

Technical Series

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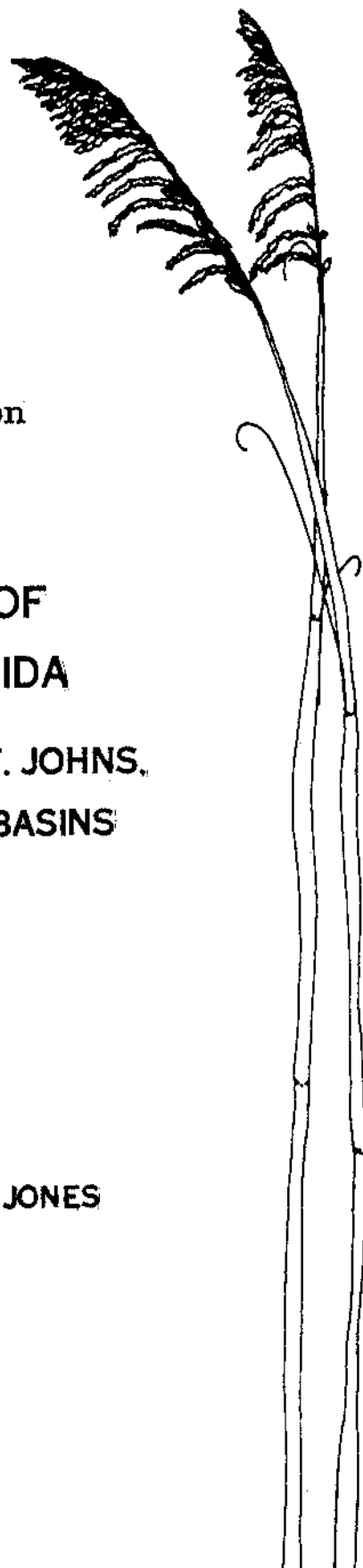
December 1979

State of Florida
Department of
Environmental Regulation

**BIOLOGICAL ASPECTS OF
WATER QUALITY IN FLORIDA**

**PART II: NASSAU - ST. MARYS, ST. JOHNS,
AND EAST COAST DRAINAGE BASINS**

EDITED BY
LANDON T. ROSS AND DOUGLAS A. JONES



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BIOLOGICAL ASPECTS OF WATER QUALITY
IN FLORIDA

(Part II: Nassau-St. Marys, St. Johns,
and East Coast Drainage Basins)

Edited by
LANDON T. ROSS
and
DOUGLAS A. JONES

Department of Environmental Regulation
Tallahassee, Florida

(See Part I for introduction, methods, and related material.)

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NASSAU - ST. MARYS DRAINAGE BASIN

The Nassau-St. Marys Drainage Basin drains more than 1100 square miles of the northeastern corner of Florida. The headwaters of the St. Marys River are in the Okefenokee Swamp. The river flows eastward to the Atlantic Ocean and drains more than 850 square miles. It constitutes the Florida-Georgia border along part of its length. The Nassau River arises from creeks flowing eastward out of Duval and Nassau Counties and discharges into the Atlantic Ocean along the southern boundary of the basin segment. It drains approximately 300 square miles. The only other notable body of water in the basin is the Amelia River, an estuary connecting the the St. Marys and the Nassau Rivers and separating Amelia Island from the mainland.

St. Mary River Sub-Basin

Two monitoring stations were sampled on the St. Marys River during the report period. Station 19.01.0002 near Macclenny had good diversity and Biotic Index numbers, indicating a fairly healthy macroinvertebrate community. Although Class III water quality standards were not observed to be exceeded, total coliform counts were occasionally high. This may be related to runoff or it may be a residual effect of the Macclenny sewage treatment plant a few miles upstream. Normally, bacteria in sewage effluent would also include high numbers of fecal coliforms (bacteria associated with warm-blooded animals); but it is possible that, because of their temperature requirements, they were unable to survive long enough in the relatively cold stream water to reach the sampling point.

Station 19.01.0001, at US 17, exhibited lower macroinvertebrate diversities than the upstream station, primarily because of its estuarine location. Salinity variations in estuaries place organisms under considerable osmotic stress and fewer species are adapted to this than occupy entirely freshwater or entirely marine habitats. The list of species collected at this station includes forms from wide ranges of salinity (e.g. freshwater insects and marine/estuarine polychaetes).

Natural substrate samples were also quite variable due to the inconsistent sediment types that were encountered when sampling. Generally, the area had a well scoured coarse sediment bottom which provided little habitat. Occasionally, though, the sampling dredge fell in an area with finer sediments and better habitat. In fact, the significant improvement in natural substrate macroinvertebrate diversity may reflect an effort by samplers to find habitable sediments more than a change in water quality.

Furthermore, artificial substrate macroinvertebrate diversities showed a significant downward trend and since this method is not subject to substrate variation, it may better reflect water quality effects in this case. Further sampling and analysis would be required to make any firm conclusions about this station's diversity trends. Frequently high total coliform counts may be attributable to pasture runoff upstream.

Nassau River Sub-Basin

The sole Nassau River station in this sub-basin, 19.02.0002, at US 17, had low macroinvertebrate diversity values, probably because of salinity stresses imposed by its estuarine location. Not enough data were collected to detect any trends in apparent water quality.

The other three stations in the sub-basin were located in the Amelia River. Station 19.02.0026, at the junction of the Amelia River and the Nassau River was sampled only three times during the report period, so no trends could be detected. However, diversity values ranged from fair to very good, apparently again because of variation in sediment composition at this well flushed location.

Macroinvertebrate species diversity at station 19.02.0005, near Marker #27 off Old Fernandina, showed a significant improvement during the report period and was generally good from mid-1975 through the end of the period. Total coliform counts were frequently in excess of Class III standards. Pollution sources in the area included two paper mills and the City of Fernandina Beach sewage treatment plant.

Station 19.02.0013, near Marker #1 is closer to the Fernandina Beach sewage treatment plant and less well flushed than station 19.02.0005 and the data reflect this. No macroinvertebrate samples have been analyzed since June, 1975 but four out of five of those analyzed before then had diversities of zero. The sediments were often anoxic as evidenced by H_2S gas brought up in bottom grabs. Bacteria were monitored routinely during the entire report period and both total and fecal coliform counts frequently exceeded Class III standards.

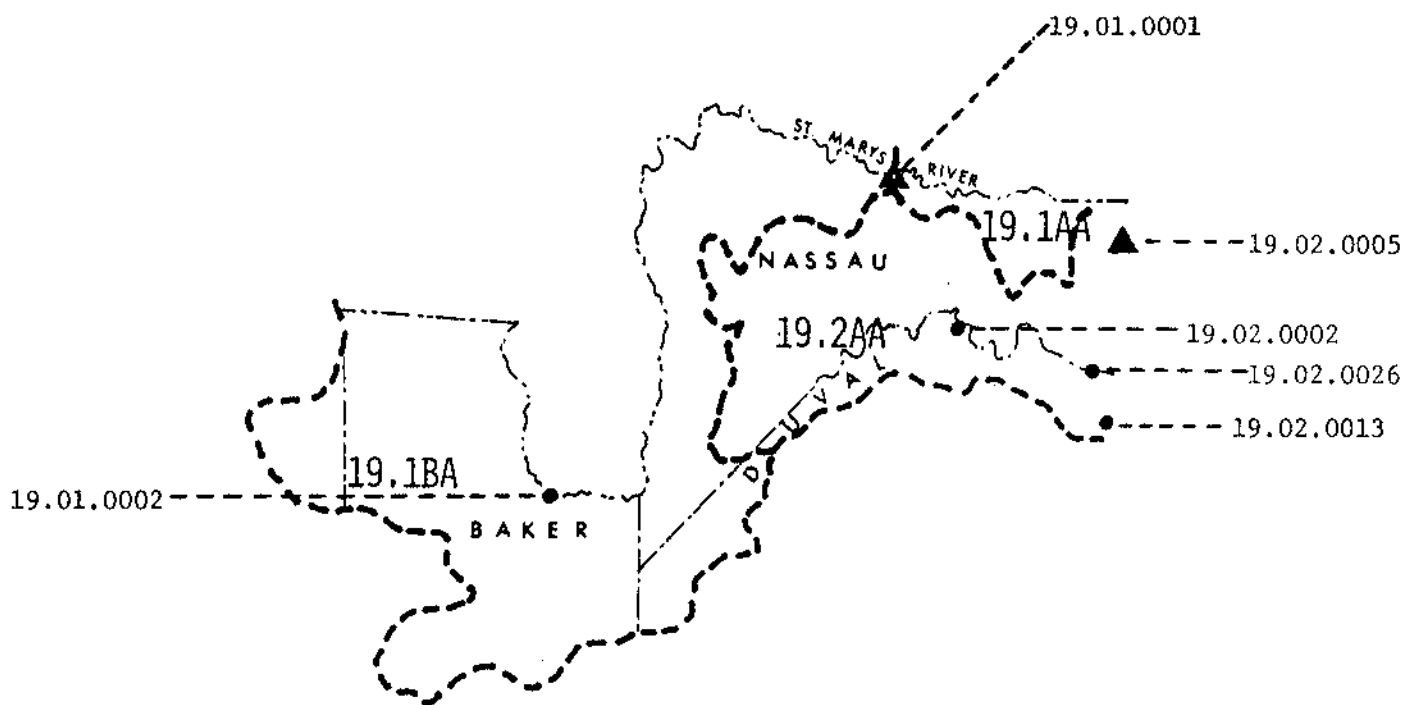
Summary

The St. Marys River macroinvertebrate diversity data indicate fairly good water quality. Lower diversities in the lower reaches probably

indicate salinity stress and strong current flow (i.e. bottom scouring) more than degraded water quality. Conflicting data precluded a statement on diversity trend at the latter site. Occasionally high total coliform counts were probably related to runoff, but with a possible connection to the Macclenny sewage treatment plant effluent.

Not enough data were collected from the Nassau River to detect a trend but the macroinvertebrates appear to be limited by salinity stresses and, at least at the mouth, by current induced sediment scouring. The Amelia River also is estuarine and at least one, perhaps two, of the stations there exhibited signs of water quality degradation, in the form of high bacteria counts, due to sewage effluent. Interestingly, the better flushed of the two locations had fairly good, and improving, macroinvertebrate diversity.

NASSAU-ST. MARYS RIVER BASIN



Station No. 19.01.0001 Body of Water St. Mary's River

Location US Hwy. 17

County Nassau

Type Body of Water river Classification III

Sources of Pollution

Nearby Land Use natural

Sampling Frequency quarterly Depth 2.7 - 5.1 m

Bottom Type sand, clay, detritus % Volatile Solids

Aquatic Plants: Submerged

Emergent Cladium jamaicense, Pontederia lanceolata,
Leersia hexandra, Cephalanthus occidentalis, Juncus sp., Panicum sp., Sagittaria sp.,

Macroinvertebrates: Taxodium distichum, Salix sp., Zizania aquatica, Spartina
sp., Typha sp.

Nematoda

unident. sp.

Annelida

Oligochaeta

Haemonais sp.

Limnodrilus hoffmeisteri

Nais elinguis

Pelosclex sp. 1 - Cormier

Premnodrilus palustris

Pristina idrensis

P. osborni

Slavina appendiculata

Stylaria lacustris

Tubifex ignotus

unident. enchytraeid

unident. lumbriculid

unident. sp.

Hirudinea

unident. sp.

19.01.0001

Polychaeta

Nereis sp.
Scolecopides viridis
unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.
A. laticaudatus
Cassidinisca lunifrons
Chiridotea caeca
Cyathura polita

Amphipoda

Corophium lacustre
Gammarus sp.
G. tigrinus
Hyalella azteca
cf. Maera sp.
Melita nitida
Monoculodes sp.
unident. haustoriid

Decapoda

Neopanope texana sayi
Rhithropanopeus harrisii
Palaemonetes paludosus
unident. xanthid

Cirripedia

Balanus improvisus

Insecta

Odonata

Aphylla sp.
Argia apicalis
Dromogomphus spinosus
D. sp.
Enallagma sp.
Gomphus sp.
G. plagiatus
Macromia taeniolata
Neurocordulia sp.

Ephemeroptera

Caenis sp.
Hexagenia munda elegans
Pseudocloeon parvulum
Stenonema exiguum
S. integrum
S. smithae

Hemiptera

Pelocoris sp.
Velia sp.
unident. corixid
unident. sp.

Trichoptera

Cynellus fraternus
Hydropsyche sp.
Nectopsyche sp.
Neureclipsis sp.
Oecetis sp.
Polycentropus sp.
Psychomyia sp.

Diptera

Ablabesmyia parajanta
A. tarella
Brillia par
Cardiocladius sp.
Cladotanytarsus sp.
Clinotanypus sp.
Coelotanypus sp.
C. concinnus
C. scapularis
C. tricolor
Corynoneura taris
Cricotopus bicinctus
Cryptochironomus sp.
C. fulvus
Cryptotendipes sp.
Dicrotendipes nervosus
Einfeldia sp.
Eukiefferiella cerulescens
Harnischia sp.
H. edwardsi
Heterotrissocladius sp.
Larsia sp.
Micropsectra sp.
Microtendipes sp.
Microcricotopus sp.

Diptera (cont.)

Nilothauma sp.
Orthocladius annectens
Pagastiella sp.
Palpomyia-Bezzia complex sp.
Parachironomus sp.
P. carinatus
Paracladopelma loganae
Paralauterborniella elachista
P. nigrohalteralis
Pentaneura sp.
Phaenopsectra sp.
Polypedilum halterale
P. illinoense
Palpomyia tibialis
Procladius sp.
Psectrocladius sp.
Pseudochironomus sp.
Rheotanytarsus exiguus
Roederodes sp.
Stictochironomus sp.
S. devinctus
Tanytarsus sp.
Thienemanniella xena
Tribelos sp.
T. fuscicornis
T. jucundus
Xenochironomus sp.
X. xenolabis
 unident. sp.

Coleoptera

Dineutes sp.
Suphisellus floridanus

Arachnida

Acarina

Mideopsis sp.
Unionicola sp.
 unident. sp.

Mollusca

Gastropoda

Amnicola (Lyogyrus) sp.
Helisoma sp.
Physa sp.
 unident. hydrobiid

Pelecypoda

Mytilopsis leucophaeta
Rangia cuneata

DATA SUMMARY: St. Mary's 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.					
19.01.0001	15 Aug 73									2300		
	4 Sep 73									46		
	15 Oct 73									540		
	1 Nov 73	1.828±0.491	0.346±0.212	5						950		
	5 Nov 73									330		
	27 Nov 73									460		
	2 Jan 74											
	30 Jan 74	1.649±0.434	0.278±0.247	4	1.593±0.291	0.403±0.125	6			1000		
	3 Feb 74									1000		
	6 Feb 74									9200		
	17 Feb 74									460		
	25 Feb 74											

See Methods for explanation of table.

DATA SUMMARY: St. Mary's 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.					
19.01.0001	4 Mar 74									1000		
	5 Mar 74									1000		
	7 Mar 74									1000		
	18 Mar 74									170		
	29 Apr 74									330		
	29 Apr 74	0.905+0.543	0.914+0.247	5								
	20 May 74									1700		
	17 Jul 74									9200	280	
	14 Aug 74									1100		
	20 Aug 74	2.964+0.425	0.310+0.100	16								
	4 Sep 74									490		
	29 Oct 74									4900		

See Methods for explanation of table.

DATA SUMMARY: St. Mary's 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						
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.				
19.01.0001	20 Nov 74									180	
	7 Jan 75									330	
	10 Jan 75	2.591±0.167	0.126±0.029	10				3	13		
	10 Feb 75									330	
	31 Mar 75									790	
	28 Apr 75									700	
	27 May 75									2200	
	27 May 75	2.640±0.350	0.230±0.060	13	2.720±0.280	0.240±0.060	15				
	18 Jun 75									3300	
	10 Jul 75									1700	
	6 Aug 75									2300	
	6 Aug 75	2.120±0.320	0.522±0.088	19	2.442±0.217	0.292±0.036	21	18	33	2300	79

See Methods for explanation of table.

DATA SUMMARY: St. Mary's 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.			BI	#Spp.	
19-01.0001	17 Sep 75											1300		
	29 Oct 75											920		
	29 Oct 75	2.755±0.341	0.226±0.059	14								920	170	
	18 Nov 75											140		
	8 Dec 75											330	49	
	26 Jan 76											490	46	
	16 Feb 76											540	350	
	23 Feb 76	2.512±0.368	0.250±0.103	10.	1.269±0.218	0.460±0.102	5	13	16		Coc BG Fil BG Coc Gr Fil Gr Gr Flag Other Flag 144 Cen Dia Pen Dia	490 0 0 0 0 0 684 18972	46	

See Methods for explanation of table.

DATA SUMMARY: St. Mary's 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.							
19.01.0001	23 Feb 76 (Cont.)									Total 19800				
	18 May 76	1.808±0.335	0.291±0.098	6							490	33		
	14 Jun 76										1300	79		
	4 Aug 76										7000	110		
	5 Aug 76	1.704±0.564	0.662±0.208	8				6	20					
	7 Sep 76													
	28 Oct 76	3.641±0.188	0.070±0.021	19	1.702±0.308	0.502±0.111	9				Coc BG LTI Ftl BG 0 Coc Gr 4 Ftl Gr LTI Gr Flag 1 Other Flag 0 Cen Dia 17 Pen Dia 33 Total 56	1700	33	

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See Methods for explanation of table.

DATA SUMMARY: St. Mary's 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.						
19.01.0001	14 Mar 77										13000	280	
	29 Mar 77	3.171±0.303	0.201±0.046	21				13		Coc BG 0 Fil BG 0 Coc Gr 4180 Fil Gr 0 Gr Flag 40 Oth Flag 0 Cen Dia 1710 Pen Dia 1870 Total 7810			
	4 Apr 77										1300	790	
	26 Apr 77	2.806±0.259	0.202±0.045	16	1.692±0.197	0.322±0.048	8						
	13 Jul 77												
	2 Aug 77	2.463±0.319	0.163±0.069	8	0.289±0.053	0.924±0.018	8			Coc BG 270 Fil BG 360 Coc Gr 980 Fil Gr 1610 Gr Flag 90	3300	130	

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See Methods for explanation of table.

DATA SUMMARY: St. Mary's 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.		
19.01.0001	2 Aug 77 (Cont.)													
	6 Oct 77	2.643+0.301	0.321+0.075	18				8	26		Other Flag 0 Cen Dia 9950 Pen Dia 4534 Total 58690	46	23	
	26 Jan 78	2.884+0.271	0.161+0.041	14	1.585+2.53 x10 ⁻⁶		3					790	330	
	2 Feb 78													
	8 Mar 78													
	21 Mar 78	3.332+0.216	0.111+0.027	18				13	22			79	49	
	5 Apr 78											3300	33	
	8 May 78													
	12 Jun 78											330	170	

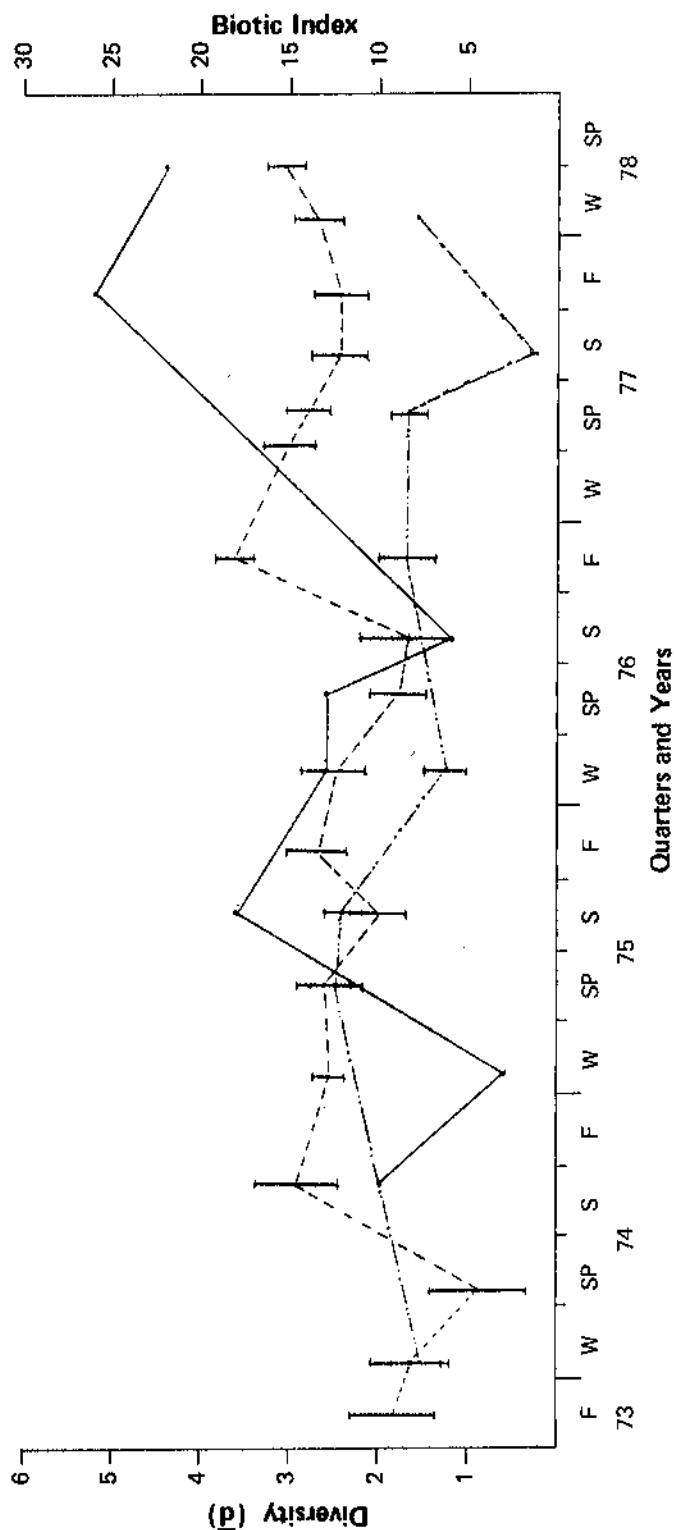
Other Flag 0
Gen Dia 9950
Pen Dia 4534
Total 58690

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 19.01.0001
BODY OF WATER: ST. MARYS RIVER

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



Station No. 19.01.0002 Body of Water St. Mary's River
Location northwest of Macclenny
County Baker
Type Body of Water river Classification III
Sources of Pollution none
Nearby Land Use natural
Sampling Frequency irregular Depth 1m
Bottom Type hard sand % Volatile Solids _____
Aquatic Plants: Submerged none
Emergent Nyssa ogeechee, Salix sp., Betula sp.,
distichum

Macroinvertebrates:

Annelida

Oligochaeta

Aulodrilus americanus
Limnodrilus hoffmeisteri
Nais communis
Pelosclex carolinensis
P. ferox
Pristina osborni
unident. lumbriculid
2 unident. spp.

Arthropoda

Crustacea

Isopoda

Asellus sp.
A. laticaudatus

Amphipoda

Gammarus tigrinus
Hyaella azteca

Decapoda

Palaemonetes paludosus
unident. astacid sp.

Insecta

Plecoptera

Perlesta sp.

Odonata

Argia bipunctulata

A. moesta

A. sedula

A. sp.

A. tibialis

Boyeria vinosa

Calopteryx sp.

Didymops sp.

Dromogomphus sp.

D. armatus

D. spinosus

Gomphus sp.

Macromia taeniolata

Nehallennia sp.

Neurocordulia moesta

Progomphus alachuensis

P. sp.

Ephemeroptera

Baetis spiethi

Caenis diminuta

C. sp.

Centroptilum sp.

C. viridocularis

Ephemerella trilineata

Stenonema exiguum

S. smithae

unident. bateid

Hemiptera

Plea striola

Rheumatobates sp.

Sigara (Phaeosigara) sp.

Trichocorixa sp.

unident. corixid

Trichoptera

Ceraclea sp.

Cheumatopsyche sp.

Chimarra sp.

Hydropsyche sp.

Macronema carolina

Molanna sp.

Oecetis sp.

Oxyethira sp.

Phylocentropus sp.

Polycentropus sp.

unident. hydroptilid

Megaloptera

Corydalis cornutus

Diptera

Ablabesmyia americana

A. aspera

A. hauberi

A. mallochi

A. ornata

A. parajanta

Arctopelopia sp.

Atherix variegata

Chrysops sp.

Chironomini sp. A (Roback)

Chironomus attenuatus

Cladotanytarsus sp.

Clinotanytarsus sp.

Coelotanypus sp.

Conchapelopia sp.

Cricotopus bicinctus

Cryptochironomus sp.

Culicoides sp.

Dicrotendipes neomodestus

Eukiefferiella sp.

Larsia sp.

Nanocladius sp.

Pagastiella sp.

Palpomyia-Bezzia complex sp. 1 - Kelly

P. tibialis

Paracladopelma loganae

Paralauterborneilla nigrohalteralis

Pentaneura inculta

Polypedilum convictum

P. fallax

P. halterale

P. illinoense

Procladius sp.

Psectrocladius sp.

Rheotanytarsus exiguus

Rheocricotopus robacki

Simulium slossonae

Stenochironomus hilaris

Tanytarsus sp.

Tribelos sp.

T. fuscicornis

unident. ceratopogonid

unident. chironomid

unident. simuliid

2 unident. spp.

Coleoptera

Ancyronyx variegata
Coptotomus interrogatus obscurus
Derovateilus lentus floridanus
Dineutes sp.
D. discolor
Dubiraphia sp.
Gyrinus rockinghamensis
Hydrovatus sp.
Peltodytes sp.
P. floridensis
P. sexmaculatus
Stenelmis sp.
S. crenata
S. fuscata
S. grossa
Tropisternus striolatus
unident. elmids

Arachnida

Acarina

Atractides sp.
Krendowskia similis
Lebertia sp.
Sperchon sp.
Sperchonopsis verrucosa
2 unident. spp.

Mollusca

Gastropoda

Amnicola sp.

DATA SUMMARY: St. Mary's 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.	
19.01.0002	15 Aug 73											350		
	4 Sep 73											230		
	14 Sep 73											1000		
	15 Oct 73											130		
	5 Nov 73											540		
	2 Jan 74											2300		
	25 Feb 74											180		
	18 Mar 74											170		
	29 Apr 74											140		
	20 May 74											1100		
	22 May 74	2.237±0.229	0.291±0.065	12				5	20					

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See Methods for explanation of table.

DATA SUMMARY: St. Mary's 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.					
19.01.0002	14 Sep 74									1000		
	17 Sep 74	3.509+0.347	0.155+0.050	18				29	37			
	4 Nov 75	2.500+0.346		6						330		
	7 Jan 75									330		
	6 Feb 75	3.832+0.204	0.076+0.018	24				41	53			
	9 Jun 75	2.880+0.470	0.280+0.090	11								
	23 Sep 75				3.543+0.189	0.118+0.029						
	12 Apr 76							33	27	170	8	
	18 May 77							31	46			
	228 Dec 77											
	23 Jan 78									490	33	
										1100	330	

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See Methods for explanation of table.

DATA SUMMARY: St. Mary's 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.	Total			Fecal		
19.01.0002	2 Feb 78												49	11	
	8 Mar 78												490	49	
	6 Apr 78							19	21				49	4	
	22 May 78												790	11	
	7 Jun 78												1100	140	

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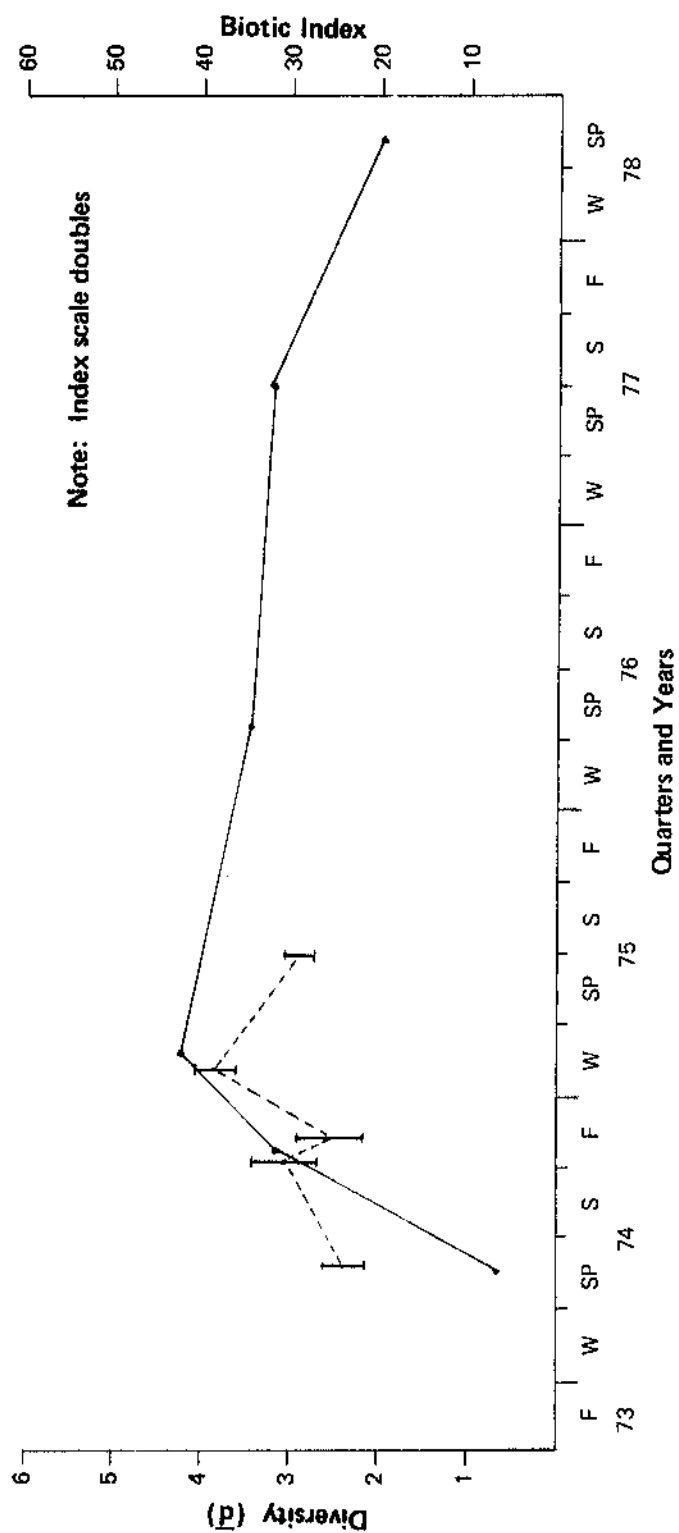
See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 19.01.0002

BODY OF WATER: ST. MARYS RIVER

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



Station No. 19.02.0002 Body of Water Nassau River
Location U.S. 17 bridge
County Nassau
Type Body of Water river Classification _____
Sources of Pollution highway runoff
Nearby Land Use natural, salt marsh
Sampling Frequency _____ Depth 2.4 - 6.2 meters
Bottom Type muck, clay % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Spartina alterniflora, Juncus roemerianus,
Pontederia sp., Scirpus sp., Cladium jamaicensis

Macroinvertebrates:

Annelida

Oligochaeta

Pelosclex sp. 1 - Cormier

Polychaeta

Mediomastus sp.
Nereis (Neanthes) succinea
Paraprionospio pinnata
Polydora websteri
Scolecoclepidus viridis
Streblospio benedicti

Arthropoda

Crustacea

Isopoda

Chiridotea almyra
Cyathura polita

Amphipoda

Ampelisca abdita
Batea sp.
Corophium sp.
Gammarus sp.
G. tigrinus
Monoculodes edwardsi

Decapoda

Callinectes sapidus
Rhithropanopeus harrisii

Insecta

Diptera

Polypedilum convictum

Mollusca

Pelecypoda

Mytilopsis leucophaeta
Rangia cuneata

Entoprocta

Barentsia discreta

Chordata

Urochordata

Mogula sp.

DATA SUMMARY: Nassau 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.				
19.02.0002	18 May 76	1.136±0.100	0.582±0.040	11							790	5	
	20 Jun 77	0.700±0.186	0.887±0.053	14									
	4 Apr 78	0.555±0.166	0.849±0.065	6							95	17	

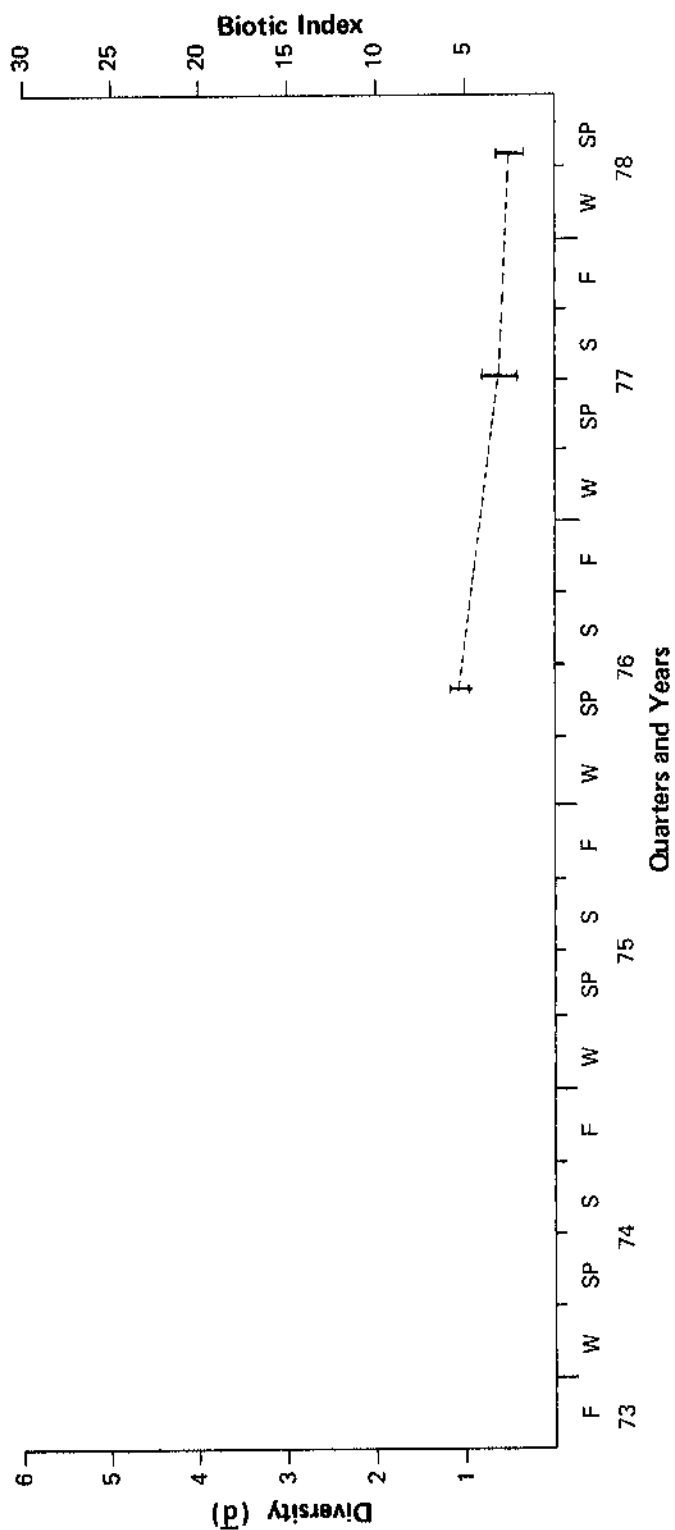
27

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 19.02.0002
 BODY OF WATER: NASSAU RIVER

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



Station No. 19.02.0005 Body of Water Amelia River
 Location Marker Buoy #20 (No. 7) off Old Fernandina
 County Nassau
 Type Body of Water estuary Classification III
 Sources of Pollution industrial complexes, domestic waste
 Nearby Land Use urban and industrial
 Sampling Frequency quarterly Depth 2 - 3.8 m
 Bottom Type sands, shells, wood chips % Volatile Solids _____
 Aquatic Plants: Submerged _____
 Emergent Spartina alterniflora

Macroinvertebrates:

Porifera

Cliona celata
Microciona prolifera
 unident. sp.

Cnidaria

Hydrozoa

cf. Tubularia crocea
 unident. sp.

Anthozoa

unident. actiniarian
 4 unident. spp.

Platyhelminthes

2 unident. spp.

Rhynchocoela

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

Nematoda

3 unident. spp.

Annelida

Oligochaeta

Lumbricillus lineatus
Peloscolex cf. benedeni
P. sp.
 2 unident. tubificids
 2 unident. spp.

Polychaeta

Asabellides sp.
Arenicola cristata
Axiiothella sp.
A. mucosa
Brania clavata
Capitella capitata
Caulleriella sp.
Cirriformia filigera
 cf. Cirrophorus lyriformis
Clymenella torquata
Eteone heteropoda
E. lactea
Eumida sanguinea
Exogone dispar
Glycinde solitaria
G. cf. nordmanni
Gyptis brevipalpa
Haploscoloplos foliosus
Hydroides dianthus
Inermonephtys inermis
Lumbrineris tenuis
 cf. Magelona phyllisae
Mediomastus sp.
Melinna maculata
Nephtys picta
Nereis sp.
N. falsa
N. succinea
Notomastus latericeus
Owenia fusiformis
 cf. Paranaitis speciosa
Paraprionospio pinnata
Pectinaria gouldii
Pista sp.
Podarke obscura
Polycirrus sp.
P. eximius
Polydora ciliata
P. websteri
Potamilla sp.
Prionospio cirrifer

Polychaeta (cont.)

Prionospio steenstrupi
Sabella microphthalma
S. vulgaris
Shistomeringos rudolphi
Sigambra tentaculata
Spiochaetopterus oculatus
Spiophanes bombyx
Streblospio benedicti
S. cf. limicola
Tharyx sp.
T. marioni
Thelepus setosus
Websterinereis tridentata
unident. sabellid
unident. spionid
unident. hesionid
unident. goniadid
unident. phyllodocid

Arthropoda

Crustacea

Isopoda

Ancinus depressus
Cassidinisca lunifrons
C. burbancki
Chiridotea stenops
Edotea montosa
cf. Exosphaeroma diminutum

Amphipoda

Ampelisca sp.
A. abdita
Caprella sp.
C. geometrica
Corophium sp.
C. cf. acutum
C. acherusicum
Erichthonius brasiliensis
Gammarus sp.
Melita sp.
M. nitida
M. appendiculata
Monoculodes sp.
Pataphoxus spinosus
unident. haustoriid
unident. stenothoid

Decapoda

Acetes americanus
Albunea gibbesii
Eurypanopeus abbreviatus
Hexapanopeus angustifrons
Neopanope texana sayi
N. texana texana

Decapoda (cont.)

Pagurus longicarpus
Panopeus herbstii
Pinnixia sayana
Portunus ancapa
Rhithropanopeus harrisii
unident. astacid
unident. sp.

Mysidacea

Bowmaniella dissimilis
Neomysis americana
Praunus flexosus
unident. sp.

Cirripedia

Balanus improvisus
B. sp.

Cumacea

Oxyurostylis smithi
unident. sp.

Mollusca

Gastropoda

Crepidula sp.
C. maculosa
Eupleura caudata
Haminoea succinea
cf. Melongena corona
Mitrella lunata
cf. Natica pusilla
Nassarius vibex
Oliva sp.
Pleuroploca gigantea
Rissoina sp.
Urosalpinx cinerea
unident. nudibranch
4 unident. spp.

Pelecypoda

Lyonsia hyalina
Macoma tenta
Mercenaria campechiensis
Mulinia lateralis
Tellina alternata
T. cf. tenella
T. sp.
unident. tellinid
2 unident. spp.

19.02.0005

Echinodermata

Ophiuroidea

Amphiodia pulchella

Amphioplus sp.

A. thromboides

Amphiura stimpsoni

Holothuroidea

Cucumaria sp.

unident. holothuroid

Bryozoa

Bugula neritina

Membranipora sp.

Hemichordata

Phoronis architecta

Chordata

Urochordata

Mogula sp.

DATA SUMMARY: Amelia 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.	
19.02.0005	27 Aug 73											70		
	8 Oct 73											1700		
	7 Nov 73											490		
	27 Nov 73											5		
	7 Jan 74											49		
	7 Feb 74	0.000		1	0.728±0.019	0.353±0.023	2					280		
	17 Feb 74											6		
	18 Mar 74											490		
	30 Apr 74											180		
	20 May 74											79		
	24 Jun 74													

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See Methods for explanation of table.

DATA SUMMARY: Amelia 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.					
19.02.0005	1 Jul 74	2.212±0.309	0.355±0.077	14						280	23	
	17 Jul 74											
	14 Aug 74	2.154±0.396	0.477±0.113	14						230		
	4 Sep 74									14000		
	29 Oct 74									13000		
	20 Nov 74									49		
	21 Jan 75	1.687±0.249	0.407±0.082	9						79		
	25 Feb 75									1300		
	28 Apr 75									9500		
	21 May 75									330		
	18 Jun 75	2.833±0.217	0.175±0.041	16						4811		

See Methods for explanation of table.

DATA SUMMARY: Amelia 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.						
19.02.0005	16 Jul 75										2200		
	17 Sep 75	3.037+0.318	0.242+0.067	19					Coc BG 0 Fil BG 2 Coc Gr 24 Fil Gr 6 Gr Flag 6 Other Flag 0 Cen Dia 5 Pen Dia 2 Total 46		220		
	18 Nov 75	3.462+0.164	0.083+0.019	20							70		
	8 Dec 75										46	LT2	
	26 Jan 76										1300	49	
	9 Feb 76	2.853+0.242	0.256+0.057	18									
	23 Feb 76								Coc BG 0 Fil BG 0				

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See Methods for explanation of table.

DATA SUMMARY: Amelia 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		#Spp.	Redundancy				#Spp.	Redundancy			
		Diversity	Redundancy	#Spp.	Diversity									Redundancy	#Spp.
19.02.0005	23 Feb 76 (cont.)								Coc Gr 34 Fil Gr 0 Gr Flag LTL Other Flag 0 Cen Dia 140 Pen Dia 15 Total 190						
	25 May 76	3.038±0.212	0.108±0.026	14							8	2			
	14 Jun 76														
	28 Jul 76	2.910±0.168	0.222±0.311	28											
	4 Aug 76														
	20 Sep 76														
	30 Sep 76	2.514±0.360	0.226±0.015	10							4900	140			
	26 Jan 77	2.718±0.228	0.392±0.050	37					Coc BG 0 Fil BG 1		35000	2300			

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See Methods for explanation of table.

DATA SUMMARY: Amelia 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.						
19.02.0005	26 Jan 77 (cont.)								Coc Gr LTI Fil Gr LTI Gr Flag 0 Other Flag LTI Cen Dia 45 Pen Dia 7 Total 54				
	14 Feb 77										13000	7900	
	14 Mar 77										460	14	
	4 Apr 77	3.732±0.151	0.111±0.015	36						Coc BG 0 Fil BG 11650 Coc Gr 43010 Fil Gr 1790 Gr Flag 0 Other Flag 0 Cen Dia 205200 Pen Dia 287630			

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See Methods for explanation of table.

DATA SUMMARY: Amelia River (Cont.)

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Amelia 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.	BI	#Spp.					
19.02.0005	11 Jan 78									Coc BG 0 Fil BG 0 Coc Gr 3 Fil Gr 17 Gr Flag 0 Other Flag 3 Cen Dia 60 Pen Dia 72 Total 155		6400 34		
	21 Mar 78	3.241±0.273	0.288±0.050	36										
	29 Mar 78											41 34		
	15 May 78											1300 790		
	12 Jun 78											490 330		

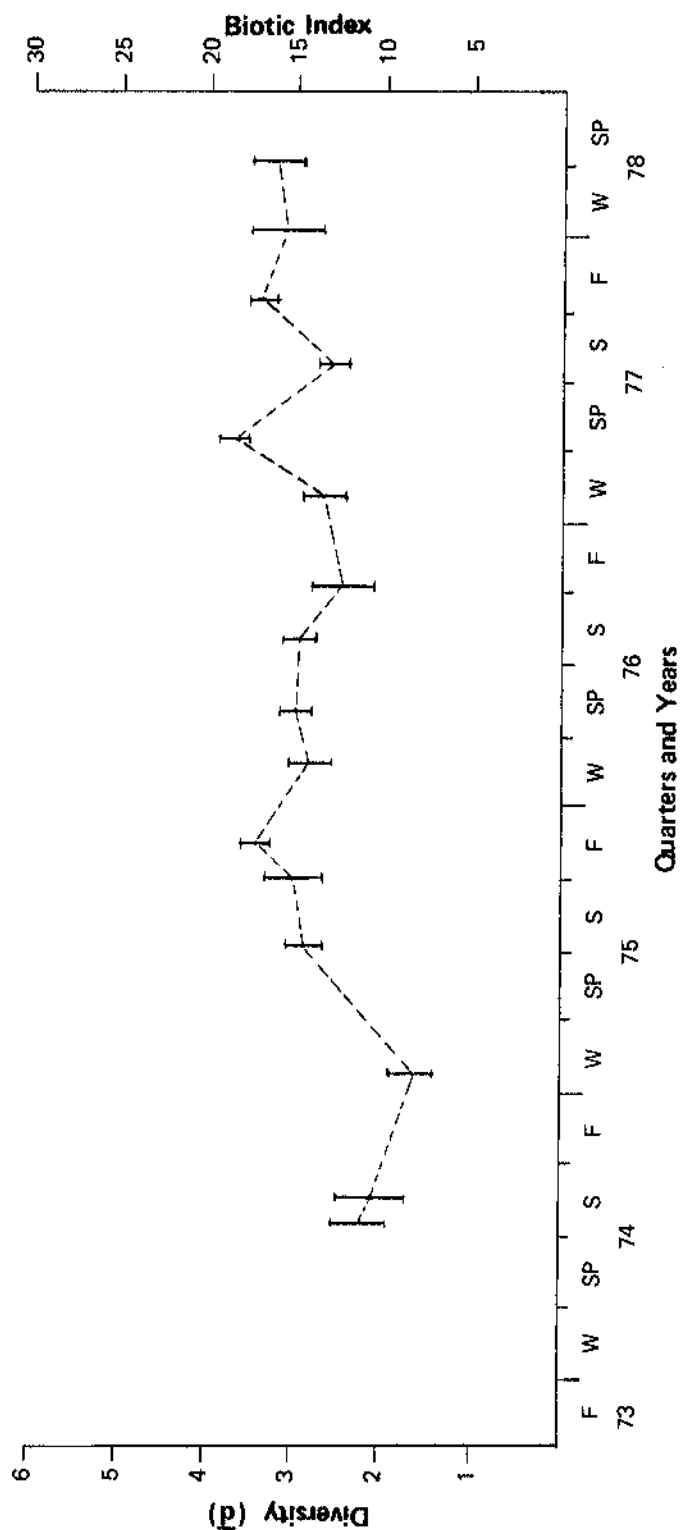
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See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 19.02.0005
 BODY OF WATER: AMELIA RIVER

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



Station No. 19.02.0013 Body of Water Amelia River
Location center, off lighted marker #1
County Nassau
Type Body of Water river Classification III
Sources of Pollution industrial complexes
Nearby Land Use industrial
Sampling Frequency irregular Depth 1.2 - 7.0 m
Bottom Type muck, organic debris % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Spartina alterniflora

Macroinvertebrates:

Annelida

Oligochaeta

unident. sp.

Polychaeta

Goniada maculata

Nereis falsa

Pectinaria gouldii

Streblospio benedicti

unident. nereid

Arthropoda

Crustacea

Amphipoda

Ampelisca sp.

Caprella geometrica

Corophium acherusicum

DATA SUMMARY: Amelia 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.					
19.02.0013 43	27 Aug 73										4900	
	8 Oct 73										35000	
	7 Nov 73										330	
	7 Jan 74										460	
	7 Feb 74	0.000		0	1.600±0.329	0.234±0.148	4				110	
	18 Mar 74										330	
	30 Apr 74										1700	
	20 May 74										490	
	24 Jun 74										490	
	1 Jul 74	0.000		0							490	
	17 Jul 74	0.000		0							3300	
	14 Aug 74											

See Methods for explanation of table.

DATA SUMMARY: Amalia 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.			BI	#Spp.	
19.02.0013 44	4 Sep 74											230		
	29 Oct 74											13000		
	20 Nov 74											1700	490	
	21 Jan 75	0.000					1					7000		
	25 Feb 75											4300		
	28 Apr 75											3300		
	21 May 75											2300		
	18 Jun 75	0.660±0.184	0.786±0.082	5								1300		
	17 Aug 75											14000		
	18 Nov 75											490		
	8 Dec 75											3300	17	

See Methods for explanation of table.

DATA SUMMARY: Amelia 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.					
19.02.0013 45	26 Jan 76											11000	490	
	14 Jun 76											490	11	
	4 Aug 76											160000	6400	
	20 Sep 76											GT240000	3300	
	14 Feb 77											24000	7900	
	19 Mar 77											230	230	
	4 Apr 77											35000	1700	
	13 Jul 77											3300	3300	
	11 Jan 78											240000	24000	
	29 Mar 78											700	490	
	15 May 78										7900	7900		

See Methods for explanation of table.

DATA SUMMARY: Amelia 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.							
		BI	#Spp.											
19.02.0013 46	12 Jun 78											3300	490	

See Methods for explanation of table.

Station No. 19.02.0026 Body of Water Amelia River
 Location at Marker #46, Junction of S. Amelia River and Nassau River
 County Nassau
 Type Body of Water estuary Classification III
 Sources of Pollution none
 Nearby Land Use natural
 Sampling Frequency annually Depth 6m
 Bottom Type sandy mud % Volatile Solids _____
 Aquatic Plants: Submerged _____
 Emergent Spartina alterniflora, Barrichia sp.,
Salicornia sp.

Macroinvertebrates:

Cnidaria

Anthozoa

unident. actinarian
 unident. halcampid
 unident. sp.

Platyhelminthes

Turbellaria

unident. sp.

Rhynchocoela

cf. Carinoma tremaphoros
 cf. Tubulanus pellucidus

Annelida

Polychaeta

Ampharete americana
Asabellides sp.
 cf. Tharyx sp.
Cirratulus sp.
 cf. Cirrophorus lyriformis
Drilonereis magna
Eteone heteropoda
Exogone dispar
Eumida sanguinea

Polychaeta (cont.)

Glycera sp.
G. americana
Glycinde solitaria
Gyptis brevipalpa
Lepidonotus sublevis
Lumbrineris tenuis
Mediomastus sp.
Nereis succinea
Onuphis magna
Paranaitis sp.
Pectinaria gouldii
cf. Phyllodoce sp.
Polycirrus sp.
Prionospio cirrifera
Sabella microphthalma
Scoloplos rubra
Spiophanes bombyx
Streblospio benedicti
Tharyx marioni
unident. nereid
unident. polynoid
unident. terebellid

Arthropoda

Crustacea

Isopoda

Edotea montosa

Amphipoda

Acanthohaustorius sp.
Ampelisca abdita
A. sp.
Batea sp.
Corophium tuberculatum
C. sp.
cf. Erichthonius sp.
Melita nitida
cf. Microdeutopus sp.
Paraphoxus spinosus
P. sp.
Pontogeneia sp.
Unciola serrata
unident. amphiloichid
unident. bateid
unident. gammarid

Decapoda

cf. Alpheus sp.
Latreutes parvulus
Libinia dubia
Neopanope texana sayi
Pagurus longicarpus
P. sp.
Portunus anceps

Mysidacea

Bowmaniella dissimilis

Cumacea

Oxyurostylis smithi

Mollusca

Gastropoda

Mitrella lunataEpitonium sp.Crepidula fornicata

Pelecypoda

Tellina versicolorTellina cf. tenellaT. alternataT. sp.Lima sp.Macoma tentaMulinia lateralis

unident. tellinid

Echinodermata

Amphioda pulchellacf. Amphioplus sp.Synapta sp.

Bryozoa

Barentsia sp.

Chordata

Urochordata

Mogula sp.

DATA SUMMARY: Amelia River

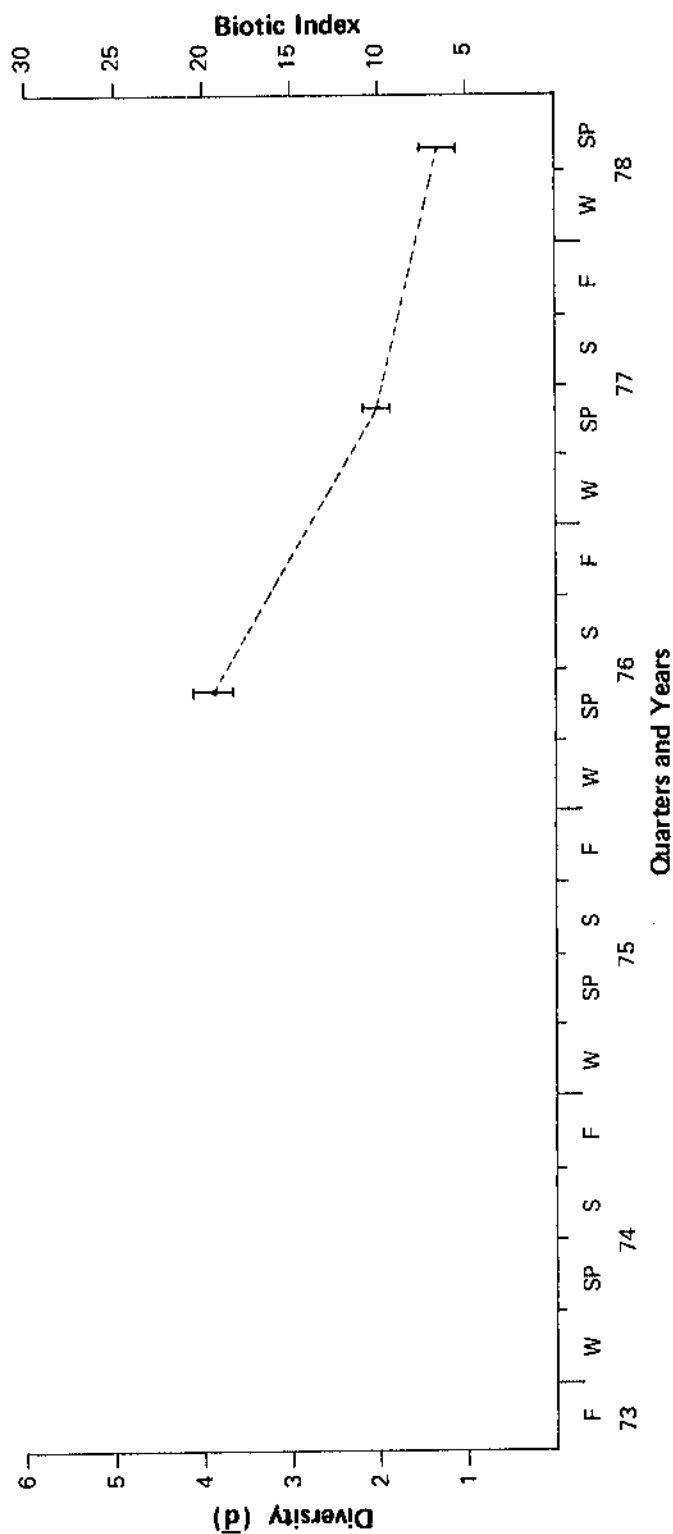
Station Number	Date	MacroInvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
19.02.0026 50	25 May 76	3.999+0.218	0.087+0.019	29						49	49	
	2 May 77	2.195+0.127	0.474+0.030	48						LT2	LT2	
	4 Apr 78	1.498+0.211	0.661+0.058	25								
	15 May 78											

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 19.02.0026
 BODY OF WATER: AMELIA RIVER

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



ST. JOHNS DRAINAGE BASIN

The St. Johns River Drainage Basin drains approximately 8,800 square miles of peninsular Florida and includes the Jacksonville and Orlando metropolitan areas. The basin is divided into three sub-basins: the Upper St. Johns River, the Oklawaha River, and the Lower St. Johns River. The St. Johns rises in a swamp in St. Lucie County and flows northward for approximately three hundred miles to the Atlantic Ocean. The Upper St. Johns River is characterized by channels, swamps, and numerous lakes. The Lower St. Johns River begins at Lake George, approximately 200 miles north of the headwaters. This reach of the river is essentially a continuous lake having a low gradient and extensive floodplain, reaching widths in excess of five miles, and containing numerous bays and lagoons. The entire lower river is subject to wind and tidal action.

