sp.
Nanocladius sp.
Nilotanypus sp.
Orthocladius annectens
Parachironomus pectinatellae
Paralauterborniella nigrohalteralis
Pentaneura inculta
Polypedilum convictum
P. fallax
P. halterale
P. illinoense
Psectrocladius sp.
P. vernalis
Pseudorthocladius sp.
Rheocricotopus sp.
Rheotanytarsus sp.
Simulium spp.
Stenochironomus sp.
Tanypus punctipennis
Tanytarsus sp.
Thienemanniella sp.
Tribelos fuscicornis
T. jucundus
T. quadripunctatus
 unident. ceratopogonid sp.
 unident. chironomid
 unident. orthocladian sp.
 unident. simuliid spp.
 unident. tanypodine

Coleoptera

Berosus sp.
Dubiraphia sp.
Gyrinus sp.

Coleoptera (cont.)

Macronychus glabratus
Stenelmis sp.
Tropisternus sp.
unident. dytiscid sp.
unident. elmids spp.
unident. gyrid
unident. hydrophilid
unident. hydrophiline

Neuroptera

Climacia sp.

Mollusca

Gastropoda

Amnicola sp.
Campeloma sp.
Ferrissia sp.
Goniobasis sp.
Gyraulus sp.
Helisoma sp.
cf. Lyogyrus sp.
Physa sp.
Pomacea sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
Musculium sp.
unident. sphaeriid spp.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate						
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.				
33.02.0009	11 Feb 74									1600	
	8 Apr 74									920	
	27 Aug 74							12	36		
	2 Oct 75	2.849±0.558	0.503±0.145	15						130	
	10 Nov 75									4	
	5 Jan 76									220	220
	22 Jan 76	2.249±0.392	0.385±0.121	71	1.884±0.380	0.600±0.113	15	25	35		
	3 Mar 76									70	33
	21 Mar 76									540	
	26 Apr 76	3.356±0.308	0.148±0.045	18						920	49
	10 May 76									540	540

See Methods for explanation of table.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm3	Periphyton Composition units/cm2	Coliform Bacteria Colonies/ 100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
33,02,0009	1 Aug 76											350	17	
	15 Aug 76											130	7	
	15 Sep 76	3.846±0.283	0.094±0.034	20					40	58		220	2	
	15 Nov 76	2.577±0.480	0.408±0.110	13	3.397±0.323	0.207±0.052	24					600	350	
												Coc BG 39400 Fil BG 125 Coc Gr 2175 Fil Gr 400 Gr Flag 0 Other Flag 25 Cen Dia 0 Pen Dia 1275 Total 43400		
	21 Nov 76											1600	240	
	15 Dec 76											1600	350	
	17 Feb 77	3.035±0.259	0.285±0.052	29					51	77		1600	240	

See Methods for explanation of table.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Sp.	Diversity	Redundancy	#Sp.						
33.02.0009	20 Feb 77										272400	34	
	4 Apr 77	2.120±0.373	0.285±0.052	7							490	19	
	3 May 77				3.47±0.275	0.125±0.032	20			Coc BG 13605 Fil BG 368 Coc Gr 704 Fil Gr 32 Gr Flag 291 Other Flag 0 Cen Dia 0 Pen Dia 148010 Total 163010	920	4	
	15 May 77										130	17	Florida Index
	5 Jul 77	3.196±0.457	0.300±0.092	17							2300	2300	
	2 Aug 77				4.442±0.192	0.054±0.015	33			Coc BG 2933 Fil BG 1008	7900	79	

See Methods for explanation of table.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
		BI	#Spp.											
87	2 Aug 77 cont.													
	8 Nov 77	2.843±0.402	0.226±0.077	12				19	46			4900	110	
	8 Dec 77											2300	130	
	24 Jan 78											940	330	
	14 Feb 78	3.478±0.126	0.216±0.054	26								330	130	
	19 Feb 78											790	23	
	16 Mar 78				3.358±0.208	0.137±0.022	27					330	130	
	1 Apr 78	3.488±0.485	0.350±0.096	19				28	49			330	23	

See Methods for explanation of table.

DATA SUMMARY: Escambia River

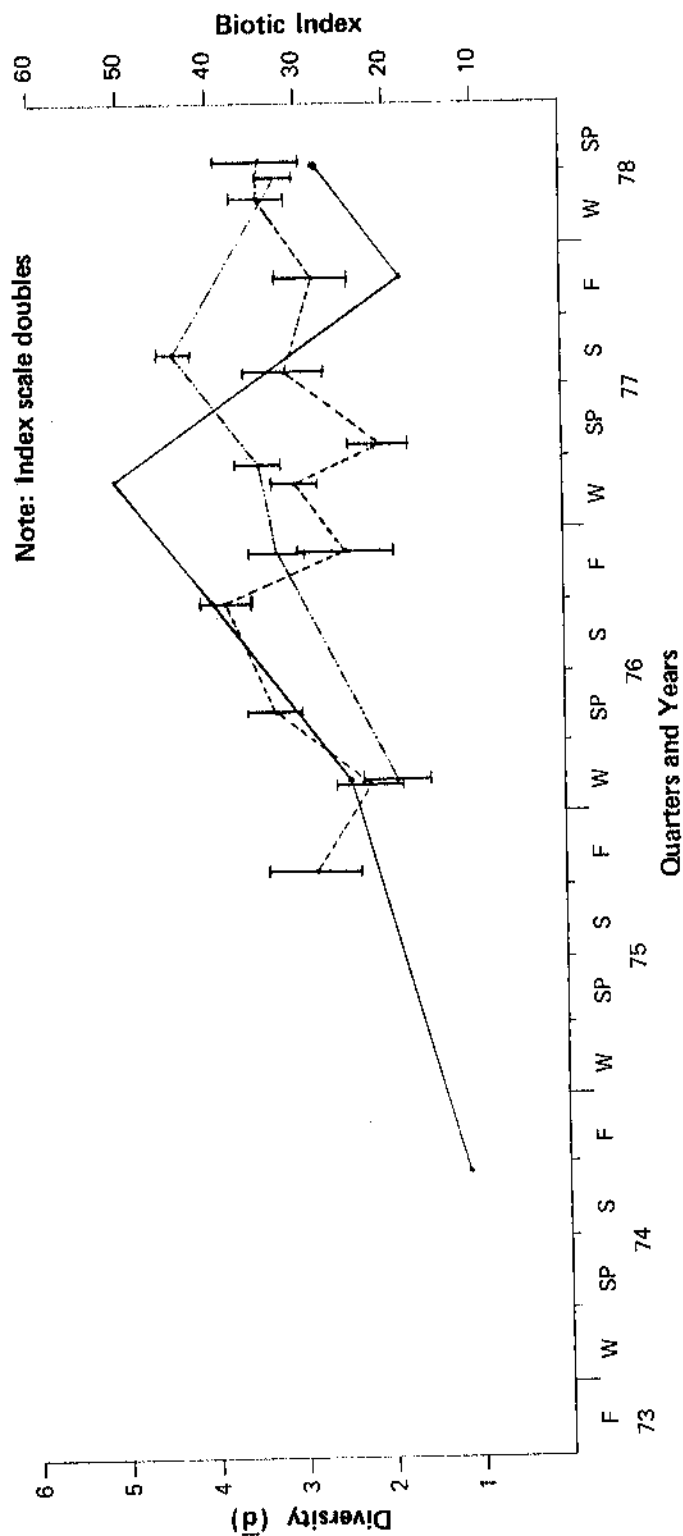
Station Number	Date	MacroInvertebrates								Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate				Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.						
88												49	23		
13.02.0009	2 May 78											272400	240		
	14 Jun 78														

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.02.0009
 BODY OF WATER: ESCAMBIA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 33.02.0C11 Body of Water Escambia Bay
Location Section C. 1 mile SW of Mulatto Bayou
County Escambia
Type Body of Water estuary/bay Classification III
Sources of Pollution Monsanto, American Cyanamid, Air Products, Boise Cascade
Container Corp., Scenic Hills STP, N.E. STP, Gulf Power, Alabama, Brewton
Nearby Land Use industry, semi-urban, residential
Sampling Frequency quarterly Depth 0.5 - 3 m
Bottom Type black carbonaceous muck % Volatile Solids 6.86
Aquatic Plants: Submerged _____
Emergent Juncus roemerianus, Spartina alterniflora
Cladium jamaicensis, Phragmites communis

Macroinvertebrates:

Cnidaria
Hydrozoa Campanularia edwardsi

Ctenopora
Nuda Beroe ovata

Platyhelminthes
Turbellaria cf. Leptoplana ciriabilis

Rhychozoela
Amphiporus caecus
Cerebratulus lacteus
Tetrastemma sp.

Annelida
Oligochaeta Lumbriculus variegatus

Hirudinea
Helobdella cf. fusca

Polychaeta

Axiiothella sp.
Capitella capitata floridana
Cistenides gouldii
Eteone heteropoda
Eumida sanguinea
Glycera dibranchiata
Haploscoloplos sp.
Hypaniola grayi
Laeonereis culveri
Lumbrineris coccinea
cf. Glycera sp.
Nereis succinea
Pectinaria gouldii
Polydora cf. ligni
P. websteri
Sabellides oculata
Scoloplos rubra
Streblospio benedicti
Tharyx sp.
Spiophanes bombyx

Arthropoda

Crustacea

Isopoda

Edotea montosa

Amphipoda

Corophium cf. louisianum
Crangonyx sp.
Grandidierella bonnieroides
Lembos smithi
Listriella barnardi
Melita dentata
Monoculodes edwardsi
Mucrogammarus macromucronatus
cf. Synchelidium sp.

Decapoda

Callinectes sapidus
Palaemonetes pugio

Mysidacea

Mysidopsis bigelowi
Mysis stenolepsis
Bowmaniella dissimilis

Cirripedia

Balanus eburneus
B. improvisus

33.02.0C11

Mollusca

Gastropoda

Cylichna bidentata
Littorina littorea
Melanella gracilis
Neritina reclinata
Pyramidella fusca

Pelecypoda

Brachidontes cf. exustus
Ensis minor
Macra fragilis
Rangia cuneata
Tagelus
Tellina lineata
T. texana

Bryozoa

Bowerbankia gracilis
Membranipora tenuis
Bugula sp.

DATA SUMMARY: Escondido Bay

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Focal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
45,02,06,11	8 Oct 73									112		
	26 Nov 73	2.669±0.571	0.455±0.171	9						146		
	14 Jan 74									9		
	6 Feb 74	1.537±0.436	0.506±0.184	6						1600		
	11 Feb 74									240		
	12 Mar 74											
	2 Apr 74	2.140±0.463	0.324±0.153	7						1		
	8 Apr 74									14		
	10 Jul 74									79		
	25 Jul 74	2.853±0.299	0.128±0.064	10						2		
	26 Aug 74											
	8 Oct 74									23		

See Methods for explanation of table.

DATA SUMMARY: Escambia Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
33.02.Oc11 Q4	30 Oct 74	2.251±0.334	0.229±0.089	8	1.854±0.181	0.354±0.049	11				Coc Gr 168000 Pen Dia 4244800 Total 4412800	79		
	15 Nov 74													
	10 Dec 74											372400		river heat flood stage
	22 Jan 75	2.504±0.172	0.210±0.029	14										
	16 Apr 75													
	11 Jun 75	1.604±0.457	0.389±0.146	5								540		
	18 Jun 75												1600	
	29 Jul 75	1.511±0.242	0.359±0.081	6									1600	
	26 Aug 75												17	

See Methods for explanation of table.

DATA SUMMARY: Escambia Bay

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
95	10 Sep 75									540		
	30 Sep 75	1.599±0.492	0.444±0.215	5						1600		
	13 Oct 75									170		
	6 Nov 75							Gr Flay 5 Gen Dia 7 Pen Dia 9 Total 21				
	20 Nov 75									350		
	19 Jan 76	0.871±0.390	0.618±0.267	3						240	LT2	
	11 Feb 76									23	2	
	16 Mar 76									350	130	
	5 Apr 76									2	LT2	
	26 Apr 76	1.430±0.140	0.304±0.050	7								

See Methods for explanation of table.

DATA SUMMARY:

[illegible]

See Methods for explanation of table.

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Escambia Bay

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate								
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
											BI	#Spp.	
35.02.0011	10 May 77	0.408±0.341 2.234±0.393	0.932±0.192 0.286±0.119	3 8							8	LT-1	Depth 2.0 m. Depth 0.2-1.0 m.
	5 Jul 77	2.428±0.300	0.197±0.070	9					Coc BG 14350 Gr Flag 275 Other Flag 25 Total 14650		230	2	Florida Index
	17 Aug 77												
	14 Nov 77	3.348±0.283	0.100±0.041	14						Coc BG 181008 Fil BG 65 Cen Dia 1486 Pen Dia 47222 Total 229781	490	23	
	8 Dec 77												
	14 Dec 77												
	30 Jan 78										2300	790	

See Methods for explanation of table.

DATA SUMMARY: Escambia Bay

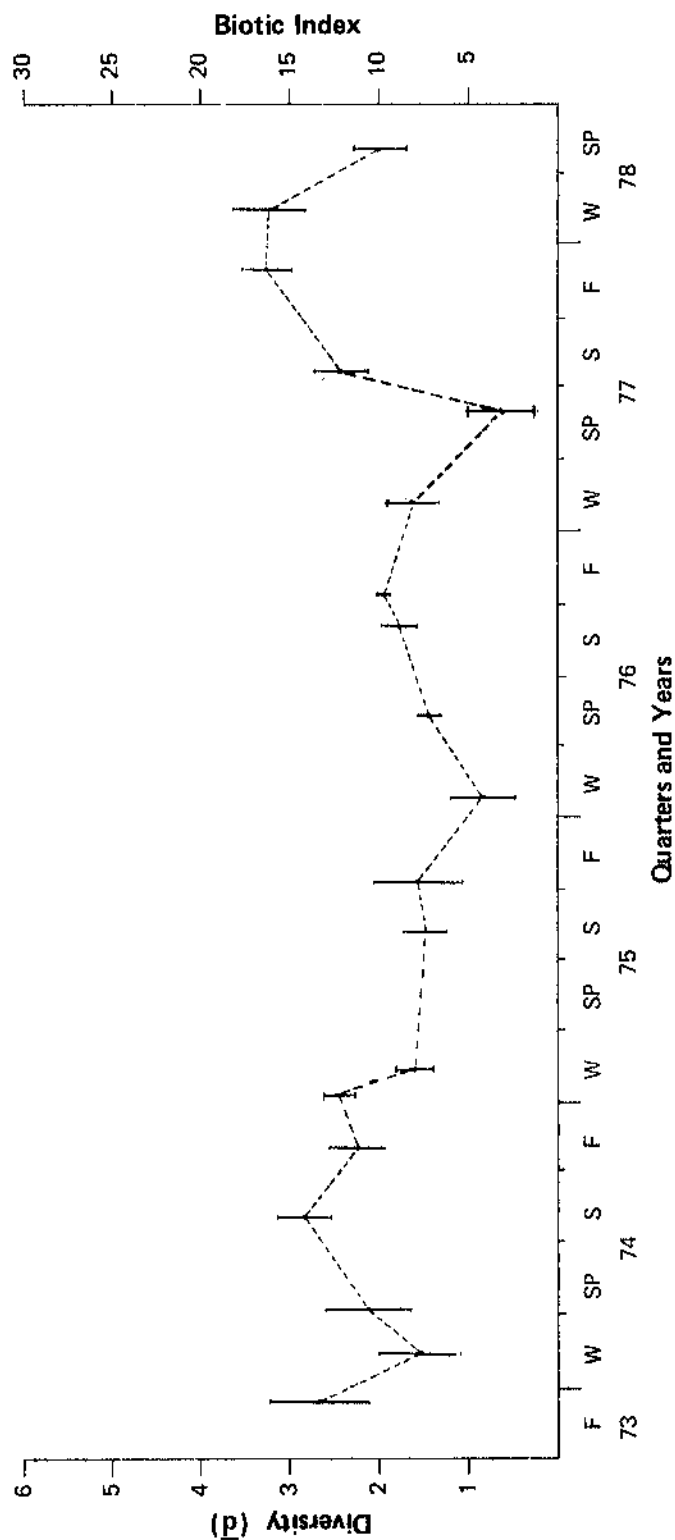
Station Number	Date	Macroinvertebrates								Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate		Artificial Substrate										
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
11,02,00:11	7 Feb 78	3.259±0.417	0.241±0.087	16								330	23	
	16 Mar 78											330	49	
	4 Apr 78											13	172	
	25 Apr 78	2.080±0.322	0.184±0.076	6								13	2	
	2 May 78											1600	23	
	14 Jun 78													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.02.0C11
 BODY OF WATER: ESCAMBIA BAY

--- NATURAL SUBSTRATE DIVERSITY
 --- ARTIFICIAL SUBSTRATE DIVERSITY
 --- BIOTIC INDEX (= FLORIDA INDEX)



Station No. 33.02.0019 Body of Water Escambia River
Location at US Highway 90
County Escambia
Type Body of Water tidal river Classification III
Sources of Pollution Jay oil field, Gulf Power, Monsanto, Boise Cascade,
UWF, Scenic Hills STP
Nearby Land Use timber, industry
Sampling Frequency quarterly - annual Depth 1 - 4 m
Bottom Type mud, organic leaf detritus, sand % Volatile Solids 11.2
Aquatic Plants: Submerged Potamogeton sp.
Emergent Juncus sp., Typha sp., Leersia sp.

Macroinvertebrates:

Platyhelminthes

Turbellaria

unident. sp.

Annelida

Polychaeta

Nereis succinea

Polydora websteri

Glycera dibranchiata

Oligochaeta

unident. sp.

Arthropoda

Crustacea

Isopoda

Sphaeroma destructor

Amphipoda

Carinogammarus mucronatus

Gammarus sp.

G. mucronatus

Grandidierella bonnieroides

Hyalella azteca

Lembos smithi

Microdeutopus gryllotalpa

Decapoda

Callinectes sapidus
Eurypanopeus depressus
Palaemonetes paludosus
 cf. Panopeus herbstii
Sesarma sp.
Uca sp.
 unident. penaeid

Mysidacea

Mysidopsis bigelowi
Mysis stenolepis

Cirripedia

Balanus eburneus

Insecta

Plecoptera

Paragnetina kansensis
Perlesta placida

Odonata

Ischnura cf. credula
Nehallenia sp.
Sympetrum sp.

Ephemeroptera

Baetis australis
Heptagenia flavescens
Isonychia spp.
Stenonema smithae
S. integrum
S. exiguum
Tricorythodes albilineatus

Hemiptera

Notonectia sp.

Trichoptera

Cheumatopsyche sp.
Hydropsyche sp.
Neureclipsis sp.
Oecetis sp.
Polycentropus sp.

Diptera

Ablabesmyia americana
A. parajanta
Atrichopogon sp.
Coelotanypus tricolor
Conchapelopia sp.
Corynoneura taris
Cricotopus sp.
C. bicinctus
Cryptochironomus sp.

Diptera (cont.)

Cryptochironomus fulvus
Dicrotendipes sp.
D. modestus
Glyptotendipes senilis
Harnischia sp.
Orthocladius annectens
Polypedilum fallax
P. convictum
P. halterale
Procladius sp.
Rheotanytarsus sp.
Rheocricotopus sp.
Sympotthastia sp.
Tanytarsus sp.
Thienemaniella sp.
Tribelos sp.
 unident. ceratopogonid sp.
 unident. chironomid sp.
 unident. orthocladian sp.

Coleoptera

Dineutus sp.
Gyrinus sp.
 unident. elmid

Mollusca

Gastropoda

Crepidula sp.
Neritina reclinata

Pelecypoda

Corbicula fluminea
Rangia cuneata

Echiura

2 unident. spp.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate					Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
													BI
104 33,02,0019	8 Oct 73									920		Qual - littoral	
	20 Nov 73	1.918±0.377		4				3	14		540		
	14 Jan 74										1512		
	4 Feb 74	2.643±0.170	0.079±0.032	8							2400		
	11 Feb 74												
	5 Mar 74				2.237±0.304	0.206±0.106	7				49		
	12 Mar 74										540		
	8 Apr 74										1600		
	25 Apr 74												
	3 May 74							1	11		350		
	10 Jun 74											Qual- littoral	
	10 Jul 74									920			

See Methods for explanation of table.

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Escondido River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
33.02.0019 106	14 Aug 75				3.89 ± 0.298	0.097 ± 0.031	20				350		
	26 Aug 75										272400		
	10 Sep 75										49		
	23 Oct 75										540		
	20 Nov 75										272400		
	30 Dec 75										240		
	1 Jan 76										240	13	
	11 Feb 76										350	11	
	16 Mar 76										920	240	
	5 Apr 76										350	17 2	
	11 May 76										1600	79	
	2 Jun 76												

See Methods for explanation of table.

DATA SUMMARY: Escambia River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
33-02-0019	28 Jun 76				2.895±0.281	0.123±0.045	11					1600	23	
	13 Jul 76											292400	33	
	3 Aug 76											240	2	
	16 Sep 76											540	34	
	4 Oct 76											2400	920	
	1 Nov 76											2400	130	
	6 Dec 76											262400	23	
	22 Jan 77											280	23	
	1 Feb 77											2300	33	
	2 Mar 77											330	17	
	21 Mar 77				2.777±0.341	0.303±0.065	20					350	13	
	13 Apr 77													

See Methods for explanation of table.

DATA SUMMARY: Escambia River

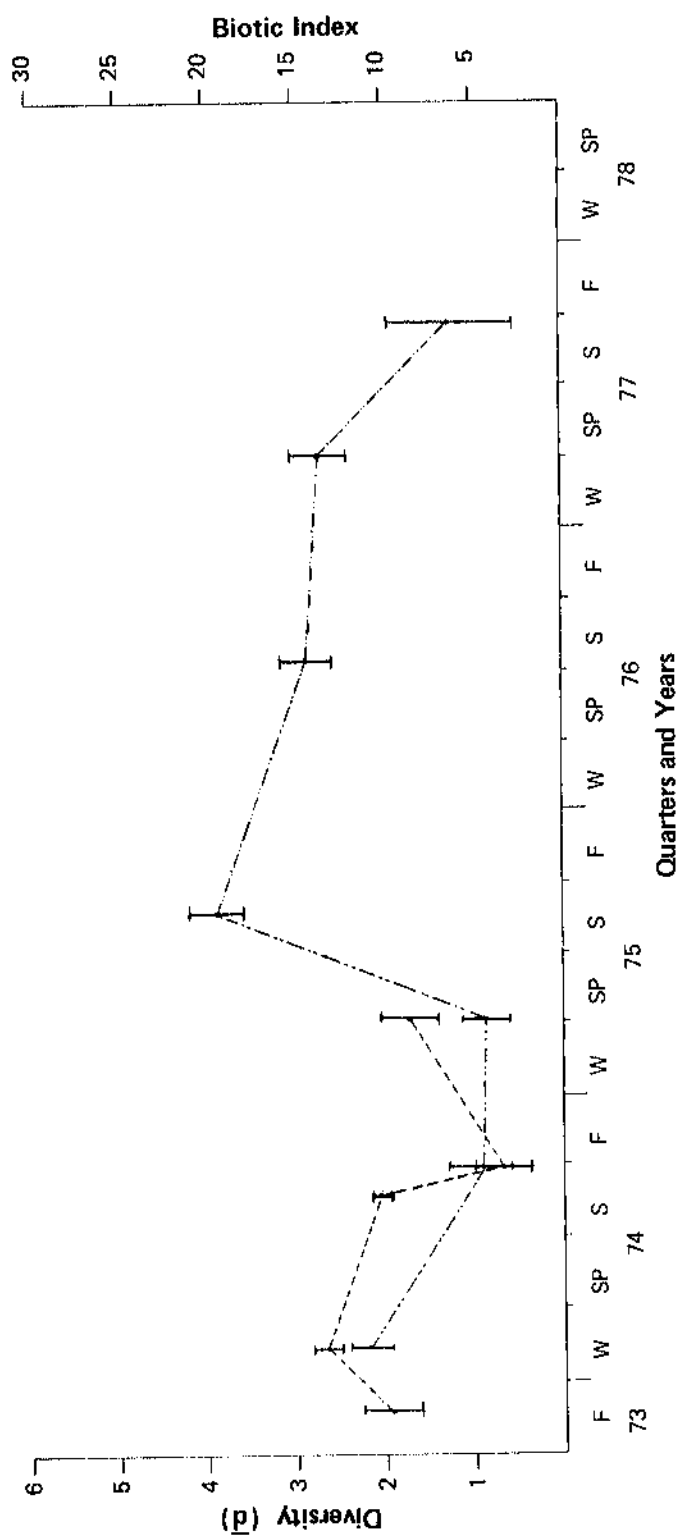
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
33-02-0019	5 Jul 77										3300	17	
	2 Aug 77										3300	79	
	1 Sep 77				1.292±0.674	0.844±0.323	5				2300	B	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.02.0019
 BODY OF WATER: ESCAMBIA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 33.02.0023 Body of Water Pensacola Bay
Location near Gulf Islands Natl. Seashore
County Santa Rosa
Type Body of Water bay Classification III
Sources of Pollution domestic waste
Nearby Land Use state park
Sampling Frequency annually Depth 2.0 m
Bottom Type sand % Volatile Solids _____
Aquatic Plants: Submerged Syringodium filiforme
Emergent _____

Macroinvertebrates:

Rhynchocoela

Tetrastemma sp.

Annelida

Polychaeta

Ammotrypane aulogaster
Armandia agilis
Chone cf. americana
C. dumeri
Eteone cf. heteropoda
Glycera dibranchiata
Haploscoloplos fragilis
Laeoneris culveri
Nereis pelagica
N. pelagica cf. occidentalis
N. succinea
Nerine cf. agilis
Pectinaria gouldi
Phyllodoce cf. fragilis
Polydora ligni
P. websteri
Prionospio texana
Scoloplos cf. capensis
cf. Syllis sp.
Spiophanes bombyx

Arthropoda

Crustacea

Isopoda

Edotea sp.
Erichsonella floridana
E. sp.
 cf. Janira sp.

Amphipoda

Ampelisca vadorum
Grandidierella bonnieroides
Haustorius sp.
Monuculodes sp.

Decapoda

Callinectes sapidus
Emerita talpoida
Hippolyte pleuracantha
Naushonia sp.
Pagurus bonairensis
Pagurus pollicaris
Penaenus cf. aztecus
 cf. Pinnixa sp.
 cf. Potonia sp.

Mysidacea

Mysidopsis bigelowi

Cirripedia

Balanus eburneus

Tanaidacea

Leptochelia rapax

Mollusca

Gastropoda

Anachis cf. avara
Bittium varium
Cyllichna bidentata
 cf. Polinices
Natica cf. pusilla
 cf. Nerita sp.
Thais haemastoma

Pelecypoda

Anomalocardia cuneimeris
Corbula sp.
Donax variabilis
Ensis minor
Macoma cf. constricta
Laevicardium mortoni

33.02.0023

Echinodermata

Ophiuroidea

Amphipholis cf. gracillima

Echinoidea

Arbacia cf. punctulata

Chordata

Cephalochordata

Branchiostoma caribaeum

See Methods for explanation of table.

See Methods for explanation of table.

DATA SUMMARY: Pensacola Bay

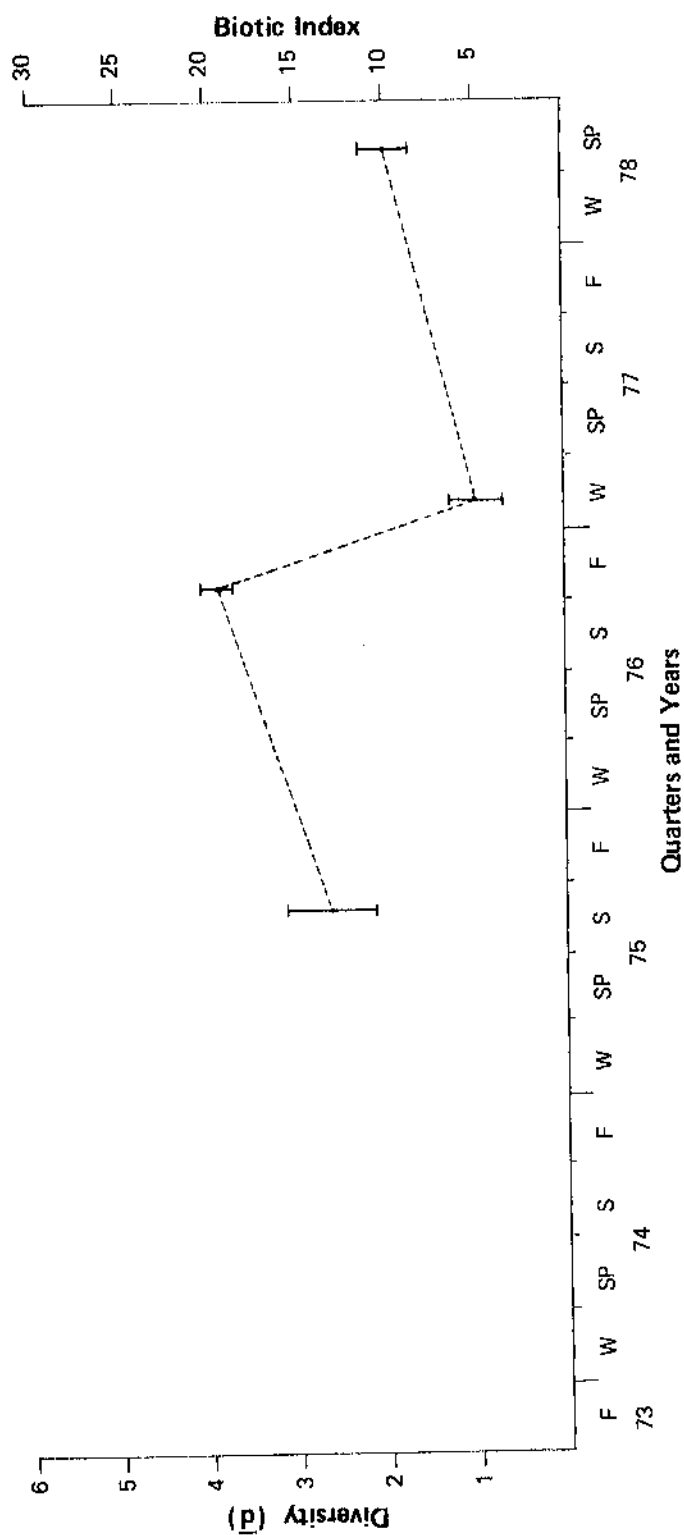
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		Biotic Index	#Spp.					
		Diversity	Redundancy	#Spp.	Diversity					Redundancy	#Spp.	
33-02-0023	25 Jan 77 (cont'd)							Pen Dia 6925 Total 14625		312400	540	
	6 Feb 77									7900	330	
	1 May 77											
	20 Apr 78	1.999±0.271	0.523±0.077	18						79	23	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.02.0023
 BODY OF WATER: PENSACOLA BAY

--- NATURAL SUBSTRATE DIVERSITY
 - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 33.03.0001 Body of Water Blackwater River
Location at SR #4
County Escambia
Type Body of Water river Classification III
Sources of Pollution agricultural runoff
Nearby Land Use forest
Sampling Frequency quarterly Depth 0.5 - 1.5 m
Bottom Type marl, sand, detritus % Volatile Solids 0.4%
Aquatic Plants: Submerged Myriophyllum sp., Cladophora sp., Batrachospermum
boryanum Emergent Salix caroliniana

Macroinvertebrates:

Platyhelminthes

Turbellaria

Leptoplana sp.

Planaria sp.

Annelida

Oligochaeta

unident. spp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Amphipoda

Hyaella azteca

Crangonyx sp.

Decapoda

Pacifastacus leniusculus

Palaemonetes kadiakensis

Procambarus versutus

unident. astacid

Insecta

Plecoptera

Acroneuria abnormis
A. arenosa/mela
A. lycorias
Perlinella ephyre
Isoperla dicala
I. bilineata
Helopicus subvarians
Leuctra ferruginea
Neoperla clymene
Paragnetina fumosa
Perlesta placida
Perlinella drymo
P. fumipennis

Odonata

Aeschna sp.
Argia apicalis
A. moesta
A. sedula
A. translata
Boyeria vinosa
Dromogomphus sp.
Didymops transversa
Enallagma sp.
Erpetogomphus sp.
Gomphus spp.
G. pallidus
G. plagiatus
Hagenius brevistylus
Ischnura sp.
Lestes vigilax
Libellula sp.
L. pulchella
Macromia sp.
M. illinoiensis
M. magnifica
M. taeniolata
Progomphus obscurus
cf. Somatochlora sp.

Ephemeroptera

Baetis australis
B. ephippiatus
B. intercalaris
B. spinosus
Baetisca sp.
B. becki
Baetisca obesa
B. rogersi
Caenis sp.
Callibaetis floridanus
Centroptilium viridocularis

Ephemeroptera (cont.)

Dolania americana
Ephemerella deficiens
E. choctawhatchee
E. trilineata
Habrophlebiodes brunneipennis
Hexagenia munda marilandica
Isonychia sp.
Leptophlebia intermedius
Necephemera sp.
Paraleptophlebia sp.
P. volitans
Pseudocloeon bimaculatus
P. parvulum
P. punctiventris
Pseudiron sp.
Stenonema exiguum
S. smithae
Stenacron floridense
S. speciosum
Tricorythodes albilineatus

Hemiptera

Notonecta sp.
 unident. corixid
 unident. gerriid

Trichoptera

Athripsodes sp.
Brachycentropus sp.
Cheumatopsyche spp.
Chimarra sp.
Hydropsyche spp.
Hydroptila sp.
Leptocella sp.
Lype sp.
Micrasema sp.
Mystacides sp.
Neureclipsis sp.
Nyctiophylax sp.
Oecetis spp.
O. cinerascens
 cf. Ptilostomis sp.
Triaenodes sp.

Megaloptera

Chauliodes sp.
Corydalus cornutus

Lepidoptera

unident. pyralidid

Diptera

Ablabesmyia americana
A. aspera
A. auriensis
A. janta
A. ornata
A. peleensis
A. philosophagnos
A. tarella
Antocha sp.
Atherix variegata
Bezzia sp.
Brillia sp.
Cardiocladius sp.
Chironomus sp.
Cladotanytarsus sp.
Conchapelopia sp.
Coelotanypus tricolor
Chironomus carus
Corynoneura sp.
Cricotopus spp.
Cryptochironomus blarina
C. fulvus
Cricotopus remus
Cryptotendipes sp.
Culicoides sp.
Demicryptochironomus sp.
Dicrotendipes leucoscelis
D. modestus
Endochironomus sp.
E. nigricans
Eukiefferiella sp.
E. cerulescens
Guttipelopia sp.
Harnischia sp.
Hexatoma sp.
Heterotrissocladius sp.
Leptochironomus sp.
Limnophora sp.
Macropelopia sp.
Limnophyes sp.
Micropsectra sp.
Microtendipes sp.
Orthocladius annectens
Parachironomus subletti
P. demejerei
Paratendipes cf. connectens
P. subaequalis
Paralauterborniella cf. elachista
P. nigrohalteralis
Paracladopelma sp.
Palpomyia spp.
P. tibialis
Parametriocnemus sp.

Diptera (cont.)

cf. Paratanytarsus sp.
Pentaneura inculta
P. sp.
Phaenopsectra sp.
Pilaria sp.
Polypedilum convictum
P. fallax
P. halterale
P. illinoense
Pseudochironomus sp.
Psectrocladius sp.
P. cf. vernalis
Pseudorthocladus sp.
Procladius sp.
Plecopteracoluthus sp.
Rheocricotopus sp.
Rheotanytarsus sp.
Robakia demeije
Simulium spp.
Stenochironomus sp.
Stilobezzia sp.
Tanytarsus spp.
Tabanus sp.
Tanypus sp.
Thienemanniella spp.
Tipula sp.
Trissocladius robacki
Tribelos jucundus
T. fuscicornis
Labrundinia cf. virescens
 unident. ceratopogonid spp.
 unident. chironomid spp.
 unident. tipulid
 unident. orthocladian
 unident. simuliid

Coleoptera

Ancronyx variegatus
Berosus sp.
Dubiraphia sp.
Ectopria sp.
Gyrinus sp.
Gonielmis dietrichi
Helichus fastigiatus
Macronychus glabratus
Simsonia sp.
Stenelmis sp.
 unident. dytiscid

33.03.0001

Arachnida

Acarina

Lebertia (Pilolebertia) sp.

Torrenticola sp.

unident. spp.

Mollusca

Gastropoda

Ferrissia sp.

DATA SUMMARY: Blackwater River

Station number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	B1	#Spp.					
43.03.0001	18 Oct 73											350		
	1 Nov 73	0.971±0.251		2								596		
	4 Feb 74	0.700±0.519	0.850±0.340	3										
	25 Feb 74											130		
	12 Mar 74	0.834±0.577	0.800±0.395	3	3.578±0.217	0.077±0.029	17					350		
	20 Mar 74													
	30 Apr 74	0.000±0.000		0				16	23			79		
	11 Jun 74											23		
	9 Jul 74											350		
	30 Jul 74	0.000±0.000		0										
	2 Oct 74							14	34			130		
	7 Nov 74	0.001±0.424	0.243±0.083	14	4.065±0.256	0.071±0.024	22				540			

See Methods for explanation of table.

DATA SUMMARY: Blackwater River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
35,01,0001	14 Jan 75								Coc Gr 767 Gr Fil 329 Pen Dia 40511 Total 41607		540		
	20 Jan 75										22400		
	10 Feb 75										920		
	26 Feb 75										240		
	3 Mar 75										8		
	7 Apr 75										240		
	29 Apr 75										240		
	12 Jun 75				2.526±0.503	0.348±0.108	10				22400		
	8 Jul 75										240		
	23 Jul 75										22400		
	21 Aug 75										22400		

See Methods for explanation of table.

DATA SUMMARY: Blackwater River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		Total	Fecal							
		Diversity	Redundancy	#Spp.	Diversity							Redundancy	#Spp.	
33.03.0001 124	30 Sep 75													
	14 Oct 75	3.187±0.404	0.255±0.075	18								920		
	13 Nov 75											350		
	8 Dec 75											LT2400		
	13 Jan 76											540		
	15 Jan 76	3.005±0.416	0.236±0.070	14				34	49			49		
	10 Feb 76											79	8	
	4 Mar 76	3.492±0.204	0.105±0.031	19						Fil BG Coc Gr Pen Dia Total	Fil BG Coc Gr Pen Dia Total	170 130		
15 Apr 76												920	LT 2	

See Methods for explanation of table.

DATA SUMMARY: Blackwater River

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate					Total	Fecal		
		Diversity		#Spp.	Diversity		#Spp.						
		Diversity	Redundancy		Diversity	Redundancy							
13.U3.0001	22 Apr 76	3.310±0.364	0.318±0.073	29						350	2		
	10 May 75									350	17 2		
	14 Jul 76									Gr2400	Gr2400		
	2 Aug 76									2400	240		
	2 Sep 76									Gr2400	920		
	14 Sep 76	3.440±0.464	0.314±0.092	19				66	86	540	17		
	5 Oct 76									350	23		
	3 Nov 76	2.835±0.311	0.430±0.673	35	3.688±0.289	0.196±0.044	33			Gr2400	1600		
	26 Jan 77												
	15 Feb 77	3.551±0.339	0.244±0.060	29				54	76	240	33		
										79	73		

See Methods for explanation of table.

DATA SUMMARY: Blackwater River

Station Number	Date	Macroinvertebrates							Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate			Biotic Index	Total			Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy						#Spp.	
33.03.0001	7 Mar 77									272400	49		
	6 Apr 77	4.003±0.332	0.134±0.036	22						3300	330		
	4 May 77									130	17		
	2 Jun 77				3.361±0.143	0.122±0.018	26		Coc BG 930 Fil BG 13 Coc Gr 762 Fil Gr 26 Pen Dia 44070 Total 45801	1600	79		
												Florida Index	
	6 Jul 77	4.397±0.239	0.073±0.017	34						1300	110		
	3 Aug 77				3.357±0.294	0.254±0.055	30		Coc BG 10297 Fil BG 52 Coc Gr 142 Fil Gr 13 Pen Dia 18527	24000	3300		

See Methods for explanation of table.

DATA SUMMARY: Blackwater River

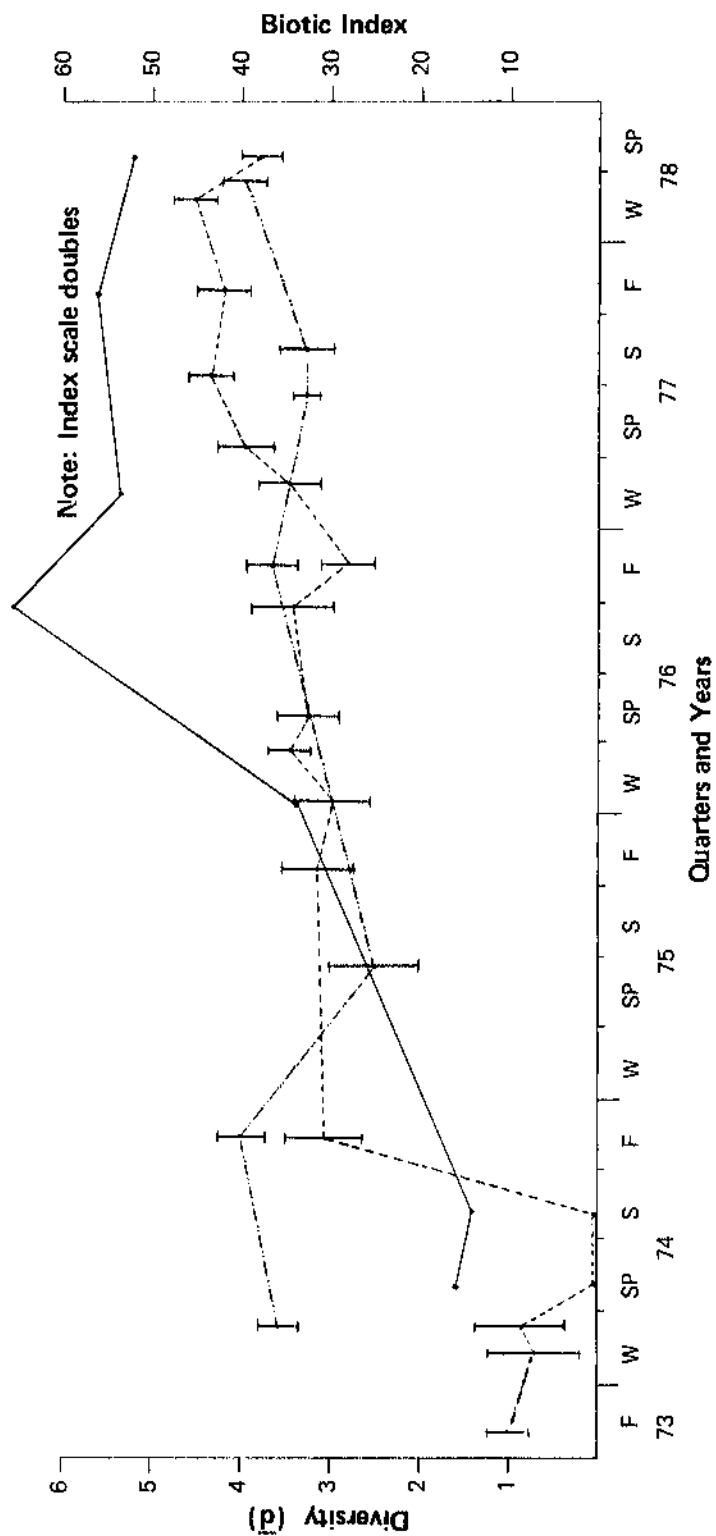
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	B1	#Spp.			Total	Fecal	
33.03.0001 127	3 Aug 77 Cont'd													
	17 Oct 77	4.271±0.308	0.137±0.030	36				57	78		Total 29031	4900	34	
	1 Dec 77											4900	1300	
	9 Jan 78											230	79	
	9 Feb 78													
	10 Feb 78	4.588±0.259	0.124±0.023	45								23	13	
	13 Mar 78				4.031±0.275	0.098±0.027	26					130	79	
	12 Apr 78	3.829±0.221	0.084±0.022	24				53	68			130	22	
	1 May 78											3300	490	
	8 Jun 78													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.03.0001
 BODY OF WATER: BLACKWATER RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Plecoptera (cont.)

Leuctra ferruginea

Odonata

Agrion maculatum

Anomalagrion hastatum

Argia sp.

Boyeria vinosa

Dromogomphus sp.

Gomphus spp.

Macromia illinoiensis

Progomphus obscurus

Perithemis seminole

Ephemeroptera

Baetis ephippiatus

B. speithi

B. spinosa

Baetisca becki

B. obesa

B. rogersi

Brachycercus sp.

Dolania americana

Ephemerella sp.

E. choctawhatchee

E. trilineata

Habrophlebia vibrans

Hexagenia munda marilandica

Isonychia sp.

Neoemphemera sp.

Pseudocloeon sp.

P. alachua

P. bimaculatus

P. puntiventris

Siphloplecton sp.

Stenonema exiguum

S. integrum

S. smithae

Hemiptera

unident. veliid

Trichoptera

Brachycentrus sp.

Cheumatopsyche sp.

Chimarra sp.

Hydropsyche spp.

Hydroptila sp.

Leptocella sp.

Micrasema sp.

Trichoptera (cont.)

Molanna sp.
Oecetis sp.
Triaenodes sp.

Megaloptera

Corydalis cornutus

Diptera

Ablabesmyia americana
Atherix variegata
Cardiocladius sp.
Conchapelopia sp.
Cricotopus bicinctus
C. sp. I
C. remus
Cryptochironomus fulvus
Eukiefferiella sp.
Glyptotendipes sp.
Hexastoma sp.
Microtendipes sp.
Limnophyes sp.
Parakiefferiella sp.
Pilaria sp.
Plecopteracoluthus sp.
Psectrocladius sp.
Polypedilum convictum
P. halterale
P. illinoense
Pseudochironomus sp.
Rheocricotopus sp.
Rheotanytarsus sp.
Simulium spp.
Tanytarsus sp.
Thienemanniella sp.
Tipula sp.
Tribelos jucundus
 unident. ceratopogonid spp.
 unident. orthocladian
 unident. simuliid

Coleoptera

Dineutus sp.
Dubiraphia sp.
Simsonia quadrinotata
Stenelmis sp.
 unident. elmids spp.

Arachnida

Acarina

Lebertia (Pilobertia) sp.
Torrenticola sp.
 unident. sp.

DATA SUMMARY: Big Coldwater Creek

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
									B1			#Spp.		
33.03.0029	16 Sep 75							11	26			540	21	Florida Index
	23 Nov 76							50	68			490	33	
	14 Mar 78							50	58					

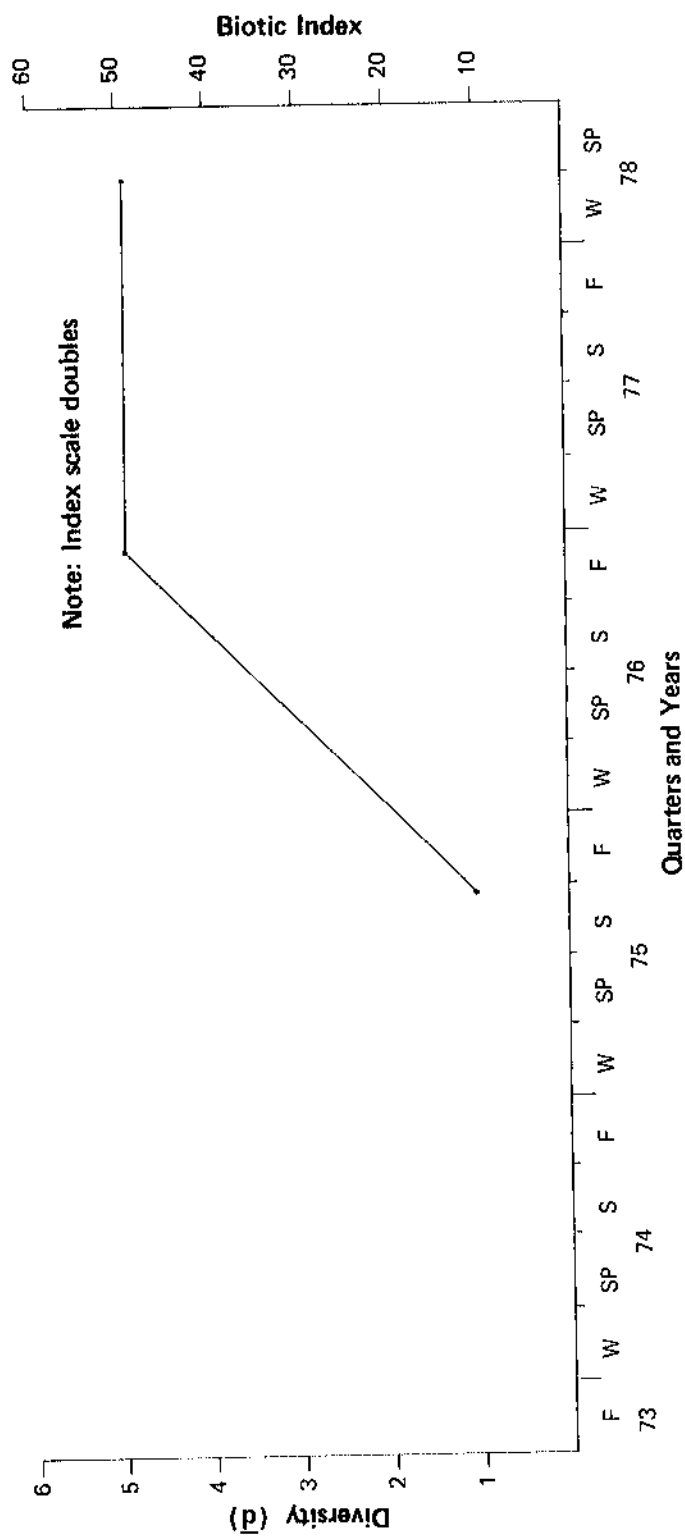
See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.03.0029

BODY OF WATER: BIG COLDWATER CREEK

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 _____ BIOTIC INDEX (= FLORIDA INDEX)



Station No. 33.03.0C30 Body of Water East Bay

Location inshore from buoy N-6

County Santa Rosa

Type Body of Water estuary Classification II

Sources of Pollution domestic and industrial effluents, urban runoff

Nearby Land Use marsh

Sampling Frequency quarterly Depth 1.0 - 3.2 m

Bottom Type mud, sand, detritus % Volatile Solids 13.1

Aquatic Plants: Submerged _____

Emergent Spartina alterniflora, Alternanthera

philoxeroides, Panicum sp., Juncus sp., Spartina sp., Myrica sp.

Macroinvertebrates:

Cnidaria

Hydrozoa

unident. campanularid

Platyhelminthes

Turbellaria

Stylochus ellipticus

Rhyncocoela

Cerebratulus lacteus

Micrura leidi

Lineus socialis

Tetrastemma sp.

Annelida

Polychaeta

Eteone heteropoda

Glycera sp.

G. dibranchiata

Haploscoloplos sp.

Laeonereis culveri

Lumbrineris coccinea

L. acuta

Nereis succinea

Paraprionospio pinnata

Pectinaria gouldii

Phyllocoel cf. fragilis

Polydora websteri

Polychaeta (cont.)

Scoloplos sp.
Spiophanes bombyx

Arthropoda

Crustacea

Isopoda

Sphaeroma quadridentatum

Amphipoda

Acanthohaustorius sp.
Carinogammarus mucronatus
Corophium sp.
C. louisianum
Grandidierella bonnieroides
Lembos smithi
Lepidactylus burbanki
Listriella sp.
Melita sp.
M. nitida
Monoculoides edwardsi
M. cf. intermedius
unident. haustorid

Decapoda

Callinectes sapidus
Eurypanopeus depressus
Palaemonetes pugio
Pinnixa sp.
Rithropanopeus harrisii

Mysidacea

Bowmaniella dissimilis
Mysis stenolepis
Mysidopsis bigelowi

Cirripedia

Balanus eburneus
B. improvisus

Cumacea

Oxyurostylis smithi

Insecta

Diptera

Cryptochironomus fulvus
Tanytarsus sp.
unident. clunioninine

33.03.0C30

Mollusca

Gastropoda

Littorina diletata
Nassarius vibex
Neritina reclinata
Tornatina canaliculata
Pyramidella fusca

Pelecypoda

Arca sp.
Brachidontes recurvus
Corbicula sp.
Ensis minor
Mercenaria campechiensis
Modiolus demissus
Rangia cuneata
Tagelus plebeius
Tellina lineata

Bryozoa

Membranipora tenuis

Hemichordata

Enteropneusta

Ptychordera sp.

DATA SUMMARY: East Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		Total	Fecal							
		Diversity	Redundancy	#Spp.	Diversity			Redundancy	#Spp.			BI	#Spp.	
31.03.06.70 137	9 Oct 73											2		
	1 Nov 73	1.777±0.122	0.409±0.028	18										
	18 Dec 73	0.927±0.587	0.867±0.314	4										
	6 Feb 74	1.634±0.491	0.424±0.210	5							272400			
	11 Feb 74													
	11 Mar 74											2		
	2 Apr 74	2.428±0.221	0.060±0.050	6								5		
	9 Apr 74											2		
	10 Jul 74											4		
	4 Aug 74	2.559±0.291	0.099±0.067	7								33		
	16 Aug 74											240		

See Methods for explanation of table.

DATA SUMMARY: East Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
		Total	Fecal											
33.03.0C30	8 Oct 74											130		
	14 Nov 74	2.267±0.303	0.132±0.089	6	1.536±0.139	0.393±0.051	7					49		
	27 Jan 75	2.411±0.347	0.214±0.111	8								49		
	16 Apr 75											79		
	27 Jun 75											130		
	19 Jun 75	2.648±0.462	0.250±0.134	8										
	13 Aug 75	1.907±0.203	0.144±0.067	5										
	26 Aug 75											33		
	11 Sep 75											130	4	
	30 Sep 75	0.000		0								540	2	
	13 Oct 75											240		
	6 Nov 75													
	</													

See Methods for explanation of table.

DATA SUMMARY: East Bay

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
33, 43, 44, 50	6 Nov 75 (cont.)							Gr Flag LT 1 Cen Dia 11 Pen Dia 3 Total 18					
	30 Dec 75										540		
	19 Jan 76	0.803±0.326	0.633±0.221	3							4		
	26 Jan 76										33	13	
	12 Feb 76										130	49	
	17 Mar 76										23	LT 2	
	6 Apr 76										130	22	
	28 Apr 76	1.560±0.422	0.440±0.202	5						Coc BG 872 Fll BG 0 Coc Gr 234 Fll Gr 45 Gr Flag 253	7	LT 2	

See Methods for explanation of table.

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
33.03.0030	28 Apr 76 cont.								Other Flag 0 Cen Dia 64 Pen Dia 24134 Total 37936	540	22	
	29 May 76									33	5	
	1 Jun 76									13	2	
	13 Jul 76									450	27	
	19 Aug 76	1.934±0.258	0.241±0.065	7						79	13	
	28 Sep 76											
	29 Sep 76	1.399±0.421	0.410±0.237	4						79	13	

See Methods for explanation of table.

DATA SUMMARY: East Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate										
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
33,01,0030	29 Sep 76 (cont.)									Pen Dia 83133 Total 254002				
	1 Oct 76											79	33	
	2 Nov 76											230	23	
	6 Dec 76											920	23	
	2 Jan 77											350	13	
	1 Feb 77	2.656±0.389	0.192±0.088	9						Coc BG 11000 Fil BG 0 Coc Gr 4550 Fil Gr 0 Gr Flag 375 Other Flag 100 Cen Dia 450 Pen Dia 1875 Total 18350	GT2400	1600		

See Methods for explanation of table.

DATA SUMMARY: East Bay

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate						Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
53-03, 06, 30	9 Mar 77										1600	540		
	4 May 77	3.108±0.330	0.123±0.057	11							13	2		
	29 Jun 77	2.145±0.417	0.254±0.170	6							13	2		
	7 Jul 77													
	14 Nov 77	1.891±0.246	0.433±0.076	12							23	172	Florida Index	
	8 Dec 77											79	23	
	30 Jan 78											1300	79	
6 Feb 78	0.449±0.352	0.854±0.120	9								330	13		

See Methods for explanation of table.

DATA SUMMARY: East Bay

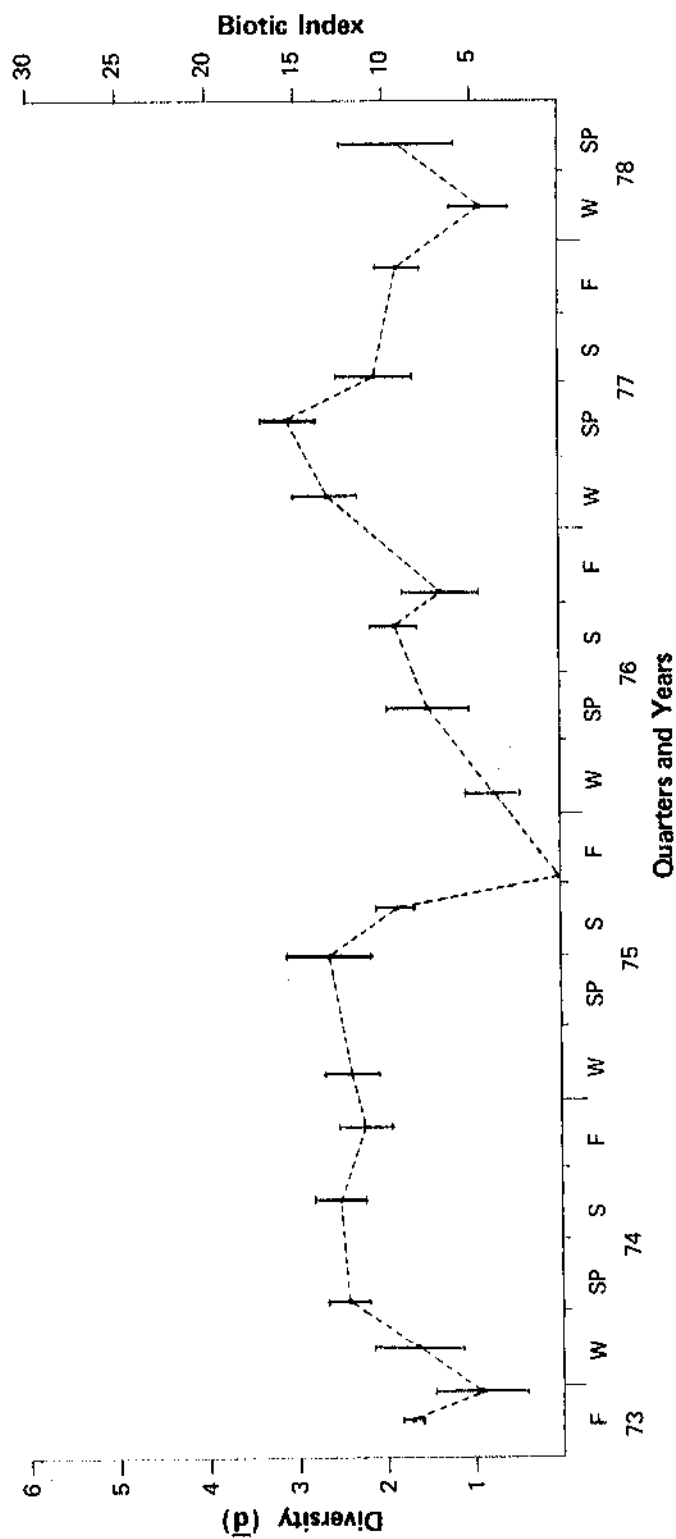
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate										
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
		BI	#Spp.											
143 S. 03, OR 50	16 Mar 78											79	33	
	4 Apr 78											14	LP 2	
	25 Apr 78	1.868±0.640	0.703±0.237	8								5	2	
	2 May 78											1600	79	
	14 Jun 78													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.03.0C30
 BODY OF WATER: EAST BAY

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 33.04.0002 Body of Water Yellow River

Location South of Holt

County Okaloosa

Type Body of Water river Classification III

Sources of Pollution _____

Nearby Land Use forest

Sampling Frequency random Depth 0.5 - 1.5 m

Bottom Type sand, mud % Volatile Solids _____

Aquatic Plants: Submerged Fontinalis filiformis, Fontinalis flaccida

Emergent Nuphar sp., Typha sp., Taxodium

distichum

Macroinvertebrates:

Nematomorpha

unident. sp.

