

Gray's Reef Benthic Community Assessment, 2005

SUBMITTED TO:

U.S. Department of Commerce
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Silver Spring, Maryland 20910

PREPARED BY:

Barry A. Vittor & Associates, Inc.
8060 Cottage Hill Rd.
Mobile, Alabama 36695
(251) 633-6100
www.bvaenviro.com

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INTRODUCTION

The Gray's Reef National Marine Sanctuary was sampled during 2005. 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). Location data for the Gray's Reef stations are given in Table 1.

METHODS

Sample Collection and Handling

A Young dredge (area = 0.04 m²) was used to collect bottom samples at each of 20 station locations (three replicate samples were taken at each station)(Table 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 Gray's Reef 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 20 stations are given in Table 1 and Figure 1. Sediment texture at the 20 stations was uniform throughout the study area (Figure 3). Sand comprised at least of 90% of the total sediment at all stations except Station 51, which had an 19.5% gravel fraction (Figure 1). The percent total organic carbon (TOC) fraction of the sediment was very low with all values less than 2% (Table 1, Figure 1).

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 9240 organisms, representing 353 taxa, were identified from the 20 stations (Table 2). Polychaetes were the most numerous organisms present representing 51% of the total assemblage, followed in abundance by malacostracans (18%) and bivalves (9%). Polychaetes represented 42.3% of the total number of taxa followed by malacostracans (29.7%), bivalves (10.5%) and gastropods (9.3%)(Table 2). The percentage abundance of the major taxa at the 20 stations is given in Table 3 and Figure 2. A diverse, mixed assemblage of annelids, mollusks and arthropods was found at each of the 20 stations (Figure 2).

The dominant taxa collected from the 20 stations were the polychaetes, *Spiophanes bombyx* and *Spio pettiboneae*, and the bivalve, *Ensis minor* representing 6.5%, 5.2% and 4.1%, respectively (Table 4). The most widely distributed taxa were the polychaete, *S. bombyx* and the phylum Rhynchocoela (LPIL) being found at 100% 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 20 stations in Table 6 and Figures 3 and 4. The mean number of taxa per station ranged from 27.3 (SD = 0.6) at Station 54 to 64.3 (SD = 24.4) at Station 53 (Table 6; Figure 3). Mean density per station ranged from 1425.0 organisms·m² (SD = 114.6) at Station 54 to 6166.7organisms·m² (SD = 1930.4) at Station 64 (Table 6; Figure 4).

Taxa diversity and evenness for the Gray's Reef stations are given in Table 6 and Figure 5. Taxa diversity (H') was uniformly high at all stations and ranged from 3.02 at Station 50 to 4.06 at Station 53 (Table 6; Figure 5). Taxa evenness (J') was also high at all stations and ranged from 0.73 at Station 50 to 0.86 at Station 58 (Table 6; Figure 5).

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 Gray's Reef stations, 2005.

Station	Latitude	Longitude	% T.O.C.	% Gravel	% Sand	% Silt+Clay	USACE Description	Median Particle Size (phi)	Sorting Coefficient	% Moisture
45	31.4169	80.9141	0.4745	1.37	98.45	0.18	Sand	1.331	0.851	19.71
46	31.4130	80.8944	0.5649	0.64	98.23	1.13	Sand	1.224	0.867	19.66
47	31.4190	80.8678	0.9349	1.74	98.01	0.26	Sand	1.305	0.522	19.44
48	31.9131	80.8972	0.7981	2.34	97.23	0.43	Sand	1.135	1.071	18.80
49	31.4125	80.8457	0.7240	2.64	97.07	0.29	Sand	0.992	0.924	23.13
50	31.3919	80.9159	-	1.56	92.95	5.49	Sand	1.215	0.957	21.79
51	31.3968	80.8861	1.9014	19.49	70.79	9.72	*	0.298	1.618	15.88
52	31.3936	80.8712	1.6448	0.36	99.18	0.46	Sand	1.899	0.791	25.70
53	31.4043	80.8539	0.9966	9.25	90.07	0.68	*	0.344	1.134	22.14
54	31.3995	80.8448	0.7846	0.12	99.65	0.23	Sand	1.777	0.783	25.65
55	31.3786	80.9186	0.8984	9.69	89.96	0.35	*	0.831	1.438	20.72
56	31.3899	80.9010	1.5639	2.47	97.29	0.23	Sand	0.996	0.935	22.20
57	31.3799	80.8825	1.5639	1.19	98.15	0.66	Sand	1.408	1.154	21.99
58	31.3883	80.8520	0.6605	6.69	93.16	0.16	*	0.684	1.102	31.85
59	31.3801	80.8441	0.9511	2.24	97.47	0.29	Sand	0.798	0.824	21.16
60	31.3757	80.9039	1.1100	0.63	99.02	0.35	Sand	1.930	0.783	24.77
61	31.3713	80.8891	1.1100	7.64	92.22	0.14	*	0.345	1.120	19.39
62	31.3666	80.8701	0.9081	1.51	98.35	0.14	Sand	0.930	1.108	21.46
63	31.3741	80.8564	0.8691	4.51	95.28	0.21	Sand	0.582	0.987	21.38
64	31.3736	80.8452	0.6101	3.1	96.72	0.19	Sand	0.767	0.908	23.55

* Too much gravel for textural description.

Table 2. Summary of overall abundance of major benthic macroinfaunal taxonomic groups for the Gray's Reef stations, 2005.

Taxa	Total No. Taxa	% Total	Total No. Individuals	% Total
Annelida				
Oligochaeta	2	0.6	462	5.0
Polychaeta	150	42.5	4,714	51.0
Mollusca				
Bivalvia	37	10.5	799	8.6
Gastropoda	33	9.3	498	5.4
Polyplacophora	1	0.3	28	0.3
Arthropoda				
Arachnida	1	0.3	2	0.0
Malacostraca	105	29.7	1,688	18.3
Pycnogonida	1	0.3	1	0.0
Echinodermata				
Asteroidea	1	0.3	7	0.1
Echinoidea	4	1.1	29	0.3
Holothuroidea	3	0.8	8	0.1
Ophiuroidea	2	0.6	149	1.6
Other Taxa	13	3.7	855	9.3
Total	353		9,240	

Table 3. Summary of abundance of major benthic macroinfaunal taxonomic groups by station for the Gray's Reef stations, 2005.

Station	Taxa	Total No.		Total No.	
		Taxa	% Total	Individuals	% Total
45	Annelida	36	50.7	141	44.1
	Mollusca	12	16.9	76	23.8
	Arthropoda	15	21.1	57	17.8
	Echinodermata	1	1.4	3	0.9
	Other Taxa	7	9.9	43	13.4
	Total	71		320	
46	Annelida	53	51.0	273	51.0
	Mollusca	21	20.2	105	19.6
	Arthropoda	20	19.2	104	19.4
	Echinodermata	2	1.9	3	0.6
	Other Taxa	8	7.7	50	9.3
	Total	104		535	
47	Annelida	43	45.3	253	44.1
	Mollusca	17	17.9	75	13.1
	Arthropoda	26	27.4	97	16.9
	Echinodermata	2	2.1	4	0.7
	Other Taxa	7	7.4	145	25.3
	Total	95		574	
48	Annelida	43	53.1	284	50.7
	Mollusca	8	9.9	81	14.5
	Arthropoda	20	24.7	110	19.6
	Echinodermata	3	3.7	10	1.8
	Other Taxa	7	8.6	75	13.4
	Total	81		560	
49	Annelida	52	53.6	231	52.1
	Mollusca	17	17.5	59	13.3
	Arthropoda	18	18.6	74	16.7
	Echinodermata	2	2.1	5	1.1
	Other Taxa	8	8.2	74	16.7
	Total	97		443	
50	Annelida	31	50.0	81	28.3
	Mollusca	15	24.2	131	45.8
	Arthropoda	8	12.9	46	16.1
	Echinodermata	1	1.6	1	0.3
	Other Taxa	7	11.3	27	9.4
	Total	62		286	

Table 3 continued:

Station	Taxa	Total No.		Total No.	
		Taxa	% Total	Individuals	% Total
51	Annelida	60	50.4	508	68.7
	Mollusca	18	15.1	67	9.1
	Arthropoda	32	26.9	88	11.9
	Echinodermata	3	2.5	8	1.1
	Other Taxa	6	5.0	68	9.2
	Total	119		739	
52	Annelida	36	36.4	108	24.8
	Mollusca	21	21.2	60	13.8
	Arthropoda	35	35.4	239	54.9
	Echinodermata	2	2.0	9	2.1
	Other Taxa	5	5.1	19	4.4
	Total	99		435	
53	Annelida	64	52.0	514	69.9
	Mollusca	18	14.6	68	9.3
	Arthropoda	32	26.0	64	8.7
	Echinodermata	2	1.6	11	1.5
	Other Taxa	7	5.7	78	10.6
	Total	123		735	
54	Annelida	17	30.9	36	21.1
	Mollusca	11	20.0	31	18.1
	Arthropoda	17	30.9	80	46.8
	Echinodermata	3	5.5	3	1.8
	Other Taxa	7	12.7	21	12.3
	Total	55		171	
55	Annelida	64	57.1	469	69.8
	Mollusca	12	10.7	83	12.4
	Arthropoda	25	22.3	60	8.9
	Echinodermata	2	1.8	6	0.9
	Other Taxa	9	8.0	54	8.0
	Total	112		672	
56	Annelida	28	50.0	110	47.2
	Mollusca	13	23.2	85	36.5
	Arthropoda	9	16.1	25	10.7
	Echinodermata	1	1.8	3	1.3
	Other Taxa	5	8.9	10	4.3
	Total	56		233	

Table 3 continued:

