1974

A program to monitor the environmental effects of shipyard expansion : A final report

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A PROGRAM TO MONITOR THE ENVIRONMENTAL EFFECTS OF SHIPYARD EXPANSION

A Final Report

by the

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February 1974

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INTRODUCTION

Dredging and land reclamation are two of the potentially most damaging activities that man undertakes in estuarine areas. Hampton Roads, the world's largest natural harbor, is a multiple use port, being a major center for fishing and shellfishing, transportation, recreation and industrial sitings. Dredging which is a necessary perpetuation for some of these activities, could be directly or indirectly detrimental to others. It is in such a multiple use situation that environmental alterations, real or potential, must be carefully planned and closely monitored. Projects of the type underway can cause changes in circulation, water depth, turbidity, and patterns of siltation, all of which can be damaging to the living components of the estuarine system. Estuarine species are, by nature, hardy organisms, however, as many live near their limit of tolerance, an additional increase in stress from one or a combination of sources could be disasterous. Besides the obvious physical stresses, there are related ones of a more insidious nature caused by, among other things, an increase in heavy metal exposure. Heavy metals become associated with clay size particles in the substrate, and as these particles are resuspended by bottom disturbances, the organisms' level of exposure can be greatly increased. This becomes of significant economic importance when the affected species is a

marketable shellfish, or a food resource for a commercially valuable species. Presently information sufficient to allow prediction or comprehensive evaluation of the effects of dredging is not available. All heavy metal data collected was presented in the interim report and will not be considered further.

The objectives of this study are to determine the immediate and short-term effects of the Shipyard's current expansion on the aquatic environment of the lower James River estuary and Hampton Roads.

Methods and Materials

Benthic Fauna

Five sampling transects have been placed in the lower James River estuary and Hampton Roads in areas through to be along the likely route of silt transport. Twenty-five sites on these transects were occupied during December 1972 and June 1973 and were sampled in triplicate using a Ponar grab of 0.05 square meters (Fig. 1).

All samples, after being returned to the laboratory, were refrigerated overnight and then washed through a 1 mm sieve to remove the majority of sediment. The material retained on the sieve was preserved in 10% formaldehyde with 100 mg/l of Phloxine B stain. The Phloxine B stains organic matter red making organisms easier to see and therefore faster to pick out. All organisms were removed from the debris remaining after sieving with the aid of a dissecting microscope or illuminated magnifying glass. The fauna was sorted, identified and enumerated. All information was placed on punch cards for computer analysis.

Community structure was analyzed using species diversity, its components, and similarity analysis to elucidate characteristics of the animal communities represented at the sampling sites. Computer classification of the 25 sites was performed using the Canberra metric dissimilarity coefficient and flexible grouping (β set at -0.25).

Results

Sediments did not change appreciably from December to June and ranged from clay to medium sand with most areas also containing shell and other debris. The predominant substrate type was fine sand, although sediments at 25% of the stations consisted predominantly of finer grained particles (Table 1).

In December, 111 taxa were taken while June samples yielded 92 (Appendix 1), a decline of 19 taxa (Table 2). One sponge, one anemone, 9 polychaetes, 12 molluscs, and 22 arthropods occurred during only one of the sampling periods. Most of these one-time species occurred in December. Three of the 18 dominant species occurred in only one sampling period. They were Paracaprella tenuis in December and Corophium acherusicum and Macoma balthica in June. There was a great amount of rearrangement of dominant species from December to June (Table 3). Quantitative community structure also changed drastically. The number of species needed to make up 90% of the total number of individuals at each station decreased at two thirds of the stations from December to June (Tables 5 and 6).

Species diversity (H') increased from December to June at all stations except 17, 19, and 23. Diversity values were lowest at station 18 in December and 17 in June and highest at 23 in December and 22 in June (Table 4). The

evenness component of diversity, which gives an indication of how evenly the individuals in a sample are distributed among the species, showed no concordant pattern, with half the stations increasing and half decreasing. The richness component of diversity, which gives an indication of the number of species that occur per number of individuals in a sample, declined from December to June at all stations except six, reflecting the general decline in the number of species taken in June (Table 4).

Computer classification of December data produced two main site groups--one running along the edge of the main channel from the James River Bridge to the Hampton Roads Bridge-Tunnel (Stations 6 to 11 and 19 to 23). The second larger and more dispersed group is composed of three subgroups--stations on Hampton Flats in the Elizabeth River channel, and above the bridge (Fig. 2). Classification of June data also produced two main site groups (Fig. 3). The smaller group included all stations above the bridge, one at the bridge and one on Hampton Flats. The second site group was the more dispersed and consisted of two subgroups--the main channel stations and Elizabeth River channel stations, one station on Hampton Flats, and one station in the main channel. The larger subgroups consists of the remaining stations along the main channel and three Hampton flats stations.

Classification of combined December and June data produced two main site groups (Figure 4)--one above the bridge and another below. The latter is composed of subgroups of stations from the main channel, Hampton Flats, and Elizabeth River Channel. Due to the heterogeneity of the data some misclassifications occurred in the combined analysis (see Boesch, 1973 for detailed explanation of misclassifications). Reallocation of these misclassified groups to form more meaningful site groups is based on subjective reevaluation of the relationships between misclassified stations and the site groups. From the combined data analysis December station 7 and June station 6 were reallocated to the main channel subgroup and December station 14 was put in the above-bridge group.

Biomass showed no concordant trend from December to June, with half the stations increasing and half decreasing (Table 7). However, the total biomass from December to June decreased from 607.7 to 464.7 grams wet weight for all 75 grabs.

Discussion

There appeared to be no significant increase in additional siltation from the shipyard project; however, this is most likely due to the dynamic nature of the tides and currents in the study area, which would prevent accumulations of fine-grained particles to any great extent.

The large scale change of species from December to June is attributed mainly to normal seasonal changes. The change of Mulinia lateralis from sixteenth in December to first dominant in June was caused by heavy sets in late winter or early spring. At sandy stations (all stations except 7, 8, 11, 23, 24 and 25) faunal changes were more intense with many species not appearing again in June samples (Table 5 and 6).

Another set of sequential winter and summer samples would distinguish seasonal faunal changes from changes due to shipyard activity. Comparing one set of winter and summer samples for changes other than seasonal faunal changes is virtually impossible.

For both December and June samples a gradient in diversity exists with lowest values at the up-river stations (18 in December and 17 in June) and highest near the Hampton Roads Bridge-Tunnel stations (23 in December and 22 in June). This gradient is produced and maintained by the salinity structure of the James estuary. In a gradient estuary, like the James,

diversity decreases with decreasing salinity (Boesch, 1972). The increase in diversity from December to June is attributable to general seasonal trend (Boesch, 1973).

The spring and early summer reproduction and setting of organisms increased the number of individuals of a few species and the decrease in the number of species taken caused the general lowering of species richness (Table 4). Evenness remained essentially the same. Even though the dominant species changed, the degree of dominance did not change. A great increase in evenness at seven stations from December to June was due to decrease in numerical abundance of dominant species. Evenness decreased at seven other stations but this was mainly attributed to an increase in the total numbers of dominant species.

Biomass varied greatly during both seasons and this was due primarily to the patchy distribution of large animals, such as hard clams and oysters. Spring and summer setting of organisms accounted for small increases (less than 10 grams wet weight) at eight stations. Effects of shipyard expansion on biomass are impossible to determine without further more intense sampling.

Computer classification of sample sites produced interesting results. In both December and June those stations along the main channel were the only sites to remain classified in essentially the same group.

Affinities between sites in this group were higher in December reflecting high homogeneity among the species found along the channel transect. In June many species previously taken did not occur again in the channel while several more ubiquitous species did, causing the channel transect to become more heterogeneous. This allowed one station (5) outside of the channel to be included and one channel station (6) to be excluded from the main channel site group (Figure 3). With respect to seasonal variation, the most homogenous group was composed of the above-bridge sites, due primarily to the predominance of Mulinia lateralis, Heteromastus filiformis and Leptocheirus plumulosus in both December and June.

In the combined analysis after reallocation the two main groups reflect the salinity structure of the James, with those stations above the bridge being in mesohaline salinity (5-10‰) and those below in polyhaline salinities (10-18‰). Water of higher and more constant salinity which moves up the channel depths allows the channel to retain a more homogeneous fauna. Stations 1 to 5 and 24 and 25 are rather heterogeneous and show no consistent relationships to either of the two site groups previously mentioned. Within this assemblage there are weak similarities that might form two somewhat related site groups (Figure 5).

Conclusions

The most pronounced characteristics of the benthos from December to June were seasonal changes and the influence of salinity. It is impossible to determine any effects of the shipyard project without replications of seasons. Normal changes from winter to summer may overshadow effects of the ongoing project.

References

Boesch, D. F. 1972. Species diversity of marine macrobenthos in the Virginia area. Ches. Sci. 13(3): 206-211.

_____. 1973. Classification and community structure of macrobenthos in the Hampton Roads area, Virginia. Mar. Biol. 21: 226-244.

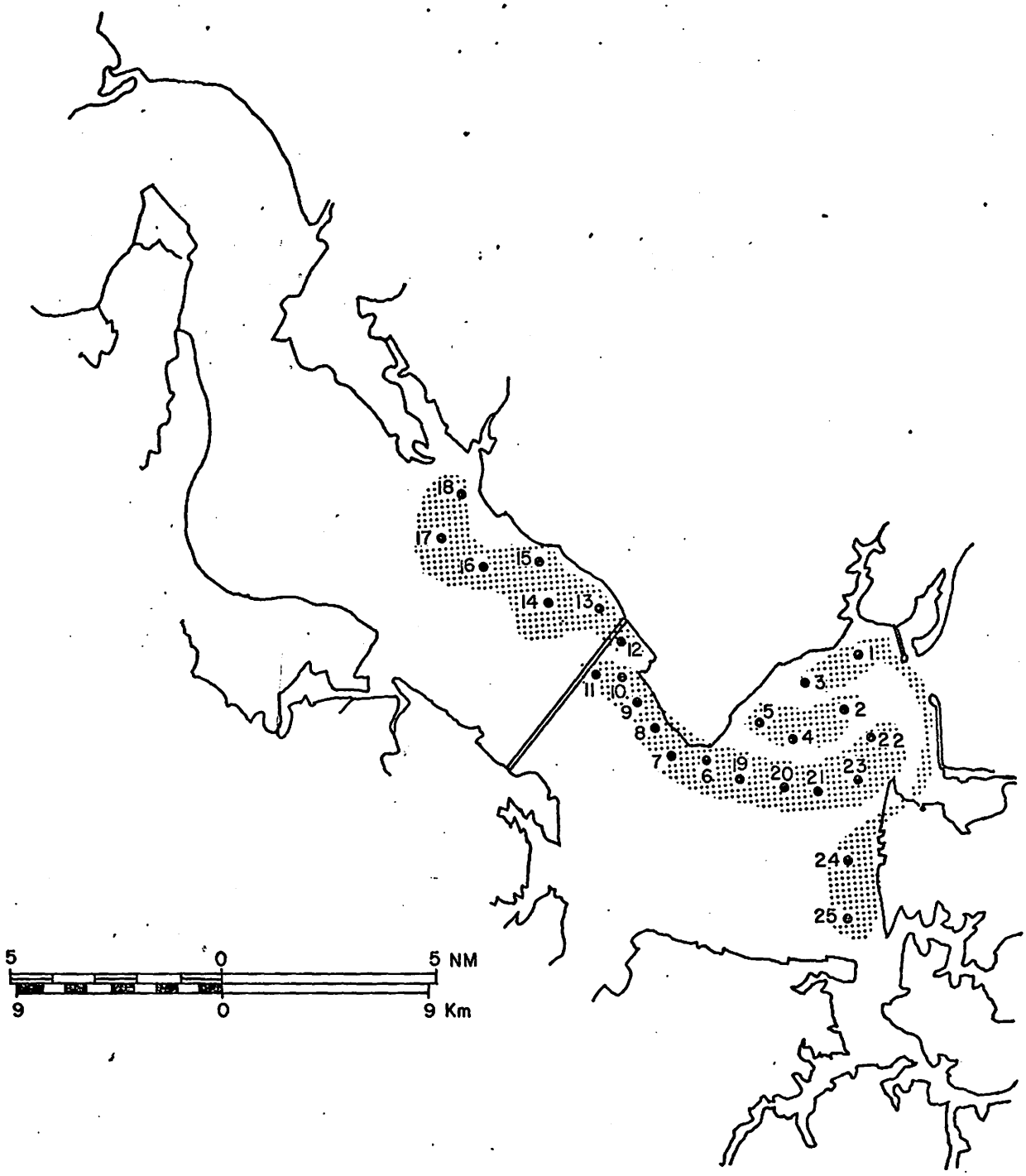

Figure 1. Map of stations.

