Spring 1999

Benthic Community Analysis of Hog Island Bay, Virginia

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BENTHIC COMMUNITY ANALYSIS OF

HOG ISLAND BAY, VIRGINIA

by

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B.S. December 1993, Radford University

A Thesis Submitted to the Faculty of
Old Dominion University in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF SCIENCE

BIOLOGY

OLD DOMINION UNIVERSITY
May 1999

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ABSTRACT

BENTHIC COMMUNITY ANALYSIS OF
HOG ISLAND BAY, VIRGINIA

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The benthic infaunal macroinvertebrate communities of Hog Island Bay of the Virginia Eastern Shore were quantitatively sampled at 30 locations on August 31 and September 1, 1995. The primary objectives of this study were: (1) to characterize the subtidal macroinfaunal benthic communities of Hog Island Bay, (2) to examine relationships between abiotic factors and the macroinfaunal communities and (3) to characterize the environmental condition of the system using the Benthic Index of Biotic Integrity (B-IBI) (Weisburg et al. 1997) and the EMAP Benthic Index for the Virginian Province (Strobel et al. 1995).

The ecological condition of Hog Island Bay appears to be largely defined by its geographic location and physical processes acting along a coastal zone. Multivariate statistical analyses reveal a community spatial pattern not unlike other temperate estuaries. Outside of a sharp community transition existing in the vicinity of Great Machipongo Inlet, benthic assemblages throughout the study area generally exhibit subtle boundaries and a high degree of internal similarity.

When compared among other estuaries and bays in the Virginian Province, community attributes measured for Hog Island Bay were most similar to polyhaline reaches of Chesapeake Bay. Also, both physical and biological data imply that the

structure of Virginia's polyhaline benthic communities is different from that occurring in communities north of Virginia.

In terms of both the B-IBI and the EMAP index, the bethic community condition of Hog Island Bay may be viewed as exceptional when compared with other systems occurring throughout the Virginian Province.

ACKNOWLEDGMENTS

This project was initiated following the submission of a proposal by Dr. Dan Dauer to Dr. Warren Flint of The Eastern Shore Institute to characterize the benthic communities of Hog Island Bay, Virginia. Partial funding for this study was provided through the Parsons Foundation via The Eastern Shore Institute and The Chesapeake Bay Monitoring Program.

Several individuals have been instrumental in contributing their scientific knowledge and spare time and may be separated into two categories; Alumni of the Benthic Ecology graduate program of Old Dominion University and other affiliates of the ODU Biological Sciences Program. Benthic Ecology alumni include Anthony Rodi, Mike Lane, Ananda Ranasinghe, Tim Morris and Mary Smith. Other affiliates of the ODU Biology Program include Dan Dauer, R. Warren Flint, Ray Alden, Kent Carpenter, Robert Bray, Debbie Miller and Jason Schratweiser.

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INTRODUCTION

Virginia's Eastern Shore has a recorded history dating back to the establishment of the Virginia Company during the early 1600's. This region was first recognized for its vast wealth of natural resources, characterized by bountiful rivers and rich farmland. Being open to larger water routes, the Eastern Shore was a favorable location upon which a stable economy could be built. Export profits accrued and communities quickly developed around the farming and seafood industries, placing more demand on these exploitable resources (Perry 1950).

Virginia's Eastern Shore comprises the southern end of the Delmarva Peninsula (Fig.1). This region is approximately 97 kilometers long and 27 kilometers wide and consists of some 2,163 square kilometers of predominately flat, low-lying terrain (U.S. Army Engineer District, Norfolk 1996). The Chesapeake Bay basin occurs west of the Peninsula, spanning a length of approximately 322 kilometers and ranging in width from about 6.5 kilometers near Annapolis, Maryland to 48.5 kilometers at its widest point near the mouth of the Potomac River (USEPA 1989). A barrier system lies seaward of the Peninsula and is defined by Davis (1985) as barrier islands in combination with their associated sedimentary environments including lagoons, marshes, inlets and tidal deltas. These systems usually occur where a low-gradient continental shelf is adjacent to a low-relief coastal plain. This situation is present along trailing edges of continents such as the east coast of North America.

Virginia's barrier system is bordered by a chain of 18 barrier islands which span a distance of 97 kilometers. This region possesses 938 square kilometers of open water

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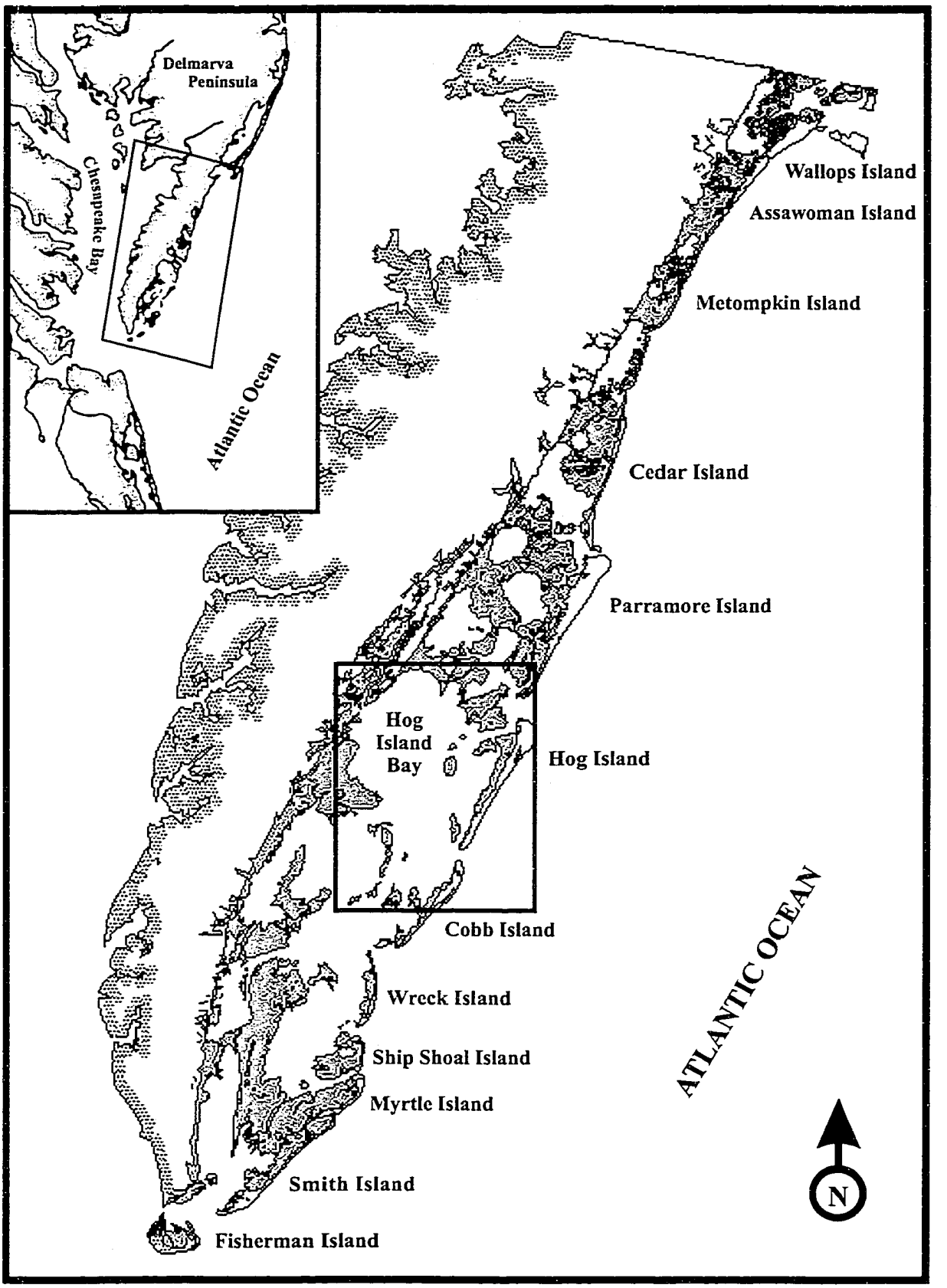


Fig. 1. Area map of Virginia's Eastern Shore.

and emergent wetlands which have important ecological and economic function (Flint 1997). These barrier systems serve as spawning and nursery areas for commercially valuable fish and shellfish species. Also, the emergent wetlands act as natural buffers to flooding and erosion, while providing essential habitat for migrant species. The coastal region supports recreational activities including boating, fishing, hunting and bird watching. These opportunities, along with the natural aesthetic appeal, are qualities that stimulate the local economy through tourism. The vulnerability of the coastal ecosystems is directly related to the diversity and intensity of activities that take place in the coastal zone (NOAA 1991, NOAA 1976).

Benthic biological communities have been useful as indicators of environmental disturbance in both marine and freshwater ecosystems. In a review by Sousa (1984) a disturbance is defined as "a discrete, punctuated killing, displacement, or damaging of one or more individuals (or colonies) that directly or indirectly creates an opportunity for new individuals (or colonies) to become established." Disturbance factors may be separated into two categories, natural disturbance and anthropogenic disturbance. Gray (1979) has described the effects of natural factors acting on populations as either physical disturbance or stress. Physical disturbances include storm events and freezing, resulting in the partial or total destruction of benthic organisms. Stress factors include low salinity, low food concentration and desiccation, resulting in a reduced productivity of the individual. Chapman (1987) defines anthropogenic disturbance factors related to pollution as levels of contamination which are biologically damaging. The utility of analyzing benthic communities as indicators of anthropogenic disturbance has been demonstrated by several authors (Pearson & Rosenberg 1978; Gray 1979, 1982, 1989,

1990; Hargrave & Thiel 1983; Warwick 1986, 1993; Roper 1988; Newell 1990; Marques et al. 1993; Dauer 1993, 1997; Weisburg et al. 1997). Because sediments of aquatic systems are effective contaminant sinks (Somerfield et al. 1994), and pollution agents in sediments have been shown to interfere with normal biological functions (Chapman 1987), the intensity of a disturbance may be measured through changes in resident benthic communities. Bilyard (1987) presents a thorough review focusing on benthic community analyses as an integral component of pollution monitoring studies.

The early detection of environmental disturbance is a major goal in assessing the environmental health of marine ecosystems (Hargrave & Thiel 1983; Gray 1989), however, benthic pollution studies have traditionally focused on the aftermath of known contaminant releases. Point sources having prompted such studies include offshore oil production (Gray 1990), metals mining (Somerfield 1994) and chemical manufacturing (Newell 1990). Eutrophication results from additions of sewage and non-point source runoff and has been regarded as the most severe form of marine pollution (Pearson & Rosenberg 1978; Gray 1982). Regardless of the polluting agent, it is important to understand natural community structure in order to measure changes in environmental conditions (Hargrave & Thiel 1983).

Hog Island bay was chosen for the present study as a representative subsystem of Virginia's coastal lagoons. Hog Island Bay is the lagoon area lying between Hog Island and the coastal upland in the vicinity of Nassawadox. The primary objectives of this study were: (1) to characterize the subtidal macroinfaunal benthic communities of Hog Island Bay, (2) to examine relationships between abiotic factors and the macroinfaunal communities and (3) to characterize the environmental condition of the system using the

Benthic Index of Biotic Integrity (Weisburg et al. 1997) and the EMAP Benthic Index for the Virginian Province (Strobel et al. 1995).

