

NOAA North Carolina NEERS Benthic Community Assessment, 2006

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INTRODUCTION

The NOAA North Carolina NEERS project was sampled during 2006. One aspect of this study 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). Station location and water quality data for the NEERS stations are given in Appendix 1.

METHODS

Sample Collection and Handling

A Young dredge (area = 0.04 m²) was used to collect bottom samples at each of 30 station locations (three replicate samples were taken at each station)(Appendix 1). Samples were prescreened through 0.5 mm mesh sieves, by NOAA in the field and fixed in 10% formalin. The preserved sample fractions were transported to BVA's laboratory in Mobile, Alabama.

Sediment Analysis

Sediment texture was determined at half-phi intervals using the hydrometer technique for fractions smaller than 44 μm and nested sieves for larger particle fractions. Texture parameters that were computed included percent gravel, sand, and silt /clay, median particle size, sorting coefficient and percent moisture. 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/Quality Control (QA/QC) reports for the NEERS samples are given in the Appendix.

Assemblage Structure

Several numerical indices were chosen for analysis and interpretation of the macroinfaunal data. Selection was based primarily on the ability of the index to provide a meaningful summary of data, as well as the applicability of the index to the characterization of the benthic community. 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 total 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 Shannon's 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 faunal equitability to 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

Sediment data for the 30 stations are given in Table 1 and Figures 1 and 2. Sediment texture at the 20 stations was variable throughout the study area (Figure 3). Sediment texture was sand at 17 stations, sandy silt at 1 station, silty sand at 7 stations and clayey silt at 2 stations – 3 stations (MI02, MI06, MI07) had significant gravel fractions (>19%) (Table 1, Figure 1). The percent total organic carbon (TOC) fraction of the sediment was typically very low with 25 stations having values less than 1% (Table 1, Figure 2).

BENTHIC COMMUNITY CHARACTERIZATION

Faunal Composition, Abundance, and Community Structure

Microsoft TMExcel spreadsheets are being provided separately to NOAA which include: raw data on taxa abundance and density, 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 number of taxa, density, taxa diversity and taxa evenness by station.

A total of 8908 organisms, representing 312 taxa, were identified from the 30 stations (Table 2). Polychaetes were the most numerous organisms present representing 59% of the total assemblage, followed in abundance by bivalves (10.7%), oligochaetes (8%), gastropods (8%) and malacostracans (7%). Polychaetes represented 41.0% of the total number of taxa followed by malacostracans (20.8%) and bivalves (16.0%) (Table 2). The percentage abundance of the major taxa at the 30 stations is given in Table 3 and Figure 3. An annelid assemblage dominated 23 of the 30 stations, an arthropod assemblage dominated at 2 stations and a mixed assemblage of annelids, arthropods and mollusks dominated the remaining stations (Figure 3).

The dominant taxon collected from the 30 stations was the polychaete, *Streblospio benedicti* and represented 19.4% of the total. Other dominant taxa included the oligochaete family, Tubificidae, the polychaete, *Mediomastus* (LPIL), and the gastropod, *Ilyanassa obsoleta* representing 7.8%, 7.5% and 5.1%, respectively (Table 4). The most widely distributed taxa were *S. benedicti*, *Mediomastus* and the oligochaete family Tubificidae being found at 77% of the stations. The distribution of taxa representing > 5% of the total assemblage at each station is given in Table 5.

Station taxa richness and abundance data are summarized for the 30 stations in Table 6 and Figures 4 and 5. The mean number of taxa per station ranged from 1.7 (SD = 0.6) at Station ZI05 to 47.0 (SD = 7.8) at Station MI07 (Table 6; Figure 4). Mean density

per station ranged from 375.0 organisms·m² (SD = 139.2) at Station ZI05 to 7841.7 organisms·m² (SD = 1634.8) at Station MI11 (Table 6; Figure 5).

Taxa diversity and evenness for the 30 stations are given in Table 6 and Figures 6 and 7. Taxa diversity (H') varied considerably between stations and ranged from 0.70 at Station ZI05 to 3.77 at Station MI07 (Table 6; Figure 6). Taxa evenness (J') also varied between stations and ranged from 0.41 at Station MI09 to 0.93 at Station MI06 (Table 6; 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. Summary of sediment data for NOAA TO8 stations, 2006.

Station	% TOC	% Gravel	% Sand	% Silt + Clay	USACE Description	Median Particle Size (phi)	Sorting Coefficient	% Moisture
CB01	0.20	0	96.76	3.24	Sand	2.305	0.662	26.58
CB02	2.51	0	44.30	55.70	Sandy Silt	4.163	1.376	68.53
CB03	0.27	0	72.46	27.54	Silty Sand	3.418	1.532	32.01
CB04	0.86	0	70.31	29.69	Silty Sand	3.684	0.885	38.95
MI01	0.19	0	89.31	10.69	Sand	2.367	1.049	23.78
MI02	0.05	19.77	78.44	1.79	**	1.130	2.031	17.26
MI03	0.47	2.68	84.29	13.03	Sand	2.623	0.865	29.81
MI04	0.53	2.41	82.94	14.65	Sand	2.825	0.861	31.91
MI05	0.09	0	97.24	2.76	Sand	2.502	0.387	24.62
MI06	0.08	27.80	71.89	0.31	**	1.549	2.273	16.95
MI07	0.13	20.29	79.16	0.55	**	2.186	2.206	53.29
MI08	1.67	1.27	54.43	44.30	Silty Sand	3.584	2.293	53.29
MI09	1.03	0	72.91	27.09	Silty Sand	3.343	1.674	47.15
MI10	0.18	0	99.08	0.92	Sand	2.504	0.402	25.67
MI11	0.25	0	91.45	8.55	Sand	2.231	1.220	24.20
MI12	0.11	0	99.83	0.17	Sand	2.221	1.092	22.08
RC01	0.09	0	99.41	0.59	Sand	2.237	0.794	22.94
RC02	0.11	0	99.66	0.34	Sand	2.321	0.645	22.02
RC03	0.23	0	91.58	8.42	Sand	2.686	0.719	26.25
RC04	0.08	0	99.42	0.58	Sand	1.066	0.298	20.85
RC05	0.90	0	53.65	46.35	Silty Sand	3.764	2.235	37.53
RC06	0.22	0	88.53	11.47	Sand	2.595	0.861	24.38
RC07	0.05	0	99.92	0.08	Sand	2.015	0.714	20.79
RC08	0.62	0	64.48	35.52	Silty Sand	3.642	1.611	39.24
RC09	0.07	0	99.20	0.80	Sand	2.346	0.651	29.72
ZI01	0.41	0	86.61	13.39	Sand	2.711	0.827	29.14
ZI02	3.78	0	27.09	72.91	Clayey Silt	6.152	2.842	68.73
ZI03	0.27	0	95.48	4.52	Sand	3.214	0.717	29.89
ZI04	0.81	0	78.50	21.50	Silty Sand	2.696	2.468	41.84
ZI05	3.68	0	33.93	66.07	Clayey Silt	5.039	3.379	68.77

**Too much gravel for textural description

Table 2. Summary of overall abundance of major benthic macroinfaunal taxonomic groups for the NOAA TO8 stations, 2006.

Taxa	Total No. Taxa	% Total	Total No. Individuals	% Total
Annelida				
Oligochaeta	7	2.2	747	8.4
Polychaeta	128	41.0	5,209	58.5
Mollusca				
Bivalvia	50	16.0	955	10.7
Gastropoda	25	8.0	749	8.4
Polyplacophora	1	0.3	2	0.0
Arthropoda				
Branchiopoda	1	0.3	1	0.0
Insecta	13	4.2	264	3.0
Malacostraca	65	20.8	636	7.1
Ostracoda	7	2.2	155	1.7
Echinodermata				
Echinoidea	1	0.3	1	0.0
Holothuroidea	1	0.3	8	0.1
Ophiuroidea	2	0.6	5	0.1
Other Taxa	11	3.5	176	2.0
Total	312		8,908	

Table 3. Summary of abundance of major benthic macroinfaunal taxonomic groups by station for the NOAA TO8 stations, 2006.

Station	Taxa	Total No. Taxa	% Total	Total No. Individuals	% Total
CB01	Annelida	4	36.4	70	87.5
	Mollusca	2	18.2	2	2.5
	Arthropoda	5	45.5	8	10.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	11		80	
CB02	Annelida	3	18.8	24	34.3
	Mollusca	1	6.3	3	4.3
	Arthropoda	12	75.0	43	61.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	16		70	
CB03	Annelida	9	30.0	543	78.1
	Mollusca	6	20.0	23	3.3
	Arthropoda	15	50.0	129	18.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	30		695	
CB04	Annelida	6	26.1	107	29.8
	Mollusca	2	8.7	8	2.2
	Arthropoda	14	60.9	243	67.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	4.3	1	0.3
	Total	23		359	
MI01	Annelida	29	76.3	142	83.5
	Mollusca	3	7.9	18	10.6
	Arthropoda	5	13.2	7	4.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	2.6	3	1.8
	Total	38		170	
MI02	Annelida	41	56.2	213	71.0
	Mollusca	19	26.0	60	20.0
	Arthropoda	8	11.0	11	3.7
	Echinodermata	1	1.4	1	0.3
	Other Taxa	4	5.5	15	5.0
	Total	73		300	

Table 3 continued:

Station	Taxa	Total No.		Total No.	
		Taxa	% Total	Individuals	% Total
MI03	Annelida	15	55.6	96	59.6
	Mollusca	4	14.8	52	32.3
	Arthropoda	6	22.2	10	6.2
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	7.4	3	1.9
	Total	27		161	
MI04	Annelida	9	64.3	28	56.0
	Mollusca	4	28.6	21	42.0
	Arthropoda	1	7.1	1	2.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	14		50	
MI05	Annelida	8	36.4	22	17.3
	Mollusca	7	31.8	55	43.3
	Arthropoda	5	22.7	47	37.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	9.1	3	2.4
	Total	22		127	
MI06	Annelida	32	69.6	91	75.2
	Mollusca	5	10.9	11	9.1
	Arthropoda	3	6.5	5	4.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	6	13.0	14	11.6
	Total	46		121	
MI07	Annelida	45	52.9	331	76.4
	Mollusca	19	22.4	55	12.7
	Arthropoda	17	20.0	37	8.5
	Echinodermata	1	1.2	1	0.2
	Other Taxa	3	3.5	9	2.1
	Total	85		433	
MI08	Annelida	7	77.8	101	68.7
	Mollusca	2	22.2	46	31.3
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	9		147	

Table 3 continued:

Station	Taxa	Total No.		Total No.	
		Taxa	% Total	Individuals	% Total
MI09	Annelida	17	58.6	568	91.0
	Mollusca	7	24.1	50	8.0
	Arthropoda	5	17.2	6	1.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	29		624	
MI10	Annelida	16	48.5	158	81.4
	Mollusca	11	33.3	27	13.9
	Arthropoda	4	12.1	6	3.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	6.1	3	1.5
	Total	33		194	
MI11	Annelida	36	51.4	733	77.9
	Mollusca	17	24.3	161	17.1
	Arthropoda	15	21.4	43	4.6
	Echinodermata	1	1.4	1	0.1
	Other Taxa	1	1.4	3	0.3
	Total	70		941	
MI12	Annelida	27	62.8	91	53.8
	Mollusca	9	20.9	40	23.7
	Arthropoda	5	11.6	36	21.3
	Echinodermata	1	2.3	1	0.6
	Other Taxa	1	2.3	1	0.6
	Total	43		169	
RC01	Annelida	23	41.1	86	30.9
	Mollusca	19	33.9	166	59.7
	Arthropoda	7	12.5	8	2.9
	Echinodermata	1	1.8	1	0.4
	Other Taxa	6	10.7	17	6.1
	Total	56		278	
RC02	Annelida	23	50.0	140	39.7
	Mollusca	9	19.6	89	25.2
	Arthropoda	10	21.7	109	30.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	4	8.7	15	4.2
	Total	46		353	