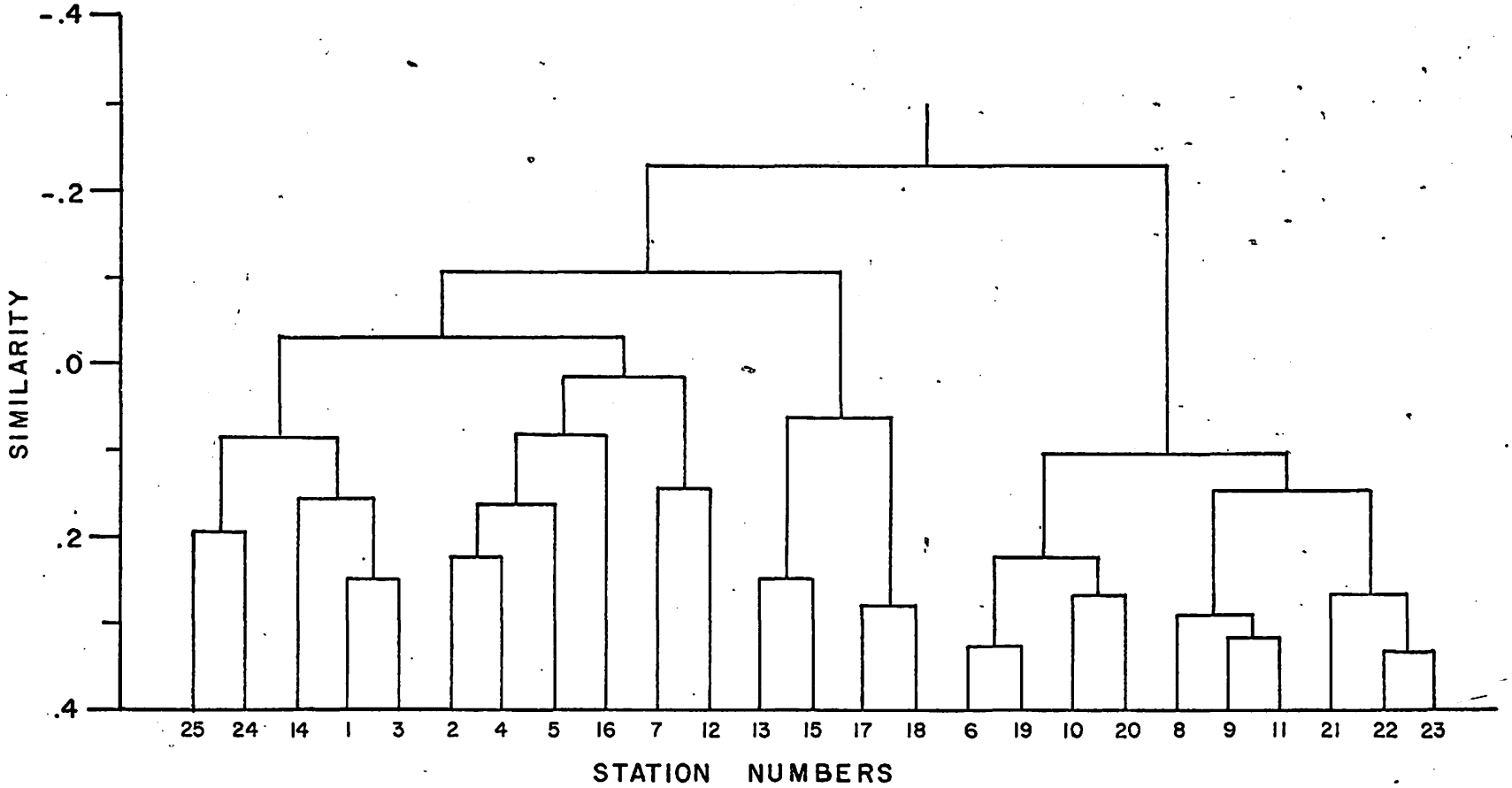

Figure 2. Computer classification of December 1972 benthic stations using the Canberra metric similarity coefficient and flexible grouping.

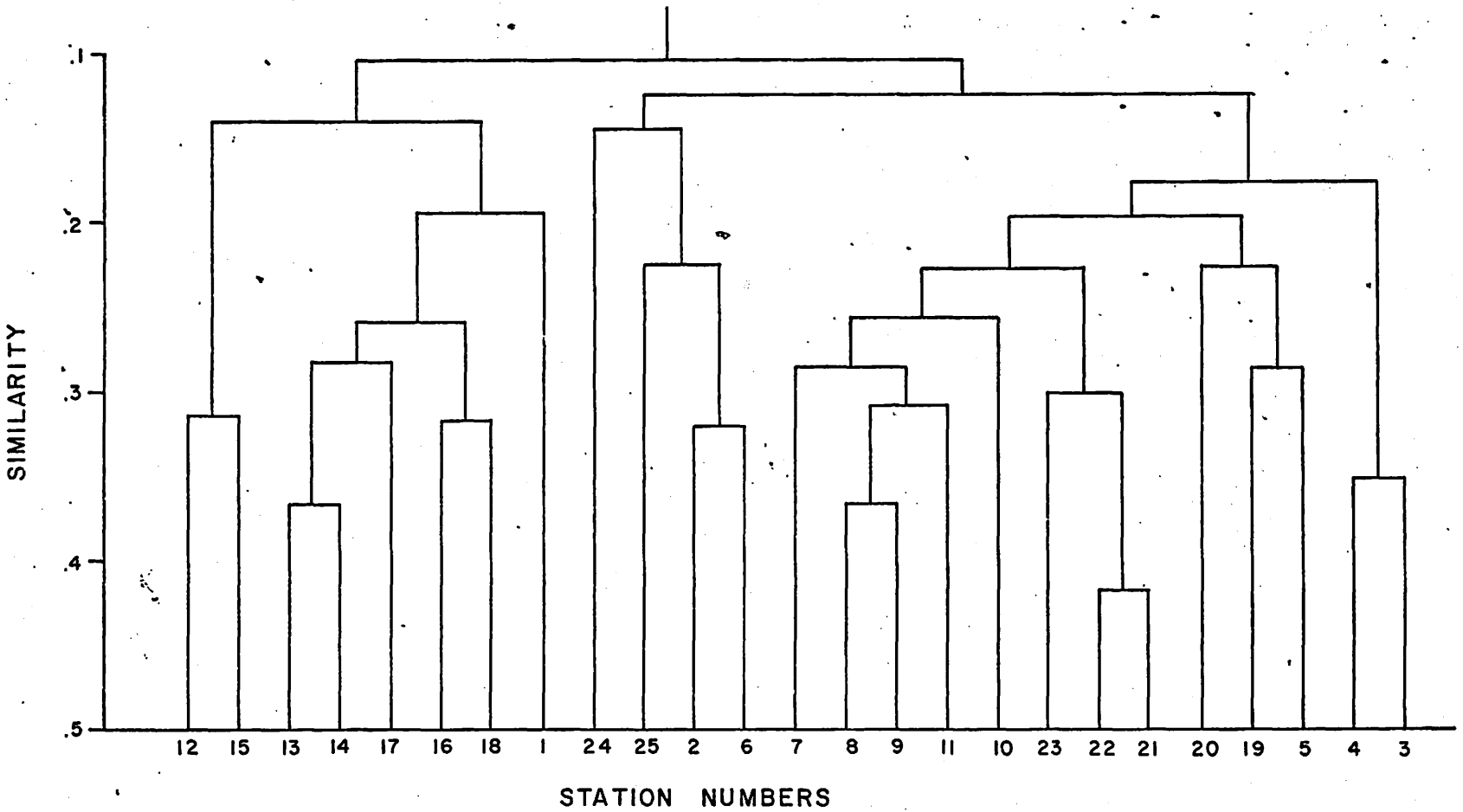

Figure 3. Computer classification of June 1973 benthic stations using the Canberra metric similarity coefficient and flexible grouping.

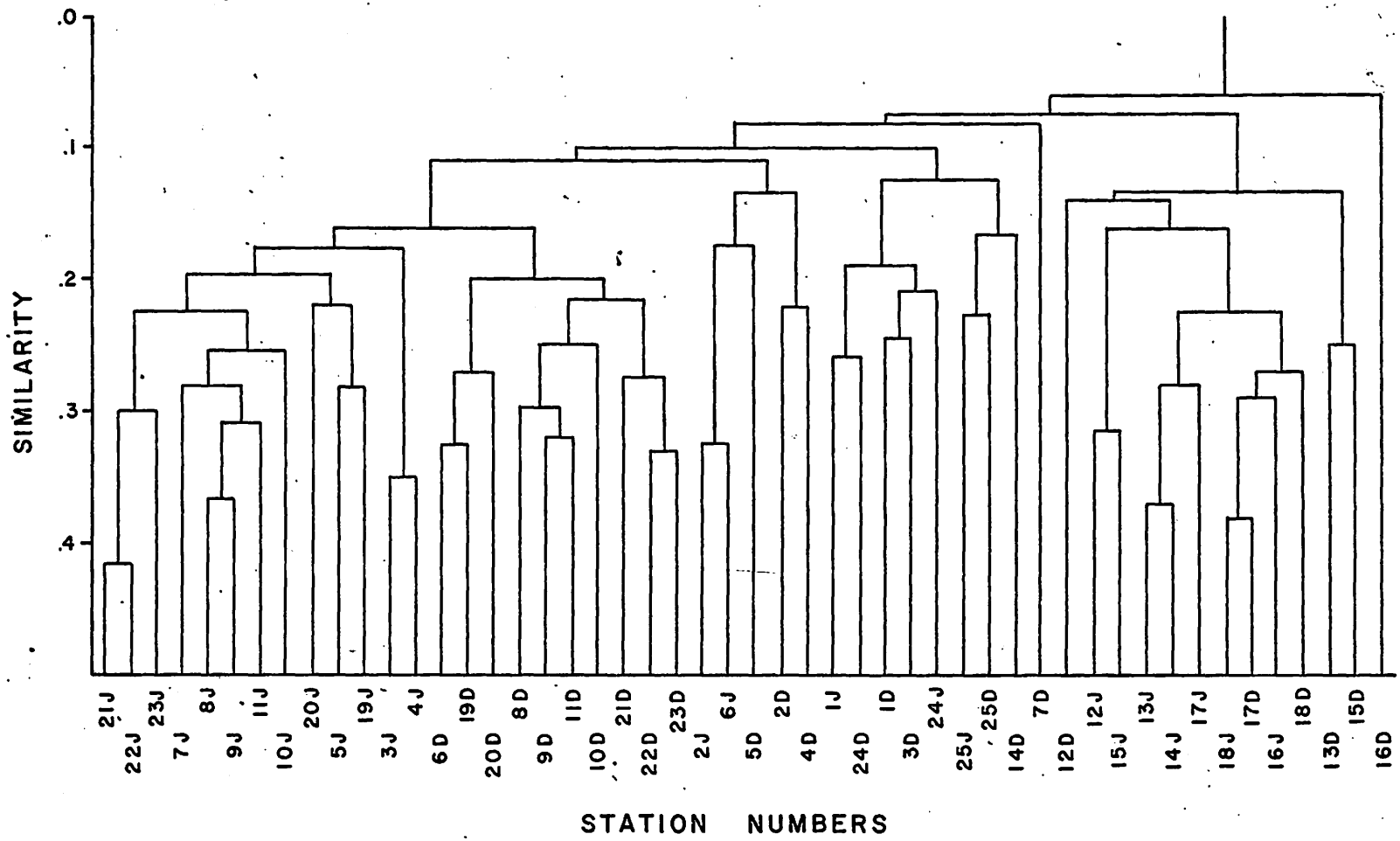

Figure 4. Combined computer classification of December and June benthic stations using the Canberra metric similarity coefficient and flexible grouping.