Station	Taxa	Total No.		Total No.	
		Taxa	% Total	Individuals	% Total
57	Annelida	44	49.4	266	58.6
	Mollusca	13	14.6	37	8.1
	Arthropoda	24	27.0	63	13.9
	Echinodermata	2	2.2	59	13.0
	Other Taxa	6	6.7	29	6.4
	Total	89		454	
58	Annelida	40	44.0	151	50.8
	Mollusca	18	19.8	61	20.5
	Arthropoda	23	25.3	59	19.9
	Echinodermata	2	2.2	6	2.0
	Other Taxa	8	8.8	20	6.7
	Total	91		297	
59	Annelida	44	52.4	375	70.4
	Mollusca	11	13.1	42	7.9
	Arthropoda	18	21.4	61	11.4
	Echinodermata	5	6.0	12	2.3
	Other Taxa	6	7.1	43	8.1
	Total	84		533	
60	Annelida	33	47.8	98	37.3
	Mollusca	16	23.2	69	26.2
	Arthropoda	13	18.8	83	31.6
	Echinodermata	2	2.9	2	0.8
	Other Taxa	5	7.2	11	4.2
	Total	69		263	
61	Annelida	36	57.1	189	63.4
	Mollusca	7	11.1	67	22.5
	Arthropoda	15	23.8	23	7.7
	Echinodermata	1	1.6	7	2.3
	Other Taxa	4	6.3	12	4.0
	Total	63		298	
62	Annelida	46	43.4	291	57.2
	Mollusca	10	9.4	32	6.3
	Arthropoda	40	37.7	133	26.1
	Echinodermata	3	2.8	24	4.7
	Other Taxa	7	6.6	29	5.7
	Total	106		509	

Table 3 continued:

Station	Taxa	Total No.		Total No.	
		Taxa	% Total	Individuals	% Total
63	Annelida	46	47.4	261	58.9
	Mollusca	14	14.4	56	12.6
	Arthropoda	29	29.9	100	22.6
	Echinodermata	2	2.1	6	1.4
	Other Taxa	6	6.2	20	4.5
	Total	97		443	
64	Annelida	61	53.5	537	72.6
	Mollusca	12	10.5	40	5.4
	Arthropoda	35	30.7	125	16.9
	Echinodermata	3	2.6	11	1.5
	Other Taxa	3	2.6	27	3.6
	Total	114		740	

Table 4. Distribution and abundance of benthic macroinfaunal taxa for the Gray's Reef stations, 2005.

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Spiophanes bombyx</i>	Ann	Poly	597	6.46	6.46	20	100
<i>Spio pettiboneae</i>	Ann	Poly	484	5.24	11.70	17	85
<i>Ensis minor</i>	Mol	Biva	376	4.07	15.77	17	85
Tubificidae (LPIL)	Ann	Olig	359	3.89	19.65	19	95
<i>Caecum johnsoni</i>	Mol	Gast	322	3.48	23.14	17	85
Branchiostoma (LPIL)	Cho	Lept	313	3.39	26.53	18	90
<i>Protodorvillea kefersteini</i>	Ann	Poly	302	3.27	29.79	19	95
<i>Bhawania goodei</i>	Ann	Poly	259	2.80	32.60	18	90
<i>Spio</i> (LPIL)	Ann	Poly	197	2.13	34.73	14	70
<i>Synelmis ewingi</i>	Ann	Poly	192	2.08	36.81	12	60
<i>Oxyurostylis smithi</i>	Art	Mala	186	2.01	38.82	17	85
<i>Armandia maculata</i>	Ann	Poly	165	1.79	40.61	18	90
<i>Sphaerosyllis piriferopsis</i>	Ann	Poly	163	1.76	42.37	14	70
<i>Metharpinia floridana</i>	Art	Mala	155	1.68	44.05	14	70
<i>Acanthohaustorius millsii</i>	Art	Mala	148	1.60	45.65	13	65
Rhynchocoela (LPIL)	Rhy	-	142	1.54	47.19	20	100
<i>Mediomastus</i> (LPIL)	Ann	Poly	133	1.44	48.63	18	90
<i>Goniadides carolinae</i>	Ann	Poly	127	1.37	50.00	15	75
Turbellaria (LPIL)	Pla	Turb	125	1.35	51.35	19	95
<i>Parapionosyllis longicirrata</i>	Ann	Poly	113	1.22	52.58	14	70
Enchytraeidae (LPIL)	Ann	Olig	103	1.11	53.69	15	75
<i>Apeudes olympiae</i>	Art	Mala	101	1.09	54.78	12	60
Sipuncula (LPIL)	Sip	-	99	1.07	55.85	16	80
Maldanidae (LPIL)	Ann	Poly	92	1.00	56.85	16	80
<i>Tanaissus psammophilus</i>	Art	Mala	92	1.00	57.85	14	70
<i>Filogranula</i> sp. A	Ann	Poly	91	0.98	58.83	11	55
<i>Crassinella lunulata</i>	Mol	Biva	90	0.97	59.81	18	90
<i>Polycirrus eximius</i>	Ann	Poly	89	0.96	60.77	8	40
Ophiuroidea (LPIL)	Ech	Ophi	88	0.95	61.72	17	85
<i>Bhawania heteroseta</i>	Ann	Poly	79	0.85	62.58	9	45
<i>Exogone lourei</i>	Ann	Poly	77	0.83	63.41	16	80
<i>Syllis cornuta</i>	Ann	Poly	77	0.83	64.24	14	70
<i>Aspidosiphon albus</i>	Sip	-	71	0.77	65.01	13	65
Onuphidae (LPIL)	Ann	Poly	70	0.76	65.77	15	75
<i>Taylorpholoe hirsuta</i>	Ann	Poly	70	0.76	66.53	12	60
<i>Pionosyllis gesae</i>	Ann	Poly	62	0.67	67.20	9	45
Amphiuridae (LPIL)	Ech	Ophi	61	0.66	67.86	3	15
<i>Hesionura elongata</i>	Ann	Poly	60	0.65	68.51	11	55
<i>Aspidosiphon muelleri</i>	Sip	-	56	0.61	69.11	14	70
<i>Cirrophorus ilvana</i>	Ann	Poly	56	0.61	69.72	15	75
Nephtyidae (LPIL)	Ann	Poly	55	0.60	70.31	16	80
Spionidae (LPIL)	Ann	Poly	52	0.56	70.88	17	85
<i>Dentatisyllis carolinae</i>	Ann	Poly	49	0.53	71.41	7	35
Bivalvia (LPIL)	Mol	Biva	47	0.51	71.92	18	90
<i>Ensis directus</i>	Mol	Biva	45	0.49	72.40	2	10
<i>Plakosyllis quadrioculata</i>	Ann	Poly	45	0.49	72.89	8	40
<i>Ervilia concentrica</i>	Mol	Biva	44	0.48	73.37	9	45
<i>Acuminodeutopus naglei</i>	Art	Mala	41	0.44	73.81	13	65
<i>Diplodonta</i> (LPIL)	Mol	Biva	41	0.44	74.25	13	65
<i>Exogone rolani</i>	Ann	Poly	41	0.44	74.70	8	40
Glyceridae (LPIL)	Ann	Poly	41	0.44	75.14	14	70
<i>Photis</i> (LPIL)	Art	Mala	41	0.44	75.58	10	50
<i>Pisone remota</i>	Ann	Poly	41	0.44	76.03	10	50
<i>Acanthohaustorius</i> (LPIL)	Art	Mala	40	0.43	76.46	9	45
<i>Photis pugnator</i>	Art	Mala	39	0.42	76.88	5	25
<i>Ptilanthura tenuis</i>	Art	Mala	39	0.42	77.31	5	25