The Oklawaha River, which drains approximately one-third of the basin, rises in a swamp in Polk County and flows northward through a chain of lakes in Orange and Lake Counties. From the lakes, the Oklawaha flows toward its confluence with the St. Johns approximately ten miles north of Lake George. Approximately one-third of the Oklawaha sub-basin has no surface runoff. These areas are generally considered important sources of recharge to the Floridan aquifer.

Upper St. Johns River Sub-basin

Blue Cypress Lake, station 20.01.0099, in northwest Indian River County, was the furthest upstream monitoring site in this basin. Interestingly, the sediment in this lake averaged over fifty percent organic matter, primarily as leaf and bark litter rather than as the flocculant muck often related to such a high organic percentage. The macroinvertebrate diversity varied from fair to good and showed no significant trend from 1975-78. Several pollution intolerant species were collected such as the dipterans, Cricotopus bicinctus and Thienemanniella sp.

Station 20.01.0115, on the St. Johns River just north of the dam at Lake Washington, had good macroinvertebrate diversities during the report period. Biotic Index numbers were acceptable considering that the Index is geared to somewhat faster flowing waters than those of the St. Johns. Of the three macroinvertebrate methods used, only natural substrate diversities showed a significant trend - downward. This was possibly due to a continuing increase in number of the recently introduced exotic clam, Corbicula manilensis. Bacteria and algae counts at this station were normally low.

The St. Johns River at its exit from Lake Poinsett, station 20.01.0105, was sampled for bacteria, beginning in 1975, and for natural substrate macroinvertebrates, beginning in mid-1976. Bacteria counts were generally low and macroinvertebrate diversities were consistently good.

Station 20.01.0130 is on the Econlockhatchee River at SR 419. This is just downstream from its junction with the Little Econlockhatchee River. The system is subject to domestic sewage effluent from the Orlando area. Macroinvertebrate diversities were fair to good and, considering the possible pollution effects, the Biotic Index values were quite good (range = 11-31). Among the pollution intolerant species collected were the mayfly larvae Stenonema exiguum and S. smithae. Apparently, this was an example of a meandering, undisturbed stream with a respectable flow rate (2.1 ft/sec) being able to assimilate sewage effluent. Of the three methods used, only natural substrate diversity showed a significant trend (upward) and no explanation for the trend was evident. Bacteria counts were occasionally somewhat elevated, probably as a result of runoff.

Station 20.01.0012, St. Johns River at SR 46, is downstream from the junction with the Econlockhatchee River. It was sampled from mid-1976-78 and macroinvertebrate diversity was usually good while Biotic Index numbers were marginal. The natural substrate diversities failed to show any significant trend during the period of record. The estuarine mud crab Rhithropanopeus harrisii was collected at this station. This reflects the influence of saline groundwater in the area on the salinity of the river.

Lake Harney, station 20.01.0026, is just downstream from station 20.01.0012. It was sampled annually for natural substrate macroinvertebrates from 1975-77. The diversities were fair and no notably clean water forms were present. However, estuarine forms were present (i.e. Rhithropanopeus harrisii, clam Rangia cuneata) again showing salinity effects far upstream from the ocean.

Waters from Lake Jessup, station 20.01.0183, flow into the St. Johns River east of Sanford. Macroinvertebrate diversities in the lake were low and showed no significant change during the report period. The benthic fauna were dominated by the pollution tolerant worm, Limnodrilus hoffmeisteri. Other indicators of poor water quality were rather high phytoplankton counts frequently dominated by blue-green algae. Conversely, bacteria counts were usually low. Pollution sources include sewage treatment plants and muck farming which probably add heavy loads of organic material to the lake.

Station 20.01.0003 is on the St. Johns River at US 17/92 near the exit from Lake Monroe. This area is subject to thermal effluent from a nearby power plant. Macroinvertebrate diversities were good overall (though somewhat variable) for artificial and natural substrates, but Biotic Index values were slightly low. No significant change was evident in any of these measures. Rhithropanopeus harrisii was found at this station, too. Periphyton growth was occasionally lush, perhaps aided by the warm water. Bacteria counts were normally low during the report period.

Station 20.01.0137, Little Wekiva River at SR 434, lies on the fringes of metropolitan Orlando. The stream flows through swamp land to join the Wekiva River which flows to the St. Johns River. Macroinvertebrate diversities at the sampling station were quite variable, but generally fair. No significant change was detected in any of the measures used. The stream is subject to domestic and citrus processing wastes. Frequent excesses of Class III total and fecal coliform standards reflected these impacts.

Blackwater Creek, station 20.01.0479, off dirt road extension of SR 439, flows eastward from Lake Norris through undeveloped swamp land to the Wekiva River just upstream from its confluence with the St. Johns River. It was sampled only three times in 1976-77, qualitatively. The Biotic Index numbers ranged from 9 to 15, which is acceptable for a central Florida swamp drainage, if not especially good.

Station 20.01.0002 is on the St. Johns River near Astor, just north of Lake George. Macroinvertebrate diversities were normally good and the somewhat low Biotic Index values probably were due to the lack of habitat suitable for the indicator species in this wide, slow stretch of river. No significant trends in diversity occurred. Bacteria levels were also acceptable.

Oklawaha River Sub-basin

Lake Minneola, station 20.02.0047, lies in southern Lake County near Clermont. It is somewhat deep (5.5 meters) by Florida standards and has a pre-dominantly coarse sand bottom. Although it was sampled only three times in 1976-77, it had a consistently very good diversity.

Lake Apopka, east of Orlando, station 20.02.0360, is the major headwater for what is known as the Apopka Chain of Lakes. It has been severely degraded by muck farming and sewage effluent. Phytoplankton populations were often very high and dominated by blue-green forms, a sign of eutrophy. The waterhyacinth, Eichhornia crassipes, was present in massive amounts. Macroinvertebrate diversities surprisingly, suggested fair water quality, especially considering the amount of highly organic muck covering the bottom. This was probably because the station is located near shore at the Beauclair Canal exit from Lake Apopka. Also, many of the species present were pollution tolerant forms such as Limnodrilus hoffmeisteri, Physa pumilia, and Chironomus attenuatus. Natural substrate diversity, nevertheless, showed a significant downward trend. Although total coliform counts occasionally exceeded Class III standards, bacteria levels were lower than might be expected in the presence of so much decaying organic matter.

Lake Harris near Leesburg, station 20.02.0376, is the only major lake in the Apopka chain which does not receive more or less direct flow from Lake Apopka. It was sampled three times during 1975-77 and macroinvertebrate diversities were fair to good. Comparison with Lake Apopka diversities is difficult since this station was in the lake center. Interestingly, the master species list for this station was shorter than that for Lake Apopka. This may reflect the difference in habitats at the two stations or it may be an artifact of the fewer samplings at Lake Harris.

Lake Griffin, also near Leesburg, station 20.02.0381, collects water from the rest of the Apopka chain (Lakes Apopka, Dora, Eustis, Harris and others) before it enters the Oklawaha River. It also receives domestic and citrus processing wastes and urban and agricultural runoff. Macroinvertebrate diversities were fair and natural substrate diversities showed a significant improvement. No specific cause for the improvement was noted. Phytoplankton

populations were frequently high and dominated by blue-green algae. Bacteria counts were low.

Lake Weir, station 20.02.0406, lies in southern Marion County. It is quite deep for a Florida lake (8.5m). It had fair macroinvertebrate diversities the three times it was sampled during 1975-77. Only a few taxa were captured. The lake's pollution sources are urban and agricultural runoff and septic tank leachate. The contributions of each of these source types would have to be determined to find any cause and effect relationship.

Little Lake Weir, station 20.02.0409, is a small lake immediately adjacent to Lake Weir and connected to it by a short creek. It is also rather deep (6.1m). The macroinvertebrate diversities and numbers of taxa from the three samplings of record (1975-77) were slightly higher than those for Lake Weir.

Station 20.02.0001 is on the Oklawaha River near SR 464 at Moss Bluff. Natural substrate macroinvertebrate diversities were variable and ranged from poor to good while artificial substrate diversities were more consistently good. Biotic Index values were rather low. Early in the report period, channel dredging was underway in the river which had two related effects: It was an active pollution source causing high turbidity and siltation and it destroyed natural habitat. In the period after dredging, therefore, the biota were, and presumably still are, recovering from those perturbations and recolonizing the new habitat. In fact, artificial and natural substrate diversities showed significant improvement over the study period. Biotic Index numbers showed no significant change, which is not surprising since this is still not a natural stream bed and the bulk of the flow comes from Lake Griffin and the Apopka chain. Bacteria counts occasionally exceeded Class III standards, probably due to runoff.

Station 20.02.0317 is located on Silver Run (also known as Silver River) upstream of its confluence with the Oklawaha River. It is this run from Silver Springs which ultimately accounts for approximately forty percent of the Oklawaha River's flow. Natural substrate macroinvertebrate diversities and Biotic Index numbers were usually good for the period of record (mid 1976-78). No significant change was detected in either of these measures.

Station 20.02.0012 is on the Oklawaha River at SR 316 near Eureka. This area is also channelized and natural substrate samples were frequently difficult to obtain due to the steep sides of the channel. All three of the macroinvertebrate measures used suggested better water quality at this station than upstream at the Moss Bluff station. This was to be expected considering the sizable dilution effect from Silver Run between the two stations. Trend analyses for the various indices were conflicting and inconclusive. Artificial substrates indicated degradation, Biotic Indices showed improvement, and natural substrates had no significant change. Further sampling and analysis are required to confirm any trend. Bacteria levels were occasionally somewhat high, probably from soil and pasture runoff.

Station 20.02.0071 is on the Oklawaha River below Rodman Dam, which forms Rodman Reservoir. This part of the river is also channelized. The macroinvertebrate diversities for natural substrates were variable from fair to good, probably reflecting the effects of channelization on habitat. Natural substrate diversity showed significant improvement, too, perhaps indicating recolonization of dredged bottom. It is possible that increased amounts of the exotic aquatic plant, Hydrilla verticillata, have provided new habitat in this disturbed location, but this has not been sufficiently studied to confirm. Artificial substrate diversities were consistently fairly good and Biotic Index numbers were acceptable throughout the study period. Neither of these measures showed a significant trend. These data apparently indicate that the direct habitat destruction by dredging has had a more severe impact on the biota than have the indirect water quality effects which accompany perturbations of the system. Again, dilution from Silver Springs is probably responsible for mitigating water quality degradation. Bacteria counts at this station were normally low.

Newnan's Lake, station 20.02.0079, is just east of Gainesville. Pollution sources are agricultural runoff and septic tank leachate. Macroinvertebrate diversity was fair during the three samplings in 1975-77; but samples were usually dominated by larvae of the phantom midge, Chaoborus sp. and only four other taxa were collected from the very fine sediments. Although upon visual inspection, the data indicate a downward trend, there were not enough samplings to test for significance.

Lake Lochloosa, station 20.02.0080, is a tannic lake in the southeast corner of Alachua County. Two of the three samples analyzed for the period 1975-77 had good macroinvertebrate diversities. The sample with the low diversity was strongly dominated by Chaoborus sp., but was otherwise similar to the others.

Lower St. Johns River Sub-basin

Station 20.03.0373 is on the St. Johns River just north (i.e. downstream) of Lake George. Macroinvertebrate diversity was generally fair during the report period and bacteria levels were acceptable. Corbicula manilensis, although collected from several upstream stations, was not found at this one or at the St. Johns River stations below this one. It is possible that salinity is the controlling factor. Investigation of this distribution might be an interesting study.

Lake Disston, station 20.02.0401, is in the southwest corner of Flagler County in a lightly developed area. It was sampled only twice (1975-76) during the study period. Macroinvertebrate diversity appeared to be good.

Station 20.03.0398 is located on the Black Branch of Haw Creek at SR 305. It was sampled qualitatively for macroinvertebrates four times during 1975-78. Biotic Index values ranged from 0 to 14. Although agricultural runoff may be causing some oxygen depletion, it is probable that low DO is a natural occurrence in this swampy region. The absence of problem pollution is also suggested by the respectable number of species collected during the samplings (i.e. 25-40).

Crescent Lake, station 20.03.0410, near Bear Island, is shared by Putman and Flagler Counties. It was sampled three times in 1976-78 and macroinvertebrate diversities were consistently good.

Dunns Creek, station 20.03.0212, at US 17 flows from Crescent Lake to the St. Johns River. Macroinvertebrate diversity was basically good during the report period. Several estuarine crustaceans were collected (e.g. Rhithropanopeus harrisi, amphipod Corophium lacustre), reflecting the higher salinities the St. Johns basin has relative to most freshwater systems. Class III total coliform standards were exceeded twice on monitoring dates, probably due to soil runoff.

Station 20.03.0213 is on the St. Johns River at US 17 at Palatka. Natural substrate macroinvertebrate diversities were good and rather consistent throughout the report period. They also displayed a significant, although very slight, upward trend.

Artificial substrate diversities and Biotic Indices also had significant upward trends, but suggested somewhat poorer water quality than did natural substrates. More comprehensive study would be required to explain these discrepancies. Incidentally, greater numbers of estuarine taxa were found at this station than at those upstream, reflecting the salt wedge effect from far downstream. Bacteria counts were normally acceptable.

George's Lake, station 20.03.0400, lies in northwest Putman County and drains by way of Etonia Creek to the St. Johns River below Palatka. The lake shore is approximately fifty percent residential. One natural and three artificial substrate samples were analyzed during 1975-77 and, overall, good macroinvertebrate diversity was indicated.

Station 20.03.0253 is on Etonia Creek at SR 309. Macroinvertebrate diversity was fairly good the three times it was analyzed (1975-77) but total and fecal (when measured) coliform counts were far in excess of Class III standards. These probably originated at a cattle farm upstream from the station.

Station 20.03.0362 is on the St. Johns River near Picolata. Macroinvertebrates were sampled four times from 1975-77 and diversity was variable from poor to good. The sample with poor diversity was dominated by the oligochaete worm Limnodrilus hoffmeisteri. Unrelated but interesting, was the most upstream appearance at a monitoring station of estuarine polychaete worm, Polydora sp. and Streblospio benedicti. This station is about fifty miles upstream from the Atlantic Ocean.

Kingsley Lake, station 20.03.0278, is in western Clay County and constitutes the headwater for the North Fork of Black Creek which flows into the St. Johns River about five miles upstream from the Jacksonville/Duval line. Although sample depths were five to six meters, springs in the lake bottom are reportedly at depths of thirty meters. The lake shore is occupied by residential development and Camp Blanding National Guard Base. Macroinvertebrate diversity was analyzed three times during 1975-77 and was generally good.

Station 20.03.0207 is on the North Fork of Black Creek at SR 21 near Middlebury. Three artificial substrate samples analyzed in 1975-77 indicated very good macroinvertebrate diversity. One natural substrate sample had only fair diversity but a respectable number of species were collected. Occasionally high total coliform counts were probably from agricultural runoff.

The South Fork of Black Creek originates near Kingsley Lake. Station 20.03.0247 is located at SR 16. Three qualitative macroinvertebrate collections were made during 1975-77 and the resulting Biotic Indices were acceptable, suggesting the absence of substantial organic loading.

Station 20.03.0244 is on the South Fork of Black Creek at SR 218, near Middleburg. Artificial substrate macroinvertebrate diversities were good and consistent for three samplings in 1975-77. Very high bacteria counts for the few samples taken were apparently from agricultural runoff since there were no known point sources of pollution nearby.

Station 20.03.0243 is at the confluence of the North and South Forks of Black Creek, near Middleburg. Two macroinvertebrate samples during 1975-76 had fairly good diversities.

Station 20.03.0204 is on Black Creek at the Atlantic Coastline Railroad bridge approximately 4.5 miles upstream from the St. Johns River. Two natural substrate samples, analyzed in 1975 and 1976, had fairly good and excellent diversities, respectively.

Station 20.03.0199 is at the US 17 bridge upstream from the mouth of Black Creek. The influence of the St. Johns River salt wedge was apparent from the collection of estuarine species (e.g. Rhithropanopeus harrisi and Rangia cuneata). Two natural substrate samples collected in 1975-76 had good macroinvertebrate diversities. The two very high bacteria records may have been due to a feedlot a few miles up a nearby tributary or may have been due to local runoff or perhaps a combination of the two.

Doctors Lake, near Orange Park, station 20.03.0188, is connected to the St. Johns River by Doctors Inlet and is strongly influenced by the salt wedge in the river. The lake shore is totally developed and until 1975, it received sewage effluent from the City of Orange Park. It still receives a small amount of sewage from a mobile home park. Macroinvertebrate species diversities from four samplings during the report period were poor. This was probably a result of the combined effects of natural estuarine stress (e.g. salinity variation) and pollution from sewage treatment plants and urban runoff. The effects of the sewage should begin to disappear in coming years if it was a significant degradation factor. The few bacteria counts performed were low.

Julington Creek, station 20.03.0317, near Hood's Landing, enters the St. Johns River from the east, across from Doctors Inlet. Three macroinvertebrate samples collected during 1975-77 had good diversities. This station also had estuarine forms present in the macroinvertebrate community (e.g. Streblospio benedicti, barnacle Balanus improvisus).

The Ortega River flows into the St. Johns River near downtown Jacksonville from the south after flowing parallel to it for several miles. Macroinvertebrate diversities for the report period were variable but generally fair. Estuarine stresses may have been partially responsible for depressing diversities but heavy urban runoff and nearby sewage effluent probably also contributed to this. The two pollution sources also were probably responsible for frequently high bacteria levels.

Station 20.03.0002 is on the St. Johns River US 1/90 in downtown Jacksonville. This station has been subjected to large amounts of domestic and industrial wastes and heavy urban runoff. These combined sources caused very high total and fecal coliform counts during the study period. Although no statistical analysis was performed, visual inspection of the data suggests that bacteria levels were lower at the end of the study period than at the beginning. This reflects efforts to remove point sources of pollution from the river. Macroinvertebrate diversity during the report period was fair to good which is somewhat surprising considering the amount of pollution present. Also, the macroinvertebrate community was almost totally composed of marine/estuarine taxa due to the strong influence of salt water from the Atlantic Ocean. Salinity stress was probably still present to some degree.

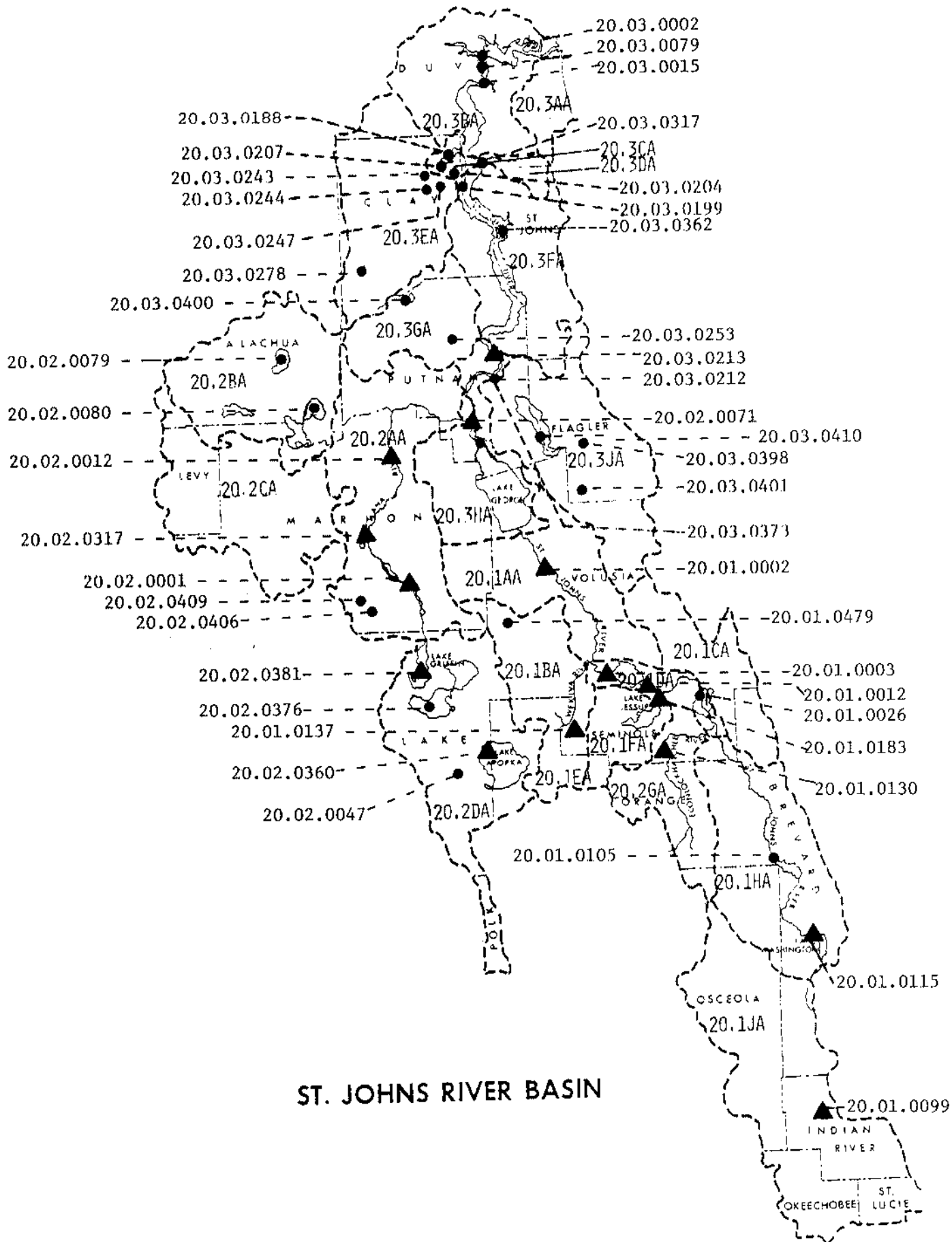
Summary

The Upper St. Johns River had good macroinvertebrate diversity at stations upstream of the metropolitan Orlando area and fairly good diversity below there during the report period. The Econlockhatchee River, despite pollution by domestic wastes, had fairly good macroinvertebrate diversities and acceptable Biotic Index numbers. This may indicate the capacity for the meandering, relatively undeveloped stream basin to assimilate wastes. The Little Wekiva River also receives domestic wastes and citrus processing wastes. Macroinvertebrate diversity was fair at the sampling station and total and fecal coliform counts frequently exceeded Class III standards. Lake Jessup is subject to domestic wastes and drainage from muck farms along its shoreline. Macroinvertebrate diversity was poor during the report period and phytoplankton counts were frequently high and dominated by blue-green forms, an indication of eutrophication.

Of the eight stations where trend analyses were performed on macroinvertebrate data, six showed no significant change. The St. Johns River below Lake Washington had a significant decline in natural substrate macroinvertebrate diversity, probably because of increasing numbers of the exotic clam, Corbicula manilensis. Natural substrate diversity improved at the Econlockhatchee River station, but no cause and effect relationship was immediately apparent. Also notable was the presence of estuarine invertebrates far upstream from the ocean because river salinities have been raised by saline groundwater.

In the Oklawaha River sub-basin, the Apopka Chain of Lakes, as represented by sampling stations on Lakes Apopka, Harris and Griffin, have been degraded by muck farming activities and domestic wastes. The macro-invertebrate diversities were only fair and phytoplankton populations were frequently high and dominated by blue-green forms. Macroinvertebrate diversity showed a significant decline in Lake Apopka, but a significant improvement in Lake Griffin, although no specific explanation for the improvement was evident. Stations on the Oklawaha River from Moss Bluff downstream had macroinvertebrate data which revealed habitat destruction by channel dredging. At the Moss Bluff and Rodman Dam stations significant improvements may have been due to recolonization of disrupted sediments. The station near Eureka had conflicting trends in the various macro-invertebrate measures. Macroinvertebrate communities were slightly more diverse in the Oklawaha River downstream from the confluence with Silver Run than upstream. This suggested the value of Silver Run, which, incidentally, had no significant diversity trends, for dilution of pollutants in the Oklawaha River.

The Lower St. Johns River apparently had fairly good water quality, as indicated by the biota, from Lake George to just above Jacksonville. The station in downtown Jacksonville still had high bacteria levels in 1978 despite an apparent decrease during the report period. Sampling stations on Crescent Lake, Haw Creek (an inflowing stream), and Dunn's Creek (a major outflow) all apparently had healthy biological communities for their locations (*i.e.* lake, swamp, stream, respectively). George's Lake, in northwest Putnam County, had good macroinvertebrate diversity and Etonia Creek, which flows from George's Lake to the St. Johns River, had fairly good diversity. But bacteria levels in Etonia Creek were very high, apparently due to a cattle farm upstream from the sampling station. Kingsley Lake had generally good macroinvertebrate diversity. The North and South Forks of Black Creek which flow from the Kingsley Lake area, converge near Middleburg and flow to the St. Johns River, both had fairly good biological communities as did the main stream after their confluence. Occasionally high bacteria counts were evidently due to runoff from pastureland or feedlots. Doctors Lake had low macroinvertebrate diversity, probably due to a combination of sewage effluents, most of which have been removed, urban runoff, and natural salinity stress. Julington Creek had generally good macroinvertebrate diversity. The Ortega River had fair diversities and frequently high bacteria levels, both of which were probably due to domestic wastes and urban runoff entering the river. A regression analysis was performed on only one station in the sub-basin. The St. Johns River at Palatka showed a significant upward trend but no specific reason was apparent. It should also be noted that estuarine organisms were collected all along the Lower St. Johns River not only because of saline groundwater effects but also because of a profound salt wedge which extends up the river to Lake George.



Station No. 20.01.0002 Body of Water St. Johns River

Location at Astor, 1/4 mile S. of SR 40 at "bridge 1/4 mile" sign

County Lake - Volusia

Type Body of Water river Classification III

Sources of Pollution domestic wastes, herbicides

Nearby Land Use recreational

Sampling Frequency quarterly Depth 1.0 - 5.0 m

Bottom Type sand, silt, mud, logs, detritus & Volatile Solids

Aquatic Plants: ^{shell} Submerged Vallisneria sp., Hydrilla verticillata

Emergent Eichhornia crassipes, Lemna minor, Nuphar
sp., Phragmites sp., Panicum sp., Salvinia sp., Scirpus sp., Pistia sp.

Macroinvertebrates:

Porifera

unident. sp.

Cnidaria

Hydrozoa

Cordylophora sp.

Platyhelminthes

Turbellaria

unident. sp.

Annelida

Hirudinea

unident. sp.

Oligochaeta

Limnodrilus hoffmeisteri

Peloscolex sp.

unident. haplotaxid

unident. lumbriculid

unident. naidid

unident. tubificid

Arthropoda

Crustacea

Isopoda

Cyathura polita
Sphaeroma sp.

Amphipoda

Corophium sp.
Gammarus sp.
Hyalella azteca
Synurella sp.

Decapoda

Rhithropanopeus harrisii
Palaemonetes paludosus

Mysidacea

Taphromysis bowmani
Mysidopsis almyra

Insecta

Odonata

Anomolagrion hastatum
Aphylla williamsoni
Enallagma sp.
Erythemis sp.
Ischnura sp.
Libellula sp.
Perithemis tenera
P. domitia

Ephemeroptera

Caenis sp.
Callibaetis sp.
Baetis sp.
Stenacron interpunctatum

Hemiptera

Rheumatobates sp.
Ranatra sp.
unident. mesoveliid
unident. naucorid

Neuroptera

Sisyra sp.

Lepidoptera

unident. pyralid

Trichoptera

Cheumatopsyche sp.
Cyrnellus sp.
Oecetis sp.

Diptera

Ablabesmyia parajanta
Chaoborus punctipennis
Chironomus attenuatus
C. crassicaudatus
C. carus
Cladotanytarsus sp.
Coelotanypus concinnus
C. scapularis
C. tricolor
Cricotopus bicinctus
C. remus
Cryptochironomus blarina
C. fulvus
Cryptotendipes casuarius
Dicrotendipes nervosus
D. lobus
D. leucoscelis
Einfeldia sp.
Endochironomus nigricans
Glyptotendipes lobiferus
Parachironomus directus
P. schneideri
P. sublettei
P. monochromus
Paralauterborniella nigrohalteralis
Pedionomus beckae
Polypedilum halterale
P. illinoense
Procladius sp.
Psectrocladius sp.
Pseudochironomus sp.
Tanytarsus sp.
T. sp. 1 - Hulbert
T. sp. 2 - Hulbert
Tribelos fuscicornis
Thienemanniella sp.
 unident. ceratopogonid

Arachnida

Acarina

unident. sp.

Mollusca

Gastropoda

Campeloma sp.
Goniobasis sp.
Ferrissia dalli
Helisoma sp.
cf. Hyalopyrgus sp.
Viviparus sp.

20.01.0002

Pelecypoda

Corbicula manilensis

Sphaerium sp.

unident. unionid

DATA SUMMARY: Upper St. John's 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.					
20.01.0002 66	6 Nov 73											100	40	
	12 Dec 73											170	20	
	16 Jan 74											220	10	
	6 Feb 74											130	20	
	3 Apr 74											30	0	
	1 May 74											0	0	
	7 Aug 74											200	0	
	4 Sep 74											80	10	
	2 Oct 74											20000	190	
	5 Dec 74	2.551±0.049	0.249±0.013	15				7	29	Coc BG 211 Fil BG 128 Coc Gr 439 Fil Gr 56		1525	26	

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.					
20.01.0002 67	5 Dec 74 cont.								Gr. Flag 17 Other Flag 0 Cen Dia 322 Pen Dia 167 Total 1340					
	9 Dec 74											80		
	14 Jan 75											210	30	
	18 Feb 75	2.732±0.027	0.159±0.005	15			11	27	Coc BG 612 Fll BG 111 Coc Gr 1056 Fll Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 1557 Pen Dia 167 Total 3503					
	11 Mar 75											90	0	
	2 Apr 75											30	0	

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.					
20-01-0002	19 May 75	2.583±0.158	0.178±0.028	14	2.201±0.159	0.259±0.030	15	6	16			0	0	
	4 Jun 75											100	0	
	7 Jul 75											310	110	
	6 Aug 75													
	13 Aug 75	1.905±0.186	0.342±0.060	10	1.918±0.157	0.305±0.041	10	6	23			160	40	
	3 Sep 75													
	14 Oct 75													
	4 Nov 75											120	10	
										Coc BG 723 Fil BG 500 Coc Gr 1006 Fil Gr 0 Gr Flag 0 Other Flag 56 Cen Dia 890 Pen Dia 223 Total 3398				

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.							
20.01.0002	2 Dec 75								Coc BG 2168		170	10		
69	5 Feb 76	2.840+0.202	0.213+0.040	21					Fil BG 723					
									Coc Cr 1223					
									Fil Cr 111					
									Cr Flag 56					
									Other Flag 0					
									Cen Dia 612					
									Pen Dia 2391					
									Total 7284		130	130		
	2 Mar 76											0		
	6 Apr 76													
	6 Jul 76												10	
	16 Nov 76	2.158+0.185	0.280+0.054	12										
	18 Jan 77													
									Coc BG 995					
									Fil BG 0					
									Coc Cr 1713					

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.						
20.01.0002	18 Jan 77 cont.							Fil Gr 398 Gr Flag 40 Other Flag 80 Cen Dia 677 Pen Dia 239 Total 4142					
	2 Feb 77										30		
	4 May 77												
	11 May 77				2.910±0.214	0.207±0.047	18			Coc BG 12400 Fil BG 52200 Coc Gr 35500 Fil Gr 800 Gr Flag 3400 Other Flag 3800 Cen Dia 95500 Pen Dia 235300 Total 438900	470	60	

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's River (Cont.)

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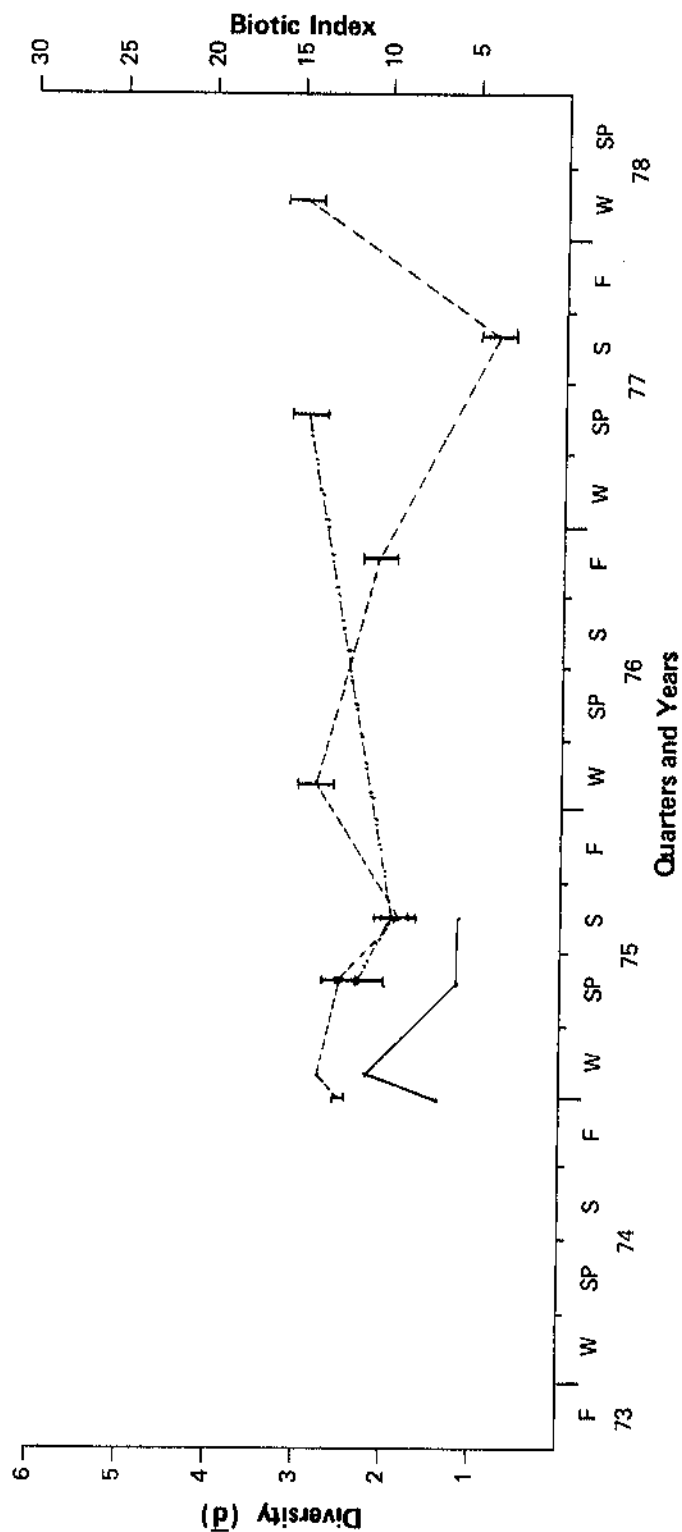
See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.01.0002

BODY OF WATER: UPPER ST. JOHNS RIVER

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



Station No. 20.01.0003 Body of Water St. Johns River
 Location at Sanford Bridge, US 17-92
 County Seminole
 Type Body of Water river Classification III
 Sources of Pollution herbicides, domestic and industrial (thermal) effluents
 Nearby Land Use agricultural, urban
 Sampling Frequency quarterly Depth 0.2-5.2 m
 Bottom Type mud, shell, sand, decayed vegetation Volatile Solids _____
 Aquatic Plants: Submerged _____
 Emergent Eichhornia crassipes, Lemna minor, Salvinia rotundi-
folia, Nuphar luteum, Panicum hemitomon, Scirpus validus, Phragmites communis,
 Macroinvertebrates: Alternanthera sp., Pistia sp.

Porifera

unident. sp.

Cnidaria

Hydrozoa

unident. sp.

Platyhelminthes

Turbellaria

unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

unident. lumbriculid

unident. naidid

unident. tubificid

Hirudinea

unident. glossiphoniid

unident. sp.

20.01.0003

Arthropoda

Crustacea

Isopoda

Asellus sp.
Cyathura polita
Sphaeroma sp.

Amphipoda

Gammarus sp.
Hyalella azteca
unident. sp.

Decapoda

Palaemonetes paludosus
Rhithropanopeus harrisii
unident. astacid

Mysidacea

Mysidopsis almyra
Taphromysis bowmani

Insecta

Odonata

Anax junius
Anomalagrion hastatum
Aphylla williamsoni
Coryphaeschna virens
Enallagma sp.
Erythemis sp.
Ischnura sp.
I. posita
Nehalennia sp.
Perithemis domitia
P. tenera

Ephemeroptera

Baetis sp.
Caenis diminuta
Callibaetis sp.
C. floridanus

Hemiptera

Belostoma sp.
Lethocerus sp.
Ranatra sp.
unident. gerrid
unident. mesoveliid
unident. pleid
unident. veliid

Trichoptera

Cyrnellus sp.
Cheumatopsyche sp.
Hydropsyche sp.
Leptocella sp.
Oecetis sp.
Orthotrichia sp.

Lepidoptera

unident. pyralid

Diptera

Ablabesmyia americana
A. parajanta
Bezzia sp.
B. setulosa
Chaoborus punctipennis
Chironomus attenuatus
C. carus
C. stigmaterus
C. crassicaudatus
Cladotanytarsus sp.
Coelotanypus sp. 1 - Hulbert
C. concinnus
C. scapularis
Cricotopus bincinctus
C. remus
Cryptochironomus fulvus
Dicrotendipes sp.
D. leucoscelis
D. lobus
D. modestus
D. nervosus
Einfeldia sp.
Endochironomus nigricans
Eristalis sp.
Glyptotendipes lobiferus
G. paripes
Goeldichironomus holoprasinus
Labrundinia neopilosella
Nimbocera sp.
Pagastiella sp.
Parachironomus hirtalatus
P. monochromus
P. schneideri
P. sublettei
Paralauterborniella nigrohalterialis
Palpomyia sp.
Phaenopsectra sp.
Pedionomus beckae
Polypedilum halterale

Diptera (cont.)

Polypedilum illinoense
P. scalaenum
Procladius sp.
Psectrocladius sp.
P. sp. 2 (Roback)
Tanytarsus sp. 1 - Hulbert
T. sp. 3 - Hulbert
T. sp. 1.1 - Hulbert
T. sp. 1.2 - Hulbert
unident. ceratopogonid
unident. culicid
unident. chironomid
unident. stratomyid
unident. tipulid

Coleoptera

unident. dytiscid
unident. gyrid
unident. haliplid
unident. hydrophilid

Arachnida

Acarina

unident. sp.

Mollusca

Gastropoda

Goniobasis sp.
Ferrissia dalli
Helisoma sp.
cf. Hyalopyrgus sp.
Melanoides tuberculata
Physa sp.
Pomacea sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
unident. sphaeriid
unident. unionid sp.

DATA SUMMARY: Upper St. John's 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.					
20-01-0003	6 Nov 73											20	0	
	13 Nov 73	2.586±0.165	0.061±0.038	7	1.824±0.110	0.332±0.031	13	7	30			98	38	
	12 Dec 73											400	40	
	8 Jan 74											250	30	
	5 Feb 74											70	10	
	5 Mar 74	2.365±0.030	0.162±0.006	10	2.910±0.045	0.137±0.008	17	8	18					
	3 Apr 74											20	10	
	1 May 74											0	0	
	6 Aug 74											100		
	3 Sep 74											30	20	
	10 Sep 74	1.089±0.029	0.629±0.011	9	1.311±0.176	0.624±0.061	11	5	23	Coc BG 2335 Fil BG 945 Loc Gr 806	Coc BG 740 Fil BG 21090 Loc Gr 10730			

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.							
20.01.0003	10 Sep 74 cont.								Fil Gr 0 Gr Flag 28 Other Flag 0 Cen Dia 139 Pen Dia 417 Total 4670	Fil Gr 550 Gr Flag 0 Other Flag 185 Cen Dia 2220 Pen Dia 96200 Total 142635	80	60		
	9 Oct 74													
	5 Nov 74											270	0	
	21 Nov 74	2.611±0.032	0.167±0.008	12				4	22	Coc BG 250 Fil BG 222 Coc Gr 973 Fil Gr 0 Gr Flag 27 Other Flag 417 Cen Dia 333 Pen Dia 0 Total 2224				

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.	#I	#Spp.					
20.01.0003	3 Dec 74											400		
	7 Jan 75										100	0		
	16 Jan 75	3.249±0.033	0.091±0.005	16			5	34	Coc BG 2557 Fil BG 667 Coc Gr 4559 Fil Gr 166 Gr Flag 0 Other Flag 0 Cen Dia 611 Pen Dia 500 Total 9062					
	18 Feb 75										30	10		
	1 Apr 75										0	0		
	3 Jun 75										100	0		
	8 Jul 75										0	0		
	5 Aug 75										330	80		

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See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.							
20.01.0603	27 Aug 75	0.910±0.240	0.804±0.081	11	2.495±0.061	0.223±0.017	13				150	0		
	7 Oct 75	1.418±0.079	0.568±0.025	13							4400	20		
	4 Nov 75										70	0		
	9 Dec 75													
	10 Feb 76	2.561±0.231	0.233±0.040	17	2.994±0.184	0.154±0.030	18	10	24	Coc BG 8652 Fil BG 1236 Coc Gr 2472 Fil Gr 0 Gr Flag 0 Other Flag 309 Cen Dia 10506 Pen Dia 2472 Total 25647	Coc BG 13400 Fil BG 38900 Coc Gr 27800 Fil Gr 0 Gr Flag 1000 Other Flag 0 Cen Dia 69900 Pen Dia 217900 Total 368900	400	20	
	9 Mar 76													

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.						
20.01.0003	20 Apr 76										0	0	
	18 May 76	2.795±0.138	0.157±0.028	14									
	22 Jun 76	2.187±0.304	0.340±0.060	14				2	17				
	30 Aug 76												
	21 Oct 76	1.952±0.261	0.268±0.086	7	1.522±0.086	0.500±0.055	13			Coc BG 143 Fil BG 485 Coc Gr 912 Fil Gr 0 Gr Flag 29 Other Flag 0 Cen Dia 143 Pen Dia 656 Total 2368	70	20	
81													
	17 Feb 77	2.332±0.206	0.277±0.053	13				9	12	Coc BG 884 Fil BG 3315 Coc Gr 27183 Fil Gr 221 Gr Flag 663			

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.						
20.01.0003	17 Feb 77 cont.							Other Flag 0 Pen Dia 1547 Pen Dia 1105 Total 37128					
	1 Mar 77										70	10	
	3 May 77	2.212±0.239	0.333±0.070	13	2.921±0.141	0.154±0.020	20		Coc BG 4900 Fil BG 11800 Coc Gr 10100 Fil Gr 3200 Gr Flag 400 Other Flag 0 Pen Dia 5200 Total 70300	0	0		
	7 Jun 77											0	
	5 Jul 77										0	0	Florida Index
82													

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's River

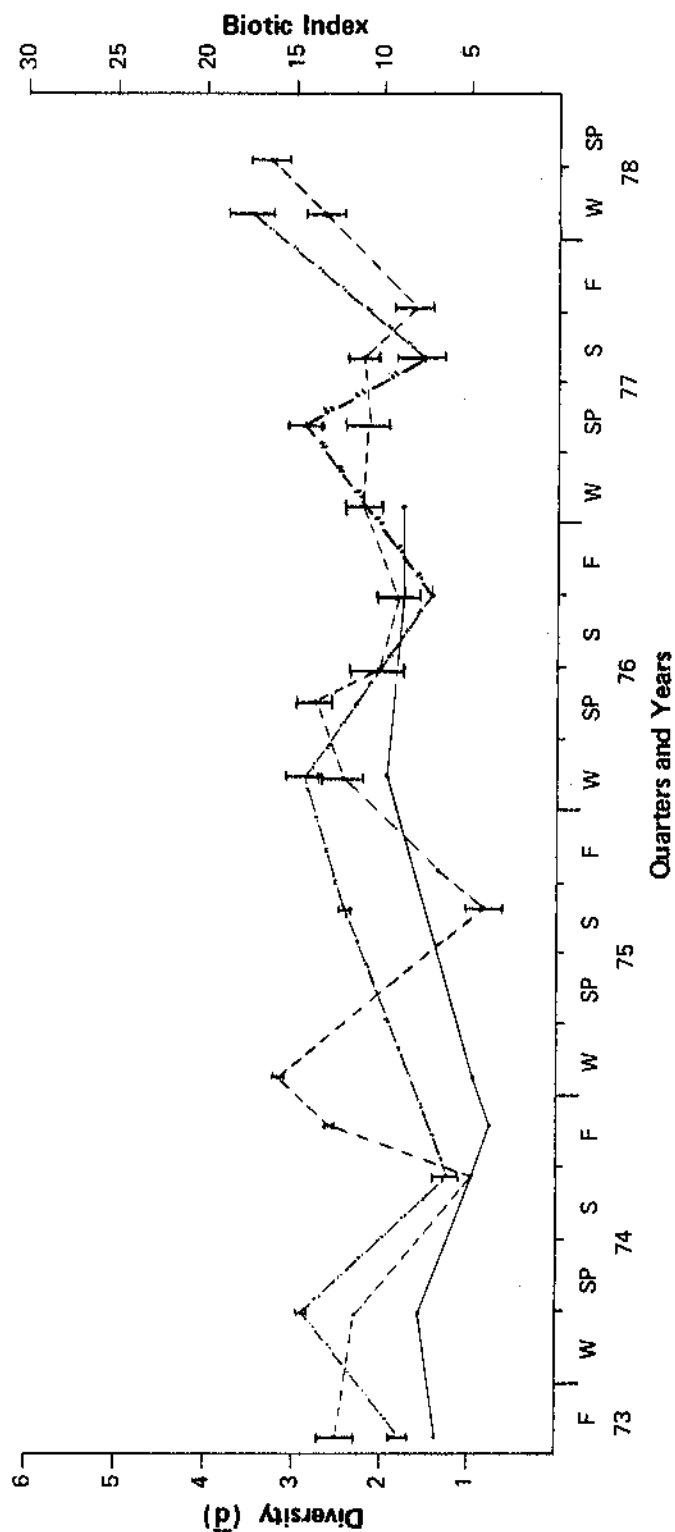
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
20.01.0003	26 Jul 77	2.272±0.155	0.273±0.041	13	1.627±0.298	0.340±0.104	6				Coc BG 5600 Fil BG 15900 Coc Gr 15400 Fil Gr 300 Gr Flag 300 Other Flag 0 Cen Dia 3600 Pen Dia 60400 Total 101500	50	0	
83	2 Aug 77													
	28 Sep 77	1.718±0.189	0.440±0.040	10								280	35	
	10 Jan 78													
	8 Feb 78	2.736±0.197	0.172±0.044	13	3.550±0.224	0.118±0.033	22					280	173	
	6 Mar 78													
	6 Apr 78	3.317±0.223	0.143±0.030	22										

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.01.0003
 BODY OF WATER: UPPER ST. JOHNS RIVER

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



Station No. 20.01.0012 Body of Water St. Johns River

Location at SR 46

County Seminole

Type Body of Water river Classification

Sources of Pollution agricultural and street runoff

Nearby Land Use agriculture

Sampling Frequency quarterly Depth 2.74 - 4.5 m

Bottom Type shell detritus, silt, sand, mud. % Volatile Solids 12.4 - 14.0

Aquatic Plants: Submerged Ceratophyllum sp., Bacopa sp., Vallisneria sp.,

Najas sp., Eleocharis sp., Utricularia sp., Hydrilla sp. Emergent Eichhornia sp., Salvinia sp.,

Panicum sp., Lemna sp., Polygonium sp., Paspalum sp., Alternanthera sp., Azolla sp.

Macroinvertebrates:

Platyhelminthes
Turbellaria
 unident. sp.

Annelida
 Oligochaeta
 Limnodrilus hoffmeisteri
 unident. tubificid
 unident. naidid
 unident. lumbriculiid

Hirudinea
 Placobdella sp.

Arthropoda
 Crustacea
 Isopoda
 Cyathura polita

Amphipoda
 Gammarus sp.
 Hyaella azteca

Decapoda
 Palaemonetes paludosus
 Rhithropanopeus harrisii

Mysidacea

Mysidopsis almyra
Taphromysis bowmani

Insecta

Odonata

Aphylla williamsoni
Enallagma sp.
E. cardenium
Gomphus sp.
Ischnura sp.

Ephemeroptera

Caenis diminuta
Callibaetis floridanus
C. pretiosus

Hemiptera

Belostoma sp.
Ranatra sp.
unident. corixid
unident. mesoveliid

Trichoptera

Cynellus sp.
Leptocella sp.
Oecetis sp.

Lepidoptera

Nymphula sp.

Diptera

Ablabesmyia auriensis
A. parajanta
Bezzia sp.
Chaoborus punctipennis
Chironomus attenuatus
C. crassicaudatus
C. carus
Cladotanytarsus sp.
Coelotanypus concinnus
C. scapularis
C. tricolor
Corynoneura scutellata
Cricotopus bicinctus
C. remus
Cryptochironomus blarina
C. fulvus
Cryptotendipes casuarius
Dicrotendipes lobus

Diptera (cont.)

Dicrotendipes nervosus
Glyptotendipes lobiferus
Nilothauma bicornis
Odontomyia sp.
Palpomyia sp.
Paralauterborniella nigrohalteralis
Polypedilum halterale
P. illinoense
P. scalaenum
Procladius sp.
Rheotanytarsus sp.
Tanytarsus sp.
Thienemanniella xena
Tribelos fuscicornis

Coleoptera

unident. dytiscid
unident. elmid
unident. haliplid

Arachnida

Acarina

Arrenurus sp.
Hygrobates sp.

Mollusca

Gastropoda

Melanoides tuberculata
Physa sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
unident. unionid

Station Number	Date	Macrobenthos						Phytoplankton Composition units/cm ³	Periphyton Composition units/m ²	Coliform Bacteria		Comments	
		Natural Substrate			Artificial Substrate					Biotic Index	Total		Fecal
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
020-01-0012	24 Jun 76	1.664±0.310	0.440±0.114	8				Coc BG 3 Fil BG 12 Coc Gr 72 Fil Gr 0 Gr Flag 6 Other Flag 9 Can Dia 47 Pen Dia 72 Total 221					
	28 Oct 76	2.227±0.193	0.250±0.048	12									
	25 Jan 77	2.995±0.201	0.132±0.027	16						11	26		
	20 Apr 77	2.089±0.224	0.191±0.056	7									
	4 Aug 77	1.490±0.331	0.305±0.172	4	3.000±0.311	0.120±0.046	11		Coc BG 200 Fil BG 5000 Coc Gr 1400 Fil Gr 5300 Gr Flag 0 Other Flag 2400			Florida Index	

See notation for explanation of table.

DATA SUMMARY:

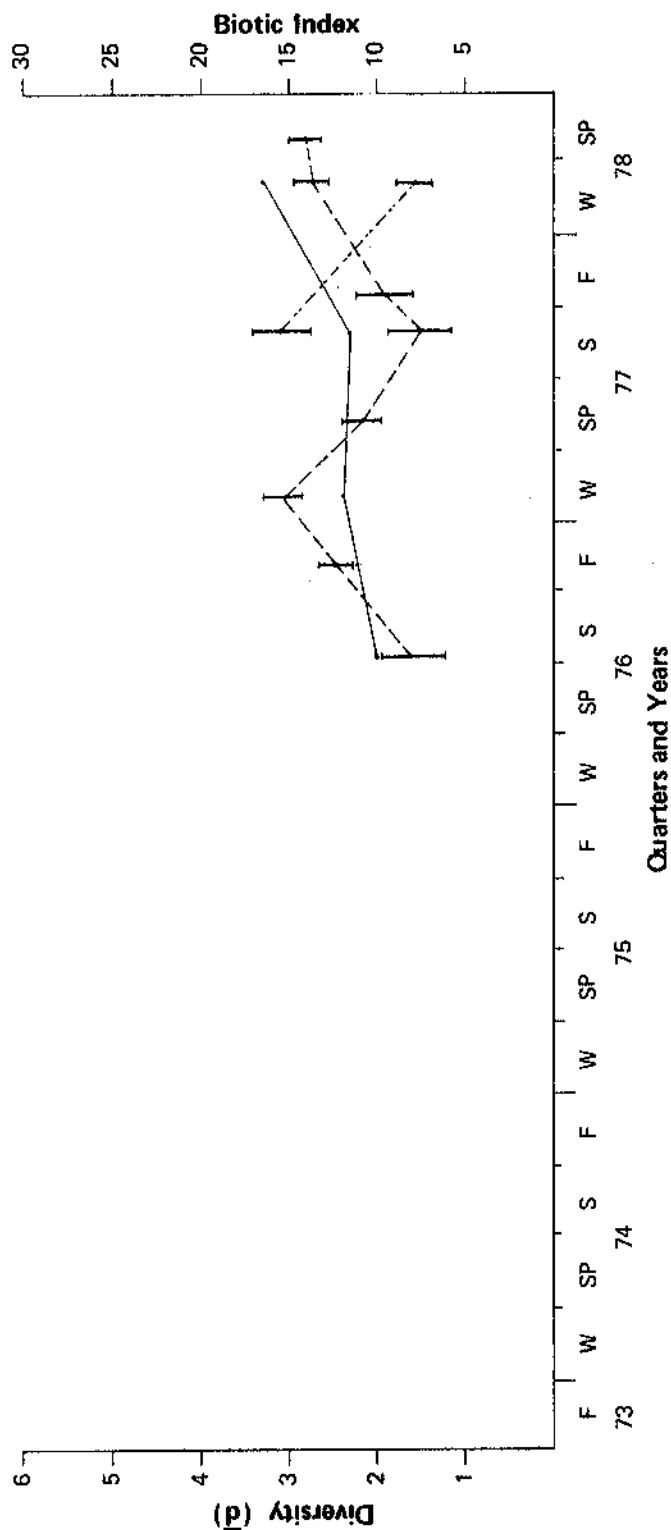
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate			BI	#Spp.			Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
20.01.0012	4 Aug 77 cont.										Cen Dia 3900 Pen Dia 177300 Total 195500			
	5 Oct 77	1.963±0.308	0.372±0.106	9				5	23					
	18 Jan 78													15
	15 Feb 78	2.633±0.222	0.194±0.052	13	1.509±0.223	0.638±0.067	16							
	18 Apr 78	2.648±0.205	0.112±0.042	9				2	23					

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.01.0012
 BODY OF WATER: ST. JOHNS RIVER

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



Station No. 20.01.0026 Body of Water Lake Harney
Location near center
County Seminole
Type Body of Water lake Classification _____
Sources of Pollution domestic waste (Orlando and Orange county STP's)
Nearby Land Use agriculture, recreation
Sampling Frequency annually Depth 2.7 - 3.0 m
Bottom Type mud, shell, detritus % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent _____

Macroinvertebrates:

Annelida
 Oligochaeta
 unident. tubificid

Arthropoda
 Crustacea
 Decapoda
 Rhithropanopeus harrisii

 Insecta
 Diptera
 Chaoborus punctipennis
 Chironomus crassicaudatus
 Coelotanypus concinnus
 C. tricolor
 Glyptotendipes paripes

Mollusca
 Gastropoda
 Viviparus sp.