Table 1. Sediment type at December 1972 and June 1973 benthic stations

Station	Sediment
1	Fine sand and silt
2	Fine to medium sand
3	Fine sand
4	Fine sand
5	Fine sand
6	Medium sand
7	Silt and clay
8	Silt and debris
9	Fine sand and silt
10	Fine sand and silt
11	Silt, clay and sand
12	Fine sand
13	Fine sand
14	Fine sand
15	Fine sand
16	Mud and shells
17	Fine sand
18	Fine sand
19	Medium sand
20	Fine to medium sand
21	Fine sand and shell
22	Fine sand and shell
23	Clay
24	Mud
25	Mud

Table 2. Species occurring for only one sampling period in December 1972 or June 1973.

	December	June
Porifera		
	Microciona prolifera	
Cindaria		
	Anemones	
Annelida		
	Aricidea jefferysii	*Harmothoe* sp.
	Polydora websteri	*Sigambra tentaculata*
	Scolecolepides viridis	*Laeonereis culveri*
	Marphysa sanguinea	
	Loimia medusa	
	Sabella microphthalma	
Mollusca		
	Epitonium rupicolum	*Yoldia limatula*
	Urosalpinx cinerea	*Mytilus edulis*
	Mitrella lunata	*Macoma tenta*
	Nassarius trivittatus	*Ensis directus*
	Odostomia impressa	
	Anadara ovalis	
	Petricola pholadiformis	
	Tagelus plebeius	
Arthropoda		
	Diastylis polita	*Erichsonella filiformis*
	Oxyurostylis smithi	*Ampelisca verrilli*
	Chiridotea caeca	*Ampithoe longimana*
	Ampelisca vadorum	*A. valida*
	A. abdita	*Corophium acherusicum*
	Corophium tuberculatum	*Gammarus mucronatus*
	Elasmopus levis	*Stenothoe* sp.
	Melita nitida	*Rhithropanopeus harrisii*
	Palaemonetes vulgaris	
	Ogyrides limnicola	
	Upogebia affinis	
	Callinectes sapidus	
	Pinnixa sp.	
	Panopeus herbstii	

Table 3. Dominant species for December and June sampling periods

December	Bioindex Value	June	Bioindex Value
Acteocina canaliculata	44	*M. lateralis*	58
Unicola irrorata	35	*M. manhattensis*	37
Clymenella torquata	27	*L. plumulosus*	31
Sabellaria vulgaris	25	*S. fragilis*	28
Leptocheirus plumulosus	22	*B. improvisus*	22
Nereis succinea	18	*C. torquata*	21
Scoloplos fragilis	15	*C. penantus*	17
Tellina agilis	14	*S. vulgaris*	16
Peloscolex sps.	12	*H. filiformis*	16
Paracaprella tenuis	10	*Phoronis* sps.	16
Molgula manhattensis	8	*Corophium acherusicum*	13
Balanus improvisus	8	*Macoma balthica*	11
Caprella penantus	4	*A. canaliculata*	8
Heteromastus filiformis	4	*Peloscolex* sps.	6
Phoronis sps.	3	*U. irrorata*	3
Mulinia lateralis	2	*N. succinea*	2
		T. agilis	1

Table 4. Community structure statistics for December 1972 and June 1973 benthic stations.

Station	Diversity (H')		Evenness (J)		Richness (SR)	
	December	June	December	June	December	June
1	2.00	3.19	.70	.78	3.53	3.34
2	2.55	2.76	.90	.80	4.16	2.86
3	2.20	2.87	.86	.70	3.32	3.00
4	1.32	3.71	.43	.86	3.74	4.25
5	2.21	3.18	.73	.68	4.53	4.13
6	3.07	3.24	.86	.85	6.77	3.82
7	1.87	3.28	.69	.76	2.94	4.21
8	2.41	3.86	.69	.83	5.82	5.00
9	2.75	2.84	.77	.60	6.25	4.58
10	3.06	3.14	.88	.78	6.82	3.10
11	2.93	3.47	.85	.79	5.86	4.24
12	1.85	2.74	.62	.79	4.50	2.63
13	1.71	2.98	.62	.74	2.93	3.02
14	1.41	2.46	.59	.62	2.58	3.22
15	1.89	2.43	.97	.73	2.73	2.67
16	1.56	2.44	.56	.58	3.26	3.50
17	2.22	1.56	.77	.41	3.72	2.46
18	1.27	3.13	.61	.80	1.54	3.00
19	3.02	3.01	.87	.61	6.26	4.47
20	2.72	3.25	.88	.64	4.82	5.42
21	2.79	3.54	.77	.78	6.35	4.49
22	3.09	4.16	.88	.84	6.06	5.85
23	3.19	2.50	.88	.55	7.03	4.05
24	2.21	2.61	.74	.78	3.90	2.32
25	1.83	2.85	.80	.86	2.01	2.70

Table 5. Quantitative community structure for December 1972 benthic stations excluding colonial forms and fish.

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
1	1	Clymenella torquata	39	39	43.3	43.3
	2	Acteocina canaliculata	12	51	13.3	56.6
	3	Listriella clymenellae	11	62	12.2	68.8
	4	Paracaprella tenuis	8	70	8.8	77.7
	5	Paraprionspio pinnata	6	76	6.6	84.4
	6	Glycinde solitaria	5	81	5.5	89.9
	7	Scoloplos robustus	2	83	2.2	92.2
	8	Heteromastus filiformus	1	84	1.1	93.3
	9	Ampelisca abdita	1	85	1.1	94.4
	10	Scoloplos fragilis	1	86	1.1	95.5
	11	Spiochaetopterus oculatus	1	87	1.1	96.6
	12	Streblospio benedicti	1	88	1.1	97.7
	13	Nereis succinea	1	89	1.1	98.8
	14	Phoronis sp.	1	90	1.1	100.0
2	1	Acteocina canaliculata	7	7	14.8	14.8
	2	Paraphoxus epistomus	7	14	14.8	29.7
	3	Glycinde solitaria	6	20	12.7	42.5
	4	Scoloplos fragilis	5	25	10.6	53.1
	5	Peloscolex sp.	4	29	8.5	61.7
	6	Spio sp.	4	33	8.5	70.2
	7	Monoculodes edwardsi	2	35	4.2	74.4
	8	Paraprionspio pinnata	2	37	4.2	78.7
	9	Neomysis americana	2	39	4.2	82.9
	10	Clymenella torquata	1	40	2.1	85.1
	11	Glycera dibranchiata	1	41	2.1	87.2
	12	Nereis succinea	1	42	2.1	89.3
	13	Gemma gemma	1	43	2.1	91.4
	14	Paracaprella tenuis	1	44	2.1	93.6
	15	Sympleustes glaber	1	45	2.1	95.7
	16	Tellina agilis	1	46	2.1	97.8
	17	Chiridotea caeca	1	47	2.1	100.0

(continued)

Table 5 (continued) -2-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
3	1	Clymenella torquata	11	11	31.4	31.4
	2	Ampelisca abdita	5	16	14.2	45.7
	3	Listriella clymenellae	4	20	11.4	57.1
	4	Nereis succinea	4	24	11.4	68.5
	5	Phoronis sp.	3	27	8.5	77.1
	6	Acteocina canaliculata	3	30	8.5	85.7
	7	Balanus improvisus	1	31	2.8	88.5
	8	Glycera dibranchiata	1	32	2.8	91.4
	9	Scoloplos fragilis	1	33	2.8	94.2
	10	Polydora ligni	1	34	2.8	97.1
	11	Glycinde solitaria	1	35	2.8	100.0
4	1	Acteocina canaliculata	54	154	74.7	74.7
	2	Glycinde solitaria	10	164	4.8	79.6
	3	Turbonilla interrupta	6	170	2.9	82.5
	4	Glycera dibranchiata	6	176	2.9	85.4
	5	Odostomia impressa	4	180	1.9	87.3
	6	Peloscolex spp.	4	184	1.9	89.3
	7	Ampelisca vadorum	3	187	1.4	90.7
	8	Scoloplos fragilis	3	190	1.4	92.2
	9	Acteon punctostriatus	3	193	1.4	93.6
	10	Streblospio benedicti	2	195	0.9	94.6
	11	Nematode	2	197	0.9	95.6
	12	Tharyx setigera	2	199	0.9	96.6
	13	Unciola irrorata	1	200	0.4	97.0
	14	Tellina agilis	1	201	0.4	97.5
	15	Urosalpinx cinerea	1	202	0.4	98.0
	16	Loimia medusa	1	203	0.4	98.5
	17	Paracaprella tenuis	1	204	0.4	99.0
	18	Phoronis architecta	1	205	0.4	99.5
	19	Spiophanes bombix	1	206	0.4	100.0

Table 5 (continued) -3-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
5	1	Acteocina canaliculata	38	38	55.0	55.0
	2	Ampelisca vadorum	4	42	5.7	60.8
	3	Acteon punctostriatus	3	45	4.3	65.2
	4	Clymenella torquata	3	48	4.3	69.5
	5	Ampelisca abdita	2	50	2.8	72.4
	6	Pyramidella fusca	2	52	2.8	75.3
	7	Lyonsia hyalina	2	54	2.8	78.2
	8	Scoloplos fragilis	2	56	2.8	81.1
	9	Glycinde solitaria	2	58	2.8	84.0
	10	Mya arenaria	2	60	2.8	86.9
	11	Tellina agilis	2	62	2.8	89.8
	12	Glycera dibranchiata	2	64	2.8	92.7
	13	Crepidula convexa	1	65	1.4	94.2
	14	Cyathura burbancki	1	66	1.4	95.6
	15	Odostomia impressa	1	67	1.4	97.1
	16	Odostomia bisuturalis	1	68	1.4	98.5
	17	Scolecolepides viridis	1	69	1.4	100.0

Table 5 (continued) -4-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
6	1	Unciola irrorata	26	26	19.1	19.1
	2	Acteocina canaliculata	16	42	11.7	30.8
	3	Tellina agilis	11	53	8.0	38.9
	4	Caprella penantus	9	62	6.6	45.5
	5	Molgula manhattensis	9	71	6.6	52.2
	6	Polydora ligni	8	79	5.8	58.0
	7	Mya arenaria	5	84	3.6	61.7
	8	Sabellaria vulgaris	5	89	3.6	65.4
	9	Anemones	5	94	3.6	69.1
	10	Gemma gemma	4	98	2.9	72.0
	11	Paracaprella tenuis	3	101	2.2	74.2
	12	Melita nitida	3	104	2.2	76.4
	13	Edotea tribola	3	107	2.2	78.6
	14	Lyonsia hyalina	3	110	2.2	80.8
	15	Nucula proxima	3	113	2.2	83.0
	16	Glycinde solitaria	3	116	2.2	85.2
	17	Cirratulus grandis	2	118	1.4	86.7
	18	Clymenella torquata	2	120	1.4	88.2
	19	Glycera dibranchiata	2	122	1.4	89.7
	20	Nereis succinea	2	124	1.4	91.4
	21	Leptocheirus plumulosus	1	125	0.7	91.9
	22	Mulinia lateralis	1	126	0.7	92.6
	23	Tharyx setigera	1	127	0.7	93.3
	24	Eteone heteropoda	1	128	0.7	94.1
	25	Nematode	1	129	0.7	94.8
	26	Mercenaria mercenaria	1	130	0.7	95.5
	27	Balanus improvisus	1	131	0.7	96.3
	28	Ampelisca vadorum	1	132	0.7	97.0
	29	Cyathura burbancki	1	133	0.7	97.7
	30	Elasmopus levis	1	134	0.7	98.5
	31	Macoma phenax	1	135	0.7	99.2
	32	Doridella obscura	1	136	0.7	100.0