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Campylaspis heardi</i>	Art	Mala	38	0.41	77.72	14	70
<i>Phyllodoce</i> (LPIL)	Ann	Poly	38	0.41	78.13	12	60
<i>Semele</i> (LPIL)	Mol	Biva	38	0.41	78.54	8	40
Syllidae (LPIL)	Ann	Poly	37	0.40	78.94	14	70
<i>Tectonatica pusilla</i>	Mol	Gast	37	0.40	79.34	8	40
<i>Ophelia denticulata</i>	Ann	Poly	36	0.39	79.73	14	70
<i>Heteropodarke formalis</i>	Ann	Poly	35	0.38	80.11	9	45
<i>Prionospio</i> (LPIL)	Ann	Poly	35	0.38	80.49	12	60
<i>Ampelisca bicarinata</i>	Art	Mala	34	0.37	80.85	12	60
Phoxocephalidae (LPIL)	Art	Mala	33	0.36	81.21	10	50
<i>Erichthonius brasiliensis</i>	Art	Mala	32	0.35	81.56	10	50
<i>Aapseudes</i> (LPIL)	Art	Mala	31	0.34	81.89	4	20
<i>Axiothella mucosa</i>	Ann	Poly	28	0.30	82.20	8	40
<i>Polyplacophora</i> (LPIL)	Mol	Polyp	28	0.30	82.50	9	45
<i>Ampelisca</i> (LPIL)	Art	Mala	27	0.29	82.79	11	55
<i>Gibberosus myersi</i>	Art	Mala	27	0.29	83.08	10	50
<i>Liljeborgia</i> sp. A	Art	Mala	27	0.29	83.38	9	45
Naticidae (LPIL)	Mol	Gast	27	0.29	83.67	10	50
<i>Oxyurostylis</i> (LPIL)	Art	Mala	25	0.27	83.94	12	60
<i>Cyclaspis unicornis</i>	Art	Mala	24	0.26	84.20	10	50
<i>Protohaustorius wigleyi</i>	Art	Mala	24	0.26	84.46	5	25
<i>Semele nuculoides</i>	Mol	Biva	24	0.26	84.72	13	65
<i>Fabricinuda trilobata</i>	Ann	Poly	23	0.25	84.97	3	15
Terebellidae (LPIL)	Ann	Poly	23	0.25	85.22	10	50
<i>Aspidosiphon</i> (LPIL)	Sip	-	22	0.24	85.45	8	40
<i>Bemlos</i> (LPIL)	Art	Mala	22	0.24	85.69	7	35
Phyllodocidae (LPIL)	Ann	Poly	22	0.24	85.93	8	40
<i>Eudevenopus honduranus</i>	Art	Mala	21	0.23	86.16	8	40
<i>Bowmaniella portoricensis</i>	Art	Mala	20	0.22	86.37	10	50
Echinoidea (LPIL)	Ech	Echi	19	0.21	86.58	11	55
<i>Eurydice</i> (LPIL)	Art	Mala	19	0.21	86.79	8	40
<i>Mediomastus californiensis</i>	Ann	Poly	19	0.21	86.99	8	40
<i>Sphaerosyllis aciculata</i>	Ann	Poly	19	0.21	87.20	7	35
<i>Acanthohaustorius shoemakeri</i>	Art	Mala	18	0.19	87.39	6	30
<i>Bathyporeia parkeri</i>	Art	Mala	18	0.19	87.59	6	30
<i>Turbonilla</i> (LPIL)	Mol	Gast	18	0.19	87.78	4	20
Aoridae (LPIL)	Art	Mala	17	0.18	87.97	10	50
<i>Cirrophorus</i> (LPIL)	Ann	Poly	17	0.18	88.15	10	50
<i>Prionospio cristata</i>	Ann	Poly	17	0.18	88.33	9	45
Gastropoda (LPIL)	Mol	Gast	16	0.17	88.51	9	45
<i>Loimia medusa</i>	Ann	Poly	16	0.17	88.68	9	45
Lucinidae (LPIL)	Mol	Biva	16	0.17	88.85	8	40
<i>Nephtys simoni</i>	Ann	Poly	16	0.17	89.03	7	35
<i>Podocerus kleidus</i>	Art	Mala	16	0.17	89.20	7	35
<i>Acteocina</i> sp. A	Mol	Gast	15	0.16	89.36	8	40
<i>Actiniaria</i> (LPIL)	Cni	Anth	15	0.16	89.52	10	50
<i>Cyclaspis</i> sp. O	Art	Mala	15	0.16	89.69	7	35
<i>Globosolembos smithi</i>	Art	Mala	15	0.16	89.85	1	5
<i>Pagurus</i> (LPIL)	Art	Mala	15	0.16	90.01	3	15
<i>Nephtys</i> (LPIL)	Ann	Poly	14	0.15	90.16	9	45
<i>Paramphinome</i> sp. B	Ann	Poly	14	0.15	90.31	7	35
<i>Americhelidium americanum</i>	Art	Mala	13	0.14	90.45	10	50
<i>Nephtys picta</i>	Ann	Poly	13	0.14	90.60	9	45
<i>Acanthohaustorius bousfieldi</i>	Art	Mala	12	0.13	90.73	1	5
<i>Aonides paucibranchiata</i>	Ann	Poly	12	0.13	90.85	5	25
<i>Bowmaniella</i> (LPIL)	Art	Mala	12	0.13	90.98	7	35
<i>Caulleriella</i> cf. <i>alata</i>	Ann	Poly	12	0.13	91.11	4	20
<i>Glycera</i> (LPIL)	Ann	Poly	12	0.13	91.24	5	25

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Ingolfiella fuscina</i>	Art	Mala	12	0.13	91.37	2	10
<i>Magelona pettiboneae</i>	Ann	Poly	12	0.13	91.50	8	40
<i>Paraonis pygoenigmatica</i>	Ann	Poly	12	0.13	91.63	5	25
<i>Sphaerosyllis taylori</i>	Ann	Poly	12	0.13	91.76	5	25
<i>Bemlos brunneomaculatus</i>	Art	Mala	11	0.12	91.88	3	15
<i>Caprella equilibra</i>	Art	Mala	11	0.12	92.00	1	5
Cirratulidae (LPIL)	Ann	Poly	11	0.12	92.12	4	20
<i>Corbula contracta</i>	Mol	Biva	11	0.12	92.24	5	25
<i>Glycera americana</i>	Ann	Poly	11	0.12	92.36	6	30
Paguridae (LPIL)	Art	Mala	11	0.12	92.48	3	15
<i>Eumida sanguinea</i>	Ann	Poly	10	0.11	92.59	7	35
<i>Glycera robusta</i>	Ann	Poly	10	0.11	92.69	7	35
<i>Kupellonura</i> sp. A	Art	Mala	10	0.11	92.80	2	10
<i>Monticellina baptistae</i>	Ann	Poly	10	0.11	92.91	2	10
<i>Nematonereis hebes</i>	Ann	Poly	10	0.11	93.02	5	25
<i>Owenia fusiformis</i>	Ann	Poly	10	0.11	93.13	8	40
<i>Pettiboneia duofurca</i>	Ann	Poly	10	0.11	93.24	5	25
<i>Rictaxis punctostriatus</i>	Mol	Gast	10	0.11	93.34	8	40
Aeginellidae (LPIL)	Art	Mala	9	0.10	93.44	3	15
<i>Ampelisca agassizi</i>	Art	Mala	9	0.10	93.54	6	30
<i>Eurydice personata</i>	Art	Mala	9	0.10	93.64	6	30
<i>Leptochela papulata</i>	Art	Mala	9	0.10	93.73	8	40
<i>Caulleriella</i> sp. J	Ann	Poly	8	0.09	93.82	5	25
<i>Crenella divaricata</i>	Mol	Biva	8	0.09	93.91	6	30
<i>Encope aberrans</i>	Ech	Echi	8	0.09	93.99	4	20
<i>Exogone</i> (LPIL)	Ann	Poly	8	0.09	94.08	6	30
<i>Heteropodarke lyonsi</i>	Ann	Poly	8	0.09	94.17	5	25
Mysidae (LPIL)	Art	Mala	8	0.09	94.25	4	20
<i>Phthisica marina</i>	Art	Mala	8	0.09	94.34	5	25
<i>Polygordius</i> (LPIL)	Ann	Poly	8	0.09	94.43	6	30
<i>Rhepoxynius epistomus</i>	Art	Mala	8	0.09	94.51	1	5
<i>Shoemakerella cubensis</i>	Art	Mala	8	0.09	94.60	4	20
Asteroidea (LPIL)	Ech	Aste	7	0.08	94.68	4	20
Capitellidae (LPIL)	Ann	Poly	7	0.08	94.75	6	30
<i>Corbula</i> (LPIL)	Mol	Biva	7	0.08	94.83	4	20
<i>Cyclaspis</i> (LPIL)	Art	Mala	7	0.08	94.90	5	25
<i>Glycera</i> sp. A	Ann	Poly	7	0.08	94.98	3	15
Hesionidae (LPIL)	Ann	Poly	7	0.08	95.05	7	35
<i>Trypanosyllis coeliaca</i>	Ann	Poly	7	0.08	95.13	3	15
<i>Arene tricarinata</i>	Mol	Gast	6	0.06	95.19	4	20
<i>Caecum pulchellum</i>	Mol	Gast	6	0.06	95.26	5	25
<i>Gammaropsis</i> (LPIL)	Art	Mala	6	0.06	95.32	5	25
<i>Polycirrus</i> (LPIL)	Ann	Poly	6	0.06	95.39	5	25
Sigalionidae (LPIL)	Ann	Poly	6	0.06	95.45	6	30
<i>Acteocina lepta</i>	Mol	Gast	5	0.05	95.51	3	15
Ampharetidae (LPIL)	Ann	Poly	5	0.05	95.56	3	15
<i>Calyptraea centralis</i>	Mol	Gast	5	0.05	95.62	4	20
<i>Chama macerophylla</i>	Mol	Biva	5	0.05	95.67	4	20
Cnidaria (LPIL)	Cni	-	5	0.05	95.73	4	20
<i>Euceramus praelongus</i>	Art	Mala	5	0.05	95.78	2	10
<i>Eurydice convexa</i>	Art	Mala	5	0.05	95.83	3	15
<i>Exogone verugera</i>	Ann	Poly	5	0.05	95.89	4	20
<i>Macrochaeta</i> sp. A	Ann	Poly	5	0.05	95.94	2	10
<i>Monticellina dorsobranchialis</i>	Ann	Poly	5	0.05	96.00	4	20
<i>Nephtys squamosa</i>	Ann	Poly	5	0.05	96.05	5	25
Nereididae (LPIL)	Ann	Poly	5	0.05	96.10	4	20
<i>Oxyurostylis lecrovayae</i>	Art	Mala	5	0.05	96.16	2	10
<i>Paramicrodeutopus myersi</i>	Art	Mala	5	0.05	96.21	4	20