 Pelecypoda
 Rangia cuneata

DATA SUMMARY: Lake Harney

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.						
20.01.0026	29 Oct 75	1.270±0.065	0.343±0.021	5								Florida Index	
	27 Jul 76	1.738±0.310	0.252±0.117	5									
	5 Oct 77	1.608±0.185	0.327±0.077	6									

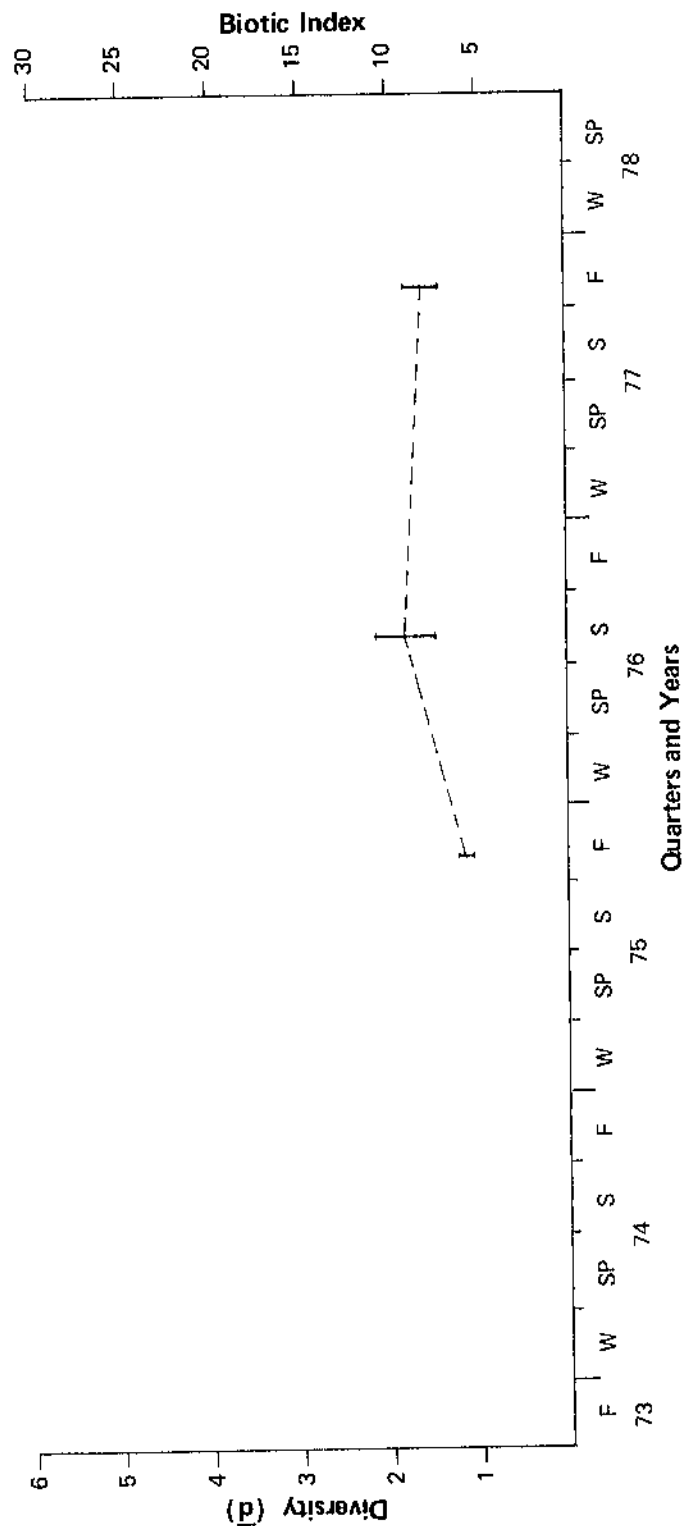
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See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.01.0026
 BODY OF WATER: LAKE HARNEY

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



Diptera

Chaoborus punctipennis
Chironomus crassicaudatus
Coelotanypus concinnus
C. scapularis
C. tricolor
Cricotopus bicinctus
Cryptochironomus fulvus
Dicrotendipes nervosus
Endochironomus nigricans
Epoicocladius sp.
Nilothauma sp.
Polypedilum illinoense
Psectrocladius sp.
Thienemanniella sp.

Arachnida

Acarina

unident. sp.

Mollusca

Gastropoda

cf. Hyalopyrgus sp.

Pelecypoda

Corbicula manilensis

DATA SUMMARY: Blue Cypress 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.					
20.01.0099	3 Sep 75	2.318±0.044	0.137±0.007	9										
	18 Nov 75													
	29 Jun 76	1.859±0.205	0.237±0.050	7										
	26 Oct 76	1.242±0.286	0.421±0.161	4										
										Coc BG 3 Fil BG 35 Coc Gr 6 Fil Gr 3 Gr Flag 6 Other Flag 0 Cen Dia 66 Pen Dia 3 Total 122		40	0	
	27 Jan 77	1.755±0.197	0.217±0.082	5										
	21 Apr 77	1.698±0.314	0.406±0.104	8										
	28 Jul 77	2.214±0.278	0.182±0.081	7										
													Florida Index	

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See Methods for explanation of table.

DATA SUMMARY: Blue Cypress Lake

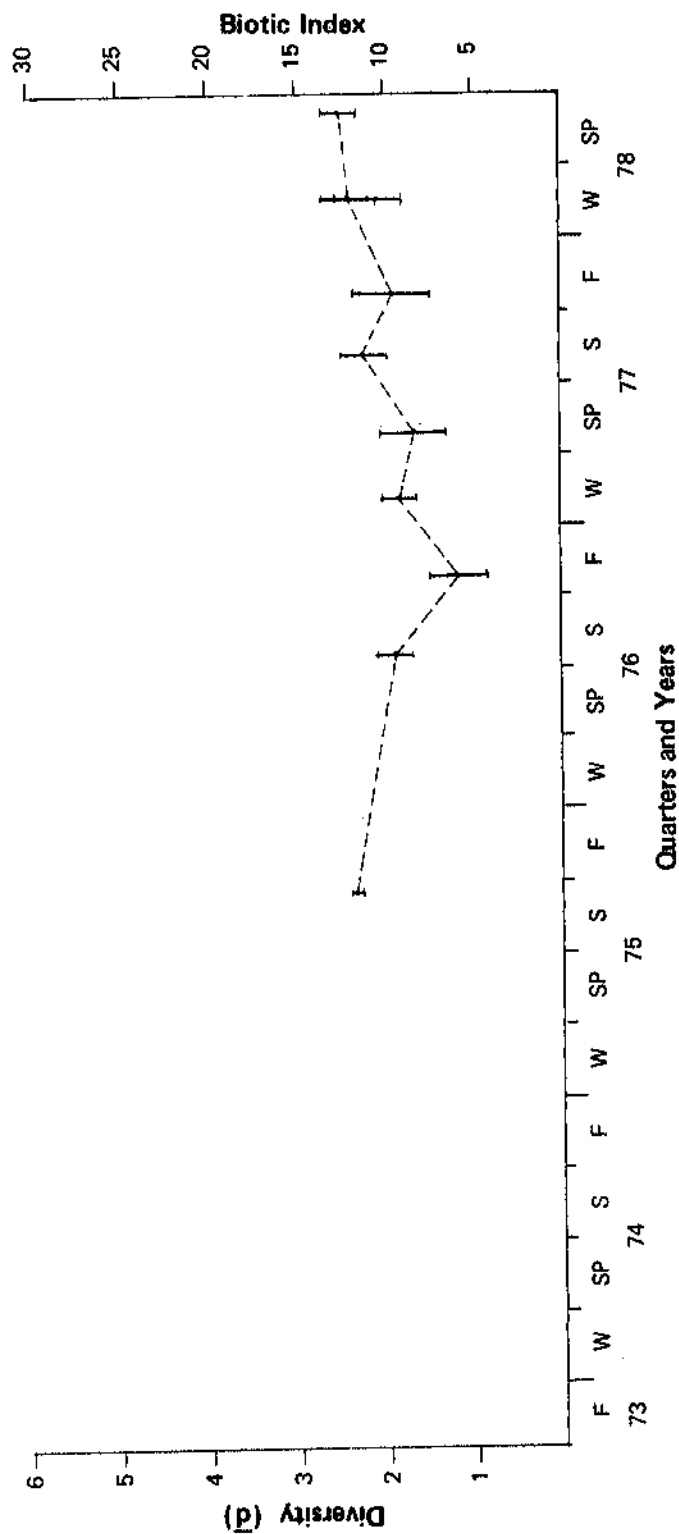
[illegible]

See methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.01.0099
 BODY OF WATER: BLUE CYPRESS LAKE

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



Station No. 20.01.0105 Body of Water Upper St. Johns River

Location at exit from Lake Poinsett, 200 yds. upstream from SR 520

County BrevardType Body of Water river Classification _____

Sources of Pollution agricultural, septic tank leachate (fish camp)

Nearby Land Use recreation, agriculture

Sampling Frequency annually **Depth** 1.52 - 3.35 m

Bottom Type sand, mud, detritus **% Volatile Solids**

Aquatic Plants: Submerged Ceratophyllum sp.

Emergent Eichhornia sp., Panicum sp., Alternanthera sp.

Salvinia sp., Nuphar sp., Pistia sp.

Macroinvertebrates:

Porifera

unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
cf. Tubifex sp.

Hirudinea

unident. sp.

Arthropoda

Crustacea

Isopoda

Cyathura polita

Amphipoda

Gammarus sp.

Hyalella azteca

Decapoda

Palaemonetes paludosus

Insecta

Odonata

Aphylla williamsoni

Enallagma sp.

Epicordulia princeps

Macrothemis sp.

Odonata (cont.)

Miathyria sp.
Perithemis tenera

Ephemeroptera

Caenis diminuta
Callibaetis floridanus

Hemiptera

Pelocoris sp.
Ranatra sp.
unident. coroxid
unident. mesoveliid

Trichoptera

Cynellus sp.
Leptocella sp.

Diptera

Ablabesmyia parajanta
Chaoborus punctipennis
Chironomus crassicaudatus
Clinotanypus sp.
Coelotanypus concinnus
C. scapularis
C. tricolor
Cricotopus bicinctus
C. remus
Cryptotendipes casuarius
Dicrotendipes lobus
D. neomodestus
Harnischia galeator
Nimbocera sp.
Palpomyia sp.
Paralauterborniella nigrohalteralis
Polypedilum halterale
Tanytarsus sp. 1 - Hulbert
T. sp. 1.2 - Hulbert

Coleoptera

unident. dytiscid sp.
unident. haliplid

Arachnida

Acarina

Arrenurus sp.
Unionicola sp.

20.01.0105

Mollusca

Gastropoda

Helisoma sp.
cf. Hyalopyrgus sp.
Physa sp.
Pseudosuccinea sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
unident. unionid

DATA SUMMARY: Lake Poinsett

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.							
20.01.0105	19 May 75										50			
	9 Jun 75										62	LT 10		
	7 Jul 75										32	LT 10		
	4 Aug 75										LT 20	LT 10		
	2 Sep 75										76	LT 20		
	7 Oct 75										250	LT 10		
	3 Nov 75										LT100	LT 10		
	8 Dec 75										32	LT 20		
	5 Jan 76										LT 20	LT 10		
	9 Feb 76										LT 100	LT 20		
	27 Jul 76	2.416±0.379	0.281±0.105	10										

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See Methods for explanation of table.

DATA SUMMARY: Lake Poinsett

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.						
20.01.0105	9 Nov 76	2.218±0.198	0.148±0.045	7									Florida Index
	22 Feb 77	2.494±0.314	0.257±0.089	11				6	22				
	22 Nov 77	2.493±0.275	0.337±0.075	15				5	36				

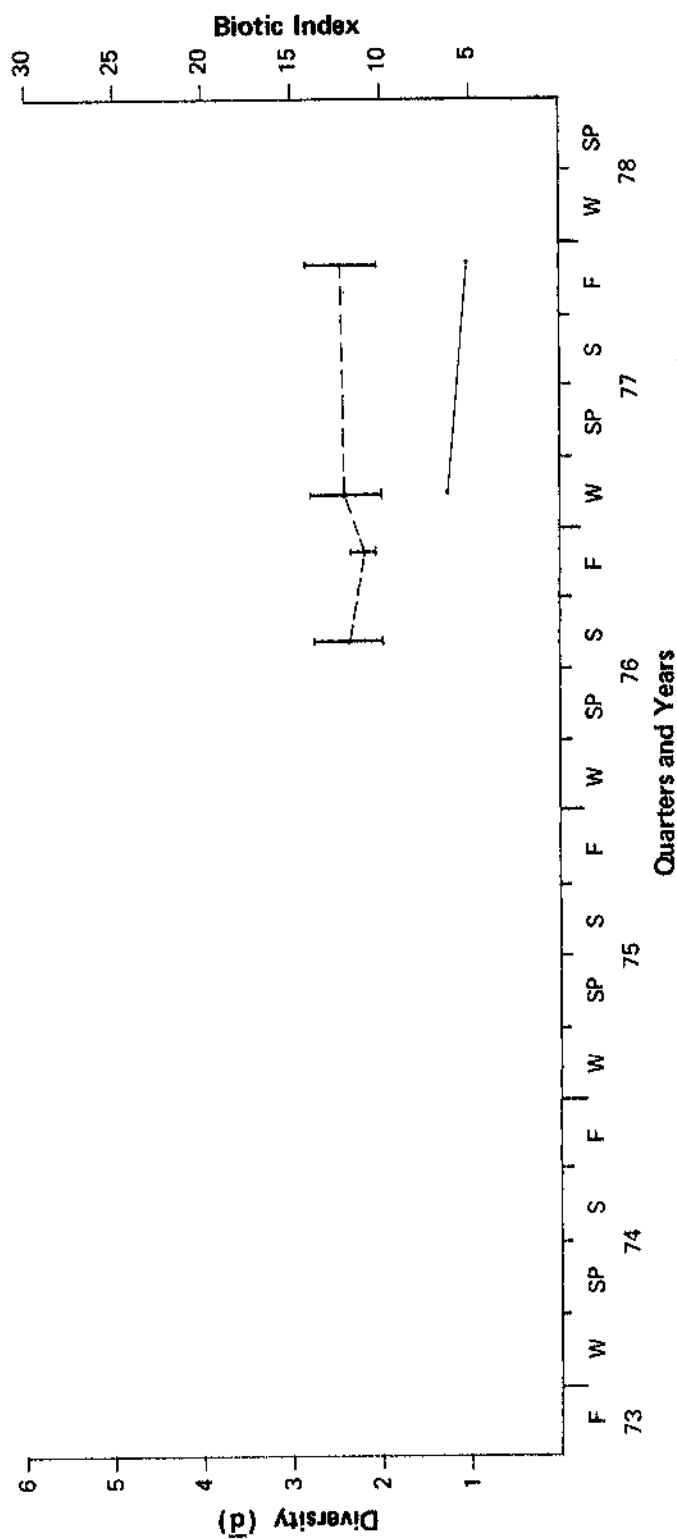
103

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.01.0105
 BODY OF WATER: LAKE POINSETT

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



Station No. 20.01.0115 Body of Water St. Johns River
 Location near Melbourne at dam north of Lake Washington
 County Brevard
 Type Body of Water river Classification I
 Sources of Pollution negligible
 Nearby Land Use agriculture, cattle pasture
 Sampling Frequency quarterly Depth 0.18 - 2.4 m.
 Bottom Type sand, gravel, peat, shells, mud
logs, rock, decayed vegetation Volatile Solids _____
 Aquatic Plants: Submerged filamentous algae, Ceratophyllum sp., Hydrilla sp.
 Emergent Eichhornia crassipes, Ludwigia peruviana
Salix sp., Panicum hemitomon, Pistia sp., Alternanthera philoxeroides, Salvinia
 Macroinvertebrates: rotundifolia, Paspalum sp., Lemna sp., Nuphar sp., Typha sp.

Porifera
 unident. spongillid
 Cnidaria
 Hydrozoa
 Cordylophora sp.
 unident. sp.
 Platyhelminthes
 Turbellaria
 unident. sp.
 Annelida
 Oligochaeta
 Aulodrilus pluriseta
 Limnodrilus hoffmeisteri
 unident. lumbricolid
 unident. tubificid
 unident. naidid
 Hirudinea
 unident. glossiphoniid
 2 unident. spp.

20.01.0115

Arthropoda

Crustacea

Isopoda

Sphaeroma terebrans

Amphipoda

Gammarus sp.

Hyalella azteca

Decapoda

Palaemonetes paludosus

unident. astacid

Insecta

Odonata

Argia tibialis

Aphylla williamsoni

Cannacria grvida

Coryphaeschna sp.

Enallagma sp.

E. cardenium

Epicordulia sp.

Gomphus sp.

Ischnura credula

I. sp.

Libellula sp.

L. auripennis

Macromia sp.

M. taeniolata

Miathyria sp.

Micrathyria sp.

Nehallenia sp.

Neurocordulia sp.

Pachydiplax longipennis

Plathemis sp.

Tetragoneuria semiaquea

Ephemeroptera

Baetis australis

B. spinosus

Brachycercus sp.

Caenis diminuta

Callibaetis sp.

C. floridanus

Hexagenia sp.

Stenonema integrum

S. smithae

Hemiptera

Belostoma sp.
Gerris sp.
Pelocoris sp.
Plea striola
Ranatra sp.
unident. belostomatid
unident. corixid
unident. mesoveliid

Trichoptera

Athripsodes sp.
Cheumatopsyche sp.
Cyrnellus sp.
Hydropsyche sp.
Hydroptila sp.
Nectopsyche sp.
N. sp. A (Ross)
Neureclipsis sp.
Oecetis sp.
Polycentropus flavus
Triaenodes sp.

Diptera

Ablabesmyia parajanta
Bezzia setulosa
Chaoborus punctipennis
Chironomus sp.
C. attenuatus
C. carus
C. stigmaterus
Cladotanytarsus sp.
Clinotanypus sp.
Coelotanypus concinnus
C. tricolor
Cricotopus sp.
C. bicinctus
C. remus
Cryptochironomus blarina
C. fulvus
Cryptotendipes sp.
Dicrotendipes lobus
D. modestus
D. neomodestus
D. nervosus
Glyptotendipes sp.
Harnischia sp.
H. galeator
Labrundinia neopilosella
Orthocladius sp.
Parachironomus hirtalatus
P. schneideri

Diptera (cont.)

Parachironomus monochromus
Pedionomus beckae
Pentaneura sp.
Phaenopsectra sp.
Polypedilum halterale
P. fallax
P. illinoense
P. scalaenum
Procladius sp.
Psectrocladius sp.
Pseudochironomus sp.
Stenochironomus sp.
Stictochironomus sp.
Tanypus carinatus
Tribelos fuscicornis
Xenochironomus xenolabis
unident. sp.
unident. ceratopogonid

Coleoptera

unident. dytiscid spp.
unident. elmid
unident. gyrid
unident. halipid
unident. hydrophilid
unident. melyrid
unident. sp.

Arachnida

Acarina

Arrenurus sp.
Albia sp.
2 unident. spp.

Mollusca

Gastropoda

Campeloma sp.
Ferrissia dalli
Helisoma sp.
cf. Hyalopyrgus sp.
Melanoides tuberculata
Physa sp.
Pomacea sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
unident. unionid
unident. sp.

DATA SUMMARY: Upper St. John's 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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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	4 Dec 73	1.496+0.322	0.481+0.102	8				16	33		37	3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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	12 Mar 74	2.466+0.035	0.102+0.007	8				11	19																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.			Total	Fecal			
20.01.0115	13 Aug 74											200	30			
110	20 Aug 74	2.281+0.028	0.258+0.006	15	2.925+0.321	0.275+0.071	19	4	28							
	10 Sep 74											70	10			
	8 Oct 74											0	0			
	5 Nov 74											0	0			
	7 Nov 74	2.083+0.055	0.228+0.018	8				7	29	Coc BG 0 Fil BG 0 Coc Gr 17 Fil Gr 0 Gr Flag 3 Other Flag 0 Cen Dia 0 Pen Dia 6 Total 26						
	3 Dec 74													0	0	
	6 Jan 75													0	0	

DATA SUMMARY: Upper St. John's 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.		
20.01.0115	28 Jan 75	2.450±0.041	0.156±0.008	10			10	15	Coc BG 0 Fil BG 0 Coc Gr 111 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 56 Pen Dia 28 Total 195					
	4 Mar 75											0	0	
	20 Mar 75											54	11	
	1 Apr 75											20	0	
	28 Apr 75	2.702±0.066	0.192±0.014	14			4	19						
	1 May 75	2.604±0.186	0.197±0.051	12	2.189±0.102	0.264±0.032	11	7	28					
	8 Jul 75											90	0	
	5 Aug 75											150	0	

See Methods for explanation of table.

DATA SUMMARY: Upper St. John's 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.					
20.01.0115 112	2 Sep 75											50	0	
	11 Sep 75	2.454±0.058	0.225±0.011	14	2.718±0.191	0.182±0.036	14	16	26			40	0	
	3 Nov 75													
	10 Nov 75	2.149±0.136	0.273±0.034	11								50	0	
	8 Dec 75											210	70	
	20 Jan 76													
	11 Mar 76	1.930±0.256	0.348±0.070	11	1.606±0.190	0.500±0.060	14	10	38	Coc BG 5 Fil BG 118 Coc Gr 5 Fil Gr 32 Gr Flag 0 Other Flag 5 Cen Dia 62 Pen Dia 1451 Total 1678		16	4	
	23 Mar 76													

See Methods for explanation of table.

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.					
20.01.0115 113	22 Apr 76	1.870±0.481	0.450±0.182	7								
	29 Jun 76	1.931±0.153	0.290±0.033	11			4	26				
	26 Oct 76	0.758±0.222	0.827±0.079	9	0.994±0.297	0.444±0.024	15					
	27 Jan 77	2.161±0.258	0.382±0.070	15			11	26				
	21 Apr 77	1.452±0.265	0.542±0.098	9	2.109±0.214	0.287±0.045						

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DATA SUMMARY: Upper St. John's 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.					
20.01.0115	21 Apr 77 cont.									Cen Dia 2400 Pen Dia 88100 Total 96000	56	4	Florida Index	
	12 Jul 77									Coc BG 0 Fil BG 3600 Coc Gr 900 Fil Gr 1100 Gr Flag 0 Other Flag 0 Cen Dia 400 Pen Dia 55800 Total 61800	125	10		
	28 Jul 77	2.221±0.206	0.236±0.031	12	3.122±0.202	0.183±0.038	22							
	9 Aug 77							9	27					
	23 Nov 77	2.441±0.367	0.384±0.100	15										

DATA SUMMARY: Upper St. John's River

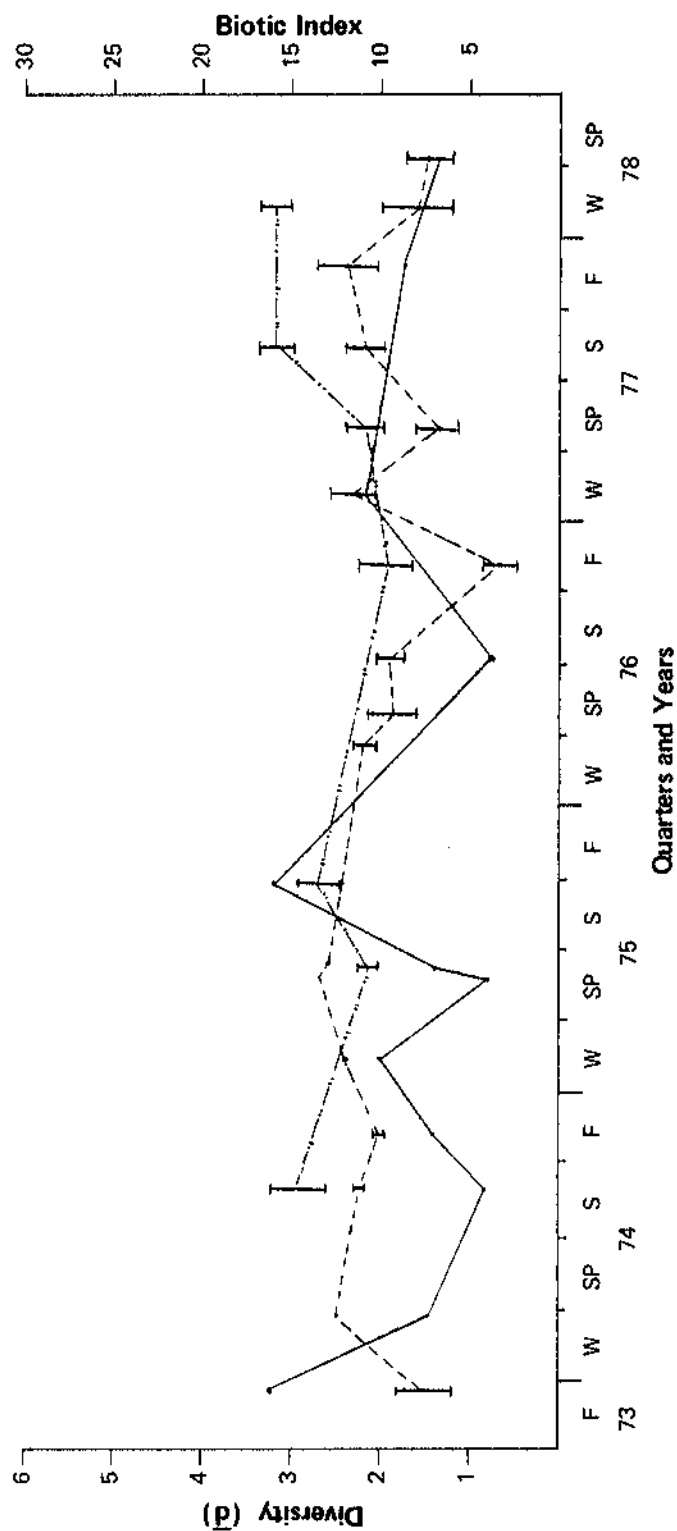
Station Number	Date	Macroinvertebrates								Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate			BI	#Spp.			Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
20.01.0115 115	10 Jan 78										20	2		
	1 Feb 78	1.670±0.437	0.698±0.137	13	3.197±0.161	0.131±0.021	22				16	0		
	20 Mar 78							7	30		64	11		
	23 May 78	1.562±0.312	0.550±0.102	11										

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.01.0115
 BODY OF WATER: UPPER ST. JOHNS RIVER

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



Station No. 20.01.0130 Body of Water Econlockhatchee River
 Location at SR 419, downstream from bridge
 County Seminole
 Type Body of Water river Classification III
 Sources of Pollution domestic wastes
 Nearby Land Use pasture, natural
 Sampling Frequency quarterly Depth 0.1 - 1.8 m
 Bottom Type silt, detritus % Volatile Solids _____
 Aquatic Plants: Submerged bryophytes, Hydrilla verticillata, filamentous algae,
Eleocharis sp., Najas sp. Emergent Salix sp., Hydrochloa sp., Lemna minor,
Polygonium sp., Hydrocotyle umbellata, Alternanthera sp., Zizaniopsis sp., Hydrocotyle
 Macroinvertebrates: sp., Eichhornia sp., Ludwigia sp.

Platyhelminthes
 Turbellaria
 unident. sp.

Annelida
 Oligochaeta
 Limnodrilus hoffmeisteri
 L. profundicola
 unident. lumbricolid
 unident. naidid
 unident. tubificid

Hirudinea
 Helobdella sp.
 unident. glossiphoniid
 unident. sp.

Arthropoda
 Crustacea
 Isopoda
 Asellus sp.

Amphipoda

Gammarus sp.
Hyaella azteca

Decapoda

Palaemonetes paludosus
unident. astacid

Insecta

Odonata

Argia sedula
Dromogomphus sp.
Enallagma sp.
Epicordulia sp.
Erythemis sp.
Gomphus sp.
Macromia taeniolata
Nasiaeschna pentacantha
Nehallenia sp.
Pachydiplax longipennis
Tetragoneuria canis

Ephemeroptera

Baetis sp.
B. spinosus
Callibaetis floridanus
Stenonema exiguum
S. integrum
S. smithae
Stenacron interpunctatum

Hemiptera

Gerris sp.
Ranatra sp.
Rheumatobates sp.
unident. belostomatid
unident. gerrid
unident. mesoveliid

Trichoptera

Cheumatopsyche sp.
Cynellus sp.
Hydropsyche sp.
Leptocella sp.
Macronemum carolina
Oecetis sp.
Orthotrichia sp.
Polycentropus sp.

Megaloptera

Corydalus cornutus

Lepidoptera

Nymphula sp.

Diptera

Ablabesmyia mallochi
A. parajanta
A. pelcensis
A. tarella
Anopheles sp.
Bezzia sp.
Chaoborus sp.
Chironomus sp.
Corynoneura sp.
Cricotopus bicinctus
Cryptochironomus blarina
C. fulvus
Cladotanytarsus sp.
Cryptotendipes casuarius
Dicrotendipes modestus
D. nervosus
D. neomodestus
Demicryptochironomus sp.
Einfeldia sp.
Harnischia collator
H. galeator
H. sp.
Labrundinia floridana
L. neopilosella
Paralauterborniella nigrohalteralis
Pentaneura inculta
Polypedilum convictum
P. halterale
P. illinoense
P. scalaenum
Procladius sp.
Psectrocladius sp.
Rheotanytarsus exiguus
Simulium sp.
Stenochironomus sp.
Tanytarsus sp. 1.1 - Hulbert
T. sp. 1 - Hulbert
T. sp. 4 - Hulbert
Thienemanniella sp.
T. xena
Tribelos fuscicornis
unident. dolichopodid
unident. ceratopogonid
unident. tabanid
unident. sp.

20.01.0130

Coleoptera

Dubiraphia sp.
Haliphus sp.
Peltodytes sp.
Stenelmis sp.
unident. elmid
unident. gyrid
unident. helodid
unident. hydrophilid
unident. ptilodactylid

Arachnida

Acarina

Hydrodroma sp.
Hygrobatas sp.
Mideopsis (s.s.) sp.

Mollusca

Gastropoda

Clappia sp.
Helisoma sp.
Ferissia dalli
Lyogyrus sp.
Promenetus sp.
Pseudosuccinea sp.
unident. hydrobiid

Pelecypoda

Eupera sp.
Musculium sp.
Sphaerium sp.
unident. sphaeriid
unident. unionid

DATA SUMMARY: Econlockhatchee 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.						
20.01.0130	3 Sep 74											350	20		
	9 Oct 74											120	110		
	5 Nov 74											2700	20		
	6 Nov 74	1.762±0.120	0.343±0.043	8				31	38	Coc BG 0 Fil BG 556 Coc Gr 361 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 0 Pen Dia 28 Total 945					
121	3 Dec 74												350		
	7 Jan 75													10	
	4 Mar 75	3.030±0.126	0.123±0.014	20				31	37	Coc BG 0 Fil BG 0		280			

See Methods for explanation of table.

DATA SUMMARY: Ecomlockhatchee 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.					
20.01.0130	4 Mar 75 cont.									Coc Gr 973 Fil Gr 0 Gr Flag 56 Other Flag 0 Cen Dia 0 Pen Dia 195 Total 1224		610 180		
	1 Apr 75											BT2000 10		
	3 Jun 75													
	16 Jun 75	2.103±0.053	0.193±0.017	7	2.533±0.097	0.207±0.021	16	11	35					
	8 Jul 75											360 10		
	5 Aug 75											260 0		
	2 Sep 75											100 0		
	4 Sep 75	0.452±0.089	0.663±0.088	2	2.867±0.204	0.190±0.029	21	16	23			8500 580		
	7 Oct 75													
	4 Nov 75									Coc BG 0		540 10		

See Methods for explanation of table.

DATA SUMMARY: Ecnolokhatchee 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.					
20.01.0130	4 Nov 75 cont.								Fil BG 0 Coc Gr. 9 Fil Gr 3 Gr Flag 6 Other Flag 0 Cen Dia 14 Pen Dia 20 Total 52					
	9 Dec 75										600	0		
	1 Feb 76	2.315±0.303	0.400±0.076	19	2.495±0.088	0.168±0.016	12	26	35		Coc BG 0 Fil BG 111 Coc Gr 0 Fil Gr 0 Gr Flag 0 Other Flag 5393 Cen Dia 56 Pen Dia 56 Total 5616	250	30	
	9 Mar 76													

See Methods for explanation of table.

DATA SUMMARY: Econlockhatchee 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.					
20.01.0130	20 Apr 76											510	0	
	20 Aug 76											700	30	
	28 Oct 76	1.445±0.796	0.999±0.456	4										
	25 Jan 77	2.714±0.190	0.158±0.027	14					26	36				
	1 Mar 77													
	20 Apr 77				2.227±0.091	0.261±0.017	18					230	60	
	3 May 77											320	0	

See methods for explanation of table.

DATA SUMMARY: Econlockhatchee River

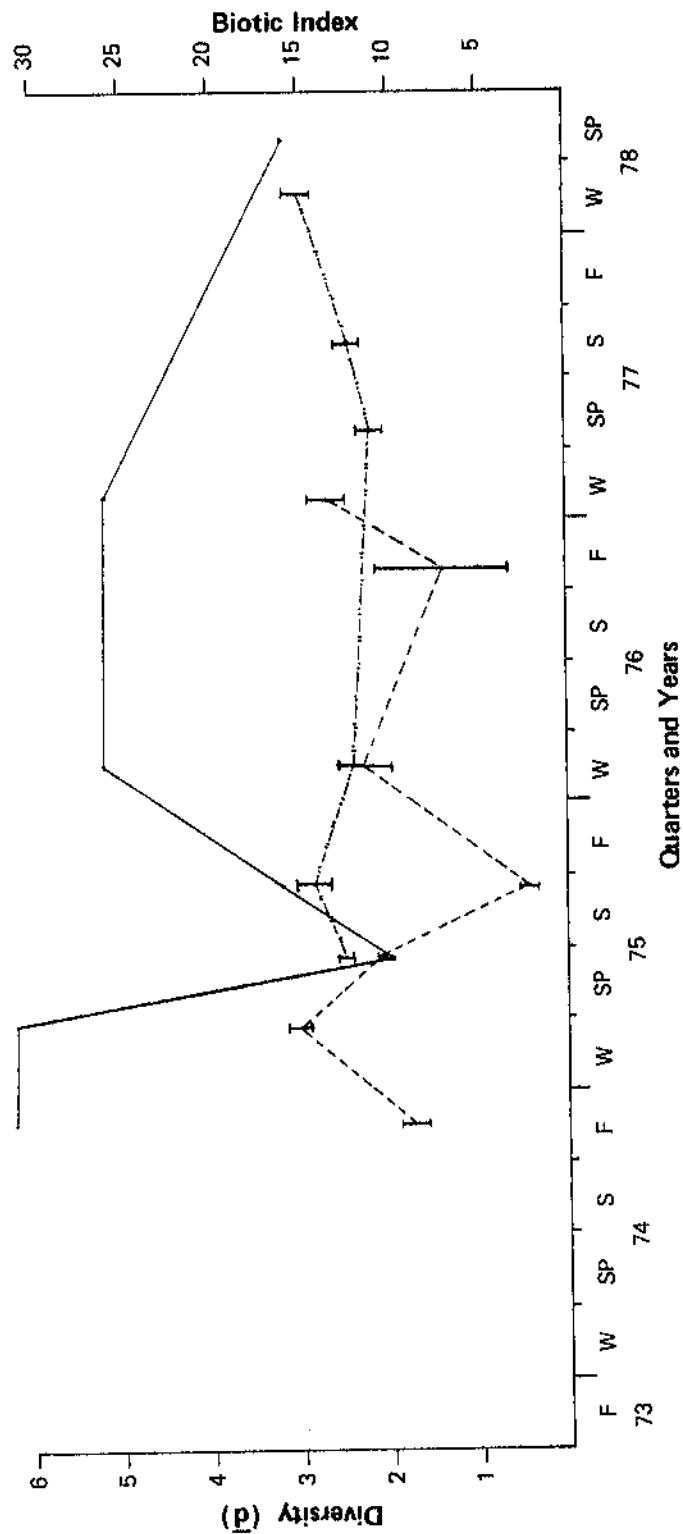
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
20.01.0130	7 Jun 77											20	Florida Index	
	5 Jul 77										270	47		
	2 Aug 77										330	96		
	4 Aug 77				2.415±0.138	0.271±0.031	21				840	104		
	18 Jan 78										330	36		
	6 Feb 78													
	15 Feb 78				3.038±0.122	0.143±0.018	21				230	316		
	6 Mar 78													
	18 Apr 78							16	35		1700	49		
	5 Jun 78													

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MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.01.0130
 BODY OF WATER: ECONLOCKHATCHEE RIVER

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



Station No. 20.01.0137 Body of Water Little Wekiva River
 Location at SR 434, upstream of bridge
 County Seminole
 Type Body of Water stream Classification III
 Sources of Pollution numerous domestic sources; industrial waste
 Nearby Land Use urban
 Sampling Frequency quarterly Depth 0.05-0.66m
 Bottom Type coarse sand/detritus % Volatile Solids _____
 Aquatic Plants: Submerged Hydrilla sp., Ceratophyllum sp., filamentous
 algae _____ Emergent Scirpus sp., Ludwigia peruviana, Salix sp.,
Leersia sp., Taxodium sp., Juncus effusus, Hydrocotyle sp., Peruviana sp.,
 Macroinvertebrates: Cephalanthus sp., Eriocaulon sp., Myrica sp.

Platyhelminthes

Turbellaria

unident. sp.

Nematoda

unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

Potamothrix vejdoskyi

unident. lumbriculid

cf. Tubifex sp.

unident sp.

unident. tubificid

unident. naidid

Hirudinea

Batrachobdella sp.

Helobdella sp.

Placobdella sp.

P. ornata

unident. glossiphoniid

Arthropoda

Crustacea

Amphipoda

Hyaella azteca

Decapoda

unident. astacid

Insecta

Odonata

Argia sedulaAphylla williamsoniEnallagma sp.Ischnura sp.Libellula sp.Macrothemis sp.Macromia taeniolataNehalennia sp.Perithemis teneraOrthemis sp.cf. Nannothemis sp.

Ephemeroptera

Caenis diminutaCallibaetis floridanus

Hemiptera

Belostoma sp.Gerris sp.Plea striolaRanatra sp.Rheumatobates sp.

unident. hydrometrid

unident naucorid

unident mesoveliid

Trichoptera

Cheumatopsyche sp.Hydropsyche sp.Orthotrichia sp.

Megaloptera

Corydalis cornutus

Diptera

Ablabesmyia parajantaA. tarellaBezzia sp.Chaoborus punctipennisChironomus crassicaudatusC. attenuatus

C. carus
C. stigmaterus
Cladotanytarsus sp.
Clinotanypus sp.
Cricotopus bicinctus
Cryptochironomus blarina
C. fulvus
Corynoneura sp.
Dicrotendipes modestus
D. nervosus
D. neomodestus
Einfeldia sp.
Glyptotendipes paripes
Goeldichironomus holoprasinus
Harnischia sp.
H. boydi
Paracladopelma loganae
Parachironomus monochromus
P. schneideri
Paralauterborniella nigrohalteralis
Paratanytarsus sp.
Pedionomus beckae
Pentaneura inculta
 cf. Palpomyia sp.
Polypedilum halterale
P. convictum
P. scalaenum
P. illinoense
Procladius sp.
Psectrocladius sp.
Rheotanytarsus exiguus
Stenochironomus sp.
Tanypus carinatus
T. neopunctipennis
Tanytarsus sp. 1 - Hulbert
T. sp. 3 - Hulbert
T. sp. 1.2 - Hulbert
Thienemanniella sp.
T. xena
T. jucundus
 unident. simuliid
 unident. tipulid

Coleoptera

Dineutus sp.
Dubiraphia sp.
Berosus sp.
 unident. chrysomelid
 unident. dytiscid

unident. elmid
unident. gyrid
unident. haliplid
unident. hydrophilid

Arachnida

Acari

Hydrodroma sp.
unident. sp.

Mollusca

Gastropoda

Helisoma sp.
Ferrissia dalli
Physa sp.
Pseudosuccinea sp.

Pelecypoda

Corbicula manilensis
Musculium sp.
Sphaerium sp.
2 unident. sphaeriid spp.
unident. unionid

DATA SUMMARY: Little Wekiva 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.				
20.01.0137	7 Aug 73									GT2000	
	21 Aug 73									800	30
	19 Nov 73									3200	300
	26 Feb 74									2300	70
	27 Aug 74									4404	815
	3 Sep 74										
	23 Sep 74										
		0.569±0.120	0.733±0.073	3	1.765±0.196	0.515±0.061	15	8	23	1100	130

See Methods for explanation of table.

DATA SUMMARY: Little Wekiva 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.						
20.01.0137	9 Oct 74										5700	540	
	5 Nov 74										450	20	
	3 Dec 74											400	
	4 Dec 74	1.881±0.049	0.404±0.015	14			14	25	Coc BG 78 Fil BG 23 Coc Gr 345 Fil Gr 0 Gr Flag 50 Other Flag 0 Cen Dia 45 Pen Dia 184 Total 725				
	7 Jan 75										1800	80	
	21 Jan 75	2.688±0.030	0.234±0.007	19			18	34	Coc BG 56 Fil BG 473 Coc Gr 1168 Fil Gr 0 Gr Flag 139				

See Methods for explanation of table.

DATA SUMMARY: Little Wekiva 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.					
20.01.0137	21 Jan 75 cont.									Other Flag 0 Can Dia 584 Pen Dia 334 Total 2754		Total	Pecal	
	11 Feb 75											GT8000	1700	
	1 Apr 75								6	24		GT 10000	GT2000	
	24 Apr 75	0.994±0.172	0.660±0.071	8	3.201±0.078	0.142±0.015	21					3500	1800	
	3 Jun 75											13700	GT1500	
	8 Jul 75											300	400	
	5 Aug 75													
	12 Aug 75	0.611±0.105	0.496±0.117	2	0.354±0.139	0.924±0.050	6	4	24					
	3 Oct 75							9	27					
	7 Oct 75											10100	320	

See Methods for explanation of table.

DATA SUMMARY: Little Mekiva 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.					
20.01.0137	4 Nov 75										2400	170		
	9 Dec 75										600	0		
	17 Feb 76	2.300±0.126	0.210±0.027	13	2.160±0.060	0.183±0.020	10	7	26	Coc BG 6 Fil BG 17 Coc Gr 156 Fil Gr 0 Gr Flag 11 Other Flag 67 Cen Dia 17 Pen Dia 367 Total 639	Coc BG 0 Fil BG 8200 Coc Gr 2100 Fil Gr 0 Gr Flag 285100 Other Flag 2100 Other Flag 18500 Cen Dia 4100 Pen Dia 71800 Total 391900			
	9 Mar 76										4800	700		
	30 Mar 76										3200	370		
	20 Apr 76										GT6000	980		

See Methods for explanation of table.

DATA SUMMARY: Little Wekiwa 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.	B1	#Spp.					
20.01.0137	18 May 76	2.071±0.730	0.823±0.264	8						Coc BG 1083				
	22 Jun 76	1.597±0.491	0.999±0.236	4				11	22	Fil BG 0				
	10 Aug 76									Coc Gr 3534		2500	1000	
	21 Oct 76	2.265±0.143	0.294±0.027	23	2.866±0.165	0.213±0.026	25			Fil Gr 0				
										Gr Flag 342				
	17 Jan 77							7	22	Other Flag 57				
	17 Feb 77	2.755±0.360	0.135±0.078	8						Cen Dia 1026		900	100	
	1 Mar 77									Pen Dia 171		2900	350	
	3 May 77	1.446±0.127	0.464±0.035	13						Total 6213			1000	
	7 Jun 77													

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See Methods for explanation of table.

DATA SUMMARY: Little Wekiva River

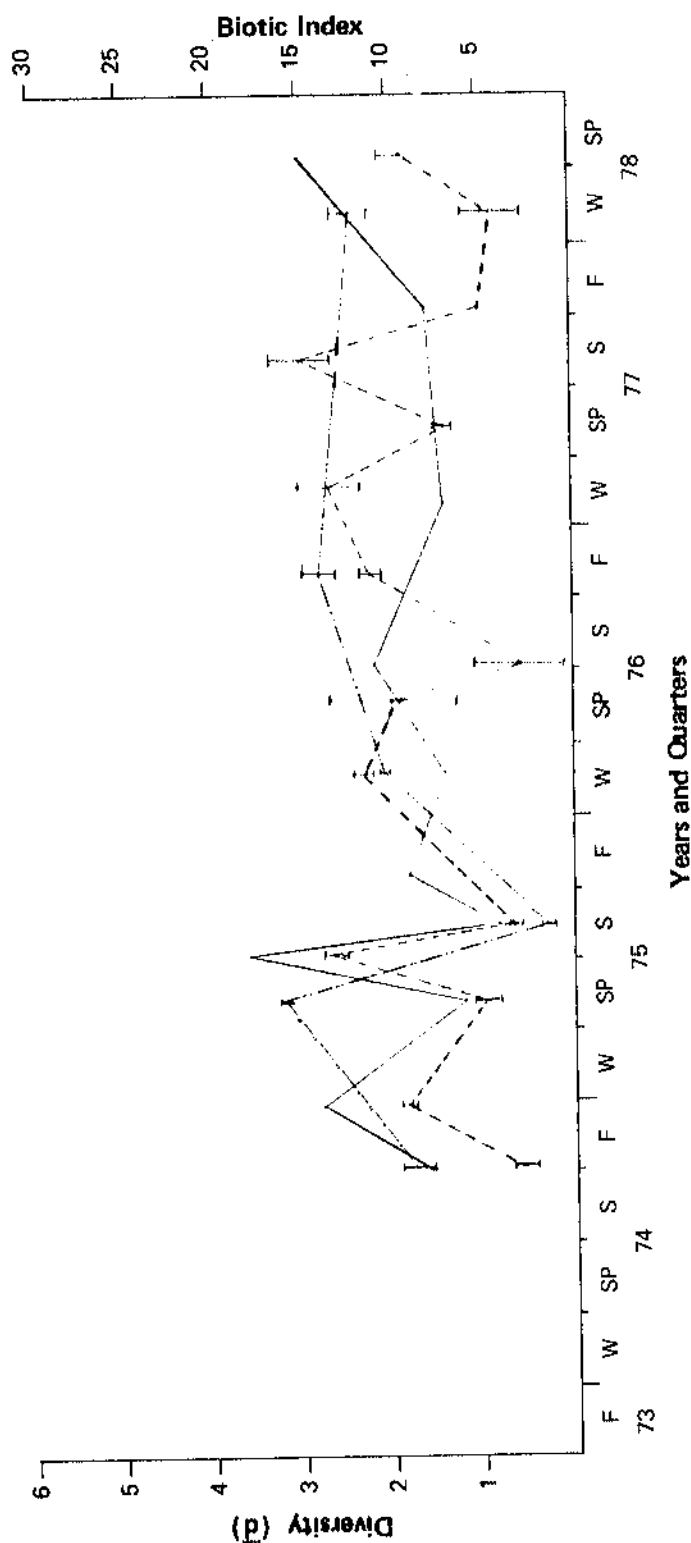
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments	
		Natural Substrate		Artificial Substrate		#Spp.	Redundancy							#Spp.
		Diversity	Redundancy	#Spp.	Diversity			Redundancy	#Spp.					
		BI	#Spp.											
20.01.0137 136	5 Jul 77											11000	1133	Florida Index
	26 Jul 77	3.007+0.307	0.186+0.042	17										
	2 Aug 77			2				8	20			7250	1433	
	28 Sep 77	1.000+0.000												
	30 Jan 78													
	6 Feb 78											30250	378	
	8 Feb 78	0.867+0.312	0.735+0.146	5	2.420+0.156	0.158+0.021	11					1000	74	
	6 Mar 78											43	122	
	3 Apr 78											1938	344	
	6 Apr 78	1.884+0.243	0.427+0.071	13				15	34					
	5 Jan. 78											20500	GT3333	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.01.0137
 BODY OF WATER: LITTLE WEKIVA RIVER

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



Station No. 20.01.0183 Body of Water Lake Jessup
Location NE Section, approximately 1.5 mi. NE of Bird Island
County Seminole
Type Body of Water lake Classification III
Sources of Pollution domestic wastes, urban runoff
Nearby Land Use agriculture, urban
Sampling Frequency quarterly Depth 1.0 - 5.0 m
Bottom Type shell, mud, detritus % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Eichhornia crassipes, Phragmites communis,
Salvinia sp., Pistia sp., Polygonium sp.

Macroinvertebrates:

Annelida

Oligochaeta

Haplotaxis sp.

Limnodrilus hoffmeisteri

unident. tubificid

Hirudinea

unident. glossiphoniid

Arthropoda

Crustacea

Isopoda

Cyathura polita

Amphipoda

Gammarus sp.

Hyaella azteca

Mysidacea

Taphromysis bowmani

Insecta

Trichoptera

Cheumatopsyche sp.

20.01.0183

Diptera

Chaoborus punctipennis

Chironomus attenuatus

Coelotanypus concinnus

Glyptotendipes paripes

Mollusca

Gastropoda

Hyalopyrgus sp.

Viviparus sp.

DATA SUMMARY: Lake Jessup

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.					
20.01.0183 140	6 Nov 73										LT 100	30		
	13 Nov 73	1.024±0.235	0.673±0.098	7							68	0		
	12 Dec 73										30	0		
	8 Jan 74										100	10		
	5 Feb 74										50	0		
	5 Mar 74	0.0860±0.033	0.578±0.019	4	0.327±0.029	0.838±0.019	3					51		
	3 Apr 74										0	0		
	1 May 74										0	0		
13 Aug 74									Coc BG 17922 Fil BG 1798 Coc Gr 13287 Fil Gr 0 Gr Flag 0 Other Flag 0					

See Methods for explanation of table.

DATA SUMMARY: Lake Jessup

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.					
20.01.0183 141	13 Aug 74 cont.								Pen Dia 2163 Pen Dia 6180 Total 46350					
	3 Sep 74										30	10		
	10 Sep 74	0.211±0.029	0.918±0.013	3							10	0		
	5 Nov 74										10	0		
	19 Nov 74													
	3 Dec 74											600		
	7 Jan 75											500	50	
	16 Jan 75	1.929±0.037	0.201±0.009	7						Coc BG 16170 Fil BG 6160 Coc Gr 30800 Fil Gr 0 Gr Flag 0 Other Flag 770				

See Methods for explanation of table.

DATA SUMMARY: Lake Jessup

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				#Spp.	Fecal	
		Diversity	Redundancy	Diversity	Redundancy			BI					
20.01.0183 142	16 Jan 75 cont.								Den Dia 6160 Pen Dia 2930 Total 62990		20	10	
	1 Apr 75										40	0	
	3 Jun 75										0	0	
	8 Jul 75												
	7 Oct 75 0.000					1			Coc BG 11565 Fil BG 16962 Coc Gr 11733 Fil Gr 0 Gr Flag 0 Other Flag 0 Den Dia 6168 Pen Dia 3855 Total 50283		140	30	
	4 Nov 75										10	0	

See Methods for explanation of table.

DATA SUMMARY: Lake Jessup

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.						
20.01.0183	9 Dec 75											30	0	
	20 Jan 76											20	50	
	9 Mar 76											0	0	
	20 Apr 76											0	0	
	20 May 76	0.400±0.232	0.940±0.092	5					Coc BG 92520 Ril BG 31611 Coc Gr 16191 Fil Gr 0 Gr Flag 771 Other Flag 0 Cen Dia 2313 Pen Dia 6939 Total 150345					
	24 Jun 76	0.181±0.193	0.944±0.142	2								0	60	
	30 Aug 76													

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See Methods for explanation of table.

DATA SUMMARY: Lake Jessup

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.							
20.01.0183	1 Feb 77	1.113±0.117	0.588±0.046	9				Coc BG 28254 Fil BG 3324 Coc Gr 6094 Fil Gr 3324 Gr Flag 554 Other Flag 554 Cen Dia 1662 Pen Dia 3324 Total 47890			200	0	Florida Index	
	1 Mar 77										0	0		
	3 May 77													
	7 Jun 77													
	5 Jul 77													
	4 Oct 77													
	11 Oct 77	0.324±0.160	0.880±0.091	3					Coc BG 63825 Fil BG 17825 Coc Gr 13225		100	10	0	

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See Methods for explanation of table.