STUDY AREA

COASTAL SETTING

Meteorological Forcing

Regional phenomena may be used to describe the present physical setting on the southern Delmarva Peninsula. The Atlantic coast of Virginia's Eastern Shore has a semidiurnal tidal range that averages 1.6 meters (U. S. Army Engineer District, Norfolk 1996) and 1.2 meters inside of Great Machipongo inlet which occurs between Hog Island and Cobb Island (Nautical Software Inc. 1993-1994). The climate has been classified as modified continental with an average annual temperature of 15°C and average annual precipitation of 107 centimeters. The prevailing winds are from the south to southwest at an average annual velocity of 36 kilometers per hour, however hurricanes and northeast storms account for the most significant shoreline erosion. Hurricanes generally occur between the months of August and October and are characterized by intense cyclone, low barometric pressure, winds exceeding 266 kilometers per hour, heavy rainfall and tidal surges. Northeast storms or "northeasters" generally occur throughout the fall, winter and spring months and are accompanied by persistent onshore winds predominately from the northeast. (U. S. Army Engineer District, Norfolk 1996). The dominant current and wave approach direction from the north results in a net southerly longshore transport of sediment (Finkelstein & Ferland 1987).

Physiography

The Eastern Shore of Virginia is situated within the Atlantic Coastal Plain physiographic region. The Coastal Plain consists of crystalline basement rock ranging in age from Precambrian to Triassic, overlain by unconsolidated and semi-consolidated

wedges of coastal plain sediments ranging in age from Cretaceous to Holocene (Richards 1967, Oaks & DuBar (eds.) 1974). These sediments are of marine and fluvial origin and vary in thickness from a few feet at the fall line in Richmond, Virginia to approximately 12,000 feet on the Virginia Continental Shelf. Eastern Shore topography attains a maximum elevation of 50 feet above sea-level, with a 100 year flood plain comprising those areas within 11 feet above sea level on the bayside and 14 feet on the seaside (U.S. Army Engineer District, Norfolk 1996).

Sea-level History and Shoreline Transgression

In order to describe the coastal zone along the Delmarva Peninsula, it is important to have an understanding of quaternary sea level fluctuations. Demarest and Kraft (1987) introduce and define appropriate terminology for describing sea level change. Eustacy is a world-wide change in the height of the sea surface with reference to the center of the earth. Relative sea-level change is change in the height of the sea surface with reference to a geodetic datum and is the combined effect of eustacy, techtonic subsidence and compaction of the pre-existing sediment column. The eustatic sea level rise following Quaternary glacial maximum (18,000 yrs. B.P.), has been the driving force of change along continental margins. Relative sea-level curves for the east coast of the United States show a continuous rise throughout the Holocene epoch (10,000 yrs. B.P. to present) although there are geological studies (Newman & Rusnak 1965, Newman & Munsart 1968, Finkelstein & Ferland 1987) that suggest different trends in relative sea level rise and lowering along the Atlantic coast of the southern Delmarva Peninsula. There has since been some argument as to the reliability of these interpretations based on more recent stratigraphic data obtained from the Eastern Shore of Virginia (Van de

Plassche 1990). Data recorded from 1940 through 1980 at fixed tidal stations along the northern east coast (Portland, ME to Portsmouth, VA) indicate an apparent nonperiodic trend in sea level rise of 2.6 mm/yr (Hicks et al. 1983).

Transgression is defined as the migration of a shoreline in a landward direction and regression is the migration of a shoreline seaward, the terms being restricted to regional, long-term phenomena. The terms progradation (building sequence) and retrogradation (deteriorating sequence) are used for shoreline fluctuations on a local scale in response to sediment movement. The mid-Atlantic continental shelf of North America has sustained a transgression driven by a rising relative sea level following Quaternary glacial maximum. Due to low sediment supply from river systems, retrogradational processes of erosion and deposition have dominated this pattern of retreat (Demarest & Kraft 1987). Bethany Beach, Delaware represents a sharp transition in the present shoreline trend along the Delmarva Peninsula. A Pleistocene shoreface that formed about 60,000 years B.P. is currently being transgressed south of Bethany Beach. This escarpment forms the most seaward lagoonal headland and is the youngest identifiable shoreline trend being inundated by the Holocene sea level rise. Surfaces being transgressed north of Bethany Beach have not been reworked by shoreface processes for at least 600,000 years and possibly over a million years (Demarest & Leatherman 1985).

BARRIER SYSTEMS

The present configuration of the barrier systems occurring along the Delmarva Peninsula are the result of geological setting and physical processes acting on the coastal zone. Physical processes include wind, wave and tidal forcing, relative sea level change,

regional climate, tectonic movements and sediment supply (Kraft et. al 1979). Geomorphic and stratigraphic data obtained from the coast of the Delmarva Peninsula indicate that the pre-transgressional topography has also had a major influence on the development of the barrier systems (Morton & Donaldson 1973, Halsey 1979, Demarest & Leatherman 1985, Oertel et al. 1989). As demonstrated by Newman and Munsart (1968), Virginia's barrier systems may be conveniently divided into three physiographic subdivisions: The barrier islands, bordering the east; the lagoon proper, including marshes, tidal flats, channels and shallow bays in the center of area; and the uplands, demarcated by the previously mentioned 60,000 yrs B.P. shoreline trend.

Barrier Islands

The late Wisconsinan regression preceding quaternary glacial maximum left behind a network of drainage channels separated by topographically higher divide areas. As transgression began, barrier beaches formed against highlands of the drainage divides, while major inlets followed ancestral stream valleys (Morton & Donaldson 1973, Halsey 1979). Stratigraphic evidence from Wachapreague lagoon indicates that the local barrier islands are Holocene formations, which have been in existence for at least 5,500 years (Newman & Munsart 1968). In 1860, the development of the Cape Assateague – Fishing Point complex at the southern end of Assateague Island obstructed southerly longshore transport of sediments. While other Virginia barrier islands have since retreated rapidly, Fishermans Island, at the southern tip of the peninsula, has accreted at a rate of about 200,000 m^3/yr. The calculated sediment loss applied evenly to all islands along the barrier chain south of Cape Assateague and excluding inlet reaches is approximately –2.5 m^3/m/yr (Everts 1987). Cape Assateague is the largest updrift-offset cape along the

United States coast and its formation has directly caused the largest historical shore-line retreat rate of any barrier system in the country (Finkelstein 1983).

The Virginia Marine Resources Commission defines barrier islands as "elongated narrow landforms consisting largely of unconsolidated and shifting sand, fronted on one side by the ocean and on the other by a bay of marshland which separates them from the mainland." Virginia's Accomack and Northampton counties have a total of about 85.3 miles of coastal sand dunes associated almost exclusively with the barrier islands (VMRC 1980). Leatherman and others (1982) have divided the Virginia barrier islands into the following three groups; *northern, middle* and *southern*, based on historic shoreline behavior from 1852 to 1974.

The *northern group* of Islands (Wallops Island to Cedar Island) has experienced a parallel beach retreat. The evident concavity of this group and its close proximity to the mainland may be influenced by a uniform wave attack and an increased tectonic subsidence (Leatherman et al. 1982). Everts (1987) reveals that Assawoman Island, just south of Wallops Island, has been retreating at a relatively constant rate of 4.3 m/yr for the past 130 yrs. Calculations suggest that sea-level rise, loss through longshore transport and loss through overwash account for approximately 60%, 30% and 10% of its retreat respectively.

The shoreline response of the *middle group* of islands (Parramore Island to Wreck Island) may be described as rotational instability. Rotation is a descriptive term for the effects of accretion and erosion in changing the orientation and shape of a barrier island. These islands are most affected by wave focusing, characterized by having dramatic downdrift offset inlets with large ebb-tidal deltas. Sequential maps constructed from

government records reveal that reversals in inlet offset have occurred at both ends of Hog Island. Conditions which formed the modern offsets of Hog and Cobb Islands began in the late 1800's after a drastic change in the configuration of the ebb channels across the ebb-tidal deltas (Leatherman et al. 1982). As determined by comparison of shoreline positions in 1852 and 1962, the north end of Hog Island has accreted at a rate of 9 ft/yr while the south end has eroded at a rate of 18 ft/yr (U.S. Army Engineer District, Norfolk 1996).

Shoreline retreat patterns of the *southern group* of islands (Ship Shoal Island to Fishermans Island) is described as non-parallel beach retreat because each island has exhibited a different response to wave attack. The general trend for these islands has been a reduction of their seaward convexity along with a gradual retreat toward the mainland (Leatherman et al. 1982).

Lagoon Proper

Radiocarbon dating of sediments in Wachapreague Lagoon indicate that the lagoons have been in existence for at least 5,100 years (Newman & Munsart 1968), however, modern marshes associated with these lagoons have developed only within the last 1,600 years (Finkelstein & Ferland 1987).

Newman and Munsart (1968) characterize the coastal lagoons as having 2 contrasting physiographic features; the shallow bays and tidal flats extending from approximately mid-tide level to below low tide level and the salt marshes with their tidal channels extending from approximately mid-tide level to Mean High Water. The bays are generally covered with shallow water and are barren of halophytic vegetation. During periods of low tide, flats become aerially exposed as many of these bays are emptied.

Finkelstein and Ferland (1987) describe the salt marshes as exhibiting horizontal surfaces with many tidal channels bisecting them. These marsh channels are characterized by having a sharp, generally steep eroding side and an accreting side with colonizing *Spartina alterniflora*. *Spartina alterniflora* reproduces through rhizomes which form a mat-like structure that traps sediment and promotes the upward growth of the marsh. As the marsh surface develops to approximately mean high water, other halophytic plants such as *Spartina patens*, *Juncus sp.* and *Salicornia sp.* are able to colonize. Oertel and others (1989) describe the channels occurring in the lagoon area known as Cobb Bay as forming a dendritic drainage system. Low-order channels on the mainland side of the lagoon feed intermediate-order channels in the center, while intermediate channels flow into trunk channels that merge toward the inlet throat.

Uplands

The Mapsburg scarp is the oldest identied shoreline trend in the Virginia sector of the Delmarva Peninsula and is thought to be equivalent in age to the shoreline being transgressed North of Bethany Beach, Delaware (600,000 yrs. B.P.). Seaward of this scarp, the Bradford-Upshur Neck complex represents the youngest pleistocene shoreline (60,000 yrs. B.P.) being inundated by the Holocene rise of sea-level. The upland shoreline of Virginia's barrier system is currently resting against the steep portion of this escarpment, resulting in a linear shoreline configuration (Demarest & Leatherman 1985). The Bradford-Upshur Neck complex forms a peninsula which is bordered on its mainland side by the Great Machipongo River Valley. It has been suggested that this feature is a relict pleistocene barrier island, with the Great Machipongo River Valley being the site of a former lagoon (Newman & Munsart 1968).

Stratigraphy and Sedimentology

The barrier systems of Virginia's Eastern Shore are composed of sediments dominated by terrigenous sand, silt and clay, with authigenic grains, mollusk shell and microfaunal tests comprising the nonterrigenous component (Finkelstein & Ferland, 1987). According to Oertel and others (1989), the variety of sedimentary environments existing behind the barrier islands is the result of antecedent topography and active marine processes. Stratigraphic data suggest that the early holocene lagoon was quite shallow and has not gone through a long infilling sequence, however, sedimentation rates are highly variable due to natural gradients in flow and sediment supply. Deep channels occurring in Cobb Bay are sites of active scouring by high-velocity tidal currents, whereas intertidal areas are conducive to deposition of fine-grained sediments and marsh initiation.

Finkelstein and Ferland (1987) describe Virginia's back-barrier depositional history as evolving from a higher to lower energy environment. The typical depositional pattern exhibits a fining-upward sequence as a response to coastal transgression. The gradual narrowing and infilling of the back-barrier region decreased the tidal prism and in turn, decreased the widths of major inlets. Present back-barrier conditions are calmer, with suspended fine-grained sedimentation replacing bedload sand influx in many areas.

Cape Assateague has obstructed southerly longshore transport of sediments, therefore shoreface erosion represents the major source of sediment to Virginia's barrier system. Sediments supplied through this mechanism may be divided into two classes, holocene sediments and pre-holocene sediments. Holocene sediments were deposited at an earlier stage within the same coastal system, whereas pre-holocene sediments

represent a new source to the system (Demarest & Leatherman 1985). Sediments are supplied to the lagoons primarily through transport of shoreface sediment by way of major inlets (Morton & Donaldson 1973), although rivers contribute important quantities of fine-grained materials. This was particularly evident during the Colonial period, where deforestation led to increased stream sediment loads (Finkelstein & Ferland 1987).