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Podarkeopsis levifuscina</i>	Ann	Poly	5	0.05	96.27	3	15
Serpulidae (LPIL)	Ann	Poly	5	0.05	96.32	4	20
<i>Tellina</i> (LPIL)	Mol	Biva	5	0.05	96.37	4	20
<i>Tellina listeri</i>	Mol	Biva	5	0.05	96.43	5	25
<i>Travisia parva</i>	Ann	Poly	5	0.05	96.48	4	20
<i>Acanthohaustorius pansus</i>	Art	Mala	4	0.04	96.53	1	5
Aricidea (LPIL)	Ann	Poly	4	0.04	96.57	4	20
<i>Asthenothaerus hemphilli</i>	Mol	Biva	4	0.04	96.61	2	10
<i>Brania wellfleetensis</i>	Ann	Poly	4	0.04	96.66	3	15
<i>Calozodion heardi</i>	Art	Mala	4	0.04	96.70	3	15
<i>Caprella</i> (LPIL)	Art	Mala	4	0.04	96.74	3	15
Haustoriidae (LPIL)	Art	Mala	4	0.04	96.79	3	15
<i>Leptosynapta tenuis</i>	Ech	Holo	4	0.04	96.83	1	5
Lineidae (LPIL)	Rhy	Anop	4	0.04	96.87	3	15
Lysianassidae (LPIL)	Art	Mala	4	0.04	96.92	3	15
<i>Lysilla</i> sp. B	Ann	Poly	4	0.04	96.96	3	15
<i>Maera caroliniana</i>	Art	Mala	4	0.04	97.00	1	5
<i>Magelona papillicornis</i>	Ann	Poly	4	0.04	97.05	3	15
<i>Microcharon</i> sp. A	Art	Mala	4	0.04	97.09	1	5
Paraonidae (LPIL)	Ann	Poly	4	0.04	97.13	4	20
<i>Poecilochaetus johnsoni</i>	Ann	Poly	4	0.04	97.18	2	10
<i>Processa</i> (LPIL)	Art	Mala	4	0.04	97.22	2	10
<i>Processa hemphilli</i>	Art	Mala	4	0.04	97.26	3	15
<i>Sphaerosyllis</i> (LPIL)	Ann	Poly	4	0.04	97.31	4	20
<i>Syllis</i> (LPIL)	Ann	Poly	4	0.04	97.35	4	20
<i>Syllis corallicola</i>	Ann	Poly	4	0.04	97.39	2	10
<i>Arabella multidentata</i>	Ann	Poly	3	0.03	97.42	3	15
Aricidea sp. D	Ann	Poly	3	0.03	97.46	3	15
<i>Aricidea suecica</i>	Ann	Poly	3	0.03	97.49	2	10
<i>Aricidea wassi</i>	Ann	Poly	3	0.03	97.52	3	15
<i>Bathyporeia</i> (LPIL)	Art	Mala	3	0.03	97.55	2	10
<i>Caprella penantis</i>	Art	Mala	3	0.03	97.59	3	15
Carditidae (LPIL)	Mol	Biva	3	0.03	97.62	2	10
<i>Caulleriella</i> (LPIL)	Ann	Poly	3	0.03	97.65	2	10
<i>Diopatra cuprea</i>	Ann	Poly	3	0.03	97.68	3	15
<i>Leptosynapta</i> (LPIL)	Ech	Holo	3	0.03	97.72	1	5
Marginellidae (LPIL)	Mol	Gast	3	0.03	97.75	3	15
<i>Metatiron tropakis</i>	Art	Mala	3	0.03	97.78	2	10
<i>Neomegamphopus</i> (LPIL)	Art	Mala	3	0.03	97.81	3	15
<i>Nereiphylla fragilis</i>	Ann	Poly	3	0.03	97.85	3	15
<i>Nereis falsa</i>	Ann	Poly	3	0.03	97.88	3	15
<i>Opisthodonta</i> sp. B	Ann	Poly	3	0.03	97.91	3	15
<i>Pseudovermilia occidentalis</i>	Ann	Poly	3	0.03	97.94	2	10
<i>Pteromeris perplana</i>	Mol	Biva	3	0.03	97.98	2	10
<i>Schistomeringos pectinata</i>	Ann	Poly	3	0.03	98.01	3	15
<i>Semele bellastrata</i>	Mol	Biva	3	0.03	98.04	3	15
<i>Sigalion arenicola</i>	Ann	Poly	3	0.03	98.07	3	15
<i>Sigambra pettiboneae</i>	Ann	Poly	3	0.03	98.11	2	10
<i>Tharyx kirkegaardi</i>	Ann	Poly	3	0.03	98.14	1	5
<i>Amakusanthura magnifica</i>	Art	Mala	2	0.02	98.16	2	10
<i>Ampelisca abdita</i>	Art	Mala	2	0.02	98.18	2	10
Amphipoda (LPIL)	Art	Mala	2	0.02	98.20	1	5
<i>Anachis floridana</i>	Mol	Gast	2	0.02	98.23	2	10
<i>Argissa hamatipes</i>	Art	Mala	2	0.02	98.25	2	10
<i>Autolytus</i> (LPIL)	Ann	Poly	2	0.02	98.27	1	5
<i>Caecum floridanum</i>	Mol	Gast	2	0.02	98.29	2	10
Caprellidae (LPIL)	Art	Mala	2	0.02	98.31	2	10
<i>Chione cancellata</i>	Mol	Biva	2	0.02	98.33	2	10

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Chione grus</i>	Mol	Biva	2	0.02	98.35	1	5
<i>Chloeia viridis</i>	Ann	Poly	2	0.02	98.38	2	10
<i>Cirrophorus lyra</i>	Ann	Poly	2	0.02	98.40	1	5
<i>Dipolydora socialis</i>	Ann	Poly	2	0.02	98.42	1	5
<i>Dispia uncinata</i>	Ann	Poly	2	0.02	98.44	2	10
<i>Dissodactylus crinitichelis</i>	Art	Mala	2	0.02	98.46	1	5
<i>Epitonium</i> (LPIL)	Mol	Gast	2	0.02	98.48	2	10
Eulimidae (LPIL)	Mol	Gast	2	0.02	98.51	2	10
<i>Glycera</i> sp. F	Ann	Poly	2	0.02	98.53	1	5
<i>Grubeulepis mexicana</i>	Ann	Poly	2	0.02	98.55	2	10
Halacaridae (LPIL)	Art	Arac	2	0.02	98.57	1	5
<i>Litocorsa antennata</i>	Ann	Poly	2	0.02	98.59	1	5
<i>Mesanthura</i> (LPIL)	Art	Mala	2	0.02	98.61	2	10
<i>Microphthalmus similis</i>	Ann	Poly	2	0.02	98.64	1	5
Montacutidae (LPIL)	Mol	Biva	2	0.02	98.66	2	10
<i>Nereis pelagica</i>	Ann	Poly	2	0.02	98.68	2	10
<i>Neverita duplicata</i>	Mol	Gast	2	0.02	98.70	2	10
<i>Odontosyllis enopla</i>	Ann	Poly	2	0.02	98.72	2	10
<i>Parametopella cypris</i>	Art	Mala	2	0.02	98.74	1	5
<i>Paranaitis speciosa</i>	Ann	Poly	2	0.02	98.77	2	10
<i>Paraonis fulgens</i>	Ann	Poly	2	0.02	98.79	2	10
<i>Pitar fulminatus</i>	Mol	Biva	2	0.02	98.81	1	5
<i>Pleuromeris tridentata</i>	Mol	Biva	2	0.02	98.83	1	5
<i>Sabellaria vulgaris</i>	Ann	Poly	2	0.02	98.85	2	10
<i>Sigambra</i> (LPIL)	Ann	Poly	2	0.02	98.87	2	10
<i>Sigatica carolinensis</i>	Mol	Gast	2	0.02	98.90	2	10
<i>Sphaerosyllis glandulata</i>	Ann	Poly	2	0.02	98.92	1	5
<i>Strombiformis</i> (LPIL)	Mol	Gast	2	0.02	98.94	2	10
<i>Syllis sardai</i>	Ann	Poly	2	0.02	98.96	2	10
Thraciidae (LPIL)	Mol	Biva	2	0.02	98.98	2	10
<i>Unciola irrorata</i>	Art	Mala	2	0.02	99.00	1	5
Aclididae (LPIL)	Mol	Gast	1	0.01	99.02	1	5
Ampeliscidae (LPIL)	Art	Mala	1	0.01	99.03	1	5
<i>Ampharete</i> (LPIL)	Ann	Poly	1	0.01	99.04	1	5
Amphilochoidea (LPIL)	Art	Mala	1	0.01	99.05	1	5
<i>Anachis lafresnayi</i>	Mol	Gast	1	0.01	99.06	1	5
<i>Ancistrosyllis hartmanae</i>	Ann	Poly	1	0.01	99.07	1	5
<i>Aricidea cerrutii</i>	Ann	Poly	1	0.01	99.08	1	5
<i>Asabellides oculata</i>	Ann	Poly	1	0.01	99.09	1	5
Asciacea (LPIL)	Cho	Asci	1	0.01	99.10	1	5
<i>Automate</i> (LPIL)	Art	Mala	1	0.01	99.11	1	5
<i>Balanoglossus</i> (LPIL)	Hem	Ente	1	0.01	99.12	1	5
Bateidae (LPIL)	Art	Mala	1	0.01	99.13	1	5
<i>Bowmaniella brasiliensis</i>	Art	Mala	1	0.01	99.15	1	5
<i>Branchiosyllis exilis</i>	Ann	Poly	1	0.01	99.16	1	5
Caecidae (LPIL)	Mol	Gast	1	0.01	99.17	1	5
<i>Caecum imbricatum</i>	Mol	Gast	1	0.01	99.18	1	5
<i>Chaetozone</i> sp. B	Ann	Poly	1	0.01	99.19	1	5
<i>Chiridotea tuftsi</i>	Art	Mala	1	0.01	99.20	1	5
<i>Chone</i> (LPIL)	Ann	Poly	1	0.01	99.21	1	5
<i>Cyclaspis pustulata</i>	Art	Mala	1	0.01	99.22	1	5
<i>Cyclaspis varians</i>	Art	Mala	1	0.01	99.23	1	5
<i>Cyclinella tenuis</i>	Mol	Biva	1	0.01	99.24	1	5
Decapoda (LPIL)	Art	Mala	1	0.01	99.25	1	5
<i>Deutella incerta</i>	Art	Mala	1	0.01	99.26	1	5
Diastylidae (LPIL)	Art	Mala	1	0.01	99.27	1	5
<i>Encope</i> (LPIL)	Ech	Echi	1	0.01	99.29	1	5
Eulepethidae (LPIL)	Ann	Poly	1	0.01	99.30	1	5