DATA SUMMARY: Lake Jessup

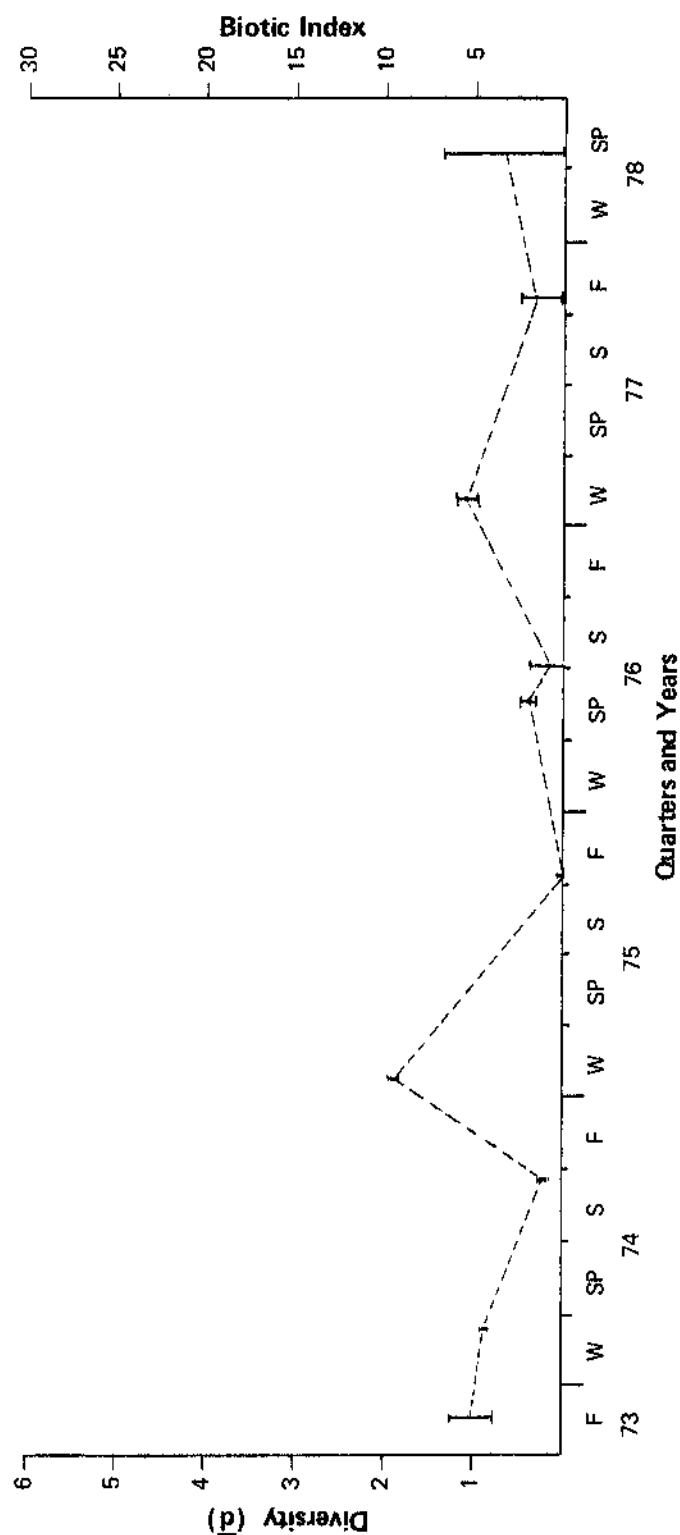
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
20.01.0183	11 Oct 77 cont.									Fil Gr 0 Gr Flag 575 Other Flag 0 Cen Dia 16675 Pen Dia 15525 Total 127650			0	
	18 Jan 78											0	10	
	6 Mar 78											0	0	
	3 Apr 78											0	0	
	18 Apr 78	0.650±0.692	1.000±0.795	2						Coc BG 9270 Fil BG 35226 Coc Gr 66744 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 5562 Pen Dia 35226 Total 152028				

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO : 20.01.0183
 BODY OF WATER: LAKE JESSUP

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



Station No. 20.01.0479 Body of Water Blackwater Creek

Location off dirt road extension of SR 439

County Lake

Type Body of Water stream Classification

Sources of Pollution

Nearby Land Use silviculture

Sampling Frequency annually Depth 0.1 - 1.0 m

Bottom Type sand, mud, detritus % Volatile Solids

Aquatic Plants: Submerged Bacopa

Emergent Cephalanthus sp., Pontederia sp., Taxodium sp.,

Alternanthera sp., Salvinia sp., Sagittaria sp.

Macroinvertebrates:

Porifera

unident. sp.

Platyhelminthes

Turbellaria

unident. sp.

Annelida

Oligochaeta

Slavina appendiculata

unident. lumbriculid

unident. tubificid

Hirudinea

unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Amphipoda

Gammarus sp.

Hyalella azteca

Decapoda

unident. astacid

Insecta

Odonata

Calopteryx maculatum
Enallagma sp.
Gomphus sp.
Ischnura sp.
Libellula sp.
Micrathyria didyma
Orthemis sp.

Ephemeroptera

Caenis sp.

Hemiptera

Ranatra sp.
unident. belostomatid

Trichoptera

Cheumatopsyche sp.

Diptera

Ablabesmyia aspera
A. hauberi
A. ornata
Alluaudomyia sp.
Chironomus crassicaudatus
Clinotanypus sp.
Conchapelopia sp.
Cricotopus sp.
Cryptochironomus fulvus
Glyptotendipes lobiferus
Labrundinia virescens
Microtendipes sp.
Polypedilum halterale
P. illinoense
Procladius sp.
Rheotanytarsus sp.
Simulium sp.
Stenochironomus sp.
Tanytarsus sp.
Tribelos fuscicornis
T. jucundus

Coleoptera

Stenelmis sp.
unident. dytiscid
unident. elmidae
unident. gyrid
unident. hydrophilid

20.01.0479

Arachnida

Acarina

unident. sp.

Mollusca

Gastropoda

Laevapex sp.

DATA SUMMARY: Blackwater Creek

Station Number	Date	Macroinvertebrates										Phytoplankton Concentration units/cm ³	Periphyton Concentration units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate			Biotic Index							
		Diversity	Redundancy	Spp.	Diversity	Redundancy	Spp.								
								Diversity	Redundancy	Spp.	Diversity				
20-01-0479	8 Jun 76														
	14 Feb 77														
	29 Nov 77														Florida Index

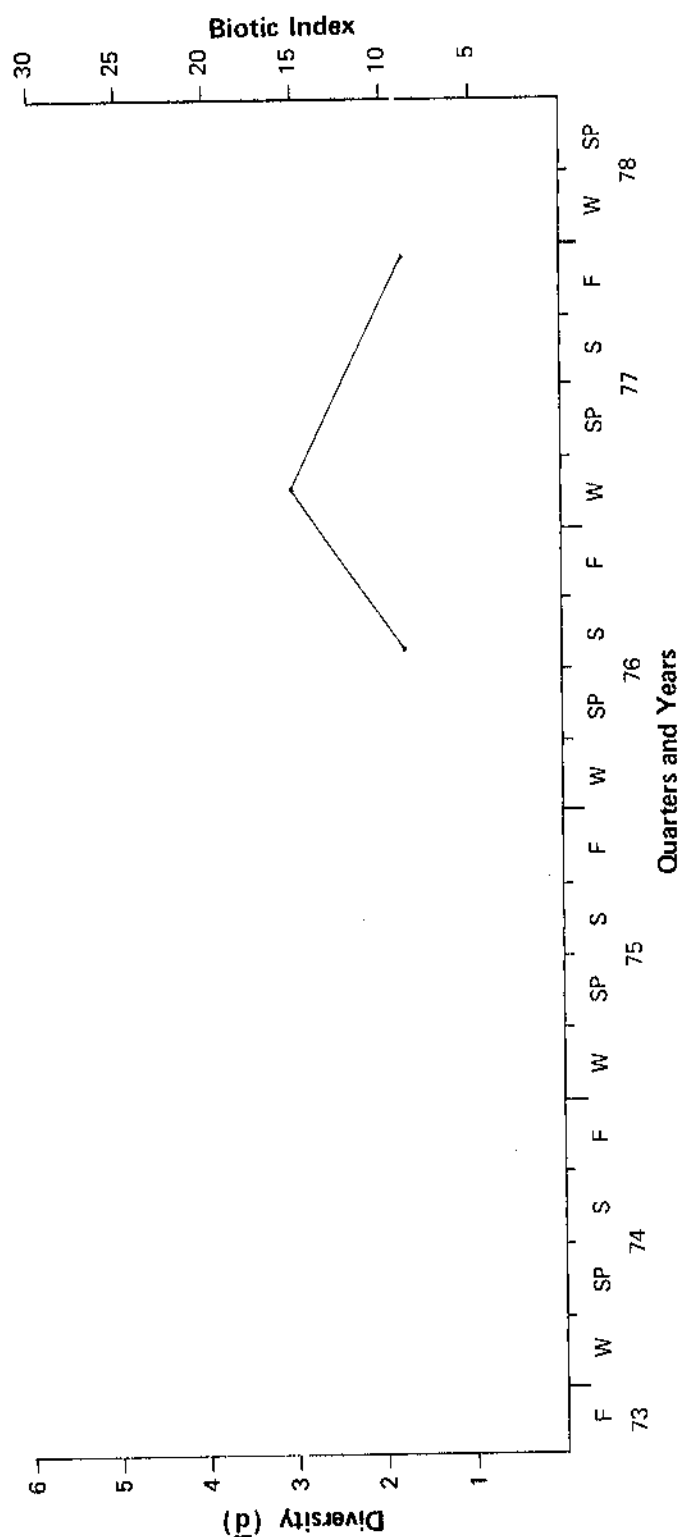
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See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.01.0479
 BODY OF WATER: BLACKWATER CREEK

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



Station No. 20.02.0001 Body of Water Oklawaha River
 Location at Moss Bluff near SR 464
 County Marion
 Type Body of Water river (channelized) Classification III
 Sources of Pollution domestic and industrial wastes, dredging activities
 Nearby Land Use agriculture
 Sampling Frequency quarterly Depth 0.16 - 5.0 m
 Bottom Type sand, detritus, silt % Volatile Solids _____
 Aquatic Plants: Submerged Utricularia sp., Eleocharis sp., filamentous algae
 Emergent Nuphar sp., Cladium sp., Eichhornia crassipes,
Pontederia sp., Salvinia rotundifolia, Typha sp., Taxodium sp., Ludwigia peruviana,
Sagittaria sp., Hydrocotyle umbellata, Alternanthera sp., Panicum sp., Lemna sp.,
 Macroinvertebrates: Juncus sp.

Platyhelminthes
 Turbellaria
 2 unident. spp.

 Annelida
 Oligochaeta
 Aulodrilus pluriset
 Dero digitata
 Pelosclex ferox
 Potamotheix vejovskyi
 cf. Tubifex sp.
 unident. lumbriculid
 unident. naidid
 unident. tubificid

 Hirudinea
 unident. erpobdellid
 unident. glossiphoniid

 Arthropoda
 Crustacea
 Isopoda
 Asellus sp.

Amphipoda

Gammarus sp.
Hyalella azteca

Decapoda

Palaemonetes paludosus
unident. astacid

Insecta

Odonata

Aphylla williamsoni
Argia sp.
Coryphaeschna ingens
C. virens
Enallagma sp.
Epicordulia princeps
E. regina
Erythemis sp.
Gomphus sp.
Ischnura sp.
Lestes vigilax
Macrothemis sp.
Miathyria marcella
Nannothemis sp.
Nehalienia sp.
Neurocordulia alabamensis
Orthemis sp.
Pachydiplax longipennis
Perithemis tenera
Telebasis byersi
Tetragoneuria sp.
T. sepia
unident. libellulid

Ephemeroptera

Baetis sp.
Caenis diminuta
Callibaetis floridanus
C. pretiosus

Hemiptera

Belostoma sp.
Mesovelis sp.
Notonecta sp.
Plea striola
Pelocoris sp.
Ranatra sp.
Gerris sp.
unident. corixid
cf. Tachygerris

Hemiptera (cont.)
unident. veliid

Trichoptera
Cyrnellus fraternis
Oecetis sp.
O. cinerascens
Orthotrichia sp.
Oxyethira sp.
Polycentropus sp.
unident. hydroptilid

Megaloptera
Chauliodes sp.

Lepidoptera
Bellura sp.

Diptera
Ablabesmyia ornata
A. parajanta
A. peleensis
A. mallochi
Atrichopogon sp.
Bezzia sp.
Chaoborus punctipennis
Chironomus atenuatus
C. carus
C. crassicaudatus
C. stigmaterus
Cladotanytarsus sp.
Clinotanytus sp.
Cricotopus remus
C. sp.
Cryptochironomus fulvus
Dicrotendipes modestus
D. neomodestus
D. nervosus
D. leucoscelis
D. lobus
Einfeldia austini
Endochironomus nigricans
Glyptotendipes paripes
G. lobiferus
Harnischia collator
H. edwardsii
H. galeator
Guttipelopia sp.
Labrundinia neopilosella

Diptera (cont.)

Lauterborniella sp.
Kiefferulus dux
Nimbocera sp.
Odontomyia sp.
Palpomyia flavipes
Parachironomus monochromus
P. schneideri
Pedionomus beckae
Polypedilum fallax
P. halterale
P. illinoense
Procladius sp.
Psectrocladius sp.
Pentaneura sp.
Rheotanytarsus sp.
Tanytarsus sp. 1 - Hulbert
T. sp. 3 - Hulbert
Paracladopelma sp.
Tanypus carinatus
T. stellatus
unident. stratiomyiid
unident. tabanid

Coleoptera

Peltodytes sp.
unident. dytiscid
unident. elmidae
unident. gyrinid
unident. haliplid
unident. helodid
unident. hydrophilid

Arachnida

Acarina

Arrenurus sp.
Hygrobates sp.
cf. Hydryphantes sp.
Limnesia (Limnesia) sp.
Neumania (Tetraneumania) sp.
Piona (Tetrapiona) sp.
Unionicola (Unionicola) sp.

Mollusca

Gastropoda

Amnicola sp.
Helisoma sp.
Laevapex sp.
Physa sp.
Pomacea sp.

20.02.0001

Gastropoda (cont.)

Pseudosuccinea sp.

Viviparus sp.

Pelecypoda

Corbicula manilensis

Eupera sp.

Musculium sp.

Sphaerium sp.

unident. unionid

Bryozoa

Pectinatella sp.

DATA SUMMARY: Oklahoma 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.							
20.02.0001 157	6 Nov 73	0.915±0.337	0.894±0.106	11	2.864±0.237	0.187±0.40	17	5	25			1042		
	11 Dec 73											100	60	
	15 Jan 74											170	100	
	5 Feb 74											220	190	
	26 Feb 74	1.285±0.024	0.439±0.006	11				5	30				141	
	5 Mar 74											40	30	
	2 Apr 74											190	20	
	30 Apr 74											300	30	
	6 Aug 74											1500		
	3 Sep 74											660	90	
	18 Sep 74	0.896±0.280	0.470±0.019	3	1.479±0.275	0.533±0.109	7	2	14	Coc BG 6839 F11 BG 3725				

See Methods for explanation of table.

DATA SUMMARY: Oklawaha 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.							
20.02.0001 158	18 Sep 74 (Cont.)									Coc Gr 6394 Fil Gr 0 Gr Flag 56 Other Flag 0 Gen Dia 0 Pen Dia 1668 Total 18682				
	1 Oct 74											350	70	
	5 Nov 74											GT8000	700	
	12 Dec 74	0.473±0.036	0.872±0.016	8				5	27	Coc BG 56 Fil BG 278 Coc Gr 500 Fil Gr 0 Gr Flag 0 Other Flag 0 Gen Dia 0 Pen Dia 0 Total 834				

See Methods for explanation of table.

DATA SUMMARY: Oklawaha River

[illegible]

See Methods for explanation of table.

DATA SUMMARY: Oklawaha 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.						
20.02.0001 160	5 Aug 75										210	0	
	19 Aug 75	0.053±0.013	0.977±0.007	2	1.607±0.083	0.392±0.022	14	5	29		1400	GT600	
	2 Sep 75										1130	100	
	30 Sep 75												
	21 Oct 75	2.053±0.099	0.223±0.024	8									
	4 Nov 75										310	0	
	2 Dec 75										120	0	
	5 Feb 76	1.321±0.333	0.750±0.110	13	2.831±0.154	0.190±0.023	22	5	22	Coc BG 697 Fil BG 306 Coc Cr 1417 Fil Cr 0 Gr Flag 83 Other Flag 0 Can Dia 83 Pen Dia 138 Total 2738			

See Methods for explanation of table.

DATA SUMMARY: Oklawaha 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.						
20.02.0001	2 Mar 76										60	10	
	6 Apr 76											10	
	15 Apr 76	0.940±0.284	0.490±0.200	3									
	1 Jul 76	0.693±0.318	0.796±0.160	4				6	35		700	40	
	7 Sep 76												
	16 Nov 76	1.186±0.251	0.652±0.096	8	2.690±0.189	0.184±0.030	17						
	1 Feb 77										270	36	

See Methods for explanation of table.

DATA SUMMARY: Oklahoma 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.					
20.02.0001 162	10 Feb 77	2.625±0.214	0.194±0.039	14				12	37					
	1 Mar 77													
	3 May 77													
	9 May 77	0.948±0.356	0.762±0.152	6	3.326±0.221	0.137±0.029	22			GT8000	GT6000			
	7 Jun 77													
	5 Jul 77													
	21 Jul 77	0.575±0.291	0.767±0.190	3	3.664±0.166	0.079±0.014	24			205	28			
	2 Aug 77													
	2 Nov 77	1.527±0.267	0.468±0.100	8				2	38					
	3 Jan 78													
	31 Jan 78	2.142±0.158	0.231±0.031	11						300	36			

See Methods for explanation of table.

DATA SUMMARY: Oklawaha River

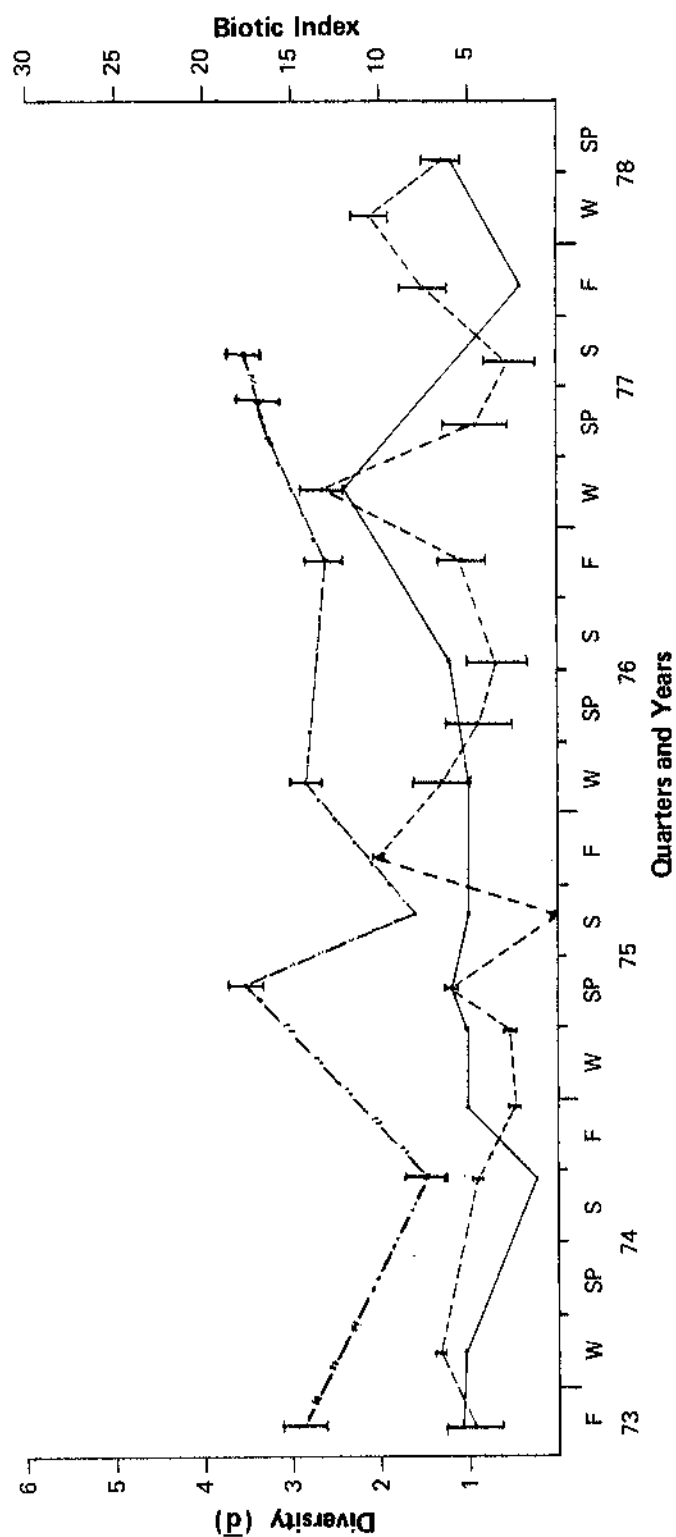
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate						Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
20.02.0001 163	6 Feb 78										980	77		
	6 Mar 78										180	37		
	3 Apr 78										80	13		
	11 Apr 78	1.358±0.151	0.402±0.032	8				6	41				10	
	5 Jun 78													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0001
 BODY OF WATER: OKLAWAHA RIVER

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



Station No. 20.02.0012 Body of Water Oklawaha River

Location at Fla. Hwy. #316 near Eureka

County Marion

Type Body of Water river Classification III

Sources of Pollution domestic waste, channelization

Nearby Land Use recreational, natural

Sampling Frequency quarterly Depth .15 - 5.66 m

Bottom Type sand, shell, silt, detritus % Volatile Solids

Aquatic Plants: Submerged Filamentous algae, Vallisneria sp., Egeria sp.,

Hydrilla sp.

Ludwigia repens, Najas sp., Emergent Nuphar lutea, Typha sp., Eichhornia crassipes,

Alternanthera alterniflora, Crinum americanum, Hydrocotyle sp.

Macroinvertebrates:

Porifera

unident. sp.

Platyhelminthes

Turbellaria

2 unident. spp.

Nematoda

unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

cf. Tubifex sp.

unident. enchytraeid

unident. lumbriculid

unident. naidid

unident. tubificid

Hirudinea

Helobdella sp.

unident. sp.

20.02.0012

Arthropoda

Crustacea

Isopoda

Cyathura polita

Amphipoda

Gammarus cf. fasciatus

G. tigrinus

Hyalella azteca

Decapoda

Palaeomonetes paludosus

unident. astacid

Insecta

Odonata

Aphylla williamsoni

Agrion sp.

Argia sedula

Boyeria vinosa

Dromogomphus sp.

Enallagma sp.

Epicordulia princeps

Gomphus sp.

Hetaerina titia

Macromia sp.

M. illinoense

Nehalennia sp.

Neurocordulia obsoleta

N. virginensis

Perithemis tenera

Ephemeroptera

Baetis australis

B. spinosus

B. intercalaris

Brachycercus sp.

Caenis sp.

Callibaetis floridanus

Ephemerella trilineata

Stenonema integrum

S. exiguum

Stenacron interpunctatum

Tricorythodes albilineatus

unident. heptageniid

Hemiptera

Gerris sp.
Metrobates sp.
Rhagovelia sp.
Trepobates sp.
unident. corixid
unident. belostomatid
unident. mesoveliid

Trichoptera

Cheumatopsyche sp.
Cyrnellus sp.
Hydropsyche cf. incommoda
Hydroptila sp.
Lype sp.
Macronemum carolina
Nectopsyche sp.
N. sp. A (Ross)
N. pavida
Neureclipsis sp.
Neotrichia sp.
Ochrotrichia sp.
Oecetis cinerascens
Polycentropus sp.
Triaenodes sp.

Megaloptera

Corydalus cornutus

Lepidoptera

unident. pyralid

Diptera

Ablabesmyia aspera
A. tarella
A. parajanta
A. ornata
Bezzia sp.
Chaoborus punctipennis
Chironomus attenuatus
Cladotanytarsus sp.
Clinotanypus sp.
Coelotanypus sp.
C. concinnus
C. scapularis
Corynoneura sp.
Cricotopus sp.
C. bicinctus
C. remus

Diptera (cont.)

Cryptochironomus fulvus
C. blarina
Cryptotendipes casuarius
Dicrotendipes lobus
D. modestus
Harnischia sp.
Hemerodromia sp.
Labrundinia virescens
L. neopilosella
Nilothauma bicornis
Nilotanypus americanus
Palpomyia sp.
Paracladopelma sp.
Parachironomus demeijerea
Paralauterborniella nigrohalteralis
Paratendipes connectens
Pentaneura inculta
Phaenopsectra sp.
Polypedilum fallax
P. halterale
P. illinoense
P. scalaenum
Psectrocladius sp.
Rheotanytarsus exiguus
R. sp.
Rheocricotopus robacki
Roederodes juncta
Stenochironomus sp.
Simulium sp.
Tanypus stellatus
Tanytarsus sp. 1 - Hulbert
T. sp. 3 - Hulbert
T. sp. 1.1 - Hulbert
Thienemanniella sp.
T. xena
T. fuscicornis
Xenochironomus sp.
 unident. chironomid
 unident. dolichopodid
 unident. empidid
 cf. Ectemnia

Coleoptera

Ancyronyx variegatus
Dineutus sp.
Hydrocanthus sp.
Macronychus glabratus

Coleoptera (cont.)

Narpus sp.
Neoelmis sp.
Steneimnis sp.
unident. dytiscid
unident. haliplid

Arachnida

Acarina

Albia sp.
Atractides (s.s.) sp.
Clathrosperchon sp.
Hydrodroma sp.
Lebertia (s.s.) sp.
Megapus sp.
Sperchon (Hispidosperchon) sp.
Torrenticola sp.

Mollusca

Gastropoda

Amnicola sp.
Goniobasis sp.
Helisoma sp.
Laevapex sp.
Lyogyrus sp.
Notogillia sp.
Physa sp.
Pomacea sp.
Promenetus sp.
Viviparus sp.

Pelecypoda

Corbicula manilensis
unident. sphaeriid

DATA SUMMARY: Oklawaha 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.					
20.02.0012 170	30 Oct 73											280	0	
	6 Nov 73	2.250±0.367	0.298±0.079	10	3.677±0.158	0.143±0.018	43	15	19			274	59	
	11 Dec 73											550	150	
	15 Jan 74											120	10	
	5 Feb 74											20	10	
	26 Feb 74	3.544±0.056	0.101±0.111	19	4.143±0.050	0.064±0.004	41	17	38					
	5 Mar 74											20	0	
	2 Apr 74											150	10	
	30 Apr 74											40	0	
	6 Aug 74											1000	0	
	22 Aug 74	0.868±0.091	0.524±0.063	3	2.978±0.295	0.197±0.067	15	19	33	Coc BG F11 BG	473 56			

See Methods for explanation of table.

DATA SUMMARY: Oklahoma 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.					
												Total	Fecal	
20.02.0012	22 Aug 74 (Cont.)								Coc Gr 306 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 0 Pen Dia 83 Total 918					
	3 Sep 74										680	0		
	1 Oct 74										240	0		
	5 Nov 74										120	0		
	2 Dec 74													
	12 Dec 74	2.012±0.051	0.266±0.016	9				20	33	Coc BG 0 Fil BG 0 Coc Gr 0 Fil Gr 0 Gr Flag 0 Other Flag 0			670	

DATA SUMMARY: Oklawaha 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.						
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.						
20.02.0012 172	12 Dec 74 (Cont.)									Cen Dia 28 Pen Dia 139 Total 167					
	7 Jan 75												70	10	
	4 Mar 75												70	20	
	11 Mar 75	1.320±0.044	0.565±0.016	9				15	22	Loc BG 0 Fil BG 0 Loc Gr 0 Fil Gr 0 Dr Flag 0 Other Flag 0 Pen Dia 139 Total 139					
	1 Apr 75														
	14 May 75	2.494±0.076	0.128±0.022	8	2.835±0.205	0.243±0.038	23	6	18				340	50	

See Methods for explanation of table.

DATA SUMMARY: Oklahoma 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	#Sep.	Diversity	Redundancy	#Spp.	BI	#Spp.					
20.02.0012	3 Jun 75											230	10	
	1 Jul 75											450	10	
	5 Aug 75											1270	10	
	19 Aug 75	1.865+0.042	0.244+0.013	7	2.608+0.113	0.351+0.027	24	13	24			1800	0	
	2 Sep 75											3100	70	
	30 Sep 75													
	21 Oct 75													
										Coc BG 1056 Fl BG 946 Coc Gr 1224 Fl Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 111 Pen Dia 390 Total 3727				

See Methods for explanation of table.

DATA SUMMARY: Oklawaha 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.							
20.02.0012 174	4 Nov 75										840	440		
	2 Dec 75										280	0		
	4 Feb 76	2.853±0.225	0.143±0.037	13	3.203±0.170	0.154±0.028	24	16	27	Coc BG 3 Fil BG 0 Coc Gr 9 Fil Gr 0 Gr Flag 0 Other Flag 3 Cen Dia 17 Pen Dia 123 Total 155	Coc BG 3 Fil BG 3500 Coc Gr 13000 Fil Gr 7600 Gr Flag 1400 Other Flag 4800 Cen Dia 7500 Pen Dia 184600 Total 222400			
	2 Mar 76													
	6 Apr 76													
	11 May 76	2.980±0.240	0.274±0.050	26				24	37			90	30	0

See Methods for explanation of table.

DATA SUMMARY: Oklawaha 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.					
20.02.0012 175	6 Jul 76											710	60	
	3 Aug 76							23	38					
	7 Sep 76											5500	172	
	3 Nov 76				3.592±0.138	0.111±0.105	32	16	34	Coc BG 9 Fll BG 11 Coc Gr 17 Fll Gr 0 Gr Flag 9 Other Flag 3 Cen Dia 11 Pen Dia 77 Total 137				
	1 Feb 77											168	64	
	1 Mar 77													
	9 Mar 77	2.135±0.157	0.436±0.043	27				22	33	Coc BG 319 Fll BG 100		80	60	

See Methods for explanation of table.

DATA SUMMARY: Oklawaha 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.						
20.02.0012	9 Mar 77 (cont.)								Coc Gr 1353 Fil Gr 0 Gr Flag 80 Other Flag 0 Cen Dia 40 Pen Dia 199 Total 2091				
	28 Apr 77				3.515±0.165	0.116±0.021	26	22	33		125	52	
	3 May 77											20	
	7 Jun 77												
	5 Jul 77				2.894±0.183	0.231±0.028	29			Coc BG 100 Fil BG 1400 Coc Gr 700 Fil Gr 2000 Gr Flag 0 Other Flag 0	145	21	
	20 Jul 77												

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See Methods for explanation of table.

DATA SUMMARY: Oklahoma River

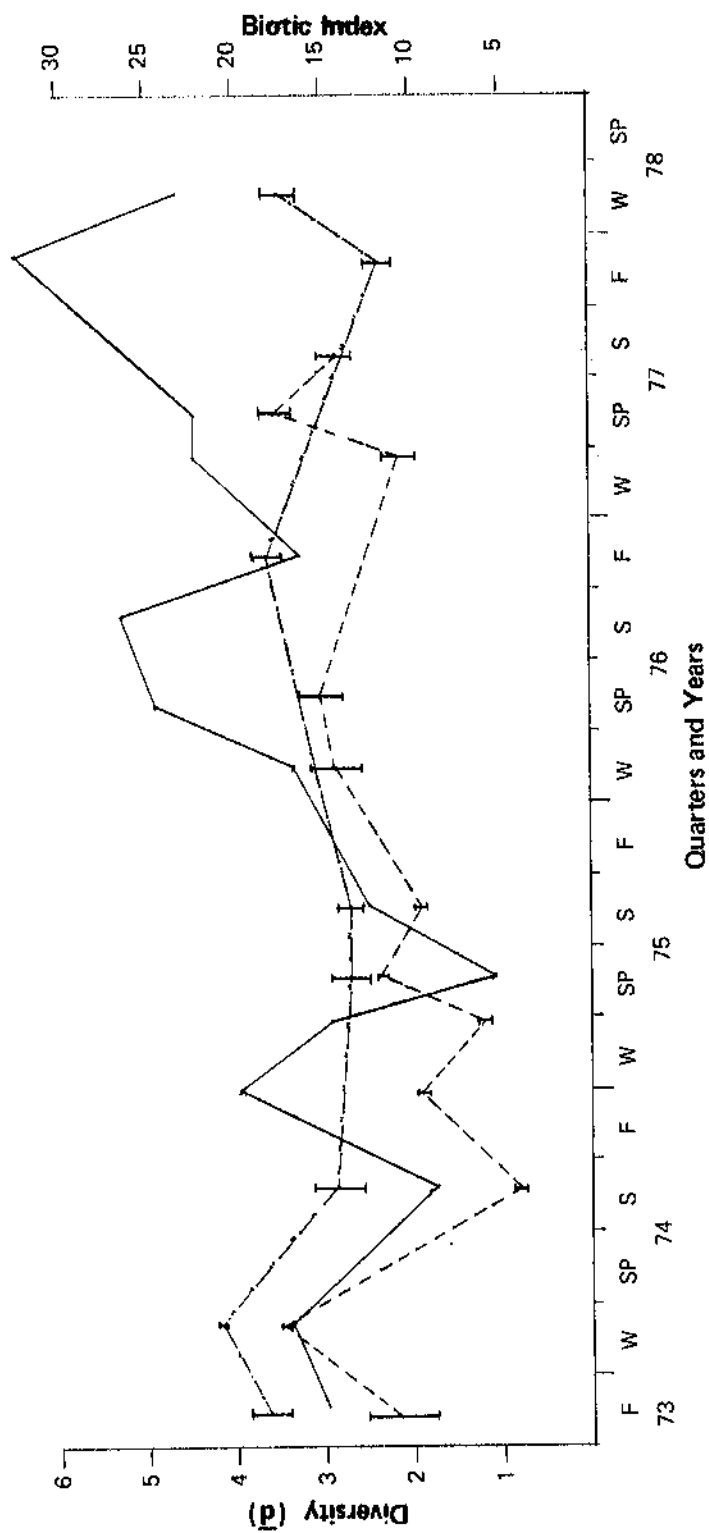
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
20.02.0012	20 Jul 77 (Cont.)								Cen Dia 3400 Pen Dia 61500 Total 69100				
	2 Aug 77										200	15	
	15 Nov 77												
	3 Jan 78											46	
	6 Feb 78										380	32	
	21 Feb 78												
	6 Mar 78										220	92	
	5 Jun 78											66	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0012
 BODY OF WATER: OKLAWAHA RIVER

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



Station No. 20.02.0047 Body of Water Lake Minneola
Location center
County Lake
Type Body of Water lake Classification _____
Sources of Pollution urban runoff
Nearby Land Use residential and recreation
Sampling Frequency annually Depth 5.0 - 5.5 meters
Bottom Type coarse sand, mud, shell % Volatile Solids _____
Aquatic Plants: Submerged Najas sp.
Emergent Scirpus sp.

Macroinvertebrates:

Porifera

unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
cf. Tubifex sp.
unident. lumbriculid
unident. tubificid

Arthropoda

Crustacea

Decapoda

Palaemonetes paludosus

Insecta

Odonata

Celithemis fasciata

Ephemeroptera

Caenis sp.
Hexagenia munda

Trichoptera

Cheumatopsyche sp.
Oxyethira sp.
Polycentropus flavus

Diptera

Ablabesmyia parajanta
Anatopynia sp.
Cladotanytarsus sp.
Coelotanypus tricolor
Dicrotendipes lobus
Glyptotendipes paripes
Labrundinia neopilosella
Pagastieella orophila
Paralauterborniella nigrohalteralis
Polypedilum halterale
Pseudochironomus fulviventrus
Tanytarsus sp.

Mollusca

Gastropoda

Helisoma sp.
Viviparus sp.

Pelecypoda

unident. unionid

DATA SUMMARY: Lake Minneola

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.					
20.02.0047	20 Feb 74											10	0	
	13 Aug 74											0	0	
	20 Apr 76	3.093±0.294	0.144±0.051	14								4	0	
	16 Feb 77	3.179±0.228	0.100±0.033	14										
	29 Nov 77	2.963±0.210	0.171±0.040	17										

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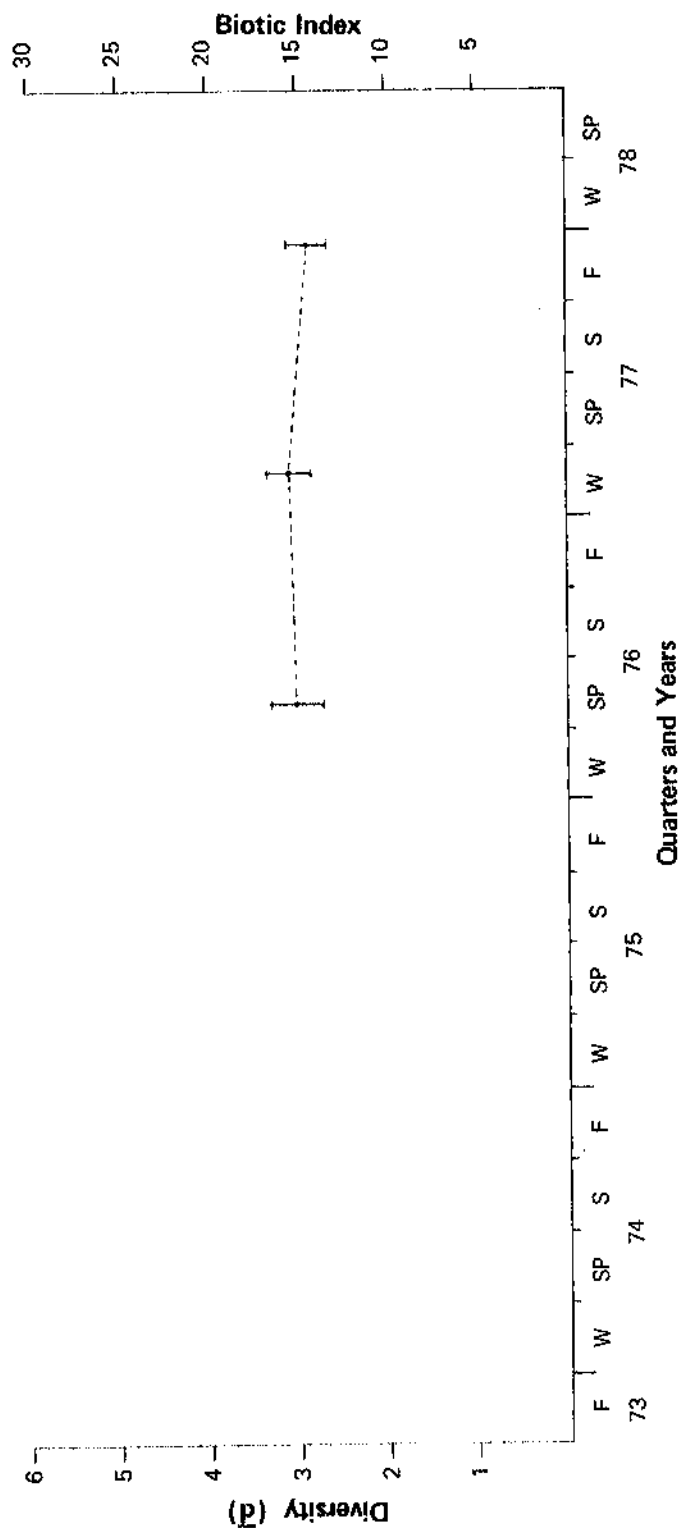
See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0047

BODY OF WATER: LAKE MINNEOLA

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



Station No. 20.02.0071 Body of Water Oklawaha River
 Location Rodman Dam, downstream of dam, midstream
 County Putnam
 Type Body of Water river (channelized) Classification III
 Sources of Pollution herbicides in reservoir above dam
 Nearby Land Use natural
 Sampling Frequency quarterly Depth 0.3 - 3.2 m
 Bottom Type sand, some detritus, shell & Volatile Solids _____
 Aquatic Plants: Submerged Ceratophyllum sp., Ludwigia repens, Hydrilla sp.
 Emergent Nuphar luteum, Pontederia sp., Salix sp.,
Cephalanthus sp., Taxodium sp., Polygonium sp., Crinum americanum, Hydrocotyle
 Macroinvertebrates: sp., Peltandra sp., Pistia sp.

Porifera
 unident. sp.
 Cnidaria
 Hydrozoa
 Cordylophora sp.
 Hydra sp.
 Platyhelminthes
 Turbellaria
 unident. sp.
 Annelida
 Oligochaeta
 Limnodrilus hoffmeisteri
 Tubifex tubifex
 unident. lumbriculid
 unident. tubificid
 unident. sp.
 Nais bretscheri
 Hirudinea
 2 unident. spp.

Arthropoda

Crustacea

Isopoda

Cyathura polita
Sphaeroma sp.

Amphipoda

Gammarus sp.
Hyalella azteca

Decapoda

Palaemonetes paludosus
Taphromysis sp.
unident. astacid

Insecta

Collembola

unident. sp.

Odonata

Aphylla williamsoni
Argia tibialis
A. sedula
Boyeria vinosa
Enallagma sp.
Epicordulia princeps
Gomphus sp.
Hetaerina titia
Ischnura sp.
Macromia sp.
Nehalennia sp.
unident. libellulid

Ephemeroptera

Baetis australis
B. spinosus
B. sp.
Caenis diminuta
Callibaetis floridanus
Pseudocloeon sp.
Stenonema integrum
S. smithae
Stenacron interpunctatum
Tricorythodes albilineatus
unident. heptageniid

Hemiptera

Gerris sp.
Metrobates sp.
Mesovelis sp.
Pelocoris sp.
Rhagovelis sp.
Rheumatobates sp.

Hemiptera (cont.)

Trepobates sp.

Trichoptera

Cheumatopsyche sp.

Cyrmellus sp.

Hydropsyche cf. incommoda

Hydroptila sp.

Leptocerus americanus

Macronemum carolina

Nectopsyche pavida

N. sp.

Neureclipsis sp.

Oecetis inconspicua

O. cf. americanus

O. cinerascens

O. sp. 1 - Pluchino

Polycentropus sp.

Oxyethira sp.

Trianodes sp.

Megaloptera

Corydalus cornutus

Lepidoptera

Nymphula sp.

Diptera

Ablabesmyia mallochi

A. parajanta

Alluaudomyia sp.

Bezzia setulosa

Chaoborus punctipennis

Chironomus attenuatus

Cladotanytarsus sp.

Clinotanytus sp.

Coelotanytus concinus

C. scapularis

Cricotopus sp.

C. bicinctus

C. remus

C. fulvus

Dicrotendipes sp.

D. modestus

D. neomodestus

D. lobus

Glyptotendipes paripes

Eukiefferiella sp.

Harnischia sp.

Labrundinia neopilosella

Microtendipes sp.

Heterotrissocladius sp.

Corynoneura sp.

Diptera (cont.)

Nilodorum sp.
Parachironomus directus
P. hirtalatus
P. schneideri
Paracladopelma loganae
Palpomyia sp.
Paralauterborniella nigrohalteralis
Paratanytarsus sp.
Paratendipes sp.
Pentaneura inculta
Polypodilum halterale
P. fallax
P. illinoense
P. convictum
P. scalaenum
Procladius sp.
Pseudochironomus sp.
Psectrocladius simulans
Rheotanytarsus exiguus
Tanytarsus sp. 1 - Hulbert
T. sp. 1.1 - Hulbert
T. sp. 4 - Hulbert
Thienemanniella xena
T. sp.
Tribelos fuscicornis
 unident. ceratopogonid
 unident. empidid
 unident. orthocladian
 unident. simuliid
 unident. tipulid

Coleoptera

Ancyronyx variegatus
Dineutus sp.
Dubiraphi^a sp.
Stenelmis sp.
 unident. dytiscid

Mollusca

Gastropoda

Helisoma sp.
Ferrissia dalli
Physa sp.
Pomacea sp.
Pseudosuccinea sp.

20.02.0071

Pelecypoda

Corbicula manilensis

Eupera sp.

unident. sphaeriid

DATA SUMMARY: Oklawaha 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.				
20.02.0071 188	29 Nov 73	1.137+0.253	0.528+0.104	6			34	39			49		
	19 Dec 73										17		
	23 Jan 74												
	27 Feb 74	1.523+0.060	0.455+0.021	8	2.230+0.024	0.184+0.005	19	24			33		
	4 Mar 74										330		
	8 Apr 74										79		
	6 May 74										5		
	3 Jun 74												
	27 Jun 74	1.091+0.036	0.475+0.017	5				19	22			49	
1 Jul 74													
22 Aug 74													
					</								

See Methods for explanation of table.

DATA SUMMARY: Oklawaha 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.		
20.02.0071 189	22 Aug 74 (cont.)									Coc Gr 111 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 28 Pen Dia 56 Total 306				
	27 Aug 74											17000		
	24 Sep 74	0.000		1	2.513±0.033	0.186±0.005		18				330		
	23 Oct 74											280		
	13 Nov 74											230		
	3 Dec 74												79	
	5 Dec 74	1.058±0.175	0.266±0.009	3				16	26	Coc BG 0 Fil BG 0 Coc Gr 8 Fil Gr 0				

See Methods for explanation of table.

DATA SUMMARY: Oklawaha 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.						
20-02.0071	5 Dec 74 (cont.)								Gr Flag 0 Other Flag 0 Cen Dia 28 Pen Dia 153 Total 189				
	18 Feb 75	1.331±0.318	0.393±0.013	6				6	20	Coc BG 0 Fil BG 0 Coc Gr 28 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 195 Pen Dia 28 Total 251			
	19 May 75	2.092±0.030	0.215±0.007	9	2.241±0.095	0.270±0.022	17	20	29				
	13 Aug 75	0.790±0.042	0.614±0.024	4				13	26				
	14 Oct 75	1.021±0.055	0.618±0.024	6									

See Methods for explanation of table.

DATA SUMMARY: Oklawaha 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.					
20.02.0071	4 Nov 75											230	10	
	2 Dec 75											30	0	
	4 Feb 76	2.573±0.192	0.208±0.036	15	2.900±0.170	0.186±0.024	23	13	19	Coc BG 0 Fil BG 0 Coc Gr 29 Fil Gr 3 Gr Flag 0 Other Flag 45 Cen Dia 29 Pen Dia 58 Total 164	Coc BG 0 Fil BG 0 Coc Gr 29 Fil Gr 3 Gr Flag 0 Other Flag 45 Cen Dia 29 Pen Dia 58 Total 164			
	2 Mar 76													
	6 Apr 76													
												20	0	
													0	

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See Methods for explanation of table.

DATA SUMMARY: Oklawaha 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.						
20.02.0071	13 May 76	1.250±0.217	0.423±0.060	6				10	20				
	6 Jul 76												
	5 Aug 76	0.418±0.361	0.715±0.102	4				16	34				
	2 Nov 76	1.240±0.301	0.715±0.102	11	1.924±0.107	0.308±0.025	15	12	25				
	1 Feb 77											8	0
	1 Mar 77											20	0
	8 Mar 77	1.038±0.327	0.792±0.114	9				16	31				

See Methods for explanation of table.

DATA SUMMARY: Oklahoma 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.						
20.02.0071	27 Apr 77	1.795±0.388	0.465±0.124	8	1.635±0.054	0.367±0.013	18			Coc BG 3100 F11 BG 20000 Coc Cr 14700 F11 Gr 15500 Cr Flag 1500 Other Flag 15400 Zen Dia 122400 Pen Dia 246400 Total 439000	260	4	
	3 May 77											70	
	7 Jun 77											13	
	5 Jul 77											115	1
	2 Aug 77												

DATA SUMMARY: Oklawaha 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.							
20.02.0071	24 Aug 77	2.955±0.157	0.138±0.021	17	2.249±0.118	0.338±0.039	22			Coc BG 100 Fil BG 4100 Coc Gr 1200 Fil Gr 1000 Gr Flag 200 Other Flag 1300 Pen Dia 2900 Pen Dia 23500 Total 34300				
	6 Sep 77										65	3		
	19 Oct 77	3.060±0.274	0.184±0.041	19				15	33				0	
	3 Jan 78													
	9 Jan 78												9	
	31 Jan 78	2.070±0.296	0.460±0.071	19	3.359±0.158	0.138±0.158		28				330		

See Methods for explanation of table.

DATA SUMMARY: Oklawaha River

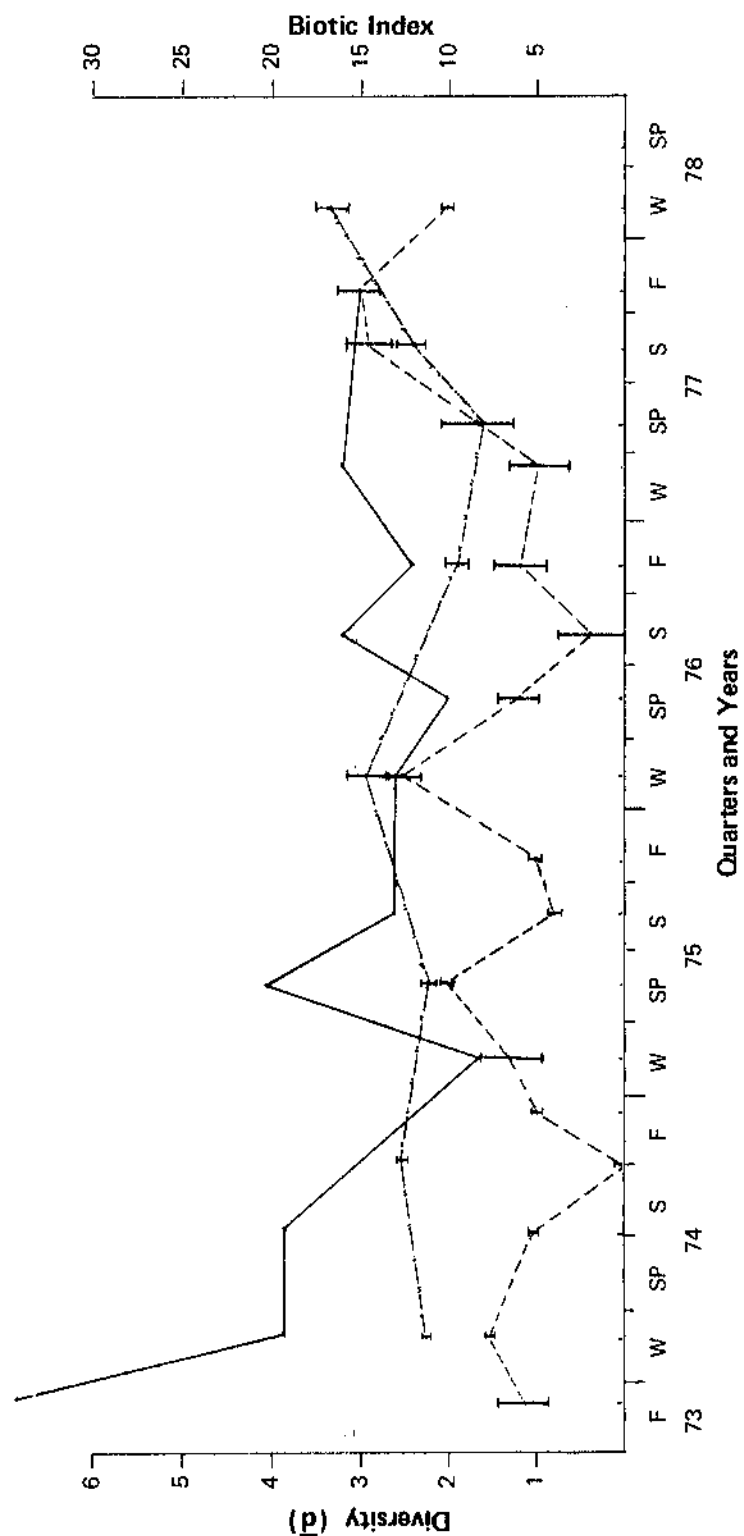
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		Total	Fecal							
		Diversity	Redundancy	#Spp.	Diversity			Redundancy	#Spp.					
		#Spp.	Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
20.02.0071 195	6 Feb 78											110	7	
	13 Feb 78											23	LT2	
	6 Mar 78											16	15	
	3 Apr 78											10	0	
	11 Apr 78	1.235±0.357	0.579±0.152	6				21	36			40	LT2	
	24 Apr 78											6	LT2	
	24 May 78												0	
	5 Jun 78											8	LT2	
	14 Jun 78													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0071
 BODY OF WATER: OKLAWAHA RIVER

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



Station No. 20.02.0079 Body of Water Newnan's Lake

Location center of southern lobe

County Alachua

Type Body of Water lake Classification

Sources of Pollution septic tank leachate, agricultural runoff

Nearby Land Use few residences and fish camps, (Uoff) Ag. Res. Center

Sampling Frequency annual Depth 1.8 - 2.0 meters

Bottom Type detritus, muck & very fine silt Volatile Solids

Aquatic Plants: Submerged

Emergent Taxodium distichum, Lemna sp., Salvinia sp.

Eichhornia crassipes, Pontederia sp., Panicum hemitomon

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

Arthropoda

Insecta

Diptera

Chaoborus sp.

Coelotanypus tricolor

Palpomyia-Bezzia complex sp. 1 - Kelly

Procladius sp.

DATA SUMMARY: Newnan's 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.					
20.02.0079	27 Oct 75	1.735±0.201	0.205±0.064	5								2	2	
	28 Sep 76	1.025±0.220	0.382±0.179	3								79	17	
	28 Mar 77													
	20 Oct 77	0.401±0.336	0.933±0.189	3										

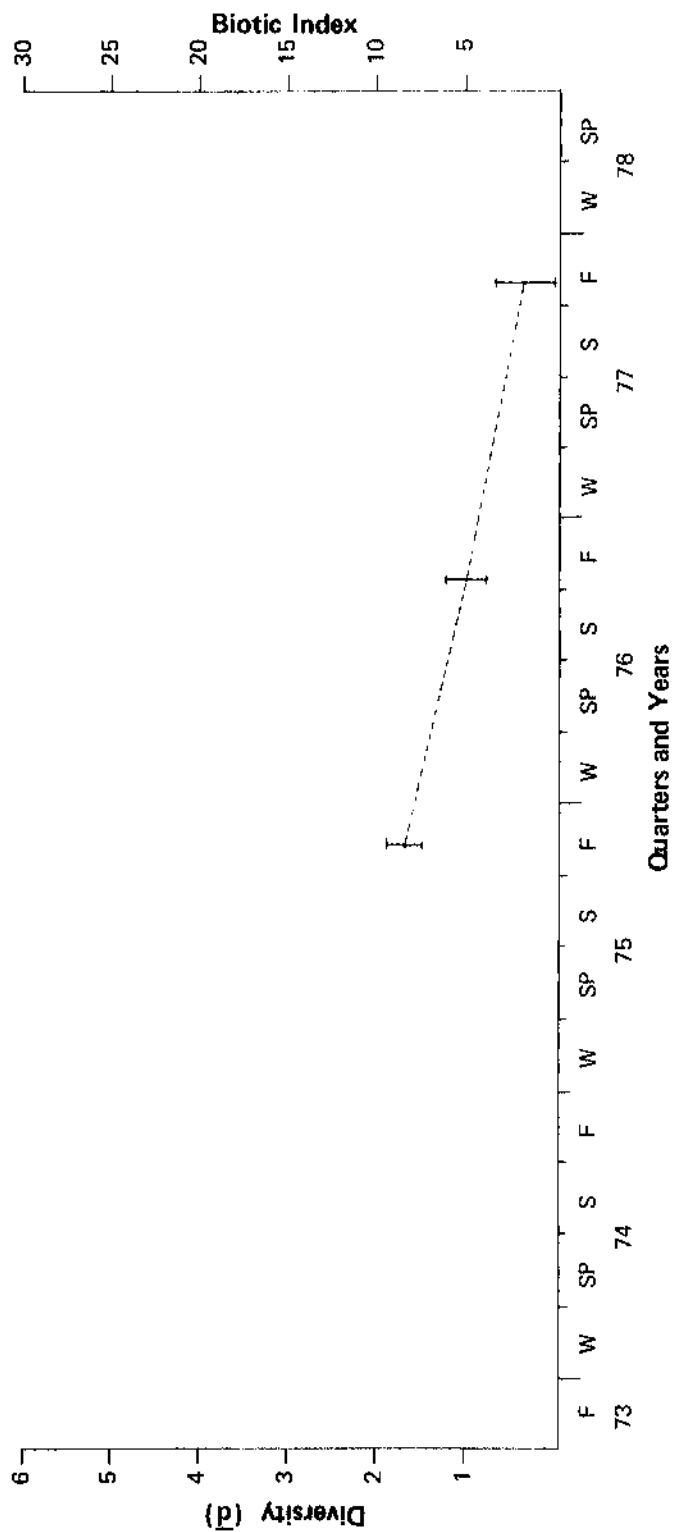
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See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0079
 BODY OF WATER: NEWNAN'S LAKE

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



Station No. 20.02.0080 Body of Water Lake Lochloosa

Location near eastern shore

County Alachua

Type Body of Water lake Classification

Sources of Pollution septic tank leachate

Nearby Land Use few residences and fish camps

Sampling Frequency annual Depth 1.6 - 2.0 meters

Bottom Type coarse sand, muck, detritus % Volatile Solids

Aquatic Plants: Submerged Hydrilla sp., Najas sp.

