

Chesapeake Bay Benthic Community Assessment, August-September 1999

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Silver Spring, Maryland 20910

PREPARED BY:

Barry A. Vittor & Associates, Inc.
8060 Cottage Hill Rd.
Mobile, Alabama 36695
(334) 633-6100

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LIST OF TABLES

- Table 1. Location and chemical data for the NOAA Chesapeake Bay stations, August – September 1999.
- Table 2. Sediment data for the NOAA Chesapeake Bay stations, August – September 1999.
- Table 3. Distribution and abundance of benthic macroinfaunal taxa for the NOAA Chesapeake Bay stations, August – September 1999.
- Table 4. Summary of overall abundance of major benthic macroinfaunal taxonomic groups for the NOAA Chesapeake Bay stations, August – September 1999.
- Table 5. Summary of abundance of major benthic taxonomic groups by station for the NOAA Chesapeake Bay stations, August – September 1999.
- Table 6. Percentage abundance of dominant benthic macroinfaunal taxa (>10% of total) for the NOAA Chesapeake Bay stations, August – September 1999.
- Table 7. Summary of the benthic macroinfaunal data for the NOAA Chesapeake Bay stations, August – September 1999.
- Table 8. Strata summaries of the benthic macroinfaunal data for the NOAA Chesapeake Bay stations, August – September 1999.

LIST OF FIGURES

- Figure 1. Locations for the NOAA Chesapeake Bay strata and stations, August-September 1999.
- Figure 2. Sediment composition for the NOAA Chesapeake Bay stations, August-September 1999.
- Figure 3. Percent gravel+sand and percent silt+clay content of the sediments for the NOAA Chesapeake Bay stations, August-September 1999.
- Figure 4. Spatial distribution of sediments for the NOAA Chesapeake Bay stations, August-September 1999.
- Figure 5. Percent total organic carbon (TOC) content of the sediments for the NOAA Chesapeake Bay stations, August-September 1999.
- Figure 6. Spatial distribution of sediment total organic carbon (TOC) for the NOAA Chesapeake Bay stations, August-September 1999.
- Figure 7. Percent abundance of major taxonomic groups for the NOAA Chesapeake Bay stations, August-September 1999.
- Figure 8. Spatial distribution of macroinvertebrate densities for the NOAA Chesapeake Bay stations, August-September 1999.
- Figure 9. Spatial distribution of taxa richness for the NOAA Chesapeake Bay stations, August-September 1999.
- Figure 10. Macroinvertebrate densities for the NOAA Chesapeake Bay strata, August-September 1999.
- Figure 11. Macroinvertebrate taxa richness for the NOAA Chesapeake Bay strata, August-September 1999.
- Figure 12. Taxa diversity (H') for the NOAA Chesapeake Bay strata, August-September 1999.
- Figure 13. Taxa evenness (J') for the NOAA Chesapeake Bay strata, August-September 1999.

Figure 14. Spatial distribution of taxa diversity (H') for the NOAA Chesapeake Bay stations, August-September 1999.

INTRODUCTION

The Chesapeake Bay region was sampled during August and September, 1999. One aspect of this evaluation was benthic community characterization, which was accomplished via sample collection by National Oceanic and Atmospheric Administration (NOAA) personnel and laboratory and data analysis by Barry A. Vittor & Associates, Inc. (BVA).

The Chesapeake Bay region and 1999 sampling stations are indicated in Figure 1.

METHODS

Sample Collection and Handling

A Young dredge (area = 0.04 m²) was used to collect bottom samples at each of 69 stations located in 23 strata in Chesapeake Bay (Figure 1, Table 1). Macroinfaunal samples were sieved through a 0.5-mm mesh screen and preserved with 10% formalin on ship. Macroinfaunal samples were transported to the BVA laboratory in Mobile, Alabama.

Sediment Analysis

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

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 labelled 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 Chesapeake Bay 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 site and strata. These data were reduced to a data summary report for each site, which included a taxonomic species list and benthic community parameters information. Archive data files of species identification and enumeration were prepared.

The QA and QC reports for the Chesapeake Bay samples are given in the Appendix.

The analytical methodologies utilized for this study were similar to those used in similar benthic community characterization reports prepared for other state and federal agency surveys. Macroinfaunal characterization involves an evaluation of several biological community structure parameters (*e.g.*, species abundance, species composition and species diversity indices) during initial data reduction, followed by pattern and classification analysis for delineation of taxa assemblages. Since species are distributed along environmental gradients, there are generally no distinct boundaries between communities. However, the relationships between habitats and species assemblages often reflect the interactions of physical and biological factors and indicate major ecological trends.

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 site and the total number of individuals per square meter (= density). Taxa

richness is reported as the total number and mean number of taxa represented in a given site collection.

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

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

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

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

p_i = is 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 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 69 stations are given in Table 2 and Figures 2, 3, 4, 5 and 6. Sediment composition at the 69 stations varied considerably from > 99% gravel+sand at stations 66, 72, 74, 80, 86, 87, 96, 102-107, 111, 113, 114, and 116 to > 90% silt+clay at stations 81, 84, 97, 112, 115, 118, 120, 124, 125, 128, and 130 (Table 2; Figures 2 and 3). The spatial distribution of sediments at the Chesapeake Bay stations is given in Figure 4. The total organic carbon (TOC) fraction of the sediment ranged from 0.01% at station 64 to 4.35% at station 93 (Table 2; Figure 5). The spatial distribution of sediment percent TOC is given in Figure 6.

BENTHIC COMMUNITY CHARACTERIZATION

Faunal Composition, Abundance, and Community Structure

Table 3 provides a complete phylogenetic listing for all sites as well as data on taxa abundance and site occurrence. Microsoft™ Excel 5.0 spreadsheets are being provided separately to NOAA which include: raw data on taxa abundance and density by site, a complete taxonomic listing with site 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 site.

A total of 7,963 organisms, representing 115 taxa, were identified from the 69 stations (Table 4). Bivalves were the most numerous organisms present representing 44.2% of the total assemblage, followed in abundance by gastropods (26.6%) and polychaetes (17.2%). Polychaetes represented 38.3% of the total number of taxa followed by malacostracans (22.6%), bivalves (13.0%), and gastropods (8.7%)(Table 4).

The abundance of major taxonomic groups by station is given in Table 5. The number of taxa per site ranged from 0 at stations 67 and 68 to 28 at station 105. The number of organisms per site ranged from 0 at stations 67 and 68 to 4408 at station 90. The percent abundance of annelids, molluscs and arthropods at the 69 stations is given in Figure 7.

The dominant taxon collected from the samples was the bivalve, *Gemma gemma*, representing 42.7% of the total assemblage (Table 3). The gastropods, *Odostomia* (LPIL) and *Acteocina canaliculata*, were also abundant representing 16.1% and 10.1% of the total assemblage, respectively. The polychaetes, *Nereis succinea*, *Glycinde solitaria*, and *Paraprionospio pinnata*, and the gastropod, *A. canaliculata* were the most widely distributed taxa being found at 67%, 62%, 61% and 61% of the sites, respectively (Table 3). The distribution of taxa representing > 10% of the total assemblage at each station is given in Table 6.

Station density and taxa richness data are given in Table 7 and Figures 8 and 9. Density per station exhibited considerable variation and ranged from 0 organisms·m⁻² at stations 67 and 68 to 110,200 organisms·m⁻² at station 90 (Table 7; Figure 8). Taxa richness also varied and ranged from 0 at stations 67 and 68 to 28 at station 105 (Table 7; Figure 9). Strata density and taxa richness data are given in Table 8 and Figures 10 and 11. Strata densities varied from 125.0 (SD = 90.1) organisms·m⁻² at station 27 to 36,816.7 (SD = 63,551.9) organisms·m⁻² at strata 26 (Table 8; Figure 10). Strata taxa richness varied from 3.3 (SD = 2.5) taxa per station to 22.3 (SD = 6.7) taxa per station (Table 8; Figure 11).

Strata taxa diversity and evenness are given in Table 8 and Figures 12 and 13. Taxa diversity (H') exhibited considerable variation and ranged from 0 at stations 67, 68, 84, and 92 to 2.83 at station 105 (Table 8; Figure 12). Taxa evenness (J) also exhibited considerable variation and ranged from 0 at stations 67, 68, 84, and 92 to 1.00.97 at station 77 (Table 8; Figure 13). The spatial distribution of taxa diversity for the Chesapeake Bay stations is given in Table 7 and Figure 14.

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. Location and chemical data for the NOAA Chesapeake Bay stations, August-September 1999.

Station	Date	Latitude	Longitude	Station Depth (ft)	Sample Location	Temp. (°C)	Salinity (ppt)	Dissolved Oxygen (mg/l)
64	8/23/99	38°31.3750	76°30.2379	25.0	bottom	27.00	17.10	–
65	8/26/99	38°17.3500	76°21.6300	27.1	surface	26.40	17.90	17.90
66	8/26/99	38°02.6133	76°18.7185	14.9	bottom	26.55	18.35	5.21
67	8/23/99	38°33.9477	76°26.9370	43.0	bottom	26.70	17.40	–
68	8/23/99	38°28.5617	76°23.9680	64.0	bottom	26.60	17.20	5.64
69	8/26/99	38°16.9000	76°21.2300	35.5	surface	26.40	18.10	4.55
70	9/21/99	38°32.7550	76°18.7000	21.9	–	–	–	–
71	9/21/99	38°26.8730	76°21.1700	72.2	–	–	–	–
72	9/21/99	38°21.9200	76°18.4170	20.0	–	–	–	–
73	8/24/99	38°29.8896	76°40.0061	17.5	bottom	26.75	14.95	4.71
74	8/24/99	38°26.0050	76°36.4205	8.2	bottom	26.70	16.00	5.27
75	8/25/99	38°24.5311	76°35.2882	21.0	bottom	27.10	16.25	4.41
76	8/24/99	38°23.8331	76°32.9601	31.4	bottom	27.00	16.40	5.14
77	8/24/99	38°21.8023	76°30.0752	40.2	bottom	27.25	16.95	4.28
78	8/24/99	38°21.1971	76°29.9077	12.2	bottom	27.35	16.90	4.92
79	8/25/99	38°19.4954	76°27.1288	17.8	bottom	26.85	17.30	4.74
80	8/25/99	38°19.0676	76°28.5181	15.8	bottom	26.90	17.20	–
81	8/25/99	38°17.3194	76°27.0197	16.2	bottom	26.60	17.20	4.45
82	9/4/99	38°17.0647	76°54.9485	16.7	bottom	23.50	14.50	5.99
83	9/6/99	38°12.3585	76°47.9626	30.2	–	–	–	–
84	9/4/99	38°13.7186	76°50.8428	24.6	bottom	23.45	11.15	5.91
85	9/4/99	38°20.1116	77°00.1035	11.1	bottom	23.55	12.50	6.36
86	9/6/99	38°10.3231	76°45.2543	11.1	bottom	23.80	15.70	6.71
87	9/6/99	38°10.1321	76°46.2627	9.5	bottom	23.95	15.25	6.72
88	8/27/99	38°09.2901	76°33.5838	40.2	surface	26.30	16.50	5.03
89	9/6/99	38°06.7610	76°24.5927	17.3	bottom	24.80	18.60	6.11
90	8/26/99	38°03.4897	76°21.6779	8.9	bottom	26.80	18.10	5.56
91	9/6/99	38°10.4446	76°36.9312	37.6	bottom	24.30	17.95	5.56
92	9/6/99	37°59.7207	76°20.3687	43.6	bottom	24.00	18.30	6.14
93	9/6/99	38°01.3092	76°25.0435	36.3	bottom	23.75	17.90	6.28
94	8/27/99	38°09.0256	76°38.9069	17.9	bottom	26.65	16.00	4.13
95	8/27/99	38°07.8313	76°38.5144	12.5	bottom	26.50	16.00	3.56
96	9/6/99	38°00.1550	76°26.2138	19.3	bottom	23.75	17.95	5.97
97	9/6/99	37°57.8821	76°14.7025	41.3	surface	24.10	18.40	6.62
98	9/8/99	37°43.6076	76°03.7970	32.4	bottom	24.35	23.30	6.86
99	9/6/99	37°41.1531	76°10.4143	61.2	bottom	24.30	21.00	6.26
100	9/13/99	38°07.5464	76°06.1639	5.0	bottom	24.75	20.00	6.10
101	9/13/99	38°02.4722	76°03.7270	18.3	bottom	24.55	21.00	5.68
102	9/8/99	37°48.9314	76°04.4377	33.0	bottom	24.15	20.70	6.05
103	9/8/99	37°55.0117	76°08.3370	59.9	surface	24.20	18.80	6.50
104	9/8/99	37°47.8262	76°09.4200	32.2	bottom	24.05	20.55	5.86
105	9/8/99	37°44.4978	76°07.4455	30.2	bottom	24.15	22.10	6.30
106	9/7/99	37°53.6297	76°12.9242	16.1	bottom	24.20	20.10	5.85
107	9/8/99	37°48.3990	76°16.2080	11.3	bottom	25.45	20.30	7.08
108	9/8/99	37°42.4952	76°14.9123	18.3	bottom	24.65	21.60	6.54

Table 1 continued:

Station	Date	Latitude	Longitude	Station Depth (ft)	Sample Location	Temp. (°C)	Salinity (ppt)	Dissolved Oxygen (mg/l)
109	9/21/99	38°15.3620	76°08.9170	11.9	–	–	–	–
110	9/10/99	37°53.8962	75°58.2040	19.1	bottom	24.40	22.50	5.13
111	9/10/99	37°52.2752	75°57.5696	14.5	bottom	24.55	22.55	5.72
112	9/10/99	37°56.5377	75°56.4593	60.1	bottom	24.45	22.55	5.41
113	9/11/99	37°54.3032	75°56.1381	13.9	bottom	24.40	23.20	5.13
114	9/12/99	37°57.2062	75°55.4004	25.2	bottom	24.40	23.15	5.30
115	9/14/99	38°10.0591	75°57.6323	14.3	bottom	24.80	20.45	5.63
116	9/13/99	38°03.5107	75°55.5738	15.1	bottom	24.70	21.25	5.76
117	9/10/99	37°50.9177	75°54.1482	11.3	bottom	25.00	24.60	5.19
118	9/14/99	38°19.9704	75°54.1710	5.6	bottom	24.60	14.80	6.09
119	9/14/99	38°16.7426	75°55.8369	12.2	bottom	24.45	16.85	6.02
120	9/15/99	38°16.4000	75°55.5523	26.3	bottom	24.60	17.15	5.95
121	9/16/99	38°13.5328	85°53.1483	5.5	bottom	24.55	17.20	6.93
122	9/17/99	38°13.3654	75°50.4120	6.0	bottom	24.05	16.50	4.26
123	9/18/99	38°12.4966	75°51.6381	6.0	bottom	24.15	17.10	5.59
124	9/21/99	38°08.2190	75°49.1090	13.3	–	–	–	–
125	9/22/99	38°07.7250	75°54.241	11.2	–	–	–	–
126	9/23/99	38°07.0540	75°55.743	7.9	–	–	–	–
127	9/13/99	38°03.6732	75°48.3874	6.0	bottom	24.95	20.10	5.16
128	9/13/99	38°02.5575	75°50.9013	16.6	bottom	24.90	21.10	5.59
129	9/13/99	38°01.8037	75°50.5722	8.7	bottom	24.95	20.85	5.76
130	9/9/99	37°57.0447	75°43.2347	12.4	bottom	26.30	21.10	5.35
131	9/10/99	37°51.5311	75°44.4552	13.8	bottom	25.80	23.80	5.72
132	9/11/99	37°50.5524	75°48.6337	34.6	bottom	25.20	24.70	6.58

Table 2. Sediment data for the NOAA Chesapeake Bay stations, August-September 1999.

