EPA United States Environmental Protection Agency

FERNANDINA BEACH, FLORIDA ODMDS 2005 BENTHIC COMMUNITY ASSESSMENT

Submitted to

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1.0 INTRODUCTION

The Fernandina Beach, Florida Ocean Dredged Material Disposal Site (ODMDS) was investigated by the U.S. Environmental Protection Agency (EPA) during 2005 as part of a monitoring study of dredged material disposal at the site. One aspect of this evaluation was benthic community characterization, which was accomplished via sample collection by EPA personnel and laboratory and data analysis by Barry A. Vittor & Associates, Inc. (BVA).

The Fernandina Beach ODMDS is located approximately 7 nautical miles east of Fernandina Beach, FL and 8.5 nautical miles northeast of the St. Johns River entrance channel. Six benthic monitoring stations were located within the disposal area and six stations were located just outside this area (Table 1, Figure 1).

2.0 METHODS

2.1 Sample Collection And Handling

A modified-Young grab (area = 0.04 m^2) was used to collect bottom samples at each of twelve stations (Figure 1). Six stations were located within the ODMDS and six were positioned outside the ODMDS. 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. Samples were also collected at each station for sediment texture analysis.

2.2 Macroinfaunal Sample Analysis

In BVA's laboratory, 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.* Oligochaeta, Mollusca, Arthropoda). Oligochaetes were individually mounted and cleared on microscope slides prior to identification. 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.

Each sample was analyzed for wet-weight biomass (g/m^2) for the major taxonomic groups identified. After identification, each taxonomic group was kept in separate vials and preserved in 70% isopropyl alcohol. A biomass technician removed the organisms from a vial, placed them on a filter paper pad, gently blotted them with a paper towel to remove moisture, placed them in a tared weighing pan, and weighed the pan to the nearest 0.1 mg using a Mettler Model AG-104 balance.

3.0 DATA ANALYSIS METHODS

3.1 Assemblage Analyses

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. Documentation of BVA's standard QA/QC procedures and results for this project are available upon request.

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 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:

$$H' = -\sum_{i=1}^{s} pi(ln\ pi)$$

where, S = the number of taxa in the sample,

i = the i'th taxa in the sample, and

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

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'/lnS, 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. An additional measure of richness, Margalef's D, was calculated as (s-1)/ln(n), where s = number of taxa and n = total number of individuals (Pielou 1966).

Univariate comparisons (ANOVA) of biomass, taxa richness and density were made assuming that each station within and outside the ODMDS were replicates.

3.2 Cluster, ANOSIM and SIMPER Analyses

Cluster analysis was performed on the benthic macroinvertebrate data by calculating the Bray-Curtis similarity coefficient for all pairs of sampling stations, after having transformed (e.g.

square root, $\ln_e$) the original taxa abundances (Clarke and Gorley 2003). Clusters were formed using the group-average linkage method between similarities. A non-parametric multi-dimensional scaling (MDS) was then performed on the similarity matrix generated by the cluster analysis. MDS represents sample stations in 2-dimensional space such that the relative distances apart of all points were in the same rank order as the relative dissimilarities of the samples as calculated by the Bray-Curtis coefficients. Points close together in an MDS plot represents sample stations that were very similar in taxa composition and points that were far apart represent very different assemblages (Clarke and Gorley 2003).

The ANOSIM (Analysis of Similarities) test was calculated to assess assemblage differences between samples within and outside the ODMDS using the Bray-Curtis similarity matrix. Subsequently, the SIMPER test was used to identify which taxa accounted for any observed differences between assemblage groups. The ANOSIM and SIMPER tests were calculated using PRIMER (Clarke and Gorley 2003).

4.0 HABITAT CHARACTERISTICS

Sediment data for the 12 stations are given in Table 2 and Figure 2. Bottom sediments at stations outside the ODMDS averaged > 98% sand. Sediments inside the ODMDS at Stations F04, F08 and F09 averaged > 97% sand, while Stations F05, F06 and F10 had significant gravel fractions (20%, 18% and 39%, respectively). In a 1989 benthic survey of the ODMDS, the outer five stations surveyed averaged >93% sand, while three stations inside the ODMDS had >75% sand and two other stations inside the ODMDS had significant gravel fractions (>21%) (Table 2).

5.0 BENTHIC COMMUNITY CHARACTERIZATION

5.1 Faunal Composition, Abundance, And Community Structure

A total of 2251 organisms, representing 255 taxa, were identified from the 12 stations (Table 3). Polychaetes were the most numerous organisms present representing 58.9% of the total assemblage, followed in abundance by bivalves (13.3%), malacostracans (10.2%) and gastropods (6.0%). Polychaetes represented 45.1% of the total number of taxa followed by malacostracans (23.5%), bivalves (11.4%) and gastropods (9.0%) (Table 3). The percent abundance of major taxa at each station is given in Table 4 and Figure 3. Station F01 outside the ODMDS was dominated by annelids (polychaetes), while the remaining stations outside the ODMDS were dominated by a mixed annelid/mollusk assemblage. Three stations within the ODMDS (F04, F05, F10) were dominated by annelids (polychaetes). Station F06 was dominated by a mixed annelid/mollusk assemblage and Station F09 by a mixed annelid/malacostracan assemblage (Table 4, Figure 3).

Wet-weight biomass data for the major taxonomic groups is summarized for each station are given in Table 5 and Figure 4. Biomass at Stations F01, F02, F03, F11 and F12 outside the ODMDS had a wet-weight biomass <0.5 g/m^2, while Station F07 had a weight-biomass of 2.1544 g/m^2 due to the abundance of arthropods (Table 5). Biomass at Stations F04, F08 and F09 inside the ODMDS had wet-weight biomass < 0.1 g/m^2. Biomass at Stations F05 and F06 was dominated by mollusks, while biomass at Station F10 was dominated by both annelids and mollusks (Figure 4). The average biomass inside the ODMDS was 0.9566 (SD = 0.9194) and 0.5564 (SD = 0.5873) outside the ODMDS. There was no significant difference, however, in biomass between stations inside and outside the ODMDS ($F = 5.32$, $P = 0.44$, $df = 1, 8$).

The dominant taxon collected from the 12 Fernandina ODMDS stations was the polychaete, *Bhawania heteroseta*, representing 5.2% of the total number of individuals (Table 6). Other dominant taxa collected included the polychaete Family, Maldanidae (LPIL) and the polychaetes, *Prionospio cristata*, *Mediomastus* (LPIL) and *Polygordius* (LPIL) representing 4.9%, 4.6%, 3.9% and 3.1% of the total assemblage, respectively (Table 6). The chordate, *Branchiostoma* (LPIL) was the most widely distributed taxon being found at 67% of the stations (Table 6). Those taxa representing more than 5% of the assemblage at each station are given in Table 7. In general the stations outside the ODMDS were dominated by a mixed assemblage of polychaetes, bivalves and gastropods, while the assemblages within the ODMDS were dominated by various polychaete taxa (Table 7).

Taxa richness data for the 12 ODMDS stations are given in Table 8 and Figure 5. Taxa richness ranged from 20 taxa/station at Station F03 to 50 taxa/station at Station F01 outside the ODMDS and from 20 at Station F08 to 88 at Station F05 inside the ODMDS. Taxa richness averaged 34.0 taxa/station outside the ODMDS and 54.0 taxa/station inside the ODMDS. There was no significant difference in taxa richness between stations inside and outside the ODMDS ($F = 4.965$, $P = 0.196$, $df = 1, 10$).

Density data for the 12 ODMDS stations are given in Table 8 and Figure 6. Densities ranged from 625 organisms/m^2 at Station F07 to 3800 organisms/m^2 at Station F01 outside the ODMDS and from 1025 organisms/m^2 at Station F08 to 17875 organisms/m^2 at Station F10 inside the ODMDS. Densities averaged 2025.0 organisms/m^2 outside the ODMDS and 7354.2 organisms/m^2 inside the ODMDS. There was no significant difference in density between stations inside and outside the ODMDS ($F = 4.965$, $P = 0.113$, $df = 1, 10$).

Taxa diversity and evenness for the ODMDS stations are given in Table 8 and Figures 7 and 8. Taxa diversity (H') showed a similar range of variation outside and within the ODMDS and averaged 3.09 and 3.24, respectively (Table 8). Taxa evenness (J') also exhibited a similar range of variation outside and within the ODMDS and averaged 0.90 and 0.86, respectively. The community indices showed considerable uniformity between stations. There was no predictable pattern in community indices between stations within and outside the disposal area (Figures 7 and 8).

5.2 Cluster, ANOSIM and SIMPER Analyses

Cluster analysis of the 12 ODMDS stations is given in Figure 9. There were two main clusters of stations; the first cluster included all of the stations outside the ODMDS except for Station F11 and Stations F04 and F08 from within the ODMDS; the second cluster included Stations F05, F06 and F10 from within the ODMDS and Station F09 and F11 from outside the ODMDS. Stations F05, F06 and F10 clustered together and the assemblages probably reflected the fact that the sediment at these stations was distinct from that found at the other stations (gravelly sand and sandy gravel vs sand). The results of the MDS analysis are given in Figure 10. The groupings in the MDS reflect the major groupings found in the cluster analysis. Stations F05, F06 and F10 again were in a tight grouping reflecting similar biological assemblages; Station F09, F11 and F07 were outliers, while the remaining stations had similar assemblages (Figure 10).

The results of the ANOSIM reflect the general similarity in assemblages between stations within and outside the ODMDS: Global R = 0.109, significance of R = 18.2% - these data indicate that the null hypothesis that the assemblages within and outside the ODMDS are similar

should be accepted. The results of the SIMPER analysis which list those taxa contributing to the dissimilarity between stations within and outside the ODMDS are given in Appendix I.

6.0 2005 vs. 1989 COMPARISONS

Biological data collected from the disposal site in 2005 can be compared to data collected from the same site in 1989 (Barry A. Vittor & Associates, Inc. 1990). Sediment texture data from 1989 and 2005 are summarized in Table 2 and Figure 11. Sediment composition at the 5 stations sampled outside the ODMDS in 1989 was variable: sand was found at Stations F6 and F12, silty sand at Station F1 and slightly gravelly sand at Stations F2 and F11. Sediment composition at the 6 stations outside the ODMDS sampled in 2005 was > 97% sand. Sediment at stations within the ODMDS in 1989 was also variable with sand at one station, slightly gravelly sand at two stations and gravelly sand at two stations. In 2005, three stations had sandy sediments (F04, F08, F09), two had gravelly sand sediments (F05 and F06) and one had sandy gravel sediments (F10).

One biologically significant difference between the 1989 and 2005 events was in the total number of samples taken. In 1989, fifteen replicates were taken (using a 0.0079 m^2 diver core) at each of the ten stations for a total of 147 samples (3 samples were lost during processing) compared to a single sample taken with a modified Young grab (0.04 m^2) at each of the 12 stations in 2005 for a total of 12 samples. The discrepancy in the number of samples taken has a potentially biologically significant effect on the number of taxa collected as well as the overall abundance of the taxa.

In 1989, 15823 individuals representing 423 taxa were collected from 147 samples collected at the 10 stations. Annelids (polychaetes) were the dominant taxa collected representing 46% of the individuals and 40% of the taxa collected. Dominant polychaetes

included the Family Serpulidae, *Exogone dispar*, *Parapionosyllis longicirrata*, *Bhawania heteroseta* and *Polygordius* (LPIL). Arthropods represented 7% of individuals and 29% of taxa collected. Dominant arthropods included the ostracod, *Reticulocythereis* sp. A and *Acetes* sp. A and *Glyptoplax* (LPIL). Mollusks represented 42% of the individuals and 25% of the taxa. Dominant mollusks included *Crassinella lunulata* and *Gouldia cerina*. The dominant annelid and mollusk taxa collected in 2005 were similar to those collected in 1989 (Table 6). The arthropod dominants between 1989 and 2005 were different, probably due to chance (147 samples were analyzed in 1989, but only 12 in 2005) and the low abundances of this group in both years.

In 1989, stations inside the ODMDS had significantly higher taxa richness and density than stations outside the ODMDS (Table 9, Barry A. Vittor & Associates, Inc. 1990). Taxa richness inside the ODMDS averaged 29.5 taxa/station and 19.6 taxa/station outside the ODMDS, while densities averaged 19152.2 organisms/m^2 inside and 7746.0 organisms/m^2 outside the ODMDS (Table 9). In 2005 taxa richness was higher both inside (54.0 vs. 29.5) and outside (34.0 vs. 19.6) the ODMDS than in 1989. In 1989 densities were higher both within (19152.2 vs. 7354.2) and outside (7746.0 vs. 2025.0) the ODMDS than in 2005. However, comparisons of taxa richness and density between 1989 and 2005 are problematic due to differences in sampling methodologies.

8.0 LITERATURE CITED

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Clarke, K.R. and R.N. Gorley. 2003. PRIMER 5 (Plymouth Routines in Multivariate Ecological Research). Plymouth Marine Laboratory, Plymouth, United Kingdom.

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Table 1. Location of the Fernandina Beach, Florida ODMDS sampling stations, 2005

Station	Latitude (N) Degrees, minutes	Longitude (W) Degrees, minutes
Outside the ODMDS		
F01	30° 34.00'	81° 18.00'
F02	30° 33.29'	81° 18.89'
F03	30° 33.28'	81° 16.58'
F07	30° 32.00'	81° 19.70'
F11	30° 30.26'	81° 16.60'
F12	30° 30.00'	81° 18.00'
Inside the ODMDS		
F04	30° 32.75'	81° 18.85'
F05	30° 32.75'	81° 17.15'
F06	30° 32.59'	81° 18.03'
F08	30° 32.00'	81° 18.85'
F09	30° 32.00'	81° 18.00'
F10	30° 31.36'	81° 17.78'

Table 2. Sediment data for the USEPA Fernandina ODMDS stations, 1989 and 2005.

Station	%Gravel	%Sand	%Silt+Clay	Textural Description	Inman's Statistics: Median phi	Inman's Statistics: Sorting Coeff
Outside the ODMDS						
F01	0	98.85	1.15	sand	2.067	0.995
F02	0	98.94	1.06	sand	2.517	0.874
F03	0	99.79	0.21	sand	2.451	0.516
F07	0.72	98.55	0.72	sand	2.490	0.439
F11	1.00	98.71	0.29	sand	1.038	0.88
F12	0	97.49	2.51	sand	3.226	0.688
	0.29	98.72	0.99			
Inside the ODMDS						
F04	2.13	97.53	0.33	sand	2.183	0.815
F05	20.03	76.33	3.64	gravelly sand	0.722	1.743
F06	18.09	80.81	1.11	gravelly sand	1.015	1.987
F08	0.15	99.19	0.66	sand	2.591	0.572
F09	1.10	98.70	0.20	sand	2.181	0.845
F10	39.35	55.39	5.26	sandy gravel	*	*
	13.48	84.66	1.87			

*Cannot calculate due to the high percentage of gravel

1989 Data

Station	%Gravel	%Sand	%Silt+Clay	Textural Description
Outside ODMDS				
1	2.3	89.54	8.32	silty sand
2	3.82	93.52	1.84	slightly gravelly sand
6	1.12	95.64	2.52	sand
11	2.66	95.75	1.04	slightly gravelly sand
12	0.48	94.38	3.71	sand
	2.08	93.77	3.49	
Inside ODMDS				
5	5.13	91.63	2.55	slightly gravelly sand
7	0.94	97.4	1.19	sand
8	21.76	75.58	1.83	gravelly sand
9	32.16	63.8	2.21	gravelly sand
10	2.12	93.81	3.35	slightly gravelly sand
	12.42	84.44	2.23	

Table 3. Summary of overall abundance of major benthic macroinfaunal taxonomic groups for the Fernandina ODMDS stations, 2005.