Annelida

Oligochaeta

unident. spp.

Hirudinea

unident. spp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Amphipoda

Hyalella azteca

Synurella sp.

Decapoda

unident. astacid sp.

Insecta

Plecoptera

Aeroneuria abnormis, A. mela/arenosa

Hydroperla cf. fugitans

Isogenus cf. subvarians

Isoperla bilineata

Nemocapnia carolina

Plecoptera (cont.)

Neoperla clymene
Perlesta placida
Pteronarcys pictetii
Taeniopteryx lita

Odonata

Argia translata
Boyeria vinosa
Dromogomphus sp.
Enallagma sp.
Ischnura sp.
Macromia illinoiensis
M. taeniolata
Neurocordulia sp.
Progomphus obscurus

Ephemeroptera

Baetis australis
B. intercalaris
B. spiethi
Baetisca obesa
Ephemerella choctawhatchee
E. trilineata
Heptagenia flavescens
H. cf. diabasia
H. munda marilandica
Isonychia sp. A
Leptophlebia intermedius
Neophemera sp.
Pseudocloeon alachua
P. parvulum
Stenacron interpunctatum
Stenonema exiguum
S. smithae
Siphloplecton speciosum
Tricorythodes albilineatus

Hemiptera

unident. notonectid

Trichoptera

Arthripsodes sp.
Brachycentrus sp.
Cheumatopsyche sp.
Chimarra sp.
Hydropsyche sp.
Hydroptila sp.
Leptocella sp.
Neureclipsis sp.
Polycentropus sp.
Potamyia sp.

Trichoptera (cont.)

Pycnopsyche sp.

Triaenodes sp.

Megaloptera

Corydalus cornutus

Diptera

Ablabesmyia aspera

A. mallochi

A. parajanta

A. tarella

Brillia sp.

Chaoborus sp.

Cladotanytarsus sp.

Conchapelopia sp.

Corynoneura sp.

Cricotopus bicinctus

C. remus

C. sp.

Cryptochironomus fulvus

Eukiefferiella sp.

cf. Heterotrissocladius sp.

Micropsectra sp.

Phaenopsectra sp.

Polypedilum convictum

P. fallax

P. halterale

P. illinoense

Psectrocladius vernalis

Pseudorthocladius sp.

Rheocricotopus sp.

Rheotanytarsus sp.

Simulium sp.

Tanytarsus spp.

Thienemanniella sp.

Tribelos sp.

unident. ceratopogonid spp.

unident. diamesid

unident. simuliid spp.

Coleoptera

Ancyronyx variegatus

Dineutus sp.

Stenelmis sp.

unident. elmids spp.

unident. hydrophilid

Mollusca

Gastropoda

Campeloma sp.

33.04.0002

Pelecypoda

Corbicula manilensis

Elliptio complanata

DATA SUMMARY: Yellow River

Station Number	Date	Macroinvertebrates								Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate				Artificial Substrate							Total	Fecal	
		Diversity		Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
		Diversity	Redundancy												
149	24 Oct 73												540		
	31 Jan 74												GT2400		
	25 Feb 74												GT2400		
	29 May 74												540		
	11 Jun 74												LT2		
	11 Jul 74								9	21					
	7 Nov 74												350		
	21 Jan 75												GT2400		
	29 Apr 75												79		
	23 Jul 75												GT2400		
	30 Sep 75												920		
	10 May 76												GT2400	LT2	

See Methods for explanation of table.

DATA SUMMARY: Yellow River

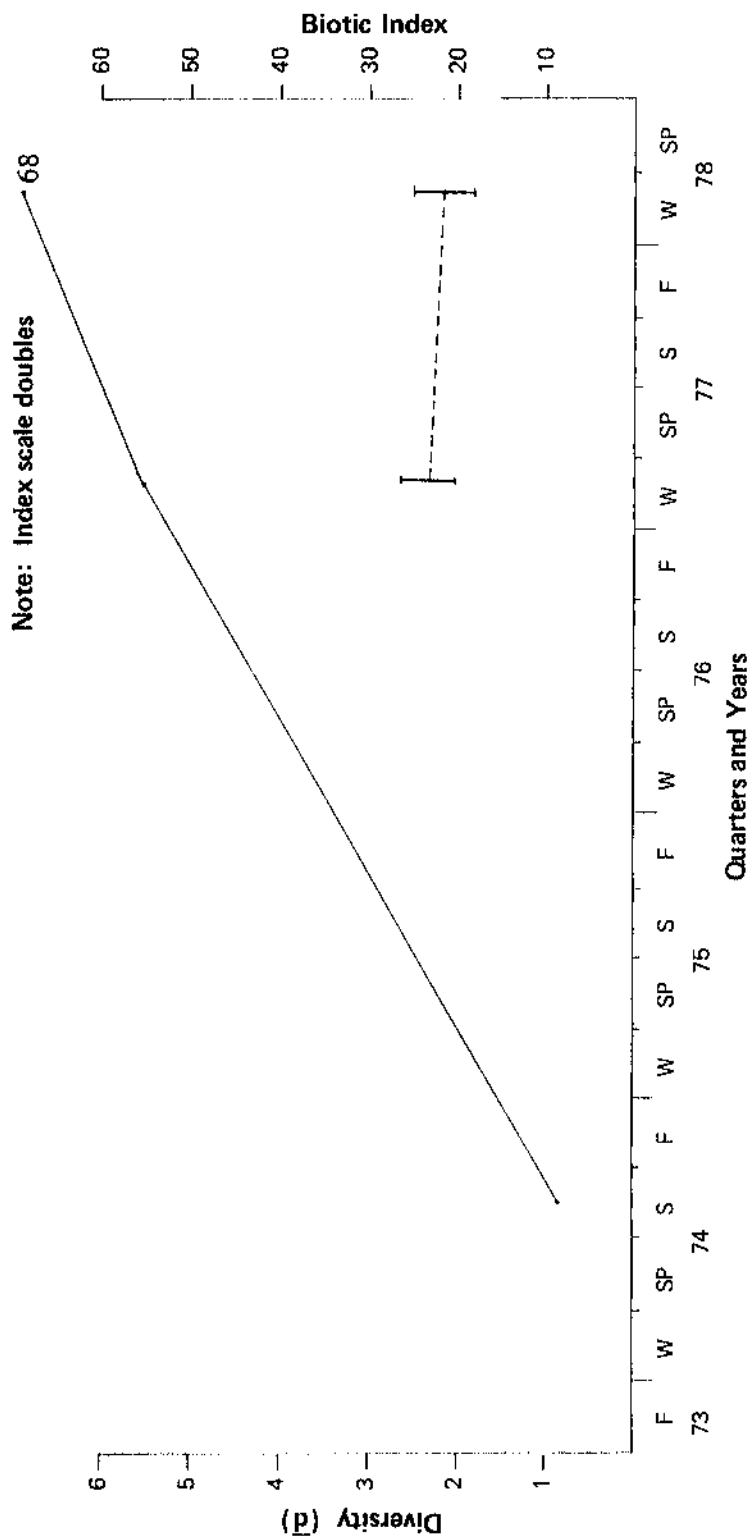
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
33.04.0002 150	14 Jul 76									240	240	
	2 Aug 76									372400	540	
	2 Sep 76									372400	B	
	1 Nov 76									350		
	6 Jan 77									920	130	
	22 Feb 77	2.311±0.416	0.195±0.136	6						240	130	
	7 Dec 77									490	23	
	16 Feb 78	2.236±0.367		5						230	33	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.04.0002
BODY OF WATER: YELLOW RIVER

--- NATURAL SUBSTRATE DIVERSITY
----- ARTIFICIAL SUBSTRATE DIVERSITY
--- BIOTIC INDEX (= FLORIDA INDEX)



Station No. 33.04.0030 Body of Water Shoal River

Location at SR 393, North of Deerland

County Okaloosa

Type Body of Water river Classification III

Sources of Pollution agricultural and domestic runoff

Nearby Land Use forest

Sampling Frequency annually Depth 1.0 m

Bottom Type sand, silt % Volatile Solids

Aquatic Plants: Submerged Tuomeya fluviatilis, Chiloscyphus polyanthus,

Fontinalis filiformis, F. flaccida Emergent Palavincia sp.

Macroinvertebrates:

Nematomorpha

unident. sp.

Annelida

Oligochaeta

unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Amphipoda

Crangonyx sp.

Synurella sp.

Decapoda

unident. sp.

Insecta

Plecoptera

Acroneuria mela/arenos

A. abnormis

A. lycorias

Helopicus dicala

Isogenus subvarians

Isoperla

Leuctra sp.

Nemocapnia carolina

Neophasganophorus capitata

Plecoptera (cont.)

Neoperla clymene
Paragnetina kansensis
Perlinella drymo
P. ephyre
Perlesta placida
Paragnetina fumosa
Pteronarcys pictetii
Taeniopteryx lita

Odonata

Agrion maculatum
Argia translata
Boyeria vinosa
Celithemis sp.
Coryphaeschna sp.
Hagenius brevistylus
Hetaerina titia
Macromia illinoiensis
Neurocordulia sp.
Progomphus obscurus

Ephemeroptera

Baetis ephippiatus
B. intercalaris
B. spiethi
B. spinosus
B. australis
Baetisca rogersi
Ephemerella choctawhatchee
E. trilineata
Heptagenia sp.
Isonychia spp.
Neoempherema sp.
Paraleptophlebia volitans
Siphloplectron sp.
Stenonema exiguum
S. integrum
S. smithae
Tricorythodes albilineatus

Trichoptera

Arthripsodes sp.
Brachycentrus sp.
Cheumatopsyche sp.
Chimarra sp.
Hydropsyche spp.
Leptocella sp.

Trichoptera (cont.)

Macronemum carolina
Micrasema sp.
Oecetis sp.
O. cineracens

Megaloptera

Corydalis cornutus

Diptera

Atherix variegata
Cardiocladius sp.
Cladotanytarsus sp.
Conchapelopia sp.
Corynoneura sp.
Cricotopus bicinctus
C. remus
C. sp. I (Beck)
Eukiefferiella sp.
Heterotrissocladius sp.
Limnophyes sp.
 cf. Pentaneura sp.
Polypedilum halterale
P. convictum
P. illinoense
Psectrocladius vernalis
 cf. Psectrocladius sp.
Rheocricotopus robacki
Rheotanytarsus sp.
Stenochironomus sp.
Symbiocladius sp.
Simulium spp.
Tanytarsus sp.
Thienemanniella spp.
Tipula sp.
Trissocladius sp.
 unident. ceratopogonid
 unident. orthocladian
 unident. stratiomyid
 unident. simuliid
 unident. tipulid

Coleoptera

Ancyronyx variegatus
Berosus sp.
Dineutus sp.
Ectoparia sp.

Coleoptera (cont.)

Gonielmis dietrichi
Gyrinus sp.
Macronychus glabratus
Simsonia dietrichi
Stenelmis convexula
Stenelmis sp.
unident. elmids sp.

Arachnida

unident. sp.

DATA SUMMARY: Shoal River

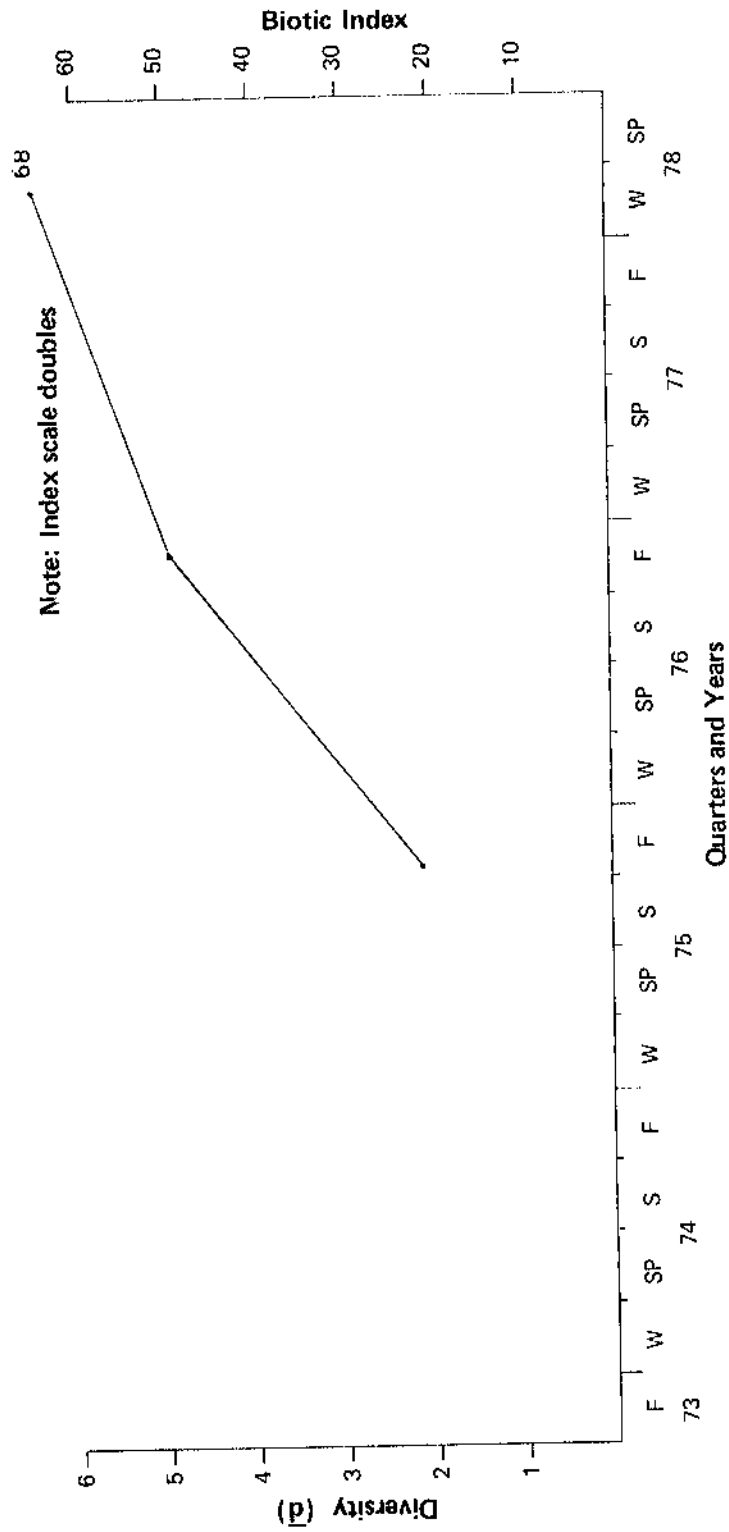
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate								
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.				
156 13-04-0030	21 Jan 75										GT2400	Florida Index	
	8 Jul 75									2			
	23 Oct 75						22	22					
	2 Nov 76						50	48		1300	8		
	7 Dec 77									490	17		
	22 Feb 78						65	80		23	49		

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.04.0030
BODY OF WATER: SHOAL RIVER

--- NATURAL SUBSTRATE DIVERSITY
-.-.- ARTIFICIAL SUBSTRATE DIVERSITY
—— Biotic Index (= FLORIDA INDEX)



CHOCTAWHATCHEE DRAINAGE BASIN

The Choctawhatchee River drainage basin includes approximately 3,300 square miles of the central Florida panhandle from Cape San Blas to Santa Rosa Sound. Three sub-basins comprise this system: 1) Choctawhatchee Bay and associated coastal drainages; 2) the Choctawhatchee River and its tributaries; 3) the coastal area eastward from Phillips Inlet, including the estuaries St. Andrews Bay, St. Josephs Bay, and Indian Pass, and the associated coastal drainages. The Choctawhatchee River, which originates in south Alabama and flows southwestward to the east end of Choctawhatchee Bay is the main drainage channel of the basin. It and its tributaries have built an extensive delta and river swamp at the mouth of the river, in Choctawhatchee Bay.

Choctawhatchee Bay Sub-Basin

Lafayette Creek (32.01.0002) flows into eastern Choctawhatchee Bay from the north. Consistently high Biotic Index values were calculated from qualitative macroinvertebrate samples. Nutrients from a large farm nearby have contributed to the lush growth of aquatic plants such as *Sagittaria* sp. and *Vallisneria* sp. At station 32.01.0C10, in Choctawhatchee Bay near Ft. Walton Beach, macroinvertebrate diversities ranged from about 1.9 to 3.0 suggesting a fairly healthy community. The Choctawhatchee Bay station near Piney Point (32.01.0I14) exhibited a significant decline in macroinvertebrate diversity during the report period. Both of these stations are being influenced by the rapid development in the west end of Choctawhatchee Bay. Although excessive levels of bacteria for Class II waters were occasionally noted at station 32.01.0I14, counts were generally low.

Choctawhatchee River Sub-Basin

Both of the Choctawhatchee River stations, 32.02.0001, at SR 2, and 32.02.0007, at SR 20, had high Biotic Indices. Macroinvertebrate diversity at the latter station was apparently good, although only three natural substrate samples were taken and the one in 1974 collected only one species, *Corbicula manilensis*, a fairly large clam. This was due to sampling in the channel of the river where shifting sand provides little habitat for most organisms. The sampling site was moved toward shore somewhat to find a more productive habitat for collections in later years. The presence of Plecoptera (stonefly) larvae at both stations aided in characterizing this as a clean fast-flowing river. Time constraints and lack of data precluded regression analyses for these stations. Both of the Choctawhatchee River stations had rather high bacteria counts, especially the SR 2 station. This station is subject to runoff from heavy farming operations in south Alabama.

The two Holmes Creek stations, 32.02.0003, at SR 2 near Graceville, and 32.02.0016 at SR 79, near Vernon, both had good macroinvertebrate diversity values and apparent occasional problems with bacteria, probably from pasture runoff. Not enough data were collected to assess trends.

Coastal Sub-Basin

Econfina Creek, station 32.03.0001, is a fast-flowing tributary to St. Andrews (North) Bay. Although, only a few samples have been taken, the well aerated stream apparently supports an excellent macroinvertebrate community with good artificial substrate diversity and very high Biotic Index values. Several species of Plecoptera larvae have been collected from this station. Occasional high bacteria counts are probably due to runoff.

Stations 32.03.ON42 and 32.03.OC29, the East and West arms of St. Andrews Bay, exhibited good diversity the few times they were sampled during the report period. High bacteria counts for Class II waters were recorded at the West Bay station, perhaps reflecting the greater development in that area than in East Bay. No significant trends could be calculated due to insufficient data.

The St. Andrews Bay background station (32.03.OJ14) and both St. Josephs Bay stations (32.03.OW31 and 32.03.OW41) had excellent macroinvertebrate diversities and only occasionally had high bacteria counts. None of these stations appeared to have been degraded by pollution during the study period. In fact, station 32.03.OW41 did not show any significant change in diversity over the five years.

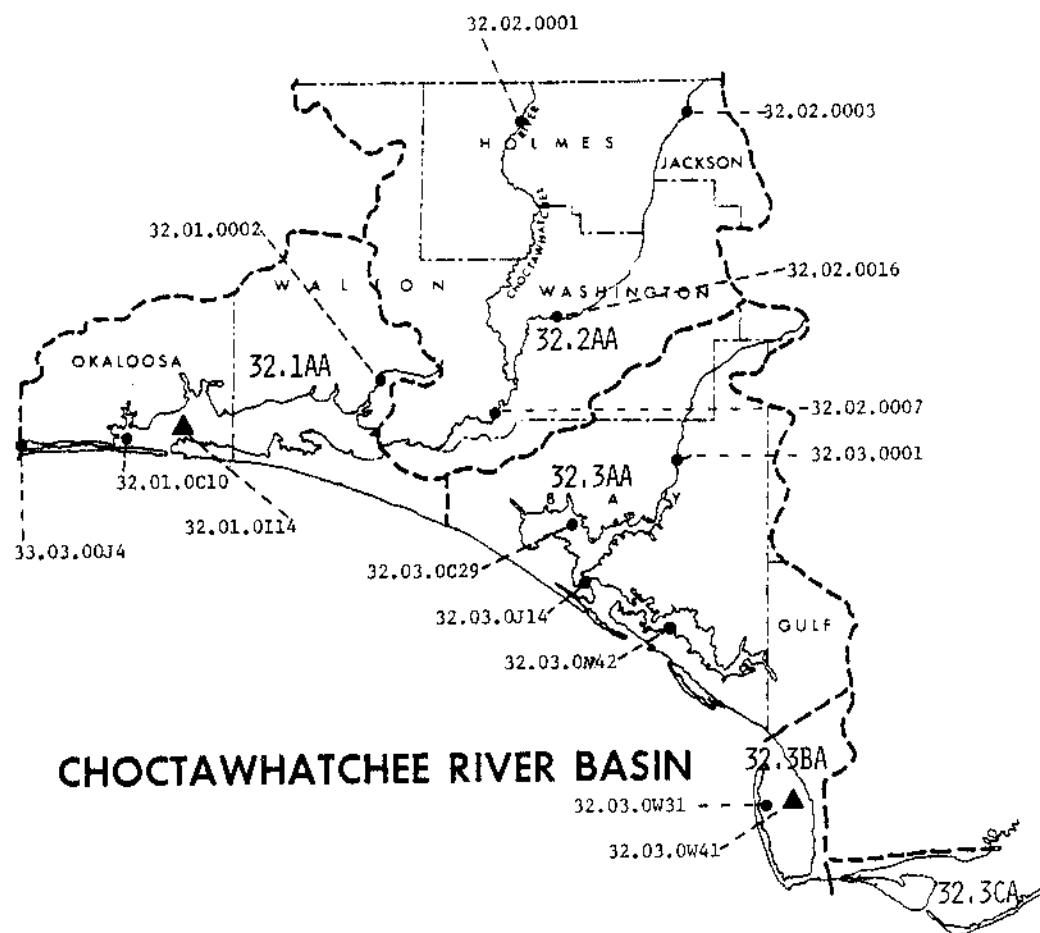
Station 33.03.OOJ4, Santa Rosa Sound at Upper Pritchard Point, despite its Escambia-Perdido (Blackwater) station number is probably more closely associated with the Choctawhatchee Bay drainage basin. The macroinvertebrate diversity values there were generally acceptable during the study period and no significant trend appeared during the report period. No notable bacteria problems were recorded.

Summary

The major tributaries to Choctawhatchee Bay - Choctawhatchee River, Holmes Creek, and Lafayette Creek - all had fairly healthy macroinvertebrate communities during the report period and apparent occasional bacteria problems due to various types of agricultural runoff. Rapid development in the Ft. Walton Beach area seemed to be degrading water quality in Choctawhatchee Bay - a significant downward trend in macroinvertebrate diversity was detected - but diversity was not yet seriously low.

Econfina Creek appeared to be a very healthy stream as reflected in the biological data. The upper areas of St. Andrews Bay had acceptable macroinvertebrate diversities although West Bay bacteria counts probably showed the effects of greater development there than in East Bay.

Santa Rosa Sound had acceptable though not exceptional diversity numbers, whereas St. Andrews Bay and St. Josephs Bay had excellent, high diversities. Where data were sufficient, regression analyses failed to detect any significant trends in these well flushed waters.



Odonata

Argia sp.
A. moesta putrida
A. maculatum
Boyeria vinosa
Dromogomphus sp.
Dythemis sp.
Enallagma sp.
Gomphus sp.
G. plagiatus
Hetaerina americana
Macromia sp.
M. illinoensis
Nehalennia sp.
Perithemis seminole
Progomphus obscura
Somatochlora sp.

Ephemeroptera

Baetis australis
Baetisca obesa
B. rogersi
Baetis spieethi
Baetis spinosus
Brachycercus sp.
Caenis sp.
C. hilaris
Ephemerella deficiens
E. trilineata
Habrophlebia vibrans
Hexagenia munda marilandica
Leptophlebia intermedius
Paraleptophlebia volitans
Pseudocloeon bimaculatus
P. punctiventris
Stenonema exiguum
S. integrum
S. smithae
Stenacron floridense
S. interpunctatum

Trichoptera

Brachycentrus sp.
Cheumatopsyche sp.
Chimarra sp.
Hydropsyche sp.
Leptocella sp.
Lype sp.
Oecetis sp.
O. cinerescens
Nyctiophylax sp.
Polycentropus sp.

Megaloptera

Corydalis cornutus
Sialis sp.

Diptera

Ablabesmyia sp.
A. cf. americana
A. hauberi
A. cf. philosphagnos
Brillia sp.
B. par
Cladotanypus sp.
Clinotanypus sp.
Coelotanypus scapularis
Conchapelopia sp.
Cricotopus bicinctus
C. sp.
C. remus
Dicrotendipes neomodestus
Endochironomus sp.
Eukiefferiella sp.
Harnischia sp.
Microcricotopus sp.
Microtendipes sp.
Orthocladius sp.
Phaenopsectra sp.
Polypedilum convictum
P. halterale
P. illinoense
Rheocricotopus sp.
Rheotanytarsus sp.
Stenochironomus sp.
S. hilaris
Tanytarsus sp.
Tribelos jucundus
unident. ceratopogonid
unident. simuliid

Coleoptera

Dineutus sp.
Dubiraphia sp.
Ectoparia sp.
Stenelmis sp.
S. hungerfordi
unident. elmiaid

Arachnida

Acarina

unident. sp.

32.01.0002

Mollusca

 Pelecypoda

 unident. sphaeriid

DATA SUMMARY: Lafayette Creek

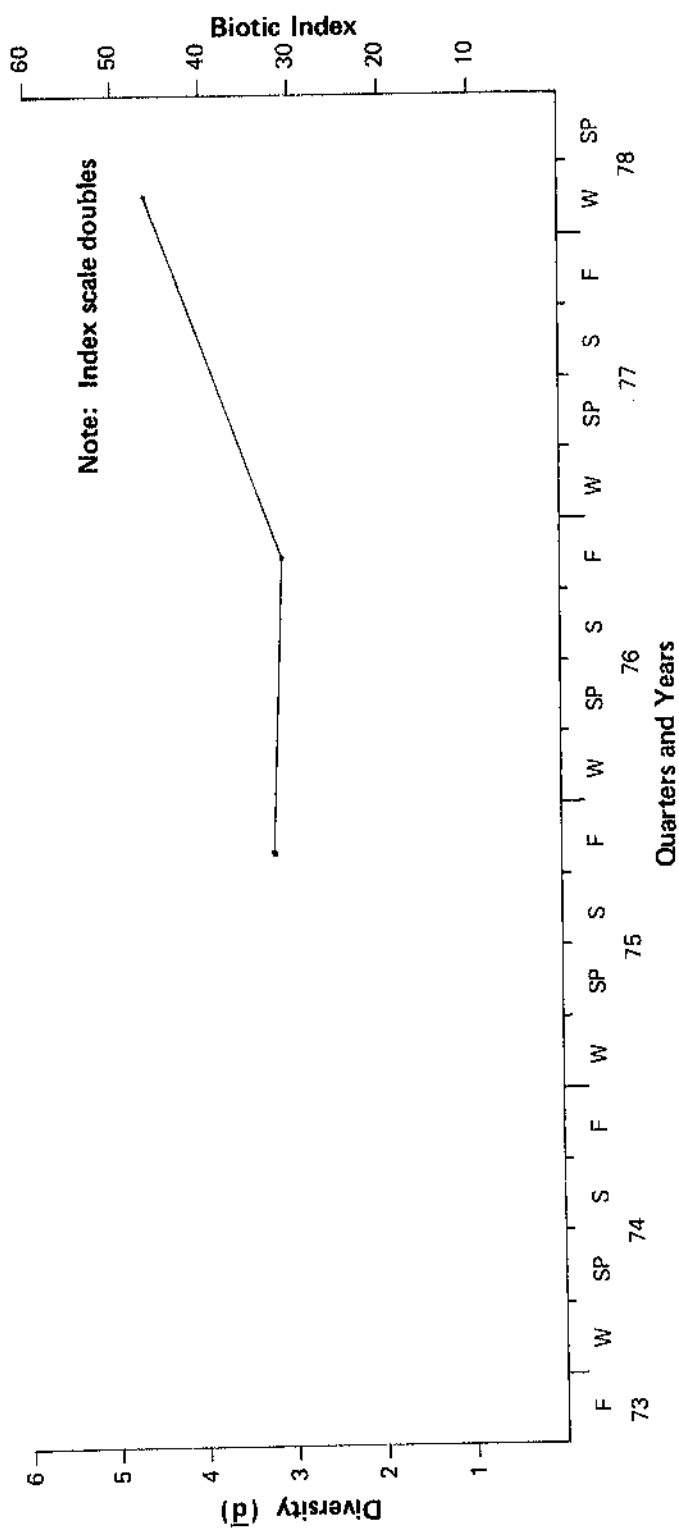
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
J2.01.0002 H 66	28 May 74											13		
	24 Apr 75											1600		
	7 May 75											612400		
	21 Oct 75						33	42				79	14	
	10 Feb 76						32	47						
	2 Nov 76						47	70				490	230	
	20 Feb 78													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.01.0002
 BODY OF WATER: LAFAYETTE CREEK AT SR 20

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 32.01.0C10 Body of Water Choctawhatchee Bay
Location Off Ft. Walton Beach - 2 miles east of Brooks Bridge 50 yds.
offshore of park on US 98 County Okaloosa
Type Body of Water bay Classification II
Sources of Pollution Ft. Walton Beach STP

Nearby Land Use urban, recreational
Sampling Frequency annually Depth 1.0 m.
Bottom Type sand, new grass % Volatile Solids 6.2
Aquatic Plants: Submerged diplanthera wrightii
Emergent Spartina patens

Macroinvertebrates:

Rhynchocoela

Carinoma tremaphorus
unident. sp. 2 - Cormier

Annelida

Polychaeta

Capitella capitata
Diopatra cuprea
Eteone heteropoda
Glycera dibranchiata
cf. Glycera
Haploscoloplos fragilis
H. cf. robustus
Laeonereis culveri
Nereis succinea
cf. Nerine agilis
Pectinaria gouldii
Prionospio sp.
Sabellaria macropthalma
Sabellides oculata
Lumbrineris sp.

Arthropoda

Crustacea

Isopoda

Cyathura cf. burbanki
Edotea triloba
Erichsonella cf. floridana

Arthropoda cont.

Amphipoda

Ampelisca verrilli
Cymadusa compta
C. sp.
Gammarus mucronatus
Monoculoides edwardsi
Mucrogammarus macromucronatus
Unciola sp.

Decapoda

Callinectes sapidus

Mysidacea

Bowmaniella dissimilis
Mysidopsis bahia
cf. Mysis stenolepis

Tanaidacea

Leptochelia rapax

Cumacea

Diastylis sculpta
Oxyurostylis smithi

Mollusca

Gastropoda

Cerithium cf. muscarum
Mitrella lunata
Nassarius vibex
Pyramidella fusca
Retusa canaliculata

Pelecypoda

Amygdalum papyria
Anomalcardia cuneimeris
cf. Ensis directus
Ensis minor
Laevicardium mortoni
Lyonsia hyalina
Rangia cuneata
Solen vividis
Tagelus plebeius
Tellina lineata

Echinodermata

Holothuroidea

Synapa sp.
unident. sp.

DATA SUMMARY: Choctawhatchee Bay

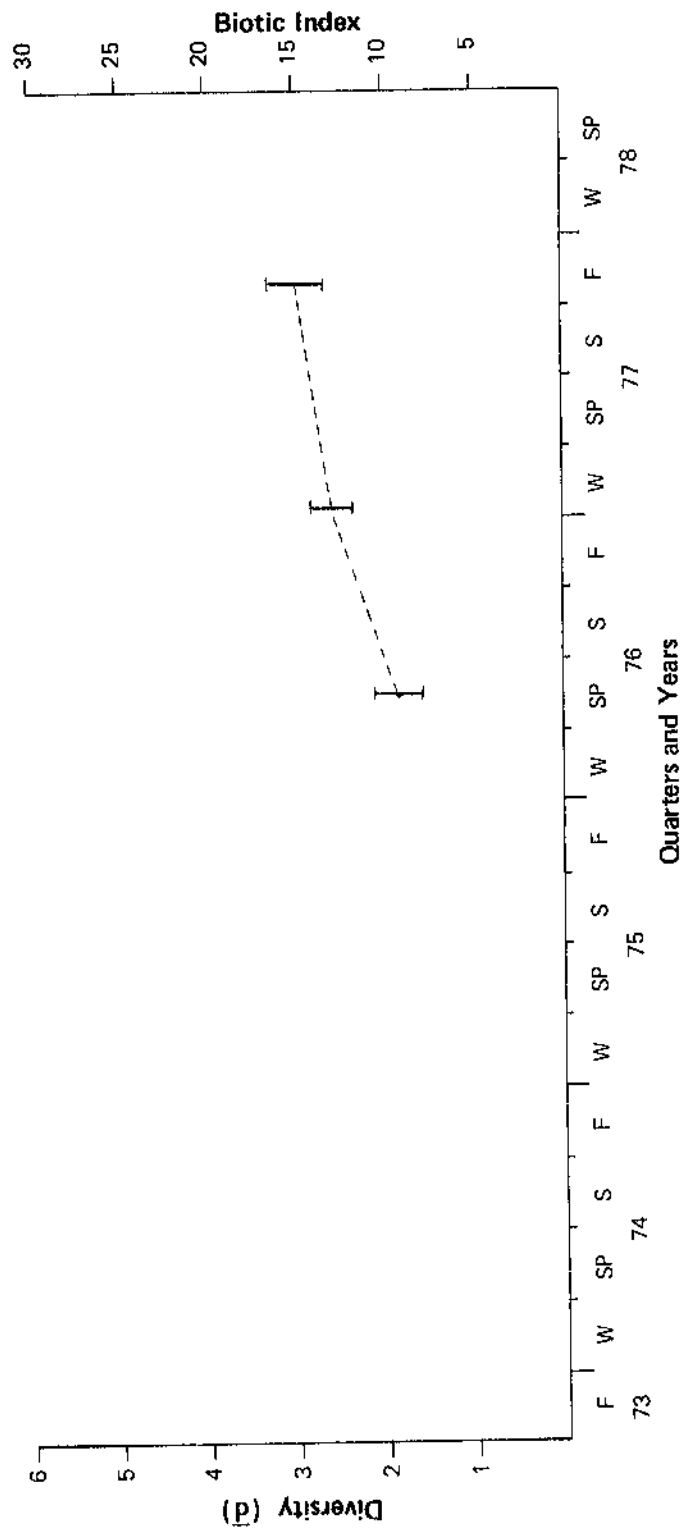
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
12.01.0C10 170	28 May 76											2		
	26 May 76	1.904±0.272	0.410±0.100	10								130	2	
	26 Jan 77	2.613±0.222	0.213±0.059	12								LT2	LT2	
	7 Nov 77	2.982±0.288	0.182±0.047	16										

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.01.0C10
 BODY OF WATER: CHOCTAWHATCHEE BAY

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 32.01.0114 Body of Water Choctawhatchee Bay
Location Approximately 1 mile north of Piney Point at Piney Point flasher
County Walton
Type Body of Water bay Classification II
Sources of Pollution domestic waste and urban runoff
Nearby Land Use generally marsh and forest, sparse development
Sampling Frequency quarterly Depth 3 - 4.2 meters
Bottom Type sand, light silt % Volatile Solids 0.1%
Aquatic Plants: Submerged Chondria sp.,
Dasya pedicellata Emergent Juncus roemerianus, Spartina alterniflora

Macroinvertebrates:

Cnidaria

Hydrozoa

Clytia cylindrica
Campanularia

Anthozoa

unident. actiniarian
Ceriantheopsis americanus
Edwardsia sp.

Platyhelminthes

Leptoplana variabilis

Rhynchocoela

Lineus sp.
Tetrastemma sp.
unident. sp. 2 - Cormier
unident. sp. 7 - Cormier

Annelida

Polychaeta

Ammotrypane sp.
Dispio uncinata
Eteone heteropoda

Annelida cont.

Cf. Glycera sp.
Glycera dibranchiata
Haploscoloplos fragilis
H. robusta
Laonereis culveri
Luibrineris coccinea
Nereis pelagica occidentalis
N. succinea
Notomastus sp.
Pectinaria gouldii
Perinereis cf. floridana
Phyllodoce sp.
Polydora ligni
P. websteri
Sabella sp.
Sabellaria sp.
Scoloplos sp.

Arthropoda

Isopoda

Accalathura sp.
cf. Accalathura crenulata
Cyathura cf. burbanki
Edotea cf. montosa
Erichsonella cf. floridana

Amphipoda

Ampelisca sp.
A. cf. verrilli
Carcinogammarus mucronatus
Corophium sp.
C. louisianum
cf. Crangonyx sp.
Cymadusa compta
Gammarus sp.
Grandidierella bonnieroides
Haustorius sp.
Lepidactylus burbanki
Listriella sp.
L. cf. barnardi
Melita nitida
Monoculodes edwardsi
Mucrogammarus macromucronatus
Unciola sp.

Decapoda

Eurypanopeus herbstii
Palaemonetes pugio

Mysidaceae

Bowmaniella dissimilis
Mysidopsis bigelowi
Mysis stenolepis

32.01.0114

Tanaidacea

Leptochelia rapax

Insecta

Diptera

unident. chironomid

Mollusca

Gastropoda

Cylichna cf. bidentata

Melanella gracilis

Bittium varium

Prunum sp.

P. apicinum

Pyramidella fusca

Retusa canaliculata

Pelecypoda

Amygdalum cf. papyria

Anomalocardia cuneimeris

Brachidontes exustus

Chione sp.

Ensis minor

Glycymeris americana

Mulinia sp.

M. lateralis

Rangia cuneata

Tagelus sp.

T. divisus

Tellina sp.

T. lineata

T. sybaritica

Bryozoa

Electra sp.

Membranipora tenuis

Chordata

Urochordata

Bostrichobranchus pilularis

Cephalochordata

Branchiostoma caribaeum

DATA SUMMARY: Choctawhatchee Bay

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
175	22 Oct 73										172		
	5 Dec 73	3.618±0.321	0.126±0.847	18							540		
	30 Jan 74												
	11 Feb 74	2.710±0.450	0.378±0.112	15							13		
	27 Mar 74										4		
	4 Apr 74	4.271±0.180	0.049±0.015	29							172		
	27 May 74										0.1		
	15 Aug 74	3.970±0.263	0.117±0.038	27							172		
	28 Aug 74										2		
	29 Oct 74										GT2		
	14 Nov 74	3.274±0.250	0.175±0.035	24	0.318±0.337	1.000±0.176	3				920		
	9 Dec 74												

See Methods for explanation of table.

DATA SUMMARY: Choctawhatchee Bay

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml Total Fecal	Comments
		Natural Substrate			Artificial Substrate							
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
176												
32.01.0114	19 Dec 74						0.681±0.134	0.756±0.059	7		LT2	
	5 Feb 75	3.436±0.334	0.135±0.048	16							LT2	
	7 Apr 75	3.030±0.311	0.106±0.068	10								
	14 Aug 75	1.701±0.392	0.461±0.154	7							5	
	27 Aug 75										LT2	LT2
	10 Oct 75											
	30 Oct 75										2	
	31 Oct 75	2.551±0.407	0.236±0.109	9						Coc BG 0 Fil BG LT1 Coc Gr 0 Fil Gr 0 Gr Flag LT1 Other Flag 0 Pen Dia LT1 Pen Dia 1 Total 2		

See Methods for explanation of table.

DATA SUMMARY: Choctawhatchee Bay

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		#Spp.	Total				Fecal		
		Diversity	Redundancy	#Spp.	Diversity							Redundancy	
32.01.0114	20 Jan 76	3.181±0.208	0.900±0.027	14							2		
	19 Feb 76										2	LT2	
	23 Mar 76										LT2	LT2	
	16 Apr 76										LT2	LT2	
	26 May 76	1.440±0.304	0.620±0.110	10							5	LT2	
	17 Jun 76										LT2	LT2	
	22 Jul 76												
Coc BG 14100 F11 BG 2180 Coc Gr 41400 F11 Gr 900 Gr Flag 450 Other Flag 0 Cen Dia 350 Pen Dia 404490 Total 463850													

See Methods for explanation of table.

DATA SUMMARY: Choctawhatchee Bay

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
32-01-0114 178	13 Sep 76	2.129±0.361	0.307±0.121	8						Coc BG 9250 Fil BG 85 Coc Gr 795 Fil Gr 3540 Gr Flag 0 Other Flag 0 Cen Dia 625 Pen Dia 47115 Total 61410	13	2	
	28 Oct 76										5	172	
	4 Nov 76	3.277±0.182	0.071±0.021	14							172	172	
	9 Dec 76										2400	1600	
	13 Jan 77										49	172	
	26 Jan 77	2.751±0.277	0.085±0.053	8					Coc BG 2475 Fil BG 0 Coc Gr 2150 Fil Gr 0				

See Methods for explanation of table.

DATA SUMMARY: Choctawhatchee Bay

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
12-01-0114 179	26 Jan 77 cont.								Gr Flag 900 Other Flag 825 Gen Dia 25 Pen Dia 3250 Total 9625				
	7 Feb 77										2	LT 2	
	8 Mar 77										5	LT 2	
	14 Apr 77										LT 2	LT 2	
	2 May 77	2.926±0.204	0.121±0.041	12									
	12 May 77											LT 2	LT 2
	13 Jul 77											LT 2	LT 2
	14 Aug 77	1.306±0.181	0.662±0.058	13							2	2	
	7 Nov 77	2.362±0.174	0.206±0.033	12							49	33	
	12 Dec 77										LT 2	LT 2	

See Methods for explanation of table.

DATA SUMMARY: Choctawhatchee Bay

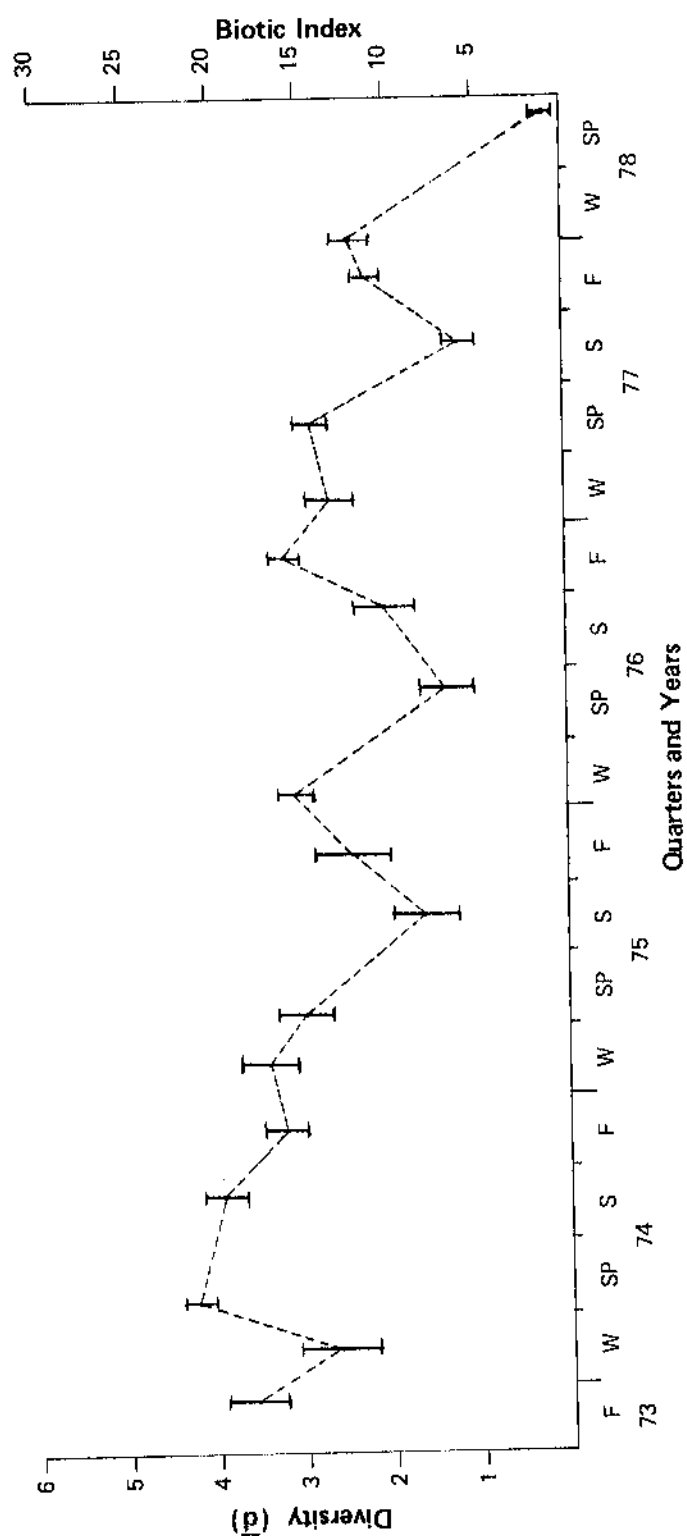
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
180	32-01-0114	13 Dec 77							Coc BG 281072 Fil BG 0 Coc Gr 0 Fil Gr 0 Gr Flag 0 Other flag 0 Cen Dia 1033 Pen Bla 112984 Total 395089	49	33	
		31 Jan 78								22	13	
		13 Feb 78	2.653±0.223	0.151±0.046	11					33	LT2	
		20 Mar 78								2	LT2	
		5 Apr 78								1300	330	
		4 May 78	0.037±0.061	1.000±0.030	2							

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.01.0114
 BODY OF WATER: CHOCTAWHATCHEE BAY

--- NATURAL SUBSTRATE DIVERSITY
 - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 32.02.0001 Body of Water Choctawhatchee River
 Location State Road #2
 _____ County Holmes
 Type Body of Water river Classification III
 Sources of Pollution domestic waste and agricultural runoff

 Nearby Land Use forest
 Sampling Frequency annually Depth 1-3m
 Bottom Type mud, sand % Volatile Solids _____
 Aquatic Plants: Submerged Ceratophyllum sp., Fontinalis filiformis, Polygonum sp.
 _____ Emergent _____

Macroinvertebrates:

Rhynchocoela
 unident. sp.

 Annelida
 Oligochaeta
 unident. sp.
 Hirudinea
 unident. sp.

 Arthropoda
 Amphipoda
 Hyaella azteca
 Decapoda
 Palaemonetes kadiakensis
 unident. astacid
 Odonata
 Argia sp.
 Didymops sp.
 Dromogomphus sp.
 Gomphus sp.
 Hagenius brevistylus
 Hetaerina americana
 Lestes sp.

Odonata cont.

Neurocordulia sp.
unident. zygopteran

Ephemeroptera

Baetisca sp.
B. becki
B. gibbera
B. obesa
Baetis intercalaris
Caenis hilaris
Ephemerella choctawhatchee
E. trilineata
Heptagenia flavescens
Hexagenia munda marilandica
Isonychia sp.
Neophemera sp.
Siphloplecton sp.
S. speciosum
Tricorythodes albilineatus
Pseudocloeon alachua
P. punctiventris
Stenonema exiguum
S. integrum
Stenacron interpunctatum

Trichoptera

Brachycentrus sp.
Cheumatopsyche sp.
Chimarra sp.
Hydropsyche sp.
Leptocella sp.
Oecetis sp.
Pycnopsyche sp.
Triaenodes sp.

Megaloptera

Corydalus cornutus

Diptera

Ablabesmyia auriensis
A. parajanta
A. terella
Brillia sp.
Cardiocladius obscurus
Chironomus sp.
Conchapelopia sp.
Corynoneura sp.
Cricotopus sp.
C. bicinctus
C. remus
Cryptochironomus sp.
C. fulvus
Eukiefferiella sp.
Micropsectra sp.
Nannocladius sp.

32.02.0001

Diptera cont.

Orthocladius annectens
Polypedilum convictum
P. fallax
P. halterale
P. illinoense
Psectrocladius sp.
Pseudochironomus sp.
Rheotanytarsus sp.
Rheocricotopus sp.
Simulium sp.
Stenochironomus sp.
Tanytarsus sp.
Thienemanniella sp.
T. fuscicornis
T. jucundus
unident. ceratopogonid
unident. chironomid
unident. ~~simuliid~~

Coleoptera

Ancyronyx variegata
Dineutus sp.
Macronychus glabratus
Stenelmis sp.
S. fuscata
S. hungerfordi
unident. dytiscid
unident. elmidae
unident. hydrophilidae

Mollusca

Gastropoda

Goniobasis sp.
Physa sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
Elliptio Mcmichaeli

DATA SUMMARY: Choctawhatchee River

Station Number	Date	Macroinvertebrates						Biologic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate							
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
											Total	
32.02.0001	8 Oct 73										GT2400	4 samples
	18 Oct 73										GT2400	
	25 Feb 74										GT2400	
	20 Mar 74										1600	
	29 May 74										GT2400	
	18 Jun 74										GT2400	
	24 Jun 74	0.000		1				11	25		2400	
	24 Jul 74										GT2400	
	2 Oct 74										GT2400	
	15 Nov 74	0.000		1							GT2400	
	14 Jan 75										GT2400	
	27 Jan 75										GT2400	

See Methods for explanation of table.

DATA SUMMARY: Choctawhatchee River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		Total	Fecal						
		Diversity	Redundancy	#Spp.	Diversity						Redundancy	#Spp.	
32.02.0001 186	12 Feb 75										GT 2400		
	24 Apr 75										GT 2400		
	4 Sept 75										1600		
	27 Oct 75										350		
	13 Nov 75										GT 2400		
	8 Dec 75										540	130	
	10 Feb 76										350		
	4 Mar 76	2.705±0.406	0.186±0.089	8	3.159±0.304	0.195±0.044	16	26	29				
	31 Mar 76										920	240	
	19 Apr 76										350	17	
	17 May 76										GT 2400	280	
	14 Jun 76										1600		
	21 Jun 76	3.445±0.271	0.100±0.037	16									

See Methods for explanation of table.

DATA SUMMARY: Choctawhatchee River

Station Number	Date	Macroinvertebrates										Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate					Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.							
12.02.0001 187	14 Jul 76												240	130		
	2 Aug 76												1600	49		
	2 Sept 76												1600	170		
	14 Oct 76												1600	540		
	8 Nov 76												540	79		
	2 Dec 76												2400	920		
	6 Jan 77												ST2400	1600		
	8 Feb 77												540	23		
	21 Feb 77	2.781±0.373	0.179±0.078	8									ST2400	350		
	7 Mar 77												ST2400	540		
20 Apr 77												ST2400	540			
10 May 77												920	110			

See Methods for explanation of table.

DATA SUMMARY: Choctawhatchee River

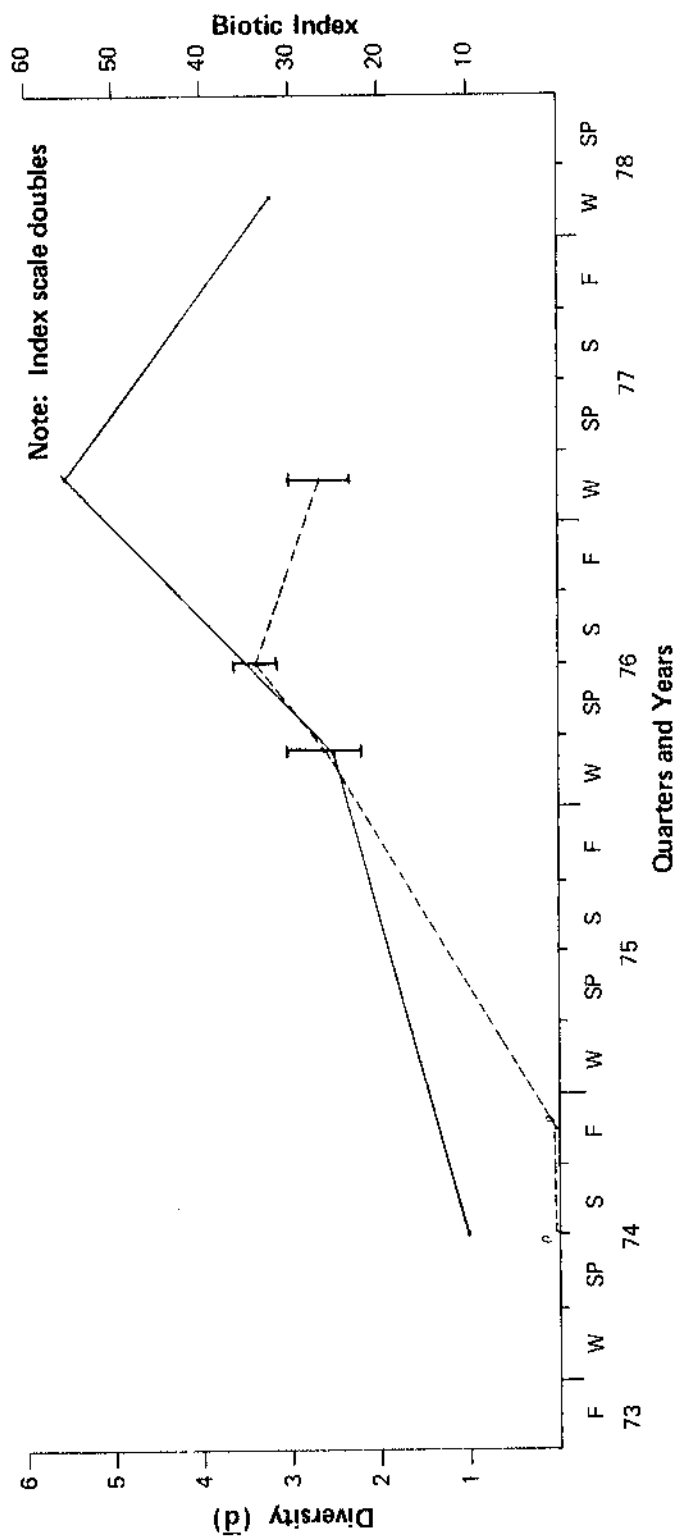
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments	
		Natural Substrate			Artificial Substrate								
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
													Total
32.02.0001 108	6 Jul 77										790	110	Florida Index
	1 Dec 77										130	23	
	4 Jan 78										1300	330	
	6 Feb 78										330	79	
	21 Feb 78							33			790	330	
	6 Apr 78										490	330	
	1 May 78										672400	540	
	7 Jun 78										130	79	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.02.0001
 BODY OF WATER: CHOCTAWHATCHEE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 32.02.0003 Body of Water Holmes Creek
Location SR 2, 1 mile west of Graceville
County Holmes
Type Body of Water stream Classification III
Sources of Pollution agricultural runoff
Nearby Land Use agriculture, timber
Sampling Frequency annually Depth 1 m
Bottom Type mud % Volatile Solids _____
Aquatic Plants: Submerged Chiloscyphus polyanthus, Fontinalis flaccida,
Fontinalis filiformis Emergent _____

Macroinvertebrates:

Annelida

Oligochaeta
unident. sp.

Hirudinea
unident. sp.

Arthropoda

Crustacea

Isopoda Asellus sp.
Lirceus sp.

Amphipoda
Hyaella azteca

Decapoda
Palaemonetes kadiakensis
unident. astacid

Insecta

Odonata

Anomalagrion hastatum
Argia sp.
A. moesta putrida
A. tibialis
Boyeria vinosa
Enallagma sp.
Gomphus sp.
Ischnura sp.

Odonata cont.

Macromia sp.
Perithemis tenera seminole

Ephemeroptera

Baetis sp.
Choroterpes hubbelli
Hexagenia munda marilandica
Leptophlebia cf. bradleyi
Stenacron floridense
Stenonema sp.

Hemiptera

Rheumatobates sp.

Trichoptera

Cheumatopsyche sp.
Oecetis cinerascens
Pycnopsyche sp.

Diptera

Ablabesmyia parajanta
Chironomus sp.
Coelotanypus concinnus
Conchapelopia sp.
Cricotopus sp.
C. bicinctus
Microtendipes modestus
D. neomodestus
Einfeldia sp.
Microtendipes sp.
Nilotanypus americana
Polypedilum fallax
P. illinoense
Psectrocladius sp.
Rheotanytarsus sp.
Stenochironomus sp.
Tanytarsus sp.
Thienemanniella sp.
Tribelos fuscicornis
T. jucundus
 unident. ceratopogonid
 unident. simuliid
 unident. tabanid
 unident. tipulid

Coleoptera

Stenelmis sp.
 unident. elmid
 unident. hydroporine
 unident. hydrophilid

Arachnida

unident. sp.

Mollusca

Gastropoda

Campeloma sp.
Ferrissia sp.
Goniobasis sp.
Viviparus sp.

32.02.0003

Mollusca cont.

Pelecypoda

Corbicula manilensis

unident. sphaeriid

Elliptio icterina

DATA SUMMARY: Holmes Creek

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
193	32.02.0003	27 Jan 75								GT2400		
		22 Jun 76					2.381±0.333	0.401±0.094	15		79	
		29 Jul 76								540	240	
		14 Oct 76								4900	2300	
		18 Jan 77								230	LT2	Florida Index
		20 Jul 77										

See Methods for explanation of table.

Station No. 32.02.0007 Body of Water Choctawhatchee River

Location near Bruce, Fl. (SR #20)

County Walton

Type Body of Water river Classification III

Sources of Pollution domestic waste, agricultural runoff

Nearby Land Use forests

Sampling Frequency annually Depth 1.8 - 4 m

Bottom Type mud, sand, clay % Volatile Solids 0.2

Aquatic Plants: Submerged Fontinalis flaccida, Potamogeton nodosus, Batrachospermum
sp. Emergent

Macroinvertebrates:

Annelida

Oligochaeta

unident. sp.

Hirudinea

unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Lirceus sp.

Amphipoda

Crangonyx sp.

Gammarus sp.

Hyaella azteca

Decapoda

Palaemonetes kadiakensis

P. paludosus

unident. astacid

Insecta

Plecoptera

Acroneuria abnormis

A. mela/arenosa

Nemocapnia carolina

Plecoptera (cont.)

cf. Hydroperla fugitans
Isoperla dicala
I. bilineata
Neoperla clymene
Perlesta placida
Pteronarcys dorsata
Taeniopteryx lita

Odonata

Argia translata
Dromogomphus sp.
Enallagma sp.
Lestes sp.
L. forcipatus
Neurocordulia sp.
Didymops transversa

Ephemeroptera

Baetis australis
B. intercalaris
Baetisca obesa
Baetis spinosus
Caenis hiliaris
Centroptilum viridocularis
Ephemerella choctawhatchee
E. trilineata
Heptagenia cf. diabasis
H. flavescens
Hexagenia munda marilandica
Isonychia sp.
Neophemera sp.
Pseudocloeon alachua
P. parvulum
Siphloplecton speciosum
Stenonema exiguum
S. integrum
S. smithae
Stenacron floridense
Tricorythodes albilineatus

Hemiptera

unident. notonectid

Trichoptera

Athripsodes sp.
Cheumatopsyche sp.
Hydropsyche sp.
Hydroptila sp.

Trichoptera (cont.)

Leptocella sp.
Neureclipsis sp.
Pycnopsyche sp.

Megaloptera

Corydalus cornutus
Chauliodes sp.

Diptera

Ablabesmyia parajanta
Chironomus sp.
Clinotanypus sp.
Coelotanypus concinnus
C. tricolor
Corynoneura sp.
Cricotopus sp.
C. bicinctus
C. remus
Cryptochironomus sp.
Dicrotendipes neomodestus
Endochironomus sp.
Eukiefferiella sp.
Orthocladius sp.
 cf. Parametriocnemus sp.
Polypedilum convictum
P. fallax
P. halterale
P. illinoense
Procladius sp.
Psectrocladius vernalis
Rheocricotopus sp.
Rheotanytarsus sp.
Stenochironomus sp.
Tanytarsus sp.
Tribelos sp.
 unident. ceratopogonid
 unident. diamesid
 unident. simuliid

Coleoptera

Haliplus punctatus
Phanocerus clavicornis
Stenelmis sp.
 unident. elmid
 unident. haliplid
 unident. hydrophilid

32.02.0007

Mollusca

Gastropoda

Goniobasis sp.

Physa sp.

Pleurocera sp.

Pseudosuccinea sp.

Viviparus sp.

unident. planorbis

DATA SUMMARY: Choctawhatchee River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments	
		Natural Substrate		Artificial Substrate		#Spp.	Diversity						Redundancy
		Diversity	Redundancy	#Spp.	Diversity						Redundancy		
		Total	Fecal										
198 32.02.0007	24 Oct 73										920		
	31 Jan 74										1600		
	25 Feb 74										540		
	29 May 74										350		
	17 Jun 74										272400		
	25 Jun 74								9	15	357		
	9 Jul 74										540		
	1 Oct 74										130		
	4 Nov 74	0.000				1					920		
	15 Jan 75										1		
	27 Jan 75												
	12 Feb 75										540		

See Methods for explanation of table.

