

BATHYMETRIC DISTRIBUTION

Total Macrobenthic Fauna -- All Taxonomic Groups Combined

Entire Middle Atlantic Bight Region

A pronounced decrease in total macrobenthos (that is, a summation of all taxonomic categories) was associated with an increase in water depth from the shallowest to deepest water depth classes. This relationship applied to both the number of individuals and biomass. Consistent trends of decreasing quantities with depth within all three subareas revealed the general nature and widespread occurrence of this relationship (figs. 80 and 81).

Number of Individuals: The density of macrobenthic invertebrates was highest (averaged $2,079/m^2$) in the shallowest depth class, 0-24 m, and decreased to $46/m^2$ in deep water (2,000-3,999 m), a 98% reduction. Table 8 lists the mean number of individuals and biomass for each of eight water-depth classes for the entire Middle Atlantic Bight Region (columns 5 and 9), and for each subarea. Density decreased substantially, although somewhat irregularly, with increased depth on the continental shelf. At mid-shelf depths the average density ranged from $1,254/m^2$ to $2,073/m^2$, and along the outer shelf it dropped to $810/m^2$. Density of organisms continued to decline on the continental slope. Along the upper slope the faunal density averaged $382/m^2$, at mid-slope $293/m^2$, and on the lower slope $72/m^2$. A further decline in density continued onto the continental rise, where macrobenthic organisms averaged only $46/m^2$. Although there were regional variations in density, which will be described below, the trend in density with respect to water depth was clear. Density was highest in the shallowest water and varied inversely with water depth.

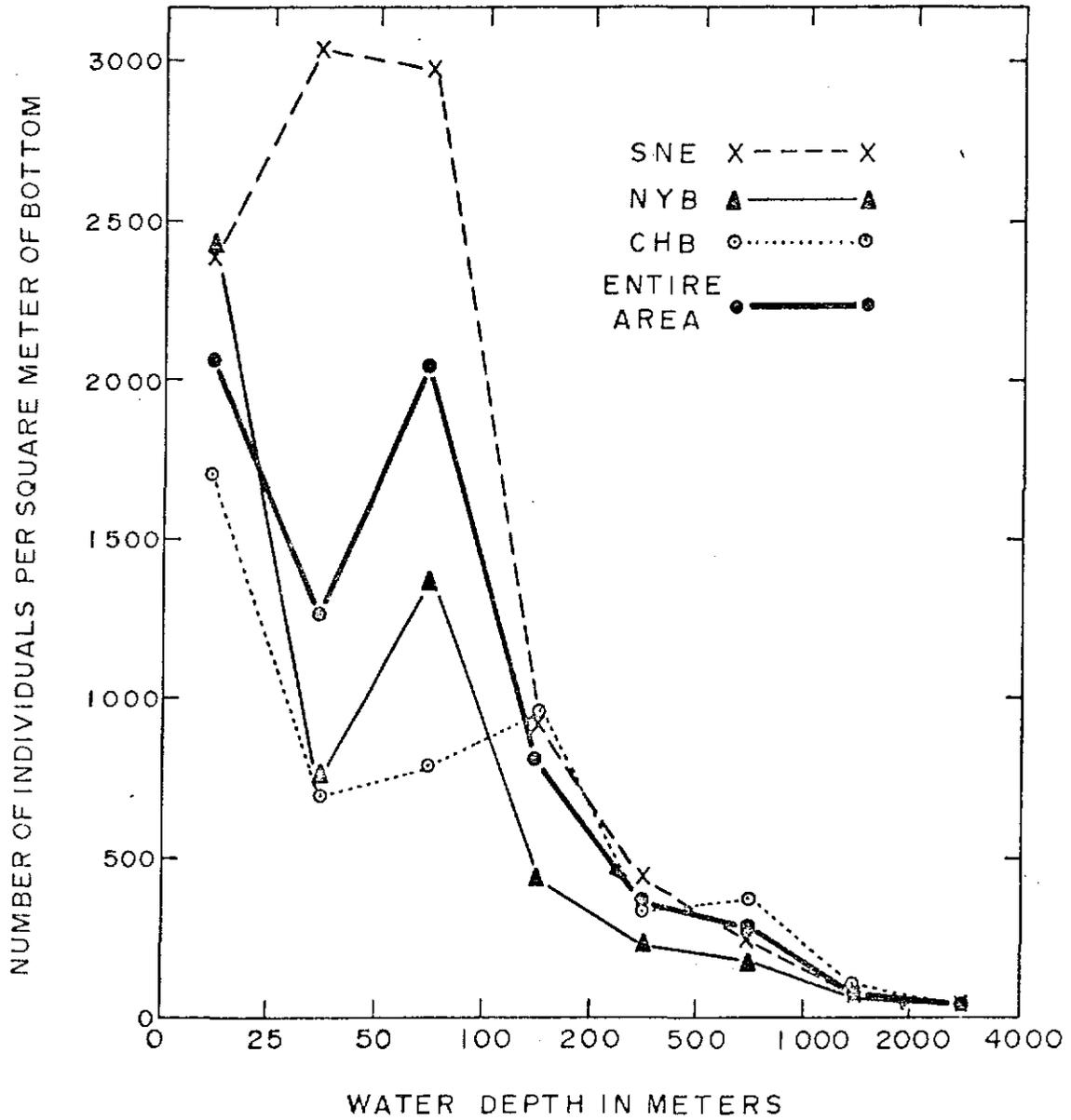


Figure 80.--Relation between number of individuals and water depth. Values represent all taxonomic groups combined for each subarea and for the entire Middle Atlantic Bight Region.

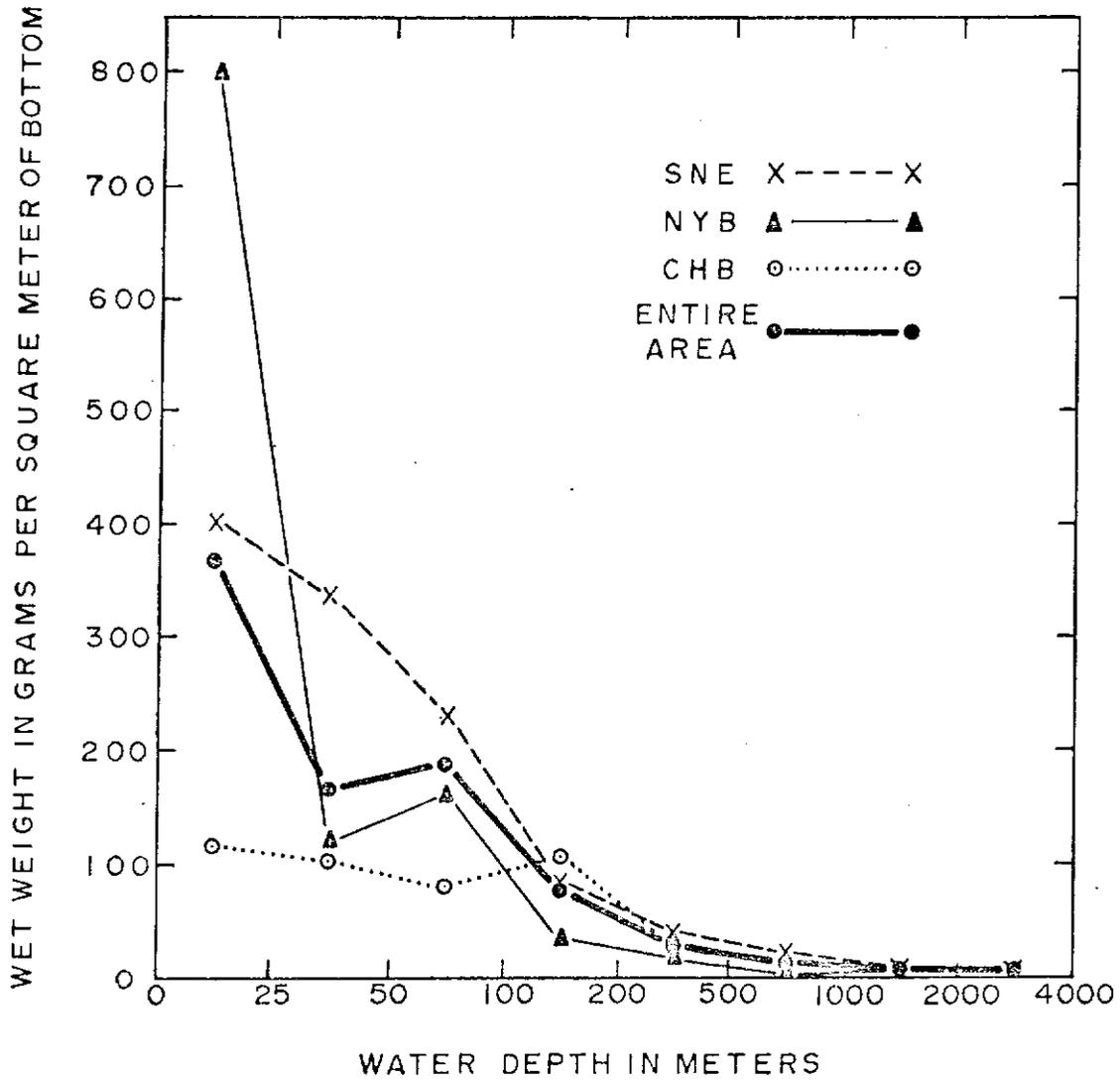


Figure 81.--Relation between biomass (wet weight) and water depth. Values represent all taxonomic groups combined for each subarea and for the entire Middle Atlantic Bight Region.

Rate of change in density as related to bathymetric changes is not readily perceived from the values listed in table 8. Therefore, another tabulation (table 9) was constructed in which the rate of change in density -- expressed as the increase or decrease in number of individuals per square meter of bottom, per meter increase in water depth -- was calculated and listed. Rate changes in density per unit change in water depth were greatest on the continental shelf. A decrease of 33 individuals per meter increase in water depth occurred in inner-shelf waters, from 0-24 m to 24-49 m. At mid-shelf depths the rate of change was spurious, and reversed to an increase of 22 individuals per meter. Modest rate changes (about -17 individuals per meter) in density occurred in the outer shelf region. Only small changes (-0.2 to -0.3 individual per square meter) were evident on the continental slope. Very small changes (-0.026 specimen per 1-meter) were detected on the continental rise.

Biomass: The relationship between invertebrate macrobenthic biomass and water depth parallels the pattern described above for density (table 8, right-hand column). Biomass was greatest (averaged 368 g/m^2) in the shallowest depth class. It decreased irregularly across the shelf, where average values ranged from 163 to 189 g/m^2 at mid-shelf, and averaged 79 g/m^2 along the outer shelf. Biomass on the continental slope averaged between 28 and 7 g/m^2 . The larger value refers to the upper slope, and the smaller to the lower slope; intermediate quantities of biomass occurred at intermediate levels. On the continental rise the biomass averaged 8 g/m^2 .

Rate of change in biomass per 1-meter increase in water depth was greatest in shallow water and least in deep water. This is evident in rate-change values listed in the right-hand column of table 10. Average biomass

Table 8.--Mean number of individuals and biomass of the macrobenthic invertebrate fauna in relation to water depth. Values are listed separately for each subarea and for the entire Middle Atlantic Bight Region.

Water depth	Mean number of individuals				Mean biomass			
	SNE	NYB	CHB	Entire area	SNE	NYB	CHB	Entire area
<u>m</u>	<u>No./m²</u>	<u>No./m²</u>	<u>No./m²</u>	<u>No./m²</u>	<u>g/m²</u>	<u>g/m²</u>	<u>g/m²</u>	<u>g/m²</u>
0-24	2,426	2,430	1,742	2,079	404	804	114	368
25-49	3,090	752	722	1,254	343	123	102	163
50-99	2,988	1,390	795	2,073	237	166	80	189
100-199	934	442	969	810	89	36	109	79
200-499	468	255	350	382	34	17	28	28
500-999	251	206	387	293	17	7	11	12
1,000-1,999	75	66	75	72	5	5	11	7
2,000-3,080	48	47	40	46	8	7	10	8

Table 9.--Change and rate of change in density of invertebrates in relation to water depth.

Water depth			Number of individuals	Change in number of individuals	Rate change in number of individuals
Range	Mean	Change			
<u>m</u>	<u>m</u>	<u>m</u>	<u>No./m²</u>	<u>No./m²</u>	<u>No./m²/m</u>
0-24	12.5	-	2,078.66	-	-
25-49	37.5	25	1,253.64	-825.02	-33.00
50-99	75	37.5	2,072.87	+819.23	+21.85
100-199	150	75	809.68	-1263.19	-16.84
200-499	350	200	381.68	- 428.00	- 2.14
500-999	750	400	292.76	- 88.92	- 0.22
1,000-1,999	1,500	750	72.38	- 220.38	- 0.29
2,000-3,999	2,540	1,040	45.75	- 26.63	- 0.026

Table 10.--Change and rate of change in biomass of invertebrates in relation to water depth.

Water depth			Biomass	Change in biomass	Rate change in biomass per meter depth
Range	Mean	Change			
<u>m</u>	<u>m</u>	<u>m</u>	<u>g/m²</u>	<u>g/m²</u>	<u>g/m²/m</u>
0-24	12.5	-	368	-	-
25-49	37.5	25	163	-205	-8.20
50-99	75	37.5	189	+ 26	+0.69
100-199	150	75	79	-110	-1.47
200-499	350	200	28	- 51	-0.26
500-999	750	400	12	- 16	-0.04
1,000-1,999	1,500	750	7	- 5	-0.007
2,000-3,999	2,540	1,040	8	+ 1	+0.001

diminished 8.2 g/m^2 with each meter of water depth, from the shallowest depth class (0-24 m) to the next deeper depth class (25-49 m). At mid-shelf there was an increase in biomass, which is believed to be caused by regional differences in biomass (described below) and, to some extent, reflects the larger standing crop of several taxonomic groups (Gastropoda, Ophiuroidea, Alcyonacea, and others) along the outer continental shelf. Rate of biomass change on the outer continental shelf averaged -1.5 g/m^2 per 1-meter increase in depth. The rate of change diminished progressively down the slope: -0.26 , -0.04 , and -0.007 g/m^2 . On the continental rise there was a slight increase in biomass rate-change ($+0.001 \text{ g/m}^2$) but this, again, appears to be due to regional differences in biomass and low sampling intensity.

The trend of decreasing biomass with increased water depth was clearly evident. Despite a few irregularities, the reduction in biomass from an average of 368 g/m^2 in shallow water to 8 g/m^2 in deep water amounts to a 98% change. This is precisely the same change described above for density of organisms.

