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BASELINE SEDIMENTARY AND FAUNAL CHARACTERISTICS OF POTENTIAL SHELL PLANTING AND REFERENCE SITES IN GREAT SOUTH BAY

by

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INTRODUCTION:

The population of commercially important hard clams (*Mercenaria mercenaria*) in Great South Bay has been in decline since the late 1970s. Starting in 1986, the Town of Brookhaven has conducted an annual census to monitor the *M. mercenaria* population and to assess their distribution and abundance in the bay. Census data show that although overall the population is in decline, there are consistent "hot spots" of abundant *M. mercenaria* with abundances approximately seven times greater than other areas (Kassner and Cerrato 1990). Papa (1994) showed that these areas of high *M. mercenaria* abundance are associated with specific sediment types, notably regions with a substrate of high sand/shell, low silt/clay content and often in the vicinity of relict oyster (*Crassostrea virginica*) beds. Cerrato et al. (1998) identified sedimentary properties that are unique to these "hot spots" of longstanding successful hard clam habitats. The four important properties are 1) the presence of shell, 2) the presence of a thin layer of loose, fine-grained material covering the shell, 3) a firm bottom underlying the loose material, and 4) a bathymetric gradient.

The purpose of this study was to establish baseline sedimentary and faunal community characteristics at several sites in Great South Bay in anticipation of a possible shell planting, habitat enhancement project. Kassner (1997) has proposed to plant shell material in Great South Bay, in an attempt to ameliorate declining *M. mercenaria* abundances. The introduction of shell to an area of bay bottom that meets the other three sedimentary characteristics required for good hard clam habitat could enhance the bottom to create suitable habitat for hard clam growth.

METHODS:

Three study sites were selected based on the results of the Town of Brookhaven's annual hard clam census, bottom sonar and sediment grain-size data, and an assessment of potential shell planting areas (Kassner 1997). The first site designated as SH (40^0 42.109', 73^0 01.563') was selected as an example of an established site of high hard clam abundance. SH displayed the four sedimentary associated with longstanding hard clam habitats as described by Cerrato *et. al.* (1998). Two other sites (TR1 and TR2) were selected as a potential shell planting site and a control or reference site, respectively. Sites TR1 (40^0 41.856', 73^0 01.575') and TR2 (40^0 41.681', 73^0 01.967') are in the vicinity of SH and meet three of the four sedimentary criteria but lack surface shell deposits. TR1 has been designated as a potential shell planting site. TR2 would serve as a local reference site to evaluate the success of the shell planting operation.

The three study sites were located using a Garmin II differential GPS system. Within each site, samples were collected at 3 locations located approximately 50-100 m apart. Two replicate samples were collected at each location, resulting in a total of 6 samples within each site. Each sample consisted of a sample for benthic macrofauna and a companion sample for sediment grain-size analysis. All samples were collected by divers.

GRAIN SIZE:

Surface sediment samples for grain-size analysis were collected from the top 5 cm of sediments by filling as completely as possible a 10 x 10 x 12.5 cm plastic box and sealing the lid. In the laboratory, suspended material was allowed to settle, and surface water was suctioned off using a syringe and a small aspirator. Samples were homogenized and then subdivided. An aliquot of approximately 40 grams of sediment was wet sieved through a 2 mm and 63 μm sieve to separate the gravel (> 2 mm), sand (63 μm – 2mm), and mud fractions (<63 μm). These fractions were dried at 50°C. Dry weights were used to calculate the percentage of each size fraction. The remaining sediments were washed through a series of large sieves (12.5 mm, 9.5 mm, 6.3 mm, 3.35 mm, and 2 mm) to measure the relative amounts of these coarse materials.

COMMUNITY:

Benthic macrofauna samples were collected with a hydraulic suction sampler. Samples were collected from the surface 5 cm of sediments within a 0.05 m^2 sampling ring. Once collected, macrofauna samples were sieved through a 500 μm screen, transferred to jars, preserved in a solution of 10% buffered formalin, and stained with rose bengal. In the laboratory, samples were transferred to 70% ethanol in order to reduce dissolution of mollusk shells. Separation of benthic fauna from sediments was assisted by elutriation.

Most fauna were identified to species level using a variety of taxonomic keys. Fauna were also assigned to a functional group based on a classification by Ambrogio (1983) that incorporates infaunal and epifaunal assignments, tube building, motility, and trophic groups (Table 1). Functional group assignments were determined primarily from Fauchald and Jumars (1979) and Bousfield (1973), for polychaetes and amphipods respectively. Other resources included a number of natural history guides and studies on individual species (Pettibone 1963, Fauchild 1977, Gosner 1978; Commito and Ambrose 1985; Perry 1985; Shillaker and Moore 1987; Delong et al. 1993; Bostrom and Johanna 1999).