DATA SUMMARY: Choctawhatchee River cont.

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate		Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
								BI	#Spp.				
32.03.0007	25 Mar 75										9		
	24 Apr 75										UT2400		
	7 May 75										350		
	4 Sep 75										920		
	13 Nov 75										130		
	10 Feb 76										240	11	
	31 Mar 76										920	79	
	17 May 76										920	130	
	14 Jun 76										350	49	
	29 Jul 76	3.570±0.310	0.190±0.055	24							24000	7	
	2 Sep 76												
	8 Nov 76										350	79	

See Methods for explanation of table.

DATA SUMMARY: Choctawhatchee River cont.

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		Total	Fecal							
		Diversity	Redundancy	#Spp.	Diversity			Redundancy	#Spp.					
32.02.0007	6 Jan 77											920	77	Florida Index
	8 Feb 77											920	23	
	22 Feb 77	2.715±0.498	0.340±0.121	11				46	65			540	23	
	7 Mar 77										GT2400	920		
	1 Dec 77										33	23		
	4 Jan 78										1300	330		
	25 Jan 78							34	45			790	790	
	6 Feb 78										1300	79		
	6 Apr 78										2300	180		
	1 May 78										1600	79		
	7 Jun 78										9200	700		

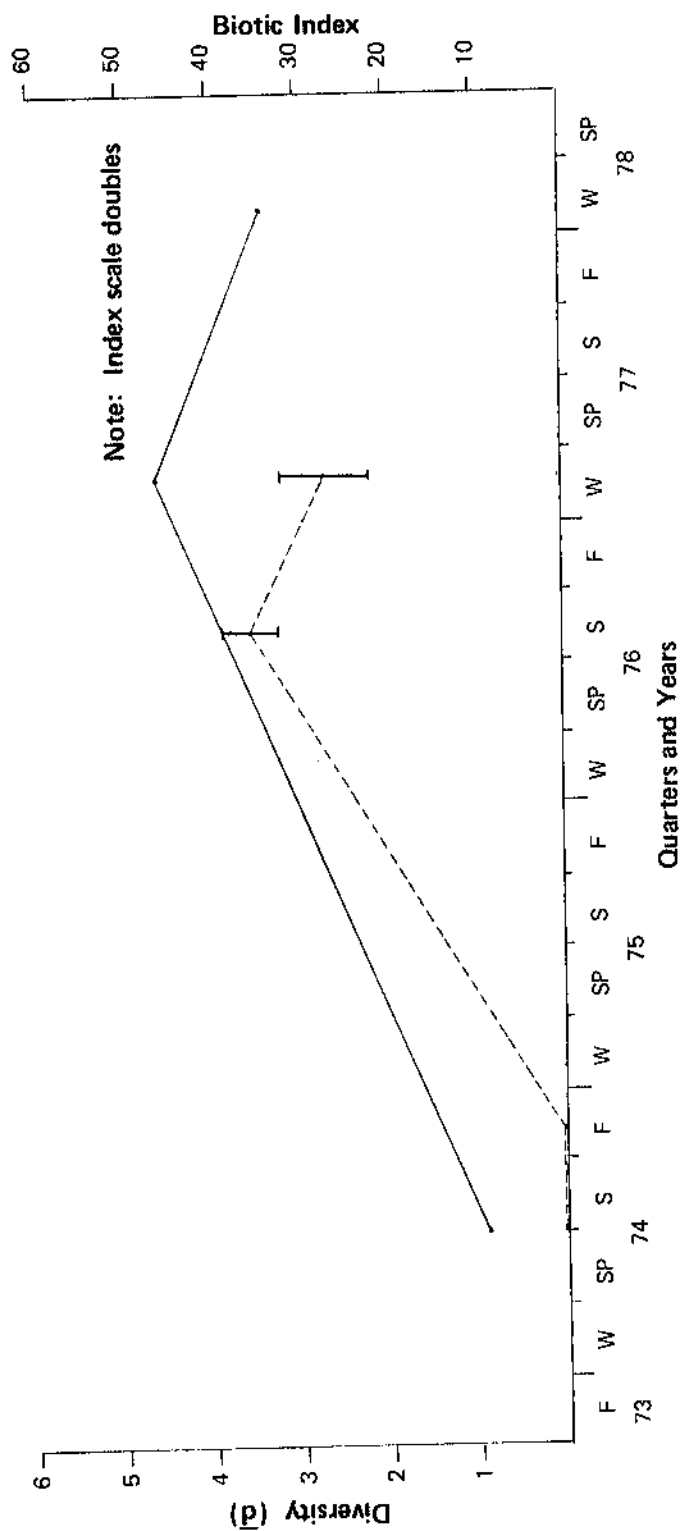
Florida Index

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.02.0007
 BODY OF WATER: CHOCTAWHATCHEE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 32.02.0016 Body of Water Holmes Creek
Location SR 79 at Vernon
County Washington
Type Body of Water creek Classification III
Sources of Pollution domestic waste, agriculture run-off
Nearby Land Use residential, agriculture
Sampling Frequency annually Depth 1.0
Bottom Type mud % Volatile Solids _____
Aquatic Plants: Submerged Fontinalis flaccida, Fontinalis filiformis,
Chiloscyphus polyanthus Emergent Typha sp.

Macroinvertebrates:

Platyhelminthes
 Turbellaria
 Planaria sp.
 unident. sp.

Annelida
 Oligochaeta
 unident. sp.

 Hirudinea
 unident. sp.

Arthropoda
 Crustacea
 Isopoda
 Asellus sp.
 Lirceus sp.
 unident. sp.

 Amphipoda
 Gammarus sp.
 Hyalella azteca
 Crangonyx sp.

Decapoda

Palaemonetes kadiakensis
unident. astacid

Insecta

Plecoptera

Acroneuria mela/arenosa
Pteronarcys pictetii
Taeniopteryx lita

Odonata

Argia moesta putrida
A. tibialis
A. sedula
Agrion maculatum
Boyeria vinosa
Enallagma sp
Ischnura sp.
Libellula deplanata
Hagenius brevistylus
Macromia sp.

Ephemeroptera

Baetis australis
B. intercalaris
Caenis sp.
C. diminuta
Ephemerella deficiens
E. choctawhatchee
E. trilineata
Heptagenia flavescens
H. munda marilandica
Isonychia sp.
Leptophlebia intermedius
Pseudocloeon parvulum
Stenonema exiguum
S. smithae
Stenacron floridense
Tricorythodes albilineatus

Hemiptera

unident. belostomid

Trichoptera

Cheumatopsyche sp.
Hydropsyche sp.
Leptocella sp.
L. cf. pavida
Lype sp.
Chimarra sp.
Oecetis sp.

Trichoptera (cont.)

Oecetis cinerascens
Polycentropus sp.
Protoptila sp.
Pycnopsyche sp.
Hydroptila sp.

Megaloptera

Corydalis cornutus
Sialis sp.

Lepidoptera

Nymphula sp.

Diptera

Ablabesmyia americana
A. mallochi
Cladotanytarsus sp.
Cricotopus sp.
C. bicinctus
C. remus
Dicrotendipes sp.
D. neomodestus
D. nervosus
Dixa sp.
Microtendipes sp.
Nilodorum devineyae
Polypedilum convictum
P. fallax
P. halterale
P. illinoense
Psectrocladius vernalis
Rheocricotopus sp.
Rheotanytarsus sp.
Tanytarsus sp.
Thienemanniella sp.
Tribelos fuscicornis
 unident. ceratopogonid
 unident. diamesid
 unident. orthocladian
 unident. simuliid
 unident. tanypodine

Coleoptera

Ancyronyx variegatus
Dineutus sp.
Dubiraphia vittata
Gyrinus sp.
Macronychus glabratus
Stenelmis sp.
 unident. dytiscid
 unident. elmids

32.02.0016

Arachnida

unident. sp.

Mollusca

Gastropoda

Campeloma sp.

Ferrissia sp.

Goniobasis sp.

Physa sp.

Pomacea sp.

Viviparus sp.

unident. planorbid

Pelecypoda

Corbicula manilensis

unident. sphaeriid

villosa vibex

DATA SUMMARY: Holmes Creek

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate						Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
32.02.0016 206	14 Jun 76				3.773±0.212	0.101±0.024	27				350	2		
	29 Jul 76											350		
	14 Oct 76										350	49		
	19 Jan 77	3.712±0.289	0.140±0.034	26				41	68		1300	490		
	21 Jul 77	1.978±0.393	0.587±0.114	16				41	69		130	49		

See Methods for explanation of table.

Station No. 32.03.0001 Body of Water Econfina Creek

Location SR #388

County Bay

Type Body of Water stream Classification III

Sources of Pollution some runoff, mainly agricultural, some domestic waste

Nearby Land Use forest, floodplain

Sampling Frequency annual Depth 0 - 1 m

Bottom Type silt, gravel, sand, clay, limestone % Volatile Solids _____

Aquatic Plants: Submerged Ceratophyllum sp., Fontinalis filiformis, Ludwigia natans

Chiloscyphus sp. Emergent Taxodium distichum, Scirpus hallii

Macroinvertebrates:

Arthropoda

Crustacea

Isopoda

Asellus sp.

Amphipoda

Hyalella azteca

Decapoda

Palaemonetes kadiakensis

P. paludosus

Macrobrachium sp.

unident. astacid

Insecta

Plecoptera

Acroneuria lycorias

A. abnormis

Helopicus (Isogenus) subvarians

H. arenosa/mela

Neoperla clymene

Paragnetina kansensis

Perlesta placida

Pteronarcys dorsata

Odonata

Aeschna sp.
Agrion maculatum
 cf. Didymops sp.
Argia sp.
A. sedula
Anomalagrion hastatus
Dromogomphus sp.
Enallagma sp.
Gomphus spp.
G. plagiatus
Hetaerina titia
H. americana
Ischnura posita
Macromia illinoiensis

Ephemeroptera

Baetis sp.
B. australis
B. intercalaris
B. spinosus
Brachycercus sp.
Caenis hilaris
Ephemerella deficiens
E. trilineata
E. cf. choctawhatchee
Heptagenia sp.
Hexagenia munda marilandica
Isonychia sp.
Leptophlebia bradleyi
L. intermedius
Neoephemera sp.
Paraleptophlebia sp.
Pseudocloeon alachua
P. punctiventris
Stenonema sp.
S. exiguum
S. smithae
Stenacron interpunctatum
Tricorythodes albilineatus

Trichoptera

Athripsodes sp.
Brachycentrus sp.
Cheumatopsyche sp.
Bhimarra sp.
Hydropsyche sp.
Hydroptila
Leptocella sp.
 cf. Lepidostoma sp.
Oecetis sp.
O. cinerascens

Megaloptera

Corvdalus cornutus

Diptera

Ablabesmyia ornataA. philosphagnosA. tarellaAntocha sp.Atherix variegataBrillia sp.Cardiocladius sp.Coelotanypus sp.Conchapelopia sp.Corynoneura sp.Cricotopus bicinctusC. sp.Cryptochironomus sp.Cryptotendipes sp.Dixa sp.Eukiefferiella sp.Glyptotendipes sp.Hemerodromia sp.Larsia luridaMacropelopia sp.Microtendipes sp.cf. Metriocnemus sp.Nanocladius sp.Orthocladius annectensParachironomus sp.P. demeijereaPolypedilum convictumP. fallaxP. halteraleP. illinoenseProcladius sp.Pseudochironomus sp.Psectrocladius vernalisRheocricotopus sp.Rheotanytarsus sp.Stenochironomus sp.Stictochironomus devinctaTanytarsus sp.Thienemaniella sp.Tipula sp.Tribelos jucundusTricladus robacki

4 unident. ceratopogonid spp.

unident. chironomid

unident. orthoclaidin

3 unident. simuliid spp.

unident. tipulid

32.03.0001

Coleoptera

Ancyronyx variegata

Dineutus sp.

Dubiraphia sp.

Gyrinus sp.

Haliphus sp.

Mollusca

Gastropoda

Campeloma sp.

Ferrissia rivularia

Goniobasis sp.

Viviparus sp.

Pelecypoda

Anodonta sp.

DATA SUMMARY: Ecoufina Creek

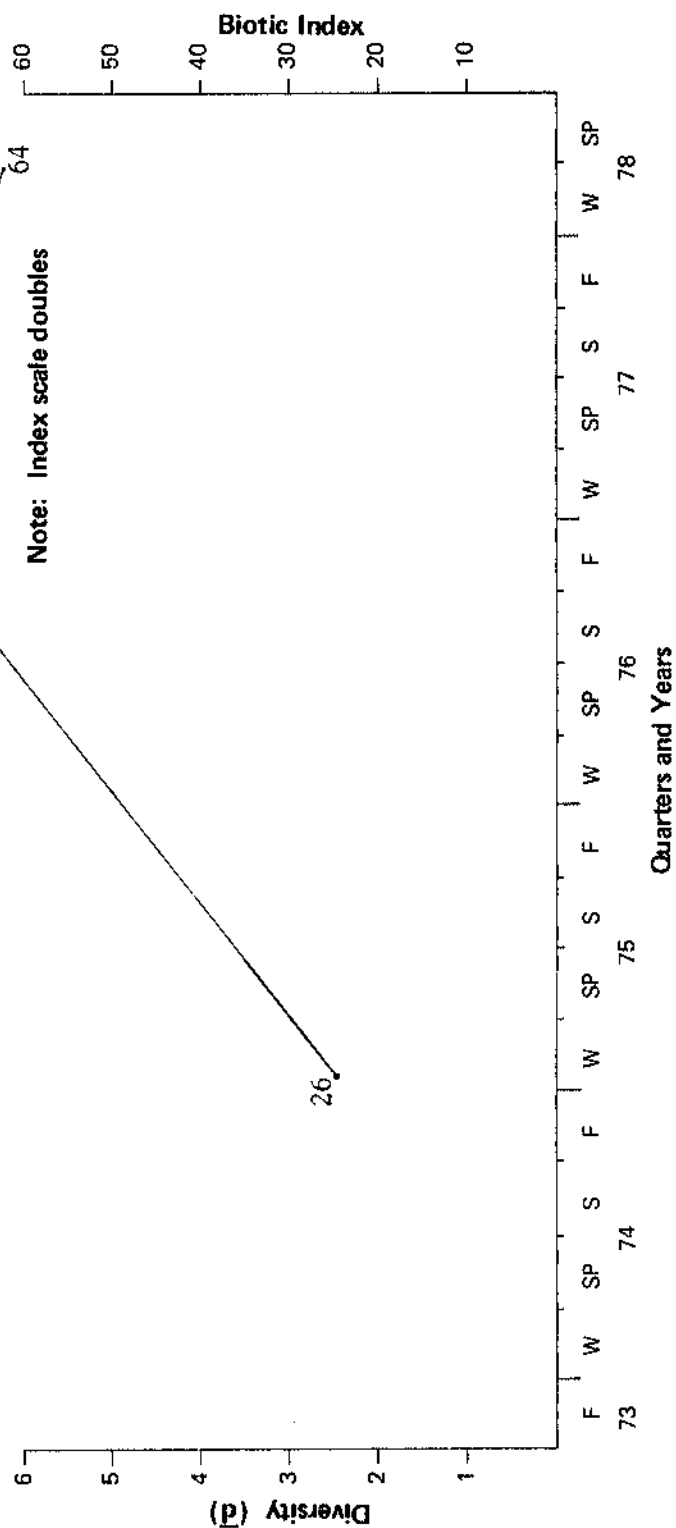
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate						
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.				
32.03.0001	16 Jan 75										
	14 May 75									920	
	13 Jan 76									572400	
	13 May 76				3.300±0.320	0.114±0.050	13			350	23
	19 Aug 76									572400	33
	19 Jan 77									330	230
	20 Feb 78									330	230
											Florida Index

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.03.0001
 BODY OF WATER: ECONFINA CREEK

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 32.03.0J14 Body of Water St. Andrews Bay
 Location Section J, background station (at Bear Pt. Light)
 _____ County Bay
 Type Body of Water bay Classification III
 Sources of Pollution industrial and domestic waste, urban runoff

 Nearby Land Use urban and industrial developments
 Sampling Frequency annual Depth 0 - 4.8 m
 Bottom Type dredge spoil, shell, sand, silt & Volatile Solids
 Aquatic Plants: Submerged Gracilaria sp. , Thalassia testudium, Diplanthera
wrightii Emergent Juncus roemerianus, Spartina patens

Macroinvertebrates:

Cnidaria

Hydrozoa

Campanularia sp.

Annelida

Oligochaeta

unident. sp.

Polychaeta

Ammotrypane cf. aulogaster
cf. Chone sp.
Glycera dibranchiata
cf. Leichone borealis
cf. Nephtys magellanica
Laonice cirrata
Laeonereis culveri
Maldane sarsi
Nereis pelagica occidentalis
N. succinea
cf. Ophelia sp.
Owenia fusiformis
Prionospio cf. steenstrupi
Sabella microphthalma
Spiophanes bombyx
cf. Scoloplos capensis

Arthropoda

Crustacea

Isopoda

Asellata sp.
Cyathura polita
Erichsonella floridana

Amphipoda

Ampelisca cf. abdita
A. cf. verrilli
Cymadusa compta
Grandidierella bonnieroides
Lembos smithi
cf. Acanthohaustorius cf. intermedius
cf. Baetea sp.
Listriella cf. barnardi
Ampelisca verrilli
Cymadusa compta
unident. Liljeborgiid sp.
Luconacia incerta
Melita sp.
M. cf. nitida
cf. Synchelium americanum
cf. Pontogeneia inermis
Monoculodes edwardsi
Mucrogammarus macromucronatus

Decapoda

Aeterocrypta granulata
Eurypanopeus depressus
Heterocrypta granulata
Hippolyte pleurocantha
Libinia emarginata
Paguristes sp.
Palaemonetes pugio
Panopeus herbstii
Penaeus duorarum

Tanaidaceae

Leptochelia rapax

Cirripedia

Balanus sp.
Balanus cf. improvisus

Cumacea

Oxyurostylis smithi

32.03.0J14

Mollusca

Gastropoda

Anomia sp.
Cerithium sp.
Crepidula fornicata
C. maculosa
Gastrosaccus dissimilis
Kurtziella sp.
Mitrella lunata
Nassarius vibex
Prunum apicinum
Pyramidella sp.

Pelecypoda

Anadara sp.
Anodontia cf. alba
Anomia simplex
Arca transversa
cf. Mercenaria campechiensis
Chione cancellata
Corbula cf. barrattiana
Crassinella lunata
Ensis minor
Glycemeris americana
Laevicardium mortoni
cf. Brachiodontes recurvis
Parastarte cf. triquetra
Seila adamsi
Semele cf. proficua
Tellina agilis
T. lineata
T. texana
Trachycardium sp.

Polyplacophora

Acanthochitona pygmaea

Bryozoa

Membranipora sp.

Echinodermata

Ophiuroidea

unident. amphiurid

Echinoidea

Arbacia punctulata

32.03.0J14

Chordata

Cephalochordata

Branchiostoma caribaeum

DATA SUMMARY: St. Andrew's Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate								
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.				
217	32.03.0114	22 Jan 74										350	
		18 Feb 74										5	
		19 Mar 74										11	
		20 May 74										2	
		10 Jul 74	3.064±0.352	0.300±0.051	27							3	
		16 Oct 74										5	
		4 Dec 74										LT2	
		6 Dec 74	3.778±0.154	0.100±0.017	32							8	
		23 Oct 75										LT2	
		18 Dec 75										22	
		20 Jan 76										23	13
		17 Feb 76											

See Methods for explanation of table.

DATA SUMMARY: St. Andrew's Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
32.03.0114 218	4 Mar 76										5	2		
	5 May 76										LT2	LT2		
	6 Jul 76	3.712±0.240	0.065±0.026	17							70	11		
	28 Jul 76										LT2	LT2		
	15 Sep 76										LT2	LT2		
	26 Oct 76										2	LT2		
	18 Nov 76										8	8		
	16 Dec 76										33	13		
	27 Jan 77										ST2400	GT2400		
	14 Feb 77	4.549±0.145	0.034±0.009	33							49	2		
17 Mar 77										22	8			
14 Apr 77										13	5			

See Methods for explanation of table.

DATA SUMMARY: St. Andrew's Bay

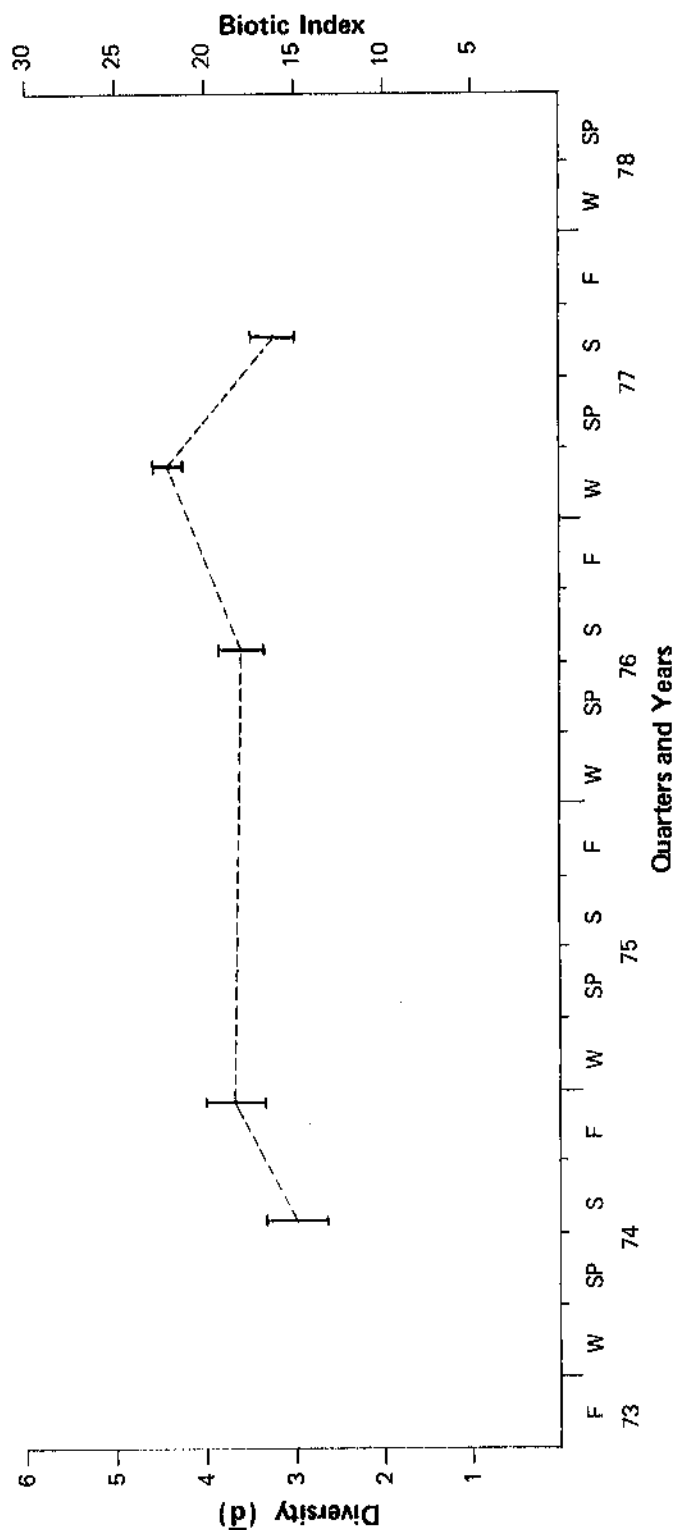
Station Number	Date	MacroInvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
32.03.0114 219	9 Aug 77	3.354±0.272	0.143±0.038	20								17 LT2		
	7 Sep 77											1300 LT2	220 LT2	
	12 Dec 77											23	23	
	10 Jan 78											23 LT2		
	15 Feb 78											230	33	
	15 Mar 78											LT2	LT2	
	3 Apr 78											330	33	
	8 May 78											LT2	LT2	
	22 Jun 78											LT2	LT2	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.03.0J14
 BODY OF WATER: ST. ANDREWS BAY

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 32.03.0C29 Body of Water St. Andrews (West) Bay
 Location 0.5 mi. below Warren Bayou
 _____ County Bay
 Type Body of Water bay Classification II
 Sources of Pollution Lansing Smith Steam Plant, Marifarms Shrimp Ponds, West
Panama City STP
 Nearby Land Use shrimp ponds, stream power plant
 Sampling Frequency annual Depth 0.5 - 1.5 m.
 Bottom Type sand, flyash, muck % Volatile Solids _____
 Aquatic Plants: Submerged Diplanthera wrightii, Thalassia testudinum
 _____ Emergent Spartina alterniflora

Macroinvertebrates:

Cnidaria

Anthozoa

unident. actiniarian

Annelida

Polychaeta

Capitella capitata
cf. Chone dumeri
Diopatra cuprea
cf. Glycera
Glycera dibranchiata
Haploscoloplos foliosus
cf. H. fragilis
Laonice sp.
cf. Melinna maculata
Nereis succinea
N. pelagica occidentalis
N. cf. lamellosa
Sabellides oculata
Scoloplos sp.
cf. S. campensis
cf. Spiophanes bombyx
Streblospio benedicti
cf. Typosyllis sp.
 unident. terebellid

Arthropoda

Crustacea

Isopoda

Edotea montosa

Isopoda (cont.)

Edotea triloba
Erichsonella floridana
Paracerceis caudata
Sphaeroma quadridentatum
 unident. caprellid

Amphipoda

Ampelisca cf. vadorum
A. cf. verrilli
Baetea sp.
Cymadusa compta
Grandidierella bonnieroides
Mucrogammarus macromucronatus
 unident. oedicerotid
 unident. stenothoidid

Decapoda

Callinectes sapidus
 cf. Eurypanopeus depressus
Hippolyte pleurocantha

Mysidacea

Mysidopsis bigelowi
Mysis stenolepis

Tanaidacea

Leptochelia rapax

Cumacea

Oxyurostylus smithi

Mollusca

Gastropoda

Nassarius sp.
Neritina reclinata
Polinices sp.
Pyramidella sp.
P. fusca

Pelecypoda

Amygdalum papyria
Ensis minor
Brachidontes cf. exustus
 cf. Papyridea soleniformis
Rangia cuneata
Solen viridis
Tagelus plebeius
Tellina lineata

DATA SUMMARY: St. Andrews (West) Bay

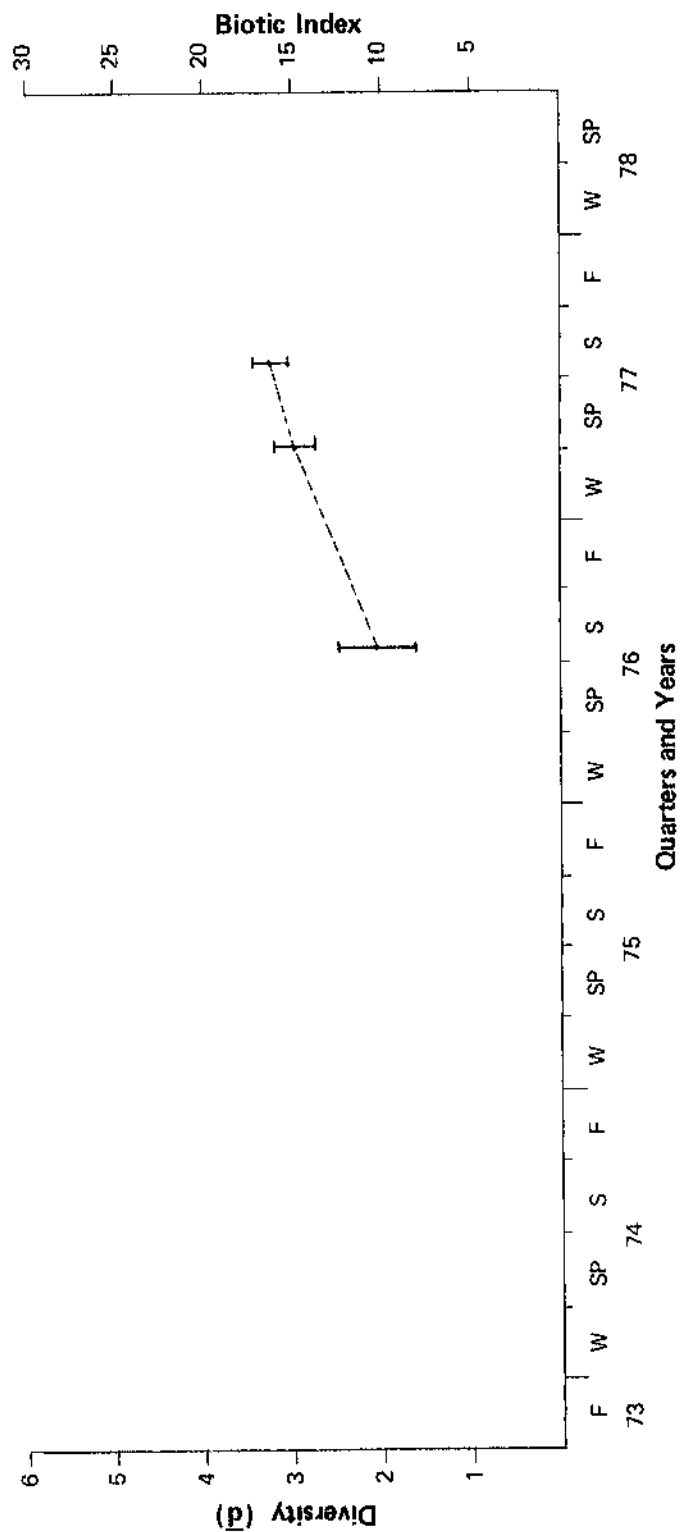
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
32.03.OC29	7 Jul 76	2.180±0.420	0.361±0.113	9							GT2400	1600	
	30 Mar 77	3.087±0.259	0.228±0.054	22							2	172	
	11 Jul 77	3.347±0.206	0.148±0.022	27							790	5	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.03.0C29
 BODY OF WATER: ST. ANDREWS (WEST) BAY

--- NATURAL SUBSTRATE DIVERSITY
 -.-.- ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 32.03.ON42 Body of Water St. Andrews (East) Bay

Location Cedar Point

County Bay

Type Body of Water bay Classification III

Sources of Pollution papermill, Tyndall A.F.B.

Nearby Land Use military base

Sampling Frequency annual Depth 2.0 meters

Bottom Type sand, organics % Volatile Solids

Aquatic Plants: Submerged Diplanthera wrightii, Rupia sp., Thalassia testudinum

Emergent Spartina alterniflora, Spartina patens

Macroinvertebrates:

Annelida

Polychaeta

cf. Chone sp.
Diopatra cuprea
Eteone heteropoda
Glycera sp.
Nereis pelagica occidentalis
N. succinea
Pectinaria gouldii
cf. Scoloplos sp.
Haploscoloplos sp.
cf. Lumbrineris sp.
Hypaniola grayi
Melinna maculata
Maldanopsis sp.
Eunice rubra
Prionospio texana
Mediomastus californiensis
Streblospio benedicti
Capitella capitata
Owenia sp.
Exogone sp.
cf. Laonice cf. cirrata

Arthropoda

Crustacea

Isopoda

Edotea cf. trilobita
Erichsonella cf. floridana

Isopoda (cont.)

Sphaeroma sp.

Amphipoda

Ampelisca cf. verrilli

Cymadusa cf. compta

Grandidierella bonnieroides

Hauistorius sp.

Listriella cf. barnardi

Monoculodes cf. edwardsi

Mucrogammarus macromucronatus

Decapoda

Hippolyte pleurocantha

Mysidacea

Mysidopsis bigelowi

Tanaidacea

Leptochelia cf. dubia

Cirripedia

Balanus eburneus

Mollusca

Gastropoda

Cerithium muscarum

Crepidula fornicata

Retusa canaliculata

Nassarius vibex

Polinices sp.

Scaphopoda

Dentalium cf. pilsbryi

cf. Cadulus quadridentatus

Pelecypoda

Anodontia cf. alba

Arca transversa

Barnea sp.

Brachidontes exustus

Chione sp.

cf. Mercenaria sp.

Rangia cf. cuneata

Solen cf. viridis

Tellina lineata

Tellina texana

Ensis minor

Anomia simplex

Pelecypoda (cont.)

Corbula barrattiana
Glycymeris pectinata

Echinodermata

Echinarachnius parma
Lytechinus variegatus

Chordata

Cephalochordata

Branchiostoma virginiae

DATA SUMMARY: St. Andrews (East) Bay

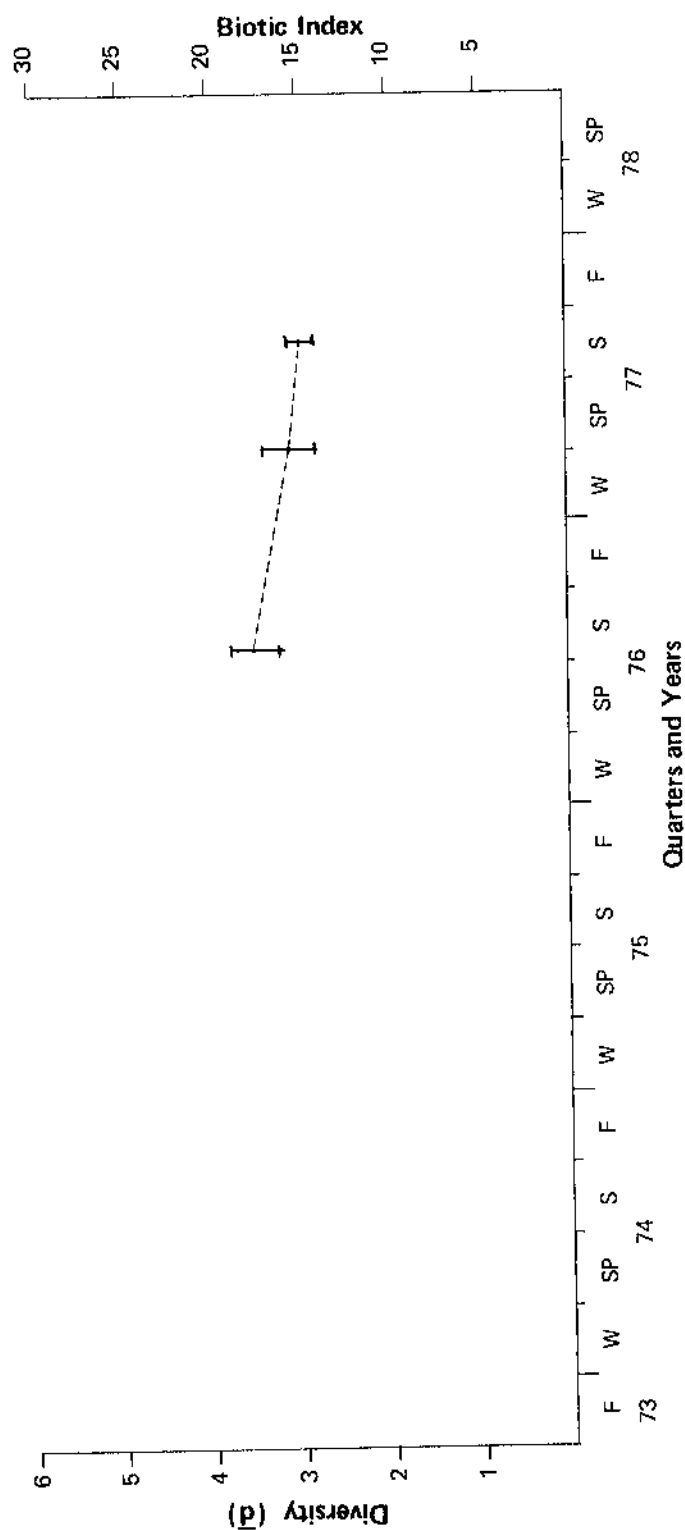
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
32.03.ON42	7 Jul 76	3.610±0.280	0.090±0.031	14						33	5	
	30 Mar 77	3.212±0.314	0.121±0.049	13						LT2	LT2	
	11 Aug 77	3.104±0.139	0.122±0.014	21						13	LT2	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.03.0N42
 BODY OF WATER: ST. ANDREWS (EAST) BAY

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 32.03.OW31 Body of Water St. Joseph Bay
Location 1,000 yards north of Stone State Park, at White Sand Bluff
County Gulf
Type Body of Water bay Classification II
Sources of Pollution St. Joe Paper Company, Sylbachem C. Corp., St. Joe
STP basic magnesium
Nearby Land Use state park reservation
Sampling Frequency annual Depth 1.0-1.5 m
Bottom Type sand, grass % Volatile Solids _____
Aquatic Plants: Submerged Thalassia testudinum, Diplanthera wrightii
Emergent Spartina alterniflora

Macroinvertebrates:

Porifera

cf. Dysidea fragilis

Annelida

Polychaeta

Ammotrypane aulogaster
Chone sp.
Ehlersia cornuta
Haploscoloplos sp.
Glycera dibranchiata
Maldane sp.
Marphysa cf. sanguinea
Megalomma sp.
Nereis pelagica occidentalis
N. (Neanthes) succinea
Owenia fusiformis
Polycirrus sp.
Polydora ligni
Prionospio texana
Tharyx setigera
unident. maldanid
unident. sabellid

Arthropoda

Crustacea

Isopoda

Aega sp.
cf. Accalathura crenulata
Cyathura sp.
Edotea triloba
Erichsonella cf. floridana
Paracerceis caudata

Amphipoda

Ampelisca verrilli
cf. Acanthohaustorius intermedius
Cymadusa compta
Grandidierella bonnieroides
Synchelidium americanum
unident. leucothoid
unident. phoxocephalid
cf. Ampithoe sp.
Ampelisca cf. verrilli
Erichthonius sp.
Elasmopus levis
cf. Lysianopsis sp.

Decapoda

Eurypanopeus depressus
Hippolyte pleuracantha
Mithrix sp.
Neopanope texana texana
Pagurus longicarpus
Palaemonetes sp.
Panopeus herbstii
Pinnixia sp.
Thor floridanus
cf. Tozeuma sp.

Mysidacea

Mysis stenolepsis

Tanaidacea

Leptochelia dubia
L. cf. rapax

Cumacea

Oxyurostylis smithi

Mollusca

Polyplacophora

Acanthochitona cf. pygmaena

Gastropoda

Caecum carolinianum

Cerithium sp.

Crepidula fornicata

C. maculosa

Nassarius vibex

Olivella mutica

O. cf. jaspidea

cf. Periscula minuta

Turbo castaneus

Turbonilla sp.

Thais haemastoma

Scaphopoda

Dentalium cf. calamus

Pelecypoda

Amygdalum papyria

Anadara transversa

Anomia simplex

Anodontia sp.

Barnea costata

Chione cancellata

Donax variabilis

Chione sp.

Lucina sp.

Laevicardium mortoni

Mercenaria campechiensis

Parastarte triquetra

Tellina texana

Echinodermata

Echinoidea

Lytechinus variegatus

Ophiuroidea

cf. Ophioderma brevispinum

Chordata

Urochordata

unident. sp.

Cephalocordata

Branchiostoma caribaeum

DATA SUMMARY: St. Joseph's Bay

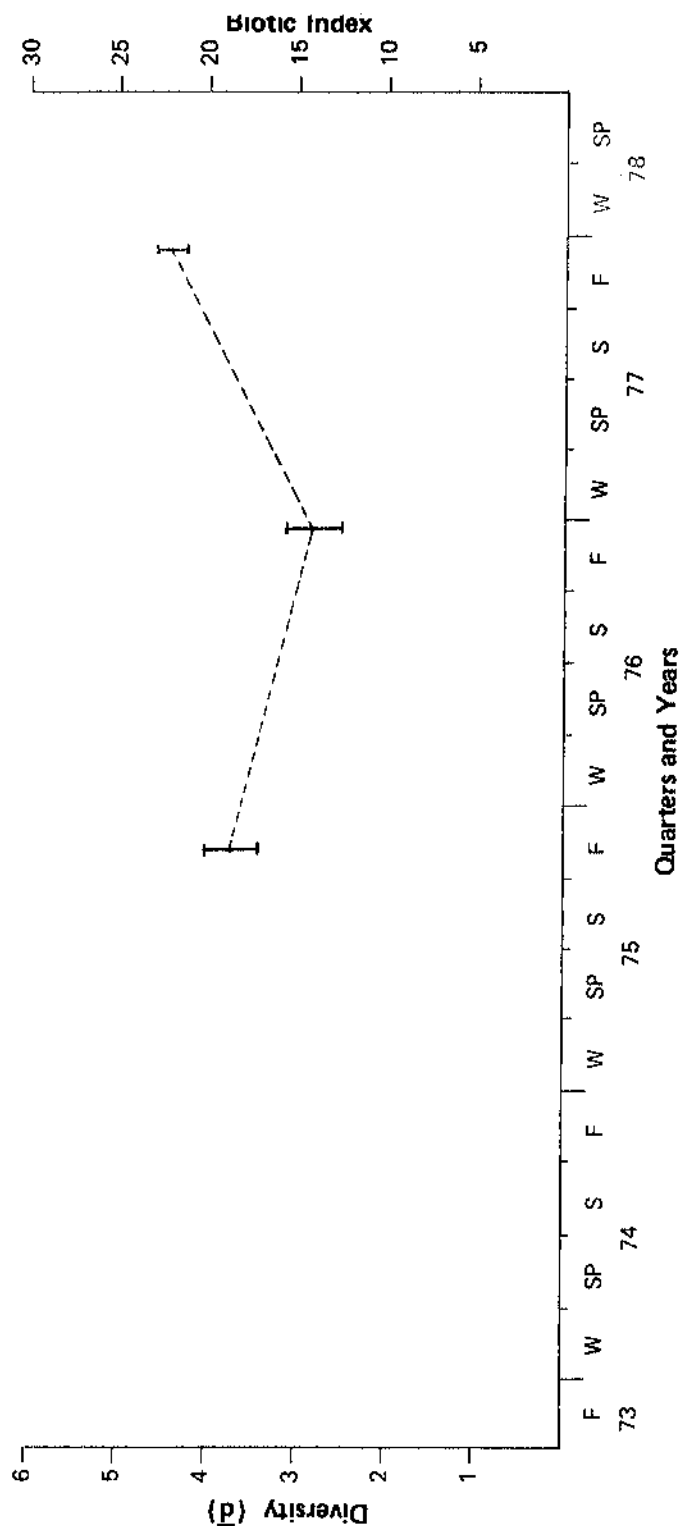
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	HI	#Spp.					
N33	29 Oct 75	3.812±0.309	0.128±0.039	23								LT2		
	16 Dec 76	2.960±0.311	0.254±0.071	18								13 LT2		
	9 Dec 77	4.557±0.175	0.061±0.013	43								LT2 LT2		

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.03.0W31
 BODY OF WATER: ST. JOSEPHS BAY

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 --- BIOTIC INDEX (= FLORIDA INDEX)



Station No. 32.03.0W41 Body of Water St. Joseph Bay
 Location 300 yards offshore, 200 yards west of Grass Island
 County Gulf
 Type Body of Water bay Classification II
 Sources of Pollution industrial and domestic effluents
 Nearby Land Use residential and industrial
 Sampling Frequency quarterly Depth 1.5 m.
 Bottom Type grassbed, sand, shell % Volatile Solids 3.8
 Aquatic Plants: Submerged Syringodium sp., Thalassia testudinum, Syringodium
filiforme, Diplanthera wrightii Emergent Spartina patens, Juncus roemerianus, Spartina
spartinae, Myrica heterophylla, Salicornia bigelowii, Baetis maritima, Bacopa (Bramis)
 Macroinvertebrates: monnieri, Borrichia frutescens

Cnidaria

Hydrozoa

unident. leptomedusan

Anthozoa

cf. Metridium senile
 unident. madreporarian

Platyhelminthes

Turbellaria

Prosthecereaus maculosus

Rhynchocoela

unident. sp.

Annelida

Polychaeta

cf. Arenicola sp.
Asabellides oculata
Axiiothella mucosa
Aricidea jeffreysii
Ceratonereis sp.
Chone spp.
Cirriiformia filigera
Clymenella cf. torquata
Diopatra cuprea
Dispio uncinata
Eunice sp.

Polychaeta (cont.)

Ehlersia cornuta
cf. Eteone heteropoda
Fabricia sp.
Glycera dibranchiata
Haploscoloplos fragilis
cf. Laeonereis culveri
Lumbrinereis cf. tenuis
Melinna maculata
Neanthes (Nereis) succinea
N. pelagica occidentalis
Onuphis nebulosa
Pectinaria gouldii
Pista palmata
Platynereis dumerili
Prionospio sp.
Sabellides oculata
Scoloplos cf. capensis
Terebellides sp.
Typosyllis sp.
cf. Paraprionospio pinnata
Spio pettiboneae
Polydora ligni
Tharyx sp.
Capitella sp.
Sabella microphthalma
Potamilla sp.
Leucothoe spinicarpa

Arthropoda

Crustacea

Isopoda

cf. Accalathura crenulata
Cyathura burbanki
Caprella geometrica
Edotea triloba
Erichsonella floridana
Paracerceis caudata
Ptilanthura tricarina
Sphaeroma quadridentatum

Amphipoda

cf. Acanthohaustorius sp.
Ampelisca sp.
A. cf. verrilli
Amphithoe sp.
cf. Amphithoe longimana
Cerapus sp.
Cirolana polita
Corophium louisiana

Amphipoda (cont.)

Cymadusa compta
 cf. Deutella mayeri
Elasmopus laevis
Erichthonius cf. brasiliensis
Grandidierella bonnieroides
Grubia compta
Haustorius sp.
 cf. Lafystius sp.
 cf. Leucothoe sp.
Lembos smithi
Leucothoe spinicarpa
Leucothoe cf. spinacarpa
Lysianopsis alba
Melita cf. dentata
Melita appendiculata
M. cf. nitida
Monoculodes edwardsi
Melita sp.
Macrogammarus macromucronatus
Podoceropsis cf. nitida
 cf. Synchelidium americanum
Unicola irrorata

Decapoda

Callinectes sapidus
 cf. Crangon sp.
Eurypanopeus depressus
Alpheus heterochelis
Hippolyte pleuracantha
Mithax cf. spinosissimus
Neopanopeus texana
Macrocoeloma trispinosum
Pagurus cf. longicarpus
Paguristes servicus
Penaeus setiferus
Panopeus herbstii
Penaeus sp.
Pinnixa sp.
P. cf. lunzi
 cf. Pitho therminieri
Siconya brevirostris
Upogebia affinis
U. zostericola
Toxeuma carolinense

Mysidacea

cf. Mysis stenolepsis
Bowmaniella dissimilis
Taphromysis louisianae

Tanaidacea

Leptochelia dubia
L. cf. rapax

Cirripedia

Balanus amphitrite

Cumacea

cf. Leptocuma minor
cf. Oxyurostylus smithi

Mollusca

Polyplacophora

Acanthochiton pygmaea
Chaetopleura apiculata

Gastropoda

Acteon sp.
Anachis ostreicola
Bulla occidentalis
Caecum cf. lermondi
Cerithidea costata
Cerithium sp.
C. muscarum
Conus sp.
C. floridanus
Crepidula sp.
Crepidula fornicata
C. maculosa
cf. Cylichna bidentata
Echininus nodulosus
Epitonium rupicola
Kurtziella cf. limonitella
Leucozonia sp.
Mitra cf. hendersoni
Modiolus sp.
Murex sp.
M. cellulosus
Nassarius vibex
Nodilittorina tuberculata
cf. Odostomia seminuda
Olivella cf. jaspidea
O. mutica
Persicula sp.
P. minuta
Polinices sp.
Prunum apicum
Pyramidella fusca
Rissoina chesneli
Terebra sp.
Turbo cf. castaneus
Turbonilla sp.

Gastropoda (cont.)

Turbonilla cf. interrupta
T. cf. nivea

Scaphopoda

Dentalium cf. calamus
cf. Dentalium sp.
D. pilsbryi

Pelecypoda

Aequipecten irradians
cf. Amygdalum papyria
Anadara cf. transversa
Anomalocardia cuneimeris
Arca sp.
Atrina sp.
Chione cancellata
C. cingenda
Glycymeris americana
Lioberus castaneus
Mercenaria campechiensis
cf. Phacoides pectinatus
cf. Pitar sp.
Rangia cuneata
Retusa canaliculata
Solen viridis
Tagelus plebeius
Tellina lineata
T. texana
Laevicardium mortoni
Mytilus sp.
Brachidontes exustus
Cerodrillia thea
Parastarte triquetra
Trachycardium egmontianum

Echinodermata

Ophiuroidea

Amphiopholis cf. graceillima
cf. A. sanamata
Echinaster echinophorus

Ophiuroidea (cont.)

Ophiactis krebsii
cf. Ophioderma brevispinum
Ophiopholis aculeata

Echinoidea

Lytechinus variegatus

Holothuroidea

Thyone cf. uniseminata

Chordata

Urochordata

Styela cf. plicata
cf. Styela sp.
unident. sp.

Cephalochordata

Branchiostoma caribaeum

DATA SUMMARY: St. Joseph's Bay

Station Number	Date	Macroinvertebrates						Plankton Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria (Colonies/100ml)		Comments
		Natural Substrate			Artificial Substrate								
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
											BI	#Spp.	
241											Total	Fecal	
32.03.0W41	31 Jul 74	4.458±0.223	0.053±0.018	28					Coc BG 0 Fil BG LTI Coc Gr 0 Fil Gr LTI Gr Flag 0 Other Flag 0 Cen Dia LTI Pen Dia LTI Total LTI				
	19 Aug 75	4.311±0.298	1.118±0.031	32									
	30 Oct 75	3.572±0.288	0.086±0.033	15									
	25 Feb 76	4.510±0.292	0.110±0.030	31								2	LT2
	15 Apr 76	3.302±0.220	0.200±0.031	31								LT2	LT2
										Coc BG 446 Fil BG 65 Coc Gr 3152 Fil Gr 65 Gr Flag 575 Other Flag 0 Cen Dia 45			

See Methods for explanation of table.

DATA SUMMARY: St. Joseph's Bay

Station Number	Date	MacroInvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
32.03.0W41	15 Apr 76 (Cont.)										Pen Dia 9432 Total 13779			
	2 Sep 76	3.357±0.325	0.254±0.053	29							Coc BG 7500 Fil BG 136 Coc Gr 906 Fil Gr 0 Gr Flag 0 Other Flag 9	130	34	
	14 Oct 76	4.264±0.179	0.055±0.013	31							Coc BG 7500 Fil BG 136 Coc Gr 906 Fil Gr 0 Gr Flag 0 Other Flag 9 Cen Dia 615 Pen Dia 24719 Total 33885	1300	49	
	25 Jan 77	3.978±0.232	0.074±0.022	24						Coc BG 5475 Fil BG 75 Coc Gr 3200 Fil Gr 0 Gr Flag 0		240	LT2	

See Methods for explanation of table.

DATA SUMMARY, St. Joseph's Bay

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Count/100ml	Comments	
		Natural Substrate			Artificial Substrate							Biotic Index
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
32-03-OW41	25 Jan 77 (Cont.)							Other Flag 0 Cen Dia 2775 Pen Dia 6175 Total 17700				
	13 Apr 77	4.306±0.206	0.061±0.023	29				Coc BG 10090 Fil BG 181 Coc Gr 1473 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 168 Pen Dia 7888 Total 90800		LT2	LT2	
	18 May 77											
	12 Jul 77	2.482±0.284	0.485±0.068	29						LT2	LT2	
	14 Aug 77							Coc BG 9141 Fil BG 265			Florida Index ¹	

See heading for explanation of table.

DATA SUMMARY: St. Joseph's Bay

Station Number	Date	Macroinvertebrates						Nutric Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
244													
32.03.0041	14 Aug 77 (Cont.)								Coc Gr 0 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 258 Pen Dia 107209 Total 116873				
	5 Dec 77	4.407±0.210	0.058±0.015	32					Coc BG 38941 Fil BG 995 Coc Gr 0 Fil Gr 0 Gr Flag 0 Other Flag 39 Cen Dia 723 Pen Dia 99236 Total 139936				
	14 Feb 78	4.012±0.269	0.108±0.027	29							230	23	
	5 Apr 78	4.357±0.213	0.068±0.014	36							LT2	LT2	

See Methods for explanation of table.

DATA SUMMARY: St. Joseph's Bay

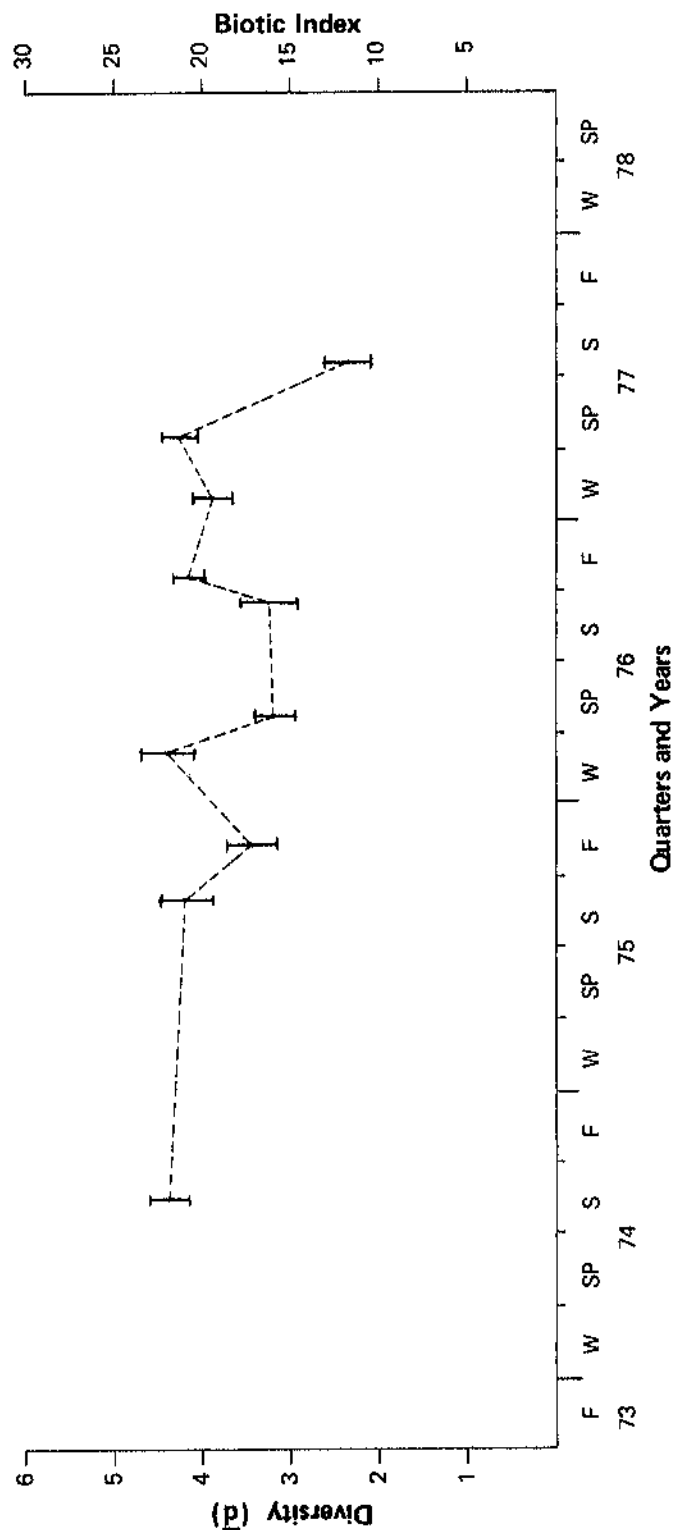
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		#Spp.	Redundancy						
		Diversity	Redundancy	Diversity	Redundancy			#Spp.			BI	Total	
245	32.03.0041	9 May 78										LT2	LT2
		20 Jun 78										230	LT2

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 32.03.0W41
 BODY OF WATER: ST. JOSEPHS BAY

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 33.03.00J4 Body of Water Santa Rosa Sound

Location Manatee Point at the narrows marker #75

County Okaloosa

Type Body of Water estuary Classification II

Sources of Pollution domestic waste

Nearby Land Use undeveloped in immediate vicinity

Sampling Frequency annually Depth 0 - 2.8 m

Bottom Type silt, sand % Volatile Solids 5%

Aquatic Plants: Submerged Diplanthera wrightii

Emergent Typha sp., Juncus roemerianus, Spartina

alterniflora, Spartina patens, Phragmites communis

Macroinvertebrates:

Porifera

2 unident. spp.

Platyhelminthes

Turbellaria

Leptoplana cf. variabilis

Stylochus ellipticus

unident. sp.

Rhynchocoela

Tetrastemma sp.

Cerebratulus lacteus

Annelida

Polychaeta

Ancistroyosyllis bassi

Arenicola sp.

Capitella capitata floridana

cf. Chone duneri

Enoplobranchus sanguineus

Eteone heteropoda

Glycera dibranchiata

Haploscoloplos fragilis

Laeonereis culveri

Lumbrineris coccinea

Mediomastus californiensis

Nereis (Neanthes) succinea

N. pelagica occidentalis

Polychaeta (cont.)

Pectinaria gouldii
Polydora ligni
P. websteri
Sabellides oculata
Spiophanes bombyx

Arthropoda

Crustacea

Isopoda

Accalathura sp.
Erichsonella floridana

Amphipoda

cf. Acanthohaustorius millsii
Ampelisca sp.
A. verrilli
A. cf. verrilli
Corophium louisianum
Hauastorius sp.
Grandidierella bonnieroides
Listriella sp.
Monoculodes edwardsi

Decapoda

Callinectes sapidus
Eurypanopeus depressus

Mysidacea

Bowmaniella dissimilis
Mysidopsis bigelowi
Mysis stenolepis

Cirripedia

Balanus eburneus

Cumacea

Leptocuma minor
Oxyurostylis smithi

Mollusca

Gastropoda

cf. Cylichna bidentata
Mitrella lunata
Nassarius vibex
Pyramidella fusca
unident. bullid
unident. nudibranch

Pelecypoda

Anomalocardia cuneimeris
cf. Brachidontes exustus
Ensis minor
Glycymeris americana
Mercenaria campechiensis
Rangia cuneata
Tagelus plebeius
Tellina lineata

Echinodermata

Holothuroidea

Chiridota sp.
Leptosynapta sp.