Subareas

Southern New England

Number of individuals was, on the average, substantially higher in Southern New England than in the other subareas. This is evident from the density values given in table 8, column 2, and plotted in figure 80. On the continental shelf the average density for each bathymetric-class in the subarea ranged from 934 to $3,090/\text{m}^2$, and the overall average was $2,360/\text{m}^2$, whereas shelf densities for the entire Middle Atlantic Bight Region ranged from 442 to $2,430/\text{m}^2$ and averaged only $1,554/\text{m}^2$. Comparative average values for New York Bight and Chesapeake Bight were 1,254 and $1,057/\text{m}^2$. On the

continental slope the faunal density, also, was moderately high compared with other subareas. Density of the continental slope fauna in Southern New England averaged $265/m^2$, compared to $249/m^2$ for the entire Middle Atlantic Bight Region, $171/m^2$ for the New York Bight subarea, and $271/m^2$ for the Chesapeake Bight subarea. Density of organisms on the Southern New England continental rise averaged $48/m^2$, a quantity only slightly higher than in the other subareas (40 to $47/m^2$) and for the entire Middle Atlantic Bight Region ($46/m^2$).

Biomass: The standing-crop biomass on the continental shelf and upper continental slope in the Southern New England subarea was considerably greater than the Middle Atlantic Bight Region averages (table 8 and fig. 81). Biomass averages for four depth classes on the continental shelf ranged from 89 to $404 g/m^2$, and the overall average was $268 g/m^2$. That quantity was only slightly less than the $282 g/m^2$ found in New York Bight, but much greater than the $101 g/m^2$ found in Chesapeake Bight. For mid-shelf depths between 25 and 99 m, the quantities of biomass in Southern New England (which averaged 237 and $343 g/m^2$) surpassed the amounts encountered in the other subareas. Biomass on the continental slope was greater (average $19 g/m^2$) in Southern New England than in either New York Bight ($10 g/m^2$) or Chesapeake Bight ($17 g/m^2$). Mean biomass of $8 g/m^2$ on the continental rise in this subarea was average for the entire Region. It was slightly higher than that for New York Bight ($7 g/m^2$) and slightly lower than that for Chesapeake Bight ($10 g/m^2$).

New York Bight

Number of Individuals in the New York Bight subarea was intermediate between that in Southern New England and Chesapeake Bight (table 8 and fig. 80). Densities on the continental shelf averaged between 442 and

2,430/m²; overall average was 1,254/m². This density compares with 1,554/m² for the entire Middle Atlantic Bight Region, 2,360/m² for Southern New England, and 1,057/m² for Chesapeake Bight. Highest densities, as expected, were in the shallowest depth class (0-24 m). Unusually low densities -- as compared with adjacent bathymetric classes and adjacent subareas -- with values of 752 and 442/m², were encountered on the continental shelf at water depths between 25 and 49 m and 100 to 199 m (table 8 , column 3). Faunal densities in these two depth classes were roughly one-half the density expected. The cause of these unusually low densities was the sparsity of representatives in a number of taxonomic groups. Additional comments on this aspect are given in the discussion of taxonomic variation below.

Fauna on the continental slope of the New York Bight subarea, also, was relatively sparse, compared to other subareas. Densities ranged from 66 to 255/m², and averaged 176/m². This overall average is about 35% below the average slope density for both Southern New England and Chesapeake Bight.

The faunal density of 47/m² on the continental rise was nearly equal to that in the other two subareas.

Biomass in New York Bight was intermediate between that in the Southern New England and Chesapeake Bight subareas. Unusually large and small quantities were encountered in the various bathymetric classes. On the continental shelf the biomass ranged from the uncommonly small quantity of 36 g/m² on the outer shelf to the unexpectedly large 804 g/m² in the inshore region. Although the overall quantity of biomass for the continental shelf, which averaged 282 g/m², was highest in the Region, this was due largely to the influence of shallow water components. A biomass of 123 g/m² near mid-shelf was substantially lower -- on the order of fifty percent -- than was anticipated. Also, the outer shelf biomass (36 g/m²) was smaller than

expected by at least 100%. These small biomass values correspond to the low densities of the fauna in the New York Bight subarea described above.

Biomass on the continental slope ranged from 5 to 17 g/m², and averaged only 10 g/m². This is substantially less than the quantities found in adjacent subareas, which averaged 19 g/m² in Southern New England and 17 g/m² in Chesapeake Bight.

On the continental rise the average biomass of 7 g/m² was smaller than that found in adjacent subareas, which averaged 8 and 10 g/m² respectively, in Southern New England and Chesapeake Bight. New York Bight biomass was 13% and 30% smaller than counterpart values in the adjacent subareas.

A discussion of the taxonomic components that were in short supply or unusually plentiful follows under the heading TAXONOMIC GROUPS.

Chesapeake Bight

Number of Individuals was slightly lower in this subarea than in New York Bight and much lower than in Southern New England. Average density in the various bathymetric classes on the continental shelf ranged from 722 to 1,742/m², which was generally lower than in other subareas, and overall averaged only 1,057/m². Comparative quantities in Southern New England and New York Bight were 2,360 and 1,254/m², respectively. Unusually low densities of 722 and 795/m² were encountered at mid-shelf depths; conversely, an unexpectedly high density (969/m²) occurred on the outer shelf.

On the continental slope the faunal density was relatively high, averaging 271/m², with a range from 75 to 387/m². These densities were slightly higher than those at comparative depths in Southern New England and much higher than those in New York Bight.

On the continental rise the faunal density averaged 40/m², which was slightly less than densities at this bathymetric level in the other subareas.

Biomass of the benthic fauna in Chesapeake Bight was substantially less than that in other parts of the Middle Atlantic Bight Region. Average values for the various depth classes on the continental shelf ranged from 80 to 114 g/m². This subarea, with its rather narrow continental shelf, did not exhibit the marked difference in biomass from inshore, shallow water regions to the outer shelf margin that was so pronounced in both Southern New England and New York Bight. Thus, Chesapeake Bight is somewhat different from the other subareas in two aspects; it is characterized by: (1) a small biomass on the continental shelf and a rather large biomass on the slope and rise, and (2) little difference in biomass from shallow to deep water on the continental shelf.

Biomass on the continental slope was moderately high, ranging from 28 g/m² on the upper slope to 11 g/m² on the lower part. Average for the entire slope was 17 g/m². This value was slightly lower than that for Southern New England (19 g/m²), but much higher than that for New York Bight which averaged only 10 g/m².

Biomass on the continental rise averaged 10 g/m². This was the highest for this depth class in any subarea in the entire Middle Atlantic Bight Region.

Taxonomic Groups

Entire Middle Atlantic Bight Region

This section contains a brief description of the quantitative distribution of each phylum and 28 major sub-components (classes and orders) as they were related to eight bathymetric classes (tables 11 and 12; figs. 82-87). These comments pertain to the entire Middle Atlantic Bight Region; later sections deal with similar relationships within each subarea.

Porifera (fig. 82) occurred in small quantities (1.3 to 0.1 m² in all bathymetric classes. The highest density occurred in shallow water, 0-24 m.

Table 11.--Mean number of individuals listed by major taxonomic groups for each bathy-
metric class, representing the entire Middle Atlantic Bight Region.

Taxonomic group	Bathymetric class (meters)							
	0-24	25-49	50-99	100-199	200-499	500-999	1,000-1,999	2,000-3,999
	no./m ²	no./m ²	no./m ²	no./m ²	no./m ²	no./m ²	no./m ²	no./m ²
PORIFERA	1.25	0.52	0.07	0.74	0.21	0.08	0.12	0.06
COELENTERATA	34.93	8.96	9.03	40.76	13.90	4.52	3.88	1.11
Hydrozoa	19.58	6.90	2.13	27.71	3.96	0.08	-	-
Anthozoa	15.35	2.06	6.90	13.05	9.94	4.44	3.88	1.11
Alcyonacea	0.01	-	0.52	2.76	1.61	1.20	0.97	0.61
Zoantharia	5.01	1.13	5.63	9.44	5.04	1.76	0.06	0.17
Unidentified	10.33	0.93	0.75	0.85	3.29	1.48	2.85	0.33
PLATYHELMINTHES								
Turbellaria	1.70	0.21	0.43	-	-	-	-	-
NEMERTEA	5.30	5.87	6.27	2.74	1.64	0.72	1.21	0.11
ASCHELMINTHES								
Nematoda	5.01	0.94	3.21	0.47	0.82	2.52	0.50	0.64
ANNELIDA	472.07	265.75	352.66	238.26	178.00	61.24	17.26	6.44
POGONOPHORA	-	0.55	0.05	-	7.21	21.32	5.21	2.53
SIPUNCULIDA	0.96	4.63	5.54	9.85	11.89	2.00	2.06	1.31
ECHIURA	0.27	0.02	-	-	-	-	0.35	0.72
PRIAPULIDA	-	-	-	-	-	-	0.24	-
MOLLUSCA	911.14	61.79	183.62	192.97	87.03	187.52	34.03	26.63
Polyplacophora	0.52	0.05	0.95	-	0.07	0.60	0.71	0.28
Gastropoda	95.52	13.95	11.54	13.47	9.21	18.40	2.59	1.25
Bivalvia	815.01	47.03	169.37	171.74	70.18	161.40	29.79	12.69
Scaphopoda	-	0.76	0.86	2.50	7.39	7.12	0.94	-
Cephalopoda	-	-	-	5.26	0.18	-	-	-
Unidentified	-	-	0.90	-	-	-	-	-
ARTHROPODA	552.99	803.12	1414.19	62.64	45.13	6.68	1.27	2.77
Pycnogonida	1.33	0.46	0.22	0.06	-	-	-	-
Arachnida	0.16	-	-	-	-	-	-	-
Crustacea	551.50	802.66	1413.97	62.58	45.13	6.68	1.27	2.77
Ostracoda	0.57	0.02	0.18	-	-	-	-	0.17
Cirripedia	101.98	0.60	0.03	-	-	-	-	-
Copepoda	-	-	0.08	-	0.21	0.20	-	-
Kebaliacea	-	-	0.05	-	-	-	-	0.06
Cumacea	1.99	31.43	36.36	8.82	4.68	0.48	0.35	0.69
Tanaidacea	-	-	-	-	0.18	-	0.06	0.72
Isopoda	17.57	20.96	11.25	1.76	1.14	0.96	0.18	0.19
Amphipoda	407.47	742.20	1361.25	49.35	38.46	4.96	0.62	0.94
Mysidacea	6.90	0.11	0.02	-	0.07	-	-	-
Decapoda	15.02	7.34	4.75	2.65	0.39	0.08	0.06	-
BRYOZOA	25.34	33.99	3.47	0.15	-	-	-	-
BRACHIOPODA	-	-	0.02	-	-	-	-	-
ECHINODERMATA	42.88	41.82	78.33	235.59	28.21	2.88	2.65	6.48
Holothuroidea	0.70	0.14	5.90	2.06	9.46	0.52	0.62	0.39
Echinoidea	41.14	40.24	10.20	1.03	0.46	-	0.06	0.17
Ophiuroidea	0.73	0.38	61.03	231.03	17.86	2.20	1.62	5.86
Asteroidea	0.31	1.02	2.10	1.47	0.43	0.16	0.35	0.06
HEMICHORDATA	0.15	-	0.35	0.15	-	0.20	-	-
CHORDATA								
Ascidiacea	11.79	35.28	9.91	19.50	1.29	-	0.76	2.58
UNIDENTIFIED	12.88	5.66	4.81	5.85	6.32	2.48	2.85	6.78

Table 12.--Mean biomass listed by major taxonomic groups for each bathymetric class, representing the entire Middle Atlantic Bight Region.

Taxonomic group	Bathymetric class (meters)							
	0-24	25-49	50-99	100-199	200-499	500-999	1,000-1,999	2,000-3,999
	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²
PORIFERA	0.036	0.190	<0.001	0.033	0.018	<0.001	0.019	0.035
COLLEENTERATA	4.653	1.419	1.297	14.906	1.020	0.303	0.464	0.513
Hydrozoa	0.860	0.130	0.055	0.025	0.048	0.001	-	-
Anthozoa	3.793	1.289	1.242	14.962	0.972	0.302	0.464	0.513
Alcyonacea	0.012	-	0.172	0.428	0.083	0.197	0.221	0.048
Zoantharia	3.588	1.175	0.892	14.431	0.721	0.164	0.048	0.198
Unidentified	0.192	0.114	0.179	0.103	0.169	0.031	0.196	0.266
PLATYHELMINTHES	0.011	0.006	0.012	-	-	-	-	-
Turbellaria	0.011	0.006	0.012	-	-	-	-	-
NEMERTEA	0.878	0.884	0.637	0.297	0.106	0.012	0.193	0.001
ASCHELMINTHES	0.006	0.003	0.005	0.003	0.004	0.011	0.004	0.004
Nematoda	0.006	0.003	0.005	0.003	0.004	0.011	0.004	0.004
ANNELIDA	19.339	12.830	20.002	7.452	7.907	5.280	0.786	0.404
POGONOPHORA	-	0.003	<0.001	-	0.056	0.145	0.020	0.010
SIPHUNCULIDA	0.125	0.293	1.033	0.218	1.003	3.488	2.082	0.451
ECHINURA	0.175	0.015	-	-	-	-	0.664	2.414
PRIAPULIDA	-	-	-	-	-	-	0.147	-
MOLLUSCA	301.965	94.611	122.904	16.566	2.140	1.187	0.450	0.233
Polyplacophora	0.474	0.006	0.013	-	<0.001	0.004	0.008	0.005
Gastropoda	6.789	0.876	4.202	0.055	0.135	0.171	0.031	0.009
Bivalvia	294.703	93.709	118.671	16.404	1.863	0.914	0.400	0.218
Scaphopoda	-	0.022	0.014	0.034	0.140	0.098	0.011	-
Cephalopoda	-	-	-	0.072	0.002	-	-	-
Unidentified	-	-	0.004	-	-	-	-	-
ARTHROPODA	19.213	7.963	7.551	0.674	0.226	0.080	0.042	0.031
Pycnogonida	0.009	0.001	0.001	0.001	-	-	-	-
Arachnida	0.001	-	-	-	-	-	-	-
Crustacea	19.203	7.962	7.549	0.674	0.226	0.080	0.042	0.031
Ostracoda	0.005	<0.001	0.001	-	-	-	-	0.001
Cirripedia	12.774	0.015	<0.001	-	-	-	-	-
Copepoda	-	-	<0.001	-	0.001	0.002	-	-
Nebalicea	-	-	<0.001	-	-	-	-	0.001
Cumacea	0.014	0.095	0.192	0.055	0.027	0.005	0.004	0.014
Tanaidacea	-	-	-	-	0.002	-	0.001	0.005
Isopoda	0.138	0.761	0.347	0.130	0.046	0.008	0.005	0.002
Amphipoda	3.525	5.583	6.659	0.276	0.141	0.048	0.004	0.008
Mysidacea	0.030	0.002	<0.001	-	0.001	-	-	-
Decapoda	2.716	1.505	0.350	0.213	0.008	0.017	0.029	-
BRYOZOA	0.555	0.684	0.079	0.002	-	-	-	-
BRACHIOPODA	-	-	0.001	-	-	-	-	-
ECHINODERMATA	13.767	38.227	33.734	35.478	15.516	1.026	2.353	3.433
Holothuroidea	0.076	0.504	20.831	6.260	5.334	0.027	1.132	2.739
Echinoidea	11.578	37.411	4.352	13.498	6.560	-	0.107	0.233
Ophiuroidea	0.255	0.031	2.601	14.212	3.611	0.995	0.998	0.461
Asteroidea	1.848	0.282	5.950	1.509	0.005	0.004	0.116	0.001
HEMICHORDATA	0.041	-	0.066	0.044	-	0.002	-	-
CHORDATA	7.077	5.801	0.924	2.608	0.054	-	0.004	0.399
Ascidacea	7.077	5.801	0.924	2.608	0.054	-	0.004	0.399
UNIDENTIFIED	0.238	0.376	0.412	0.140	0.064	0.148	0.197	0.084

Biomass was small; average quantity per depth class ranged from less than 0.001 to 0.04 g/m². There were no evident correlations between biomass and water depth.