Taxa	Total No. Taxa	% Total	Total No. Individuals	% Total
Annelida				
Oligochaeta	2	0.8	65	2.9
Polychaeta	115	45.1	1,326	58.9
Mollusca				
Bivalvia	29	11.4	299	13.3
Gastropoda	23	9.0	136	6.0
Polyplacophora	1	0.4	2	0.1
Scaphopoda	2	0.8	4	0.2
Arthropoda				
Malacostraca	60	23.5	230	10.2
Ostracoda	5	2.0	8	0.4
Echinodermata				
Asteroidea	1	0.4	1	0.0
Holothuroidea	1	0.4	1	0.0
Ophiuroidea	2	0.8	56	2.5
Other Taxa	14	5.5	123	5.5
Total	**255**		**2,251**	

Table 4. Summary of abundance of major benthic macroinfaunal taxonomic groups by station for the Fernandina ODMDS stations, 2005.

Station	Taxa	Total No. Taxa	% Total	Total No. Individuals	% Total
F01	Annelida	33	66.0	110	72.4
	Mollusca	2	4.0	10	6.6
	Arthropoda	8	16.0	8	5.3
	Echinodermata	1	2.0	17	11.2
	Other Taxa	6	12.0	7	4.6
	Total	**50**		**152**	**100.0**
F02	Annelida	14	43.8	27	45.0
	Mollusca	8	25.0	14	23.3
	Arthropoda	4	12.5	6	10.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	6	18.8	13	21.7
	Total	**32**		**60**	**100.0**
F03	Annelida	6	30.0	12	25.5
	Mollusca	9	45.0	28	59.6
	Arthropoda	2	10.0	3	6.4
	Echinodermata	1	5.0	2	4.3
	Other Taxa	2	10.0	2	4.3
	Total	**20**		**47**	**100.0**
F07	Annelida	10	47.6	10	40.0
	Mollusca	3	14.3	5	20.0
	Arthropoda	5	23.8	7	28.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	14.3	3	12.0
	Total	**21**		**25**	**100.0**
F11	Annelida	21	46.7	37	33.0
	Mollusca	12	26.7	32	28.6
	Arthropoda	7	15.6	11	9.8
	Echinodermata	1	2.2	5	4.5
	Other Taxa	4	8.9	27	24.1
	Total	**45**		**112**	**100.0**
F12	Annelida	12	33.3	34	37.8
	Mollusca	14	38.9	38	42.2
	Arthropoda	5	13.9	7	7.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	5	13.9	11	12.2
	Total	**36**		**90**	**100.0**

Table 4 continued:

Station	Taxa	Total No. Taxa	% Total	Total No. Individuals	% Total
F04	Annelida	18	66.7	41	77.4
	Mollusca	3	11.1	3	5.7
	Arthropoda	4	14.8	4	7.5
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	7.4	5	9.4
	Total	**27**		**53**	**100.0**
F05	Annelida	51	58.0	236	70.0
	Mollusca	17	19.3	52	15.4
	Arthropoda	11	12.5	24	7.1
	Echinodermata	4	4.5	10	3.0
	Other Taxa	5	5.7	15	4.5
	Total	**88**		**337**	**100.0**
F06	Annelida	44	50.6	262	45.7
	Mollusca	14	16.1	179	31.2
	Arthropoda	24	27.6	109	19.0
	Echinodermata	2	2.3	14	2.4
	Other Taxa	3	3.4	9	1.6
	Total	**87**		**573**	**100.0**
F08	Annelida	9	45.0	27	65.9
	Mollusca	4	20.0	7	17.1
	Arthropoda	4	20.0	4	9.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	15.0	3	7.3
	Total	**20**		**41**	**100.0**
F09	Annelida	13	52.0	21	45.7
	Mollusca	2	8.0	2	4.3
	Arthropoda	8	32.0	17	37.0
	Echinodermata	1	4.0	5	10.9
	Other Taxa	1	4.0	1	2.2
	Total	**25**		**46**	**100.0**
F10	Annelida	42	54.5	574	80.3
	Mollusca	13	16.9	71	9.9
	Arthropoda	14	18.2	38	5.3
	Echinodermata	1	1.3	5	0.7
	Other Taxa	7	9.1	27	3.8
	Total	**77**		**715**	**100.0**

Table 5. Weight-weight biomass of major benthic macroinfaunal groups by station for the Fernandina ODMDS stations, 2005.

Station	Taxa Group	Biomass (gm/m²)	Station	Taxa Group	Biomass (gm/m²)
F01	**Annelida**	0.3906	F04	**Annelida**	0.1115
	Mollusca	0.0036		**Mollusca**	0.0027
	Arthropoda	0.0059		**Arthropoda**	0.0409
	Echinodermata	0.0018		**Echinodermata**	0.0000
	Other Taxa	0.0132		**Other Taxa**	0.0018
	Total	0.4151		**Total**	0.1569
F02	**Annelida**	0.0524	F05	**Annelida**	0.1944
	Mollusca	0.1133		**Mollusca**	0.6008
	Arthropoda	0.0121		**Arthropoda**	0.0198
	Echinodermata	0.0000		**Echinodermata**	0.0305
	Other Taxa	0.0201		**Other Taxa**	0.0968
	Total	0.1979		**Total**	0.9423
F03	**Annelida**	0.0049	F06	**Annelida**	0.2361
	Mollusca	0.0400		**Mollusca**	1.1612
	Arthropoda	0.0001		**Arthropoda**	0.1493
	Echinodermata	0.0001		**Echinodermata**	0.0405
	Other Taxa	0.0014		**Other Taxa**	0.0026
	Total	0.0465		**Total**	1.5897
F07	**Annelida**	0.0132	F08	**Annelida**	0.0226
	Mollusca	0.0042		**Mollusca**	0.0033
	Arthropoda	2.1344		**Arthropoda**	0.0022
	Echinodermata	0.0000		**Echinodermata**	0.0000
	Other Taxa	0.0026		**Other Taxa**	0.0080
	Total	2.1544		**Total**	0.0361
F11	**Annelida**	0.1003	F09	**Annelida**	0.0506
	Mollusca	0.0211		**Mollusca**	0.0058
	Arthropoda	0.0376		**Arthropoda**	0.0311
	Echinodermata	0.0036		**Echinodermata**	0.0060
	Other Taxa	0.0238		**Other Taxa**	0.0001
	Total	0.1864		**Total**	0.0936
F12	**Annelida**	0.0313	F10	**Annelida**	0.8488
	Mollusca	0.0342		**Mollusca**	0.4472
	Arthropoda	0.0011		**Arthropoda**	0.1416
	Echinodermata	0.0000		**Echinodermata**	0.0416
	Other Taxa	0.3261		**Other Taxa**	0.0726
	Total	0.3927		**Total**	1.5518

Table 6. Distribution and abundance and of benthic macroinfaunal taxa for the Fernandina ODMDS stations, 2005.

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
Bhawania heteroseta	Ann	Poly	117	5.20	5.20	3	25
Maldanidae (LPIL)	Ann	Poly	111	4.93	10.13	4	33
Prionospio cristata	Ann	Poly	103	4.58	14.70	3	25
Mediomastus (LPIL)	Ann	Poly	87	3.86	18.57	6	50
Polygordius (LPIL)	Ann	Poly	69	3.07	21.63	7	58
Prionospio (LPIL)	Ann	Poly	66	2.93	24.57	6	50
Anadara transversa	Mol	Biva	65	2.89	27.45	3	25
Armandia maculata	Ann	Poly	65	2.89	30.34	7	58
Magelona sp. H	Ann	Poly	56	2.49	32.83	3	25
Crassinella lunulata	Mol	Biva	55	2.44	35.27	5	42
Odostomia (LPIL)	Mol	Gast	51	2.27	37.54	1	8
Ophiuroidea (LPIL)	Ech	Ophi	51	2.27	39.80	7	58
Gouldia cerina	Mol	Biva	46	2.04	41.85	4	33
Goniadides carolinae	Ann	Poly	39	1.73	43.58	3	25
Tubificidae (LPIL)	Ann	Olig	38	1.69	45.27	5	42
Nereididae (LPIL)	Ann	Poly	37	1.64	46.91	7	58
Branchiostoma (LPIL)	Cho	Lept	31	1.38	48.29	8	67
Globosolembos smithi	Art	Mala	31	1.38	49.67	1	8
Tellina (LPIL)	Mol	Biva	29	1.29	50.96	5	42
Apoprionospio pygmaea	Ann	Poly	27	1.20	52.15	6	50
Enchytraeidae (LPIL)	Ann	Olig	27	1.20	53.35	3	25
Capitellidae (LPIL)	Ann	Poly	26	1.16	54.51	7	58
Exogone lourei	Ann	Poly	26	1.16	55.66	4	33
Parapionosyllis longicirrata	Ann	Poly	26	1.16	56.82	3	25
Paraprionospio pinnata	Ann	Poly	26	1.16	57.97	5	42
Rhynchocoela (LPIL)	Rhy	-	25	1.11	59.08	7	58
Cirratulidae (LPIL)	Ann	Poly	23	1.02	60.11	6	50
Acteocina bidentata	Mol	Gast	22	0.98	61.08	6	50
Pleuromeris tridentata	Mol	Biva	20	0.89	61.97	2	17
Aricidea (LPIL)	Ann	Poly	19	0.84	62.82	5	42
Bivalvia (LPIL)	Mol	Biva	19	0.84	63.66	5	42
Lumbrineris latreilli	Ann	Poly	18	0.80	64.46	3	25
Autolytus (LPIL)	Ann	Poly	16	0.71	65.17	2	17
Dulichiella sp. A	Art	Mala	16	0.71	65.88	2	17
Laonice cirrata	Ann	Poly	16	0.71	66.59	3	25
Neomegamphopus (LPIL)	Art	Mala	16	0.71	67.30	4	33
Phyllodocidae (LPIL)	Ann	Poly	15	0.67	67.97	5	42
Turbellaria (LPIL)	Pla	Turb	14	0.62	68.59	3	25
Ampharetidae (LPIL)	Ann	Poly	13	0.58	69.17	3	25
Aspidosiphon gosnoldi	Sip	-	13	0.58	69.75	4	33
Hesionidae (LPIL)	Ann	Poly	13	0.58	70.32	3	25
Caecum johnsoni	Mol	Gast	12	0.53	70.86	4	33
Liljeborgia sp. A	Art	Mala	12	0.53	71.39	4	33
Mooreonuphis pallidula	Ann	Poly	12	0.53	71.92	5	42
Magelona pettiboneae	Ann	Poly	11	0.49	72.41	3	25
Owenia fusiformis	Ann	Poly	11	0.49	72.90	5	42
Caecum pulchellum	Mol	Gast	10	0.44	73.35	4	33
Chone (LPIL)	Ann	Poly	10	0.44	73.79	2	17
Nephtys picta	Ann	Poly	10	0.44	74.23	5	42
Protohadzia schoenerae	Art	Mala	10	0.44	74.68	1	8
Aoridae (LPIL)	Art	Mala	9	0.40	75.08	1	8
Goneplacidae (LPIL)	Art	Mala	9	0.40	75.48	2	17

Table 6 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
Goniada littorea	Ann	Poly	9	0.40	75.88	5	42
Schistomeringos pectinata	Ann	Poly	9	0.40	76.28	2	17
Acteocina candei	Mol	Gast	8	0.36	76.63	4	33
Apanthura cracenta	Art	Mala	8	0.36	76.99	1	8
Arabella mutans	Ann	Poly	8	0.36	77.34	1	8
Dentatisyllis carolinae	Ann	Poly	8	0.36	77.70	1	8
Ervilia concentrica	Mol	Biva	8	0.36	78.05	3	25
Lumbrineridae (LPIL)	Ann	Poly	8	0.36	78.41	4	33
Polycirrus eximius	Ann	Poly	8	0.36	78.76	3	25
Syllis gracilis	Ann	Poly	8	0.36	79.12	1	8
Tharyx acutus	Ann	Poly	8	0.36	79.48	1	8
Aspidosiphon albus	Sip	-	7	0.31	79.79	5	42
Lineidae (LPIL)	Rhy	Anop	7	0.31	80.10	4	33
Phyllodoce (LPIL)	Ann	Poly	7	0.31	80.41	3	25
Xanthidae (LPIL)	Art	Mala	7	0.31	80.72	2	17
Aglaophamus verrilli	Ann	Poly	6	0.27	80.99	2	17
Dipolydora socialis	Ann	Poly	6	0.27	81.25	4	33
Glycera americana	Ann	Poly	6	0.27	81.52	3	25
Lucina multilineata	Mol	Biva	6	0.27	81.79	2	17
Magelona papillicornis	Ann	Poly	6	0.27	82.05	4	33
Photis (LPIL)	Art	Mala	6	0.27	82.32	3	25
Spiophanes missionensis	Ann	Poly	6	0.27	82.59	4	33
Tellinidae (LPIL)	Mol	Biva	6	0.27	82.85	1	8
Amphiuridae (LPIL)	Ech	Ophi	5	0.22	83.07	2	17
Bemlos brunneomaculatus	Art	Mala	5	0.22	83.30	2	17
Diplodonta (LPIL)	Mol	Biva	5	0.22	83.52	3	25
Ehlersia ferrugina	Ann	Poly	5	0.22	83.74	1	8
Eumida sanguinea	Ann	Poly	5	0.22	83.96	2	17
Eunicidae (LPIL)	Ann	Poly	5	0.22	84.18	2	17
Kupellonura sp. B	Art	Mala	5	0.22	84.41	3	25
Lumbrinerides acuta	Ann	Poly	5	0.22	84.63	2	17
Metharpinia floridana	Art	Mala	5	0.22	84.85	2	17
Paguridae (LPIL)	Art	Mala	5	0.22	85.07	2	17
Panoplax depressa	Art	Mala	5	0.22	85.30	1	8
Spionidae (LPIL)	Ann	Poly	5	0.22	85.52	2	17
Terebellidae (LPIL)	Ann	Poly	5	0.22	85.74	2	17
Tubulanus (LPIL)	Rhy	Anop	5	0.22	85.96	2	17
Americhelidium americanum	Art	Mala	4	0.18	86.14	4	33
Anodontia alba	Mol	Biva	4	0.18	86.32	1	8
Arabella multidentata	Ann	Poly	4	0.18	86.49	1	8
Cyclaspis varians	Art	Mala	4	0.18	86.67	2	17
Diopatra cuprea	Ann	Poly	4	0.18	86.85	2	17
Ensis directus	Mol	Biva	4	0.18	87.03	1	8
Eunice (LPIL)	Ann	Poly	4	0.18	87.21	1	8
Exogone atlantica	Ann	Poly	4	0.18	87.38	3	25
Glycera (LPIL)	Ann	Poly	4	0.18	87.56	3	25
Kurtziella rubella	Mol	Gast	4	0.18	87.74	2	17
Lepidonotus sp. A	Ann	Poly	4	0.18	87.92	2	17
Maera sp. D	Art	Mala	4	0.18	88.09	1	8
Melitidae (LPIL)	Art	Mala	4	0.18	88.27	2	17
Phascolion strombi	Sip	-	4	0.18	88.45	1	8
Phoronis (LPIL)	Pho	-	4	0.18	88.63	4	33
Pisione remota	Ann	Poly	4	0.18	88.80	1	8
Psammolyce arenosa	Ann	Poly	4	0.18	88.98	1	8