Table 3 continued:

Station	Taxa	Total No.		Total No.	
		Taxa	% Total	Individuals	% Total
RC03	Annelida	35	52.2	283	71.3
	Mollusca	18	26.9	64	16.1
	Arthropoda	11	16.4	34	8.6
	Echinodermata	1	1.5	2	0.5
	Other Taxa	2	3.0	14	3.5
	Total	67		397	
RC04	Annelida	30	60.0	313	79.8
	Mollusca	12	24.0	60	15.3
	Arthropoda	6	12.0	14	3.6
	Echinodermata	1	2.0	1	0.3
	Other Taxa	1	2.0	4	1.0
	Total	50		392	
RC05	Annelida	26	52.0	125	52.3
	Mollusca	12	24.0	41	17.2
	Arthropoda	9	18.0	64	26.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	6.0	9	3.8
	Total	50		239	
RC06	Annelida	29	59.2	265	63.7
	Mollusca	13	26.5	115	27.6
	Arthropoda	5	10.2	30	7.2
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	4.1	6	1.4
	Total	49		416	
RC07	Annelida	12	36.4	21	23.3
	Mollusca	10	30.3	39	43.3
	Arthropoda	8	24.2	20	22.2
	Echinodermata	1	3.0	1	1.1
	Other Taxa	2	6.1	9	10.0
	Total	33		90	
RC08	Annelida	39	53.4	394	71.6
	Mollusca	18	24.7	78	14.2
	Arthropoda	14	19.2	71	12.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	2.7	7	1.3
	Total	73		550	

Table 3 continued:

Station	Taxa	Total No.		Total No.	
		Taxa	% Total	Individuals	% Total
RC09	Annelida	26	48.1	65	28.5
	Mollusca	15	27.8	89	39.0
	Arthropoda	8	14.8	62	27.2
	Echinodermata	3	5.6	5	2.2
	Other Taxa	2	3.7	7	3.1
	Total	54		228	
ZI01	Annelida	16	72.7	178	55.3
	Mollusca	4	18.2	135	41.9
	Arthropoda	1	4.5	2	0.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	4.5	7	2.2
	Total	22		322	
ZI02	Annelida	6	75.0	53	67.1
	Mollusca	1	12.5	24	30.4
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	12.5	2	2.5
	Total	8		79	
ZI03	Annelida	16	53.3	366	86.9
	Mollusca	8	26.7	38	9.0
	Arthropoda	4	13.3	10	2.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	6.7	7	1.7
	Total	30		421	
ZI04	Annelida	10	71.4	314	68.7
	Mollusca	3	21.4	126	27.6
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	7.1	17	3.7
	Total	14		457	
ZI05	Annelida	2	66.7	35	77.8
	Mollusca	1	33.3	10	22.2
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	3		45	

Table 4. Distribution and abundance of benthic macroinfaunal taxa for the NOAA TO8 stations, 2006.

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Streblospio benedicti</i>	Ann	Poly	1729	19.41	19.41	23	77
Tubificidae (LPIL)	Ann	Olig	690	7.75	27.16	23	77
<i>Mediomastus</i> (LPIL)	Ann	Poly	666	7.48	34.63	23	77
<i>Ilyanassa obsoleta</i>	Mol	Gast	455	5.11	39.74	9	30
<i>Tellina</i> (LPIL)	Mol	Biva	352	3.95	43.69	19	63
Chironomus (LPIL)	Art	Inse	202	2.27	45.96	3	10
<i>Acteocina canaliculata</i>	Mol	Gast	201	2.26	48.22	11	37
Maldanidae (LPIL)	Ann	Poly	182	2.04	50.26	10	33
<i>Scoletoma tenuis</i>	Ann	Poly	148	1.66	51.92	6	20
<i>Hobsonia florida</i>	Ann	Poly	134	1.50	53.42	2	7
<i>Gemma gemma</i>	Mol	Biva	133	1.49	54.92	13	43
<i>Spiochaetopterus oculatus</i>	Ann	Poly	128	1.44	56.35	8	27
<i>Brania wellfleetensis</i>	Ann	Poly	121	1.36	57.71	8	27
<i>Haplocytheridea setipunctata</i>	Art	Ostr	121	1.36	59.07	11	37
<i>Laeonereis culveri</i>	Ann	Poly	119	1.34	60.41	8	27
<i>Rhepoxynius hudsoni</i>	Art	Mala	119	1.34	61.74	4	13
Rhynchocoela (LPIL)	Rhy	-	100	1.12	62.86	22	73
<i>Prionospio</i> (LPIL)	Ann	Poly	97	1.09	63.95	14	47
<i>Mediomastus ambiseta</i>	Ann	Poly	93	1.04	65.00	4	13
<i>Caulleriella</i> sp. J	Ann	Poly	92	1.03	66.03	7	23
<i>Aricidea taylora</i>	Ann	Poly	84	0.94	66.97	5	17
<i>Hargeria rapax</i>	Art	Mala	82	0.92	67.89	5	17
<i>Parapionosyllis longicirrata</i>	Ann	Poly	82	0.92	68.81	7	23
Bivalvia (LPIL)	Mol	Biva	81	0.91	69.72	20	67
<i>Capitella capitata</i>	Ann	Poly	81	0.91	70.63	8	27
<i>Acanthohaustorius millsi</i>	Art	Mala	78	0.88	71.51	2	7
Cirratulidae (LPIL)	Ann	Poly	68	0.76	72.27	14	47
<i>Tharyx acutus</i>	Ann	Poly	68	0.76	73.04	12	40
Spionidae (LPIL)	Ann	Poly	61	0.68	73.72	15	50
<i>Axiothella mucosa</i>	Ann	Poly	57	0.64	74.36	8	27
<i>Paraonis fulgens</i>	Ann	Poly	53	0.59	74.96	4	13
<i>Polydora cornuta</i>	Ann	Poly	53	0.59	75.55	6	20
<i>Cirrophorus</i> (LPIL)	Ann	Poly	52	0.58	76.13	8	27
<i>Tellina iris</i>	Mol	Biva	48	0.54	76.67	8	27
<i>Parandalia tricuspis</i>	Ann	Poly	47	0.53	77.20	7	23
<i>Aricidea suecica</i>	Ann	Poly	46	0.52	77.72	10	33
<i>Scoloplos rubra</i>	Ann	Poly	41	0.46	78.18	11	37
<i>Leitoscoloplos</i> (LPIL)	Ann	Poly	39	0.44	78.61	18	60
<i>Listriella barnardi</i>	Art	Mala	39	0.44	79.05	11	37
Nereididae (LPIL)	Ann	Poly	37	0.42	79.47	9	30
<i>Ampelisca verrilli</i>	Art	Mala	35	0.39	79.86	7	23
<i>Nephtys picta</i>	Ann	Poly	35	0.39	80.25	9	30
<i>Streptosyllis arenae</i>	Ann	Poly	35	0.39	80.65	5	17
<i>Armandia maculata</i>	Ann	Poly	33	0.37	81.02	6	20
<i>Diplodonta</i> (LPIL)	Mol	Biva	33	0.37	81.39	12	40
<i>Tagelus divisus</i>	Mol	Biva	33	0.37	81.76	6	20
Tubulanus (LPIL)	Rhy	Anop	32	0.36	82.12	9	30
<i>Cyathura polita</i>	Art	Mala	31	0.35	82.47	4	13
<i>Prionospio heterobranchia</i>	Ann	Poly	31	0.35	82.81	5	17
Corophiidae (LPIL)	Art	Mala	29	0.33	83.14	6	20
<i>Notomastus latericeus</i>	Ann	Poly	29	0.33	83.46	7	23
<i>Parvilucina multilineata</i>	Mol	Biva	28	0.31	83.78	10	33
Capitellidae (LPIL)	Ann	Poly	25	0.28	84.06	8	27
Gastropoda (LPIL)	Mol	Gast	25	0.28	84.34	8	27

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
Lucinidae (LPIL)	Mol	Biva	25	0.28	84.62	7	23
Haustoriidae (LPIL)	Art	Mala	24	0.27	84.89	3	10
<i>Mulinia lateralis</i>	Mol	Biva	24	0.27	85.16	9	30
<i>Spiophanes bombyx</i>	Ann	Poly	24	0.27	85.43	12	40
<i>Dipolydora socialis</i>	Ann	Poly	23	0.26	85.69	6	20
<i>Glycinde solitaria</i>	Ann	Poly	23	0.26	85.95	7	23
<i>Marenzelleria viridis</i>	Ann	Poly	23	0.26	86.20	1	3
<i>Nereis succinea</i>	Ann	Poly	23	0.26	86.46	10	33
<i>Exogone rolandi</i>	Ann	Poly	22	0.25	86.71	5	17
Chironomidae (LPIL)	Art	Inse	21	0.24	86.94	4	13
Phyllodocidae (LPIL)	Ann	Poly	21	0.24	87.18	8	27
<i>Leitoscoloplos robustus</i>	Ann	Poly	20	0.22	87.40	6	20
<i>Scolecopsis texana</i>	Ann	Poly	20	0.22	87.63	7	23
<i>Ampelisca</i> (LPIL)	Art	Mala	18	0.20	87.83	11	37
<i>Heteromastus filiformis</i>	Ann	Poly	18	0.20	88.03	7	23
<i>Fabricinuda trilobata</i>	Ann	Poly	17	0.19	88.22	2	7
<i>Polycirrus eximius</i>	Ann	Poly	17	0.19	88.41	5	17
<i>Sabellaria vulgaris</i>	Ann	Poly	17	0.19	88.61	6	20
<i>Tellina versicolor</i>	Mol	Biva	17	0.19	88.80	5	17
<i>Apoprionospio pygmaea</i>	Ann	Poly	16	0.18	88.98	7	23
Enchytraeidae (LPIL)	Ann	Olig	16	0.18	89.16	2	7
<i>Chione cancellata</i>	Mol	Biva	15	0.17	89.32	7	23
<i>Nereis falsa</i>	Ann	Poly	15	0.17	89.49	3	10
<i>Prionospio cristata</i>	Ann	Poly	15	0.17	89.66	2	7
<i>Olivella mutica</i>	Mol	Gast	14	0.16	89.82	1	3
<i>Semele proficua</i>	Mol	Biva	14	0.16	89.98	5	17
<i>Limnodrilus hoffmeisteri</i>	Ann	Olig	13	0.15	90.12	2	7
Mactridae (LPIL)	Mol	Biva	13	0.15	90.27	3	10
Opheliidae (LPIL)	Ann	Poly	13	0.15	90.41	5	17
<i>Glycera americana</i>	Ann	Poly	12	0.13	90.55	5	17
<i>Hypereteone fauchaldi</i>	Ann	Poly	12	0.13	90.68	6	20
Naididae (LPIL)	Ann	Olig	12	0.13	90.82	2	7
<i>Nereis</i> (LPIL)	Ann	Poly	12	0.13	90.95	5	17
<i>Nucula aegeensis</i>	Mol	Biva	12	0.13	91.09	3	10
<i>Pagurus</i> (LPIL)	Art	Mala	12	0.13	91.22	7	23
<i>Paraprionospio pinnata</i>	Ann	Poly	12	0.13	91.36	6	20
<i>Polypedilum halterale</i> group	Art	Inse	12	0.13	91.49	3	10
Branchiostoma (LPIL)	Cho	Lept	11	0.12	91.61	3	10
<i>Dero</i> (LPIL)	Ann	Olig	11	0.12	91.74	1	3
<i>Eudevenopus honduranus</i>	Art	Mala	11	0.12	91.86	3	10
Hesionidae (LPIL)	Ann	Poly	11	0.12	91.98	4	13
<i>Parvilucina blanda</i>	Mol	Biva	11	0.12	92.11	4	13
<i>Polygordius</i> (LPIL)	Ann	Poly	11	0.12	92.23	3	10
<i>Streptosyllis pettiboneae</i>	Ann	Poly	11	0.12	92.36	5	17
<i>Syllis cornuta</i>	Ann	Poly	11	0.12	92.48	3	10
<i>Tanytarsus limneticus</i>	Art	Inse	11	0.12	92.60	1	3
Tellinidae (LPIL)	Mol	Biva	11	0.12	92.73	3	10
<i>Drilonereis longa</i>	Ann	Poly	10	0.11	92.84	5	17
<i>Gammarus</i> (LPIL)	Art	Mala	10	0.11	92.95	3	10
Ostracoda (LPIL)	Art	Ostr	10	0.11	93.06	2	7
<i>Parasterope pollex</i>	Art	Ostr	10	0.11	93.17	3	10
<i>Podarke obscura</i>	Ann	Poly	10	0.11	93.29	4	13
<i>Nereis micromma</i>	Ann	Poly	9	0.10	93.39	5	17
<i>Paraphoxus spinosus</i>	Art	Mala	9	0.10	93.49	3	10
<i>Phascolion strombi</i>	Sip	-	9	0.10	93.59	3	10

