

St. John's River Benthic Community Assessment, 2000-2001

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INTRODUCTION

The St. John's River (SJR) was sampled during December, 2000 and March and July, 2001. One aspect of this evaluation was benthic community characterization, which was accomplished via sample collection by National Oceanic and Atmospheric Administration (NOAA) personnel and laboratory and data analysis by Barry A. Vittor & Associates, Inc. (BVA). Location data for the St. John's River stations are given in Tables 1, 2 and 3.

METHODS

Sample Collection And Handling

A Young-modified Van Veen grab (area = 0.04 m²) was used to collect bottom samples (three replicate samples) at each of the seven stations during December, 2000 and March and July, 2001. Macroinfaunal samples were sieved through a 0.5-mm mesh screen and preserved with 10% formalin on ship. Macroinfaunal samples were transported to the BVA laboratory in Mobile, Alabama.

Sediment Analysis

Sediment texture was determined at half-phi intervals using the hydrometer technique for fractions smaller than 44 μ m and nested sieves for larger particle fractions. Texture parameters that were computed included percent gravel, sand, and silt /clay. Total organic carbon (TOC) content was measured as ash-free dry weight expressed as a percentage.

Macroinfaunal Sample Analysis

In the laboratory of BVA, benthic samples were inventoried, rinsed gently through a 0.5 mm mesh sieve to remove preservatives and sediment, stained with Rose Bengal, and stored in 70% isopropanol solution until processing. Sample material (sediment, detritus, organisms) was placed in white enamel trays for sorting under Wild M-5A dissecting microscopes. All macroinvertebrates were carefully removed with forceps and placed in labeled glass vials containing 70% isopropanol. Each vial

represented a major taxonomic group (e.g. Polychaeta, Mollusca, Arthropoda). All sorted macroinvertebrates were identified to the lowest practical identification level (LPIL), which in most cases was to species level unless the specimen was a juvenile, damaged, or otherwise unidentifiable. The number of individuals of each taxon, excluding fragments, was recorded. A voucher collection was prepared, composed of representative individuals of each species not previously encountered in samples from the region.

DATA ANALYSIS

All data generated as a result of laboratory analysis of macroinfauna samples were first coded on data sheets. Enumeration data were entered for each species according to station and replicate. These data were reduced to a data summary report for each station, which included a taxonomic species list and benthic community parameters information. Archive data files of species identification and enumeration were prepared.

The Quality Assurance and Quality Control reports for the SJR samples are given in the Appendix.

Assemblage Structure

Several numerical indices were chosen for analysis and interpretation of the macroinfaunal data. Infaunal abundance is reported as the total number of individuals per station and the total number of individuals per square meter (= density). Taxa richness is reported as the average number of taxa represented in a given station collection.

Taxa diversity, which is often related to the ecological stability and environmental "quality" of the benthos, was estimated by the Shannon-Weaver Index (Pielou, 1966), according to the following formula:

$$H' = - \sum_{i=1}^S p_i (\ln p_i)$$

where, S = the number of taxa in the sample,
i = the i'th taxa in the sample, and

p_i = the number of individuals of the i 'th taxa divided by the total number of individuals in the sample.

Taxa diversity was calculated using \ln ; however, diversity may also be calculated using \log_2 . Both methods of calculating diversity are common in the scientific literature. The taxa diversity calculated in this report using \ln , can be converted to \log_2 diversity by multiplying the \ln taxa diversity by 1.4427. Taxa diversity within a given community is dependent upon the number of taxa present (taxa richness) and the distribution of all individuals among those taxa (equitability or evenness). In order to quantify and compare the equitability in the fauna to the taxa diversity for a given area, Pielou's Index J' (Pielou, 1966) was calculated as $J' = H' / \ln S$, where $\ln S = H'_{\max}$, or the maximum possible diversity, when all taxa are represented by the same number of individuals; thus, $J' = H' / H'_{\max}$.

HABITAT CHARACTERISTICS

December

Sediment data for the 7 SJR stations in December are given in Table 1 and Figures 1 and 2. Sediment composition varied from > 90% sand at Stations 5, 6, and 7 to 44% silt+ clay at Station 2 (Table 1; Figure 1). The total organic carbon (TOC) fraction of the sediment was uniformly low (< 1%) at all stations (Table 2; Figure 2).

March

Sediment data for the 7 SJR stations in March are given in Table 2 and Figures 1 and 2. Sediment composition varied from > 95% sand at Stations 1, 6, and 7 to > 30% silt+ clay at Stations 2 and 3 (Table 2; Figure 1). The total organic carbon (TOC) fraction of the sediment was uniformly low (< 1.5%) at all stations (Table 2; Figure 2).

July

Sediment data for the 7 SJR stations in July are given in Table 3 and Figures 1 and 2. Sediment composition varied from 100% sand at Station 6 to > 30% silt+ clay at Stations 2, 4 and 5 (Table 3; Figure 1). The total organic carbon (TOC) fraction of the sediment was uniformly low (< 1%) at all stations (Table 3; Figure 2).

BENTHIC COMMUNITY CHARACTERIZATION

Microsoft TMExcel spreadsheets are being provided separately to NOAA which include: raw data on taxa abundance and density by replicate, a complete taxonomic listing with station abundance and occurrence, a major taxa table with overall taxa abundance, and an assemblage parameter table including data on mean number of taxa, mean density, taxa diversity and taxa evenness by station.

December 2000

A total of 870 organisms, representing 98 taxa, were identified from the 7 SJR stations (Table 4). Polychaetes were the most numerous organisms present representing 52.8% of the total assemblage, followed in abundance by Other Taxa (14.5%) and bivalves (13.0%). Polychaetes represented 42.9% of the total number of taxa followed by bivalves (17.3%) and malacostracans (21.4%) (Table 4).

The abundance of major taxa by station are given in Table 5 and Figure 3. The number of taxa per station ranged from 6 at Station 6 to 55 at Station 7. The number of organisms per station ranged from 11 at Station 6 to 453 at Station 7. In December, mollusks dominated the assemblage at Stations 1 and 2, while annelids (polychaetes) dominated at the remaining stations (Figure 3).

The dominant taxon collected from the SJR samples was the polychaete, *Mediomastus* (LPIL) representing 22.2% of the total individuals collected (Table 6). Other dominant taxa included the chordate class, Ascidiacea (LPIL) and the polychaete, *Streblospio benedicti* representing 10.1% and 10.0% of the total assemblage, respectively. Rhynchocoela (LPIL) was the most widely distributed taxon being found at 100% of the stations (Table 6). The distribution of dominant taxa representing > 10% of the total assemblage at each station is given in Table 7.

Mean station taxa richness and station density data are given in Table 8 and Figures 4 and 5. Taxa richness varied and ranged from 2.7 (± 1.5) at Station 6 to 29.3 (± 5.5) at Station 7 (Table 8; Figure 4). Station mean densities exhibited considerable variation ranging from 91.7 organisms/m² (± 28.9) at Station 6 to 3775.0 organisms/m² (± 680.5) at Station 7 (Table 8; Figure 5).

Taxa diversity and evenness are given in Table 8 and Figures 6 and 7. Taxa diversity (H') ranged from 1.42 at Station 6 to 2.59 at Station 5 (Table 8; Figure 6). Taxa evenness (J') was generally high and values ranged from 0.63 at Station 7 to 0.89 at Station 2 (Table 8; Figure 7).

March 2001

A total of 2960 organisms, representing 123 taxa, were identified from the 7 SJR stations in March (Table 9). Polychaetes were the most numerous organisms present representing 51.0% of the total assemblage, followed in abundance by bivalves (24.0%) and Other Taxa (12.1%). Polychaetes represented 41.5% of the total number of taxa followed by malacostracans (25.2%) and bivalves (13.8%) (Table 9).

The abundance of major taxa by station are given in Table 10 and Figure 3. The number of taxa per station ranged from 9 at Station 2 to 56 at Station 7. The number of organisms per station ranged from 44 at Station 2 to 1064 at Station 3. In March, mollusks dominated the assemblage at Stations 1 and 2, and were co-dominant with annelids at Station 3 (Figure 3). Annelids dominated the assemblage at Stations 4 and 5 (Figure 3).

The dominant taxa collected from the SJR samples were the polychaetes, *Streblospio benedicti* and *Mediomastus* (LPIL) representing 22.0% and 20.5% of the total individuals collected, respectively (Table 11). The bivalve, *Mulinia lateralis* and the phoronid, *Phoronis* (LPIL) were also abundant representing 15.1% and 8.1% of the total assemblage, respectively. *Streblospio benedicti* and the oligochaete Family, Tubificidae (LPIL) were the most widely distributed taxa being found at 86% of the stations (Table 11). The distribution of dominant taxa representing > 10% of the total assemblage at each station is given in Table 12.

Mean station taxa richness and station density data are given in Table 13 and Figures 4 and 5. Taxa richness varied and ranged from 5.0 (\pm 1.0) at Station 2 to 33.0 (\pm 2.6) at Station 7 (Table 13; Figure 4). Station mean densities exhibited considerable variation ranging from 366.7 organisms/m² (\pm 80.4) at Station 2 to 8866.7 organisms/m² (\pm 1863.2) at Station 2 (Table 13; Figure 5).

Taxa diversity and evenness are given in Table 13 and Figures 6 and 7. Taxa diversity (H') ranged from 1.41 at Station 3 to 2.74 at Station 6 (Table 13; Figure 6). Taxa evenness (J') varied considerably and ranged from 0.42 at Station 3 to 0.90 at Station 6 (Table 13; Figure 7).

July 2001

A total of 1789 organisms, representing 140 taxa, were identified from the 7 SJR stations in July (Table 14). Polychaetes were the most numerous organisms present representing 44.2% of the total assemblage, followed in abundance by bivalves (17.5%), gastropods (17.0%), Other Taxa (10.2%) and malacostracans (8.0%). Polychaetes represented 44.3% of the total number of taxa followed by bivalves (16.4%), malacostracans (15.7%) and gastropods (12.1%)(Table 14).

The abundance of major taxa by station are given in Table 15 and Figure 3. The number of taxa per station ranged from 6 at Station 2 to 77 at Station 5. The number of organisms per station ranged from 39 at Station 6 to 450 at Station 5. In July, mollusks dominated the assemblage at Stations 1 and 2, and were co-dominant with annelids at Stations 6 and 7 (Figure 3). Annelids dominated the assemblage at Stations 3 and 4 (Figure 3).

The dominant taxon collected from the SJR samples was the polychaete, *Mediomastus* (LPIL) representing 15.7% the total individuals collected (Table 16). The gastropods, *Ilyanassa obsoleta* and *Littoridinops* (LPIL) were also common representing 6.7% and 4.2% of the total assemblage, respectively. Rhynchocoela (LPIL) was the most widely distributed taxon being found at 100% of the stations (Table 16). The distribution of dominant taxa representing > 10% of the total assemblage at each station is given in Table 17.

Mean station taxa richness and station density data are given in Table 18 and Figures 4 and 5. Taxa richness varied and ranged from 2.7 (± 0.6) at Station 2 to 41.7 (± 6.7) at Station 5 (Table 18; Figure 4). Station mean densities ranged from 325.0

organisms/m² (\pm 152.1) at Station 6 to 3750.0 organisms/m² (\pm 1072.1) at Station 5 (Table 18; Figure 5).

Taxa diversity and evenness are given in Table 18 and Figures 6 and 7. Taxa diversity (H') varied considerably and ranged from 0.68 at Station 2 to 3.50 at Station 5 (Table 18; Figure 6). Taxa evenness (J') ranged from 0.38 at Station 2 to 0.83 at Station 6 (Table 18; Figure 7).

LITERATURE CITED

Pielou, E.C. 1966. The measurement of diversity in different types of biological collections. *Journal of Theoretical Biology* 13:131-144.

Table 1. Station location, water quality and sediment data for NOAA St. John's River stations, December 2000.