Table 6 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
Pythinella cuneata	Mol	Biva	4	0.18	89.16	1	8
Rildardanus laminosa	Art	Mala	4	0.18	89.34	1	8
Scoloplos rubra	Ann	Poly	4	0.18	89.52	3	25
Spiochaetopterus oculatus	Ann	Poly	4	0.18	89.69	3	25
Spiophanes bombyx	Ann	Poly	4	0.18	89.87	2	17
Aonides mayaguezensis	Ann	Poly	3	0.13	90.00	1	8
Aspidosiphon (LPIL)	Sip	-	3	0.13	90.14	2	17
Asteropterygion oculitristis	Art	Ostr	3	0.13	90.27	3	25
Calyptraea centralis	Mol	Gast	3	0.13	90.40	2	17
Cnidaria (LPIL)	Cni	-	3	0.13	90.54	2	17
Dentalium laqueatum	Mol	Scap	3	0.13	90.67	1	8
Diplodonta punctata	Mol	Biva	3	0.13	90.80	1	8
Glyceridae (LPIL)	Ann	Poly	3	0.13	90.94	3	25
Heterocrypta granulata	Art	Mala	3	0.13	91.07	2	17
Latreutes parvulus	Art	Mala	3	0.13	91.20	2	17
Maera (LPIL)	Art	Mala	3	0.13	91.34	1	8
Montacutidae (LPIL)	Mol	Biva	3	0.13	91.47	1	8
Mytilidae (LPIL)	Mol	Biva	3	0.13	91.60	2	17
Paleanotus sp. A	Ann	Poly	3	0.13	91.74	2	17
Sabellidae (LPIL)	Ann	Poly	3	0.13	91.87	2	17
Scoletoma (LPIL)	Ann	Poly	3	0.13	92.00	2	17
Sipuncula (LPIL)	Sip	-	3	0.13	92.14	3	25
Tectonatica pusilla	Mol	Gast	3	0.13	92.27	3	25
Turbonilla (LPIL)	Mol	Gast	3	0.13	92.40	1	8
Turridae (LPIL)	Mol	Gast	3	0.13	92.54	2	17
Albunea paretii	Art	Mala	2	0.09	92.63	1	8
Amakusanthura magnifica	Art	Mala	2	0.09	92.71	2	17
Ampelisca vadorum	Art	Mala	2	0.09	92.80	1	8
Anomia simplex	Mol	Biva	2	0.09	92.89	2	17
Apocorophium simile	Art	Mala	2	0.09	92.98	1	8
Apseudes sp. A	Art	Mala	2	0.09	93.07	1	8
Aricidea taylori	Ann	Poly	2	0.09	93.16	2	17
Armandia agilis	Ann	Poly	2	0.09	93.25	2	17
Brachiopoda (LPIL)	Bra	-	2	0.09	93.34	1	8
Brania wellfleetensis	Ann	Poly	2	0.09	93.43	2	17
Caecum floridanum	Mol	Gast	2	0.09	93.51	1	8
Cirrophorus (LPIL)	Ann	Poly	2	0.09	93.60	2	17
Cirrophorus ilvana	Ann	Poly	2	0.09	93.69	1	8
Crepidula plana	Mol	Gast	2	0.09	93.78	1	8
Decapoda (LPIL)	Art	Mala	2	0.09	93.87	1	8
Euceramus praelongus	Art	Mala	2	0.09	93.96	2	17
Eudevenopus honduranus	Art	Mala	2	0.09	94.05	1	8
Eusarsiella sp. L	Art	Ostr	2	0.09	94.14	1	8
Filogranula sp. A	Ann	Poly	2	0.09	94.22	1	8
Gibberosus myersi	Art	Mala	2	0.09	94.31	2	17
Golfingia (LPIL)	Sip	-	2	0.09	94.40	1	8
Litocorsa antennata	Ann	Poly	2	0.09	94.49	2	17
Lucinidae (LPIL)	Mol	Biva	2	0.09	94.58	1	8
Magelona (LPIL)	Ann	Poly	2	0.09	94.67	1	8
Mediomastus californiensis	Ann	Poly	2	0.09	94.76	2	17
Mesanthura (LPIL)	Art	Mala	2	0.09	94.85	1	8
Metatiron tropakis	Art	Mala	2	0.09	94.94	2	17
Mitrella lunata	Mol	Gast	2	0.09	95.02	1	8
Neomegamphopus kalanii	Art	Mala	2	0.09	95.11	1	8

Table 6 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
Nephtyidae (LPIL)	Ann	Poly	2	0.09	95.20	2	17
Nephtys simoni	Ann	Poly	2	0.09	95.29	1	8
Nucula aegeenis	Mol	Biva	2	0.09	95.38	1	8
Onuphis eremita oculata	Ann	Poly	2	0.09	95.47	2	17
Pectinidae (LPIL)	Mol	Biva	2	0.09	95.56	2	17
Pinnotheridae (LPIL)	Art	Mala	2	0.09	95.65	2	17
Podarke obscura	Ann	Poly	2	0.09	95.74	1	8
Polyplacophora (LPIL)	Mol	Poly	2	0.09	95.82	1	8
Processa hemphilli	Art	Mala	2	0.09	95.91	1	8
Sabellaria vulgaris	Ann	Poly	2	0.09	96.00	2	17
Semele (LPIL)	Mol	Biva	2	0.09	96.09	2	17
Sigatica semisulcata	Mol	Gast	2	0.09	96.18	1	8
Sthenelais sp. A	Ann	Poly	2	0.09	96.27	1	8
Tanaissus sp. A	Art	Mala	2	0.09	96.36	2	17
Tellina iris	Mol	Biva	2	0.09	96.45	1	8
Acuminodeutopus naglei	Art	Mala	1	0.04	96.49	1	8
Ampelisca (LPIL)	Art	Mala	1	0.04	96.53	1	8
Ampelisca agassizi	Art	Mala	1	0.04	96.58	1	8
Ampelisca parapacifica	Art	Mala	1	0.04	96.62	1	8
Antalis (LPIL)	Mol	Scap	1	0.04	96.67	1	8
Aricidea catherinae	Ann	Poly	1	0.04	96.71	1	8
Aricidea minuta	Ann	Poly	1	0.04	96.76	1	8
Aricidea wassi	Ann	Poly	1	0.04	96.80	1	8
Asteroidea (LPIL)	Ech	Aste	1	0.04	96.85	1	8
Automate (LPIL)	Art	Mala	1	0.04	96.89	1	8
Axiothella (LPIL)	Ann	Poly	1	0.04	96.93	1	8
Batea catharinensis	Art	Mala	1	0.04	96.98	1	8
Bowmaniella (LPIL)	Art	Mala	1	0.04	97.02	1	8
Carditidae (LPIL)	Mol	Biva	1	0.04	97.07	1	8
Ceratocephale oculata	Ann	Poly	1	0.04	97.11	1	8
Corbula contracta	Mol	Biva	1	0.04	97.16	1	8
Diodora (LPIL)	Mol	Gast	1	0.04	97.20	1	8
Dispio uncinata	Ann	Poly	1	0.04	97.25	1	8
Divaricella quadrisulcata	Mol	Biva	1	0.04	97.29	1	8
Ebalia stimpsonii	Art	Mala	1	0.04	97.33	1	8
Eulimidae (LPIL)	Mol	Gast	1	0.04	97.38	1	8
Eurypanopeus depressus	Art	Mala	1	0.04	97.42	1	8
Eusarsiella cresseyi	Art	Ostr	1	0.04	97.47	1	8
Eusarsiella spinosa	Art	Ostr	1	0.04	97.51	1	8
Exogone (LPIL)	Ann	Poly	1	0.04	97.56	1	8
Fabricinuda trilobata	Ann	Poly	1	0.04	97.60	1	8
Glycera dibranchiata	Ann	Poly	1	0.04	97.65	1	8
Goniada (LPIL)	Ann	Poly	1	0.04	97.69	1	8
Hepatus (LPIL)	Art	Mala	1	0.04	97.73	1	8
Heteromastus filiformis	Ann	Poly	1	0.04	97.78	1	8
Heteromysis (LPIL)	Art	Mala	1	0.04	97.82	1	8
Kalliapseudes macsweenyi	Art	Mala	1	0.04	97.87	1	8
Leitoscoloplos (LPIL)	Ann	Poly	1	0.04	97.91	1	8
Leptochela serratorbita	Art	Mala	1	0.04	97.96	1	8
Leptosynapta (LPIL)	Ech	Holo	1	0.04	98.00	1	8
Levinsenia gracilis	Ann	Poly	1	0.04	98.05	1	8
Lioberus castaneus	Mol	Biva	1	0.04	98.09	1	8
Lucina (LPIL)	Mol	Biva	1	0.04	98.13	1	8
Lumbrineris (LPIL)	Ann	Poly	1	0.04	98.18	1	8

Table 6 continued:

Taxa	Phylum	Class	No. of Individuals	% Total	Cumulative %	Station Occurrence	% Station Occurrence
Macromphalina floridana	Mol	Gast	1	0.04	98.22	1	8
Melinna maculata	Ann	Poly	1	0.04	98.27	1	8
Mesochaetopterus (LPIL)	Ann	Poly	1	0.04	98.31	1	8
Metatiron triocellatus	Art	Mala	1	0.04	98.36	1	8
Muricidae (LPIL)	Mol	Gast	1	0.04	98.40	1	8
Nephtys (LPIL)	Ann	Poly	1	0.04	98.45	1	8
Nereis succinea	Ann	Poly	1	0.04	98.49	1	8
Odontosyllis enopla	Ann	Poly	1	0.04	98.53	1	8
Onuphidae (LPIL)	Ann	Poly	1	0.04	98.58	1	8
Opisthodonta sp. B	Ann	Poly	1	0.04	98.62	1	8
Oxyurostylis (LPIL)	Art	Mala	1	0.04	98.67	1	8
Paranaitis speciosa	Ann	Poly	1	0.04	98.71	1	8
Pectinaria gouldii	Ann	Poly	1	0.04	98.76	1	8
Philine sagra	Mol	Gast	1	0.04	98.80	1	8
Pinnidae (LPIL)	Mol	Biva	1	0.04	98.84	1	8
Pinnixa (LPIL)	Art	Mala	1	0.04	98.89	1	8
Pinnotheres (LPIL)	Art	Mala	1	0.04	98.93	1	8
Pionosyllis gesae	Ann	Poly	1	0.04	98.98	1	8
Pista palmata	Ann	Poly	1	0.04	99.02	1	8
Polycirrus (LPIL)	Ann	Poly	1	0.04	99.07	1	8
Polynoidae (LPIL)	Ann	Poly	1	0.04	99.11	1	8
Portunus gibbesii	Art	Mala	1	0.04	99.16	1	8
Processa (LPIL)	Art	Mala	1	0.04	99.20	1	8
Protohaustorius sp. B	Art	Mala	1	0.04	99.24	1	8
Rictaxis punctostriatus	Mol	Gast	1	0.04	99.29	1	8
Sabaco americanus	Ann	Poly	1	0.04	99.33	1	8
Sabellaria sp. A	Ann	Poly	1	0.04	99.38	1	8
Saccocirrus sp. A	Ann	Poly	1	0.04	99.42	1	8
Scaphandridae (LPIL)	Mol	Gast	1	0.04	99.47	1	8
Schistomeringos rudolphi	Ann	Poly	1	0.04	99.51	1	8
Sigambra tentaculata	Ann	Poly	1	0.04	99.56	1	8
Spio pettiboneae	Ann	Poly	1	0.04	99.60	1	8
Strombiformis (LPIL)	Mol	Gast	1	0.04	99.64	1	8
Strombiformis bilineatus	Mol	Gast	1	0.04	99.69	1	8
Syllidae (LPIL)	Ann	Poly	1	0.04	99.73	1	8
Syllis cornuta	Ann	Poly	1	0.04	99.78	1	8
Synasterope setisparsa	Art	Ostr	1	0.04	99.82	1	8
Synelmis ewingi	Ann	Poly	1	0.04	99.87	1	8
Upogebia (LPIL)	Art	Mala	1	0.04	99.91	1	8
Upogebia affinis	Art	Mala	1	0.04	99.96	1	8
Veneridae (LPIL)	Mol	Biva	1	0.04	100.00	1	8

Taxa Key

Ann=Annelida
- Olig=Oligochaeta
- Poly=Polychaeta

Art=Arthropoda
- Inse=Insecta
- Mala=Malacostraca
- Ostr=Ostracoda

Bra=Brachiopoda

Cni=Cnidaria
- Anth=Anthozoa

Ech=Echinodermata
- Holo=Holothuroidea
- Ophi=Ophiuroidea

Mol=Mollusca
- Biva=Bivalvia
- Gast=Gastropoda

Pla=Platyhelminthes
- Turb=Turbellaria

Rhy=Rhynchocoela
- Anop=Anopla

Sip=Sipuncula

Table 7. Percent abundance of dominant benthic macroinfaunal taxa (>5% of the total) for the Fernandina ODMDS stations, 2005.

Taxa	F01	F02	F03	F07	F11	F12	F04	F05	F06	F08	F09	F10
Annelida												
Oligochaeta												
Enchytraeidae (LPIL)								6.5				
Tubificidae (LPIL)								7.4				
Polychaeta												
Aglaophamus verrilli		5.0										
Apoprionospio pygmaea			12.8				13.2			22.0		
Aricidea (LPIL)	5.3											
Armandia maculata									9.2		8.7	
Bhawania heteroseta								10.7				9.7
Goniada littorea										7.3		
Magelona papillicornis							5.7					
Magelona sp. H	28.3	5.0				11.1						
Maldanidae (LPIL)												14.5
Mediomastus (LPIL)												8.3
Nephtys picta										7.3		
Nereididae (LPIL)											6.5	
Paraprionospio pinnata		11.7				11.1						
Polygordius (LPIL)					6.3		26.4			14.6		
Prionospio (LPIL)									7.2			
Prionospio cristata								10.7				7.8
Arthropoda												
Malacostraca												
Albunea paretii				8.0								
Dulichiella sp. A											6.5	
Globosolembos smithi									5.4			
Metharpinia floridana				8.0								
Xanthidae (LPIL)											8.7	
Chordata												
Leptocardia												
Branchiostoma (LPIL)					18.8							
Echinodermata												
Ophiuroidea												
Ophiuroidea (LPIL)	11.2										10.9	
Mollusca												
Bivalvia												
Anadara transversa									9.6			
Ervilia concentrica					5.4							
Lucina multilineata			10.6									
Pythinella cuneata		6.7										
Tellina (LPIL)	5.9		14.9	8.0		8.9				7.3		
Tellinidae (LPIL)					5.4							
Gastropoda												
Acteocina bidentata			6.4			15.6						
Caecum pulchellum					5.4							
Crepidula plana				8.0								
Kurtziella rubella			6.4									
Odostomia (LPIL)									8.9			

Table 7 continued:

Taxa	F01	F02	F03	F07	F11	F12	F04	F05	F06	F08	F09	F10
Scaphopoda												
Dentalium laqueatum		5.0										
Rhynchocoela												
Anopla												
Lineidae (LPIL)		5.0										
Rhynchocoela (LPIL)						6.7	7.5					
Sipuncula												
Phascolion strombi		6.7										

Table 8. Summary of assemblage parameters for the Fernandina ODMDS stations, 2005.

Station	Total No. Taxa	Total No. Individuals	Density (nos/m2)	H' Shannon (log e)	d Diversity (log 2)	J' Pielou Evenness	D Margalef Richness	1/S Simpson Diversity	e Equitability
Outside the ODMDS									
F01	50	152	3800.0	3.06	4.42	0.78	9.75	9.88	0.63
F02	32	60	1500.0	3.28	4.73	0.95	7.57	33.40	1.23
F03	20	47	1175.0	2.78	4.02	0.93	4.93	18.02	1.17
F07	21	25	625.0	3.00	4.32	0.98	6.21	75.00	1.40
F11	45	112	2800.0	3.35	4.83	0.88	9.32	19.55	0.94
F12	36	90	2250.0	3.08	4.44	0.86	7.78	16.69	0.89
	34.0		2025.0	3.09		0.90			
Inside the ODMDS									
F04	27	53	1325.0	2.80	4.04	0.85	6.55	11.20	0.88
F05	88	337	8425.0	3.80	5.48	0.85	14.95	26.04	0.77
F06	87	573	14325.0	3.60	5.19	0.81	13.54	22.88	0.63
F08	20	41	1025.0	2.66	3.84	0.89	5.12	13.23	1.03
F09	25	46	1150.0	3.06	4.41	0.95	6.27	29.57	1.25
F10	77	715	17875.0	3.54	5.10	0.81	11.56	19.15	0.67
	54.0		7354.2	3.24		0.86			

Table 9. Summary of assemblage parameters for the Fernandina ODMDS stations, 1989.