Chordata

Urochordata

Bostrichobranthus pilularis
B. cf. pilularis
Molgula occidentalis

Cephalochordata

Branchiostoma caribaeum

MATA SIMPLY: Santa Rosa Sound

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Santa Rosa Sound

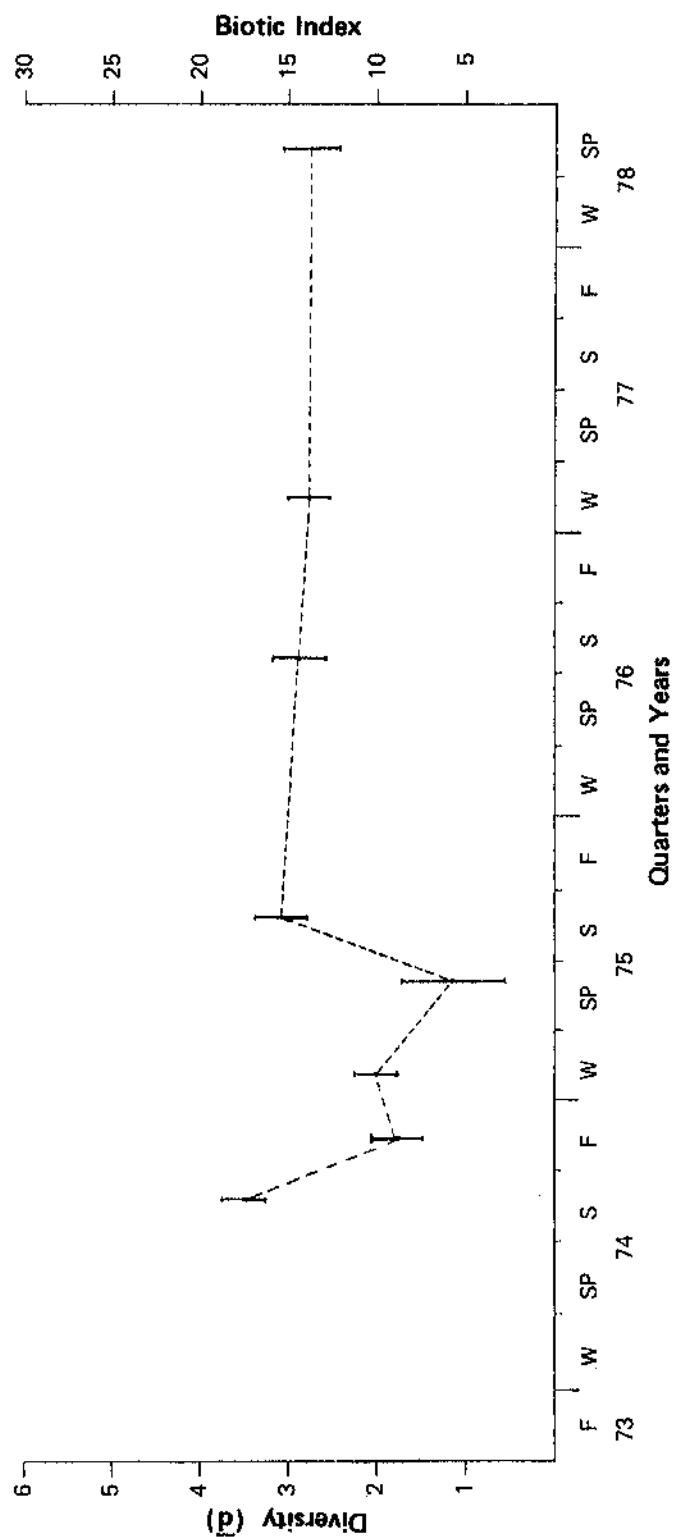
Station Number	Date	Invertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/m ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate					Biotic Index	Total		Fecal
		Diversity	Richness	ISpp.	Diversity	Richness	ISpp.						
251	6 Jun 77 (Cont.)								Coc Gr 138 Fil Gr 155 Gr Flag 0 Other Flag 0 Cen Dia 103 Pen Dia 111869 Total 113503				
	24 Apr 78	2.721±0.332	0.207±0.051	13					Coc BG 1767 Fil BG 10 Coc Gr 0 Fil Gr 0 Gr Flag 417 Other Flag 35 Cen Dia 7 Pen Dia 70 Total 2306	13	5		

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 33.03.00J4
 BODY OF WATER: SANTA ROSA SOUND

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



APALACHICOLA DRAINAGE BASIN

The Apalachicola River Basin in Florida is part of a much larger basin made up primarily of the Apalachicola and Chattahoochee Rivers. This system of rivers drains approximately 20,000 square miles of Georgia, Alabama and Florida. The Florida portion of the basin consists primarily of the Apalachicola and Chipola Rivers, which collectively drain approximately 2,100 square miles. The Apalachicola is the largest river in terms of flow in Florida, discharging an average of 24,650 cubic feet per second into the Gulf of Mexico.

Apalachicola River Sub-Basin

Station 31.01.0001, Chattahoochee River at SR 2, exhibited fair macroinvertebrate diversities and marginal Biotic Index numbers. Artificial substrates have been collected which had heavy growths of blue-green algae on them which suggests probable nutrient problems. The river is subject to numerous pollution sources before entering Florida, including textile mills, sewage treatment plants, and a nuclear power plant. However, not enough data were collected to detect a trend in the biotic community.

Lake Seminole was formed by the impoundment of the Chattahoochee and Flint Rivers. Station 31.01.0007, at Buoy #5 above Jim Woodruff Dam, had generally good diversities and showed a significant improvement during the report period. This was perhaps more a reflection of samplers' efforts to move the specific sampling site away from muck pockets to find better habitat for organisms than a change in water quality. Frequently high total and fecal coliform counts (in excess of Class III standards) suggest the impact of polluted waters from Alabama and Georgia collecting in this impoundment.

Station 31.01.0014, Apalachicola River near the Bristol boat landing, was sampled only a few times but macroinvertebrate diversity appeared to be good on those occasions. The same was true further downstream at station 31.01.0019, 1.5 miles below the Chipola River cutoff.

Station 31.01.0021 is on the Brothers River one mile above the confluence with Apalachicola River. It is essentially an undeveloped swamp drainage and this is reflected in the good macroinvertebrate diversity for the three samples analyzed during the report period.

Station 31.01.0022 is on the Apalachicola River at Buoy #40, in Franklin County. Natural substrate macroinvertebrate diversity and the Biotic Index improved significantly during the study period and, although the Biotic Index was still marginal, the diversity was generally good during 1977-78. This, however, may have been a result of samplers' efforts to find habitable sediments nearer shore than those in mid-channel which were sampled originally.

Artificial substrate diversity, less affected by location in stream, did not show a significant change. Occasionally high total coliform counts at this station were probably due to runoff.

Lake Wimico, station 31.01.0131, one-half mile west of Jackson River, is a lake which flows (via Jackson River) into the Apalachicola River. It had generally good macroinvertebrate diversity the three times it was sampled during the report period. Interestingly, the Intracoastal Waterway, which flows into the lake from the West (East St. Andrews Bay), has brought estuarine forms into the lake (e.g. Rangia cuneata, Grandidierella bonnieroides).

Both of the Apalachicola Bay stations, 31.01.0C33, off Green Point, and 31.01.0G27, off Cedar Point, exhibited good macroinvertebrate diversity numbers during the report period. The latter station apparently supports a more stable and diverse community, probably because of its better flushed, more marine location.

The Green Point station exhibited a very slight significant upward trend during the five years. Also notable was that bacteria counts at this station were occasionally high for Class II waters.

Chipola River Sub-Basin

The uppermost station monitored on the Chipola River is 31.02.0024, downstream from Waddell's Mill Creek, in Jackson County. Although the few diversities calculated were good, they were not as good as would be expected; numbers of species collected were somewhat low, and the Biotic Index was marginal. Farming activities at the stream edge contribute heavy silt loads which have apparently degraded water quality.

The Chipola River flows underground near Marianna and returns to the surface downstream. Station 31.02.0012, at SR 274, had excellent macroinvertebrate diversities and Biotic Index values. This reach of the river, with limestone bottom and alkaline water supported a community including large numbers of Goniobasis sp., a low DO intolerant snail. A significant upward trend was noted for artificial substrate macroinvertebrate diversity and for the Biotic Index, but not for natural substrate macroinvertebrate diversity. This is unexplained. Occasionally, Class III bacteria standards were exceeded, perhaps because of effluent from the Marianna sewage treatment plant, although it is quite far upstream relative to the expected survival of fecal coliform bacteria.

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Juniper Creek, station 31.02.0027, near Frink, is a tributary of the Chipola River. The water is very highly colored. Although it was sampled only three times, one high macroinvertebrate diversity number and two high Biotic Index numbers were obtained from this station. High bacteria counts were probably due to runoff. Especially notable was collection of the mayfly larva Dolania americana, previously collected only from the Savannah and Blackwater Rivers.

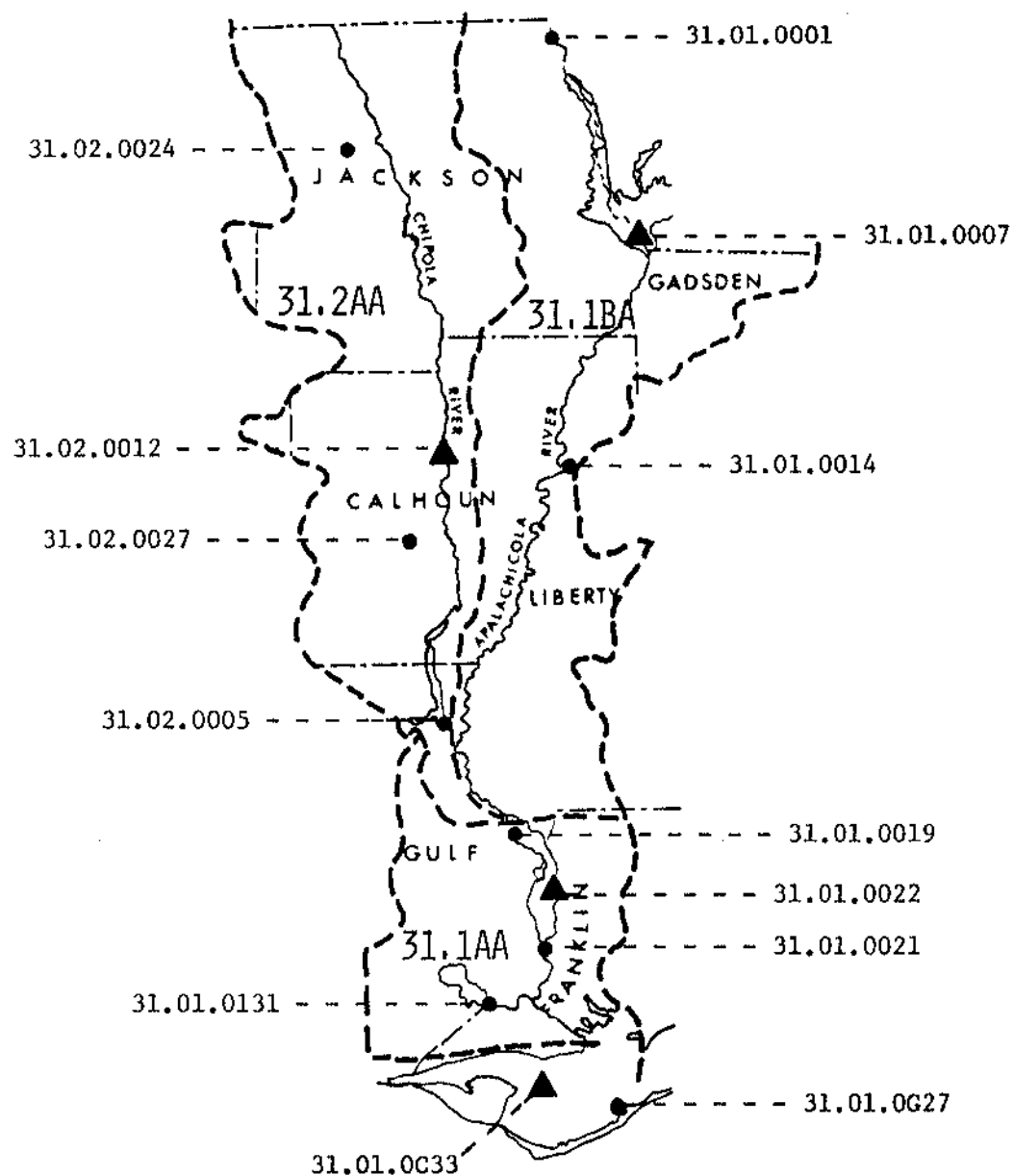
Station 31.02.0005, Dead Lakes, south end of SR 22 bridge, is actually just downstream of the dam which forms the Dead Lakes impoundment, but shares many characteristics with the upstream area. It was sampled only twice during the report period but had good macroinvertebrate diversity both times. The exotic clam, Corbicula manilensis, was collected in numbers there.

Summary

Generally, the Apalachicola River Sub-basin showed better water quality downstream from Jim Woodruff Dam than upstream, as indicated by biological data. High bacteria counts were notable in Lake Seminole, probably due to sources in Georgia and Alabama. Significant upward trends were noted in some macroinvertebrate indicators at Lake Seminole and at Buoy #40 far down river in Franklin County, but in both cases, a change in sampling strategy and increased collection success probably played a bigger part in the trend than did a change in water quality. Other stations in the sub-basin on the Brothers River, Lake Wimico, and in Apalachicola Bay, all had good water quality according to the biological data. The Apalachicola Bay station off Green Point exhibited a slightly significant upward trend.

In the Chipola River Sub-basin, biological data suggested excellent water quality in the river near Altha and in Juniper Creek, and good water quality at Dead Lakes. A significant improvement was noted at the station near Altha (SR 274), although unexplained. This station also had occasionally high bacteria counts, possibly related to Marianna sewage effluent. Although the station upstream near Waddell's Mill Creek had acceptable biological indicator numbers, they were not as good as those downstream. Apparently, heavy silt loads from farming were causing degradation of water quality and habitat loss.

APALACHICOLA RIVER BASIN



Trichoptera

Cyrnellus sp.
Leptocella sp.
Hydropsyche sp.

Diptera

Ablabesmyia americana
A. parajanta
A. peleensis
Cardiocladius sp.
Chironomus sp.
Cladotanytarsus sp.
Cricotopus bicinctus
C. remus
C. sp.

Coleoptera

unident. hydrophilid

DATA SUMMARY: Chattoahoochee River

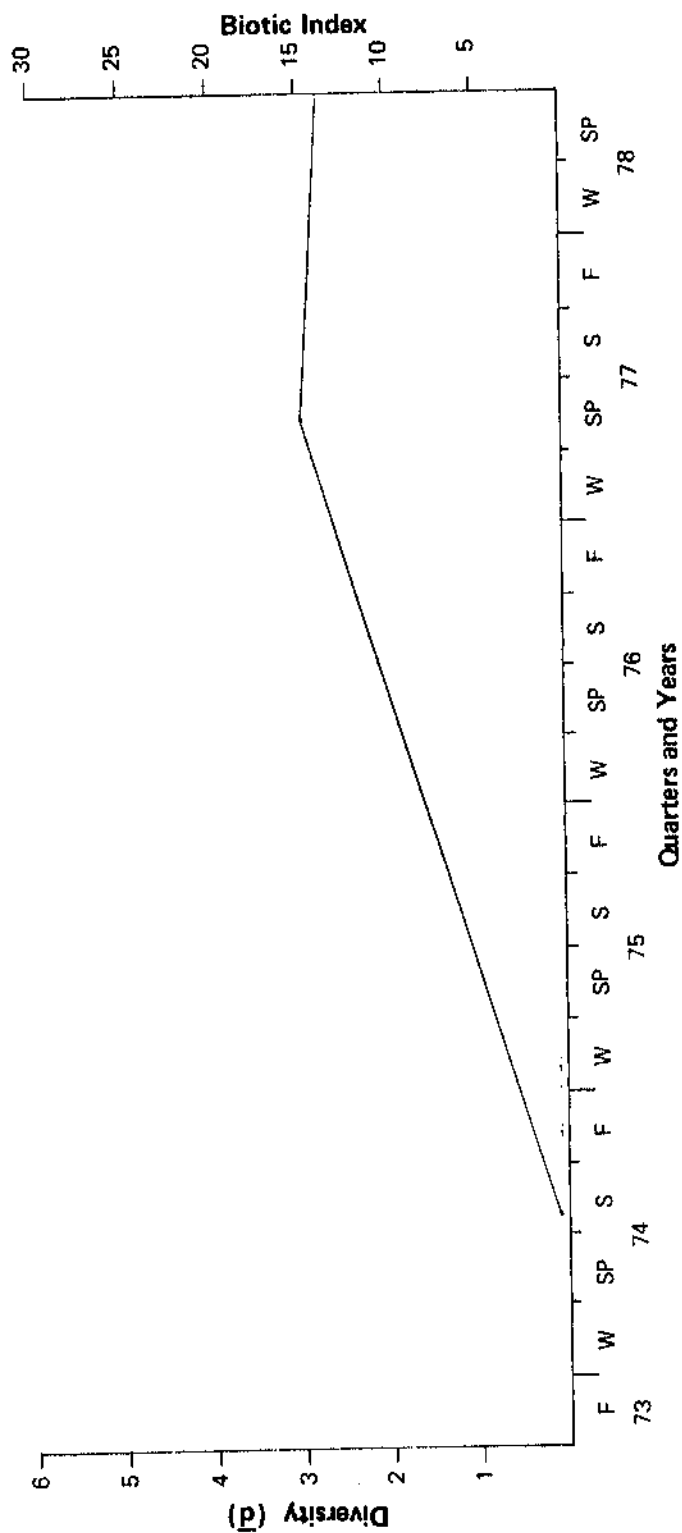
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Concentration $\mu\text{g}/\text{cm}^3$	Periphyton Concentration $\mu\text{g}/\text{cm}^2$	Comments	
		Natural Substrate			Artificial Substrate								
		Diversity	Richness	#Sp.	Diversity	Richness	#Sp.	Diversity	Richness				#Sp.
31-01-0001	20 Mar 74								1	9	920	350	
	18 Jul 74												
	12 May 76				1.820±0.320	0.340±0.133	6		15	24	350	13	
	26 Apr 77										170	7	
	16 Aug 77				1.770±0.171	0.377±0.042	13		12	10	490	2	
	7 Aug 78	2.625±0.471	0.291±0.137	8							25,000	130	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 31.01.0001
 BODY OF WATER: APALACHICOLA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 31.01.0007 Body of Water Lake Seminole
Location at buoy #5 above Jim Woodruff Dam
County Jackson
Type Body of Water reservoir Classification III
Sources of Pollution Alabama-Georgia textile industry, paper mill, agriculture
municipality, steam plant (nuclear)
Nearby Land Use US preserves, prison, municipality
Sampling Frequency quarterly Depth 1.5 - 7 m
Bottom Type muck % Volatile Solids 3.13 - 4.04
Aquatic Plants: Submerged Ceratophyllum demersum, Rhizoclonium hieroglyphicum
Emergent Typha sp., Sagittaria sp., Eichhornia
crassipes, Justicia obovata, Myriophyllum exalbescens

Macroinvertebrates:

Annelida

Hirudinea

unident. sp.

Oligochaeta

unident. spp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Amphipoda

Hyalella azteca

Decapoda

Cambarus sp.

Palaemonetes paludosus

Insecta

Odonata

Argia sp.

Anomalagrion hastatum

Enallagma sp.

Libellula sp.

Ephemeroptera

Hexagenia munda marilandica

Hemiptera

Belostoma sp.

Trichoptera

Oecetis sp.

Diptera

Ablabesmyia auriensis

A. mallochi

A. peleensis

A. philosophagnos

Chaoborus sp.

Coelotanypus scapularis

C. concinnus

C. tricolor

Cricotopus sp.

C. bicinctus

Cryptochironomus sp.

C. blarina

C. fulvus

Dicrotendipes nervosus

Epoicocladius sp.

Eukiefferiella sp.

Glyptotendipes lobiferus

Microtendipes sp.

Macropelopia sp.

Nanocladius sp.

Orthocladius annectens

Parachironomus sp.

Pentaneura sp.

Polypedilum halterale

P. illinoense

Procladius sp.

Pseudochironomus sp.

Symbiocladius sp.

Tanytarsus sp.

Tanypus neopunctipennis

Tribelos sp.

Zavrelia sp.

Cardiocladius sp.

Chironomus sp.

C. attenuatus

C. carus

C. crassicaudatus

unident. ceratopogonid

unident. simuliid

unident. tanytarsine

Coleoptera

Dineutus sp.

unident. haliplid

Mollusca

Gastropoda

Laevapex sp.

Physa sp.

Pelecypoda

Corbicula manilensis

unident. sphaeriid

DATA SUMMARY, Lake Seminole

Station Number	Date	Microbayerlebrates						Plate Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml
		Natural Substrate			Artificial Substrate						
		Diversity	Reducancy	ISpp.	Diversity	Reducancy	ISpp.				
265 31.01.0007	18 Sep 73										240
	7 Nov 73	0.954±0.247	0.111±0.335	2				3	5		1600
	21 Feb 74										1600
	8 Mar 74	1.000±0.200	1.000±0.210	2							13
	20 May 74										
	1 May 74										
	2 May 74	1.098 ±0.544	0.822±0.356	4	3.096±0.346	0.133±0.061	11	4	10		GT2400
	21 May 74										560
	18 Jun 74										
	19 Jul 74	2.745±0.291	0.169±0.047	12				7	19		1600
	3 Oct 74	1.868±0.263	0.240±0.081	6	0.952±0.059	0.067±0.080	2				
	5 Jan 75										

See Methods for explanation of table.

DATA SUMMARY: Lake Seminole

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Concentration $\mu\text{g}/\text{cm}^3$	Periphyton Concentration $\mu\text{g}/\text{cm}^2$	Coliforms Bacteria/Coliforms/ Total	Comments
		Natural Substrate		Artificial Substrate		Diversity	Redundancy					
		Diversity	Redundancy	Diversity	Redundancy							
31.01.0007	(Cont.)											
	5 Aug 75										49	
	30 Sep 75										240	
	28 Oct 75										23	
	19 Nov 75										1	
	3 Dec 75	2.396 $\pm$ 0.319	0.257 $\pm$ 0.088			10			Coc BG 0 Fil BG LTI Coc CR LTI Fil CR LTI Gr Flag 0 Other Flag 0 Gen. Dia LTI Pen Dia 1 Total 1		49	13
	13 Jan 76										1600	540

See Methods for explanation of table.

DATA SUMMARY: Lake Seminole

Station Number	Date	Macroinvertebrates						Phytoplankton Concentration $\mu\text{g}/\text{cm}^3$	Periphyton Concentration $\mu\text{g}/\text{cm}^2$	Coliform Bacteria Concentration/100ml
		Natural Substrate		Artificial Substrate		Niche Index				
		Frequency	Redundancy	Frequency	Redundancy	NI	#Spp.			
31.01.0007	10 Feb 76								Coc BG 0 Fll BG 13 Coc GR 7699 Fll GR 65 Gr Flag 297 Other Flag 0 Cen Dia 0 Pen Dia 123000 Total 131073	
	19 Feb 76									540
	11 Mar 76									2400 CT2400
	7 Apr 76									2400 CT2400
	7 Apr 76	3.020 $\pm$ 0.200	0.160 $\pm$ 0.030				21			CT2400 CT2400
	19 Apr 76									540 350
	6 May 76									1600 920

See Methods for explanation of table.

DATA SUMMARY: Lake Seminole

Station Number	Date	Macroinvertebrates					Diatom Index	Phytoplankton Concentration units/cm ²	Periphyton Concentration units/cm ²	Coliform Bacteria Concentration (pphm)	Comments
		Natural Substrate		Artificial Substrate							
		Diversity	Richness	Diversity	Richness	Sp.					
31-02-0007	(Cont.)										
	18 Jun 76										
	21 Jun 76									170	LT2
	28 Jul 76										GT2400 GT2400
	28 Jul 76	2.965±0.356	0.180±0.079			12					
	</										

See Methods for explanation of table.

DATA SUMMARY: Lake Seminole

Station Number	Date	Macrobenthos						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria/Colony/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Extra	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
31.01.00072 (Cont.)	29 Jul 76							Cen Dia 0 Pen Dia 1475 Total 17850			2400	
	28 Aug 76									GT2400	GT2400 MPN	
	30 Aug 76									GT2400	33	
	13 Sep 76									79	130	
	25 Oct 76									79	8	
	13 Dec 76									540	18	
	15 Feb 77	2.228±0.325	0.273±0.083	10				Coc BG 48575 Fil BG 0 Coc Gr 12775 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 67100 Pen Dia 128450 Total 128450		33	172	

See Methods for explanation of table.

INVENTORY, Lake Superior

— 177 —

See Methods for explanation of table.

DATA SUMMARY, Lake Seminole

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Count/100ml	Comments
		Natural Substrate		Artificial Substrate		Mobile Index					
		Diversity	Redundancy	Diversity	Redundancy	BI	ESpp.				

DATA SUMMARY: Lake Seminole

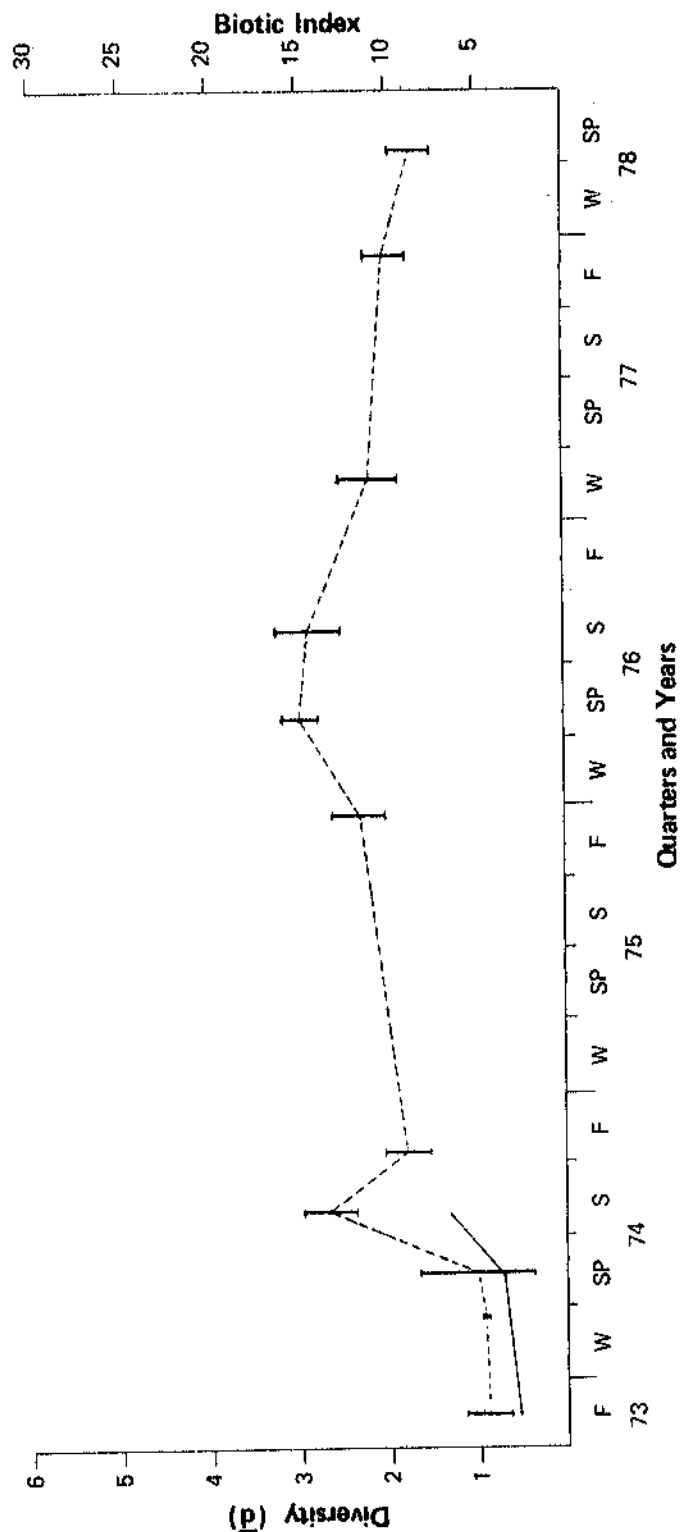
Date	Macrobenthos				Biotic Index		Phytoplankton Concentration $\mu\text{g}/\text{cm}^3$	Periphyton Concentration $\mu\text{g}/\text{cm}^2$	Coliform Bacteria/100ml	Comments
	Natural Substrate		Artificial Substrate							
	Diversity	Redundancy	Diversity	Redundancy	BI	ESpp.				
(Cont.)										
8 Dec 77									33	2
8 Feb 78									2300	330
21 Mar 78									230	33
17 Apr 78	1.731 $\pm$ 0.221	0.119 $\pm$ 0.063					Coc BG 13592 Pfl BG 172 Coc Gr 15 Pfl Gr 0 Gr Pflg 535 Other Pflg 0 Gen Dia 20 Pen Dia 210 Total 14544		2300	350 MPN
27 Jun 78									17	132

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 31.01.0007
 BODY OF WATER: LAKE SEMINOLE

--- NATURAL SUBSTRATE DIVERSITY
 - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 31.01.0014 Body of Water Apalachicola River

Location Buoy 152, Bristol boat landing

County Calhoun

Type Body of Water river Classification III

Sources of Pollution boat ramp, upstream industry

Nearby Land Use park, municipality

Sampling Frequency annual Depth 1 - 2.5 m

Bottom Type sand, clay % Volatile Solids _____

Aquatic Plants: Submerged _____

Emergent _____

Macroinvertebrates:

Annelida

Hirudinea

unident. sp.

Oligochaeta

unident. sp.

Arthropoda

Crustacea

Decapoda

Palaemonetes kadiakensis

unident. astacid

Amphipoda

Hyalella azteca

Insecta

Plecoptera

Taeniopteryx cf. burksi

Odonata

Argia sedula

Ischnura sp.

Neurocordulia sp.

Ephemeroptera

Baetis australis
Ephemerella trilineata
Heptagenia flavescens
Isonychia pictipes
I. sp.
Stenonema exiguum
S. integrum
S. smithae
Tortopus sp.
Tricorythodes albilineatus

Trichoptera

Athripsodes sp.
Cynellus sp.
Cheumatopsyche sp.
Hydropsyche sp.
Hydroptila sp.
Macronemum sp.
Neureclipsis sp.
Oecetis sp.
Orthotrichia sp.
Polycentropus sp.

Megaloptera

Corydalus cornutus

Diptera

Ablabesmyia parajanta
Atherix variegata
Cricotopus sp.
C. remus
Dicrotendipes nervosus
Epoicocladus sp.
Polypedilum convictum
P. fallax
P. illinoense
Pseudochironomus sp.
Rheotanytarsus sp.
Tribelos fuscicornis

Mollusca

Gastropoda

Goniobasis sp.
Physa sp.

Pelecypoda

Corbicula manilensis

DATA SUMMARY: Apalachicola River

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments					
		Natural Substrate		Artificial Substrate		P.I.	R.S.P.										
		Diversity	Redundancy	Diversity	Redundancy												
31-01-0014	2 Jul 76	3.570±0.200	0.113±0.020									136	33				
	8 Feb 77	2.555±0.468	0.288±0.119							12	18	79	ET2				
	15 Aug 77			3.613±0.177	0.075±0.015			21				4900	490				

See Methods for explanation of table.

Station No. 31.01.0019 Body of Water Apalachicola River

Location below Chipola River cutoff, 1.5 miles

County Gulf

Type Body of Water river Classification III

Sources of Pollution upstream industrial

Nearby Land Use forest, swamp and fish camps

Sampling Frequency _____ Depth 1.5 m

Bottom Type _____ % Volatile Solids _____

Aquatic Plants: Submerged _____

Emergent _____

Macroinvertebrates:

Annelida

Oligochaeta

unident. sp.

Hirudinea

unident. sp.

Arthropoda

Crustacea

Decapoda

unident. astacid

Insecta

Pelecoptera

Perlesta placida

Odonata

Gomphus sp.

Ischnura sp.

Tetragoneuria sp.

Ephemeroptera

Baetis australis

B. spinosus

Caenis diminuta

Ephemeroptera (cont.)

Ephemerella sp.
Heptagenia flavescens
Isonychia sp. A (Berner)
I. sp. B (Berner)
I. pictipes
Stenonema exiguum
S. integrum
S. smithae
Stenacron interpunctatum
Tortopus sp.
Tricorythodes albilineatus

Trichoptera

Cheumatopsyche sp.
Cyrnellus sp.
Hydroptila sp.
Hydropsyche sp.
Leptocella sp.
Neotrichia sp.
Neureclipsis sp.
Polycentropus sp.

Megaloptera

Corydalus cornutus

Diptera

Ablabesmyia americana
A. parajanta
A. philosophagnos
Atherix variegata
Bezzia sp.
Cardiocladius sp.
Conchapelopia sp.
Corynoneura sp.
Endochironomus sp.
Labrundinia sp.
Polypedilum fallax
P. halterale
P. illinoense
P. convictum
Rheotanytarsus sp.
Thienemaniella sp.
Tribelos fuscicornis
 unident. chironomid
 unident. simuliid

Coleoptera

Ancyronyx variegatus
Macronychus glabratus
 unident. elmid

31.01.0019

Mollusca

Gastropoda

Ferrissia sp.

DATA SUMMARY: Apalachicola River

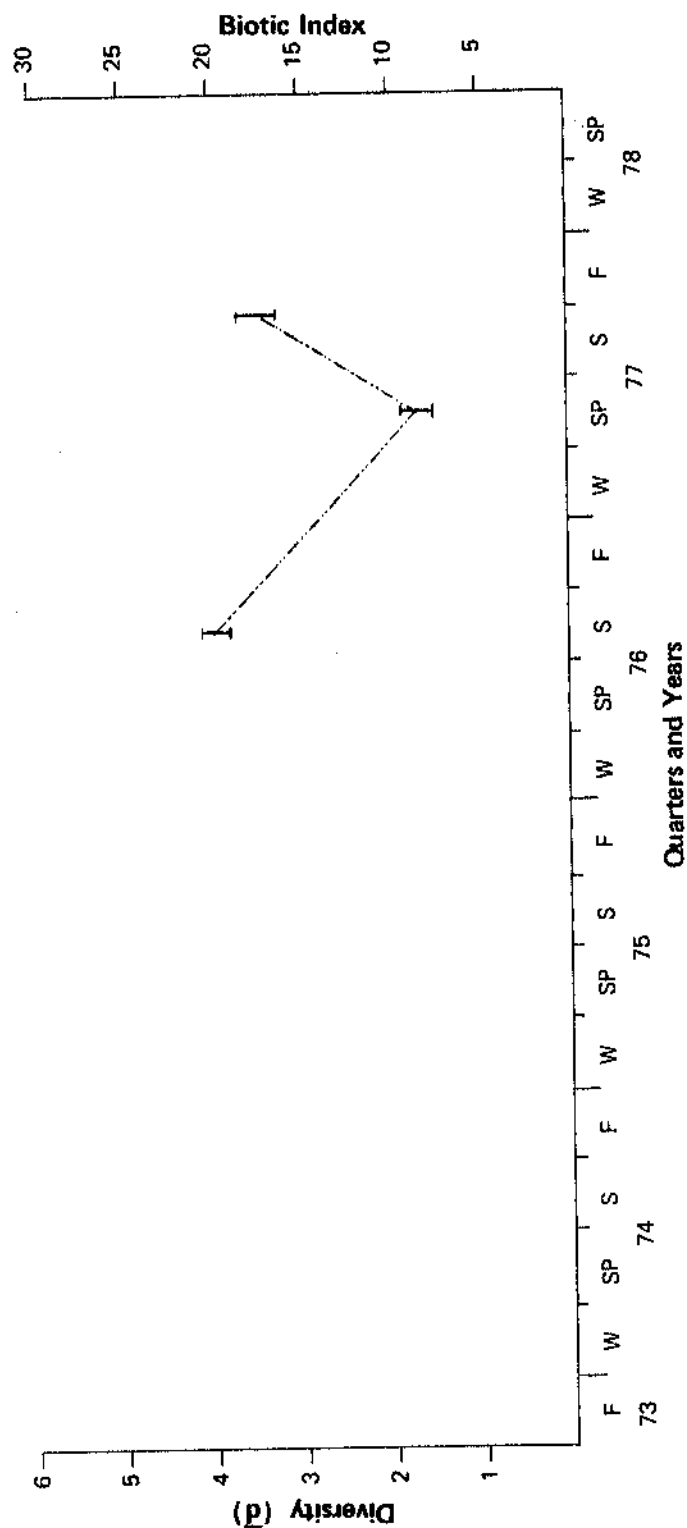
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate						Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
280	28 Jul 76				4.040±0.165	0.070±0.015	28				230	79		
31.01.0019	12 Apr 77											230	79	
	17 May 77				1.775±0.182	0.467±0.052	17					230	79	
	12 Jul 77											1300	79	
	13 Sep 77				3.550±0.226	0.104±0.023	22							

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 31.01.0019
 BODY OF WATER: APALACHICOLA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 31.01.0021 Body of Water Apalachicola River

Location Brothers River, 1 mi. north of Apalachicola River confluence

County Gulf

Type Body of Water river Classification III

Sources of Pollution _____

Nearby Land Use timber

Sampling Frequency _____ Depth 0.5 - 6.5 m

Bottom Type _____ % Volatile Solids _____

Aquatic Plants: Submerged _____

Emergent _____

Macroinvertebrates:

Annelida

Oligochaeta

unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Iirceus sp.

Amphipoda

Gammarus sp.

Insecta

Odonata

Argia sp.

Ephemeroptera

Baetis australis

Caenis sp.

Heptagenia sp.

Isonychia sp.

Pseudocloeon sp.

Stenonema exiguum

S. integrum

Stenacron floridense

S. interpunctatum

Tricorythodes albilineatus

Trichoptera

Cyrnellus sp.
Hydroptila sp.
Hydropsyche sp.
Nyctiophylax sp.
 unident. hydroptilid

Diptera

Ablabesmyia parajanta
Cardiocladius sp.
Corynoneura sp.
Coelotanypus concinnus
Cricotopus sp.
C. bicinctus
Dicrotendipes neomodestus
D. modestus
D. nervosus
Heterotrissocladius sp.
Nilotanypus sp.
Polypedilum convictum
P. fallax
P. illinoense
Pentaneura sp.
Pseudochironomus sp.
Rheocricotopus sp.
Rheotanytarsus sp.
Symbiocladius sp.
Tanytarsus sp.
Thienemanniella sp.
Tribelos fuscicornis
 unident. chironomid
 unident. simuliid

Coleoptera

Dineutus sp.

Mollusca

Gastropoda

Physa sp.
Viviparus sp.
Ferrissia sp.

Pelecypoda

Corbicula manilensis

DATA SUMMARY : Brothers River

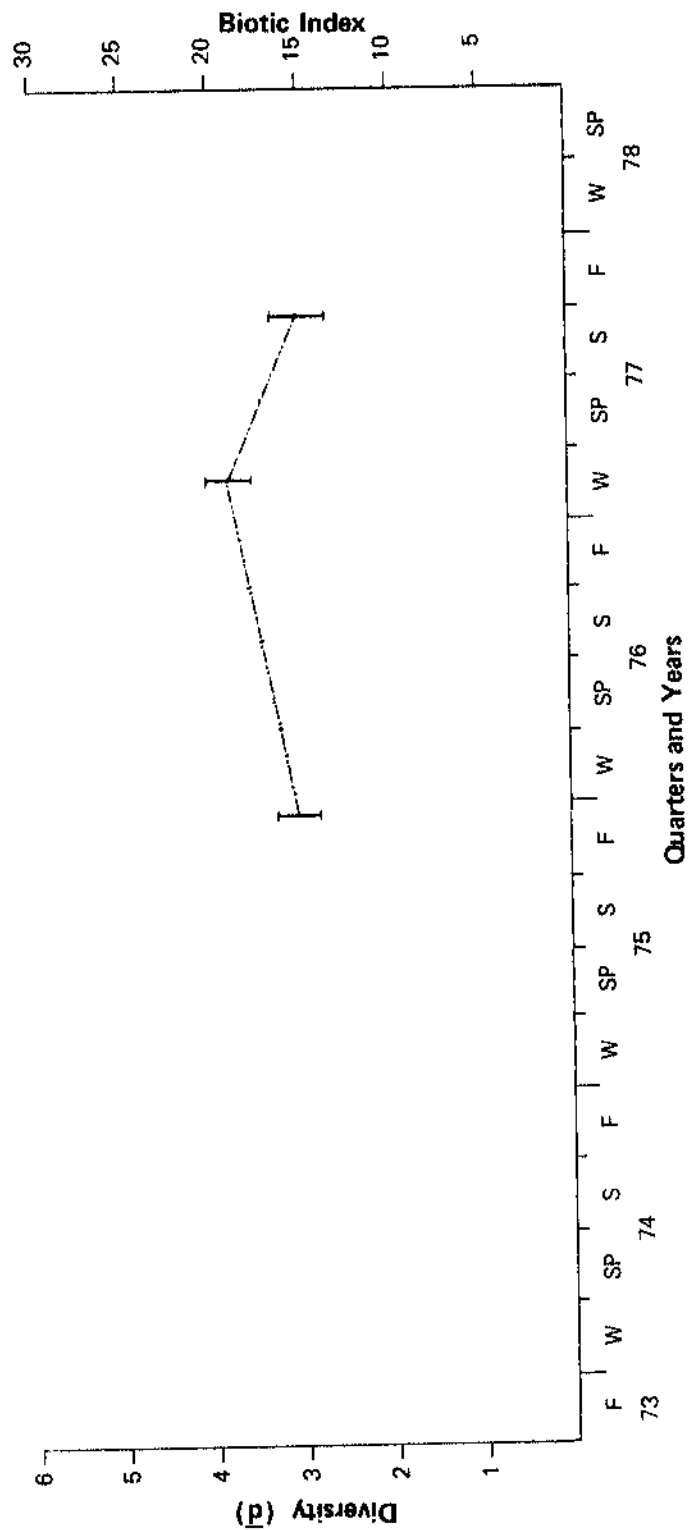
Station Number	Date	Macroinvertebrates							Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	#Spp.						
31.01.0021 284	10 Jul 73										400			
	4 Dec 75				3.145±0.227	0.212±0.045	23				240			
	6 Jan 76										250	140		
	26 Jan 77				3.885±0.241	0.057±0.021	18							
	16 Feb 77				3.088±0.308	0.216±0.055	20				1300	13		
	13 Sep 77													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 31.01.0021
 BODY OF WATER: APALACHICOLA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 31.01.0022 Body of Water Apalachicola River
 Location Buoy 40, mile 11
 County Franklin
 Type Body of Water river Classification III
 Sources of Pollution domestic, industrial and agricultural wastes from
upstream areas
 Nearby Land Use timber, cattle, swamp
 Sampling Frequency quarterly Depth 0.5 - 4 m
 Bottom Type sand, gravel, mud, detritus & Volatile Solids 0.08
 Aquatic Plants: Submerged Callitriche sp., Potamogeton sp., Oedogonium sp.,
caroliniana
Ludwigia brevipes, Bacopa Emergent Salix sp., Cladium jamaicensis, Zizaniopsis
miliaceae, Typha sp., Micranthemum umbrosum, Fontinalis filiformis, Euryhynchium riparioides

Macroinvertebrates:

Annelida

Oligochaeta

unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Lirceus sp.

Amphipoda

Gammarus fasciatus

G. sp.

Hyalella azteca

Decapoda

Orconectes sp.

Palaemonetes kadiakensis

unident. astacid

Mysidacea

Mysis stenolepsis

M. sp.

Insecta

Plecoptera

Paragnetina kansensis
Perlesta placida
Taeniopteryx cf. burksi

Odonata

Argia apicalis
A. moesta putrida
Anomalagrion hastatum
Dromogomphus spinosus
Enallagma sp.
Gomphus sp.
G. plagiatus
Hetaerina titia
Ischnura credula
I. sp.
Libellula sp.
Macromia sp.
Neurocordulia sp.
Tetragoneuria sp.
 unident. agrionid

Ephemeroptera

Baetis ephippiatus
B. australis
B. intercalaris
B. sp.
B. spinosus
Caenis diminuta
C. hilaris
Centroptilum viridocularis
Ephemerella deficiens
E. rotunda
E. hirsuta
E. trilineata
Heptagenia sp.
Hexagenia munda marilandica
Isonychia pictipes
I. fattigi
I. sp.
Paraleptophlebia sp.
Pentagenia sp.
Pseudocloeon alachua
P. parvulum
Stenonema exiguum
S. smithae
S. interpunctatum
Stenacron integrum
S. floridense
Tricorythodes albilineatus
 unident. sp.

Hemiptera

Lethocerus sp.
 unident. corixid
 unident. notonectid

Trichoptera

Cheumatopsyche sp.
Cyrnellus sp.
Hydropsyche sp.
Hydroptila sp.
Leptocella sp.
Neureclipsis sp.
Oecetis sp.
Phylocentropus sp.
Polycentropus sp.
Pycnopsyche sp.
Triaenodes sp.

Lepidoptera

Nymphula sp.

Diptera

Ablabesmyia sp.
A. aspera
A. americana
A. peleensis
A. tarella
A. parajanta
Chironomus attenuatus
Chironomus tribelos
Coelotanypus sp.
C. concinnus
Cardiocladius obscurus
Corynoneura sp.
Cricotopus sp.
C. bicinctus
C. remus
Cryptochironomus sp.
C. fulvus
Culicoides sp.
Bezzia sp.
Dicrotendipes neomodestus
D. modestus
D. leucoscelis
D. nervosus
D. lobus
Eukiefferiella sp.
Endochironomus nigricans
Glyptotendipes sp.
Hemerodromia sp.
Nanocladius sp.
Omisus pica
Orthocladius annectens

Diptera (cont.)

Paralauterborniella nigrohalteralis
Paratendipes sp.
P. connectens
Parachironomus carinatus
P. sp.
Palpomyia sp.
P. tibialis
Pentaneura inculta
Polypedilum fallax
P. halterale
P. illinoense
Psectrocladius sp.
Pseudochironomus sp.
Pseudorthocladius sp.
Rheotanytarsus sp.
Simulium sp.
Smittia sp.
Stenochironomus sp.
Sympotthastia sp.
Tanytarsus sp.
Thienemanniella sp.
Tribelos sp.
T. fusicornis
 unident. ceratopogonid
 unident. chironomid
 unident. tipulid
 unident. tanytarsine

Coleoptera

Dineutus sp.
Gyrinus sp.
Stenelmis sp.
 unident. dytiscid

Mollusca

Gastropoda

Ferrissia sp.
F. rivularis
Gyraulus sp.
Helisoma sp.
Laevapex sp.
Physa sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
 unident. unionid
 unident. sphaeriid

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Apalachicola River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Esp.	Diversity	Redundancy	#Esp.	BI	#Esp.					
31.01.0022 (Cont.)										Total	546/6500	672400		
	6 Aug /75											540		
	17 Sep /75											1360		
	7 Oct /75	1.005±0.264	0.217±0.130	4								220		
	8 Oct /75											240		
	6 Nov /75											1		
	4 Dec /75													
	6 Jan /76											170	27	
	3 Feb /76													
	21 Feb /76	0.430±0.354	1.000±0.187	3	3.000±0.136	0.174±0.023	23	21	29			33	472	
	3 Mar /76											240	79	
	10 Mar /76													

See Methods for explanation of table.

DATA SUMMARY: Apalachicola River

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies / 100ml		Comments
		Natural Substrate			Artificial Substrate					Biotic Index		
		Diversity	Redundancy	#Sp.	Diversity	Redundancy	#Sp.			BI	#Sp.	
31-01-0022	14 Apr 76	2.490±0.263	0.137±0.063	8						350	7	
	6 May 76									79	8	
	8 Jun 76									79	14	
	17 Aug 76									130	112	
	31 Aug 76	2.655±0.126	0.401±0.076	25						112	112	
	14 Sep 76									150	112	
	12 Oct 76	0.651±0.318	0.816±0.121	7	3.771±0.310	0.106±0.029	19	Cooc BG 87/3 Fij BG 150 Co BG 2175 Fij Gr 0 Gr Flag 0 Other Flag 0 Can Dia 0 Pen Dia 1550 Total 12650		540	13	
	18 Nov 76											

See Methods for explanation of table.

STAY GREEN: Apalachicola River

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria (Colonies/100ml)		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
31.01.0022	14 Dec 76									540	130	
	26 Jan 77	3.017±0.305	0.231±0.057	20						1600	74	
	15 Mar 77									1400	34	
	12 Apr 77	2.086±0.456	0.493±0.143	11	2.860±0.305	0.225±0.057	17		Coc BG 7868 F11 BG 129 Coc BG 465 F11 Gr 0 Other Flag 0 Gen Dis 26 Pen Dis 2261 Total 10749			
	12 May 77											
	17 May 77		0.286±0.088	17						11	LT2	Florida Index
	14 Jul 77	3.081±0.419								17000	70	

See Methods for explanation of table.

DATA SUMMARY: Apalachicola River

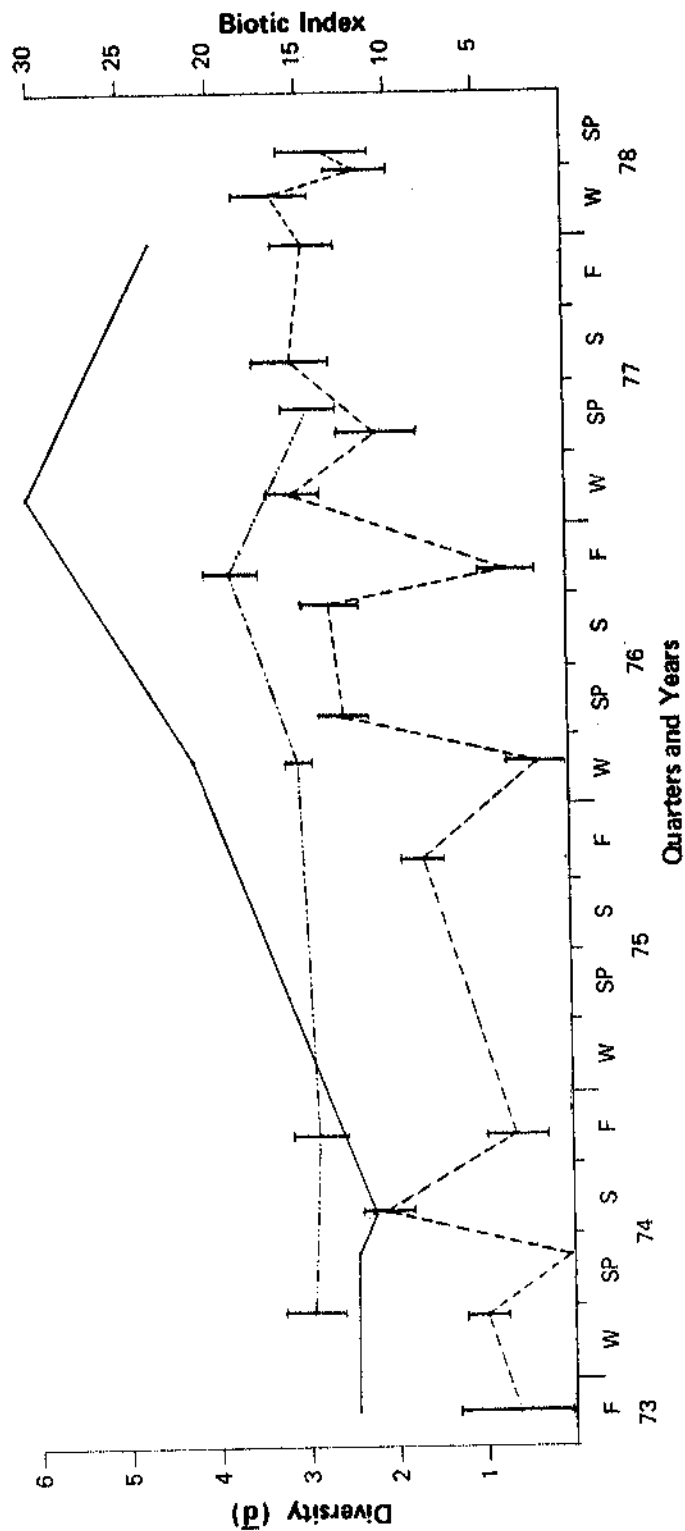
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Focal	
		Diversity	Redundancy	#Sp.	Diversity	Redundancy	#Sp.						
294 31.01.0072	7 Dec 77	2.873±0.358	0.214±0.062	14				23	47		33	79	
	13 Feb 78	3.271±0.422	0.267±0.073	17							49±6	2300	
	14 Mar 78	2.278±0.377	0.544±0.100	20									
	1 Apr 78	2.671±0.498	0.380±0.136	12				22	47				
	4 Apr 78										336	27	
	21 Jun 78										2300	23	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 31.01.0022
 BODY OF WATER: APALACHICOLA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 31.01.0G27 Body of Water Apalachicola Bay
 Location 200 yards offshore of Cedar Point
 County Franklin
 Type Body of Water estuary, bay Classification II
 Sources of Pollution Apalachicola River
 Nearby Land Use low density housing
 Sampling Frequency annually Depth 1.5 m
 Bottom Type sand % Volatile Solids _____
 Aquatic Plants: Submerged Ruppia maritima, Lyngbya sp., Ulva lactuca
 Emergent Herposiphonia tenella, Grammatophora marina
Synedra sp.

Macroinvertebrates:

Rhynchocoela

Tetrastemma sp.

Annelida

Polychaeta

Armandia sp.
Capitella capitata
Diopatra cuprea
Eteone heteropoda
cf. Glycera sp.
Haploscoloplos fragilis
H. robustus
Lumbrineris sp.
Nereis succinea
N. pelagica occidentalis
Paraprionospio pinnata
Polydora websteri
P. ligni
Sabellides oculata
Scoloplos capensis
S. rubra
Sabella microphthalma
Syllis sp.
Streblospio sp.
cf. Spio cf. setosa

31.01.0G27

Arthropoda

Crustacea

Isopoda

Cyathura burbanki
Edotea trilobita
Erichsonella floridana

Amphipoda

Ampelisca sp.
A. verrilli
Corophium louisianum
Cerapus sp.
Cymadusa compta
Gammarus tigrinus
Grandidierella bonnieroides
Haustorius sp.
Hyaella azteca
Monoculodes edwardsi
Mucrogammarus macromucronatus

Decapoda

Callinectes sapidus

Tanaidacea

Leptochelia dubia

Cirripedia

Balanus amphitrite
B. eburneus

Cumacea

Oxyurostylis smithi

Mollusca

Gastropoda

Kurtziella limonitella
Mitrella lunata
Nassarius vibex
Neritina reclinata
Retusa canaliculata

Pelecypoda

Amygdalum papyria
Ensis minor
Lioberus castaneus
Mercenaria campechiensis
Rangia cuneata
Retusa canaliculata
Parastarte triquetra
Tellina lineata

DATA SUMMARY: Apalachicola Bay

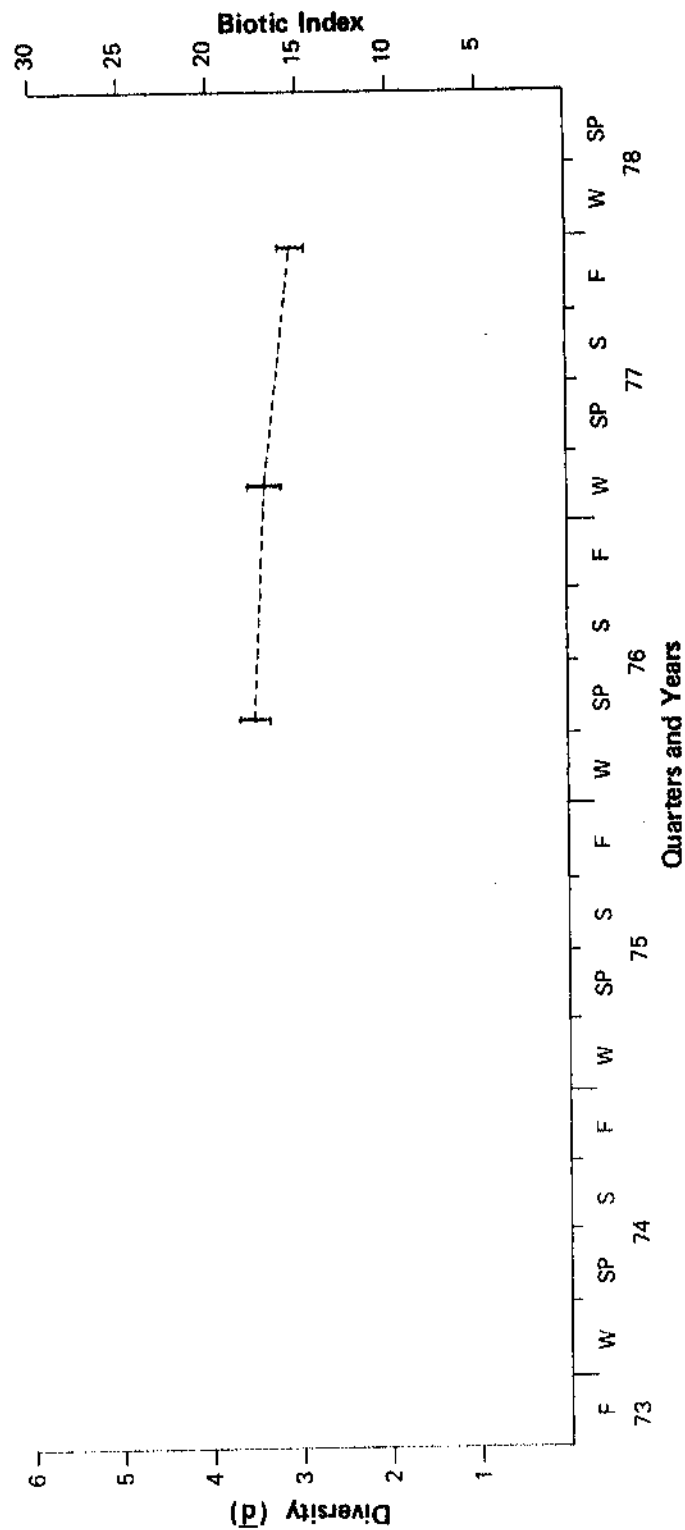
Station Number	Date	Macroinvertebrates						Phytoplankton Composition (units/cm ³)	Periphyton Composition (units/cm ²)	Coliform Bacteria (Colonies/100ml)	
		Natural Substrate			Artificial Substrate						
		Diversity	Richness	#Sp.	Diversity	Richness	#Sp.			BI	#Sp.
31.01.0627	14 Apr 76	3.491±0.180	0.100±0.023	20							
	15 Feb 77	3.379±0.187	0.080±0.024	18						33	23
	8 Dec 77	3.049±0.121	0.206±0.024	29							

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 31.01.0G27
 BODY OF WATER: APALACHICOLA BAY

--- NATURAL SUBSTRATE DIVERSITY
 - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 31.01.0C33 Body of Water Apalachicola Bay
 Location 1.5 mi. offshore of Green Point near oyster lease
 County Franklin
 Type Body of Water estuary Classification II
 Sources of Pollution domestic waste, Apalachicola River
 Nearby Land Use undeveloped
 Sampling Frequency quarterly Depth 1 - 3 m.
 Bottom Type mud, shell, sand, clay/silt % Volatile Solids 1.25
 Aquatic Plants: Submerged Polysiphonia sp., Lyngbya sp.
 Emergent Spartina sp., Juncus romerianus, Phragmites communis, Scirpus americanus, Daubentonia punicea, Baccharis halimifolia
Macroinvertebrates:

Cnidaria
 Hydrozoa unident. campanulariid
 Anthozoa unident. actiniarian
 Platyhelminthes
 Turbellaria Leptoplana variabilis
 Rhynchocoela
 Amphiporus sp.
 Cerebratulus sp.
 cf. Carinoma tremaphorus
 Lineus socialis
 Tetrastemma sp.
 unident. sp. 7 - Cormier
 Annelida
 Oligochaeta unident. sp.

Polychaeta

Ammotrypane sp.
Autolytus sp.
Ancistrosyllis cf. bassii
Capitella capitata
Eteone heteropoda
Glycera sp.
G. americana
G. dibranchiata
Glycinde solitaria
Haploscoloplos foliosus
H. fragilis
Hypaniola grayi
Lumbrinereis sp.
L. coccinea
L. tenuis
Nereis succinea
Polydora sp.
P. wrighti
P. websteri
P. ligni
Paraprionospio pinnata
Prionospio sp.
Sabellides oculata
Sabella microphthalma
Scoloplos rubra
 unident. terebellid

Arthropoda

Crustacea

Isopoda

Accalathura crenulata
Cyathura burbanki
Ptilanthura sp.

Amphipoda

Ampelisca vadorum
Corophium sp.
Cymadusa compta
Elasmopus sp.
Gammarus mucronatus
Grandidierella bonnieroides
Haustorius sp.
Lembos smithi
Listriella sp.
Monoculodes edwardsii

Decapoda

Acetes sp.
Callinectes sapidus

Decapoda (cont.)

Eurypanopeus depressus
Palaemonetes pugio
P. vulgaris
Processa bermudensis
Pinnixa sp.
Sesarma cinereum

Mysidacea

Mysidopsis bigelowi
Mysis stenolepsis

Cumacea

unident. sp.

Cirripedia

Balanus eburneus
B. improvisus

Insecta

unident. chironomid

Mollusca

Gastropoda

Cerithiopsis subulata
Cerithium sp.
Crepidula fornicata
Epitonium sp.
Leucozonia ocellata
Mangelia sp.
Nassarius acutus
N. vibex
Prunum apicinum
Pyramidella fusca
Retusa canaliculata

Pelecypoda

Brachidontes recurvus
Crassostrea virginica
Ensis directus
Modiolus demissus
Neritina reclinata
Rangia cuneata
Tellina lineata
T. agilis
T. texana

31.01.0C33

Echinodermata

Ophiuroidea

unident. sp.

Bryozoa

Membranipora tenuis

Hemichordata

Enteropneusta

Ptychodera sp.