Station	Sample Date	Latitude	Longitude	Depth (m)	Temp (C)	Salinity (ppt)	D.O. (mg/l)	pH	% T.O.C.	% Gravel	% Sand	% Silt	% Clay	% Silt + Clay	USACE Description	Median Particle Size (phi)	Sorting Coefficient	% Moisture
1	12/1/00	30° 08.97	81° 41.94	5.0	13.25	1.48	8.83	7.93	0.03	0.45	98.39	–	–	1.17	Sand	2.476	0.469	44.75
2	12/1/00	30° 16.62	81° 42.68	1.9	15.11	17.55	7.15	7.82	0.93	10.95	56.19	14.43	18.43	32.86	–	2.921	3.864	65.33
3	12/1/00	30° 21.57	81° 37.18	1.7	15.79	25.43	7.07	8.01	0.82	0.00	61.35	19.18	19.47	38.65	Silty Sand	3.415	3.523	65.70
4	12/1/00	30° 23.48	81° 39.32	2.7	14.59	25.26	7.09	8.01	0.85	38.20	41.84	9.75	10.21	19.96	–	2.020	–	51.35
5	12/1/00	30° 22.99	81° 33.69	0.4*	14.05	28.14	7.50	8.07	0.58	3.27	52.22	24.38	20.13	44.51	Clayey Sand	3.677	3.668	49.25
6	12/1/00	30° 22.71	81° 32.35	1.8	14.03	29.10	7.33	8.07	0.25	0.00	99.80	–	–	0.20	Sand	2.524	0.496	23.10
7	12/1/00	30° 26.05	81° 30.44	1.5	11.76	26.60	7.44	7.88	0.28	3.56	95.38	–	–	1.07	Sand	2.375	0.591	35.09

– unable to calculate due to amount of sample retained in sieve

* only surface measurements taken (unable to obtain bottom measurements due to strong currents)

Table 2. Station location, water quality and sediment data for NOAA St. John's River stations, March 2001.

Station	Sample Date	Latitude	Longitude	Depth (m)	Temp (C)	Salinity (ppt)	D.O. (mg/l)	pH	% T.O.C.	% Gravel	% Sand	% Silt	% Clay	% Silt + Clay	USACE Description	Median Particle Size (phi)	Sorting Coefficient	% Moisture
1	3/1/01	30° 08.96	81° 41.92	3.5	16.83	5.25	8.53	7.83	0.41	9.48	73.71	5.80	11.01	16.81	–	2.548	1.292	43.76
2	3/1/01	30° 16.61	81° 42.69	2.0	16.57	9.75	8.29	7.85	1.45	0.04	55.74	19.83	24.39	44.22	Clayey Sand	3.312	4.315	76.39
3	3/1/01	30° 21.57	81° 37.17	3.9	17.55	18.02	7.59	7.80	0.86	0.56	70.28	9.56	19.60	29.16	Silty Sand	3.198	3.744	78.61
4	3/1/01	30° 23.47	81° 39.31	3.0	17.17	16.62	7.90	7.87	0.10	58.10	26.64	5.09	10.17	15.26	–	–	–	53.77
5	3/1/01	30° 22.98	81° 33.71	3.5	16.78	25.11	7.52	7.93	0.01	9.03	90.11	–	–	0.85	–	2.421	0.951	41.16
6	3/1/01	30° 22.72	81° 32.33	3.4	16.58	22.65	7.81	7.95	0.01	0.00	99.70	–	–	0.30	Sand	2.498	0.417	31.89
7	3/1/01	30° 26.06	81° 30.47	1.4	16.17	26.21	7.72	7.93	0.02	1.35	98.25	–	–	0.40	Sand	2.424	0.426	17.25

– unable to calculate due to amount of sample retained in sieve

Table 3. Station location, water quality and sediment data for NOAA St. John's River stations, July 2001.

Station	Latitude	Longitude	Depth (m)	Temp (C)	Salinity (ppt)	D.O. (mg/l)	pH	% T.O.C.	% Gravel	% Sand	% Silt	% Clay	% Silt + Clay	USACE Description	Median Particle Size (phi)	Sorting Coefficient	% Moisture
1	30° 08.98	81° 41.92	4.6	30.20	5.07	6.35	7.60	0.14	13.17	69.42	7.48	9.93	17.41	–	2.658	1.530	33.03
2	30° 16.61	81° 42.68	1.6	30.50	8.56	4.95	7.40	1.47	2.68	58.42	16.56	22.34	38.90	Clayey Sand	3.180	4.053	55.06
3	30° 21.57	81° 37.17	5.3	30.61	16.86	5.31	7.60	0.48	1.71	69.21	12.30	16.78	29.08	Silty Sand	3.272	3.137	53.91
4	30° 23.48	81° 39.30	3.1	30.21	19.94	6.02	7.85	0.43	5.91	58.35	14.72	21.02	35.74	–	2.659	4.506	38.14
5	30° 22.99	81° 33.68	0.3*	29.40	23.04	6.05	7.92	0.03	3.50	57.40	12.77	26.33	39.10	Clayey Sand	3.274	4.419	63.32
6	30° 22.73	81° 32.32	4.0	29.32	24.65	5.44	7.89	0.24	0.00	100.00	–	–	0.00	Sand	2.539	0.482	18.81
7	30° 26.06	81° 30.45	1.4	29.40	29.43	4.92	7.69	0.02	5.25	93.97	–	–	0.78	–	2.300	0.715	48.36

– unable to calculate due to amount of sample retained in sieve

* only surface measurements taken (unable to obtain bottom measurements due to strong currents)

Table 4. Summary of overall abundance of major benthic macroinfaunal taxonomic groups for the NOAA St. John's River stations, December 2000.

Taxa	Total No. Taxa	% of Total	Total No. Individuals	% of Total
Annelida				
Oligochaeta	1	1.0	43	4.9
Polychaeta	42	42.9	459	52.8
Mollusca				
Bivalvia	17	17.3	113	13.0
Gastropoda	8	8.2	17	2.0
Arthropoda				
Insecta	4	4.1	25	2.9
Malacostraca	21	21.4	85	9.8
Echinodermata				
Ophiuroidea	1	1.0	2	0.2
Other Taxa	4	4.1	126	14.5
Total	98		870	

Table 5. Summary of abundance of major benthic macroinfaunal taxonomic groups by station for the NOAA St. John's River stations, December 2000.

Station	Phylum	No. of Taxa	% of Total	No. of Individuals	% of Total
1	Annelida	3	20.0	34	30.9
	Mollusca	6	40.0	50	45.5
	Arthropoda	5	33.3	21	19.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	6.7	5	4.5
	Total		15		110
2	Annelida	2	25.0	12	33.3
	Mollusca	3	37.5	15	41.7
	Arthropoda	1	12.5	5	13.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	25.0	4	11.1
	Total		8		36
3	Annelida	7	70.0	115	94.3
	Mollusca	0	0.0	0	0.0
	Arthropoda	2	20.0	6	4.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	10.0	1	0.8
	Total		10		122
4	Annelida	8	50.0	47	75.8
	Mollusca	3	18.8	7	11.3
	Arthropoda	4	25.0	7	11.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	6.3	1	1.6
	Total		16		62
5	Annelida	8	32.0	35	46.1
	Mollusca	8	32.0	17	22.4
	Arthropoda	8	32.0	22	28.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	4.0	2	2.6
	Total		25		76
6	Annelida	3	50.0	8	72.7
	Mollusca	1	16.7	1	9.1
	Arthropoda	1	16.7	1	9.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	16.7	1	9.1
	Total		6		11
7	Annelida	29	52.7	251	55.4
	Mollusca	10	18.2	40	8.8
	Arthropoda	11	20.0	48	10.6
	Echinodermata	1	1.8	2	0.4
	Other Taxa	4	7.3	112	24.7
	Total		55		453

Table 6. Distribution and abundance and of taxa for the NOAA St. John's River stations, December 2000.

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Mediomastus</i> (LPIL)	Ann	Poly	193	22.18	22.18	3	43
Asciacea (LPIL)	Cho	Asci	88	10.11	32.30	1	14
<i>Streblospio benedicti</i>	Ann	Poly	87	10.00	42.30	5	71
Tubificidae (LPIL)	Ann	Olig	43	4.94	47.24	3	43
<i>Nereis</i> (LPIL)	Ann	Poly	39	4.48	51.72	3	43
<i>Mytilopsis leucophaeata</i>	Mol	Biva	32	3.68	55.40	1	14
Rhynchocoela (LPIL)	Rhy	-	26	2.99	58.39	7	100
<i>Capitella capitata</i>	Ann	Poly	22	2.53	60.92	2	29
Bivalvia (LPIL)	Mol	Biva	21	2.41	63.33	4	57
<i>Ampelisca</i> (LPIL)	Art	Mala	20	2.30	65.63	1	14
<i>Nereis succinea</i>	Ann	Poly	16	1.84	67.47	3	43
<i>Clinotanypus</i> (LPIL)	Art	Inse	15	1.72	69.20	1	14
<i>Ampelisca vadorum</i>	Art	Mala	15	1.72	70.92	1	14
<i>Dipolydora socialis</i>	Ann	Poly	12	1.38	72.30	2	29
Spionidae (LPIL)	Ann	Poly	12	1.38	73.68	1	14
<i>Macoma mitchelli</i>	Mol	Biva	10	1.15	74.83	2	29
<i>Tubulanus</i> (LPIL)	Rhy	Anop	10	1.15	75.98	2	29
Petricolidae (LPIL)	Mol	Biva	9	1.03	77.01	1	14
<i>Chironomus</i> (LPIL)	Art	Inse	8	0.92	77.93	2	29
Corophiidae (LPIL)	Art	Mala	8	0.92	78.85	1	14
<i>Eurypanopeus depressus</i>	Art	Mala	8	0.92	79.77	1	14
<i>Scoloplos rubra</i>	Ann	Poly	7	0.80	80.57	2	29
<i>Nassarius vibex</i>	Mol	Gast	7	0.80	81.38	1	14
<i>Heteromastus filiformis</i>	Ann	Poly	6	0.69	82.07	1	14
<i>Nereis micromma</i>	Ann	Poly	6	0.69	82.76	2	29
<i>Paraonis fulgens</i>	Ann	Poly	6	0.69	83.45	1	14
<i>Lucina multilineata</i>	Mol	Biva	6	0.69	84.14	1	14
Mytilidae (LPIL)	Mol	Biva	6	0.69	84.83	1	14
<i>Sphenia antillensis</i>	Mol	Biva	5	0.57	85.40	1	14
Tellinidae (LPIL)	Mol	Biva	5	0.57	85.98	1	14
<i>Grandidierella bonnieroides</i>	Art	Mala	4	0.46	86.44	1	14
Mactridae (LPIL)	Mol	Biva	4	0.46	86.90	2	29
<i>Rangia cuneata</i>	Mol	Biva	4	0.46	87.36	1	14
<i>Turbonilla</i> (LPIL)	Mol	Gast	4	0.46	87.82	1	14
<i>Aglaophamus verrilli</i>	Ann	Poly	3	0.34	88.16	1	14
<i>Diopatra cuprea</i>	Ann	Poly	3	0.34	88.51	1	14
<i>Mediomastus californiensis</i>	Ann	Poly	3	0.34	88.85	1	14
<i>Podarkeopsis levifuscina</i>	Ann	Poly	3	0.34	89.20	1	14
<i>Polydora cornuta</i>	Ann	Poly	3	0.34	89.54	1	14
<i>Sabellaria vulgaris</i>	Ann	Poly	3	0.34	89.89	2	29
<i>Spiochaetopterus oculus</i>	Ann	Poly	3	0.34	90.23	1	14
Syllidae (LPIL)	Ann	Poly	3	0.34	90.57	1	14
Amphipoda (LPIL)	Art	Mala	3	0.34	90.92	2	29
Melitidae (LPIL)	Art	Mala	3	0.34	91.26	2	29
<i>Panopeus herbstii</i>	Art	Mala	3	0.34	91.61	2	29
<i>Amygdalum papyria</i>	Mol	Biva	3	0.34	91.95	1	14
<i>Armandia maculata</i>	Ann	Poly	2	0.23	92.18	1	14
<i>Capitella</i> (LPIL)	Ann	Poly	2	0.23	92.41	1	14
<i>Nereis falsa</i>	Ann	Poly	2	0.23	92.64	1	14
<i>Owenia fusiformis</i>	Ann	Poly	2	0.23	92.87	1	14
<i>Scoletoma verrilli</i>	Ann	Poly	2	0.23	93.10	1	14
<i>Streptosyllis pettiboneae</i>	Ann	Poly	2	0.23	93.33	1	14
<i>Americhelidium americanum</i>	Art	Mala	2	0.23	93.56	2	29
<i>Batea catharinensis</i>	Art	Mala	2	0.23	93.79	2	29
<i>Bowmaniella floridana</i>	Art	Mala	2	0.23	94.02	1	14
<i>Cerapus</i> (LPIL)	Art	Mala	2	0.23	94.25	1	14
<i>Cerapus benthophilus</i>	Art	Mala	2	0.23	94.48	1	14