Coelenterata were about equally represented in number of individuals between Hydrozoa and the two anthozoan subcomponents, Alcyonaria (Alcyonacea) and Zoantharia (fig. 82). Hydroids were present at all depths on the continental shelf and on the upper half of the continental slope. Density was highest in the inner shelf region and along the outer shelf with densities of 20 and 28/m², respectively. Lowest average density was at depths from 500 to 1,000 m. The decreasing biomass of hydroids corresponded rather closely with increased water depth. Anthozoans were represented in all bathymetric classes. Densities ranged from 1.1/m² in deep water (2,000-3,999 m) to 15.4/m² in the shallowest depth (0-24 m); the trend of abundance with water depth was irregular. Biomass of anthozoans averaged between 0.3 g/m² to nearly 15 g/m² at the various depths but was not correlated with depth, except that quantities were generally higher on the continental shelf and generally lower on the continental slope and rise.

Platyhelminthes (fig. 82), which consisted entirely of Turbellaria, occurred only in rather shallow water, between 0 and 99 m. Density ranged from 0.4 to 1.7/m², with the highest density in the shallowest bathymetric class. Biomass was exceedingly small at all depths, ranging from 0.006 to 0.012 g/m².

Nemertea (fig. 82) were present in all bathymetric classes. Densities ranged from 0.1 to 6.3/m². Highest densities occurred on the inner and middle continental shelf and decreased with only slight irregularity to lowest density on the continental rise. The relationship between biomass and water depth was very similar to that of density. Greatest biomass, 0.9 g/m², occurred in the inner shelf at 0 to 50 m, and bathymetric-class averages decreased to 0.001 g/m² at depths of 2,000-3,999 m.

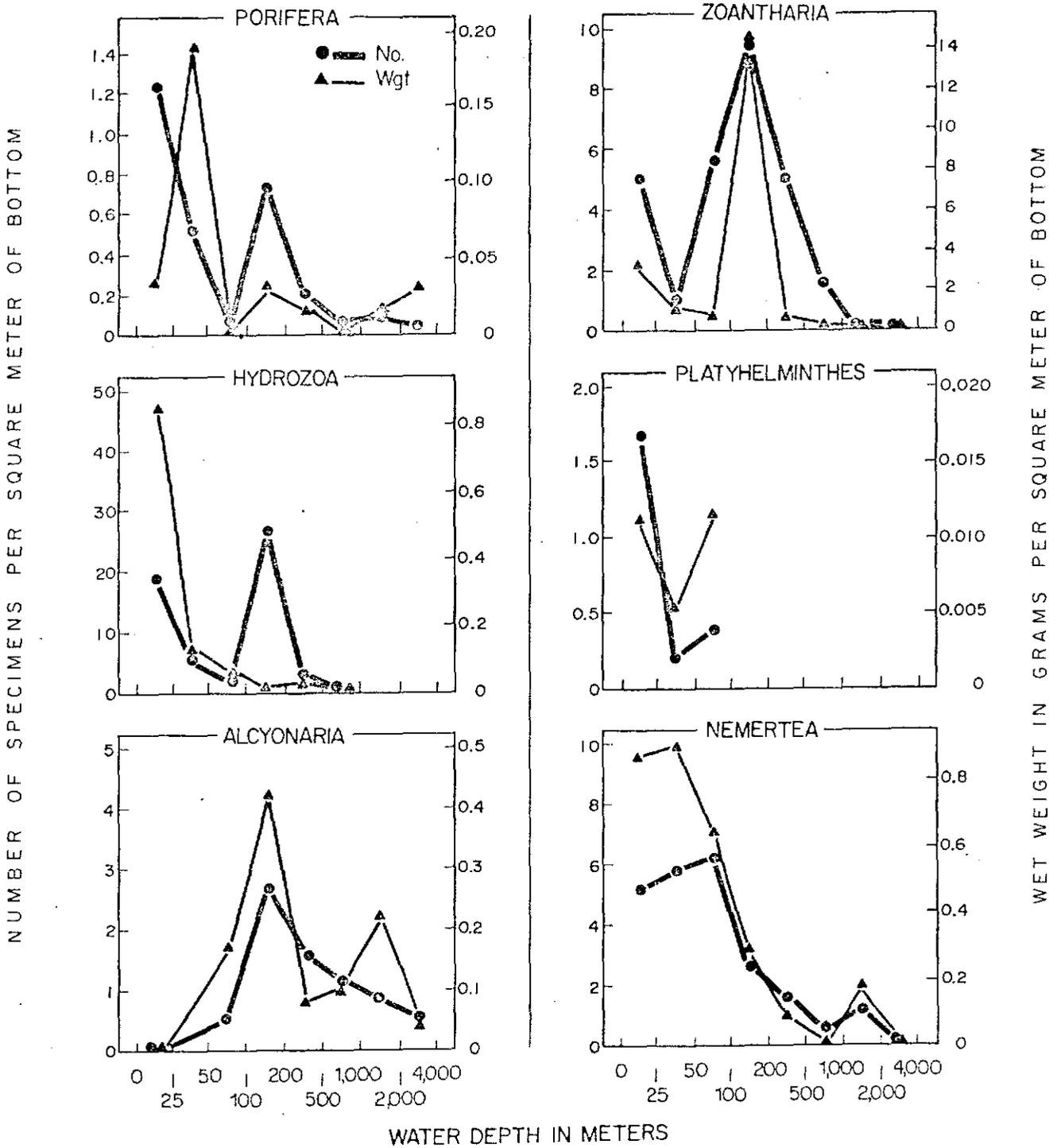


Figure 82.--Density and biomass in relation to water depth in the entire Middle Atlantic Bight Region for: Porifera, Hydrozoa, Alcyonaria, Zoantharia, Platyhelminthes, and Nemertea.

Aschelminthes (fig. 83), as presently defined by Barnes (1974), were represented entirely by Nematoda. Only the largest members of this group were retained by the sieving screen, thus only a small portion of this taxon is represented in these samples. They were present at all water depths; average densities ranged from 0.5 to 5/m². There was considerable irregularity in density as related to water depth, but the general trend was a higher density in shallow water and lower density in deeper water. Biomass of Nematoda was uniformly low at all depths. Quantities ranged from 0.003 to 0.01 g/m², without apparent correlation with density or bathymetric level.

Annelida (fig. 83), occurred in substantial numbers in all bathymetric classes sampled. They were most plentiful in shallow water and decreased markedly with increased water depth. High densities of about 472/m² were present in shallow water along the inner continental shelf. Their density decreased to about 238/m² on the outer shelf, and continued to diminish to 85/m² on the continental slope, and to only 6.4/m² on the continental rise. Biomass revealed a similar trend of decreasing amounts with increased water depth. On the continental shelf annelids averaged as much as 20 g/m², on the continental slope about 5 g/m², and on the continental rise 0.4 g/m².

Pogonophora (fig. 83), are a deep-water group and were present primarily at water depths ranging from 200 to 3,999 m. One exceptional group was encountered at depths between 43 and 66 m, which is much shallower than is typical for this phylum. For a group rarely reported from this region they were present in surprisingly high densities -- typically from 2.5 to 21.3/m². Highest densities were at mid-slope, at depths ranging from 500 to 1,000 m; moderate densities occurred on the continental rise. The unusually shallow occurrences were low (less than 0.6/m²) in density. Biomass of these small animals ranged from less than 0.001 to 0.14 g/m². Largest biomass occurred at mid-slope, where the density was highest.

Sipunculida (Sipuncula) (fig. 83) were present in all bathymetric classes. Their average density ranged from $1/m^2$ to $12/m^2$. High densities were present at mid-depths, 100 to 499 m, and decreased in both shallower and deeper waters. The relationship between biomass and water depth was similar to that between density and depth. Greatest biomass ($3.5 g/m^2$) occurred at depths 500 to 999 m, and decreased to $0.45 g/m^2$ on the continental rise, and to their smallest average quantity of $0.12 g/m^2$ in shallow (0-24 m) water.

Echiura (fig. 83) were uncommon in the Region and were one of the few taxonomic groups having a disjunct depth distribution. They were present in shallow water, 0-49 m, and in very deep water, 1,000-3,999 m. They were present in low densities at all depths; in shallow water their average density was only 0.02 to $0.27/m^2$, and in deep water they were somewhat more numerous, averaging 0.35 and $0.72/m^2$. Biomass of Echiura in relation to water depth was similar to that indicated by density. Biomass in shallow water averaged 0.02 to $0.2 g/m^2$ and in deep water 0.7 to $2.4 g/m^2$.

Priapulida (fig. 83) were rare in the study area. Only a few specimens were obtained and they were present only in deep water, 1,000-1,999 m. The density of priapulids averaged $0.24/m^2$ and biomass averaged $0.15 g/m^2$.

Mollusca were one of the more common faunal groups represented in the Middle Atlantic Bight Region; they were present in all bathymetric classes. They exhibited an irregular trend of decreasing density with increased water depth. Highest density, $911/m^2$, occurred in the shallowest depth class, 0-24 m. At deeper levels on the continental shelf their density ranged from 62 to $193/m^2$. On the continental slope their density ranged from 34 to $188/m^2$. Lowest average density, $27/m^2$, occurred on the continental rise, 2,000-3,999 m. The relationship between biomass and water depth was similar to that for density, except that changes in biomass from class-to-class were much more uniform and regular. The largest average biomass was $302 g/m^2$,

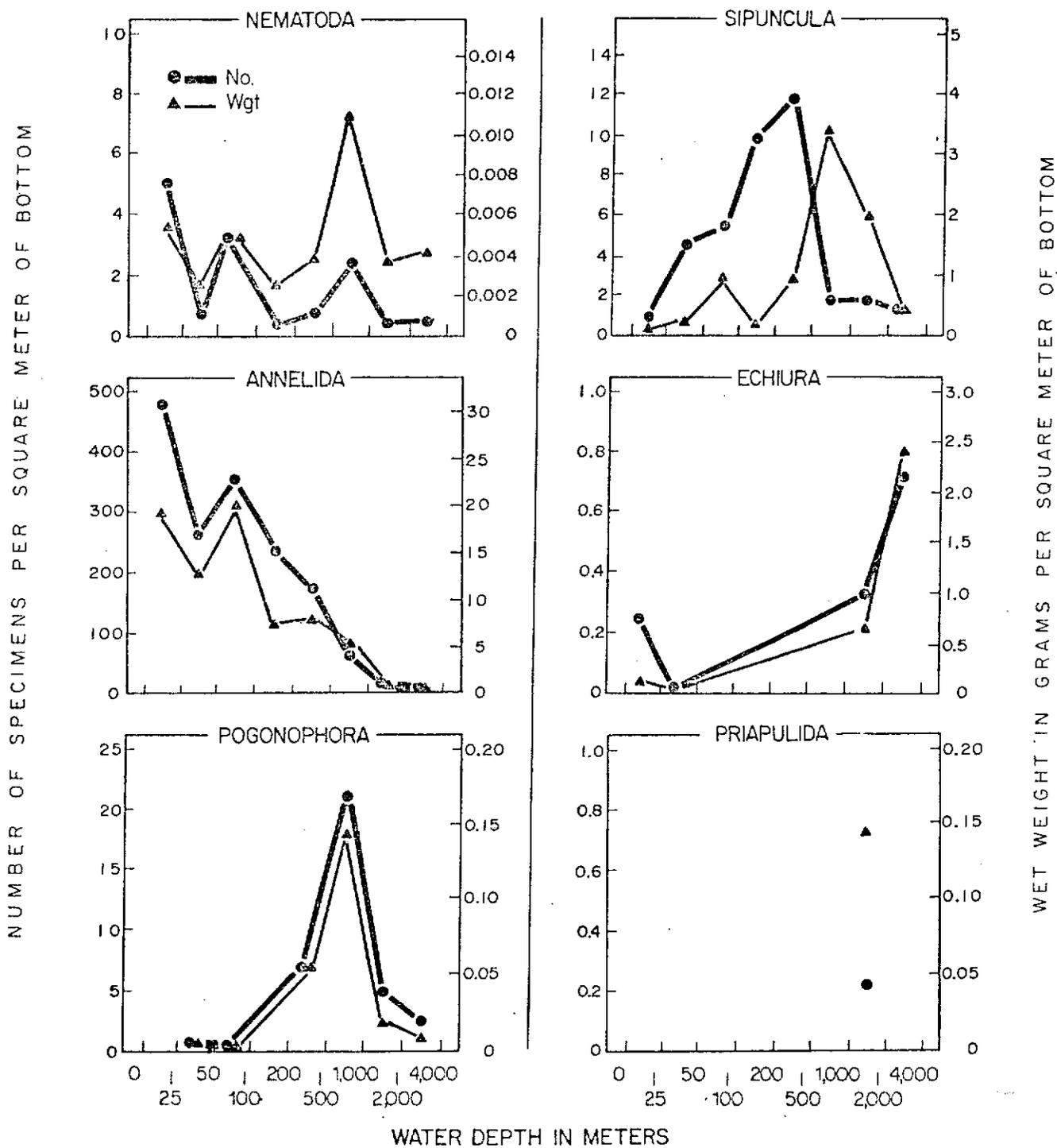


Figure 83.--Density and biomass in relation to water depth in the entire Middle Atlantic Bight Region for: Nematoda, Annelida, Pogonophora, Sipuncula, Echiura, and Priapulida.

which occurred in the 0-24 m depth class, and the smallest average biomass was 0.23 g/m^2 , which occurred in the deepest water -- 2,000-3,999 m.