DATA SUMMARY: Apalachicola Bay

Station number	Date	Macroinvertebrates						Phytoplankton composition units/cm ³	Periphyton composition units/cm ²	Coliform Bacteria colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
31-010034	2 Oct 73									1000	Unseasonably high water temperature	
	5 Nov 73	2.583±0.597	0.506±0.169	10					112			
	6 Nov 73								0.5			
	5 Feb 74								170			
	6 Mar 74											
	7 Mar 74	2.095±0.278	0.111±0.097	5	1.38±0.331	0.199±0.241	3		23			
	3 Apr 74											
	10 Apr 74	0.630±0.370	0.780±0.240	3					112			
	1 May 74								49			
	5 Jun 74											
	31 Jul 74	3.263±0.376	0.122±0.082	13					112			
	1 Aug 74											

See Methods for explanation of table.

DATA SUMMARY: *Aplocheilichthys* Bay

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Apalachicola Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria colonies/100ml	Comments
		Natural Substrate		Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
								#Spp.					
306 81.01.0033	23 Oct 75										27		
	6 Nov 75										79		
	1 Dec 75										23		
	6 Jan 76										33		
	3 Feb 76										79	13	
	12 Feb 76	2.91±0.314	0.195±0.066	14							112	132	
	3 Mar 76										79	11	
	13 Apr 76										112	132	
	4 May 76												
	24 May 76	3.181±0.151	0.090±0.040	12									

See Methods for explanation of table.

DATA SUMMARY: Apalachicola Bay

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
31.01.0033	17 Aug 76											79	LT2	
	31 Aug 76	1.808±0.484	0.429±0.204	6							Coc BG 436627 Fil BG 21253 Coc Gr 75064 Fil Gr 194 Gr Flag 6 Other Flag 4 Gen Dia 14729 Pen Dia 937403 Total 1485370	79	LT2	
	14 Sep 76											13	LT2	
	11 Oct 76	2.331±0.155	0.073±0.039	6								79	8	
	12 Oct 76											LT2	LT2	
	18 Nov 76											240	240	
	14 Dec 76													

See Methods for explanation of table.

DATA SUMMARY: Apalachicola Bay

Station number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
308	18 Jan 77										230	49	
	26 Jan 77	2.908±0.203	0.073±0.024	10						Coc BG 5625 F11 BG 0 Coc Gr 45/5 F11 Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 6875 Pen Dia 1400 Total 18475			
	12 Apr 77	2.347±0.308	0.199±0.075	8							230	4	
	17 May 77										11	LT2	Flot Ida Index
	14 Jul 77	3.037±0.241	0.070±0.037	10							2	2	
	5 Dec 77	2.873±0.332	0.163±0.070	11							130	34	

See Methods for explanation of table.

DATA SUMMARY: Apalachicola Bay

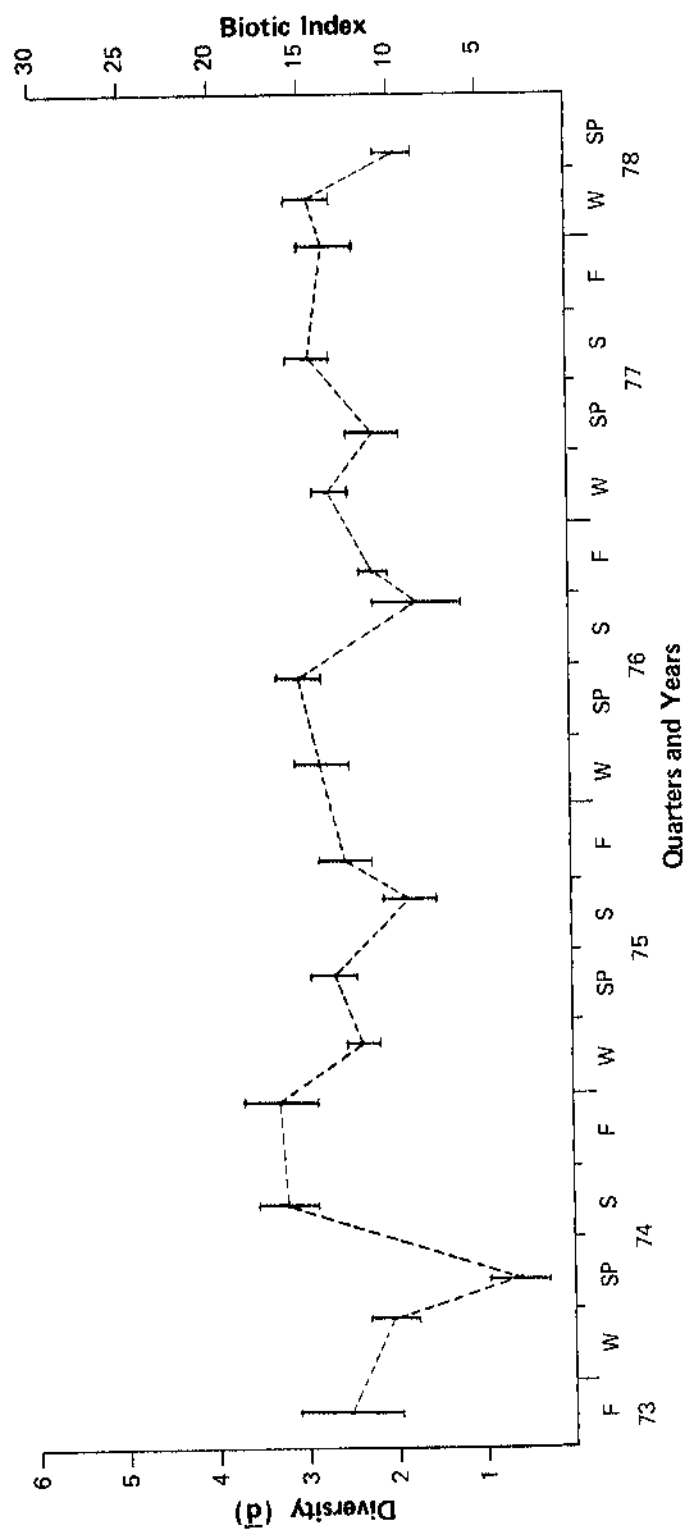
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
31.01.0033	11 Jan 78									Loc BG 10827 Flt BG 90 Loc Gr 0 Flt Gr 0 Gr Flag 0 Other Flag 0 Gen Dia 568 Pen Dia 18902 Total 30387	4		
	14 Feb 78										679	5	
	14 Feb 78	3.048±0.265	0.132±0.039	14							59	5	
	15 Mar 78										2300	139	
	3 Apr 78										490	172	
	5 Apr 78	2.324±0.203	0.179±0.048	9									
	9 May 78										79	5	
	21 Jun 78										3300	790	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 31.01.0C33
 BODY OF WATER: APALACHICOLA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 31.01.0131 Body of Water Lake Wimico

Location 0.5 mi. West of Jackson River

County	Gulf

Type Body of Water riverine lake Classification III

Sources of Pollution M & K Ranches

Nearby Land Use flood-plain swamp

Sampling Frequency _____ Depth 0.5 - 1 m

Bottom Type sand, detritus % Volatile Solids

Aquatic Plants: Submerged filamentous algae, *Najas guadalupensis*.

Dichotomosiphon tuberosus **Emergent** Cladium sp., Scirpus sp., Saururus cernuus

Macroinvertebrates:

Annelida

Oligochaeta

unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Amphipoda

Crangonyx sp.

Gammarus sp.

Grandidierella bonnieroides

Decapoda

Palaemonetes kadiakensis

P. paludosus

Insecta

Odonata

Enallagma sp.

Ischnura sp.

Libellula sp.

Ephemeroptera
Caenis sp.

Trichoptera
Leptocella sp.
Oecetis sp.

Diptera
Ablabesmyia parajanta
Coelotanypus concinus
C. scapularis
C. tricolor
Cryptochironomus fulvus
Leptochironomus sp.
Glyptotendipes sp.
Polypedilum halterale
Psectrocladius sp.
Pseudochironomus sp.
Rheotanytarsus robacki
Stictochironomus devinctus
unident. ceratopogonid
unident. chironomid

Mollusca

Gastropoda

Amnicola sp.
Helisoma sp.
Physa sp.
Notogillia sp.

Pelecypoda

Rangia cuneata
unident. sphaeriid

DATA SUMMARY: Lake Winnebago

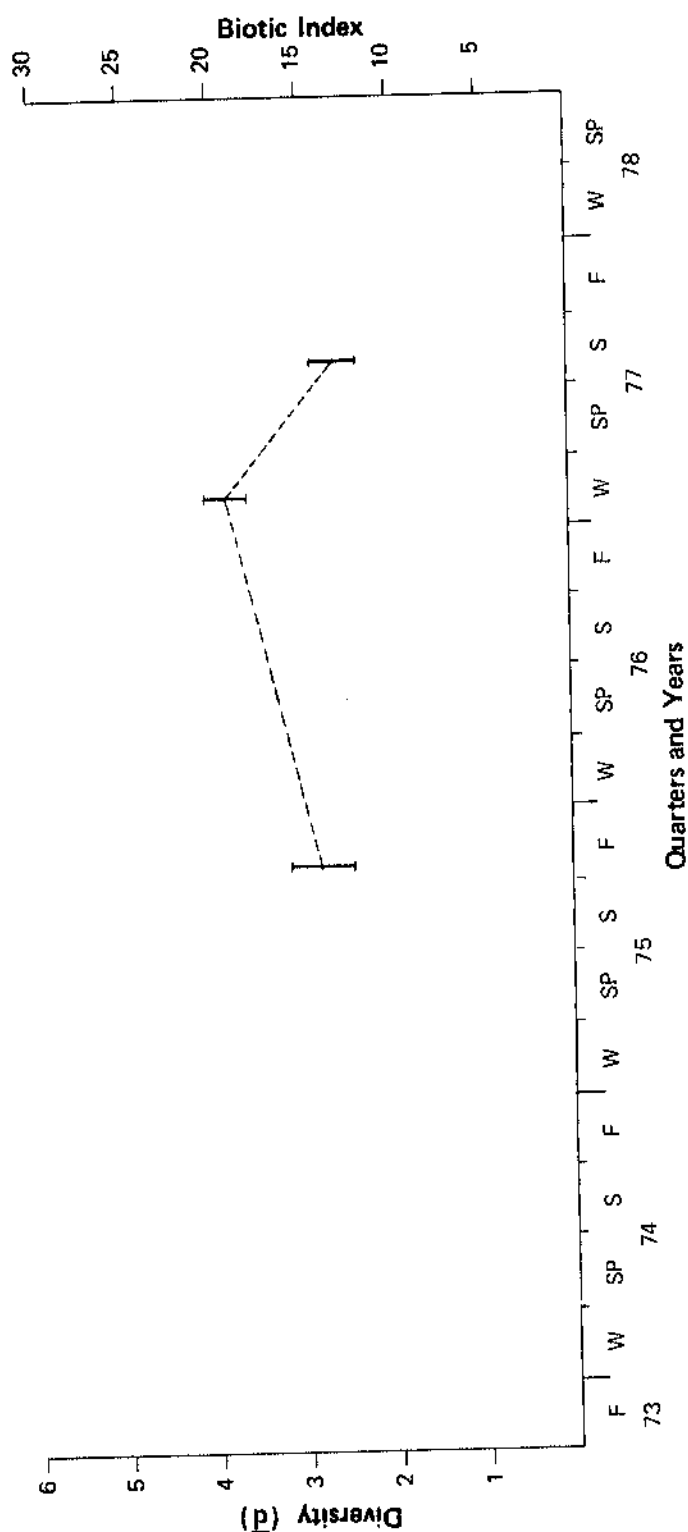
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	H1	#Spp.					
313 31.01.0131	11 Jul 73											43		
	6 Mar 74											130		
	24 Sep 74											130		
	17 Sep 75											49		
	8 Oct 75	2.872±0.357	0.182±0.056	12								350	23	
	6 Jan 76											49		
	26 Jan 76	3.959±0.236	0.096±0.024	28								540	49	
	14 Jul 77	2.482±0.262	0.335±0.069	17								8	172	
								</						

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 31.01.0131
 BODY OF WATER: LAKE WIMICO

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 31.02.0005 Body of Water Dead Lakes

Location south end of SR 22 bridge

County Gulf

Type Body of Water impoundment Classification III

Sources of Pollution _____

Nearby Land Use municipality

Sampling Frequency annual Depth 0.5 - 1.5 m

Bottom Type sand and silt % Volatile Solids _____

Aquatic Plants: Submerged _____

Emergent _____

Macroinvertebrates:

Annelida

Oligochaeta

unident. sp.

Hirudinea

unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Lirceus sp.

Insecta

Odonata

Argia sp.

Aphylla sp.

Boyeria vinosa

Enallagma sp.

Gomphus sp.

Libellula sp.

Perithemis sp.

Ephemeroptera

Brachycerus sp.
Caenis sp.
Hexagenia munda marlandica

Trichoptera

Oecetis sp.
Polycentropus sp.
Phylocentropus sp.

Diptera

Ablabesmyia americana
Chaoborus sp.
Chironomus sp.
Coelotanypus concinnus
C. tricolor
Cryptochironomus fulvus
Lauterborniella sp.
Nilotanypus sp.
Procladius sp.
Psectrocladius sp.
Stenochironomus sp.
Tanytarsus sp.
Tribelos fuscicornis
unident. chironomid
Polypedilum halterale

Coleoptera

Dubiraphia vittata

Mollusca

Gastropoda

Campeloma sp.
Ferrissia sp.
Goniobasis sp.
Pomacea sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis

DATA SUMMARY: Dead Lakes

Station number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria (Colony Units/100ml)		Comments																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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	12 Jul 77	3.917±0.227	0.104±0.018	33								22	5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

See Methods for explanation of table.

Station No. 31.02.0012 Body of Water Chipola River

Location SR #274, 4 mi. SW of Altha

County Calhoun

Type Body of Water river Classification III

Sources of Pollution domestic and agricultural sources, dolomite mining

Nearby Land Use forests

Sampling Frequency quarterly Depth 0.5 - 4 m

Bottom Type sand, limestone % Volatile Solids 0.76

Aquatic Plants: Submerged Vallisneria sp., Fontinalis sp., Gloeotrichia sp.,

Pithophora varia Emergent Polygonium sp., Fontinalis sp.,

Hypericum tubulosum

Macroinvertebrates:

Platyhelminthes

Planaria sp.
unident. sp.

Annelida

Oligochaeta
unident. sp

Hirudinea

unident. sp.

Arthropoda

Crustacea

Asellus sp.
Crangonyx sp.
Cambarus sp.
Gammarus sp.
Hyalella azteca
Lirceus sp.
Macrobrachium sp.
Palaemonetes kadiakensis
P. paludosus
unident. astacid

Insecta

Plecoptera

Acroneuria abnormis
A. mela/arenosa
Attaneuria ruralis
Helopicus subvarians
Isoperla clio
Neoperla clymene
Paragnetina kansensis
P. fumosa
Perlesta placida
Pteronarcys pictetii
P. dorsata
Taeniopteryx lita

Odonata

Argia sp.
Argia moesta putrida
Agrion maculatum
Boyeria vinosa
Dromogomphus sp.
Enallagma sp.
Gomphus sp.
Hagenius brevistylus
Hetaerina americana
Ischnura sp.
Macromia illinoiense
Tetragoneuria sp.

Ephemeroptera

Baetis sp.
B. australis
B. intercalaris
B. spinosus
Caenis hilaris
Callibaetis sp.
C. hobbsi
C. viridocularis
Cloeon sp.
Ephemerella sp.
E. deficiens
E. trilineata
Heptagenia sp.
Isonychia sp.
I. pictipes
Leptophlebia sp.
Neoemphemera sp.
Pseudocloeon sp.
P. parvulum

Ephemeroptera (cont.)

Pseudocloeon bimaculatus
P. punctiventris
Stenonema exiguum
S. smithae
Stenacron interpunctatum
Tricorythodes albilineatus

Hemiptera

Gerris sp.
 unident. corixid

Trichoptera

Arthripsodes sp.
Cheumatopsyche sp.
Chimarra sp.
Helicopsyche borealis
Hydropsyche sp.
Hydroptila sp.
Leptocella sp.
Lype sp.
Mayatrichia sp.
Micrasema sp.
Neureclipsis sp.
Nyctiophylax sp.
Oecetis sp.
Psychomyia sp.
Pycnopsyche sp.
Protophila sp.
Rhyacophila sp.
Setodes sp.
Triaenodes sp.
 unident. sp.
 unident. leptocerid

Neuroptera

Corydalus cornutus

Lepidoptera

Elophila sp.
Paragyraetis sp.

Diptera

Ablabesmyia cinctipes
A. parajanta
A. ornata
A. auriensis
Atherix variegata
Bezzia sp.
Brillia sp. 2 - Ray
Cardiocladius sp.

Diptera (cont.)

Ceratopogonidae sp.
Cladotanytarsus sp.
Conchapelopia sp.
Corynoneura sp.
C. taris
Cryptochironomus sp.
Crictopus remus
C. bicinctus
C. sp.
Endochironomus nigricans gp. (Beck)
Eukiefferiella sp.
Epoicocladius sp.
Eukiefferiella cerulescens gp. (Beck)
Microsectra sp.
Microtendipes sp.
Micropelopia sp.
Nanocladius sp.
Orthocladius annectens
Parakiefferiella sp.
Paralauterborniella nigrohalteralis
Polypedilum convictum
P. fallax
P. convictum
P. halterale
P. illinoense
Procladius sp.
Pseudochironomus fulviventris
Rheotanytarsus sp.
Rheocricotopus sp.
Psectrocladius vernalis
Paratanytarsus sp.
Simulium sp.
Smittia sp.
Stenochironomus sp.
Synorthocladius sp.
Tanytarsus sp.
Thienemaniella sp.
T. xena
Tanypus sp.
Trivelos fuscicornis
 unident. ceratopogonid
 unident. orthocladiin

Coleoptera

Ancyronyx variegata
Dineutus sp.
Dubiraphia sp.
Ectoparia nervosa
Macronychus sp.
M. glabratus
Simsonia quadrinotata
Stenelmis sp.

31.02.0012

Coleoptera (cont.)
 unident. hydrophilid
 unident. dryopid
 unident. gyrinid

Arachnida

 Acarina

 unident. sp.

Mollusca

 Gastropoda

Campeloma sp.
 Goniobasis spp.
 Ferrissia sp.
 Helisoma sp.
 Notogillia sp.
 Physa sp.
 Pleurocera sp.
 Viviparus sp.
 unident. lymnaeid

 Pelecypoda

Anodonta sp.
 Corbicula manilensis
 Elliptio complanata
 E. crassidens
 Lampsilis subangulata

DATA SUMMARY: Chipola River

Station Number	Date	Macroinvertebrates								Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate			Biotic Index	Total			Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
													Bf	
31-02-0012	22 May 74										540		Low Stage	
	2 Jul 74	2.052±0.416	0.288±0.173	5				17	28		49			
	23 Jul 74										79			
	1 Oct 74										350			
	3 Oct 74										372400			
	7 Nov 74						3.340±0.235	0.139±0.029	22		540		High Stage	
	14 Jan 75													
	28 Jan 75													
	29 Jan 75													
	2 May 75						1.669±0.372	0.437±0.029	7	21	28			
	4 Dec 75	3.201±0.356	0.163±0.062	14							772400	GT2400		

See Methods for explanation of table.

DATA SUMMARY: Chipola River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
324	10 Feb 76	3.845±0.333	0.128±0.034	21			38	47	Coc BG F11 BG Coc Gr Gr Flag Other Flag Pen Dia Pen Dia Total	57 4 38 0 0 33 131 Total	0 0 145000 103 0 0 2751 147856	2400 540 272400 2400 240 920 130	920 79 672400 2400 49 79 7	
	11 Mar 76													
	8 Apr 76	3.660±0.423	0.243±0.058	20										
	1 Sep 76													
	2 Sep 76	2.447±0.120	0.190±0.015	60			58	90						
	1 Nov 76	2.938±0.189	0.151±0.025	18	3.411±0.205	0.162±0.024								
	7 Feb 77	1.196±0.462	0.554±0.171	5			50	58						
	24 Apr 77													

See Methods for explanation of table.

DATA SUMMARY: Chipola River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria (Colonies/100ml)		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
31.02.001.2	25 Apr 77	4.182±0.265	0.084±0.025	26	4.024±0.127	0.072±0.010	36			Coc BG 19212 P11 BG 26 Coc Gr 49 Gr Flag 0 Other Flag 0 Cen Dia 0 Pen Dia 0 Total 13675	1400	14	
	13 Jul 77	3.978±0.176	0.097±0.015	39							230	27	Florida Index
	15 Aug 77										2300	49	
	17 Aug 77				3.507±0.172	0.153±0.028	30			Coc BG 75982 P11 BG 633 Coc Gr 5039 Gr Flag 0 Other Flag 0 Cen Dia 0 Pen Dia 0 Total 284974	2300	49	
	22 Nov 77	2.446±0.290	0.327±0.068	16				46	54	Total 366628	3300	230	

See Methods for explanation of table.

DATA SUMMARY: Chipola River

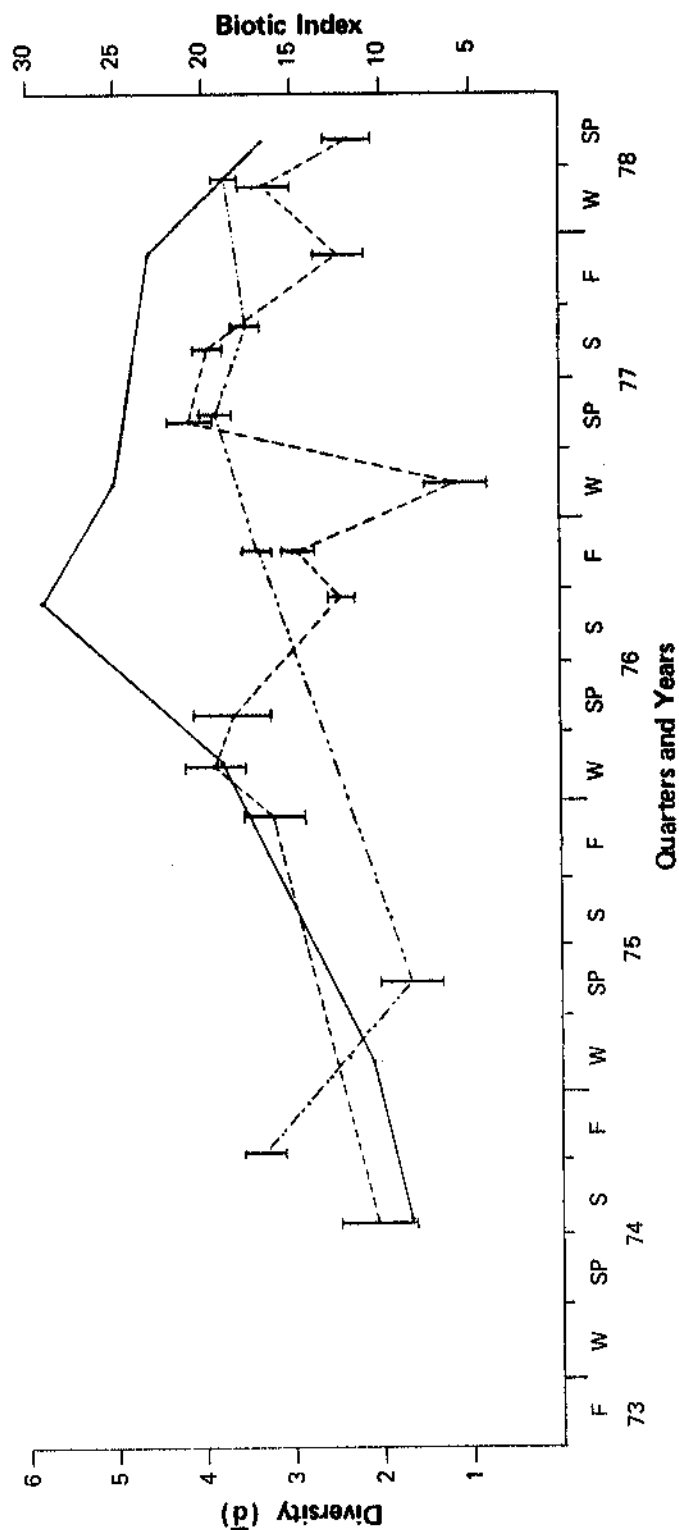
Station Number	Date	Macroinvertebrates							Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
326 H.02.0012	25 Jan 78										2300	790		
	22 Feb 78	3.309±0.284	0.182±0.042	23	3.728±0.128	0.078±0.013	27				790	230		
	15 Apr 78	2.380±0.285	0.329±0.080	14				33	36		2300	490		

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 31.02.0012
 BODY OF WATER: CHIPOLA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 31.02.0024 Body of Water Chipola River

Location downstream from Waddell's Mill Creek

County Jackson

Type Body of Water river Classification III

Sources of Pollution domestic and agricultural wastes, mainly from
neighboring state, local agricultural run-off

Nearby Land Use bottomland, forests, agriculture

Sampling Frequency random Depth 2.5 m

Bottom Type mud, silt, sand % Volatile Solids

Aquatic Plants: Submerged

Emergent

Macroinvertebrates:

Annelida

Hirudinea
unident. sp.

Oligochaeta
unident. sp.

Nematomorpha

Paragordius sp.

Arthropoda

Crustacea

Amphipoda

Asellus sp.
Crangonyx sp.
Hyalella azteca

Decapoda

Palaemonetes kadiakensis
unident. astacid

Insecta

Plecoptera

Neoperla clymene
Perlesta placida

Odonata

Argia sp.
Agrion maculatum
Boyeria vinosa
Dromogomphus sp.
Enallagma sp.
Epicordulia sp.
Ischnura sp.
Macromia illinoiensis
Neurocordulia sp.

Ephemeroptera

Baetis australis
B. intercalaris
Baetisca obesa
Caenis hilaris
Ephemerella deficiens
E. choctawhatchee
E. hirsuta
E. trilineata
Heptagenia sp.
Isonychia sp.
I. pictipes
Paraleptophlebia volitans
Hexagenia munda marilandica
Tricorythodes albilineatus
Stenacron floridense
Stenonema smithae
S. integrum

Hemiptera

Pelocoris sp.
Rheumatobates sp.

Trichoptera

Athripsodes sp.
Cheumatopsyche sp.
Hydroptila sp.
Hydropsyche sp.
Leptocella sp.
L. pavida
Lype sp.
Neureclipsis sp.
Oecetis cinerascens
Polycentropus sp.
Pycnopsyche sp.
Triaenodes sp.

Neuroptera

Corydalis cornutus

Lepidoptera

Parargyractis sp.

Diptera

Ablabesmyia americana

Chironomus sp.

Cladotanytarsus sp.

Conchapelopia sp.

Cricotopus sp.

Cryptotendipes sp.

Cryptochironomus fulvus

Dicrotendipes lobus

D. modestus

D. neomodestus

Eukiefferiella sp.

Leptochironomus sp.

Macropelopia sp.

Microtendipes sp.

Pentaneura inculta

Polypedilum halterale

P. convictum

P. fallax

P. illinoense

Rheotanytarsus sp.

Stenochironomus sp.

Tanytarsus sp.

Tipula sp.

Tribelos fuscicornis

unident. tabanid

unident. chironomid

unident. ceratopogonid

Coleoptera

Ancyronyx variegatus

Dubiraphia sp.

Macronychus glabratus

Stenelmis sp.

S. fuscata

S. sp.

unident. dytiscid

unident. elmids

unident. hydrophilid

unident. helodid

Arachnida

Acarina

unident. sp.

31.02.0024

Mollusca

Gastropoda

Goniobasis sp.

Physa sp.

Pseudosuccinea sp.

Viviparus sp.

Pelecypoda

Corbicula manilensis

unident. sphaeriid

DATA SUMMARY: Chipola River

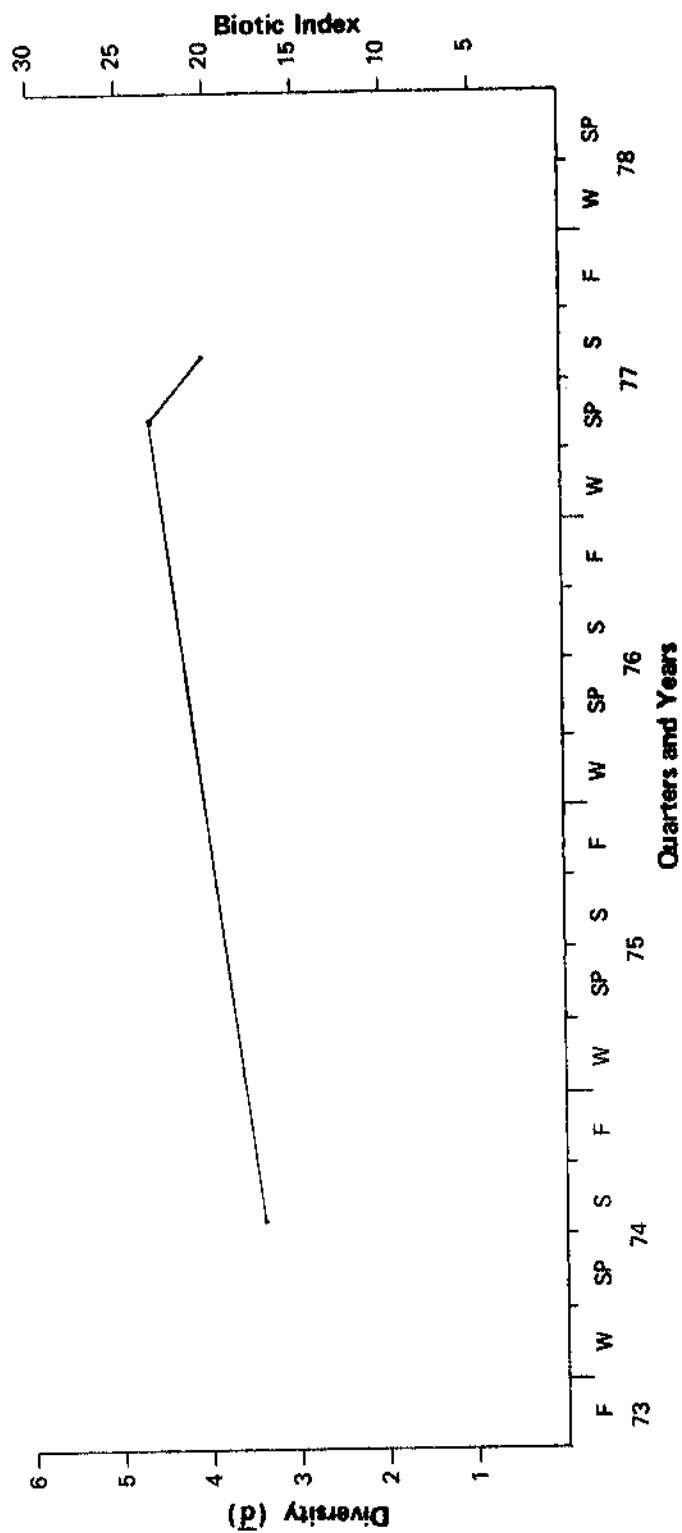
Station Number	Date	Macroinvertebrates										Coliform Bacteria Colonies/100ml	Total Fecal	Comments
		Natural Substrate			Artificial Substrate			Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²			
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
31.02.0024	3 Jul 74													
	22 Jun 76													
	26 Apr 77	2.68±0.489	0.333±0.129	8	3.092±0.366	0.283±0.083	19	17	34			1600	230	Florida Index
	19 Jul 77	2.406±0.532	0.999±0.201	6				20	46			230	130	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 31.02.0024
 BODY OF WATER: CHIPOLA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 _____ BIOTIC INDEX (= FLORIDA INDEX)



Station No. 31.02.0027 Body of Water Juniper Creek

Location at SR #73 (near Frink)

County Calhoun

Type Body of Water creek Classification III

Sources of Pollution _____

Nearby Land Use forestry, farming

Sampling Frequency _____ Depth 0.5 - 1 m

Bottom Type sand % Volatile Solids _____

Aquatic Plants: Submerged Cladophora sp., Rhizoclonium sp., Batrachospermum
sp., Fontinalis filiformis Emergent Sagittaria subulata, Cladium mariscoides,
Orontium aquaticum, Nuphar luteum, Nuphar sp.

Macroinvertebrates:

Annelida

Oligochaeta

unident sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Decapoda

Crangonyx sp.

Palaemonetes kadiakensis

unident. astacid

Insecta

Collembola

Isotomurus palustris

Plecoptera

Acroneuria arenosa/mela

A. abnormis

Plecoptera (cont.)

Helopicus subvarians
Leuctra ferruginea
Paragnetina fumosa
Perlinella ephyre
Perlesta placida
Pteronarcys dorsata
P. pictetii
Taeniopteryx lita
Isoperla dicala

Odonata

Agrion maculatum
Anomalagrion hastatum
Dromogomphus sp.
Gomphus sp.
Lestes sp.
Perithemis seminole
Promogomphus obscurus

Ephemeroptera

Baetis australis
Baetisca rogersi
B. sp.
Dolania americana
Ephemerella trilineata
Hexagenia munda marilandica
Leptophlebia intermedius
Neomphemera sp.
Paraleptophlebia volitans
Pseudocloeon bimaculatus
Stenonema sp.
S. smithae

Hemiptera

unident. corixid
 unident. hebrid
 unident. gerrid

Trichoptera

Brachycentrus sp.
Cheumatopsyche sp.
Chimarra sp.
Hydropsyche sp.
Hydroptila sp.
Leptocella sp.
Lepidostoma sp.
Neureclipsis sp.
Nyctiophylax sp.
Oecetis sp.
Lype sp.

Megaloptera

Chauliodes sp.
Corydalus cornutus

Diptera

Ablabesmyia auriensis
A. philosophagnos
Atherix variegata
Cladotanytarsus sp.
Conchapelopia sp.
Corynoneura sp.
Cricotopus spp.
C. remus
C. bicinctus
Dicrotendipes lobus
Eukiefferiella sp.
Hexatoma sp.
Heterotrissocladius sp.
Microtendipes sp.
Micropsectra sp.
Palpomyia sp.
Parachironomus demeijera
Pentaneura sp.
Plecopteracoluthus/Psectrocladius sp.
Polypedilum convictum
P. illinoense
P. halterale
Psectrocladius sp.
Pseudochironomus sp.
Rheotanytarsus sp.
Rheocricotopus sp.
Stenochironomus sp.
Tanytarsus sp.
Thienemanniella sp.
Tribelos jucundus
Trichocladius robacki
unident. ceratopogonid
unident. chironomine
unident. simuliid
unident. tipulid
unident. diamesine

Coleoptera

Ancyronyx variegata
Dineutus sp.
Dubiraphia sp.
Ectoparia nervosus
Optioservus sp.
Stenelmis sp.
unident. elmia
unident. hydroporine

DATA SUMMARY: Juniper Creek

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments		
		Natural Substrate			Artificial Substrate					Biotic Index	Total			
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
31-02-0027	13 May 76						3.762±0.390	0.201±0.050	22		1600	42		
	20 Jan 77									48	60	350	136	
	22 Nov 77									52	76	2300	230	

See Methods for explanation of table.

AUCILLA-OUCHLOCKONEE-ST. MARKS DRAINAGE BASIN

The Aucilla-Ochlockonee-St. Marks River Basin drains approximately 5,400 square miles of the Big Bend of Florida, the area where the peninsula and the panhandle join. It is bounded on the east by the Suwannee River Basin and on the west by the Apalachicola River Basin. Within this area are four major sub-basins: the Ochlockonee, St. Marks, and Aucilla River basins, and the coastal area between the Aucilla and the Suwannee. The entire basin is underlain by limestone, and groundwater discharge from the Floridan aquifer is a major source of the stream flow, especially in the eastern portion of the basin. Three first-magnitude springs (having an average flow of more than 100 cubic feet per second), are located south of Tallahassee.

Ochlockonee River Sub-Basin

The Ochlockonee River enters Florida near Concord, flows southwestward to Lake Talquin, a man-made impoundment, and then flows southward through the Apalachicola National Forest to Ochlockonee Bay. Station 22.03.0011, just south of the Florida-Georgia border was sampled only a few times. Macroinvertebrate diversities appeared to be good but Biotic Index numbers indicated a possibility of dissolved oxygen problems during summer low flow. This is highly conjectural as there are too few data to form a firm conclusion.

There are also too few macroinvertebrate data for station 22.03.0006, below the Lake Talquin dam, to make any judgements. Bacteria counts were occasionally high, probably due to runoff. The Sopchoppy River, station 22.02.0073, at SR 375, is primarily a swamp drainage stream. Although only three macroinvertebrate samples were analyzed during the report period, diversity appeared to be good at the station, based on these samples.

Ochlockonee Bay, station 22.02.0B19, west of Bald Point, had consistently good macroinvertebrate diversity for the three consecutive annual samples analyzed during the report period. Estuarine stresses (e.g., salinity variation and siltation) might have kept diversities lower than some would expect.

Lake Jackson, station 22.02.0037, north of Tallahassee, was not sampled enough to measure a statistically significant trend, despite an upward trend apparent upon visual inspection of the data. Nutrient and silt inputs from urban and residential runoff have degraded apparent water quality and contributed to nuisance growth of aquatic weeds.

St. Marks River Sub-Basin

The St. Marks River is a spring fed stream with origins west of Tallahassee. It flows southward to the town of St. Marks where it is augmented by the Wakulla River (which originates at Wakulla Springs), from which it flows to Apalachee Bay. Three stations in this sub-basin were sampled: 22.03.0009, St. Marks River at US 98; 22.03.0021, Wakulla River at US 98; and 22.03.0060, Apalachee Bay east of Pine Island. None of these stations was sampled enough to detect a trend, but all three had generally excellent diversity.

Aucilla River Sub-Basin

The Aucilla River enters Florida near Ashville and flows generally southward to Apalachee Bay. The Little Aucilla River flows into the Aucilla near the town of Aucilla from Madison County. The Wacissa River originates at Wacissa Springs near the town of Wacissa, flows southward, and enters the Aucilla just north of US 98. A monitoring station was located on each of these streams.

Station 22.04.0016, Little Aucilla River at US 90, was sampled only a few times. The Biotic Index was acceptable but not as high as might be expected considering that thirty to fifty taxa were collected at each sampling.

The Aucilla River, station 22.04.0002, at US 27, exhibited excellent macroinvertebrate diversity and good Biotic Index values. Only artificial substrate diversity numbers showed any significant trend (upward) during the report period and this is unexplained. Occasionally high bacteria levels were probably related to pasture runoff.

Station 22.04.0010, Wacissa River, below Wacissa Springs, had fair macroinvertebrate diversity numbers the few times it was sampled. It is possible that naturally low dissolved oxygen concentrations in the spring water contributed to the lower than expected diversities.

Coastal Sub-Basin

In this sub-basin, three rivers and two coastal areas were monitored during the report period. None of the stations was sampled enough to determine any significant trends in the data.

The Econfinia River drains the northern part of Taylor County to the Gulf of Mexico. Although the station (22.05.0038) was sampled for macroinvertebrates only once quantitatively and three times qualitatively during the report period, the diversity index was over four and the Biotic Index values were good. Also, large numbers of species were collected.

The Fenholloway River flows through Taylor County near Perry to the Gulf. Effluent from the Buckeye Cellulose Corporation contributes a large part of the river's flow. In fact, the Fenholloway is the only stream in the state in water use Class V-A - Navigation, Utility and Industrial Use-Surface Waters. High biochemical oxygen demand has caused low dissolved oxygen levels and at station 22.05.0029, at SR 3, the macroinvertebrate community reflects this stress with low diversity numbers and the presence of low-DO tolerant organisms.

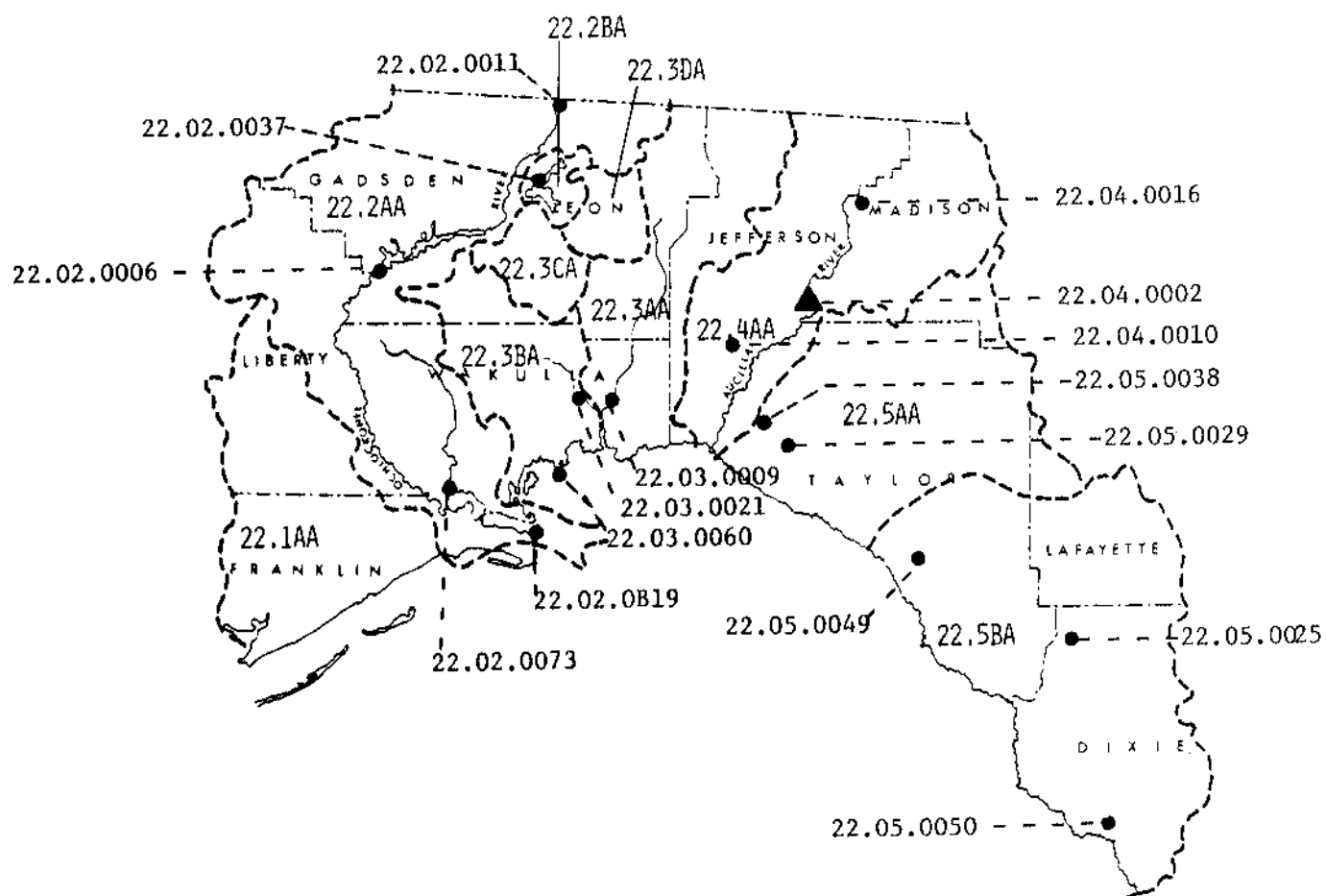
The Steinhatchee River, station 22.05.0025, at US 19-98 forms the Taylor-Dixie County line and drains swampland in Lafayette County. It is characterized by ponding during dry periods and underground flow. Macroinvertebrate diversity numbers were good during the report period and might have been better if the natural conditions allowed more steady flow.

Both of the coastal stations in this sub-basin had good macroinvertebrate diversities for their respective locations. Station 22.05.0049, at Spring Warrior Creek, had lower values, probably because of estuarine salinity and siltation stresses. Conversely, station 22.05.0050, at Horseshoe Point had very high diversity values, probably due to its more consistently marine waters.

Summary

The Ochlockonee River Sub-Basin had fair to good macroinvertebrate diversities and Biotic Index numbers based on the few data collected. Some bacteria problems may occur in conjunction with runoff. Also, Lake Jackson has experienced accelerated eutrophication and siltation due to urban and residential runoff. The St. Marks Sub-Basin had generally excellent water quality as reflected by the Biotic community. The Aucilla River Sub-Basin biological data suggested fair to excellent water quality; but the lower indicator values were apparently due to natural effects. The Aucilla River station was the only one for which enough data were available to test for a significant trend. An upward trend was apparent, but no explanation offered. In the Coastal sub-basin, Econfinia River and the two Gulf of Mexico sites all seemed to have healthy macroinvertebrate communities. The Steinhatchee River had slightly depressed, though good, macroinvertebrate diversities due to natural flow conditions. The Fenholloway River was evidently severely degraded by effluent from the Buckeye Cellulose Corporation.

AUCILLA-CHLOCKONEE-ST. MARKS RIVER BASIN



Station No. 22.02.0006 Body of Water Ocklockonee River
Location near Bloxham, bridge on Fla. Hwy. 20
County Leon
Type Body of Water river (Dam tailwaters) Classification III
Sources of Pollution domestic wastes, agricultural runoff
Lake Talquin Dam Outfall
Nearby Land Use recreational, natural state, some low-density residential
Sampling Frequency annual Depth 3 m
Bottom Type silty sand, clay % Volatile Solids .19
Aquatic Plants: Submerged _____
Emergent Chiloscyphus polyanthus, Taxodium distichum

Macroinvertebrates:

Annelida

Oligochaeta

3 unident. spp.

Arthropoda

Crustacea

Amphipoda

Hyalrella azteca

Decapoda

Palaemonetes kadiakensis

Insecta

Odonata

Argia sp.

A. apicalis

Coryphaeschna sp.

Enallagma sp.

Gomphus sp.

Ephemeroptera

Caenis sp.

Callibaetis floridanus

Trichoptera

Cheumatopsyche sp.
Cyrnellus sp.
Hydropsyche sp.
Hydroptila sp.
Neureclipsis sp.
Polycentropus sp.
Oecetis sp.

Diptera

Ablabesmyia cinctipes
A. mallochi
A. parajanta
Chaoborus sp.
Chironomus sp.
Cricotopus sp.
Cryptochironomus fulvus
Dicrotendipes lobus
D. nervosus
Glyptotendipes lobus
Metriocnemus sp.
Microtendipes sp.
Orthocladius annectens
Paracladopelma sp.
Parachironomus sp.
Polypedilum halterale
P. fallax
P. illinoense
Psectrocladius sp.
Tanytarsus sp.
Tribelos sp.
T. fuscicornis
Cricotopus remus
unident. chironomine

Coleoptera

Berosus sp.
Dineutus sp.
Gyrinus sp.
Haliplus sp.
unident. hydroporine

Mollusca

Gastropoda

Viviparus sp.
Physa sp.

Pelecypoda

Corbicula manilensis

DATA SUMMARY: Ochlocknee River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
344													
22-02-0006	18 Oct 74											672480	
	21 Feb 74											920	
	22 May 74											920	
	18 Jun 74											350	
	25 Jul 74												
	1 Oct 74							4	16			171	
	6 Nov 74	0.855±0.138	0.204±0.179	2								8	
	15 Jan 74											22	
	30 Sep 74											171	
	28 Oct 74											23	
	19 Nov 74										172		
	16 Dec 74												

See Methods for explanation of table.

DATA SUMMARY: Ochlockonee River (Cont.)

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
345	22.02.00006	13 Jan 76									23	23	
		19 Feb 76									79	2	
		30 Mar 76									240	23	
		19 Apr 76									49	LT2	
		11 May 76						0.260±0.062	19		17	LT2	
		17 May 76						2.973±0.350			130	7	
		21 Jun 76									72400		
		28 Jul 76									350	33	
		30 Aug 76									350	2	
		19 Sep 76									11	LT2	
		25 Oct 76									49	5	
		13 Dec 76									240	14	

See Methods for explanation of table.

DATA SUMMARY: Ochlockonee River (Cont.)

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
22-02-0006	8 Feb 77										33	LT2	Florida Index
	9 Feb 77	2.550±0.259	0.199±0.050	12							330	49	
	9 Mar 77										130	8	
	8 Dec 77										7900	7900	
	8 Feb 78										230	14	
	27 Mar 78										350	142	
	3 May 78							12			230	23	
	27 Jun 78												

See Methods for explanation of table.

Station No. 22.02.0011 Body of Water Ochlockonee River
Location at SR #12 bridge (west of Concord)
County Gadsden
Type Body of Water river Classification III
Sources of Pollution agricultural runoff, domestic and industrial
wastes
Nearby Land Use lowland swamp
Sampling Frequency random Depth 1-1.5 m (7 m flood stage)
Bottom Type mud % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Taxodium distichum

Macroinvertebrates:

Annelida

Oligochaeta

3 unident. spp.

Hirudinea

unident. sp.

Arthropoda

Crustacea

Amphipoda

Hyaella azteca

Decapoda

Palaemonetes paludosus
unident. astacid

Insecta

Plecoptera

Perlesta placida
Neoperla clymene

Odonata

Coryphaeschna sp.
Gomphus sp.

Ephemeroptera

Brachycercus sp.
Caenis sp.
Ephemerella sp.
E. choctawhatchee
Baetis intercalaris
B. australis
Hexagenia munda marilandica
Heptagenia sp.
Isonychia sp.
Stenonema smithae
S. exiguum
S. integrum

Hemiptera

Lethocerus sp.
unident. corixid

Trichoptera

Cheumatopsyche sp.
Leptocella sp.
Neureclipsis sp.
cf. Rhyacophila sp.

Megaloptera

Corydalis cornutus

Lepidoptera

unident. sp.

Diptera

Ablabesmyia peleensis
Chaoborus sp.
Coelotanypus sp.
Cryptochironomus sp.
Leptochironomus sp.
Microtendipes sp.
Polypedilum fallax
P. illinoense
P. convictum
P. halterale
Procladius sp.
Psectrocladius sp.
Rheotanytarsus sp.
Stenochironomus sp.
Tipula sp.
Tribelos sp.
2 unident. stimuliid spp.

Coleoptera

Ancyronyx variegata
Dineutus sp.
Macronychus glabratus
Gyrinus sp.
Haliphus punctatus
unident. dytiscid
Dubiraphia sp.

Mollusca

Gastropoda

Ferrissia sp.
Physa sp.

Pelecypoda

Corbicula manilensis
Elliptoides sloatianus
unident. sphaeriid

DATA SUMMARY: Ochlocknee River

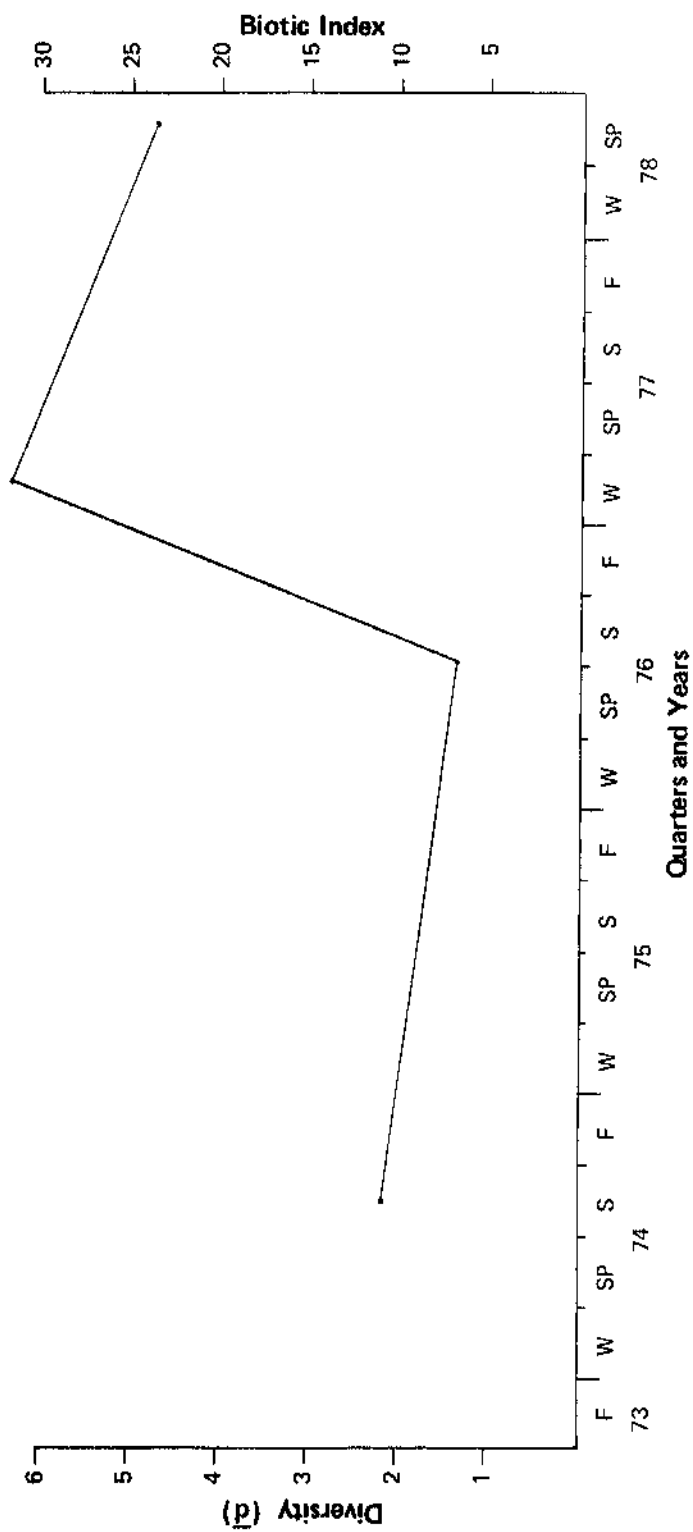
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate					Total	Fecal		
		Diversity		Redundancy	Diversity		Redundancy						# Spp.
		Diversity	Redundancy	# Spp.	# Spp.								
350	24 Jul 74											Florida Index	
	4 Feb 75												
	22 Jan 76	3.032±0.230	0.163±0.034	18						540	672400		920
	10 Feb 77	2.333±0.213	0.388±0.049	26						350	79		
	2 May 78									490	230		

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.02.0011
 BODY OF WATER: OCHLOCKONEE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 -.-.- ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 22.02.0B19 Body of Water Ochlockonee Bay
Location west of Bald Point
County Franklin County
Type Body of Water estuary, bay Classification III
Sources of Pollution _____
Nearby Land Use fishing industry, residential (low density)
Sampling Frequency annually Depth 0.3 - 1.5 m.
Bottom Type mud, detritus, sand % Volatile Solids _____
Aquatic Plants: Submerged Diplanthera wrightii
Emergent Spartina patens

Macroinvertebrates:

Annelida

Polychaeta

Capitella capitata
Chone sp.
Diopatra cuprea
Eteone heteropoda
Eupomatus dianthus
cf. Glycera sp.
Haploscoloplos sp.
Laeonereis culveri
Nereis pelagica occidentalis
N. (Neanthes) succinea
Paraprionospio cf. pinnata
P. pinnata
Pectinaria gouldii
Polydora websteri
Scoloplos rubra
S. cf. capensis
Streblospio benedicti

Arthropoda

Crustacea

Isopoda

Accalanthura cf. crenulata
Cyathura cf. burbanki
Erichsonella cf. floridana

Amphipoda

Ampelisca abdita
A. cf. verrilli
Cymadusa compta
Corophium lacustre
cf. Erichthonius braziliensis
Gammarus fasciatus
cf. Grandidierella cf. bonnieroides
Haustorius sp.
Listriella barnardi
Monoculodes edwardsi
Mucrogammarus macromucronatus

Decapoda

Naushonia sp.
Panopeus herbstii

Cumacea

Oxyurostylis cf. smithi

Tanaidacea

Leptochelia cf. dubia

Mollusca

Gastropoda

Bittium varium
Brachidontes exustus
Cylichna cf. bidentata
Mitrella lunata
Nassarius vibex

Pelecypoda

Rangia cuneata
Solen viridis
Tellina cf. lineata

DATA SUMMARY: Ochlockonee Bay

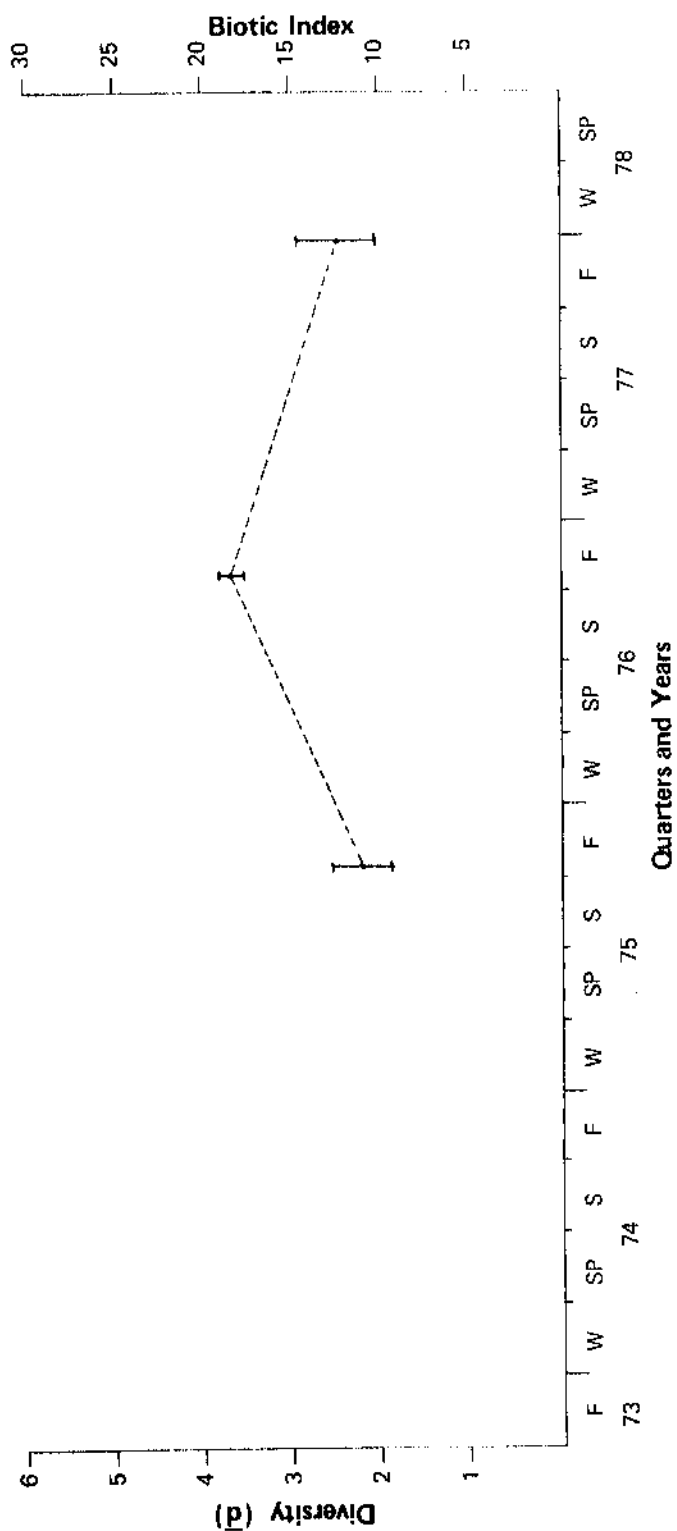
Station Number	Date	Macroinvertebrates								Phytoplankton Composition units/cm ³	Fetiphyton Composition units/cm ²	Coliform Bacteria Colonies/ 100ml		Comments
		Natural Substrate			Artificial Substrate			Biotic Index	Total			Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
22-02-0819 354	9 Oct 75	2.274±0.353	0.388±0.101	13							350	142		
	13 Oct 76	3.754±0.148	0.047±0.016	18							130	79		
	7 Dec 77	2.578±0.452	0.416±0.116	15										

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.02.0819
 BODY OF WATER: OCHLOCKONEE BAY

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 22.02.0037 Body of Water Lake Jackson

Location 100 yards offshore - Millers Landing

County Leon

Type Body of Water lake Classification III

Sources of Pollution agricultural runoff, urban runoff

Nearby Land Use agricultural, residential

Sampling Frequency annual Depth 1 - 3 m

Bottom Type muck, detritus, sand, clay & Volatile Solids

Aquatic Plants: Submerged Isoetes sp., Eleodea canadensis

Emergent Nelumbo lutea, Micranthemum

umbrosum, Scirpus sp.