Station	Total No. Taxa	Mean No. of Taxa per Repl.	Total No. Individuals	Mean Density (nos/m2)	Density (Std Dev)	H' Shannon (log e)	J' Pielou Evenness	D Margalef Richness
Inside ODMDS								
5	112	20.7	1095	9240	4608	2.76	0.58	15.86
7	78	14.0	434	3662	1388	3.28	0.75	12.68
8	143	27.9	768	6481	2144	4.13	0.83	21.37
9	220	67.8	8331	70303	22564	3.31	0.61	24.26
10	105	17.1	720	6075	3116	2.68	0.58	15.81
		29.5		19152.2		3.23	0.67	
Outside ODMDS								
1	104	20.4	822	7432	2320	3.44	0.74	15.35
2	93	16.8	638	5383	1957	2.84	0.63	14.25
6	56	10.4	364	3544	1135	2.74	0.68	9.33
11	142	32.0	1213	10236	3778	3.76	0.76	19.86
12	89	18.2	1438	12135	4380	1.93	0.43	12.10
		19.6		7746.0		2.94	0.65	

Figure 1. Sample stations for the Fernandina Beach, Florida ODMDS, 2005.

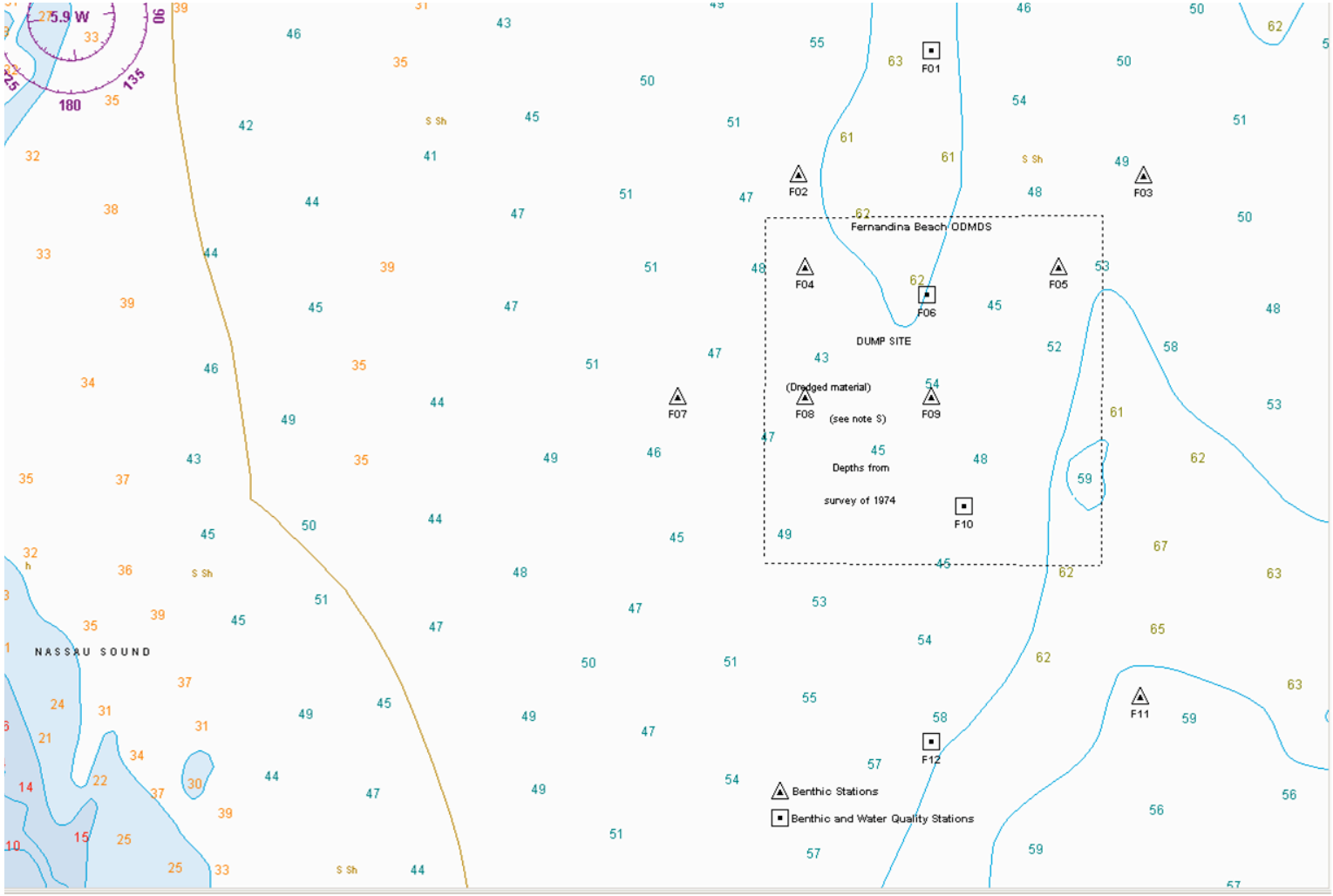


Figure 2. Sediment texture for the Fernandina ODMDS stations, 2005.

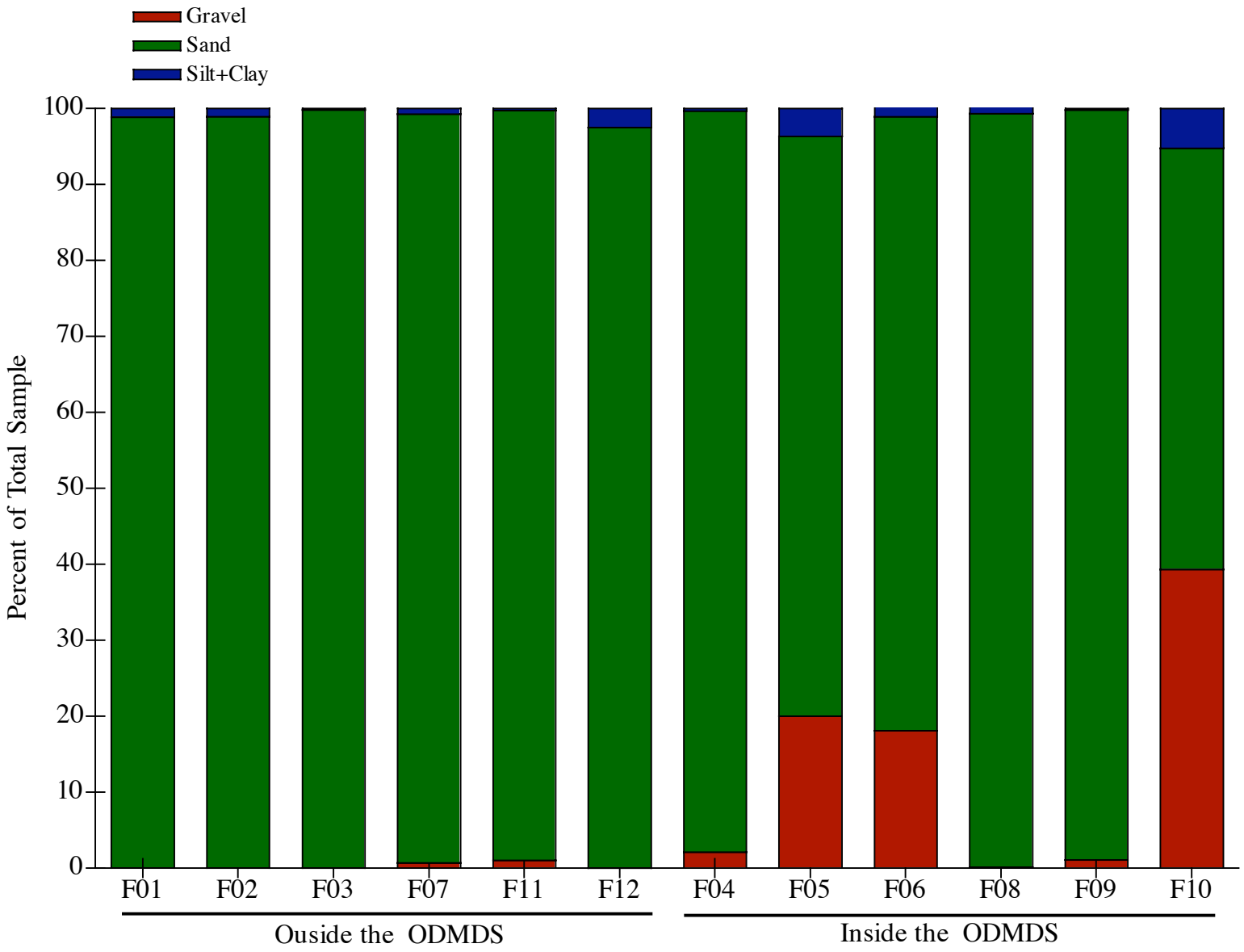


Figure 3. Abundance of major macroinvertebrate taxa groups for the Fernandina ODMDS stations, 2005.

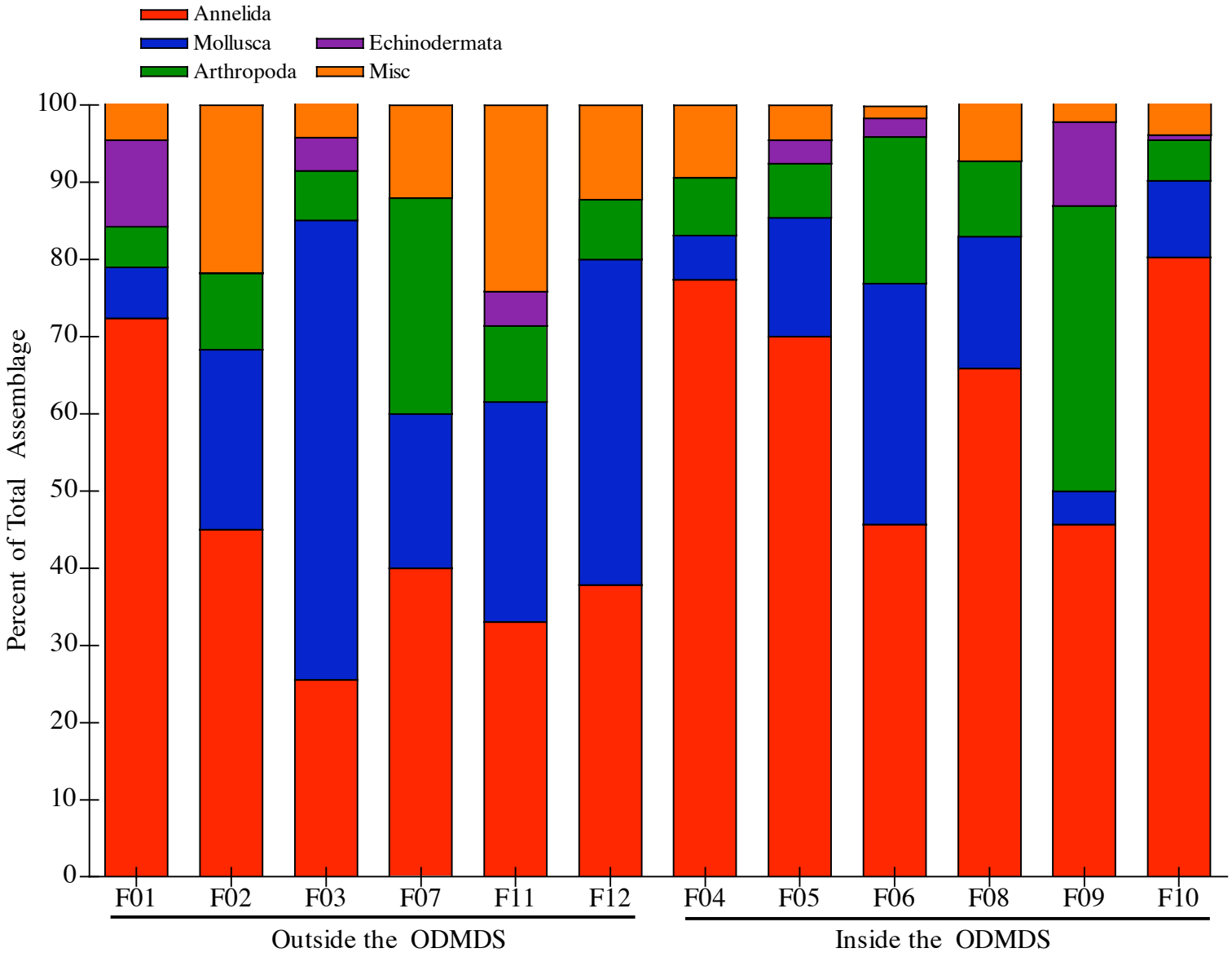


Figure 4. Wet-weight biomass of the major macroinvertebrate groups for the Fernandina ODMDS stations, 2005.

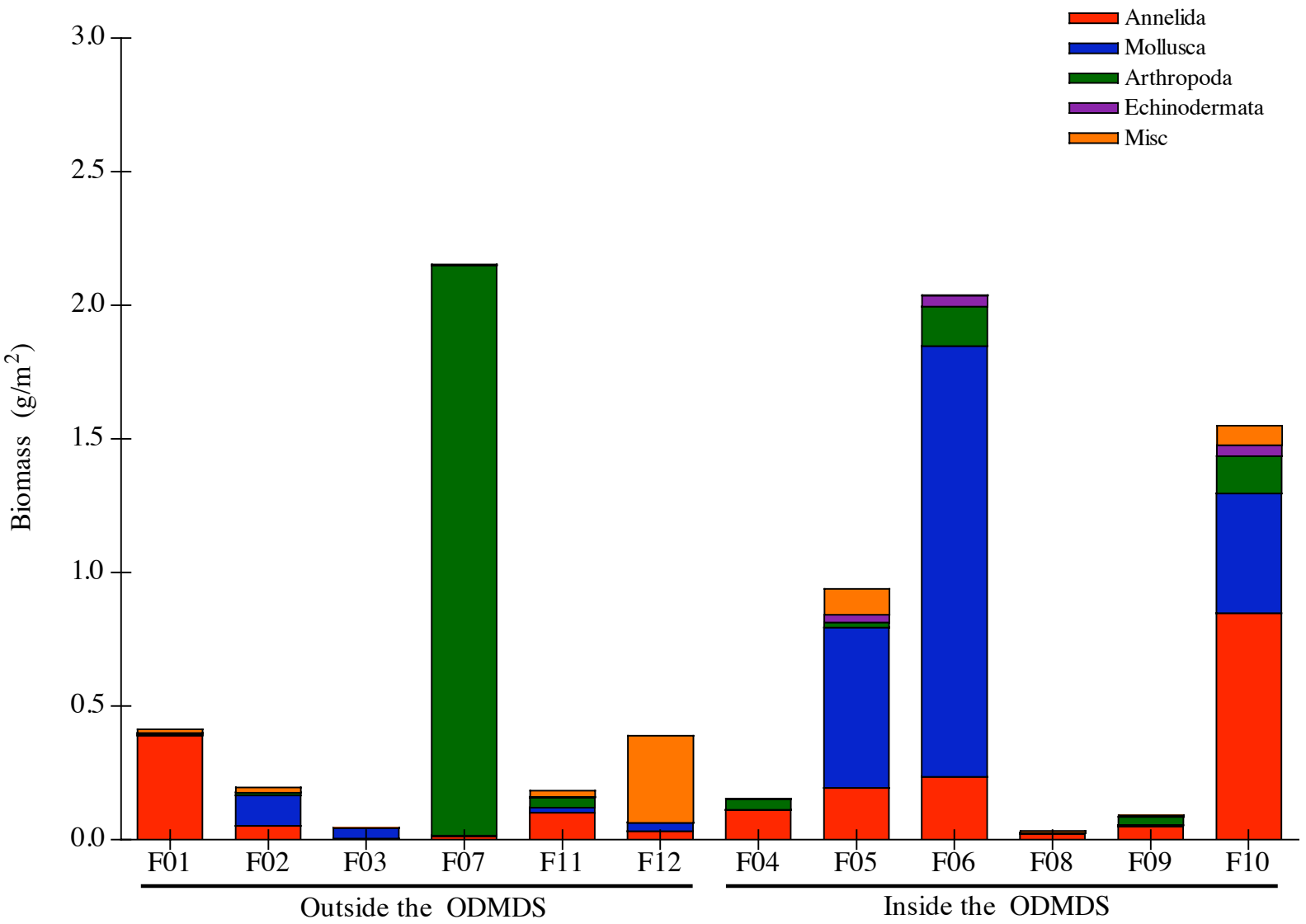


Figure 5. Taxa richness for the Fernandina ODMDS stations, 2005.