Polyplocophora (fig. 84) were sparse (0.05 to $0.95/\text{m}^2$) and revealed no special affinity for any particular bathymetric level. Biomass, also, was small (0.001 to 0.47 g/m^2) at all depths where they were present.

Gastropoda (fig. 84) were represented in all water-depth classes. They were present in highest densities in shallow water and decreased with slight irregularity with increased water depth. Density of gastropods at 0-24 m averaged $96/\text{m}^2$. Farther out on the continental shelf their average density ranged from 12 to $14/\text{m}^2$. They were slightly more abundant on the continental slope between 500 and 999 m, where they averaged $18/\text{m}^2$. On the lower continental slope their density averaged $2.6/\text{m}^2$, and on the continental rise $1.2/\text{m}^2$. Biomass was moderately small and the quantity varied with depth in a pattern similar to their density. Largest biomass (6.8 g/m^2) was in shallow water, 0-24 m, and it decreased irregularly with increased water depth. On the continental slope the biomass of gastropods averaged only 0.1 g/m^2 , and on the continental rise less than 0.01 g/m^2 .

Bivalvia (fig. 84) were very abundant and were the preeminent group in terms of biomass. Their highest densities occurred in shallow water and decreased irregularly with increased water depth. In shallow water, 0-24 m, their density averaged $815/\text{m}^2$. At lower levels on the continental shelf their density ranged between 47 and $172/\text{m}^2$. On the continental slope the average density ranged from 30 to $161/\text{m}^2$. Biomass trends in relation to bathymetric level were similar to those for density, but exhibited fewer irregularities. Largest biomass (295 g/m^2) occurred in shallow water (0-24 m). Mid-shelf biomasses ranged from 94 to 119 g/m^2 ; outer shelf biomass averaged

16 g/m². On the continental slope the average biomass was only 1 g/m², and on the continental rise 0.2 g/m².

Scaphopoda (fig. 84) were represented in all depth classes except the shallowest (0-24 m) and deepest (2,000-3,999 m). At all depths where they occurred, they were present in low densities. In relative terms they were most common on the upper and middle parts of the continental slope, where their average density was 7/m². Density decreased to 0.9/m² along the lower slope and diminished regularly inshore across the continental shelf to 0.09/m² in shallow water, 0-24 m. Biomass of scaphopods was small in all depths; average values ranged from less than 0.001 g/m² in shallow water to 0.14 g/m² on the upper slope, and to 0.01 g/m² along the lower slope.

Cephalopoda (fig. 84) were represented only by eggs deposited on the sea floor. They were taken at mid-depths -- 100 to 500 m -- where their density averaged 0.2 to 5.3/m². Biomass of the cephalopod eggs was very small, averaging 0.002 to 0.07 g/m².

Arthropoda were exceedingly common and were represented mainly by Crustacea. Only two other classes of arthropods were represented in our samples: Arachnida and Pycnogonida. Arachnida were rare; they were taken only in shallow water, 0-24 m, where they were present in low density (0.2/m²), and their biomass was less than 0.001 g/m². Pycnogonida (fig. 84) were absent in samples from deep water, 200 to 3,999 m, but were represented at all bathymetric classes in the shallower areas. Average densities ranged from 0.06 to 1.3/m². Biomass was very small at all depths, averaging less than 0.001 to 0.009 g/m².

Crustacea was the most numerous taxonomic group encountered in the Region, and were present at all water depths. They occurred in highest

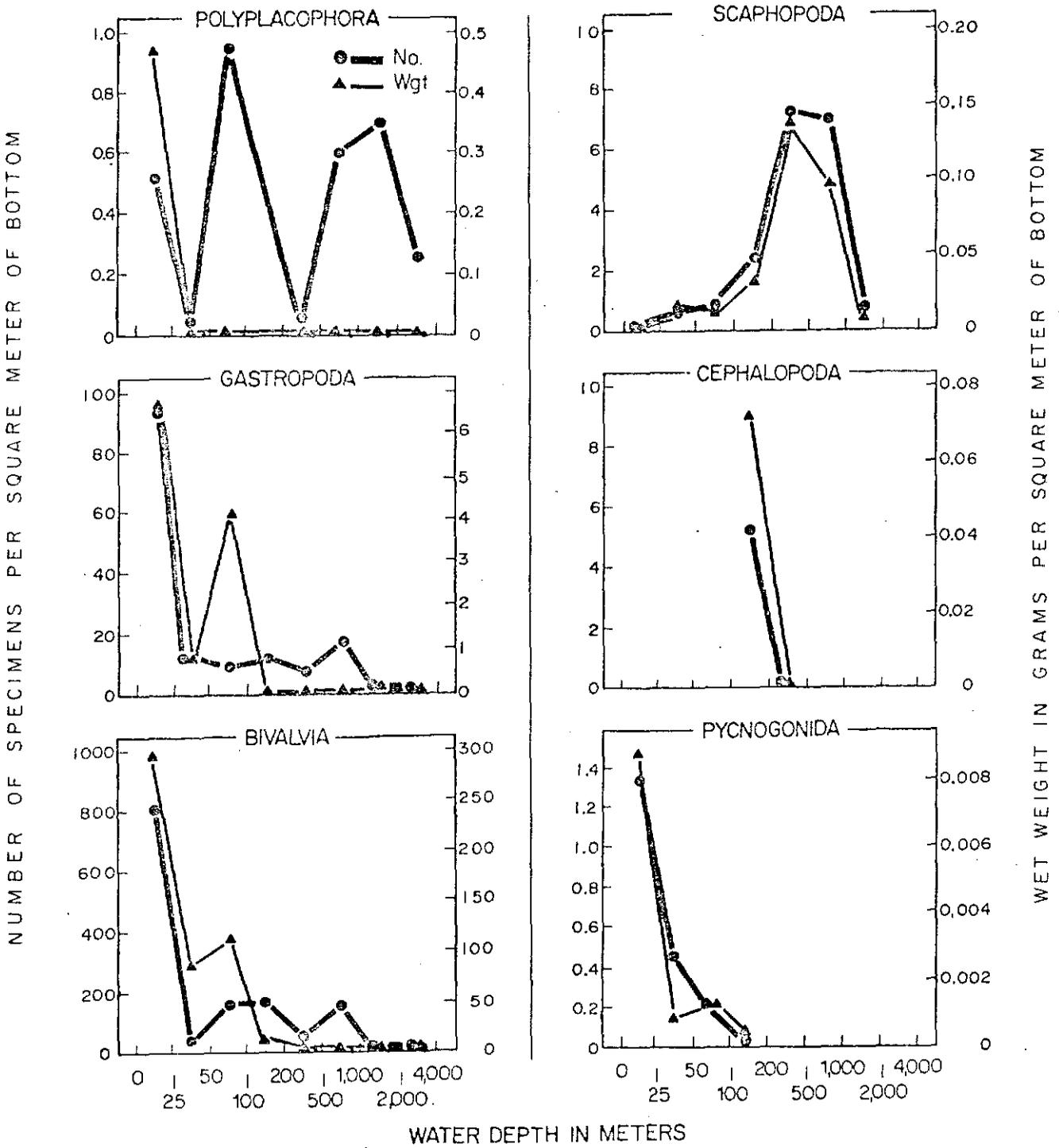


Figure 84.--Density and biomass in relation to water depth in the entire Middle Atlantic Bight Region for: Polyplacophora, Gastropoda, Bivalvia, Scaphopoda, Cephalopoda, and Pycnogonida.

density ($1,414/m^2$) on the continental shelf at depths between 50 and 99 m, and decreased in both deeper and shallower waters. In the shallow shelf waters they averaged 552 to $802/m^2$, whereas in deeper waters they averaged only 1 to $62/m^2$. Biomass was rather regularly inversely related to water depth. Largest biomass ($19 g/m^2$) occurred in shallow water, 0-24 m, and decreased to $0.7 g/m^2$ on the outer continental shelf. On the upper continental slope the biomass averaged $0.2 g/m^2$, but only $0.04 g/m^2$ on the lower slope. Their average biomass on the continental rise was $0.03 g/m^2$.

Ostracoda (fig. 85) were only partially sampled, because of their small size. They were represented in samples from shallow (0-99 m) and very deep (2,000-3,999 m) bathymetric classes. Where present they occurred in low densities, averaging 0.02 to $0.57/m^2$. Their biomass, as judged from these samples, was very small; average quantities ranged from less than 0.001 to $0.005 g/m^2$.

Cirreperdia (fig. 85) were restricted to water depths from 0 to 99 m, and their density was clearly related to water depth. In shallow water (0-24 m) their average density was $102/m^2$ and decreased to $0.03/m^2$ at depths between 50 and 99 m. Biomass showed a similar relationship with water depth. Average biomass in shallow water was $12.8 g/m^2$ and decreased to less than $0.001 g/m^2$ at depths of 50 to 99 m.

Copepoda (fig. 85), because of their small size, were incompletely sampled. They occurred at mid-depths (50 to 999 m) and were present in low densities, $0.21/m^2$ and less. Biomass, also, was very small, averaging $0.002 g/m^2$ and less.

Nebaliacea (fig. 85) were rare; they were present at only three stations, all at water depths between 50 and 99 m. Density averaged $0.05/m^2$ and biomass averaged less than $0.001 g/m^2$.

Cumacea (fig. 85) were rather widely distributed bathymetrically, and were represented in all depth classes. Densities were generally low to moderate. Their center of abundance was located at mid-shelf (25 to 99 m), where their density averaged 31 to 36/m². Along the inner shelf (0-24 m) they averaged only 2/m², and on the outer shelf and upper continental slope 4.7 to 8.8/m². At depths below 500 m their average density ranged between 0.4 and 0.7/m². Biomass of cumaceans was small at all depths; average quantities ranged between 0.004 and 0.19 g/m². Trends in biomass were similar to those exhibited by density. Largest quantities were present at mid-shelf depths, with smaller quantities along the inner shelf and upper continental slope. Smallest quantities occurred on the lower slope and on the continental rise.

Tanaidacea (fig. 85) were uncommon and restricted to deep water. Depths at which they occurred ranged from 200 to 3,999 m. In all bathymetric classes they were present in low density, 0.06 to 0.72/m². Biomass averaged less than 0.001 to 0.005 g/m².

Isopoda (fig. 86) were common and represented in all bathymetric classes. Densities were moderately low with the highest abundance, 18 to 20/m², in shallow water (0-49 m). Intermediate densities occurred on the outer shelf and upper slope, 1.1 to 11.2/m², and low densities, 0.2 to 1.0/m², in deep water (500-3,999 m). Biomass of isopods reflected a trend with water depth similar to that exhibited by density. Largest biomass, 0.13 to 0.76 g/m², occurred on the continental shelf; intermediate amounts, 0.005 to 0.046 g/m², on the continental slope; and smallest quantities, 0.002 g/m², on the continental rise.

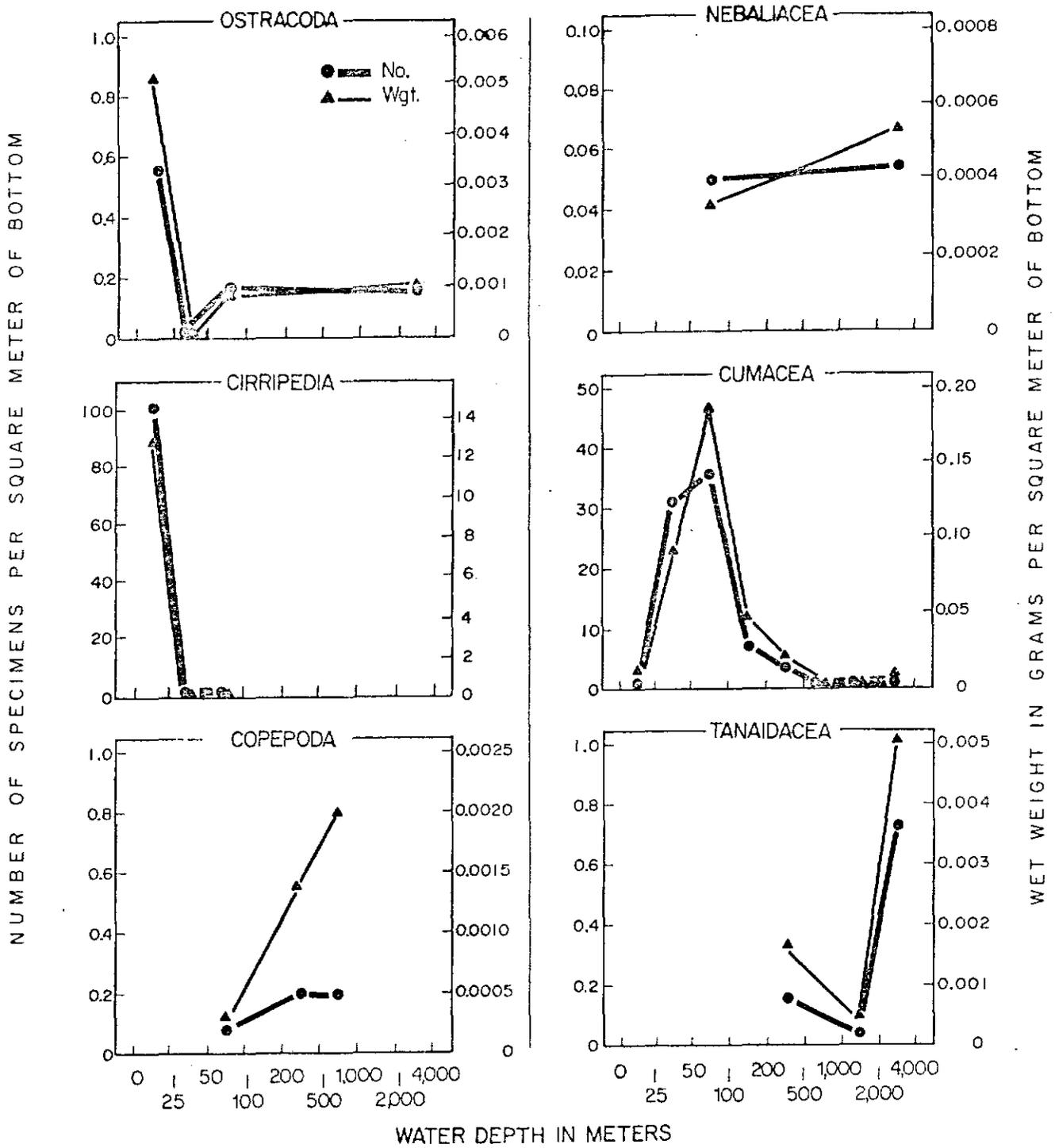


Figure 85.--Density and biomass in relation to water depth in the entire Middle Atlantic Bight Region for: Ostracoda, Cirripedia, Copepoda, Nebaliacea, Cumacea, and Tanaidacea.