Macroinvertebrates:

Platyhelminthes

Turbellaria

unident. sp.

Annelida

Oligochaeta

unident. sp.

Hirudinea

unident. sp.

Arthropoda

Crustacea

Isopoda

unident. sp.

Amphipoda

Hyalella azteca

Insecta

Odonata

Tetragoneuria sp.

Trichoptera

Cynellus sp.

Oecetis sp.

Polycentropus sp.

Lepidoptera

Nymphula sp.

Diptera

Ablabesmyia americana

A. aspera

Chaoborus sp.

Chironomus sp.

Cryptochironomus fulvus

Dicrotendipes lobus

Glyptotendipes sp.

Microtendipes sp.

Polypedilum halterale

P. illinoense

Tanytarsus sp.

unident. tanypodine

Arachnida

Acarina

unident. sp.

Mollusca

Gastropoda

Amphigyra sp.

Helisoma sp.

Physa sp.

Pelecypoda

Corbicula manilensis

unident. sphaeriid

DATA SUMMARY: Lake Jackson

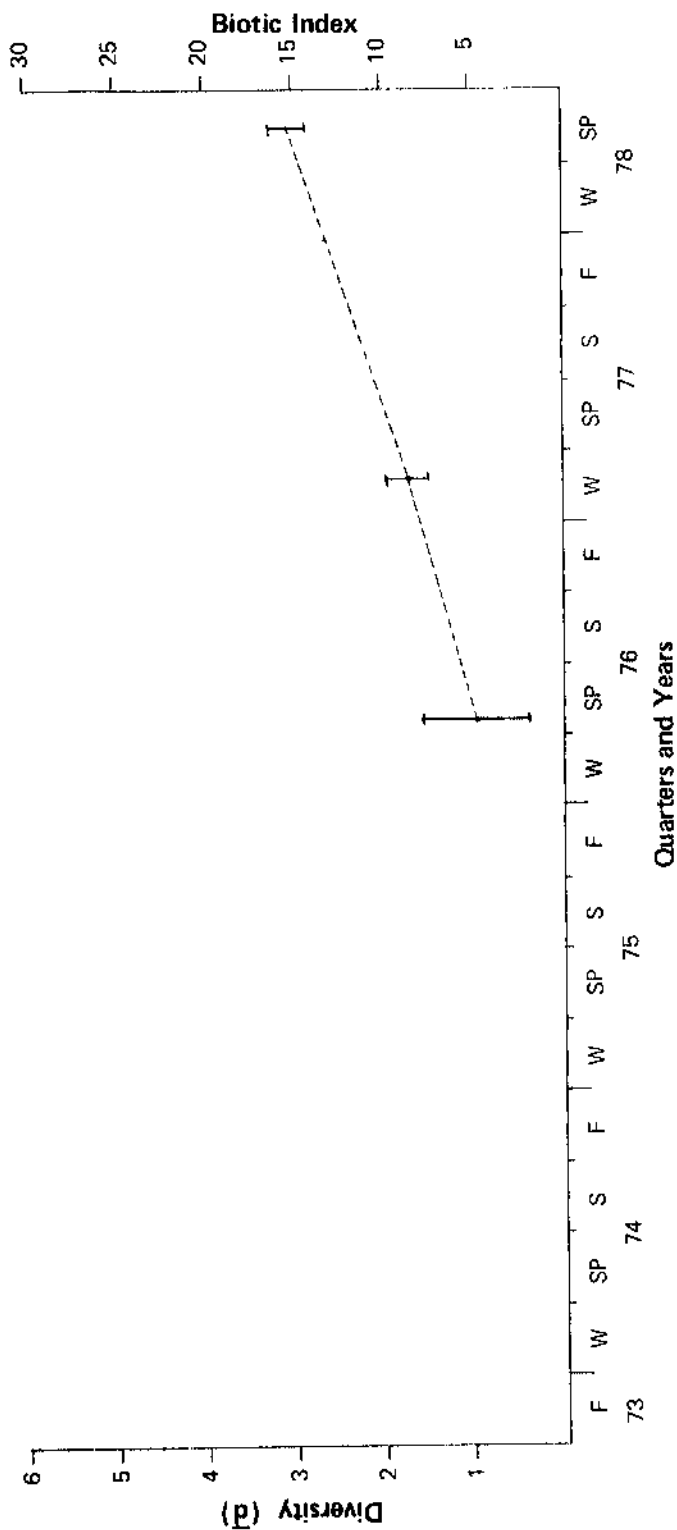
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Concentrations/100ml	Comments
		Natural Substrate		Artificial Substrate		#Spp.	Redundancy					
		Diversity	Redundancy	#Spp.	Diversity			Redundancy			#Spp.	
		RI	#Spp.									
22.02.0017 358	6 Apr 76	0.950±0.611	0.750±0.431	3							2	LT2
	9 Feb 77	1.693±0.237	0.504±0.074	14							13	5
	2 May 78	3.046±0.217	0.194±0.035	23								

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.02.0037
 BODY OF WATER: LAKE JACKSON

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Diptera (cont.)

Ablabesmyia tarella
Conchapelopia sp.
Corynoneura sp.
Cricotopus sp.
Eukiefferiella sp.
Heterotrissocladius sp.
Micropsectra sp.
Microtendipes sp.
 cf. Parametriocnemus sp.
Polypedilum fallax
P. halterale
P. illinoense
Psectrocladius vernalis
Rheocricotopus sp.
Tanytarsus sp.
Tribelos fuscicornis
T. jucundus
 cf. Trissocladius sp.
 unident. chironomine

Coleoptera

Stenelmis sp.
 unident. hydroporine

DATA SUMMARY: Sapchohoy River

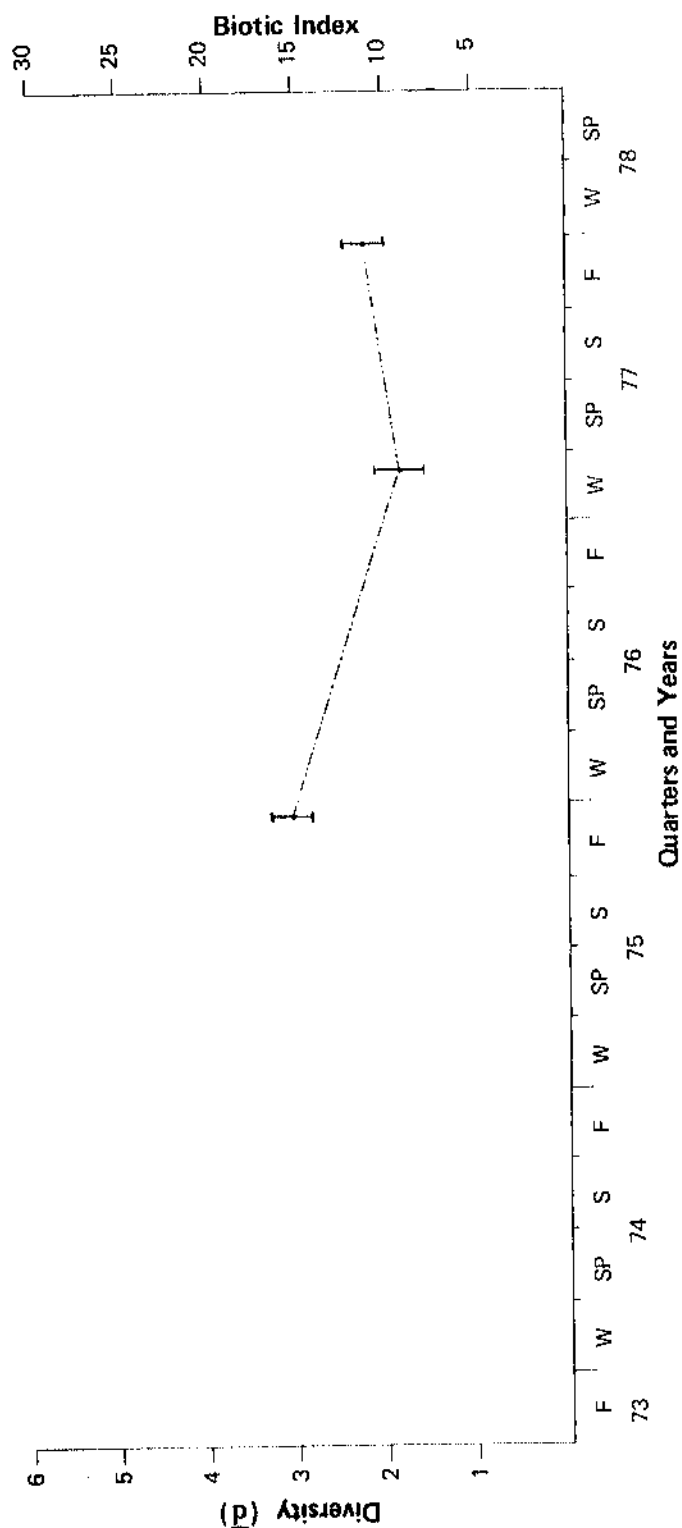
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
362	2 Dec 75				3.093±0.235	0.090±0.033	12					130	
	23 Feb 77				1.873±0.265	0.514±0.079	16					1300	
	5 Dec 77				2.279±0.244	0.433±0.067	19					240	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.02.0073
 BODY OF WATER: SOPCHOPPY RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 22.03.0009 Body of Water St. Marks River

Location at U.S. Hwy. 98 at Newport

County Wakulla

Type Body of Water river Classification III

Sources of Pollution Wakulla Springs Resort runoff

Nearby Land Use _____

Sampling Frequency annual Depth 1 - 1.3 m

Bottom Type limestone, silt, detritus % Volatile Solids _____

Aquatic Plants: Submerged Vallisneria, Najas guadalupensis, Sagittaria subulata

Emergent _____

Macroinvertebrates:

Platyhelminthes

Turbellaria

unident. sp.

Annelida

Oligochaeta

unident. sp.

Hirudinea

✓ Piscicolaria cf. reducta

Arthropoda

Crustacea

Isopoda

✓ Asellus sp.

Lirceus sp.

Amphipoda

Gammarus sp.

Hyalella azteca

Decapoda

unident. astacid

Insecta

Odonata

Argia sp.
A. translata

Ephemeroptera

Caenis sp.
Pseudocloeon parvulum
Stenacron interpunctatum
Stenonema exiguum
S. integrum
S. smithae
Tricorythodes sp.

Trichoptera

Cheumatopsyche sp.
Oxyethira sp.
Polycentropus sp.

Lepidoptera

Nymphula sp.

Diptera

Ablabesmyia ornata
A. philosphagnos
A. tarella
Cladotanytarsus sp.
Coelotanypus scapularis
Conchapelopia sp.
cf. Cricotopus sp.
Cryptochironomus fulvus
Dicrotendipes neomodestus
Harnischia sp.
Micropsectra sp.
Microtendipes sp.
Polypedilum convictum
P. fallax
Procladius sp.
Rheocricotopus sp.
Rheotanytarsus sp.
Tanytarsus sp.
Tribelos fuscicornis
T. jucundus
unident. ceratopogonid sp.

Coleoptera

Chrysops sp.
Dubiraphia sp.

22.03.0009

Arachnida

Lebertia (Pilolebertia) sp.

Mollusca

Gastropoda

Ferrissia sp.

Lyogyrus sp.

Neritina reclivata

Physa sp.

Viviparus sp.

unident. planorbid

Pelecypoda

unident. sphaeriid

DATA SUMMARY: St. Marks River

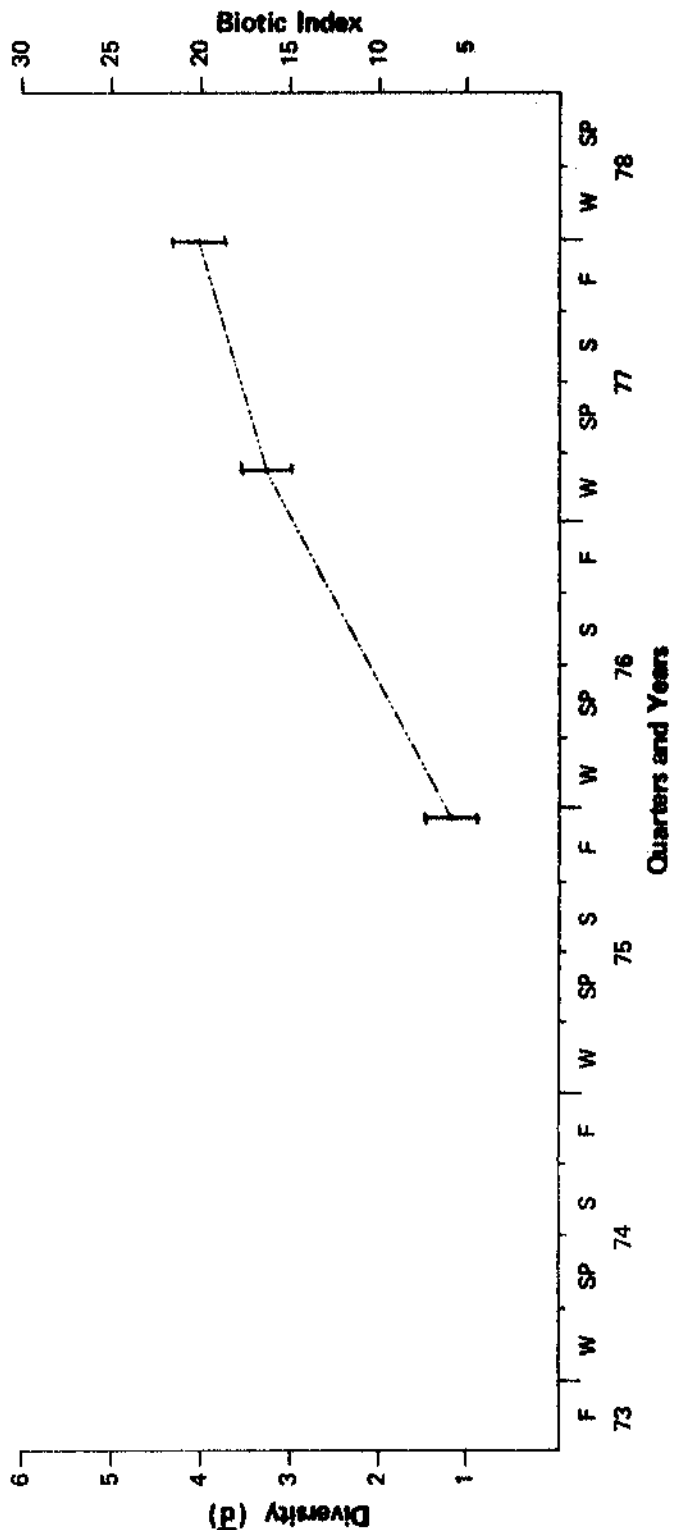
DATA SUMMARY: ST. MILES RIVER													
Station Number	Date	Macroinvertebrates							Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
								BI					
367 22.03.0009	22 Apr 74										1700		
	2 Jul 74										460		
	10 Dec 74										1200		
	20 May 75										700		
	2 Dec 75				1.208±0.303	0.682±0.110	9					58	
	23 Feb 77				3.307±0.280	0.140±0.039	18					13	
	6 Dec 77				4.039±0.301	0.123±0.029	29				490		
	18 Jan 78	3.270±0.188	0.157±0.034	23									

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.03.0009
 BODY OF WATER: ST. MARKS RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 22.03.0021 Body of Water Wakulla River

Location at US Hwy. 98

County Wakulla

Type Body of Water river Classification III

Sources of Pollution _____

Nearby Land Use silviculture

Sampling Frequency annual Depth 0.5 - 1.5 m

Bottom Type sand, limestone, detritus % Volatile Solids _____

Aquatic Plants: Submerged Vallisneria americana, Elodea, Potamogeton

nodosus, Najas guadalupensis Emergent _____

Macroinvertebrates:

Platyhelminthes

Turbellaria

unident. sp.

Annelida

Oligochaeta

unident. sp.

Arthropoda

Crustacea

Amphipoda

Gammarus sp.

Hyalella azteca

Mysidacea

unident. sp.

Insecta

Odonata

cf. Nehalennia sp.

unident. zygopteran

Ephemeroptera

Isonychia sp.

Pseudocloeon parvulum

Stenacron interpunctatum

Ephemeroptera (cont.)

Stenonema exiguum
Tricorythodes albilineatus

Trichoptera

Athripsodes sp.
Cheumatopsyche sp.
cf. Orthotrichia sp.
Polycentropus sp.

Diptera

Ablabesmyia ornata
Gricotopus bicinctus
C. remus
C. sp.
Dicrotendipes neomodestus
Glyptotendipes sp.
Micropsectra sp.
Microtendipes sp.
Pentaneura sp.
Polypedilum convictum
P. fallax
P. halterale
P. illinoense
Rheotanytarsus sp.
Symbiocladius sp.
Tanypus stellatus
Tanytarsus sp.
Thienemanniella sp.
Tribelos jucundus

Mollusca

Gastropoda

Helisoma sp.
Neritina reclinata
Physa sp.
Pomacea sp.

DATA SUMMARY: Makulla River at US98

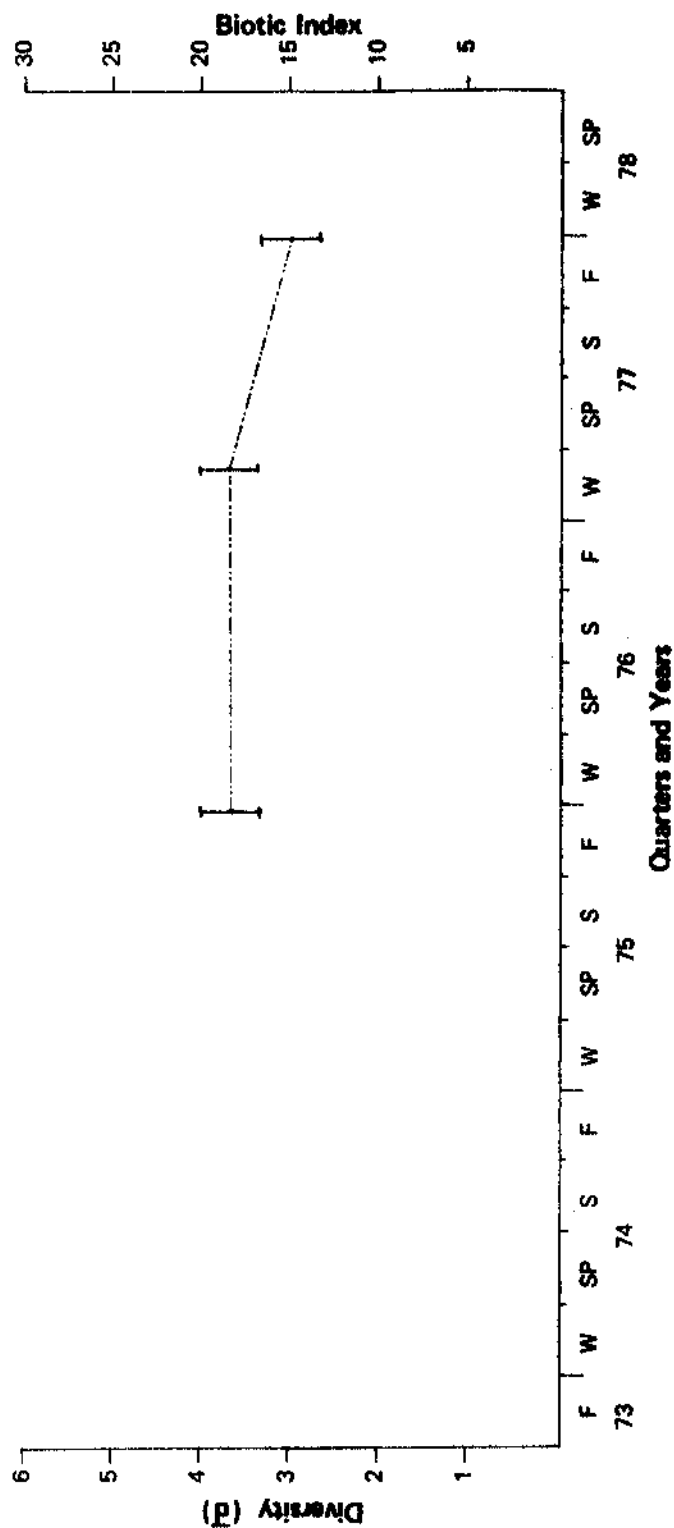
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	B1	#Spp.					
371	22.03.0021													
	8 Apr 74				3.700±0.357	0.158±0.056	18				330			
	2 Dec 75				3.764±0.327	0.181±0.057	25					82		
	23 Feb 77				3.027±0.358	0.167±0.075	9				790	220		
	6 Dec 77													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.03.0021
 BODY OF WATER: WAKULLA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 --- BIOTIC INDEX (= FLORIDA INDEX)



Station No. 22.03.0060 Body of Water Apalachee Bay
Location grassbed 200 yds. east of Pine Island near Shell Point
County Wakulla
Type Body of Water bay, estuary Classification II
Sources of Pollution sewage effluent
Nearby Land Use residential
Sampling Frequency annual Depth 1.0 m.
Bottom Type silty sand % Volatile Solids _____
Aquatic Plants: Submerged Syringodium filiforme, Halodule wrightii, Ulva sp.
Halophila engelmannii Emergent Spartina alterniflora

Macroinvertebrates:

Cnidaria
Hydrozoa
 unident. sp.

Platyhelminthes
Turbellaria
 unident. sp.

Rhynchocoela
 cf. Carinoma tremaphorus
 cf. Cerebratulus sp.

Annelida
Polychaeta
 cf. Autolytus sp.
 Axiiothella mucosa
 Chone cf. americana
 Diopatra cuprea spiribranchia
 Eteone heteropoda
 Glycera dibranchiata
 Haploscoloplos foliosus

Polychaeta (cont.)

Laeoneris culveri
Loima cf. medusa
Lumbrineris tenuis
Melinna maculata
Nereis pelagica occidentalis
Onuphis nebulosa
Owenia fusiformis
Pectinaria gouldii
Phyllodoce cf. acenae
Polydora ligni
Sabella microphthalma
Scoloplos cf. capensis
unident. terebellid

Arthropoda

Crustacea

Isopoda

Cyathura burbanki
C. polita
cf. Diastylis sp.
Edotea triloba
Erichsonella cf. floridana
cf. Paracerceis sp.

Amphipoda

Ampelisca verrilli
Cerapus tubularis
Cymadusa compta
Grandidierella bonnieroides
Leucothoe spinacarpa
Monoculodes cf. intermedius
cf. Hyperia sp.
unident. cf. calliopid
unident. cf. pontogeneiid

Decapoda

Pagurus longicarpus
Penaeus sp.
P. herbstii
unident. palaemonid

Tanaidacea

Leptochelia rapax

Cumacea

Oxyurostylis smithi

Mollusca

Gastropoda

Bittium varium
Cerithium muscarum

Gastropoda (cont.)

Crepidula fornicata
Bulla occidentalis
Gibberulina ovuliformis
Kurtziella limonitella
Melanella gracilis
Mitrella lunata
Nassarius vibex
Olivella fornicata
O. mutica
Persicula cf. minuta
cf. Prunum apicum
Spiratella sp.
Turbinella sp.

Pelecypoda

Brachidontes exustus
Ensis minor
cf. Laevicardium sp.
Lyonsia hyalina floridana
Rangia cuneata
Tellina lineata

Echinodermata

Ophiuroidea

Amphipholis cf. squamata

Chordata

Cephalochordata

Amphioxus sp.

DATA SUMMARY: Apalachee Bay

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
22.03.0060	13 Oct 76	4.053±0.146	0.051±0.012	26							79	172	
	6 Dec 77	4.305±0.221	0.084±0.016	39							130	33	

See Methods for explanation of table.

Station No. 22.04.0002 Body of Water Aucilla River

Location at Lamont, U.S. Hwy 27

County Jefferson-Madison

Type Body of Water river Classification III

Sources of Pollution domestic effluent

Nearby Land Use natural

Sampling Frequency quarterly Depth .9 - 3 m

Bottom Type sand & thick brown mud % Volatile Solids

Aquatic Plants: Submerged Elodea sp., Vallisneria americana, Egeria densa,
Ludwigia sp., Potamogeton sp.

Hydrilla verticillata Emergent Nuphar sp., Eichhornia crassipes, Salix sp.

Taxodium sp., Phragmites sp., Cephalanthus sp., Typha latifolia, Polygonum

Macroinvertebrates: sp., Bacopa mouerias, Panicum sp., Pontederia cordata
Hydrocotyle sp.

Porifera

Spongilla sp.

Cnidaria

Hydra americana

Platyhelminthes

Dugesia tigrina

Prostoma rubrum

Nematoda

unident. sp.

Annelida

Oligochaeta

Eclipidrilus palustris

Limnodrilus hoffmeisteri

Nais communis

Pelosclex ferox

Pristina osborni

Slavina appendiculata

Tubifex tubifex

3 unident. spp.

unident. tubificid

Hirudinea

Bactracobdella phalera
B. picta
Erpobdella phalera
Helobdella elongata
Placobdella ornata
2 unident. spp.

Arthropoda

Crustacea

Isopoda

Asellus communis
Cyathura polita

Amphipoda

Crangonyx sp.
Gammarus tigrinus
Hyaletella azteca
unident. sp.

Decapoda

Palaemonetes paludosus
Procambarus sp.

Diplopoda

unident. sp.

Insecta

Plecoptera

Acroneuria mela
A. sp.
Perlesta sp.
P. placida

Odonata

Anax sp.
Aphylla sp.
A. williamsoni
Argia sp.
A. fumipennis
A. sedula
A. tibialis
A. moesta
Coryphaeschna sp.
Didymops sp.
Dromogomphus sp.
D. armatus
D. spinosus
Didymops transversa
Enallagma sp.

Odonata (cont.)

Epicordulia regina
Erythemis simplicicollis
Erythrodiplax sp.
Gomphus sp.
G. (Gomphus) minutus
G. (Gomphus) sp.
Ischnura sp.
Lepthemis vesiculosa
Lestes sp.
Macromia sp.
M. alleghaniensis
M. taeniolata
Nasiaeschna pentacantha
Neurocordulia sp.
Orthemis ferruginea
Pachydiplax longipennis
Perithemis tenera
Plathemis lydia
Somatochlora sp.
Tetragoneuria sp.
T. cynosura
T. petechialis
Tramea sp.
 2 unident. libellulid
 unident. agrionid
 unident. zygoptera

Ephemeroptera

Baetis sp.
B. intercalaris
B. spiethi
B. spinosus
Brachycercus sp.
B. maculatus
B. sp.
Caenis sp.
C. hilaris
Callibaetis sp.
Centroptilum sp.
C. viridocularis
Choroterpes hubbelli
Cloeon sp.
Ephemerella trilineata
E. sp.
Hexagenia munda elegans
Neophemera sp.
Paraleptophelbia sp.
Stenacron floridense
S. integrum
S. exiguum
S. smithae

Ephemeroptera (cont.)

Tricorythodes albilineatus

Hemiptera

Abedus immaculatus
Ambrysus sp.
Belostoma sp.
Gerris sp.
Hebrus sp.
Limnogonus hesione
Pelocoris sp.
Plea striola
Ranatra sp.
Rhagovelia choreutes
Trepobates pictus
Trichocorixa sp.
Velia sp.
 unident. corixid

Trichoptera

Agapetus sp.
Ceraclea sp.
Cheumatopsyche sp.
Chimarra aterrima
C. socia
C. sp.
C. stigmatorus
Cyrnellus fraternus
Ironoquia sp.
Nectopsyche sp.
N. sp. a (Ross)
N. pavida
Oecetis sp.
Cyrnellus fraternus
Polycentropus sp.
Hydropsyche sp.
Macronemum carolina
Hydatophylax sp.
Pycnopsyche sp.
Nyctiophylax sp.
Ceracula sp.
Lype sp.
 unident. sp.

Megaloptera

Chauliodes sp.
Corydalus cornutus

Lepidoptera

Synclita sp.

Diptera

Ablabesmyia aspera
A. americana
A. parajanta
A. ornata
A. tarella
Anopheles sp.
Chaoborus sp.
Chironomus sp.
C. stigmaterus
C. attenuatus
Cladotanytarsus sp.
Clinotanytus sp.
Coelotanytus sp.
C. tricolor
Conchapelopia sp.
Corynoneura taris
Cricotopus bicinctus
Cryptochironomus sp.
C. fulvus
C. blarina
Cryptotendipes sp.
Dicrotendipes sp.
D. modestus
D. leucoscelis
D. neomodestus
D. nervosus
D. lobus
Einfeldia sp.
Epoicocladius sp.
Endochironomus nigricans
Glyptotendipes sp.
Harnischia sp.
H. edwardsi
Kiefferulus sp.
K. dux
Labrundinia johannseni
L. virescens
L. floridana
L. neopilosella
Microtendipes sp.
Micropsectra sp.
Nilothauma bicornis
Orthocladius annectens
Pagastiella sp.
Palpomyia tibialis
Palpomyia-Bezzia sp. 1 - Kelly
Paracladopelma undine
Parachironomus sp.
Paralauterborniella nigrohalteralis

Diptera (cont.)

Parametriocnemus lundbecki
Parorthocladius sp.
Parachironomus monochromus
P. pectinatellae
Phaenopsectra sp.
Plecopteracoluthus sp.
Polypedilum halterale
P. illinoense
P. sp.
Procladius sp.
Psectrocladius sp.
Psectrotanypus sp.
Pseudochironomus sp.
Rheotanytarsus exiguus
Polypedilum fallax
Simulium slossonae
Stenochironomus hilaris
Tanypus sp.
T. stellatus
T. carinatus
Tanytarsus sp.
Tabanus sp.
Tribelos sp.
T. jucundus
T. fuscicornis
Trichocladius sp.
Thienemanniella xena
Xenochironomus sp.
Zavrelia sp.
 unident. ceratopogonid

Coleoptera

Agabus sp.
Ancyronyx sp.
A. variegatus
Copelatus glyphicus
C. sp.
Coptotomus interrogatus obscurus
Deronectes sp.
Desmopachria grana
Dineutes sp.
D. discolor
D. emarginatus floridensis
Dubiraphia sp.
D. vittata
Dytiscus sp.
Gyrinus sp.
G. elevatus
G. floridensis

Coleoptera (cont.)

Gyrinus pachysomus
Haliphus punctatus
Helichus basales
Hydrobius tumidus
Hydroporus sp.
Hydrovatus sp.
Hydrocanthus oblongus
Macronychus glabratus
Oreodytes sp.
Peltodytes sp.
Scirtes sp.
Simsonia quadrinotata
Stenelmis sp.
S. fuscata
S. crenata
S. convexula
Stenocolus sp.
Suphisellus punctipennis
Tropisternus sp.
T. natator
T. striolatus
 unident. sp.

Arachnida

Acarina

Arrenurus sp.
Atractides sp.
Eylais sp.
Forelia sp.
Frontipoda sp..
Hydrodroma sp.
Hygrobates sp.
Lebertia sp.
Mideopsis sp.
Neumania sp.
Torrenticola sp.
Unionicola sp.
 6 unident. sp.

Mollusca

Gastropoda

Amnicola sp.
Ferrissia sp.
Gyraulus sp.
Hebetancylus excentricus
Helisoma sp.
Physa sp.
Pomacea paludosa
Pseudosuccinea sp.
 unident. hydrobiid

22.04.0002

Pelecypoda

Corbicula manilensis
Elliptio sp.
E. icterina
Eupera cubensis
Pisidium sp.
P. adamsi
P. dubium
Sphaerium partumeium
unident. sphaeriid
3 unident. unionid spp.

DATA SUMMARY: Aucilla River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate						Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
22.04.0002 685	23 Jul 73										1700			
	15 Oct 73										330			
	29 Nov 73	2.227±0.466	0.388±0.151	9							330			
	11 Dec 73										170			
	9 Jan 74										330			
	6 Feb 74										220			
	11 Mar 74										460			
	15 Apr 74										1100			
	13 May 74													
	12 Jun 74	4.435±0.245	0.063±0.017	28					3	42				
8 Jul 74								8	37		230			
	17 Sep 74	1.676±0.351	0.280±0.061	35										

See Methods for explanation of table.

DATA SUMMARY: Aucilla River (Cont.)

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
22-04-0002 386	24 Oct 74	3.771±0.188	0.056±0.019	19								1200		
	13 Jan 75											130		
	25 Feb 75	3.043±0.212	0.098±0.025	13				33	75			170		
	24 Mar 75											3300		
	19 May 75													
	20 May 75	3.043±0.447	0.319±0.080	18										
	9 Jun 75											2100		
	14 Jul 75											7900		
	11 Aug 75	3.243±0.539	0.462±0.107	15	2.437±0.319	0.292±0.075	13	33	56					
	16 Dec 75	3.118±0.283	0.157±0.040	17								1100	140	
	3 Feb 76	3.267±0.280	0.111±0.047	14	2.416±0.228	0.330±0.051	20	27	41	Coc BG LT 1 F11 BG 1 Coc Gr 11		330	130	

See Methods for explanation of table.

DATA SUMMARY: Aucilla River (Cont.)

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
22-04-0002 387	3 Feb 76 cont.								Fl Gr 7 Gr Flag 4 Other Flag 0 Ben Dia 0 Ben Dia 4 Total 28					
	8 Jun 76										790	31		
	16 Jun 76	2.678±0.276	0.204±0.067	12							490	330		
	19 Jul 76										330	240		
	2 Aug 76	2.726±0.163	0.094±0.024	10				13	39		790	33		
	29 Sep 76										950	220		
	18 Oct 76									Coc BG LT1 Fl BG LT1 Coc Gr 2 Fl Gr 1				
	9 Nov 76	3.587±0.290	0.169±0.046	25	2.920±0.272	0.291±0.041	33							

See Methods for explanation of Table.

DATA SUMMARY: Aucilla River (Cont.)

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Pteridophyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
22-04-0002 388	9 Nov 76 cont.								Gr Flag 1 Other Flag 0 Cen Dia 1 Pen Dia 2 Total 7				
	16 Nov 76										490	330	
	14 Feb 77										140	70	
	8 Mar 77	3.137±0.213	0.154±0.025	23				20					
	19 May 77	4.006±0.271	0.109±0.034	27	4.247±0.188	0.079±0.012	42	53					
	18 Jul 77										1300	280	Florida Index

See Methods for explanation of table.

DATA SUMMARY: Aucilla River (Cont.)

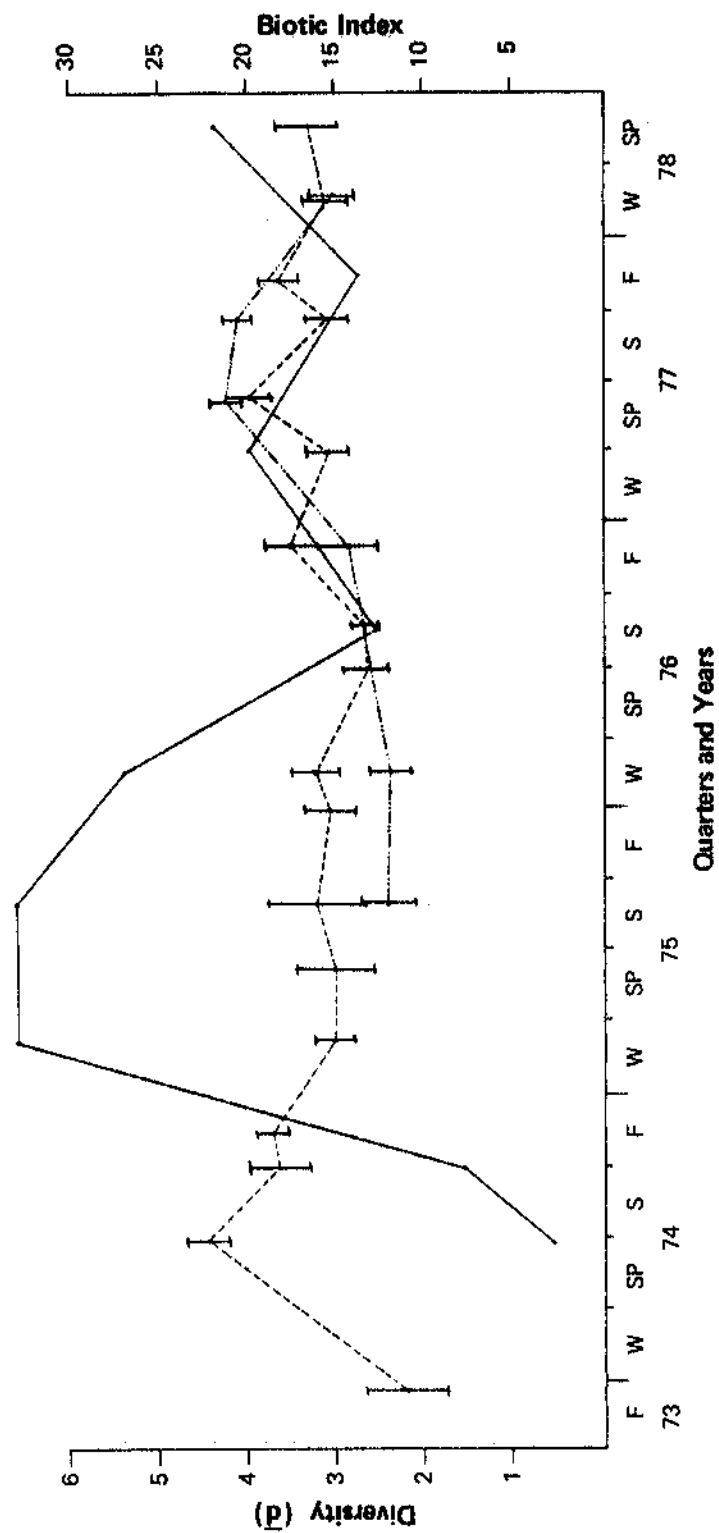
Station Number	Date	Macroinvertebrates								Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate				Artificial Substrate						Total	Fecal	
		Diversity		Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
		Diversity	Redundancy						BI					
22-04-0002	25 Aug 77	3.157±0.221	0.139±0.023	20	4.182±0.152	0.060±0.012	32			Coc BG 270 F11 BG 3220 Coc Gr 2150 F11 Gr 11830 Gr Flag 0 Other Flag 0 Gen Dia 31450 Pen Dia 44090 Total 93000	3300	70		
	18 Oct 77	3.686±0.221	0.118±0.025	27				14	51					
	10 Jan 78													
	7 Feb 78	3.172±0.225	0.096±0.028	14	3.096±0.261	0.142±0.036	16							
	1 Mar 78													
	12 Apr 78							22	36			130	33	
	9 May 78	3.374±0.173	0.158±0.057	14								460	33	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.04.0002
 BODY OF WATER: AUCILLA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 22,04,0010 Body of Water Wacissa River
Location downstream from Wacissa Spring
County Jefferson
Type Body of Water river Classification III
Sources of Pollution _____
Nearby Land Use recreation, lumbering
Sampling Frequency annually Depth 1 m
Bottom Type sand % Volatile Solids _____
Aquatic Plants: Submerged Vallisneria americana, Elodea densa, Limnorum
spongia Emergent Taxodium distichum, Najas guadalupensis,
Cladium jamaicensis, Lemna minor, Pontederia cordata

Macroinvertebrates:

Annelida

Oligochaeta

unident. spp.

Hirudinea

unident. sp.

Arthropoda

Crustacea

Amphipoda

Hyalella azteca

Decapoda

unident. sp.

Insecta

Diptera

Ablabesmyia tarella

Cladotanytarsus sp.

Corynoneura sp.

Crictopus bicinctus

Cryptochironomus sp.

Eukiefferiella sp.

Glyptotendipes sp.

Micropsectra sp.

Parachironomus monochromus

Polypedilum fallax

Diptera (cont.)

Polypedilum halterale

P. illinoense

Rheotanytarsus sp.

cf. Zavrelia sp.

Ephemeroptera

Baetis spiethi

Caenis sp.

Stenacron interpunctatum

Odonata

Argia sp.

Mollusca

Gastropoda

Ferrissia sp.

Goniobasis sp.

DATA SUMMARY: Macissa River

Station Number	Date	Macroinvertebrates							Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	#Spp.						
									HI	#Spp.				
22,04,0010 393	3 Apr 74				1.940±0.393	0.600±0.110	17				490			
	11 May 76				1.236±0.319	0.752±0.104	12				590	172		
	21 Feb 77											70		
	1 May 78	1.187±0.273	0.583±0.110	7							172400	2		

See Methods for explanation of table.

Station No. 22.04.0016 Body of Water Little Aucilla River
Location at US 90
County Madison
Type Body of Water river Classification
Sources of Pollution agricultural runoff

Nearby Land Use natural, agricultural
Sampling Frequency Depth 2 meters
Bottom Type sand % Volatile Solids
Aquatic Plants: Submerged Ludwigia sp., Hydrocotyle sp.
Emergent Salix sp., Taxodium sp., Panicum sp., Juncus sp.

Macroinvertebrates:

Annelida

Oligochaeta

Dero obtusa
Eclipidrilus palustris
Limnodrilus hoffmeisteri
Lumbriculus sp.
Nais communis
Premnodrilus palustris
Slavina appendiculata

Arthropoda

Crustacea

Isopoda

Asellus obtusus

Amphipoda

Crangonyx sp.

Decapoda

Palaemonetes kadiakensis
Procambarus sp.

Insecta

Odonata

Agrion dimidiatum
Enallagma sp.
Tetragoneuria sp.

Ephemeroptera

Callibaetis floridanus
Ephemerella trilineata
Leptophlebia sp.

Hemiptera

Hesperocorixa sp.
Plea striola
Ranatra sp.

Trichoptera

Ceraclea sp.
Hesperophylax sp.
Ironoquia sp.
Nectopsyche sp.
Molanna sp.
Oxyethira sp.
Phylocentropus sp.
Pycnopsyche sp.

Diptera

Ablabesmyia ornata
Anopheles sp.
Chironomus carus
Clinotanypus sp.
Cnephia pecuarum
Corynoneura taris
Cricotopus bicinctus
Cryptochironomus fulvus
Culicoides sp.
Helius sp.
Heterotrissocladius sp.
Labrundinia floridana
Nanocladius sp.
Parachironomus pectinatellae
Parorthocladius sp.
Phaenopsectra obediens
Polypedilum fallax
P. illinoense
Procladius sp.
Psectrocladius vernalis
Rheotanytarsus exiguus
Simulium congareenarum
Stenochironomus hiliaris
Tanytarsus sp.
Tipula sp.
Tribelos fuscicornis

22.04.0016

Coleoptera

Coptotomus interrogatus obscurus

Deronectes sp.

Dactylosternum sp.

Enochrus cinctus

Haliphus punctatus

Hydroporus sp.

Dineutus discolor

Matus ovatus blatchleyi

Peltodytes sp.

Stenelmis sinuata

Tropisternus sp.

Mollusca

Gastropoda

Ferrissia sp.

DATA SUMMARY: Little Aucilla River

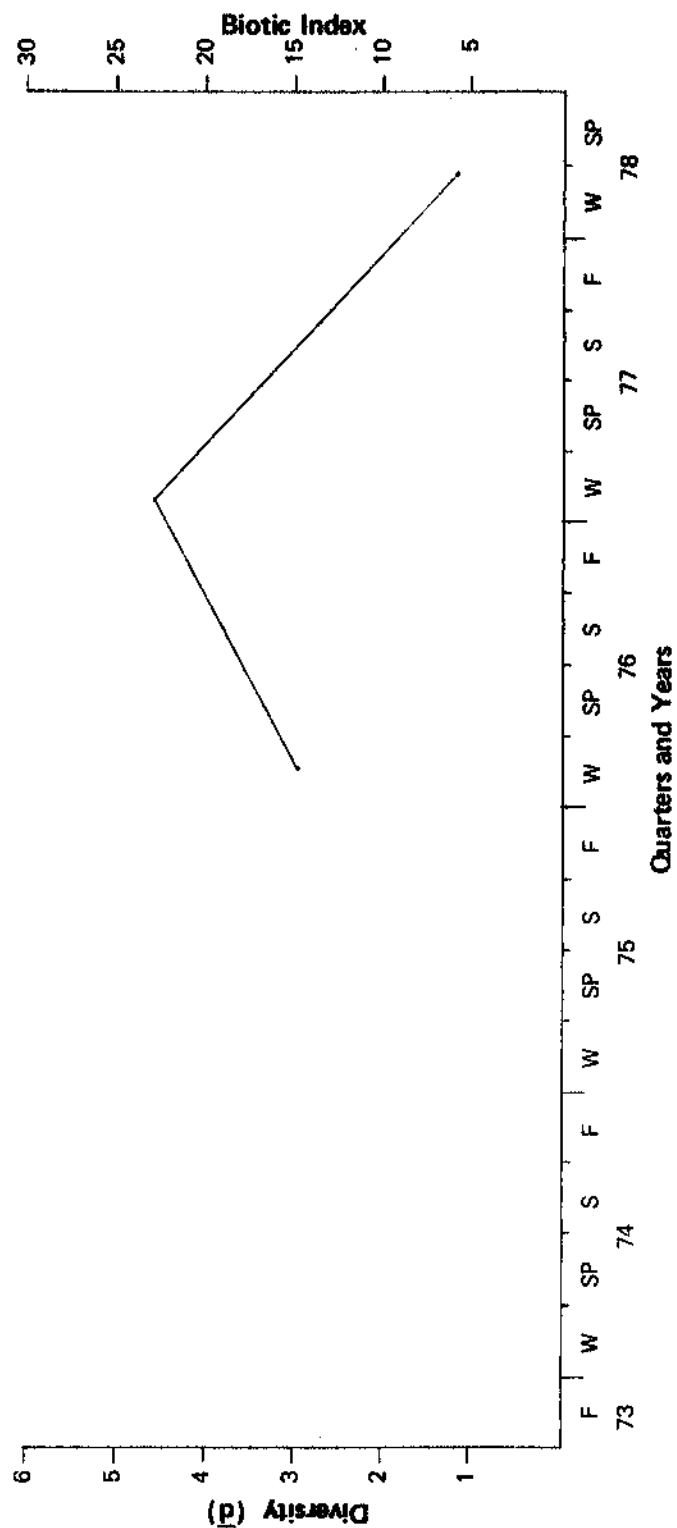
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
397	22.04.0016	9 Feb 76						15	30				Florida Index	
		19 Jan 77					23	58						
		7 Mar 78			0.329±0.133	0.916±0.053	5	6	32					

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.04.0016
 BODY OF WATER: LITTLE AUCILLA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Decapoda

Palaemonetes paludosus
Procambarus sp.

Odonata

Enallagma sp.
Ischnura sp.
Libellula vibrans
Macromia taeniolata
Perithemis tenera

Ephemeroptera

Baetis sp.
Caenis diminuta

Hemiptera

Sigara (Phaeosigara) sp.

Diptera

Ablabesmyia parajanta
A. tarella
Chaoborus sp.
Cladotanytarsus sp.
Clinotanypus sp.
Cryptochironomus fulvus
Einfeldia sp.
Glyptotendipes sp.
Lauterborniella sp.
Microtendipes sp.
Paralauterborniella nigrohalteralis
Polypedilum halterale
P. illinoense
Procladius sp.
Simulium sp.
Tanytarsus sp.
Tribelos fuscicornis
unident. ceratopogonid sp.

Coleoptera

Gyrinus pachysomus
Peltodytes sexmaculatus

Arachnida

Acarina

Arrenurus sp.
Frontipoda sp.
Krendowskia sp.
Limnesia sp.
Mideopsis sp.
Neumania sp.
Oxus sp.

22.05.0025

Mollusca

Gastropoda

Amnicola sp.
Goniobasis sp.
Gyraulus sp.
Helisoma sp.
Physa sp.
Viviparus georgianus

Pelecypoda

Eupera cubensis
Pisidium sp.
Sphaerium partumeium

DATA SUMMARY: Steinhatchee River

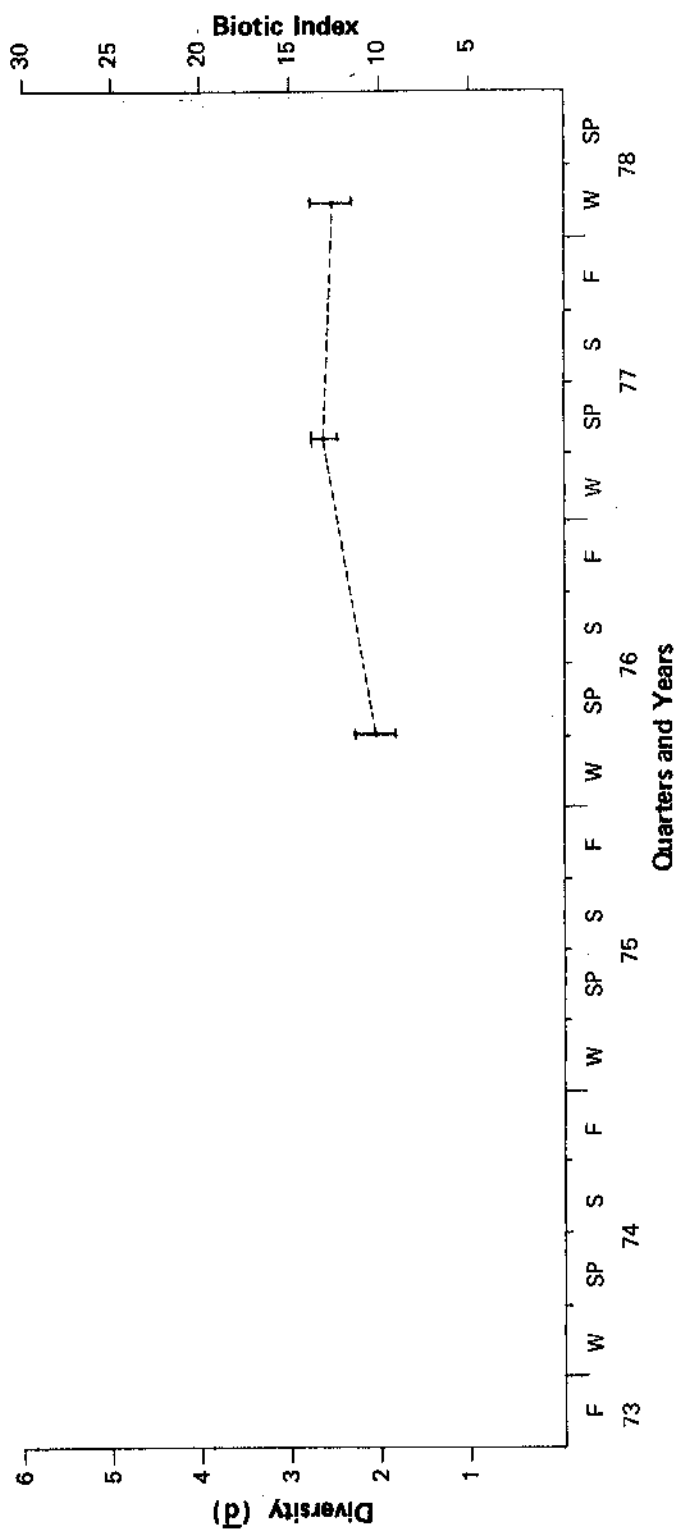
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
22-05-0025	18 Mar 74										230		Florida Index
	16 Jun 75										7000		
	18 Mar 76	2.066±0.221	0.290±0.057	11									
	30 Mar 77	2.630±0.174	0.265±0.033	25				13	48				
	31 Jan 78	2.572±0.229	0.210±0.041	14									

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.05.0025
 BODY OF WATER: STEINHATCHEE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 22.05.0029 Body of Water Fenholloway River

Location at SR 356 near Hampton Springs

County Taylor

Type Body of Water river Classification

Sources of Pollution pasture and paper mill

Nearby Land Use pasture, woods

Sampling Frequency annually Depth 2 m

Bottom Type sand, detritus % Volatile Solids

Aquatic Plants: Submerged

Emergent Lemna sp., Salix sp., Ludwigia sp.,

Wolffiella sp., Typha sp., Hydrocotyle sp.

Macroinvertebrates:

Cnidaria

Hydrozoa

Hydra americana

Annelida

Oligochaeta

Ilyodrilus templetoni

Limnodrilus hoffmeisteri

Tubifex tubifex

unident. naidid

Arthropoda

Insecta

Diptera

Chironomus stigmaterus

Mollusca

Gastropoda

Laevapex sp.

Physa sp.

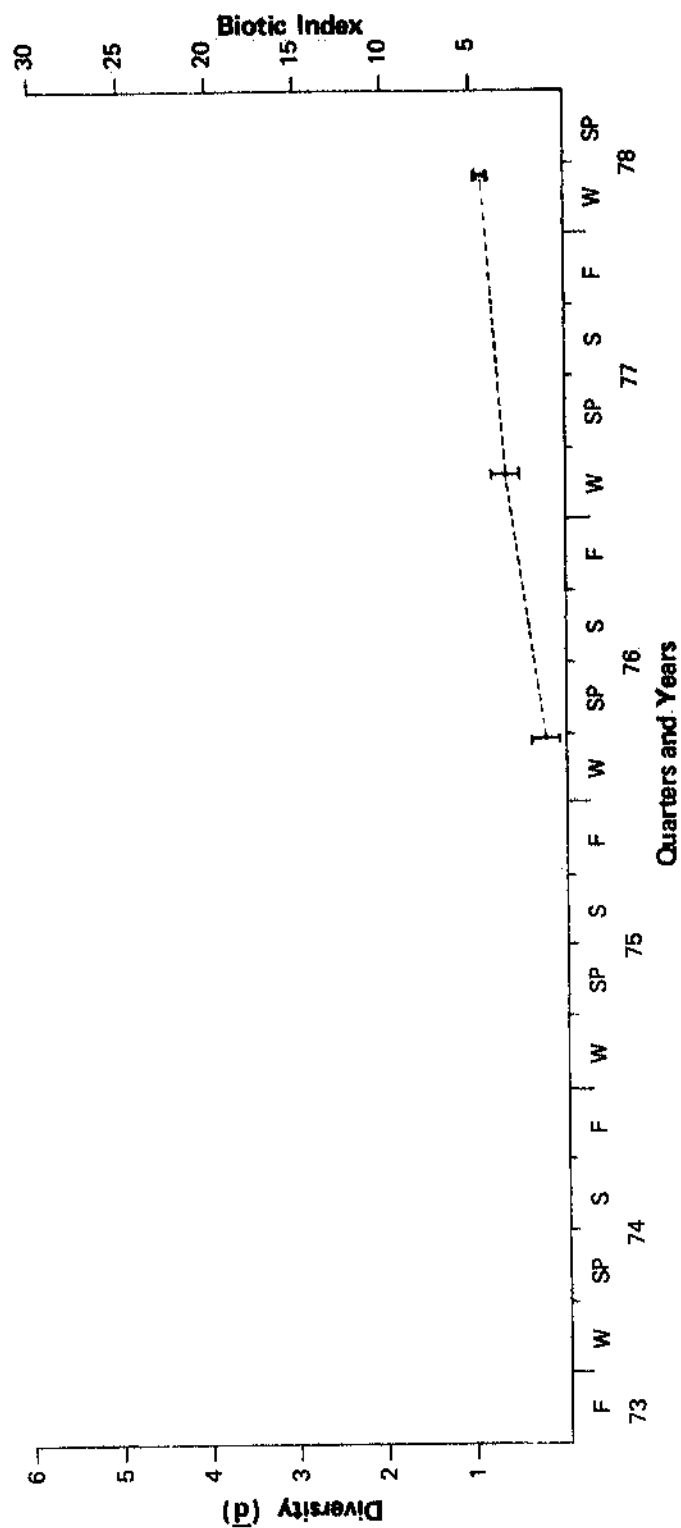
Promenetus sp.

DATA SUMMARY: Featherholloway River

Station Number	Date	Macroinvertebrates										Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate			BI	#Spp.	Total	Fecal					
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.									
405	23 Aug 73												490			
	19 Nov 73												3900			
	28 Jan 74												490			
	11 Feb 74												350			
	11 Mar 74												40			
	1 Mar 76	0.229±0.145	0.938±0.070	3												
	11 Feb 77	0.670±0.157	0.817±0.058	9												
	23 Feb 78	0.977±0.021	0.032±0.029	2									350	220		
	1 Mar 78															

See Methods for explanation of table.

STATION NO.:	22.05.0029	
BODY OF WATER:	FENHOLLOWAY RIVER	
		NATURAL SUBSTRATE DIVERSITY
		ARTIFICIAL SUBSTRATE DIVERSITY
		BIOTIC INDEX (= FLORIDA INDEX)



Station No. 22.05.0038 Body of Water Econfina River

Location dirt road approximately 3 mi. N of US 96

County Taylor

Type Body of Water river Classification _____

Sources of Pollution none

Nearby Land Use _____

Sampling Frequency annually Depth 1.25 - 2.4 m

Bottom Type sand, leaves % Volatile Solids _____

Aquatic Plants: Submerged _____

Emergent Salix sp., Najas sp., Nuphar sp., Taxodium sp.

Hydrocotyle sp., Ludwigia sp., Spirodela sp.

Macroinvertebrates:

Porifera

Spongilla sp.

Platyhelminthes

Turbellaria

Dugesia tigrina

Annelida

Oligochaeta

Eclipidrilus palustris
Limnodrilus hoffmeisteri
unident. naidid
unident. tubificid

Hirudinea

Helobdella elongata
unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus communis
A. intermedius

Amphipoda

Crangonyx floridanus
Gammarus tigrinus

Decapoda

Palaemonetes paludosus
Procambarus sp.
P. paeninsulanus

Insecta

Odonata

Argia sp.
A. tibialis
A. moesta
Boyeria vinosa
Dromogomphus spinosus
Enallagma sp.
E. cardenium
Epicordulia regina
Gomphus sp.
G. pallidus
Hetaerina titia
Ischnura sp.
Lestes sp.
Libellula sp.
Macromia sp.
M. taeniolata
Plathemis lydia
Progomphus sp.
Somatochlora sp.
Tetragoneuria semiaquea
T. sepia

Ephemeroptera

Baetis spiethi
B. spinosus
Caenis diminuta
Callibaetis floridanus
Ephemerella trilineata
Pseudocloeon puntiventris
Stenacron interpunctatum
Stenonema smithae

Hemiptera

unident. corixid

Trichoptera

Ceraclea sp.
Cheumatopsyche sp.
Chimarra sp.
C. socia
Hydatophylax sp.
Nectopsyche sp.
N. candida
Oecetis sp.
Polycentropus sp.
Pseudostenophylax sp.

Megaloptera

Corydalis cornutus
Sialis sp.

Lepidoptera

Nymphula sp.

Diptera

Ablabesmyia aspera
A. mallochi
A. ornata
A. parajanta
A. tarella
Corynoneura taris
Cryptochironomus fulvus
Dicrotendipes lobus
D. neomodestus
D. nervosus
Eukiefferiella sp.
Labrundinia floridana
Orthocladius annectens
Palpomyia-Bezzia sp. 1 - Kelly
Parachironomus monochromus
Paralauterborniella nigrohalteralis
Parametriocnemus sp.
Pedionomus beckae
Pentaneura inculta
Polypedilum convictum
P. halterale
P. illinoense
Procladius sp.
Rheotanytarsus exiguus
Rheocricotopus robacki
Simulium jenningsi
S. slossonae
Tanytarsus sp.
Thienemanniella xena
Tribelos jucundus
Trissocladius sp.
unident. ceratopogonid

Coleoptera

Agabus sp.
Coptotomus interrogatus obscurus
Deronectes sp.
Dineutus sp.
Dubiraphia sp.
Gyrinus sp.
G. pachysomus
Haliphus mutchleri
Helichus sp.
Hydroporus sp.
Macronychus glabratus
Peltodytes sp.

Coleoptera (cont.)

Peltodytes sexmaculatus

Stenelmis sp.

Arachnida

Acarina

Atractides sp.

Hydrochoreutes unguatus

Lebertia sp.

Neumania sp.

Piona sp.

Unionicola sp.

Sperchon sp.

Mollusca

Gastropoda

Amnicola sp.

Ferrissia sp.

Gyraulus sp.

Helisoma sp.

Physa sp.

Pomacea paludosa

Promenetus sp.

Pelecypoda

Pisidium sp.