Station	T.O.C. (%)	% Gravel	% Sand	% Silt	% Clay	% Gravel + Sand	% Silt + Clay
64	0.01	0.00	79.55	8.66	11.79	79.55	20.45
65	0.00	0.04	94.96	0.00	0.00	95.00	0.00
66	0.20	20.97	78.88	0.00	0.00	99.85	0.00
67	3.33	0.00	24.73	47.51	27.77	24.73	75.28
68	3.24	1.21	26.79	49.13	22.87	28.00	72.00
69	0.70	0.00	71.17	6.63	22.20	71.17	28.83
70	0.41	0.06	96.63	0.00	0.00	96.69	0.00
71	1.71	0.00	50.11	15.87	34.02	50.11	49.89
72	0.29	0.60	99.09	0.00	0.00	99.69	0.00
73	2.61	0.00	12.38	34.64	52.98	12.38	87.62
74	0.54	25.92	73.50	0.00	0.00	99.42	0.00
75	2.98	0.00	20.22	29.17	50.61	20.22	79.78
76	3.18	0.00	29.21	38.95	31.84	29.21	70.79
77	3.89	0.00	19.67	36.68	43.64	19.67	80.32
78	1.30	0.00	71.41	7.00	21.59	71.41	28.59
79	1.53	0.44	66.96	9.18	23.41	67.40	32.59
80	0.72	0.00	99.41	0.00	0.00	99.41	0.00
81	2.77	0.00	9.42	46.84	43.74	9.42	90.58
82	1.28	0.00	51.26	19.44	29.30	51.26	48.74
83	3.70	0.00	22.82	28.34	48.83	22.82	77.17
84	3.71	0.00	7.39	53.44	39.17	7.39	92.61
85	2.75	0.31	48.36	24.16	27.16	48.67	51.32
86	0.78	1.23	98.04	0.00	0.00	99.27	0.00
87	0.78	1.84	97.24	0.00	0.00	99.08	0.00
88	3.02	0.00	43.97	25.44	30.60	43.97	56.04
89	0.00	0.10	94.95	0.00	0.00	95.05	0.00
90	1.33	3.98	93.89	0.00	0.00	97.87	0.00
91	0.00	1.29	12.45	43.80	42.46	13.74	86.26
92	4.03	0.00	18.10	37.10	44.81	18.10	81.91
93	4.35	0.00	10.53	32.40	57.07	10.53	89.47
94	2.79	0.00	37.96	31.57	30.46	37.96	62.03
95	0.00	0.00	34.99	35.61	29.40	34.99	65.01
96	0.21	0.98	98.32	0.00	0.00	99.30	0.00
97	2.55	0.00	7.10	50.62	42.28	7.10	92.90
98	0.27	0.00	97.89	0.00	0.00	97.89	0.00
99	0.81	0.00	57.07	20.46	22.47	57.07	42.93
100	0.12	0.00	97.21	0.00	0.00	97.21	0.00
101	0.27	1.12	96.37	0.00	0.00	97.49	0.00
102	0.17	0.00	99.13	0.00	0.00	99.13	0.00
103	0.21	0.00	99.53	0.00	0.00	99.53	0.00
104	0.06	0.00	99.85	0.00	0.00	99.85	0.00
105	0.16	0.00	99.84	0.00	0.00	99.84	0.00
106	0.16	0.25	99.69	0.00	0.00	99.94	0.00
107	0.15	18.50	80.91	0.00	0.00	99.41	0.00
108	0.00	8.30	90.46	0.00	0.00	98.76	0.00
109	0.34	0.00	73.10	8.50	18.41	73.10	26.91
110	0.11	5.18	92.61	0.00	0.00	97.79	0.00
111	0.06	1.72	98.09	0.00	0.00	99.81	0.00
112	2.04	0.00	8.38	53.43	38.18	8.38	91.61
113	0.09	0.00	99.58	0.00	0.00	99.58	0.00
114	0.15	0.00	99.78	0.00	0.00	99.78	0.00

Table 2 continued:

Station	T.O.C. (%)	% Gravel	% Sand	% Silt	% Clay	% Gravel + Sand	% Silt + Clay
115	2.51	0.00	9.66	52.08	38.26	9.66	90.34
116	0.09	3.11	96.53	0.00	0.00	99.64	0.00
117	0.10	0.00	98.95	0.00	0.00	98.95	0.00
118	2.82	0.00	8.97	55.41	35.62	8.97	91.03
119	1.95	0.15	22.44	44.63	32.78	22.59	77.41
120	2.40	0.00	2.95	60.62	36.43	2.95	97.05
121	0.31	0.00	95.55	0.00	0.00	95.55	0.00
122	1.74	0.00	51.13	17.85	31.01	51.13	48.86
123	0.48	0.29	97.08	0.00	0.00	97.37	0.00
124	2.79	0.00	8.84	55.73	35.42	8.84	91.15
125	2.02	0.00	9.27	53.96	36.77	9.27	90.73
126	0.66	0.03	95.61	0.00	0.00	95.64	0.00
127	0.44	1.68	96.97	0.00	0.00	98.65	0.00
128	2.55	0.00	8.71	51.20	40.09	8.71	91.29
129	2.74	0.00	12.58	51.56	35.86	12.58	87.42
130	1.98	0.00	7.72	61.85	30.44	7.72	92.29
131	2.08	0.00	22.33	44.34	33.33	22.33	77.67
132	1.81	0.00	12.74	40.28	46.98	0.00	87.26

Table 3. Distribution and abundance of benthic macroinfaunal taxa for the NOAA Chesapeake Bay stations, August-September 1999.

Taxa	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Gemma gemma</i>	Mol	Biva	3396	42.65	42.65	12	17
<i>Odostomia</i> (LPIL)	Mol	Gast	1278	16.05	58.70	6	9
<i>Acteocina canaliculata</i>	Mol	Gast	802	10.07	68.77	42	61
<i>Paraprionospio pinnata</i>	Ann	Poly	267	3.35	72.12	42	61
<i>Mediomastus</i> (LPIL)	Ann	Poly	219	2.75	74.87	33	48
<i>Glycinde solitaria</i>	Ann	Poly	202	2.54	77.41	43	62
<i>Nereis succinea</i>	Ann	Poly	179	2.25	79.66	46	67
Tubificidae (LPIL)	Ann	Olig	153	1.92	81.58	23	33
Rhynchocoela (LPIL)	Rhy	-	92	1.16	82.73	28	41
<i>Branchiostoma</i> (LPIL)	Cho	Lept	89	1.12	83.85	9	13
<i>Acanthohaustorius millsi</i>	Art	Mala	73	0.92	84.77	4	6
<i>Oligochaeta</i> (LPIL)	Ann	Olig	71	0.89	85.66	1	1
<i>Loimia medusa</i>	Ann	Poly	66	0.83	86.49	20	29
<i>Tubificoides heterochaetus</i>	Ann	Olig	65	0.82	87.30	10	14
<i>Sphaeroma quadridentata</i>	Art	Mala	60	0.75	88.06	3	4
Bivalvia (LPIL)	Mol	Biva	53	0.67	88.72	23	33
<i>Leitoscoloplos robustus</i>	Ann	Poly	42	0.53	89.25	22	32
<i>Leucon americanus</i>	Art	Mala	39	0.49	89.74	13	19
<i>Listriella barnardi</i>	Art	Mala	39	0.49	90.23	16	23
Phoronis (LPIL)	Pho	-	32	0.40	90.63	14	20
<i>Pectinaria gouldii</i>	Ann	Poly	31	0.39	91.02	11	16
<i>Edotia triloba</i>	Art	Mala	30	0.38	91.40	13	19
<i>Heteromastus filiformis</i>	Ann	Poly	30	0.38	91.77	16	23
<i>Streblospio benedicti</i>	Ann	Poly	29	0.36	92.14	11	16
<i>Bhawania heteroseta</i>	Ann	Poly	28	0.35	92.49	3	4
Turbellaria (LPIL)	Pla	Turb	26	0.33	92.82	17	25
Enchytraeidae (LPIL)	Ann	Olig	25	0.31	93.13	4	6
<i>Mulinia lateralis</i>	Mol	Biva	25	0.31	93.44	12	17
<i>Spiochaetopterus oculatus</i>	Ann	Poly	23	0.29	93.73	9	13
<i>Leitoscoloplos</i> (LPIL)	Ann	Poly	21	0.26	94.00	5	7
<i>Spiophanes bombyx</i>	Ann	Poly	21	0.26	94.26	7	10
Actiniaria (LPIL)	Cni	Anth	19	0.24	94.50	9	13
<i>Nereis</i> (LPIL)	Ann	Poly	18	0.23	94.73	5	7
<i>Podarkeopsis levifuscina</i>	Ann	Poly	18	0.23	94.95	12	17
Gastropoda (LPIL)	Mol	Gast	17	0.21	95.17	14	20
<i>Paramphinome</i> sp. B	Ann	Poly	17	0.21	95.38	6	9
<i>Notomastus latericeus</i>	Ann	Poly	16	0.20	95.58	3	4
<i>Cerapus tubularis</i>	Art	Mala	15	0.19	95.77	3	4
<i>Paraonis fulgens</i>	Ann	Poly	15	0.19	95.96	7	10
Lineidae (LPIL)	Rhy	Anop	14	0.18	96.13	11	16
<i>Mediomastus ambiseta</i>	Ann	Poly	14	0.18	96.31	7	10
<i>Macoma balthica</i>	Mol	Biva	13	0.16	96.47	4	6
<i>Hypereteone heteropoda</i>	Ann	Poly	12	0.15	96.62	9	13
<i>Ampelisca</i> (LPIL)	Art	Mala	11	0.14	96.76	8	12
Hesionidae (LPIL)	Ann	Poly	11	0.14	96.90	8	12
<i>Marenzelleria viridis</i>	Ann	Poly	11	0.14	97.04	4	6
<i>Sigambra tentaculata</i>	Ann	Poly	11	0.14	97.17	3	4
<i>Ampelisca verrilli</i>	Art	Mala	10	0.13	97.30	6	9
<i>Cyathura polita</i>	Art	Mala	10	0.13	97.43	3	4
<i>Eusarsiella zostericola</i>	Art	Ostr	10	0.13	97.55	4	6
<i>Ogyrides alphaerostris</i>	Art	Mala	10	0.13	97.68	4	6
<i>Turbonilla</i> (LPIL)	Mol	Gast	10	0.13	97.80	3	4
<i>Balanoglossus</i> (LPIL)	Hem	Ente	8	0.10	97.90	4	6
<i>Odostomia weberi</i>	Mol	Gast	8	0.10	98.00	4	6

Table 3 continued:

Taxa	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	% Station Occurrence
Spionidae (LPIL)	Ann	Poly	8	0.10	98.10	6	9
<i>Leptocheirus plumulosus</i>	Art	Mala	7	0.09	98.19	1	1
<i>Ampelisca abdita</i>	Art	Mala	6	0.08	98.27	4	6
<i>Brania wellfleetensis</i>	Ann	Poly	6	0.08	98.34	3	4
Capitellidae (LPIL)	Ann	Poly	6	0.08	98.42	5	7
<i>Lucina multilineata</i>	Mol	Biva	6	0.08	98.49	2	3
Nereidae (LPIL)	Ann	Poly	6	0.08	98.57	6	9
Tellinidae (LPIL)	Mol	Biva	6	0.08	98.64	5	7
Terebellidae (LPIL)	Ann	Poly	6	0.08	98.72	4	6
<i>Glycera americana</i>	Ann	Poly	5	0.06	98.78	4	6
Mactridae (LPIL)	Mol	Biva	5	0.06	98.84	3	4
<i>Tubulanus</i> (LPIL)	Rhy	Anop	5	0.06	98.91	3	4
<i>Lepidonotus sublevis</i>	Ann	Poly	4	0.05	98.96	3	4
<i>Monticellina dorsobranchia</i>	Ann	Poly	4	0.05	99.01	3	4
<i>Pectinaria</i> (LPIL)	Ann	Poly	4	0.05	99.06	3	4
<i>Phyllodoce arenae</i>	Ann	Poly	4	0.05	99.11	3	4
<i>Ptilanthura tenuis</i>	Art	Mala	4	0.05	99.16	3	4
<i>Scoloplos rubra</i>	Ann	Poly	4	0.05	99.21	2	3
<i>Americamysis</i> (LPIL)	Art	Mala	3	0.04	99.25	3	4
Asciadiacea (LPIL)	Cho	Asci	3	0.04	99.28	1	1
<i>Cyclaspis varians</i>	Art	Mala	3	0.04	99.32	1	1
Lucinidae (LPIL)	Mol	Biva	3	0.04	99.36	2	3
Ophiuroidea (LPIL)	Ech	Ophi	3	0.04	99.40	2	3
<i>Podocopida</i> (LPIL)	Art	Ostr	3	0.04	99.43	3	4
<i>Cantharus cancellarius</i>	Mol	Gast	2	0.03	99.46	1	1
Chaetopteridae (LPIL)	Ann	Poly	2	0.03	99.49	2	3
<i>Cyathura burbancki</i>	Art	Mala	2	0.03	99.51	1	1
<i>Leptosynapta tenuis</i>	Ech	Holo	2	0.03	99.54	1	1
<i>Prionospio</i> (LPIL)	Ann	Poly	2	0.03	99.56	2	3
Pyramidellidae (LPIL)	Mol	Gast	2	0.03	99.59	2	3
<i>Rangia cuneata</i>	Mol	Biva	2	0.03	99.61	1	1
Veneridae (LPIL)	Mol	Biva	2	0.03	99.64	2	3
Aeginellidae (LPIL)	Art	Mala	1	0.01	99.65	1	1
<i>Americamysis almyra</i>	Art	Mala	1	0.01	99.66	1	1
<i>Ampelisca vadorum</i>	Art	Mala	1	0.01	99.67	1	1
Amphiuridae (LPIL)	Ech	Ophi	1	0.01	99.69	1	1
<i>Anadara transversa</i>	Mol	Biva	1	0.01	99.70	1	1
Aoridae (LPIL)	Art	Mala	1	0.01	99.71	1	1
<i>Chione cancellata</i>	Mol	Biva	1	0.01	99.72	1	1
<i>Cossura soyeri</i>	Ann	Poly	1	0.01	99.74	1	1
<i>Epitonium</i> (LPIL)	Mol	Gast	1	0.01	99.75	1	1
<i>Eusarsiella texana</i>	Art	Ostr	1	0.01	99.76	1	1
Goniadidae (LPIL)	Ann	Poly	1	0.01	99.77	1	1
<i>Ilyanassa trivittata</i>	Mol	Gast	1	0.01	99.79	1	1
<i>Mediomastus californiensis</i>	Ann	Poly	1	0.01	99.80	1	1
<i>Microprotopus raneyi</i>	Art	Mala	1	0.01	99.81	1	1
<i>Mya</i> (LPIL)	Mol	Biva	1	0.01	99.82	1	1
Mytilidae (LPIL)	Mol	Biva	1	0.01	99.84	1	1
Opheliidae (LPIL)	Ann	Poly	1	0.01	99.85	1	1
<i>Oxyurostylis smithi</i>	Art	Mala	1	0.01	99.86	1	1
<i>Parahaustorius holmesi</i>	Art	Mala	1	0.01	99.87	1	1
<i>Paramphinome</i> (LPIL)	Ann	Poly	1	0.01	99.89	1	1
<i>Parasterope pollex</i>	Art	Ostr	1	0.01	99.90	1	1
Phyllodocidae (LPIL)	Ann	Poly	1	0.01	99.91	1	1
Pilargiidae (LPIL)	Ann	Poly	1	0.01	99.92	1	1

Table 3 continued:

Taxa	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	% Station Occurrence
<i>Podarke obscura</i>	Ann	Poly	1	0.01	99.94	1	1
<i>Politolana polita</i>	Art	Mala	1	0.01	99.95	1	1
Scaphandridae (LPIL)	Mol	Gast	1	0.01	99.96	1	1
Sphaeromatidae (LPIL)	Art	Mala	1	0.01	99.97	1	1
<i>Tellina</i> (LPIL)	Mol	Biva	1	0.01	99.99	1	1
<i>Unciola</i> (LPIL)	Art	Mala	1	0.01	100.00	1	1

Taxa Key

Ann=Annelida	Cho=Chordata	Mol=Mollusca
Poly=Polychaeta	Asci=Ascidiacea	Biva=Bivalvia
Olig=Oligochaeta	Lept=Leptocardia	Gast=Gastropoda
Art=Arthropoda	Ech=Echinodermata	Pho=Phoronida
Mala=Malacostraca	Holo=Holothuroidea	Pla=Plathyhelminthes
Ostr=Ostracoda	Ophi=Ophiuroidea	Turb=Turbellaria
Cni=Cnideria	Hem=Hemichordata	Rhy=Rhynchocoela
Anth=Anthozoa	Ente=Enteropneusta	Anop=Anopla

Table 4. Summary of overall abundance of major benthic macroinfaunal taxonomic groups for the NOAA Chesapeake Bay stations, August-September 1999.

Taxa	Total No. Taxa	% of Total	Total No. Individuals	% of Total
Annelida				
Polychaeta	44	38.3	1,370	17.2
Oligochaeta	4	3.5	314	3.9
Mollusca				
Bivalvia	15	13.0	3,516	44.2
Gastropoda	10	8.7	2,122	26.6
Arthropoda				
Malacostraca	26	22.6	332	4.2
Ostracoda	4	3.5	15	0.2
Echinodermata				
Ophiuroidea	2	1.7	4	0.1
Holothuroidea	1	0.9	2	0.0
Other Taxa	9	7.8	288	3.6
Total	115		7,963	

Table 5. Summary of abundance of major benthic taxonomic groups by station for the NOAA Chesapeake Bay stations, August-September 1999.

Station	Taxa	No. of Taxa	% of Total	No. of Individuals	% of Total
64	Annelida	7	70.0	17	73.9
	Mollusca	2	20.0	5	21.7
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	10.0	1	4.3
	Total	10		23	
65	Annelida	3	60.0	12	27.2
	Mollusca	2	40.0	32	72.7
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	5		44	
66	Annelida	12	50.0	97	49.7
	Mollusca	5	20.8	40	20.5
	Arthropoda	2	8.3	27	13.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	5	20.8	31	15.8
	Total	24		195	
67	Annelida	0	0.0	0	0.0
	Mollusca	0	0.0	0	0.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	0		0	
68	Annelida	0	0.0	0	0.0
	Mollusca	0	0.0	0	0.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	0		0	
69	Annelida	11	84.6	44	77.1
	Mollusca	1	7.6	12	21.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	7.6	1	1.7
	Total	13		57	

Table 5 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals	% of Total
70	Annelida	9	56.2	34	24.4
	Mollusca	5	31.2	103	74.1
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	12.5	2	1.4
	Total	16		139	
71	Annelida	5	100.0	7	100.0
	Mollusca	0	0.0	0	0.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	5		7	
72	Annelida	11	47.8	50	39.3
	Mollusca	3	13.0	21	16.5
	Arthropoda	4	17.3	23	18.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	5	21.7	33	25.9
	Total	23		127	
73	Annelida	1	50.0	2	66.6
	Mollusca	1	50.0	1	33.3
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	2		3	
74	Annelida	6	42.8	19	38.0
	Mollusca	5	35.7	24	48.0
	Arthropoda	1	7.1	3	6.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	14.2	4	8.0
	Total	14		50	
75	Annelida	1	50.0	2	66.6
	Mollusca	1	50.0	1	33.3
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	2		3	
76	Annelida	2	50.0	6	66.6
	Mollusca	1	25.0	1	11.1
	Arthropoda	1	25.0	2	22.2
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	4		9	

Table 5 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals	% of Total
77	Annelida	3	60.0	4	66.6
	Mollusca	1	20.0	1	16.6
	Arthropoda	1	20.0	1	16.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	5		6	
78	Annelida	10	50.0	61	64.8
	Mollusca	3	15.0	3	3.1
	Arthropoda	4	20.0	23	24.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	15.0	7	7.4
	Total	20		94	
79	Annelida	7	87.5	14	87.5
	Mollusca	1	12.5	2	12.5
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	8		16	
80	Annelida	3	60.0	3	21.4
	Mollusca	1	20.0	8	57.1
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	20.0	3	21.4
	Total	5		14	
81	Annelida	4	80.0	8	53.3
	Mollusca	0	0.0	0	0.0
	Arthropoda	1	20.0	7	46.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	5		15	
82	Annelida	7	58.3	36	78.2
	Mollusca	3	25.0	7	15.2
	Arthropoda	1	8.3	1	2.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	8.3	2	4.3
	Total	12		46	
83	Annelida	4	80.0	6	85.7
	Mollusca	0	0.0	0	0.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	20.0	1	14.2
	Total	5		7	

Table 5 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals	% of Total
84	Annelida	1	100.0	2	100.0
	Mollusca	0	0.0	0	0.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	1		2	
85	Annelida	5	55.5	39	76.4
	Mollusca	2	22.2	8	15.6
	Arthropoda	1	11.1	3	5.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	11.1	1	1.9
	Total	9		51	
86	Annelida	4	66.6	8	72.7
	Mollusca	1	16.6	2	18.1
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	16.6	1	9.0
	Total	6		11	
87	Annelida	8	61.5	17	65.3
	Mollusca	3	23.0	6	23.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	15.3	3	11.5
	Total	13		26	
88	Annelida	0	0.0	0	0.0
	Mollusca	2	100.0	3	100.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	2		3	
89	Annelida	3	100.0	7	100.0
	Mollusca	0	0.0	0	0.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	3		7	
90	Annelida	6	66.6	52	1.1
	Mollusca	2	22.2	4,354	98.7
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	11.1	2	0.0
	Total	9		4,408	

Table 5 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals	% of Total
91	Annelida	4	66.6	6	66.6
	Mollusca	2	33.3	3	33.3
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	6		9	
92	Annelida	1	100.0	2	100.0
	Mollusca	0	0.0	0	0.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	1		2	
93	Annelida	3	100.0	4	100.0
	Mollusca	0	0.0	0	0.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	3		4	
94	Annelida	1	50.0	3	75.0
	Mollusca	1	50.0	1	25.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	2		4	
95	Annelida	4	66.6	12	85.7
	Mollusca	2	33.3	2	14.2
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	6		14	
96	Annelida	7	77.7	14	45.1
	Mollusca	1	11.1	16	51.6
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	11.1	1	3.2
	Total	9		31	
97	Annelida	5	83.3	12	92.3
	Mollusca	0	0.0	0	0.0
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	16.6	1	7.6
	Total	6		13	

Table 5 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals	% of Total
98	Annelida	10	45.4	25	39.6
	Mollusca	5	22.7	21	33.3
	Arthropoda	3	13.6	6	9.5
	Echinodermata	1	4.5	1	1.5
	Other Taxa	3	13.6	10	15.8
	Total	22			63
99	Annelida	13	76.4	70	92.1
	Mollusca	1	5.8	2	2.6
	Arthropoda	2	11.7	2	2.6
	Echinodermata	1	5.8	2	2.6
	Other Taxa	0	0.0	0	0.0
	Total	17			76
100	Annelida	4	44.4	16	6.9
	Mollusca	3	33.3	211	91.7
	Arthropoda	2	22.2	3	1.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	9			230
101	Annelida	10	52.6	35	25.3
	Mollusca	4	21.0	95	68.8
	Arthropoda	2	10.5	3	2.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	15.7	5	3.6
	Total	19			138
102	Annelida	5	55.5	11	19.6
	Mollusca	1	11.1	40	71.4
	Arthropoda	2	22.2	4	7.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	11.1	1	1.7
	Total	9			56
103	Annelida	8	53.3	24	68.5
	Mollusca	3	20.0	7	20.0
	Arthropoda	1	6.6	1	2.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	20.0	3	8.5
	Total	15			35
104	Annelida	12	50.0	22	30.1
	Mollusca	5	20.8	35	47.9
	Arthropoda	2	8.3	3	4.1
	Echinodermata	1	4.1	2	2.7
	Other Taxa	4	16.6	11	15.0
	Total	24			73

Table 5 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals	% of Total
105	Annelida	11	39.2	21	28.0
	Mollusca	5	17.8	26	34.6
	Arthropoda	6	21.4	12	16.0
	Echinodermata	1	3.5	1	1.3
	Other Taxa	5	17.8	15	20.0
	Total	28		75	
106	Annelida	1	20.0	2	2.9
	Mollusca	1	20.0	6	8.9
	Arthropoda	1	20.0	51	76.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	40.0	8	11.9
	Total	5		67	
107	Annelida	8	57.1	12	19.0
	Mollusca	2	14.2	5	7.9
	Arthropoda	2	14.2	33	52.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	14.2	13	20.6
	Total	14		63	
108	Annelida	9	56.2	90	62.0
	Mollusca	3	18.7	16	11.0
	Arthropoda	2	12.5	7	4.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	12.5	32	22.0
	Total	16		145	
109	Annelida	9	60.0	43	35.5
	Mollusca	3	20.0	67	55.3
	Arthropoda	0	0.0	0	0.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	20.0	11	9.0
	Total	15		121	
110	Annelida	11	52.3	41	62.1
	Mollusca	4	19.0	16	24.2
	Arthropoda	4	19.0	4	6.0
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	9.5	5	7.5
	Total	21		66	
111	Annelida	11	47.8	48	68.5
	Mollusca	5	21.7	13	18.5
	Arthropoda	3	13.0	3	4.2
	Echinodermata	0	0.0	0	0.0
	Other Taxa	4	17.3	6	8.5
	Total	23		70	