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Eunice</i> (LPIL)	Ann	Poly	1	0.01	99.31	1	5
<i>Glycera sphyrabrancha</i>	Ann	Poly	1	0.01	99.32	1	5
Glycymerididae (LPIL)	Mol	Biva	1	0.01	99.33	1	5
Goniadidae (LPIL)	Ann	Poly	1	0.01	99.34	1	5
<i>Gouldia cerina</i>	Mol	Biva	1	0.01	99.35	1	5
<i>Haminoea</i> (LPIL)	Mol	Gast	1	0.01	99.36	1	5
Holothuroidea (LPIL)	Ech	Holo	1	0.01	99.37	1	5
Hyssuridae (LPIL)	Art	Mala	1	0.01	99.38	1	5
<i>Kalliapseudes</i> (LPIL)	Art	Mala	1	0.01	99.39	1	5
<i>Kalliapseudes</i> sp. C	Art	Mala	1	0.01	99.40	1	5
<i>Kurtziella atrostyla</i>	Mol	Gast	1	0.01	99.42	1	5
<i>Lembos</i> (LPIL)	Art	Mala	1	0.01	99.43	1	5
<i>Leptochela</i> (LPIL)	Art	Mala	1	0.01	99.44	1	5
<i>Leptochelia</i> (LPIL)	Art	Mala	1	0.01	99.45	1	5
Liljeborgiidae (LPIL)	Art	Mala	1	0.01	99.46	1	5
<i>Lima pellucida</i>	Mol	Biva	1	0.01	99.47	1	5
<i>Lucina</i> (LPIL)	Mol	Biva	1	0.01	99.48	1	5
<i>Lucina multilineata</i>	Mol	Biva	1	0.01	99.49	1	5
Lucinidae Genus C (LPIL)	Mol	Biva	1	0.01	99.50	1	5
<i>Lumbrineris</i> (LPIL)	Ann	Poly	1	0.01	99.51	1	5
<i>Lumbrineris latreilli</i>	Ann	Poly	1	0.01	99.52	1	5
<i>Lysidice notata</i>	Ann	Poly	1	0.01	99.53	1	5
Majidae (LPIL)	Art	Mala	1	0.01	99.55	1	5
<i>Marginella</i> (LPIL)	Mol	Gast	1	0.01	99.56	1	5
<i>Marginella hartleyana</i>	Mol	Gast	1	0.01	99.57	1	5
<i>Metatiron</i> (LPIL)	Art	Mala	1	0.01	99.58	1	5
<i>Mooreonuphis pallidula</i>	Ann	Poly	1	0.01	99.59	1	5
<i>Nassarius albus</i>	Mol	Gast	1	0.01	99.60	1	5
<i>Neomegamphopus kalanii</i>	Art	Mala	1	0.01	99.61	1	5
<i>Nereis acuminata</i>	Ann	Poly	1	0.01	99.62	1	5
<i>Nereis micromma</i>	Ann	Poly	1	0.01	99.63	1	5
<i>Notomastus americanus</i>	Ann	Poly	1	0.01	99.64	1	5
<i>Notomastus tenuis</i>	Ann	Poly	1	0.01	99.65	1	5
Nudibranchia (LPIL)	Mol	Gast	1	0.01	99.66	1	5
<i>Olivella</i> (LPIL)	Mol	Gast	1	0.01	99.68	1	5
<i>Olivella mutica</i>	Mol	Gast	1	0.01	99.69	1	5
Opheliidae (LPIL)	Ann	Poly	1	0.01	99.70	1	5
<i>Ovalipes ocellatus</i>	Art	Mala	1	0.01	99.71	1	5
<i>Paracaprella tenuis</i>	Art	Mala	1	0.01	99.72	1	5
<i>Paracerceis caudata</i>	Art	Mala	1	0.01	99.73	1	5
Paraonis (LPIL)	Ann	Poly	1	0.01	99.74	1	5
Phoronis (LPIL)	Pho	-	1	0.01	99.75	1	5
<i>Phyllodoce longipes</i>	Ann	Poly	1	0.01	99.76	1	5
<i>Pinnixa</i> (LPIL)	Art	Mala	1	0.01	99.77	1	5
<i>Pinnixa chaetoptera</i>	Art	Mala	1	0.01	99.78	1	5
<i>Polydora cornuta</i>	Ann	Poly	1	0.01	99.79	1	5
<i>Pseudonototanaia</i> sp. B	Art	Mala	1	0.01	99.81	1	5
Pycnogonida (LPIL)	Art	Pycn	1	0.01	99.82	1	5
<i>Saccocirrus cirratus</i>	Ann	Poly	1	0.01	99.83	1	5
Scaphandridae (LPIL)	Mol	Gast	1	0.01	99.84	1	5
Schizasteridae Genus A	Ech	Echi	1	0.01	99.85	1	5
Semelidae (LPIL)	Mol	Biva	1	0.01	99.86	1	5
<i>Sicyonia typica</i>	Art	Mala	1	0.01	99.87	1	5
<i>Sphaerodoropsis vittori</i>	Ann	Poly	1	0.01	99.88	1	5
<i>Spiochaetopterus ocellatus</i>	Ann	Poly	1	0.01	99.89	1	5
<i>Streblospio benedicti</i>	Ann	Poly	1	0.01	99.90	1	5
<i>Syllis corallicoloides</i>	Ann	Poly	1	0.01	99.91	1	5
<i>Syllis danieli</i>	Ann	Poly	1	0.01	99.92	1	5

Table 4 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Tellina sybaritica</i>	Mol	Biva	1	0.01	99.94	1	5
<i>Tellina versicolor</i>	Mol	Biva	1	0.01	99.95	1	5
Tellinidae (LPIL)	Mol	Biva	1	0.01	99.96	1	5
<i>Uromunna reynoldsi</i>	Art	Mala	1	0.01	99.97	1	5
Veneridae (LPIL)	Mol	Biva	1	0.01	99.98	1	5
<i>Vermiliopsis annulata</i>	Ann	Poly	1	0.01	99.99	1	5
Vitrinellidae (LPIL)	Mol	Gast	1	0.01	100.00	1	5

Taxa Key

Ann=Annelida

Olig=Oligochaeta

Poly=Polychaeta

Art=Arthropoda

Arac=Arachnida

Mala=Malacostraca

Pycn=Pycnogonida

Cho=Chordata

Asci=Asciacea

Lept=Leptocardia

Cni=Cnidaria

Anth=Anthozoa

Ech=Echinodermata

Aste=Asteroidea

Echi=Echinoidea

Holo=Holothuroidea

Ophi=Ophiuroidea

Hem=Hemichordata

Ente=Enteropneusta

Mol=Mollusca

Biva=Bivalvia

Gast=Gastropoda

Polyp=Polyplacophora

Pho=Phoronida

Pla=Platyhelminthes

Turb=Turbellaria

Rhy=Rhynchocoela

Anop=Anopla

Sip=Sipuncula

Table 5. Percentage abundance of dominant benthic macroinfaunal taxa (> 5% of the total) for the Gray's Reef stations, 2005.

Taxa	45	46	47	48	49	50	51
Annelida							
Oligochaeta							
Enchytraeidae (LPIL)							
Tubificidae (LPIL)							
Polychaeta							
<i>Armandia maculata</i>							
<i>Bhawania goodei</i>							16.4
<i>Bhawania heteroseta</i>							6.6
<i>Filogranula</i> sp. A							
<i>Mediomastus</i> (LPIL)					6.1		
Nephtyidae (LPIL)							
<i>Parapionosyllis longicirrata</i>	6.9						
<i>Polycirrus eximius</i>							
<i>Protodorvillea kefersteini</i>		10.7			8.4		
<i>Sphaerosyllis piriferopsis</i>							
<i>Spio</i> (LPIL)			6.1				
<i>Spio pettiboneae</i>							
<i>Spiophanes bombyx</i>			6.3	5.0		5.2	7.6
<i>Synelmis ewingi</i>				24.3			
Arthropoda							
Malacostraca							
<i>Acanthohaustorius</i> (LPIL)							
<i>Acanthohaustorius millsi</i>							
<i>Metharpinia floridana</i>							
<i>Oxyurostylis smithi</i>							
Phoxocephalidae (LPIL)						5.2	
<i>Ptilanthura tenuis</i>							
<i>Tanaisius psammophilus</i>	5.9					5.6	
Chordata							
Leptocardia							
<i>Branchiostoma</i> (LPIL)	5.3		20.0				6.1

Table 5 continued:

Taxa	45	46	47	48	49	50	51
Echinodermata							
Ophiuroidea							
Amphiuridae (LPIL)							
Mollusca							
Bivalvia							
<i>Ensis directus</i>	13.8						
<i>Ensis minor</i>		5.6		8.0	6.8	35.0	
Gastropoda							
<i>Caecum johnsoni</i>			5.6				
Platyhelminthes							
Turbellaria							
Turbellaria (LPIL)				7.3			
Sipuncula							
<i>Aspidosiphon albus</i>					7.2		

Table 5 continued:

Taxa	52	53	54	55	56	57	58	59
Annelida								
Oligochaeta								
Enchytraeidae (LPIL)		5.0						
Tubificidae (LPIL)								10.9
Polychaeta								
<i>Armandia maculata</i>								
<i>Bhawania goodei</i>		5.0		6.0				
<i>Bhawania heteroseta</i>								
<i>Filogranula</i> sp. A						7.7	11.4	
<i>Mediomastus</i> (LPIL)								
Nephtyidae (LPIL)								
<i>Parapionosyllis longicirrata</i>								
<i>Polycirrus eximius</i>				9.8				
<i>Protodorvillea kefersteini</i>								
<i>Sphaerosyllis piriferopsis</i>								
<i>Spio</i> (LPIL)						5.6	5.1	
<i>Spio pettiboneae</i>				11.2		6.8		14.8
<i>Spiophanes bombyx</i>		7.2		7.1		12.3		5.8
<i>Synelmis ewingi</i>								
Arthropoda								
Malacostraca								
<i>Acanthohaustorius</i> (LPIL)	6.0							
<i>Acanthohaustorius millsi</i>	17.2		7.6					
<i>Metharpinia floridana</i>			18.7					
<i>Oxyurostylis smithi</i>	6.4							
Phoxocephalidae (LPIL)								
<i>Ptilanthura tenuis</i>								
<i>Tanaisius psammophilus</i>								
Chordata								
Leptocardia								
<i>Branchiostoma</i> (LPIL)		5.6						

Table 5 continued:

Taxa	60	61	62	63	64
Annelida					
Oligochaeta					
Enchytraeidae (LPIL)					
Tubificidae (LPIL)		5.7	6.1		6.2
Polychaeta					
<i>Armandia maculata</i>				8.6	
<i>Bhawania goodei</i>					
<i>Bhawania heteroseta</i>					
<i>Filogranula</i> sp. A					
<i>Mediomastus</i> (LPIL)					
Nephtyidae (LPIL)	6.1				
<i>Parapionosyllis longicirrata</i>					
<i>Polycirrus eximius</i>					
<i>Protodorvillea kefersteini</i>					5.0
<i>Sphaerosyllis piriferopsis</i>					5.0
<i>Spio</i> (LPIL)					
<i>Spio pettiboneae</i>			12.8	15.3	14.3
<i>Spiophanes bombyx</i>		16.1	7.7	6.3	7.6
<i>Synelmis ewingi</i>					
Arthropoda					
Malacostraca					
<i>Acanthohaustorius</i> (LPIL)					
<i>Acanthohaustorius millsii</i>					
<i>Metharpinia floridana</i>	6.1				
<i>Oxyurostylis smithi</i>	17.5				
Phoxocephalidae (LPIL)					
<i>Ptilanthura tenuis</i>			5.3		
<i>Tanaisius psammophilus</i>					
Chordata					
Leptocardia					
<i>Branchiostoma</i> (LPIL)					

Table . Continued:

Taxa	60	61	62	63	64
Echinodermata Ophiuroidea Amphiuridae (LPIL)					
Mollusca Bivalvia <i>Ensis directus</i> <i>Ensis minor</i> Gastropoda <i>Caecum johnsoni</i>	19.4	19.5		6.1	
Platyhelminthes Turbellaria Turbellaria (LPIL)					
Sipuncula <i>Aspidosiphon albus</i>					

Table 6. Summary of the benthic macroinfaunal data for the Gray's Reef stations, 2005.

Station	Rep	No. of Taxa	No. of Individuals	Density (no/m ²)	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
45	A	46	116	2900	39.3	9.9	2666.7	1365.0	71	320	3.63	0.85
	B	44	156	3900								
	C	28	48	1200								
46	A	80	302	7550	50.7	25.5	4458.3	2730.9	104	535	3.93	0.85
	B	38	138	3450								
	C	34	95	2375								
47	A	39	151	3775	50.7	13.9	4783.3	1514.6	95	574	3.59	0.79
	B	66	261	6525								
	C	47	162	4050								
48	A	38	179	4475	45.3	9.5	4666.7	780.4	81	560	3.36	0.76
	B	56	221	5525								
	C	42	160	4000								
49	A	58	177	4425	53.0	11.4	3691.7	808.3	97	443	3.87	0.85
	B	61	153	3825								
	C	40	113	2825								
50	A	42	114	2850	33.7	7.2	2383.3	416.3	62	286	3.02	0.73
	B	29	82	2050								
	C	30	90	2250								
51	A	72	306	7650	61.7	22.4	6158.3	3095.0	119	739	3.78	0.79
	B	77	329	8225								
	C	36	104	2600								
52	A	59	144	3600	53.3	6.0	3625.0	662.9	99	435	3.79	0.83
	B	47	119	2975								
	C	54	172	4300								
53	A	84	352	8800	64.3	24.4	6125.0	4021.7	123	735	4.06	0.84
	B	72	323	8075								
	C	37	60	1500								
54	A	27	61	1525	27.3	0.6	1425.0	114.6	55	171	3.41	0.85
	B	27	52	1300								
	C	28	58	1450								
55	A	75	370	9250	61.3	11.8	5600.0	3161.1	112	672	3.87	0.82
	B	54	152	3800								
	C	55	150	3750								
56	A	22	51	1275	29.0	6.2	1941.7	869.4	56	233	3.43	0.85
	B	31	65	1625								
	C	34	117	2925								
57	A	65	280	7000	48.3	15.0	3783.3	2878.5	89	454	3.75	0.84
	B	44	116	2900								
	C	36	58	1450								
58	A	51	137	3425	42.0	8.5	2475.0	832.2	91	297	3.89	0.86
	B	41	85	2125								
	C	34	75	1875								
59	A	35	113	2825	44.3	19.7	4441.7	3584.7	84	533	3.55	0.80
	B	31	78	1950								
	C	67	342	8550								
60	A	46	143	3575	32.7	11.6	2191.7	1204.5	69	263	3.28	0.77
	B	27	55	1375								
	C	25	65	1625								

Table 6 continued:

Station	Rep	No. of Taxa	No. of Individuals	Density (no/m ²)	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
61	A	40	119	2975	33.0	6.2	2483.3	873.3	63	298	3.28	0.79
	B	31	120	3000								
	C	28	59	1475								
62	A	49	140	3500	53.7	12.7	4241.7	2303.8	106	509	3.88	0.83
	B	44	96	2400								
	C	68	273	6825								
63	A	42	104	2600	50.7	15.9	3691.7	1479.1	97	443	3.78	0.83
	B	69	215	5375								
	C	41	124	3100								
64	A	65	192	4800	63.3	5.7	6166.7	1930.4	114	740	3.81	0.80
	B	68	335	8375								
	C	57	213	5325								

Figure 1. Sediment texture and Total Organic Carbon (TOC) data for the Gray's Reef stations, 2005.

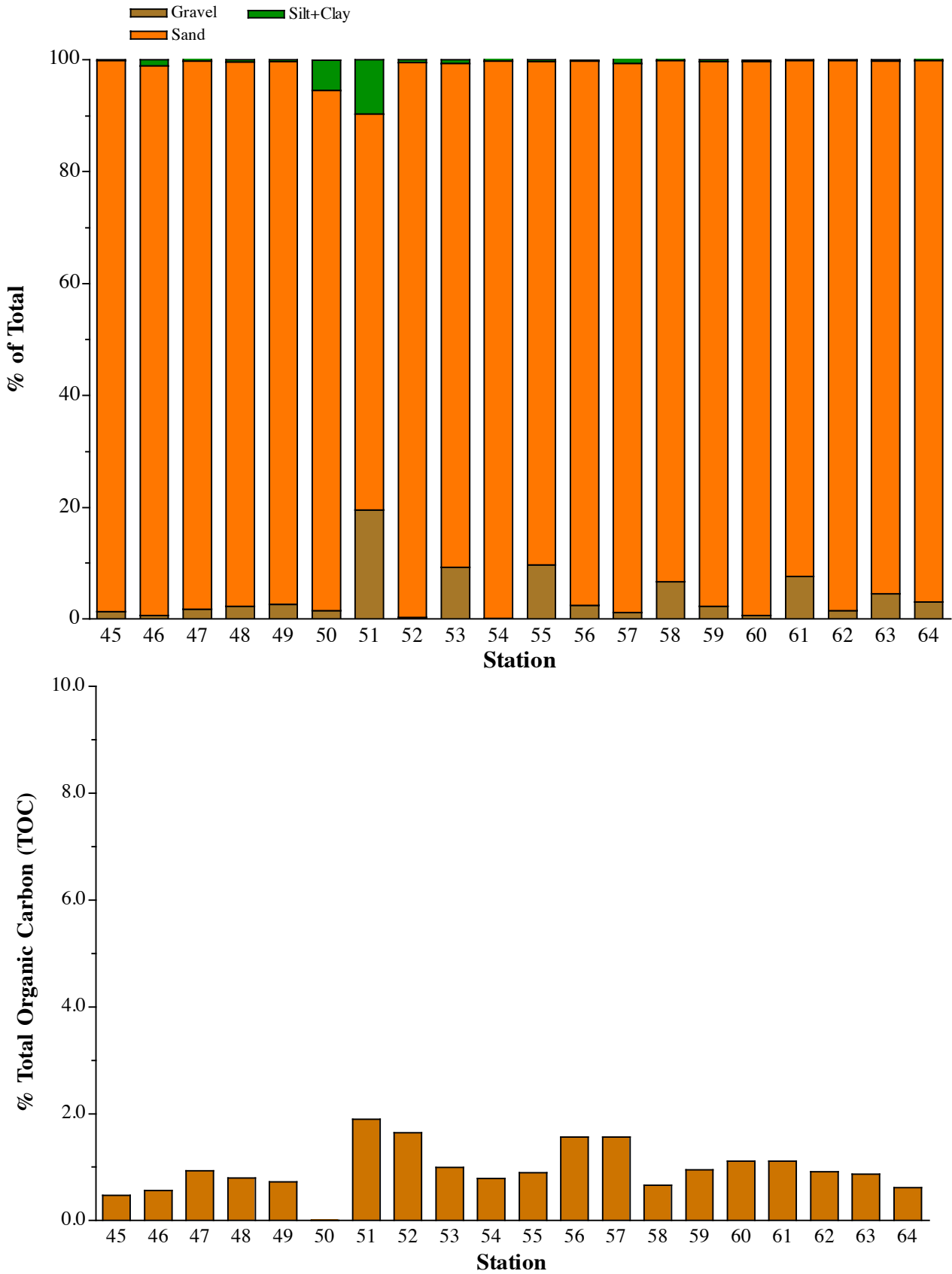


Figure 2. Percent abundance of major taxonomic groups for the Gray's Reef stations, 2005.