ANALYSIS:

Multivariate analysis was conducted using the direct gradient technique Canonical Correspondence Analysis (CCA). CCA creates an ordination diagram of species, sites, and environmental variables to display the relationships among these variables. CCA was also used to test for differences among faunal assemblages at the three sites. In a CCA plot, environmental variables are represented by arrows, and species and samples are represented as points. The ordering of samples and species along environmental gradients can be estimated by the position of the points when projected onto environmental arrows. The points which project in the direction of the head of the arrow are associated with the highest values of that environmental variable. Points which project near the origin are associated with the mean environmental value. Points which project opposite the head of the arrow are associated with lower values of the environmental variable. Samples that plot close to one another have similar faunal composition, while samples that plot apart are dissimilar.

RESULTS:

GRAIN SIZE:

The data indicate that the established hard-clam habitat (SH) has a unique set of sedimentary characteristics that set it apart from the two other sites (TR1 and TR2). On average, SH had a larger fraction of coarse-grained material than the other two sites (36.1% for SH, 1.3 and 0.6% for TR1 and TR2 respectively) (Figure 1, Table 2). Sites TR1 and TR2 were similar in grain-size composition, although TR1 had a slightly higher mud component.

SH sediments had a much greater proportion of large particles (>2mm) than the transitional sites TR1 and TR2 (Figure 2, Table 3). The distribution of coarse-grained particles at SH was dominated by the size fractions > 6.3 mm. The bulk of coarse-grained particles in the transition sites were contained in the 2-6.3 mm size fractions. In addition, higher sample to sample variability in the sedimentary parameters was evident within SH compared to TR1 and TR2 (Table 3)

COMMUNITY:

A total of 10,252 animals representing 75 taxa and 20 functional groups were collected. A complete list of species is given in Table 4. One of the replicates at TR2 did not preserve well, and results for this sample were discarded. This had no effect on the overall analysis. Annelids were the most well represented Phyla accounting for 49% of the species collected. Arthropods were the next most well represented group and accounted for 32% of the species.

Average abundance of macrofauna and species richness were greater at SH than the transitional sites TR1 and TR2 (Figure 3). Additionally, the total number of species represented at SH (62) was greater than the number of species represented at the transitional sites (43 and 50 at TR1 and TR2 respectively) (Table 5). Capitellid worms and *Neomysis americana* were among the most abundant species across all sites but the abundance of these species was highest at SH. The tube building annelid *Clymenella torquata* was also more abundant at SH than the transitional sites. The bivalves *Mercenaria mercenaria* and *Tellina agilis* were among the eighteen species present only at SH.

Canonical Correspondence Analysis (CCA) displayed the relationships among the species distributions and measured environmental variables and revealed differences among species assemblages at these three sites. The faunal assemblage at SH was significantly different ($p < 0.01$) from the faunal assemblages at TR1 and TR2. Faunal assemblages at TR1 and TR2 were not different from one another ($p > 0.05$). When the large sedimentary variables (fractions > 2mm) were included as covariates in the CCA analysis, the faunal difference between the shell site SH and the non-shell sites TR1 and TR2 was removed ($p > 0.05$).

Biotic-environmental patterns are revealed in the position of sample points in the ordination diagram (Figure 4). The CCA ordination plot displays a clear separation between SH and the transition sites TR1 and TR2 based on sedimentary characteristics and faunal assemblages. Envelopes are drawn around all of the samples from each of the three sites to identify their position in the ordination. All of the samples collected from the TR1 and TR2 plot to the upper left of the diagram in the direction of finer sediments. Samples collected from SH plot to the bottom right of the diagram in the direction of increasing predominance of coarse particles. The size of the envelopes indicates the variability in faunal assemblages within the group. The smaller envelopes around TR1 and TR2 indicate less variability, while the larger envelope around SH samples indicates greater variability.

The faunal assemblage at SH was characterized by relatively more *Mercenaria mercenaria*, the bivalve *Tellina agilis*, and the polychaetes *Cirriforma grandis*, *Clymenella torquata* and *Orbiniidae*. Some of the carnivores which were present in greater relative abundances in SH included the polychaetes *Brania* spp., *Schistomeringos rudolphi*, *Eumidia sanguinea*, *Eteone* sp., the scaleworm *Lepidontus* spp., and the mud crab *Panopeus herbstii*. Encrusting fauna such as the filter-feeding polychaete *Hydroides dianthus* and the common barnacle *Semibalanus balanoides* were also more common in SH. The transitional sites TR1 and TR2 were characterized by greater relative abundances of polychaetes *Pectinaria gouldi*, *Asabellides oculata*, *Sabellaria vulgaris*, and the tubiculous amphipod *Ampelisca abdita*.

SUMMARY:

SH has a unique set of sedimentary characteristics that set it apart both physically and biologically from TR1 and TR2. The significant difference between the faunal assemblages in these two habitat types can be explained by the presence/absence of coarse-grained particles. In addition:

- SH had a larger fraction of coarse material than either TR1 or TR2. Sediment characteristics were also more heterogeneous at this site compared to the other two.
- The hard clam *M. mercenaria* was present only at the shell site SH.
- The shell site SH was characterized by greater abundance, species richness, and total number of species present at that site compared to the transitional sites TR1 and TR2.
- The significant difference between the fauna at SH and the transitional sites TR1 and TR2 was explained by the presence of coarse-grained particles like shell.