Table 5 (continued) -5-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
7	1	Sabellaria vulgaris	4	4	20.0	20.0
	2	Scoloplos fragilis	4	8	20.0	40.0
	3	Mya arenaria	3	11	15.0	55.0
	4	Caprella penantus	3	14	15.0	70.0
	5	Diopatra cuprea	1	15	5.0	75.0
	6	Shell-less gastropod	1	16	5.0	80.0
	7	Petricola pholadiformis	1	17	5.0	85.0
	8	Edotea tribola	1	18	5.0	90.0
	9	Nereis succinea	1	19	5.0	95.0
	10	Nucola proxima	1	20	5.0	100.0

Table 5 (continued) -6-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
8	1	Unciola irrorata	91	91	38.8	38.8
	2	Sabellaria vulgaris	31	122	13.2	52.1
	3	Scoloplos fragilis	19	141	8.1	60.2
	4	Acteocina canaliculata	18	159	7.6	67.9
	5	Pectinaria gouldii	17	176	7.2	75.2
	6	Pseudeurythoe paucibranchiata	8	184	3.4	78.6
	7	Mercenaria mercenaria	6	190	2.5	81.1
	8	Peloscolex	5	195	2.1	83.3
	9	Glycinde solitaria	5	200	2.1	85.4
	10	Nereis succinea	5	205	2.1	87.6
	11	Balanus improvisus	4	209	1.7	89.3
	12	Nucula proxima	3	212	1.2	90.5
	13	Lyonsia hyalina	2	214	0.8	91.4
	14	Acteon punctostriatus	2	216	0.8	92.3
	15	Paracaprella tenuis	2	218	0.8	93.1
	16	Cyathura burbancki	2	220	0.8	94.0
	17	Polychaetes	2	222	0.8	94.8
	18	Tellina agilis	1	223	0.4	95.2
	19	Glycera dibranchiata	1	224	0.4	95.7
	20	Sympleustes glaber	1	225	0.4	96.1
	21	Edotea tribola	1	226	0.4	96.5
	22	Amphiodia atra	1	227	0.4	97.0
	23	Polydora ligni	1	228	0.4	97.4
	24	Clymenella torquata	1	229	0.4	97.8
	25	Anemones	1	230	0.4	98.2
	26	Ampelisca abdita	1	231	0.4	98.6
	27	Crangon septemspinosa	1	232	0.4	99.0
	28	Nephtys	1	233	0.4	99.4
	29	Lumbrinerius tenuis	1	234	0.4	100.0

Table 5 (continued) -7-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
9	1	Unciola irrorata	48	48	21.4	21.4
	2	Clymenella torquata	32	80	14.2	35.7
	3	Sabellaria vulgaris	29	109	12.9	48.6
	4	Molgula manhattensis	26	135	11.6	60.2
	5	Pseudeurythoe paucibranchiata	15	150	6.6	66.9
	6	Phoronis sp.	9	159	4.0	70.9
	7	Acteocina canaliculata	8	167	3.5	74.5
	8	Scoloplos fragilis	6	173	2.6	77.2
	9	Lyonsia hyalina	5	178	2.2	79.4
	10	Balanus improvisus	4	182	1.7	81.2
	11	Mulinia lateralis	4	186	1.7	83.0
	12	Anadara transversa	4	190	1.7	84.8
	13	Cyathura burbancki	3	193	1.3	86.1
	14	Edotea tribola	3	196	1.3	87.4
	15	Nereis succinea	3	199	1.3	88.8
	16	Amphiodia atra	2	201	0.8	89.7
	17	Turbonilla interrupta	2	203	0.8	90.6
	18	Odostomia impressa	2	205	0.8	91.5
	19	Paracaprella tenuis	2	207	0.8	92.4
	20	Ampelisca abdita	2	209	0.8	93.3
	21	Mya arenaria	2	211	0.8	94.1
	22	Pectinaria gouldii	2	213	0.8	95.0
	23	Crangon septemspinosa	2	215	0.8	95.9
	24	Callinectes sapidus	1	216	0.4	96.4
	25	Ogyrides limicola	1	217	0.4	96.8
	26	Listriella clymenellae	1	218	0.4	97.3
	27	Spiochaetopterus oculatus	1	218	0.4	97.7
	28	Neomysis americana	1	220	0.4	98.2
	29	Nucula proxima	1	221	0.4	98.6
	30	Acteon punctostriatus	1	222	0.4	99.1
	31	Marphysa sanguinea	1	223	0.4	99.5
	32	Glycinde solitaria	1	234	0.4	100.0

Table 5 (continued) -8-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
10	1	Sabellaria vulgaris	12	12	13.0	13.0
	2	Clymenella torquata	12	24	13.0	26.0
	3	Acteocina canaliculata	10	34	10.8	36.9
	4	Nassarius vibex	7	41	7.6	44.5
	5	Cyathura burbancki	6	47	6.5	51.0
	6	Unicola irrorata	4	51	4.3	55.4
	7	Lyonsia hyalina	4	55	4.3	59.7
	8	Lumbrinereis tenuis	4	59	4.3	64.1
	9	Acteon punctostriatus	3	62	3.2	67.3
	10	Drilonereis filum	2	64	2.1	69.5
	11	Mercenaria mercenaria	2	66	2.1	71.7
	12	Nucula proxima	2	68	2.1	73.9
	13	Spiochaetopterus oculatus	2	70	2.1	76.0
	14	Glycera dibranchiata	2	72	2.1	78.2
	15	Listriella clymenellae	2	74	2.1	80.4
	16	Molgula manhattensis	2	76	2.1	82.6
	17	Peloscolex spp.	2	78	2.1	84.7
	18	Heteromastus filiformia	2	80	2.1	86.9
	19	Phoronis architecta	1	81	1.0	88.0
	20	Scoloplos fragilis	1	82	1.0	89.1
	21	Glycinde solitaria	1	83	1.0	90.2
	22	Nereis succinea	1	84	1.0	91.3
	23	Mya arenaria	1	85	1.0	92.3
	24	Mulinia lateralis	1	86	1.0	93.4
	25	Turbonilla interrupta	1	87	1.0	94.6
	26	Pectinaria gouldii	1	88	1.0	95.7
	27	Edotea triloba	1	89	1.0	96.8
	28	Pseudeurythoe paucibranchiata	1	90	1.0	97.9
	29	Streblospio benedicti	1	91	1.0	98.9
	30	Petricola pholadiformis	1	92	1.0	100.0

Table 5 (continued) -9-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
11	1	Molgula manhattensis	26	26	15.5	15.5
	2	Sympleustes glaber	17	43	10.1	25.7
	3	Clymenella torquata	16	59	9.5	35.3
	4	Mulinia lateralis	14	73	8.3	43.7
	5	Unicola irrorata	12	85	7.1	50.8
	6	Sabellaria vulgaris	12	97	7.1	58.0
	7	Scoloplos fragilis	10	107	5.9	64.0
	8	Palaemonetes vulgaris	7	114	4.1	68.2
	9	Cyathura burbancki	5	119	2.9	71.2
	10	Anadara transversa	5	124	2.9	74.2
	11	Pseudeurythoe paucibranchiata	5	129	2.9	77.2
	12	Peloscolex spp.	4	133	2.3	79.6
	13	Pectinaria gouldii	4	137	2.3	82.0
	14	Anemones	4	141	2.3	84.4
	15	Amphiodia atra	3	144	1.7	86.2
	16	Nereis succinea	3	147	1.7	88.0
	17	Neomysis americana	2	149	1.1	89.2
	18	Mitrella lunata	2	151	1.1	90.4
	19	Sabella micropthalma	2	153	1.1	91.6
	20	Lyonsia hyalina	2	155	1.1	92.8
	21	Mya arenaria	2	157	1.1	94.0
	22	Mercenaria mercenaria	1	158	0.5	94.6
	23	Polydora ligni	1	159	0.5	95.2
	24	Paracaprella tenuis	1	160	0.5	95.8
	25	Caprella penantus	1	161	0.5	96.4
	26	Syllid	1	162	0.5	97.0
	27	Neopanope sayi	1	163	0.5	97.6
	28	Balanus improvisus	1	164	0.5	98.2
	29	Tellina agilis	1	165	0.5	98.8
	30	Streblospio benedicti	1	166	0.5	99.4
	31	Glycinde solitaria	1	167	0.5	99.9

Table 5 (continued) -10-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
12	1	Nassarius obsoletus	40	40	64.5	64.5
	2	Tagelus plebeius	2	42	3.2	67.7
	3	Mya arenaria	2	44	3.2	70.9
	4	Pectinaria gouldi	2	46	3.2	74.1
	5	Pseudeurythoe paucibranchiata	2	48	3.2	77.4
	6	Heteromastus filiformis	2	50	3.2	80.6
	7	Nereis succinea	2	52	3.2	83.8
	8	Leptocheirus plumulosus	1	53	1.6	85.4
	9	Pyramidella fusca	1	54	1.6	87.0
	10	Cyathura burbancki	1	55	1.6	88.7
	11	Edotea triloba	1	56	1.6	90.3
	12	Scoloplos fragilis	1	57	1.6	91.9
	13	Brachidontes recurvus	1	58	1.6	93.5
	14	Acteocina canaliculata	1	59	1.6	95.1
	15	Clymenella torquata	1	60	1.6	96.7
	16	Tubulanus pellucidus	1	61	1.6	98.3
	17	Unicola irrorata	1	62	1.6	100.0
13	1	Nassarius obsoletus	64	64	38.3	38.3
	2	Balanus improvisus	52	116	31.1	69.4
	3	Brachidontes recurvus	21	137	12.5	82.0
	4	Leptocheirus plumulosus	9	146	5.3	87.4
	5	Nereis succinea	4	150	2.3	89.8
	6	Cyathura polita	3	153	1.7	91.6
	7	Crassostrea virginica	2	155	1.1	92.8
	8	Streblospio benedicti	2	157	1.1	94.0
	9	Nemertean	2	159	1.1	95.2
	10	Tellina agilis	2	161	1.1	96.4
	11	Pinnotheres ostreum	1	162	0.5	97.0
	12	Polydora websteri	1	163	0.5	97.6
	13	Nassarius vibex	1	164	0.5	98.2
	14	Mya arenaria	1	165	0.5	98.8
	15	Heteromastus filiformis	1	166	0.5	99.4
	16	Glycinde solitaria	1	167	0.5	99.9

Table 5 (continued) -11-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
14	1	Leptocheirus plumulosus	31	31	64.5	64.5
	2	Pseudeurythoe paucibranchiata	4	35	8.3	72.9
	3	Balanus improvisus	3	38	6.2	79.1
	4	Phoronis architecta	2	40	4.1	83.3
	5	Scoloplos fragilis	2	42	4.1	87.4
	6	Scolecolepides viridis	1	43	2.0	89.5
	7	Nassarius vibex	1	44	2.0	91.6
	8	Ogyridis limicola	1	45	2.0	93.7
	9	Glycinde solitaria	1	46	2.0	95.8
	10	Nereis succinea	1	47	2.0	97.9
	11	Microciona prolifera	1	48	2.0	99.9
15	1	Leptocheirus plumulosus	2	2	25.0	25.0
	2	Nereis succinea	2	4	25.0	50.0
	3	Polydora websteri	1	5	12.5	62.5
	4	Callinectes sapidus	1	6	12.5	75.0
	5	Cyathura polita	1	7	12.5	87.5
	6	Heteromastus filiformis	1	8	12.5	100.0
16	1	Balanus improvisus	59	59	67.0	67.0
	2	Nereis succinea	13	72	14.7	81.8
	3	Brachidontes recurvus	8	80	9.0	90.9
	4	Scoloplos fragilis	4	84	4.5	95.4
	5	Corophium lacustre	1	85	1.1	96.5
	6	Streblospio benedicti	1	86	1.1	97.7
	7	Tellina agilis	1	87	1.1	98.8
	8	Acteon punctostriatus	1	88	1.1	100.0