HOG ISLAND BAY – IN FOCUS

Hog Island Bay is defined by the coastal embayment within 37°30′ N latitude and 37°20′ N latitude from a point on the bordering lagoon side of Cobb Island, extending an imaginary line to the town of Nassawadox (Fig. 2). The Great Machipongo River Valley and Upshur Neck peninsula form the mainland side of the lagoon. The Great Machipongo River is defined by a narrow and deep tidal channel, which cuts through the bay to eventually terminate seaward of its coastal inlet. The length of this channel within the defined study area is approximately 11 nautical miles with depths ranging from 9 feet in the vicinity of Upshur Neck to 66 feet at Great Machipongo Inlet. North Channel is a smaller channel which flushes the northern portion of Hog Island Bay by way of Quinby Inlet. As demonstrated by Halsey (1979), these major channels represent a portion of a paleochannel network which formed during the late Wisconsinan regression. Associated with these two channels are lower order channels which transport water into and out of shallow bays and salt marshes. Large expanses of salt marsh fringe the lagoonal shorelines, while scattered marshes occur on topographically higher areas of the shallow embayment (NOAA/NOS 1994).

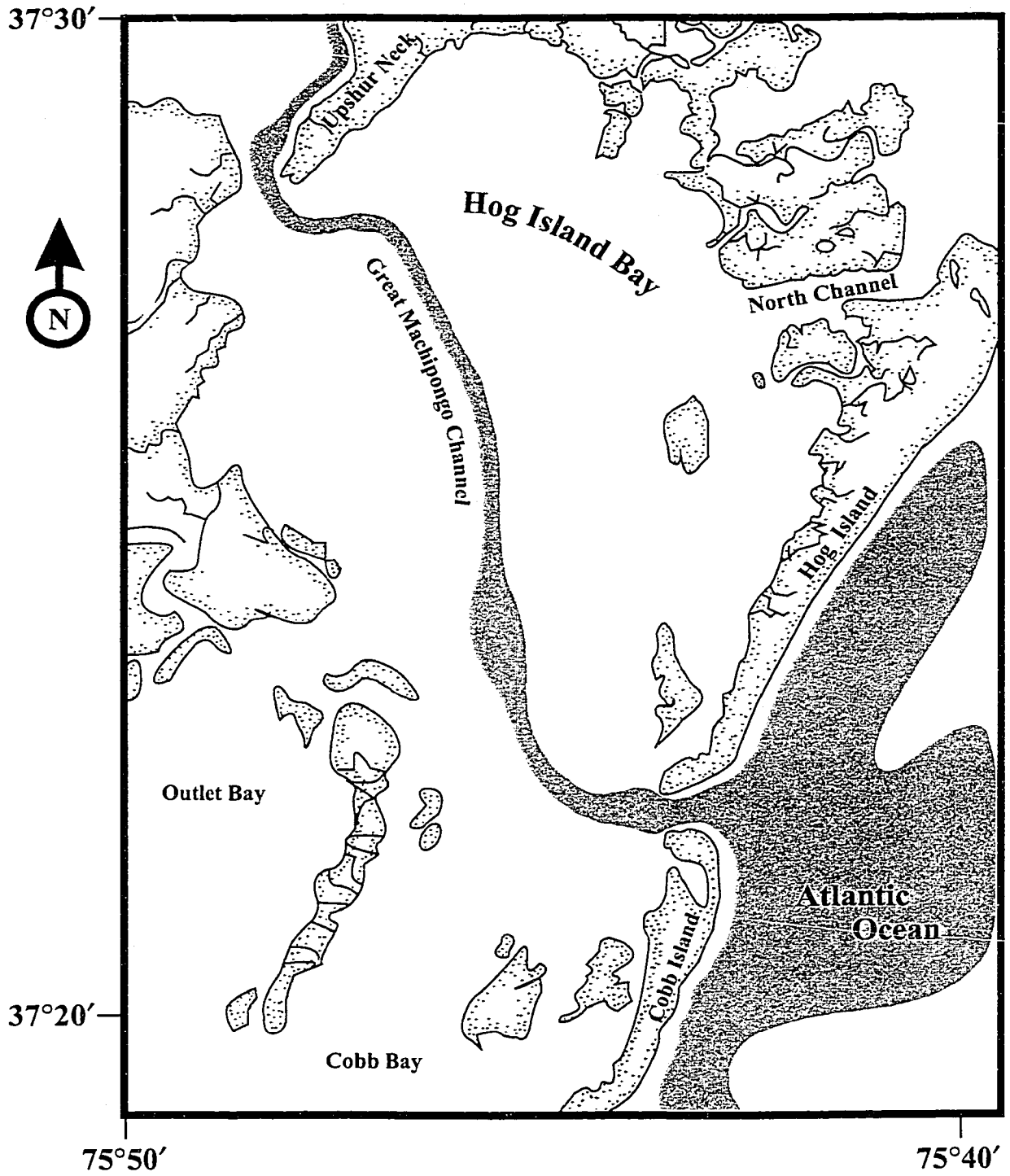


Fig. 2. Map showing the defined study area of Hog Island Bay.

METHODS AND MATERIALS

PROCEDURE FOR SITE ALLOCATION

In order to characterize the macrobenthic communities of Hog Island Bay, the subtidal environment was sampled at 30 locations on August 31 and September 1, 1995. For site selection, the lagoon was partitioned *a priori* into two strata: channel and flat. Ten sites were allocated within Great Machipongo Channel and 20 sites were allocated on flats lying beneath shallow bays (Fig. 3). A digital planimeter was used to calculate the areas of each respective sampling strata from a corresponding nautical chart (NOAA/NOS, 1994).

Channel Site Allocation

For channel site allocation, Great Machipongo channel was defined as going from the midpoint between Cobb and Hog Island to a point inland where the channel intersected the 37°30′ N latitude line. The approximate 9.95 square kilometer section of channel is spread out along 11 nautical miles. The entire span was divided into 10, 1.1 nautical mile segments, which were further divided into 10 segments. The resulting 100 equal segments of channel were appropriately numbered from 1 (at the inlet) to 100 (at the northern extent of the marked channel). Ten consecutive numbers were chosen from SAS random numbers generator (1-100) for allocating channel sites. After the 10 site locations were marked, latitude and longitude coordinates were determined.

Flat Site Allocation

Subtidal flat regions, as revealed through an overlay of local satellite imagery onto the corresponding nautical chart, totaled an area of approximately 78.19 square kilometers. Random site locations were established using consecutive numbers from

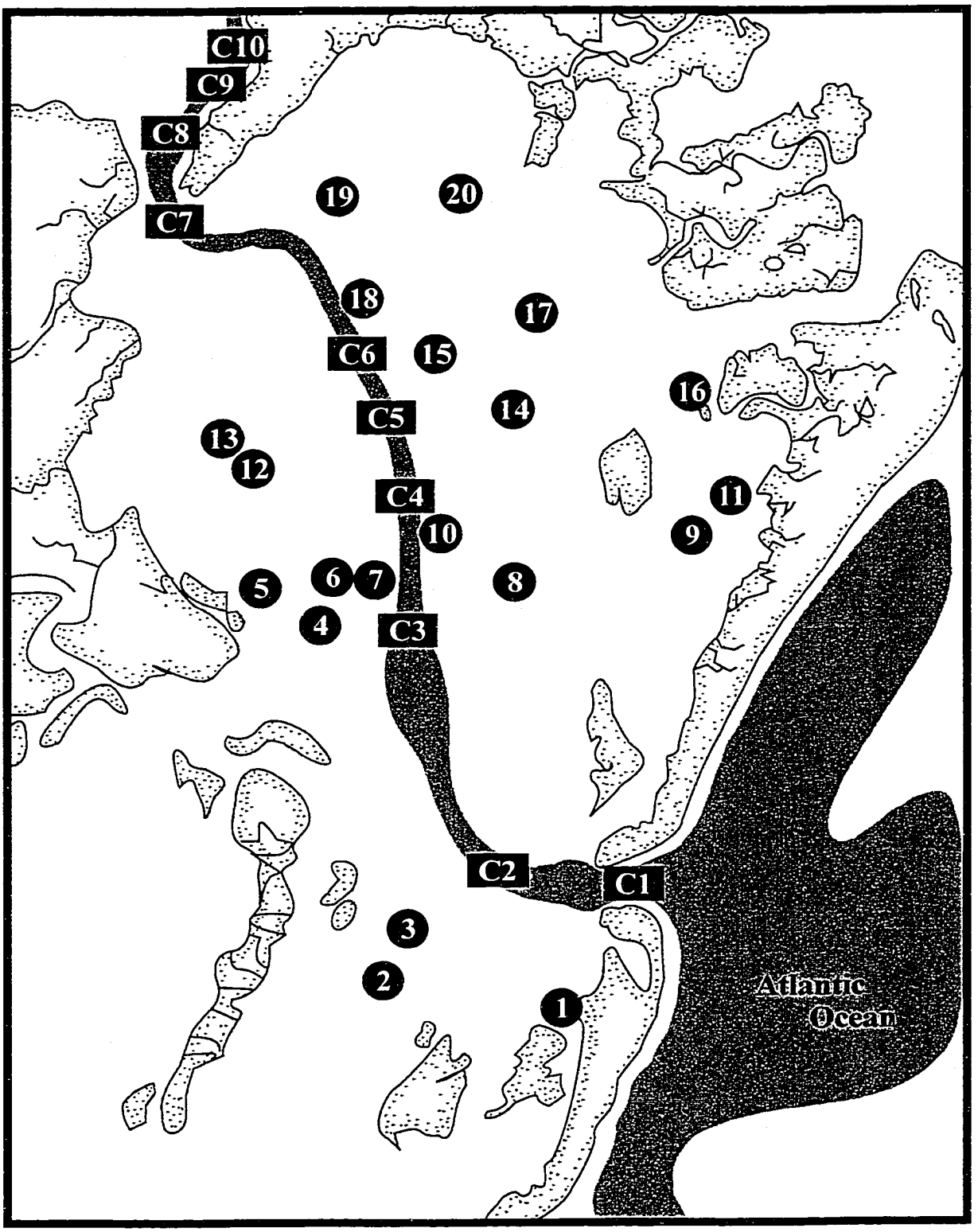


Fig. 3. Map showing the sample sites of Hog Island Bay study area.

SAS random numbers generator and latitude-longitude coordinates determined from the chart. The first random number represented the minute and tenth of minute on the longitude scale (75°40′ – 75°50′ W), while the next number represented the minute and tenth of minute on the latitude scale (37°20′ – 37°30′). Perpendicular lines were drawn from those random points relative to each scale and points of intersection determined a potential sampling site. If a selected site occurred on a land mass, marsh, or intertidal flat, it was eliminated and the technique was applied using the next two consecutive random numbers. After 20 subtidal flat sites were selected, 10 additional sites were chosen as alternatives to be used if field sampling indicated that the location was not a sedimentary subtidal bottom type. No alternative sites were used during the field collections of August 31 and September 1, 1995.

COLLECTION PROCEDURE

At each of the 30 stations, three replicate samples were collected for characterization of the macrobenthic community. Each benthic sample was collected using a Young grab that sampled a surface area of 440 cm^2 with a minimum depth of penetration of 7 cm required before a sample was accepted. Each replicate was sieved separately on a 0.5 mm. screen, relaxed in dilute isopropyl alcohol and preserved with a buffered formalin-rose bengal solution. At each station a sample of surface sediment was taken for sediment particle size analysis and organic content analysis. Bottom salinity and temperature were measured at each station with a conductive salinometer (Beckman RS5-3) and bottom dissolved oxygen was measured using a YSI Model 57 oxygen meter.