Amphipoda (fig. 86) were the most numerous taxonomic component in the entire benthos. They were particularly common on the continental shelf. Density was highest ($1,261/m^2$) at mid-shelf at depths of 50 to 99 m, and decreased in both shallower and deeper waters. Average density in shallow water (0-24 m) was $407/m^2$. On the outer shelf and upper slope their density averaged 38 to $49/m^2$. In deeper water (greater than 500 m) their density averaged between 0.6 and $5/m^2$. Biomass of amphipods was generally quite small with largest amounts (3.5 to $6.6 g/m^2$) on the middle and inner continental shelf; intermediate quantities (0.1 to $0.3 g/m^2$) were present on the outer shelf and upper slope. Small quantities, less than $0.05 g/m^2$, were present in water depths greater than 500 m.

Mysidacea (fig. 86) were uncommon and were represented only in the shallow and intermediate depths (less than 500 m). Density was highest, $6.9/m^2$, in shallow water (0-24 m), and low, 0.02 to $0.11/m^2$, at all depths greater than 25 m. Average biomass was small at all depth classes. In shallow water (0-24 m), it averaged $0.03 g/m^2$, and in deeper water the average biomass ranged from less than 0.001 to $0.002 g/m^2$.

Decapoda (fig. 86) were moderately common and were present in all bathymetric classes except those from 200 to 3,999 m. Density was highest, $15/m^2$, in shallow water (0-24 m) and decreased to $0.06/m^2$ in deep water (1,000 to 1,999 m). Biomass, also, was largest, $2.7 g/m^2$, in shallow water, and decreased to $0.03 g/m^2$ in deep water (1,000-1,999 m).

Bryozoa (fig. 86) were restricted to the relatively shallow bathymetric range of 0 to 199 m. Highest densities, 25 to $34/m^2$, occurred in the inner shelf waters of less than 50 m. On the outer shelf at depths between 50 and 199 m the average density of bryozoans ranged between 0.15 and $3.5/m^2$. Biomass exhibited a trend similar to that for density. Largest biomass, 0.6 to 0.7

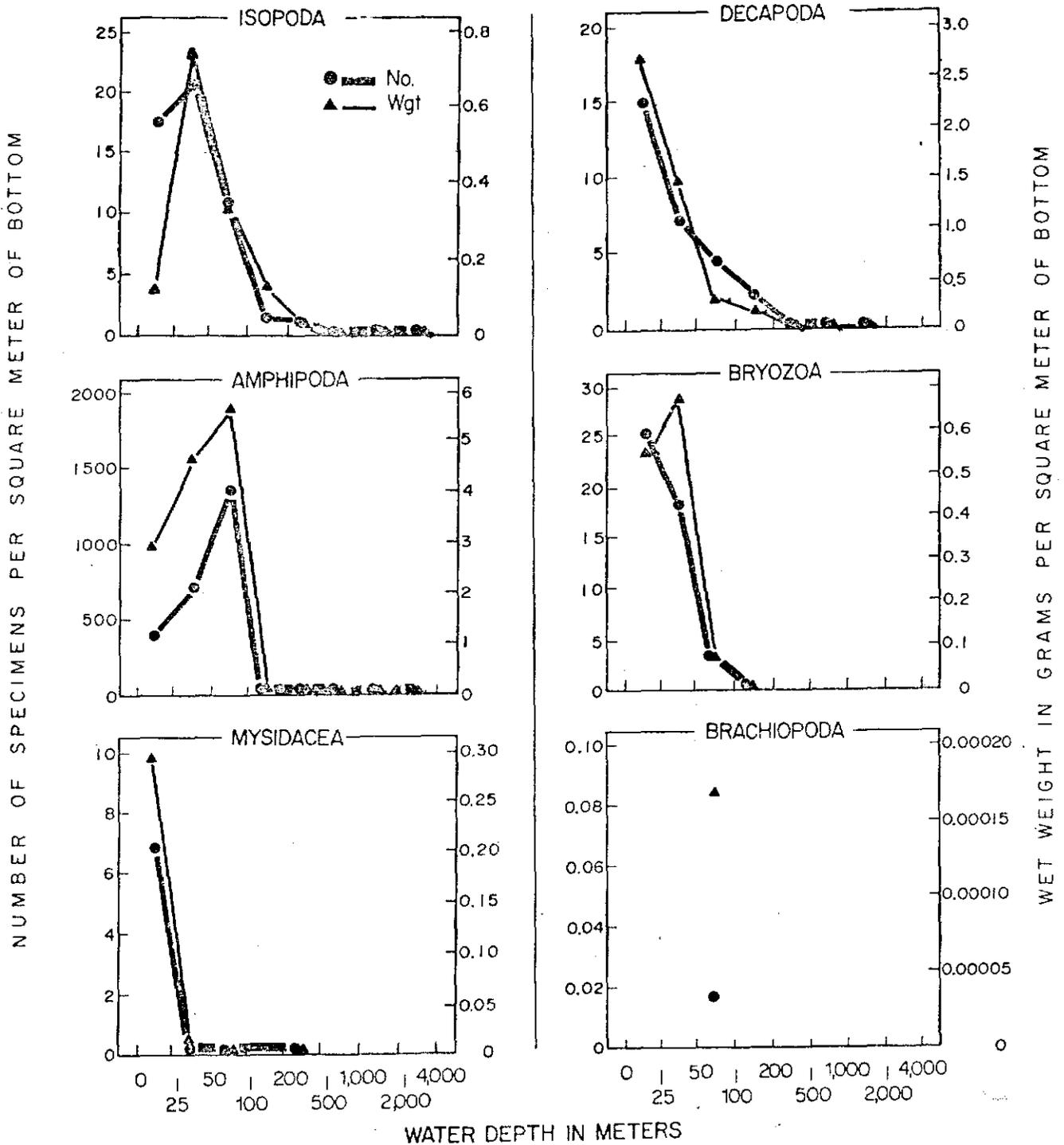


Figure 86.--Density and biomass in relation to water depth in the entire Middle Atlantic Bight Region for: Isopoda, Amphipoda, Mysidacea, Decapoda, Bryozoa, and Brachiopoda.

g/m^2 , occurred in shallow water (0-49 m); intermediate quantities (0.08 g/m^2) were present at mid-shelf; and very small quantities (0.002 g/m^2) occurred along the outer shelf.

Brachiopoda (fig. 86) were rare in the Middle Atlantic Bight Region. They were present only at water depths of 50 to 99 m. Density averaged $0.02/\text{m}^2$ and biomass averaged less than 0.001 g/m^2 .

Echinodermata were common components of the fauna throughout the Region. They were most common, average density of $236/\text{m}^2$, along the outer continental shelf and decreased to $43/\text{m}^2$ in shallow water (0-24 m). Biomass was moderately large at all bathymetric levels. On the continental shelf the average biomass ranged from 14 g/m^2 to 38 g/m^2 ; on the continental slope it ranged between 1 and 16 g/m^2 ; and on the continental rise the average biomass was 3.4 g/m^2 .

Holothuroidea (fig. 87) were not numerous, but they occurred in all bathymetric classes and contributed substantially to the biomass. Density was highest (2 to 9 g/m^2) at mid-shelf to upper slope and decreased to $0.1/\text{m}^2$ in shallow water and to $0.4/\text{m}^2$ in deep water. Biomass trends were similar to those of density; largest biomass, 21 g/m^2 , occurred at mid-shelf and decreased to 5.3 g/m^2 on the upper slope. Small quantities, 0.08 to 0.5 g/m^2 , were present on the inner shelf. Small to moderate quantities, 0.03 to 2.74 g/m^2 , occurred on the lower continental slope and continental rise.

Echinoidea (fig. 87) were common in shallow water and uncommon in deep water. They were present in all depth classes except one -- on the mid-slope at 500 to 999 m. Density on the inner shelf ranged from 40 to $41/\text{m}^2$; on the outer shelf it averaged 0.5 to $1.0/\text{m}^2$; and on the lower continental slope and on the rise the average density was only 0.06 to $0.17/\text{m}^2$. Biomass of echinoids was large (4 to 37 g/m^2) on the continental shelf and upper slope. On the lower continental shelf and the continental rise their average biomass was only 0.1 to 0.2 g/m^2 .

Ophiuroidea (fig. 87) were present in all bathymetric classes and were abundant (average density $231/m^2$) on the outer shelf. Density was low (0.4 to $0.7/m^2$) on the inner shelf, but averaged $61/m^2$ at mid-shelf. Density averaged $18/m^2$ on the upper slope, decreased to 1.6 and $2.2/m^2$ on the middle and lower slope, but averaged $5.9/m^2$ on the continental rise. Biomass was largest, $14 g/m^2$ on the outer shelf and decreased in both shallower and deeper waters. In shallow shelf waters the average biomass was only 0.03 to $0.26 g/m^2$, whereas in deep water (200 to $3,999$ m) the biomass averaged between 0.5 and $3.6 g/m^2$.

Asteroidea (fig. 87) were present in all bathymetric classes and the relationship between density and water depth was irregular, but revealed a trend of higher density in shallower waters and lower density in deeper waters. Density of starfish on the continental shelf averaged between 0.3 and $2.1/m^2$. On the continental slope the average density ranged from 0.2 to $0.4/m^2$. Density on the continental rise averaged $0.06/m^2$. Biomass trends for starfish were similar to those for density. Average biomass on the shelf ranged from 0.3 to $6.0 g/m^2$. On the continental slope the biomass averaged between 0.004 and $0.12 g/m^2$. On the continental rise the average biomass was less than $0.001 g/m^2$.

Hemichordata (fig. 87) were sparse and revealed no conspicuous relationship in regard to bathymetric level. They were present on the continental shelf at densities averaging 0.2 to $0.4/m^2$. On the mid-continental slope, their only deepwater occurrence, their density averaged $0.2/m^2$. Biomass of hemichordates was small at all depths, averaging between 0.04 and $0.06 g/m^2$ on the shelf and $0.002 g/m^2$ on the slope.

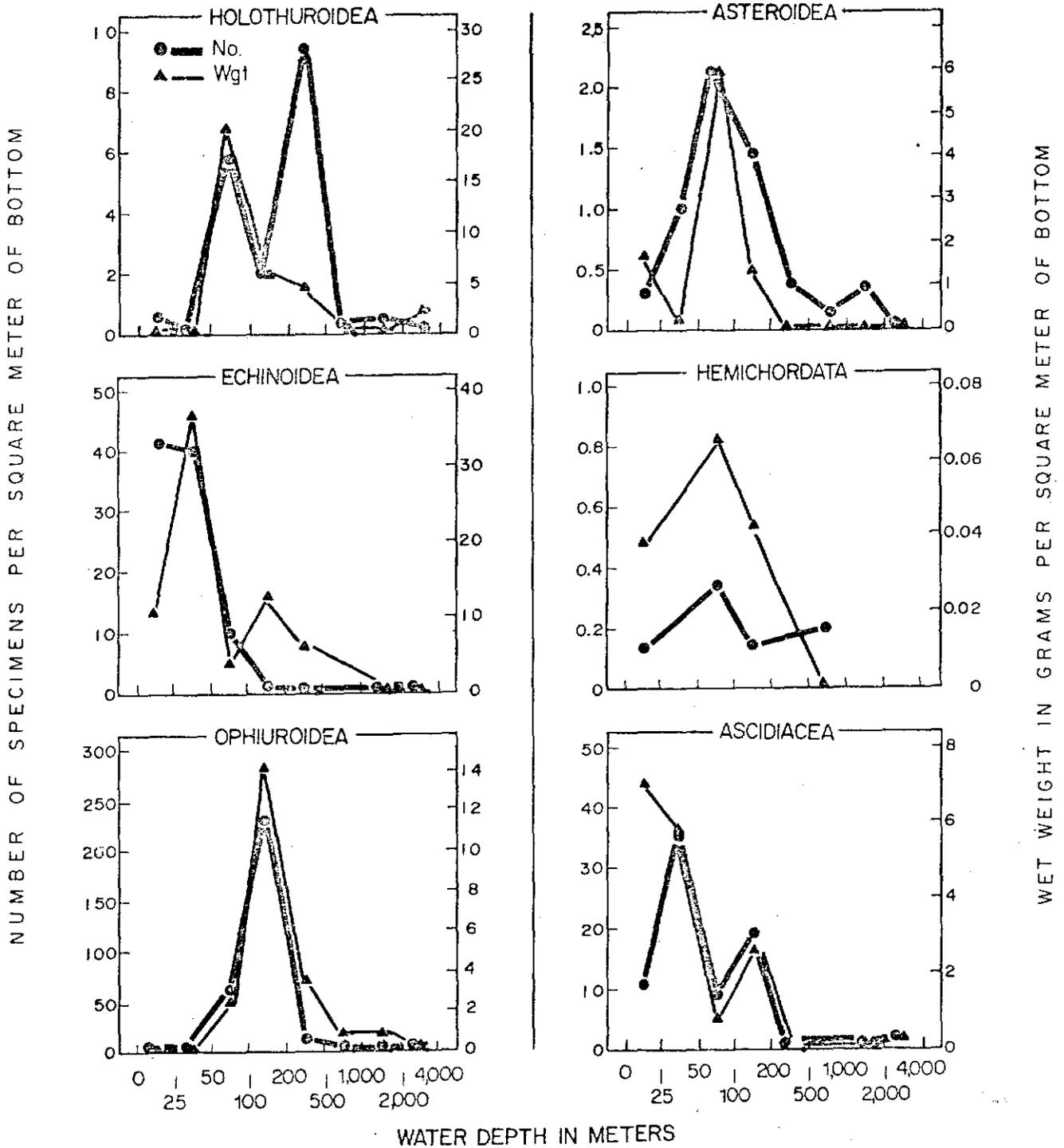


Figure 87.--Density and biomass in relation to water depth in the entire Middle Atlantic Bight Region for: Holothuroidea, Echinoidea, Ophiuroidea, Asteroidea, Hemichordata, and Ascidiacea.

Chordata (Ascidiacea) (fig. 87) were present in all bathymetric classes, except at mid-slope at depths between 500 and 999 m. They occurred in substantial quantity and the densities on the shelf were highest with quantities averaging between 10 and 35/m². Densities on the continental slope and rise averaged 0.8 to 2.6/m². Biomass was moderately high on the continental shelf; average quantities ranged from 0.9 to 7.1 g/m². Biomass in deep water, 200 to 3,999 m, ranged from 0.004 to 0.4 g/m².

Subarea Differences in the Distribution of Taxonomic Groups

In this section the principal differences in bathymetric distribution of the various taxonomic groups from one subarea to another are described. Also, differences or similarities in density and biomass from one subarea to another, for each major taxonomic group, are pointed out. The quantitative values most commonly given are average densities and biomasses for a particular taxon in one bathymetric class, or average densities or biomasses of a taxon for all bathymetric classes where it occurred.