Table 5 (continued) -12-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
17	1	Leptocheirus plumulosus	26	26	35.1	35.1
	2	Peloscolex spp.	11	37	13.7	50.0
	3	Nereis succinea	9	46	11.2	62.1
	4	Balanus improvisus	7	53	8.7	71.6
	5	Tellina agilis	4	57	5.0	77.0
	6	Heteromastus filiformis	4	61	5.0	82.4
	7	Brachidontes recurvus	3	64	3.7	86.4
	8	Pyramidella fusca	2	66	2.5	89.1
	9	Polydora ligni	2	68	2.5	91.8
	10	Sympleustes glaber	1	69	1.2	93.2
	11	Nemertean	1	70	1.2	94.5
	12	Macoma balthica	1	71	1.2	97.2
	13	Pseudeurythoe paucibranchiata	1	72	1.2	98.6
	14	Neomysis americana	1	73	1.2	98.7
	15	Mulinia lateralis	1	74	1.2	100.0
18	1	Leptocheirus plumulosus	59	59	63.4	63.4
	2	Cyathura polita	13	72	13.9	77.4
	3	Heteromastus filiformis	6	78	6.4	83.8
	4	Tellina agilis	5	83	5.3	89.2
	5	Nereis succinea	5	88	5.3	94.6
	6	Nemertean	2	90	2.1	96.7
	7	Macoma balthica	2	92	2.1	98.9
	8	Peloscolex spp.	1	93	1.0	99.9

Table 5 (continued) -13-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
19	1	Unicola irrorata	21	21	15.5	15.5
	2	Acteocina canaliculata	18	39	13.3	28.8
	3	Turbonilla interrupta	11	50	8.1	37.0
	4	Peloscolex spp.	10	60	7.4	44.0
	5	Tellina agilis	8	68	5.9	50.3
	6	Lyonsia hyalina	7	75	5.1	55.5
	7	Glycera dibranchiata	7	82	5.1	60.7
	8	Neomysis americana	6	88	4.4	65.1
	9	Ampelisca vadorum	5	93	3.7	68.8
	10	Caprella penantus	4	97	2.9	71.8
	11	Sabellaria vulgaris	4	101	2.9	74.8
	12	Anemones	4	105	2.9	77.7
	13	Odostomia impressa	3	108	2.2	79.9
	14	Pseudeurythoe paucibranchiata	3	111	2.1	82.2
	15	Chymenella torquata	3	114	2.2	84.3
	16	Glycinde solitaria	3	117	2.2	86.5
	17	Oxyurostylis smithi	2	119	1.4	87.9
	18	Mercenaria mercenaria	2	121	1.4	89.3
	19	Nucula proxima	2	123	1.4	90.7
	20	Acteon punctostriatus	2	125	1.4	92.1
	21	Nassarius trivittatus	1	126	0.7	92.9
	22	Epitonium rupicolum	1	127	0.7	93.6
	23	Streblospio benedicti	1	128	0.7	94.3
	24	Paraprionspio pinnata	1	129	0.7	95.0
	25	Paracaprella tenuis	1	130	0.7	95.7
	26	Cyathura burbancki	1	131	0.7	96.4
	27	Mulinia lateralis	1	132	0.7	97.1
	28	Nemertean	1	133	0.7	97.8
	29	Polydora ligni	1	134	0.7	99.2
	30	Busycon canaliculatum	1	135	0.7	100.0

Table 5 (continued) -14-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
20	1	Tellina agilis	15	15	21.7	21.7
	2	Paraphoxus epistomus	10	25	14.4	36.2
	3	Gemma gemma	8	33	11.5	47.8
	4	Acteocina canaliculata	6	39	8.6	56.5
	5	Nucula proxima	4	43	5.7	62.3
	6	Sabellaria vulgaris	4	47	5.7	68.1
	7	Peloscolex spp.	3	50	4.3	72.4
	8	Edotea tribola	3	53	4.3	76.8
	9	Heteromastus filiformis	2	55	2.8	79.7
	10	Streblospio benedicti	2	57	2.8	82.6
	11	Glycinde solitaria	2	59	2.8	85.5
	12	Glycera dibranchiata	2	61	2.8	88.4
	13	Phoronis architecta	1	62	1.4	89.8
	14	Tharyx setigera	1	63	1.4	91.3
	15	Polydora ligni	1	64	1.4	92.7
	16	Corophium lacustre	1	65	1.4	94.2
	17	Mulinia lateralis	1	66	1.4	95.6
	18	Nemertean	1	67	1.4	97.1
	19	Unicola irrorata	1	68	1.4	98.5
	20	Mercenaria mercenaria	1	69	1.4	100.0

Table 5 (continued) -15-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
21	1	Unicola irrorata	85	85	25.0	25.2
	2	Sabellaria vulgaris	61	146	17.9	43.4
	3	Paracaprella tenuis	19	165	5.5	49.1
	4	Nereis succinea	18	183	5.2	54.4
	5	Glycinde solitaria	16	199	4.7	59.2
	6	Polydora ligni	13	212	3.8	63.0
	7	Clymenella torquata	12	224	3.5	66.6
	8	Scoloplos fragilis	11	235	3.2	69.9
	9	Corphium tuberculatum	10	245	2.9	72.9
	10	Neomysis americana	9	254	2.6	75.5
	11	Listriella clymenellae	8	262	2.3	77.9
	12	Ampelisca vadorum	7	269	2.0	80.0
	13	Paraprionspio pinnata	7	276	2.0	82.1
	14	Acteocina canaliculata	7	283	2.0	84.2
	15	Streblospio benedicti	7	290	2.0	86.3
	16	Pectinaria gouldi	6	296	1.7	88.0
	17	Amphiodia atra	5	301	1.4	89.5
	18	Sympleustes glaber	4	305	1.1	90.7
	19	Crepidula convexa	4	309	1.1	91.9
	20	Spiochaetopterus oculatus	3	312	0.8	92.8
	21	Melita nitida	3	315	0.8	93.7
	22	Peloscolex spp.	3	318	0.8	94.6
	23	Glycera dibranchiata	2	320	0.5	95.7
	24	Anadara transversa	2	322	0.5	96.4
	25	Nemertean	2	324	0.5	97.0
	26	Anemones	2	326	0.5	97.3
	27	Aricidea jeffreysii	1	327	0.2	97.5
	28	Balanus improvisus	1	328	0.2	97.7
	29	Edotea triloba	1	329	0.2	97.9
	30	Molgula manhattensis	1	330	0.2	98.2
	31	Mulinia lateralis	1	331	0.2	98.5
	32	Mercenaria mercenaria	1	332	0.2	98.8
	33	Callinectes sapidus	1	333	0.2	99.1
	34	Nephtys sp.	1	334	0.2	99.4
	35	Corophium lacustre	1	335	0.2	99.7
	36	Lumbrineris tenuis	1	336	0.2	100

Table 5 (continued) -16-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
22	1	Unicola irrorata	36	36	15.9	15.9
	2	Peloscolex spp.	23	59	10.1	26.1
	3	Tharyx setigera	19	78	8.4	34.5
	4	Sabellaris vulgaris	14	92	6.1	40.7
	5	Melita nitida	13	105	5.7	46.4
	6	Nereis succinea	13	118	5.7	52.2
	7	Lumbrineris tenuis	10	128	4.4	56.6
	8	Edotea triloba	9	137	3.9	60.6
	9	Nucula proxima	9	146	3.9	64.6
	10	Anadara transversa	8	154	3.5	68.1
	11	Polydora websteri	7	161	3.0	71.2
	12	Glycinde solitaria	7	168	3.0	74.3
	13	Corophium tuberculatum	6	174	2.6	76.9
	14	Paracaprella tenuis	5	179	2.2	79.2
	15	Streblospio benedicti	5	184	2.2	81.8
	16	Neopanope sayi	4	188	1.7	83.5
	17	Tellina agilis	4	192	1.7	85.2
	18	Mercenaria mercenaria	4	196	1.7	87.0
	19	Ampelisca vadorum	3	199	1.3	88.3
	20	Corophium lacustre	3	202	1.3	89.6
	21	Ampelisca abdita	3	205	1.3	90.9
	22	Neomysis americana	3	208	1.3	92.2
	23	Crepidula convexa	3	211	1.3	93.5
	24	Clymenella torquata	3	214	1.3	94.8
	25	Mya arenaria	2	216	0.8	95.6
	26	Sympleustes glaber	2	218	0.8	96.5
	27	Polydora ligni	2	220	0.8	97.4
	28	Heteromastus filiformis	1	221	0.4	97.8
	29	Nematode	1	222	0.4	98.2
	30	Nemertean	1	223	0.4	98.7
	31	Diastylis polita	1	224	0.4	99.1
	32	Panopeus herbstii	1	225	0.4	99.5
	33	Cirratulus grandis	1	226	0.4	100.0

Table 5 (continued) -17-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
23	1	Paracaprella tenuis	32	32	17.4	17.4
	2	Unicola irrorata	15	47	8.1	25.6
	3	Tellina agilis	12	59	6.5	32.2
	4	Lumbrineris tenuis	10	69	5.4	37.7
	5	Sabellaria vulgaris	10	79	5.4	43.1
	6	Neomysis americana	9	88	4.9	48.0
	7	Nucula proxima	8	96	4.3	52.4
	8	Clymenella torquata	8	104	4.3	56.8
	9	Edotea triloba	8	112	4.3	61.2
	10	Scoloplos fragilis	8	120	4.3	65.5
	11	Nereis succinea	8	128	4.3	69.9
	12	Spiochaetopterus oculatus	7	135	3.8	73.7
	13	Glycinde solitaria	5	140	2.7	76.5
	14	Neopanope sayi	5	145	2.7	79.2
	15	Acteocina canaliculata	4	149	2.1	81.4
	16	Peloscolex spp.	3	152	1.6	83.0
	17	Mercenaria mercenaria	3	155	1.6	84.6
	18	Amphiodia atra	3	158	1.6	86.3
	19	Pectinaria gouldi	3	161	1.6	87.9
	20	Anadara transversa	2	163	1.0	89.0
	21	Tharyx setigera	2	165	1.0	90.1
	22	Anadara ovalis	2	167	1.0	91.2
	23	Molgula manhattensis	2	169	1.0	92.3
	24	Ampelisca abdita	2	171	1.0	93.4
	25	Pagurus longicarpus	2	173	1.0	94.5
	26	Caprella penantus	1	174	0.5	95.0
	27	Sympleustes glaber	1	175	0.5	95.6
	28	Listriella clymenellae	1	176	0.5	96.1
	29	Hydrodies dianthus	1	177	0.5	96.7
	30	Melita nitida	1	178	0.5	97.4
	31	Mya arenaria	1	179	0.5	97.9
	32	Mulinia lateralis	1	180	0.5	98.4
	33	Turbonilla interrupta	1	181	0.5	98.9
	34	Upogebia affinis	1	182	0.5	99.4
	35	Nemertean	1	183	0.5	100.0