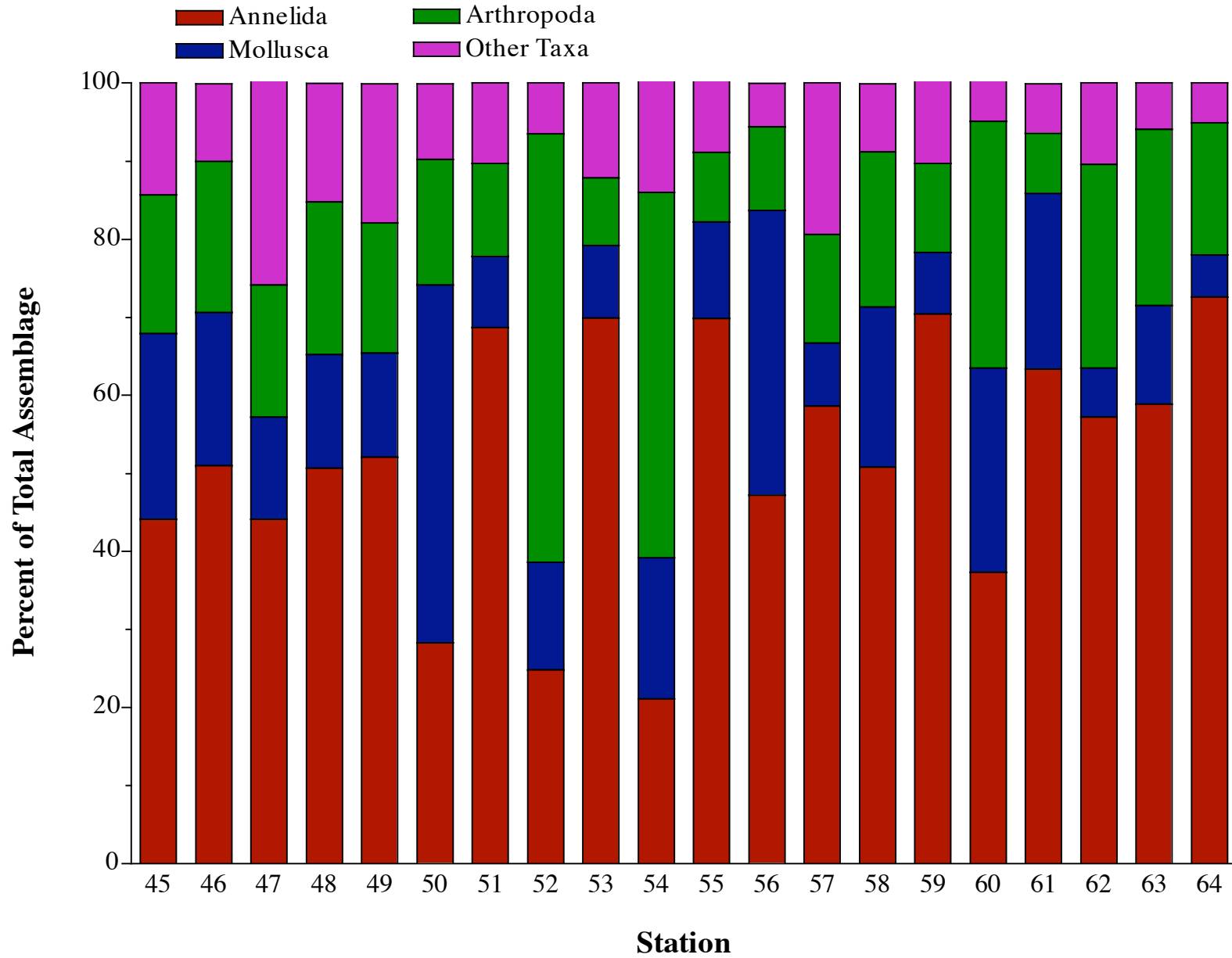


Figure 3. Taxa richness data for the Gray's Reef stations, 2005.

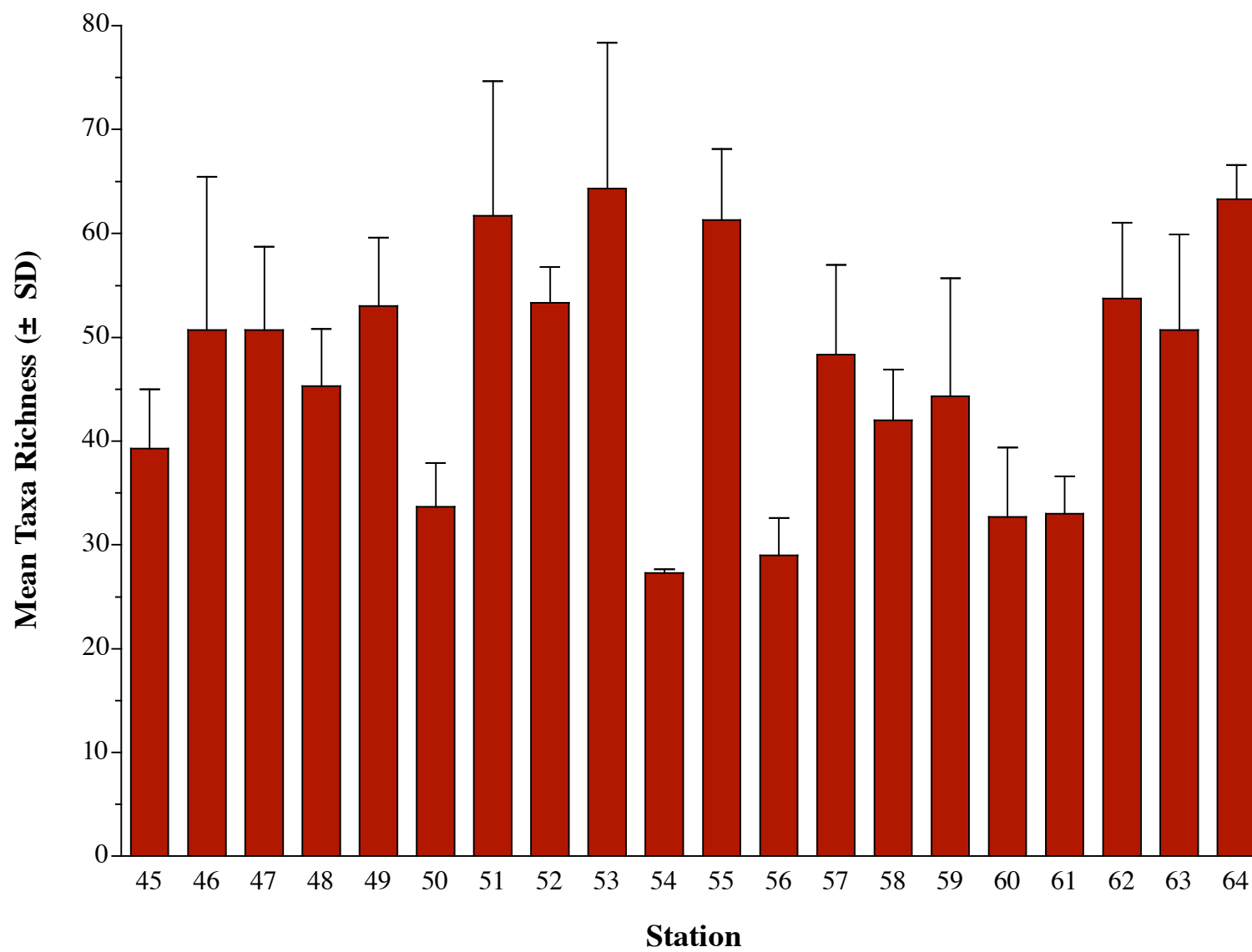


Figure 4. Mean macroinvertebrate densities for the Gray's Reef stations, 2005.