	Infaunal (I)				Epifaunal (E)			
	Tubiculous (T)		Non-Tubiculous (N)		Tubiculous (T)		Non-Tubiculous (N)	
	Motile (M)	Sessile (S)	Motile (M)	Sessile (S)	Motile (M)	Sessile (S)	Motile (M)	Sessile (S)
Suspension feeder (Sf)	ITMSf			INSSf	ETMSf	ETSSf		ENSSf
Surface Deposit feeder (Ds)	ITMDs	ITSDs	INMDs	INSDs	ETMDs		ENMDs	
Infaunal Deposit feeder (Di)	ITMDi	ITSDi	INMDi					
Carnivore (C)	ITMC		INMC				ENMC	ENSC
Omnivore (O)			INMO				ENMO	

Table 1: Functional group assignment chart, adapted from Ambrogio 1983 and Larson, 2000. Filled cells indicate groups found in this study.

	% mud	std. error	% sand	std. error	% gravel	std. error
SH	21.0%	17.9%	42.9%	10.9%	36.1%	27.9%
TR1	21.2%	4.2%	77.5%	4.6%	1.3%	0.7%
TR2	7.6%	1.9%	91.8%	2.0%	0.6%	0.4%

Table 2: Average percent composition and standard errors of mud, sand and gravel at sites SH, TR1 and TR2.

	2-3.35 mm	std. error	3.35-6.3 mm	std. error	6.3-9.5 mm	std. error	9.5-12.5 mm	std. error	> 12.5 mm	std. error
SH	15.1%	14.5%	21.5%	18.5%	8.8%	7.4%	8.4%	7.0%	46.2%	30.9%
TR1	35.4%	14.6%	40.5%	14.1%	4.0%	4.2%	2.6%	6.4%	17.5%	30.2%
TR2	37.3%	5.3%	59.9%	3.3%	2.8%	3.6%	0.0%	0.0%	0.0%	0.0%

Table 3: Average percent composition and standard errors of the gravel (> 2mm) fraction of sediments at sites SH, TR1 and TR2.

		AVERAGE ABUNDANCE		
Taxa	**Functional Group**	**SH**	**TR1**	**TR2**
Arabella iricolor	INMC	0.2		
Asabellides oculata	ITSDs	1.2	0.5	3.4
Brania sp.	ENMC	1.2		
Capitella spp.	ITMDi	319.5	119.7	256.4
Cirriforma grandis	INMDs	1.2		
Clymenella torquata	ITSDi	65.3	13.2	2.0
Eteone	ENMC	0.7		
Eumidia sanguinea	ENMC	18.0	0.5	2.6
Exogone dispar	INMC	6.3	1.5	1.8
Fabrica sabella	ETSSf			0.2
Glycera dibranchia	INMO	4.5	1.3	3.2
Harmothoe extenuata	ENMC			0.2
Hesionidae	INMC	8.0	1.8	7.0
Hydroides dianthus	ETSSf	11.3		10.6
Lepidontus spp.	ENMC	1.3		0.2
Melinna cristata	ITSDs	0.5		
Nereis acuminata	ITMC	9.8	0.7	3.0
Nereis succina	ITMC	3.7	0.3	0.6
Orbiniidae	INMDi	1.0	0.3	
Paranaitis speciosa	ENMC	3.3	0.7	2.0
Paraprionospio pinnata	ITMDs	6.0	1.0	0.4
Pectinaria gouldii	ITMDi	0.5	0.2	1.4
Pherusa spp.	INSDs	0.2		
Pholoe minuta	INMC		0.2	
Phyllodoce arenae	ENMC	1.5		0.6
Polycirrus eximius	ITSDs	0.5		0.4
Polydora websterii	ITMDs		0.2	0.2
Prionospio cerrifera	ITMDs	0.2		
Prionospio heterobranchia	ITMDs	1.8		
Prionospio strenstrupi	ITMDs	0.3		
Sabella crassicornis	ETSSf			0.2
Sabellaria vulgaris	ETSSf		0.2	4.0
Schistomeringos rudolphi	INMC	2.0		
Spionidae	ITMDs	1.0		1.2
Spiophanes bombyx	ITMDs	0.2		0.2
Tharyx spp.	INMDs	0.3		
Tubificoides	INMDi	44.7	10.8	27.4
Ampelisca abdita	ITSDs	29.7	92.5	50.8
Ampelisca vadorum	ITSDs	2.0	0.5	1.4
Ampelisca verrilli	ITMDs	1.2	1.5	3.8

Table 4: Species list with functional group assignment and average abundance at sites SH, TR1 and TR2.