Table 5 (continued) -18-

Station Number	Rank	Species	Number	Cumulative Number	Percent	Cumulative Percent
24	1	Acteocina canaliculata	34	34	26.3	26.3
	2	Clymenella torquata	30	64	23.2	49.6
	3	Ogyridis limnicola	15	79	11.6	61.2
	4	Paraprionspio pinnata	15	94	11.6	72.8
	5	Spiochaetopterus oculatus	11	105	8.5	81.3
	6	Listriella clymenellae	4	109	3.1	84.4
	7	Mulinia lateralis	3	112	2.3	86.8
	8	Glycinde solitaria	3	115	2.3	89.1
	9	Peloscolex spp.	2	117	1.5	90.6
	10	Phoronis architecta	2	119	1.5	92.5
	11	Pseudeurythoe paucibranchiata	2	121	1.5	93.7
	12	Ampelisca abdita	1	122	0.7	94.5
	13	Cyathura polita	1	123	0.7	95.3
	14	Turbonilla interrupta	1	124	0.7	96.1
	15	Pectinaria gouldii	1	125	0.7	96.9
	16	Pinnixa sp.	1	126	0.7	97.6
	17	Leucon americanus	1	127	0.7	98.4
	18	Aricidea jeffreysii	1	128	0.7	99.2
	19	Neomysis americana	1	129	0.7	99.9
25	1	Acteocina canaliculata	21	21	36.2	36.2
	2	Paraprionspio pinnata	10	31	17.2	53.4
	3	Scoloplos fragilis	9	40	15.5	68.9
	4	Pseudeurythoe paucibranchiata	7	47	12.0	81.0
	5	Ogryridis limnicola	6	53	10.3	91.3
	6	Glycinde solitaria	2	55	3.4	94.8
	7	Anemones	1	56	1.7	96.5
	8	Mulinia lateralis	1	57	1.7	98.2
	9	Acteon punctostriatus	1	58	1.7	100.0

Table 6. Quantitative community structure for June 1973 benthic stations excluding colonial forms and fish.

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
1	1	Clymenella torquata	28	28	23.7	23.7
	2	Phoronis sp.	23	51	43.2	19.4
	3	Scoloplos fragilis	22	73	61.8	18.6
	4	Glycinde solitaria	10	83	70.3	08.4
	5	Macoma balthica	9	92	77.9	07.6
	6	Mulinia lateralis	8	100	84.7	06.7
	7	Paraprionospio pinnata	5	105	88.9	04.2
	8	Listriella clymenellae	4	109	92.3	03.3
	9	Mya arenaria	2	111	94.0	01.6
	10	Turbonilla interrupta	1	112	94.9	00.8
	11	Acteocina canaliculata	11	113	95.7	00.8
	12	Peloscolex spp.	1	114	96.6	00.8
	13	Pseudeurythoe sp.	1	115	97.4	00.8
	14	Glycera dibranchiata	1	116	98.3	00.8
	15	Nereis succinea	1	117	99.1	00.8
	16	Eteone heteropoda	1	118	100.0	00.8
2	1	Glycera dibranchiata	11	11	34.3	34.3
	2	Mulinia lateralis	9	20	62.5	28.1
	3	Acteocina canaliculata	3	23	71.8	09.3
	4	Lyonsia hyalina	2	25	78.1	06.2
	5	Tellina agilis	2	27	84.3	06.2
	6	Phoronis sp.	1	28	87.5	03.1
	7	Pagurus longicarpus	1	29	90.6	03.1
	8	Leucon americanus	1	30	93.7	03.1
	9	Acteon punctostriatus	1	31	96.8	03.1
	10	Sabellaria vulgaris	1	32	100.0	03.1

Table 6 (continued) -2-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
3	1	Phoronis sp.	67	67	32.6	32.6
	2	Molgula manhattensis	59	126	61.4	28.7
	3	Mulinia lateralis	21	147	71.7	10.2
	4	Ampelisca verrilli	12	159	77.5	05.8
	5	Scoloplos fragilis	7	166	80.9	03.4
	6	Clymenella torquata	7	173	84.3	03.4
	7	Glycinde solitaria	7	180	87.8	03.4
	8	Lyonsia hyalina	6	186	90.7	02.9
	9	Glycera dibranchiata	5	191	93.1	02.4
	10	Corophium acherusicum	4	195	95.1	01.9
	11	Acteocina canaliculata	3	198	96.5	01.4
	12	Acteon punctostriatus	2	200	97.5	00.9
	13	Paraprionospio pinnata	2	202	98.5	00.9
	14	Mya arenaria	1	203	99.0	00.4
	15	Macoma tenta	1	204	99.5	00.4
	16	Nemertean	1	205	100.0	00.4

Table 6 (continued) -3-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
4	1	Mulinia lateralis	20	20.0	22.4	22.4
	2	Clymenella torquata	11	31.0	34.8	12.3
	3	Corophium acherusicum	9	40.0	44.9	10.1
	4	Ampelisca verrilli	9	49.0	55.0	10.1
	5	Glycinde solitaria	6	55.0	61.7	06.7
	6	Glycera dibranchiata	4	59.0	66.2	04.4
	7	Nemertean	4	63.0	70.7	04.4
	8	Phoronis sp.	3	66.0	74.1	03.3
	9	Caprella penantis	3	69.0	77.5	03.3
	10	Listriella clymenellae	3	72.0	80.8	03.3
	11	Scoloplos fragilis	3	75.0	84.2	03.3
	12	Molgula manhattensis	2	77.0	86.5	02.2
	13	Macoma tenta	2	79.0	88.7	02.2
	14	Acteocina canaliculata	2	81.0	91.0	02.2
	15	Stylocus elipticus	2	83.0	93.2	02.2
	16	Edotea triloba	1	84.0	94.3	01.1
	17	Leucon americanus	1	85.0	95.5	01.1
	18	Mercenaria mercenaria	1	86.0	96.6	01.1
	19	Pectinaria gouldii	1	87.0	97.7	01.1
	20	Paraprionospio pinnata	1	88.0	98.8	01.1
	21	Heteromastus filiformis	1	89.0	100.0	01.1

Table 6 (continued) -4-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
5	1	Caprella penantis	109	109	25.4	25.4
	2	Balanus improvisus	96	205	47.8	22.4
	3	Molgula manhattensis	87	292	68.2	20.3
	4	Corophium acherusicum	38	320	77.1	08.8
	5	Edotea triloba	13	343	80.1	03.0
	6	Unciola irrorata	8	351	82.0	01.8
	7	Heteromastus filiformis	7	358	83.6	01.6
	8	Ampelisca verrilli	6	364	85.0	01.4
	9	Sabellaria vulgaris	6	370	86.4	01.4
	10	Mya arenaria	5	375	87.6	01.1
	11	Crepidula convexa	5	380	88.7	01.1
	12	Scoloplos fragilis	5	385	89.9	01.1
	13	Glycinde solitaria	5	390	91.1	01.1
	14	Nereis succinea	5	395	92.2	01.1
	15	Eteone Heteropoda	5	300	93.4	01.1
	16	Stylochus ellipticus	5	405	94.6	01.1
	17	Gammarus mucronatus	4	409	95.5	00.9
	18	Lyonsia hyalina	4	413	96.4	00.9
	19	Mulinia lateralis	4	417	97.4	00.9
	20	Streblospio benedicti	3	420	98.1	00.7
	21	Acteocina canaliculata	2	422	98.5	00.4
	22	Laeonereis culveri	2	424	99.0	00.4
	23	Phoronis sp.	1	425	99.2	00.2
	24	Paracaprella tenuis	1	426	99.5	00.2
	25	Pseudeurythoe sp.	1	427	99.7	00.2
	26	Clymenella torquata	1	428	100.0	00.2

Table 6 (continued) -5-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
6	1	Mulinia lateralis	10	10	34.4	34.4
	2	Sabellaria vulgaris	4	14	48.2	13.7
	3	Mya arenaria	3	17	58.6	10.3
	4	Lyonsia hyalina	2	19	65.5	06.8
	5	Scoloplos fragilis	2	21	72.4	06.8
	6	Phoronis sp.	1	22	75.8	03.4
	7	Caprella penantis	1	23	79.3	03.4
	8	Leucon americanus	1	24	82.7	03.4
	9	Tellina agilis	1	25	86.2	03.4
	10	Nassarius obsoletus	1	26	89.6	03.4
	11	Glycinde solitaria	1	27	93.1	03.4
	12	Glycera dibranchiata	1	28	96.5	03.4
	13	Nemertean	1	29	100.0	03.4
7	1	Mulinia lateralis	20	20	21.9	21.9
	2	Scoloplos fragilis	20	40	43.9	21.9
	3	Caprella penantis	19	59	64.8	20.8
	4	Edotea triloba	6	65	71.4	06.5
	5	Clymenella torquata	4	69	75.8	04.3
	6	Gammarus mucronatus	3	72	79.1	03.2
	7	Mya arenaria	3	75	82.4	03.2
	8	Peloscolex spp.	3	78	85.7	03.2
	9	Pectinaria gouldii	2	80	87.9	02.1
	10	Molgula manhattensis	1	81	89.0	01.0
	11	Listriella clymenellae	1	82	90.1	01.0
	12	Unciola irrorata	1	83	91.2	01.0
	13	Balanus improvisus	1	84	92.3	01.0
	14	Lyonsia hyalina	1	85	93.4	01.0
	15	Mytilus edulis	1	86	94.5	01.0
	16	Pseudeurythoe sp.	1	87	95.6	01.0
	17	Diopatra cuprea	1	88	96.7	01.0
	18	Sabellaria vulgaris	1	89	97.8	01.0
	19	Heteromastus filiformis	1	90	98.9	01.0
	20	Nereis succinea	1	91	100.0	01.0

Table 6 (continued) -6-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
8	1	Mulinia lateralis	29	29	23.9	23.9
	2	Clymenella torquata	15	44	36.3	12.3
	3	Scoloplos fragilis	13	57	47.1	10.7
	4	Unciola irrorata	8	65	53.7	06.6
	5	Pectinaria gouldii	8	73	60.3	06.6
	6	Mya arenaria	7	80	66.1	05.7
	7	Listriella clymenellae	5	85	70.2	04.1
	8	Lyonsia hyalina	5	90	74.3	04.1
	9	Glycinde solitaria	4	94	77.6	03.3
	10	Peloscolex spp.	3	97	80.1	02.4
	11	Drilonereis filum	3	100	82.6	02.4
	12	Edotea triloba	2	102	84.2	01.6
	13	Ensis directus	2	104	85.9	01.6
	14	Tellina agilis	2	106	87.6	01.6
	15	Mercenaria mercenaria	2	108	89.2	01.6
	16	Pseudeurythoe sp.	2	110	90.9	01.6
	17	Streblospio benedicti	2	112	92.5	01.6
	18	Glycera dibranchiata	2	114	94.2	01.6
	19	Molgula manhattensis	1	115	95.0	00.8
	20	Phoronis sp.	1	116	95.8	00.8
	21	Crangon septemspinosus	1	117	96.6	00.8
	22	Cyathura burbancki	1	118	97.5	00.8
	23	Mytilus edulis	1	119	98.3	00.8
	24	Nereis succinea	1	120	99.1	00.8
	25	Nemertean	1	121	100.0	00.8