Sphaerium partumeium

DATA SUMMARY: Econfina River

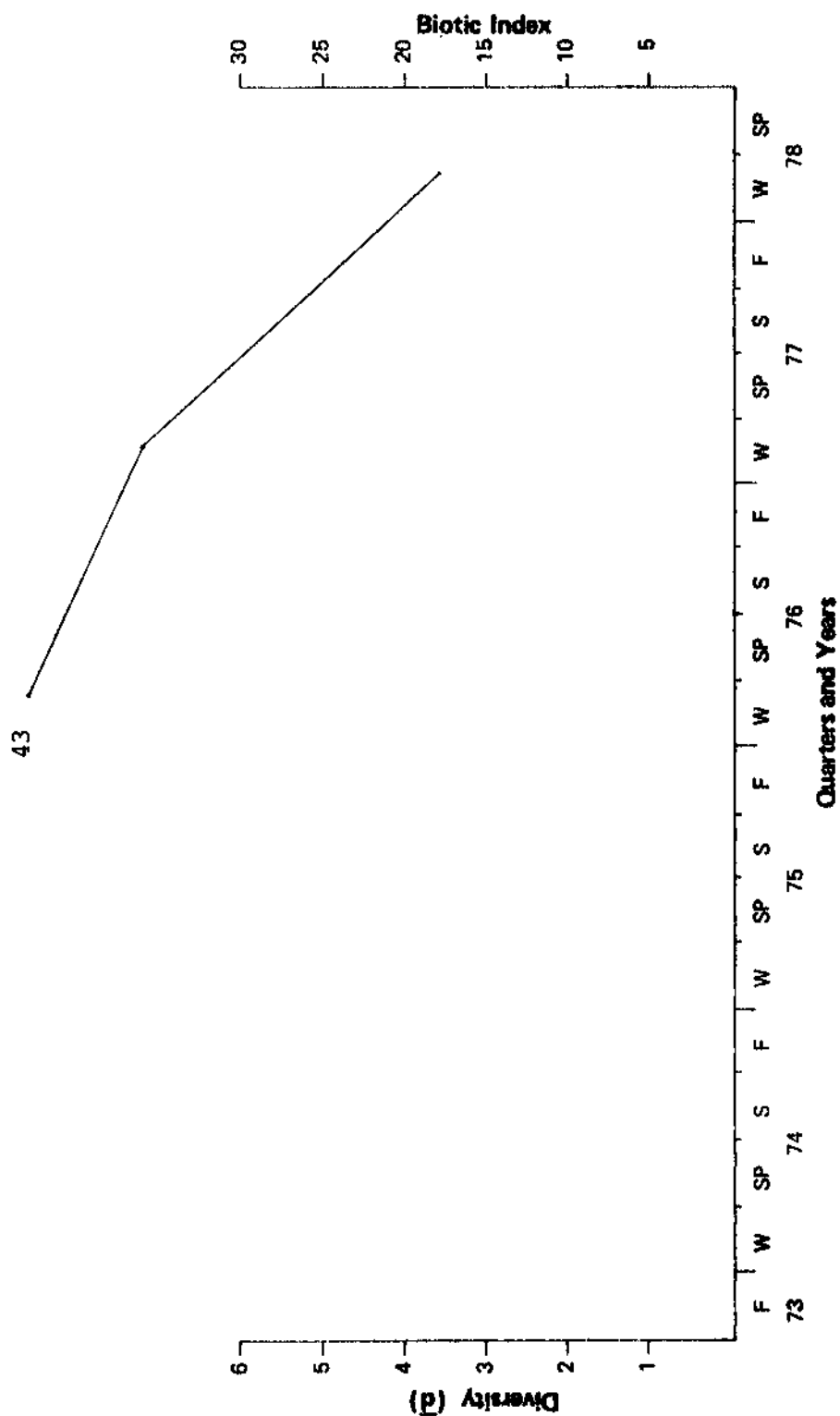
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
22.05.0038 411	4 Mar 74											330		
	3 Jun 74											230		
	27 May 75											220		
	8 Mar 76	4.022±0.227	0.116±0.024	38				43	59					
	1 Feb 77							30	68					
	21 Feb 78							18	34			220	23	Pla. Index
	12 Apr 78													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.05.0038
 BODY OF WATER: ECONFINA RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 22.05.0049 Body of Water Gulf of Mexico

Location at Spring Warrior Creek, 1/4 mile out from marker

County Taylor

Type Body of Water estuary Classification

Sources of Pollution

Nearby Land Use marsh

Sampling Frequency annually Depth 0.4 - 1.3 m

Bottom Type shell, muck, sand % Volatile Solids

Aquatic Plants: Submerged

Emergent Spartina alterniflora, Juncus roemerianus

Macroinvertebrates:

Rhynchocoela

cf. Carinoma tremaphoros
cf. Tubulanus pellucidus
unident. sp.

Annelida

Oligochaeta

Pelosclex cf. gabriellae
unident. tubificid

Hirudinea

unident. ichthyobdellid

Polychaeta

Aricidea taylori
Diopatra cuprea
Eteone heteropoda
Glycera americana
Glycinde solitaria
Gyptis brevipalpa
Haploscoloplos foliosus
H. fragilis
Magelona pettiboneae lanceolata
Mediomastus sp.

Polychaeta (cont.)

Melinna maculata
Onuphis magna
Paraprionospio pinnata
Sigambra bassi
Streblospio benedicti
Tharyx sp.
 unident. capitellid
 unident. maldanid
 unident. nereid
 unident. paraonid

Arthropoda

Isopoda

Edotea montosa
 unident. sphaeromid

Amphipoda

Ampelisca abdita
Gammarus mucronatus
Grandidierelle bonnieroides
Melita nitida
Monoculodes sp.

Decapoda

Pagurus pollicaris
Palaemonetes vulgaris
Rhithropanopeus harrisii

Mysidacea

Mysidopsis bigelowi

Cumacea

Leptocuma minor

Tanaidacea

unident. sp.

Mollusca

Gastropoda

Polinices duplicatus

Pelecypoda

Acteocina canaliculata
Brachidontes exustus
Haminoea succinea
Macoma tenta
Tellina alternata
 unident. tellinid

22.05.0049

Echinodermata

Ophiuroidea

Ophiophragmus filograneus

Sipunculida

cf. Phascolosoma sp.

DATA SUMMARY: Gulf of Mexico at Spring Warrior Creek

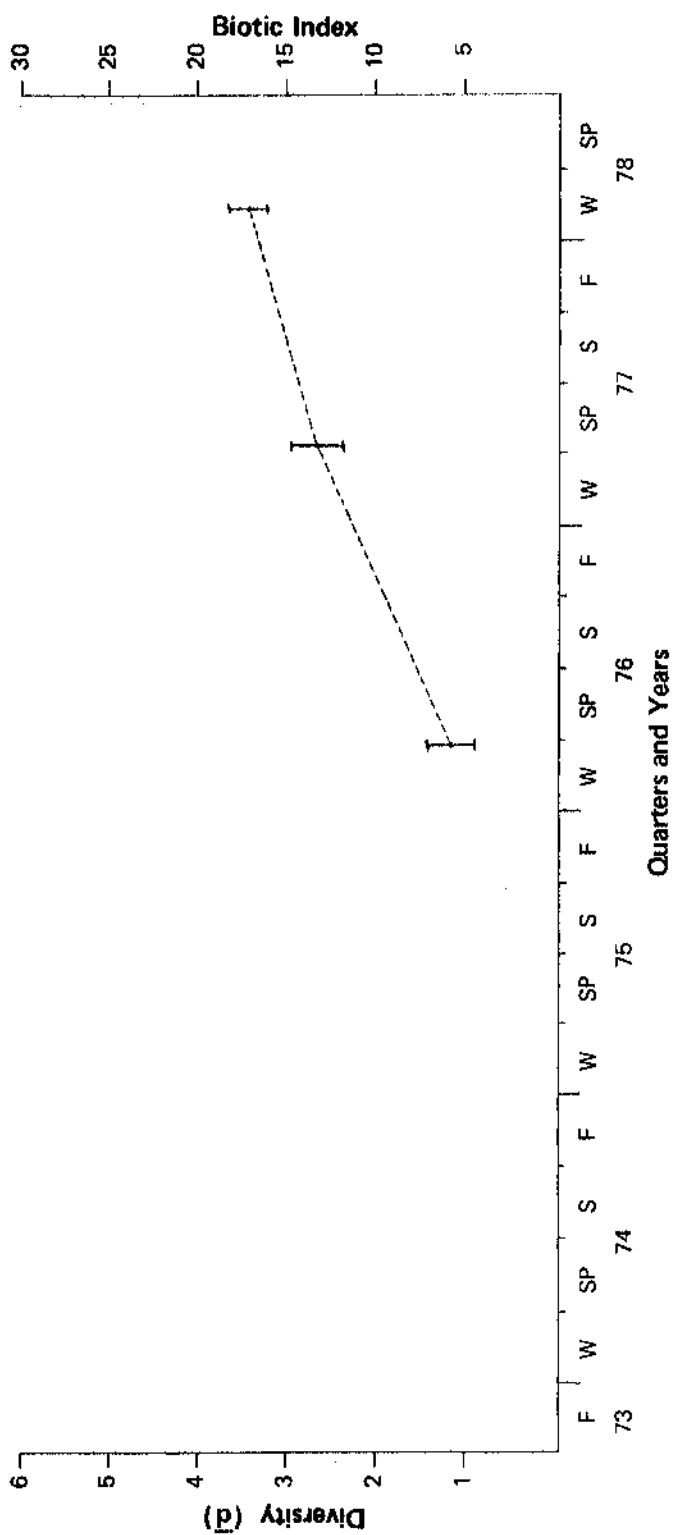
Station Number	Date	Macroinvertebrates							Rlotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
22.05.0049	3 Mar 76	1.221±0.267	0.768±0.079	16										
	21 Mar 77	2.766±0.238	0.280±0.949	23										
	31 Jan 78	3.556±0.212	0.116±0.027	24										

See methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.05.0049
 BODY OF WATER: GULF OF MEXICO AT
 SPRING WARRIOR CREEK

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 22.05.0050 Body of Water Gulf of Mexico
Location at Horseshoe Point
County Dixie
Type Body of Water ocean Classification _____
Sources of Pollution _____
Nearby Land Use natural, town
Sampling Frequency annually Depth 1m
Bottom Type sand, shell, mud % Volatile Solids _____
Aquatic Plants: Submerged Thalassia testudinum, Syringodium filiforme,
Caulerpa prolifera Emergent _____

Macroinvertebrates:

Cnidaria
 Anthozoa unident. actiniarian

Platyhelminthes
 Turbellaria unident. sp.

Rhynchocoela
 cf. Carinoma tremaphoros
 cf. Tubulanus pellucidus
 unident. sp. 1 - Cormier
 unident. sp. 3 - Cormier
 unident. sp. 4 - Cormier
 unident. sp. 5 - Cormier

Annelida
 Oligochaeta Monopylephorous sp.
 Peloscolex sp.
 cf. Tubifex sp.

Polychaeta
 Aricidea taylori
 Asabellides sp. 1 - Cormier
 cf. Arenicola cristata
 Autolytus sp.
 Axiiothella mucosa

Polychaeta (cont.)

Brania clavata
Capitomastus sp.
Caulleriella sp.
 cf. Chone sp.
Dexiospira corrugatus
 cf. Dasychone sp.
Diopatra cuprea
Exogone dispar
Fabricia sp.
Glycera americana
Glycinde solitaria
Gyptis brevipalpa
Haploscoloplos foliosus
Heteromastus filiformis
Lumbrineris impatiens
Magelona sp.
Mediomastus sp.
Mellina maculata
Nereis sp.
N. falsa
N. succinea
Odontosyllis sp.
Onuphis magna
 cf. Oriopsis sp.
Owenia fusiformis
Pectinaria gouldii
Phyllodoce (Anaitides) mucosa
Pista palmata
Platynereis dumerilii
Polydora sp.
Prionospio cirrifera
P. heterobranchia
Podarke obscura
Sabella sp.
Scoloplos rubra
Shistomeringos cf. caeca
Streblospio benedicti
 cf. Sphaerosyllis hystrix
Syllis cornuta
 unident. phyllodocid
 unident. serpulid
 unident. spionid

Arthropoda

Crustacea

Isopoda

Cleantis planicauda
Erichsonella filiformis

Isopoda (cont.)

Paracerceis caudata

Amphipoda

Ampelisca sp.

A. vadorum

A. abdita

Amphilocheus sp.

Ampithoe sp.

Batea sp.

B. catharinensis

cf. Carinobatea sp.

Corophium sp.

Cymadusa sp.

Elasmopus levis

Erichthonius brasiliensis

Gammarus sp.

cf. Gitantopsis sp.

Heterophlias seclusus

Lembos websteri

L. smithi

Lysianopsis alba

Melita appendiculata

Monoculodes sp.

Pontogeneia sp.

Rudilemboides naglei

Stenothoe sp.

Synchelidium sp.

Microdeutopus sp.

unident. lysianassid

unident. dexaminiid

unident. pleustid

unident. ampithoid

Decapoda

Eurypanopeus abbreviatus

Mycrophrys bicornutus

Neopanopes texana

Palaemonetes pugio

Pagurus longicarpus

Pinnixa chaetopterana

P. sayana

Sicyonia brevirostris

Caprellidea

Caprella sp.

Mysidacea

Mysidopsis sp.

Tanaidacea

Leptochelia sp.
unident. sp.

Cumacea

Cyclaspis varians
Oxyurostylis smithi

Mollusca

Polyplacophora

cf. Chaetopleura apiculata

Gastropoda

Batillaria minima
Cerithium sp.
Crepidula fornicata
C. maculosa
Haminoea succinea
Mitrella lunata
Nassarius vibex
Olivella mutica
O. pusilla
Prunum apicinum
Persicula sp.
Acteocina canaliculata
Rissoina cf. bryerea
R. browniana
Turbonilla sp.
Urosalpinx tampaensis

Scaphopoda

Dentalium sp.

Pelecypoda

cf. Abra aequalis
Brachidontes exustus
Glycymeris cf. undata
Laevicardium cf. pictum
Lucina nassula
Mercenaria campechiensis
cf. Siliqua sp.
Tellina cf. tenella
T. alternata
T. sp.
unident. mytilid

22.05.0050

Echinodermata

Ophiuroidea

Ophiothorix angulata

Ophiophragmus filograneus

Holothuroidea

Synapta inhaerens

cf. Thyone sp.

Phoronida

Phoronis architecta

Sipunculida

cf. Phascolosoma sp.

Hemichordata

unident. enteropneustan

Chordata

Cephalochordata

Branchiostoma virginiae

DATA SUMMARY, Gulf of Mexico at Horseshoe Point

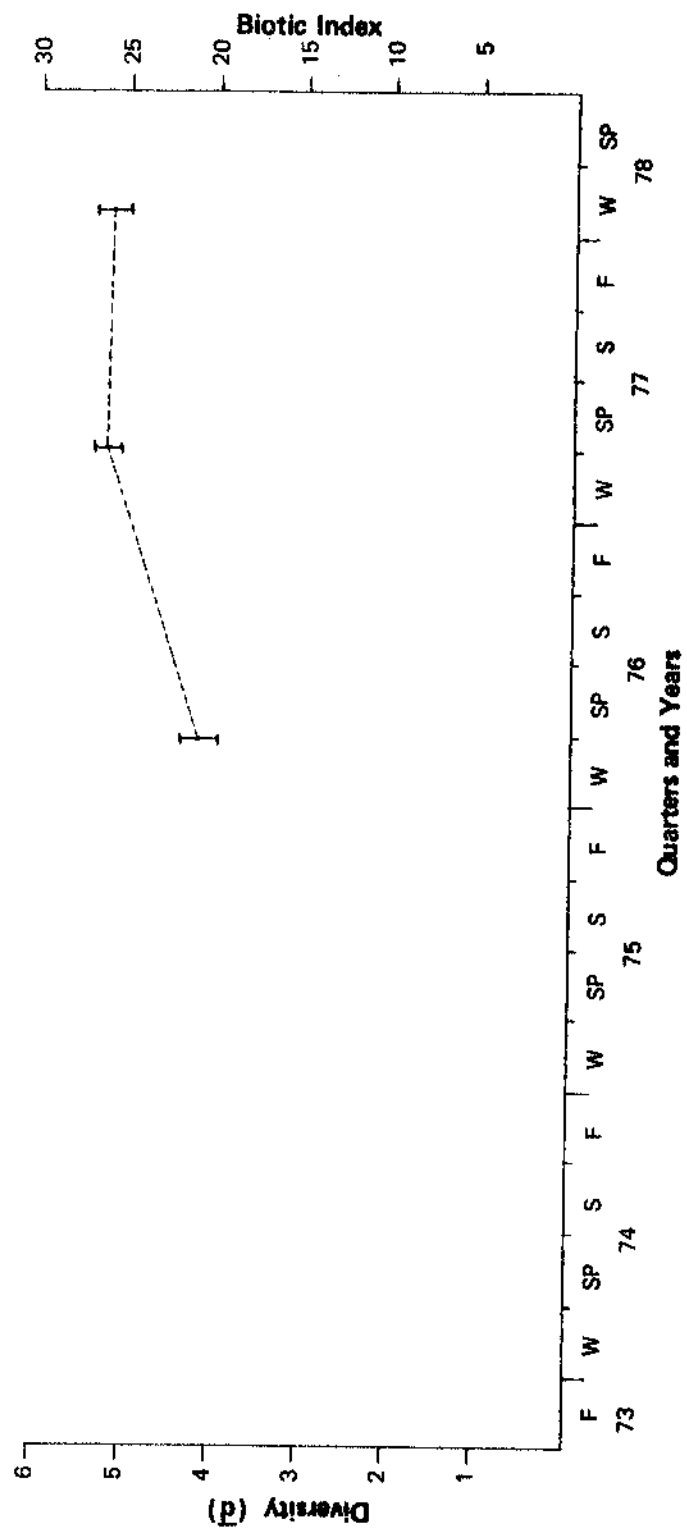
Station Number	Date	Macroinvertebrates							Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate								
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
								#1	#Spp.				
22.05.0050	15 Mar 76	4.201±0.206	0.085±0.017	38									
	22 Mar 77	5.260±0.166	0.057±0.009	85									
	30 Jan 78	4.211±0.195	0.204±0.028	74									

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 22.05.0050
 BODY OF WATER: GULF OF MEXICO AT HORSESHOE POINT

--- NATURAL SUBSTRATE DIVERSITY
 - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



SUWANNEE DRAINAGE BASIN

The Suwannee River Drainage Basin in Florida encompasses approximately 4,100 square miles of the northwest corner of the peninsula. This area is the smaller portion of a basin which drains approximately 11,100 square miles in south central Georgia and north Florida. The upper Suwannee River Sub-basin includes the upper Suwannee and its two interstate tributaries, the Alapaha and the Withlacoochee. The headwaters of the Suwannee River are in the Okefenokee Swamp. The Santa Fe River Sub-basin includes the western portion of the Suwannee River basin. The lower Suwannee River Sub-basin includes the Suwannee River from its confluence with the Withlacoochee River to its mouth, at the Gulf of Mexico. The Suwannee and its three largest tributaries, the Alapaha, the Santa Fe, and the Withlacoochee Rivers, are fast-flowing streams with channels cut through shallow overburden into the limestone which underlies the entire basin. This porous limestone contributes toward the importance of this basin, especially the Santa Fe River area, in the recharge of the Floridan aquifer.

Upper Suwannee River Sub-Basin

Three stations were monitored in this sub-basin during the report period: Falling Creek at SR 246 before it enters the Suwannee River from the south above White Springs (21.01.0018); Suwannee River at SR 136 near White Springs (21.02.0006); and Withlacoochee River, at SR 6 (21.01.0002) before it enters the Suwannee River near Ellaville.

The Falling Creek station was sampled only twice during the period of record. Although Biotic Index numbers were somewhat low (4 and 5) the numbers of species collected (32 and 31, respectively) suggest that this probably was not a pollution problem. This seems reasonable since the stream is primarily tannic swamp drainage and often with no flow. In such a system, dissolved oxygen can naturally drop to low concentrations, which may eliminate many of the sensitive indicator organisms; yet, other problems often associated with pollution (e.g. high suspended solids) are absent, thus allowing many other forms to survive.

Despite its number, station 21.02.0006 lies in the Upper Suwannee River Sub-basin. Macroinvertebrate diversity was generally very good and Biotic Index numbers were acceptable. The presence of Plecoptera (stonefly) larvae suggested that this is a clean fast flowing river. Significant improvements in natural and artificial substrate diversities were unexplained. Rare records of high total coliform counts (they were usually low) probably were caused by runoff.

The Withlacoochee River flows from south Georgia into Florida near Bellville. Only one natural substrate sample and three qualitative samples were collected at station 21.01.0002 during the report period. However, the macroinvertebrate diversity and Biotic Index values suggested good, though not exceptional, water quality.

Santa Fe River Sub-Basin

The Santa Fe River flows due westward from Santa Fe Lake (also called Big Santa Fe Lake) in eastern Alachua County to enter the Suwannee River south of Branford. Station 21.03.0052, in Santa Fe Lake, was sampled for macroinvertebrates once a year from 1975 through 1977. The diversities indicated a good macroinvertebrate community, and, although no significant trend was measured, visual inspection of the data suggested the possibility of improvement. The only known pollution source on the lake was residential runoff.

Lake Sampson, station 21.03.0029, drains through Sampson Creek to the Santa Fe River. It was sampled only twice during the report period, but the macroinvertebrate diversities obtained were judged to be good and excellent, respectively.

Station 21.03.0001, Santa Fe River at SR 235, near Brooker, was sampled qualitatively once each year, 1975-77. The Biotic Index values calculated were slightly low (range= 7-13) considering the high numbers of species collected (40-52). The only nearby pollution source was pasture runoff which although not considered heavy organic pollution, may have occasionally caused slightly depressed oxygen levels and, therefore, low Biotic Index numbers.

The New River, station 21.03.0053, at SR 100, originates in southeast Baker County and flows southwestward, forming the Bradford-Union County line, to enter the Santa Fe River near Worthington Springs. It was sampled annually for natural substrate macroinvertebrates from 1975-77 and the diversities indicated excellent water quality.

Olustee Creek, station 21.03.0051, at SR 238, flows from Ocean Pond southward forming the Union-Columbia County line, to the Santa Fe River. It was sampled qualitatively four times from 1975-77. Biotic Index values were fair but not good. Although, visually, the data showed an upward trend, the significance was not tested due to the few samplings.

The Ichetucknee River, station 21.03.0050, at US 27, originates at Ichetucknee Springs and, after a short run along the Columbia-Suwannee County line, enters the Santa Fe River south of Hildreth. The springs and rivers constitute a very heavily used recreation area. Macroinvertebrate diversities calculated from artificial substrate samples were excellent. Only one natural substrate sample was taken. It had a good diversity, which would have been better were it not for a density of Goniobasis sp., a low dissolved oxygen intolerant snail, of 1390/m². This concentration was ten times greater than the next most numerous species. Although only four bacteria samples were analyzed, the somewhat high counts might have been due to the heavy recreational use.

Station 21.03.0004 is on the Santa Fe River at US 129. The macroinvertebrate diversity numbers were generally good to excellent. The notable exception (0.719) was probably due to flow related sediment scouring. Total coliform counts were occasionally high, probably from runoff.

Alligator Lake, station 21.03.0054, lies in Columbia County on the south-east side of Lake City. It was sampled once annually from 1975-77. The macroinvertebrate diversities suggested a fairly good community but several of the species collected were pollution tolerant forms and there was a lack of intolerant forms.

Lower Suwannee River Sub-Basin

Station 21.02.0034, Suwannee River at SR 51, near Luraville was sampled from 1974 through 1976. Although macroinvertebrate diversities varied, they were basically good. The exotic clam, Corbicula manilensis, was found in numbers at this station.

The Suwannee River at US 27, station 21.02.0035, had good macroinvertebrate diversities early in the report period but showed a significant downward trend. No explanation for this is readily apparent. Small amounts of domestic waste and runoff are the only known sources in the area. These may have caused the decline or it may have been a false trend caused by sampling error due to strong flow. If the latter is the case, the trend should disappear in the future as the cumulative number of samplings increases. Class III standards for total and fecal coliform bacteria were exceeded once according to the records.

The Suwannee River station at US 19/98, 21.02.0031, had notably variable macroinvertebrate diversities (poor to very good) in natural substrate samples. This station is subject to variable and occasionally heavy flow, which probably explains this range of natural substrate diversities. In fact, the significant improvement noted in this indicator was probably more a result of improved sampling techniques than of improved water quality. Artificial substrate diversities, less subject to flow effects, were higher (i.e., excellent) and more consistent than those for natural substrates and showed no significant trend during the report period. Biotic Index values were also quite variable-probably flow related-and showed no significant trend. Bacteria counts were usually low with occasionally higher numbers probably from runoff.

Of note, biologically, Corbicula manilensis was found in large numbers at this station as well as at stations 21.02.0034 and 21.02.0035. Another collection of special interest was that of the mayfly, Dolania americana, previously reported only from the Savannah and Blackwater Rivers.

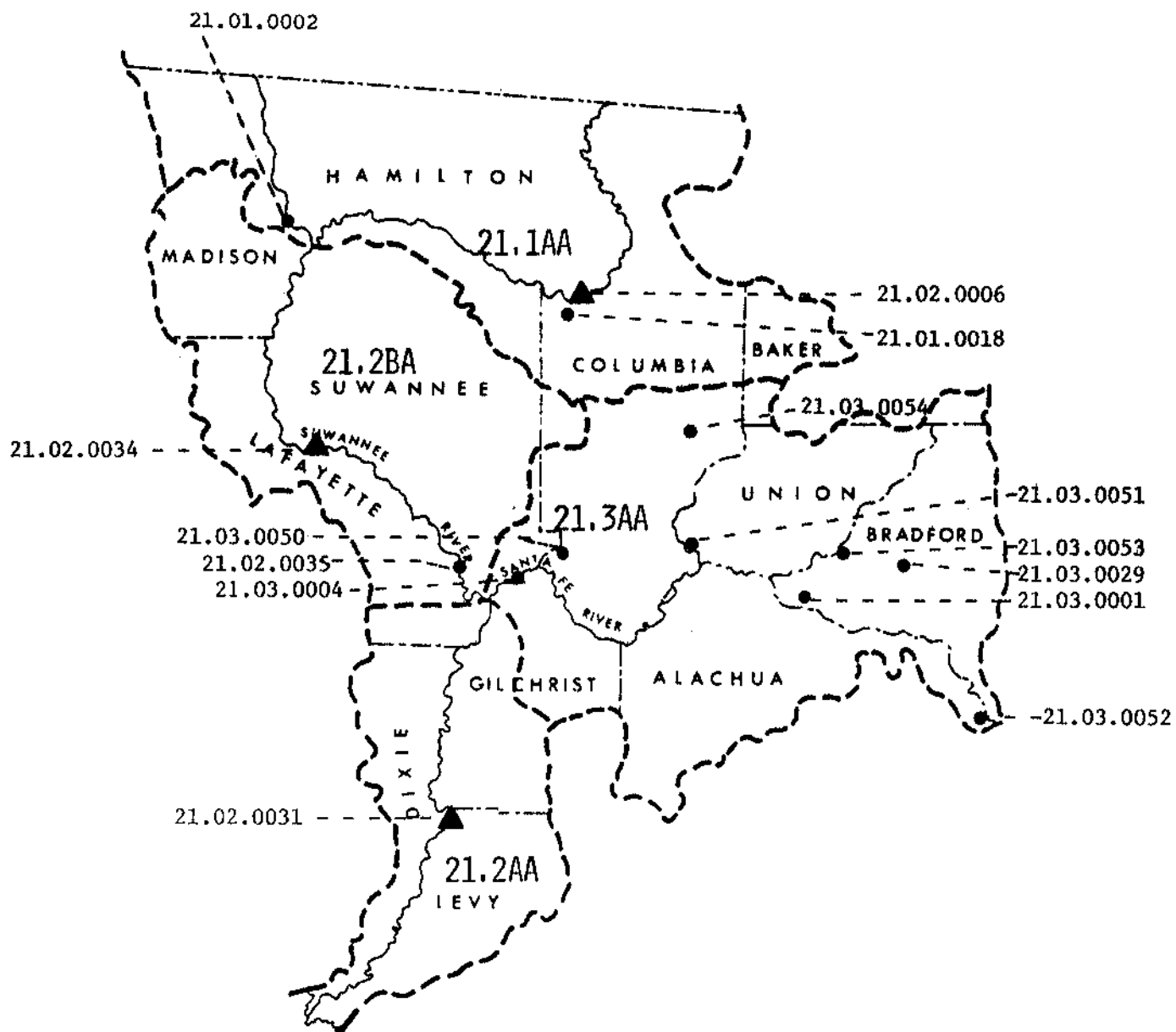
Summary

Because this basin is relatively undeveloped compared to many others in Florida, it was not monitored as extensively as some. This sometimes made it difficult to draw conclusions about apparent water quality, and to detect and explain trends.

The Suwannee River appears to have very good water quality throughout its length in Florida as reflected by the biota. Occasionally strong flow and bottom scouring appeared to cause inconsistent natural substrate sampling success, but artificial substrates always indicated very good community diversity. The only data for the basin tested for significant trends were those from three of the Suwannee River stations. One of these showed an upward trend, one had no significant change, and one displayed a decline in macroinvertebrate diversity. No confident explanations were apparent from the available information.

Although Santa Fe Lake and the upper reaches of the Santa Fe River had fairly good macroinvertebrate diversities, the river's water quality appeared to improve somewhat in its lower reaches. This was probably due to the clean swamp and spring water inflow from New River, Olustee Creek, and Ichetucknee River.

SUWANNEE RIVER BASIN



Station No. 21.01.0002 Body of Water Withlacoochee River

Location at SR 6

County Hamilton - Madison

Type Body of Water river Classification

Sources of Pollution paper mill effluent, light residential runoff

Nearby Land Use silviculture

Sampling Frequency annually Depth 0.6 - 2.4 m

Bottom Type coarse sand, detritus, rocks & Volatile Solids

Aquatic Plants: ^{gravel} Submerged

Emergent Taxodium distichum, Betula, Salix,

Nyssa ogeche

Macroinvertebrates:

Platyhelminthes

Turbellaria

Dugesia tigrina
unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
Tubifex sp.
unident. lumbriculid

Hirudinea

Helobdella elongata
unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus laticaudatus
A. racovitzai

Amphipoda

Gammarus tigrinus

Hyalella azteca

Decapoda

Palaemonetes paludosus

Procambarus sp.

Insecta

Odonata

Argia sp.

A. moesta

A. sedula

A. tibialis

Didymops transversa

Dromogomphus spinosus

D. spoliatus

Erythemis simplicicollis

Macromia taeniolata

Neurocordulia sp.

Ephemeroptera

Baetis sp.

B. intercalaris

B. spinosus

Caenis diminuta

Centroptilum hobbsi

Cloeon sp.

Neoephemera sp.

Pseudocloeon parvulum

P. punctiventris

Stenacron interpunctatum

Stenonema exiguum

Tricorythodes albilineatus

Hemiptera

Gerris sp.

Metrobates sp.

unident. corixid

Trichoptera

Chimarra socia

Megaloptera

Corydalus cornutus

Diptera

Ablabesmyia mallochi

Anopheles sp.

Atrichopogon sp.

Diptera (cont.)

Cladotanytarsus sp.
Coelotanypus concinnus
Cricotopus bicinctus
Cryptochironomus fulvus
Cryptotendipes sp.
Dicrotendipes lobus
D. modestus
Eukiefferiella sp.
Parachironomus demeijerei
Paracladopelma sp.
Paralauterborniella nigrohalteralis
Pedionemus beckae
Pentaneura inculata
Polypedilum halterale
P. illinoense
P. sp.
Rheotanytarsus exiguus
Simulium slossonae
Stenochironomus hilaris
Tanytarsus sp.
Thienemanniella xena
Tipula sp.
Tribelos fuscicornis
 unident. orthocladiid

Coleoptera

Ancyronyx variegata
Coptotomus interrogatus obscurus
Dineutus angustus
Dubiraphia sp.
D. vittata
Gyrinus floridensis
G. rockinghamensis
Hydroporus sp.
H. dixianus
Peltodytes sp.
Stenelmis sp.
Tropisternus sp.

Arachnida

Acarina

Lebertia sp.
Unionicola sp.
 unident. acarina

Mollusca

Gastropoda

Amnicola sp.
Campeloma geniculum
Goniobasis sp.
 cf. Ferrissia sp.
Lyogyrus sp.

21.01.0002

Gastropoda (cont.)

Viviparus georgiana

V. sp.

Pelecypoda

Corbicula manilensis

unident. unionid

DATA SUMMARY: Withlacoochee River

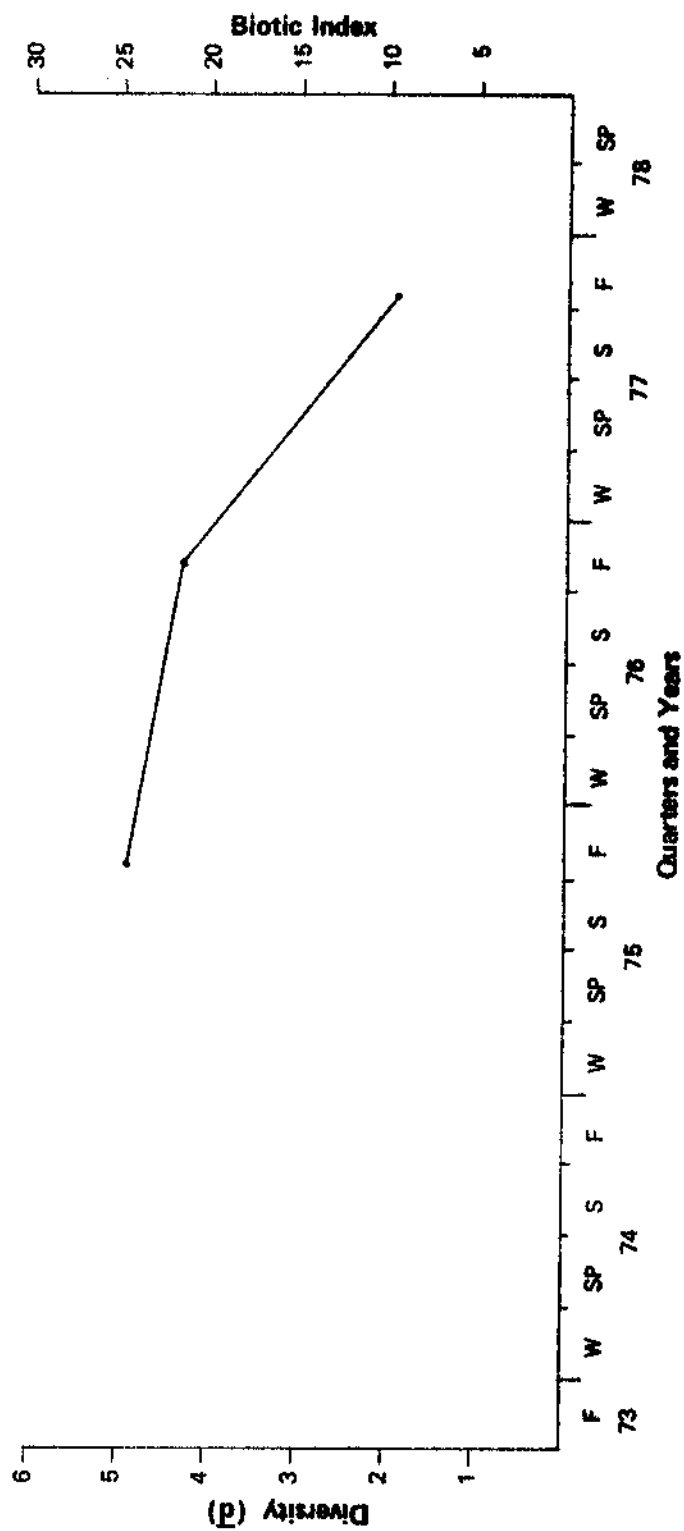
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
434													
21.01.0002	6 May 74											230	
	2 Oct 74	2.093±0.405	0.344±0.091	9				25	30				
	19 Oct 76							22	56				
	29 Sep 77							10	33				

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.01.0002
 BODY OF WATER: WITHLACOOCHIEE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 21.01.0018 Body of Water Falling Creek

Location at SR 246

County Columbia

Type Body of Water stream Classification

Sources of Pollution

Nearby Land Use natural

Sampling Frequency Depth varies

Bottom Type mud % Volatile Solids

Aquatic Plants: Submerged

Emergent

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

Hirudinea

Batracobdella paludosa

Arthropoda

Crustacea

Isopoda

Asellus communis

Amphipoda

Gammarus tigrinus

Decapoda

unident. astacid

Insecta

Odonata

Dromogomphus sp.

Enallagma sp.

Erythemis simplicicollis

Ischnura sp.

Lestes sp.

Orthemis ferruginea

Pachydiplax longipennis

Tauriphila australis

21.01.0018

Odonata (cont.)

Tetragoneuria cynosura

Ephemeroptera

Baetis intercalaris

Hemiptera

Abedus immaculatus

Belostoma sp.

Mesovelgia mulsanti

Ranatra sp.

Trichocorixa sp.

Diptera

Chaoborus sp.

Chironomus attenuatus

Conchapelopia sp.

Cryptochironomus fulvus

Dicrotendipes leucoscelis

D. lobus

Kiefferulus dux

Polypedilum illinoense

Procladius sp.

Rheotanytarsus exiguus

Nimboera patagonica

Tanypus carinatus

Tanytarsus sp.

unident. ceratopogonid

unident. tipulid

Coleoptera

Colpius inflatus

Deronectes sp.

Dineutus emarginatus floridensis

Gyrinus pachysomus

Peltodytes sp.

Arachnida

Acarina

Arrenurus sp.

Sperchon sp.

Mollusca

Gastropoda

cf. Ferrissia sp.

Helisoma sp.

Physa sp.

Pelecypoda

Pisidium sp.

DATA SUMMARY: Falling Creek

Station Number	Date	Macroinvertebrates								Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonyes/100ml		Comments
		Natural Substrate				Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.		Diversity	Redundancy	#Spp.							
438	21.01.0018								4	32					Florida Index
	5 Oct 76								5	31					
	19 Jul 77														

See Methods for explanation of table.

Station No. 21.02.0006 Body of Water Suwannee River
Location at SR 136 and US 41, White Springs
County Hamilton
Type Body of Water river Classification III
Sources of Pollution _____

Nearby Land Use natural
Sampling Frequency quarterly Depth 0.9 - 3.05 m
Bottom Type sand, rock, very hard clay % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Taxodium distichum, Salix sp., Nyssa
ogeche

Macroinvertebrates:

Porifera

Spongilla sp.

Platyhelminthes

Procotyla fluviatilis

Annelida

Oligochaeta

Dero nivea
Eclipidrilus palustris
Limnodrilus hoffmeisteri
Nais sp.
N. communis
Premnodrilus palustris
Pristina osborni
Slavina appendiculata
unident. sp.
unident. naidd
unident. tubificid
unident. lumbriculid

Arthropoda

Crustacea

Isopoda

Asellus sp.

Decapoda

Palaemonetes paludosus
Procambarus sp.
unident. sp.

Insecta

Plecoptera

Acroneuria sp.
Perlita placida

Odonata

Argia moesta
A. sedula
A. sp.
Dromogomphus armatus
D. spinosus
Calopteryx sp.
Gomphus sp.
Ischnura sp.
Macromia sp.
M. taeniolata
Progomphus sp.
P. alachuensis
unident. coenagrionid
unident. libellulid

Ephemeroptera

Brachycercus maculatus
Caenis diminuta
Ephemerella trilineata
Paraleptophlebia bradleyi
P. volitans
Stenonema smithae
S. sp.
S. exiguum
Stenacron annexum
S. integrum
S. interpunctatum
S. pulchellum
Tricorythodes albilineatus

Hemiptera

Abedus immaculatus
Gerris sp.
Trichocorixa sp.

Trichoptera

Ceraclea sp.
Cheumatopsyche sp.
Chimarra sp.
C. aterrima
C. socia
Cyrnellus fraternus

Trichoptera (cont.)

Hydroptila sp.
Hydropsyche sp.
Nectopsyche sp.
Mayatrichia sp.
Macroneum carolina
Molanna sp.
Nyctiophylax vestitus
N. sp.
Oecetis sp.
Polycentropus sp.

Megaloptera

Corydalis cornutus

Neuroptera

Climacia areolaris

Diptera

Ablabesmyia mallochi
A. parajanta
A. tarella
Atherix sp.
Chironomini sp. A (Roebuck)
Chironomus sp.
Cladotanytarsus sp.
Clinotanypus sp.
Conchapelopia sp.
Corynoneura taris
Circotopus bicinctus
C. sp. 1 - Beck
Cryptochironomus blarina
C. sp.
Cryptotendipes sp.
Culicoides sp.
Dicrotendipes lobus
D. modestus
D. neomodestus
Eukiefferiella sp.
Forcipomyia sp.
Harnischia edwardsi
H. sp.
Heterotrissocladius sp.
Labrundinia floridana
L. johannseni
L. neopilosella
Microtendipes sp.
Nilothauma bicornis
Nilothauma sp.
Pagastiella sp.

Diptera (cont.)

Palpomyia-Bezzia complex sp. 1 - Kelly
P. tibialis
Parachironomus demeijerei
P. monochromus
Parachironomus pectintellae
Paracladopelma loganae
P. sp.
Paralauterborniella nigrohalteralis
Polypedilum convictum
P. halterale
P. illionense
Procladius sp.
Psectrocladius sp.
Pseudochironomus sp.
Simulium slossonae
Stempellina sp.
Stenochironomus hilaris
S. sp.
Stictochironomus devinctus
Tanypus carinatus
T. stellatus
Trissocladius sp.

Coleoptera

Ancyronyx variegata
Berosus sp.
Coptotomus interrogatus obscurus
Deronectes sp.
Dineutus sp.
D. discolor
Dubiraphia vittata
D. sp.
Emolenota sp.
Gyrinus analis
Haliphus punctatus
Hydroporus sp.
Gyrinus rockinghamensis
Peltodytes sp.
Stenelmis fuscata
S. sp.
S. hungerfordi
S. convexula

21.02.0006

Coleoptera (cont.)

Suphisellus gibbulus

Oreodytes sp.

unident. elmids

unident. histerid

Arachnida

Acarina

Acerus sp.

Arrenurus sp.

Atractides sp.

Hygrobat sp.

Sperchonopsis verrucosa

Torrenticola sp.

Unionicola sp.

U. (Hexatax) sp.

Sperchon sp.

Piona sp.

unident. sp.

Mollusca

Gastropoda

Physa sp.

Pelecypoda

Corbicula manilensis

Pisidium sp.

Sphaerium partumeium

DATA SUMMARY: Sawannee River

Station Number	Date	Macroinvertebrates								Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate				Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.								
21-02-0006	6 Sep 74	1.474±0.330	0.591±0.121	9					5	13			700		
	11 Sep 74												330		
	16 Oct 74												95		
	6 Nov 74														
	29 Jan 75	3.704±0.272	0.093±0.032	19					17	26					
	30 Mar 75														
	14 Apr 75												33		
	12 Jun 75	3.350±0.377	0.186±0.070	16									1300		

See Methods for explanation of table.

DATA SUMMARY: Suwannee River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
21.02.0006 445	14 Jul 75											3300		
	12 Aug 75											330		
	9 Sep 75	0.221±0.243	0.100±0.115	3	2.893±0.207	0.215±0.034	23	19	25			1300	110	
	6 Oct 75	1.509±0.405	0.711±0.131	12								46	8	
	8 Dec 75													
	20 Jan 76													
	17 Feb 76	3.817±0.290	0.100±0.036	20	2.783±0.194	0.214±0.034	19	37	46	Coc Gr 3 Fil Gr 1 Cen Dia 12 Pen Dia 25	Coc BG 0 Fil BG 5 Coc Gr 22 Fil Gr 20 Gr Flag 0 Other Flag 0 Cen Dia 412 Pen Dia 486 Total 944	79	13	

See Methods for explanation of table.

DATA SUMMARY: Suvaanee River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
21.02.0006 446	17 Feb 76 (Cont.)								Total 40		140	2	
	13 Apr 76	2.643±0.369	0.183±0.084	9							170	5	
	7 Jun 76										170	13	
	19 Jul 76							19	30				
	9 Aug 76	4.038±0.194	0.052±0.016	23									
	29 Aug 76				2.988±0.304	0.290±0.068	22				170	17	
	18 Oct 76										130	17	
	2 Nov 76	3.580±0.251	0.138±0.033	26						Coc BG LT1 Fil BG 2 Coc Gr 4 Fil Gr 24 Gr Flag 1 Other Flag 0 Can Dia 7			

See Methods for explanation of table.

DATA SUMMARY: Suwannee River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate						Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
21.02.0006 447	2 Nov 76 (Cont).								Pen Dia 14 Total 52					
	16 Nov 76										220	32		
	7 Feb 77										130	17		
	1 Mar 77	3.848±0.344	0.157±0.037	25				30			140	31		
	31 May 77	3.358±0.430	0.260±0.065	19	3.706±0.198	0.111±0.019	30	53	Coc BG 0 F11 BG 40 Coc Gr 300 F11 Gr 660 Gr Flag 0 Other Flag 2720 Cen Dia 1120 Pen Dia 4880 Total 9660		790	70		
	18 Jun 77													Florida Index

See Methods for explanation of table.

DATA SUMMARY: Suwannee River

Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
21,02,0006 448	16 Aug 77	3.652±0.292	0.144±0.044	23	4.062±0.214	0.085±0.022	30		Joc BG 360 Fl BG 3050 Joc Gr 6450 Fl Br 2870 Gr Flag 0 Other Flag 0 Pen Dia 22940 Pen Dia 44980 Total 80650	22	17	
	8 Nov 77	3.216±0.284	0.159±0.031	20				14	31	33	8	
	28 Dec 77									330	33	
	25 Jan 78	3.828±0.259	0.120±0.031	27	2.979±0.215	0.168±0.026	20			460	23	
	27 Feb 78									49	2	
	18 Apr 78	2.252±0.377		5					18	23		

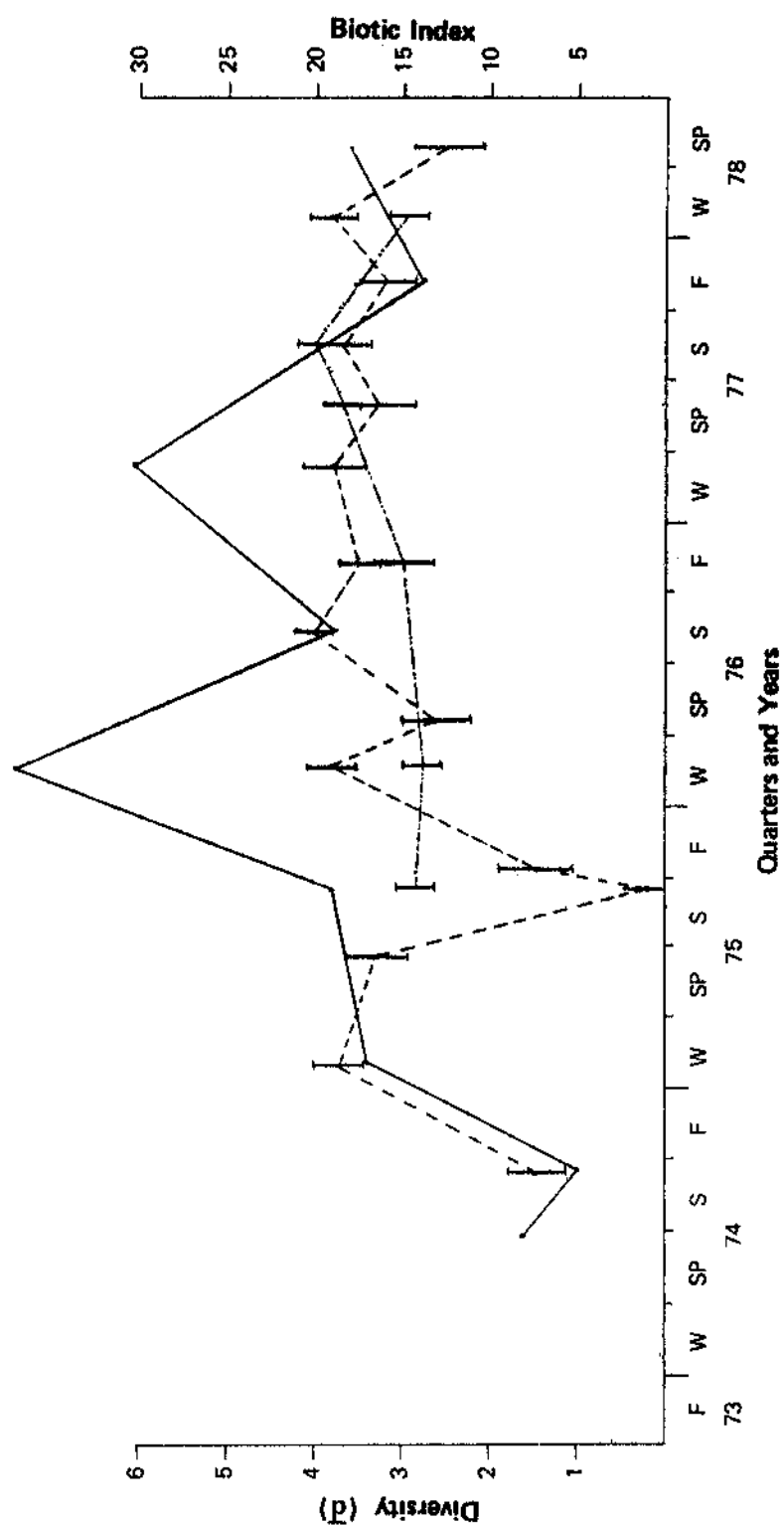
See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.02.0006

BODY OF WATER: SUWANNEE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 21.02.0031 Body of Water Suwannee River

Location Old Town bridge, US Hwy. 19-98

County Dixie - Levy

Type Body of Water river Classification III

Sources of Pollution none known

Nearby Land Use natural, some low-density residential

Sampling Frequency quarterly Depth 1.8 - 5 m

Bottom Type sand % Volatile Solids

Aquatic Plants: Submerged Vallisneria sp., Ludwigia sp., Salvinia sp.

Emergent Taxodium distichum, Salix sp., Sagittaria sp.

Hydrocotyle sp., Eichhornia sp., Lemna sp., Alternanthera sp.

Macroinvertebrates:

Cnidaria

Hydrozoa

Hydra sp.

Rhynchocoela

Prostoma rubrum

Nematoda

unident. sp.

Annelida

Oligochaeta

Aulodrilus piqueti

Aulophorus vagus

Ilyodrilus templetoni

Nais communis

N. elinguis

N. variabilis

Premnodrilus palustris

Slavina appendiculata

Tubifex sp.

unident. lumbriculiid

unident. sp.

21.02.0031

Hirudinea

Helobdella fusca
H. stagnalis
unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.
A. racovitzai australis
Cyathura polita

Amphipoda

Corophium sp.
Crangonyx sp.
Gammarus tigrinus
Hyaella azteca

Decapoda

Palaemonetes kadiakensis
P. paludosus
Procambarus sp.
P. fallax

Mysidacea

Taphromysis louisianae

Insecta

Odonata

Argia sp.
A. tibialis
A. moesta
Dromogomphus spinosus
D. armatus
Enallagma sp.
Erthrodiplex sp.
Erythemis sp.
Gomphus sp.
G. stylurus
Macromia sp.
Nasiaeschna pentacantha
Nehalennia sp.
Neurocordulia virginiana
N. obsoleta
Progomphus obscurus
Tetragoneuria semiaquea
T. sepia
unident. gomphid

Ephemeroptera

Baetis sp.
B. spinosus
Brachycercus sp.
B. maculatus
Caenis sp.
C. diminuta
Centroptilum viridocularis
Callibaetis floridanus
Choroterpes hubbelli
Dolania americana
Hexagenia munda elegans

Neophemera sp.
Stenonema exiguum
Stenacron floridense
S. interpunctatum
Tricorythodes albilineatus

Hemiptera

Abedus immaculatus
Pelocoris sp.
Plea striola
Trichocorixa sp.
unident. corixid
unident. gerrid

Trichoptera

Agarodes sp.
Cheumatopsyche sp.
Cyrnellus fraternus
Hydroptila sp.
Hydropsyche sp.
Nectopsyche sp.
N. candida
Neureclipsis sp.
Oecetis sp.
Ochrotrichia sp.
Oxyethira sp.
Polycentropus sp.
Psychomyia sp.
Athripsodes ceraclea
unident. sp.

Megaloptera

Sialis sp.

Diptera

Ablabesmyia americana
A. aspera
A. mallochi
A. ornata
A. parajanta
A. tarella
Anopheles sp.
Chironomus sp.
C. attenuatus
C. stigmaterus
Chaoborus sp.
Cladotanytarsus sp.
Coelotanypus sp.
C. concinnus
C. tricolor
C. scapularis
Conchapelopia sp.

Cryptochironomus sp.
C. fulvus
C. blarina
C. sp.
Cryptotendipes sp.
Corynoneura taris
Dasyhelea sp.
Dicrotendipes modestus
D. sp.
D. neomodestus
D. leucoscelis
D. lobus
D. nervosus
Eukiefferiella sp.
Euparyphus sp.
Glyptotendipes sp.
Harnischia sp.
Labrundinia virescens
L. neopilosella
Larsia lurida
Microtendipes sp.
Nanocladius sp.
Pagastiella sp.
Palpomyia tibialis
P.-Bezzia complex sp. 1 - Kelly
Paratanytarsus sp.
Parachironomus pectinatellae
P. monochromus
Paracladopelma loganae
P. demeijerei
Paralauterborniella elachista
P. nigrohalteralis
Paracladopelma undine
Paratendipes "connectens"
P. sp.

Diptera (cont.)

Pentaneura inculata
Polypedilum fallax
P. halterale
P. illinoense
P. convictum
Pedionomus beckae
Procladius sp.
Psectrocladius sp.
P. vernalis
Rheotanytarsus exiguus
Stenochironomus sp.
S. hilaris
Stictochironomus devinctus
Simulium slossonae
Tanytarsus sp.
Thienemanniella xena
Tribelos sp.
Trissocladius sp.
Zavrelia sp.
 unident. ceratopogonid
 unident. chironomid

Coleoptera

Cybister fimbriolatus
Dineutus angustus
D. sp.
Dubiraphia sp.
Dineutis discolor
Gyrinus analis
G. floridensis
Haliphus sp.
Hydroporus sp.
Peltodytes sp.
Stenelmis sp.
S. humerosa

Arachnida

Acarina

Hydrachna sp.
Hygrobates sp.
Krendowskia similis
Lebertia sp.
Limnesia sp.
Mideopsis sp.
Piona sp.
Sperchonopsis verrucosa
Tyrellia sp.
Unionicola sp.
Hydrochoreutes unguatus
 unident. sp.

21.02.0031

Mollusca

Gastropoda

Amnicola sp.
Campeloma geniculum
Goniobasis sp.
Gyraulus sp.
Helisoma sp.
Lymnaea columella
Lyogyrus sp.
Notogillia sp.
Pomacea paludosa
Promenetus sp.
Physa sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
Pisidium sp.
Sphaerium partumeium

Bryozoa

unident. sp.

DATA SUMMARY: Suwannee River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate						Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
456	17 Oct 73	0.845±0.372		2							33			
	22 Oct 73										490			
	17 Dec 73										79			
	16 Jan 74													
	13 Feb 74	2.067±0.259	0.223±0.046	8	3.197±0.257	0.143±0.035	18				220			
	11 Mar 74										230			
	15 Apr 74										95			
	13 May 74													
	21 May 74	1.932±0.448	0.517±0.149	10				5	16			46	17	
	10 Jun 74											220		
	8 Jul 74													

See Methods for explanation of table.

DATA SUMMARY: Suwannee River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
457	21 Aug 74											230		
	11 Sep 74											790	33	
	12 Sep 74	1.459±0.343	0.579±0.120	9				9	15					
	16 Oct 74											140	14	
	6 Nov 74											110	11	
	7 Nov 74	0.714±0.332	0.902±0.121	7										
	22 Jan 75	1.403±0.320	0.596±0.122	8				10	20					
	17 Feb 75													
	10 Mar 75											330		
	29 May 75	2.540±0.284	0.312±0.049	22	3.799±0.233	0.246±0.039	53					220		
	13 Aug 75	3.230±0.471	0.299±0.096	15	4.036±0.195	0.078±0.016	31	31	45					

See Methods for explanation of table.

DATA SUMMARY: Suwannee River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
21.02.0031	20 Oct 75	2.040+0.268	0.201+0.087	6								350	33	
	8 Dec 75											170	26	
	30 Dec 75													
	27 Jan 76				2.910+0.249	0.128+0.044	12							
	16 Feb 76													
	18 Feb 76	2.060+0.187	0.296+0.037	13				7	18			230	22	
	</													

See Methods for explanation of table.

DATA SUMMARY: Sawannee River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
21.02.0031 459	18 Feb 76 (cont.)								Gr Flag Cen Dia Pen Dia Total				
	5 May 76	3.026±0.413	0.241±0.087	14							49	5	
	7 Jun 76										330	23	
	17 Jul 76	2.239±0.484	0.361±0.159	8				20					
	19 Jul 76							47			31	5	
	29 Sep 76										330	33	
	18 Oct 76										34	17	
	26 Oct 76	2.473±0.319	0.300±0.084	13	3.596±0.275	0.180±0.033		33	Coc BG Fil BG Coc Gr Fil Gr Gr Flag Other Flag				

See Methods for explanation of table.

DATA SUMMARY: Suwannee River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		Total	Fecal						
		Diversity	Redundancy	#Spp.	Diversity						Redundancy	#Spp.	
21.02.0031 460	26 Oct 76 (cont)								Gen Dia 5				
	7 Feb 77								Pen Dia 15				
	15 Feb 77	2.153±0.320	0.561±0.082	25				22	24		230	130	
	1 Mar 77												
	7 Jun 77	3.359±0.298	0.161±0.038	21	3.951±0.237	0.128±0.029	35			Coc BG 200 Pll BG 410 Coc Gr 2680 Pll Gr 4820 Gr Flag 0 Other Flag 0 Pen Dia 15270 Pen Dia 8620 Total 32000	110	13	
	18 Jul 77										330	130	
	9 Aug 77	1.296±0.235	0.721±0.069	17	2.999±0.235	0.202±0.046	20						Florida Index

See Methods for explanation of Table.

DATA SUMMARY: Suwannee River

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate						Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
461	29 Aug 77									Coc BG 7840 Fil BG 24830 Coc Gr 4780 Fil Gr 2170 Gr Flag 540 Other Flag 0 Gen Dia 1.167x10 ⁵ Pen Dia 3.483x10 ⁵ Total 5.05x10 ⁵				
	15 Nov 77	0.346±0.193	0.960±0.067	6				9	27			1700	220	
	23 Jan 78													
	9 Feb 78	1.287±0.318	0.480±0.146	5	4.511±0.185	0.059±0.013	39					330	230	
	8 Mar 78													

See Methods for explanation of table.