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Pythinella cuneata</i>	Mol	Biva	9	0.10	93.69	2	7
Syllidae (LPIL)	Ann	Poly	9	0.10	93.79	4	13
<i>Tagelus</i> (LPIL)	Mol	Biva	9	0.10	93.89	4	13
Actiniaria (LPIL)	Cni	Anth	8	0.09	93.98	5	17
<i>Batea catharinensis</i>	Art	Mala	8	0.09	94.07	3	10
<i>Edotia triloba</i>	Art	Mala	8	0.09	94.16	4	13
<i>Leptosynapta tenuis</i>	Ech	Holo	8	0.09	94.25	5	17
<i>Notomastus americanus</i>	Ann	Poly	8	0.09	94.34	5	17
<i>Sphenia</i> (LPIL)	Mol	Biva	8	0.09	94.43	2	7
<i>Ceratonereis irritabilis</i>	Ann	Poly	7	0.08	94.51	2	7
<i>Mediomastus californiensis</i>	Ann	Poly	7	0.08	94.59	2	7
<i>Monocorophium acherusicum</i>	Art	Mala	7	0.08	94.67	4	13
<i>Sigambra tentaculata</i>	Ann	Poly	7	0.08	94.75	5	17
<i>Tellina sybaritica</i>	Mol	Biva	7	0.08	94.82	3	10
<i>Corbula</i> (LPIL)	Mol	Biva	6	0.07	94.89	4	13
<i>Diopatra cuprea</i>	Ann	Poly	6	0.07	94.96	4	13
<i>Eusarsiella texana</i>	Art	Ostr	6	0.07	95.03	5	17
<i>Eusarsiella zostericola</i>	Art	Ostr	6	0.07	95.09	3	10
Hydrobiidae (LPIL)	Mol	Gast	6	0.07	95.16	2	7
Mytilidae (LPIL)	Mol	Biva	6	0.07	95.23	4	13
Onuphidae (LPIL)	Ann	Poly	6	0.07	95.30	4	13
<i>Parvilucina</i> (LPIL)	Mol	Biva	6	0.07	95.36	4	13
<i>Platynereis dumerilli</i>	Ann	Poly	6	0.07	95.43	1	3
<i>Schistomeringos rudolphi</i>	Ann	Poly	6	0.07	95.50	1	3
<i>Scoletoma</i> (LPIL)	Ann	Poly	6	0.07	95.57	1	3
<i>Aricidea</i> (LPIL)	Ann	Poly	5	0.06	95.62	4	13
<i>Bhawania heteroseta</i>	Ann	Poly	5	0.06	95.68	3	10
<i>Dipolydora quadrilobata</i>	Ann	Poly	5	0.06	95.73	1	3
<i>Eumida sanguinea</i>	Ann	Poly	5	0.06	95.79	2	7
<i>Glycera</i> (LPIL)	Ann	Poly	5	0.06	95.85	3	10
Leptocheilidae (LPIL)	Art	Mala	5	0.06	95.90	2	7
<i>Melinna maculata</i>	Ann	Poly	5	0.06	95.96	2	7
<i>Microprotopus raneyi</i>	Art	Mala	5	0.06	96.01	2	7
<i>Monocorophium tuberculatum</i>	Art	Mala	5	0.06	96.07	1	3
<i>Mytilopsis leucophaeata</i>	Mol	Biva	5	0.06	96.13	2	7
Odostomia (LPIL)	Mol	Gast	5	0.06	96.18	5	17
<i>Ophelina acuminata</i>	Ann	Poly	5	0.06	96.24	3	10
<i>Paracaprella tenuis</i>	Art	Mala	5	0.06	96.30	1	3
<i>Petaloproctus</i> (LPIL)	Ann	Poly	5	0.06	96.35	1	3
<i>Petricola pholadiformis</i>	Mol	Biva	5	0.06	96.41	1	3
Phoxocephalidae (LPIL)	Art	Mala	5	0.06	96.46	3	10
<i>Podarkeopsis levifuscina</i>	Ann	Poly	5	0.06	96.52	4	13
<i>Protohaustorius wigleyi</i>	Art	Mala	5	0.06	96.58	2	7
<i>Sigambra pettiboneae</i>	Ann	Poly	5	0.06	96.63	2	7
<i>Acuminodeutopus naglei</i>	Art	Mala	4	0.04	96.68	2	7
<i>Ameroculodes</i> sp. A	Art	Mala	4	0.04	96.72	2	7
<i>Aulodrilus pigueti</i>	Ann	Olig	4	0.04	96.77	1	3
Brachiopoda (LPIL)	Bra	-	4	0.04	96.81	2	7
<i>Caecum pulchellum</i>	Mol	Gast	4	0.04	96.86	2	7
Calyptraeidae (LPIL)	Mol	Gast	4	0.04	96.90	2	7
<i>Crepidula</i> (LPIL)	Mol	Gast	4	0.04	96.95	1	3
<i>Cryptochironomus</i> (LPIL)	Art	Inse	4	0.04	96.99	2	7
<i>Cyclaspis varians</i>	Art	Mala	4	0.04	97.04	4	13
<i>Glycera dibranchiata</i>	Ann	Poly	4	0.04	97.08	4	13
<i>Microphthalmus</i> (LPIL)	Ann	Poly	4	0.04	97.13	2	7

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
Montacutidae (LPIL)	Mol	Biva	4	0.04	97.17	3	10
<i>Ophelina cylindricaudata</i>	Ann	Poly	4	0.04	97.22	1	3
Ophiuroidea (LPIL)	Ech	Ophi	4	0.04	97.26	4	13
<i>Panopeus herbstii</i>	Art	Mala	4	0.04	97.31	1	3
Paraonidae (LPIL)	Ann	Poly	4	0.04	97.35	4	13
Phoronis (LPIL)	Pho	-	4	0.04	97.40	2	7
<i>Pinnixa</i> (LPIL)	Art	Mala	4	0.04	97.44	3	10
<i>Rimapenaeus</i> (LPIL)	Art	Mala	4	0.04	97.49	4	13
<i>Acanthohaustorius intermedius</i>	Art	Mala	3	0.03	97.52	2	7
<i>Ampelisca abdita</i>	Art	Mala	3	0.03	97.55	1	3
Ampharetidae (LPIL)	Ann	Poly	3	0.03	97.59	2	7
Ampithoidae (LPIL)	Art	Mala	3	0.03	97.62	1	3
<i>Anomia simplex</i>	Mol	Biva	3	0.03	97.65	2	7
Arcidae (LPIL)	Mol	Biva	3	0.03	97.69	2	7
<i>Bemlos</i> (LPIL)	Art	Mala	3	0.03	97.72	1	3
<i>Cerapus</i> (LPIL)	Art	Mala	3	0.03	97.75	1	3
<i>Crassinella</i> (LPIL)	Mol	Biva	3	0.03	97.79	2	7
<i>Crassinella lunulata</i>	Mol	Biva	3	0.03	97.82	2	7
Decapoda (LPIL)	Art	Mala	3	0.03	97.86	3	10
<i>Gammarus mucronatus</i>	Art	Mala	3	0.03	97.89	1	3
<i>Goniada littorea</i>	Ann	Poly	3	0.03	97.92	2	7
<i>Mitrella lunata</i>	Mol	Gast	3	0.03	97.96	2	7
<i>Nassarius acutus</i>	Mol	Gast	3	0.03	97.99	2	7
<i>Nassarius vibex</i>	Mol	Gast	3	0.03	98.02	3	10
<i>Nucula</i> (LPIL)	Mol	Biva	3	0.03	98.06	3	10
<i>Pandora trilineata</i>	Mol	Biva	3	0.03	98.09	1	3
Phaenopsectra (LPIL)	Art	Inse	3	0.03	98.13	1	3
Portunidae (LPIL)	Art	Mala	3	0.03	98.16	3	10
Semelidae (LPIL)	Mol	Biva	3	0.03	98.19	2	7
<i>Terebra concava</i>	Mol	Gast	3	0.03	98.23	2	7
Turbellaria (LPIL)	Pla	Turb	3	0.03	98.26	2	7
<i>Acanthohaustorius</i> (LPIL)	Art	Mala	2	0.02	98.28	1	3
<i>Acteocina</i> (LPIL)	Mol	Gast	2	0.02	98.30	1	3
Aeginellidae (LPIL)	Art	Mala	2	0.02	98.33	2	7
Amphipoda (LPIL)	Art	Mala	2	0.02	98.35	1	3
Aoridae (LPIL)	Art	Mala	2	0.02	98.37	1	3
<i>Aricidea catherinae</i>	Ann	Poly	2	0.02	98.39	2	7
<i>Callinectes sapidus</i>	Art	Mala	2	0.02	98.42	2	7
<i>Capitella jonesi</i>	Ann	Poly	2	0.02	98.44	2	7
<i>Coelotanypus</i> (LPIL)	Art	Inse	2	0.02	98.46	2	7
<i>Dicrotendipes</i> (LPIL)	Art	Inse	2	0.02	98.48	2	7
<i>Dosinia elegans</i>	Mol	Biva	2	0.02	98.51	2	7
<i>Erichsonella attenuata</i>	Art	Mala	2	0.02	98.53	1	3
Goniadidae (LPIL)	Ann	Poly	2	0.02	98.55	2	7
<i>Kurtziella rubella</i>	Mol	Gast	2	0.02	98.57	1	3
<i>Leptochelia</i> (LPIL)	Art	Mala	2	0.02	98.60	2	7
Lineidae (LPIL)	Rhy	Anop	2	0.02	98.62	2	7
<i>Lyonsia hyalina</i>	Mol	Biva	2	0.02	98.64	2	7
Lysianassidae (LPIL)	Art	Mala	2	0.02	98.66	1	3
<i>Magelona papillicornis</i>	Ann	Poly	2	0.02	98.69	1	3
<i>Magelona</i> sp. L	Ann	Poly	2	0.02	98.71	2	7
<i>Metharpinia floridana</i>	Art	Mala	2	0.02	98.73	2	7
<i>Olivella dealbata</i>	Mol	Gast	2	0.02	98.75	1	3
<i>Parachironomus</i> (LPIL)	Art	Inse	2	0.02	98.78	1	3
<i>Paramphinome</i> sp. B	Ann	Poly	2	0.02	98.80	2	7