Table 6 (continued) -7-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
9	1	Molgula manhattensis	98	98	41.8	41.8
	2	Clymenella torquata	53	151	64.5	22.6
	3	Pseudeurythoe sp.	23	174	74.3	09.8
	4	Mulinia lateralis	15	189	80.7	06.4
	5	Scoloplos fragilis	7	196	83.7	02.9
	6	Listriella clymenellae	5	201	85.8	02.1
	7	Gammarus mucronatus	4	205	87.6	01.7
	8	Mercenaria mercenaria	4	209	89.3	01.7
	9	Lyonsia hyalina	3	212	90.5	01.2
	10	Phoronis sp.	2	214	91.4	00.8
	11	Edotea triloba	2	216	92.3	00.8
	12	Mya arenaria	2	218	93.1	00.8
	13	Drilonereis filum	2	220	94.0	00.8
	14	Spiochaetopterus oculatus	2	222	94.8	00.8
	15	Caprella penantis	1	223	95.2	00.4
	16	Unciola irrorata	1	224	95.7	00.4
	17	Leptocheirus plumulosus	1	225	96.1	00.4
	18	Cyathura burbancki	1	226	96.5	00.4
	19	Leucon americanus	1	227	97.0	00.4
	20	Mytilus edulis	1	228	97.4	00.4
	21	Acteocina canaliculata	1	229	97.8	00.4
	22	Peloscolex spp.	1	230	98.2	00.4
	23	Pectinaria gouldii	1	231	98.7	00.4
	24	Diopatra cuprea	1	232	99.1	00.4
	25	Glycinde solitaria	1	233	99.5	00.4
	26	Nemertean	1	234	100.0	00.4

Table 6 (continued) -8-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
10	1	Molgula manhattensis	35	35	30.7	30.7
	2	Balanus improvisus	16	51	44.7	14.0
	3	Scoloplos fragilis	9	60	52.6	07.8
	4	Peloscolex spp.	8	68	59.6	07.0
	5	Pseudeurythoe sp.	7	75	65.7	06.1
	6	Mulinia lateralis	6	81	71.0	05.2
	7	Clymenella torquata	6	87	76.3	05.2
	8	Mya arenaria	4	91	79.8	03.5
	9	Streblospio benedicti	4	95	83.3	03.5
	10	Glycinde solitaria	3	98	85.9	02.6
	11	Nereis succinea	3	101	88.5	02.6
	12	Diadumene leucolena	3	104	91.2	02.6
	13	Nemertean	2	106	92.9	01.7
	14	Unciola irrorata	1	107	93.8	00.8
	15	Lyonsia hyalina	1	108	94.7	00.8
	16	Crassostrea virginica	1	109	95.6	00.8
	17	Nassarius obsoletus	1	110	96.4	00.8
	18	Pectinaria gouldii	1	111	97.3	00.8
	19	Heteromastus filiformis	1	112	98.2	00.8
	20	Glycera dibranchiata	1	113	99.1	00.8
	21	Syllid	1	114	100.0	00.8
11	1	Molgula manhattensis	36	36	29.2	29.2
	2	Mulinia lateralis	20	56	45.5	16.2
	3	Scoloplos fragilis	19	75	60.9	15.4
	4	Pseudeurythoe sp.	12	87	70.7	09.7
	5	Clymenella torquata	10	97	78.8	08.1
	6	Mya arenaria	8	105	85.3	06.5
	7	Peloscolex spp.	6	111	90.2	04.8
	8	Glycinde solitaria	4	115	93.4	03.2
	9	Crangon septemspinosus	3	118	95.9	02.4
	10	Unciola irrorata	1	119	96.7	00.8
	11	Edotea triloba	1	120	97.5	00.8
	12	Mercenaria mercenaria	1	121	98.3	00.8
	13	Mytilus edulis	1	122	99.1	00.8
	14	Streblospio benedicti	1	123	100.0	00.8

Table 6 (continued) -9-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
12	1	Leptocheirus plumulosus	15	15	33.3	33.3
	2	Mulinia lateralis	9	24	53.3	20.0
	3	Balanus improvisus	8	32	71.1	17.7
	4	Nassarius obsoletus	4	36	80.0	08.8
	5	Heteromastus filiformis	3	39	86.6	06.6
	6	Monoculodes edwardsi	1	40	88.8	02.2
	7	Mya arenaria	1	41	91.1	02.2
	8	Clymenella torquata	1	42	93.3	02.2
	9	Nereis succinea	1	43	95.5	02.2
	10	Laeonereis culveri	1	44	97.7	02.2
	11	Nemertean	1	45	100.0	02.2
13	1	Leptocheirus plumulosus	50	50	35.2	35.2
	2	Heteromastus filiformis	25	75	52.8	17.6
	3	Macoma balthica	18	93	65.4	12.6
	4	Mulinia lateralis	14	107	75.3	09.8
	5	Nemertean	8	115	80.9	05.6
	6	Scoloplos fragilis	7	122	85.9	04.9
	7	Glycinde solitaria	5	127	89.4	03.5
	8	Cyathura polita	4	131	92.2	02.8
	9	Nassarius obsoletus	2	133	93.6	01.4
	10	Peloscolex spp.	2	135	95.0	01.4
	11	Streblospio benedicti	2	137	96.4	01.4
	12	Nereis succinea	2	139	97.8	01.4
	13	Balanus improvisus	1	140	98.5	00.7
	14	Mya arenaria	1	141	99.2	00.7
	15	Pseudeurythoe sp.	1	142	100.0	00.7

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
14	1	Leptocheirus plumulosus	60	60	56.6	56.6
	2	Mulinia lateralis	12	72	67.9	11.3
	3	Heteromastus filiformis	7	79	74.5	06.6
	4	Balanus improvisus	4	83	78.3	03.7
	5	Pseudeurythoe sp.	4	87	82.0	03.7
	6	Nemertean	4	91	85.8	03.7
	7	Glycinde solitaria	3	94	88.6	02.8
	8	Macoma balthica	2	96	90.5	01.8
	9	Spiochaetoperus oculatus	2	98	92.4	01.8
	10	Streblospio benedicti	2	100	94.3	01.8
	11	Edotea triloba	1	101	95.2	00.9
	12	Mya arenaria	1	102	96.2	00.9
	13	Macoma tenta	1	103	97.1	00.9
	14	Peloscolex spp.	1	104	98.1	00.9
	15	Glycera dibranchiata	1	105	99.0	00.9
	16	Eteone heteropoda	1	106	100.0	00.9
15	1	Leptocheirus plumulosus	23	23	46.0	46.0
	2	Heteromastus filiformis	11	34	68.0	22.0
	3	Cyathura polita	8	42	84.0	16.0
	4	Laeonereis culveri	3	45	89.9	06.0
	5	Mulinia lateralis	2	47	93.9	04.0
	6	Paracaprella tenuis	1	48	95.9	02.0
	7	Monoculodes edwardsi	1	49	97.9	02.0
	8	Nemertean	1	50	100.0	02.0

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
16	1	Balanus improvisus	74	74	58.7	58.7
	2	Corophium lacustre	11	85	67.4	08.7
	3	Heteromastus filiformis	10	95	75.3	07.9
	4	Nereis succinea	8	103	81.7	06.3
	5	Leptocheirus plumulosus	6	109	86.5	04.7
	6	Mya arenaria	3	112	88.8	02.3
	7	Crassostrea virginica	3	115	91.2	02.3
	8	Macoma balthica	2	117	92.8	01.5
	9	Brachidontes recurvis	2	119	94.4	01.5
	10	Edotea triloba	1	120	95.2	00.7
	11	Peloscolex spp.	1	121	96.0	00.7
	12	Pseudeurythoe sp.	1	122	96.8	00.7
	13	Glycinde solitaria	1	123	97.6	00.7
	14	Syllid	1	124	98.4	00.7
	15	Eteone heteropoda	1	125	99.2	00.7
	16	Nemertean	1	126	100.0	00.7
17	1	Leptocheirus plumulosus	148	148	75.8	75.8
	2	Macoma balthica	14	162	83.0	07.1
	3	Mulinia lateralis	9	171	87.6	04.6
	4	Nemertean	6	177	90.7	03.0
	5	Heteromastus filiformis	5	182	93.3	02.5
	6	Macoma phenax	3	185	94.8	01.5
	7	Peloscolex spp.	3	188	96.4	01.5
	8	Phoronis sp.	2	190	97.4	01.0
	9	Crangon septemspinosus	1	191	97.9	00.5
	10	Cyathura polita	1	192	98.4	00.5
	11	Scoloplos fragilis	1	193	98.9	00.5
	12	Pseudeurythoe sp.	1	194	99.4	00.5
	13	Glycinde solitaria	1	195	100.0	00.5

Table 6 (continued) -12-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
18	1	Leptocheirus plumulosus	32	32	31.0	31.0
	2	Balanus improvisus	24	56	54.3	23.3
	3	Macoma balthica	10	66	64.0	09.7
	4	Peloscolex spp.	8	74	71.8	07.7
	5	Cyathura polita	6	80	77.6	05.8
	6	Nereis succinea	5	85	82.5	04.8
	7	Macoma phenax	4	89	86.4	03.8
	8	Corophium lacustre	3	92	89.3	02.9
	9	Heteromastus filiformis	3	95	92.2	02.9
	10	Nemertean	3	98	95.1	02.9
	11	Brachidontes recurvis	2	100	97.0	01.9
	12	Mya arenaria	1	101	98.0	00.9
	13	Mulinia lateralis	1	102	99.0	00.9
	14	Pseudeurythoe sp.	1	103	100.0	00.9

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
19	1	Caprella penantis	308	308	48.0	48.0
	2	Molgula manhattensis	88	396	61.7	13.7
	3	Mya arenaria	56	452	70.5	08.7
	4	Sabellaria vulgaris	32	484	75.5	04.9
	5	Corophium acherusicum	28	512	79.8	04.3
	6	Mytilus edulis	23	535	83.4	03.5
	7	Nereis succinea	16	551	85.9	02.4
	8	Unicola irrorata	9	560	87.3	01.4
	9	Clymenella torquata	9	569	88.7	01.4
	10	Paracaprella tenuis	8	577	90.0	01.2
	11	Gammarus mucronatus	7	584	91.1	01.0
	12	Pectinaria gouldii	7	591	92.1	01.0
	13	Ampelisca verrilli	6	597	93.1	00.9
	14	Drilonereis filum	6	603	94.0	00.9
	15	Cyathura burbancki	5	608	94.8	00.7
	16	Diadumene leucolena	5	613	95.6	00.7
	17	Lyonsia hyalina	4	617	96.2	00.6
	18	Peloscolex spp.	4	621	96.8	00.6
	19	Balanus improvisus	3	624	97.3	00.4
	20	Heteromastus filiformis	3	627	97.8	00.4
	21	Mulinia lateralis	2	629	98.1	00.3
	22	Ensis directus	2	631	98.4	00.3
	23	Mercenaria mercenaria	2	633	98.7	00.3
	24	Glycinde solitaria	2	635	99.0	00.3
	25	Eteone heteropoda	2	637	99.3	00.3
	26	Nemertean	2	639	99.6	00.3
	27	Nassarius obsoletus	1	640	99.8	00.1
	28	Scoloplos fragilis	1	641	100.0	00.1

Table 6 (continued) -14-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
20	1	Corophium acherusicum	36	36	32.1	32.1
	2	Caprella penantis	21	57	50.8	18.7
	3	Mya arenaria	12	69	61.6	10.7
	4	Molgula manhattensis	11	80	71.4	09.8
	5	Lyonsia hyalina	5	85	75.8	04.4
	6	Tellina agilis	4	89	79.4	03.5
	7	Mulinia lateralis	3	92	82.1	02.6
	8	Macoma tenta	3	95	84.8	02.6
	9	Glycinde solitaria	3	98	87.4	02.6
	10	Unciola irrorata	2	100	89.2	01.7
	11	Ensis directus	2	102	91.0	01.7
	12	Pseudeurythoe sp.	2	104	92.8	01.7
	13	Glycera dibranchiata	2	106	94.6	01.7
	14	Pagurus longicarpus	1	107	95.5	00.8
	15	Paracaprella tenuis	1	108	96.4	00.8
	16	Edotea triloba	1	109	97.3	00.8
	17	Peloscolex spp.	1	110	98.2	00.8
	18	Scoloplos fragilis	1	111	99.1	00.8
	19	Nereis succinea	1	112	100.0	00.8