Emergent Panicum hemitomon, Taxodium distichum,

Eichhornia crassipes, Salvinia sp., Pistia stratiotes sp., Nuphar sp.

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

Nais sp.

Hirudinea

Helobdella elongata

Arthropoda

Insecta

Diptera

Chaoborus sp.

Chironomus attenuatus

Cladotanytarsus sp.

Coelotanypus concinnus

C. scapularis

C. tricolor

Cryptotendipes sp.

Eukiefferiella sp.

Glyptotendipes sp.

Harnischia sp.

Nimbocera patagonica

Palpomyia-Bezzia complex sp. 1 - Kelly

Procladius sp.

Psectrocladius sp.

Tanytarsus sp.

Arachnida

Krendowskia similis

Midiopsis sp.

Piona sp.

Unionicola sp.

20.02.0080

Lake Lochloosa

Mollusca

Gastropoda

unident. hydrobiid

Pelecypoda

Elliptio sp.

DATA SUMMARY: Lake Lochloosa

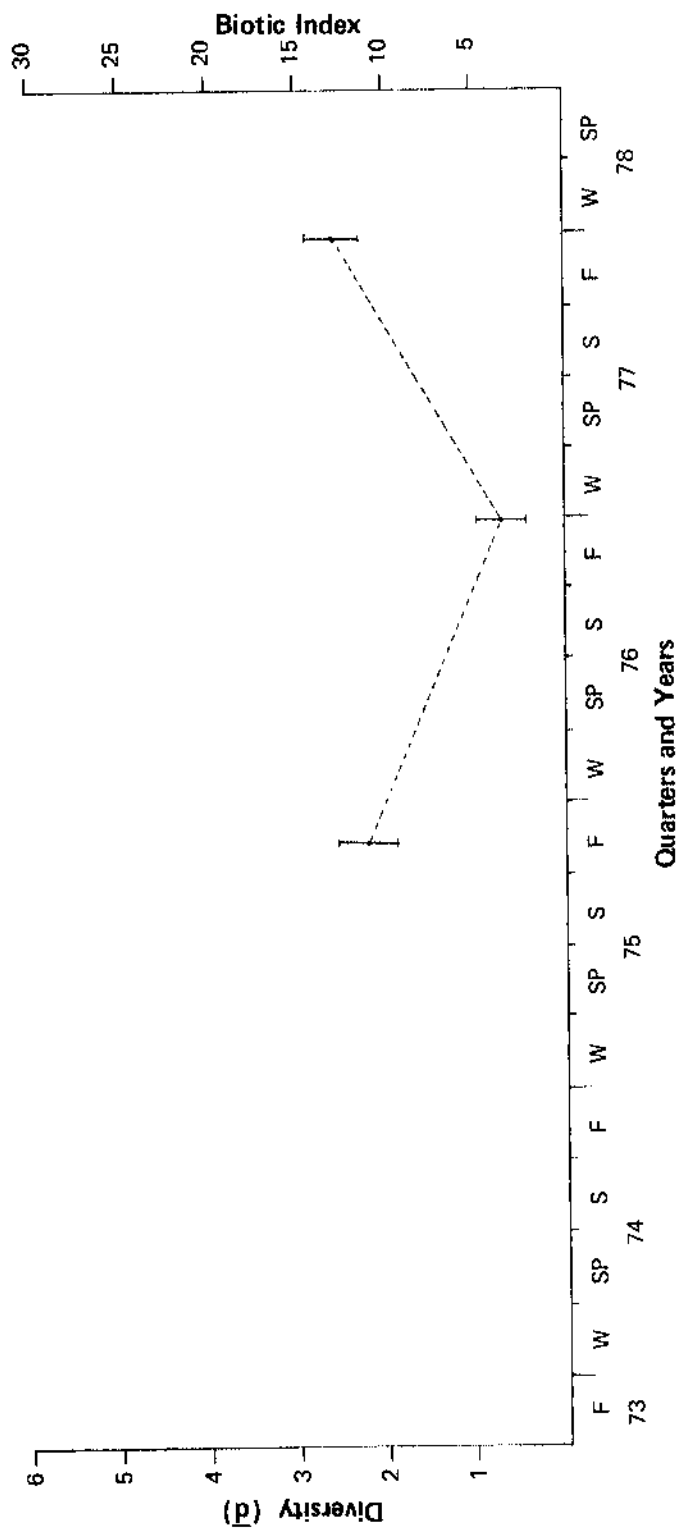
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Pecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
20.02.0080	27 Oct 75	2.256±0.359	0.473±0.108	16						220	13	
	6 Dec 76	0.770±0.280	0.892±0.089	10								
	28 Mar 77											
	6 Dec 77	2.634±0.288	0.199±0.055	12						13	4.5	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0080
 BODY OF WATER: LAKE LOCHLOOSA

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



Station No. 20.02.0317 Body of Water Silver Run
 Location upstream of confluence with Oklawaha River
 County Marion
 Type Body of Water river Classification _____
 Sources of Pollution runoff (Silver Springs attraction and wayside
park off SR 40)
 Nearby Land Use pasture
 Sampling Frequency quarterly Depth 2.7 - 6.4 meters
 Bottom Type sand, shell, detritus % Volatile Solids _____
 Aquatic Plants: Submerged Ceratophyllum sp., Najas sp., Vallisneria sp.
Sagittaria sp. Emergent Hydrocotyle sp., Alternanthera sp., Peltandra sp.
Pontederia sp., Cephalanthus sp., Pistia sp., Lemna sp., Eichhornia sp., Sagittaria sp.

Macroinvertebrates:

Platyhelminthes
 Turbellaria
 unident. sp.
 Annelida
 Oligochaeta
 Limnodrilus angustipenis
 L. hoffmeisteri
 L. profundicola
 cf. Tubifex sp.
 unident. lumbriculid
 Hirudinea
 cf. Erpobdella sp.
 unident. sp.
 Arthropoda
 Crustacea
 Isopoda
 Asellus sp.
 Cyathura polita

Amphipoda

Gammarus sp.
Hyaella azteca

Decapoda

Palaemonetes paludosus

Insecta

Odonata

Argia sedula
Enallagma sp.
Gomphus sp.
Hetaerina titia
Nehalennia sp.

Ephemeroptera

Baetis intercalaris
B. spinosus
Caenis sp.
Callibaetis floridanus
Centroptilum hobbsi
Stenonema exiguum
S. integrum
S. sp.
Tricorythodes albilineatus

Hemiptera

Mesovelgia sp.
Metrobates sp.
Pelocoris sp.
Plea striola
Rheumatobates sp.
Trepobates sp.
unident. belostomatid

Trichoptera

Cheumatopsyche sp.
Cyrneilus sp.
Hydropsyche sp.
Hydroptila sp.
Nectopsyche sp. A (Ross)
N. pavida
Neureclipsis sp.
Oecetis sp.
Oxyethira sp.
Polycentropus sp.

Lepidoptera

cf. Elophila sp.

Diptera

Ablabesmyia mallochi
A. tarella
Bezzia sp.
Chironomus crassicaudatus
Cladotanytarsus sp.
Clinotanypus sp.
Cricotopus bicinctus
C. sp.
C. remus
Cryptochironomus blarina
Dicrotendipes leucoscelis
D. neomodestus
Glyptotendipes sp.
Harnischia sp.
Nilotanypus sp.
Palpomyia sp.
Parachironomus monochromus
Paracladopelma sp.
Paralauterborniella nigrohalteralis
Pentaneura inculta
Polypedilum convictum
P. halterale
P. illinoense
P. scalaenum
Procladius sp.
Psectrocladius sp.
Pseudochironomus sp.
Rheocricotopus sp.
Rheotanytarsus sp.
Roederodes juncta
Simulium sp.
Stilobezzia sp.
Tanypus carinatus
Tanytarsus sp. 1.1 - Hulbert
T. sp. 3 - Hulbert
Thienemanniella sp.
 unident. sp.
 unident. orthocladiin

Coleoptera

Dineutus sp.
 cf. Pelonomus sp.
Stonelmis sp.
 unident. dytiscid
 unident. helodid
 unident. hydrophilid
 unident. haliplid

20.02.0317

Arachnida

Acarina

Atractides (s.s.) sp.
Hygrobates (s.s.) sp.
Lebertia (s.s.) sp.
L. (Pilolebertia) sp.
Neumania sp.
Sperchon sp.
Torrenticola (s.s.) sp.

Mollusca

Gastropoda

Amnicola sp.
Ferrissia dalli
Goniobasis sp.
Helisoma sp.
Physa sp.
Pomacea sp.
Pseudosuccinea sp.

Pelecypoda

Corbicula manilensis
unident. unionid

DATA SUMMARY: Silver Run

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.							
20.02.0317 208	1 Jun 76							25	41					
	6 Jul 76	2.850±0.255	0.109±0.048	10				15	32			290	50	
	17 Nov 76	2.260±0.285	0.328±0.083	12										
	10 Feb 77	2.351±0.243	0.252±0.063	12				31	41					
	11 May 77	2.176±0.307	0.385±0.079	15										
	22 Jul 77	1.556±0.135	0.518±0.037	22										
	14 Nov 77	3.051±0.232	0.140±0.042	15				22	37					

See Methods for explanation of table.

DATA SUMMARY: Silver Run

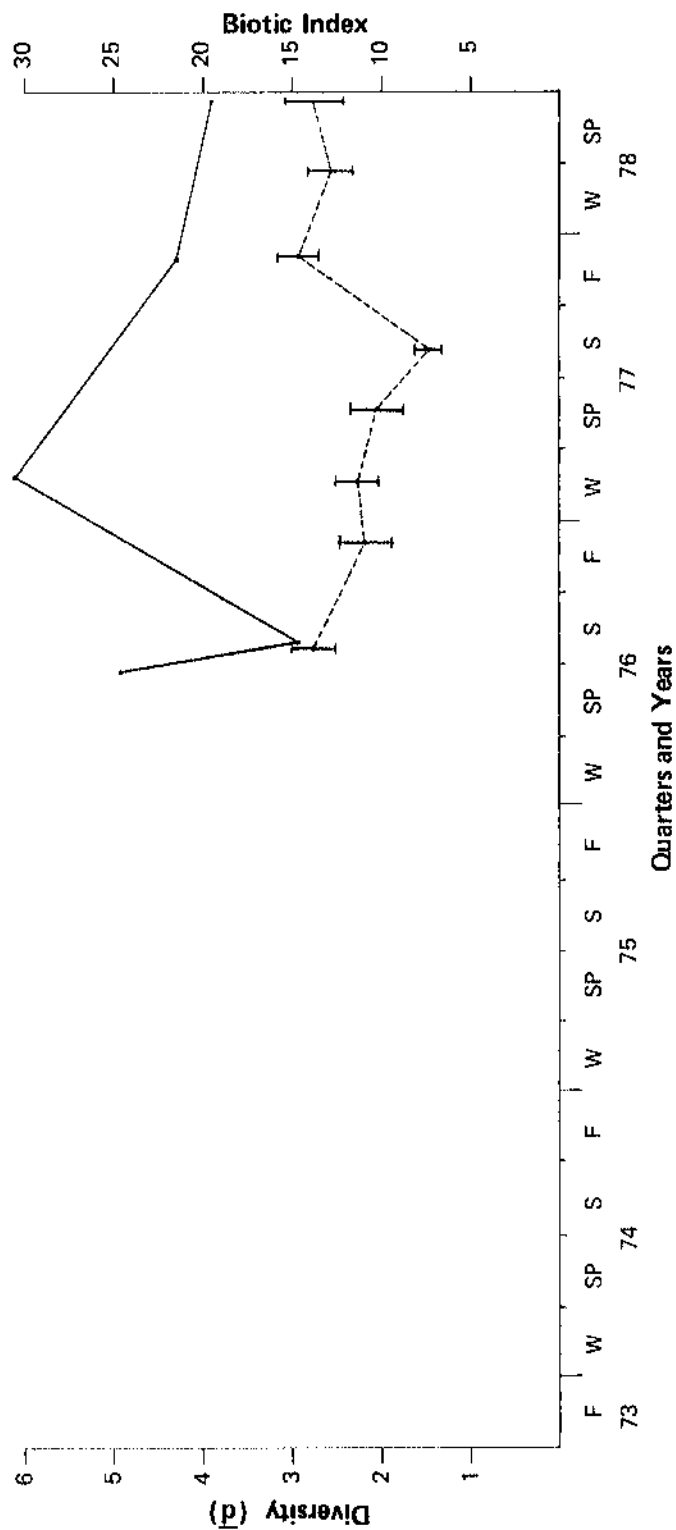
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colouies/ 100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
20.02.0317	7 Mar 78	2.650±0.258	0.175±0.045	12								
	13 Jun 78	2.837±0.334	0.173±0.076	11				20	37			
209												

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0317
 BODY OF WATER: SILVER RUN

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



Station No. 20.02.0360 Body of Water Lake Apopka
Location Beauclair Canal, south end of lake immediately upstream of dam,
canal entrance from Lake Apopka County Lake
Type Body of Water lake-canal confluence Classification III
Sources of Pollution domestic and agricultural wastes

Nearby Land Use agricultural
Sampling Frequency quarterly Depth 1.0 - 3.0 m
Bottom Type muck, detritus % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Typha sp., Peltandra virginica, Salix sp.,
Sagittaria sp., Eichhornia crassipes

Macroinvertebrates:

Platyhelminthes
Turbellaria
Dugesia tigrina
Cura foremanii

Annelida
Oligochaeta
Limnodrilus hoffmeisteri
Nais sp. 1 - Daigle

Arthropoda
Crustacea
Amphipoda
Hyalella azteca

Decapoda
Palaemonetes paludosus

Insecta
Odonata
Ischnura ramburii
I. posita

Ephemeroptera

Caenis diminuta

Hemiptera

Belostoma fluminea

Trichoptera

Oxyethira glasa

Diptera

Chironomus attenuatus

Chaoborus punctipennis

Coelotanypus concinnus

Cricotopus remus

Glyptotendipes lobiferus

Parachironomus monochromus

P. sp. 1 - Daigle

Psectrocladius sp. 1 - Daigle

Stilobezzia sp. 1 - Daigle

Tanytarsus sp. 1 - Daigle

Coleoptera

Tropisternus lateralis nimbatus

Enochrus sp. 1 - Daigle

Arachnida

Acarina

Limnochares americana

Mollusca

Gastropoda

Helisoma duryi

Amnicola sp. 1 - Daigle

Physa pumilia

Pomatiopsis sp. 1 - Daigle

DATA SUMMARY: Lake Apopka

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.							
20.02.0160	30 Oct 73										110	0		
	12 Dec 73										200	30		
	8 Jan 74										50	0		
	5 Feb 74										20	0		
	6 Mar 74				1.897±0.223	0.379±0.076	10				851	58		
	2 Apr 74				1.003±0.131	0.643±0.055	7				400			
	1 May 74													
	21 May 74				0.610±0.489	0.765±0.022	6				2200	80		
	30 Jul 74										3000			
	6 Aug 74										4400	200		
	3 Sep 74													

See Methods for explanation of table.

DATA SUMMARY: Lake Apopka

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.	
20.02.0360	1 Oct 74										100	30	
	5 Nov 74										20	0	
	3 Dec 74											40	
	14 Jan 75										160	30	
	13 Feb 75	2.268±0.038	0.133±0.007	8							40	10	
	4 Mar 75										100	10	
	1 Apr 75										1900	260	
	3 Jun 75										920	175	
	9 Jun 75										590	1750	
	8 Jul 75										4800	100	
	2 Sep 75												

See Methods for explanation of table.

DATA SUMMARY: Lake Apopka

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.						
20-02-0360	3 Nov 75										LT50	LT20	
	8 Dec 75										110	46	
	5 Jan 76	1.856±0.562	0.425±0.251	5	0.380±0.062	0.890±0.022	8		Coc BG 53970 Fil BG 77871 Coc Gr 16191 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 771 Pen Dia 11565 Total 160368		32	LT20	
	3 Feb 76										30	LT20	
	1 Mar 76										LT20	LT20	
	3 May 76										320	LT100	
	7 Jun 76										8300	LT100	

See Methods for explanation of table.

DATA SUMMARY: Lake Apopka

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.					
20.02.0360	18 Jun 76								Coc BG 80955 Fil BG 60138 Coc Gr 6939 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 771 Pen Dia 4626 Total 153429					
	19 Jul 76											520	25	
	3 Aug 76											8200	LT40	
	7 Sep 76											LT50	LT50	
	6 Oct 76											210	LT20	
	3 Nov 76											470	LT40	
	22 Dec 76											LT100	LT40	

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See Methods for explanation of table.

DATA SUMMARY: Lake Apopka

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.											
20.02.0360 217	7 Feb 77										1500	12		
	7 Mar 77										1100	12		
	14 Mar 77	0.000		0			1	14	Coc BG 23400 Fil BG 34680 Coc Gr 2640 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 1560 Pen Dia 6540 Total 68820					
	13 Apr 77										180	LT20		
	10 May 77												LT100	Florida Index
	11 Jul 77								Coc BG 47160 Fil BG 157200 Coc Gr 4620 Fil Gr 0					

See Methods for explanation of table.

DATA SUMMARY: Lake Apopka

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.					
20.02.0360	11 Jul 77 (cont.)									Gr Flag 120 Other Flag 0 Cen Dia 1440 Pen Dia 420 Total 210960				
	9 Aug 77									Coc BG 23580 Fil BG 120060 Coc Gr 1620 Fil Gr 0 Other Flag 0 Cen Dia 120 Pen Dia 300 Total 145680				
	19 Oct 77									Coc BG 31680 Fil BG 79960 Coc Gr 1860 Fil Gr 0 Gr Flag 180 Other Flag 0 Cen Dia 240		LT100 LT50		

See Methods for explanation of table.

DATA SUMMARY: Lake Apopka

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.					
20.02.0360	19 Oct 77 (cont.)								Pen Dia 60 Total 113980			24	LT50	
	8 Nov 77								Coc BG 39300 Fil BG 161520 Coc Gr 540 Fil Gr 0 Gr Flag 60 Other Flag 0 Cen Dia 240 Pen Dia 240 Total 201900					
	12 Dec 77	1.352±0.687	0.733±0.387	4					Coc BG 47610 Fil BG 243740 Coc Gr 2640 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 360 Pen Dia 180 Total 294530					

See Methods for explanation of table.

DATA SUMMARY: Lake Apopka

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.							
20.02.0360	10 Jan 78								Coc BG 23760 Fil BG 63180 Coc Gr 1740 Fil Gr 0 Gr Flag 0 Other Flag 0 Pen Dia 960 Pen Dia 1920 Total 91620		170	LT50		
	7 Feb 78											110	LT50	
	7 Mar 78											LT1000	LT100	
	11 Apr 78											LT100	LT100	
	12 Jun 78	0.850±0.233	0.643±0.128	4						Coc BG 62880 Fil BG 86460 Coc Gr 1260 Fil Gr 0 Gr Flag 0 Other Flag 0				

See Methods for explanation of table.

DATA SUMMARY: Lake Apopka

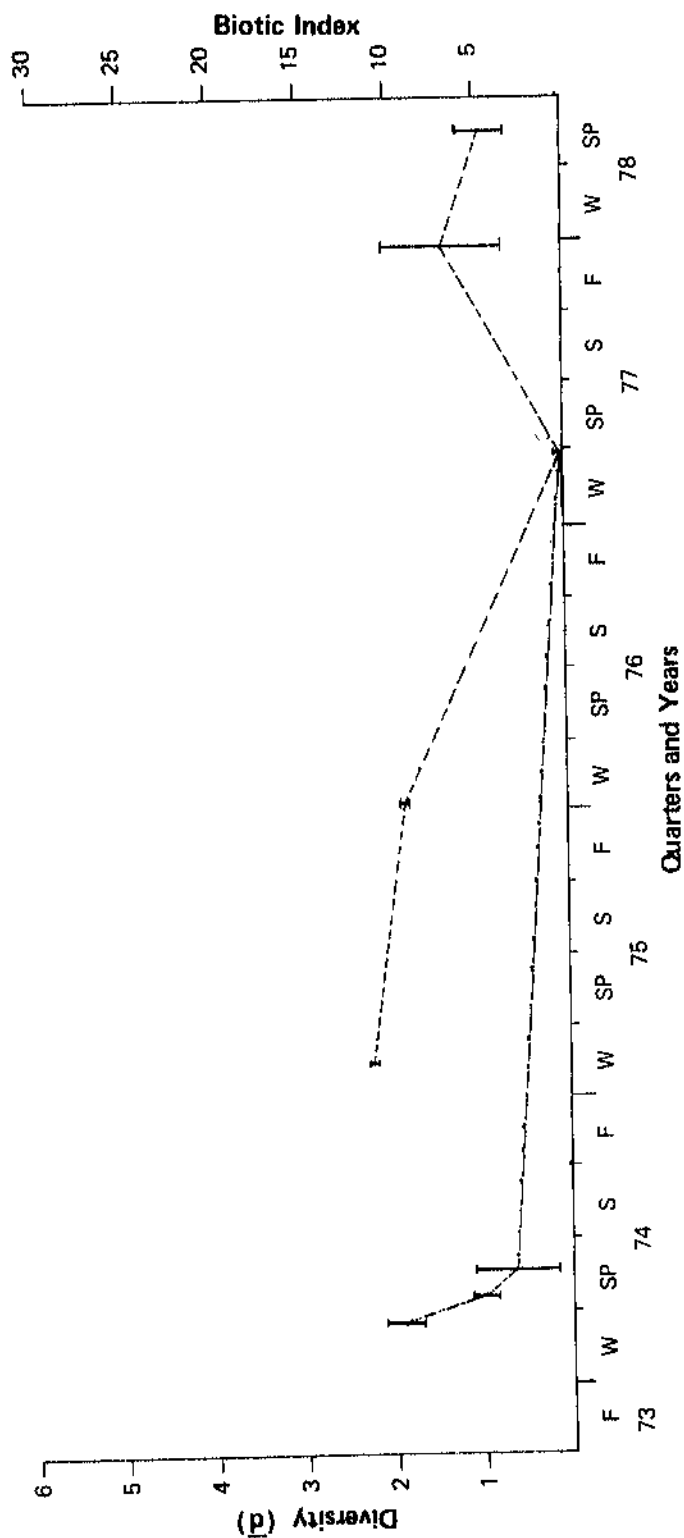
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate							
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
20,02,0360	12 Jun 78 (cont.)								Cen Dia 720 Pen Dia 540 Total 151860			

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MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0360
 BODY OF WATER: LAKE APOPKA

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



Station No. 20.02.0376 Body of Water Lake Harris
Location center
County Lake
Type Body of Water lake Classification _____
Sources of Pollution muck farms and backflow from Apopka
Nearby Land Use farms, residential, recreation
Sampling Frequency annually Depth 4.5 - 4.9 m
Bottom Type mud, detritus % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Panicum sp.

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
unident. tubificid

Arthropoda

Crustacea

Amphipoda

Hyaella azteca

Insecta

Diptera

Chaoborus punctipennis
Coelotanypus tricolor
Polypedilum illinoense
Procladius sp.

Mollusca

Gastropoda

cf. Hyalopyrgus sp.
unident. hydrobiid

DATA SUMMARY: Lake Harris

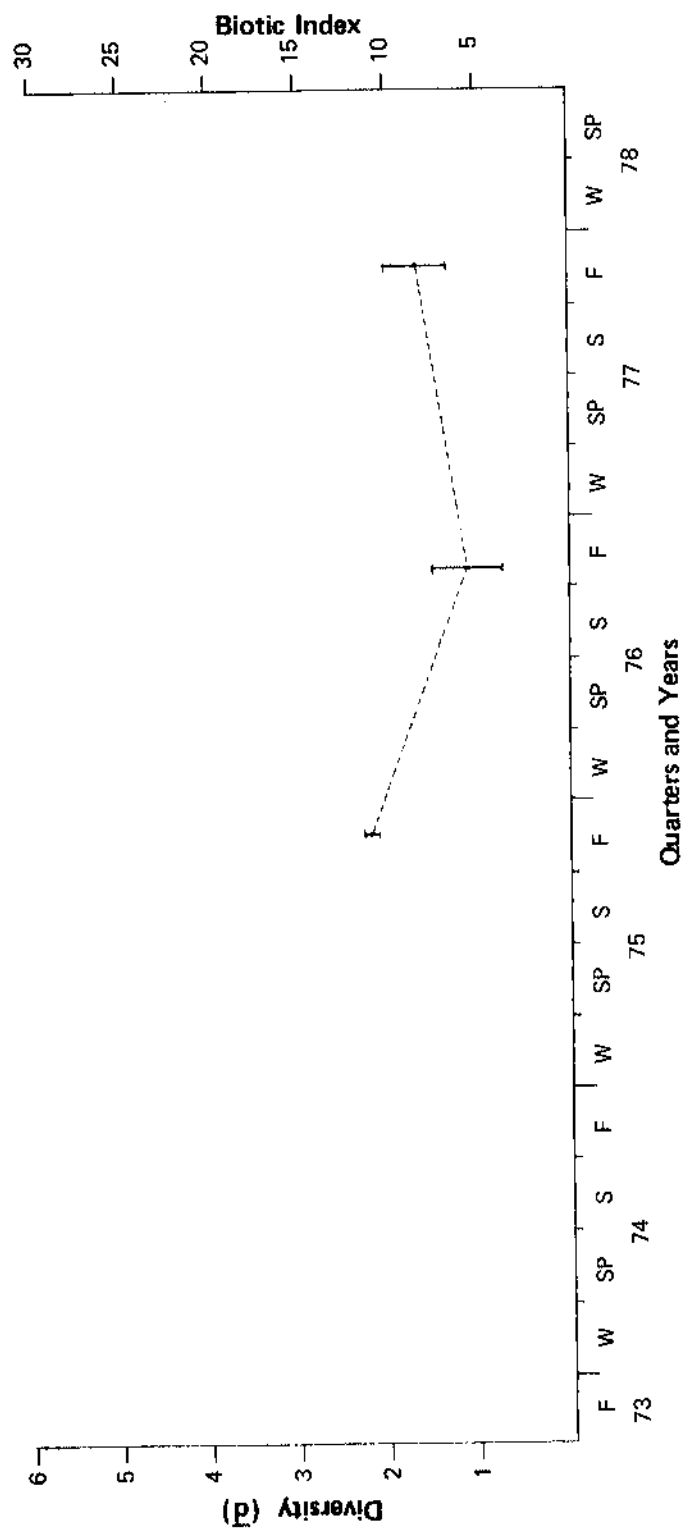
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate							
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
20.02.0376	30 Jul 74										0	0
	5 Nov 75	2.204±0.091	0.178±0.024	8					Coc BG 25344 Fil BG 87912			
	12 Oct 76	1.187±0.403	0.293±0.161	6					Coc Gr 2376 Fil Gr 0 Gr Flag 0 Other Flag 792 Cen Dia 792 Pen Dia 2376 Total 119592			
	2 Nov 77	1.702±0.368	0.349±0.119	6								

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0376
 BODY OF WATER: LAKE HARRIS

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



Station No. 20.02.0381 Body of Water Lake Griffin
Location approximately 100 ft. from shore, just east of first dock
County Lake
Type Body of Water lake Classification III
Sources of Pollution domestic and agricultural sources, urban run-off
Nearby Land Use recreational and agricultural
Sampling Frequency quarterly Depth 3 - 4 m
Bottom Type sand, shell, mud, detritus % Volatile Solids
Aquatic Plants: Submerged
Emergent Ludwigia peruviana, Pontederia rotundifolia,
Typha latifolia, Panicum hemitomon

Macroinvertebrates:

Nematoda

unident. sp.

Annelida

Oligochaeta

Haemonais waldvogeli

Limnodrilus hoffmeisteri

Tubifex sp.

Hirudinea

unident. glossiphoniid

unident. sp.

Arthropoda

Crustacea

Amphipoda

Hyalella azteca

Insecta

Odonata

Libellula sp.

Nehalennia sp.

Ephemeroptera

Stenonema sp.

Trichoptera
 unident. hydroptilid

Diptera
 Bezzia setulosa
 Chaoborus punctipennis
 Chironomus attenuatus
 Cladotanytarsus sp.
 Coelotanypus concinnus
 Cricotopus remus
 C. bicinctus
 Cryptochironomus fulvus
 Dicrotendipes nervosus
 Glyptotendipes paripes
 G. lobiferus
 Parachironomus schneideri
 P. hirtalatus
 P. directus
 Psectrocladius sp.
 Polypedilum illinoense
 Tanytarsus sp. 1.1 - Hulbert
 T. sp. 2 - Hulbert
 Thienemanniella sp.
 unident. ceratopogonid

Mollusca

 Gastropoda

Hyalopyrgus sp.
 Viviparus sp.

Bryozoa

Plumatella sp.

DATA SUMMARY: Lake Griffin

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.					
20.02.0381	31 Oct 73								Coc BG 189420 Fil BG 16940 Coc Gr 29260 Fil Gr 0 Gr Flag 0 Other Flag 0 Cen Dia 2310 Pen Dia 44660 Total 282590		70	0		
228	11 Dec 73	0.199±0.060	0.591±0.021	15							12	7		
	12 Dec 73											40	0	
	8 Jan 74											20	0	
	6 Feb 74											0	0	
	13 Mar 74	1.014±0.077	0.544±0.042	4	0.776±0.081	0.763±0.030	7					10	0	
	3 Apr 74													

See Methods for explanation of table.

DATA SUMMARY: Lake Griffin

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.	BI	#Spp.	Total			Fecal		
		Diversity	Redundancy	Diversity	Redundancy									
													#Spp.	
20.02.0381	1 May 74									Coc BG 40810		0	0	
	30 Jul 74									Fil BG 65450		30	10	
	6 Aug 74									Coc Gr 29260				
	15 Aug 74									Fil Gr 0		0		
		0.865±0.110	0.535±0.075							Gr Flag 0				
						3			Other Flag 770					
	3 Sep 74									Cen Dia 770		0	0	
	1 Oct 74									Pen Dia 12320		0	0	
										Total 149380				

DATA SUMMARY: Lake Griffin

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.											
20.02.0381	17 Oct 74	2.000±1.960 x 10 ⁻⁶				4				Coc BG 33110 Fil BG 88550 Coc Cr 6930 Fil Cr 0 Gr Flag 0 Other Flag 0 Cen Dia 770 Pen Dia 6160 Total 135520				
	5 Nov 74											0	0	
	3 Dec 74													
	14 Jan 75	1.953±0.013	0.210±0.003			9				Coc BG 5871 Fil BG 8961 Coc Cr 11124 Fil Cr 0 Gr Flag 309 Other Flag 0 Cen Dia 1236 Pen Dia 1236 Total 28737		0	100	

DATA SUMMARY: Lake Griffin

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.					
20.02.0381	4 Mar 75											0	0	
231	1 Apr 75											0	0	
	21 Apr 75	1.896±0.015	0.276±0.004	11								0	0	
	3 Jun 75											0	0	
	1 Jul 75											0	0	
	5 Aug 75											10	0	
	25 Aug 75													
										Coc BG 53130 F11 BG 158620 Coc Gr 3850 F11 Gr 0 Gr Flag 0 Other Flag 770 Gen Dia 4620 Pen Dia 2310 Total 223300				

See Methods for explanation of table.

DATA SUMMARY: Lake Griffin

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.	Diversity			Redundancy					
		BI	#Spp.										
20-02-038J	19 Sep 75	1.411±0.110	0.390±0.037	8					Coc BG 35420 Fil BG 244860 Coc Gr 3080 Fil Gr 0 Gr Flag 0 Other Flag 770 Cen Dia 6160 Pen Dia 2310 Total 292600		10	0	
232	27 Sep 75												
	30 Sep 75												
	4 Nov 75								Coc BG 7925 Fil BG 6974 Coc Gr 7925 Fil Gr 7291 Gr Flag 634 Other Flag 0		40	0	
	5 Nov 75												

See Methods for explanation of table.

DATA SUMMARY: Lake Griffin

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.								
20.02.0381 233	5 Nov 75 (cont.)								Gen Dia 3855 Pen Dia 1542 Total 79871		20	0			
	2 Dec 75											0	0		
	19 Feb 76						9					0	0		
	2 Mar 76											0	0		
	6 Apr 76											0	0		
	7 Sep 76														
	12 Oct 76	1.231±0.413	0.333±0.250	3									0	0	
	1 Mar 77														
	4 Mar 77														
									Coc BG 7925 Fil BG 6974 Coc Gr 7925 Fil Gr 7291						

See Methods for explanation of table.

DATA SUMMARY: Lake Griffin

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.						
20.02.0381	4 Mar 77 (cont.)							Gr Flag 634 Other Flag 0 Cen Dia 317 Pen Dia 2536 Total 33656			0	Florida Index	
	7 Jun 77										13		
	5 Jul 77												
	9 Aug 77				1.180±0.125	0.399±0.029	6					0	
	3 Jan 78				1.719±0.409	0.490±0.147	8					10	
	22 Feb 78											110	
	6 Mar 78											0	
	5 Jun 78											70	
	13 Jun 78								Coc BG 18202 Fil BG 90052 Coc Gr 5748 Fil Gr 0				

See Methods for explanation of table.

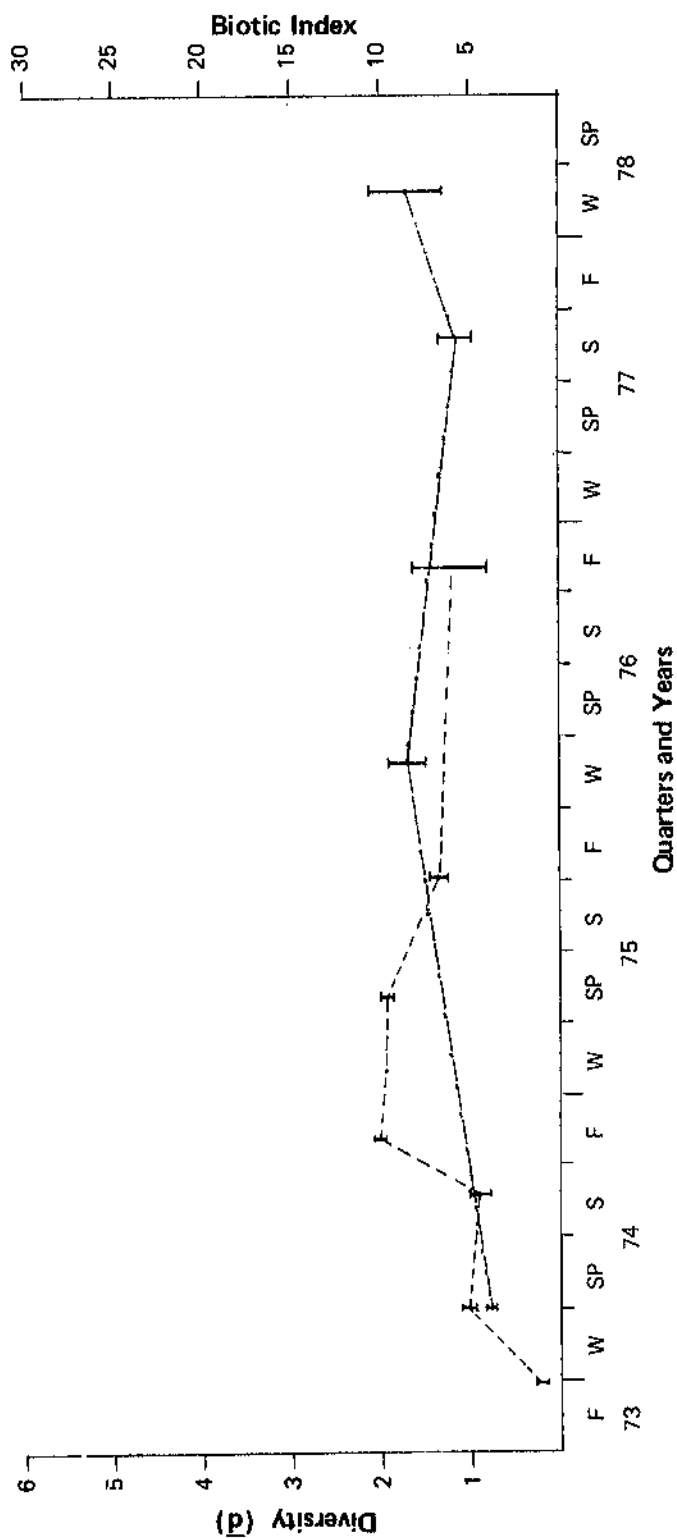
DATA SUMMARY: Lake Griffin

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.							
20.02.0381	13 Jun 78 (cont.)											Gr Flag 0 Other Flag 958 Cen Dia 2874 Pen Dia 1916 Total 119750				

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0381
 BODY OF WATER: LAKE GRIFFIN

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



Station No. 20.02.0406 Body of Water Lake Weir
Location center
County Marion
Type Body of Water lake Classification _____
Sources of Pollution urban runoff, septic tank leachate, agricultural runoff
Nearby Land Use recreational, residential, citrus groves
Sampling Frequency annually Depth 7.3 - 8.5 meters
Bottom Type _____ % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Eleocharis sp., Panicum sp.

Macroinvertebrates:

Annelida
 Oligochaeta
 unident. tubificid

Hirudinea
 unident. glossiphoniid

Arthropoda
 Crustacea
 Amphipoda
 Hyaella azteca

Insecta
 Diptera
 Chaoborus punctipennis
 Coelotanypus tricolor

Arachnida
 Acarina
 Piona sp.

DATA SUMMARY: Lake Weir

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.	
20.02.0406	25 Mar 75											80	20	
	2 Dec 75	1.857±0.051	0.059±0.020	4								0	0	
	7 Sep 76	0.391±0.519		3								20	0	
	12 Jul 77	1.585±2.530 x 10 ⁻⁶		3								0	0	

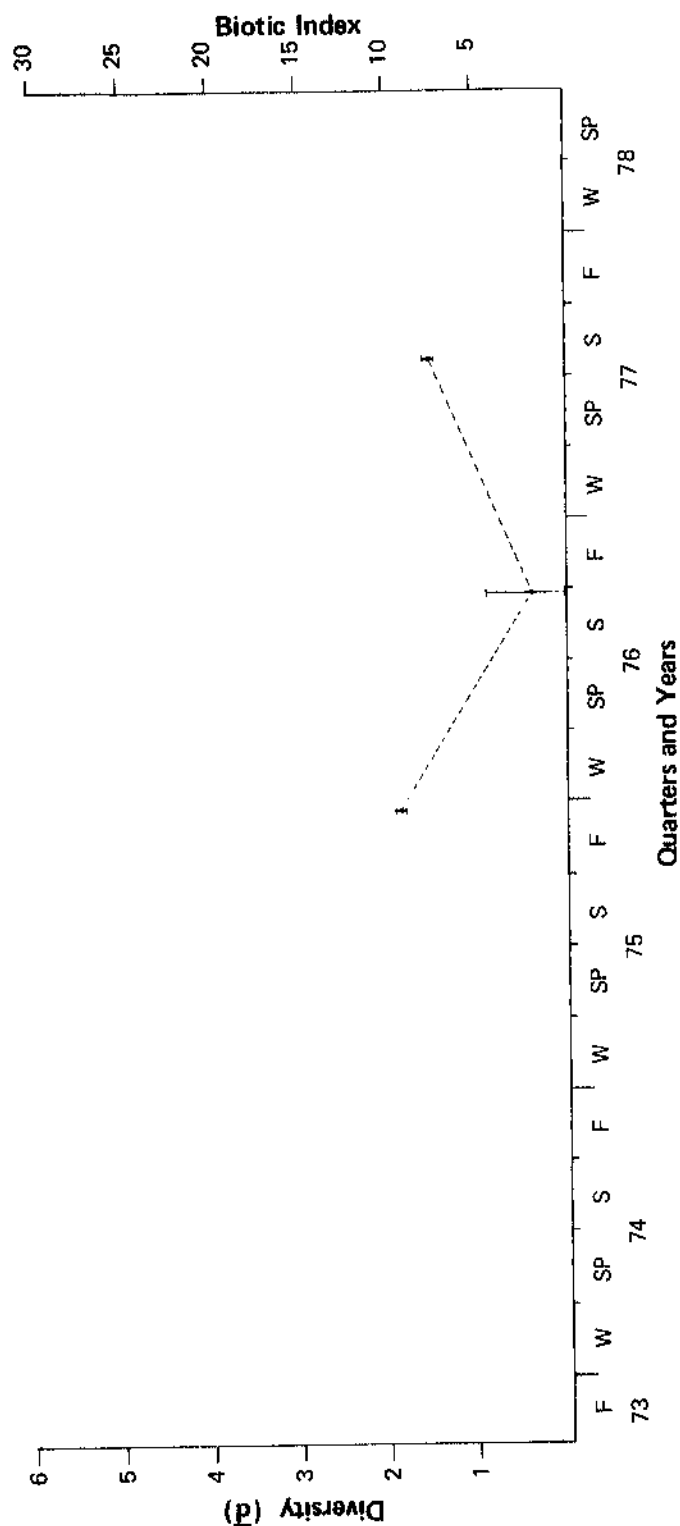
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See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0406
BODY OF WATER: LAKE WEIR

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



Station No. 20.02.0409 Body of Water Little Lake Weir

Location center

County Marion

Type Body of Water lake Classification

Sources of Pollution agricultural runoff, septic tank leachate

Nearby Land Use some residential

Sampling Frequency Depth 5.2 - 6.1 m

Bottom Type mud, sand % Volatile Solids

Aquatic Plants: Submerged Eleocharis sp., Bacopa sp., Utricularia sp.

Emergent

Macroinvertebrates:

Annelida

Oligochaeta

unident. tubificid

Hirudinea

unident. glossiphoniid

Arthropoda

Crustacea

Amphipoda

Hyalella azteca

Insecta

Ephemeroptera

Hexagenia munda orlando

Diptera

Bezzia sp.

Chaoborus punctipennis

Coelotanypus tricolor

Cryptochironomus sp.

Glyptotendipes sp.

Palpomyia tibialis

Polypedilum halterale

Procladius sp.

Tanytarsus sp. 3 - Hulbert

unident. ceratopogonid

Mollusca

Pelecypoda

unident. sphaeriid

DATA SUMMARY: Little Lake Weir

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	Redundancy	#Spp.					
		Diversity	Redundancy									
20.02.0409	25 Mar 75									0	0	
	2 Dec 75	2.039±0.091	0.323±0.028	11						30	0	
	7 Sep 76	2.015±0.458	0.425±0.165	8						56	20	
	12 Jul 77	2.001±0.391	0.361±0.126	8						0	0	

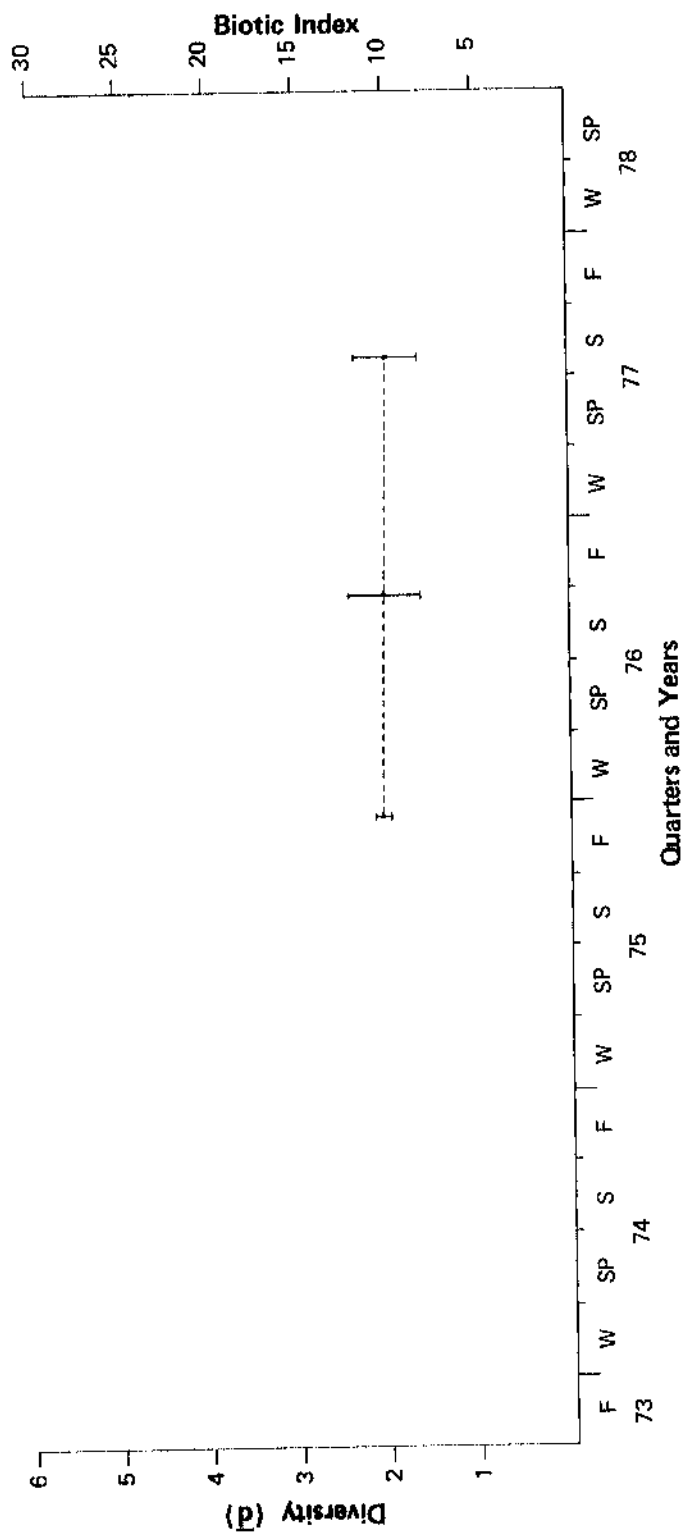
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See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.02.0409
 BODY OF WATER: LITTLE LAKE WEIR

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



Station No. 20.03.0002 Body of Water St. Johns River
Location Main Street Bridge, U.S. 1 and 90, Jacksonville
County Duval
Type Body of Water river Classification III
Sources of Pollution domestic and industrial wastes, urban runoff,
agricultural runoff upstream
Nearby Land Use urban, industrial
Sampling Frequency quarterly Depth 1.2 - 3.5 meters
Bottom Type sand, shells, muck % Volatile Solids _____
Aquatic Plants: Submerged none
Emergent none

Macroinvertebrates:

Cnidaria

Hydrozoa

unident. campanularid

Anthozoa

unident. sp.

Rhynchocoela

cf. Carinoma trematophoros

unident. sp.

Nematoda

unident. sp.

Annelida

Oligochaeta

unident. sp.

Polychaeta

Capitella capitata

Eteone heteropoda

Heteromastus sp.

Laeonereis culveri

Nereis sp.

Polydora websteri

Scolecopides viridis

unident. sp.

Arthropoda

Crustacea

Isopoda

Chiridotea caecaCyathura politaEdotea montosa

Amphipoda

Calliopius sp.Corophium sp.Gammarus sp.G. tigrinusMonoculodes edwardsiMelita nitidaParahaustorius cf. longimerus

Decapoda

Rhithropanopeus harrisii

Mysidacea

Mysidopsis sp.cf. Neomysis americana

unident. sp.

Tanaidacea

Leptochelia sp.

Cirripedia

Balanus improvisus

Cumacea

Leptocuma minor

Insecta

Odonata

Nehallenia sp.

Mollusca

Gastropoda

Physa sp.

unident. sp.

Pelecypoda

Branchidontes exustusCrassostrea sp.Geukensia demissaMytilopsis leucophaetaRangia cuneata

Bryozoa

unident. sp.

DATA SUMMARY: St. John's 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.				
245	20.03.0002	13 Aug 73									23000		
		9 Oct 73									4600		
		7 Nov 73									11000		
		4 Dec 73									10000	1900	
		7 Jan 74									6400	1100	
		25 Feb 74									220000		
		19 Mar 74									15000	720	
		3 Jun 74									17000		
		10 Jun 74									17000		
		11 Jun 74	1.967±0.247	0.148±0.100	5								

See Methods for explanation of table.

DATA SUMMARY: St. John's 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		#Spp.	Redundancy	#Spp.							
		Diversity	Redundancy	#Spp.	Diversity				Redundancy						#Spp.
246 20.03.0002	12 Jun 74												3100		
	21 Jun 74												17000		
	30 Jun 74												17000		
	15 Jul 74												11000		
	12 Aug 74	1.170±0.126	0.575±0.050	8									23000		
	16 Sep 74												4900		
	29 Oct 74												15600	1210	
	18 Nov 74												7900		
	10 Dec 74												4130	1600	
	13 Dec 74	2.071±0.124	0.236±0.043	9									9222	1247	
	6 Jan 75												17000		
	3 Feb 75												7900		

See Methods for explanation of table.

DATA SUMMARY: St. John's 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.	BI	#Spp.					
20.03.0002 247	3 Mar 75	1.729±0.163	0.277±0.048	7								13000		
	10 Mar 75											11000		
	21 Apr 75													
	1 May 75	2.450±0.230	0.210±0.050	11	0.200±0.250	0.960±0.007	12					4200	950	
	5 May 75											7900		
	21 Jul 75											17000		
	4 Aug 75													
	25 Aug 75	1.608±0.220	0.369±0.085	7								4900		
	8 Sep 75											550	40	
	13 Oct 75													

See Methods for explanation of table.

DATA SUMMARY: St. John's 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.	#Spp.	#Spp.	#Spp.			Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity									
						Diversity	Redundancy	#Spp.	Diversity			Redundancy	#Spp.	
2488 20.03.0002	3 Nov 75											5000	5000	
	15 Dec 75											4900	3300	
	22 Mar 76											4900	2200	
	19 Apr 76											4000	630	
	21 Jun 76											7900	1100	
	19 Jul 76											8000	8000	
	30 Aug 76											13000	7900	
	9 Sep 76	1.389+0.163	0.442+0.051	9								11000	2600	
	20 Sep 76											7900	2300	
	1 Nov 76											7100	680	
15 Dec 76											8400	800		
	17 Jan 77													

See Methods for explanation of table.

DATA SUMMARY: St. John's 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.					
20.03.0002 249	6 Apr 77											7900	3300	
	22 Sep 77	1.925±0.483	0.559±0.163	10								400	100	
	19 Dec 77											1300	330	
	4 Jan 78											490	170	
	31 Jan 78											800	90	
	31 Jan 78											7000	1300	
	6 Mar 78											2800	840	
	5 Apr 78											1100	130	
	8 May 78											2300	230	
	7 Jun 78													
	22 Jun 78	2.793±0.181	0.165±0.030	16										

See Methods for explanation of table.

DATA SUMMARY: St. John's River (cont.)

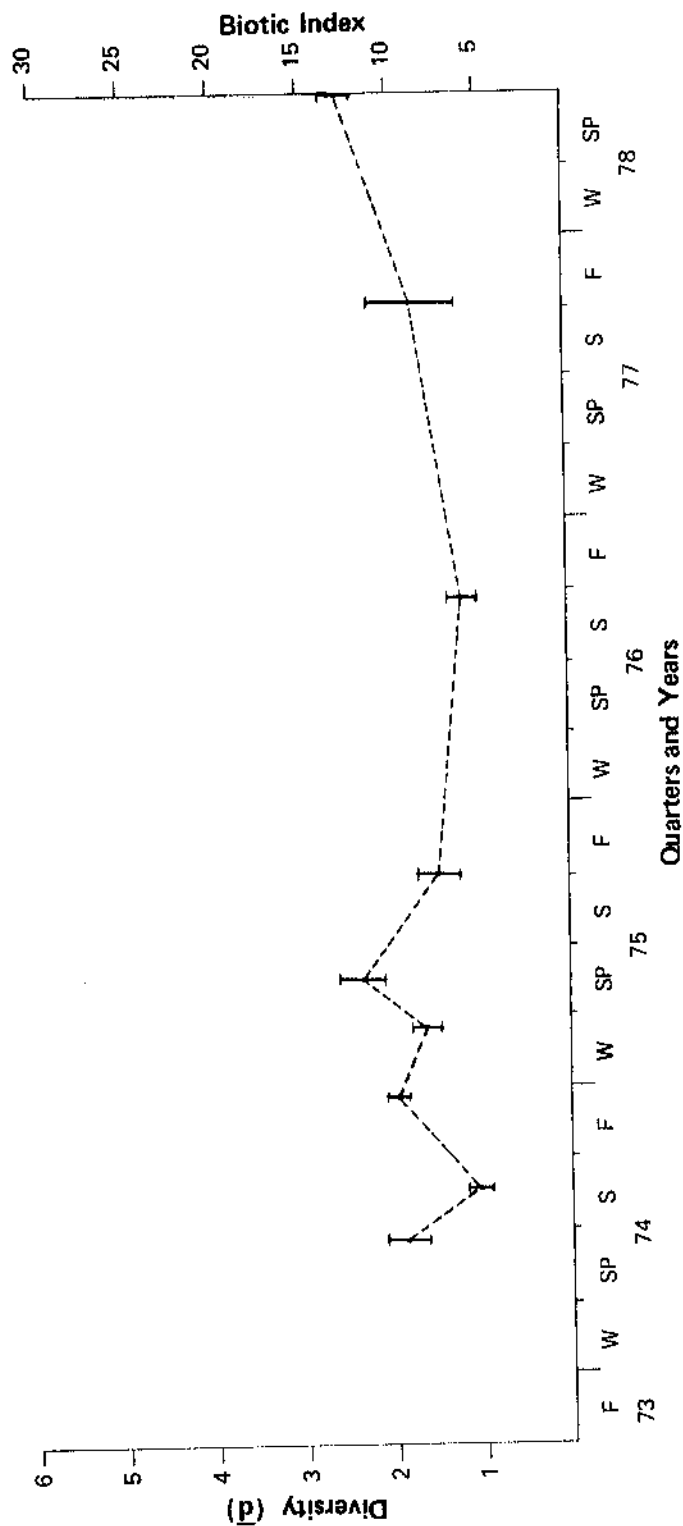
Station Number	Date	Macroinvertebrates								Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate			BI	#Spp.			Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
250														
20.03.0002	26 Jun 78											100		

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0002
 BODY OF WATER: ST. JOHNS RIVER

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



Station No. 20.03.0079 Body of Water Ortega River
 Location bridge at Timuquanna Road, Jacksonville
 County Duval
 Type Body of Water river Classification III
 Sources of Pollution domestic and industrial waste, urban runoff
 Nearby Land Use mixed residential and natural
 Sampling Frequency quarterly Depth 1 - 1.5 m
 Bottom Type muck, detritus % Volatile Solids _____
 Aquatic Plants: Submerged Myriophyllum brasiliense, filamentous algae
 Emergent Cladium jamaicensis, Eichhornia crassipes,
Taxodium distichum, Typha sp., Lemna sp., Salvinia rotundifolia, Alternanthera
 Macroinvertebrates: philoxeroides, Sagittaria sp., Pontederia cordata, Panicum
hemitomon, Hibiscus sp., Baccharis sp.