Table 4 (continued):

		AVERAGE ABUNDANCE		
Taxa	**Functional Group**	**SH**	**TR1**	**TR2**
Anoplodactylus lentus	ENMC		0.3	1.2
Balanus spp.	ENSSf	1.3		
Batea catharinenis	ENMDs	0.2		
Caprella penatis	ENMO	0.2	0.2	0.4
Cerapus tubularis	ETMDs	0.5	0.3	0.4
Corophium spp.	ITMSf	1.8	0.2	5.8
Crangon septemspinosa	ENMO	4.7	4.7	2.0
Cumacean	ENMDs	0.5	0.2	0.4
Edotea spp.	ENMO	4.3	3.3	3.8
Gammarid annulatus	ENMO			0.4
Gammarus oceanicus	ENMO	3.3	1.7	0.4
Lembos websteri	ITMSf			0.2
Leptocheirus plumulosus	ITMSf	0.2	0.3	0.2
Lysianopsis alba	ITSDs		0.2	
Microdeutopus gryllotalpa	ETMSf		1.7	0.8
Monoculodes edwardsi	INMO	1.8	3.3	
Mysidopsis bigelowi	ENMO		0.3	1.4
Isopod species A	ENMO	0.5		
Neomysis Americana	ENMO	109.5	37.8	41.8
Ostracoda	ENMO	70.8	76.0	81.2
Panopeus herbstii	ENMO	2.3	0.5	0.4
Nematodes	INMDi	84.5	6.3	17.2
Bryzoa	ENSSf	present		present
Anthozoa	INMC	1.3	1.3	3.0
Haloclava producta	INMC	5.2	1.5	3.6
Urticinia felina	ENSC	0.2		
Acteocina canaliculata	ENMC	1.3	0.2	1.0
Mercenaria mercenaria	INSSf	0.5		
Mulinia lateralis	INSSf	3.0	0.5	1.6
Pyramidellidae	ENMC		0.2	
Tellina agilis	INSDs	0.7		
Nemertinea	INMC	0.2		
Platyhelminthes	ENMO	0.2		
Cliona celata	ENSSf	present		present
Cerebratulus lactucus	INMDi	3.0	3.7	8.2

	Abundance	std. error	Species Richness	std. error	Number of Species / Site
SH	851.0	531.4	30.5	6.0	62
TR1	390.7	122.4	19.7	3.9	43
TR2	560.4	199.7	27.0	8.1	50

Table 5: Average abundance and standard error, species richness and standard error and total number of species collected at sites SH, TR1 and TR2.

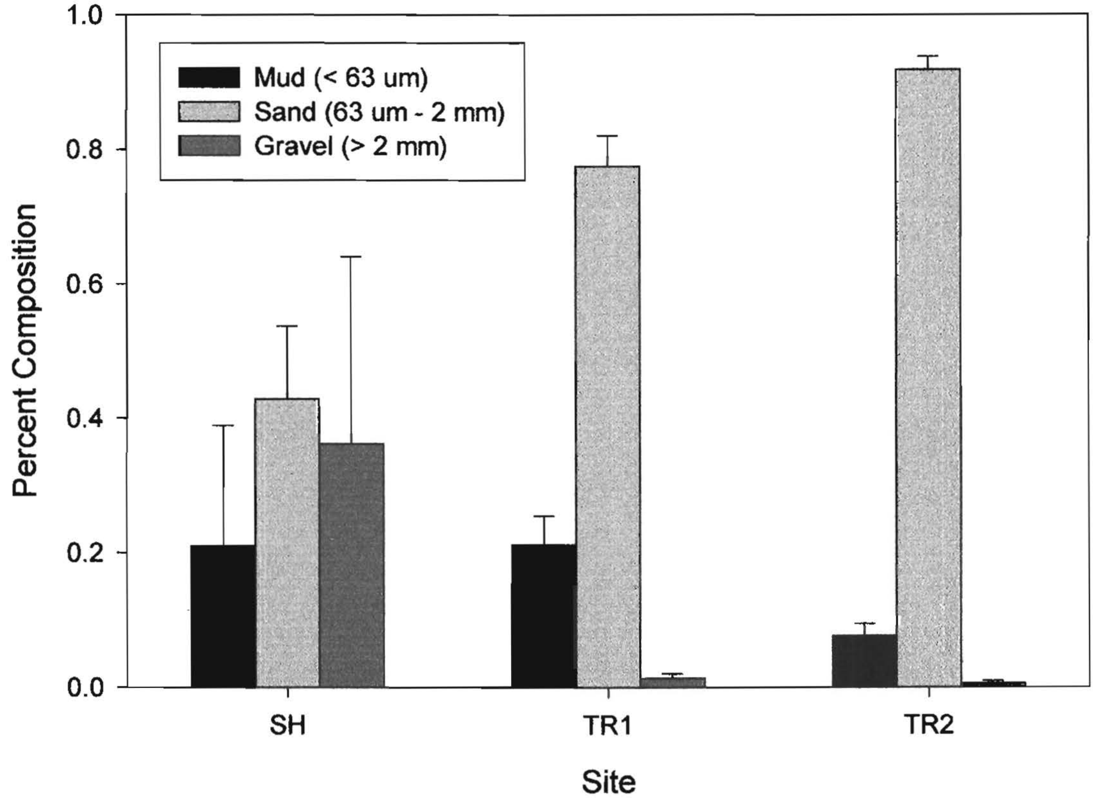

Figure 1: Average percent composition (+/- standard error) of mud, sand and gravel at sites SH, TR1 and TR2.