Porifera were present in nearly all bathymetric classes in Southern New England (table 13), whereas in New York Bight they were restricted to depths less than 100 m (table 15), and limited (with one exception) to depths less than 50 m in Chesapeake Bight (table 17). Density decreased from north to south; sponges averaged 0.8/m² in Southern New England, 0.5/m² in New York Bight, and 0.4/m² in Chesapeake Bight. Biomass was substantially greater, averaging 0.11 g/m² (table 14), in Southern New England than in the other subareas, where the biomass averaged 0.03 and 0.04 g/m², respectively (tables 16 and 18).

Coelenterata occurred in all bathymetric classes in each subarea and exhibited similar trends of quantity in relation to water depth. Coelenterates were most numerous and occurred in largest biomass in Southern New England,

were relatively sparse in New York Bight, and were present in intermediate quantity in Chesapeake Bight.

Hydrozoa were common on the continental shelf in all subareas, but were rare below 500 m. The quantity of hydroids varied only modestly from one subarea to another, except for the irregular occurrence of very high or low densities, which may have resulted from the vagaries of sampling. Both density and biomass revealed the same inter-subarea trends; slightly higher quantities in Southern New England, lower quantities in New York Bight, and intermediate quantities in Chesapeake Bight.

Anthozoa, as a group, were distributed much the same, in relation to bathymetric level, in all three subareas. However, one of the main subgroups, the Alcyonacea, presented a different pattern. They were common at mid-depths and in deep water (50 to 3,999 m) in Southern New England and New York Bight, but in Chesapeake Bight they occurred only in very shallow (0-24 m) and very deep (1,000-3,999 m) waters.

Platyhelminthes occupied the same bathymetric classes in all three subareas. They were present in largest quantities, in terms of both density and biomass, in Southern New England; lowest amounts in New York Bight; and intermediate quantities in Chesapeake Bight.

Nemertea were distributed similarly (as described in the preceding section) in regard to bathymetric level in all subareas. In terms of density, they ranked first in Southern New England with an average of $6/m^2$, ranked second in New York Bight with $2.6/m^2$, and were least abundant in Chesapeake Bight with $0.4/m^2$. Biomass values reflected the same sequential order, with average values of $0.8 g/m^2$, $0.7 g/m^2$, and $0.3 g/m^2$.

Table 13.--Mean number of individuals listed by major taxonomic groups for each bathy-metric class, representing the Southern New England subarea.

Taxonomic group	Bathymetric class (meters)							
	0-24	25-49	50-99	100-199	200-499	500-999	1,000-1,999	2,000-3,999
	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²
PORIFERA	2.60	3.37	-	1.32	0.43	0.25	0.18	0.13
COELENTERATA	113.40	4.75	12.23	19.68	15.64	3.00	3.18	0.51
Hydrozoa	73.20	2.19	0.82	-	2.36	-	-	-
Anthozoa	40.20	2.56	11.41	19.68	13.28	3.00	3.18	0.51
Alcyonacea	-	-	1.05	2.42	2.14	0.50	0.45	0.25
Zoantharia	3.40	2.04	9.79	16.47	9.64	-	0.18	0.13
Unidentified	36.80	0.52	0.57	0.79	1.50	2.50	2.55	0.13
PLATYHELMINTHES	6.77	0.22	0.50	-	-	-	-	-
Turbellaria	6.77	0.22	0.50	-	-	-	-	-
NEMERTEA	3.06	12.00	9.96	3.47	2.07	0.75	2.09	0.13
ASCHELMINTHES	17.97	1.56	6.66	0.84	0.86	5.13	0.18	0.75
Nematoda	17.97	1.56	6.66	0.84	0.86	5.13	0.18	0.75
ANNELIDA	315.54	547.37	484.36	333.63	254.93	106.00	13.73	7.19
POGONOPHORA	-	-	-	-	7.14	10.38	2.64	1.56
SIPUNCULIDA	4.49	20.15	7.70	15.32	18.79	2.50	0.18	1.50
ECHIURA	-	-	-	-	-	-	0.91	0.38
PRIAPULIDA	-	-	-	-	-	-	0.54	-
MOLLUSCA	478.97	91.36	209.01	134.01	72.43	106.13	44.18	12.07
Polyplacophora	2.14	0.22	1.89	-	-	0.25	0.64	0.13
Gastropoda	135.83	46.07	19.43	2.11	9.14	13.13	2.73	0.25
Bivalvia	340.57	45.07	185.80	120.74	55.50	91.25	40.45	11.69
Scaphopoda	-	-	-	1.74	7.43	1.50	0.36	-
Cephalopoda	-	-	-	9.42	0.36	-	-	-
Unidentified	-	-	1.89	-	-	-	-	-
ARTHROPODA	1370.57	2146.64	2080.46	61.59	45.14	10.13	1.45	3.63
Pycnogonida	1.23	1.37	0.21	-	-	-	-	-
Arachnida	-	-	-	-	-	-	-	-
Crustacea	1369.34	2145.27	2080.25	61.59	45.14	10.13	1.45	3.63
Ostracoda	1.11	-	1.37	-	-	-	-	-
Cirripedia	107.46	2.41	-	-	-	-	-	-
Copepoda	-	-	0.11	-	0.43	0.63	-	-
Nebaliacea	-	-	-	-	-	-	-	-
Cumacea	1.26	88.30	49.18	7.53	3.07	0.75	0.36	1.00
Tanaidacea	-	-	-	-	0.36	-	0.18	0.88
Isopoda	4.94	36.67	10.46	1.37	0.93	2.50	0.18	0.31
Amphipoda	1220.31	2008.67	2015.79	52.16	39.71	6.25	0.73	1.44
Mysidacea	7.03	0.11	-	-	-	-	-	-
Decapoda	27.23	9.11	3.34	0.53	0.64	-	-	-
BRYDZOA	83.29	73.63	0.29	0.26	-	-	-	-
BRACHIOPODA	-	-	-	-	-	-	-	-
ECHINODERMATA	4.12	39.49	154.71	321.11	40.51	3.00	3.18	8.63
Holothuroidea	1.83	-	11.71	2.11	8.86	-	1.00	0.25
Echinoidea	1.29	34.89	14.68	1.42	0.79	-	0.18	0.38
Ophiuroidea	0.89	0.89	125.14	315.47	30.29	3.00	1.64	8.00
Asteroidea	0.11	3.81	3.18	2.11	0.57	-	0.36	-
Unidentified	-	-	0.73	0.26	-	0.63	-	-
HEMICHORDATA	-	-	-	-	-	-	-	-
CHORDATA	20.69	73.63	15.30	34.58	2.43	-	1.36	2.31
Ascidiacea	20.69	73.63	15.30	34.58	2.43	-	1.36	2.31
UNIDENTIFIED	4.26	16.93	7.09	7.63	7.21	3.50	1.55	9.25

Table 14.--Mean biomass listed by major taxonomic groups for each bathymetric class, representing the Southern New England subarea.

Taxonomic group	Bathymetric class (meters)							
	0-24	25-49	50-99	100-199	200-499	500-999	1,000-1,999	2,000-3,999
	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²
PORIFERA	0.147	0.478	-	0.059	0.035	0.002	0.002	0.079
COELENTERATA	5.640	2.264	2.117	23.411	31.412	0.054	0.429	2.478
Hydrozoa	2.933	0.287	0.081	-	0.142	-	-	-
Anthozoa	2.708	1.977	2.036	23.411	31.270	0.054	0.429	2.478
Alcyonacea	-	-	0.361	0.435	0.081	0.005	0.116	0.004
Zoantharia	1.833	1.950	1.542	22.935	31.126	-	0.148	2.091
Unidentified	0.875	0.027	0.133	0.040	0.062	0.049	0.166	0.382
PLATYHELMINTHES	0.036	0.003	0.016	-	-	-	-	-
Turbellaria	0.036	0.003	0.016	-	-	-	-	-
NEMERTEA	0.752	2.010	1.013	0.232	0.164	0.011	0.103	0.001
ASCHELMINTHES	0.003	0.008	0.010	0.005	0.005	0.015	0.002	0.006
Nematoda	0.003	0.008	0.010	0.005	0.005	0.015	0.002	0.006
ANNELIDA	23.890	24.373	31.012	19.416	5.575	3.276	0.796	0.299
POGONOPHORA	-	-	-	-	0.089	0.032	0.011	0.369
SIPUNCULIDA	0.588	1.126	1.412	1.142	1.453	10.676	0.012	1.003
ECHIURA	-	-	-	-	-	-	0.472	0.267
PRIAPULIDA	-	-	-	-	-	-	0.361	-
MOLLUSCA	294.898	263.083	131.102	4.572	2.004	0.958	0.524	0.312
Polyplacophora	2.207	0.025	0.027	-	-	0.002	0.008	0.001
Gastropoda	4.058	2.238	7.914	0.013	0.054	0.076	0.049	0.004
Bivalvia	288.598	260.820	123.154	4.403	1.831	0.858	0.460	0.306
Scaphopoda	-	-	-	0.027	0.115	0.021	0.006	-
Cephalopoda	-	-	-	0.129	0.004	-	-	-
Unidentified	-	-	0.008	-	-	-	-	-
ARTHROPODA	53.305	16.668	10.685	0.533	0.224	0.058	0.024	-
Pycnogonida	0.006	0.002	0.002	-	-	-	-	-
Arachnida	-	-	-	-	-	-	-	-
Crustacea	53.299	16.665	10.682	0.533	0.224	0.058	0.024	0.049
Ostracoda	0.011	-	0.002	-	-	-	-	-
Cirripedia	38.950	0.056	-	-	-	-	-	-
Copepoda	-	-	<0.001	-	0.003	0.006	-	-
Rebaliacea	-	-	-	-	-	-	-	-
Cumacea	0.020	0.277	0.269	0.056	0.014	0.008	0.004	0.026
Tanaidacea	-	-	-	-	0.004	-	0.002	0.006
Isopoda	0.053	0.616	0.343	0.005	0.047	0.019	0.013	0.003
Amphipoda	10.558	13.957	9.827	0.377	0.144	0.025	0.006	0.014
Mysidacea	0.045	0.001	-	-	-	-	-	-
Decapoda	3.652	1.758	0.241	0.005	0.013	-	-	-
BRYOZOA	1.917	2.755	0.044	0.003	-	-	-	-
BRACHIOPODA	-	-	-	-	-	-	-	-
ECHINODERMATA	13.141	4.560	57.353	44.956	23.066	1.714	1.307	4.586
Holothuroidea	0.101	-	43.353	3.342	3.950	-	0.331	3.579
Echinoidea	12.277	4.229	2.261	17.123	12.931	-	0.332	0.525
Ophiuroidea	0.489	0.058	5.312	22.570	6.118	1.714	0.519	0.482
Asteroidea	0.274	0.274	6.427	1.922	0.006	-	0.126	-
HEMICHORDATA	-	-	0.139	0.080	-	0.006	-	-
CHORDATA	9.697	24.209	1.666	4.625	0.106	-	0.007	0.369
Ascidacea	9.697	24.209	1.666	4.625	0.106	-	0.007	0.369
UNIDENTIFIED	0.095	1.138	0.066	0.195	0.100	0.035	0.466	0.142

Table 15.--Mean number of individuals listed by major taxonomic groups for each bathymetric class, representing the New York Bight subarea.

Taxonomic group	Bathymetric class (meters)							
	0-24	25-49	50-99	100-199	200-499	500-999	1,000-1,999	2,000-3,999
	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²
PORIFERA	1.02	0.94	0.17	-	-	-	-	-
COELENTERATA	19.54	6.06	4.42	9.33	7.51	10.29	1.80	1.58
Hydrozoa	11.26	4.65	1.40	2.00	-	0.29	-	-
Anthozoa	8.28	1.41	3.02	7.33	7.51	10.00	1.80	1.58
Alcyonacea	-	-	0.04	5.33	1.88	3.71	1.60	0.75
Zoantharia	8.28	0.60	2.38	0.67	0.75	6.29	-	0.33
Unidentified	-	0.81	0.60	1.33	4.88	-	0.20	0.50
PLATYHELMINTHES	0.04	0.13	0.09	-	-	-	-	-
Turbellaria	0.04	0.13	0.09	-	-	-	-	-
NEMERTEA	3.30	4.17	2.55	1.78	0.50	0.29	-	0.17
ASCHELMINTHES	-	0.04	0.13	-	1.13	0.29	0.60	-
Nematoda	-	0.04	0.13	-	1.13	0.29	0.60	-
ANNELIDA	1119.52	136.60	265.94	127.22	113.88	43.43	24.10	7.33
POGONOPHORA	-	-	-	-	1.25	9.71	3.80	3.50
SIPUNCULIDA	-	0.50	4.32	4.89	7.50	1.29	2.80	0.50
ECHIURA	0.52	-	-	-	-	-	-	0.83
PRIAPULIDA	-	-	-	-	-	-	-	-
MOLLUSCA	652.31	54.94	109.88	117.87	86.00	129.43	23.60	20.66
Polyplacophora	-	-	0.13	-	-	-	-	0.50
Gastropoda	62.46	4.31	5.38	44.44	12.25	31.29	3.80	2.33
Bivalvia	589.85	50.63	102.61	68.99	64.25	86.00	18.40	17.83
Scaphopoda	-	-	1.76	4.44	9.50	12.14	1.40	-
Cephalopoda	-	-	-	-	-	-	-	-
Unidentified	-	-	-	-	-	-	-	-
ARTHROPODA	488.05	492.13	978.18	48.67	22.89	4.57	1.20	2.17
Pycnogonida	0.24	-	-	-	-	-	-	-
Arachnida	0.57	-	-	-	-	-	-	-
Crustacea	487.24	492.13	978.18	48.67	22.89	4.57	1.20	2.17
Ostracoda	1.15	-	-	-	-	-	-	-
Cirripedia	283.48	-	0.06	-	-	-	-	-
Copepoda	-	-	0.09	-	-	-	-	-
Nebaliacea	-	-	-	-	-	-	-	0.17
Cumacea	2.07	3.38	25.27	13.78	2.38	-	0.60	0.75
Tanaidacea	-	-	-	-	-	-	-	0.33
Isopoda	5.43	21.73	13.69	2.44	2.13	-	0.20	-
Amphipoda	171.09	459.10	932.10	23.78	18.13	4.57	0.20	0.92
Mysidacea	3.61	0.17	0.04	-	0.25	-	-	-
Decapoda	20.41	7.75	6.93	8.67	-	-	0.20	-
BRYOZOA	11.91	3.83	4.04	-	-	-	-	-
BRACHIOPODA	-	-	-	-	-	-	-	-
ECHINODERMATA	120.65	38.79	10.84	125.67	13.75	3.00	2.70	3.33
Holothuroidea	1.07	0.04	0.77	1.11	6.50	0.29	0.40	0.50
Echinoidea	118.04	38.44	5.08	0.89	0.25	-	-	-
Ophiuroidea	0.61	-	3.59	123.00	6.75	2.71	2.10	2.83
Asteroidea	0.93	0.31	1.40	0.67	0.25	-	0.20	-
Unidentified	0.28	-	-	-	-	-	-	-
HEMICHORDATA	-	-	-	-	-	-	-	-
CHORDATA	1.24	13.52	5.57	0.67	0.25	-	-	3.33
Ascidiacea	1.24	13.52	5.57	0.67	0.25	-	-	3.33
UNIDENTIFIED	11.89	0.77	0.79	5.56	0.50	3.29	5.00	3.08

Table 16.--Mean biomass listed by major taxonomic groups for each bathymetric class, representing the New York Bight subarea.