LABORATORY PROCEDURE

In the laboratory, each replicate was sorted separately and the individuals were identified to the lowest possible taxon and enumerated. Biomass was estimated for each taxon within each replicate as ash-free dry weight (AFDW) by drying to constant weight at 60 °C and ashing at 550 °C for four hours. Biomass was calculated as the difference between the dry and ashed weight.

Sediment samples were separated into sand and silt-clay fractions, which were thereafter analyzed using the techniques of Folk (1974). Total volatile solids of each sediment sample were determined as the AFDW of the sediment.

DATA ANALYSIS

Community structure of Hog Island Bay was characterized by measures of biological parameters such as species diversity, total abundance and total biomass. Species diversity was calculated using the Shannon index:

$$H' = -\sum_{i=1}^{s} (p_i \log_2 p_i)$$

where pi is the proportion of the i-th species and s is the number of species. Species richness was calculated using Margelef's index:

$$SR = (S-1) / \ln N$$

Where S is the total number of species and N is the total number of individuals collected at the site. Species evenness was measured using an index developed by Pielou (1966).

$$J = H'/ \log_2 (S)$$

Quantitative methods of classification were applied to the abundance data to reveal underlying similarities among sites. A numerical approach developed by Williams

and Stephenson (1973) was used as a first step to reduce the data to a manageable level. Using this strategy, species were ranked in order of spatial importance and plotted as a cumulative percentage of total spatial information content. Those species accounting for 90% of the cumulative total spatial information content were retained for all subsequent classification and multivariate analyses.

The Bray-Curtis coefficient was used to measure the degree of dissimilarity between the sites based on their species assemblages:

$$\frac{\sum_{j=1}^{n} | \chi_{1j} - \chi_{2j} |}{\sum_{j=1}^{n} (\chi_{1j} + \chi_{2j})}$$

where n is the number of species and χ_{1j} and χ_{2j} are the values of the jth species for any pair of sites. This coefficient is greatly influenced by larger values, therefore raw data was log-transformed to reduce the discrepancy between large and small values. The group average sorting strategy was applied to the resulting dissimilarity matrix to sort sites into clusters. This method defines inter-group resemblance as the mean of all resemblances between sites of one group and sites of another. This strategy has been regarded as space conserving in its ability to maintain the relationships originally expressed in the dissimilarity matrix (Clifford and Stephenson 1975, Boesch 1977).

Site clusters identified in the classification analyses were transposed onto a site map to graphically depict their spatial distribution throughout the study area. Maurer et al. (1978) used this approach to compare faunal assemblages defined from two consecutive summer sampling events in Delaware Bay. A similar strategy was used by

Newell et al. (1990) to identify clusters of impacted benthic assemblages in relation to point source discharges of industrial waste.

The following multivariate tests were used to determine if there were significant differences between centroids of defined clusters: Wilk's Lambda, Pillai's Trace, Hotelling-Lawley Trace, and Roy's Greatest Root.

A discriminate reclassification was performed using major clusters or site groups. This analysis finds a function which best separates site groups and thereafter reassigns sites to major groups as a method of validation.

A multivariate analysis of variance (MANOVA) was used to identify species which were significantly different between groups. A canonical discriminate analysis was then used to determine which species best discriminated between the site groups identified. The 95% confidence ellipses of the first and second discriminate functions for each site group were plotted. Those species which were significantly different ($Pr>f < .01$) between site groups and which had high (>0.75) loading coefficients for one of the two discriminate functions were used as axis labels. Species were arranged on the axis labels in the order of highest to lowest loading values to indicate those best discriminating between the site groups.

For each site in this study, the Benthic Index of Biotic Integrity (B-IBI) developed for the Chesapeake Bay (Weisberg et al. 1997) and the EMAP Benthic Index developed for the Virginian Province (Strobel et al. 1995) were used to characterize the environmental health of the system.

The B-IBI is a system developed to reflect environmental health of benthic assemblages on a regional scale. By defining expected conditions at reference sites, the

index is a universal tool that may be applied to a variety of habitat types. B-IBI parameters were selected through the careful examination of a variety of assemblage attributes as applied to a calibration data set containing sites of known community health. Those parameters responding to degraded and undegraded sites in a predictable manner were chosen as metrics for defining relative site conditions. Reference sites were chosen based on known conditions of acceptable health, such as those having consistently high dissolved oxygen values and little to no sediment contaminants. Metrics selected for each of 7 pre-established habitat types were assigned threshold values based on reference conditions. Fixed threshold values approximated the 5^{th} and 50^{th} percentile values for each habitat- specific reference site. The B-IBI employs a 1-3-5 scoring system to assign a habitat status to a particular site of interest. Metric values falling below the 5^{th} percentile values for reference sites were given a score of 1; values between the 5^{th} and 50^{th} percentiles were scored as 3, and values exceeding the 50^{th} percentile were scored as 5. For the 2 metrics, abundance and biomass, scoring was modified so that exceptionally high (exceeding the 95^{th} percentile) and low ($<5^{th}$ percentile) metric values were scored as 1. A site score was computed by averaging scores across all metrics for which thresholds were developed. Sites receiving a score below 3 were given a "degraded" benthic habitat status while sites scoring above 3 were given a "undegraded" status. The regional environmental health status of Hog Island Bay was defined as the percentage of bad sites versus good sites in the entire study (Weisburg et al. 1997).

The EMAP benthic index is another approach to determine the optimal combination of individual benthic community metrics that discriminate between good and bad benthic conditions. This was accomplished by applying a series of descriminate

analyses to a calibration data set. The test data set was constructed from sites sampled in the Virginian Province 1990-93 that had valid benthic assemblages, bottom dissolved oxygen, bottom salinity, sediment toxicity and sediment contaminant data. 60 chosen test sites were separated into 2 groups, impacted (30) and unimpacted (30), based on dissolved oxygen and sediment contaminant criteria. For each of these categories, 10 sites occurred in each of 3 salinity zones ;<5, 5-18, and >18ppt. The goal for selection of metrics for the benthic index was 90% correct classification and 80% validation of the test data. The 3 chosen metrics were: 1) salinity normalized Gleason's diversity based upon infauna and epifauna, 2) salinity normalized tubificid abundance, and 3) spionid abundance. The overall efficiency of the EMAP applied to the test data was 86% for impacted sites and 86% for unimpacted sites. The EMAP Virginia Province 1990-93 benthic index was calculated as follows:

Benthic Index Score =

1.389 (salinity normalized Gleason's diversity – 51.5) / 28.4
-0.651 (salinity normalized tubificid abundance – 28.2) / 119.5
-0.375 (spionid abundance – 20.0) / 45.4

where

Salinity normalized Gleason diversity index value =

Gleason / (4.283 – 0.498 * bottom sal. + 0.0542 * bottom sal.^{2} – 0.00103 * bottom sal.^{3}) * 100

and

Salinity normalized tubificid abundance=

tubificid abundance – 500 * exp (-15 * bottom salinity)

and

exp(...) denotes the exponential function

Gleason's diversity measure is associated with unimpacted conditions (positive contribution) and tubificid abundance and abundance of spionids are associated with impacted conditions (negative contribution), with tubificid abundance important in low salinity regimes and spionid abundance important in higher salinity regimes. The descriminate function calculation normalizes each metric using the mean and standard deviation for the metric in the calibration data set. An index score was assigned to each of the Hog Island Bay sites based on mean values across replicate samples taken at each site. Sites receiving a score below zero were given a "degraded" status whereas sites receiving a score above zero were given an "undegraded" status. As with the B-IBI, the regional environmental health status was defined as the percentage of bad sites versus good sites in the study (Strobel et al. 1995).

RESULTS

PHYSICAL PARAMETERS

Water Quality

Water quality measures of depth, salinity, temperature and dissolved oxygen are presented in Appendix I-A. The diurnal tidal range was 1.62 meters on the sampling dates of August 31 and September 1, 1995 (Nautical Software Inc. 1993-1994). The water depths at the time of sampling ranged from .91 meters on the flats, to 17.37 meters at the mouth of Great Machipongo Inlet. Bottom water salinities throughout Hog Island Bay were polyhaline, ranging between 26.0 and 29.25 parts per thousand. Bottom water temperatures exhibit slight variability among sites, ranging between 25.0 and 27.20 degrees celsius. Bottom water dissolved oxygen varied between 7.3 parts per thousand on the shallow flats and a value of 4.6 in the deeper reaches of Great Machipongo Inlet.

Sediment Properties

Results of sediment analyses are presented in Appendix 1-B. Sediment composition was expressed in relation to its major size components, sand (>.63 mm.), silt (.63 - .04 mm.) and clay (<.04 mm.). The analyses revealed a mixed variety of sediment types throughout the study area ranging from 11.53% sand on the flats to 98.92% sand at Great Machipongo Inlet (Fig. 4). Mean grain size was presented in phi notation along the Krumbein scale, with sites ranging from -.21ϕ to 5.99ϕ. A particle sorting coefficient was used as a statistical expression of dispersion around the mean. Sites range from being very poorly sorted (2.87) on the flats to well sorted (.41) at Great Machipongo inlet. Organic content of sediments was expressed as a percentage of volatile solids ranging from 4.56 at mid-channel to .38 at Great Machipongo Inlet.

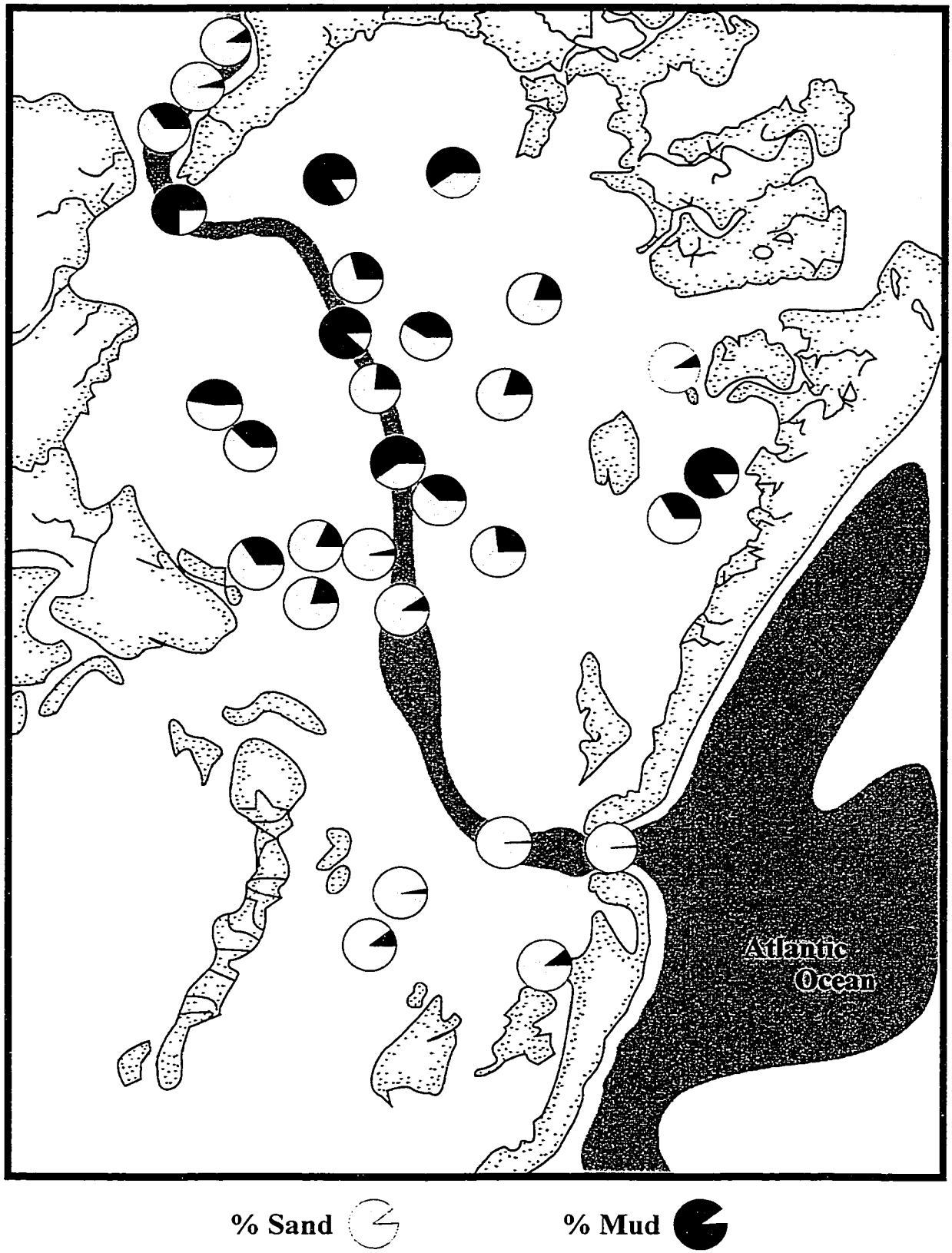


Fig. 4. Map showing the relative contribution of sand (>.63mm) and mud (<.63mm) at each of the sample sites.