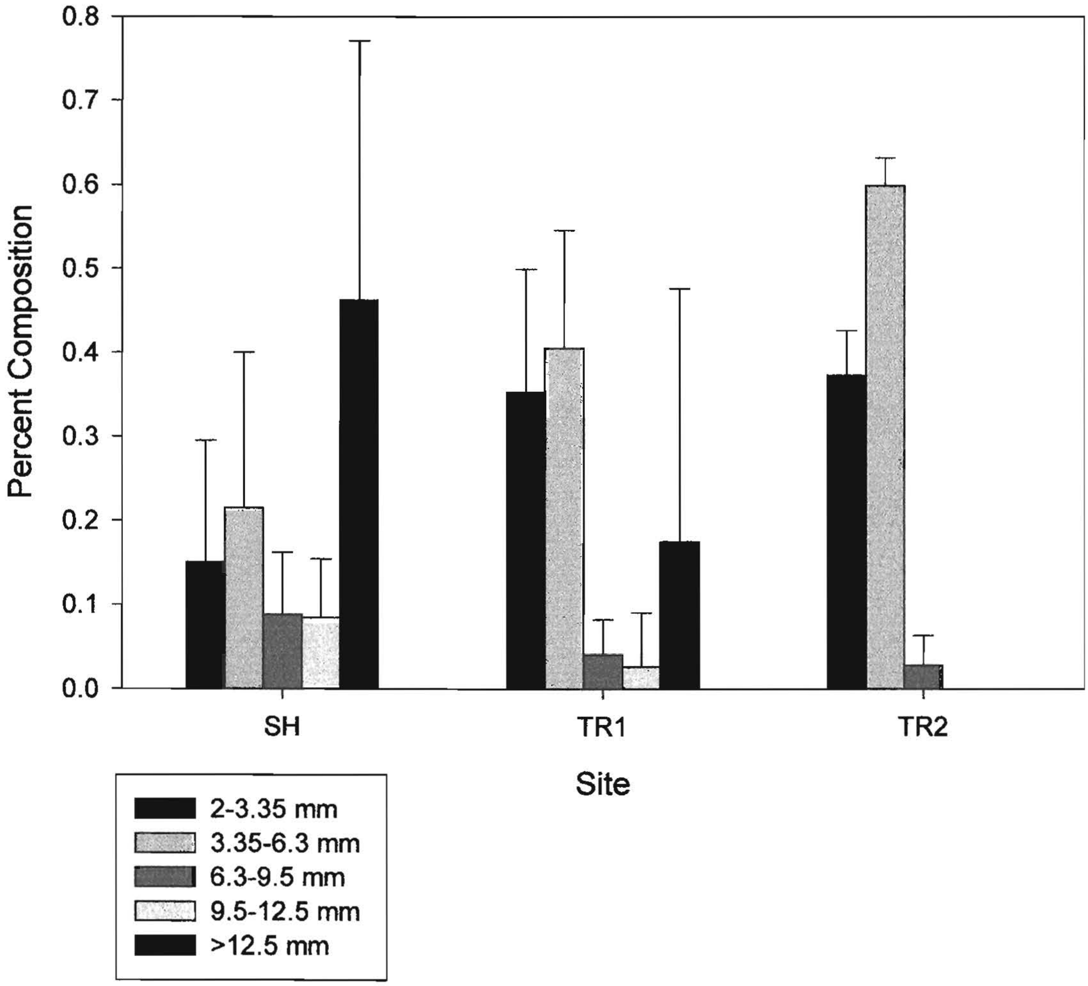

Figure 2: Average percent composition of the coarse sedimentary fraction (> 2 mm) (+/- standard error) at sites SH, TR1 and TR2.