Table 6 continued:

Taxon Name	Phylum	Class	No. of		Cumulative %	Station Occurrence	% Station Occurrence
			Individuals	% of Total			
<i>Ogyrides alphaerostris</i>	Art	Mala	2	0.23	94.71	1	14
<i>Paracaprella pusilla</i>	Art	Mala	2	0.23	94.94	2	29
Xanthidae (LPIL)	Art	Mala	2	0.23	95.17	1	14
Actiniaria (LPIL)	Cni	Anth	2	0.23	95.40	1	14
<i>Hemipholis elongata</i>	Ech	Ophi	2	0.23	95.63	1	14
<i>Lucina</i> (LPIL)	Mol	Biva	2	0.23	95.86	2	29
<i>Sphenia</i> (LPIL)	Mol	Biva	2	0.23	96.09	1	14
Capitellidae (LPIL)	Ann	Poly	1	0.11	96.21	1	14
<i>Cirrophorus</i> (LPIL)	Ann	Poly	1	0.11	96.32	1	14
<i>Demonax microphthalmus</i>	Ann	Poly	1	0.11	96.44	1	14
<i>Glycera americana</i>	Ann	Poly	1	0.11	96.55	1	14
Glyceridae (LPIL)	Ann	Poly	1	0.11	96.67	1	14
<i>Glycinde solitaria</i>	Ann	Poly	1	0.11	96.78	1	14
Hesionidae (LPIL)	Ann	Poly	1	0.11	96.90	1	14
<i>Marenzellaria viridis</i>	Ann	Poly	1	0.11	97.01	1	14
<i>Nematoneis hebes</i>	Ann	Poly	1	0.11	97.13	1	14
Nereididae (LPIL)	Ann	Poly	1	0.11	97.24	1	14
<i>Pectinaria gouldii</i>	Ann	Poly	1	0.11	97.36	1	14
Phyllodocidae (LPIL)	Ann	Poly	1	0.11	97.47	1	14
<i>Piromis roberti</i>	Ann	Poly	1	0.11	97.59	1	14
<i>Pista palmata</i>	Ann	Poly	1	0.11	97.70	1	14
<i>Podarke obscura</i>	Ann	Poly	1	0.11	97.82	1	14
Sabellidae (LPIL)	Ann	Poly	1	0.11	97.93	1	14
<i>Scolelepis texana</i>	Ann	Poly	1	0.11	98.05	1	14
Chironomidae (LPIL)	Art	Inse	1	0.11	98.16	1	14
<i>Polypedilum scalaenum</i> group	Art	Inse	1	0.11	98.28	1	14
Aoridae (LPIL)	Art	Mala	1	0.11	98.39	1	14
<i>Automate</i> (LPIL)	Art	Mala	1	0.11	98.51	1	14
<i>Cyclaspis varians</i>	Art	Mala	1	0.11	98.62	1	14
Oedicerotidae (LPIL)	Art	Mala	1	0.11	98.74	1	14
<i>Pinnixa</i> (LPIL)	Art	Mala	1	0.11	98.85	1	14
<i>Anadara transversa</i>	Mol	Biva	1	0.11	98.97	1	14
<i>Gemma gemma</i>	Mol	Biva	1	0.11	99.08	1	14
<i>Tagelus plebeius</i>	Mol	Biva	1	0.11	99.20	1	14
<i>Tellina</i> (LPIL)	Mol	Biva	1	0.11	99.31	1	14
<i>Acteocina canaliculata</i>	Mol	Gast	1	0.11	99.43	1	14
<i>Calotrophon ostrearum</i>	Mol	Gast	1	0.11	99.54	1	14
Gastropoda (LPIL)	Mol	Gast	1	0.11	99.66	1	14
Turridae (LPIL)	Mol	Gast	1	0.11	99.77	1	14
<i>Vitrinella floridana</i>	Mol	Gast	1	0.11	99.89	1	14
Vitrinellidae (LPIL)	Mol	Gast	1	0.11	100.00	1	14

Taxa Key

Ann = Annelida	Cho = Chordata	Mol = Mollusca
Olig = Oligochaeta	Asci = Ascidiacea	Biva = Bivalvia
Poly = Polychaeta	Cni = Cnidaria	Gast = Gastropoda
Art = Arthropoda	Anth = Anthozoa	Rhy = Rhynchocoela
Inse = Insecta	Ech = Echinodermata	Anop = Anopla
Mala = Malacostraca	Ophi = Ophiuroidea	

Table 7. Percentage abundance of dominant taxa (> 10% of the total assemblage) for the NOAA St. John's River stations, December 2000.

Taxa	1	2	3	4	5	6	7
Annelida							
Oligochaeta							
Tubificidae (LPIL)			32.0				
Polychaeta							
<i>Capitella capitata</i>			17.2				
<i>Mediomastus</i> (LPIL)			10.7	16.1			37.5
<i>Nereis</i> (LPIL)				27.4	27.6		
<i>Nereis succinea</i>				11.3			
<i>Paraonis fulgens</i>						54.5	
<i>Streblospio benedicti</i>	29.1	30.6	27.9				
Arthropoda							
Insecta							
<i>Chironomus</i> (LPIL)		13.9					
<i>Clinotanytus</i> (LPIL)	13.6						
Malacostraca							
Corophiidae (LPIL)					10.5		
<i>Eurypanopeus depressus</i>					10.5		
Chordata							
Ascidiacea							
Ascidiacea (LPIL)							19.4
Mollusca							
Bivalvia							
Bivalvia (LPIL)		11.1					
<i>Macoma mitchelli</i>		16.7					
<i>Mytilopsis leucophaeata</i>	29.1						
Petricolidae (LPIL)					11.8		
Tellinidae (LPIL)		13.9					

Table 8. Summary of benthic macroinfaunal data for the NOAA St. John's River stations, December 2000.

Station	Rep	Taxa	Indvs	Density	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
1	1	11	52	1300	8.3	2.5	916.7	387.6	15	110	1.98	0.73
1	2	6	21	525								
1	3	8	37	925								
2	1	4	15	375	3.3	1.2	300.0	129.9	8	36	1.86	0.89
2	2	2	6	150								
2	3	4	15	375								
3	1	6	32	800	7.0	1.0	1016.7	240.2	10	122	1.73	0.75
3	2	8	51	1275								
3	3	7	39	975								
4	1	12	25	625	8.3	3.5	516.7	128.3	16	62	2.31	0.83
4	2	5	15	375								
4	3	8	22	550								
5	1	3	8	200	10.7	7.1	633.3	388.4	25	76	2.59	0.80
5	2	12	38	950								
5	3	17	30	750								
6	1	3	3	75	2.7	1.5	91.7	28.9	6	11	1.42	0.79
6	2	1	3	75								
6	3	4	5	125								
7	1	24	120	3000	29.3	5.5	3775.0	680.5	55	453	2.54	0.63
7	2	29	171	4275								
7	3	35	162	4050								

Table 9. Summary of overall abundance of major benthic macroinfaunal taxonomic groups for the NOAA St. John's River stations, March 2001.

Taxa	Total No. Taxa	% of Total	Total No. Individuals	% of Total
Annelida				
Oligochaeta	2	1.6	56	1.9
Polychaeta	51	41.5	1,510	51.0
Mollusca				
Bivalvia	17	13.8	710	24.0
Gastropoda	10	8.1	42	1.4
Arthropoda				
Insecta	4	3.3	70	2.4
Malacostraca	31	25.2	209	7.1
Echinodermata				
Holothuroidea	1	0.8	4	0.1
Other Taxa	7	5.7	359	12.1
Total	123		2,960	

Table 10. Summary of abundance of major benthic macroinfaunal taxonomic groups by station for the NOAA St. John's River stations, March 2001.

Station	Phylum	No. of Taxa	% of Total	No. of Individuals	% of Total
1	Annelida	8	32.0	109	32.2
	Mollusca	7	28.0	149	44.0
	Arthropoda	9	36.0	77	22.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	4.0	4	1.2
	Total		25		339
2	Annelida	5	55.6	6	13.6
	Mollusca	2	22.2	24	54.5
	Arthropoda	2	22.2	14	31.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total		9		44
3	Annelida	14	48.3	592	55.6
	Mollusca	6	20.7	453	42.6
	Arthropoda	5	17.2	7	0.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	10.3	11	1.1
	Total		29		1,064
4	Annelida	14	51.9	135	78.5
	Mollusca	4	14.8	7	4.1
	Arthropoda	7	25.9	27	15.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	7.4	3	1.7
	Total		27		172
5	Annelida	24	45.3	456	78.9
	Mollusca	14	26.4	29	5.0
	Arthropoda	10	18.9	41	7.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	5	9.4	52	9.0
	Total		53		578
6	Annelida	7	33.3	19	34.5
	Mollusca	4	19.0	13	23.6
	Arthropoda	7	33.3	19	34.5
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	14.3	4	7.3
	Total		21		55
7	Annelida	27	48.2	249	35.2
	Mollusca	16	28.6	77	10.9
	Arthropoda	7	12.5	94	13.3
	Echinodermata	1	1.8	4	0.6
	Other Taxa	5	8.9	284	40.1
	Total		56		708

Table 11. Distribution and abundance and of taxa for the NOAA St. John's River stations, March 2001.

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Streblospio benedicti</i>	Ann	Poly	651	21.99	21.99	6	86
<i>Mediomastus</i> (LPIL)	Ann	Poly	607	20.51	42.50	5	71
<i>Mulinia lateralis</i>	Mol	Biva	448	15.14	57.64	4	57
<i>Phoronis</i> (LPIL)	Pho	–	240	8.11	65.74	2	29
<i>Mytilopsis leucophaeata</i>	Mol	Biva	83	2.80	68.55	1	14
<i>Tubulanus</i> (LPIL)	Rhy	Anop	73	2.47	71.01	5	71
<i>Ischadium recurvum</i>	Mol	Biva	43	1.45	72.47	1	14
Tubificidae (LPIL)	Ann	Olig	42	1.42	73.89	6	86
<i>Ampelisca</i> (LPIL)	Art	Mala	42	1.42	75.30	2	29
<i>Marenzelleria viridis</i>	Ann	Poly	34	1.15	76.45	1	14
<i>Polypedilum scalaenum</i> group	Art	Inse	30	1.01	77.47	1	14
<i>Macoma mitchelli</i>	Mol	Biva	27	0.91	78.38	3	43
<i>Nereis succinea</i>	Ann	Poly	26	0.88	79.26	4	57
<i>Ampelisca vadorum</i>	Art	Mala	26	0.88	80.14	1	14
<i>Lucina multilineata</i>	Mol	Biva	24	0.81	80.95	1	14
Corophiidae (LPIL)	Art	Mala	23	0.78	81.72	3	43
Mactridae (LPIL)	Mol	Biva	23	0.78	82.50	4	57
<i>Scoloplos rubra</i>	Ann	Poly	21	0.71	83.21	3	43
Spionidae (LPIL)	Ann	Poly	19	0.64	83.85	5	71
<i>Chironomus</i> (LPIL)	Art	Inse	19	0.64	84.49	3	43
Ascidiacea (LPIL)	Cho	Asci	19	0.64	85.14	3	43
<i>Oxyurostylis smithi</i>	Art	Mala	18	0.61	85.74	2	29
<i>Clinotanypus</i> (LPIL)	Art	Inse	16	0.54	86.28	1	14
Tellinidae (LPIL)	Mol	Biva	16	0.54	86.82	5	71
<i>Leitoscoloplos</i> (LPIL)	Ann	Poly	15	0.51	87.33	3	43
<i>Cyathura polita</i>	Art	Mala	15	0.51	87.84	2	29
<i>Ilyanassa obsoleta</i>	Mol	Gast	15	0.51	88.34	3	43
Rhynchocoela (LPIL)	Rhy	–	15	0.51	88.85	5	71
<i>Tubificoides heterochaetus</i>	Ann	Olig	14	0.47	89.32	3	43
Bivalvia (LPIL)	Mol	Biva	14	0.47	89.80	5	71
<i>Lucina</i> (LPIL)	Mol	Biva	13	0.44	90.24	2	29
<i>Nereis</i> (LPIL)	Ann	Poly	10	0.34	90.57	3	43
<i>Sigambra tentaculata</i>	Ann	Poly	10	0.34	90.91	3	43
Amphipoda (LPIL)	Art	Mala	9	0.30	91.22	2	29
<i>Eobrolgus spinosus</i>	Art	Mala	9	0.30	91.52	1	14
<i>Melita</i> (LPIL)	Art	Mala	9	0.30	91.82	1	14
<i>Asabellides oculata</i>	Ann	Poly	8	0.27	92.09	4	57
<i>Paraonis fulgens</i>	Ann	Poly	8	0.27	92.36	1	14
<i>Protohaustorius wigleyi</i>	Art	Mala	8	0.27	92.64	1	14
Actiniaria (LPIL)	Cni	Anth	8	0.27	92.91	2	29
<i>Acteocina canaliculata</i>	Mol	Gast	8	0.27	93.18	3	43
<i>Dipolydora socialis</i>	Ann	Poly	7	0.24	93.41	3	43
<i>Spiophanes bombyx</i>	Ann	Poly	7	0.24	93.65	4	57
<i>Podarkeopsis levifuscina</i>	Ann	Poly	6	0.20	93.85	1	14
<i>Tharyx acutus</i>	Ann	Poly	6	0.20	94.05	1	14
<i>Ampelisca</i> sp. C	Art	Mala	6	0.20	94.26	1	14
<i>Monocorophium acherusicum</i>	Art	Mala	6	0.20	94.46	2	29
<i>Abra aequalis</i>	Mol	Biva	6	0.20	94.66	2	29
<i>Diplodonta semiaspera</i>	Mol	Biva	6	0.20	94.86	1	14
<i>Heteromastus filiformis</i>	Ann	Poly	5	0.17	95.03	1	14
<i>Nephtys</i> (LPIL)	Ann	Poly	5	0.17	95.20	2	29
<i>Paraprionospio pinnata</i>	Ann	Poly	5	0.17	95.37	1	14
Chironomidae (LPIL)	Art	Inse	5	0.17	95.54	1	14
Melitidae (LPIL)	Art	Mala	5	0.17	95.71	1	14
<i>Monoculodes</i> sp. D	Art	Mala	5	0.17	95.88	3	43
<i>Nassarius vibex</i>	Mol	Gast	5	0.17	96.05	3	43