Table 6 (continued) -15-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
21	1	Sabellaria vulgaris	180	180	49.0	49.0
	2	Molgula manhattensis	31	211	57.4	08.4
	3	Pectinaria gouldii	24	235	64.0	06.5
	4	Corophium acherusicum	13	248	67.5	03.5
	5	Unciola irrorata	11	259	70.5	02.9
	6	Neomysis americanus	11	270	73.5	02.9
	7	Scoloplos fragilis	8	278	75.7	02.1
	8	Clymenella torquata	7	285	77.6	01.9
	9	Nemertean	7	292	79.5	01.9
	10	Glycinde solitaria	6	298	81.1	01.6
	11	Amphiodea atra	5	303	82.5	01.3
	12	Caprella penantis	5	308	83.9	01.3
	13	Mulinia lateralis	5	313	85.2	01.3
	14	Ensis directus	5	318	86.6	01.3
	15	Tellina agilis	5	323	88.0	01.3
	16	Mytilus edulis	5	328	89.3	01.3
	17	Acteocina canaliculata	5	333	90.7	01.3
	18	Mya arenaria	4	337	91.8	01.0
	19	Paracaprella tenuis	3	340	92.6	00.8
	20	Ampelisca verrilli	3	343	93.4	00.8
	21	Edotea triloba	3	346	94.2	00.8
	22	Anadara transversa	3	349	95.0	00.8
	23	Peloscolex spp.	3	352	95.9	00.8
	24	Laeonereis culveri	3	355	96.7	00.8
	25	Listrella clymenellae	2	357	97.2	00.5
	26	Leucon americanus	2	359	97.8	00.5
	27	Mercenaria mercenaria	2	361	98.3	00.5
	28	Nereis succinea	2	363	98.9	00.5
	29	Gammarus mucronatus	1	364	99.1	00.2
	30	Lyonsia hyalina	1	365	99.4	00.2
	31	Crepidula convexa	1	366	99.7	00.2
	32	Spiochaetoperus oculatus	1	367	100.0	00.2

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
22	1	Molgula manhattensis	31	31	19.0	19.0
	2	Sabellaria vulgaris	24	55	33.7	14.7
	3	Scoloplos fragilis	19	74	45.3	11.6
	4	Mulinia lateralis	10	84	51.3	06.1
	5	Ensis directus	8	92	56.4	04.9
	6	Pectinaria gouldii	8	100	61.3	04.9
	7	Clymenella torquata	8	108	66.2	04.9
	8	Drilonereis filum	6	114	69.9	03.6
	9	Unciola irrorata	5	119	73.0	03.0
	10	Paraprionospio pinnata	5	124	76.0	03.0
	11	Mytilus edulis	4	128	78.5	02.4
	12	Streblospio benedicti	4	132	80.9	02.4
	13	Glycinde solitaria	4	136	83.4	02.4
	14	Laeonereis culveri	4	140	85.8	02.4
	15	Nemertean	4	144	88.3	02.4
	16	Peloscolex spp.	3	147	90.1	01.8
	17	Corophium acherusicum	2	149	91.4	01.2
	18	Ampelisca verrilli	2	151	92.6	01.2
	19	Tellina agilis	2	153	93.8	01.2
	20	Nereis succinea	2	155	95.0	01.2
	21	Listrella clymenellae	1	156	95.7	00.6
	22	Gammarus mucronatus	1	157	96.3	00.6
	23	Neomysis americanus	1	158	96.9	00.6
	24	Edotea triloba	1	159	97.5	00.6
	25	Anadara transversa	1	160	98.1	00.6
	26	Yoldia limulata	1	161	98.7	00.6
	27	Acteocina canaliculata	1	162	99.3	00.6
	28	Heteromastus filiformis	1	163	100.0	00.6

Table 6 (continued) -17-

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
23	1	Mulinia lateralis	131	131	57.2	57.2
	2	Pectinaria gouldii	20	151	65.9	08.7
	3	Scoloplos fragilis	19	170	74.2	08.2
	4	Peloscolex spp.	18	188	82.0	07.8
	5	Neomysis americanus	5	193	84.2	02.1
	6	Nemertean	5	198	86.4	02.1
	7	Acteocina canaliculata	4	202	88.2	01.7
	8	Clymenella torquata	4	206	89.9	01.7
	9	Glycinde solitaria	4	210	91.7	01.7
	10	Drilonereis filum	3	213	93.0	01.3
	11	Phoronis sp.	2	215	93.8	00.8
	12	Edotea triloba	2	217	94.7	00.8
	13	Ensis directus	2	219	95.6	00.8
	14	Amphiodia atra	1	220	96.0	00.4
	15	Listrella clymenellae	1	221	96.5	00.4
	16	Gammarus mucronatus	1	222	96.9	00.4
	17	Unciola irrorata	1	223	97.3	00.4
	18	Mya arenaria	1	224	97.8	00.4
	19	Yoldia limulata	1	225	98.2	00.4
	20	Turbonilla interrupta	1	226	98.6	00.4
	21	Sabellaria vulgaris	1	227	99.1	00.4
	22	Streblospio benedicti	1	228	99.5	00.4
	23	Paraprionospio pinnata	1	229	100.0	00.4

Station Number	Rank	Species	Number	Cumulative Number	Cumulative Percent	Percent
24	1	Phoronis sp.	21	21	43.7	43.7
	2	Mulinia lateralis	7	28	58.3	14.5
	3	Spiochaetoperus oculatus	5	33	68.7	10.4
	4	Clymenella torquata	4	37	77.0	08.3
	5	Sabellaria vulgaris	3	40	83.3	06.2
	6	Glycinde solitaria	3	43	89.5	06.2
	7	Acteocina canaliculata	2	45	93.7	04.1
	8	Pectinaria gouldii	1	46	95.8	02.0
	9	Scoloplos fragilis	1	47	97.9	02.0
	10	Streblospio benedicti	1	48	100.0	02.0
25	1	Acteocina canaliculata	7	7	25.9	25.9
	2	Scoloplos fragilis	7	14	51.8	25.9
	3	Macoma tenta	5	19	70.3	18.5
	4	Phoronis sp.	2	21	77.7	07.4
	5	Mulinia lateralis	2	23	85.1	07.4
	6	Leucon americanus	1	24	88.8	03.7
	7	Pseudeurythoe sp.	1	25	92.5	03.7
	8	Glycinde solitaria	1	26	96.2	03.7
	9	Nemerteans	1	27	100.0	03.7

Table 7. Biomass totals for December 1972 and June 1973 benthic stations in grams wet weight.

	December	June
1	2.5	2.7
2	0.3	1.3
3	0.4	5.2
4	0.8	45.1
5	1.9	20.4
6	6.7	2.3
7	8.8	6.7
8	20.4	28.5
9	15.8	33.7
10	10.0	10.3
11	18.1	49.1
12	73.8	7.3
13	158.1	3.3
14	4.0	1.6
15	8.5	.3
16	4.7	5.5
17	4.0	4.6
18	2.1	3.6
19	125.6	98.9
20	30.8	13.1
21	10.4	55.3
22	40.2	29.0
23	52.0	5.0
24	6.5	.9
25	1.3	1.0

Appendix 1

Species list for December 1972
and June 1973 benthic stations

	December	June
PORIFERA		
Microciona prolifera	x	
CNIDARIA		
Bougainvillia rugosa	x	x
Sertularia argentea	x	x
Anthozoans	x	
RHYNCHOCOELA		
Tubulanus pellucidus	x	
Anoplans	x	x
NEMATODA		
ANNELIDA (POLYCHAETA)		
Drilonereis filum	x	x
Heteromastus filiformis	x	x
Spiochaetopterus oculatus	x	x
Cirratulus grandis	x	x
Tharyx setigera	x	x
Marphysa sanguinea	x	
Glycera dibranchiata	x	x
Glycinde solitaria	x	x
Lumbrinereis tenuis	x	x
Clymenella torquata	x	x
Nephtys sp.	x	x
Nereis succinea	x	x
Diopatra cuprea	x	x
Scoloplos fragilis	x	x
Scoloplos robustus	x	x
Aricidea jefferei	x	
Pectinaria gouldi	x	x
Eteone heteropoda	x	x
Sabellaria vulgaris	x	x
Sabella microphthalma	x	
Pseudeurythoe sp.	x	x
Hydroides dianthus	x	x

Appendix 1 (continued)

Species list for December 1972
and June 1973 benthic stations

	December	June
Polydora ligni	x	x
Polydora websteri	x	x
Paraprionospio pinnata	x	x
Scolecolepides viridis	x	x
Spio sp.	x	x
Spiophanes bombyx	x	x
Streblospio benedicti	x	x
Syllid	x	x
Loimia medusa	x	
Harmothoe sp.		x
Sigambra tentaculata		x
Laeonereis culveri		x
ANNELIDA (Oligochaeta)		
Peloscolex spp.	x	x
MOLLUSCA (Pelecypoda)		
Nucula proxima	x	x
Anadara transversa	x	x
Anadara ovalis	x	
Brachiodontes recurvus	x	x
Crassostrea virginica	x	x
Mercenaria mercenaria	x	x
Gemma gemma	x	x
Petricola pholadiformis	x	
Mulinia lateralis	x	x
Tellina agilis	x	x
Macoma baltica	x	x
Macoma phenax	x	x
Tagelus plebeius	x	
Mya arenaria	x	x
Cyrtopleura costata	x	x
Lyonsia hyalina	x	x
Epitonium rupicolum	x	
Crepidula convexa	x	x
Yoldia limulata		x
Mytilus edulis		x
Macoma tenta		x
Ensis directus		x

Appendix 1 (continued)

Species list for December 1972
and June 1973 benthic stations

	December	June
ECHINODERMATA		
Amphiodia atra	x	x
UROCHORDATA		
Molgula manhattensis	x	x
TELEOSTEI		
Gobiosoma bosci	x	x
MOLLUSCA (Gastropoda)		
Urosalpinx cinerea	x	
Mitrella lunata	x	
Busycon canaliculatum	x	x
Nassarius vibex	x	x
Nassarius trivittatus	x	
Nassarius obsoletus	x	x
Odostomia impressa	x	
Pyramidella fusca	x	x
Turbonilla interrupta	x	x
Acteon punctostriatus	x	x
Acteocina canaliculata	x	x
Doridella obscura	x	x
Odostomia bisuturalis	x	x
ARTHROPODA		
Balanus improvisus	x	x
Neomysis americana	x	x
Leucon americanus	x	x
Diastyli polita	x	
Oxyurostylis smithi	x	
Cyathura polita	x	x
Cyathura burbancki	x	x
Crassidonidea lunifrons	x	x
Chiridotea caeca	x	
Edotea triloba	x	x

Appendix 1 (continued)

Species list for December 1972
and June 1973 benthic stations

	December	June
Ampelisca verrilli		x
Ampelisca abdita	x	
Ampelisca vadorum	x	
Leptocheirus plumulosus	x	x
Corophium lacustre	x	x
Corophium tubesculatum	x	
Unciola irrorata	x	x
Elasmopus levis	x	
Melita nitida	x	
Listrella clymenellae	x	x
Monoculodes edwardsi	x	x
Paraphoxus epistomus	x	x
Sympleystes glaber	x	x
Caprella penantus	x	x
Paracaprella tenuis	x	x
Palaemonete vulgaris	x	
Ogryrides limnicola	x	
Crangon septemspinosus	x	x
Upogebia affinis	x	
Pagurus longicarpus	x	x
Callinectes sapidus	x	
Neopanope sayi	x	x
Panopeus herbstii	x	
Pinnixa sp.	x	
Pinnothenas ostreum	x	x
Rhithropanopeus harrisii		x
Stenothoe sp.		x
Gammarus mucronatus		x
Corophium acherusicum		x
Ampithoe valida		x
Ampithoe longimana		x
Erichsonella filiformis		x
ECTOPROCTA		
Aeuerrillia armata	x	x
Anguinella palmata	x	x
Electra membranacca	x	x
PHORONIDA		
Phoronis architecta	x	x