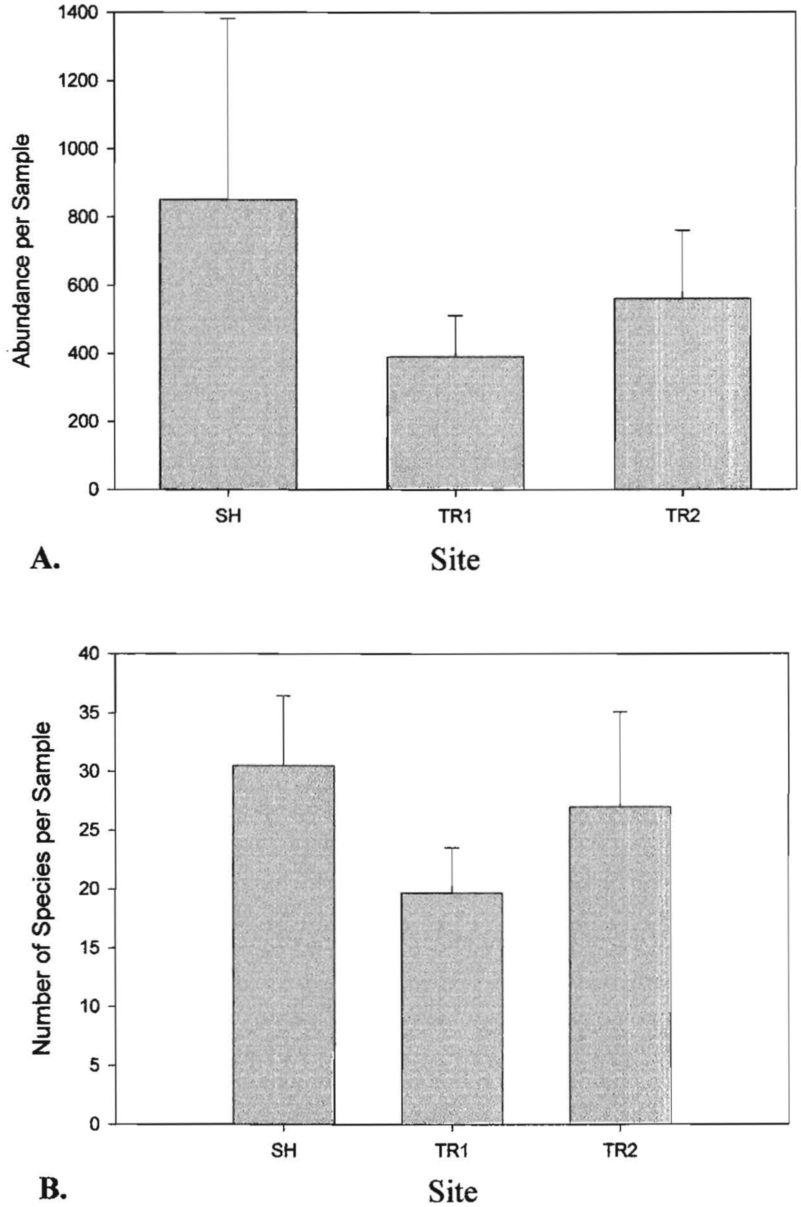

Figure 3: Average species abundance (A.) and species richness (B.) per sample (+/- standard error) for sites SH, TR1 and TR2.