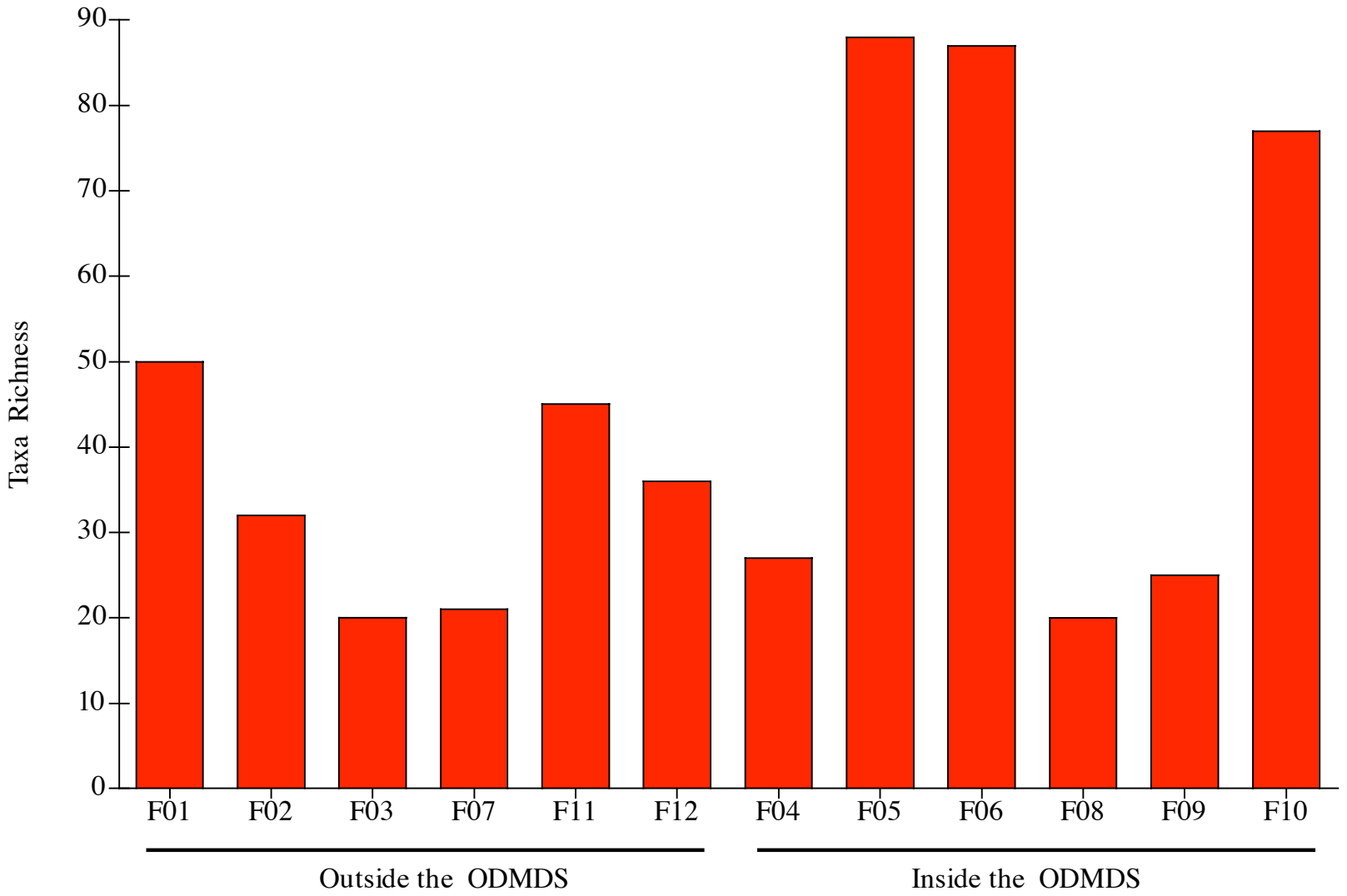


Figure 6. Macroinvertebrate densities for the Fernandina ODMDS stations, 2005.

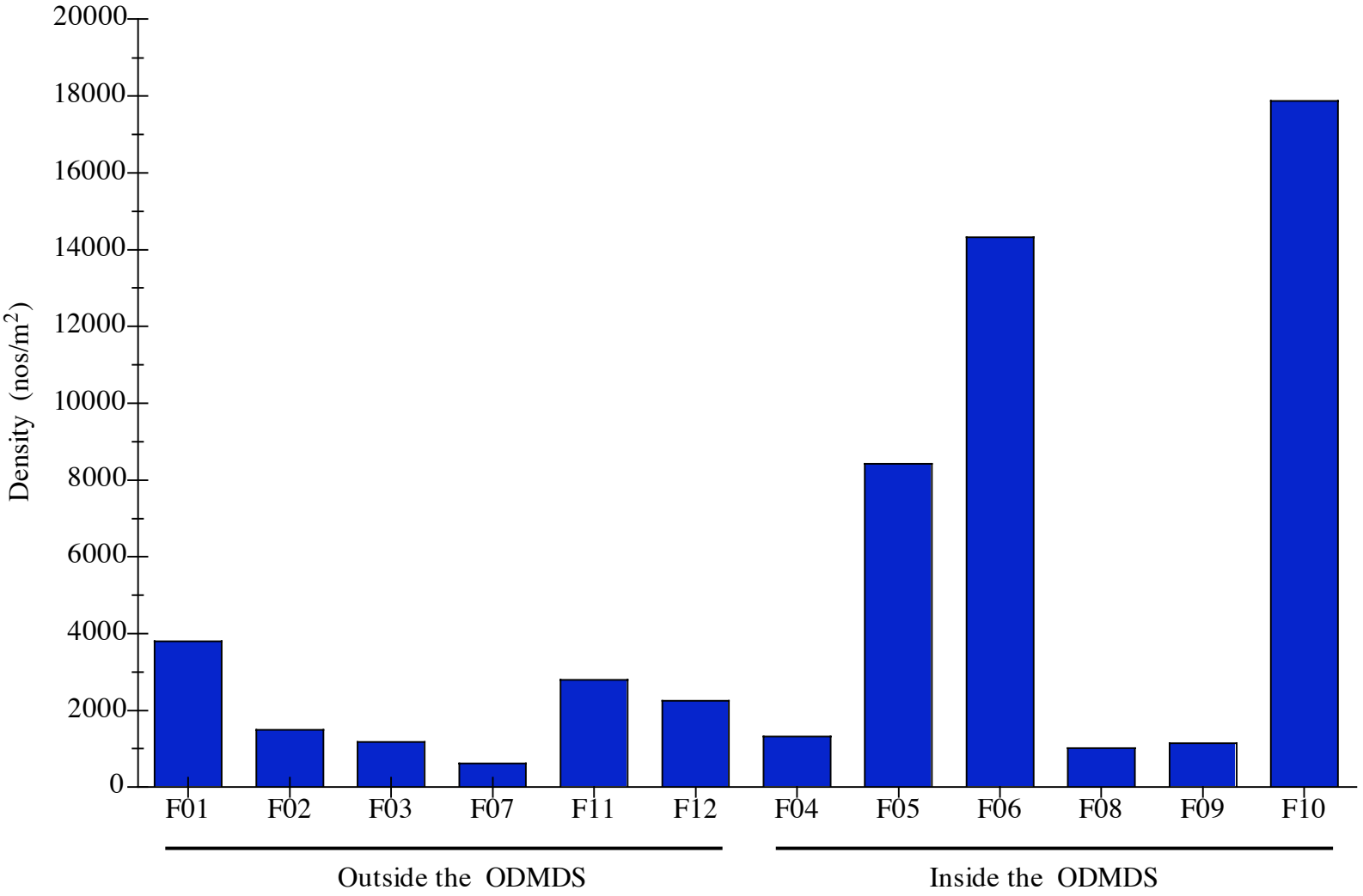


Figure 7. Taxa diversity (H') for the Fernandina ODMDS stations, 2005.

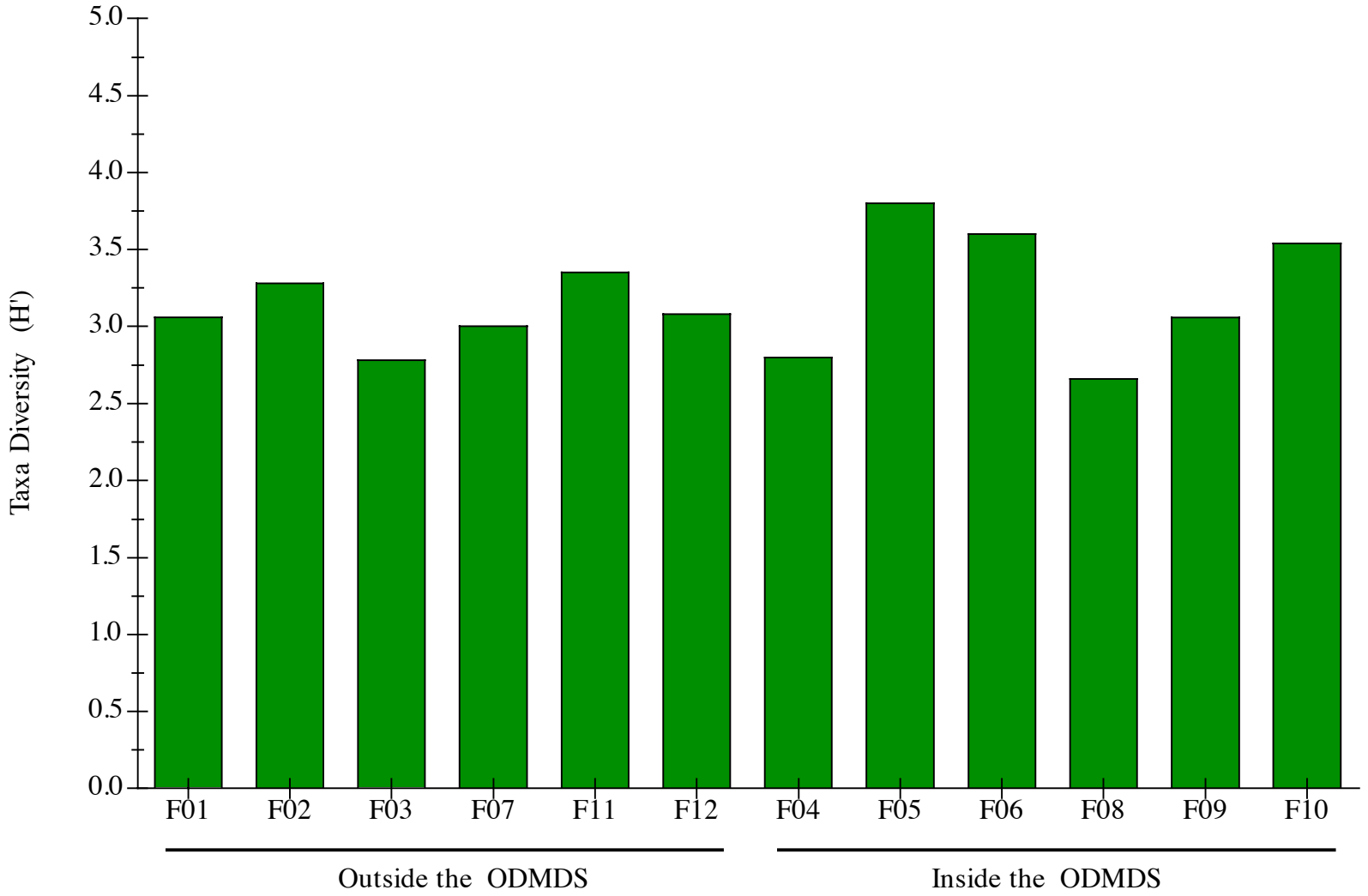


Figure 8. Taxa evenness (J') for the Fernandina ODMDS stations, 2005.

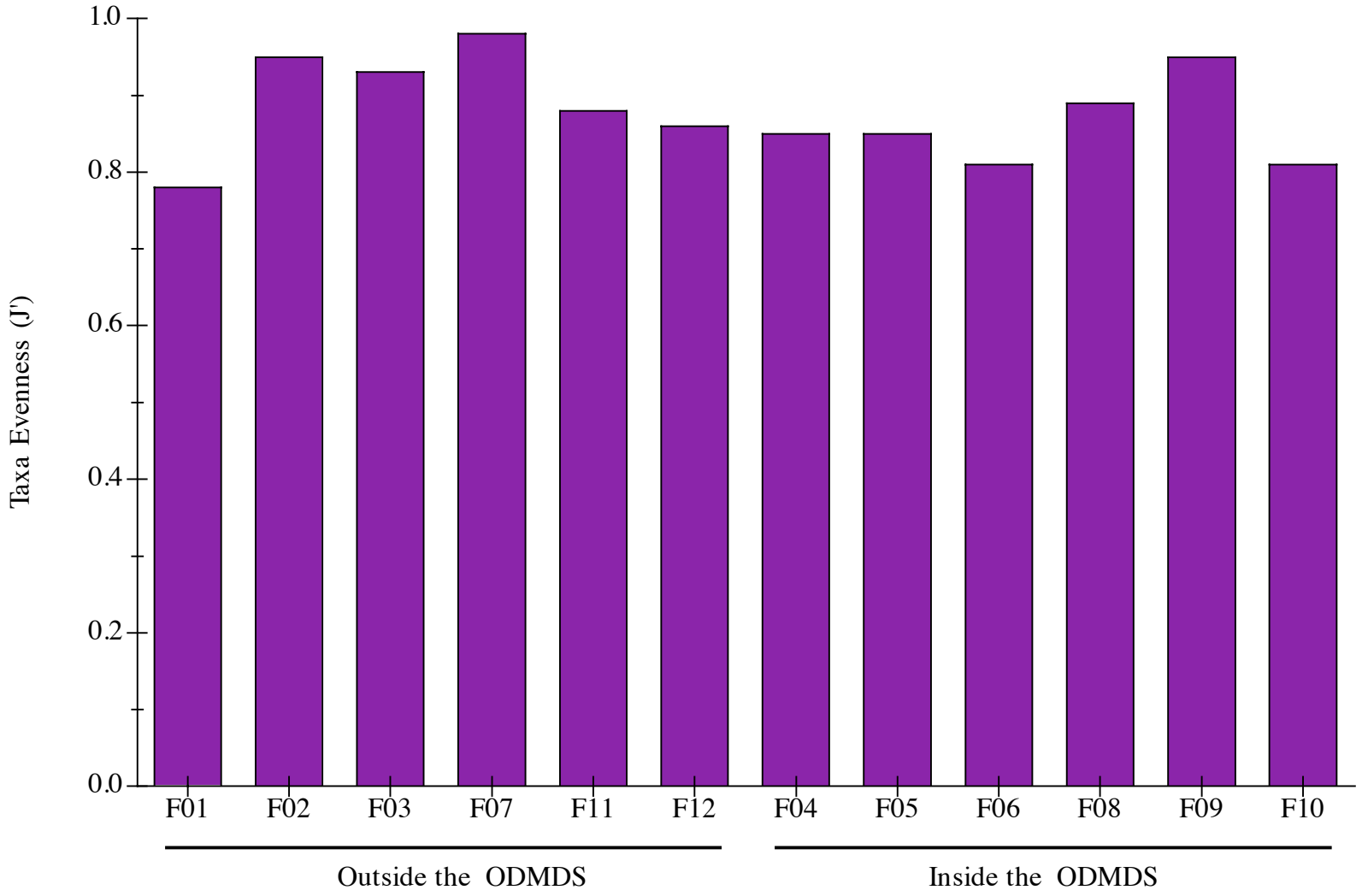


Figure 9. Cluster analysis for the Fernandina ODMDS stations, 2005.