BIOLOGICAL PARAMETERS

Community Abundance and Biomass

Species of benthic macroinvertebrates sampled on August 31 and September 1, 1995 totaled 200. Total abundance and biomass values for each species throughout the study are presented in Appendix II-A and II-B. Ninety four percent of all species are classified into 3 dominant phyla, whereas the remaining 6% are scattered across 7 phyla (Fig. 5). The top 10 taxa in terms of species abundance and species biomass are presented in Table 1.

Total abundance and biomass values per replicate sample and mean values across replicates are presented in Appendix II-C. For each of the 30 sites abundance values are expressed as indiv/m^2 and biomass values are expressed as g/m^2. Mean abundance values among sites range from 265.15 to 26242.46 and biomass values range from .14 to 27.34. Species abundance and biomass values per replicate at each of the 30 sites are included in Appendix II-D and II-E. Abundance and biomass are presented as number of individuals per replicate and grams per replicate respectively.

Benthic biodiversity measures

Biodiversity measures for all sites including number of species, Shannon diversity, Margelef's richness and Pielou's evenness are presented in Appendix II-F. Number of species per site is presented as both a site mean and a site total across replicates. Total species sampled among the 30 sites range from 11 to 72. Measures of species diversity, richness and evenness are presented as mean values across replicates. Shannon diversity integrates richness and evenness components, yielding values ranging from 1.06 to 4.55.

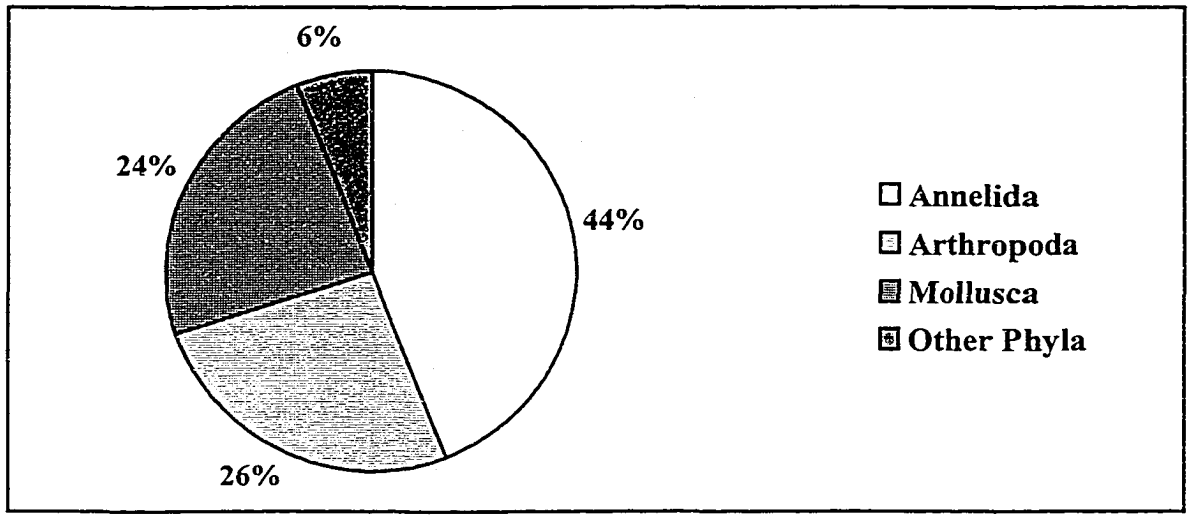


Figure 5. Relative contribution of 3 dominant phyla to total species composition.

Table 1. Top 10 taxa in terms of total abundance and biomass throughout the study.

Dominant Taxa			
Abundance		**Biomass**	
Taxon	Total indiv.	Taxon	Total grams
Mediomastus ambiseta	3171	*Mercenaria mercenaria*	5.218
Tubibficoides spp.	2202	*Neotia pondorosa*	1.722
Ampelisca spp.	959	*Anadara ovalis*	1.279
Exogone dispar	906	*Tagelus divisus*	0.815
Ceratonereis irritabilis	766	*Arabella iricolor*	0.793
Tellina agilis	679	*Panopeus herbstii*	0.737
Ampelisca verrilli	634	*Ceratonereis irritabilis*	0.613
Carazziella hobsonae	587	*Clymenella torquata*	0.577
Listriella barnardi	575	*Notomastus spp.*	0.562
Glycinde solitaria	572	*Ensis directus*	0.403

MULTIVARIATE ANALYSES

The plots of cumulative percentage of spatial information content indicated that 75 species accounted for 90% of the total spatial information content (Fig. 6). The group average sorting strategy was then applied to the resulting dissimilarity matrix and results were depicted in a dendrogram (Fig. 7). Six different site groups (A-F) are defined at a 0.9 average distance level.

Clusters were transposed onto a site map to depict the spatial distribution of similar sites throughout Hog Island Bay (Fig. 8). Mean values for physical and biological parameters across sites within each group are presented in Table 2, while specific patterns are discussed in the following summary.

Groups A and B, represented by the channel sites C6 and C10 respectively, have both physical and biological attributes set apart from other groups. Site group A has the highest mud (88.47 % silt/clay) and volatile solids (4.56 %) components, while having the lowest species abundance (265.15 indiv./m^2) and biomass (.14 g/m^2) values of all groups. Site Group B is represented by the most upstream channel site and has the largest sediment grain size (-0.21 mean phi), species abundance (26242.46 indiv./m^2) and species biomass (10.36 g/m^2) values of all defined groups.

Group C is represented by the 2 flat sites 3 and 7, both of which occur in close proximity to Great Machipongo Channel and exhibit similar values for physical and biological parameters.

Group D is comprised of the deepest site (C1) located between Hog and Cobb Islands and the next closest channel site (C2), occurring just inside of Great Machipongo

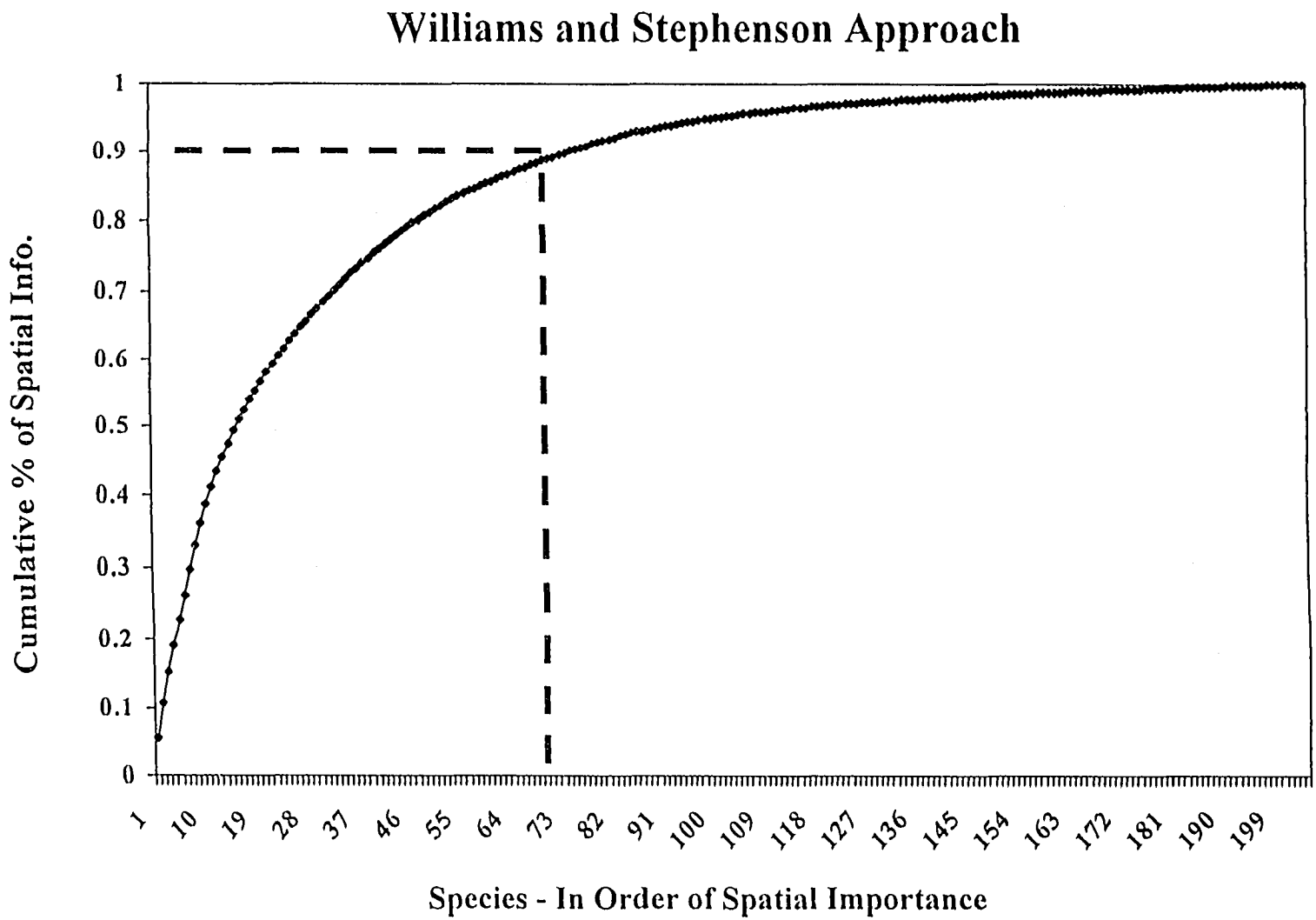


Fig. 6. Chart showing the cumulative percent of spatial information content associated with each species. Numbers along the x-axis correspond to species (1-200) ranked in order of spatial importance. The dashed line indicates the point where the first 75 most important species represent 90% of the total spatial information content.