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Paranaitis speciosa</i>	Ann	Poly	2	0.02	98.82	2	7
<i>Phascolion</i> (LPIL)	Sip	-	2	0.02	98.84	1	3
<i>Poecilochaetus johnsoni</i>	Ann	Poly	2	0.02	98.87	2	7
<i>Polypedilum</i> (LPIL)	Art	Inse	2	0.02	98.89	1	3
<i>Polyplacophora</i> (LPIL)	Mol	Poly	2	0.02	98.91	1	3
<i>Prionospio perkinsi</i>	Ann	Poly	2	0.02	98.93	1	3
<i>Pyramidella crenulata</i>	Mol	Gast	2	0.02	98.96	1	3
Pyramidellidae (LPIL)	Mol	Gast	2	0.02	98.98	1	3
<i>Sabaco elongatus</i>	Ann	Poly	2	0.02	99.00	2	7
<i>Schistomeringos pectinata</i>	Ann	Poly	2	0.02	99.02	1	3
<i>Scoloplos</i> (LPIL)	Ann	Poly	2	0.02	99.05	1	3
<i>Sigambra</i> (LPIL)	Ann	Poly	2	0.02	99.07	2	7
<i>Turbonilla</i> (LPIL)	Mol	Gast	2	0.02	99.09	2	7
<i>Turbonilla interrupta</i>	Mol	Gast	2	0.02	99.11	2	7
<i>Alpheus</i> (LPIL)	Art	Mala	1	0.01	99.12	1	3
<i>Americamysis almyra</i>	Art	Mala	1	0.01	99.14	1	3
<i>Americhelidium americanum</i>	Art	Mala	1	0.01	99.15	1	3
<i>Amerocolodes</i> (LPIL)	Art	Mala	1	0.01	99.16	1	3
Amphiuridae (LPIL)	Ech	Ophi	1	0.01	99.17	1	3
<i>Ampithoe</i> (LPIL)	Art	Mala	1	0.01	99.18	1	3
<i>Ancinus depressus</i>	Art	Mala	1	0.01	99.19	1	3
<i>Ancistrosyllis</i> (LPIL)	Ann	Poly	1	0.01	99.20	1	3
<i>Ancistrosyllis jonesi</i>	Ann	Poly	1	0.01	99.21	1	3
<i>Arabella mutans</i>	Ann	Poly	1	0.01	99.23	1	3
<i>Arandia agilis</i>	Ann	Poly	1	0.01	99.24	1	3
<i>Asthenothaerus hemphilli</i>	Mol	Biva	1	0.01	99.25	1	3
<i>Autolytus</i> (LPIL)	Ann	Poly	1	0.01	99.26	1	3
<i>Brachidontes exustus</i>	Mol	Biva	1	0.01	99.27	1	3
Callianassidae (LPIL)	Art	Mala	1	0.01	99.28	1	3
<i>Cassidinidea ovalis</i>	Art	Mala	1	0.01	99.29	1	3
Ceratopogonidae (LPIL)	Art	Inse	1	0.01	99.30	1	3
<i>Corbula contracta</i>	Mol	Biva	1	0.01	99.32	1	3
<i>Crepidula fornicata</i>	Mol	Gast	1	0.01	99.33	1	3
<i>Cumingia tellinoides</i>	Mol	Biva	1	0.01	99.34	1	3
<i>Cylichna</i> (LPIL)	Mol	Gast	1	0.01	99.35	1	3
<i>Divaricella quadrisulcata</i>	Mol	Biva	1	0.01	99.36	1	3
<i>Enallagma</i> (LPIL)	Art	Inse	1	0.01	99.37	1	3
<i>Exogone</i> (LPIL)	Ann	Poly	1	0.01	99.38	1	3
<i>Exogone lourei</i>	Ann	Poly	1	0.01	99.39	1	3
<i>Fimbriosthenelais</i> sp. A	Ann	Poly	1	0.01	99.41	1	3
<i>Gammarus tigrinus</i>	Art	Mala	1	0.01	99.42	1	3
Glyceridae (LPIL)	Ann	Poly	1	0.01	99.43	1	3
<i>Hauchiella</i> sp. A	Ann	Poly	1	0.01	99.44	1	3
<i>Hiatella arctica</i>	Mol	Biva	1	0.01	99.45	1	3
Hydra (LPIL)	Cni	Hydr	1	0.01	99.46	1	3
<i>Ilyocryptus</i> (LPIL)	Art	Bran	1	0.01	99.47	1	3
Isaeidae (LPIL)	Art	Mala	1	0.01	99.48	1	3
Ischyroceridae (LPIL)	Art	Mala	1	0.01	99.49	1	3
<i>Kinbergonuphis simoni</i>	Ann	Poly	1	0.01	99.51	1	3
Lepidoptera (LPIL)	Art	Inse	1	0.01	99.52	1	3
<i>Leptocheirus plumulosus</i>	Art	Mala	1	0.01	99.53	1	3
<i>Loimia</i> sp. A	Ann	Poly	1	0.01	99.54	1	3
Lumbrineridae (LPIL)	Ann	Poly	1	0.01	99.55	1	3
<i>Lysidice notata</i>	Ann	Poly	1	0.01	99.56	1	3
<i>Marginella</i> (LPIL)	Mol	Gast	1	0.01	99.57	1	3

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Mellita isometra</i>	Ech	Echi	1	0.01	99.58	1	3
<i>Microphthalmus hartmanae</i>	Ann	Poly	1	0.01	99.60	1	3
<i>Modiolus modiolus</i>	Mol	Biva	1	0.01	99.61	1	3
<i>Myodocopina</i> (LPIL)	Art	Ostr	1	0.01	99.62	1	3
Mysidae (LPIL)	Art	Mala	1	0.01	99.63	1	3
<i>Neaeromya floridana</i>	Mol	Biva	1	0.01	99.64	1	3
<i>Nephtys simoni</i>	Ann	Poly	1	0.01	99.65	1	3
<i>Notocirrus spiniferus</i>	Ann	Poly	1	0.01	99.66	1	3
<i>Notomastus</i> (LPIL)	Ann	Poly	1	0.01	99.67	1	3
Oedicerotidae (LPIL)	Art	Mala	1	0.01	99.69	1	3
<i>Owenia fusiformis</i>	Ann	Poly	1	0.01	99.70	1	3
<i>Oxyurostylis smithi</i>	Art	Mala	1	0.01	99.71	1	3
Paguridae (LPIL)	Art	Mala	1	0.01	99.72	1	3
<i>Parastarte triquetra</i>	Mol	Biva	1	0.01	99.73	1	3
<i>Pectinaria granulata</i>	Ann	Poly	1	0.01	99.74	1	3
<i>Pettiboneia duofurca</i>	Ann	Poly	1	0.01	99.75	1	3
<i>Phyllodoce</i> (LPIL)	Ann	Poly	1	0.01	99.76	1	3
Pinnotheridae (LPIL)	Art	Mala	1	0.01	99.78	1	3
<i>Pleuromeris tridentata</i>	Mol	Biva	1	0.01	99.79	1	3
Podocopida (LPIL)	Art	Ostr	1	0.01	99.80	1	3
<i>Prionospio cirrifera</i>	Ann	Poly	1	0.01	99.81	1	3
<i>Pristina leidyi</i>	Ann	Olig	1	0.01	99.82	1	3
<i>Pyrgocythara plicosa</i>	Mol	Gast	1	0.01	99.83	1	3
Sabellidae (LPIL)	Ann	Poly	1	0.01	99.84	1	3
<i>Scolecopsis</i> (LPIL)	Ann	Poly	1	0.01	99.85	1	3
<i>Semele</i> (LPIL)	Mol	Biva	1	0.01	99.87	1	3
<i>Shoemakerella cubensis</i>	Art	Mala	1	0.01	99.88	1	3
Solenidae (LPIL)	Mol	Biva	1	0.01	99.89	1	3
<i>Sphaerosyllis</i> (LPIL)	Ann	Poly	1	0.01	99.90	1	3
<i>Spio pettiboneae</i>	Ann	Poly	1	0.01	99.91	1	3
<i>Spiophanes</i> (LPIL)	Ann	Poly	1	0.01	99.92	1	3
<i>Spisula solidissima</i>	Mol	Biva	1	0.01	99.93	1	3
<i>Strigilla mirabilis</i>	Mol	Biva	1	0.01	99.94	1	3
<i>Syllis beneliahui</i>	Ann	Poly	1	0.01	99.96	1	3
<i>Tanaisius psammophilus</i>	Art	Mala	1	0.01	99.97	1	3
<i>Tellina alternata</i>	Mol	Biva	1	0.01	99.98	1	3
<i>Terebra dislocata</i>	Mol	Gast	1	0.01	99.99	1	3
Xanthidae (LPIL)	Art	Mala	1	0.01	100.00	1	3

Taxa key

Ann=Annelida

Olig=Oligochaeta

Poly=Polychaeta

Art=Arthropoda

Bran=Branchiopoda

Inse=Insecta

Mala=Malacostraca

Ostr=Ostracoda

Bra=Brachiopoda

Cho=Chordata

Lept=Leptocardia

Cni=Cnidaria

Anth=Anthozoa

Hydr=Hydrozoa

Ech=Echinodermata

Echi=Echinoidea

Holo=Holothuroidea

Ophi=Ophiuroidea

Mol=Mollusca

Biva=Bivalvia

Gast=Gastropoda

Poly=Polyplacophora

Pho=Phoronida

Pla=Platyhelminthes

Turb=Turbellaria

Rhy=Rhynchocoela

Anop=Anopla

Sip=Sipuncula

Table 5 continued:

Taxa	RC05	RC06	RC07	RC08	RC09	ZI01	ZI02	ZI03	ZI04	ZI05
Annelida										
Oligochaeta										
<i>Aulodrilus pigueti</i>										
Tubificidae (LPIL)				10.4			7.6		6.6	
Polychaeta										
<i>Aricidea taylori</i>										
<i>Brania wellfleetensis</i>										
<i>Capitella capitata</i>						8.7				
<i>Cautleriella</i> sp. J										
Cirratulidae (LPIL)										
<i>Cirrophorus</i> (LPIL)										
<i>Hobsonia florida</i>										
<i>Laonereis culveri</i>										
<i>Leitoscoloplos robustus</i>										
Maldanidae (LPIL)		13.2								
<i>Mediomastus</i> (LPIL)	8.8	5.3		10.4				33.3	24.9	
<i>Mediomastus ambiseta</i>										
<i>Nephtys picta</i>										
<i>Parandalia tricuspis</i>										
<i>Paraonis fulgens</i>										
<i>Parapionosyllis longicirrata</i>										
<i>Polycirrus eximius</i>										
<i>Prionospio</i> (LPIL)				6.5						
<i>Sabellaria vulgaris</i>										
<i>Scoletoma tenuis</i>	18.0			17.8						
<i>Spiochaetopterus oculatus</i>								24.9		
<i>Streblospio benedicti</i>		20.4			5.7	34.5	51.9	15.7	32.2	73.3
<i>Streptosyllis arenae</i>										
<i>Tharyx acutus</i>										
Arthropoda										
Insecta										
Malacostraca										
<i>Acanthohaustorius millsii</i>										
Corophiidae (LPIL)										
<i>Eudevenopus honduranus</i>			8.9							
<i>Gammarus</i> (LPIL)										
<i>Hargeria rapax</i>										
Haustoriidae (LPIL)										
<i>Rhepoxynius hudsoni</i>					19.7					
Ostracoda										
<i>Haplocytheridea setipunctata</i>	23.0			5.1						

Table 5 continued:

Taxa	RC05	RC06	RC07	RC08	RC09	ZI01	ZI02	ZI03	ZI04	ZI05
Chordata										
Leptocardia										
<i>Branchiostoma</i> (LPIL)			5.6							
Mollusca										
Bivalvia										
<i>Diplodonta</i> (LPIL)										
<i>Gemma gemma</i>										
<i>Tellina</i> (LPIL)		5.0	13.3		12.7					
<i>Tellina iris</i>					10.1					
Gastropoda										
<i>Acteocina canaliculata</i>		15.6			7.9					
<i>Ilyanassa obsoleta</i>						38.8	30.4	7.1	26.3	22.2
<i>Olivella mutica</i>			15.6							

Table 6. Summary of the benthic macrofaunal data for the NOAA TO8 stations, 2006.

Station	Rep	No. of Taxa	No. of Indvs	Density (no/m ²)	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
CB01	1	6	40	1000	5.3	1.2	666.7	293.0	11	80	1.26	0.53
	2	4	18	450								
	3	6	22	550								
CB02	1	5	14	350	8.0	4.4	583.3	225.5	16	70	2.15	0.77
	2	6	24	600								
	3	13	32	800								
CB03	1	12	313	7825	20.3	7.4	5791.7	2313.2	30	695	1.70	0.50
	2	23	251	6275								
	3	26	131	3275								
CB04	1	14	88	2200	15.0	1.0	2991.7	743.4	23	359	1.99	0.64
	2	16	147	3675								
	3	15	124	3100								
MI01	1	12	37	925	17.7	7.4	1416.7	939.5	38	170	2.38	0.65
	2	26	100	2500								
	3	15	33	825								
MI02	1	44	111	2775	39.3	5.0	2500.0	542.6	73	300	3.76	0.88
	2	40	114	2850								
	3	34	75	1875								
MI03	1	18	73	1825	13.3	5.0	1341.7	418.6	27	161	2.31	0.70
	2	8	44	1100								
	3	14	44	1100								
MI04	1	2	2	50	6.0	3.5	416.7	341.3	14	50	2.09	0.79
	2	8	29	725								
	3	8	19	475								
MI05	1	17	59	1475	12.7	3.8	1058.3	374.4	22	127	2.05	0.66
	2	11	30	750								
	3	10	38	950								
MI06	1	26	47	1175	21.3	8.1	1008.3	472.6	46	121	3.57	0.93
	2	26	55	1375								
	3	12	19	475								
MI07	1	38	120	3000	47.0	7.8	3608.3	551.3	85	433	3.77	0.85
	2	51	163	4075								
	3	52	150	3750								
MI08	1	5	40	1000	5.7	2.1	1225.0	225.0	9	147	1.23	0.56
	2	8	49	1225								
	3	4	58	1450								
MI09	1	7	118	2950	14.3	8.1	5200.0	2201.7	29	624	1.39	0.41
	2	13	212	5300								
	3	23	294	7350								
MI10	1	23	85	2125	17.0	6.6	1616.7	461.2	33	194	2.22	0.64
	2	10	49	1225								
	3	18	60	1500								
MI11	1	32	288	7200	39.7	15.0	7841.7	1634.8	70	941	2.66	0.63
	2	57	388	9700								
	3	30	265	6625								
MI12	1	24	66	1650	20.0	7.8	1408.3	839.0	43	169	3.13	0.83
	2	25	84	2100								
	3	11	19	475								
RC01	1	27	76	1900	26.0	13.5	2316.7	1567.1	56	278	2.94	0.73
	2	12	40	1000								
	3	39	162	4050								
RC02	1	31	97	2425	21.0	9.5	2941.7	1234.0	46	353	2.80	0.73
	2	20	174	4350								
	3	12	82	2050								
RC03	1	40	211	5275	34.3	6.0	3308.3	1707.8	67	397	3.13	0.74
	2	28	88	2200								
	3	35	98	2450								
RC04	1	26	119	2975	27.3	5.1	3266.7	685.7	50	392	2.63	0.67
	2	23	111	2775								
	3	33	162	4050								
RC05	1	26	84	2100	23.7	5.9	1991.7	1141.4	50	239	3.02	0.77
	2	17	32	800								
	3	28	123	3075								

Table 6 continued:

Station	Rep	No. of Taxa	No. of Indvs	Density (no/m2)	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
RC06	1	36	185	4625	29.0	6.1	3466.7	1020.5	49	416	2.90	0.75
	2	25	108	2700								
	3	26	123	3075								
RC07	1	13	24	600	17.0	4.6	750.0	129.9	33	90	3.09	0.88
	2	22	33	825								
	3	16	33	825								
RC08	1	34	153	3825	40.7	7.0	4583.3	1357.0	73	550	3.31	0.77
	2	40	151	3775								
	3	48	246	6150								
RC09	1	36	75	1875	27.3	7.6	1900.0	43.3	54	228	3.11	0.78
	2	24	78	1950								
	3	22	75	1875								
ZI01	1	16	101	2525	12.3	3.5	2683.3	750.1	22	322	1.71	0.55
	2	12	140	3500								
	3	9	81	2025								
ZI02	1	5	33	825	4.3	2.1	658.3	267.3	8	79	1.28	0.62
	2	2	14	350								
	3	6	32	800								
ZI03	1	14	99	2475	18.0	4.0	3508.3	1136.1	30	421	2.04	0.60
	2	18	133	3325								
	3	22	189	4725								
ZI04	1	11	165	4125	9.3	2.1	3808.3	1109.4	14	457	1.65	0.63
	2	7	103	2575								
	3	10	189	4725								
ZI05	1	2	16	400	1.7	0.6	375.0	139.2	3	45	0.70	0.64
	2	1	9	225								
	3	2	20	500								

Figure 1. Sediment texture data for the NOAA TO8 stations, 2006.

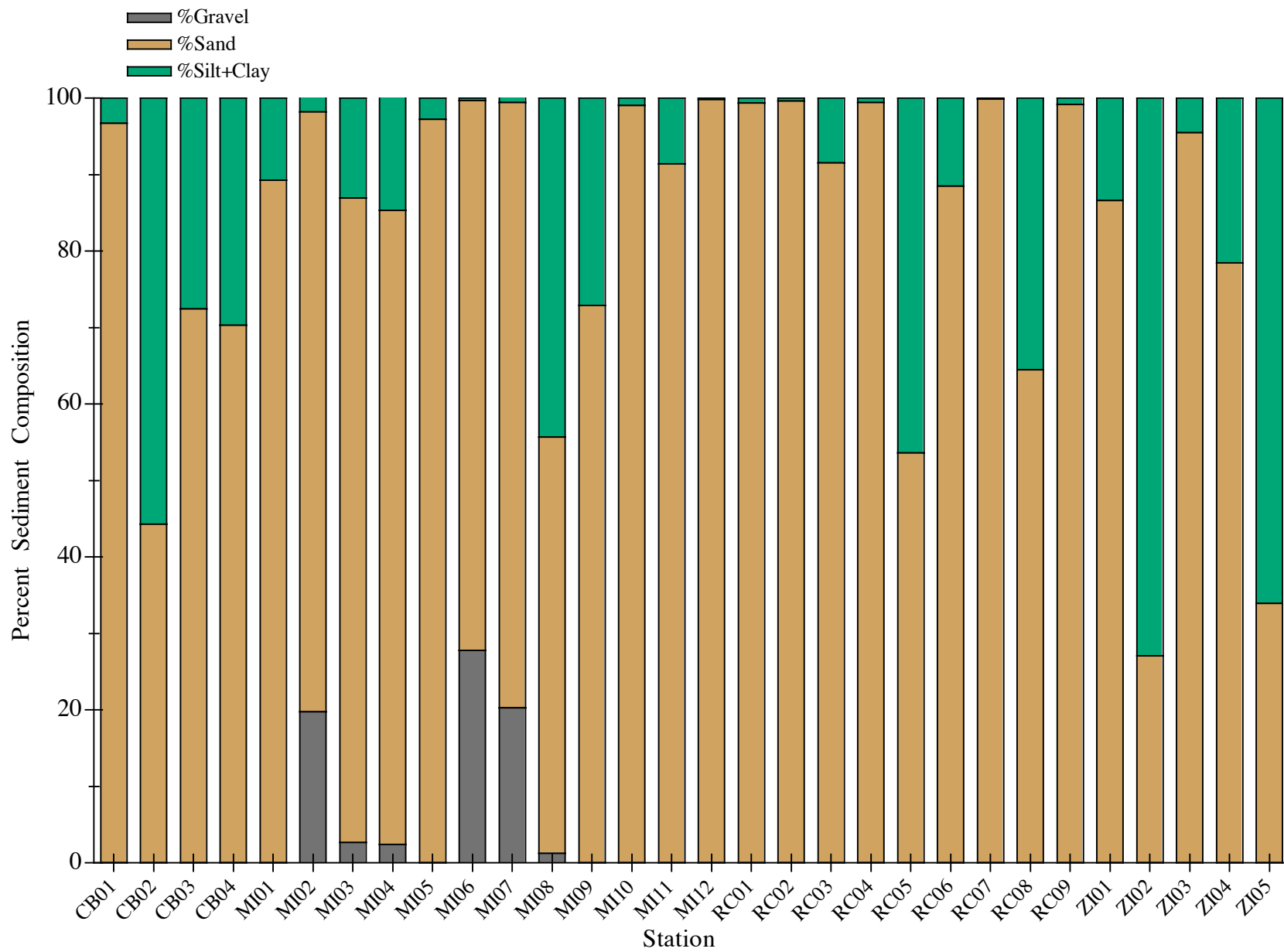


Figure 2. Sediment percent Total Organic Carbon (TOC) data for the NOAA TO8 stations, 2006.