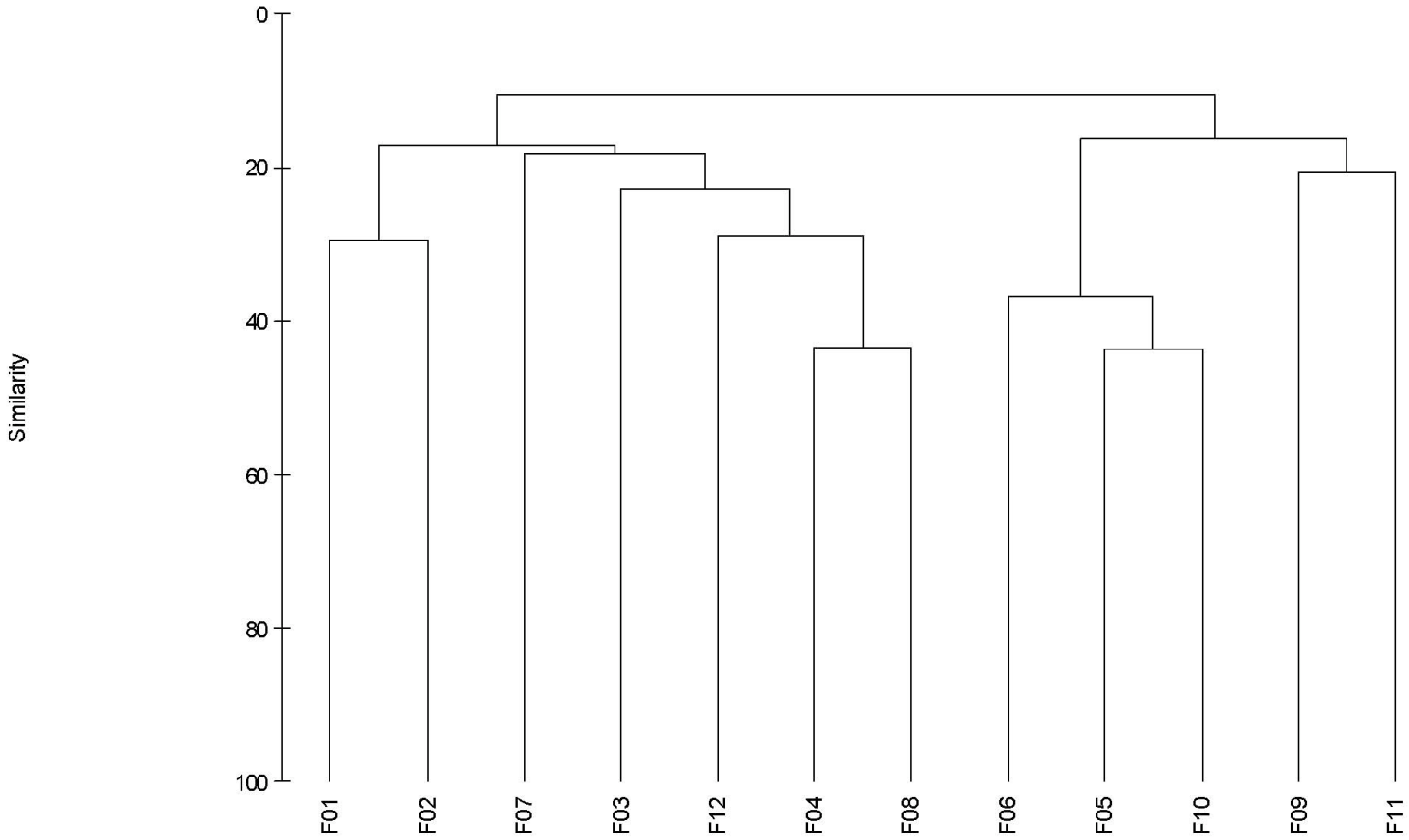


Figure 10. MDS analysis for the Fernandina ODMDS stations, 2005.

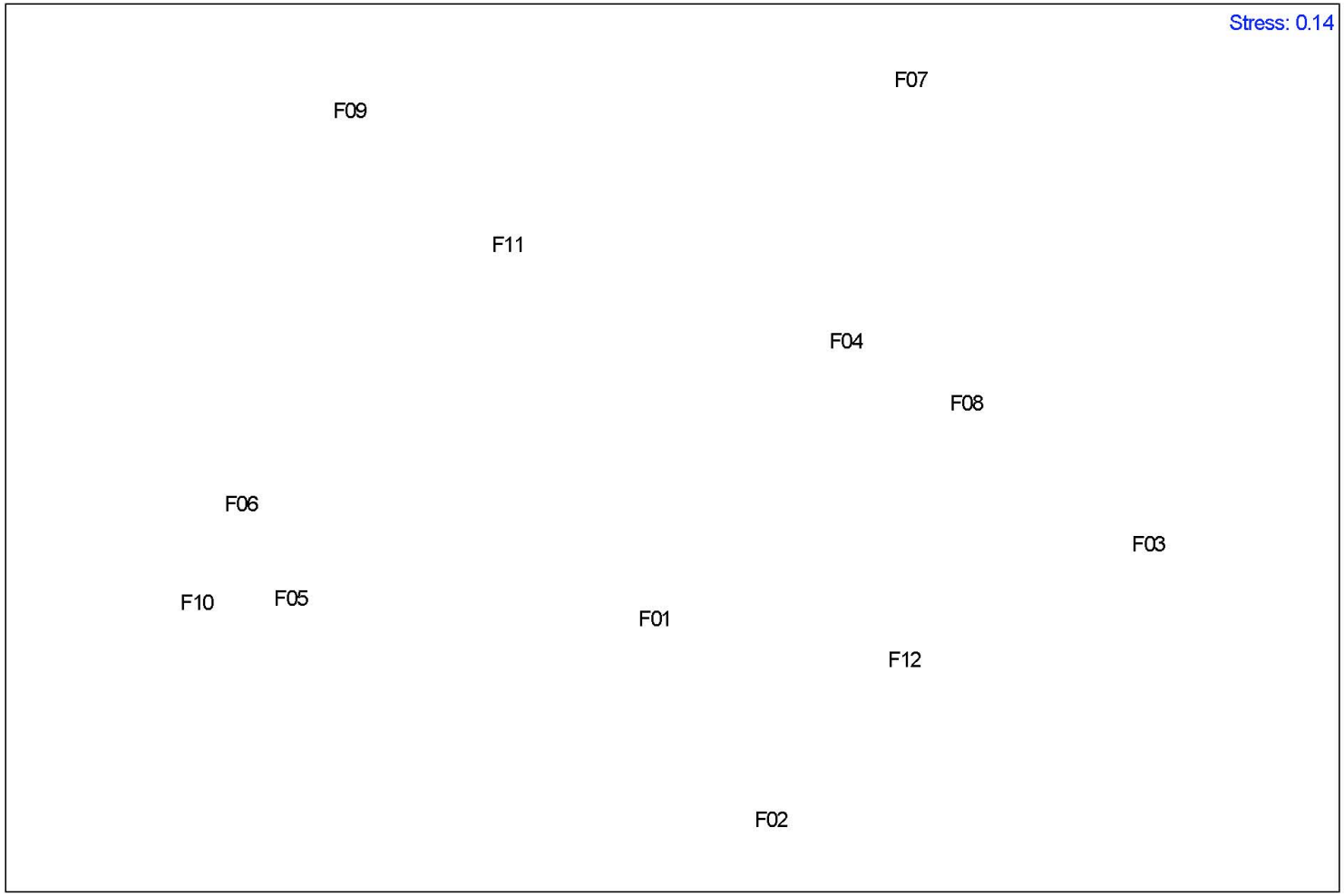


Figure 11. A comparison of sediment texture for the Fernandina ODMDS, 1989 and 2005.

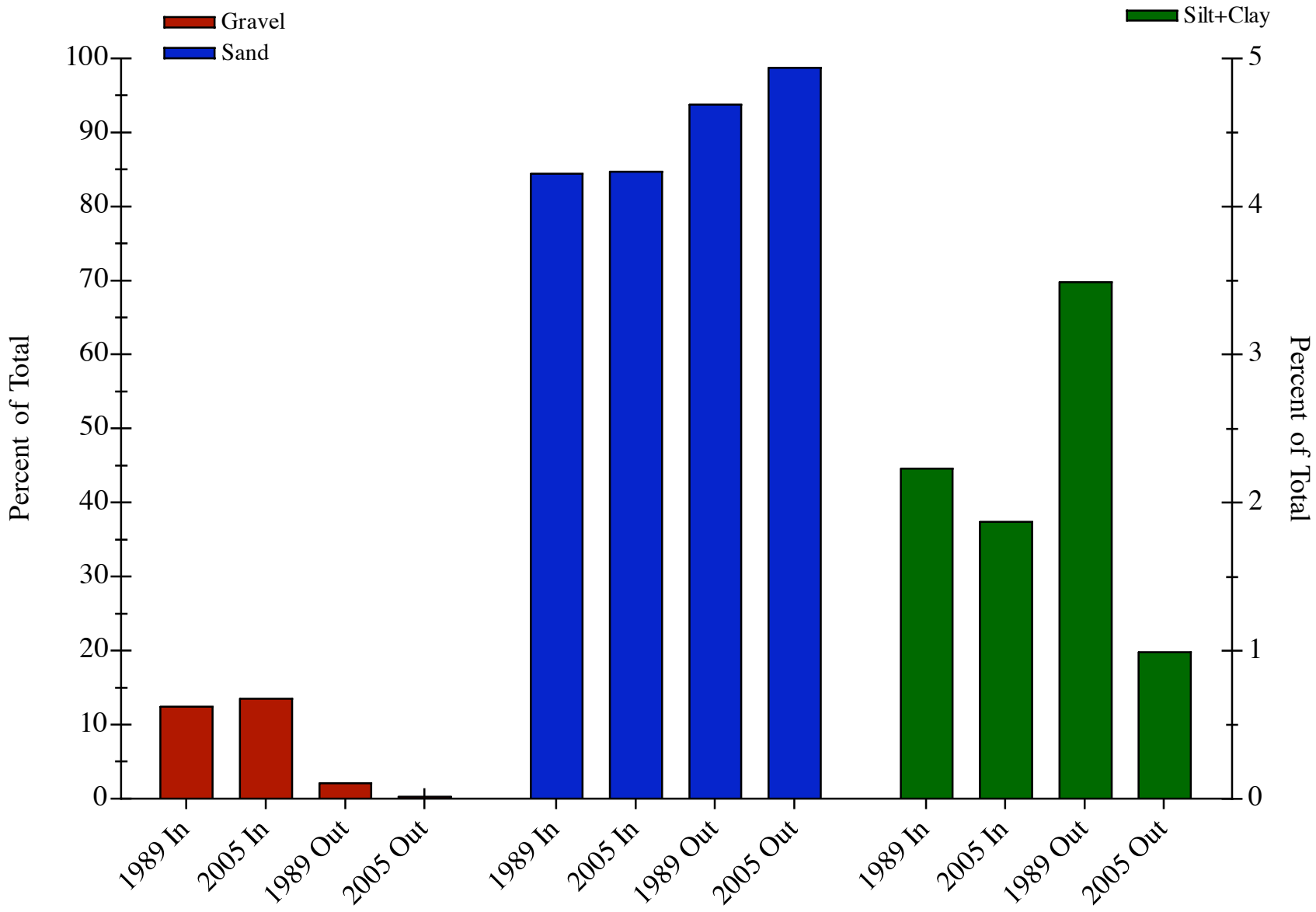
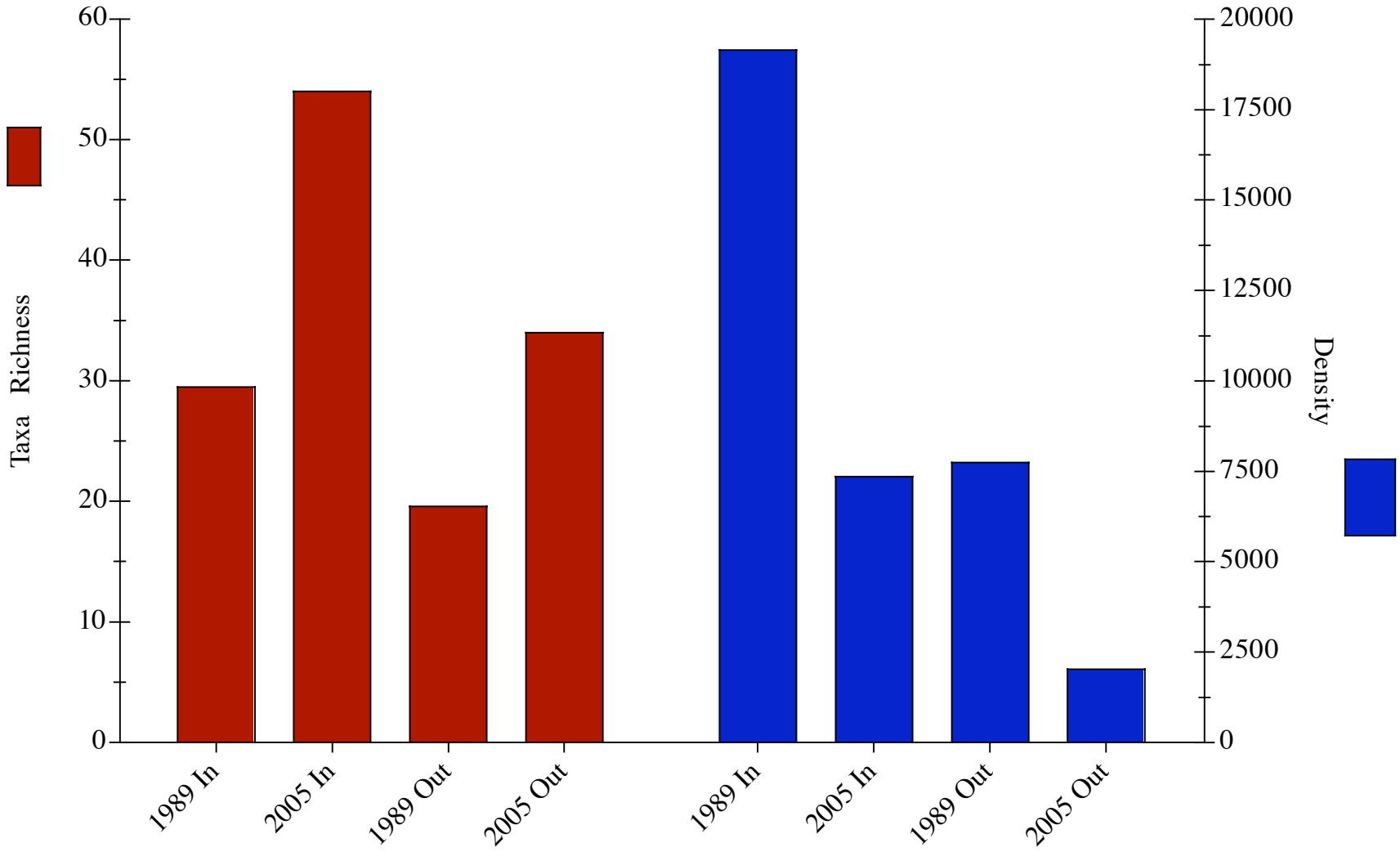


Figure 12. A comparison of taxa richness and density data for the Fernandina ODMDS, 1989 and 2005.