Table 11 continued:

Taxon Name	Phylum	Class	No. of		Cumulative	Station	% Station
			Individuals	% of Total	%	Occurrence	Occurrence
<i>Turbonilla interrupta</i>	Mol	Gast	5	0.17	96.22	1	14
<i>Owenia fusiformis</i>	Ann	Poly	4	0.14	96.35	2	29
<i>Pectinaria gouldii</i>	Ann	Poly	4	0.14	96.49	2	29
Xanthidae (LPIL)	Art	Mala	4	0.14	96.62	1	14
<i>Leptosynapta tenuis</i>	Ech	Holo	4	0.14	96.76	1	14
Ampharetidae (LPIL)	Ann	Poly	3	0.10	96.86	1	14
<i>Capitella</i> (LPIL)	Ann	Poly	3	0.10	96.96	2	29
<i>Capitella capitata</i>	Ann	Poly	3	0.10	97.06	1	14
<i>Cirrophorus</i> sp. A	Ann	Poly	3	0.10	97.16	1	14
<i>Nereis micromma</i>	Ann	Poly	3	0.10	97.26	1	14
<i>Sabellaria vulgaris</i>	Ann	Poly	3	0.10	97.36	1	14
<i>Apocorophium lacustre</i>	Art	Mala	3	0.10	97.47	1	14
<i>Odostomia</i> (LPIL)	Mol	Gast	3	0.10	97.57	2	29
Lineidae (LPIL)	Rhy	Anop	3	0.10	97.67	2	29
<i>Armandia maculata</i>	Ann	Poly	2	0.07	97.74	1	14
<i>Autolytus</i> (LPIL)	Ann	Poly	2	0.07	97.80	1	14
<i>Diopatra cuprea</i>	Ann	Poly	2	0.07	97.87	2	29
<i>Glycera americana</i>	Ann	Poly	2	0.07	97.94	1	14
<i>Hydroides dianthus</i>	Ann	Poly	2	0.07	98.01	1	14
<i>Mediomastus ambiseta</i>	Ann	Poly	2	0.07	98.07	1	14
<i>Melinna maculata</i>	Ann	Poly	2	0.07	98.14	2	29
Phyllodoceidae (LPIL)	Ann	Poly	2	0.07	98.21	1	14
<i>Streptosyllis pettiboneae</i>	Ann	Poly	2	0.07	98.28	2	29
<i>Americhelidium americanum</i>	Art	Mala	2	0.07	98.34	1	14
Amphilochidae (LPIL)	Art	Mala	2	0.07	98.41	1	14
Caprellidae (LPIL)	Art	Mala	2	0.07	98.48	1	14
<i>Leucon americanus</i>	Art	Mala	2	0.07	98.55	1	14
<i>Oxyurostylis</i> (LPIL)	Art	Mala	2	0.07	98.61	2	29
<i>Sphenia antillensis</i>	Mol	Biva	2	0.07	98.68	2	29
<i>Turbonilla</i> (LPIL)	Mol	Gast	2	0.07	98.75	1	14
Cirratulidae (LPIL)	Ann	Poly	1	0.03	98.78	1	14
<i>Glycinde solitaria</i>	Ann	Poly	1	0.03	98.82	1	14
<i>Goniada littorea</i>	Ann	Poly	1	0.03	98.85	1	14
<i>Hobsonia florida</i>	Ann	Poly	1	0.03	98.89	1	14
<i>Magelona</i> sp. H	Ann	Poly	1	0.03	98.92	1	14
<i>Marphysa</i> (LPIL)	Ann	Poly	1	0.03	98.95	1	14
<i>Mediomastus californiensis</i>	Ann	Poly	1	0.03	98.99	1	14
<i>Nephtys bucera</i>	Ann	Poly	1	0.03	99.02	1	14
<i>Paraonis</i> (LPIL)	Ann	Poly	1	0.03	99.05	1	14
<i>Polydora cornuta</i>	Ann	Poly	1	0.03	99.09	1	14
<i>Prionospio</i> (LPIL)	Ann	Poly	1	0.03	99.12	1	14
<i>Sabaco americanus</i>	Ann	Poly	1	0.03	99.16	1	14
<i>Spiochaetopterus oculus</i>	Ann	Poly	1	0.03	99.19	1	14
<i>Spiophanes missionensis</i>	Ann	Poly	1	0.03	99.22	1	14
Syllidae (LPIL)	Ann	Poly	1	0.03	99.26	1	14
Terebellidae (LPIL)	Ann	Poly	1	0.03	99.29	1	14
<i>Caprella scaura</i>	Art	Mala	1	0.03	99.32	1	14
<i>Cyclaspis varians</i>	Art	Mala	1	0.03	99.36	1	14
<i>Eurypanopeus depressus</i>	Art	Mala	1	0.03	99.39	1	14
<i>Mancocuma stellifera</i>	Art	Mala	1	0.03	99.43	1	14
<i>Monoculodes</i> (LPIL)	Art	Mala	1	0.03	99.46	1	14
Oedicerotidae (LPIL)	Art	Mala	1	0.03	99.49	1	14
<i>Ogyrides alphaerostris</i>	Art	Mala	1	0.03	99.53	1	14
<i>Panopeus herbstii</i>	Art	Mala	1	0.03	99.56	1	14
<i>Petrolisthes politus</i>	Art	Mala	1	0.03	99.59	1	14
<i>Rhepoxynius epistomus</i>	Art	Mala	1	0.03	99.63	1	14
<i>Synidotea</i> (LPIL)	Art	Mala	1	0.03	99.66	1	14

Table 11 continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	% Station Occurrence
Hydrozoa (LPIL)	Cni	Hydr	1	0.03	99.70	1	14
Arcidae (LPIL)	Mol	Biva	1	0.03	99.73	1	14
<i>Gemma gemma</i>	Mol	Biva	1	0.03	99.76	1	14
Nuculidae (LPIL)	Mol	Biva	1	0.03	99.80	1	14
<i>Rangia cuneata</i>	Mol	Biva	1	0.03	99.83	1	14
<i>Sphenia</i> (LPIL)	Mol	Biva	1	0.03	99.86	1	14
<i>Calotrophon ostrearum</i>	Mol	Gast	1	0.03	99.90	1	14
Doridella (LPIL)	Mol	Gast	1	0.03	99.93	1	14
<i>Doridella obscura</i>	Mol	Gast	1	0.03	99.97	1	14
Nassariidae (LPIL)	Mol	Gast	1	0.03	100.00	1	14

Taxa Key

Ann = Annelida

Olig = Oligochaeta

Poly = Polychaeta

Art = Arthropoda

Inse = Insecta

Mala = Malacostraca

Cho = Chordata

Asci = Ascidiacea

Cni = Cnidaria

Anth = Anthozoa

Hydr = Hydrozoa

Ech = Echinodermata

Holo = Holothuroidea

Mol = Mollusca

Biva = Bivalvia

Gast = Gastropoda

Pho = Phoronida

Rhy = Rhynchozoela

Anop = Anopla

Table 13. Summary of benthic macroinfaunal data for the NOAA St. John's River stations, March 2001.

Station	Rep	Taxa	Indvs	Density	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
1	1	21	160	4000	15.7	4.7	2825.0	1018.3	25	339	2.48	0.77
1	2	12	91	2275								
1	3	14	88	2200								
2	1	6	17	425	5.0	1.0	366.7	80.4	9	44	1.42	0.65
2	2	5	16	400								
2	3	4	11	275								
3	1	12	273	6825	15.3	3.1	8866.7	1863.2	29	1064	1.41	0.42
3	2	16	419	10475								
3	3	18	372	9300								
4	1	17	81	2025	13.0	4.6	1433.3	600.2	27	172	2.44	0.74
4	2	8	33	825								
4	3	14	58	1450								
5	1	26	191	4775	26.7	2.1	4816.7	563.7	53	578	1.78	0.45
5	2	25	216	5400								
5	3	29	171	4275								
6	1	7	17	425	9.3	2.5	458.3	202.1	21	55	2.74	0.90
6	2	9	11	275								
6	3	12	27	675								
7	1	35	199	4975	33.0	2.6	5900.0	1913.3	56	708	2.65	0.66
7	2	34	185	4625								
7	3	30	324	8100								

Table 14. Summary of overall abundance of major benthic macroinfaunal taxonomic groups for the NOAA St. John's River stations, July 2001.

Taxa	Total No. Taxa	% of Total	Total No. Individuals	% of Total
Annelida				
Oligochaeta	2	1.4	23	1.3
Polychaeta	62	44.3	791	44.2
Mollusca				
Bivalvia	23	16.4	313	17.5
Gastropoda	17	12.1	304	17.0
Arthropoda				
Insecta	2	1.4	2	0.1
Malacostraca	22	15.7	144	8.0
Ostracoda	2	1.4	9	0.5
Echinodermata				
Holothuroidea	1	0.7	15	0.8
Ophiuroidea	2	1.4	6	0.3
Other Taxa	7	5.0	182	10.2
Total	140		1,789	

Table 15. Summary of abundance of major benthic macroinfaunal taxonomic groups by stations for the NOAA St. John's River stations, July 2001.

Station	Phylum	No. of Taxa	% of Total	No. of Individuals	% of Total
1	Annelida	8	32.0	20	7.1
	Mollusca	11	44.0	248	88.3
	Arthropoda	4	16.0	9	3.2
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	8.0	4	1.4
	Total	25		281	
2	Annelida	2	33.3	3	6.8
	Mollusca	3	50.0	40	90.9
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	16.7	1	2.3
	Total	6		44	
3	Annelida	17	48.6	236	77.1
	Mollusca	8	22.9	16	5.2
	Arthropoda	5	14.3	15	4.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	5	14.3	39	12.7
	Total	35		306	
4	Annelida	17	45.9	159	67.4
	Mollusca	8	21.6	30	12.7
	Arthropoda	9	24.3	30	12.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	8.1	17	7.2
	Total	37		236	
5	Annelida	37	48.1	227	50.4
	Mollusca	19	24.7	83	18.4
	Arthropoda	14	18.2	67	14.9
	Echinodermata	2	2.6	6	1.3
	Other Taxa	5	6.5	67	14.9
	Total	77		450	
6	Annelida	6	50.0	17	43.6
	Mollusca	2	16.7	12	30.8
	Arthropoda	1	8.3	1	2.6
	Echinodermata	1	8.3	5	12.8
	Other Taxa	2	16.7	4	10.3
	Total	12		39	
7	Annelida	25	43.9	152	35.1
	Mollusca	21	36.8	188	43.4
	Arthropoda	5	8.8	33	7.6
	Echinodermata	1	1.8	10	2.3
	Other Taxa	5	8.8	50	11.5
	Total	57		433	

Table 16. Distribution and abundance and of taxa for the NOAA St. John's River stations, July 2001.