Taxonomic group	Bathymetric class (meters)							
	0-24	25-49	50-99	100-199	200-499	500-999	1,000-1,999	2,000-3,999
	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²
PORIFERA	0.010	0.092	0.002	-	-	-	-	-
COELENTERATA	2.955	0.380	0.439	7.119	0.551	0.966	0.164	0.625
Hydrozoa	0.179	0.050	0.024	0.027	-	0.003	-	-
Anthozoa	2.776	0.330	0.415	7.092	0.551	0.963	0.164	0.625
Alcyonacea	-	-	0.001	0.699	0.185	0.376	0.104	0.032
Zoantharia	2.776	0.202	0.362	6.092	0.122	0.587	-	0.307
Unidentified	-	0.129	0.052	0.301	0.244	-	0.060	0.285
PLATYHELMINTHES	0.002	0.004	0.094	-	-	-	-	-
Turbellaria	0.002	0.004	0.004	-	-	-	-	-
NEMERTEA	2.048	0.711	0.193	0.152	0.011	0.003	-	0.002
ASCHELMINTHES	-	<0.001	0.001	-	0.002	0.003	0.006	-
Nematoda	-	<0.001	0.001	-	0.002	0.003	0.006	-
ANNELIDA	31.180	7.980	11.257	3.955	10.350	3.149	0.894	0.723
POGONOPHORA	-	-	-	-	0.008	0.046	0.030	0.012
SIPUNCULIDA	-	0.116	0.858	0.522	0.934	0.083	0.194	0.037
ECHIURA	0.519	-	-	-	-	-	-	2.400
PRIAPULIDA	-	-	-	-	-	-	-	-
MOLLUSCA	710.785	41.072	131.048	2.738	2.264	1.011	0.515	0.225
Polyplacophora	-	-	0.001	-	-	-	-	0.012
Gastropoda	7.897	0.426	1.073	0.167	0.346	0.133	0.030	0.014
Bivalvia	702.888	40.646	129.944	2.507	1.708	0.687	0.469	0.199
Scaphopoda	-	-	0.030	0.064	0.210	0.191	0.016	-
Cephalopda	-	-	-	-	-	-	-	-
Unidentified	-	-	-	-	-	-	-	-
ARTHROPODA	23.438	5.669	5.667	1.162	0.163	0.113	0.110	0.018
Pycnogonida	0.005	-	-	-	-	-	-	-
Arachnida	0.003	-	-	-	-	-	-	-
Crustacea	23.430	5.669	5.667	1.162	0.163	0.113	0.110	0.018
Ostracoda	0.010	-	-	-	-	-	-	-
Cirripedia	16.175	-	0.001	-	-	-	-	-
Copepoda	-	-	<0.001	-	-	-	-	-
Kebaliacea	-	-	-	-	-	-	-	0.002
Cumacea	0.017	0.014	0.127	0.000	0.016	-	0.006	0.007
Tanaidacea	-	-	-	-	-	-	-	0.003
Isopoda	0.075	0.874	0.394	0.234	0.076	-	0.002	-
Amphipoda	2.678	2.831	4.579	0.059	0.068	0.113	0.002	0.007
Mysidacea	0.016	0.004	<0.001	-	0.002	-	-	-
Decapoda	4.458	1.947	0.565	0.789	-	-	0.100	-
BRYOZOA	0.206	0.153	0.052	-	-	-	-	-
BRACHIOPODA	-	-	-	-	-	-	-	-
ECHINODERMATA	32.851	66.242	8.434	19.354	2.590	1.154	3.459	2.472
Holothuroidea	0.132	0.145	0.629	0.098	0.571	0.013	2.487	1.906
Echinoidea	25.864	65.592	7.472	14.844	0.226	-	-	-
Ophiuroidea	0.435	-	0.184	4.246	1.790	1.141	0.724	0.567
Asteroidea	6.420	0.505	7.244	0.781	0.092	-	0.248	-
HEMICHORDATA	0.022	-	-	-	-	-	-	-
CHORDATA	0.094	0.791	0.294	0.100	0.002	-	-	-
Ascidiacea	0.094	0.791	0.294	0.100	0.002	-	-	0.544
UNIDENTIFIED	0.376	0.229	0.264	0.113	0.005	0.471	0.044	0.025

Nematoda were more widely distributed bathymetrically and occurred in larger quantities in Southern New England (average density $6/m^2$ and biomass $0.007 g/m^2$) than in the other two subareas. In New York Bight their distribution was irregular and they were present in relatively small quantities (average density of $0.1/m^2$ and biomass less than $0.001 g/m^2$). In Chesapeake Bight nematodes were slightly irregular in distribution and the quantity was intermediate between that in Southern New England and New York Bight (density averaged $2/m^2$ and biomass $0.006 g/m^2$).

Annelida were widely distributed in all subareas. They were most abundant in Southern New England, intermediate in New York Bight, and relatively sparse in Chesapeake Bight. An exceptionally high density of annelids ($1,120/m^2$) occurred in the shallow waters (0-24 m) of New York Bight, as compared with the other subareas where the density at this depth averaged 316 and $183/m^2$. Biomass trends were similar to those of density; Southern New England averaged $19 g/m^2$, New York Bight $13 g/m^2$, and Chesapeake Bight $9 g/m^2$.

Pogonophora occurred primarily in deep water (200 to 3,999 m) in all three subareas. Density and biomass were approximately equal in Southern New England and New York Bight, but were three to four times more abundant in Chesapeake Bight. In the two northern subareas the density of pogonophorans averaged approximately $5/m^2$, in the deep water, whereas in Chesapeake Bight their average density was $16/m^2$. An unusually shallow occurrence of pogonophorans was found on the continental shelf in Chesapeake Bight. Live specimens and tubes were taken as shallow as 66 meters and tubes only were present at 43 meters.

Sipunculida were widely distributed bathymetrically in all three subareas, but there was a marked difference in density and biomass. Density was highest (average about $9/m^2$) in Southern New England, intermediate ($3/m^2$) in New York Bight, and lowest ($1.5/m^2$) in Chesapeake Bight. Trends in biomass were nearly the same; largest ($1.4 g/m^2$) in Southern New England and substantially lower (0.4 and $0.3 g/m^2$) in New York Bight and Chesapeake Bight.

Echiura occurred in both very shallow (less than 50 m) and very deep (greater than 1,000 m) water in two subareas, New York Bight and Chesapeake Bight. In Southern New England they were present only in deep water, 1,000 to 1,999 m. Densities were low in all areas in both shallow and deep water. Biomass, however, was larger (1.3 to $6.7 g/m^2$) in deep water than in shallow water; also it was larger in New York Bight and Chesapeake Bight than in Southern New England where the average quantities were less than $0.5 g/m^2$.

Priapulida were rare; they were taken in only two subareas, Southern New England and Chesapeake Bight. All samples were from the same bathymetric class - 1,000 to 1,999 m. Densities were less than $1/m^2$ and biomass less than $0.4 g/m^2$; occurrence records were too infrequent for any comparisons.

Mollusca were abundant in terms of number of individuals and were dominant in biomass in all three subareas. The distribution of each molluscan class, by subarea, is presented separately.

Polyplacophora occurred in low densities in all areas. They were relatively more numerous in Southern New England where the average density was $1/m^2$. In New York Bight they occurred in low densities in two classes (50-99 m and 2,000-3,999 m) and their densities were less than $0.5/m^2$. In Chesapeake Bight they occurred in low densities in all areas and their average density

Table 17.--Mean number of individuals listed by major taxonomic groups for each bathymetric class, representing the Chesapeake Bight subarea.

Taxonomic group	Bathymetric class (meters)							
	0-24	25-49	50-99	100-199	200-499	500-999	1,000-1,999	2,000-3,999
	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²	No./m ²
PORIFERA	0.82	0.17	-	-	-	-	0.15	-
COELENTERATA	10.67	14.25	11.47	154.65	18.33	1.70	6.07	1.63
Hydrozoa	1.80	11.81	9.27	154.00	13.00	-	-	-
Anthozoa	8.87	2.44	2.20	0.66	5.33	1.70	6.07	1.63
Alcyonacea	0.02	-	-	-	-	-	0.92	1.13
Zoantharia	3.89	1.15	0.27	0.33	-	-	-	-
Unidentified	4.96	1.29	1.93	0.33	5.33	1.70	5.15	0.50
PLATYHELMINTHES	0.50	0.29	1.27	-	-	-	-	-
Turbellaria	0.50	0.29	1.27	-	-	-	-	-
NEMERTEA	7.32	4.13	4.13	1.83	2.17	1.00	1.38	-
ASCHELMINTHES	2.35	1.50	-	-	0.33	2.00	0.69	1.38
Nematoda	2.35	1.50	-	-	0.33	2.00	0.69	1.38
ANNELIDA	182.73	236.48	132.73	102.83	84.00	39.40	15.00	3.63
POGONOPHORA	-	1.42	0.40	-	15.33	38.20	8.46	3.00
SIPUNCULIDA	0.02	0.04	1.33	-	1.67	2.10	3.08	2.13
ECHIURA	0.25	0.04	-	-	-	-	0.15	1.25
PRIAPULIDA	-	-	-	-	-	-	0.13	-
MOLLUSCA	1232.94	52.00	319.53	492.50	122.49	293.30	33.47	8.88
Polyplacophora	0.13	-	-	-	0.33	1.30	1.31	0.25
Gastropoda	96.82	5.52	1.40	3.00	5.33	13.60	1.54	1.63
Bivalvia	1135.99	44.54	316.93	487.50	112.33	270.30	29.54	7.00
Scaphopoda	-	1.94	1.20	2.00	4.50	8.10	1.08	-
Cephalopoda	-	-	-	-	-	-	-	-
Unidentified	-	-	-	-	-	-	-	-
ARTHROPODA	247.89	358.40	293.80	86.99	74.83	5.40	1.15	2.00
Pycnogonida	1.96	0.42	0.93	0.33	-	-	-	-
Arachnida	-	-	-	-	-	-	-	-
Crustacea	245.93	357.98	292.87	86.66	74.83	5.40	1.15	2.00
Ostracoda	0.02	0.04	-	-	-	-	-	0.75
Cirripedia	0.31	0.19	-	-	-	-	-	-
Copepoda	-	-	-	-	-	-	-	-
Nebaliacea	-	-	0.40	-	-	-	-	-
Cumacea	2.26	27.50	23.13	5.50	11.50	0.60	0.15	-
Tanaidacea	-	-	-	-	-	-	-	1.00
Isopoda	29.48	11.35	6.47	2.00	0.33	0.40	0.15	0.25
Amphipoda	198.23	312.90	259.67	78.83	62.67	4.20	0.85	-
Mysidacea	8.65	0.06	-	-	-	-	-	-
Decapoda	6.98	5.94	3.20	0.33	0.33	0.20	-	-
BRYOZOA	8.55	2.31	13.73	-	-	-	-	-
BRACHIOPODA	-	-	0.13	-	-	-	-	-
ECHINODERMATA	16.45	45.98	11.74	129.67	18.83	2.70	2.15	6.88
Holothuroidea	0.04	0.31	0.27	3.33	14.83	1.10	0.46	0.50
Echinoidea	15.63	45.04	9.53	-	-	-	-	-
Ophiuroidea	0.73	0.48	1.67	125.67	3.67	1.20	1.23	6.13
Asteroidea	0.05	0.15	0.27	0.67	0.33	0.40	0.46	0.25
HEMICHORDATA	0.13	-	-	-	-	-	-	-
CHORDATA	13.87	0.79	3.33	-	-	-	0.85	2.00
Asciacea	13.87	0.79	3.33	-	-	-	0.85	2.00
UNIDENTIFIED	17.01	4.21	1.27	0.67	12.00	1.10	2.31	7.38

Table 18.--Mean biomass listed by major taxonomic groups for each bathymetric class, representing the Chesapeake Bight subarea.

Taxonomic group	Bathymetric class (meters)							
	0-24	25-49	50-99	100-199	200-499	500-999	1,000-1,999	2,000-3,999
	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²	g/m ²
PORIFERA	0.094	0.126	-	-	-	-	0.048	-
COELENTERATA	5.170	1.984	0.923	0.110	0.352	0.039	0.725	0.165
Hydrozoa	0.359	0.120	0.055	0.100	0.035	-	-	-
Anthozoa	4.832	1.864	0.868	0.010	0.317	0.039	0.725	0.165
Alcyonacea	0.024	-	-	-	-	-	0.399	0.160
Zoantharia	4.764	1.713	0.121	0.007	-	-	-	-
Unidentified	0.013	0.150	0.747	0.003	0.317	0.039	0.326	0.005
PLATYHELMINTHES	0.006	0.009	0.021	-	-	-	-	-
Turbellaria	0.006	0.009	0.021	-	-	-	-	-
NEMERTEA	0.289	0.423	0.653	0.720	0.100	0.018	0.417	-
ASCHELMINTHES	0.009	0.002	-	-	0.003	0.014	0.005	0.008
Nematoda	0.009	0.002	-	-	0.003	0.014	0.005	0.008
ANNELIDA	10.936	11.186	6.298	3.312	10.092	8.374	0.694	0.134
POGONOPHORA	-	0.009	0.001	-	0.047	0.305	0.020	0.010
SIPUNCULIDA	<0.001	<0.001	0.163	-	0.043	0.120	5.287	0.011
ECHIURA	0.060	0.038	-	-	-	-	1.336	6.731
PRIAPULIDA	-	-	-	-	-	-	0.078	-
MOLLUSCA	81.043	53.362	66.783	75.288	2.295	1.493	0.338	0.084
Polyplacophora	0.011	-	-	-	0.003	0.008	0.014	0.002
Gastropoda	7.304	0.558	0.148	0.018	0.042	0.273	0.015	0.012
Bivalvia	73.728	52.772	66.619	75.257	2.147	1.118	0.297	0.069
Scaphopoda	-	0.032	0.016	0.013	0.103	0.094	0.012	-
Cephalopoda	-	-	-	-	-	-	-	-
Unidentified	-	-	-	-	-	-	-	-
ARTHROPODA	2.694	5.361	1.755	0.392	0.317	0.074	0.006	0.012
Pycnogonida	0.012	0.001	0.003	0.003	-	-	-	-
Arachnida	-	-	-	-	-	-	-	-
Crustacea	2.682	5.360	1.752	0.388	0.317	0.074	0.006	0.012
Ostracoda	<0.001	<0.001	-	-	-	-	-	0.005
Cirripedia	0.002	0.008	-	-	-	-	-	-
Copepoda	-	-	-	-	-	-	-	-
Mebiacea	-	-	0.003	-	-	-	-	-
Cumacea	0.011	0.075	0.105	0.017	0.072	0.006	0.002	-
Tanaidacea	-	-	-	-	-	-	-	0.005
Isopoda	0.208	0.730	0.216	0.083	0.003	0.004	0.002	0.002
Amphipoda	1.060	3.624	1.350	0.282	0.235	0.022	0.003	-
Lysidacea	0.030	0.001	-	-	-	-	-	-
Decapoda	1.371	0.922	0.079	0.007	0.007	0.042	-	-
BRYOZOA	0.179	0.049	0.291	-	-	-	-	-
BRACHIOPODA	-	-	0.001	-	-	-	-	-
ECHINODERMATA	3.556	29.148	2.598	28.728	15.138	0.378	2.386	2.568
Holothuroidea	0.035	1.145	0.047	24.745	14.940	0.059	0.766	2.308
Echinoidea	3.462	27.895	2.381	-	-	-	-	-
Ophiuroidea	0.059	0.046	0.053	2.693	0.192	0.318	1.613	0.258
Asteroidea	<0.001	0.062	0.116	1.290	0.007	0.001	0.007	0.002
HEMICHORDATA	0.068	-	-	-	-	-	-	-
CHORDATA	9.809	0.412	0.125	-	-	-	0.003	0.242
Ascidiacea	9.809	0.412	0.125	-	-	-	0.003	0.242
UNIDENTIFIED	0.223	0.094	0.021	0.003	0.060	0.011	0.087	0.058

ranged from 0.1 to $1.3/m^2$. Biomass, also, was small in all areas; values ranged from 0.001 to $2.2 g/m^2$ and was generally proportional to the density.