Rhynchocoela

cf. Tubulanus pellucidus
unident. sp.

Annelida

Oligochaeta

Aulodrilus pigueti
Laonice cirrata
Limnodrilus hoffmeisteri
unident. sp.

Hirudinea

unident. sp.

Polychaeta

Amphicteis gunneri
Melinna maculata
3 unident. spp.

Arthropoda

Crustacea

Isopoda

Cassidinisca lunifrons
Cyathura polita
Edotea montosa

Amphipoda

Corophium sp.
Gammarus tigrinus

Decapoda

Palaemonetes paludosus
Rhithropanopeus harrisii

Cirripedia

Balanus sp.

Mysidacea

Neomysis americana

Insecta

Odonata

Aphylla williamsoni
Enallagma sp.
Ischnura sp.

Ephemeroptera

Cloeon sp.

Hemiptera

Abedus immaculatus
Plea striola
Ranatra sp.
Trichocorixa sp.

Trichoptera

Oecetis sp.

Diptera

Chironomus sp.
Clinotanypus sp.
Coelotanypus sp.
C. concinnus
C. scapularis
Cryptochironomus sp.
Dicrotendipes sp.
Glyptotendipes sp.
Paralauterborniella nigrohalteralis
Polypedilum halterale
Procladius sp.
Tanytarsus sp.

Arachnida

unident. sp.

20.03.0079

Mollusca

Gastropoda

Helisoma sp.

Hydrobia sp.

H. totteni

Lymnaea sp.

Amnicola (Lyogyrus) sp.

Littoridinops sp.

Physa sp.

Pomatiopsis sp.

Pelecypoda

Mytilopsis leucophaeta

Rangia cuneata

DATA SUMMARY: Ortega 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.						
255 20.03.0079	9 Oct 73										1300		
	7 Nov 73										3300		
	4 Dec 73										2800	420	
	7 Jan 74										2400	50	
	25 Feb 74										700		
	19 Mar 74										3600	55	
	31 Jun 74	1.389±0.126	0.445±0.048	8				3	15		1429		
	25 Jul 74										490		
	29 Jul 74										17000		
	12 Aug 74	1.274±0.131	0.532±0.052	8				3	22		4900	106	
	19 Aug 74										1700		
	16 Sep 74										5400		

See Methods for explanation of table.

DATA SUMMARY: Ortega 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			Diversity	Redundancy							
256 20.03.0079	29 Oct 74											200	53	
	18 Nov 74											490		
	10 Dec 74											220	20	
	13 Dec 74	2.266±0.254	0.239±0.077			9	1.317±0.131	0.327±0.072	4			790		
	6 Jan 75											1700		
	3 Feb 75											230		
	3 Mar 75	2.752±0.161	0.173±0.280			16				8	28	3300		
	10 Mar 75											1300		
	24 Mar 75											790		
	31 Mar 75											1400		
	21 Apr 75											180	40	
	5 May 75													

See Methods for explanation of table.

DATA SUMMARY: Ortega 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.					
20.03.0079 257	16 Jun 75	1.590±0.111	0.445±0.037	13								600		
	30 Jun 75											3300		
	21 Jul 75											400		
	4 Aug 75													
	25 Aug 75	0.639±0.307	0.861±0.133	5								330		
	8 Sep 75											820	33	
	13 Oct 75											3300	1100	
	3 Nov 75											1100	200	
	15 Dec 75											35000	700	
	22 Mar 76											490	14	
	19 Apr 76											2700	700	
	17 May 76													

See Methods for explanation of table.

DATA SUMMARY: Ortega 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.					
258 20.03.0079	21 Jun 76											490	14	
	19 Jul 76											50	50	
	30 Aug 76											130	80	
	9 Sep 76	1.513±0.180	0.485±0.060	11								490	80	
	20 Sep 76											330	130	
	1 Nov 76											4300	880	
	15 Dec 76											3100	510	
	17 Jan 77													
	16 Sep 77	1.986±0.300	0.290±0.111	7								490	33	
	4 Jan 78											160000	11000	
	6 Mar 78										31	31		
	5 Apr 78													

See Methods for explanation of table.

DATA SUMMARY: Orteja River (cont.)

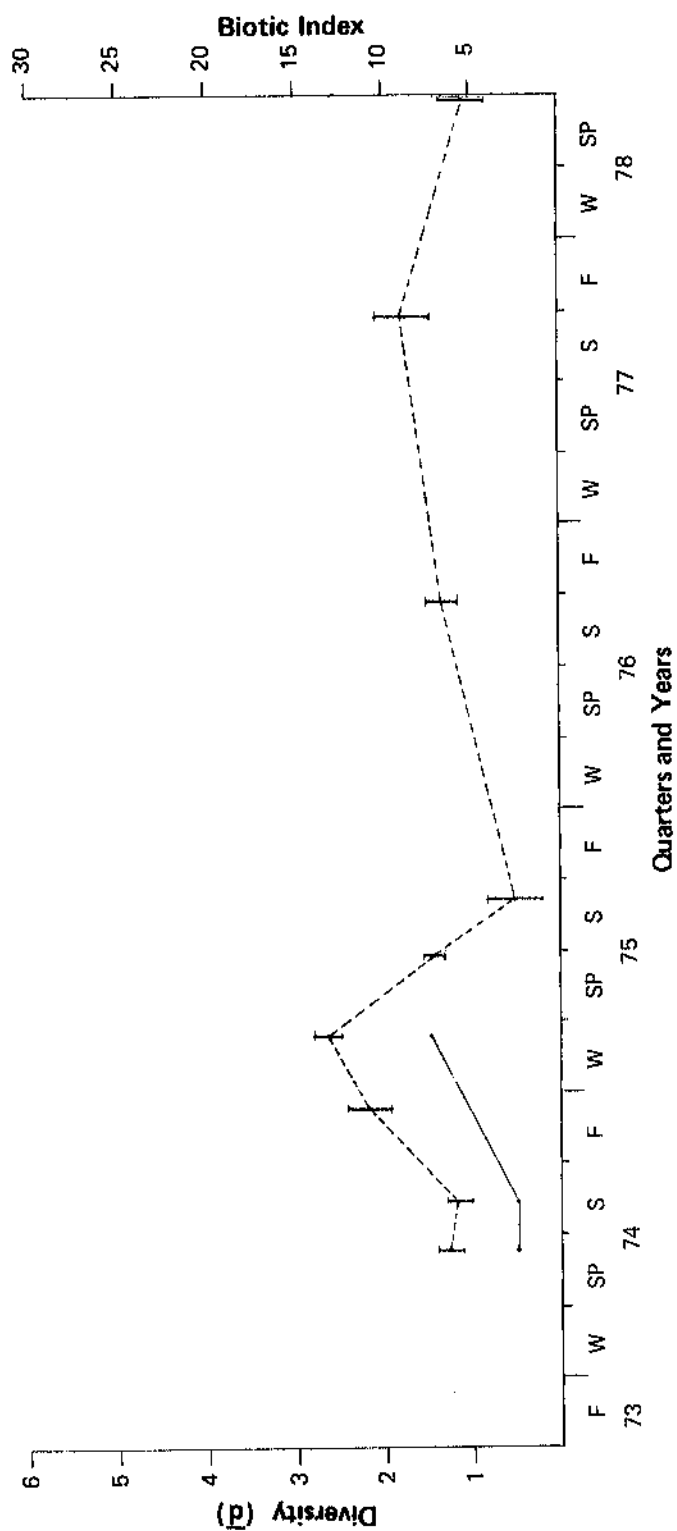
Station Number	Date	Macroinvertebrates								Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate		Artificial Substrate		#Spp.	Diversity	Redundancy	#Spp.						
		Diversity	Redundancy	#Spp.	Diversity								Redundancy	#Spp.	
20.03.0079	8 May 78											230	49		
	7 Jun 78												1100	70	
	22 Jun 78	1.278±0.266	0.370±0.131	4									300		
	26 Jun 78														

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0079
 BODY OF WATER: ORTEGA RIVER

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



Station No. 20.03.0188 Body of Water Doctors Lake
Location midway between Catfish Point and Cane Point
County Clay
Type Body of Water brackish lake Classification _____
Sources of Pollution sewage treatment plants, urban runoff
Nearby Land Use urban
Sampling Frequency annually Depth 1.50 - 5.18 m
Bottom Type muck, sand, silt % Volatile Solids _____
Aquatic Plants: Submerged Vallisneria sp.
Emergent Typha sp., Taxodium sp.

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
unidentified sp.

Polychaeta

Streblospio benedicti

Arthropoda

Crustacea

Amphipoda

Monoculodes edwardsi

Insecta

Diptera

Coelotanypus sp.
C. concinnus
Chaoborus sp.
Chironomus stigmaterus
Clinotanypus sp.
Endochironomus nigricans
Palpomyia tibialis
Parachironomus directus
Pedionomus beckae
Tanypus carinatus
T. neopunctipennis

DATA SUMMARY: Doctor's Lake

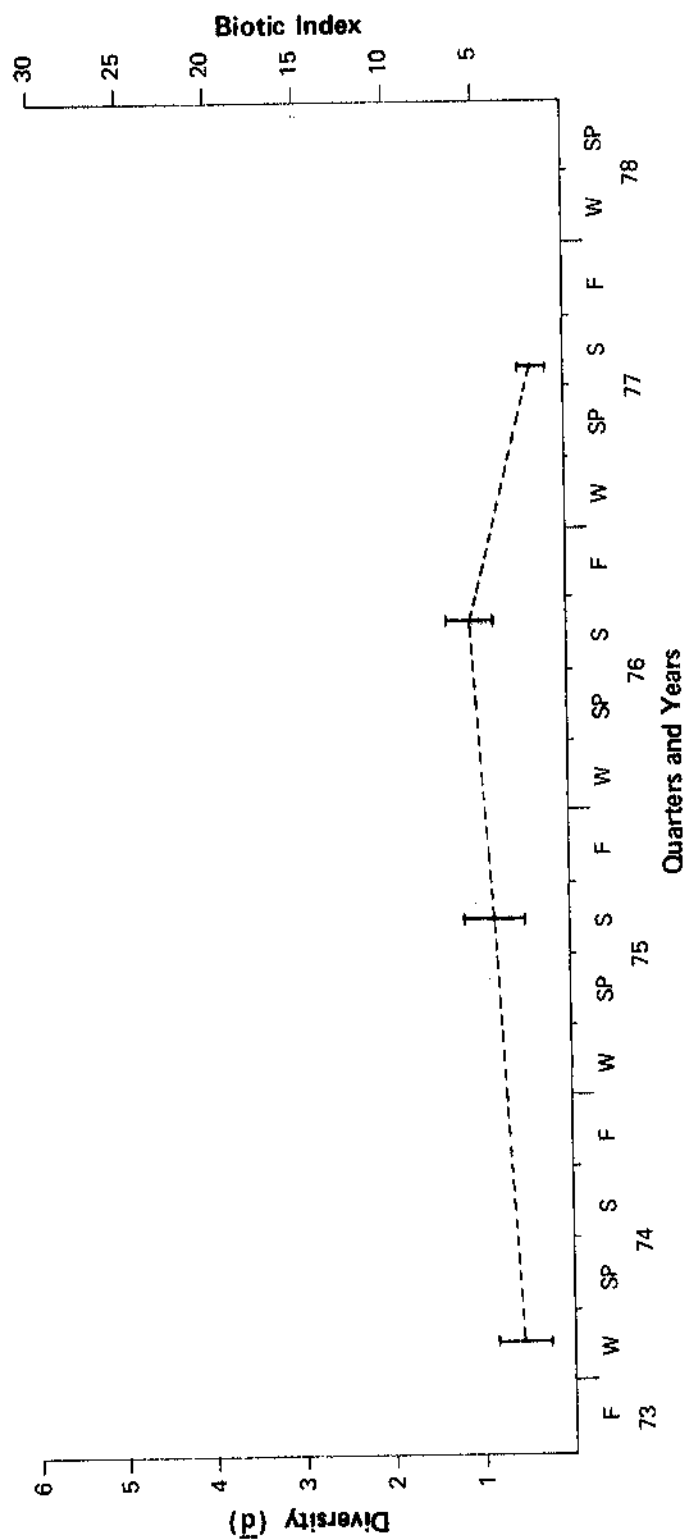
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate					Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
262 20.03.0188	7 Aug 73									8		
	18 Feb 74	0.571+0.295	0.595+0.322	2						13		
	29 Jul 75	0.871+0.377	0.722+0.198	4								
	18 Aug 76	1.128+0.271	0.664+0.106	8						11	2	
	6 Apr 77											
	31 Jul 77	0.407+0.132	0.899+0.048	6						79	17	
	4 Jan 78											

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0188
 BODY OF WATER: DOCTOR'S LAKE

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



Station No. 20.03.0199 Body of Water Black Creek
Location 1/2 mile upstream of US Hwy 17 bridge
County Clay
Type Body of Water stream Classification _____
Sources of Pollution urban runoff, industrial effluent upstream
Nearby Land Use none
Sampling Frequency annually Depth 2.1 - 2.4 m.
Bottom Type muck, sand, mud, detritus % Volatile Solids _____
Aquatic Plants: Submerged none
Emergent Nuphar sp., Taxodium distichum, Eichhornia
crassipes

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
Pleosclex ferox
Pristina osborni

Arthropoda

Crustacea

Isopoda

Cyathura polita

Decapoda

Rhithropanopeus harrisii

Insecta

Ephemeroptera

Caenis sp.

Chaoborus sp.

Cladotanytarsus sp.

Coelotanypus concinnus

C. scapularis

C. tricolor

Coelotanytarsus sp.

Cryptochironomus sp.

Glyptotendipes sp.

Harnischia edwardsi

Pagastiella sp.

Palpomyia-Bezzia complex sp. 1 - Kelly

Polypedilum halterale

Procladius sp.

Tanypus carinatus

Tanytarsus sp.

20.03.0199

Black Creek

Arthropoda cont.

Arachnida

Hygrobates sp.

Mollusca

Gastropoda

Amnicola sp.

unident. hydrobiid

Pelecypoda

Mytilopsis leucophaeta

Rangia cuneata

DATA SUMMARY: Black 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.	BI	#Spp.				
20.03.0199	20 Mar 74										330		
	29 May 74										330		
	30 Sep 74										1700		
	25 Nov 74										2200		
	15 Sep 75	2.113±0.249	0.488±0.068	20							17000		
	15 Sep 76	2.559±0.306	0.260±0.085	12									

See Methods for explanation of table.

Station No. 20.03.0204 Body of Water Black Creek

Location at Atlantic Coast Line RR Bridge approximately 4.5 mi. upstream

from confluence with St. Johns River County Clay

Type Body of Water freshwater river Classification

Sources of Pollution urban runoff

Nearby Land Use

Sampling Frequency annual Depth 4.8 - 4.6 meters

Bottom Type sand, detritus % Volatile Solids

Aquatic Plants: Submerged

Emergent Nuphar sp., Eichhornia crassipes,

Taxodium distichum, Panicum hemitomon, Alternanthera sp.

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
Nais communis
Pristina osborni
Slavina appendiculata

Arthropoda

Insecta

Odonata

Perithemis tenera seminole

Ephemeroptera

Hexagenia munda elegans
Stenacron interpunctatum

Trichoptera

Cynellus fraternus

Diptera

Ablabesmyia parajanta
Chaoborus sp.
Coelotanypus concinnus
C. tricolor
Dicrotendipes lobus
D. nervosus
Microtendipes sp.
Pagastiella sp.
Palpomyia-Bezzia complex sp.1 - Kelly
Polypedilum halterale
Procladius sp.
Tanytarsus sp.
Tribelos sp.

20.03.0204

Black Creek

Mollusca

Gastropoda

Viviparus georgianus

Plecypoda

Uniomorus tetralasmus

unident. unionid

DATA SUMMARY: Black 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.	BI	#Spp.					
20.03.0204	15 Sep 75	1.918±0.202	0.139±0.064	10								2300		
	15 Sep 76	3.235±0.279	0.147±0.044	17								2300	49	

See Methods for explanation of table.

Station No. 20.03.0207 Body of Water Black Creek

Location north fork at state Hwy #21 near Middleburg

County Clay

Type Body of Water stream Classification _____

Sources of Pollution urban runoff upstream

Nearby Land Use residential, recreation

Sampling Frequency annual Depth 2.2 - 3.1 meters

Bottom Type coarse sand, gravel, detritus % Volatile Solids _____

Aquatic Plants: Submerged _____

Emergent Nuphar sp., Eichhornia crassipes, Salvinia sp.

Taxodium distichum, Pontederia sp.

Macroinvertebrates:

Porifera

Spongilla sp.

Annelida

Oligochaeta

Dero nivea

Limnodrilus hoffmeisteri

Slavina appendiculata

Arthropoda

Crustacea

Amphipoda

Hyalella azteca

Insecta

Odonata

Argia sp.

A. tibialis

Gomphus sp.

Macromia sp.

Neurocordulia sp.

N. obsoleta

N. virginiensis

Ephemeroptera

Caenis sp.

C. diminuta

C. hilaris

Cloeon sp.

Hexagenia munda elegans

Stenacron interpunctatum

Stenonema smithae

Insecta cont.

Megaloptera

Sialis sp.

Diptera

Ablabesmyia hauberiA. ornataA. parajantaCladotanytarsus sp.Coelotanypus scapularisC. tricolorCryptochironomus sp.Dicrotendipes leucoscelisD. lobusGlyptotendipes sp.Labrundinia sp.Micropsectra sp.Microtendipes sp.Nilothauma sp.Orthocladius annectensPalpomyia-Bezzia complex sp. 1 - KellyParachironomus hirtalatusP. pectinatellaeParalauterborniella nigrohalteralisPolypedilum fallaxP. halteraleProcladius sp.Psectrocladius vernalisPseudochironomus sp.Stictochironomus devinctusTanytarsus sp.Tribelos sp.T. fuscicornisXenochironomus sp.Zavrelia sp.

unident. chironomid

Coleoptera

Ancyronyx variegataLutrochus sp.Stenelmis sp.

Arachnida

Acarina

unident. sp.

Mollusca

Gastropoda

Hebetancylus excentricus

Pelecypoda

Corbicula manilensis

unident. unionid

DATA SUMMARY: Black Creek, North Fork

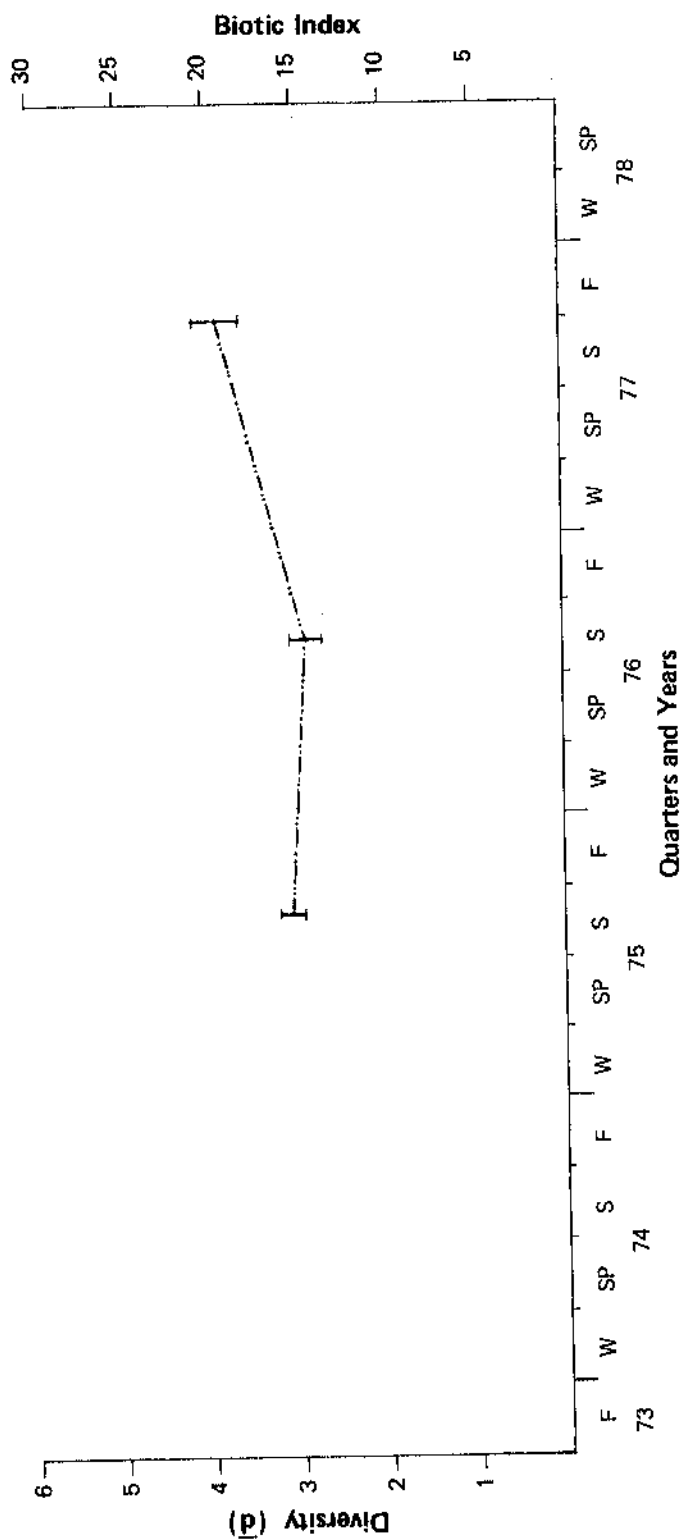
Station Number	Date	Macroinvertebrates								Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate				Artificial Substrate								
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
								BI	#Spp.					
272	20.03.0207	20 Mar 74										130		
		29 May 74										330		
		30 Sep 74										3300		
		25 Nov 74										170		
		18 Aug 75	1.381±0.253	0.712±0.074	20	3.11±0.129	0.127±0.015	21				490	49	
		26 Jul 76				2.987±0.177	0.117±0.022	15				2300	140	
		20 Sep 77				3.938±0.262	0.122±0.024	33						

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0207
 BODY OF WATER: BLACK CREEK, NORTH FORK

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



Station No. 20.03.0212 Body of Water Dunns Creek
Location at US Hwy 17
County Putnam
Type Body of Water stream Classification III
Sources of Pollution none
Nearby Land Use wooded
Sampling Frequency quarterly Depth 1 - 5 meters
Bottom Type sand, detritus % Volatile Solids _____
Aquatic Plants: Submerged Ceratophyllum demersum, Hydrilla verticillata
Emergent Eichhornia crassipes, Salvinia rotundifolia
Nuphar sp., Taxodium sp., Lemna sp., Pontederia sp., Nymphaea sp.

Macroinvertebrates:

Nematoda

unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

Tubifex tubifex

unident. lumbriculid

unident. sp.

Hirudinea

unident. sp.

Arthropoda

Crustacea

Isopoda

Chiridotea caeca

Cyathura polita

unident. sphaeromid

Amphipoda

Corophium lacustre

Gammarus tigrinus

Hyalella azteca

Decapoda

Rhithropanopeus harrisii

Arthropoda cont.

Insecta

Ephemeroptera

Ephemerella trilineataStenonema sp.

Trichoptera

Nectopsyche sp.Oecetis sp.Polycentropus sp.

unident. sp.

Diptera

Chironomus sp.Cladotanytarsus sp.Clinotanytus sp.Coelotanytus sp.C. concinnusConstempeilina sp.Dicrotendipes sp.Glyptotendipes sp.Micropsectra sp.Palpomyia-Bezzia complex sp. 1 - KellyPalpomyia tibialisParalauterborniella nigrohalteralisPolypedilum halteraleP. illinoenseProcladius sp.Psectrocladius sp.Rheotanytarsus exiguusStenochironomus hilarisTanytus sp.Tanytarsus sp.Xenochironomus sp.

unident. sp.

Arachnida

unident. sp.

Mollusca

Gastropoda

Gyraulus sp.

unident. sp.

DATA SUMMARY: Danus 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.					
276 20.03.0212	10 Sep 73											2300		
	18 Sep 73	2.879±0.219	0.067±0.035	9								130		
	17 Oct 73											790		
	13 Nov 73											230		
	10 Dec 73											330		
	21 Jan 74											49		
	4 Feb 74											33		
	4 Mar 74													
	5 Mar 74	1.864±0.136	0.243±0.034	8	0.076±0.027	0.984±0.008	5					170		
	8 Apr 74											110		
	6 May 74											130		
	1 Jun 74													

See Methods for explanation of table.

DATA SUMMARY: Penns Creek (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.					
20.03.0212	1 Jul 74										920	
	20 Aug 74	3.327±0.269	0.140±0.043	18				10	22		4900	
	27 Aug 74											
	20 Sep 74				1.953±0.142	0.169±0.042	6				1100	
	24 Sep 74										79	
	23 Oct 74										230	
	13 Nov 74										130	
	3 Dec 74										130	
	8 Jan 75											
	18 Feb 75	2.786±0.186	0.194±0.037	17								
	11 Mar 75											
	5 Apr 75	2.717±0.237	0.215±0.066	12							2-0	

See Methods for explanation of table.

DATA SUMMARY: Dunn's Creek (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.						
278	20.03.0212	16 Apr 75									130		
		21 Jun 75	0.797±0.137	0.800±0.045	13						13		
		7 Jul 75									4900		
		5 Aug 75									1600		
		30 Sep 75									33	13	
		15 Dec 75									79	4	
		3 Jan 76									460	6	
		6 Feb 76									180	2	
		22 Mar 76											
		20 Apr 76	2.369±0.154	0.207±0.035	11						1300	170	
		8 Jun 76											

See Methods for explanation of table.

DATA SUMMARY: Dunns Creek (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.				
279	20.03.0212	7 Jul 76									490	49	
		16 Aug 76									330	49	
		28 Sep 76									240	130	
		18 Oct 76									790	8	
		15 Nov 76									790	110	
		2 Feb 77									110	2	
		7 Mar 77									230	49	
		18 Jul 77									1100	79	
		9 Jan 78									230	79	
		13 Feb 78									70	23	
		24 Apr 78									490	22	

See Methods for explanation of table.

DATA SUMMARY: Dunns Creek (Cont.)

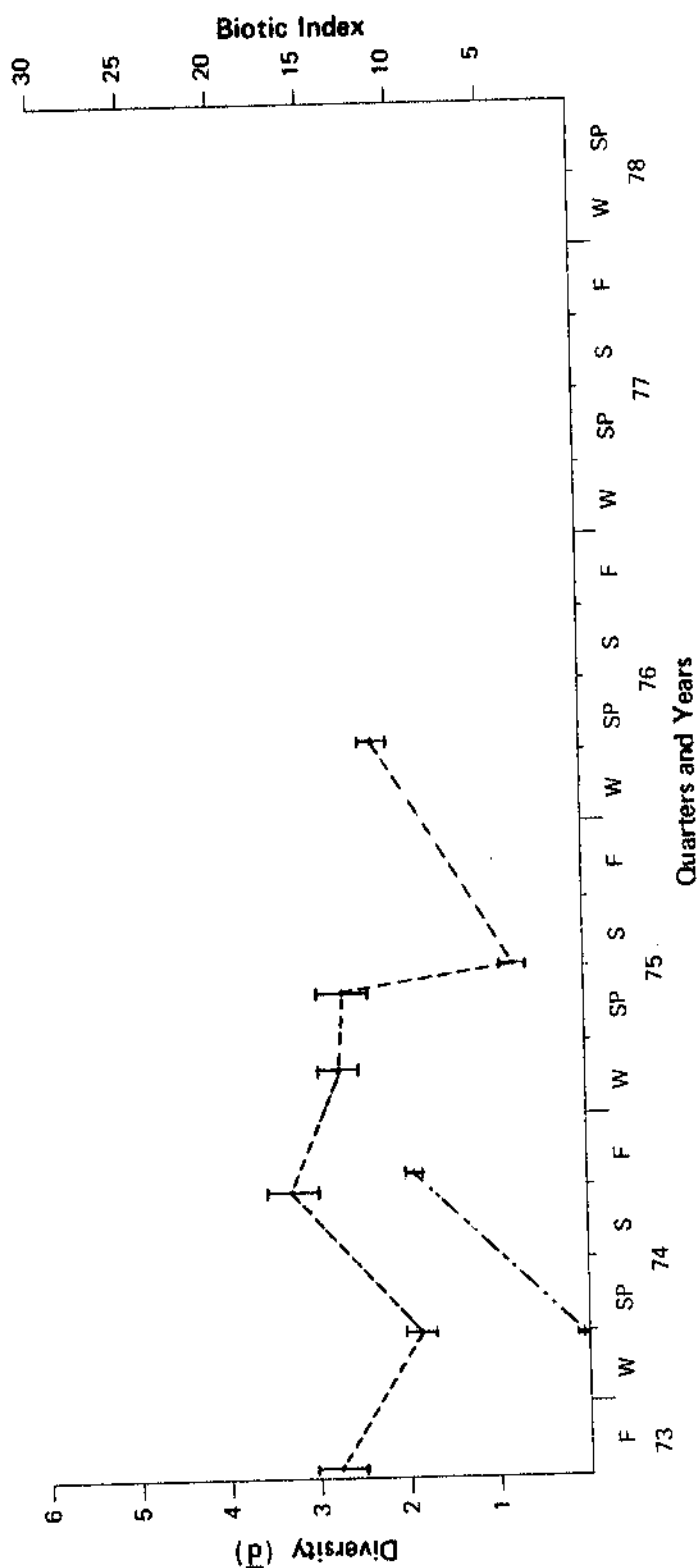
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
20.03.0212	24 May 78										790	14	
	14 Jun 78										79	4	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0212
 BODY OF WATER: DUNNS CREEK

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



Station No. 20.03.0213 Body of Water St. Johns River

Location U.S. Highway 17, City of Palatka

County Putnam

Type Body of Water river Classification III

Sources of Pollution urban run-off

Nearby Land Use east bank natural, west bank developed

Sampling Frequency quarterly Depth 1 - 4.6 meters

Bottom Type muck, detritus, sand % Volatile Solids

Aquatic Plants: Submerged Vallisneria americana, Ceratophyllum sp.,

Salvinia sp. Emergent Eichhornia crassipes, Pontederia lanceolata,

Pistia stratiotes, Lemna sp., Nuphar sp., Panicum hemitomon, Phragmites communis,
Typha latifolia, Bacopa monnieri, Najas sp.

Macroinvertebrates:

Porifera

Spongilla sp.

Nematoda

2 unident. spp.

Platyhelminthes

Turbellaria

Curtisia foremani

Cura formanii

Dugesia tigrina

Rhynchocoela

unident. sp.

Annelida

Oligochaeta

Aulodrilus pigueti

Limnodrilus hoffmeisteri

L. profundicola

Nais sp.

N. elinguis

Potamotheix hammoniensis

Premnodrilus palustris

Pristina osborni

P. longiseta leidyi

Slavina appendiculata

unident. tubificid

unident. sp.

Annelida cont.

Hirudinea

Dina lateralis
Helobdella elongata
H. stagnalis
Myzobdella moorei
unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus communis
Cyathura polita
Edotea montosa
unident. sphaeromid

Amphipoda

Corophium lacustre
Gammarus tigrinus
Hyalella azteca
Monoculodes edwardsi
Melita nitida
cf. Pontogeneia sp.
unident

Decapoda

Palaemonetes paludosus
Procambarus sp.
Rhithropanopeus harrisii

Mysidacea

cf. Neomysis americana

Insecta

Odonata

Aphylla williamsoni
Cannacria grvida
Enallagma sp.
Ischnura sp.
Nehalennia sp.

Ephemeroptera

Baetis spinosus
Caenis diminuta
Callibaetis floridanus
Stenonema integrum

Hemiptera

Abedus immaculatus
Ranatra sp.
Sigara sp.
Trichocorixa sp.
unident. sp.

Trichoptera

Cynellus fraternus
Hydroptila sp.
Oecetis sp.
Orthotrichia sp.
Polycentropus sp.

Diptera

Ablabesmyia parajanta
Chaborus sp.
Chironomus sp.
C. attenuatus
C. stigmaterus
Cladotanytarsus sp.
Coelotanypus sp.
C. concinnus
C. scapularis
C. tricolor
Cricotopus bicinctus
Cryptochironomus fulvus
Dicrotendipes modestus
D. neomodestus
D. lobus
D. nervosus
D. leucoscelis
Einfeldia sp.
Eukiefferiella sp.
Endochironomus nigricans
Glyptotendipes sp.
Lauterborniella sp.
Palpomyia-Bezzia complex sp. 1 - Kelly
P. tibialis
Paralauterborniella nigrohalteralis
Parachironomus monochromus
P. schneideri
P. carinatus
Parakiefferiella sp.
Polypedilum halterale
Procladius sp.
Psectrocladius sp.
P. vernalis
Orthocladius annectens
Rheotanytarsus exiguus
Smittia sp.
Tanytarsus sp.
Tribelos sp.
 unident. sp.

Coleoptera

Cybister sp.
Hydrocanthus oblongus
Laccophilus proximus
Stenelmis sp.
Tropisternus striolatus

Arachnida

Acarina

Acercus sp.
Mideopsis sp.
Unionicola sp.
 2 unident. spp.

20.03.0213

St. Johns River

Mollusca

Gastropoda

Amnicola sp.

Ferrissia sp.

Gyraulus sp.

Helisoma scalare

H. campanulatum

H. sp.

Physa sp.

Pomacea paludosa

5 unident. hydrobiid spp.

unident. sp.

Bryozoa

unident. sp.

DATA SUMMARY: St. John's 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	Fecal											
286	20.03.0213													
	17 Oct 73										170			
	23 Oct 73	1.899±0.153	0.343±0.056	8							790			
	13 Nov 73										1100			
	10 Dec 73										79			
	21 Jan 74										140			
	4 Feb 74										280			
	4 Mar 74													
	28 Mar 74	2.324±0.225	0.246±0.055	11							110			
	8 Apr 74										79	8		
	6 May 74										330			
3 Jun 74														

See Methods for explanation of table.

DATA SUMMARY: St. John's 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.	BI	#Spp.						
287	20.03.0213	18 Jun 74	3.159±0.108	0.075±0.014	14			2	20			700			
		1 Jul 74													
		24 Jul 74	1.890±0.250	0.361±0.092	8			2	16			1300			
		27 Aug 74										700			
		24 Sep 74										84			
		23 Oct 74										330			
		13 Nov 74													
		3 Dec 74	3.158±0.093	0.137±0.028	20								230		
		8 Jan 75													
		12 Feb 75	3.155±0.094	0.037±0.011	11			6	25				2800		2
		14 May 75	2.930±0.160	0.090±0.020	13	0.710±0.140	0.810±0.040								

See Methods for explanation of table.

DATA SUMMARY: St. John's 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.	BI	#Spp.					
20-03-0213	5 Aug 75	2.374±0.216	0.375±0.056	20	1.064±0.128	0.679±0.044	14	8	31					
	13 Oct 75	2.370±0.094	0.238±0.023	14										
	11 Feb 76	2.417±0.163	0.201±0.039	12	1.188±0.177	0.619±0.068	9	10	23					
	5 Apr 76	2.695±0.200	0.160±0.032	13										
	16 Aug 76	2.985±0.187	0.192±0.011	22				13	49		Coc Bg 1 Fil BG 1 Coc Gr 5 Fil Gr 2 Gr Flag LTL Oth Flag LTL Pen Dia 18 Pen Dia 71 Total 97			
	13 Jan 76													
	18 Mar 76										Coc BG 157 Fil BG 11			

See Methods for explanation of table.

DATA SUMMARY: St. John's 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.					
289	20.03.0213	18 Mar 76 (Cont.)								Coc Gr 940 Fll Gr 286 Gr Flag 16 Other Flag 0 Cen Dia 167 Pen Dia 32 Total 1615				
		16 Oct 76								Coc BG 30 Fll BG 23 Coc Gr 25 Fll GR 4 Gr Flag 0 Other Flag 0 Cen Dia 258 Pen Dia 108 Total 448		110	5	
		16 Dec 76	2.196±0.199	0.242±0.058	9	2.398±0.258	0.284±0.068	13						
		11 Jan 77	2.492±0.173	0.196±0.038	13				5	34				

See Methods for explanation of table.

DATA SUMMARY: St. John's 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.					
20.03.0213	13 May 77	2.740±0.200	0.127±0.036	11	0.457±0.103	0.866±0.040	7		Coc BC 29 Fil BG 176 Coc Gr 45 Fil Gr 109 Gr Flag 0 Other Flag 2 Cen Dia 136 Pen Dia 108 Total 604					
	26 Jul 77	2.904±0.121	0.147±0.015	19	1.017±0.221	0.672±0.092	7		Coc BC 2870 Fil BG 4600 Coc Gr 2150 Fil Gr 6990 Gr Flag 360 Other Flag 36560 Cen Dia 11290 Pen Dia 37280 Total 102100					

See Methods for explanation of table.

DATA SUMMARY: St. John's River (Cont.)

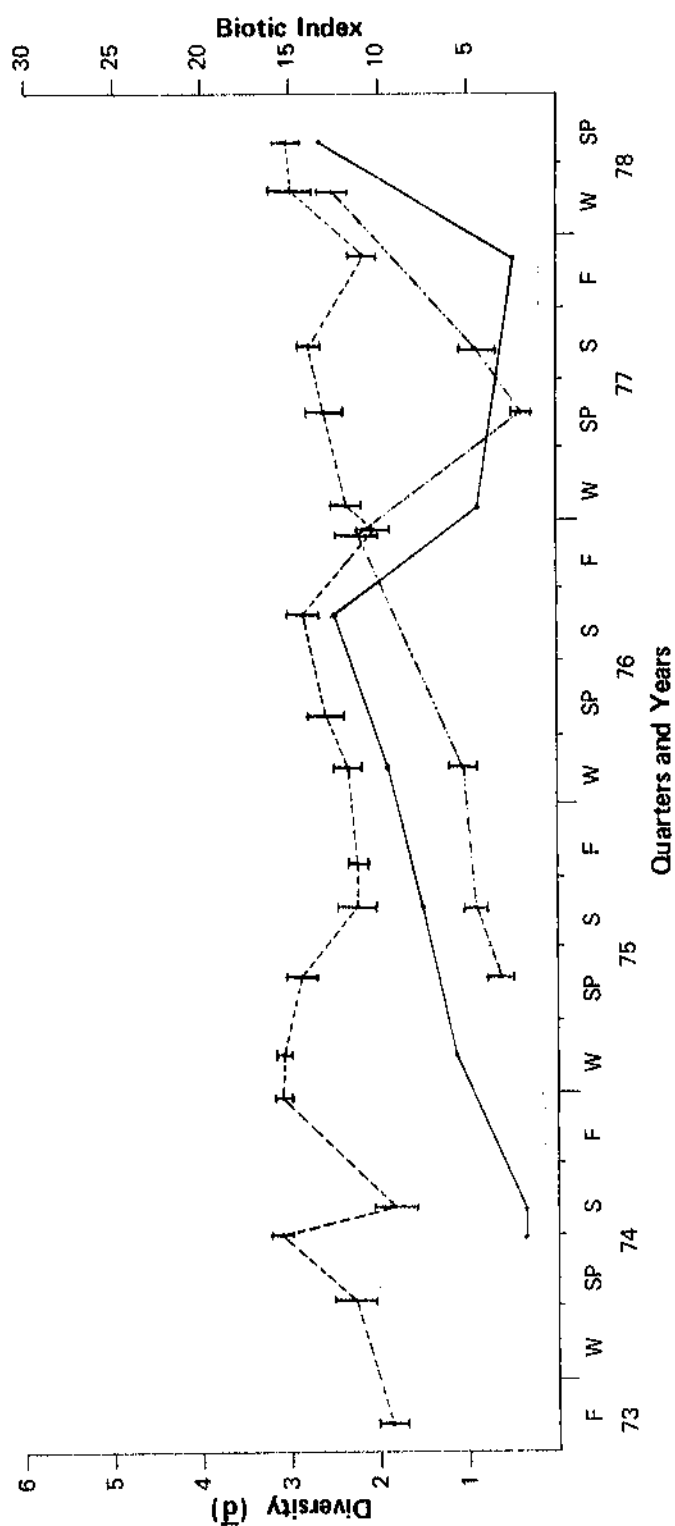
Station Number	Date	Macroinvertebrates							Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
291	20 Oct 77	2.348±0.144	0.257±0.040	12				3	19			790	79	Florida Index
	9 Jan 78											49	8	
	13 Feb 78													
	14 Feb 78	3.149±0.237	0.129±0.038	16	2.685±0.253	0.222±0.054	15				220	110		
	24 Mar 78													
	20 Apr 78	3.189±0.183	0.119±0.029	17				14	31		40	11		
	24 May 78										23	8		
	14 Jun 78													

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0213
 BODY OF WATER: ST. JOHNS RIVER

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



Station No. 20.03.0243 Body of Water Black Creek

Location confluence of North and South forks of Black Creek

County Clay

Type Body of Water freshwater stream Classification

Sources of Pollution urban runoff, septic tank leachate

Nearby Land Use residential

Sampling Frequency random Depth 4.7 - 4.8 meters

Bottom Type sand, detritus % Volatile Solids

Aquatic Plants: Submerged

Emergent Nuphar sp., Taxodium distichum, Salvinia sp.

Eichhornia crassipes, Nyssa ogeechee

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

Nais communis

Pristina osborni

Arthropoda

Insecta

Ephemeroptera

Hexagenia munda elegans

Trichoptera

Cyrtellus fraternus

Oecetis sp.

Megaloptera

Sialis sp.

Diptera

Chaoborus sp.

Cladotanytarsus sp.

Coelotanypus concinnus

C. scapularis

Pagastieilla sp.

Palpomyia-Bezzia complex sp. 1 - Kelly

Polypedilum halterale

Procladius sp.

Rheotanytarsus exiguus

Stenochironomus sp.

Tanytarsus sp.

unident. ceratopogonid

Odonata

Gomphus sp.

20.03.0243

Black Creek

Arthropoda cont.

Arachnida

Acarina

unident. sp.

Mollusca

Gastropoda

Lyogyrus sp.

Pelecypoda

Corbicula manilensis

unident. unionid

DATA SUMMARY: Black 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.	BI	#Spp.				
295	20 Mar 74										1300		
	29 May 74										790		
	25 Nov 74										330		
	18 Aug 75	1.923±0.259	0.525±0.073	18									
	26 Jul 76	2.590±0.400	0.396±0.098	17									

See Methods for explanation of Table.

Station No. 20.03.0244 Body of Water Black Creek

Location south fork at State Hwy #218, near Middleburg

County Clay

Type Body of Water stream Classification

Sources of Pollution urban runoff

Nearby Land Use light residential

Sampling Frequency annual Depth 1.22 - 3.1 meters

Bottom Type fine sand, detritus % Volatile Solids

Aquatic Plants: Submerged

Emergent Nuphar sp., Salvinia sp., Taxodium distichum,

Nyssa ogeechee, Eichhornia sp., Cephalanthus sp.

Macroinvertebrates:

Platyhelminthes

Turbellaria

unident. sp.

Annelida

Oligochaeta

Aulodrilus pigueti

Limnodrilus hoffmeisteri

Nais communis

N. elinguis

Arthropoda

Crustacea

Isopoda

Asellus sp.

Amphipoda

Gammarus tigrinus

Insecta

Odonata

Argia tibialis

Enallagma sp.

Neurocordulia sp.

N. obsoleta

Tetragoneuria cynosura

Insecta cont.

Ephemeroptera

Baetis spinosus
Caenis diminuta
Choroterpes hubbelli
Hexagenia munda elegans
Stenonema exiguum
S. smithae
Stenacron interpunctatum

Trichoptera

Cynellus fraternus
Polycentropus sp.
unident. sp.

Megaloptera

Sialis sp.

Diptera

Ablabesmyia parajanta
A. philosophagnos
A. tarella
Cladotanytarsus sp.
Conchapelopia sp.
Corynoneura taris
Cricotopus bicinctus
Cryptochironomus sp.
Dicrotendipes leucoscelis
Labrundinia neopilosella
L. virescens
Micropsectra sp.
Palpomyia-Bezzia complex sp. 1 - Kelly
Paracladopelma sp.
Parachironomus hirtalatus
Paralauterborniella nigrohalteralis
Parametriocnemus sp.
Pentaneura inculta
Polypedilum fallax
P. halterale
P. illinoense
Procladius sp.
Pseudochironomus sp.
Stenochironomus aestivalis
Tanytarsus sp.
Tribelos fuscicornis
T. sp.
Xenochironomus sp.

Coleoptera

Ancyronyx variegata
Stenelmis sp.

DATA SUMMARY: Black Creek

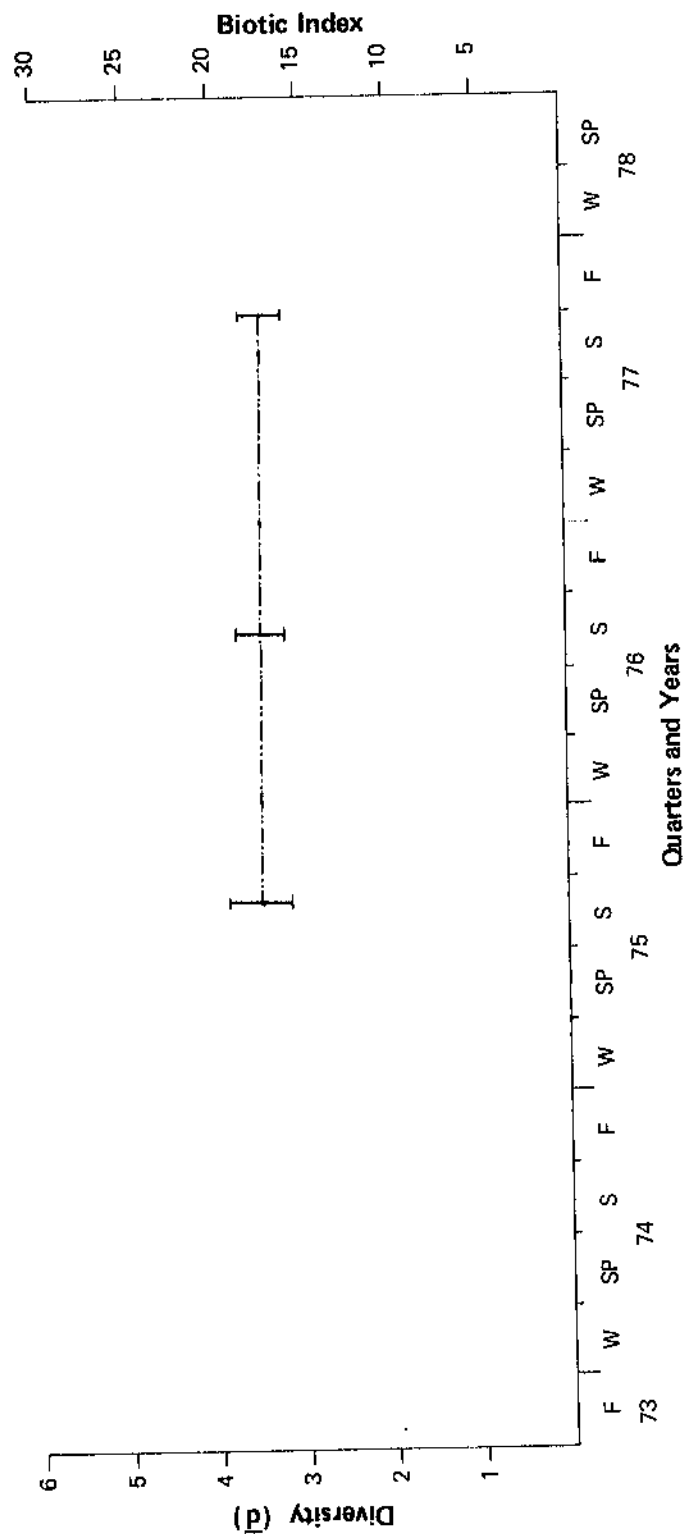
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
20.03.0244	20 Mar 74											1100		
	29 May 74											700		
	30 Sep 74											17000		
	25 Nov 74											330		
	18 Aug 75	2.995±0.372	0.287±0.085	18	0.500±0.178	0.107±0.021	23					54000	35000	
	26 Jul 76				3.447±0.275	0.110±0.033	18					2300	1300	
	20 Sep 77				3.441±0.222	0.123±0.037	20							

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0244
 BODY OF WATER: BLACK CREEK, S. FORK
 AT S.R. 218

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



Station No. 20.03.0247 Body of Water Black Creek

Location South fork at SR 16

County Clay

Type Body of Water fresh water stream Classification _____

Sources of Pollution road runoff

Nearby Land Use _____

Sampling Frequency random Depth 0 - 1 meter

Bottom Type sand, detritus % Volatile Solids _____

Aquatic Plants: Submerged Vallisneria sp.

Emergent Salix caroliniana, Taxodium distichum,

Alternanthera sp.

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri
Pelosclex ferox
unident. lumbriculid
unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.
A. communis

Amphipoda

Crangonyx floridanus
Gammarus tigrinus

Decapoda

Palaemonetes paludosus
Procambarus (Ortmannicus) sp.
P. pictus
P. sp.

Insecta

Odonata

Argia sp.
Boyeria vinosa
Calopteryx sp.
C. diminuta
Dromogomphus armatus
D. spinosus
Enallagma sp.

Insecta cont.

Odonata cont.

Gomphus sp.
Hagenius brevistylus
Macromia sp.
M. taeniolata
Progomphus sp.

Ephemeroptera

Baetis sp.
B. spinosus
Stenonema exiguum
S. pulchellum
S. smithae

Hemiptera

Lethocerus sp.
Notonecta sp.
Ranatra sp.
Sigara sp.

Trichoptera

Cheumatopsyche sp.
Chimarra aterrima
Nectopsyche candida
Oecetis sp.
Polycentropus sp.
Pycnopsyche sp.

Megaloptera

Corydalus cornutus

Diptera

Ablabesmyia parajanta
A. tarella
Chironomus attenuatus
Clinotanypus sp.
Cryptochironomus blarina
Palpomyia-Bezzia complex sp. 1 - Kelly
Pentaneura incul
Polypedilum halterale
P. illinoense
Simulium sp.
Stenochironomus hilaris
Thienemaniella xena
Tipula sp.
Tribelos fuscicornis
T. jucundus

Coleoptera

Celina sp.
Berosus sp.
Deronectes sp.
Gyrinus sp.
Hydrochus sp.
Macronychus glabratus
Peltodytes sp.
Stenelmis sp.
S. fuscata

20.03.0247

Black Creek

Mollusca

Gastropoda

Campeloma geniculum

Ferrissia sp.

Viviparus sp.

Pelecypoda

Sphaerium sp.

DATA SUMMARY: Black Creek

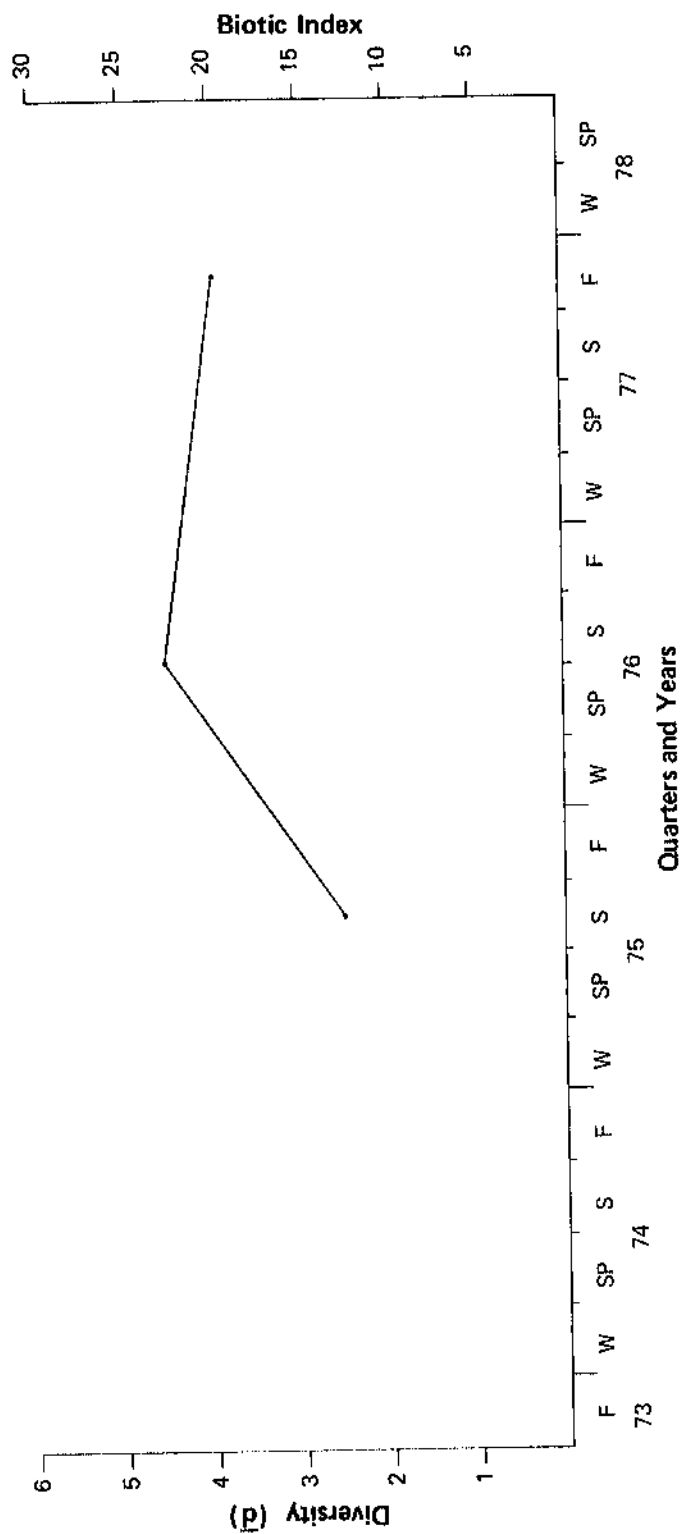
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate							
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
		BI	#Spp.	Total	Fecal							
20.03.0247 303	28 Feb 74										1100	
	1 May 74										330	
	1 Aug 75							13	21			
	28 Jun 76							23	36			
	10 Nov 77							20	25			
												Florida Index

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0247
 BODY OF WATER: BLACK CREEK, S. FORK
 AT S.R. 16

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



Station No. 20.03.0253 Body of Water Etonia Creek
Location at State Road 309 bridge
County Putnam
Type Body of Water stream Classification
Sources of Pollution agricultural runoff, urban runoff

Nearby Land Use agriculture and silviculture, some residential
Sampling Frequency annual Depth 0.5 - 2.0 meters
Bottom Type fine sand, detritus % Volatile Solids
Aquatic Plants: Submerged none
Emergent Salix sp., Nuphar sp., Taxodium sp.