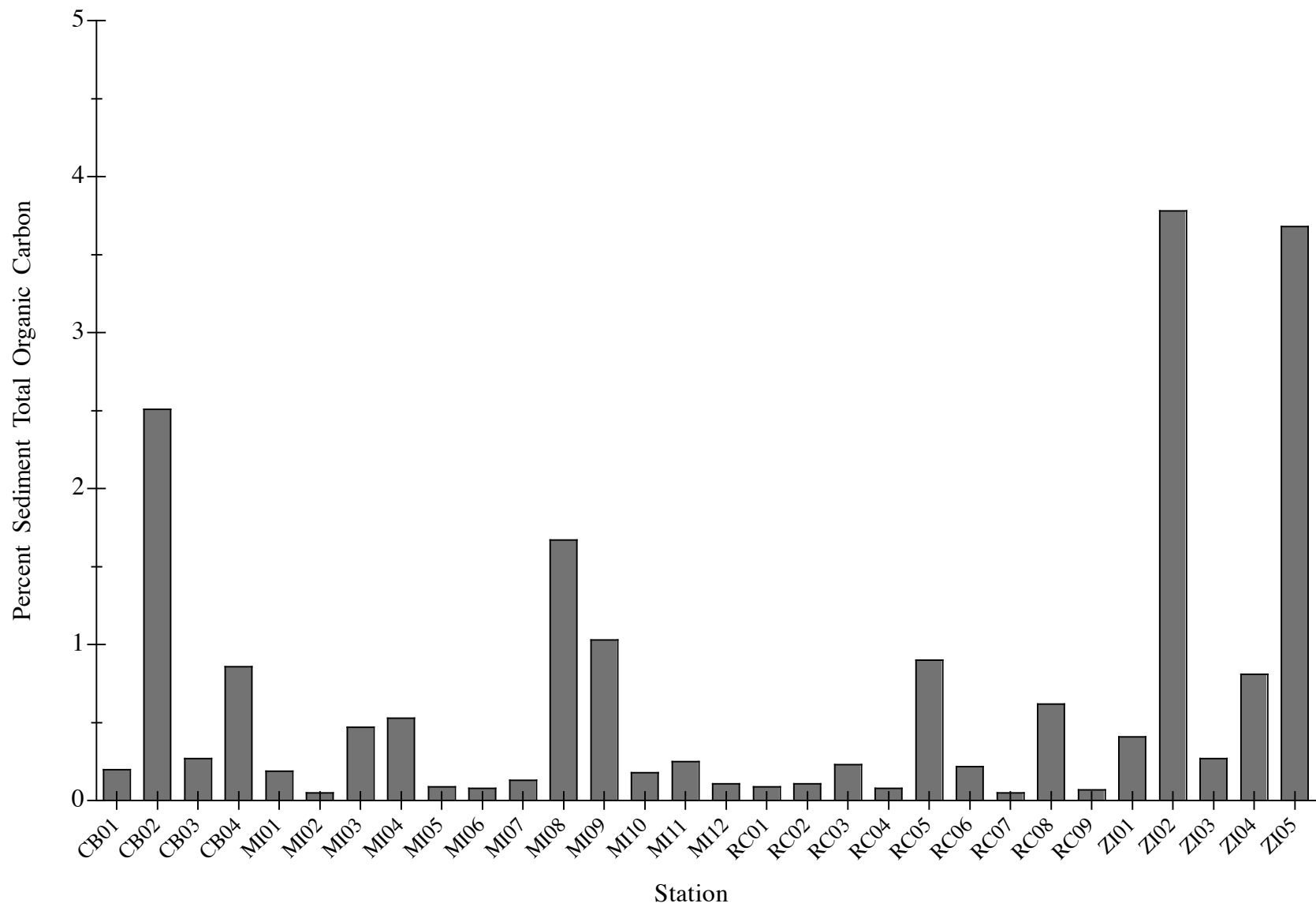


Figure 3. Percent abundance of major taxonomic groups for the NOAA TO8 stations, 2006.

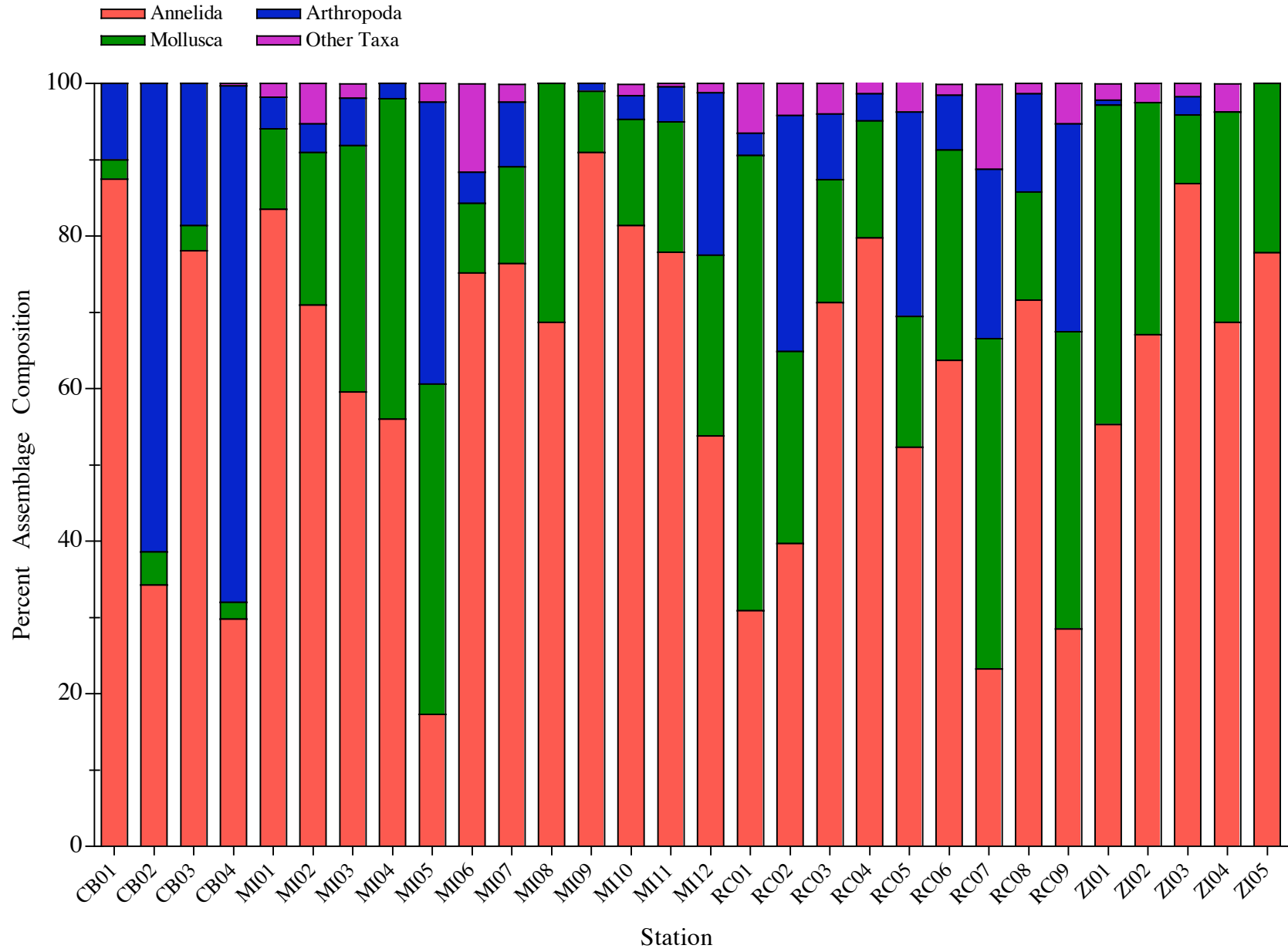


Figure 4. Taxa richness data for the NOAA TO8 stations, 2006.

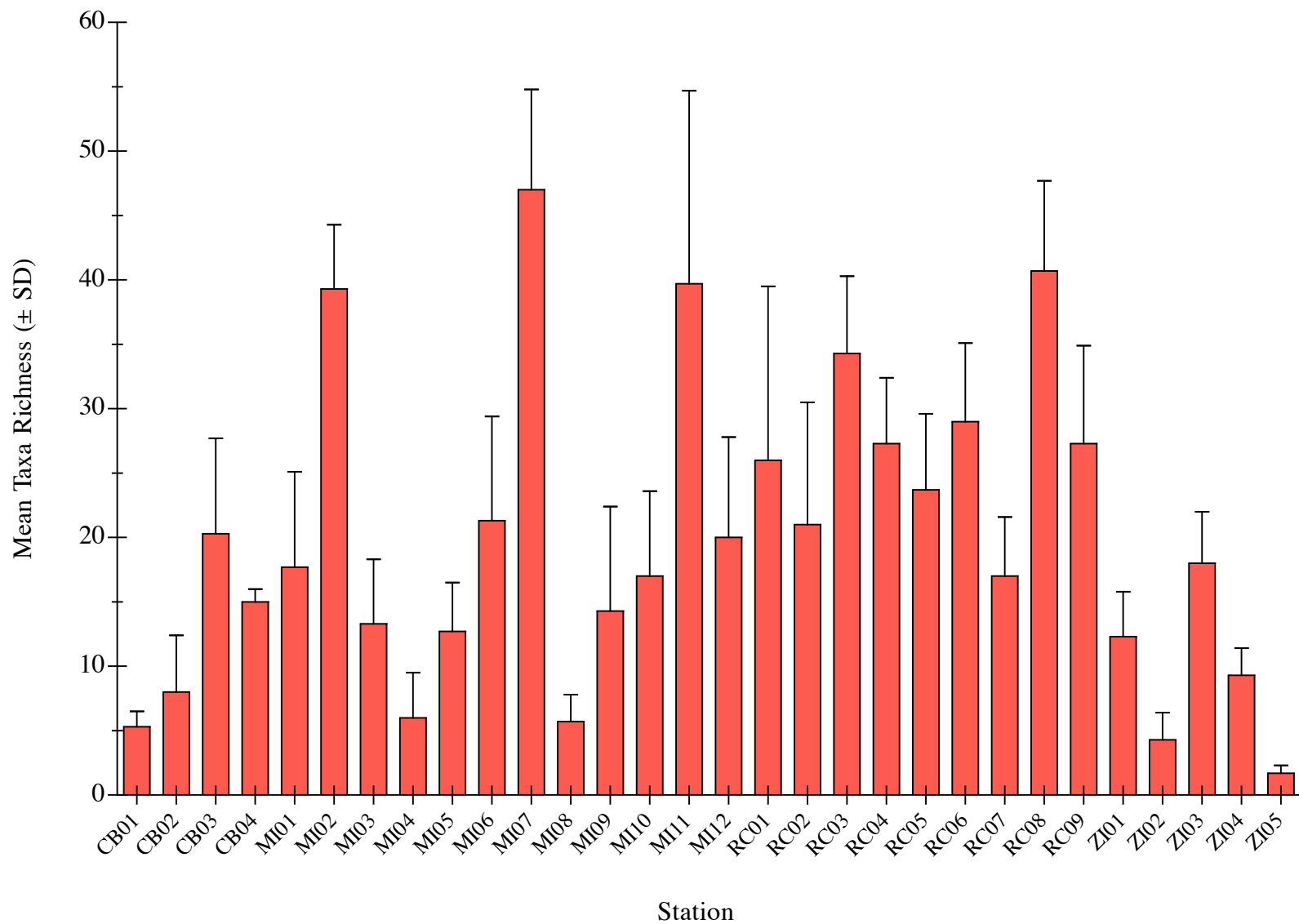


Figure 5. Mean macroinvertebrate densities for the NOAA TO8 stations, 2006.