Gastropoda were one of the more common components of the Mollusca. In each subarea they exhibited a similar distribution in relation to water depth. Densities generally were highest ($29/m^2$) in Southern New England, intermediate ($21/m^2$) in New York Bight, and lowest ($16/m^2$) in Chesapeake Bight. Biomass reflected this same trend of decreasing abundance, $1.8 g/m^2$ in the north to $1.0 g/m^2$ in the south.

Bivalvia were different from many other major taxa in having the highest densities (averaging $300/m^2$) in the Chesapeake Bight subarea, intermediate densities (average $125/m^2$) in New York Bight, and lowest densities (average $111/m^2$) in Southern New England. Particularly high densities ($1,136$ and $590/m^2$) in Chesapeake Bight and New York Bight occurred in shallow water, 0-24 m. Differences in density, associated with water depth, were the same in each subarea. Biomass averaged nearly the same in the three subareas; it was only slightly higher (average $109 g/m^2$) in New York Bight, and about equal (84 and $85 g/m^2$) in Chesapeake Bight and Southern New England. Decreases in biomass with increased water depth were generally similar in all subareas.

Scaphopoda occurred in moderately deep water in all subareas. They were present in highest density ($5.8/m^2$) in New York Bight, and about equal densities (approximately $3/m^2$) in both Southern New England and Chesapeake Bight. Biomass of scaphopods was small in all subareas and the relative quantities were similar to their density. Largest biomass (average $0.1 g/m^2$) was in New York Bight, and substantially smaller quantities (about $0.04 g/m^2$) were present in Southern New England and Chesapeake Bight.

Cephalopoda, which were represented by benthic eggs, were present only in Southern New England. They were taken at water depths between 100 and 499 m. Highest density (average $9.4/m^2$) was taken at 100 to 199 m, and lowest density (average $0.4/m^2$) was taken in deeper water. Biomass averaged 0.12 to $0.004 g/m^2$, with the larger amount present along the outer continental shelf and the smaller amount on the continental slope.

Arthropoda were represented principally by Crustacea; only minor quantities of Pycnogonida and Arachnida were present in the samples.

Pycnogonida occurred in shallow water only; from 0 to 99 m in Southern New England, 0 to 24 m in New York Bight, and 0 to 199 m in Chesapeake Bight. Density was low ($0.2/m^2$) in New York Bight, as well as being geographically restricted there. Densities in Southern New England and Chesapeake Bight were roughly similar, with averages ranging from 2.0 to $0.2/m^2$ in each subarea. Highest densities were in shallow water and lowest densities were in deep water in each subarea. Biomass of pycnogonids was very small (equal to or less than $0.01 g/m^2$) in all subareas. Trends of biomass in relation to water depth were similar to those for density.

Arachnida were incompletely sampled because of their small size. They were present only in New York Bight where their average density was less than $0.6/m^2$ and biomass less than $0.003 g/m^2$.

Crustacea were the single most numerous taxonomic group in all three subareas. Average density in the various bathymetric classes ranged from 1 to $2,145/m^2$. Trends of decreasing density with increased water depth were the same in all subareas. Density differences from one subarea to another were substantial; highest densities occurred in Southern New England, intermediate densities were in New York Bight, and lowest densities occurred

in Chesapeake Bight. Biomass was moderate, ranging from an average of 0.006 g/m^2 in deep water to 53 g/m^2 in shallow water. Differences in biomass from one subarea to another were similar to those of density; in Southern New England they averaged 16 g/m^2 , in New York Bight they averaged 9 g/m^2 , and in Chesapeake Bight they averaged 3 g/m^2 .

Ostracoda were incompletely sampled, but exhibited a similar pattern of occurrence in each subarea. They were present only in shallow water, 0 to 99 m, and always in low density ($1.4/\text{m}^2$ or less). Biomass was extremely small, averaging 0.01 g/m^2 or less.

Cirripedia were present only in shallow water (less than 99 m) in all subareas. Because of their spotty distribution and highly clustered occurrence their density varied considerably from one subarea to another and between bathymetric classes. Highest average density ($283/\text{m}^2$) occurred in 0 to 24 m in New York Bight, intermediate density ($107/\text{m}^2$) occurred in 0 to 24 m in Southern New England, and low density (less than $1/\text{m}^2$) occurred in Chesapeake Bight. In water deeper than 24 m their density was low (maximum of $2.4/\text{m}^2$) in all subareas. Biomass of barnacles was largest (39 g/m^2) at 0 to 24 m in Southern New England, intermediate (16 g/m^2) in New York Bight, and very small (less than 0.003 g/m^2) in Chesapeake Bight, and was small to very small in all subareas at water depths greater than 25 m.

Copepoda were incompletely sampled, because of their small size. In Southern New England they were taken at three depth classes (50-99 m, 200-499 m, and 500-999 m); in New York Bight they were taken at one depth class (50-99 m), and none were taken in Chesapeake Bight. Average density and biomass in all localities were very small -- maximum values $0.6/\text{m}^2$ and 0.003 g/m^2 , respectively.

Nebaliacea were incompletely sampled. None were taken in Southern New England. A few were taken in very deep water (2,000 to 3,999 m) in New York Bight, where their density averaged $0.17/m^2$. A few specimens were taken at water depths of 50 to 99 m in Chesapeake Bight, where their density averaged $0.4/m^2$. Biomass was very small, equal to or less than $0.003 g/m^2$.

Cumacea were widely distributed bathymetrically and geographically. Their bathymetric distribution was similar in all subareas, but their density, and biomass to a limited extent, differed from one subarea to another. Cumaceans were most abundant in Southern New England, where their average density was $29/m^2$ and their biomass was $0.13 g/m^2$. Approximately equal densities (average 8 and $10/m^2$, respectively) and biomass (average 0.045 and $0.035 g/m^2$) were present in New York Bight and Chesapeake Bight.

Tanaidacea were present only in deep water and occurred in low densities (0.18 to $1.0/m^2$). In New York Bight and Chesapeake Bight they were present only in very deep water (2,000-3,999 m), but in Southern New England they occurred in both deep water (1,000-3,999 m) and at mid-depths (200-499 m). Biomass, also, was small at all localities (0.003 to $0.006 g/m^2$) and no geographic differences were apparent.

Isopoda were distributed in the same bathymetric pattern and at roughly equal densities in all subareas. In each subarea the high densities, which ranged from 22 to $36/m^2$, occurred in shallow water (0-49 m), intermediate densities occurred at mid-depths (50-999 m) and low densities, 0.3 to $0.2/m^2$, were found in deep water (1,000 m or deeper). Biomass was small (maximum bathymetric class average was $0.6 g/m^2$) in all bathymetric classes in each subarea.

Amphipoda were the most abundant taxonomic group in the Middle Atlantic Bight Region. There were major differences in their density from one subarea to another. In Southern New England they were most numerous, averaging $1,137/m^2$; in New York Bight they were moderately common, averaging $396/m^2$; and in Chesapeake Bight they were least numerous, averaging $192/m^2$. Biomass, also, differed from one subarea to another. In Southern New England it averaged $7.0 g/m^2$, in New York Bight it averaged $2.5 g/m^2$, and in Chesapeake Bight it averaged only $1.5 g/m^2$. Relationships of density and biomass with water depth were very similar among the three subareas.

Mysidacea, although incompletely sampled, revealed the same trend of decreasing density with increased water depth in all three subareas. They were taken only at depths less than 500 m, but were most common at depths from 0 to 24 m, where their average density ranged from 3.6 to $8.6/m^2$. In water depths greater than 25 m their average density ranged from 0.25 to $0.4/m^2$. Biomass was small (maximum bathymetric class average $0.04 g/m^2$) in all subareas.

Decapoda revealed a bathymetric distribution pattern that was similar in each subarea. They were regularly taken at depths from 0 to 200 m, but only occasionally present at greater depths. The density of decapods was about the same ($8/m^2$) in Southern New England and New York Bight, but substantially lower ($3/m^2$) in Chesapeake Bight. Biomass was largest ($1.6 g/m^2$) in New York Bight, intermediate ($1.1 g/m^2$) in Southern New England, and smallest ($0.8 g/m^2$) in Chesapeake Bight. The trends of density and biomass in relation to water depth were similar in all subareas.

Bryozoa had much the same bathymetric distribution in all subareas. In Southern New England they occurred in each bathymetric class on the continental shelf (0-199 m) and in New York Bight and Chesapeake Bight

they occurred at depths from 0 to 99 m. Density was much higher in Southern New England (overall average of $39/m^2$) than in the other subareas, where the average was about 6 to $8/m^2$ in each. Biomass was relatively high in Southern New England, where it averaged $1.2 g/m^2$, compared to an average of less than $0.2 g/m^2$ in New York Bight and Chesapeake Bight.

Brachiopoda were absent in the Southern New England and New York Bight subareas; they were present only in one sample from Chesapeake Bight at a depth of 91 m.

Echinodermata were very common in all subareas and were present in all bathymetric classes. Echinoidea and Ophiuroidea were the two dominant subgroups. These and the other two major classes are described below.

Holothuroidea were widely distributed bathymetrically as well as geographically. They were present in all depth classes from the shallowest to deepest. The pattern of density distribution in relation to depth was the same in each subarea. Highest density (1 to $15/m^2$) occurred along the outer continental shelf and upper slope and decreased in both shallower and deeper water. In terms of biomass the holothurians were substantially more important in Southern New England than in the other subareas. On the outer shelf and upper slope off Southern New England their average biomass ranged between 23 and $51 g/m^2$. In New York Bight their average biomass was less than $0.7 g/m^2$ at these bathymetric levels. In Chesapeake Bight their average biomass at all depths was $7 g/m^2$ and was largest (15 to $25 g/m^2$ at depths between 100 and 500 m. Biomass in very deep water (greater than 1,000 m) averaged about 2 to $3 g/m^2$ in all subareas, whereas in shallow water, 0 to 50 m, the average quantity usually was smaller than $1 g/m^2$.

Echinoidea exhibited a pronounced decrease in density from shallow to deep water. This relationship between density and water depth was the same in all subareas; however, echinoids occurred across the shelf into deep water

(below 2,000 m) in Southern New England, to moderate depths (500 m) in New York Bight, and to only 99 m in Chesapeake Bight. Average densities were highest (bathymetric class average up to $118/m^2$) in New York Bight, intermediate in Chesapeake Bight, and slightly lower in Southern New England. Echinoids accounted for a major share of the biomass especially in New York Bight, where inner shelf quantities averaged 26 and $66 g/m^2$. In Southern New England biomass averages on the inner shelf were 4 and $12 g/m^2$, and in Chesapeake Bight were 3 and $28 g/m^2$.

Ophiuroidea were distributed bathymetrically much the same in each subarea. High density (averages of 123 to $350/m^2$) occurred at mid-depths, and decreased to densities of less than $1/m^2$ in shallow shelf waters, and to 1 to $8/m^2$ in very deep water (greater than 1,000 m). Biomass was largest, averaging up to $22 g/m^2$, in Southern New England; intermediate in New York Bight; and smallest (0.5 to $2.7 g/m^2$) in Chesapeake Bight. Trends in density and biomass in relation to water depth were the same in all subareas.

Asteroidea had a rather low density and a wide bathymetric range in all subareas. The general relationship between density and water depth was a relatively high density (0.7 to $4/m^2$) at mid-depths, 25 to 200 m, and low density (0.2 to $0.5/m^2$) in shallower and deeper waters. Overall density was highest in Southern New England, intermediate in New York Bight, and lowest in Chesapeake Bight. Although their density was modest, asteroids constituted a substantial biomass at mid-depths, which was largest in Southern New England, averaging 2 to $17 g/m^2$; intermediate in New York Bight, averaging 0.8 to $7 g/m^2$; and smallest in Chesapeake Bight, averaging 0.1 to $1.2 g/m^2$.

Hemichordata were sparse in all subareas and in all bathymetric classes (a total of 6) in which they occurred. Average densities were less than $0.7/m^2$ and average biomasses were less than $0.14 g/m^2$. In Southern New England their bathymetric range was from 50 to 999 m, whereas in New York Bight and Chesapeake Bight they occurred only in very shallow (0 to 24 m) waters.

Chordata (Ascidiacea) were widely distributed bathymetrically and geographically. In all three subareas density was highest on the continental shelf, lowest on the continental slope, and intermediate on the continental rise. Densities were substantially higher (average $32/m^2$) in Southern New England than in both New York Bight (average $5/m^2$) and Chesapeake Bight (average $7/m^2$). Biomass of ascidians behaved similarly to their density with largest quantities occurring in Southern New England (average $5.8 g/m^2$), smallest in New York Bight (average $0.3 g/m^2$), and intermediate quantities in Chesapeake Bight (average $2.1 g/m^2$).