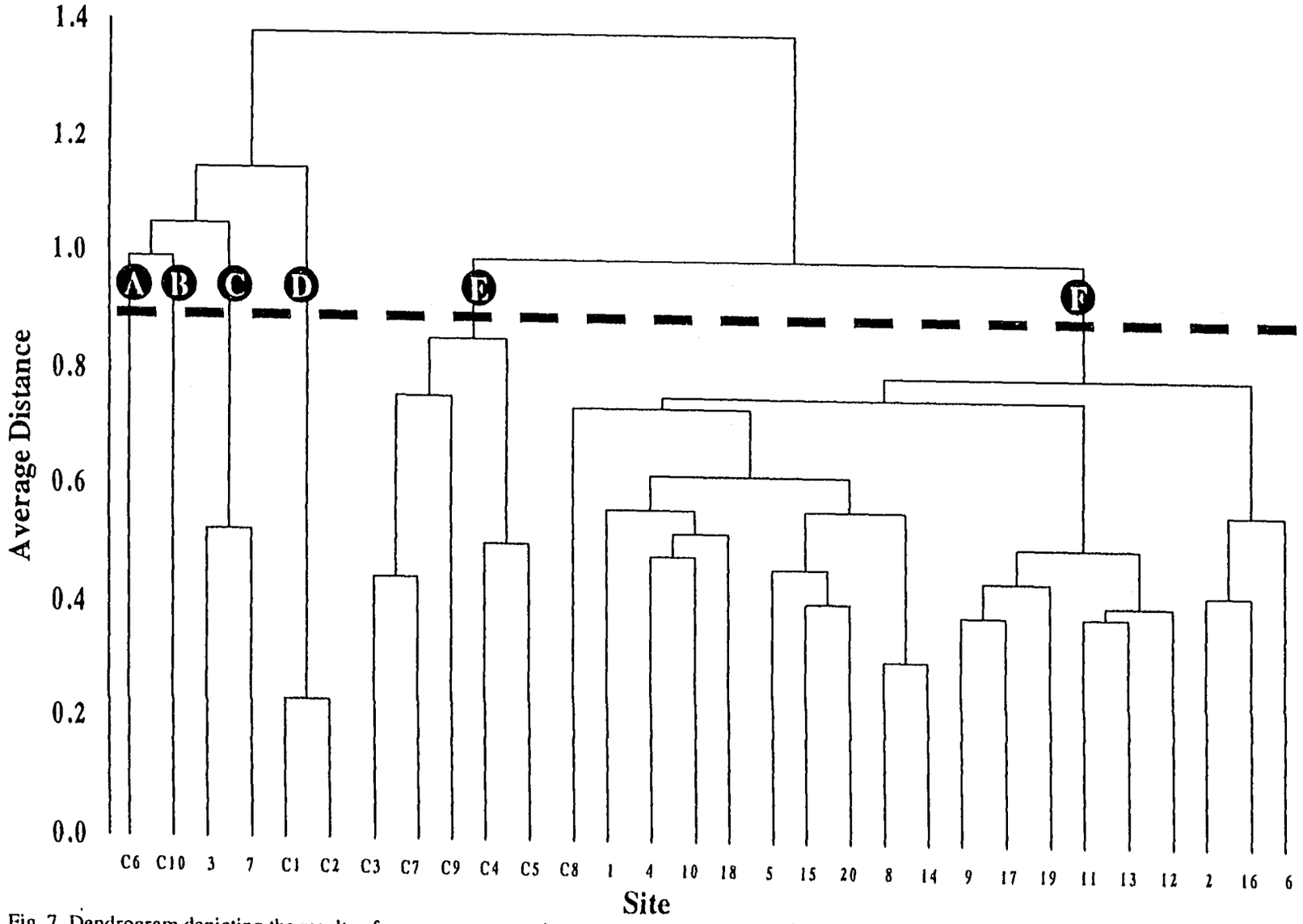


Fig. 7. Dendrogram depicting the results of group average sorting applied to the Bray-Curtis dissimilarity matrix. Letters (A-F) indicate site groups defined at a .9 average distance level.

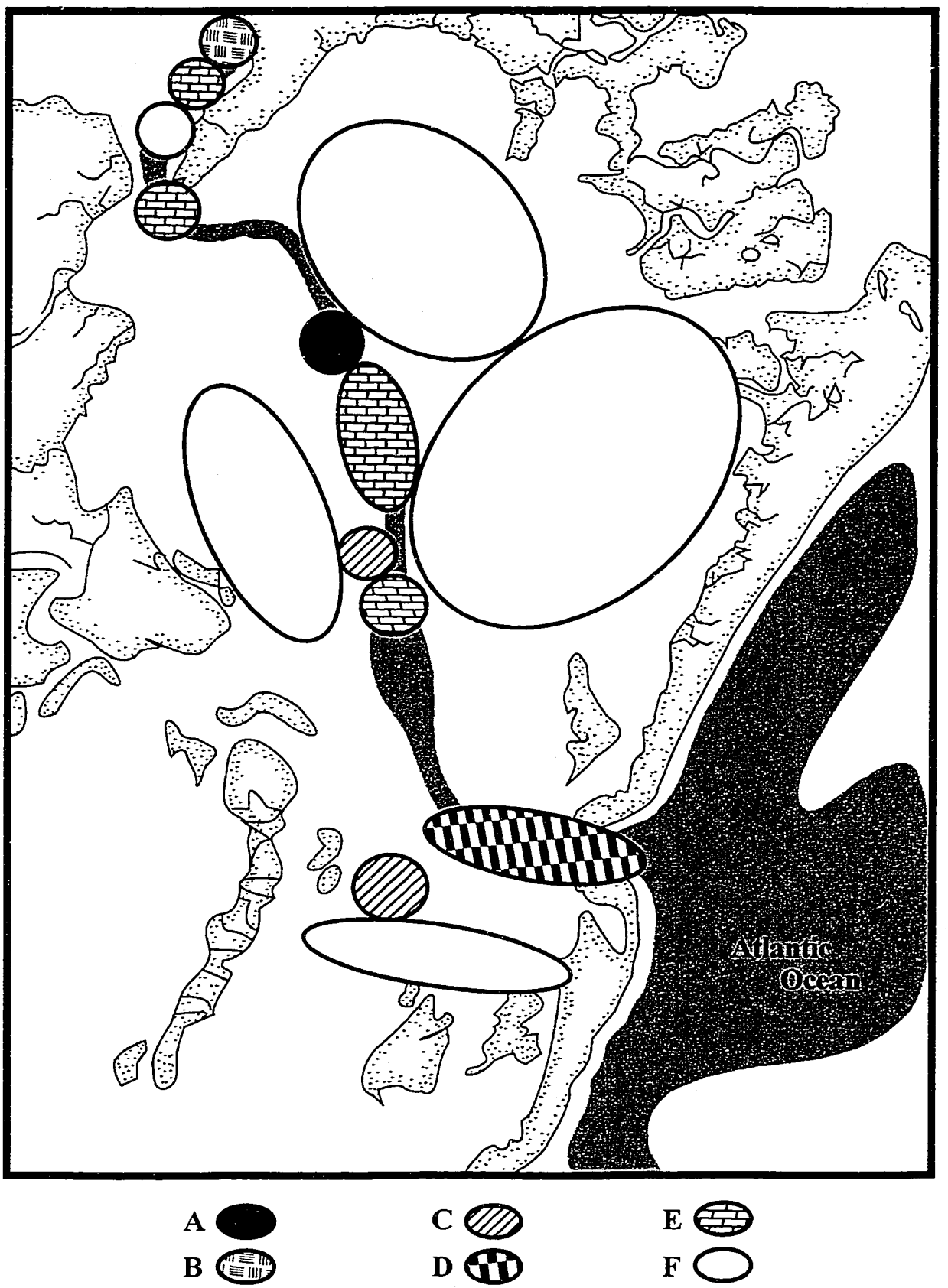


Fig. 8. Exhibit showing defined site groups transposed onto a site map. Ellipses encompass clustered sites as they are distributed throughout Hog Island Bay.

Table 2. Mean values for physical and biological parameters within defined site groups.

Group A

Site	Depth (m)	Salinity (‰)	Temp.(°C)	D.O.(‰)	%Silt/Clay	Mean Phi	Sorting	%Volatile	# Species	H'	indiv./m^2	g/m^2
C6	9.45	27.50	25.20	5.70	88.47	5.99	2.08	4.56	11.00	2.07	265.15	0.14
Mean	9.45	27.50	25.20	5.70	88.47	5.99	2.08	4.56	11.00	2.07	265.15	0.14

Group B

Site	Depth (m)	Salinity (‰)	Temp.(°C)	D.O.(‰)	%Silt/Clay	Mean Phi	Sorting	%Volatile	# Species	H'	indiv./m^2	g/m^2
C10	12.19	28.50	25.80	4.60	9.09	-0.21	2.24	0.97	62.00	3.24	26242.46	10.36
Mean	12.19	28.50	25.80	4.60	9.09	-0.21	2.24	0.97	62.00	3.24	26242.46	10.36

Group C

Site	Depth (m)	Salinity (‰)	Temp.(°C)	D.O.(‰)	%Silt/Clay	Mean Phi	Sorting	%Volatile	# Species	H'	indiv./m^2	g/m^2
3	1.22	27.00	25.30	6.90	2.44	2.77	0.58	0.60	30.00	3.34	1871.21	0.82
7	1.22	27.00	26.10	6.90	3.44	3.20	0.61	0.88	29.00	3.03	2098.49	0.93
Mean	1.22	27.00	25.70	6.90	2.94	2.99	0.60	0.74	29.50	3.19	1984.85	0.88

Group D

Site	Depth (m)	Salinity (‰)	Temp.(°C)	D.O.(‰)	%Silt/Clay	Mean Phi	Sorting	%Volatile	# Species	H'	indiv./m^2	g/m^2
C1	17.37	28.50	25.20	6.80	1.09	2.51	0.41	0.38	18.00	1.31	1598.49	1.03
C2	5.18	28.50	25.40	6.60	1.08	2.14	0.63	0.39	11.00	1.17	1265.15	0.45
Mean	11.28	28.50	25.30	6.70	1.09	2.33	0.52	0.39	14.50	1.24	1431.82	0.74

Group E

Site	Depth (m)	Salinity (‰)	Temp.(°C)	D.O.(‰)	%Silt/Clay	Mean Phi	Sorting	%Volatile	# Species	H'	indiv./m^2	g/m^2
C3	14.94	29.25	25.90	6.20	8.88	1.49	2.46	1.69	33.00	3.06	3431.82	4.02
C9	8.53	28.00	25.70	4.80	4.73	0.64	1.74	0.76	45.00	3.77	4234.85	1.35
C4	9.14	27.00	25.30	6.10	60.40	5.07	2.18	3.91	41.00	2.60	3803.03	1.85
C5	10.05	27.50	25.20	5.70	23.67	3.33	2.38	2.20	49.00	2.25	8265.16	9.90
C7	4.57	27.00	25.90	5.10	75.04	5.61	2.54	3.80	32.00	3.05	2204.55	1.01
Mean	9.45	27.75	25.60	5.58	34.54	3.23	2.26	2.47	40.00	2.95	4387.88	3.62

Table 2. (cont.)