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Mediomastus</i> (LPIL)	Ann	Poly	280	15.65	15.65	4	57
<i>Ilyanassa obsoleta</i>	Mol	Gast	119	6.65	22.30	1	14
<i>Littoridinops</i> (LPIL)	Mol	Gast	75	4.19	26.50	1	14
Actiniaria (LPIL)	Cni	Anth	71	3.97	30.46	4	57
Asciidiacea (LPIL)	Cho	Asci	69	3.86	34.32	4	57
Hydrobiidae (LPIL)	Mol	Gast	68	3.80	38.12	1	14
<i>Sabellaria vulgaris</i>	Ann	Poly	64	3.58	41.70	1	14
<i>Streblospio benedicti</i>	Ann	Poly	60	3.35	45.05	4	57
<i>Macoma mitchelli</i>	Mol	Biva	56	3.13	48.18	4	57
Tellinidae (LPIL)	Mol	Biva	56	3.13	51.31	4	57
<i>Nereis succinea</i>	Ann	Poly	54	3.02	54.33	3	43
<i>Anadara transversa</i>	Mol	Biva	42	2.35	56.68	3	43
<i>Mytilopsis leucophaeata</i>	Mol	Biva	42	2.35	59.03	1	14
<i>Nereis</i> (LPIL)	Ann	Poly	39	2.18	61.21	5	71
<i>Sphenia antillensis</i>	Mol	Biva	30	1.68	62.88	2	29
Serpulidae (LPIL)	Ann	Poly	27	1.51	64.39	2	29
<i>Paracaprella pusilla</i>	Art	Mala	27	1.51	65.90	4	57
<i>Hydroides dianthus</i>	Ann	Poly	26	1.45	67.36	3	43
<i>Batea catharinensis</i>	Art	Mala	25	1.40	68.75	1	14
Tubificidae (LPIL)	Ann	Olig	22	1.23	69.98	4	57
<i>Diopatra cuprea</i>	Ann	Poly	21	1.17	71.16	3	43
<i>Lucina multilineata</i>	Mol	Biva	21	1.17	72.33	2	29
<i>Dipolydora socialis</i>	Ann	Poly	20	1.12	73.45	4	57
<i>Tubulanus</i> (LPIL)	Rhy	Anop	20	1.12	74.57	4	57
<i>Scoloplos rubra</i>	Ann	Poly	18	1.01	75.57	3	43
<i>Melita longisetosa</i>	Art	Mala	17	0.95	76.52	3	43
Rhynchozoela (LPIL)	Rhy	-	17	0.95	77.47	7	100
Cirratulidae (LPIL)	Ann	Poly	15	0.84	78.31	1	14
<i>Leptosynapta tenuis</i>	Ech	Holo	15	0.84	79.15	2	29
<i>Capitella capitata</i>	Ann	Poly	14	0.78	79.93	2	29
<i>Ampelisca</i> (LPIL)	Art	Mala	13	0.73	80.66	3	43
<i>Spiophanes bombyx</i>	Ann	Poly	11	0.61	81.27	2	29
<i>Ampelisca cristata</i>	Art	Mala	11	0.61	81.89	1	14
<i>Rangia cuneata</i>	Mol	Biva	10	0.56	82.45	2	29
<i>Nereis micromma</i>	Ann	Poly	9	0.50	82.95	1	14
Xanthidae (LPIL)	Art	Mala	9	0.50	83.45	3	43
<i>Acteocina canaliculata</i>	Mol	Gast	9	0.50	83.96	3	43
<i>Grandidierella bonnieroides</i>	Art	Mala	8	0.45	84.40	1	14
Melitidae (LPIL)	Art	Mala	8	0.45	84.85	2	29
<i>Demonax microphthalmus</i>	Ann	Poly	7	0.39	85.24	1	14
<i>Glycinde solitaria</i>	Ann	Poly	7	0.39	85.63	3	43
<i>Eusarsiella zostericola</i>	Art	Ostr	7	0.39	86.03	1	14
<i>Mulinia lateralis</i>	Mol	Biva	7	0.39	86.42	4	57
Ostreidae (LPIL)	Mol	Biva	7	0.39	86.81	2	29
<i>Magelona</i> sp. H	Ann	Poly	6	0.34	87.14	2	29
<i>Nephtys picta</i>	Ann	Poly	6	0.34	87.48	1	14
<i>Podarkeopsis levifuscina</i>	Ann	Poly	6	0.34	87.81	3	43
Spionidae (LPIL)	Ann	Poly	6	0.34	88.15	4	57
<i>Panopeus herbstii</i>	Art	Mala	6	0.34	88.49	2	29
<i>Abra aequalis</i>	Mol	Biva	6	0.34	88.82	2	29
Bivalvia (LPIL)	Mol	Biva	6	0.34	89.16	5	71
Mytilidae (LPIL)	Mol	Biva	6	0.34	89.49	2	29
<i>Nucula proxima</i>	Mol	Biva	6	0.34	89.83	2	29
<i>Odostomia impressa</i>	Mol	Gast	6	0.34	90.16	2	29
<i>Heteromastus filiformis</i>	Ann	Poly	5	0.28	90.44	2	29
<i>Mediomastus californiensis</i>	Ann	Poly	5	0.28	90.72	1	14

Table 16 continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Syllis beneliahui</i>	Ann	Poly	5	0.28	91.00	1	14
Ophiuroidea (LPIL)	Ech	Ophi	5	0.28	91.28	1	14
<i>Epitonium multistriatum</i>	Mol	Gast	5	0.28	91.56	2	29
<i>Armandia maculata</i>	Ann	Poly	4	0.22	91.78	2	29
<i>Paraprionospio pinnata</i>	Ann	Poly	4	0.22	92.01	2	29
Phyllodocidae (LPIL)	Ann	Poly	4	0.22	92.23	3	43
<i>Prionospio</i> (LPIL)	Ann	Poly	4	0.22	92.45	1	14
<i>Spirochaetopterus oculatus</i>	Ann	Poly	4	0.22	92.68	2	29
<i>Spiophanes missionensis</i>	Ann	Poly	4	0.22	92.90	1	14
Mactridae (LPIL)	Mol	Biva	4	0.22	93.12	1	14
<i>Mitrella lunata</i>	Mol	Gast	4	0.22	93.35	3	43
<i>Exogone rolani</i>	Ann	Poly	3	0.17	93.52	1	14
<i>Hobsonia florida</i>	Ann	Poly	3	0.17	93.68	1	14
Onuphidae (LPIL)	Ann	Poly	3	0.17	93.85	2	29
<i>Polydora cornuta</i>	Ann	Poly	3	0.17	94.02	2	29
Polynoidae (LPIL)	Ann	Poly	3	0.17	94.19	2	29
<i>Sigambra tentaculata</i>	Ann	Poly	3	0.17	94.35	2	29
Terebellidae (LPIL)	Ann	Poly	3	0.17	94.52	2	29
<i>Cyathura polita</i>	Art	Mala	3	0.17	94.69	1	14
<i>Eurypanopeus depressus</i>	Art	Mala	3	0.17	94.86	1	14
<i>Amygdalum papyria</i>	Mol	Biva	3	0.17	95.03	3	43
<i>Odostomia</i> (LPIL)	Mol	Gast	3	0.17	95.19	1	14
<i>Odostomia seminuda</i>	Mol	Gast	3	0.17	95.36	2	29
<i>Odostomia weberi</i>	Mol	Gast	3	0.17	95.53	2	29
<i>Vitrinella floridana</i>	Mol	Gast	3	0.17	95.70	1	14
Hesionidae (LPIL)	Ann	Poly	2	0.11	95.81	1	14
<i>Leitoscoloplos</i> (LPIL)	Ann	Poly	2	0.11	95.92	2	29
<i>Lepidonotus sublevis</i>	Ann	Poly	2	0.11	96.03	1	14
<i>Melinna maculata</i>	Ann	Poly	2	0.11	96.14	1	14
<i>Nereis falsa</i>	Ann	Poly	2	0.11	96.25	1	14
<i>Odontosyllis enopla</i>	Ann	Poly	2	0.11	96.37	1	14
<i>Pectinaria gouldii</i>	Ann	Poly	2	0.11	96.48	1	14
<i>Pista quadrilobata</i>	Ann	Poly	2	0.11	96.59	1	14
Syllidae (LPIL)	Ann	Poly	2	0.11	96.70	2	29
<i>Alpheus armillatus</i>	Art	Mala	2	0.11	96.81	2	29
<i>Ampelisca abdita</i>	Art	Mala	2	0.11	96.93	1	14
Ampithoidae (LPIL)	Art	Mala	2	0.11	97.04	1	14
Podocopida (LPIL)	Art	Ostr	2	0.11	97.15	1	14
Hydrozoa (LPIL)	Cni	Hydr	2	0.11	97.26	2	29
<i>Chione intapurpurea</i>	Mol	Biva	2	0.11	97.37	1	14
<i>Diplodonta semiaspera</i>	Mol	Biva	2	0.11	97.48	1	14
<i>Ischadium recurvum</i>	Mol	Biva	2	0.11	97.60	1	14
<i>Phoronis</i> (LPIL)	Pho	-	2	0.11	97.71	1	14
<i>Tubificoides heterochaetus</i>	Ann	Olig	1	0.06	97.76	1	14
Ampharetidae (LPIL)	Ann	Poly	1	0.06	97.82	1	14
<i>Apoprionospio dayi</i>	Ann	Poly	1	0.06	97.88	1	14
<i>Armandia agilis</i>	Ann	Poly	1	0.06	97.93	1	14
Capitellidae (LPIL)	Ann	Poly	1	0.06	97.99	1	14
<i>Carazziella hobsonae</i>	Ann	Poly	1	0.06	98.04	1	14
Dorvilleidae (LPIL)	Ann	Poly	1	0.06	98.10	1	14
<i>Eumida sanguinea</i>	Ann	Poly	1	0.06	98.16	1	14
Eunicidae (LPIL)	Ann	Poly	1	0.06	98.21	1	14
<i>Fimbriosthenelais minor</i>	Ann	Poly	1	0.06	98.27	1	14
<i>Grubeosyllis clavata</i>	Ann	Poly	1	0.06	98.32	1	14
<i>Laeonereis culveri</i>	Ann	Poly	1	0.06	98.38	1	14
Nereididae (LPIL)	Ann	Poly	1	0.06	98.43	1	14
<i>Owenia fusiformis</i>	Ann	Poly	1	0.06	98.49	1	14