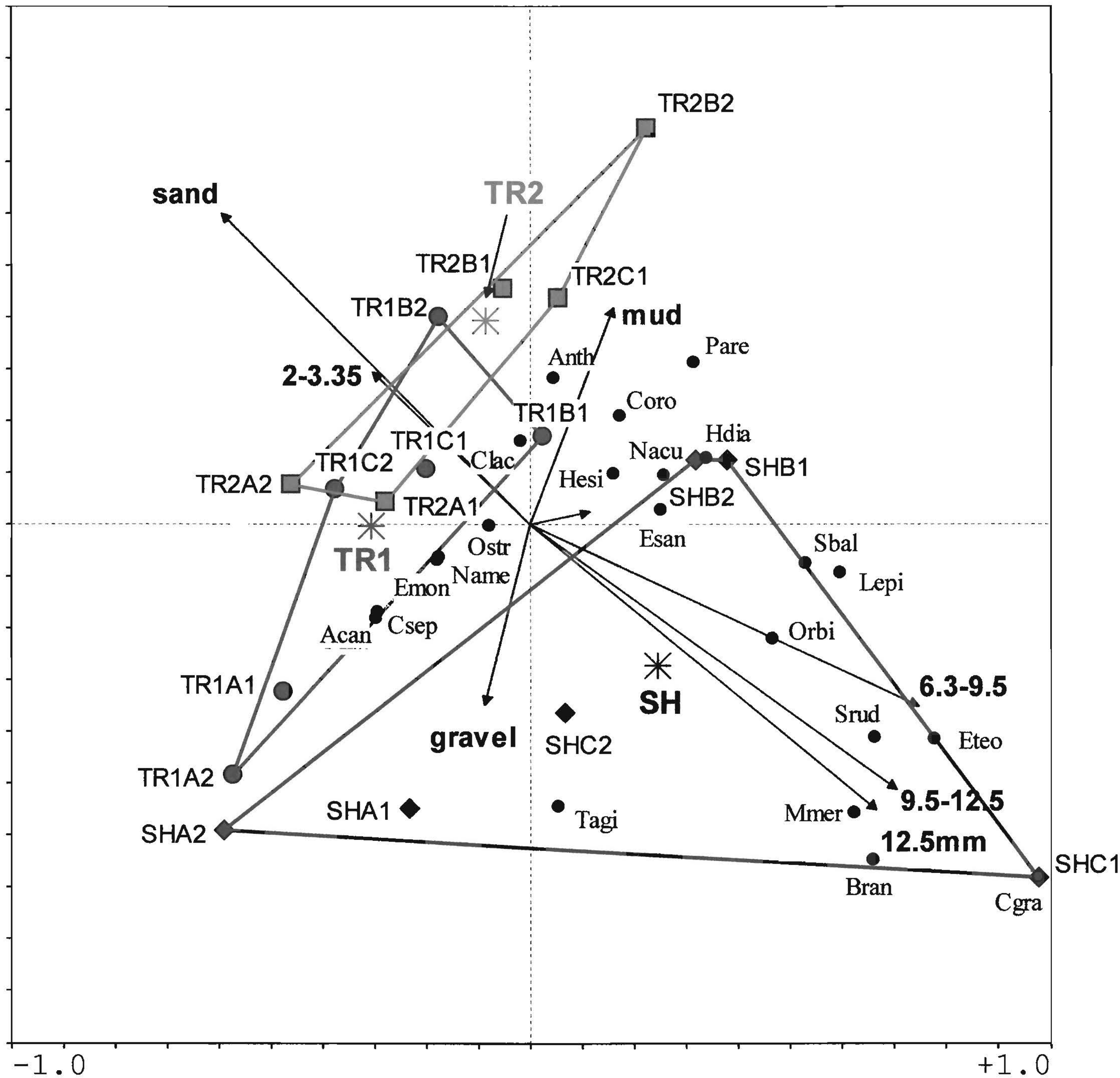

Figure 4: CCA triplot displaying the relationships among the species, samples, sites and environmental variables. Envelopes are drawn around all of the sample points within each of the sites. The center of each site is marked with a * and the site name. Environmental variables are displayed as arrows pointing in the direction of greater value. Individual samples are labeled with the site name and then a replicate ID code (For example TR2B2 indicates that that sample belongs to site TR2, and is the second sample collected at the second subsite within TR2.) Species codes are listed in Appendix III.

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APPENDIX I: Sediment Data								
				Percent composition within the gravel (> 2 mm) fraction:				
Sample	**% mud**	**% sand**	**% gravel**	**2-3.35 mm**	**3.35-6.3 mm**	**6.3-9.5 mm**	**9.5-12.5 mm**	**>12.5 mm**
SHA1	45.0%	54.3%	0.7%	4.7%	9.0%	0.0%	0.0%	86.3%
SHA2	43.1%	56.5%	0.4%	42.7%	57.3%	0.0%	0.0%	0.0%
SHB1	8.1%	40.7%	51.2%	11.1%	16.7%	14.4%	13.6%	44.2%
SHB2	8.8%	43.1%	48.1%	18.6%	25.1%	17.8%	14.4%	24.0%
SHC1	13.0%	32.5%	54.6%	7.3%	10.7%	11.1%	14.6%	56.4%
SHC2	8.1%	30.1%	61.8%	5.9%	10.1%	9.4%	7.9%	66.6%
TR1A1	15.6%	83.5%	0.9%	10.9%	15.4%	0.1%	0.0%	73.6%
TR1A2	17.5%	81.4%	1.1%	34.3%	50.0%	0.0%	15.7%	0.0%
TR1B1	22.9%	75.7%	1.4%	49.6%	45.6%	4.8%	0.0%	0.0%
TR1B2	19.9%	79.3%	0.8%	44.8%	53.6%	1.5%	0.0%	0.0%
TR1C1	25.5%	71.8%	2.7%	26.8%	33.2%	8.8%	0.0%	31.2%
TR1C2	25.9%	73.3%	0.9%	45.6%	45.3%	9.1%	0.0%	0.0%
TR2A1	9.4%	90.1%	0.5%	40.7%	59.3%	0.0%	0.0%	0.0%
TR2A2	5.2%	94.4%	0.4%	43.1%	56.9%	0.0%	0.0%	0.0%
TR2B1	6.5%	93.1%	0.4%	39.6%	56.2%	4.2%	0.0%	0.0%
TR2B2	6.2%	92.8%	1.0%	33.8%	65.0%	1.1%	0.0%	0.0%
TR2C1	9.8%	89.2%	1.0%	28.5%	62.2%	9.3%	0.0%	0.0%
TR2C2	8.3%	91.5%	0.1%	38.2%	59.8%	2.0%	0.0%	0.0%