Table 5 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals	% of Total
112	Annelida	5	50.0	19	61.2
	Mollusca	1	10.0	5	16.1
	Arthropoda	3	30.0	6	19.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	10.0	1	3.2
	Total	10		31	
113	Annelida	6	35.2	19	55.8
	Mollusca	3	17.6	4	11.7
	Arthropoda	5	29.4	6	17.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	17.6	5	14.7
	Total	17		34	
114	Annelida	15	55.5	29	39.1
	Mollusca	3	11.1	12	16.2
	Arthropoda	5	18.5	14	18.9
	Echinodermata	0	0.0	0	0.0
	Other Taxa	4	14.8	19	25.6
	Total	27		74	
115	Annelida	10	71.4	51	87.9
	Mollusca	3	21.4	6	10.3
	Arthropoda	1	7.1	1	1.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	14		58	
116	Annelida	9	50.0	59	47.5
	Mollusca	2	11.1	39	31.4
	Arthropoda	5	27.7	17	13.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	11.1	9	7.2
	Total	18		124	
117	Annelida	10	58.8	30	68.1
	Mollusca	2	11.7	5	11.3
	Arthropoda	2	11.7	6	13.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	17.6	3	6.8
	Total	17		44	
118	Annelida	6	42.8	25	67.5
	Mollusca	4	28.5	6	16.2
	Arthropoda	3	21.4	4	10.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	7.1	2	5.4
	Total	14		37	

Table 5 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals	% of Total
119	Annelida	11	57.8	55	66.2
	Mollusca	3	15.7	10	12.0
	Arthropoda	4	21.0	17	20.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	5.2	1	1.2
	Total	19		83	
120	Annelida	2	40.0	4	19.0
	Mollusca	2	40.0	16	76.1
	Arthropoda	1	20.0	1	4.7
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	5		21	
121	Annelida	4	33.3	18	43.9
	Mollusca	4	33.3	17	41.4
	Arthropoda	3	25.0	3	7.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	8.3	3	7.3
	Total	12		41	
122	Annelida	8	53.3	15	57.6
	Mollusca	1	6.6	4	15.3
	Arthropoda	4	26.6	4	15.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	13.3	3	11.5
	Total	15		26	
123	Annelida	5	41.6	62	70.4
	Mollusca	5	41.6	24	27.2
	Arthropoda	2	16.6	2	2.2
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	12		88	
124	Annelida	4	36.3	6	20.6
	Mollusca	1	9	16	55.1
	Arthropoda	2	18.1	3	10.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	4	36.3	4	13.7
	Total	11		29	
125	Annelida	6	60.0	16	38.0
	Mollusca	2	20.0	24	57.1
	Arthropoda	1	10.0	1	2.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	10.0	1	2.3
	Total	10		42	

Table 5 continued:

Station	Taxa	No. of Taxa	% of Total	No. of Individuals	% of Total
126	Annelida	11	57.8	69	57.5
	Mollusca	1	5.2	34	28.3
	Arthropoda	5	26.3	13	10.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	10.5	4	3.3
	Total	19		120	
127	Annelida	8	47.0	31	25.2
	Mollusca	5	29.4	82	66.6
	Arthropoda	1	5.8	2	1.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	17.6	8	6.5
	Total	17		123	
128	Annelida	4	57.1	19	33.9
	Mollusca	1	14.2	34	60.7
	Arthropoda	2	28.5	3	5.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	7		56	
129	Annelida	7	53.8	34	70.8
	Mollusca	3	23.0	6	12.5
	Arthropoda	3	23.0	8	16.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	0	0.0	0	0.0
	Total	13		48	
130	Annelida	5	45.4	27	25.2
	Mollusca	2	18.1	68	63.5
	Arthropoda	3	27.2	9	8.4
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	9.0	3	2.8
	Total	11		107	
131	Annelida	3	50.0	5	33.3
	Mollusca	1	16.6	6	40.0
	Arthropoda	1	16.6	2	13.3
	Echinodermata	0	0.0	0	0.0
	Other Taxa	1	16.6	2	13.3
	Total	6		15	
132	Annelida	5	50.0	31	70.4
	Mollusca	1	10.0	4	9.0
	Arthropoda	1	10.0	3	6.8
	Echinodermata	0	0.0	0	0.0
	Other Taxa	3	30.0	6	13.6
	Total	10		44	

Table 6 continued:

Taxa	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132									
Annelida																																						
Oligochaeta																																						
Enchytraeidae (LPIL)							10.6	11.4																														
Oligochaeta (LPIL)					49.0																																	
Tubificidae (LPIL)									18.6					12.9			13.5			15.4							20.8											
<i>Tubificoides heterochaetus</i>															24.3	30.1																						
Polychaeta																																						
<i>Bhawania heteroseta</i>																																						
<i>Glycinde solitaria</i>					12.4					15.5	11.4	16.2			9.5	29.3	15.4	12.5					13.3							12.5								
Hesionidae (LPIL)																																						
<i>Heteromastus filiformis</i>																																						
<i>Leitoscoloplos robustus</i>																																						
<i>Lepidonotus sublevis</i>																																						
<i>Loimia medusa</i>																														18.2								
<i>Marenzelleria viridis</i>																																						
<i>Medtomastus</i> (LPIL)							15.2	15.7	9.7	14.7			31.0	9.7	22.7					46.6			20.0							12.5								
<i>Nereis succinea</i>							13.6																															
<i>Notomastus latericeus</i>																																						
<i>Paramphinoe</i> sp. B																																						
<i>Paraprionospio pinnata</i>											41.9			12.1					9.5					10.3	23.8	10.0					12.5	11.2	20.0	38.6				
<i>Pectinaria</i> (LPIL)																																						
<i>Pectinaria gouldii</i>																																						
<i>Podarke obscura</i>																																						
<i>Podarkeopsis levifuscina</i>																																						
<i>Sigambra tentaculata</i>																																						
<i>Streblospio benedicti</i>																																						
Arthropoda																																						
Malacostraca																																						
<i>Acanthohaustorius millsii</i>				76.1																																		
<i>Cerapus tubularis</i>											12.9			9.5																								
<i>Edotia triloba</i>																																						
<i>Leptocheirus plumulosus</i>																																						
<i>Leucon americanus</i>																		13.3																				
<i>Ogyrides alphaerostris</i>																														13.3								
<i>Sphaeroma quadridentata</i>				50.8																																		
Chordata																																						
Ascidiacea																																						
Ascidiacea (LPIL)																																						
Leptocardia																																						
<i>Branchiostoma</i> (LPIL)	9.6	10.7			15.9	20.7																																
Mollusca																																						
Bivalvia																																						
Bivalvia (LPIL)											10.0															15.4												
<i>Gemma gemma</i>																					22.0																	
<i>Macoma balthica</i>																																						
Mactridae (LPIL)																																						
<i>Mulinia lateralis</i>																		19.0																				
Tellinidae (LPIL)																																						
Gastropoda																																						
<i>Acteocina canaliculata</i>	37.0	25.3				52.9	10.6	16.1			13.5			29.8					57.1	14.6	19.3	55.2	54.8	28.3	63.4	27.6			62.6	40.0								
Gastropoda (LPIL)																																						
<i>Ostostoma</i> (LPIL)																																						
<i>Turbonilla</i> (LPIL)																																						
Rhynchocoela																																						
Rhynchocoela (LPIL)												10.8																			13.3							
Anopla																																						
Lineidae (LPIL)																																						

Table 7. Summary of the benthic macroinfaunal data for the NOAA Chesapeake Bay stations, August-September 1999.

Strata	Station	No. of Taxa	No. of Indvs	Density (no/m ²)	H' Diversity	J' Evenness
18	64	10	23	575	2.10	0.91
18	65	5	44	1100	0.88	0.55
18	66	24	195	4875	2.44	0.77
19	67	0	0	0	0.00	0.00
19	68	0	0	0	0.00	0.00
19	69	13	57	1425	1.95	0.76
20	70	16	139	3475	1.86	0.67
20	71	5	7	175	1.55	0.96
20	72	23	127	3175	2.56	0.82
21	73	2	3	75	0.64	0.92
21	74	14	50	1250	2.18	0.83
21	75	2	3	75	0.64	0.92
22	76	4	9	225	1.27	0.92
22	77	5	6	150	1.56	0.97
22	78	20	94	2350	2.45	0.82
23	79	8	16	400	1.91	0.92
23	80	5	14	350	1.22	0.76
23	81	5	15	375	1.40	0.87
24	82	12	46	1150	2.11	0.85
24	83	5	7	175	1.55	0.96
24	84	1	2	50	0.00	0.00
25	85	9	51	1275	1.79	0.82
25	86	6	11	275	1.64	0.92
25	87	13	26	650	2.47	0.96
26	88	2	3	75	0.64	0.92
26	89	3	7	175	0.80	0.72

Table 7 continued:

Strata	Station	No. of Taxa	No. of Indvs	Density (no/m²)	H' Diversity	J' Evenness
26	90	9	4408	110200	0.68	0.31
27	91	6	9	225	1.74	0.97
27	92	1	2	50	0.00	0.00
27	93	3	4	100	1.04	0.95
28	94	2	4	100	0.56	0.81
28	95	6	14	350	1.63	0.91
28	96	9	31	775	1.59	0.72
29	97	6	13	325	1.41	0.79
29	98	22	63	1575	2.80	0.91
29	99	17	76	1900	2.26	0.80
30	100	9	230	5750	0.51	0.23
30	101	19	138	3450	1.50	0.51
30	102	9	56	1400	1.13	0.51
31	103	15	35	875	2.46	0.91
31	104	24	73	1825	2.46	0.78
31	105	28	75	1875	2.83	0.85
32	106	5	67	1675	0.85	0.53
32	107	14	63	1575	1.80	0.68
32	108	16	145	3625	1.76	0.63
33	109	15	121	3025	1.70	0.63
33	110	21	66	1650	2.68	0.88
33	111	23	70	1750	2.69	0.86
34	112	10	31	775	1.81	0.79
34	113	17	34	850	2.57	0.91
34	114	27	74	1850	2.96	0.90
35	115	14	58	1450	2.12	0.80
35	116	18	124	3100	2.26	0.78
35	117	17	44	1100	2.56	0.90

Table 7 continued:

Strata	Station	No. of Taxa	No. of Indvs	Density (no/m²)	H' Diversity	J' Evenness
36	118	14	37	925	2.32	0.88
36	119	19	83	2075	2.44	0.83
36	120	5	21	525	1.23	0.76
37	121	12	41	1025	2.05	0.82
37	122	15	26	650	2.51	0.93
37	123	12	88	2200	1.68	0.67
38	124	11	29	725	1.68	0.70
38	125	10	42	1050	1.44	0.63
38	126	19	120	3000	2.26	0.77
39	127	17	123	3075	1.52	0.54
39	128	7	56	1400	1.30	0.67
39	129	13	48	1200	2.30	0.90
40	130	11	107	2675	1.38	0.57
40	131	6	15	375	1.59	0.89
40	132	10	44	1100	1.88	0.82

Table 8. Summaries of the benthic macroinfaunal data for the NOAA Chesapeake Bay strata, August-September 1999.

Strata	Mean Density (± SD)	Mean No. Taxa (± SD)	Mean H' (± SD)	Mean J' (± SD)
18	2183.3	13.0	1.81	0.74
	2345.8	9.8	0.82	0.18
19	475.0	4.3	0.65	0.25
	822.7	7.5	1.13	0.44
20	2275.0	14.7	1.99	0.82
	1824.8	9.1	0.52	0.15
21	466.7	6.0	1.15	0.89
	678.4	6.9	0.89	0.05
22	908.3	9.7	1.76	0.90
	1249.1	9.0	0.62	0.08
23	375.0	6.0	1.51	0.85
	25.0	1.7	0.36	0.08
24	458.3	6.0	1.22	0.60
	602.3	5.6	1.09	0.53
25	733.3	9.3	1.97	0.90
	505.2	3.5	0.44	0.08
26	36816.7	4.7	0.70	0.65
	63551.9	3.8	0.08	0.31
27	125.0	3.3	0.92	0.64
	90.1	2.5	0.87	0.55
28	408.3	5.7	1.26	0.82
	341.3	3.5	0.61	0.09
29	1266.7	15.0	2.16	0.83
	831.5	8.2	0.70	0.07
30	3533.3	12.3	1.04	0.42
	2176.2	5.8	0.50	0.16
31	1525.0	22.3	2.59	0.85
	563.5	6.7	0.21	0.07
32	2291.7	11.7	1.47	0.61
	1155.8	5.9	0.54	0.08
33	2141.7	19.7	2.36	0.79
	766.6	4.2	0.57	0.14
34	1158.3	18.0	2.45	0.86
	600.2	8.5	0.58	0.07
35	1883.3	16.3	2.31	0.83
	1068.1	2.1	0.22	0.06
36	1175.0	12.7	1.99	0.82
	804.7	7.1	0.67	0.06
37	1291.7	13.0	2.08	0.81
	808.7	1.7	0.42	0.13
38	1591.7	13.3	1.79	0.70
	1230.4	4.9	0.42	0.07
39	1891.7	12.3	1.71	0.70
	1029.7	5.0	0.53	0.18
40	1383.3	9.0	1.61	0.76
	1175.9	2.6	0.25	0.16

Figure 1. Locations for the NOAA Chesapeake Bay strata and stations, August-September 1999.