Table 16 continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Phyllodoce arenae</i>	Ann	Poly	1	0.06	98.55	1	14
<i>Podarke obscura</i>	Ann	Poly	1	0.06	98.60	1	14
<i>Sabaco americanus</i>	Ann	Poly	1	0.06	98.66	1	14
Sabellidae (LPIL)	Ann	Poly	1	0.06	98.71	1	14
<i>Chironomus</i> (LPIL)	Art	Inse	1	0.06	98.77	1	14
<i>Cryptochironomus</i> (LPIL)	Art	Inse	1	0.06	98.83	1	14
<i>Americhelidium americanum</i>	Art	Mala	1	0.06	98.88	1	14
Corophiidae (LPIL)	Art	Mala	1	0.06	98.94	1	14
Ischyroceridae (LPIL)	Art	Mala	1	0.06	98.99	1	14
<i>Melita</i> (LPIL)	Art	Mala	1	0.06	99.05	1	14
<i>Monocorophium acherusicum</i>	Art	Mala	1	0.06	99.11	1	14
<i>Pagurus</i> (LPIL)	Art	Mala	1	0.06	99.16	1	14
<i>Synidotea</i> (LPIL)	Art	Mala	1	0.06	99.22	1	14
<i>Unciola serrata</i>	Art	Mala	1	0.06	99.27	1	14
<i>Hemipholis elongata</i>	Ech	Ophi	1	0.06	99.33	1	14
<i>Crassinella lunulata</i>	Mol	Biva	1	0.06	99.39	1	14
<i>Gemma gemma</i>	Mol	Biva	1	0.06	99.44	1	14
<i>Macoma tenta</i>	Mol	Biva	1	0.06	99.50	1	14
<i>Tagelus plebeius</i>	Mol	Biva	1	0.06	99.55	1	14
<i>Tellina</i> (LPIL)	Mol	Biva	1	0.06	99.61	1	14
<i>Anachis lafresnayi</i>	Mol	Gast	1	0.06	99.66	1	14
<i>Calotrophon ostrearum</i>	Mol	Gast	1	0.06	99.72	1	14
<i>Crepidula</i> (LPIL)	Mol	Gast	1	0.06	99.78	1	14
<i>Cyclostremiscus pentagonus</i>	Mol	Gast	1	0.06	99.83	1	14
Gastropoda (LPIL)	Mol	Gast	1	0.06	99.89	1	14
<i>Nassarius vibex</i>	Mol	Gast	1	0.06	99.94	1	14
Lineidae (LPIL)	Rhy	Anop	1	0.06	100.00	1	14

Taxa Key

Ann = Annelida

Olig = Oligochaeta

Poly = Polychaeta

Art = Arthropoda

Inse = Insecta

Mala = Malacostraca

Ostr = Ostracoda

Cho = Chordata

Asci = Ascidiacea

Cni = Cnidaria

Anth = Anthozoa

Hydr = Hydrozoa

Ech = Echinodermata

Holo = Holothuroidea

Ophi = Ophiuroidea

Mol = Mollusca

Biva = Bivalvia

Gast = Gastropoda

Pho = Phoronida

Rhy = Rhynchocoela

Anop = Anopla

Table 17. Percentage abundance of dominant taxa (> 10% of the total assemblage) for the NOAA St. John's River stations, July 2001.

Taxa	1	2	3	4	5	6	7
Annelida							
Polychaeta							
<i>Mediomastus</i> (LPIL)			44.8	27.1			14.3
<i>Nephtys picta</i>						15.4	
<i>Nereis</i> (LPIL)				12.3			
<i>Nereis succinea</i>				18.6			
<i>Sabellaria vulgaris</i>					14.2		
<i>Spiophanes bombyx</i>						17.9	
<i>Streblospio benedicti</i>			13.4				
Echinodermata							
Holothuroidea							
<i>Leptosynapta tenuis</i>						12.8	
Mollusca							
Bivalvia							
<i>Macoma mitchelli</i>		84.1					
<i>Mytilopsis leucophaeata</i>	14.9						
Tellinidae (LPIL)						28.2	
Gastropoda							
Hydrobiidae (LPIL)	24.2						
<i>Ilyanassa obsoleta</i>							27.5
<i>Littoridinops</i> (LPIL)	26.7						

Table 18. Summary of benthic macroinfaunal data for the NOAA St. John's River stations, July 2001.

Station	Rep	Taxa	Indvs	Density	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
1	1	18	76	1900	12.7	4.7	2341.7	1059.0	25	281	2.21	0.69
1	2	11	142	3550								
1	3	9	63	1575								
2	1	2	16	400	2.7	0.6	366.7	38.2	6	44	0.68	0.38
2	2	3	13	325								
2	3	3	15	375								
3	1	22	63	1575	19.0	2.6	2550.0	1121.1	35	306	2.29	0.64
3	2	18	151	3775								
3	3	17	92	2300								
4	1	14	55	1375	18.3	5.9	1966.7	1134.8	37	236	2.56	0.71
4	2	25	131	3275								
4	3	16	50	1250								
5	1	45	187	4675	41.7	6.7	3750.0	1072.1	77	450	3.50	0.80
5	2	46	160	4000								
5	3	34	103	2575								
6	1	5	16	400	6.0	2.6	325.0	152.1	12	39	2.07	0.83
6	2	9	17	425								
6	3	4	6	150								
7	1	36	103	2575	33.0	4.4	3608.3	895.2	57	433	2.92	0.72
7	2	35	166	4150								
7	3	28	164	4100								

Figure 1. Sediment texture data for the NOAA St. John's River stations, 2000-2001.

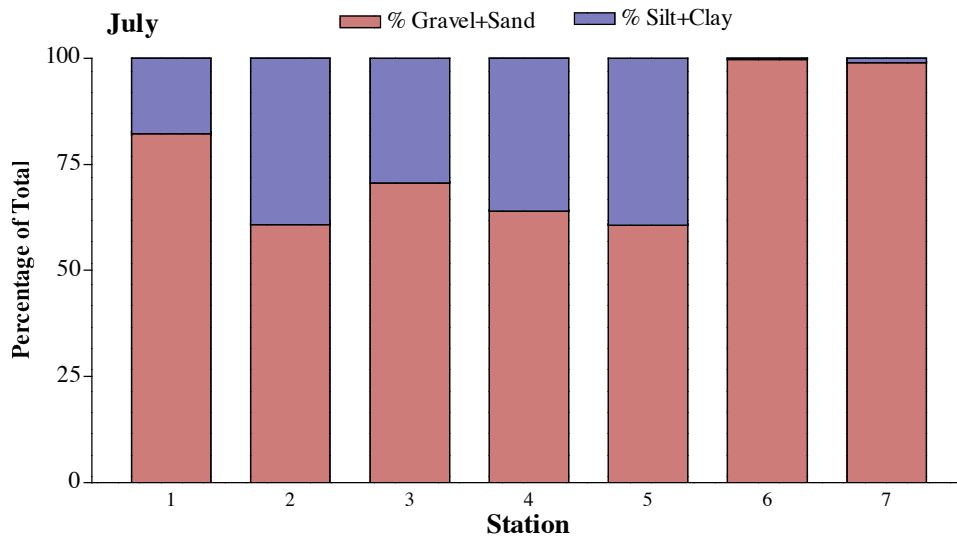
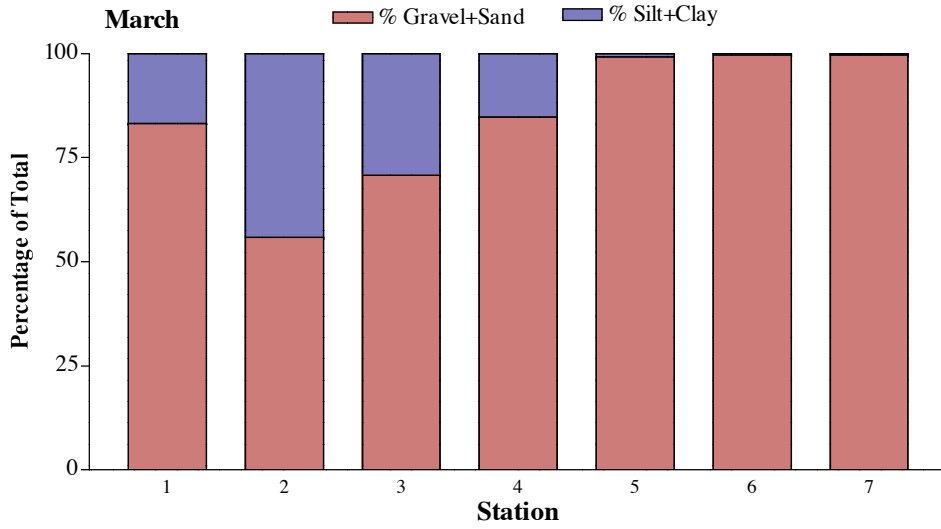
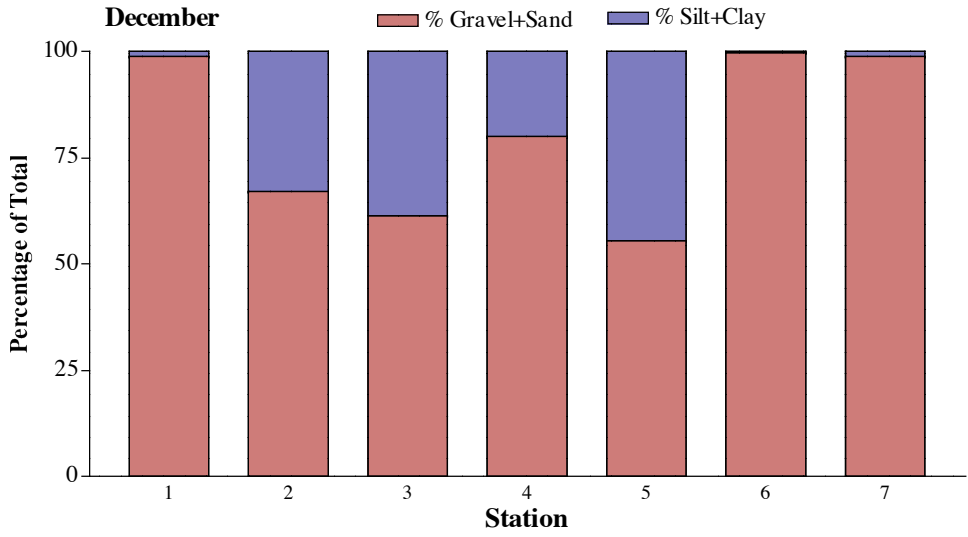


Figure 2. Sediment percent organic carbon (TOC) for the NOAA St. John's River stations, 2000-2001.

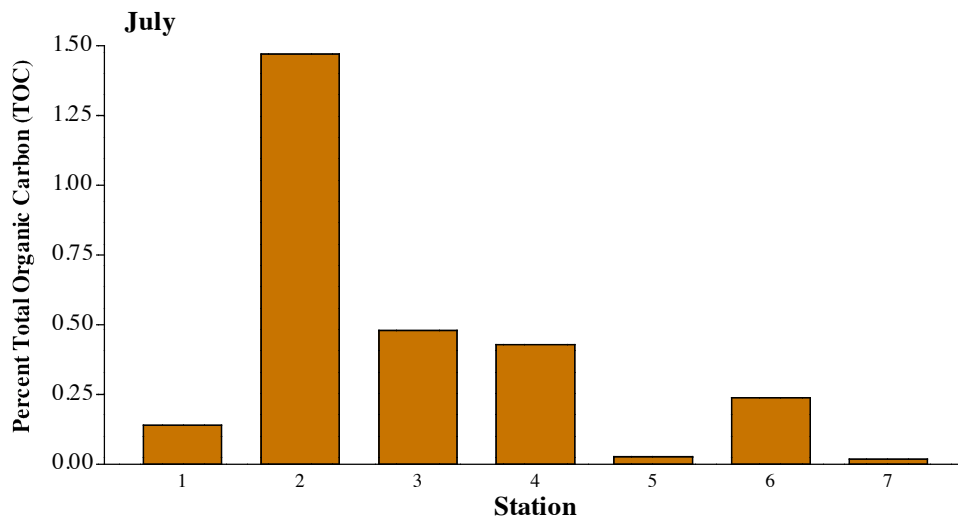
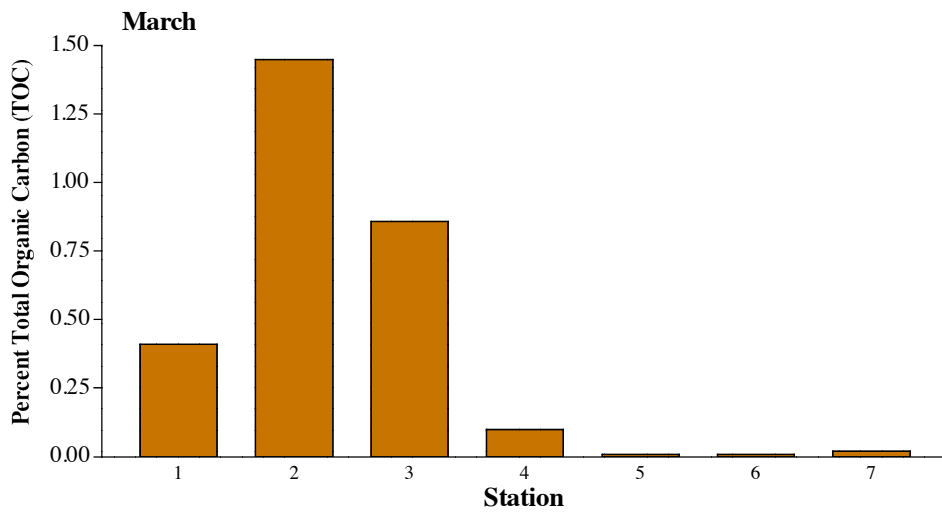
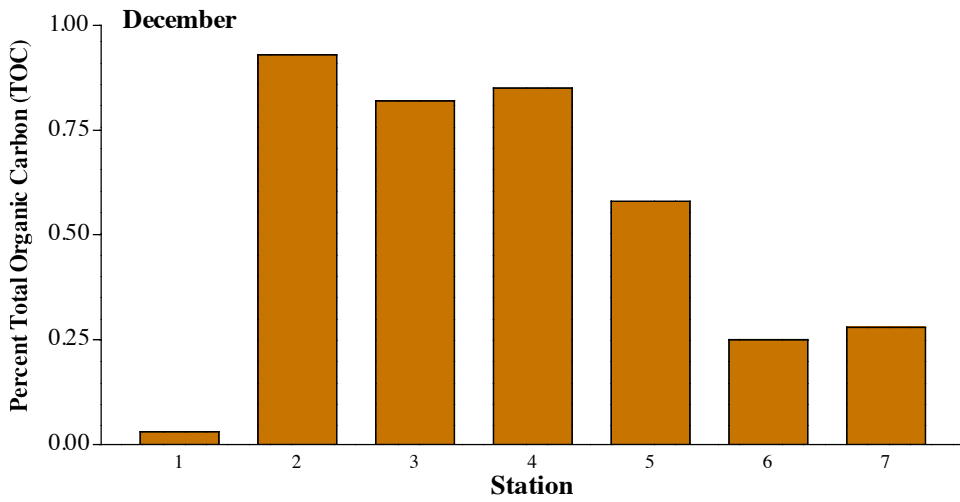