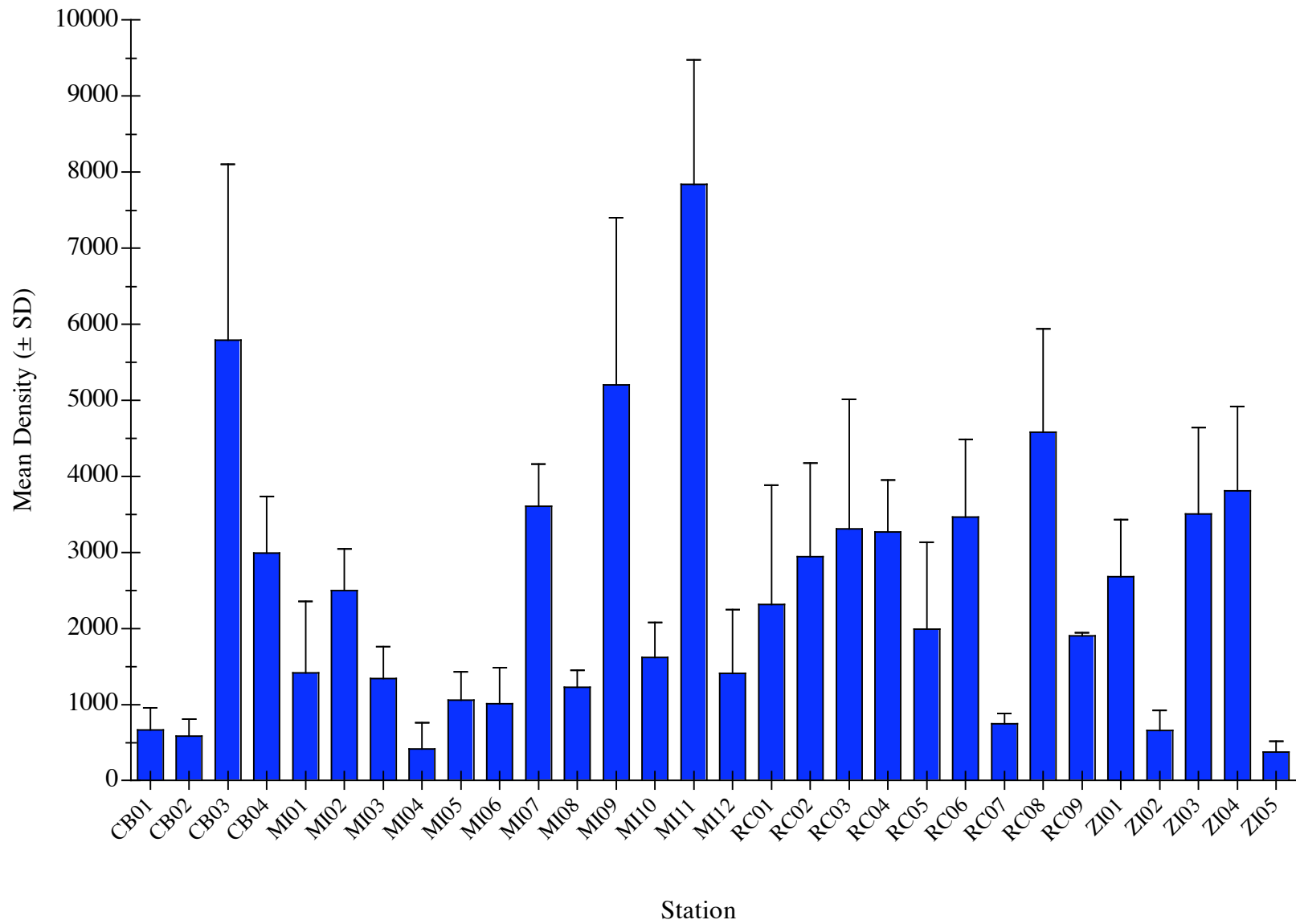


Figure 6. Taxa diversity (H') data for the NOAA TO8 stations, 2006.

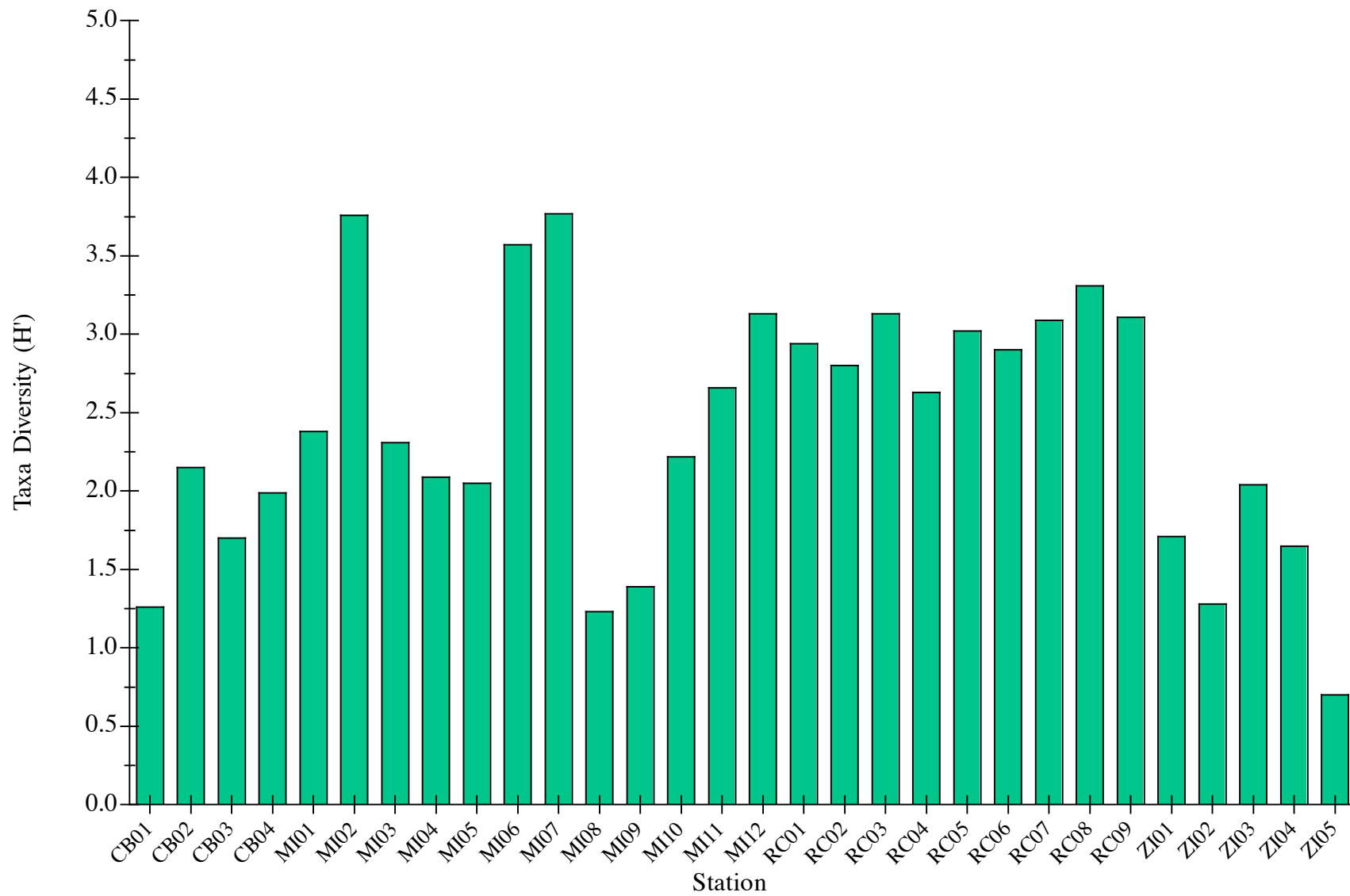
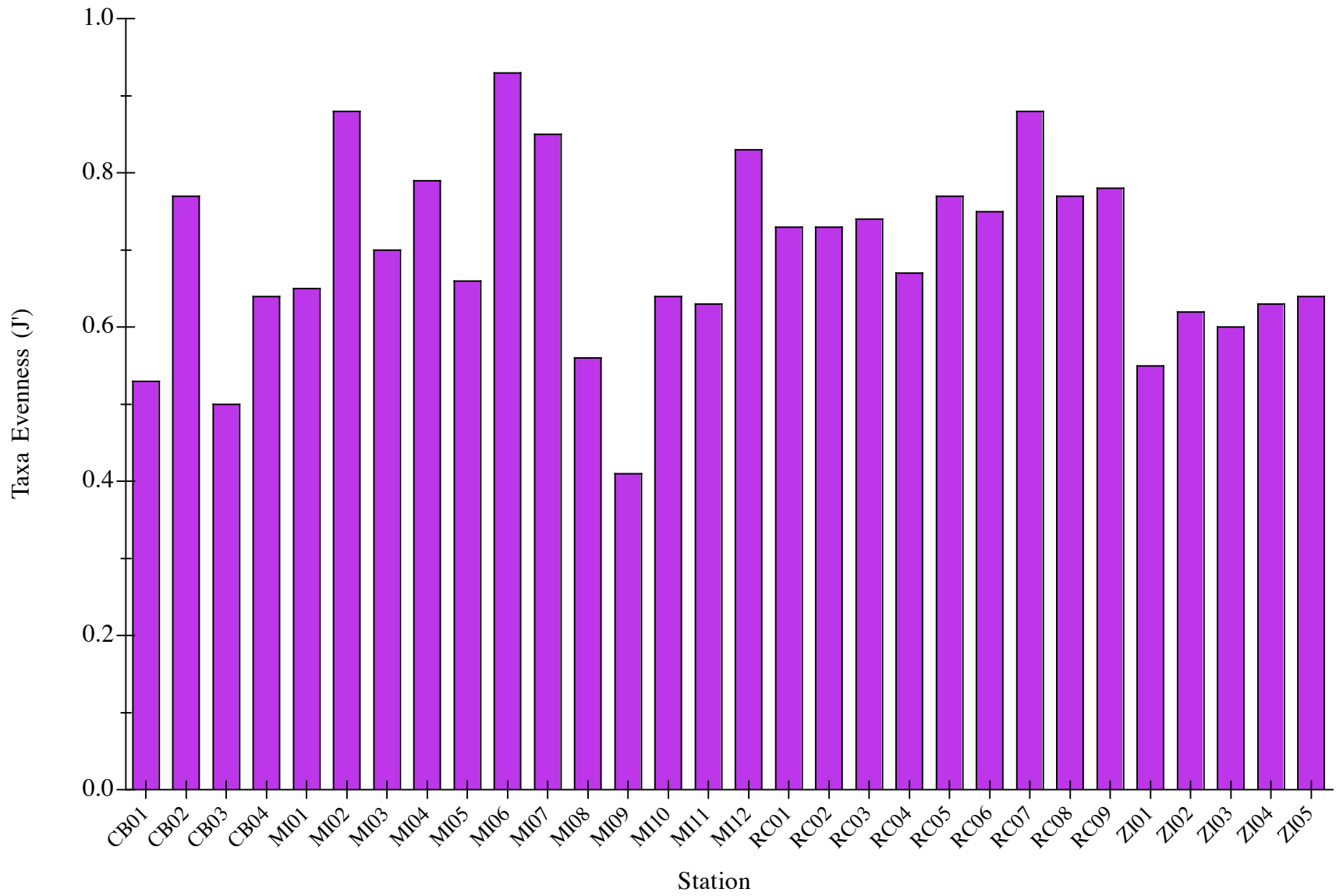


Figure 7. Taxa evenness (J') data for the NOAA TO8 stations, 2006.