APPENDICES

Appendix I. Results of the Simpler Analysis.

Group Inside the ODMDS

Average similarity: 13.38

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Tellina (LPIL)	4.33	2.34	0.69	17.52	17.52
Paraprionospio pinnata	3.67	1.21	0.44	9.06	26.58
Aspidosiphon albus	1.17	1.06	1.11	7.91	34.49
Magelona sp. H	9.33	1.01	0.43	7.52	42.01
Nereididae (LPIL)	2.00	0.71	0.75	5.32	47.33
Apoprionospio pygmaea	1.83	0.69	0.58	5.16	52.49
Ophiuroidea (LPIL)	4.00	0.55	0.46	4.14	56.63
Acteocina bidentata	3.00	0.51	0.42	3.78	60.41
Caecum pulchellum	1.50	0.33	0.44	2.47	62.88
Acteocina candei	1.17	0.33	0.44	2.47	65.36
Mooreonuphis pallidula	0.83	0.33	0.42	2.45	67.80
Lineidae (LPIL)	1.00	0.30	0.41	2.21	70.01
Goniada littorea	0.83	0.30	0.44	2.21	72.22
Capitellidae (LPIL)	0.50	0.30	0.44	2.21	74.42
Owenia fusiformis	1.33	0.27	0.45	2.02	76.44
Mediomastus (LPIL)	1.00	0.27	0.42	2.01	78.45
Branchiostoma (LPIL)	3.83	0.22	0.46	1.67	80.11
Phoronis (LPIL)	0.50	0.21	0.47	1.55	81.66
Metharpinia floridana	0.83	0.19	0.26	1.45	83.12
Aglaophamus verrilli	1.00	0.19	0.26	1.41	84.53
Prionospio (LPIL)	0.67	0.13	0.26	1.00	85.53
Polygordius (LPIL)	1.50	0.13	0.26	0.99	86.51
Lucina multilineata	1.00	0.12	0.26	0.93	87.44
Americhelidium americanum	0.33	0.12	0.26	0.87	88.31
Sipuncula (LPIL)	0.33	0.10	0.26	0.73	89.04
Magelona papillicornis	0.33	0.10	0.26	0.73	89.77
Kurtziella rubella	0.67	0.10	0.26	0.73	90.49

Group Outside the ODMDS

Average similarity: 12.97

Species	Av.Abund	Av.Sim	Sim/SD	Contrib%	Cum.%
Polygordius (LPIL)	10.00	1.88	0.56	14.50	14.50
Apoprionospio pygmaea	2.67	0.99	0.26	7.66	22.16
Bhawania heteroseta	19.50	0.76	0.41	5.83	28.00
Armandia maculata	10.00	0.73	0.56	5.66	33.66
Prionospio cristata	17.17	0.73	0.40	5.64	39.30
Ophiuroidea (LPIL)	4.50	0.59	0.70	4.53	43.82
Rhynchocoela (LPIL)	3.00	0.58	0.81	4.46	48.28
Crassinella lunulata	9.00	0.55	0.57	4.24	52.52
Prionospio (LPIL)	10.33	0.35	0.53	2.70	55.21
Branchiostoma (LPIL)	1.33	0.33	0.66	2.56	57.77
Nephtys picta	1.50	0.29	0.52	2.27	60.04
Mediomastus (LPIL)	13.50	0.28	0.36	2.15	62.19
Paraprionospio pinnata	0.67	0.27	0.26	2.08	64.27
Acteocina bidentata	0.67	0.21	0.38	1.63	65.90
Exogone lourei	4.00	0.20	0.45	1.55	67.45
Tubificidae (LPIL)	5.83	0.20	0.50	1.54	68.99
Capitellidae (LPIL)	3.83	0.18	0.55	1.42	70.41
Anadara transversa	10.83	0.18	0.45	1.39	71.80
Gouldia cerina	7.50	0.17	0.31	1.33	73.13
Parapionosyllis longicirrata	4.33	0.16	0.43	1.26	74.39
Nereididae (LPIL)	4.17	0.16	0.47	1.22	75.61
Phyllodocidae (LPIL)	2.33	0.14	0.68	1.11	76.72
Bivalvia (LPIL)	2.67	0.14	0.44	1.10	77.82
Magelona papillicornis	0.67	0.14	0.26	1.09	78.91
Goniada littorea	0.67	0.14	0.26	1.09	80.00
Asteropterygion oculitristis	0.33	0.14	0.26	1.09	81.10
Americhelidium americanum	0.33	0.14	0.26	1.09	82.19
Laonice cirrata	2.67	0.13	0.41	0.97	83.16
Cirratulidae (LPIL)	3.33	0.12	0.71	0.95	84.11
Neomegamphopus (LPIL)	2.50	0.11	0.39	0.86	84.97
Dipolydora socialis	0.83	0.11	0.38	0.82	85.79
Ampharetidae (LPIL)	2.17	0.10	0.44	0.79	86.59
Maldanidae (LPIL)	18.33	0.09	0.36	0.68	87.27
Liljeborgia sp. A	1.50	0.08	0.36	0.63	87.90

Magelona pettiboneae	1.83	0.08	0.46	0.59	88.49
Caecum johnsoni	1.67	0.08	0.38	0.58	89.07
Scoloplos rubra	0.67	0.07	0.45	0.54	89.61
Dulichiella sp. A	2.67	0.06	0.26	0.50	90.11

Groups Inside & Outside the ODMDS

Average dissimilarity = 89.71

Species	Group O Av.Abund	Group I Av.Abund	Av.Diss	Diss/SD	Contrib%	Cum.%
Polygordius (LPIL)	1.50	10.00	3.67	0.87	4.09	4.09
Magelona sp. H	9.33	0.00	3.38	0.55	3.77	7.86
Bhawania heteroseta	0.00	19.50	3.21	0.80	3.57	11.43
Prionospio cristata	0.00	17.17	2.91	0.79	3.24	14.67
Maldanidae (LPIL)	0.17	18.33	2.44	0.50	2.72	17.39
Armandia maculata	0.67	10.00	2.25	0.78	2.50	19.89
Apoprionospio pygmaea	1.83	2.67	2.24	0.71	2.50	22.39
Mediomastus (LPIL)	1.00	13.50	2.12	0.82	2.36	24.76
Ophiuroidea (LPIL)	4.00	4.50	2.03	0.87	2.26	27.02
Tellina (LPIL)	4.33	0.50	1.98	0.92	2.21	29.23
Prionospio (LPIL)	0.67	10.33	1.82	0.86	2.02	31.25
Paraprionospio pinnata	3.67	0.67	1.78	0.85	1.98	33.23
Anadara transversa	0.00	10.83	1.73	0.56	1.93	35.16
Branchiostoma (LPIL)	3.83	1.33	1.65	0.47	1.84	37.00
Crassinella lunulata	0.17	9.00	1.58	1.11	1.76	38.76
Acteocina bidentata	3.00	0.67	1.50	0.57	1.67	40.43
Tubificidae (LPIL)	0.50	5.83	1.44	0.68	1.60	42.03
Nereididae (LPIL)	2.00	4.17	1.33	1.16	1.48	43.51
Odostomia (LPIL)	0.00	8.50	1.31	0.44	1.45	44.97
Rhynchocoela (LPIL)	1.17	3.00	1.23	0.90	1.38	46.34
Gouldia cerina	0.17	7.50	1.09	0.76	1.22	47.56
Enchytraeidae (LPIL)	0.17	4.33	1.02	0.52	1.13	48.69
Goniadides carolinae	0.17	6.33	0.94	0.62	1.05	49.74
Globosolembos smithi	0.00	5.17	0.79	0.44	0.88	50.63
Dulichiella sp. A	0.00	2.67	0.77	0.65	0.86	51.49
Exogone lourei	0.33	4.00	0.75	0.98	0.84	52.33
Capitellidae (LPIL)	0.50	3.83	0.72	1.03	0.81	53.14
Aricidea (LPIL)	1.50	1.67	0.72	0.66	0.80	53.93

Parapionosyllis longicirrata	0.00	4.33	0.69	0.81	0.77	54.71
Caecum pulchellum	1.50	0.17	0.69	0.65	0.77	55.48
Nephtys picta	0.17	1.50	0.68	0.72	0.76	56.24
Xanthidae (LPIL)	0.00	1.17	0.65	0.46	0.73	56.96
Bivalvia (LPIL)	0.50	2.67	0.65	0.94	0.72	57.68
Cirratulidae (LPIL)	0.50	3.33	0.63	0.89	0.70	58.38
Goniada littorea	0.83	0.67	0.62	0.68	0.69	59.07
Lucina multilineata	1.00	0.00	0.62	0.41	0.69	59.76
Aspidosiphon albus	1.17	0.00	0.61	1.00	0.68	60.44
Acteocina candei	1.17	0.17	0.56	0.72	0.63	61.07
Mooreonuphis pallidula	0.83	1.17	0.56	0.94	0.62	61.69
Ampharetidae (LPIL)	0.00	2.17	0.55	0.76	0.62	62.31
Owenia fusiformis	1.33	0.50	0.55	0.69	0.62	62.92
Ervilia concentrica	1.17	0.17	0.54	0.53	0.61	63.53
Magelona papillicornis	0.33	0.67	0.54	0.63	0.60	64.13
Pleuromeris tridentata	0.00	3.33	0.53	0.48	0.59	64.72
Lumbrineris latreilli	0.17	2.83	0.51	0.66	0.57	65.28
Neomegamphopus (LPIL)	0.17	2.50	0.49	1.02	0.55	65.83
Lineidae (LPIL)	1.00	0.17	0.49	0.59	0.54	66.37
Phyllodocidae (LPIL)	0.17	2.33	0.47	1.08	0.53	66.90
Metharpinia floridana	0.83	0.00	0.46	0.52	0.52	67.42
Laonice cirrata	0.00	2.67	0.46	0.79	0.51	67.93
Aspidosiphon gosnoldi	0.67	1.50	0.46	0.81	0.51	68.45
Aglaophamus verrilli	1.00	0.00	0.44	0.52	0.49	68.94
Glycera americana	0.50	0.50	0.44	0.57	0.49	69.43
Liljeborgia sp. A	0.50	1.50	0.41	0.72	0.46	69.89
Dipolydora socialis	0.17	0.83	0.41	0.60	0.46	70.35
Tellinidae (LPIL)	1.00	0.00	0.40	0.37	0.44	70.79
Autolytus (LPIL)	0.00	2.67	0.39	0.57	0.44	71.23
Kurtziella rubella	0.67	0.00	0.39	0.43	0.43	71.66
Magelona pettiboneae	0.00	1.83	0.39	0.88	0.43	72.09
Caecum johnsoni	0.33	1.67	0.38	0.84	0.42	72.51
Pythinella cuneata	0.67	0.00	0.37	0.35	0.42	72.93
Phascolion strombi	0.67	0.00	0.37	0.35	0.42	73.34
Paguridae (LPIL)	0.00	0.83	0.37	0.53	0.41	73.76
Turbellaria (LPIL)	0.17	2.17	0.35	0.62	0.39	74.15
Cyclaspis varians	0.50	0.17	0.34	0.54	0.38	74.52
Chone (LPIL)	0.00	1.67	0.33	0.60	0.36	74.89
Apanthura cracenta	0.00	1.33	0.32	0.44	0.36	75.24

Hesionidae (LPIL)	0.17	2.00	0.31	0.79	0.35	75.59
Eunicidae (LPIL)	0.00	0.83	0.31	0.67	0.34	75.94
Anodontia alba	0.67	0.00	0.30	0.36	0.34	76.27
Mesanthura (LPIL)	0.00	0.33	0.29	0.41	0.33	76.60
Apocorophium simile	0.00	0.33	0.29	0.41	0.33	76.93
Ampelisca vadorum	0.00	0.33	0.29	0.41	0.33	77.26
Photis (LPIL)	0.50	0.50	0.29	0.56	0.33	77.58
Asteropterygion oculitristis	0.17	0.33	0.29	0.65	0.32	77.91
Dentalium laqueatum	0.50	0.00	0.28	0.35	0.31	78.22
Nephtys simoni	0.00	0.33	0.28	0.42	0.31	78.53
Phyllodoce (LPIL)	0.00	1.17	0.27	0.81	0.30	78.83
Glycera (LPIL)	0.17	0.50	0.27	0.66	0.30	79.13
Crepidula plana	0.33	0.00	0.27	0.34	0.30	79.43
Albunea paretii	0.33	0.00	0.27	0.34	0.30	79.72
Spiophanes missionensis	0.33	0.50	0.26	0.67	0.29	80.02
Americhelidium americanum	0.33	0.33	0.26	0.66	0.29	80.31
Turridae (LPIL)	0.50	0.00	0.26	0.48	0.29	80.60
Goneplacidae (LPIL)	0.00	1.50	0.26	0.63	0.29	80.89
Lumbrineridae (LPIL)	0.33	1.00	0.26	0.75	0.29	81.18
Polycirrus eximius	0.17	1.17	0.25	0.82	0.28	81.46
Phoronis (LPIL)	0.50	0.17	0.25	0.65	0.28	81.74
Scoloplos rubra	0.00	0.67	0.24	0.73	0.27	82.01
Sipuncula (LPIL)	0.33	0.17	0.23	0.58	0.26	82.27
Aoridae (LPIL)	0.00	1.50	0.23	0.44	0.26	82.53
Diopatra cuprea	0.00	0.67	0.22	0.61	0.25	82.78
Protohadzia schoenerae	0.00	1.67	0.21	0.44	0.23	83.01
Tellina iris	0.33	0.00	0.21	0.35	0.23	83.25
Sigatica semisulcata	0.33	0.00	0.21	0.35	0.23	83.48
Lucinidae (LPIL)	0.33	0.00	0.21	0.35	0.23	83.71
Eusarsiella sp. L	0.33	0.00	0.21	0.35	0.23	83.95
Spionidae (LPIL)	0.33	0.50	0.21	0.58	0.23	84.18
Glyceridae (LPIL)	0.33	0.17	0.21	0.51	0.23	84.41
Armandia agilis	0.17	0.33	0.20	0.59	0.22	84.63
Spiochaetopterus oculatus	0.50	0.17	0.19	0.60	0.22	84.85
Schistomeringos pectinata	0.00	1.50	0.19	0.52	0.22	85.07
Metatiron tropakis	0.17	0.17	0.19	0.50	0.22	85.28
Diplodonta (LPIL)	0.33	0.50	0.19	0.74	0.21	85.49
Spiophanes bombyx	0.33	0.50	0.19	0.75	0.21	85.71
Nephtyidae (LPIL)	0.00	0.33	0.19	0.53	0.21	85.91

Amakusanthura magnifica	0.00	0.33	0.19	0.53	0.21	86.12
Brachiopoda (LPIL)	0.33	0.00	0.19	0.35	0.21	86.33
Apseudes sp. A	0.33	0.00	0.19	0.35	0.21	86.54
Tectonatica pusilla	0.33	0.17	0.18	0.58	0.20	86.74
Mediomastus californiensis	0.00	0.33	0.18	0.55	0.20	86.94
Sabellaria vulgaris	0.00	0.33	0.17	0.49	0.19	87.13
Semele (LPIL)	0.00	0.33	0.17	0.49	0.19	87.33
Gibberosus myersi	0.33	0.00	0.17	0.52	0.19	87.52
Cnidaria (LPIL)	0.17	0.33	0.17	0.53	0.19	87.71
Aricidea taylori	0.33	0.00	0.17	0.54	0.19	87.89
Tharyx acutus	0.00	1.33	0.17	0.44	0.19	88.08
Syllis gracilis	0.00	1.33	0.17	0.44	0.19	88.27
Dentatisyllis carolinae	0.00	1.33	0.17	0.44	0.19	88.46
Arabella mutans	0.00	1.33	0.17	0.44	0.19	88.64
Pisione remota	0.00	0.67	0.16	0.44	0.18	88.82
Ensis directus	0.00	0.67	0.16	0.44	0.18	89.00
Lucina (LPIL)	0.00	0.17	0.15	0.41	0.17	89.17
Kupellonura sp. B	0.00	0.83	0.15	0.81	0.17	89.35
Magelona (LPIL)	0.33	0.00	0.15	0.36	0.17	89.51
Bemlos brunneomaculatus	0.17	0.67	0.15	0.60	0.17	89.68
Amphiuridae (LPIL)	0.00	0.83	0.14	0.61	0.16	89.84
Exogone atlantica	0.17	0.50	0.14	0.68	0.15	89.99
Scoletoma (LPIL)	0.33	0.17	0.14	0.49	0.15	90.15

Appendix II. Taxa listing for the Fernandina ODMDS stations, 2005.