Figure 3. Major macroinvertebrate taxonomic groups for the NOAA St. John's River stations, 2000-2001.

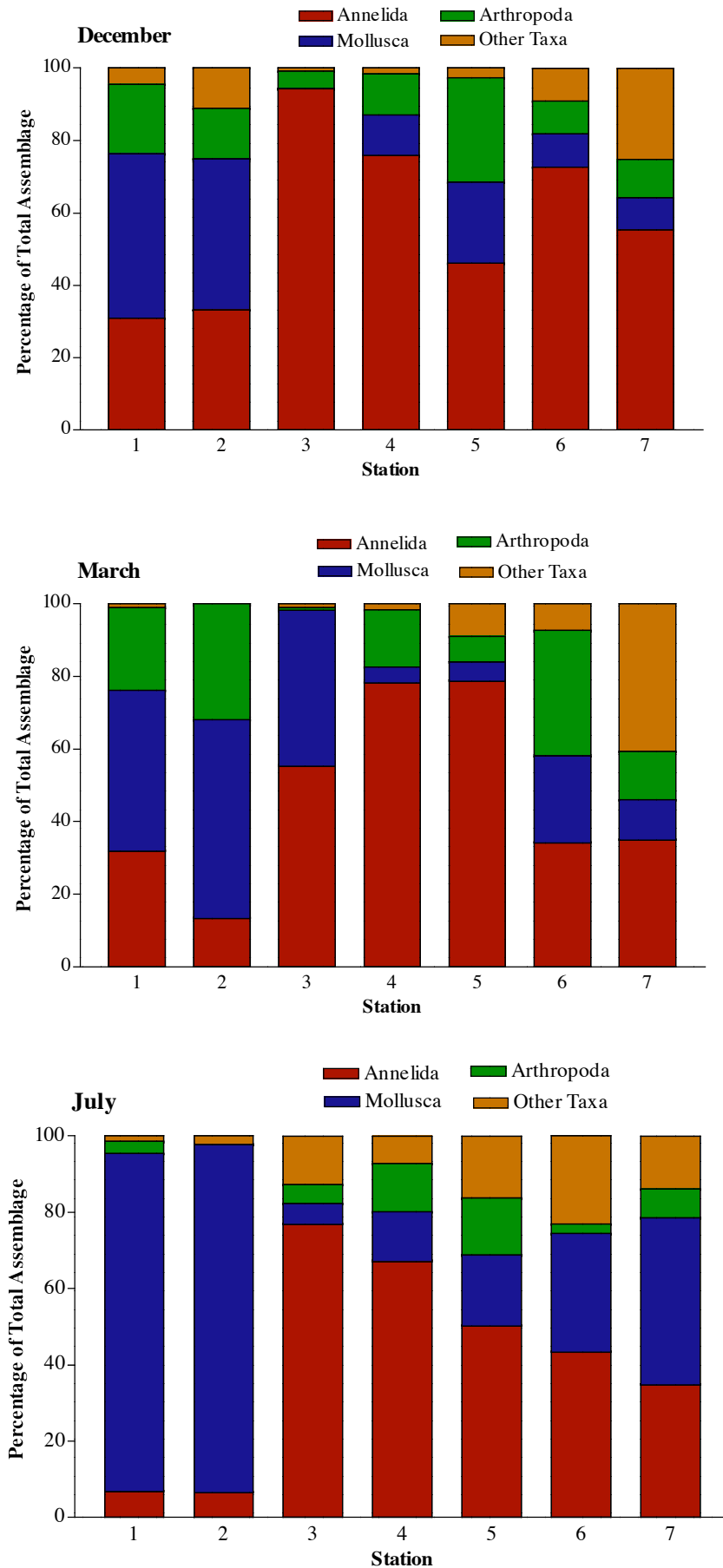


Figure 4. Macroinvertebrate taxa richness for the NOAA St. John's River stations, 2000-2001.

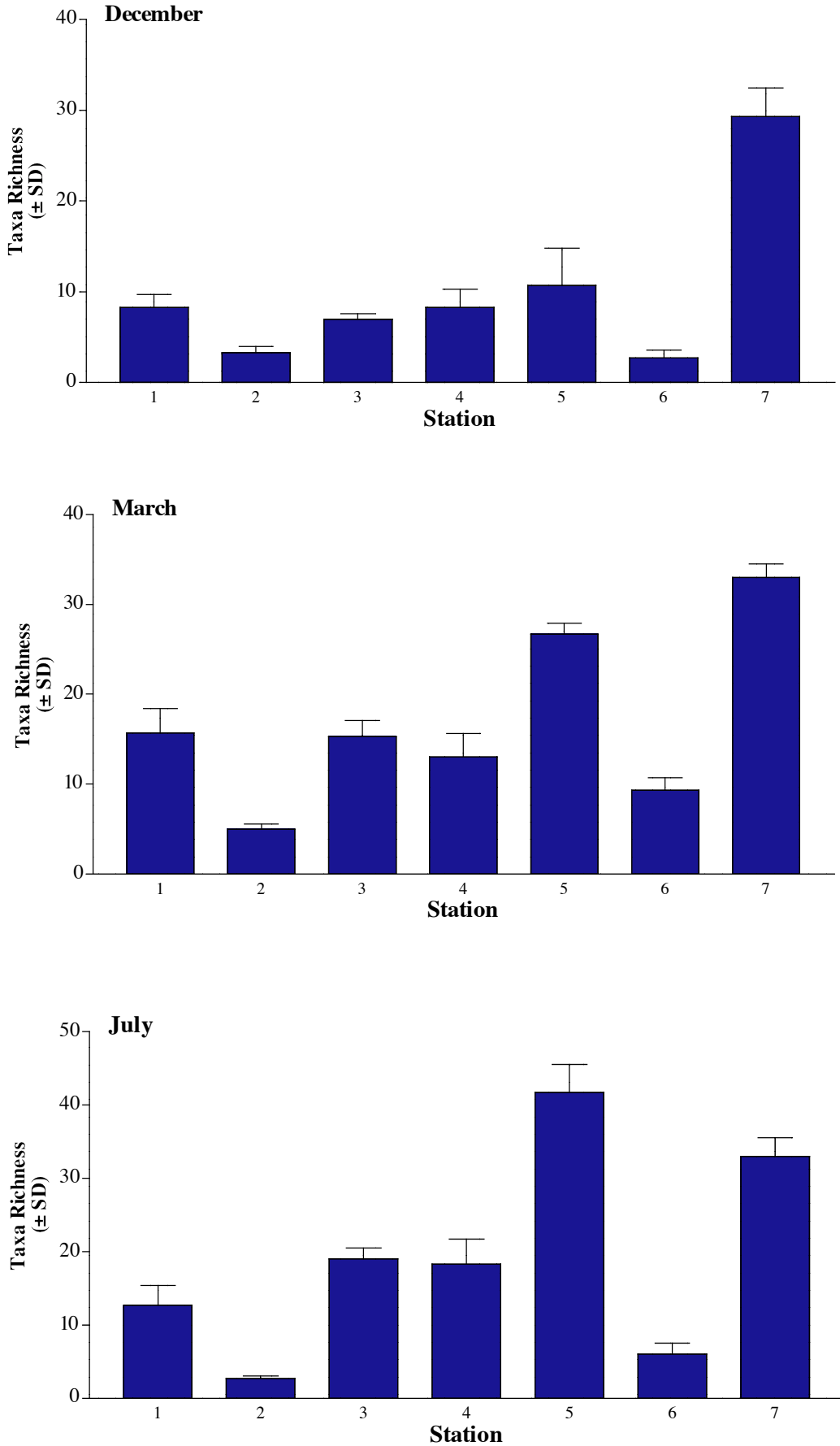


Figure 5. Macroinvertebrate densities for the NOAA St. John's River stations, 2000-2001.

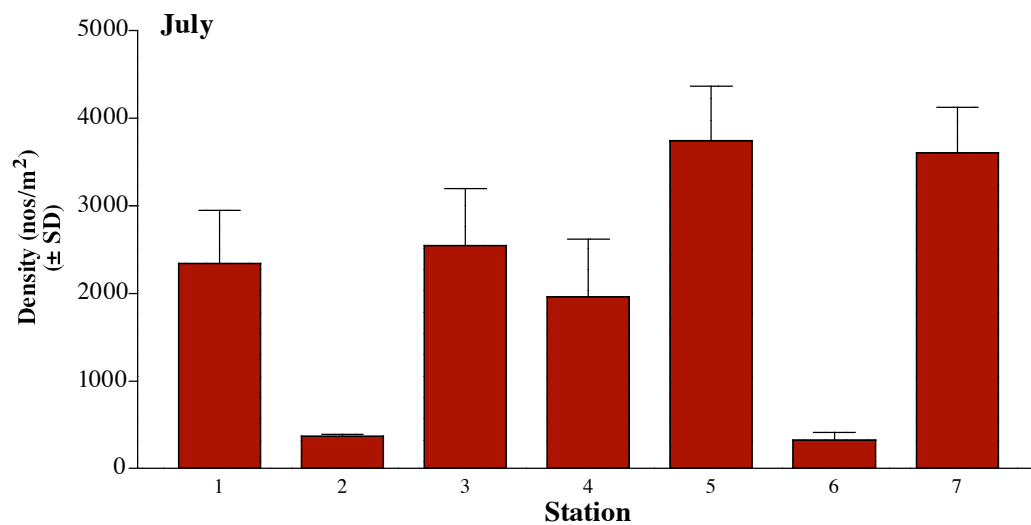
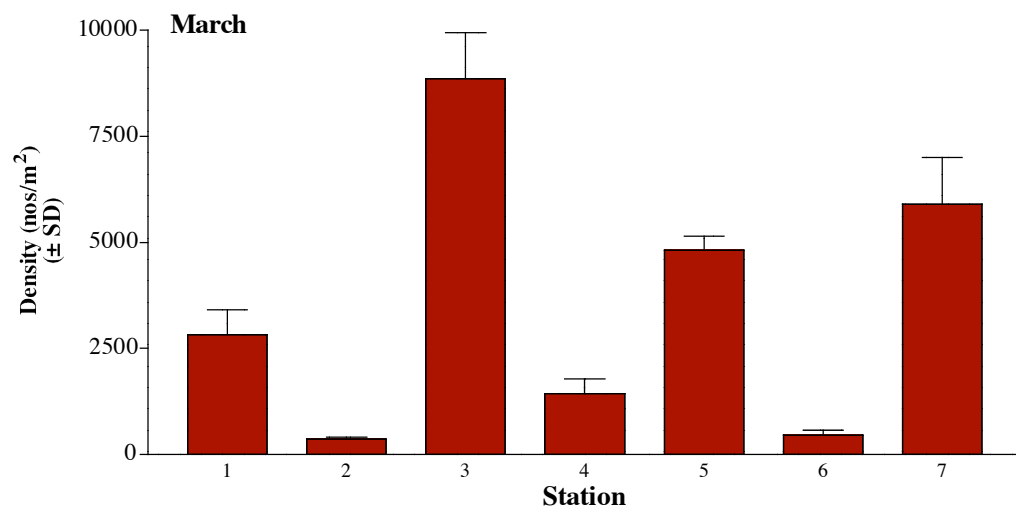
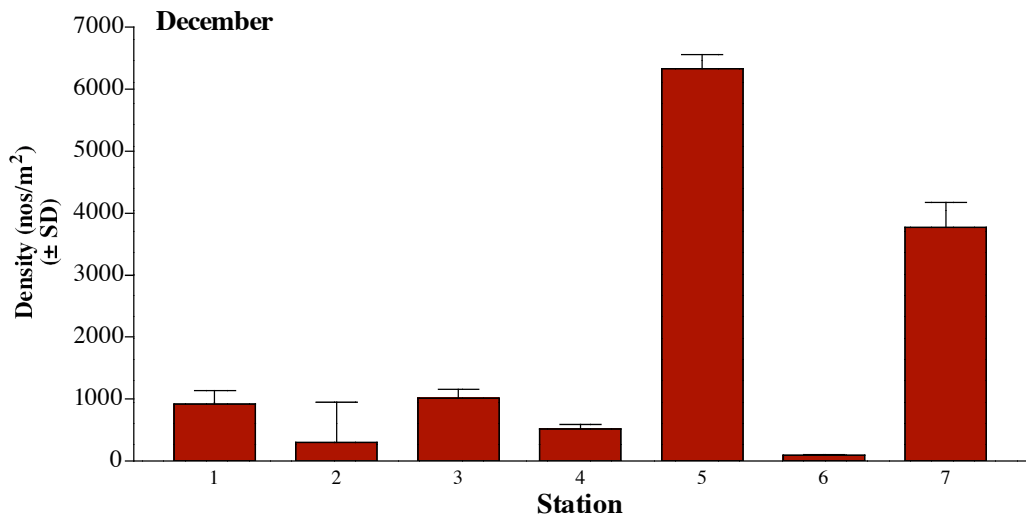