Group F

Site	Depth (m)	Salinity (‰)	Temp.(°C)	D.O.(‰)	%Silt/Clay	Mean Phi	Sorting	%Volatile	# Species	H'	indiv./m^2	g/m^2
1	1.52	26.50	25.50	6.60	10.01	3.17	1.03	0.93	43.00	4.12	2553.03	0.92
2	1.83	26.50	25.60	6.80	9.89	3.17	1.12	0.91	49.00	4.00	2833.34	1.06
4	2.13	27.00	25.50	6.50	20.27	2.14	2.87	2.35	72.00	4.80	3727.28	3.42
5	1.83	28.50	25.90	6.80	33.61	3.96	1.36	1.90	56.00	4.43	3643.94	3.03
6	2.44	27.00	25.90	6.50	17.71	3.48	1.23	1.19	66.00	4.25	3727.28	15.23
8	1.83	27.50	25.40	6.80	26.54	3.79	1.43	1.36	51.00	3.89	4303.04	2.95
9	1.52	27.50	25.30	6.50	33.69	4.19	1.70	1.93	48.00	4.01	5378.79	2.53
10	1.52	28.00	25.30	6.90	37.05	4.09	1.46	2.01	53.00	4.77	3151.52	3.55
11	1.52	27.50	25.30	5.90	83.84	5.63	2.06	4.07	45.00	3.76	6022.73	3.09
12	0.91	27.50	27.20	7.30	37.19	4.05	1.42	1.92	52.00	4.06	8401.53	18.54
13	0.91	28.00	26.80	6.80	47.58	4.55	2.14	2.94	51.00	3.70	9484.86	6.07
14	1.52	27.50	25.80	6.40	19.84	3.63	1.09	1.25	54.00	3.98	4015.16	2.25
15	1.52	28.00	25.20	6.00	40.83	4.33	1.77	1.94	41.00	4.26	3295.46	27.34
16	1.22	27.50	25.40	6.70	8.05	2.89	0.90	0.77	38.00	3.21	3659.10	0.60
17	1.22	28.00	25.50	6.00	20.02	3.49	1.36	1.35	46.00	3.59	4310.61	3.90
18	1.22	27.50	25.40	6.80	28.63	3.87	1.39	1.62	51.00	4.73	2863.64	3.00
19	1.52	27.00	25.00	5.70	84.04	5.63	2.20	3.95	40.00	3.60	4462.13	1.59
20	1.83	26.00	25.20	6.00	60.01	4.92	1.88	3.25	34.00	4.21	2871.22	2.05
C8	6.10	27.50	25.50	4.80	35.11	3.48	2.71	2.38	51.00	4.43	2590.91	2.07
Mean	**1.80**	**27.39**	**25.62**	**6.41**	**34.42**	**3.92**	**1.64**	**2.00**	**49.53**	**4.09**	**4278.71**	**5.43**

Inlet. These 2 sites also exhibit similar mean values for both physical and biological parameters.

Groups E and F are comprised of sites which display a broad range of values for physical and biological parameters. Group E is represented by 5 sites scattered along approximately 7.5 nautical miles of Great Machipongo Channel. Group F is the largest site cluster having 18 flat sites and 1 channel site.

Multivariate statistical tests indicate a significant difference between centroids of defined clusters (Table 3). Results of a subsequent discriminate analysis were 100% reclassification of sites back to groups previously defined in the clustering strategy.

Table 3. Multivariate statistical tests used to determine if there were significant differences between centroids of defined clusters. Columns indicate MANOVA test criteria and F approximations for the hypothesis of no overall group effect.

Statistic	Value	F	Num DF	Den DF	Pr>F
Wilks' Lambda	0.00	13.81	375	55.57	0.0001
Pillai's Trace	4.90	8.94	375	70.00	0.0001
Hotelling-Lawley Trace	695.54	15.58	375	42.00	0.0001
Roy's Greatest Root	260.92	48.71	75	14.00	0.0001

Confidence ellipses of the first and second canonical discriminate functions for each site group were plotted, while species determined to be most important in defining the separation of site groups (Table 4) are included as axis labels (Figure 9). Those species with loading values achieving the greatest distance from zero along both the negative (CAN 1) and positive (CAN 2) scales are most significant in discriminating between groups. Ellipses for site groups did not overlap, therefore indicating that statistical differences between groups existed.

Table 4. Species determined to be most important in defining the separation of site groups.

Species	Pr>f	CAN 1	CAN 2
Leitoscoloplos spp.	0.0007	-0.901	
Mulinia lateralis	0.0005	-0.810	
Ampelisca verrilli	0.0001	-0.785	
Listriella barnardi	0.0001	-0.781	
Acteocina canaliculata	0.0001	-0.767	
Dorvillea rudolphi	0.0001		0.901
Arabella spp. complex	0.0001		0.879
Scoloplos rubra	0.0001		0.846
Astyris lunata	0.0003		0.845
Parapionosyllis longicirrata	0.0001		0.829
Exogone dispar	0.0001		0.827
Podarke obscura	0.0001		0.823
Brania wellfleetensis	0.0001		0.809
Lysidice ninetta	0.0001		0.808
Polycirrus eximus	0.0001		0.807
Autolytus prolifer	0.0001		0.805
Eobrolgus spinosus	0.0001		0.802
Pista palmata	0.0001		0.792
Tubificoides spp.	0.0001		0.784
Nucula proxima	0.0001		0.784
Unciola serrata	0.0001		0.777
Mercenaria mercenaria	0.0001		0.753
Polinices duplicata	0.0001		0.751

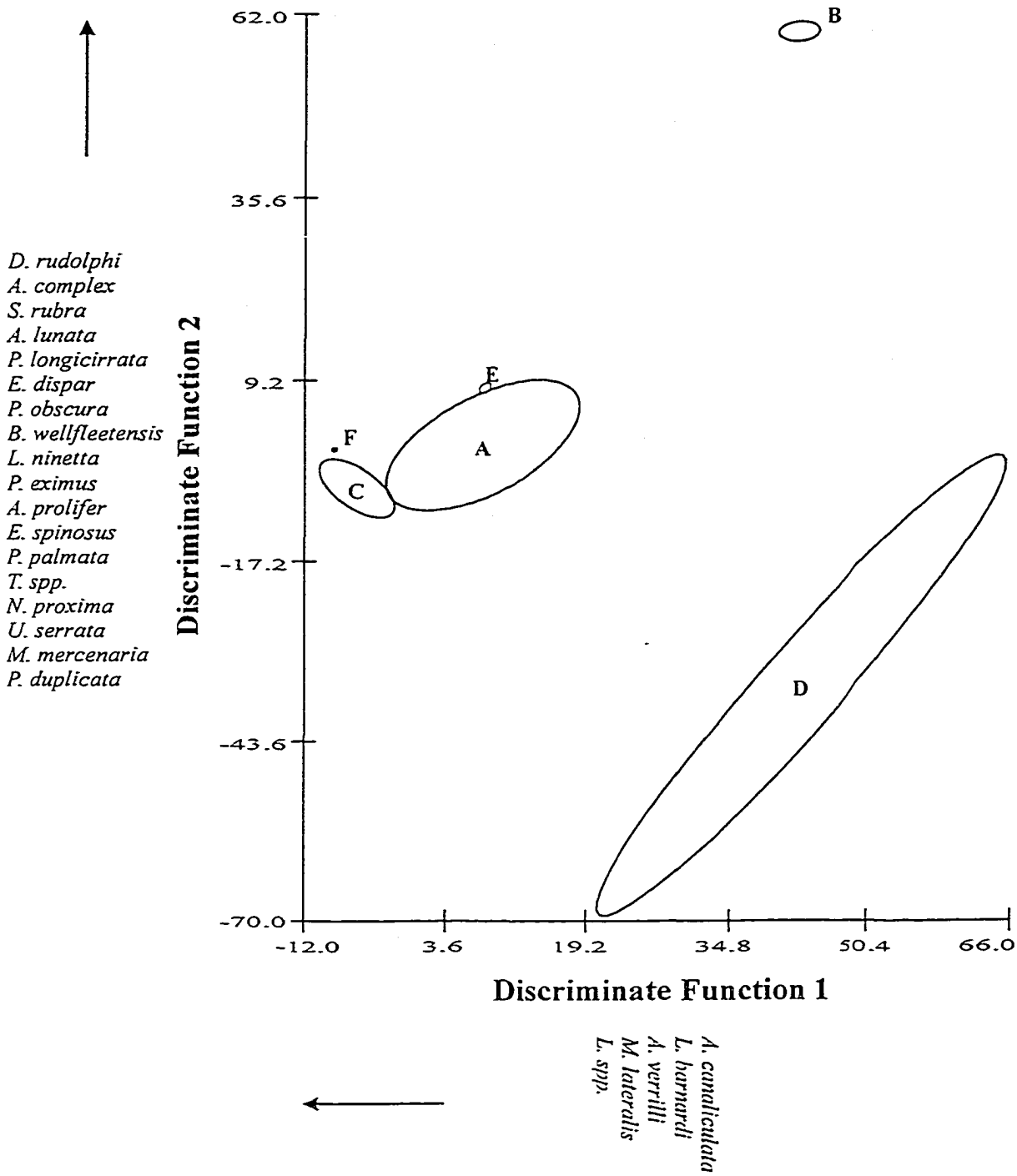


Fig. 9. Graph showing site groups with 95% confidence interval ellipses plotted along discriminate functions 1 and 2. Species determined to be most important in defining the separation of site groups (Table 4) are included as axis labels.

Abundance values (indiv/m^2) associated with each selected species across site groups are graphically presented in Fig. 10a-w. Five species were selected along canonical discriminate function 1 as having abundance values that were significantly different among site groups. Selected species were absent from site groups A, B, and D, while having significantly high abundance values in one or more remaining groups. Site group F contains high values for each of the five species, only to be rivaled by group C for the most significant two species, *Leitoscoloplos spp.* and *Mulinia lateralis*.

Eighteen species were selected along canonical discriminate function 2 as having abundance values that were significantly different among site groups. Selected species were either absent, or had markedly low abundance values in site groups A, C, and D. Site group B contains high values for each of the 18 species, while similar values were found only at group E with the two species *Astris lunata* and *Tubificoides spp.*

Mean abundance values are also presented for the remaining top 10 dominant taxa (Table 1) that were not selected as important in defining the separation of site groups (Fig. 11a-f). The outcome of this exercise reveals a pattern supportive of both discriminate functions 1 and 2, with high abundance values predominately associated with groups B and F.

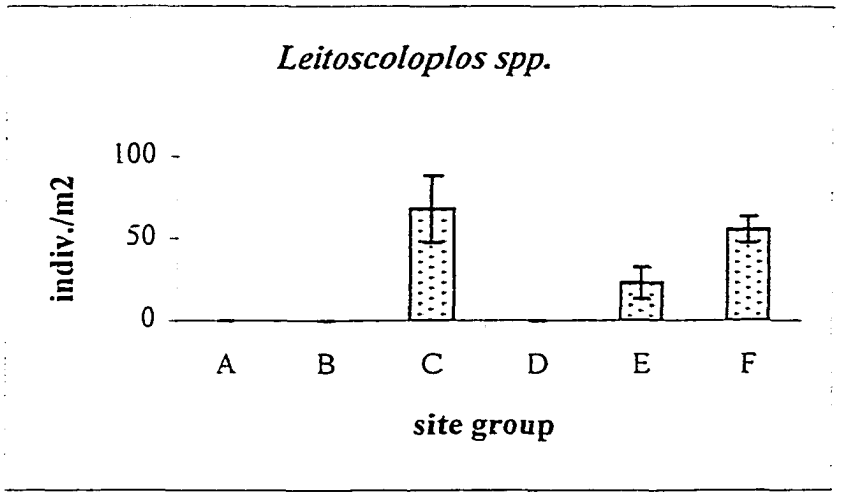
BENTHIC COMMUNITY HEALTH

Benthic Index of Biotic Integrity (B-IBI)

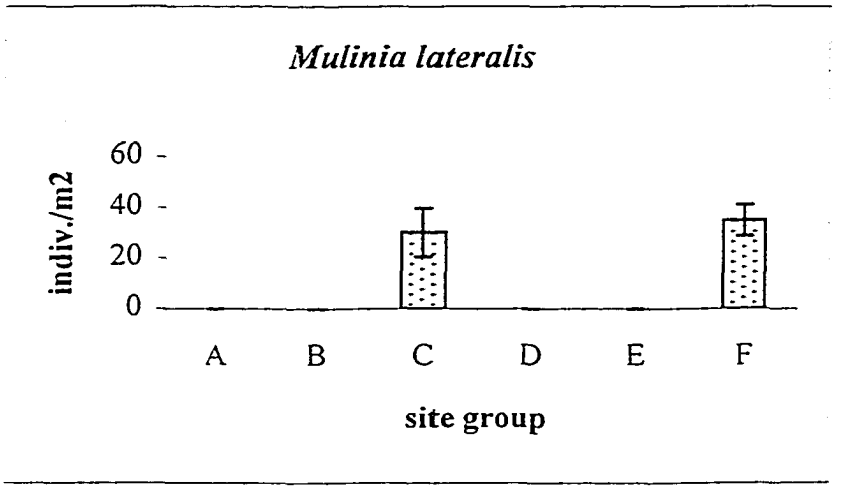
Metrics used to calculate the B-IBI incorporate threshold values developed for polyhaline systems and vary according to the sediments existing at individual sites. A summary of metric values and corresponding index scores are presented in Appendix III-A through

CAN 1

a.



b.



c.