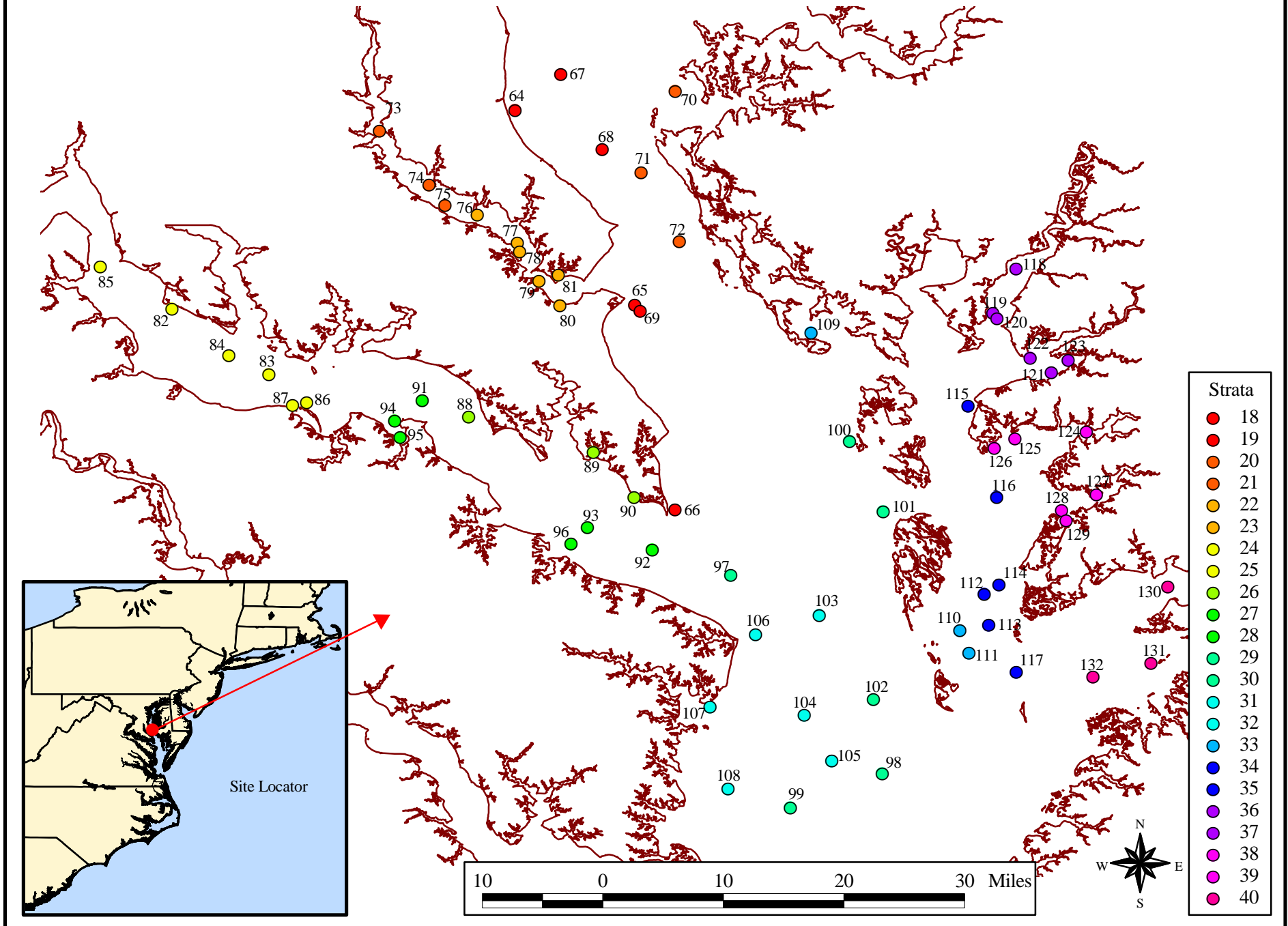


Figure 2. Sediment composition for the NOAA Chesapeake Bay stations, August-September 1999.

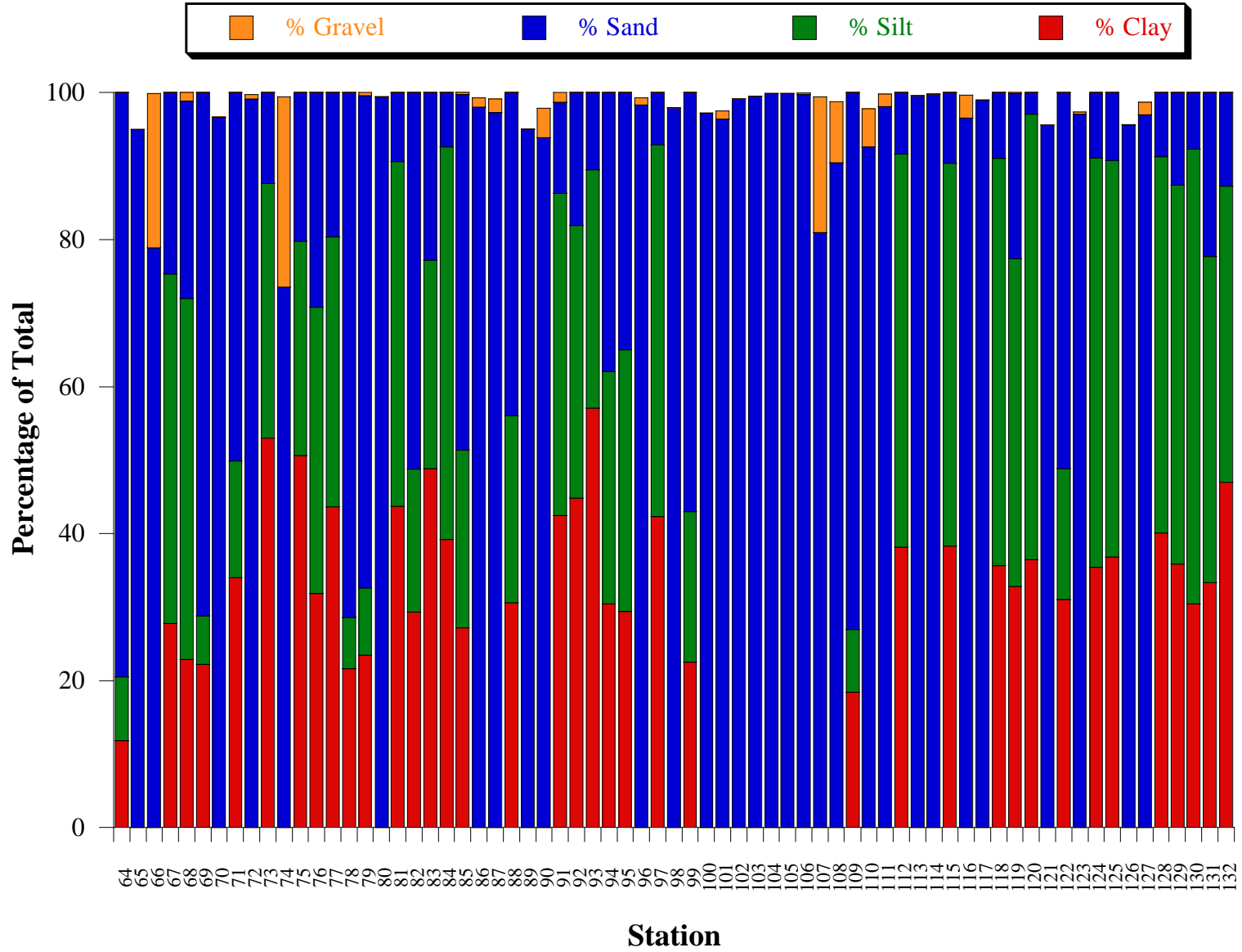


Figure 3. Percent gravel+sand and percent silt+clay content of the sediments for the NOAA Chesapeake Bay stations, August-September 1999.

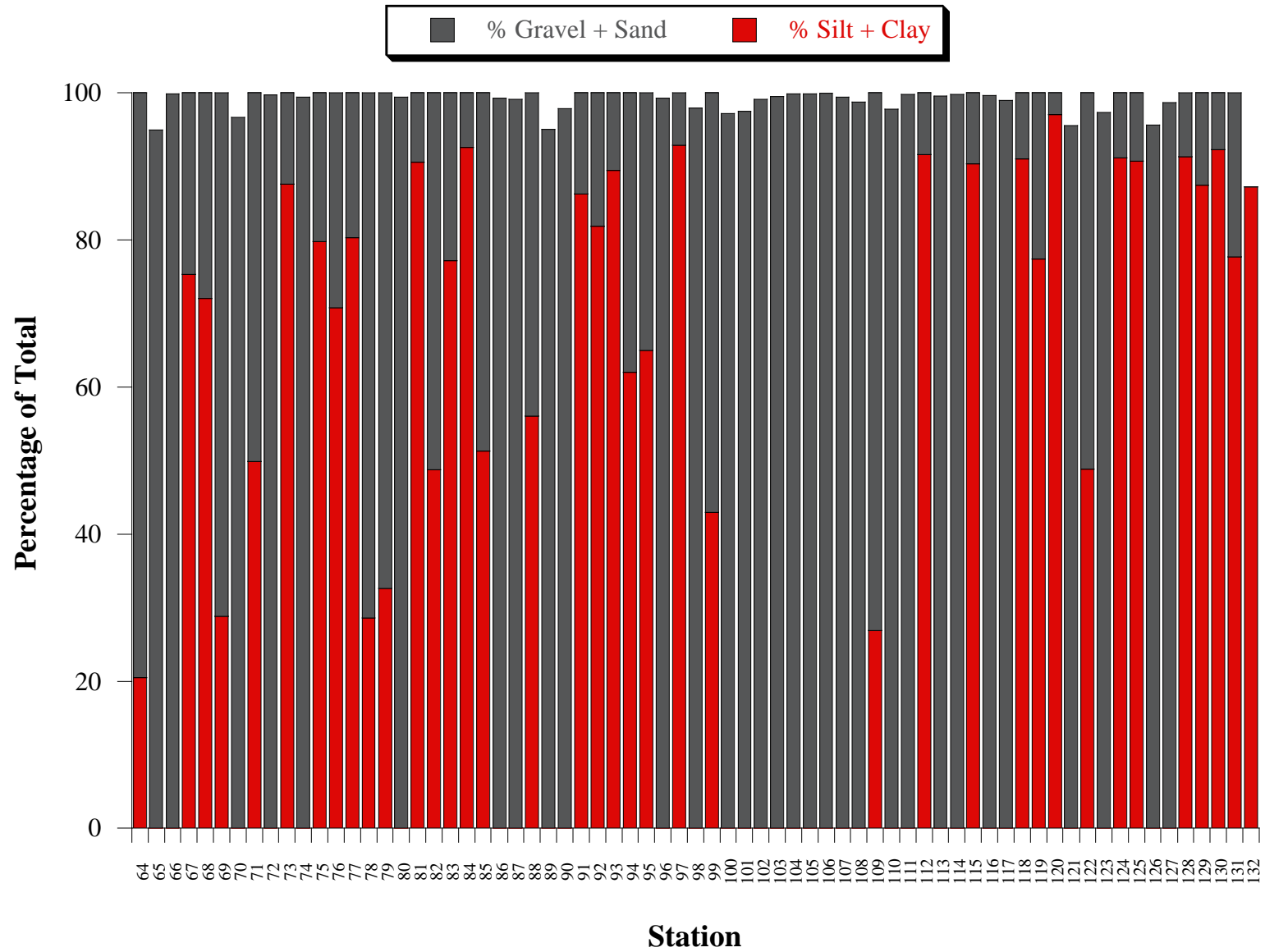


Figure 4. Spatial distribution of sediments for the NOAA Chesapeake Bay stations, August-September 1999.

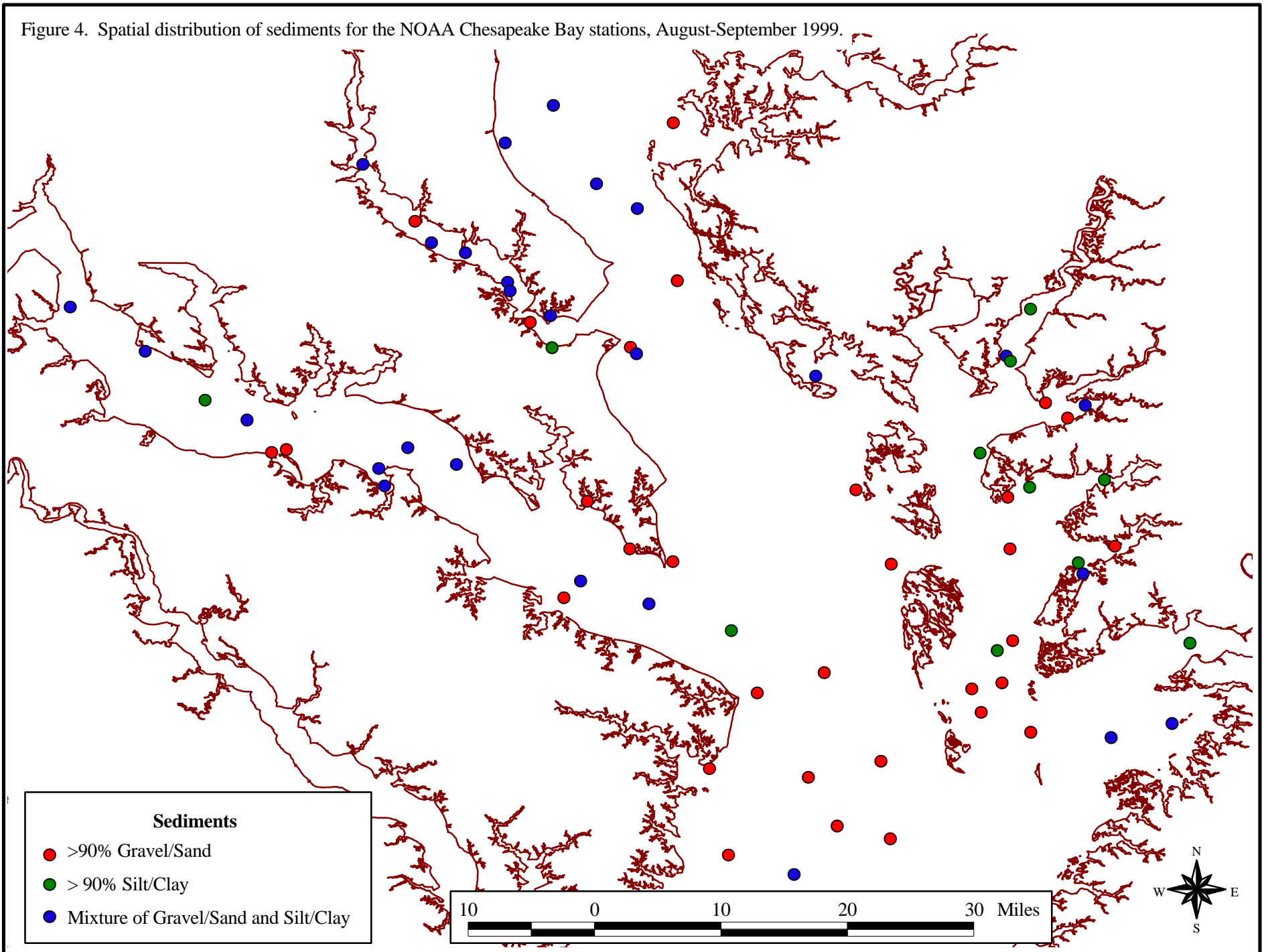


Figure 5. Percent total organic carbon (TOC) content of the sediments for the NOAA Chesapeake Bay stations, August-September 1999.