Figure 6. Taxa diversity (H') for the NOAA St. John's River stations, 2000-2001.

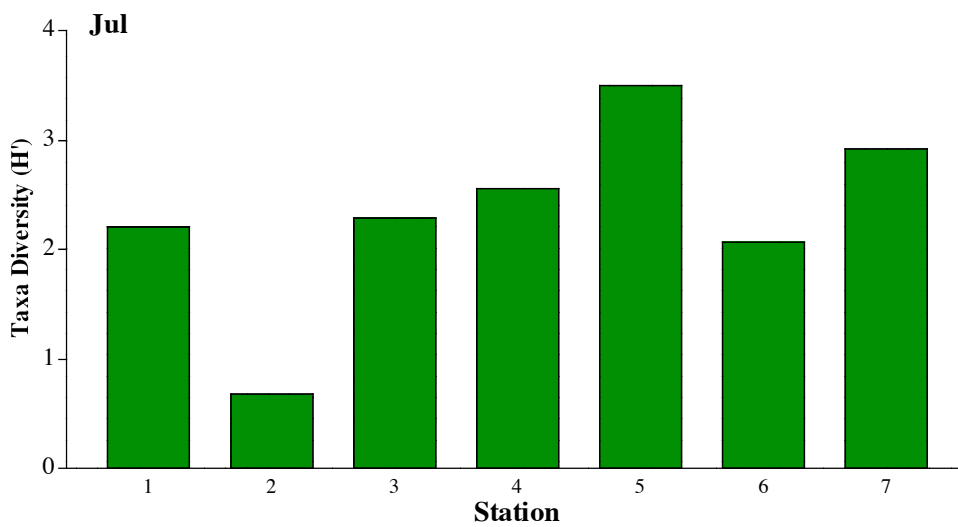
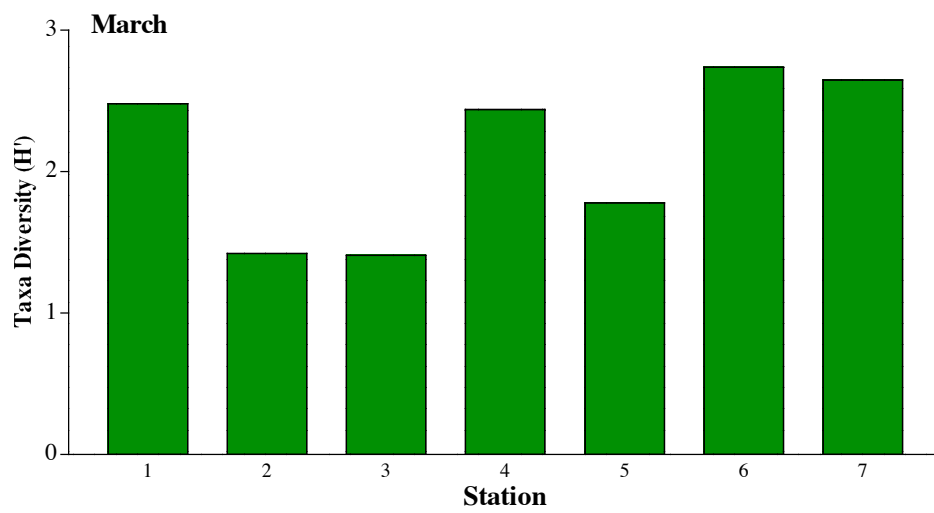
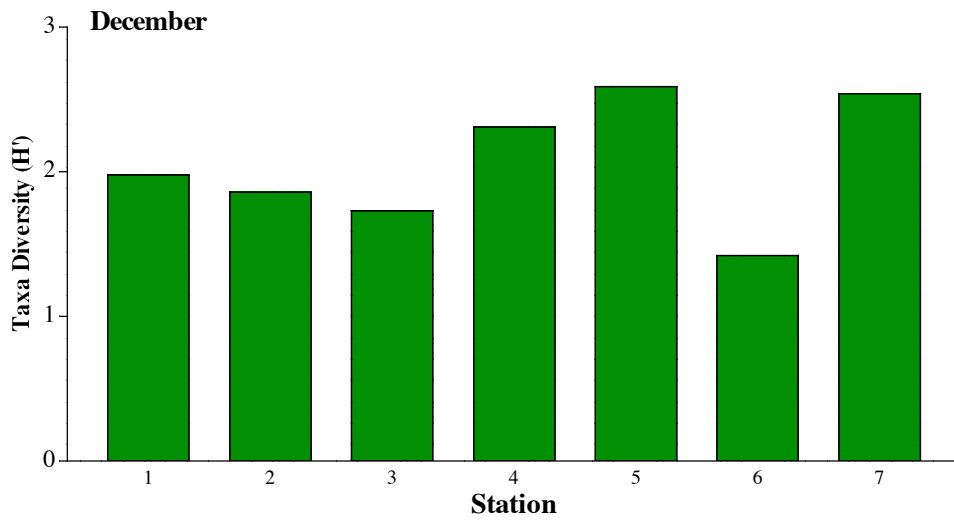
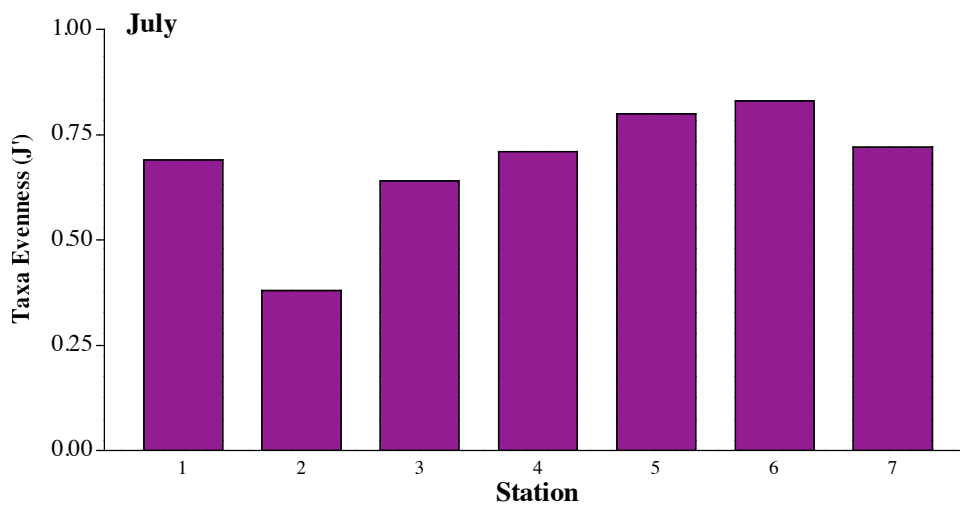
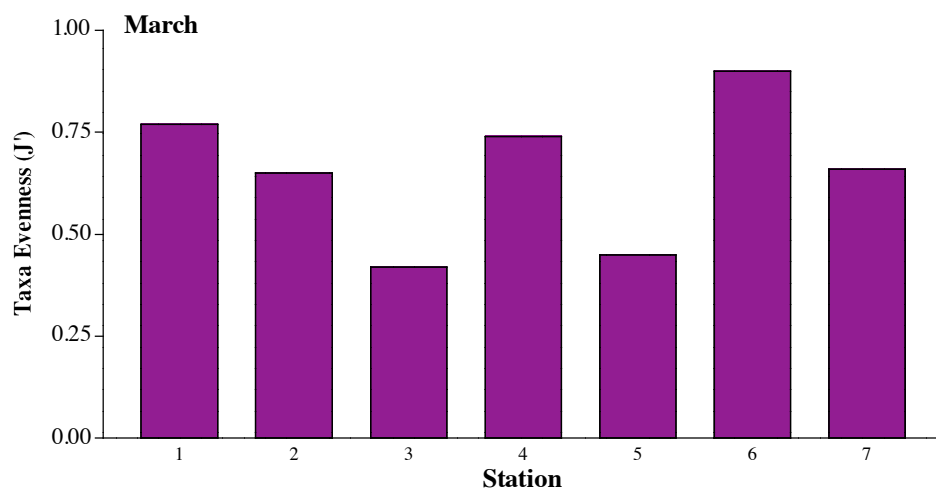
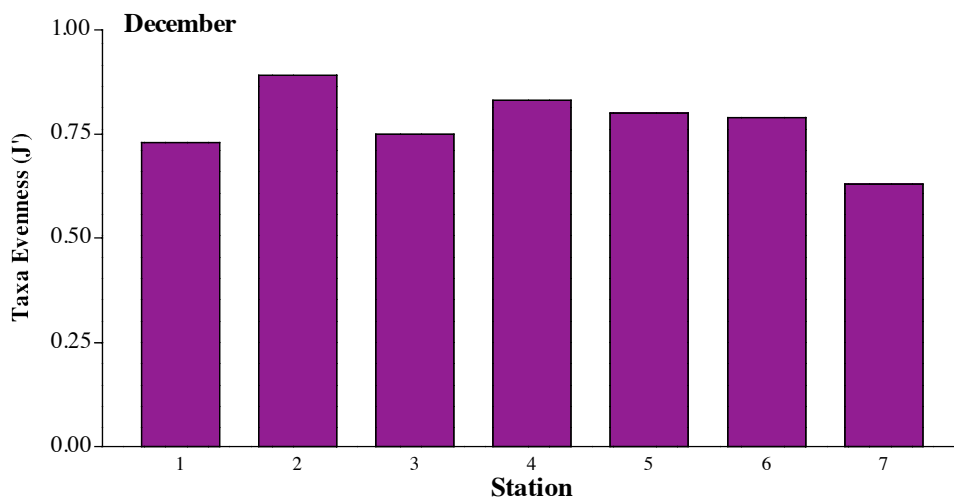


Figure 7. Taxa evenness (J') for the NOAA St. John's River stations, 2000-2001.



APPENDICES