Appendix II: Species Data																	
TAXA / SAMPLE	SHA1	SHA2	SHB1	SHB2	SHC1	SHC2	TR1A1	TRA2	TRB1	TR1B2	TR1C1	TR1C2	TR2A1	TR2A2	TR2B1	TR2B2	TR2C1
Acteocina canaliculata	1	5	2					1					1	3	1		
Ampelisca abdita	66	4	53	34	12	9	168	35	19	31	185	117	23	121	12	86	12
Ampelisca vadorum	9	1		2			2				1			7			
Ampelisca verrilli		1	2			4			1			8	3	8	8		
Andoplodactylus lentus								1			1		1	1	2	1	1
Anthozoa			6	1		1		1		5		2			1	14	
Arabella iricolor			1														
Asabellides oculata	3		3		1					1	1	1	2	7	4	3	1
Batea catharinenis	1																
Brania sp.	1				6												
Capitella	266	199	620	290	345	197	60	260	74	161	46	117	240	144	436	139	323
Caprella penatis				1								1			1	1	
Cerapus tubans			2			1		2					1			1	
Cerebratulus lactucus	2		11	2	3			1	2	8	6	5	3	13	8	15	2
Cirriforma grandis					7												
Clymenella torquata	131	26	76	26	119	14		10	41	21	3	4	1	1	3	5	
Corophium			6	1	3	1					1			5	1	20	3
Crangon septemspinosa	10	11	4	2	1		2	10	4	7	1	4		6	1	2	1
Cumacean		2	1					1							1		1
Edotea montosa	11	9	1	1	2	2	4	2		7	1	6	1	10	4	3	1
Eteone			1		3												
Eumidia sanguinea	2		60	23	22	1			2		1		2	2	1	7	1
Exogone spp.		1	22	11	3	1				6	1	2	3	2	3	1	
Fabrica sabella															1		
Gammarid annulatus														2			
Gammarus oceanicus	13	1	5			1	6		2	1		1		2			
Glycera dibranchia	4	5	5	4	5	4		3		4			4	1	8		3
Haloclava producta	6	4	14	1	5	1		4	2		1	2	3		7	3	5
Harmothoe extenuata																1	
Hesionidae	2		24	9	11	2		2	1	8				2	8	25	
Hydroides dianthus			47		19	2									37	16	
Isopoda (unknown)			2	1													
Lembos websteri														1			
Lepidontus spp.			4		4											1	
Leptocheirus plumulosus		1										2					
Lysianopsis alba											1				4		
Melinna cristata				3													
Mercenaria mercenaria					2	1											
Microdeutopus gryllotalpa										10							
Mononucloides edwardsi	1	3	6			1	3	15		2			1	1	3	2	
Mulinia lateralis	4	12				2		2				1		2	4		2
Mysidopsis bigelowi										2							
Nematodes	7		266	130	82	22	12	2		1	3	11	13	11	34	13	15
Nemertinea				1													
Neomysis Americana	372	76	154	22	22	11	9	76	14	83	6	39	14	73	97	13	12
Nereis acuminata			31	13	13	2			2	1		1		2	3	10	
Nereis succina			21		1					1		1		1	1	1	
Orbiniidae			2		4						2						
Ostracoda	37	58	178	50	91	11	109	100	29	96	27	95	25	111	134	111	25
Panopeus herbstii		1	7	1	3	2	1			2						2	
Paranaitis speciosa	1		16		3				4						2	8	
Paraprionospio pinnata	11	6	12	6	1		4	1		1							2
Pectinaria gouldii	1	2								1				2	4	1	
Pherusa spp.	1																
Pholoe minuta							1										
Phyllodoce arenae			6	3												3	
Platyhelminthes	1																
Polycirrus eximius				2	1										2		
Polydora websterii											1					1	
Prionospio cerrifera					1												
Prionospio heterobranchia				11													
Prionospio strenstrupi					2												
Pyramidellidae												1					
Sabella crassicornis																1	
Sabellaria vulgaris							1								14	6	
Schistomeringos rudolphi			2		9	1											
Semibalanus balanoides			7		1												
Spionidae			5	1										3		3	
Spiophanes bombyx						1									1		
Tellina agilis	1	1			1	1											
Tharyx complex				1		1											
Tubificoides	12		113	25	101	17	29	2	1	12	7	14	28	13	34	44	18
Urticinia felina				1													

APPENDIX III: Species Codes for CCA

Taxa	Code
Acteocina canaliculata	Acan
Ampelisca abdita	Aabd
Ampelisca vadorum	Avad
Ampelisca verrilli	Aver
Andoplodactylus lentus	Alen
Anthozoa	Anth
Asabellides oculata	Aocu
Brania sp.	Bran
Capitella	Capi
Caprella penatis	Cpen
Cerapus tubans	Ctub
Cerebratulus lactucus	Clac
Cirriforma grandis	Cgra
Clymenella torquata	Ctor
Corophium	Coro
Crangon septemspinosa	Csep
Cumacean	Cuma
Edotea montosa	Emon
Eteone	Eteo
Eumidia sanguinea	Esan
Exogone spp.	Exog
Gammarus oceanicus	Goce
Glycera dibranchia	Gdib
Haloclava producta	Hpro
Hesionidae	Hesi
Hydroides dianthus	Hdia
Isopoda (unknown species)	Isop
Lepidontus spp.	Lepi
Leptocheirus plumulosus	Lplu
Lysianopsis alba	Lalb
Mercenaria mercenaria	Mmer
Microdeutopus gryllotalpa	Mgry
Mononucloides edwardsi	Medw
Mulinia lateralis	Mlat
Nematodes	Nema
Neomysis americana	Name
Nereis acuminata	Nacu
Nereis succina	Nsuc
Orbiniidae	Orbi
Ostracoda	Ostr
Panopeus herbstii	Pher
Paranaitis speciosa	Pspe
Paraprionospio pinnata	Ppin
Pectinaria gouldii	Pgou

Taxa	Code
Phyllodoce arenae	Pare
Polycirrus eximius	Pexi
Polydora websterii	Pweb
Prionospio heterobranchia	Phet
Sabellaria vulgaris	Svul
Schistomeringos rudolphi	Srud
Semibalanus balanoides	Sbal
Spionidae	Spio
Spiophanes bombyx	Sbom
Tellina agilis	Tagi
Tharyx complex	Tcom
Tubificoides	Tubi