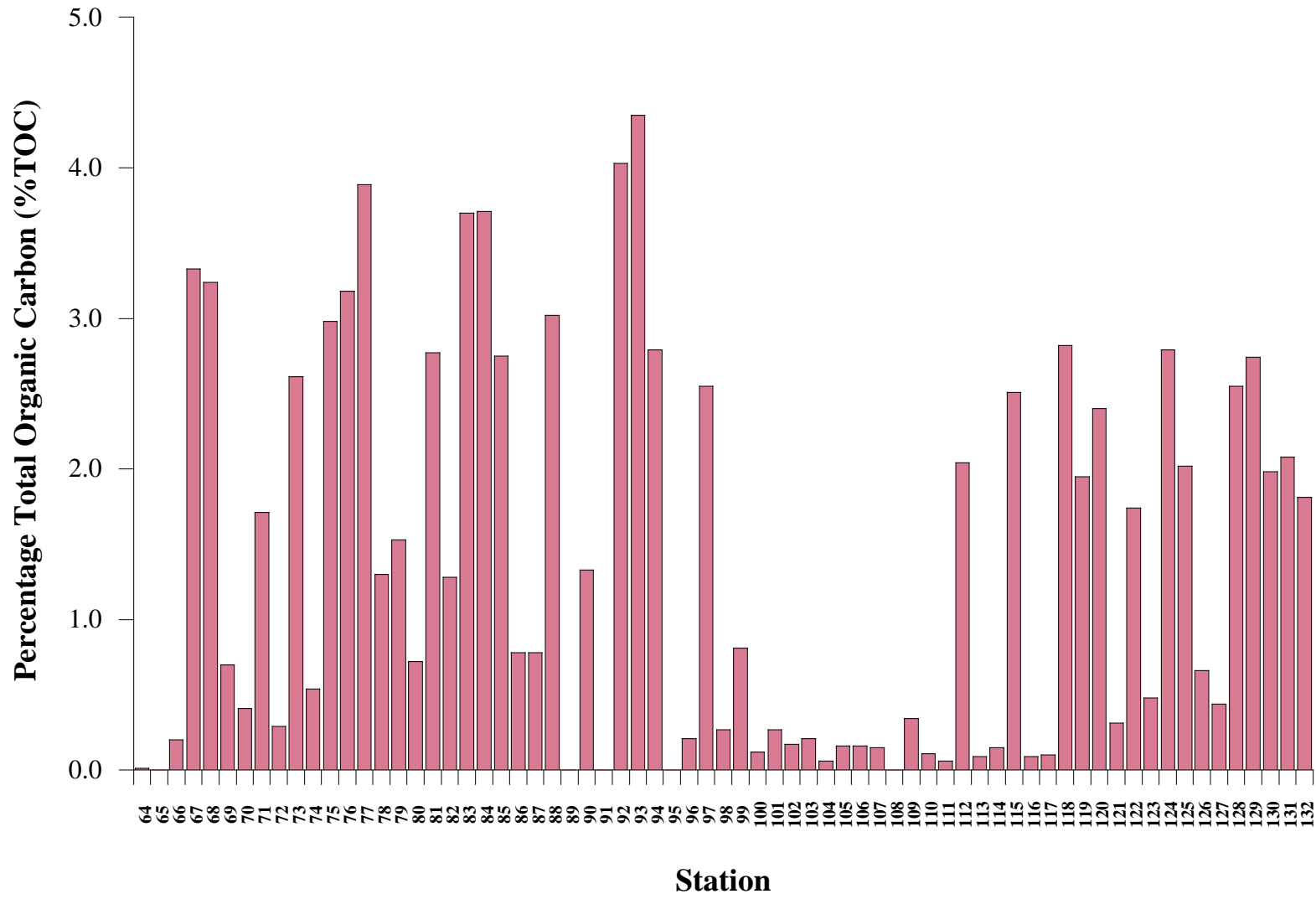


Figure 6. Spatial distribution of sediment total organic carbon (TOC) for the NOAA Chesapeake Bay stations, August-September 1999.

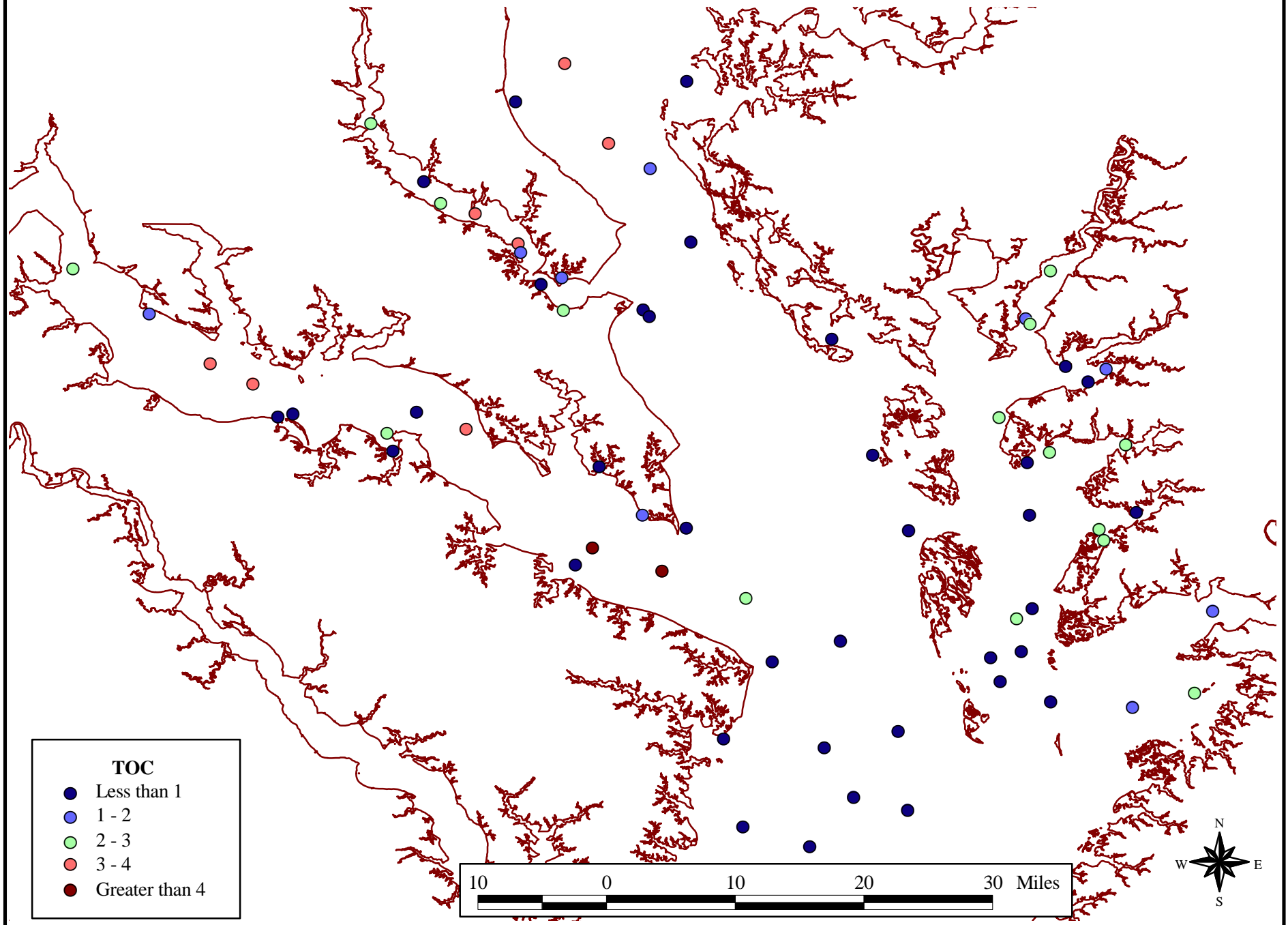


Figure 7. Percent abundance of major taxonomic groups for the NOAA Chesapeake Bay stations, August-September 1999.

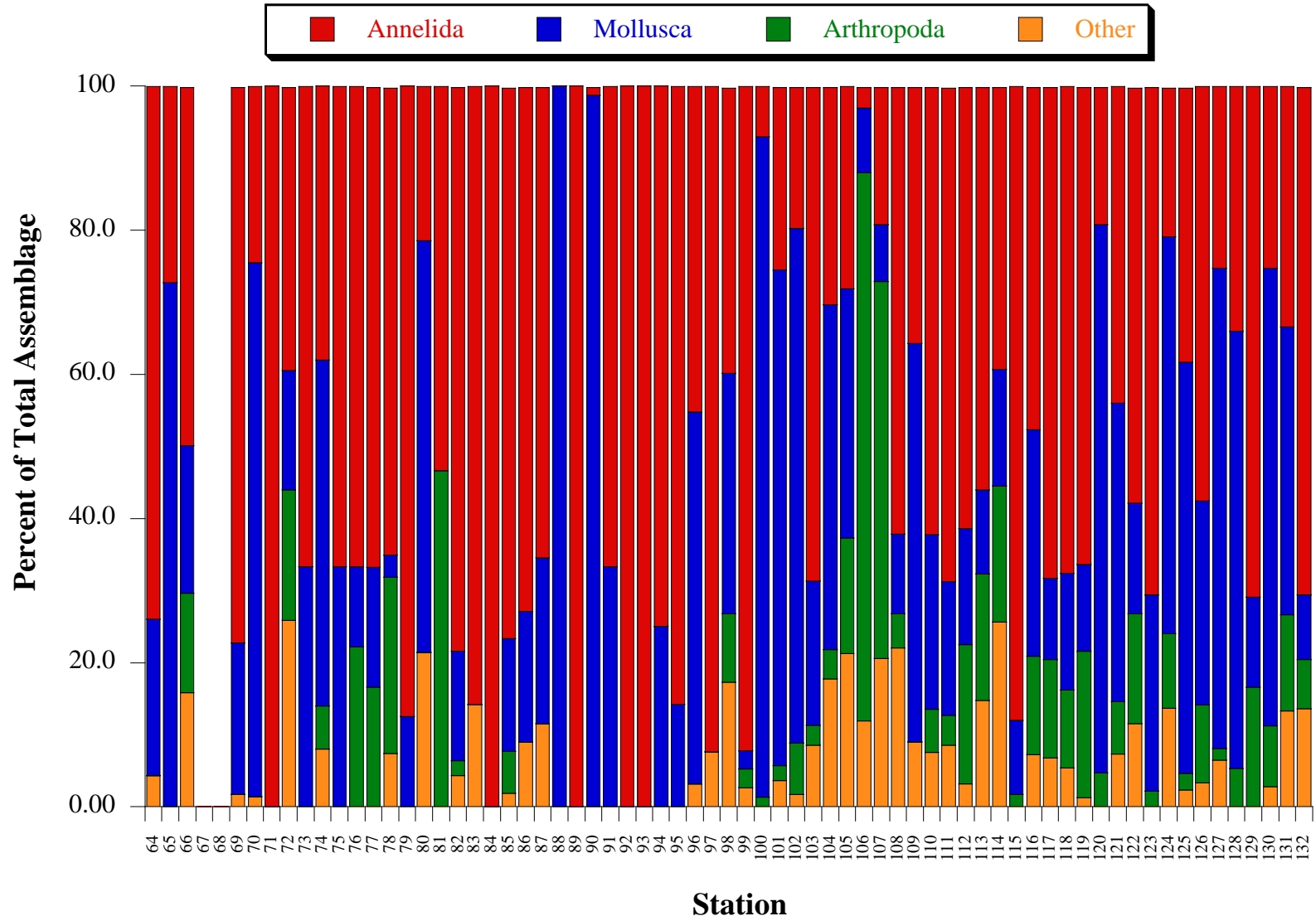


Figure 8. Spatial distribution of macroinvertebrate densities for the NOAA Chesapeake Bay stations, August-September 1999.