Macroinvertebrates:

Platyhelminthes

Turbellaria

unident. sp.

Rhynchocoela

Prostoma rubrum

Annelida

Oligochaeta

Aeolosoma niveum

Limnodrilus hoffmeisteri

Nais sp.

Pristina foreli

Tubifex sp.

unident. tubificid

Hirudinea

Helobdella elongata

H. fusca

H. lineata

H. stagnalis

Arthropoda

Crustacea

Amphipoda

Gammarus tigrinus

Hyalella azteca

Arthropoda cont.

Insecta

Odonata

Argia sp.
Gomphus (Stylurus) sp.
Ischnura sp.
Macromia sp.

Hemiptera

Abedus immaculatus
Hebrus sp.
Trichocorixa sp.

Trichoptera

Oecetis sp.

Diptera

Ablabesmyia parajanta
Clinotanypus sp.
Coelotanypus tricolor
Cryptochironomus blarina
C. fulvus
Harnischia sp.
Palpomyia-Bezzia complex sp. 1 - Kelly
Paralauterborniella nigrohalteralis
Polypedilum halterale
Rheotanytarsus exiguus
Tanytarsus sp.
Tribelos sp.

Coleoptera

Ancyronyx variegata
Dubiraphia sp.
D. vittata
Gyrinus rockinghamensis
Microcylloepus pusillus lodingi

Mollusca

Gastropoda

Amnicola sp.
cf. Ferrissia sp.
Physa sp.
unident hydrobiid

Pelecypoda

Elliptio complanata
E. congaraea
Eupera cubensis
Sphaerium sp.
S. partumeium
unident. unionid

DATA SUMMARY: Eronia 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.						
307	20 Aug 73										4900		
	17 Oct 73										9200		
	10 Dec 73										7000		
	21 Jan 74										3300		
	4 Feb 74										4600		
	10 Apr 74										2300		
	12 Jun 74										35000		
	26 Sep 74										15000		
	10 Dec 74										1300		
	20 Aug 75	1.800±0.235	0.507±0.071	17				6	23		13000	7900	
	2 Jul 76	2.241±0.185	0.287±0.046	13				10	29		24000	13000	Florida Index

See Methods for explanation of table.

DATA SUMMARY: Etonia Creek (Cont.)

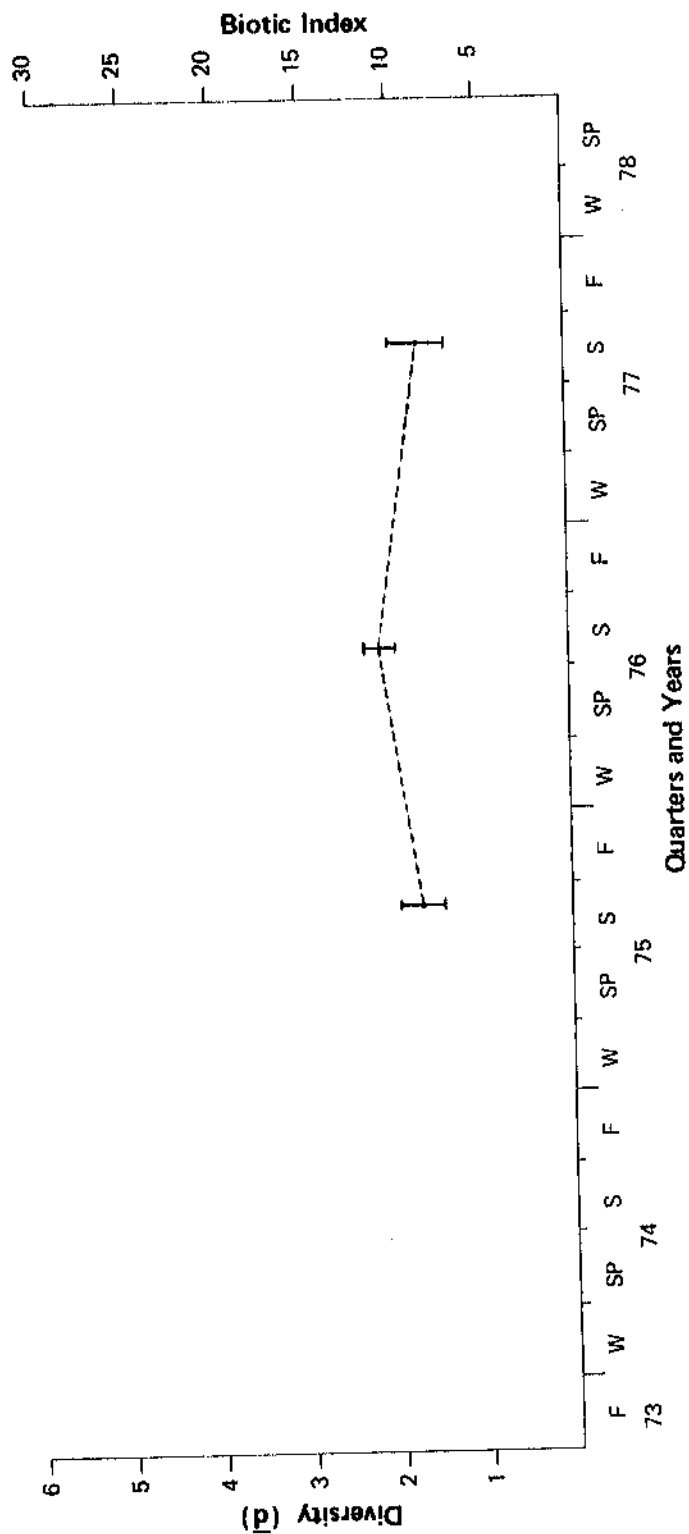
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
308 20.03.0253	4 Aug 77	1.787±0.309	0.483±0.107	10							35000	11000	
	9 Jan 78										24000	24000	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0253
 BODY OF WATER: ETONIA CREEK AT S.R. 309

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



Station No. 20.03.0278 Body of Water Kingsley Lake
Location NW section at SR 16
County Clay
Type Body of Water lake Classification _____
Sources of Pollution urban runoff
Nearby Land Use residential
Sampling Frequency annual Depth 4.92 - 6.10 meter
Bottom Type sand, mud, detritus % Volatile Solids _____
Aquatic Plants: Submerged Utricularia sp.
Emergent _____

Macroinvertebrates:

Nematoda

unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

unident. lumbriculid

Hirudinea

Helobdella elongata

Arthropoda

Crustacea

Amphipoda

Hyalella azteca

Gammarus tigrinus

Insecta

Trichoptera

Oecetis sp.

2 unident. sp.

Diptera

Ablabesmyia parajanta

Chironomus attenuatus

C. stigmaterus

Cladotanytarsus sp.

Clingtanypus sp.

Dicrotendipes lobus

Palpomyia-Bezzia complex sp. 1 - Kelly

Diptera (cont.)

Polypedilum halterale
P. illinoense
Rheotanytarsus exiguus
Tanytarsus sp.

Arachnida

Acarina

Arrenurus sp.
Atractides sp.
Mideopsis sp.

Mollusca

Gastropoda

Helisoma sp.
Gyraulus sp.

DATA SUMMARY: Kingsley Lake

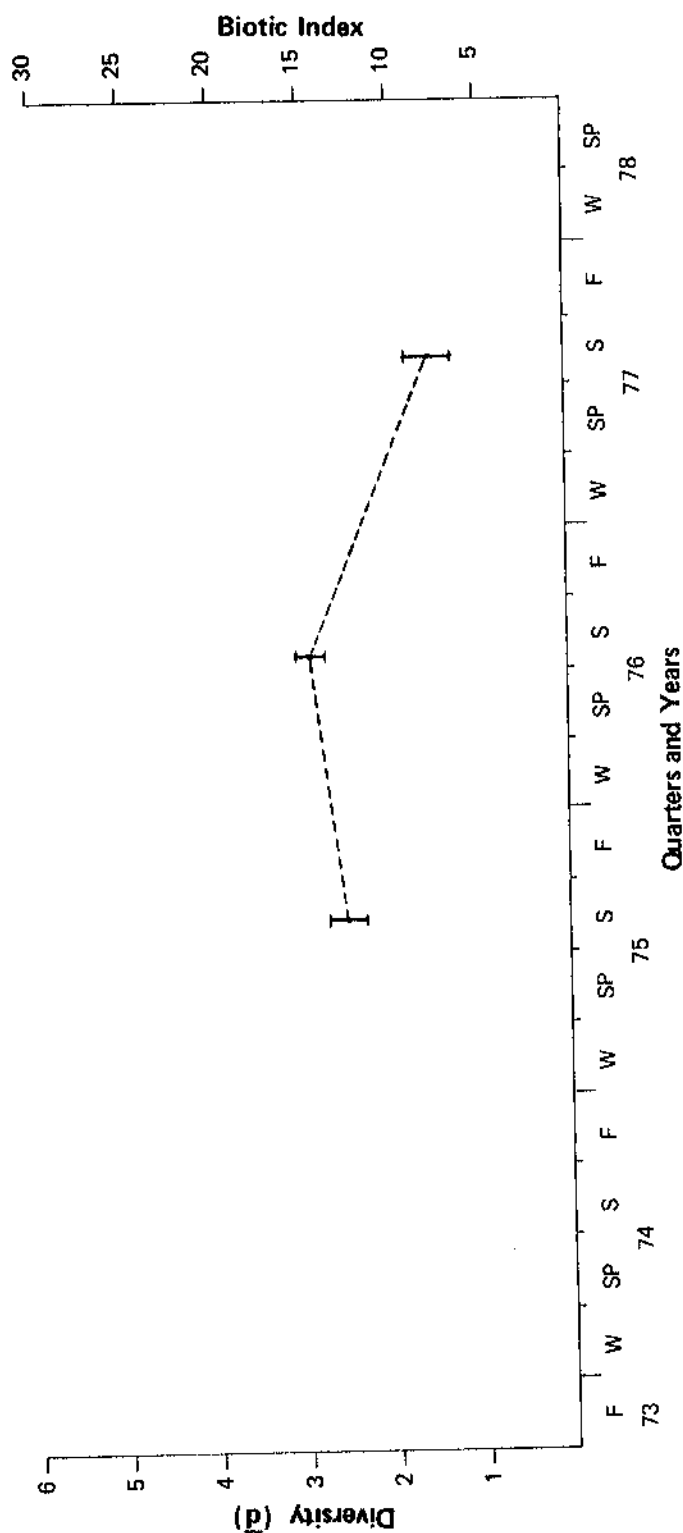
Station Number	Date	Macroinvertebrates								Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate			BI	#Spp.			Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
20.03.0278	22 Jul 75	2.583±0.203	0.199±0.036	14							33			
	30 Jun 76	2.941±0.179	0.131±0.028	15							21	13		
	20 Jul 77	1.600±0.260	0.616±0.079	15										

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0278
 BODY OF WATER: KINGSLEY LAKE AT S.R. 16

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



Station No. 20.03.0317 Body of Water Julington Creek

Location at Hood's Landing

County Duval

Type Body of Water stream Classification

Sources of Pollution residential runoff

Nearby Land Use some residential, mostly natural, fish camp

Sampling Frequency Depth 1.6 - 3.1 meters

Bottom Type detritus, sand, silt % Volatile Solids

Aquatic Plants: Submerged

Emergent Pistia stratiotes, Nuphar sp., Eichhornia sp.

Taxodium sp., Alternanthera sp., Panicum sp., Lemna sp., Salvinia sp.

Macroinvertebrates:

Annelida

Oligochaeta

Aulodrilus pigueti
Limnodrilus hoffmeisteri
Nais communis
Pelosclex ferox
unident. lumbriculid

Polychaeta

Scolecoides viridis
Streblospio benedicti

Arthropoda

Crustacea

Isopoda

Cyathura polita

Amphipoda

Gammarus tigrinus

Decapoda

Rhithropanopeus harrisii

Cirripedia

Balanus improvisus

Insecta

Odonata

Aphylla williamsoni
Perithemis tenera

Insecta cont.

Ephemeroptera

Caenis sp.C. diminuta

Trichoptera

Oecetis sp.

Diptera

Chaoborus sp.Chironomus attenuatusClinotanypus sp.Coelotanypus concinnusC. tricolorCryptotendipes sp.Lauterborniella sp.Palpomyia-Bezzia complex sp. 1 - KellyPolypedilum halteraleProcladius sp.Tanytarsus sp.

Mollusca

Gastropoda

Amnicola sp.Littoridinops monroensis

unident. hydrobiid

Pelecypoda

Mytilopsis leucophaeataPisidium dubiumRangia cuneata

DATA SUMMARY: Jurlington Creek

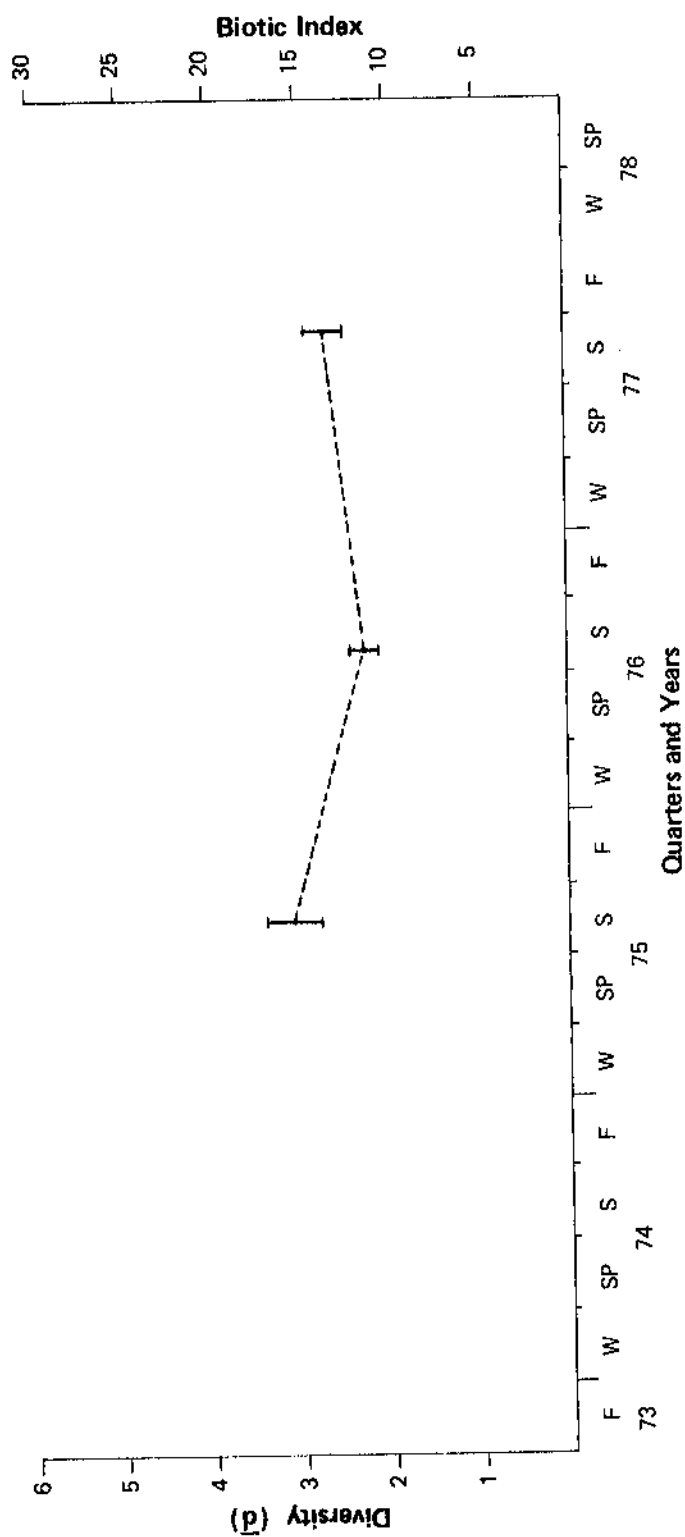
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml	Comments
		Natural Substrate			Artificial Substrate							
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.					
20.03.0317	29 Jul 75	3.152±0.306	0.163±0.049	16								
	14 Jul 76	2.391±0.148	0.151±0.031	9							4600	
	23 Aug 77	2.769±0.207	0.206±0.038	18							31	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0317
 BODY OF WATER: JULINGTON CREEK
 AT HOOD'S LANDING

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



Station No. 20.03.0362 Body of Water St. Johns River
Location at Piccolata, Channel Marker #25
County St. Johns
Type Body of Water river Classification _____
Sources of Pollution urban runoff, septic tank leachate
Nearby Land Use light residential
Sampling Frequency annual Depth 3.0 - 5.64 meters
Bottom Type sand, muck, shell, detritus % Volatile Solids _____
Aquatic Plants: Submerged Vallisneria sp., Najas sp.
Emergent Eichhornia crassipes, Taxodium sp.,
Juncus sp.

Macroinvertebrates:

Nematoda

unident. sp.

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

Nais elinguis

Tubifex tubifex

unident. tubificid

Polychaeta

Polydora sp.

Streblospio benedicti

Arthropoda

Crustacea

Isopoda

Cassidinisca lunifrons

Cyathura polita

Amphipoda

Corophium lacustre

Gammarus tigrinus

Monoculodes edwardsi

Decapoda

Rhithropanopeus harrisi

Mysidacea

unident. sp.

Cirripedia

Balanus improvisus

Arthropoda cont.

Insecta

Diptera

Chironomus sp.C. attenuatusCladotanytarsus sp.Coelotanypus concinnusCryptochironomus sp.C. fulvusDicrotendipes lobusD. nervosusD. sp.Glyptotendipes sp.Palpomyia-Bezzia complex sp. 1 - KellyPolypedilum halterale

Mollusca

Gastropoda

2 unident. hydrobiid spp.

Pelecypoda

Mytilopsis leucophaetaRangia cuneata

DATA SUMMARY: St. John's River

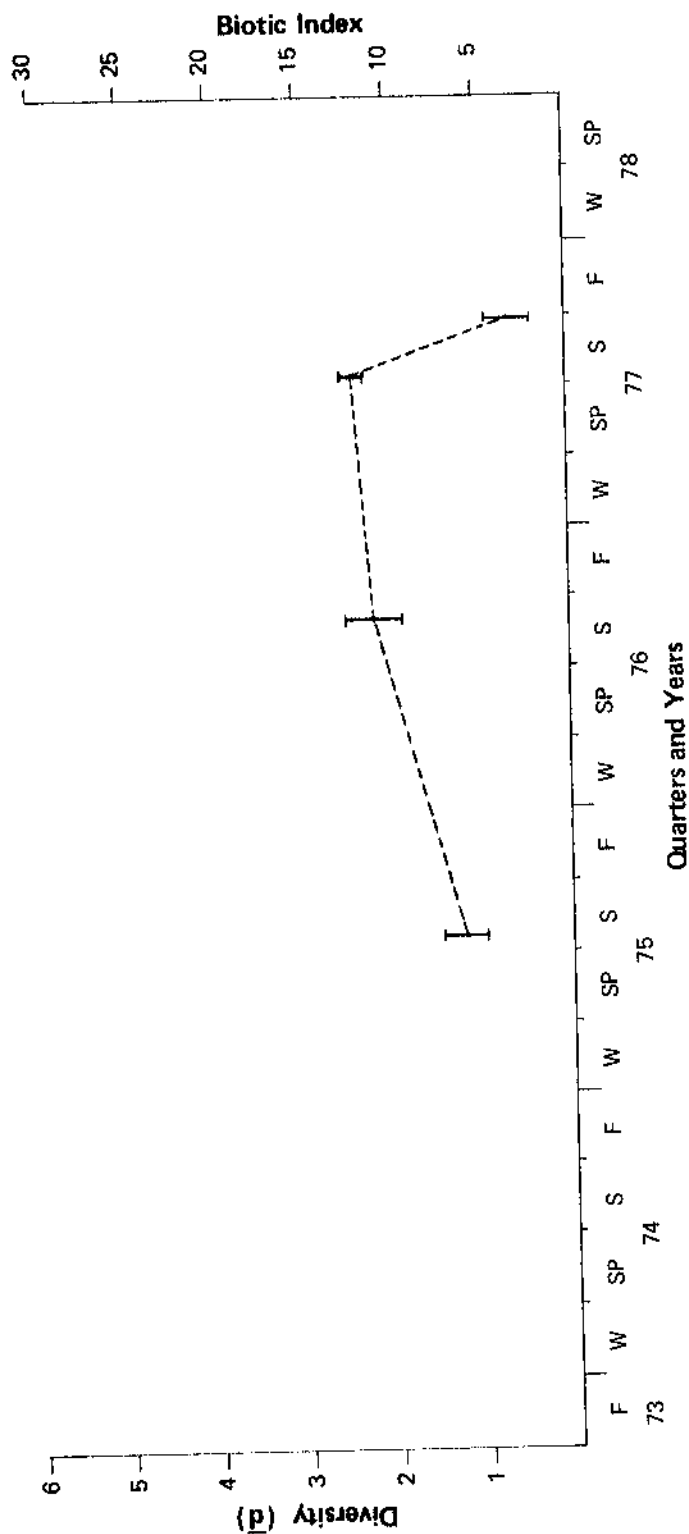
Station Number	Date	Macroinvertebrates								Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate			Total	Fecal						
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.								
320 20.03.0362	1 Jul 75	1.265±0.230	0.597±0.092	7								4900	12		
	11 Aug 76	2.220±0.332	0.350±0.087	12								12	2		
	28 Jun 77	2.454±0.127	0.219±0.023	16											
	8 Sep 77	0.678±0.272	0.894±0.092	8											

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0362
 BODY OF WATER: ST. JOHNS RIVER

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



Station No. 20.03.0373 Body of Water St. Johns River
Location at channel marker #72 midstream, just north of Lake George
County Putnam
Type Body of Water river Classification III
Sources of Pollution agricultural and domestic sources
Nearby Land Use low density residential and natural
Sampling Frequency quarterly Depth 4.3 m
Bottom Type detritus, sand, mud % Volatile Solids
Aquatic Plants: Submerged none
Emergent Eichhornia crassipes

Macroinvertebrates:

Annelida

Oligochaeta

Aulodrilus piqueti
Limnodrilus hoffmeisteri
cf. Tubifex sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.
Cyathura polita

Amphipoda

Gammarus sp.

Insecta

Trichoptera

Oecetis sp.

20.03.0373

Diptera

Bezzia sp.
Chaoborus punctipennis
Chironomus crassicaudatus
Coelotanypus tricolor
C. concinnus
C. scapularis
Einfeldia sp.
Glyptotendipes paripes
Procladius sp.
Tanytarsus sp.

Mollusca

Gastropoda

Hyalopyrgus aequicostatus

DATA SUMMARY: St. John's 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			BI	#Spp.			Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.								
324 20-03.0373	18 Sep 73	2.082±0.091	0.212±0.022	9								33			
	19 Dec 73											11			
	4 Mar 74														
	28 Mar 74				0.222±0.088	0.963±0.026	7					110			
	8 Apr 74											0	0		
	1 May 74											220	100		
	7 Aug 74											640	70		
	4 Sep 74											70	20		
	2 Oct 74												60		
	9 Dec 74											100	0		
	14 Jan 75														

See Methods for explanation of table.

DATA SUMMARY: St. John's 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.						
20,03-0373	19 Feb 75	1.139±0.031	0.217±0.011	3					Coc BG 0 Fil BG 612 Coc Gr 723 Fil Gr 0 Cr Flag 56 Other Flag 0 Cen Dia 278 Pen Dia 111 Total 1779		131		
	11 Mar 75										110		
	2 Apr 75										40	30	
	4 Jun 75										0	0	
	7 Jul 75										0	0	
	6 Aug 75										0	0	
	3 Sep 75										100	0	

See Methods for explanation of table.

DATA SUMMARY: St. John's 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		#Spp.	Redundancy				#Spp.	Total		Fecal		
		Diversity	Redundancy	#Spp.	Diversity										Redundancy	#Spp.
326 20.03.0373	4 Nov 75										20	10				
	5 Dec 75										60	0				
	2 Mar 76										40	0				
	6 Apr 76	1.530±0.160	0.500±0.062			8					40	70				
	6 Jul 76											0				
	17 Jan 77	0.626±0.206	0.833±0.083			6						4				
	2 Feb 77										0	0				
	4 May 77										0	0				
	8 Jun 77										20	3				
6 Jul 77																
2 Aug 77											3	0				

See Methods for explanation of table.

DATA SUMMARY: St. John's River (Cont.)

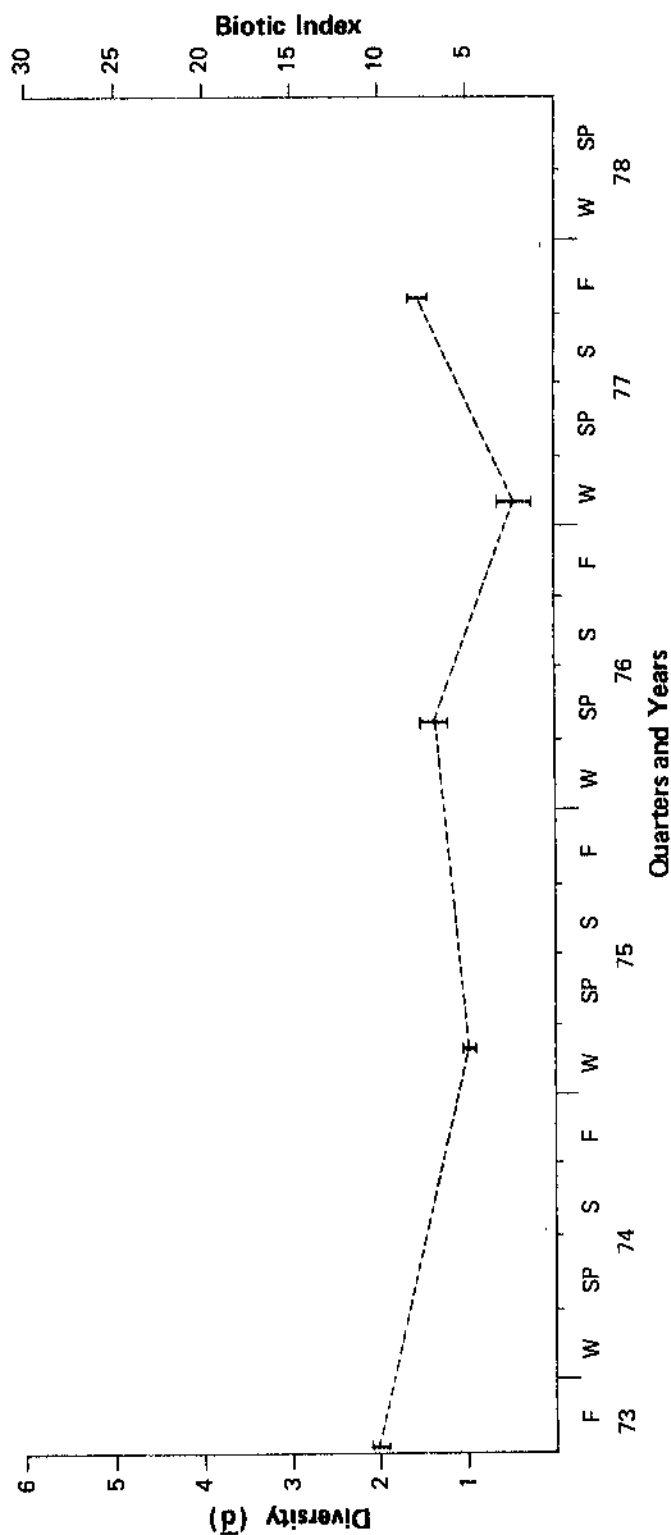
DATA SUMMARY: St. John's River (Cont.)													
Station Number	Date	Macroinvertebrates						Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments	
		Natural Substrate			Artificial Substrate					Total	Fecal		
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
													BI
327												Florida Index	
20.03.0373	4 Oct 77	1.781±0.099	0.384±0.034	11						101	44	8	
	3 Jan 78												
	6 Feb 78												
	6 Mar 78									65	37		

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0373
 BODY OF WATER: ST. JOHNS RIVER

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



Station No. 20.03.0398 Body of Water Haw Creek

Location Black Branch at SR 305

County Flagler

Type Body of Water freshwater stream Classification

Sources of Pollution agricultural runoff

Nearby Land Use agriculture

Sampling Frequency Depth

Bottom Type % Volatile Solids

Aquatic Plants: Submerged Myriophyllum brasiliense

Emergent Taxodium sp., Salvinia rotundifolia,

Alternanthera philoxeroides, Salix sp., Baccharis sp., Cephalanthus occidentalis
Eichhornia crassipes

Macroinvertebrates:

Platyhelminthes

Planaria sp.

Annelida

Hirudinea

unident. sp.

Arthropoda

Crustacea

Isopoda

Asellus sp.

Amphipoda

Gammarus tigrinus

Hyalella azteca

Decapoda

Palaemonetes paludosus

Procambarus sp.

Insecta

Odonata

Argia moesta

Didymops sp.

Dromogomphus spinosus

Enallagma sp.

Epicordulia regina

Erythemis simplicollis

Ischnura sp.

Leptthemis vesiculosa

Macromia sp.

Nasiaeschna sp.

Nehalennia sp.

Tetragoneuria sp.

Insecta cont.

Ephemeroptera

Baetis sp.
Caenis sp.
C. diminuta
Centroptilum viridocularis
Callibaetis floridanus
Stenacron interpunctatum

Trichoptera

Oecetis sp.
unident. sp.

Hemiptera

Abedus immaculatus
Mesovelgia mulsanti
Nerthra sp.
Plea striola
Ranatra sp.

Megaloptera

Sialis sp.

Diptera

Ablabesmyia americana
A. parajanta
Chrysops sp.
Cladotanytarsus sp.
Clinotanytus sp.
Cricotopus bicinctus
Culex sp.
Glyptotendipes sp.
Palpomyia-Bezzia complex sp. 1 - Kelly
Paralauterborniella nigrohalteralis
Polypedilum halterale
Psectrotanytus sp.
unident. sp.

Coleoptera

Ancyronyx variegatus
Copelatus sp.
Cybister sp.
Dineutus sp.
D. discolor
Dubiraphia sp.
Hydrobius sp.
Peltodytes sp.
P. floridanus
Stenelmis fuscata
Thermonectus sp.

Arachnida

Acarina

Arrenurus sp.
Mideopsis sp.
unident. sp.

20.03.0398

Haw Creek

Mollusca

Gastropoda

Campeloma geniculum

Ferrissia sp.

Gyraulus sp.

Lyogyrus sp.

Physa sp.

Pomacea paludosa

Pseudosuccinea sp.

Viviparus sp.

V. georgianus

Pelecypoda

Sphaerium sp.

unident.-unionid

DATA SUMMARY: Haw Creek

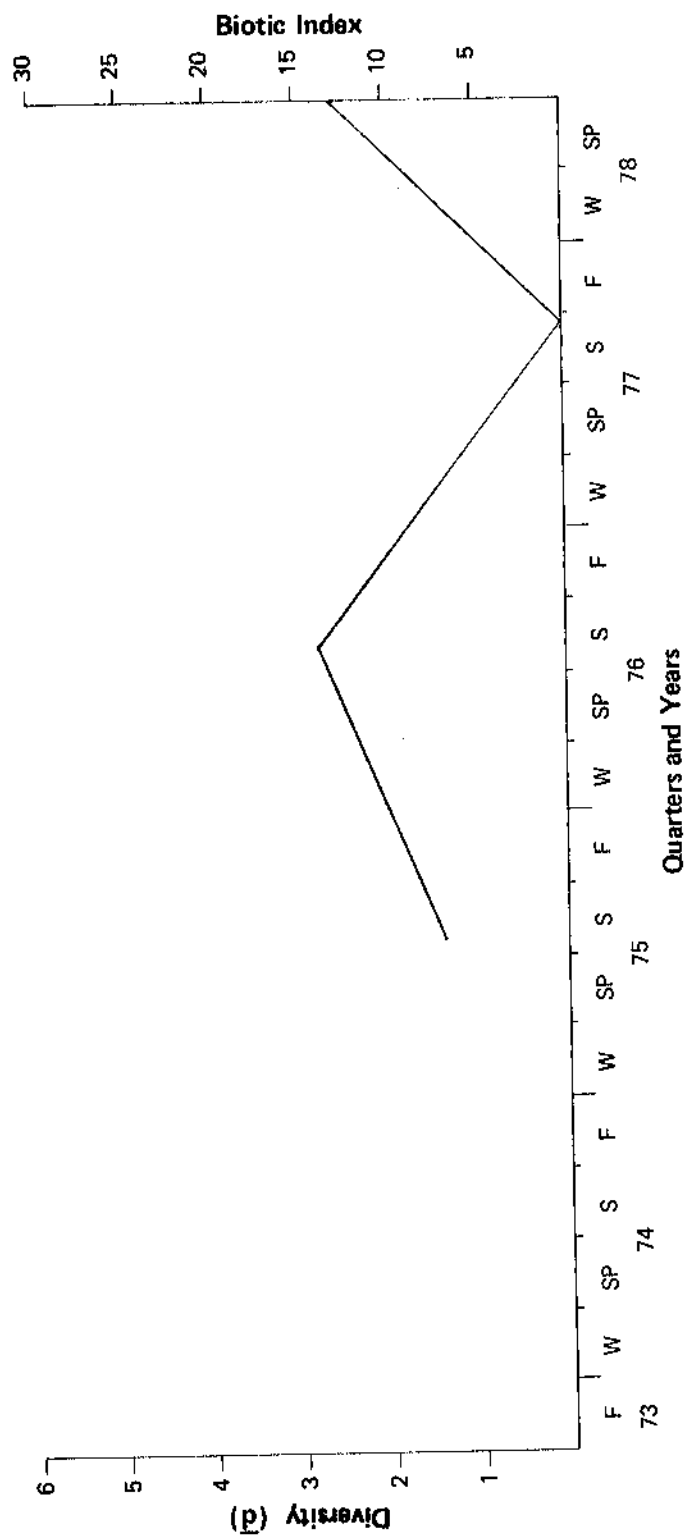
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm3	Periphyton Composition units/cm2	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
		BI	#Spp.											
20.03.0398	3 Jul 75							7	27				Florida Index	
	12 Jul 75							14	36					
	30 Aug 77							0	25					
	29 Jun 78							13	45					

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0398
 BODY OF WATER: HAW CREEK

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



Station No. 20.03.0400 Body of Water George's Lake
Location south end of lake
County Putnam
Type Body of Water lake Classification _____
Sources of Pollution urban runoff
Nearby Land Use light residential
Sampling Frequency annual Depth 0.8 - 4 meters
Bottom Type muck, sand, silt, detritus % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Taxodium sp., Nyssa sp., Panicum sp.
Nuphar sp., Eichhornia crassipes

Macroinvertebrates:

Annelida

Oligochaeta

Homochaeta naidina

Nais sp.

unident. naidid

Hirudinea

Helobdella elongata

Arthropoda

Crustacea

Amphipoda

Gammarus tigrinus

Hyaella azteca

Insecta

Odonata

Argia tibialis

Enallagma sp.

Erythrodiplax sp.

Gomphus sp.

Macromia sp.

Tetragoneuria sp.

Ephemeroptera

Hexagenia munda orlando

Trichoptera

Cynellus fraternus

Chimarra sp.

Oecetis sp.

Oxyethira sp.

Polycentropus sp.

unident. sp.

Insecta cont.

Diptera

Ablabesmyia parajanta
Chaoborus sp.
Cladotanytarsus sp.
Cricotopus sp.
Dicrotendipes lobus
D. leucoscelis
D. neomodestus
D. nervosus
Glyptotendipes sp.
Labrundinia neopilosella
L. virescens
Microtendipes sp.
Nilothauma sp.
Orthocladius annectens
Pagastiella sp.
Parachironomus schneideri
Pentaneura inculta
Polypedilum halterale
P. illinoense
Psectrocladius vernalis
Stenochironomus hilaris
Tanytarsus sp.
Tribelos sp.
T. fuscicornis

Coleoptera

Ancyronyx variegata
Stenelmis sp.

Arachnida

Arrenurus sp..
Frontipoda sp.

DATA SUMMARY: George's Lake

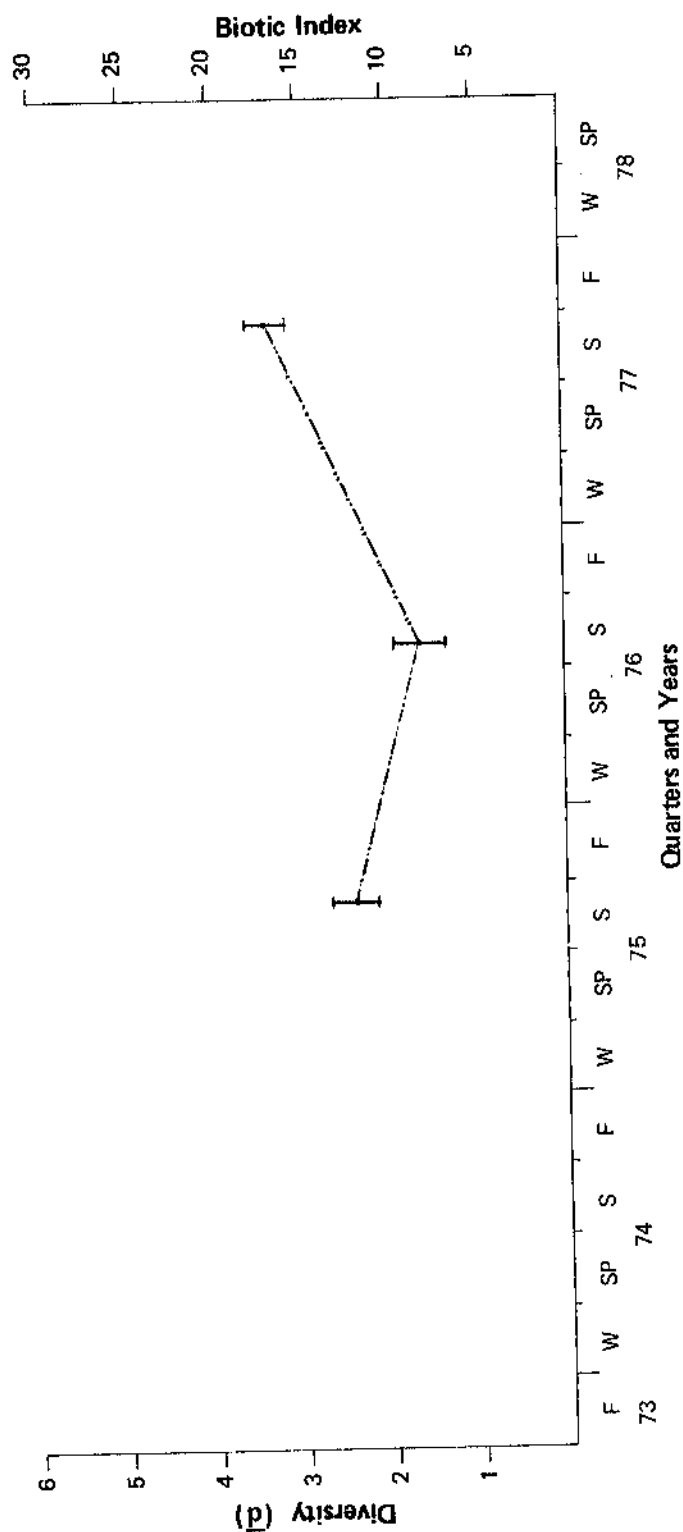
Station Number	Date	Macroinvertebrates								Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate				Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.								
20.03.0400	22 Jul 75	2.042+0.537	0.487+0.189	8								350	LT 2		
	20 Aug 75				2.454+0.265	0.232+0.053	12					220	LT 2		
	22 Jun 76											2	LT 2		
	20 Jul 76				1.723+0.288	0.472+0.100	10					LT 1.8	LT 2		
	15 Nov 76											1700	LT 2		
	28 Mar 77				3.412+0.223	0.103+0.025	19					5	2		
	1 Sep 77														

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0400
 BODY OF WATER: GEORGES LAKE

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



Station No. 20.03.0401 Body of Water Lake Disston
Location SR #305-A
County Flagler
Type Body of Water lake Classification _____
Sources of Pollution suburban runoff
Nearby Land Use light residential
Sampling Frequency irregular Depth 3.89 - 4.4 meters
Bottom Type sand, mud % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Nuphar sp., Taxodium sp., Salvinia sp.,
Panicum hematomon, Typha sp., Pontedaria sp.

Macroinvertebrates:

Annelida

Oligochaeta

Limnodrilus hoffmeisteri

Hirudinea

Helobdella elongata

H. stagnalis

Arthropoda

Crustacea

Amphipoda

Gammarus tigrinus

Hyalella azteca

Insecta

Ephemeroptera

Hexagenia munda orlando

Diptera

Chaoborus sp.

Chironomus sp.

Coelotanypus sp.

C. tricolor

Polypedilum halterale

Procladius sp.

Mollusca

Gastropoda

Viviparus sp.

Pelecypoda

Sphaerium sp.

DATA SUMMARY: Lake Diaton

Station Number	Date	Macroinvertebrates										Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate			#Spp.	Diversity	Redundancy	#Spp.			BI	#Spp.	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.									
20.03.0401	3 Jul 75	1.809±0.324	0.288±0.103	5									5	2		
339	12 Jul 76	2.584±0.321	0.222±0.077	11												

See Methods for explanation of table.

Station No. 20.03.0410 Body of Water Crescent Lake
Location at marker 7 near Bear Island
County Putnam - Flagler
Type Body of Water lake Classification _____
Sources of Pollution urban runoff, septic tank leachate
Nearby Land Use light residential
Sampling Frequency annual Depth 1.5 - 3.0 meters
Bottom Type sand, detritus, mud % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent Taxodium sp., Panicum hemitomon,
Scirpus sp.

Macroinvertebrates:

Annelida

Oligochaeta

Aulodrilus piqueti
Limnodrilus hoffmeisteri
Pristina osborni
Tubifex tubifex

Arthropoda

Crustacea

Isopoda

Cyathura polita

Amphipoda

Corophium lacustre
Gammarus tigrinus
Hyaella azteca
Monoculodes edwardsi

Insecta

Trichoptera

Oecetis sp.

Diptera

Cladotanytarsus sp.
Chironomus crassicaudatus
C. stigmaterus
Chaoborus sp.
Coelotanypus concinnus
Coelotanypus tricolor
Cryptochironomus fulvus

Diptera cont.

Dicrotendipes nervosusD. neomodestusEinfeldia sp.Glyptotendipes sp.Palpomyia-Bezzia complex sp. 1 - KellyParalauterborniella nigrohalteralisPolypedilum halteraleProcladius sp.Tanytarsus sp.

Mollusca

Gastropoda

cf. Hyalopyrgus aequicostatus

2 unident. hydrobiid spp.

Pelecypoda

Corbicula manilensis

DATA SUMMARY: Crescent Lake

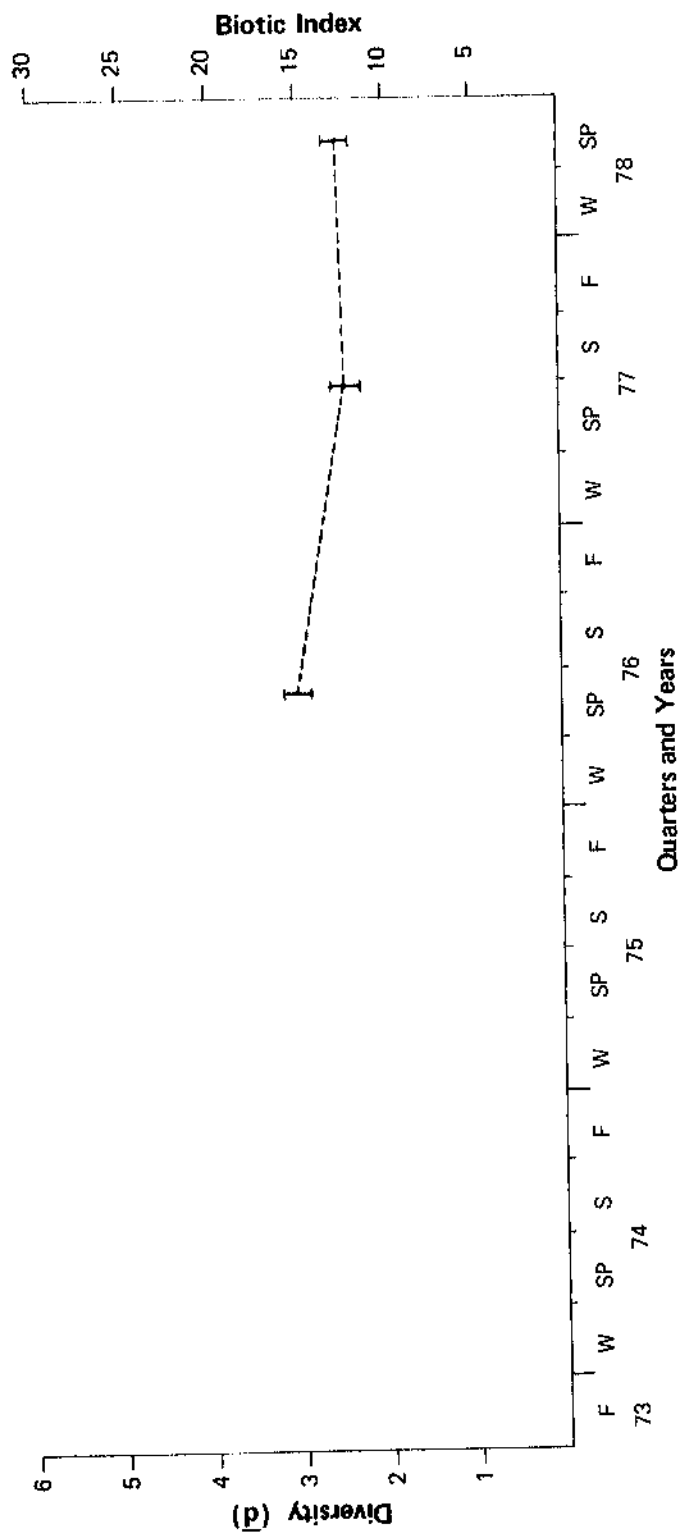
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.				
		20.03.0410	19 May 76	3.058±0.151	0.089±0.022	13						14	
	28 Sep 76												
	21 Jun 77	2.475±0.166	0.214±0.030	15									
	26 Apr 78	2.531±0.128	0.142±0.018	12							2	LT2	
	26 Jun 78												

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 20.03.0410
 BODY OF WATER: CRESENT LAKE

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



FLORIDA EAST COAST DRAINAGE BASIN

The Florida East Coast Drainage Basin includes approximately 2,200 square miles of the east coast of peninsular Florida from north of St. Augustine to south of Vero Beach. The coastline of this basin is more than 200 miles long, not including the numerous estuarine rivers inside the barrier islands. Two sub-basins, including nine drainage areas, are recognized in the uplands. However, the estuarine rivers are interconnected with each other.

Upper East Coast Sub-basin

This sub-basin includes seven drainage areas extending from St. Johns County to Indian River County. The Tolomato River, station 27.01.0136, US ALA, drains coastal St. Johns County north of St. Augustine to St. Augustine Inlet. Because of its proximity to the inlet, this station is well flushed and has a scoured bottom. Macroinvertebrates (all estuarine forms) were sampled three times during 1976-78 and diversities were good, despite urban runoff from St. Augustine.

The Matanzas River, station 27.01.0097, at SR 206 drains south coastal St. Johns County north to St. Augustine Inlet and south to Matanzas Inlet. Macroinvertebrate diversity (estuarine species) was generally good during the report period except in 1974. The relatively low diversities obtained then were possibly due to sampling error (e.g. wrong dredge type, sampling during strong tidal flow). Bacteria concentrations normally were low and met Class II standards.

The Tomoka River, station 27.01.0023, at US 1, drains northeast Volusia County and flows to the Halifax River. It was sampled for macroinvertebrates three times during 1975-78. Diversities were variable, ranging from 0.21 to 2.6 and only ten taxa were collected in all. The stream is quite tannic freshwater during high flow periods and is tidally influenced (estuarine) during low flow. This natural stress may account for the variable data, although freshwater forms dominate the species list. Also, the location of the station between a highway bridge and a railroad trestle may have a detrimental effect on the fauna. Bacteria counts were normally acceptable.

The Halifax River flows along the northern coast of Volusia County north and south of the City of Daytona Beach. Station 27.01.0037 is in downtown Daytona Beach. There are several sewage treatment plants in the area and heavy urban runoff. Despite apparently considerable pollution sources and field biologists' judgments of only fair water quality, macroinvertebrate diversities were good. There was no significant trend in diversity during the report period.

The Indian River is a coastal estuarine/marine body reaching from the west side of Merritt Island southward to Stuart. Station 27.01.0581 is at Bennett Causeway near the City of Merritt Island. The area is subject to urban runoff and there are several sewage treatment plants in the vicinity. Nevertheless, the macroinvertebrate diversities were very good. However, regression analysis revealed a significant but very slight

downward trend in macroinvertebrate diversity during the study period. It should be interesting to monitor this station in the future. Bacteria concentrations were very low throughout the report period.

The Banana River reaches from the east side of Merritt Island southward to near Eau Gallie where it joins the Indian River. Station 27.01.0550 is on the Banana River north of SR 528. Two natural substrate macroinvertebrate samples were taken in 1974 and 1977, respectively, and the diversities were good. Also, bacteria were monitored throughout the report period and counts were low. The area is relatively free from pollution sources.

Lower East Coast Sub-basin

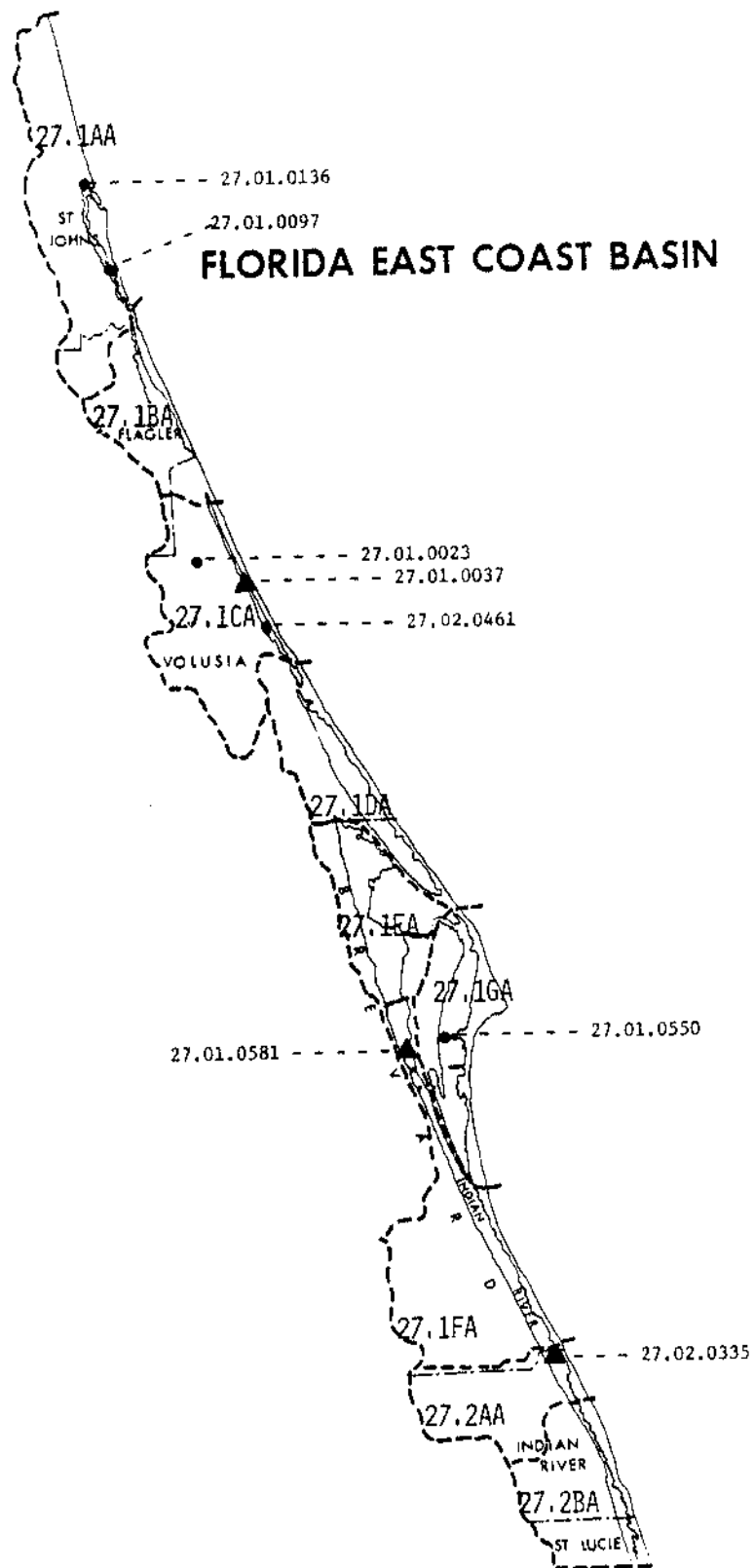
This sub-basin includes approximately 380 square miles of Indian River County. The Sebastian River drains northeastern Indian River County to the Indian River. Across the Indian River from the mouth of the Sebastian River is Sebastian Inlet which experiences strong tidal flushing. Station 27.02.0335 is on the Indian River at the mouth of the Sebastian River. The salinity is normally greater than 30 ppt. Macroinvertebrate diversity was normally good and occasionally very good during the report period. A notable exception (diversity = 1.30) occurred in 1977 when the sample was taken from a slightly deeper location with somewhat softer sediment. A polychaete worm, Streblospio benedicti, strongly dominated that sample. Overall there was a significant improvement in diversity during the study period but no direct cause could be determined. Bacteria counts were usually low. Apparently, strong flushing by Sebastian Inlet maintains good water quality despite pollution from domestic wastes and urban and agricultural runoff.

Station 27.02.0461 is on the Indian River north of Fort Pierce near Garfield Point. The station is fairly well flushed due to its proximity to Ft. Pierce Inlet, but also receives enough freshwater influence to cause considerable salinity variation. Two macroinvertebrate samples were analyzed in 1976-77 and diversities were 2.35 and 3.33, respectively. Urban runoff and natural salinity stress were probably influencing the benthic community.