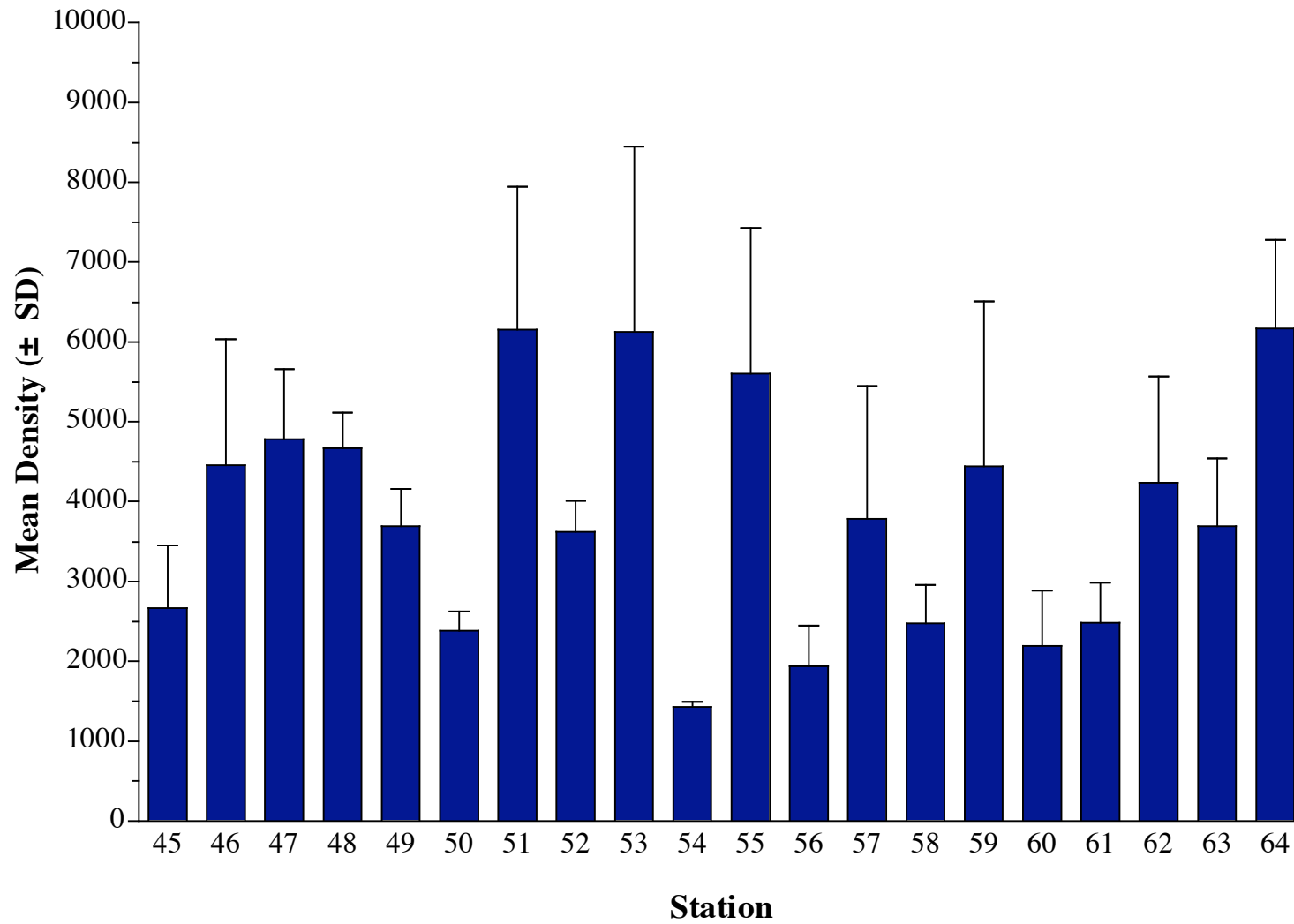
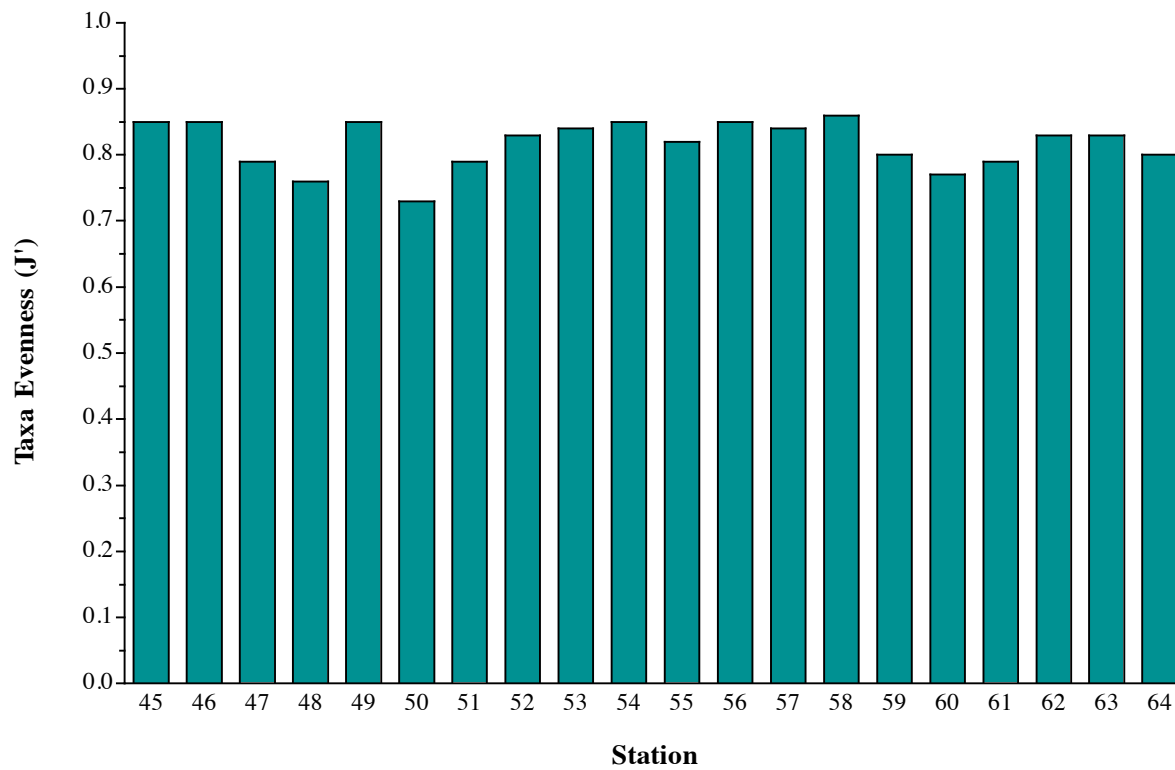
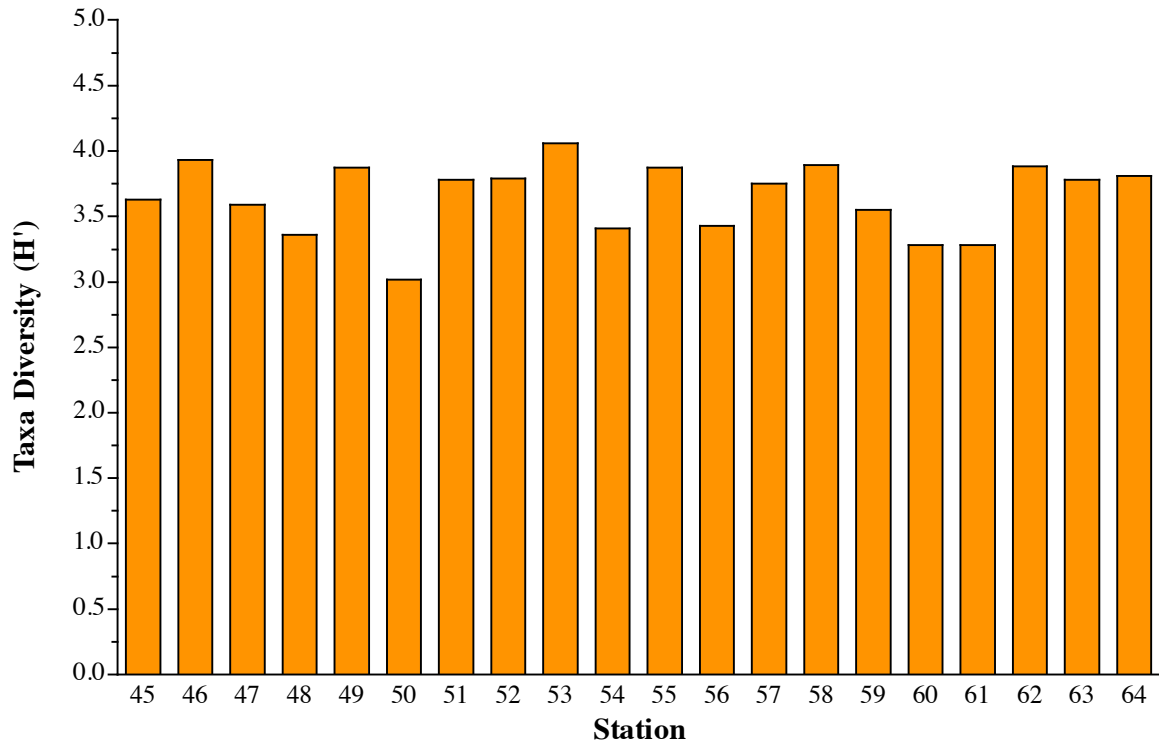


Figure 5. Taxa diversity (H') and evenness (J') for the Gray's Reef stations, 2005.



APPENDICES

QUALITY ASSURANCE STATEMENT

Client/Project: NOAA

Work Assignment Title: Gray's Reef

Task Number: 005

Description of Data Set or Deliverable: 60 Benthic macroinvertebrate samples collected in 2005; 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 and printed. This list was checked for accuracy against original taxonomic data sheets.

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

Signature of QA Officer or Reviewer

Date

Signature of Project Manager

Date

QUALITY CONTROL REWORKS

Client/Project: NOAA Gray's Reef 2005
Task Number: 5

Sorting Results:	Sample #	% Accuracy
	GR05-054-3	100%
	GR05-059-1	100%
	GR05-064-1	100%
	GR05-052-3	100%
	GR05-054-2	100%
	GR05-058-3	100%
	GR05-061-1	100%
	GR05-059-2	100%

Taxonomy Results:	Sample #	Taxa	% Accuracy
	GR052-059-1	Crust./Moll.	100%
	GR025-045-3	Crust./Moll.	96%
	GR05-055-1	Crust./Moll.	98%
	GR05-061-3	Crust./Moll.	100%
	GR05-053-1	Crust./Moll.	98%
	GR05-046-3	Crust./Moll.	95%
	GR05-046-3	Annelida	98%
	GR05-049-3	Annelida	98%
	GR05-062-2	Annelida	100%
	GR05-049-2	Annelida	98%
	GR05-047-1	Annelida	100%
	GR05-055-2	Annelida	97%

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

Signature of QA Officer or Reviewer

Date