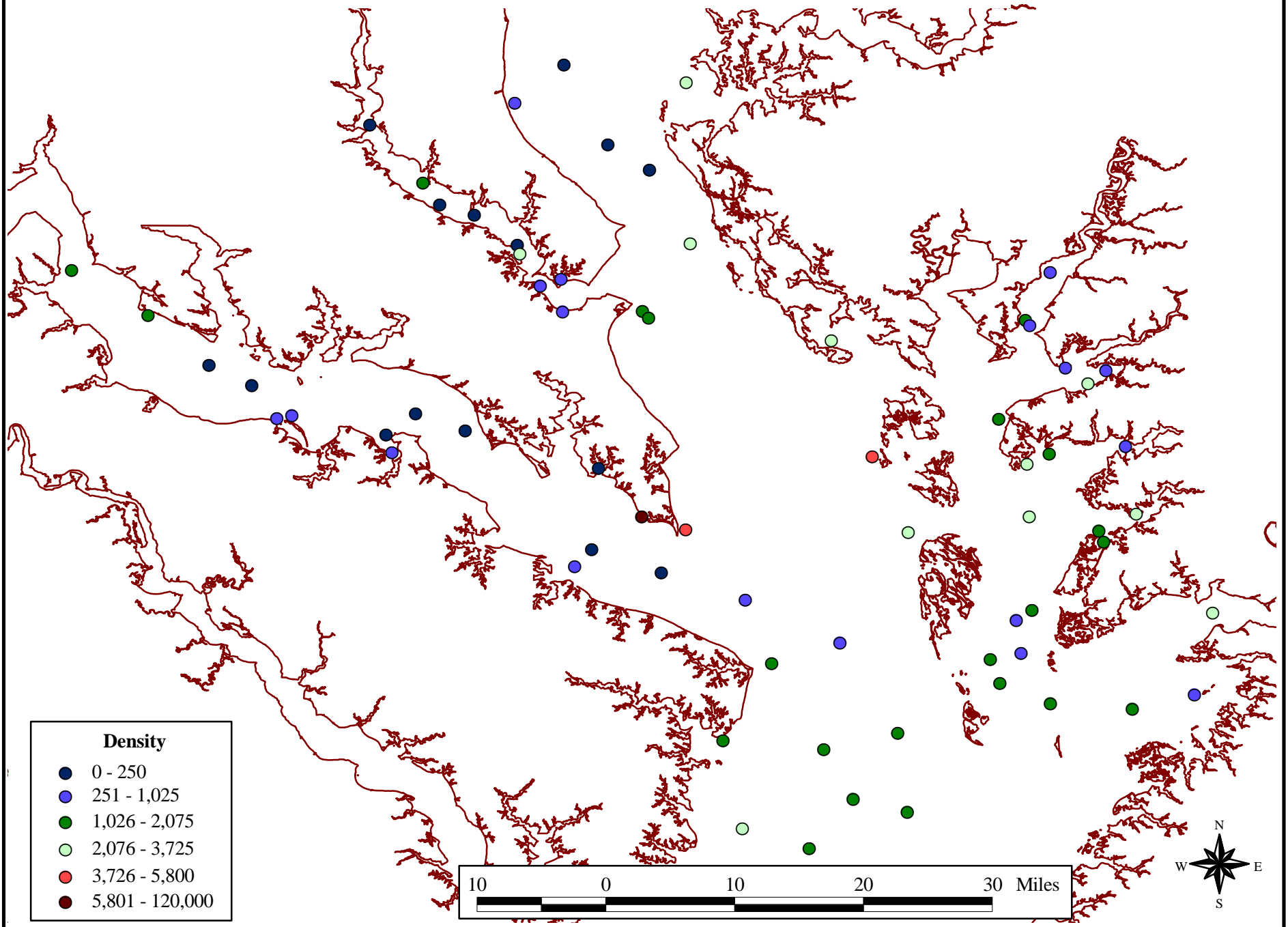


Figure 9. Spatial distribution of taxa richness for the NOAA Chesapeake Bay stations, August-September 1999.

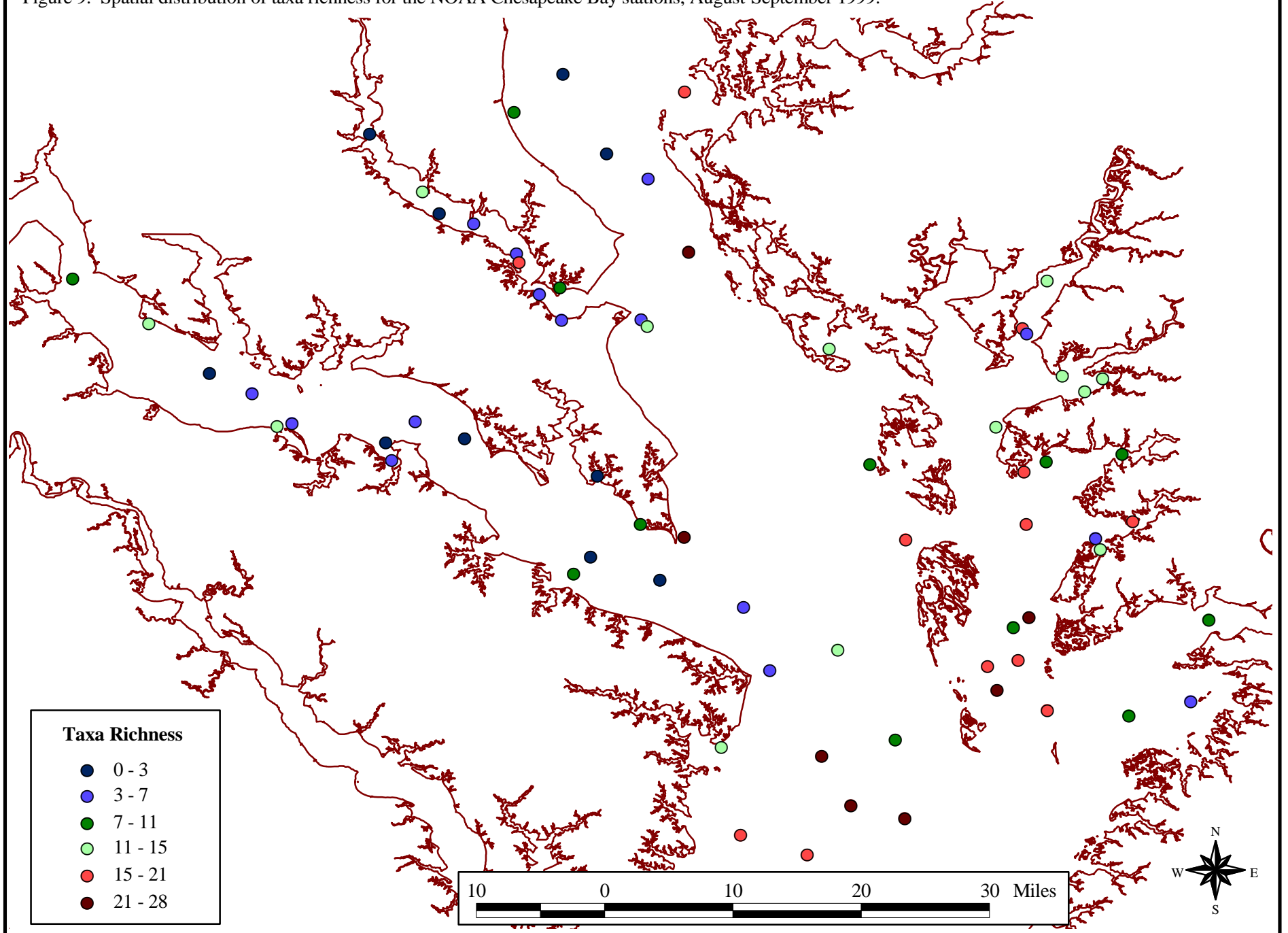


Figure 10. Macroinvertebrate densities for the NOAA Chesapeake Bay strata, August-September 1999.

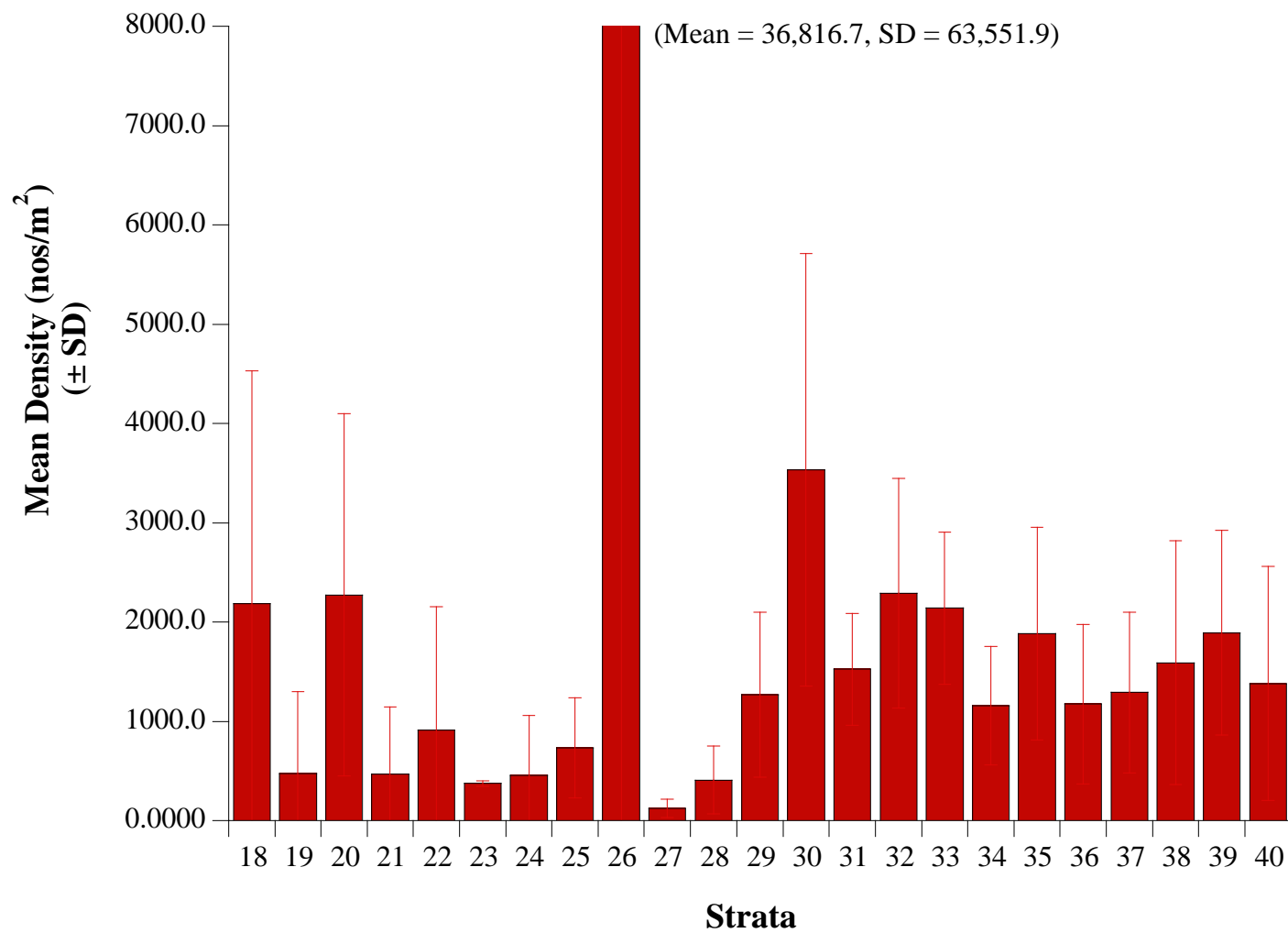


Figure 11. Macroinvertebrate taxa richness for the NOAA Chesapeake Bay strata, August-September 1999.

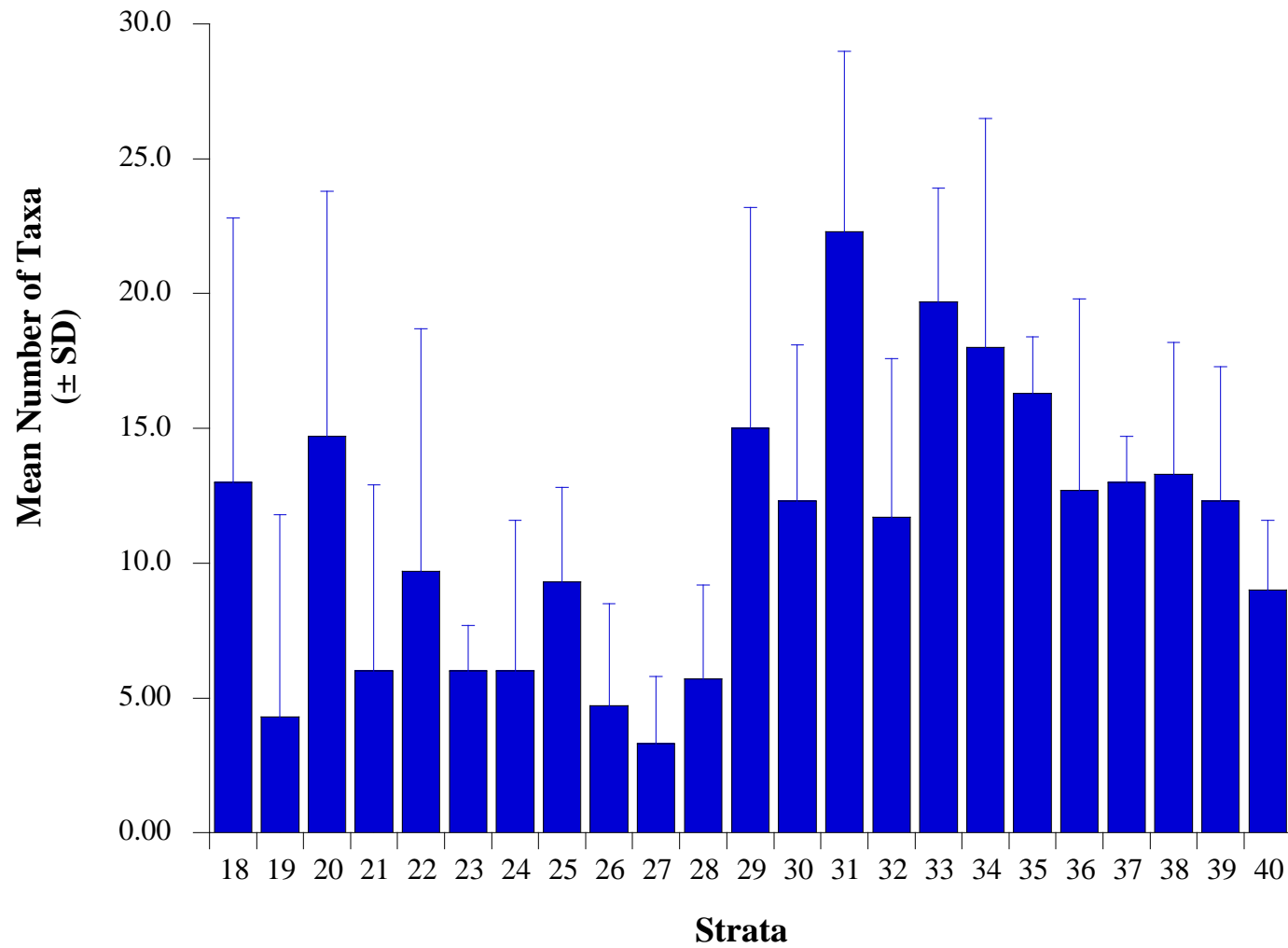


Figure 12. Taxa diversity (H') for the NOAA Chesapeake Bay strata, August-September 1999.