APPENDICES

Appendix I. Water quality data for the NOAA TO8 stations, 2006.

Station Code (8 digits)	Date	Latitude (DD)	Longitude (DD)	Station Depth (m)	Depth (m)	Temp. (C)	Water Column Profile				Comments
							Salinity (ppt)	Cond. (µS/cm)	DO (mg/L)	pH	
NC06CB01	9/7/06	36.38929	75.84133	1.00	0.50	24.25	2.70	4924	8.30	8.01	
NC06CB02	9/7/06	36.39447	75.84682	1.00	0.50	23.69	2.74	4996	6.81	7.64	seagrass
NC06CB03	9/7/06	36.39127	75.85897	1.00	0.50	25.21	2.59	4725	8.97	8.70	submerged aquatic vegetation
NC06CB04	9/7/06	36.39926	75.84735	1.00	0.50	23.19	2.71	4946	5.92	7.28	
NC06RC01	9/11/06	34.70448	76.65826	4.30	4.00	25.30	36.05	54391	5.77	8.02	
NC06RC01	9/11/06	34.70448	76.65826	4.30	2.00	25.31	36.06	54365	5.81	8.02	
NC06RC01	9/11/06	34.70448	76.65826	4.30	0.50	25.31	36.03	54297	5.73	8.03	
NC06RC02	9/11/06	34.70024	76.64532	0.80	0.50	25.07	35.69	53898	5.81	7.94	extremely windy
NC06RC03	9/9/06	34.69266	76.61234	1.03	0.54	23.31	34.71	52551	5.56	7.75	
NC06RC04	9/11/06	34.70261	76.63722	1.37	1.14	23.94	33.89	51453	5.78	7.57	
NC06RC04	9/11/06	34.70261	76.63722	1.37	0.81	23.97	33.84	51506	5.56	7.74	
NC06RC04	9/11/06	34.70261	76.63722	1.37	0.49	23.89	33.82	51270	5.46	7.75	
NC06RC05	9/9/06	34.69811	76.60224	0.95	0.52	23.91	34.76	52599	6.01	7.78	
NC06RC06	9/9/06	34.71168	76.67321	1.10	0.50	23.74	32.78	49887	5.23	7.43	max depth 0.82 m?
NC06RC07	9/11/06	34.70574	76.67474	2.27	2.09	25.39	35.90	54188	5.89	8.04	
NC06RC07	9/11/06	34.70574	76.67474	2.27	1.05	25.39	35.91	54162	5.74	8.05	
NC06RC07	9/11/06	34.70574	76.67474	2.27	0.50	25.39	35.92	54162	5.82	8.06	
NC06RC08	9/9/06	34.69778	76.60926	1.05	0.49	25.26	35.96	54185	5.88	7.92	
NC06RC09	9/9/06	34.7001	76.63074	1.51	1.52	25.60	35.65	53826	6.32	7.90	station depth shallower than bottom water depth value?
NC06RC09	9/9/06	34.7001	76.63074	1.51	0.75	25.52	35.56	53753	6.33	7.93	
NC06RC09	9/9/06	34.7001	76.63074	1.51	0.25	25.52	35.53	53623	6.27	7.95	
NC06MI01	9/12/06	34.12385	77.86794	2.02	1.98	24.39	35.23	53259	5.80	7.82	in inter-coastal waterway
NC06MI01	9/12/06	34.12385	77.86794	2.02	1.01	24.34	35.00	52891	5.89	7.83	in inter-coastal waterway
NC06MI01	9/12/06	34.12385	77.86794	2.02	0.48	24.38	34.93	53004	5.82	7.84	in inter-coastal waterway
NC06MI02	9/13/06	34.18657	77.81848	3.83	3.49	25.03	36.14	54510	6.29	8.02	lots of shell hash in inf.
NC06MI02	9/13/06	34.18657	77.81848	3.83	1.68	25.04	36.15	54482	5.91	8.03	lots of shell hash in inf.
NC06MI02	9/13/06	34.18657	77.81848	3.83	0.46	25.05	36.16	54521	5.91	8.03	lots of shell hash in inf.
NC06MI03	9/14/06	34.12228	77.8588	1.05	0.96	23.61	21.91	34843	5.34	7.59	
NC06MI03	9/14/06	34.12228	77.8588	1.05	0.48	23.62	21.79	34683	5.34	7.58	
NC06MI04	9/14/06	34.11205	77.86269	0.66	0.60	23.30	19.95	32271	5.08	7.69	pinfish
NC06MI04	9/14/06	34.11205	77.86269	0.66	0.46	23.31	19.91	31943	5.09	7.65	pinfish
NC06MI05	9/13/06	34.15813	77.85067	1.20	1.09	22.87	33.86	51433	5.34	7.74	
NC06MI05	9/13/06	34.15813	77.85067	1.20	0.49	22.91	33.84	51437	5.20	7.75	
NC06MI06	9/13/06	34.17625	77.82579	3.40	3.33	25.06	36.20	54542	5.84	8.03	
NC06MI06	9/13/06	34.17625	77.82579	3.40	1.69	25.06	36.19	54544	5.84	8.03	
NC06MI06	9/13/06	34.17625	77.82579	3.40	0.54	25.06	36.20	54564	5.85	8.03	
NC06MI07	9/13/06	34.16906	77.84251	1.24	1.06	23.23	35.53	53685	5.67	7.86	rep. #2 80% full
NC06MI07	9/13/06	34.16906	77.84251	1.24	0.50	23.24	35.54	53686	5.51	7.86	rep. #2 80% full
NC06MI08	9/14/06	34.13656	77.8503	1.15	0.97	23.65	29.62	45575	5.06	7.63	pinfish
NC06MI08	9/14/06	34.13656	77.8503	1.15	0.49	23.61	29.63	45605	5.06	7.64	pinfish
NC06MI09	9/12/06	34.09257	77.87086	1.30	1.13	24.89	35.79	54106	6.19	7.83	
NC06MI09	9/12/06	34.09257	77.87086	1.30	0.70	24.82	34.86	53014	6.29	7.86	
NC06MI09	9/12/06	34.09257	77.87086	1.30	0.50	24.82	34.81	52749	6.35	6.35	
NC06MI10	9/14/06	34.14796	77.85262	0.85	0.81	22.48	29.49	45396	4.61	7.65	pinfish

Appendix I continued:

Water Column Profile											
Station Code (8 digits)	Date	Latitude (DD)	Longitude (DD)	Station Depth (m)	Depth (m)	Temp. (C)	Salinity (ppt)	Cond. (µS/cm)	DO (mg/L)	pH	Comments
NC06MI10	9/14/06	34.14796	77.85262	0.85	0.47	22.52	28.74	44460	5.00	7.64	pinfish
NC06MI11	9/12/06	34.13828	77.86426	2.26	2.09	25.26	36.22	54580	5.72	7.94	
NC06MI11	9/12/06	34.13828	77.86426	2.26	1.09	25.29	36.10	54525	5.98	7.96	
NC06MI11	9/12/06	34.13828	77.86426	2.26	0.50	25.29	36.04	54365	5.98	7.96	
NC06MI12	9/13/06	34.17035	77.82964	2.15	2.01	24.76	36.09	54402	6.07	8.03	raining
NC06MI12	9/13/06	34.17035	77.82964	2.15	1.02	24.78	36.07	54434	5.93	8.03	raining
NC06MI12	9/13/06	34.17035	77.82964	2.15	0.50	24.86	36.14	54465	5.71	8.03	raining
NC06ZI01	9/15/06	33.92343	77.94843	1.07	1.03	24.14	11.42	19234	5.66	7.61	
NC06ZI01	9/15/06	33.92343	77.94843	1.07	0.51	24.15	11.41	19235	5.62	7.56	
NC06ZI02	9/15/06	33.951	77.94567	0.69	0.51	23.67	12.13	20378	5.90	7.70	
NC06ZI03	9/15/06	33.93167	77.95407	1.97	1.70	23.80	9.89	16726	5.70	7.56	
NC06ZI03	9/15/06	33.93167	77.95407	1.97	0.92	23.82	9.68	16522	5.85	7.50	
NC06ZI03	9/15/06	33.93167	77.95407	1.97	0.50	23.84	9.76	16631	5.71	7.47	
NC06ZI04	9/15/06	33.93312	77.93909	1.01	0.50	24.72	11.83	19972	5.68	7.76	
NC06ZI05	9/15/06	33.95433	77.93597	1.41	1.30	24.84	11.73	19756	5.44	7.53	
NC06ZI05	9/15/06	33.95433	77.93597	1.41	0.55	24.61	9.27	15864	5.50	7.49	

QUALITY ASSURANCE STATEMENT

Client/Project: NOAA

Work Assignment Title: NC-NEERS

Task Number: 008

Description of Data Set or Deliverable: 90 Benthic macroinvertebrate samples collected in 2006; Young Dredge grabs.

Description of audit and review activities: Judged accuracy rates were well above standard levels for sorting and taxonomy. Laboratory QC reports were completed. Copies of QC results follow (see attachment.) All taxonomic data were entered into computer files and printed. This list was checked for accuracy against original taxonomic data sheets.

Description of outstanding issues or deficiencies that may affect data quality: None

Signature of QA Officer or Reviewer

Date

Signature of Project Manager

Date

QUALITY CONTROL REWORKS

Client/Project: NOAA- NC-NEERS
Task Number: 8

Sorting Results:	Sample #	% Accuracy
	NC06-MI02-3	100%
	NC06-MI03-3	100%
	NC06-ZI02-3	100%
	NC06-MI05-2	100%
	NC06-MI06-3	100%
	NC06-RC05-1	98%
	NC06-CB04-1	95%
	NC06-CB01-1	100%
	NC06-RC08-1	100%

Taxonomy Results:	Sample #	Taxa	% Accuracy
	NC06-CB03-1	Crust./Moll.	100%
	NC06-RC05-1	Crust./Moll.	100%
	NC06-MI01-1	Crust./Moll.	100%
	NC06-MI04-2	Crust./Moll.	95%
	NC06-MI09	Crust./Moll.	100%
	NC06-ZI01-1	Crust./Moll.	100%
	NC06-MI05-1	Crust./Moll.	100%
	NC06-MI11-1	Crust./Moll.	100%
	NC06-RC06-1	Crust./Moll.	100%
	NC06-RC02-1	Annelida	100%
	NC06-MI03-3	Annelida	100%
	NC06-MI09-2	Annelida	100%
	NC06-RC05-2	Annelida	100%
	NC06-ZI03-3	Annelida	99%
	NC06-MI09-1	Annelida	100%
	NC06-MI07-1	Annelida	98%
	NC06-RC06-2	Annelida	98%
	NC06-MI12-2	Annelida	98%
	NC06-MI-02	Annelida	99%

Description of outstanding issues or deficiencies which may affect data quality: None

Signature of QA Officer or Reviewer

Date