DATA SUMMARY: Suwannee River

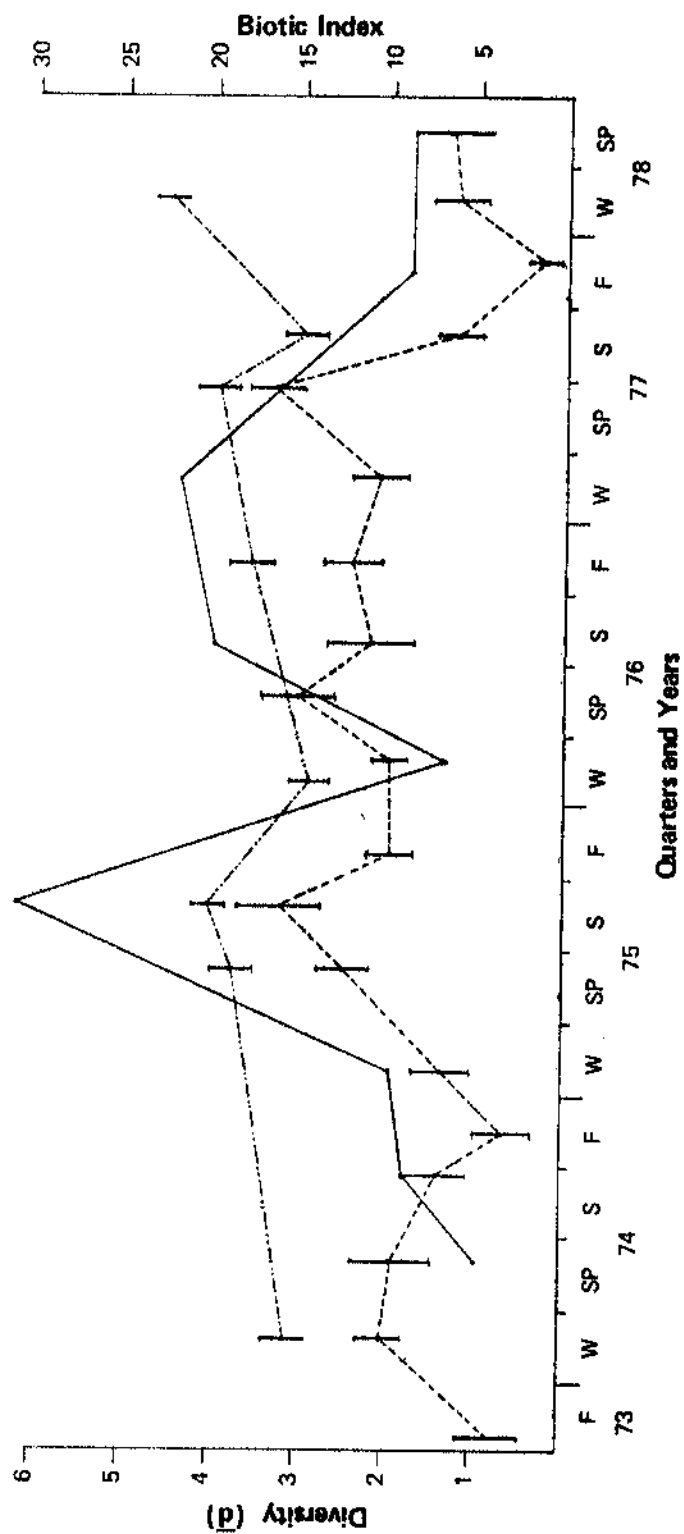
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
21.02.0031 462	2 May 78	1.391±0.439	0.604±0.191	6				9	24	79	LT2	
	12 Jun 78									170	17	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.02.0031
 BODY OF WATER: SUWANNEE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 21.02.0034 Body of Water Suwannee River
Location at US Hwy. 51 bridge near Luraville
County Suwannee-Lafayette
Type Body of Water river Classification III
Sources of Pollution road runoff
Nearby Land Use natural state
Sampling Frequency random Depth 2.13 - 4.6 m
Bottom Type clay, brown sand, rock % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Taxodium distichum, Salix sp.
Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
Premnodrilus palustris
Slavina appendiculata
Tubifex tubifex
unident. lumbriculid
unident. sp.

Arthropoda

Crustacea

Amphipoda

Corophium sp.

Decapoda

Palaemonetes paludosus

Insecta

Odonata

Gomphus sp.
Dromogomphus spinosus

Ephemeroptera

Ephemerella trilineata
Stenonema exiguum
Brachycercus maculatus

Trichoptera

Cheumatopsyche sp.
Lype sp.
Macronemum carolina
Molanna sp.
Nectopsyche sp.
Polycentropus sp.

Diptera

Ablabesmyia mallochi
Cladotanytarsus sp.
Conchapelopia sp.
Corynoneura taris
Cricotopus sp.
Cryptochironomus blarina
Endochironomus sp.
Eukiefferiella sp.
Palpomyia-Bezzia sp. 1 - Kelly
Paracladopelma sp.
P. loganae
Polypedilum sp.
P. halterale
Simulium slossonae
Tanytarsus sp.
unident. culicid
unident. empidid
unident. ceratopogonid

Coleoptera

Coptotomus interrogatus obscurus
Dineutus sp.
Dubiraphia sp.
Haliphus punctatus
Hydroporus vittatipennis
H. sp.
Stenelmis fuscata
S. hungerfordi

Arachnida

Acarina

Lebertia sp.
6 unident. spp.

21.02.0034

Mollusca

Gastropoda

Campeloma geniculum

Lioplax sp.

Physa sp.

Viviparus sp.

Pelecypoda

Corbicula manilensis

Elliptio sp.

Quincuncina sp.

unident. unionid

DATA SUMMARY: Sawannee River

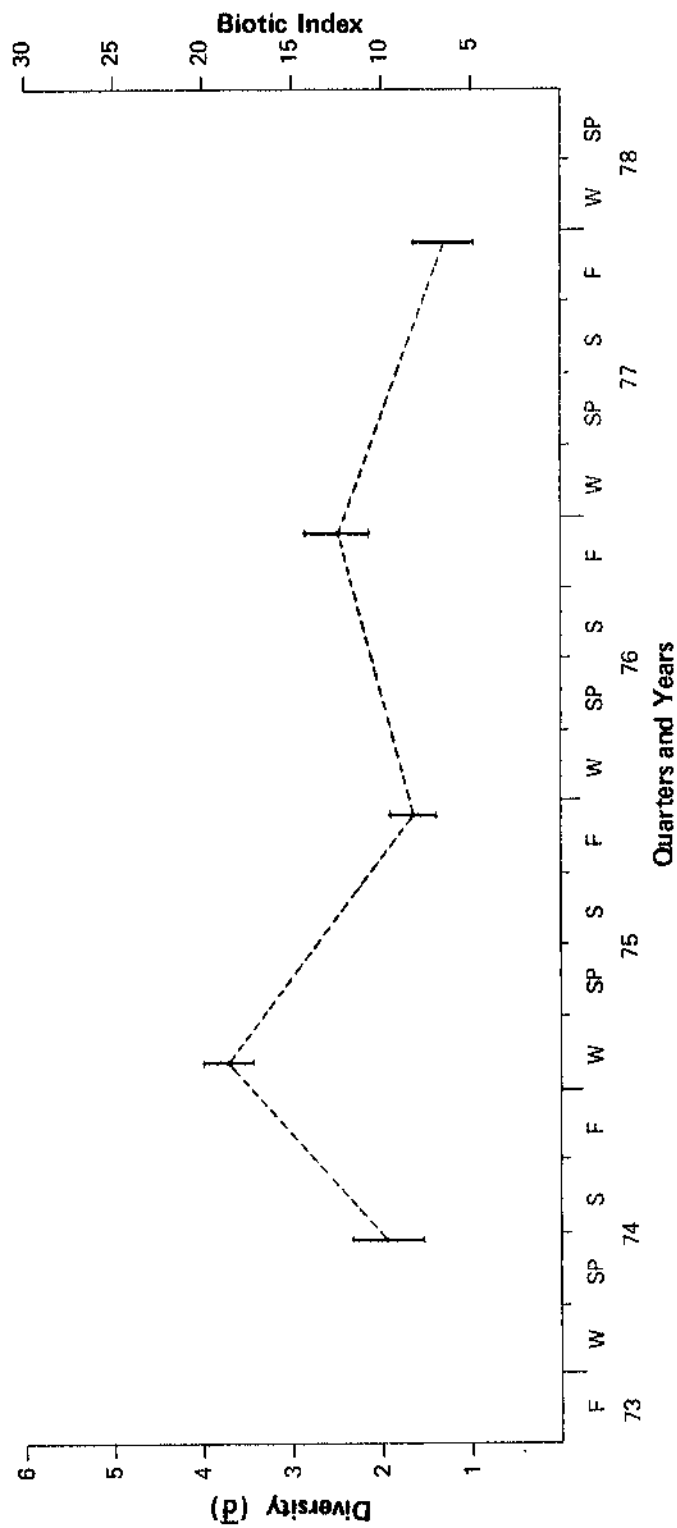
Station Number	Date	Macroinvertebrates										Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate				BI	#Spp.	Total			Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.									
467	22 Oct 73													31		
	17 Dec 73													140		
	31 Mar 74													230		
	35 Apr 74													460		
	13 May 74													3300		
	17 Jun 74	1.990±0.400	0.408±0.319	9							3	11				
	29 Jan 75	3.751±0.281	0.101±0.033	20							17	26				
	2 Dec 75	1.671±0.256	0.279±0.104	5												
	30 Nov 76	2.556±0.384	0.334±0.068	16												
	1 Dec 76	1.344±0.351	0.526±0.150	6												

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.02.0034
 BODY OF WATER: SUWANNEE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Amphipoda

Gammarus tigrinus
Hyalella azteca

Decapoda

Palaemonetes paludosus

Insecta

Odonata

Argia sp.
Dromogomphus sp.
Gomphus sp.
Macromia sp.

Ephemeroptera

Baetis sp.
B. obesa
Ephemerella trilineata
Isonychia sp.
Stenonema exiguum
S. smithae
Tricorythodes albilineatus

Hemiptera

Belostoma sp.
Hebrus sp.
Mesovelis sp.
Plea striola

Trichoptera

Cheumatopsyche sp.
Chimarra sp.
Hydropsyche sp.
Macronemum carolina
Oecetis sp.
unident. sp.

Diptera

Ablabesmyia aspera
A. parajanta
A. tarella
A. mallochi
A. ornata
Chironomus sp.
Cladotanytarsus sp.
Clinotanytus sp.
Coelotanytus sp.
C. tricolor
Conchapelopia sp.
Corynoneura taris
Cryptochironomus sp.
C. blarina
Dicrotendipes sp.

Diptera (cont.)

Eukiefferiella sp.
Harnischia galeator
Nanocladius sp.
Orthocladius annectens
Palpomyia tibialis
P.-Bezzia complex sp. 1 - Kelly
Paracladopelma loganae
Paralauterborniella nigrohalteralis
Polypedilum convictum
P. fallax
P. halterale
P. illinoense
P. sp.
Procladius sp.
Psectrocladius sp.
Rheotanytarsus exiguus
Simulium slossonae
Stictochironomus devinctus
Tanytarsus sp.
Tipula sp.
Tribelos sp.
unident. chironomid
unident. tabanid
unident. sp.
unident. ceratopogonid

Coleoptera

Dubiraphia sp.
Gyrinus analis
Haliphus mutchleri
H. punctatus
Peltodytes sp.

Arachnida

Acarina

Mideopsis sp.
unident. sp.

Mollusca

Gastropoda

Campeloma geniculum
Ferrissia sp.
Gundlachia sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
Pisidium sp.

DATA SUMMARY: Saginaw River

Station Number	Date	Macroinvertebrates								Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate				Artificial Substrate						Total	Fecal	
		Diversity		Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
		Diversity	Redundancy											
472 21.02.0035	17 Sep 74	3.222±0.256	0.133±0.038	17										
	19 Nov 74	3.147±0.261	0.176±0.041	20	4.202±0.296	0.103±0.031	26							
	13 Feb 75	2.780±0.253	0.156±0.048	12										
	7 May 75											79		
	4 Jun 75	2.916±0.382	0.214±0.070	13	3.138±0.195	0.149±0.029	20							
	2 Dec 75	2.927±0.249	0.171±0.050	15										
	30 Nov 76	0.994±0.474	0.842±0.198	6										
	1 Dec 77	1.531±0.480	0.617±0.193	7										
	23 Jan 78											4600	1700	
	8 Feb 78											95	11	
	8 Mar 78											460	460	
	17 Apr 78											79	11	

See Methods for explanation of table.

DATA SUMMARY: Savannah River

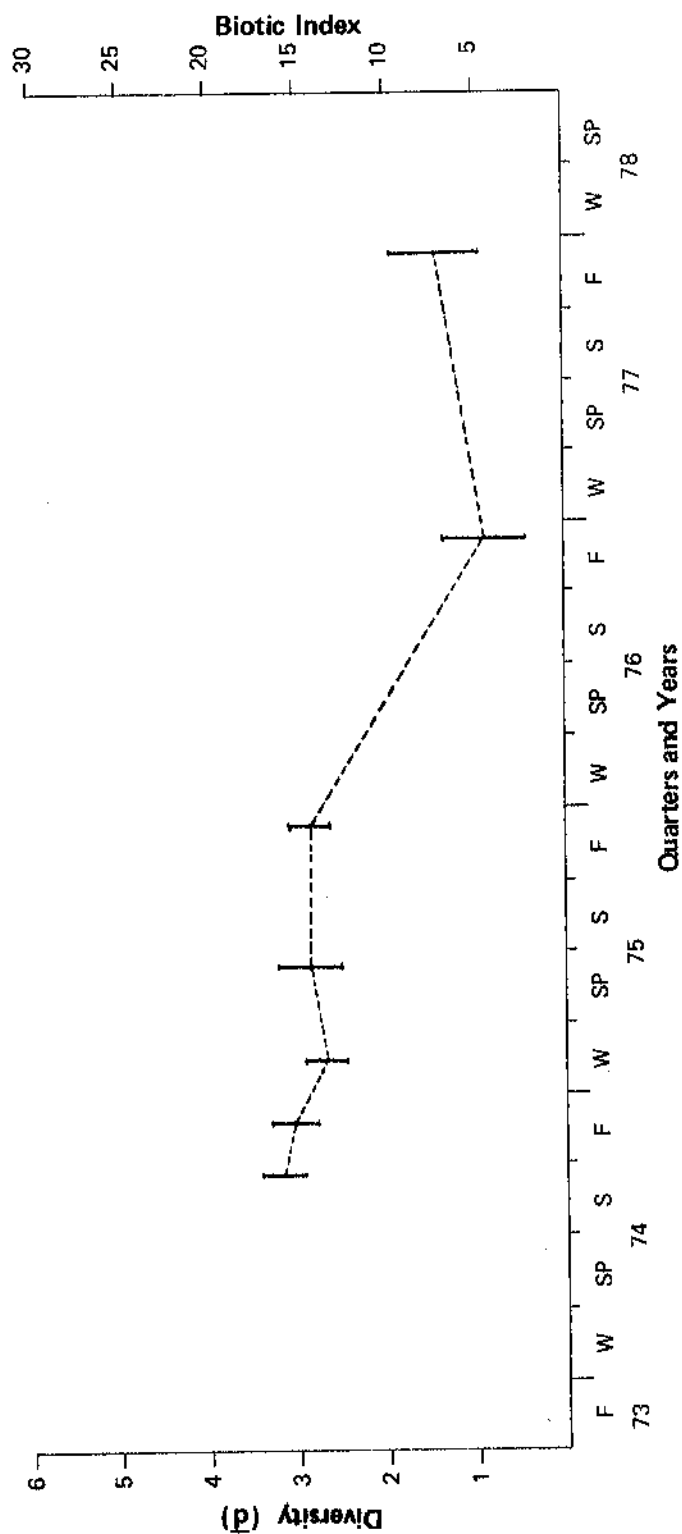
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
473 21.02.0035	3 May 78											330	49	
	12 Jun 78											79	2	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.02.0035
 BODY OF WATER: SUWANNEE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — BIOTIC INDEX (= FLORIDA INDEX)



Station No. 21.03.0001 Body of Water Santa Fe River

Location at SR 235 south of Brooker

County Alachua - Bradford

Type Body of Water river Classification

Sources of Pollution pasture runoff

Nearby Land Use pasture

Sampling Frequency annually Depth 0.6 m.

Bottom Type fine sand, detritus % Volatile Solids

Aquatic Plants: Submerged

Emergent Alternanthera sp., Elatine sp., Eleocharis sp.,

Hydrocotyle sp., Taxodium distichum, Salix sp.

Macroinvertebrates:

Porifera

Spongilla sp.

Platyhelminthes

unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

Nais elinguis

unident. naidid

Hirudinea

Philobdella floridana

Arthropoda

Crustacea

Amphipoda

Crangonyx serratus

Gammarus tigrinus

Hyaella azteca

Decapoda

Palaemonetes paludosus

Procambarus cf. (Scapulicambarus) paeninsulanus

Insecta

Collembola

Isotomurus palustris

Odonata

Argia sp.

Anax sp.

Didymops transversa

Dromogomphus armatus

D. spinosus

Enallagma sp.

E. pulchellum

E. vibrans

Epicordulia regina

Hagenius brevistylus

Ischnura sp.

Lestes sp.

Libellula sp.

Macromia sp.

Nasiaeschna pentacantha

Neurocordulia obsoleta

Pachydiplax longipennis

Progomphus alachuensis

Somatochlora sp.

Ephemeroptera

Baetis spinosus

Caenis sp.

Callibaetis sp.

C. floridanus

Centroptilum viridocularis

Cloeon rubropictum

Ephemerella trilineata

Hexagenia munda elegans

Paraleptophlebia sp.

Stenacron interpunctatum

Hemiptera

Belostoma sp.

Gerris sp.

Ranatra sp.

Trichocorixa sp.

Velia sp.

unident. corixid

Trichoptera

Oecetis sp.

Polycentropus sp.

Diptera

Ablabesmyia parajanta
A. tarella
Cryptotendipes sp.
Cladotanytarsus sp.
Dicrotendipes lobus
D. neomodestus
D. modestus
Endochironomus sp.
Palpomyia-Bezzia complex sp. 1 - Kelly
Polypedilum halterale
Procladius sp.
Stictochironomus devinctus
Tanytarsus sp.
Tabanus sp.
Tribelos fuscicornis
T. jucundus
Paralauterborniella nigrohalteralis
Cryptochironomus blarina
Chironomus attenuatus
Anopheles sp.
unident. ceratopogonid

Coleoptera

Cybister sp.
Deronectes sp.
Dineutes sp.
Dubiraphia sp.
Galerucella sp.
Haliphus punctatus

Arachnida

Acarina

Arrenurus sp.
Forelia sp.
Mideopsis sp.
Neumania sp.
Piona sp.
Sperchon sp.
Unionicola sp.

Mollusca

Gastropoda

Amnicola sp.
Campeloma sp.
Laevapex sp.
Micromenetus dilatatus
Notogillia wetherbyi
Pomacea paludosa

21.03.0001

Gastropoda (cont.)

Physa sp.

Viviparus sp.

unident. hydrobiid

Pelecypoda

Elliptio congaraea

Villosa villosa

unident. unionid

Orthoptera

Tridactylus sp.

DATA SUMMARY: Santa Fe River

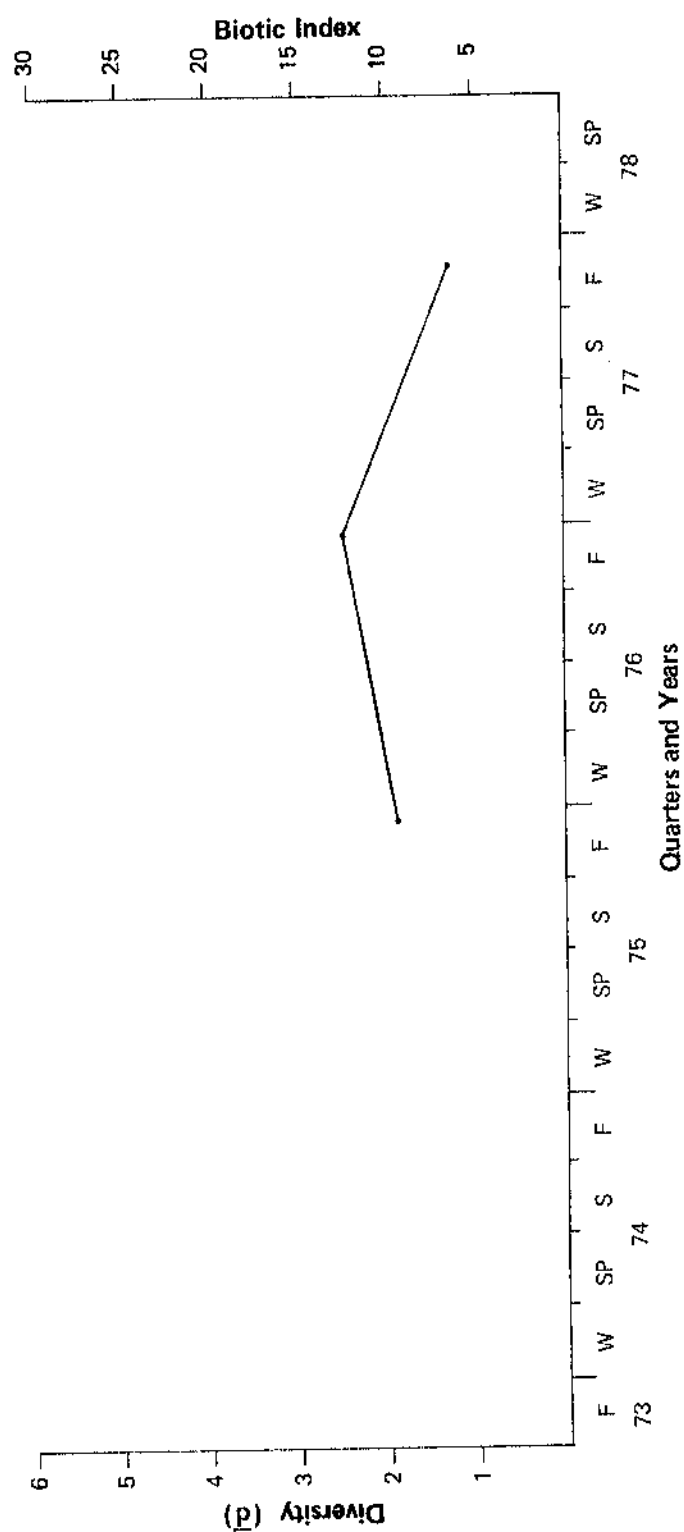
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Sp.	Diversity	Redundancy	#Sp.						
479	21.03.0001	10 Jul 74									1100		Florida Index
		14 Jan 75									1700		
		15 Dec 75						10	40		1300	280	
		2 Dec 76						13	52				
		10 Nov 77						7	44				
		8 Feb 78									220	220	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.03.0001
 BODY OF WATER: SANTA FE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)



Station No. 21.03.0004 Body of Water Sante Fe River
 Location at US Hwy. 129 bridge near Hildreth
 County Suwannee - Gilchrist
 Type Body of Water river Classification III
 Sources of Pollution none known
 Nearby Land Use natural state
 Sampling Frequency random Depth 1.2 - 3.7 m
 Bottom Type limestone % Volatile Solids _____
 Aquatic Plants: Submerged _____
 Emergent Nuphar luteum, Salix sp., Taxodium distichum,
Lemna sp., Sagittaria sp., Hypericum sp., Eichhornia crassipes, Panicum hemitomon

Macroinvertebrates:

Nematoda

unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

Nais communis

Pelosclex ferox

Pristina sp.

Slavina appendiculata

Stylaria lacustris

Tubifex tubifex

2 unident. spp.

unident. naidid

unident. lumbriculid

Hirudinea

Helobdella fusca

Batrachobdella phalera

unident. sp.

Arthropoda

Crustacea

Amphipoda

Gammarus tigrinus

Decapoda

Palaemonetes paludosus

Insecta

Collembola

Sminthurides sp.

Odonata

Argia moesta

Boyeria vinosa

Gomphus sp.

Libellula auripennis

Perithemis tenera seminole

Ephemeroptera

Baetis spinosus

Brachycercus lacustris

Caenis sp.

Stenonema exiguum

S. proximum

Stenacron floridense

S. interpunctatum

Tricorythodes albilineatus

Hemiptera

Abedus immaculatus

Ranatra sp.

Trichoptera

Athripsodes sp.

Cheumatopsyche sp.

Chimarra socia

C. sp.

Cyrnellus sp.

Helicopsyche sp.

Hydropsyche sp.

Hydroptila sp.

Macronemum carolina

Neotrichia sp.

Oecetis sp.

Polycentropus sp.

4 unident. spp.

Megaloptera

Corydalus cornutus

Lepidoptera

unident. sp.

Diptera

Ablabesmyia tarella

A. parajanta

A. mallochi

A. ornata

Cladotanypus sp.

Cladotanytarsus sp.

Clinotanypus sp.

Coelotanypus sp.

C. concinnus

Corynoneura sp.

C. taris

Conchapelopia sp.

Cricotopus bicinctus

C. sp. 1 (Beck)

Cryptochironomus sp.

Dicrotendipes modestus

D. sp.

D. leucoscelis

D. lobus

Eulalia sp.

Eukiefferiella sp.

Harnischia galeator

Larsia cf. lurida

Labrundinia neopilosella

Micropsectra sp.

Nilotanypus cf. americanus

Orthocladius annectens

Pagastiella sp.

Palpomyia-Bezzia sp. 1 - Kelly

Palpomyia tibialis

Paracladopelma sp.

Parachironomus pectinatellae

Pentaneura inculta

Polypedilum convictum

P. sp.

P. halterale

P. illinoense

Procladius sp.

Psectrocladius sp..

Rheotanytarsus exiguus

Simulium sp.

S. slossonae

Diptera (cont.)

Stenochironomus hiliaris
Pseudochironomus sp.
Tanypus sp.
Tanytarsus sp.
Tribelos sp.
Thienemaniella xena
 unident. sp.
 unident. chironomid

Coleoptera

Berosus infuscatus
 B. sp.
Brachyvatus seminulum
Coptotomus interrogatus obscurus
Dubiraphia sp.
Dineutus ciliatus
 D. sp.
Enochrus blatchleyi
Hydrocanthus regius
Onychylis sp.
Stenelmis sp.

Arachnida

Acarina

Megapus sp.
 4 unident. spp.

Mollusca

Gastropoda

Amnicola sp.
Campeloma geniculum
Goniobasis floridensis
 G. sp. 1 - Bickner
 G. sp. 2 - Bickner
Helisoma sp.
H. duryi
Hebetancylus excentricus
Laevapex sp.
Lymnaea sp.
Lyogyrus sp.
Notogillia sp.
Physa sp.
Pomacea paludosa
Somatogyrus sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
Pisidium sp.
 unident. unionid

DATA SUMMARY: Santa Re River

Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
								BI	#Spp.					
485	22 Oct 74											31		
	17 Dec 73											170		
	16 Jan 74											2200		
	11 Mar 74											280	27	
	15 Apr 74											1100		
	13 May 74											130		
	21 May 74	3.060±0.227	0.176±0.033	21				6	31			220	70	
	10 Jun 74											950		
	8 Jul 74											950		
	11 Sep 74													
	12 Sep 74	3.105±0.261	0.175±0.048	18				6	30					
	16 Oct 74											230		

See Methods for explanation of table.

DATA SUMMARY: Santa Fe River

Station Number	Date	Macroinvertebrates								Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate			BI	#Spp.			Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
486	21.03.0004													
	6 Nov 74											2200	70	
	7 Nov 74	0.719±0.324	0.695±0.212	3	3.144±0.248	0.267±0.049	30					180		
	14 Jan 75													
	22 Jan 75	3.817±0.309	0.316±0.044	20				21	34			1100	49	
	17 Feb 75											330		
	10 Mar 75											230		
	7 May 75	3.901±0.250	0.100±0.030	27	2.340±0.230	0.330±0.040	20					1100	110	
	10 Sep 75				1.230±0.187	0.738±0.053	21					490		
	20 Oct 75											1100		
	17 Nov 75				3.369±0.119	0.124±0.023	23					330	23	
	15 Dec 75													

See Methods for explanation of table.

DATA SUMMARY: Santa Fe River

Station Number	Date	Macroinvertebrates							Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate							
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	#Spp.				
487 21.03.0004	16 Feb 76									700	79	
	7 Jun 76									350	8	
	19 Jul 76									220	33	
	29 Sep 76									490	33	
	18 Oct 76									430	110	
	21 Dec 76							4	20	230	17	
	7 Feb 77											
	7 Jun 77				3.643±0.200	0.106±0.029	23			2300	49	
	18 Jul 77				1.886±0.178	0.478±0.051	21					
	1 Nov 77									490	230	
	23 Jan 78									230	130	
	8 Feb 78											

See Methods for explanation of table.

DATA SUMMARY: Santa Fe River

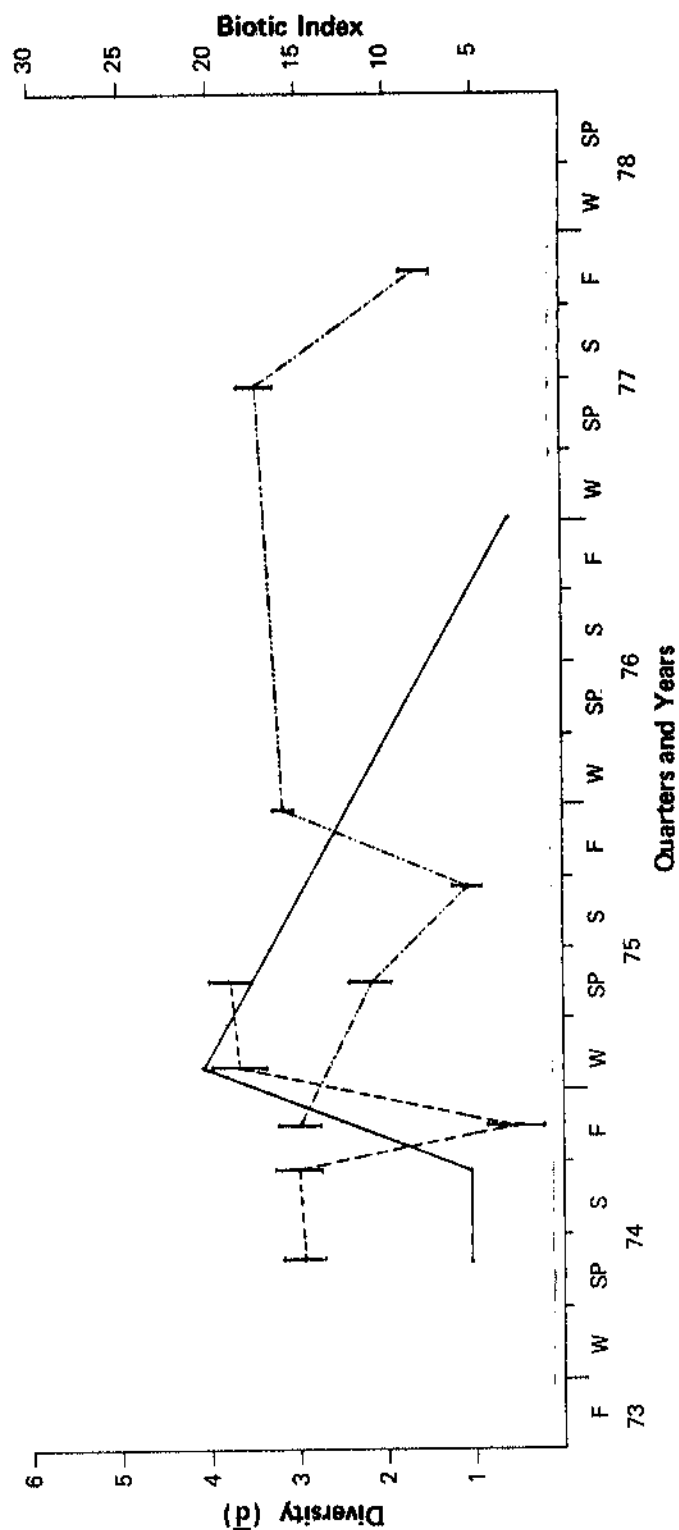
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
488													
21.03.0004	8 Mar 78										230	79	
	3 May 78										79	13	
	12 Jan 78										1700	27	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.03.0004
 BODY OF WATER: SANTA FE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 -.-.- ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 21.03.0029 Body of Water Lake Sampson
Location S.W. sector
County Bradford
Type Body of Water lake Classification _____
Sources of Pollution runoff
Nearby Land Use natural and residential
Sampling Frequency _____ Depth 1.3 - 1.5 m
Bottom Type sand % Volatile Solids _____
Aquatic Plants: Submerged Eleocharis acicularis
Emergent Pontederia sp., Panicum hematomon, Juncus sp.
Nuphar sp., Typha latifolia, Taxodium distichum, Nymphaea odorata, Salix sp.

Macroinvertebrates:

Cnidaria
Hydrozoa
Hydra sp.

Annelida
Oligochaeta
Limnodrilus hoffmeisteri
Nais communis
N. elinguis

Arthropoda
Crustacea
Amphipoda
Gammarus tigrinus

Decapoda
Palaemonetes paludosus

Insecta
Ephemeroptera
Caenis diminuta

Trichoptera
Polycentropus sp.
Oecetis sp.

21.03.0029

Diptera

Ablabesmyia parajanta
Chaoborus sp.
Chironomus attenuatus
Cladotanytarsus sp.
Coelotanypus concinnus
C. scapularis
Cryptochironomus fulvus
Palpomyia-Bezzia complex sp. 1 - Kelly
Palpomyia sp.
Paralauterborniella nigrohalteralis
Polypedilum halterale
P. illinoense
Procladius sp.
unident. ceratopogonid

Mollusca

Gastropoda

Physa sp.
Pomacea paludosa

Pelecypoda

Corbicula manilensis

DATA SUMMARY: Lake Sampson

Station Number	Date	Macroinvertebrates								Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		BI	#Spp.	Redundancy	#Spp.					
		Diversity	Redundancy	#Spp.	Diversity							Redundancy	#Spp.	
492	27 Oct 75	2.605±0.285	0.140±0.051	7										
	11 Oct 77	3.714±0.190	0.074±0.021	21										

See Methods for explanation of table.

Station No. 21.03.0050 Body of Water Ichetucknee River

Location at US Hwy. 27

County Suwannee - Columbia

Type Body of Water river Classification

Sources of Pollution suburban runoff

Nearby Land Use partly developed (residential) State Park

Sampling Frequency annual Depth 1.22 - 3.00 m

Bottom Type sand, muck, detritus, shells Volatile Solids

Aquatic Plants: Submerged Chara sp., Myriophyllum sp., Ceratophyllum demersum,

Vallisneria sp. Emergent Sagittaria sp., Ludwigia sp., Salix sp.,

Taxodium sp., Nuphar sp., Alternanthera philoxeroides, Lemna sp., Juncus sp., Hydrocotyle sp.

Macroinvertebrates: Pistia sp.

Rhynchocoela

Prostoma rubrum

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
unident. lumbriculid

Hirudinea

Helobdella elongata
unident. sp.

Arthropoda

Crustacea

Amphipoda

Gammarus tigrinus
Hyalella azteca

Decapoda

Palaemonetes paludosus
Procambarus sp.

Insecta

Odonata

Enallagma sp.
Epicordulia regina
Gomphus sp.
Libellula sp.

Ephemeroptera

Baetis sp.
B. spiethi
B. spinosus
Caenis diminuta
Pseudocloeon parvulum
Stenonema exiguum
Stenacron interpunctatum
Stenonema smithae
Tricorythodes albineatus

Hemiptera

Abedus immaculatus
Gerris sp.
Metrobates sp.
Ranatra sp.
Rhagovelia sp.

Trichoptera

Cheumatopsyche sp.
Chimarra sp.
Cyrnellus fraternus
Hydroptila sp.
Hydropsyche sp.
Macronemum carolina
Mayatrichia ayama
Micrasema sp.
Polycentropus sp.
Oecetis sp.
 unident. hydroptilid
 unident. sp.

Megaloptera

Corydalus cornutus

Diptera

Cladotanytarsus sp. 1 - Kelly
C. sp. 2 - Kelly
Conchapelopia sp.
Corynoneura taris
Cricotopus bicinctus
C. sp. 1 - (Beck)
Cryptochironomus fulvus

Diptera (cont.)

Dicrotendipes nervosus
Hermione sp.
Pentaneura inculta
Polypedilum convictum
P. fallax
P. halterale
P. illinoense
Rheotanytarsus exiguus
Roederodes sp.
Simulium glossonae
Stenochironomus hilaris
Tanytarsus sp.
Thienemanniella xena
Tribelos fuscicornis

Coleoptera

Dineutus sp.
Gyrinus sp.
Hydroporus sp.
Listronotus sp.
Stenelmis sp.
Tropisternus striolatus

Arachnida

Acarina

Atractides sp.
Hygrobates sp.
Megapus sp.

Mollusca

Gastropoda

Amnicola sp.
Ferrissia sp.
Goniobasis sp. 1 - Bickner
G. sp. 2 - Bickner
Helisoma sp.
Physa sp.
Pomacea paludosa

DATA SUMMARY: Lehigh River

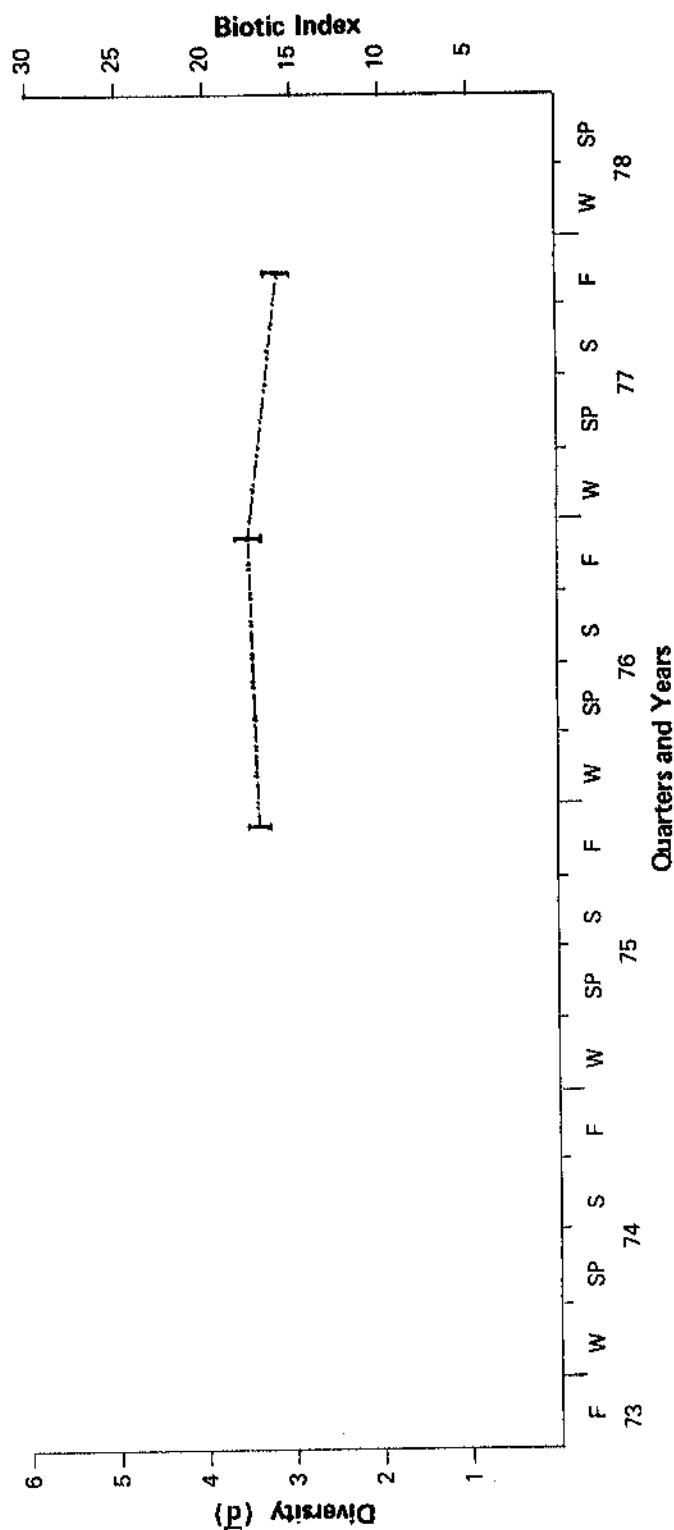
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
496	21 Oct 75										460		
	17 Nov 75										330	33	
	30 Mar 76	2.417±0.348	0.465±0.091	20		3.426±0.118	0.054±0.015	15					
	23 Nov 76					3.594±0.134	0.092±0.010	29	56		490	33	
	1 Nov 77					3.259±0.134	0.100±0.019	18			1800	95	
	17 Apr 78												

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.03.0050
 BODY OF WATER: ICHETUCKNEE RIVER

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 — Biotic Index (= FLORIDA INDEX)



Station No. 21.03.0051 Body of Water Olustee Creek
Location at SR 238
County Columbia - Union
Type Body of Water stream Classification
Sources of Pollution agricultural runoff

Nearby Land Use agricultural (pasture)
Sampling Frequency annually Depth 2.0 - 2.8 m
Bottom Type sand, muck, detritus & Volatile Solids
Aquatic Plants: Submerged
Emergent Salix sp., Ludwigia sp., Alternanthera sp.
Panicum sp., Taxodium sp., Lemna sp.

Macroinvertebrates:

Porifera

Spongilla sp.

Platyhelminthes

Turbellaria

Dugesia tigrina
unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
Nais sp.
N. communis
Premnodrilus palustris
Pristina plumaseta
Vejdovskyella comata
unident. enchytraeid
unident. lumbriculid

Hirudinea

Helobdella elongata
unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus racovitzai australis

Amphipoda

Crangonyx serratus

Gammarus tigrinus

Hyalella azteca

unident. sp.

Decapoda

Palaemonetes paludosus

Procambarus fallax

P. sp.

Insecta

Odonata

Anax amazili

Argia sp.

Didymops sp.

Dromogomphus spinosus

Enallagma sp.

Gomphus sp.

Ischnura sp.

Leptemis vesiculosa

Lestes sp.

Libellula auripennis

Macromia sp.

M. taeniolata

Neurocordulia alabamensis

Orthemis ferruginea

Pachydiplax longipennis

Perithemis tenera

Tetragoneuria semiaquea

Ephemeroptera

Caenis sp.

C. diminuta

C. hilaris

Callibaetis pretiosus

Ephemerella trilineata

Hexagenia munda elegans

Leptophlebia bradleyi

Stenonema smithae

Hemiptera

Abedus immaculatus

Gerris sp.

Mesovelia mulsanti

Hemiptera (cont.)

Microvelia sp.
Plea striola
Ranatra sp.
Trichocorixa sp.
 unident. corixid

Trichoptera

Cynellus sp.
Molanna sp.
Oxyethira sp.
 unident. sp.

Lepidoptera

unident. sp.

Diptera

Ablabesmyia aspera
A. tarella
A. hauberi
A. ornata
A. peleensis
A. tarella
Atrichopogon sp.
Cladotanytarsus sp.
Clinotanytus sp.
Corynoneura taris
Cryptochironomus fulvus
Culicoides sp.
Demicryptochironomus sp.
Dicrotendipes modestus
Endochironomus nigricans
Labrundinia johannseni
L. neopilosella
Limonia sp.
Microtendipes sp.
Orthocladius annectens
Palpomyia-Bezzia complex sp. 1 - Kelly
P. tibialis
Parachironomus monochromus
P. pectinatellae
Polypedilum fallax
P. halterale
P. illinoense
Procladius sp.
Psectrocladius sp.
Tabanus sp.
Tanytarsus sp.
Simulium sp.
 unident. ceratopogonid

Coleoptera

Berosus sp.
Bidessonotus longovalis
Copelatus glyphicus
Coptotomus interrogatus obscurus
Dineutus sp.
Dubiraphia quadrinotata
Haliphus punctatus
Hydrocanthus oblongus
Hydroporus falli
H. sp.
Peltodytes floridensis
P. oppositus
P. sp.
Scirtes sp.
Stenelmis sp.
Tropisternus sp.

Arachnida

Acarina

Arrenurus sp.
Atractides sp.
Mideopsis sp.
Neumania sp.
Tiphys sp.
Unionicola sp.

Mollusca

Gastropoda

cf. Ferrissia sp.
Laevapex sp.
Micromenetus dilatatus

Pelecypoda

Sphaerium sp.

DATA SUMMARY: Olustee Creek

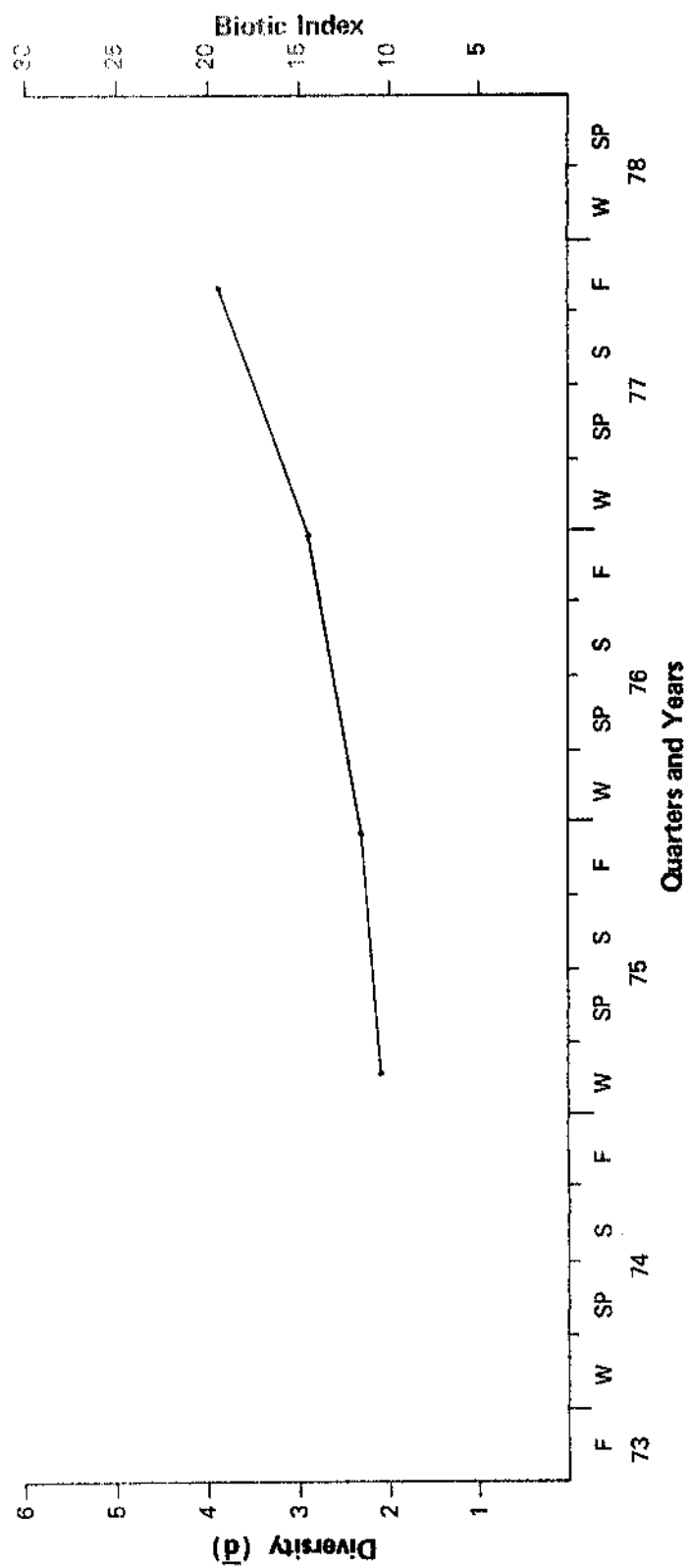
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate								
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
								Total	Fecal				
502	21.03.0051	13 Feb 75						11	19				Florida Index
		10 Dec 75						12	27				
		15 Dec 76						15	46				
		20 Oct 77						20	71				

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.03.0051
 BODY OF WATER: OLUSTEE CREEK

--- NATURAL SUBSTRATE DIVERSITY
 ---- ARTIFICIAL SUBSTRATE DIVERSITY
 _____ BIOTIC INDEX (= FLORIDA INDEX)



Station No. 21.03.0052 Body of Water Big Santa Fe Lake

Location northend

County Alachua

Type Body of Water lake Classification

Sources of Pollution urban runoff

Nearby Land Use residential

Sampling Frequency annually Depth 3.10 m

Bottom Type muck, sand, detritus % Volatile Solids

Aquatic Plants: Submerged

Emergent Taxodium sp., Panicum sp., Eichhornia

crassipes, Salvinia sp.

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

unident. lumbriculid

unident. naidd

Hirudinea

unident. sp.

Arthropoda

Crustacea

Amphipoda

Gammarus tigrinus

Hyalella azteca

Insecta

Odonata

Dromogomphus spinosus

Gomphus sp.

Macromia sp.

Somatochlora sp.

Ephemeroptera

Hexagenia munda orlando

Trichoptera

Oecetis sp.
Cyrnellus fraternis
Polycentropus sp.

Diptera

Ablabesmyia cinctipes
Chaoborus sp.
Cladotanytarsus sp.
Coelotanypus tricolor
Cryptochironomus fulvus
Dicrotendipes lobus
Glyptotendipes sp.
Kiefferulus dux
Nilothauma sp.
Orthocladius annectens
Palpomyia-Bezzia complex sp. 1 - Kelly
Parakiefferiella sp.
Polypedilum halterale
Procladius sp.
Pseudochironomus sp.
Tanytarsus sp.

Arachnida

Acarina

Albia sp.
Arrenurus sp.
Atractides sp.
Mideopsis sp.

Mollusca

Gastropoda

Physa sp.

Pelecypoda

Pisidium sp.
Sphaerium sp.

DATA SUMMARY: Big Santa Fe Lake

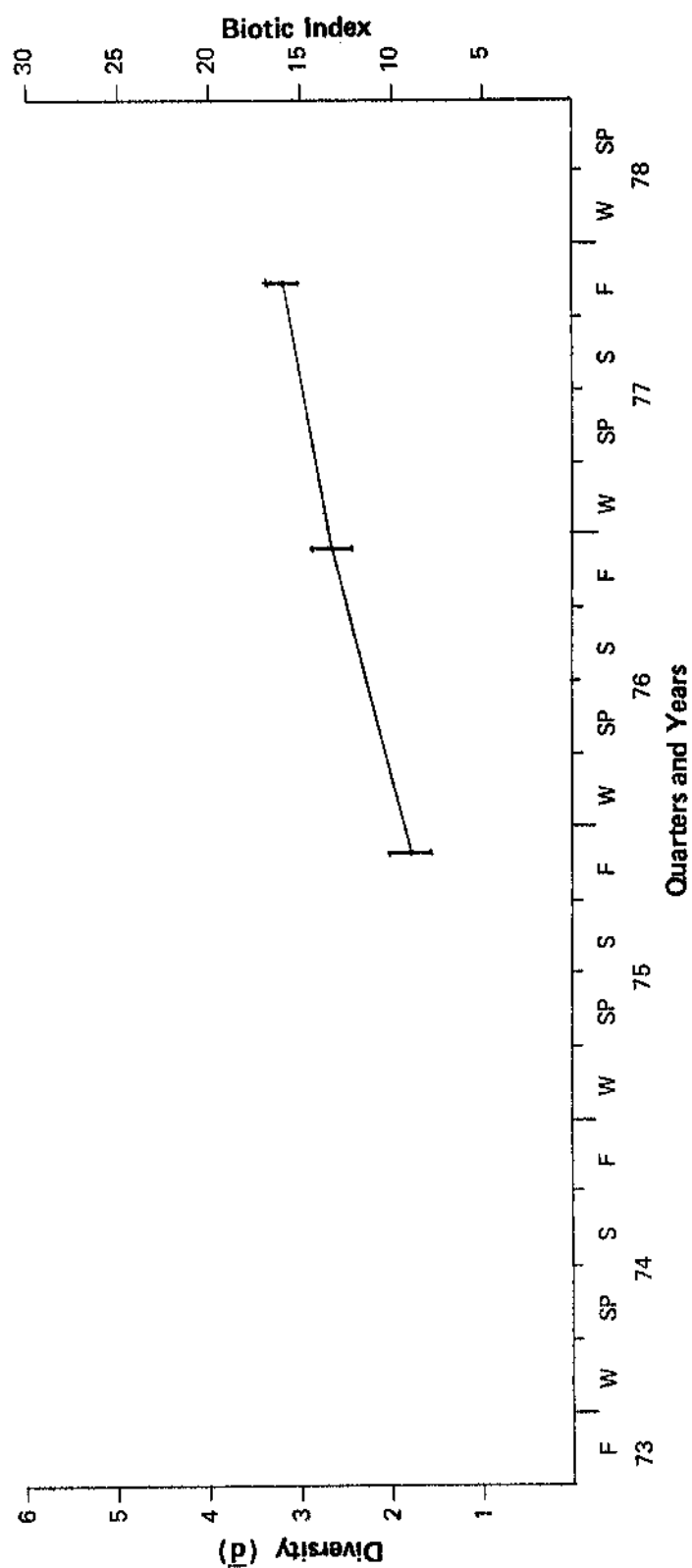
DATA SUMMARY: Big Santa Fe Lake														
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
21-01-0052 506	24 Nov 75	1.826±0.257	0.547±0.075	17										
	6 Dec 76	2.700±0.210	0.224±0.032	21										
	28 Mar 77													
	3 Nov 77	3.223±0.184	0.137±0.031	20								240	79	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.03.0052
 BODY OF WATER: BIG SANTA FE LAKE

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 _____ BIOTIC INDEX (= FLORIDA INDEX)



Arthropoda

Crustacea

Amphipoda

Gammarus tigrinus

Insecta

Collembola

Bourlettiella sp.

Sminthurides sp.

Odonata

Argia tibialis

Dromogomphus armatus

D. spinosus

Gomphus sp.

cf. G. dilatatus

Ephemeroptera

Baetis spinosus

Caenis hilaris

Choroterpes hubbelli

Hexagenia munda elegans

Stenacron interpunctatum

Stenonema smithae

Leptophlebia bradleyi

Neuroptera

Climacia areolaris

Diptera

Ablabesmyia ornata

A. parajanta

Chironomus sp. A (Beck)

C. attenuatus

Cladotanytarsus sp.

Corynoneura taris

Cryptochironomus fulvus

C. blarina

C. sp.

Dicrotendipes leucoscelis

Demicryptochironomus sp.

Endochironomus sp.

Glyptotendipes sp.

Microsectra sp.

Paralauterborniella nigrohalteralis

Paracladopelma sp.

Palpomyia-Bezzia complex sp. 1 - Kelly

Polypedilum fallax

P. halterale

P. illinoense

Diptera (cont.)

Rheocricotopus robacki
Rheotanytarsus exiguus
Roederodes sp.
Microtendipes sp.
Stenochironomus hilaris
Stictochironomus devinctus
Thienemanniella xena
Tribelos fuscicornis
Xenochironomus xenolabis
Zavrelia sp.
unident. ceratopogonid

Coleoptera

Ancyronyx variegatus
Dubiraphia quadrinotata
Microcylloepus pusillus
Stenelmis fuscata
S. sp.

Arachnida

Acarina

Mideopsis sp.
Sperchon sp.
Unionicola sp.

Mollusca

Gastropoda

Amnicola sp.
Laevapex sp.
Physa sp.
Pomacea paludosa

Pelecypoda

Corbicula manilensis
Elliptio sp.
Sphaerium sp.
Villosa villosa
unident. unionid

DATA SUMMARY: New River

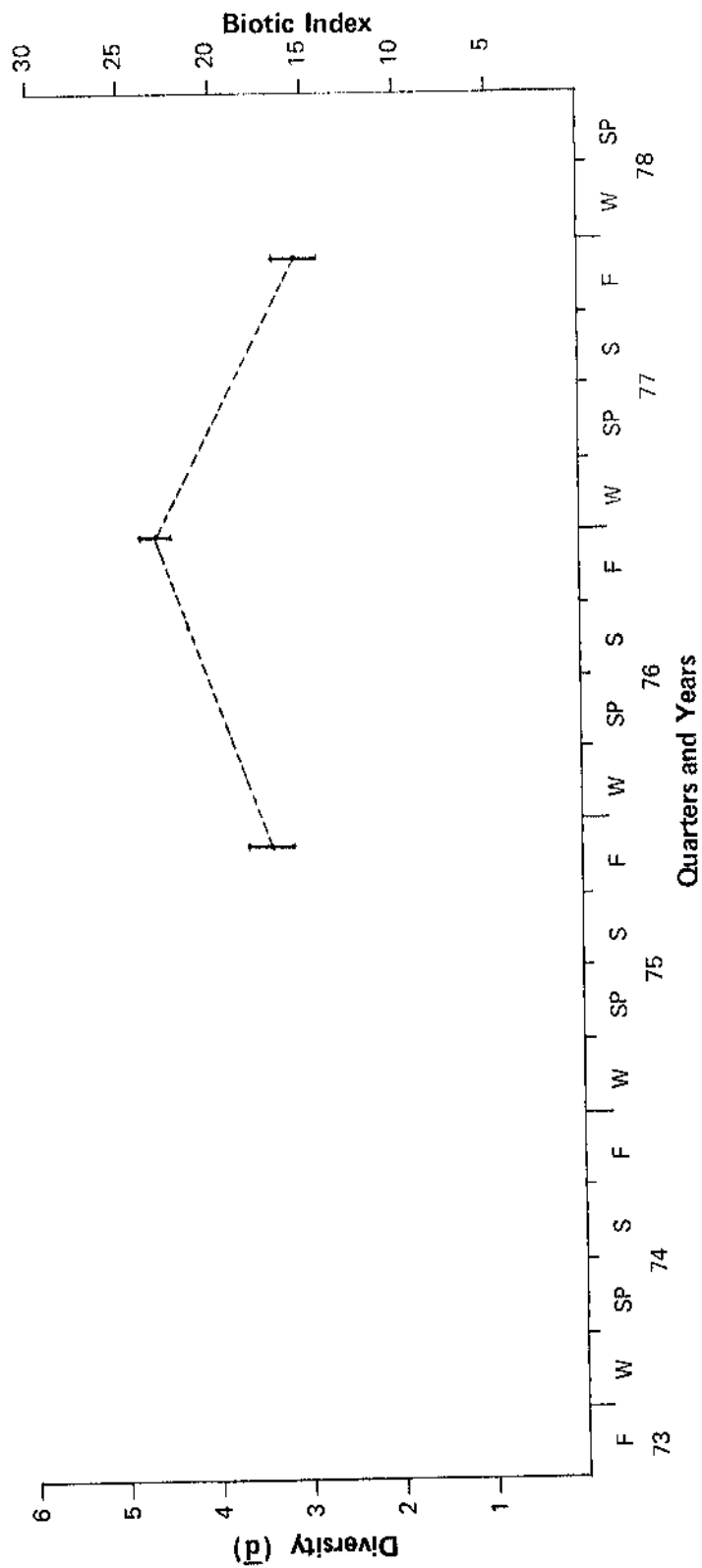
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	RI	#Spp.				
21.03.0053 511	24 Nov 75	3.501±0.238	0.098±0.256	19									
	15 Dec 76	4.755±0.173	0.082±0.014	68									
	29 Nov 77	3.165±0.249	0.144±0.042	17							2300	330	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.03.0053
 BODY OF WATER: NEW RIVER

--- NATURAL SUBSTRATE DIVERSITY
 --- ARTIFICIAL SUBSTRATE DIVERSITY
 --- BIOTIC INDEX (= FLORIDA INDEX)



Station No. 21.03.0054 Body of Water Alligator Lake
Location center of lake
County Columbia
Type Body of Water lake Classification _____
Sources of Pollution suburban runoff, sewage treatment plant effluent
Nearby Land Use residential
Sampling Frequency annually Depth 0.35 - 1.6 m
Bottom Type mud, sand, detritus % Volatile Solids _____
Aquatic Plants: Submerged Najas sp.
Emergent Eichhornia crassipes, Taxodium distichum
Panicum hematomon, Lemna sp., Ricciacarpus sp., Pontederia sp., Nuphar sp.

Macroinvertebrates:

Nematoda
 unident. sp.

Annelida
 Oligochaeta
 Limnodrilus hoffmeisteri
 Nais sp.
 Pristina osborni

Hirudinea
 Helobdella elongata

Arthropoda
 Crustacea
 Amphipoda
 Hyalella azteca

 Insecta
 Hemiptera
 unident. corixid

Diptera

Chaoborus sp.
Chironomus attenuatus
C. stigmaterus
Cladotanytarsus sp.
Coelotanypus concinnus
Cryptotendipes sp.
Dicrotendipes nervosus
Einfeldia sp.
Glyptotendipes sp.
Kiefferulus dux
Palpomyia-Bezzia sp. 1 - Kelly
Procladius sp.
Tanytarsus sp.
unident. ceratopogonid

Arachnida

Acarina

Arrenurus sp.

DATA SUMMARY: Alligator Lake

DATA SUMMARY: ALLIGATOR LAKE

Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
21.03.0054 515	10 Dec 75	2.059±0.165	0.300±0.050	10									
	9 Dec 76	1.608±0.134	0.454±0.048	12									
	27 Oct 77	2.081±0.196	0.272±0.061	9									

See methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 21.03.0054
 BODY OF WATER: ALLIGATOR LAKE

--- NATURAL SUBSTRATE DIVERSITY
 - - - - - ARTIFICIAL SUBSTRATE DIVERSITY
 ——— BIOTIC INDEX (= FLORIDA INDEX)