Client: EPA
Project Date: 08/01/2005
Project: EPA Fernandina ODMDS
Total Number of Taxa: 255

- ANNELIDA
  - CLASS OLIGOCHAETA
    - Order TUBIFICIDA
      - FAMILY ENCHYTRAEIDAE
        - Enchytraeidae (LPIL)
      - FAMILY TUBIFICIDAE
        - Tubificidae (LPIL)
  - CLASS POLYCHAETA
    - Order ARCHIANNELIDA
      - FAMILY POLYGORDIIDAE
        - Polygordius (LPIL)
      - FAMILY SACCOCIRRIDAE
        - Saccocirrus sp. A
    - Order CAPITELLIDA
      - FAMILY CAPITELLIDAE
        - Capitellidae (LPIL)
        - Heteromastus filiformis
        - Mediomastus (LPIL)
        - Mediomastus californiensis
      - FAMILY MALDANIDAE
        - Maldanidae (LPIL)
        - Axiothella (LPIL)
        - Sabaco americanus
    - Order EUNICIDA
      - FAMILY DORVILLEIDAE
        - Schistomeringos pectinata
        - Schistomeringos rudolphi
      - FAMILY EUNICIDAE
        - Eunicidae (LPIL)
        - Eunice (LPIL)
      - FAMILY LUMBRINERIDAE
        - Lumbrineridae (LPIL)
        - Lumbrinerides acuta
        - Lumbrineris (LPIL)
        - Lumbrineris latreilli
        - Scoletoma (LPIL)
      - FAMILY OENONIDAE
        - Arabella multidentata
        - Arabella mutans
      - FAMILY ONUPHIDAE
        - Onuphidae (LPIL)
        - Diopatra cuprea
        - Mooreonuphis pallidula
        - Onuphis eremita oculata

- Order OPHELIIDA
  - FAMILY OPHELIIDAE
    - Armandia agilis
    - Armandia maculata
- Order ORBINIIDA
  - FAMILY ORBINIIDAE
    - Leitoscoloplos (LPIL)
    - Scoloplos rubra
  - FAMILY PARAONIDAE
    - Aricidea (LPIL)
    - Aricidea catherinae
    - Aricidea minuta
    - Aricidea taylori
    - Aricidea wassi
    - Cirrophorus (LPIL)
    - Cirrophorus ilvana
    - Levinsenia gracilis
- Order OWENIIDA
  - FAMILY OWENIIDAE
    - Owenia fusiformis
- Order PHYLLODOCIDA
  - FAMILY CHRYSOPETALIDAE
    - Bhawania heteroseta
    - Paleanotus sp. A
  - FAMILY GLYCERIDAE
    - Glyceridae (LPIL)
    - Glycera (LPIL)
    - Glycera americana
    - Glycera dibranchiata
  - FAMILY GONIADIDAE
    - Goniada (LPIL)
    - Goniada littorea
    - Goniadides carolinae
  - FAMILY HESIONIDAE
    - Hesionidae (LPIL)
    - Podarke obscura
  - FAMILY NEPHTYIDAE
    - Nephtyidae (LPIL)
    - Aglaophamus verrilli
    - Nephtys (LPIL)
    - Nephtys picta
    - Nephtys simoni
  - FAMILY NEREIDAE
    - Nereididae (LPIL)
    - Ceratocephale oculata
    - Nereis succinea
  - FAMILY PHYLLODOCIDAE
    - Phyllodocidae (LPIL)
    - Eumida sanguinea
    - Paranaitis speciosa
    - Phyllodoce (LPIL)

- FAMILY PILARGIIDAE
  - Litocorsa antennata
  - Sigambra tentaculata
  - Synelmis ewingi
- FAMILY PISIONIDAE
  - Pisione remota
- FAMILY POLYNOIDAE
  - Polynoidae (LPIL)
  - Lepidonotus sp. A
- FAMILY SIGALIONIDAE
  - Psammolyce arenosa
  - Sthenelais sp. A
- FAMILY SYLLIDAE
  - Syllidae (LPIL)
  - Autolytus (LPIL)
  - Brania wellfleetensis
  - Dentatisyllis carolinae
  - Ehlersia ferrugina
  - Exogone (LPIL)
  - Exogone atlantica
  - Exogone lourei
  - Odontosyllis enopla
  - Opisthodonta sp. B
  - Parapionosyllis longicirrata
  - Pionosyllis gesae
  - Syllis cornuta
  - Syllis gracilis

Order SABELLIDA
- FAMILY SABELLIDAE
  - Sabellidae (LPIL)
  - Chone (LPIL)
  - Fabricinuda trilobata
- FAMILY SERPULIDAE
  - Filogranula sp. A

Order SPIONIDA
- FAMILY CHAETOPTERIDAE
  - Mesochaetopterus (LPIL)
  - Spiochaetopterus oculatus
- FAMILY CIRRATULIDAE
  - Cirratulidae (LPIL)
  - Tharyx acutus
- FAMILY MAGELONIDAE
  - Magelona (LPIL)
  - Magelona papillicornis
  - Magelona pettiboneae
  - Magelona sp. H
- FAMILY SPIONIDAE
  - Spionidae (LPIL)
  - Aonides mayaguezensis
  - Apoprionospio pygmaea
  - Dipolydora socialis
  - Dispio uncinata
  - Laonice cirrata

- Paraprionospio pinnata
- Prionospio (LPIL)
- Prionospio cristata
- Spio pettiboneae
- Spiophanes bombyx
- Spiophanes missionensis

Order TEREBELLIDA

FAMILY AMPHARETIDAE

- Ampharetidae (LPIL)
- Melinna maculata

FAMILY PECTINARIIDAE

- Pectinaria gouldii

FAMILY SABELLARIIDAE

- Sabellaria sp. A
- Sabellaria vulgaris

FAMILY TEREBELLIDAE

- Terebellidae (LPIL)
- Pista palmata
- Polycirrus (LPIL)
- Polycirrus eximius

ARTHROPODA

CLASS MALACOSTRACA

Order AMPHIPODA

FAMILY AMPELISCIDAE

- Ampelisca (LPIL)
- Ampelisca agassizi
- Ampelisca parapacifica
- Ampelisca vadorum

FAMILY AORIDAE

- Aoridae (LPIL)
- Acuminodeutopus naglei
- Bemlos brunneomaculatus
- Globosolembos smithi
- Rildardanus laminosa

FAMILY BATEIDAE

- Batea catharinensis

FAMILY COROPHIIDAE

- Apocorophium simile

FAMILY HAUSTORIIDAE

- Protohaustorius sp. B

FAMILY ISAEIDAE

- Photis (LPIL)

FAMILY LILJEBORGIIDAE

- Liljeborgia sp. A

FAMILY MELITIDAE

- Melitidae (LPIL)
- Dulichiella sp. A
- Maera (LPIL)
- Maera sp. D
- Protohadzia schoenerae

FAMILY MELPHIDIPPIDAE

- Gibberosus myersi

- FAMILY NEOMEGAMPHOPIDAE
  - Neomegamphopus (LPIL)
  - Neomegamphopus kalanii
- FAMILY OEDICEROTIDAE
  - Americhelidium americanum
- FAMILY PHOXOCEPHALIDAE
  - Metharpinia floridana
- FAMILY PLATYISCHNOPIDAE
  - Eudevenopus honduranus
- FAMILY SYNOPIIDAE
  - Metatiron triocellatus
  - Metatiron tropakis

Order CUMACEA
- FAMILY BODOTRIIDAE
  - Cyclaspis varians
- FAMILY DIASTYLIDAE
  - Oxyurostylis (LPIL)

Order DECAPODA
- Decapoda (LPIL)
- FAMILY ALBUNEIDAE
  - Albunea paretii
- FAMILY ALPHEIDAE
  - Automate (LPIL)
- FAMILY CALAPPIDAE
  - Hepatus (LPIL)
- FAMILY GONEPLACIDAE
  - Goneplacidae (LPIL)
  - Panoplax depressa
- FAMILY HIPPOLYTIDAE
  - Latreutes parvulus
- FAMILY LEUCOSIIDAE
  - Ebalia stimpsonii
- FAMILY PAGURIDAE
  - Paguridae (LPIL)
- FAMILY PARTHENOPIDAE
  - Heterocrypta granulata
- FAMILY PASIPHAEIDAE
  - Leptochela serratorbita
- FAMILY PINNOTHERIDAE
  - Pinnotheridae (LPIL)
  - Pinnixa (LPIL)
  - Pinnotheres (LPIL)
- FAMILY PORCELLANIDAE
  - Euceramus praelongus
- FAMILY PORTUNIDAE
  - Portunus gibbesii
- FAMILY PROCESSIDAE
  - Processa (LPIL)
  - Processa hemphilli
- FAMILY UPOGEBIIDAE
  - Upogebia (LPIL)
  - Upogebia affinis

- FAMILY XANTHIDAE
  - Xanthidae (LPIL)
  - Eurypanopeus depressus
- Order ISOPODA
  - FAMILY ANTHURIDAE
    - Amakusanthura magnifica
    - Apanthura cracenta
    - Mesanthura (LPIL)
  - FAMILY HYSSURIDAE
    - Kupellonura sp. B
- Order MYSIDACEA
  - FAMILY MYSIDAE
    - Bowmaniella (LPIL)
    - Heteromysis (LPIL)
- Order TANAIDACEA
  - FAMILY APSEUDIDAE
    - Apseudes sp. A
  - FAMILY KALLIAPSEUDIDAE
    - Kalliapseudes macsweenyi
  - FAMILY NOTOTANAIDAE
    - Tanaissus sp. A

- CLASS OSTRACODA
  - Order MYODOCOPINA
    - FAMILY CYLINDROLEBERIDIDAE
      - Asteropterygion oculitristis
      - Synasterope setisparsa
    - FAMILY SARSIELLIDAE
      - Eusarsiella cresseyi
      - Eusarsiella sp. L
      - Eusarsiella spinosa

BRACHIOPODA
- Brachiopoda (LPIL)

CHORDATA
- CLASS LEPTOCARDIA
  - Order AMPHIOXI
    - FAMILY BRANCHIOSTOMIDAE
      - Branchiostoma (LPIL)

CNIDARIA
- Cnidaria (LPIL)

ECHINODERMATA
- CLASS ASTEROIDEA
  - Asteroidea (LPIL)

- CLASS HOLOTHUROIDEA
  - Order APODIDA
    - FAMILY SYNAPTIDAE
      - Leptosynapta (LPIL)

- CLASS OPHIUROIDEA
  - Ophiuroidea (LPIL)
  - Order OPHIURIDA
    - FAMILY AMPHIURIDAE
      - Amphiuridae (LPIL)

- MOLLUSCA
  - CLASS BIVALVIA
    - Bivalvia (LPIL)
    - Order ARCOIDA
      - FAMILY ARCIDAE
        - Anadara transversa
    - Order MYOIDA
      - FAMILY CORBULIDAE
        - Corbula contracta
    - Order MYTILOIDA
      - FAMILY MYTILIDAE
        - Mytilidae (LPIL)
        - Lioberus castaneus
    - Order NUCULOIDA
      - FAMILY NUCULIDAE
        - Nucula aegeenis
    - Order OSTREOIDA
      - FAMILY ANOMIIDAE
        - Anomia simplex
      - FAMILY PECTINIDAE
        - Pectinidae (LPIL)
    - Order PTERIOIDA
      - FAMILY PINNIDAE
        - Pinnidae (LPIL)
    - Order VENEROIDA
      - FAMILY CARDITIDAE
        - Carditidae (LPIL)
        - Pleuromeris tridentata
      - FAMILY CRASSATELLIDAE
        - Crassinella lunulata
      - FAMILY LUCINIDAE
        - Lucinidae (LPIL)
        - Anodontia alba
        - Divaricella quadrisulcata
        - Lucina (LPIL)
        - Lucina multilineata
      - FAMILY MESODESMATIDAE
        - Ervilia concentrica
      - FAMILY MONTACUTIDAE
        - Montacutidae (LPIL)
        - Pythinella cuneata
      - FAMILY SEMELIDAE
        - Semele (LPIL)
      - FAMILY SOLENIDAE
        - Ensis directus
      - FAMILY TELLINIDAE
        - Tellinidae (LPIL)
        - Tellina (LPIL)
        - Tellina iris

- FAMILY UNGULINIDAE
  - Diplodonta (LPIL)
  - Diplodonta punctata
- FAMILY VENERIDAE
  - Veneridae (LPIL)
  - Gouldia cerina

CLASS GASTROPODA
- Order ARCHAEOGASTROPODA
  - FAMILY FISSURELLIDAE
    - Diodora (LPIL)
- Order CEPHALASPIDEA
  - FAMILY ACTEONIDAE
    - Rictaxis punctostriatus
  - FAMILY PHILINIDAE
    - Philine sagra
  - FAMILY SCAPHANDRIDAE
    - Scaphandridae (LPIL)
    - Acteocina bidentata
    - Acteocina candei
- Order MESOGASTROPODA
  - FAMILY CAECIDAE
    - Caecum floridanum
    - Caecum johnsoni
    - Caecum pulchellum
  - FAMILY CALYPTRAEIDAE
    - Calyptraea centralis
    - Crepidula plana
  - FAMILY EULIMIDAE
    - Eulimidae (LPIL)
    - Strombiformis (LPIL)
    - Strombiformis bilineatus
  - FAMILY NATICIDAE
    - Sigatica semisulcata
    - Tectonatica pusilla
  - FAMILY TORNIDAE
    - Macromphalina floridana
- Order NEOGASTROPODA
  - FAMILY COLUMBELLIDAE
    - Mitrella lunata
  - FAMILY MURICIDAE
    - Muricidae (LPIL)
  - FAMILY TURRIDAE
    - Turridae (LPIL)
    - Kurtziella rubella
- Order PYRAMIDELLOIDA
  - FAMILY PYRAMIDELLIDAE
    - Odostomia (LPIL)
    - Turbonilla (LPIL)

CLASS POLYPLACOPHORA
- Polyplacophora (LPIL)

- CLASS SCAPHOPODA
  - Order DENTALIIDA
    - FAMILY DENTALIIDAE
      - Antalis (LPIL)
      - Dentalium laqueatum

- PHORONIDA
  - FAMILY PHORONIDAE
    - Phoronis (LPIL)

- PLATYHELMINTHES
  - CLASS TURBELLARIA
    - Turbellaria (LPIL)

- RHYNCHOCOELA
  - Rhynchocoela (LPIL)

- CLASS ANOPLA
  - Order HETERONEMERTEA
    - FAMILY LINEIDAE
      - Lineidae (LPIL)
  - Order PALEONEMERTEA
    - FAMILY TUBULANIDAE
      - Tubulanus (LPIL)

- SIPUNCULA
  - Sipuncula (LPIL)
  - FAMILY ASPIDOSIPHONIDAE
    - Aspidosiphon (LPIL)
    - Aspidosiphon albus
    - Aspidosiphon gosnoldi
  - FAMILY GOLFINGIIDAE
    - Golfingia (LPIL)
    - Phascolion strombi