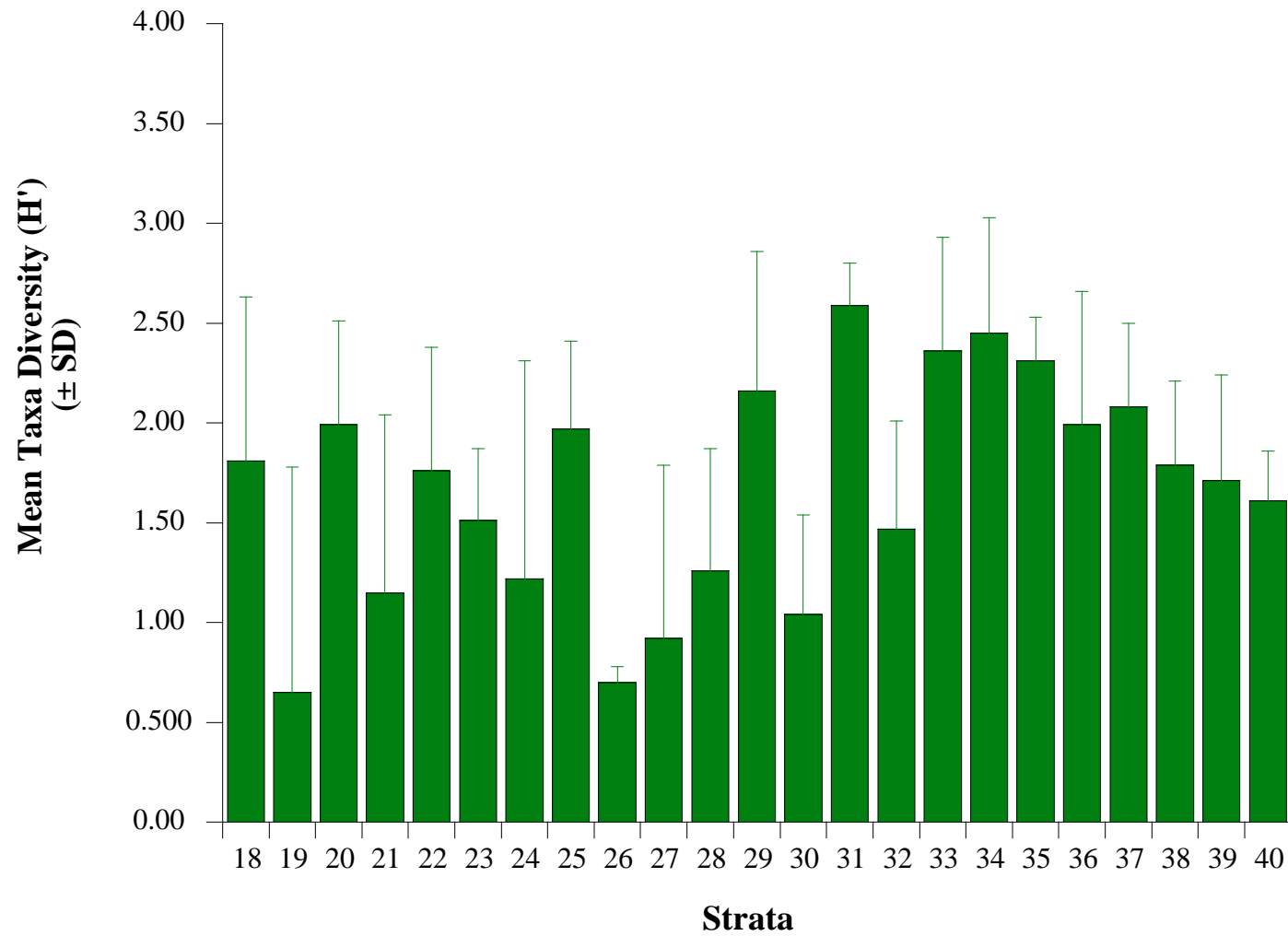


Figure 13. Taxa evenness (J') for the NOAA Chesapeake Bay strata, August-September 1999.

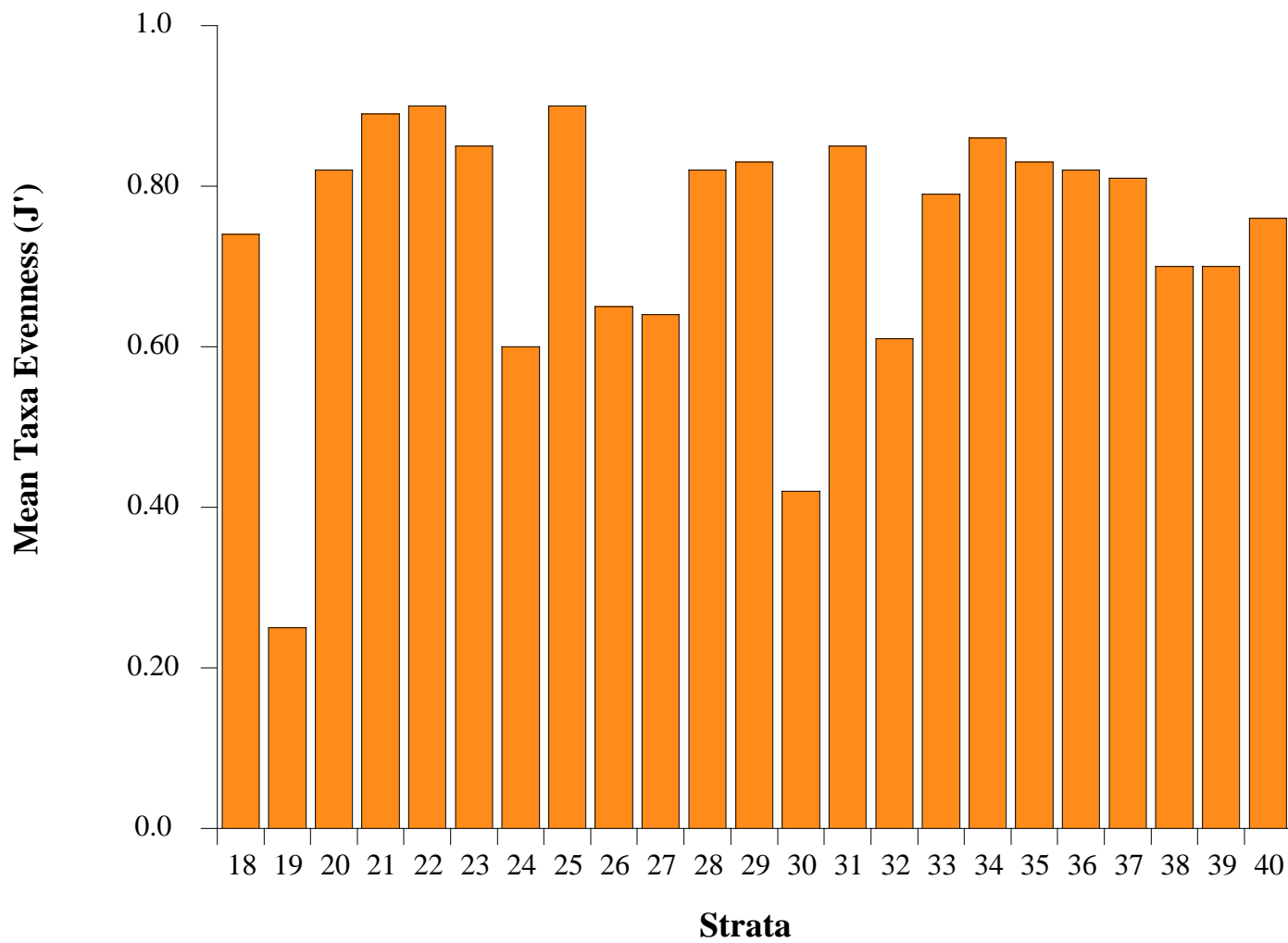
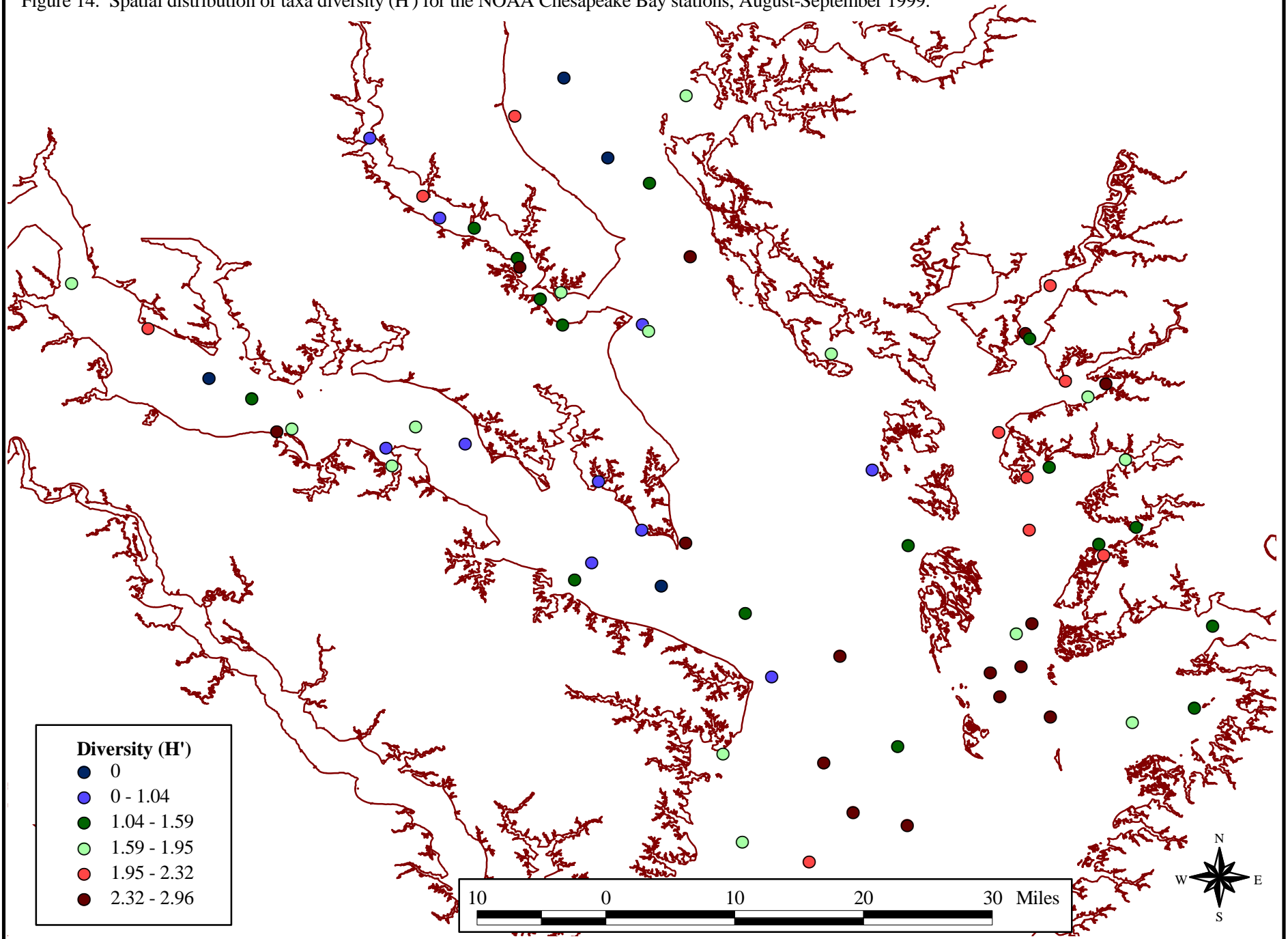


Figure 14. Spatial distribution of taxa diversity (H') for the NOAA Chesapeake Bay stations, August-September 1999.



APPENDIX

QUALITY ASSURANCE STATEMENT

Client/Project NOAA

Work Assignment Title 1999 Chesapeake Bay

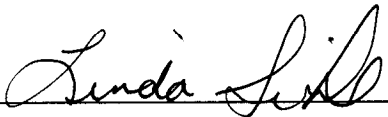
Work Assignment Number

Task Number

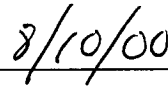
Description of Data Set or Deliverable: 69 Benthic macroinvertebrate samples collected
August 24-September 21, 1998; Young Dredge grabs.

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



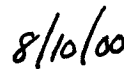
Signature of QA Officer or Reviewer



Date



Signature of Project Manager



Date


Client/Project NOAA
Work Assignment Title Chesapeake Bay 1999

Task Number DO 4

Sorting Results:	Sample #	% Accuracy
	73	100%
	64	100%
	125	100%
	102	100%
	132	100%
	75	100%
	67	100%

Taxonomy Results:	Sample #	Taxa	% Accuracy
	100	Crust./Moll.	99%
	78	Crust./Moll.	100%
	69	Crust./Moll.	100%
	119	Crust./Moll.	100%
	124	Crust./Moll.	100%
	107	Crust./Moll.	98%
	130	Poly./Misc.	100%
	126	Poly./Misc.	100%
	103	Poly./Misc.	100%
	98	Poly./Misc.	100%
	78	Poly./Misc.	100%
	72	Poly./Misc.	100%
	119	Poly./Misc.	100%
	77	Chironomid/Oligo	100%
	126	Chironomid/Oligo	100%
	116	Chironomid/Oligo	100%

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


Signature of QA Officer or Reviewer

8/10/00
Date