Summary

The Tolomato and Matanzas Rivers, in the St. Augustine area, both receive urban runoff, but during the study period, had generally healthy macroinvertebrate communities. Flushing from St. Augustine Inlet probably benefits the Tolomato River station's water quality considerably. The Tomoka River had a rather surprisingly limited macroinvertebrate community. More study would be required to determine a controlling factor. The Halifax River flows through metropolitan Daytona Beach and is subjected to domestic wastes and urban runoff. Nevertheless, macroinvertebrate diversity was good and no significant trend was detected. In the vicinity of Merritt Island the Indian River is subject to domestic wastes and urban runoff. The biota appeared to be very healthy and diverse. In the same area, the Banana River has fewer influent pollution sources and also apparently good water quality. In the Lower East Coast Sub-basin at

the mouth of the Sebastian River, Sebastian Inlet apparently keeps the Indian River well flushed and biologically stable according to monitoring data. A significant improvement in macroinvertebrate diversity was noted. Near Ft. Pierce, the macroinvertebrate diversity was somewhat low, perhaps due to natural salinity variation and urban runoff.



Station No. 27.01.0023 Body of Water Tomoka River
Location US Hwy 1 bridge midway between bridge and railroad tressle,
center of channel County Volusia
Type Body of Water river/estuary Classification _____
Sources of Pollution _____

Nearby Land Use transportation
Sampling Frequency _____ Depth 3.1 - 3.7 m
Bottom Type mud, shell, sand % Volatile Solids _____
Aquatic Plants: Submerged Eleocharis sp.
Emergent Juncus sp., Spartina sp.

Macroinvertebrates:

Arthropoda

Crustacea

Isopoda

cf. Edotea sp.

unident. sp.

Insecta

Diptera

Chaoborus punctipennis

Chironomus attenuatus

C. crassicaudatus

C. stigmaterus

Coelotanypus scapularis

Procladius sp.

Tanytarsus sp.

unident. ceratopogonid

DATA SUMMARY: Tomoka 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.							
349	16 Jan 74										60	30		
	6 Feb 74										180	90		
	3 Apr 74										10	0		
	1 May 74										0	0		
	4 Sep 74										200	10		
	2 Oct 74										560	10		
	9 Dec 74											20		
	14 Jan 75										110	20		
	2 Apr 75										20	10		
	6 Aug 75										50	0		
3 Sep 75											60	30		
	7 Oct 75	1.347±0.262	0.202±0.190	3										

See Methods for explanation of table.

DATA SUMMARY: Tomoka 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.						
350 27.01.0023	4 Nov 75											290	0		
	2 Dec 75											100	70		
	3 Mar 76											20	10		
	6 Jul 76											700	130		
	2 Feb 77											2320			
	2 Mar 77											120	40		
	4 May 77											190	100		
	8 Jun 77												50		
	6 Jul 77											15	0		
	2 Aug 77											68	20		
	10 Aug 77	2.595±0.475	0.214±0.109	8										200	

See Methods for explanation of table.

DATA SUMMARY: Tomoka River

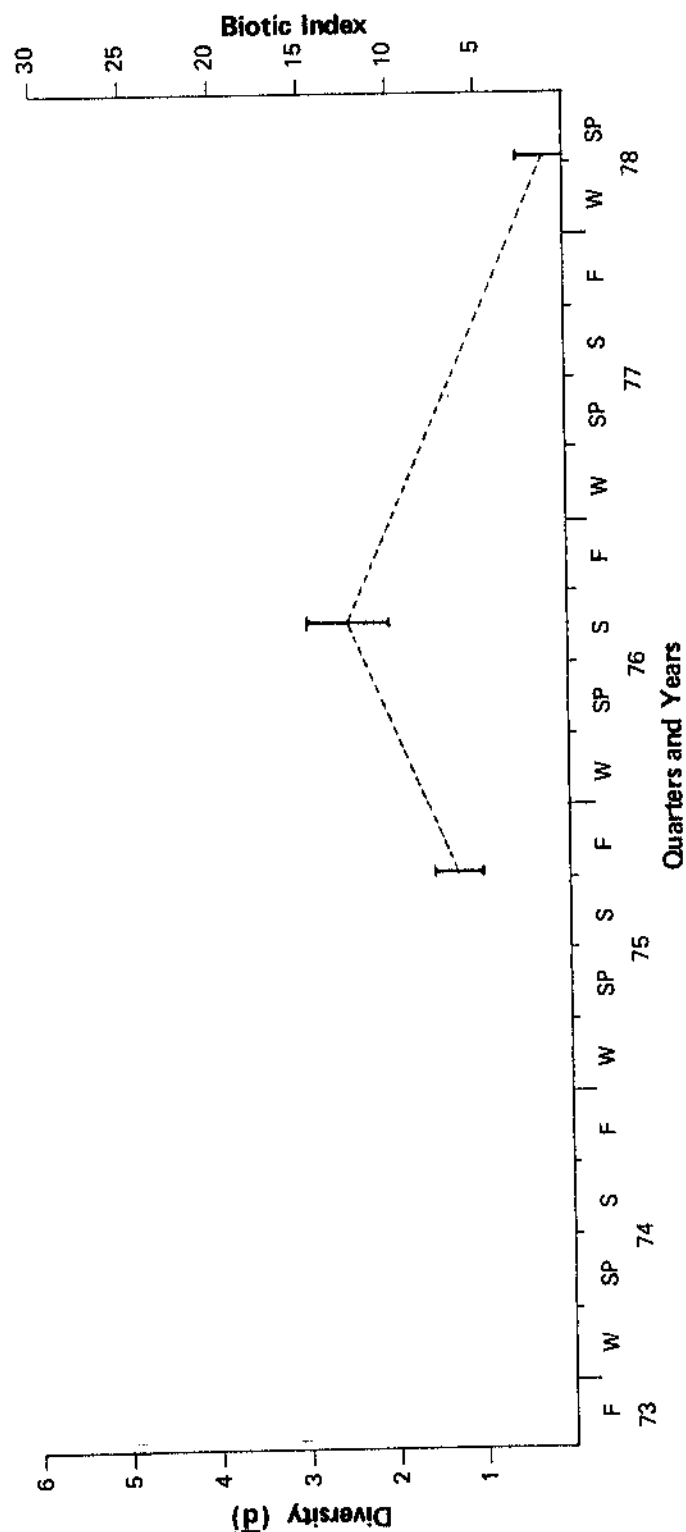
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
27-01-0023	6 Feb 78										150	28	
	6 Mar 78										440	630	
	3 Apr 78	0.211±0.312	1.000±140	2							75	25	
	5 Jun 78										1420	LT200	

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 27.01.0023
 BODY OF WATER: TOMOKA RIVER

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



Station No. 27.01.0037 Body of Water Halifax River
Location 100 ft. north of Silver Beach Memorial Bridge
County Volusia
Type Body of Water estuary Classification III
Sources of Pollution domestic waste, urban runoff
Nearby Land Use multi-purpose urban
Sampling Frequency random Depth 2.0 - 7.0 m.
Bottom Type mud, shell % Volatile Solids _____
Aquatic Plants: Submerged none
Emergent Spartina alterniflora, Juncus
roemerianus, Avicennia germinans

Macroinvertebrates:

Cnidaria

unident. sp.

Rhynchocoela

cf. Tubulanus pellucidus
unident. sp.

Annelida

Oligochaeta

cf. Limnodriloides medioporus
2 unident. spp.

Polychaeta

Amphicteis gunneri
Asychis sp.
Autolytus sp.
Brania clavata
Capitella capitata
Diopatra cuprea
Eteone lactea
Glycinde sp.
G. solitaria
Gyptis vittata
Haploscoloplos foliosus
H. robustus

Polychaeta cont.

Marphysa sanguinea
Mediomastus sp.
Nereis (Neanthes) succinea
Owenia fusiformis
Paraprionospio pinnata
Phyllodoce castanea
Podarke obscura
Polydora sp.
Sabellaria vulgaris
Spiochaetopterus oculatus
Spiophanes bombyx
Streblospio benedicti
Scoloplos (Leodamas) rubra
Tharyx marioni
T. sp.
Thelepus setosus
 unident. maldanid
 unident. sphaerodorid
 unident. spionid
 unident. spp.

Arthropoda

Crustacea

Isopoda

Chiridotea sp.
Edotea sp.

Amphipoda

Ampelisca sp.
A. abdita
Corophium sp.
C. acherusicum
C. lacustre
C. simile
C. sp.
Erichthonius brasiliensis
Melita nitida
Monoculodes edwardsi
 3 unident. spp.

Cumacea

Oxyurostylis smithi

Mollusca

Gastropoda

Acteocina canaliculata
Crepidula sp.
Nassarius vibex
Rissoina browniana
 unident. nudibranch

27.01.0037

Halifax River

Mollusca cont.

 Pelecypoda

Amygdalum papyrium

Branchidontes exustus

Mercenaria campechiensis

Mulinia lateralis

Parastarte triquetra

Tagelus sp.

Tellina alternata

Sipunculida

Phascolion sp.

Hemichordata

 unident. sp.

Chordata

 Urochordata

 unident sp.

DATA SUMMARY: Halifax 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.					
356 27-01.0037	4 Sep 74											30	20	
	2 Oct 74											40	0	
	9 Dec 74												30	
	14 Jan 75											80	10	
	18 Mar 75											2900	0	
	2 Apr 75											30	0	
	4 Jun 75											320	60	
	7 Jul 75											140	0	
	6 Aug 75											20	0	
	3 Sep 75											180	140	
	4 Nov 75											790	60	
	2 Dec 75											100	20	

See Methods for explanation of table.

DATA SUMMARY: Halifax 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.											
27.01.0037 357	17 Jul 73										2900	760		
	2 Oct 73										4800	330		
	9 Oct 73										1000	30		
	6 Nov 73										20	0		
	12 Dec 73										70	10		
	16 Jan 74										90	0		
	6 Feb 74										80	40		
	3 Apr 74										0	0		
	1 May 74										0	0		
	7 Aug 74										50	0		
	21 Aug 74	3.041±0.057	0.049±0.010	10										
	21 Aug 74	3.869±0.317	0.117±0.035	21										

Not at monitoring pt

Not at monitoring site.

See Methods for explanation of table.

DATA SUMMARY: Halifax 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.						
27-01-0037 358	3 Mar 76										30	0	
	1 Apr 76	3.563±0.168	0.114±0.016	30					Coc BG 40 F11 BG 0 Coc Gr 557 F11 Gr 0 Gr Flag 239 Other Flag 239 Cen Dia 1194 Pen Dia 756 Total 3025		GT800	220	
	6 Jul 76			4									
	2 Dec 76	1.437±0.420	0.352±0.159										
												50	
	2 Feb 77										40	0	
	2 Mar 77										130	0	
	4 May 77												76
	8 Jun 77												

See Methods for explanation of table.

DATA SUMMARY: Halifax 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
359	27 Jul 77										3	3		
	2 Aug 77										70	14		
	8 Dec 77	4.087±0.233	0.075±0.016	28									17	
	3 Jan 78													
	6 Feb 78										220	50		
	6 Mar 78										220	150		
	10 Mar 78	3.413±0.187	0.162±0.029	31										
	3 Apr 78										335	550		
	17 May 78	3.067±0.201	0.146±0.029	19							420	233		
	5 Jun 78													

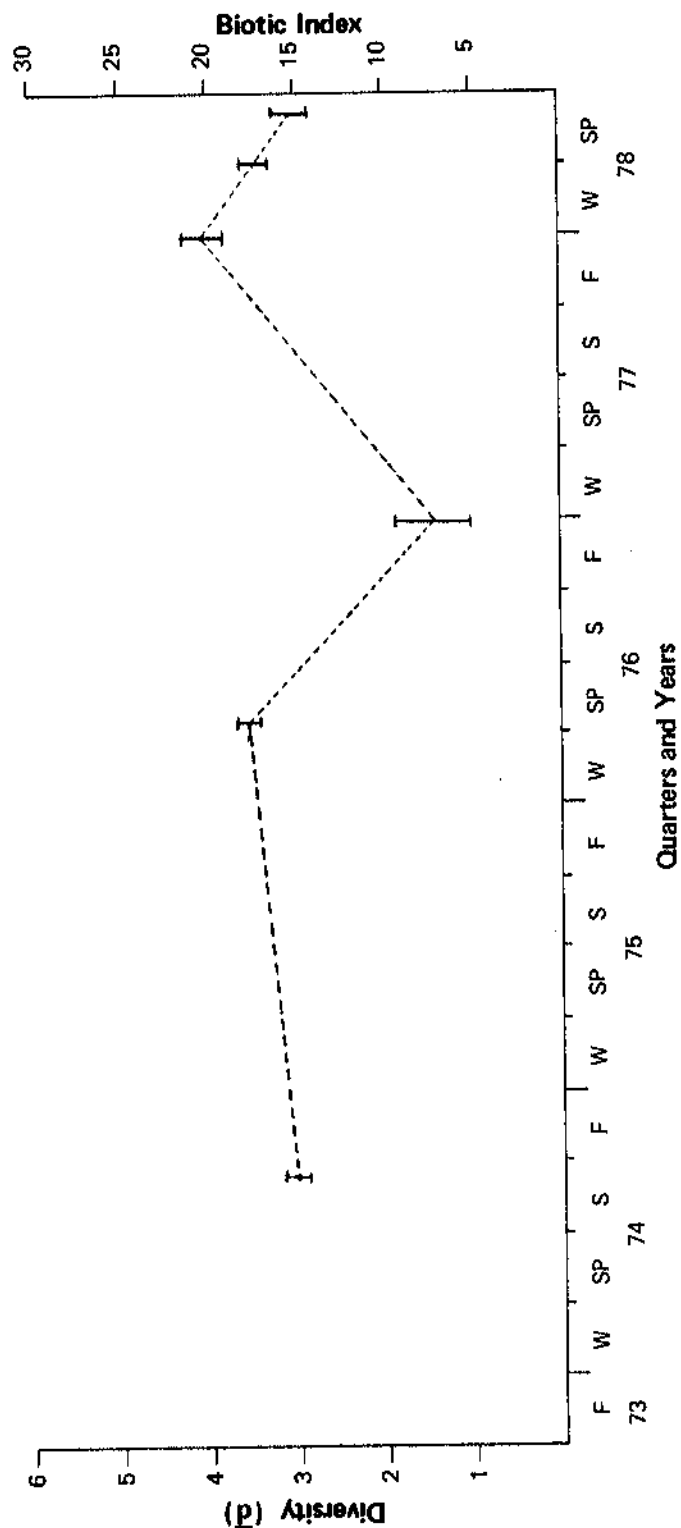
See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 27.01.0037

BODY OF WATER: HALIFAX RIVER

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



Station No. 27.01.0097 Body of Water Matanzas River
 Location Marker #60, just north of Crescent Beach Bridge, Fla. Hwy. #206
 County St. Johns
 Type Body of Water estuary Classification III
 Sources of Pollution some urban runoff, I.C.W.W.
 Nearby Land Use natural and residential
 Sampling Frequency random Depth 0.9-3.8 m
 Bottom Type sand, shells, mud, clay % Volatile Solids _____
 Aquatic Plants: Submerged Juncus sp., Baccharis sp., Salicornia sp.
 Emergent Spartina alterniflora, Sesuvium sp.,
Avicennia germinans, Borreria sp., Distichlis sp.

Macroinvertebrates:

Porifera

Cliona sp.
 unident. sp.

Cnidaria

Hydrozoa

Campanularia sp.
 unident. sp.

Anthozoa

3 unident. spp.

Platyhelminthes

unident. sp.

Rhynchocoela

unident. sp.
 cf. Carinoma tremaphoros

Annelida

Oligochaeta

unident. sp.

Polychaeta

Asychis sp.
Arabella iricolor
Asabellides sp.
Asychis sp.
Axiiothella mucosa
Brania clavata
Ceratonereis versipedata
Clymenella torquata
Diopatra cupraea
Exogone dispar
Glycinde solitaria
Gyptis brevipalpa
Haploscoloplos foliosus
Hauchiella sp.
Laeonereis culveri
Lumbrineris tenuis
Marphysa sanguinea
Mediomastus sp.
Nereis falsa
Owenia fusiformis
Pectinaria gouldii
Phyllodoce (Nereiphylla) fragilis
cf. phyllodoce arenae
Polycirrus sp.
Polydora ligni
P. sp.
Prionospio cirrifer
Sabella microphthalma
Scoloplos rubra
Sigambra tentaculata
Spiophanes bombyx
Spiochaetopterus oculatus
Streblospio benedicti
Tharyx marioni
T. sp.
 unident. orbinid
 unident. sabellid
 unident. serpulid
 unident. sp.

Arthropoda

Crustacea

Isopoda

Cassidinisca lunifrons
Cyathura burbancki
C. polita
Edotea montosa
Sphaeroma destructor

Amphipoda

Ampelisca sp.
A. abdita
A. verrilli
Batea catharinensis
B. sp.
Caprella equilibra
C. geometrica
C. sp.
Corophium acherusicum
C. sp.
Elasmopus sp.
E. brasiliensis
Gammarus spp.
Lembos websteri
Microjassa macrocoxa
Melita nitida
Microdeutopus sp.
Monoculodes sp.
Podocerus brasiliensis
P. sp.
Stenothoe marina
Unciola serrata
 unident. haustorid
 unident. sp.

Decapoda

Acetes americanus
Callinectes ornatus
Palaemonetes vulgaris
Panopeus herbstii
Periclimenes longicaudatus
Pinnixa chaetopterana
P. retinene
Portunus anceps
Rhithropanopeus sp.

Mysidacea

unident. sp.

Tanaidacea

Leptochelia sp.
 unident. sp.

Cirripedia

Balanus sp.

Cumacea

Oxyurostylis smithi

27.01.0097

Pycnogonida

Callipalene brevirostris
Tanystylum orbiculare

Echinodermata

Ophiuroidea

Amphioda pulchella
Synapta sp.
unident. sp.

Bryozoa

Bugula neritina
B. turrita

Phoronida

Phoronis architecta
unident. enteropneustan

Sipunculida

Dendrostoma sp.

Chordata

Urochordata

Mogula sp.
unident. sp.

DATA SUMMARY: Matanzas 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				#Spp.	Total	
		Diversity	Redundancy	#Spp.	Diversity			Redundancy	#Spp.				
									BI	#Spp.			
27.01.0097 365	3 Oct 73										2	LT2	
	29 Oct 73										8	8	
	10 Dec 73										31	31	
	14 Jan 74										23		
	4 Feb 74										49	33	
	4 Mar 74										7	2	
	8 Apr 74										33	33	
	6 May 74										8	LT2	
	3 Jun 74										LT2	LT2	
	18 Jun 74	1.229±0.156	0.570±0.058				10				17	LT8	
	1 Jul 74										350	14	
	29 Jul 74	0.836±0.100	0.813±0.028				20						

See Methods for explanation of table.

DATA SUMMARY: Matanzas 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.					
366	27 Aug 74											330	330	
	24 Sep 74											11	14	
	23 Oct 74											46	172	
	13 Nov 74											230	49	
	3 Dec 74	3.358±0.304	0.118±0.044	15	2.834±0.221	0.172±0.054	13					49	49	
	8 Jan 75											5	2	
	12 Feb 75	2.306±0.322	0.436±0.083	19								220	8	
	11 Mar 75											33	172	
	16 Apr 75											23	23	
	11 Jun 75	3.078±0.249	0.138±0.034	16	2.846±0.035	0.159±0.005	25					23		
	6 Aug 75											280		
	15 Dec 75												13	

See Methods for explanation of table.

DATA SUMMARY: Matanzas 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.					
367	27.01.0091													
	12 Jan 76										7	4		
	16 Feb 76										23	2		
	22 Mar 76										220	LT2		
	13 Apr 76										LT2	LT2		
	26 Apr 76	2.330±0.312	0.431±0.082	19							23	8		
	8 Jun 76										330	11		
	7 Jul 76										LT2	LT2		
	16 Aug 76										22	17		
	4 Oct 76										8	2		
	8 Dec 76										33	7		
	2 Feb 77										33	33		
	7 Mar 77													

See Methods for explanation of table.

DATA SUMMARY: Matanzas River

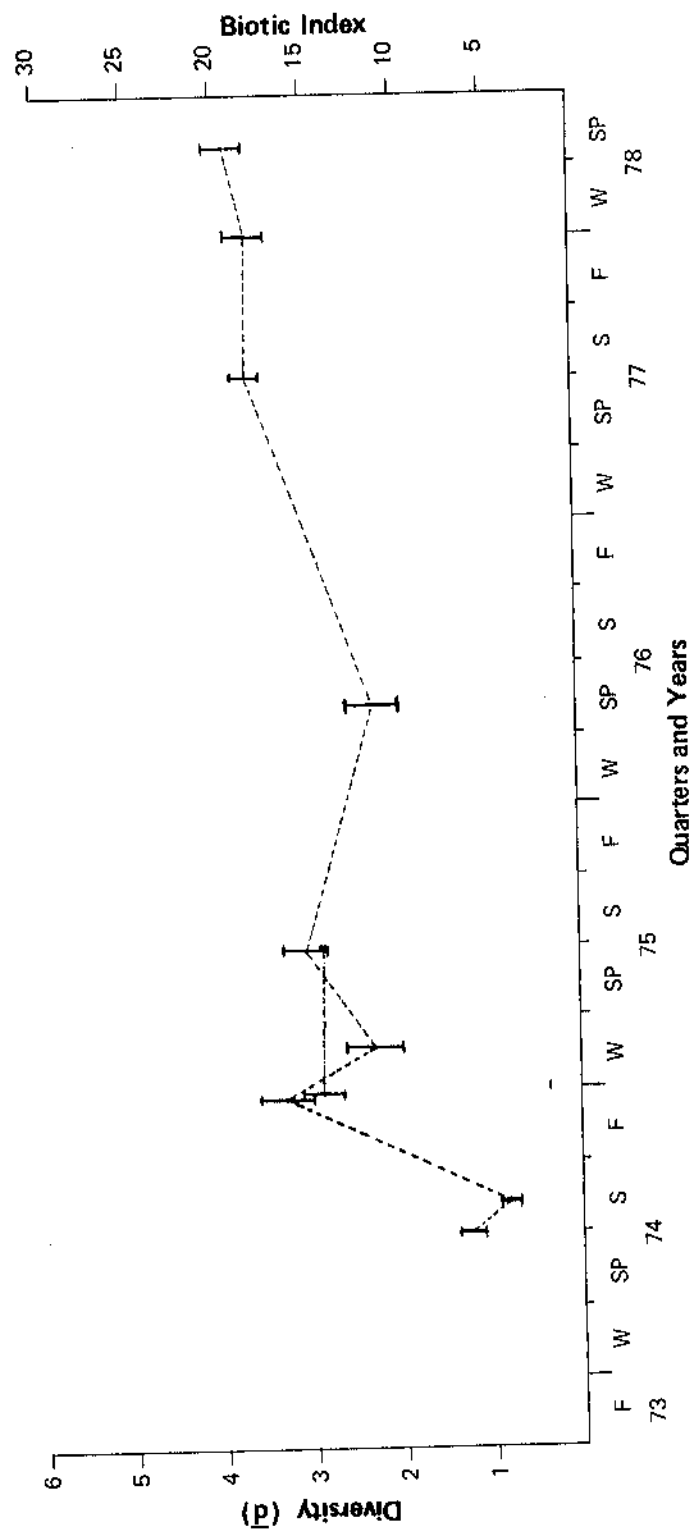
Station Number	Date	Macroinvertebrates							Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
								B1					
27-01-0097 368	17 Jun 77	3.696±0.185	0.116±0.018	34						7	5	Florida Index	
	18 Jul 77												
	13 Dec 77	3.700±0.217	0.140±0.031	31						46	LT2		
	18 Jan 78									33	7		
	13 Feb 78												
	13 Apr 78	3.930±0.215	0.108±0.011	34						8	LT2		
	24 Apr 78									8	5		
	24 May 78									5	2		
	14 Jun 78												

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 27.01.0097
 BODY OF WATER: MATANZAS RIVER

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



Station No. 27.01.0136 Body of Water Tolomato River
 Location Intercoastal Waterway near US A1A, Vilano Beach, 200 yds n. of A1A, 75 ft.
from east shore County St. Johns
 Type Body of Water Intercoastal Waterway Classification _____
 Sources of Pollution city of St. Augustine, urban runoff

 Nearby Land Use beach, marsh, road, marinas, residential
 Sampling Frequency _____ Depth 1.7 - 2.4 meters
 Bottom Type fine sand % Volatile Solids _____
 Aquatic Plants: Submerged _____
 _____ Emergent Spartina alterniflora, Caularipa prolifera,
Avicennia germinans

Macroinvertebrates:

Cnidaria

Renilla reniformis
unident. campanularid

Rhynchocoela

cf. Carinoma tremaphoros
cf. Tubulanus pellucidus

Annelida

Polychaeta

Armandia maculata
Asabellides sp.
Asychis sp.
Axiiothella mucosa
Branchiomma nigromaculata
Ceratonereis irritabilis
Cirriformia filigera
Exogone dispar
Goniada brunnea
Haploscoloplos robustus
cf. Laonice cirrata
Lumbrineris coccinea
Mediomastus sp.
Melinna maculata

Polychaeta (cont.)

Nepthys picta
Pseudomalacoceros sp.
Podarke obscura
Owenia fusiformis
Pista palmata
cf. Phyllodoce arenae
Polycirrus sp.
Polydora socialis
Polydora websteri
Prionospio sp.
Prionospio cirrifer
Prionospio dayi
Paraprionospio pinnata
Sabella microphthalma
Spirochaetopterus oculatus
Spiophanes bombyx
Streblospio benedicti
Streptosyllis sp.
Sigambra tentaculata
Tharyx sp.
 unident. capitellid
 unident. maldanid
 unident. sabellid
Nereis falsa

Arthropoda

Crustacea

Isopoda

Cyathura burbancki
 unident. epicarid

Amphipoda

Ampelisca sp.
Ampelisca vadorum
Ampelisca verrilli
Caprella sp.
Calliopius sp.
Corophium acherusicum
Erichthonius sp.
Erichthonius brasiliensis
Maera sp.
Microprotopus raneyi
Monoculodes sp.
Monoculodes edwardsi
Paraphoxus spinosus
Pontogoneia sp.
Unciola serrata
 unident. corophiid
 unident. phoxocephalid

Decapoda

Pagurus longicarpus
Palaemonetes sp.
Portunus sp.
Rhithropanopeus harrisii
Trachypeneus constrictus
unident. pinnotherid
unident. sp.

Cumacea

Oxyurostylis smithi

Mollusca

Gastropoda

Haminoea succinea
Acteocina canaliculata
Rictaxis punctostriatus
unident. nudibranch

Pelecypoda

Ostrea equestris
Chione sp.
Dosinia discus
Lyonsia sp.
Mercenaria campechiensis
Nucula proxima
Tellina sp.
Tellina alternata
Tellina cf. tenella

Echinodermata

Amphiodia planispina
unident. amphiurid

Bryozoa

Bugula neritina
Bugula turrita

Branchiopoda

Glottidia sp.

Sipunculida

Phascolion sp.

Hemichordata

Phoronis architecta

DATA SUMMARY: Tolomato River

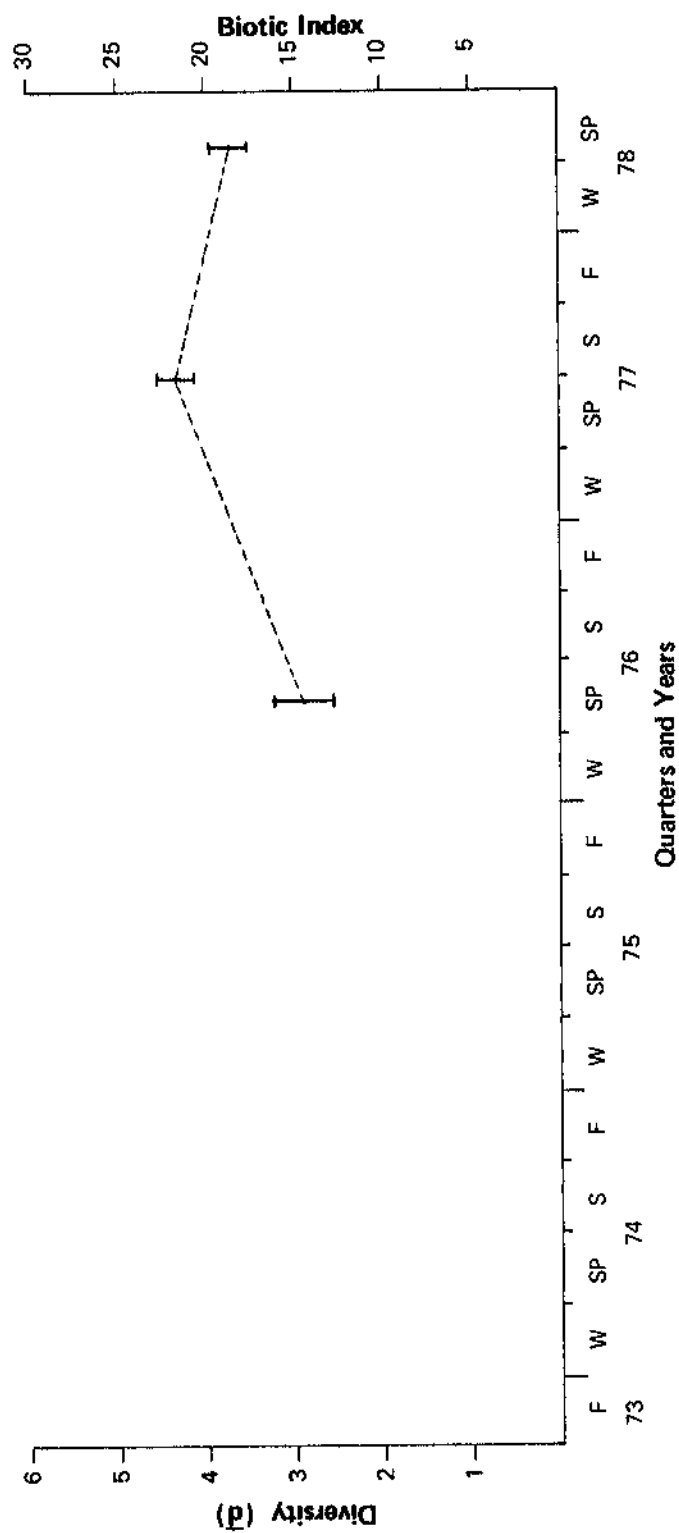
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate							Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	BI	#Spp.					
373	27.01.0136	26 Apr 76	3.031±0.383	0.359±0.086	23									
		17 Jun 77	4.530±0.208	0.083±0.017	48									
		13 Apr 78	3.961±0.204	0.117±0.019	42									

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 27.01.0136
 BODY OF WATER: TOLOMATO RIVER

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



Station No. 27.01.0550 Body of Water Banana River
Location north of SR 528 bridge, at second power pole, east of west bank
County Brevard
Type Body of Water estuary Classification III
Sources of Pollution runoff
Nearby Land Use transportation, residential
Sampling Frequency random Depth 2.0 - 2.5 m.
Bottom Type sand, shell, mud % Volatile Solids
Aquatic Plants: Submerged sparse filamentous algae, *Caulerpa* sp.
Emergent

Macroinvertebrates:

Cnidaria

unident. sp.

Platyhelminthes

Stylochus oculiferus

Rhynchocoela

unident. sp. 1 - Grizzle

unident. sp. 2 - Grizzle

Annelida

Polychaeta

Armandia maculata

Capitella capitata

Diopatra cuprea

Eteone heteropoda

Glycera americana

Glycinde solitaria

Gyptis vittata

Melinna maculata

Naineris setosa

Nereis succinea

Polychaeta

Paraprionospio pinnata
Pectinaria gouldii
Phyllodoce castanea
Platynereis dumerilii
Podarke obscura
Polydora sp.
Prionospio heterobranchia
Sabella microphthalma
Schistomeringos rudolphi
Scoelelepis sp.
Streblospio benedicti
Tharyx sp.
unident sp. 83 - Grizzle

Arthropoda

Crustacea

Isopoda

Cymodoce faxoni

Amphipoda

Ampelisca abdita
Corophium ellisi
Cymadusa compta

Tanaidacea

Leptochelia rapax

Mysidacea

unident. sp.

Cumacea

unident. sp. 1 - Grizzle

Mollusca

Gastropoda

Acteocina canaliculata
Caecum pulchellum
Cerithiopsis sp.
Cerithium muscarum
Marginella apicina
Mitrella lunata

Pelecypoda

Amygdalum papyrium
Brachidontes exustus
Laevicardium mortoni
Mulinia lateralis
unident tellinid sp. 1 - Grizzle

Echinodermata

Ophiophragmus filograneus

Sipunculida

Phascolion strombi

27.01.0550

Banana River

Phoronida

Phoronis sp.

Chordata

unident. sp.

DATA SUMMARY: Banana 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.					
27.01.0550 378	9 Jul 73									23		
	16 Oct 73									10	0	
	7 Nov 73									0	0	
	17 Dec 73									10	0	
	22 Jan 74									10	0	
	12 Feb 74									0	0	
	9 Apr 74									10	0	
	13 Aug 74									0	0	
	14 Aug 74	3.245±0.048	0.131±0.009	19						12	3	
	10 Sep 74									20	0	
	8 Oct 74									70	40	
	5 Nov 74									0	0	

See Methods for explanation of table.

DATA SUMMARY: Banana 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		Redundancy	#Spp.				Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity		Redundancy	#Spp.					
379	27.01.0550	3 Dec 74										0	
		7 Jan 75									10	0	
		4 Mar 75									0	0	
		1 Jul 75									10	0	
		5 Aug 75									0	0	
		2 Sep 75									20	0	
		4 Nov 75									0	0	
		2 Dec 75									0	0	
		2 Mar 76									0	0	
		6 Apr 76									0	0	
		28 Sep 76										10	
		15 Feb 77		4.455±0.110	0.063±0.008	52						0	0

See Methods for explanation of table.

DATA SUMMARY - Banana River

[illegible]

See Methods for explanation of table.

Station No. 27.01.0581 Body of Water Indian River
Location Bennett Causeway SR 528 - between first and second unbuffered
power poles east of ICW County Brevard
Type Body of Water estuary Classification III
Sources of Pollution domestic waste and urban runoff

Nearby Land Use transportation and residential
Sampling Frequency quarterly Depth 1.5 - 2.5 m.
Bottom Type mud, shell % Volatile Solids _____
Aquatic Plants: Submerged _____
Emergent _____

Macroinvertebrates:

Platyhelminthes

Turbellaria

Euplana gracilis

Stylochus oculiferus

Rhynchocoela

unident. sp. 2 - Grizzle

Annelida

Polychaeta

Armandia maculata

Asychis sp.

Axiiothella mucosa

Branchioasychis americana

Branchiomma nigromaculata

Brania clavata

Capitella capitata

Diopatra cuprea

Eteone lactea

Eulalia sanguinea

Glycera americana

Glycinde solitaria

Annelida

Polychaeta cont.

Gyptis vittata
Haploscoloplos fragilis
H. robustus
Lepidonotus sp.
Lumbrineris sp.
Marphysa sanguinea
Mediomastus sp.
Melinna maculata
Nereis succinea
Nerinides unidentata
Notomastus latericeus
Orbinia sp.
Paraehesione luteola
Paraprionospio pinnata
Platynereis dumerilii
Pectinaria gouldii
Pista palmata
Podarke obscura
Polydora websteri
Prionospio heterobranchia
P. cirrifer
Sabella microphthalma
Schistomeringos rudolphi
Scoloplos rubra
Streblospio benedicti
Sthenelais boa
Tharyx sp.
unident. polynoid sp. 83 - Grizzle
unident. serpulid sp. 1 - Grizzle

Arthropoda

Crustacea

Amphipoda

Ampelisca abdita
Corophium ellisi
Gammarus mucronatus
Grandidierella bonnieroides

Decapoda

Hippolyte zostericola
Neopanope packardii
Ogyrides limicola
Pagurus bonairensis
Rhithropanopeus harrisi

27.01.0581

Indian River

Arthropoda

Pycnogonida

Callipallene brevirostris

Mollusca

Gastropoda

Acteocina canaliculata
Bittium varium
Caecum pulchellum
Crepidula fornicata
Epitonium rupicola
Eupleura caudata
Haminoea succinea
Mangelia plicosa
Marginella apicina
Mitra sp.
Mitrella lunata
Nassarius vibex
Turbonilla sp. 1 - Grizzle
Triphora sp.
Urosalpinx cinerea
unident. nudibranch

Pelecypoda

Anadara transversa
Anomalocardia auberiana
Amygdalum papyrium
Branchidontes exustus
Corbula sp.
Laevicardium mortoni
Mulinia lateralis
Parvilucina multinlineata
Tagelus plebeius
unident. tellinid sp. 1 - Grizzle
unident. sp. 2 - Grizzle
unident. sp. 3 - Grizzle

Echinodermata

Ophiuroidea

Ophiophragmus filograneus
O. pulcher

Holothuroidea

unident. sp.

Phoronida

Phoronis sp.

27.01.0581

Indian River

Sipunculida

Phascolion strombi

Chordata

Urochordata

unident. sp. 2 - Grizzle
unident. sp. 3 - Grizzle

DATA SUMMARY: Indian 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			BI	#Spp.			Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.							
385	27 Jul 73											150		
	7 Nov 73										0	0		
	17 Dec 73										0	0		
	20 Dec 73	3.536±0.215	0.096±0.031	19							10	10		
	22 Jan 74										0	0		
	12 Feb 74										12	2		
	19 Mar 74	3.569±0.238	0.111±0.033	21	0.660±0.038	0.841±0.011	18				0	0		
	9 Apr 74										0	0		
	13 Aug 74													
	5 Sep 74	4.301±0.032	0.063±0.003	38							0	0		
10 Sep 74										0	10			
	8 Oct 74													

See Methods for explanation of table.

DATA SUMMARY: Indian 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.					
27.01.0581	5 Nov 74										130	0		
	3 Dec 74											0		
	10 Dec 74	3.447+0.230	0.142+0.026	26										
	7 Jan 75													
	20 Feb 75	3.944+0.134	0.075+0.012	33							0	0		
	4 Mar 75											0	0	
	1 Apr 75											0	0	
	29 Apr 75	4.172+0.161	0.077+0.013	38	0.809+0.018	0.800+0.005	27							

See Methods for explanation of table.

DATA SUMMARY: Indian 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.					
27.01.0581 387	1 Jul 75											0	0	
	5 Aug 75											0	0	
	2 Sep 75	4.424±0.093	0.058±0.007	50								180	0	
	4 Nov 75											10	0	
	11 Nov 75	4.105±0.097	0.068±0.006	46								0	0	
	2 Dec 75											20	10	
	2 Mar 76													
	12 Mar 76	3.646±0.113	0.187±0.018	57									0	
	6 Apr 76													
	1 Jun 76	4.335±0.092	0.064±0.006	54										
	5 Aug 76	4.353±0.114	0.066±0.008	48								0	0	
	28 Sep 76													

See Methods for explanation of table.

DATA SUMMARY: Indian 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.					
27.01.0581	2 Nov 76	4.196±0.143	0.084±0.014	43						Coc BG 0 Fil BG 0 Coc Gr 119 Fil Gr 0 Gr Flag 199 Other Flag 199				
	15 Feb 77	3.788±0.132	0.130±0.015	49						Gen Dia 2789 Pen Dia 279 Total 3585				
	3 May 77	4.167±0.099	0.099±0.010	59								0	0	
	12 Jul 77											0	0	
	9 Aug 77											0	0	
	10 Aug 77	3.548±0.120	0.215±0.021	53										
10 Nov 77	3.086±0.115	0.264±0.021	51											

See Methods for explanation of table.

DATA SUMMARY: Indian River

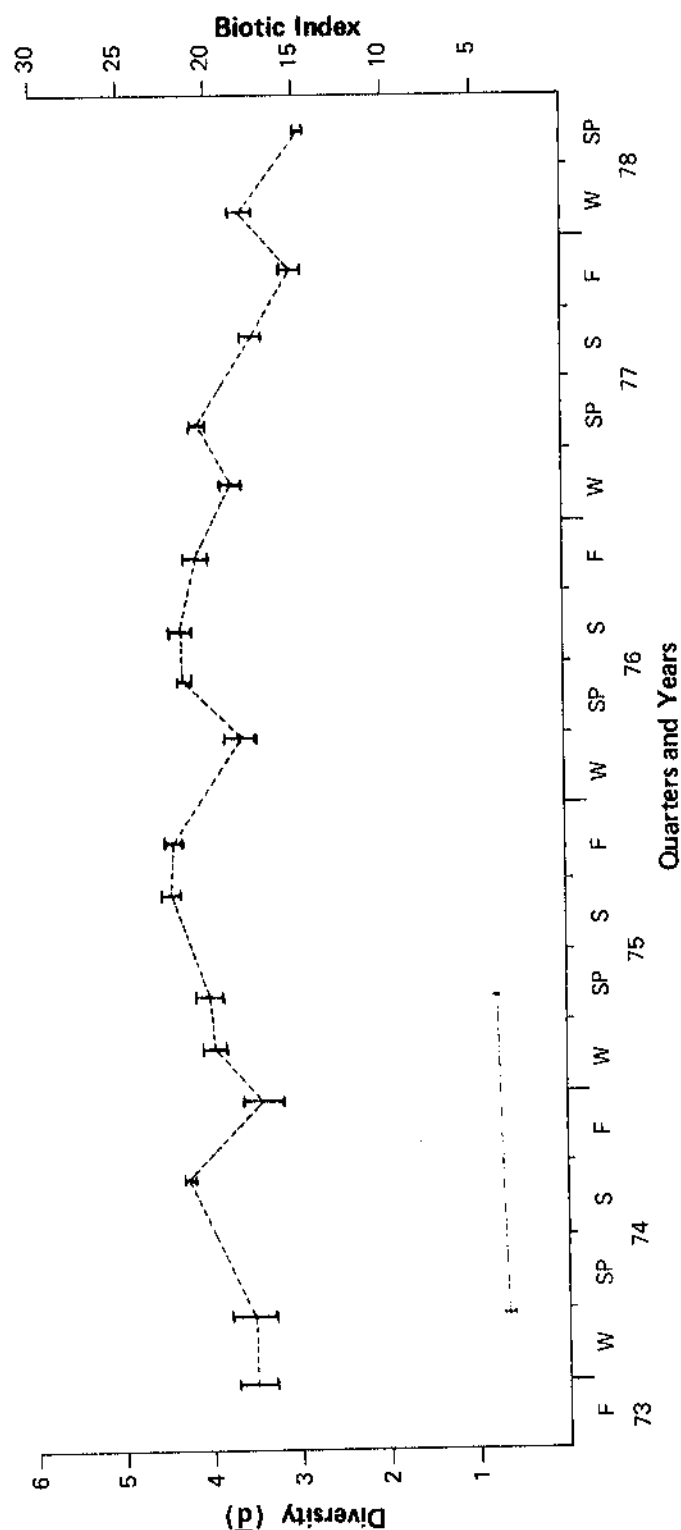
Station Number	Date	Macroinvertebrates						Biotic Index	Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate						Total	Fecal	
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.						
27.01.0581 389	10 Jan 78										9	6	
	2 Feb 78	3.620±0.140	0.208±0.023	52							6	0	
	13 Feb 78										3	2	
	20 Mar 78												
	8 May 78	2.985±0.070	0.252±0.011	57									

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 27.01.0581
 BODY OF WATER: INDIAN RIVER

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



Station No. 27.02.0335 Body of Water Indian River
 Location confluence, Sebastian River - Indian River 100 ft. east of ICWW
 Marker #61 County Brevard-Indian River line
 Type Body of Water estuary; inlet-influenced Classification II
 Sources of Pollution agricultural, dairy, urban
 Nearby Land Use state park, low density residential
 Sampling Frequency quarterly Depth 2.0 - 3.0 m
 Bottom Type fine sand, some organic material Volatile Solids 1.22
 Aquatic Plants: Submerged sparse algae, several spp.
 Emergent

Macroinvertebrates:

Platyhelminthes

Stylochus oculiferus

Rhynchocoela

unident. sp. 1 - Grizzle
 unident. sp. 2 - Grizzle
 unident. sp. 4 - Grizzle

Annelida

Polychaeta

Aglaophamus verrilli
Amaeana sp. 1 - Grizzle
A. sp. 2 - Grizzle
Apoprionospio pygmaea
Armandia agilis
A. maculata
Asychis sp. 1 - Grizzle
Axiiothella mucosa
Branchiomma nigromaculata
Capitella capitata
C. capitata 3 - Grassle and Grassle
Diopatra cuprea
Glycera americana
Glycinde solitaria
Gyptis vittata
Loimia medusa
Lumbrineris sp.
Megalomma bioculatum
Melinna maculata

Polychaeta (cont.)

Nereis sp.
N. succinea
Lepidasthenia sp.
Onuphis nebulosa
Owenia fusiformis
Platynereis dumerilii
Paraprionospio pinnata
Phyllodoce arenae
Pectinari gouldii
Piromis sp.
Pista palmata
Podarke obscura
Polydora anoculata
P. socialis
P. ligni
Prionospio cirrifera
P. heterobranchia
Pulliella sp.
Sabella microphthalma
S. vulgaris
Scolecopides sp.
Scoloplos rubra
Spiophanes bombyx
Sthenelais boa
Streblospio benedicti
Tharyx sp.
Thelepus setosus
 unident. aphroditid sp. 97 - Grizzle
 unident. syllid sp. 100 - Grizzle

Arthropoda

Crustacea

Isopoda

Anthelura sp.
Cymodoce faxoni
Erichsonella attenuata
E. filiformis

Amphipoda

Ampelisca abdita
Cymadusa compta
Corophium ellisi
Gammarus mucronatus
Grandidierella bonnieroides

Decapoda

Hippolyte sp.
Neopanope packardii
Ogyrides limicola
Pagurus sp.
Palaemonetes sp.
Pinnixa sp.
 unident. portunid

Tanaidacea

Apseudes sp.
Leptochelia rapax

Pycnogonida

Callipallene brevirostris

Mollusca

Gastropoda

Acteocina canaliculata
Anachis avara
Bittium varium
Bulla striata
Caecum pulchellum
Crepidula fornicata
Haminoea succinea
H. elegans
Mitrella lunata
Nassarius vibex
Odostomia sp. 1 - Grizzle
Polinices duplicatus
Turbonilla sp. 2 - Grizzle
Urosalpinx cinerea
unident. mellinellid
unident. nudibranch

Scaphopoda

Dentalium texasianum

Pelecypoda

Anomalocardia auberiana
Anadara transversa
Amygdalum papyrium
Barbatia sp.
Chione cancellata
C. grus
Corbula sp.
Crassinella sp. 1 - Grizzle
Lucina nassula
Mulinia lateralis
Nucula proxima
Parvilucina multilineata
Parastarte triquetra
Solen sp.
Tagelus plebius
Tellidora cristata
Trachycardium muricatum
unident. tellinid sp. 1 - Grizzle
unident. tellinid sp. 3 - Grizzle
unident. tellinid sp. 4 - Grizzle
unident. sp. 21 - Grizzle
unident. sp. 28 - Grizzle

27.02.0335

Pelecypoda (cont.)

unident. sp. 27 - Grizzle
unident. sp. 33 - Grizzle
unident. sp. 34 - Grizzle

Echinodermata

Ophiuroidea

Hemipholis elongata
Ophioderma brevispinum
2 unident. spp.

Phoronida

Phoronis sp.

Sipunculida

Phascolion strombi

DATA SUMMARY: Sebastian 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.				
27-02-0335	3 Jul 73											9	
	14 Nov 73	3.450±0.165	0.240±0.026	62									
	16 Jan 74	3.113±0.187	0.202±0.025	33									
	12 Feb 74				2.261±0.031	0.288±0.007	29						
	1 May 74	3.517±0.210	0.146±0.025	31									
	15 Jul 74	2.703±0.257	0.181±0.036	36									
	17 Jul 74												
									Coc BG 25701 F11 BG 47 Coc Gr 764 F11 Gr 15 Gr Flag 42 Other Flag 0 Cen Dia 0 Pen Dia 15 Total 26574				

See Methods for explanation of table.

DATA SUMMARY: Sebastian 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.					
27.01.0335 596	6 Nov 74	3.905±0.213	0.117±0.022	35	3.380±0.025	0.107±0.003	30							
	5 Feb 75	4.046±0.242	0.087±0.021	29										
	21 May 75	3.928±0.248	0.141±0.027	38	2.863±0.020	0.115±0.004	16							
	2 Jul 75	3.987±0.225	0.104±0.027	31										
	19 Aug 75	4.837±0.121	0.047±0.006	62							0	0		
	23 Sep 75										0	0		
	27 Oct 75										0	0		
	4 Nov 75										0	0		
	9 Dec 75	4.179±0.177	0.105±0.017	50							10	10		
	17 Feb 76	3.368±0.174	0.251±0.029	51										
16 Mar 76										0	0			
10 May 76	3.421±0.120	0.240±0.020	71											

See Methods for explanation of table.

DATA SUMMARY: Sebastian 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.	
397	27.01.0135	28 Sep 76									0	0	Florida Index
		20 Dec 76	3.901±0.250	0.155±0.027	41								
		2 Feb 77	1.295±0.116	0.740±0.028	45								
		17 May 77	4.043±0.105	0.094±0.008	64						0	0	
		12 Jul 77											
	9 Aug 77												
	23 Aug 77	4.553±0.123	0.079±0.010	73							0	0	
	15 Nov 77	3.776±0.206	0.193±0.025	55									

Florida Index

See Methods for explanation of table.

DATA SUMMARY: Sebastian River

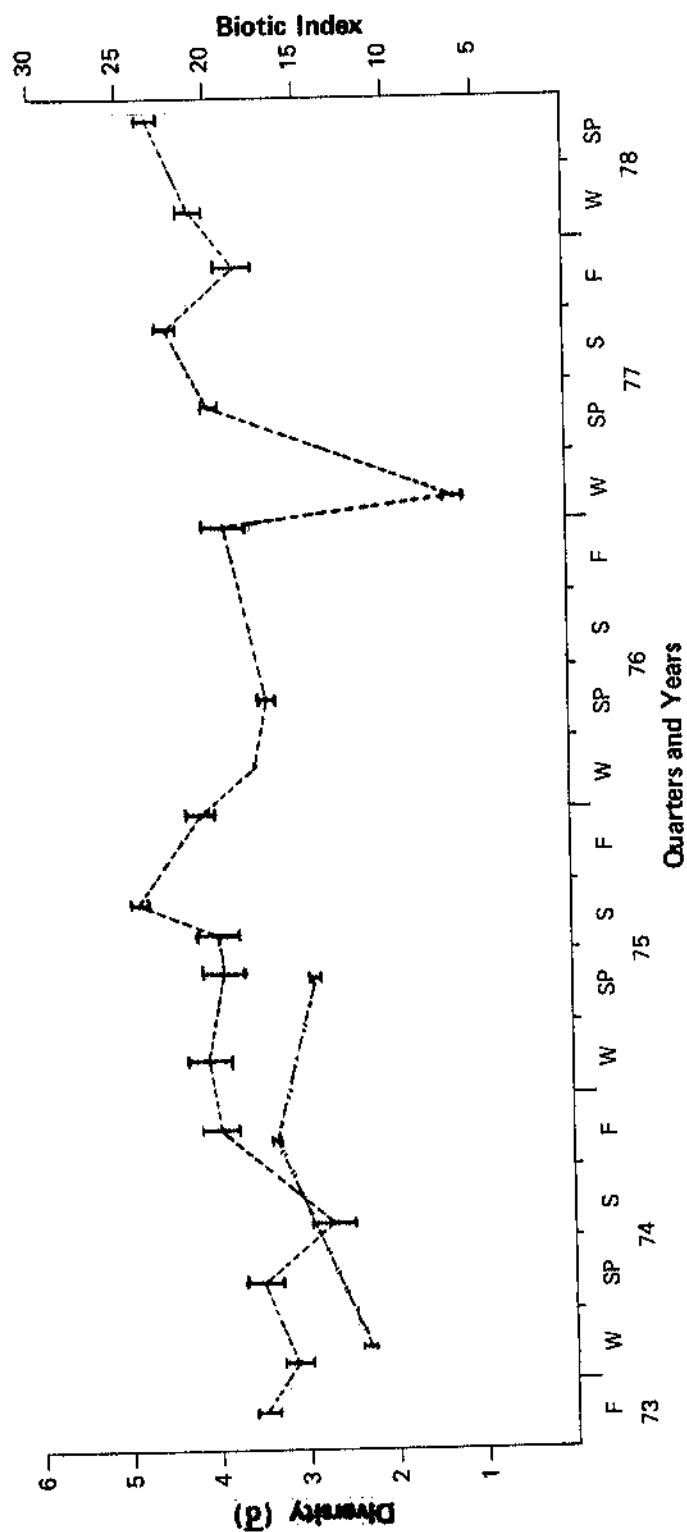
Station Number	Date	Macroinvertebrates						Biotic Index		Phytoplankton Composition units/cm ³	Periphyton Composition units/cm ²	Coliform Bacteria Colonies/100ml		Comments
		Natural Substrate			Artificial Substrate									
		Diversity	Redundancy	#Spp.	Diversity	Redundancy	#Spp.	Bf	#Spp.					
27.01.0335	10 Jan 78											2	4	
	31 Jan 78	4.228±0.158	0.095±0.010	61								1	0	
	14 Feb 78													
	22 May 78	4.753±0.095	0.055±0.006	76										

See Methods for explanation of table.

MACROINVERTEBRATE PARAMETERS VS TIME

STATION NO.: 27.02.0335
 BODY OF WATER: SEBASTIAN RIVER AT INDIAN RIVER

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



Station No. 27.02.0461 Body of Water Indian River
Location North of ALA bridge, west of markers 175 black, 176 red
County St. Lucie
Type Body of Water estuary Classification III
Sources of Pollution domestic, recreational, industrial
Nearby Land Use residential
Sampling Frequency Depth 1.7 - 1.8 m.
Bottom Type sand, shell % Volatile Solids
Aquatic Plants: Submerged
Emergent

Macroinvertebrates:

Rhynchocoela

unident. sp.

Annelida

Oligochaeta

unident tubificid

Polychaeta

Axiiothella mucosa
Exogone dispar
Fabricia sabella
Lumbrineris impatiens
Mediomastus californiensis
Nereis sp.
Phyllodoce sp.
Polydora socialis
Prionospio heterobranchia
Streblospio benedicti
Syllis cornuta
unident sp.

Arthropoda

Crustacea

Amphipoda

Leucothoe spinicarpa
Platyschnopus sp.
Rudilemboides naglei
Synchelidum americanum

Arthropoda

Crustacea

Mysidacea

Mysidopsis sp.

Tanaidacea

Leptochelia sp.

Mollusca

Gastropoda

Acteocina canaliculata

Bittium varians

Caecum pulchellum

Mitrella lunata

Nassarius alba

Olivella dealbata

Pelecypoda

Chione cancellata

Codakia orbiculata

Lucina pectinata

Macoma tenta

Mulinia lateralis

Tagelus divisus

Phoronida

Phoronis architecta

Sipunculida

Phascolion sp.

Phascolion strombi

DATA SUMMARY: Indian 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.					
27.02.0461	30 Aug 76	2.346±0.232	0.427±0.053	28										
	7 Jul 77	3.326±0.261	0.232±0.049	29										
	31 May 78											53		

See Methods for explanation of table.