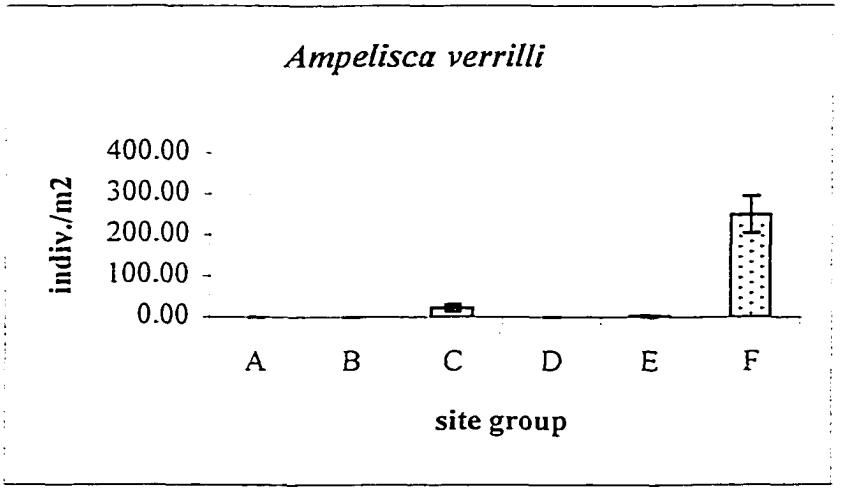
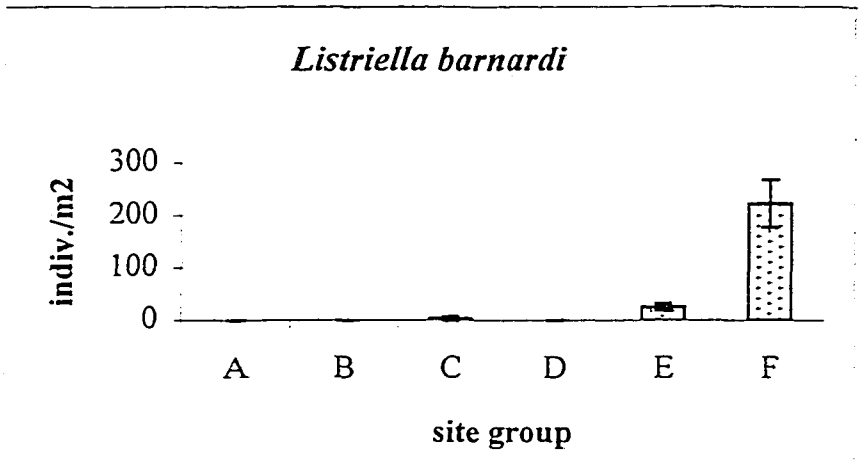


Figure 10a-w. Mean abundance values (indiv./m2) for species selected as most important in defining the separation of site groups.

Figure 10 (cont.)

CAN 1

d.



e.

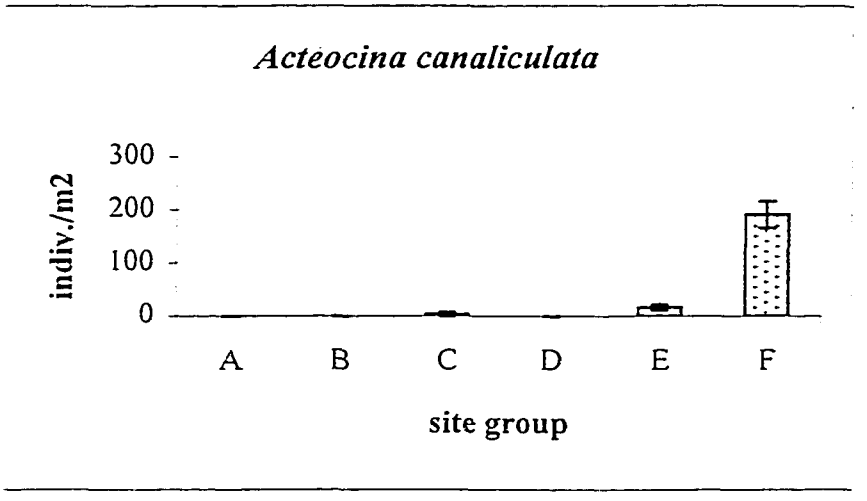
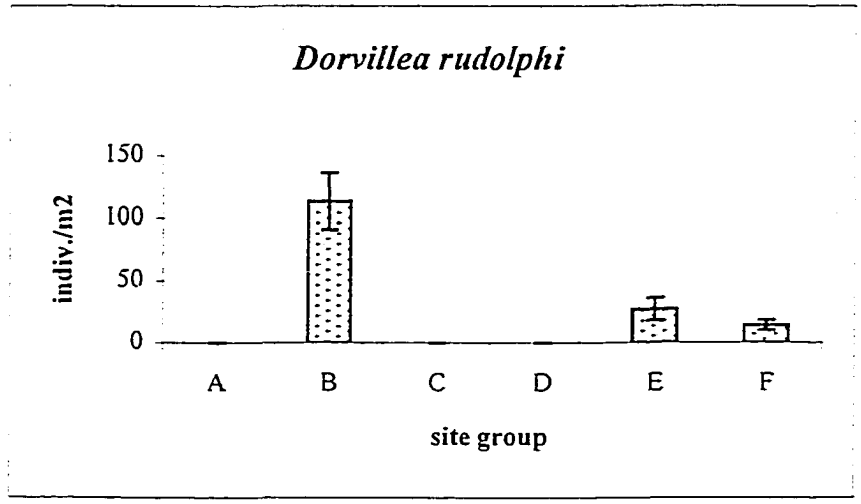


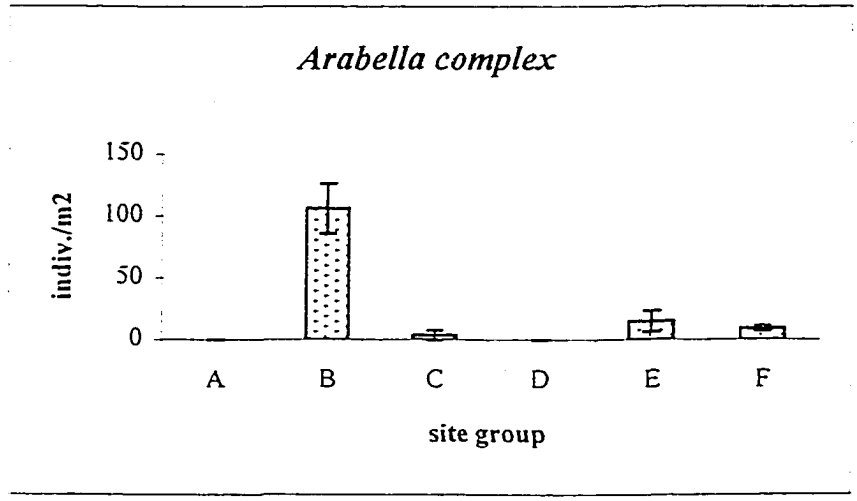
Figure 10 (cont.)

CAN 2

f.



g.



h.

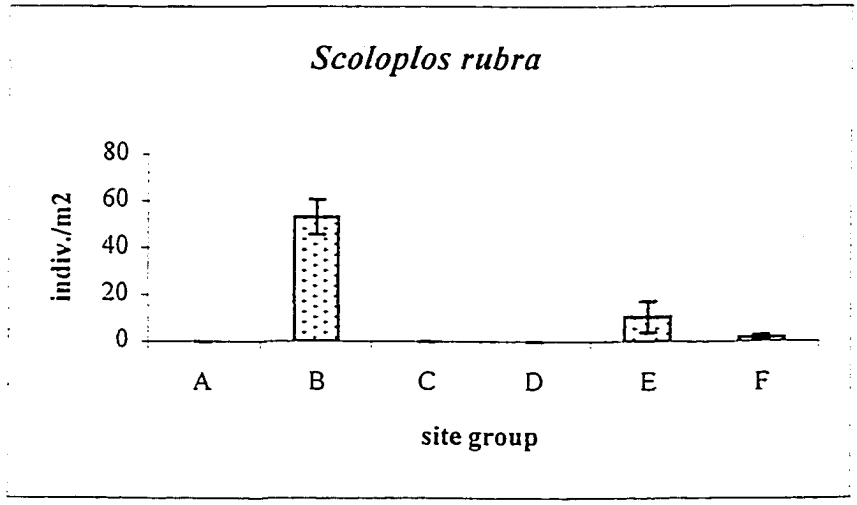
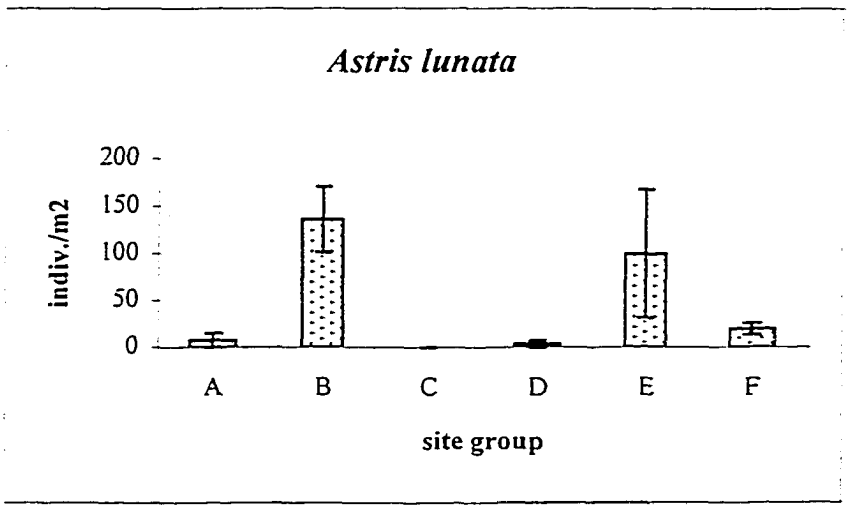


Figure 10 (cont.)

CAN 2

i.



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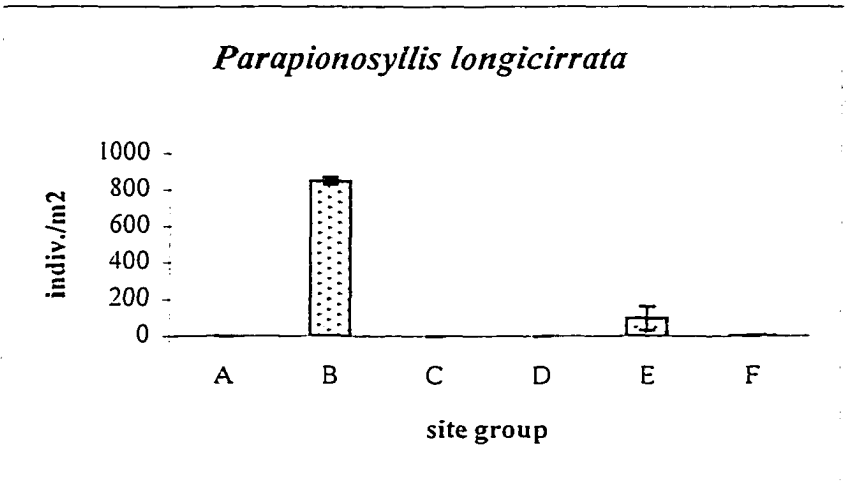

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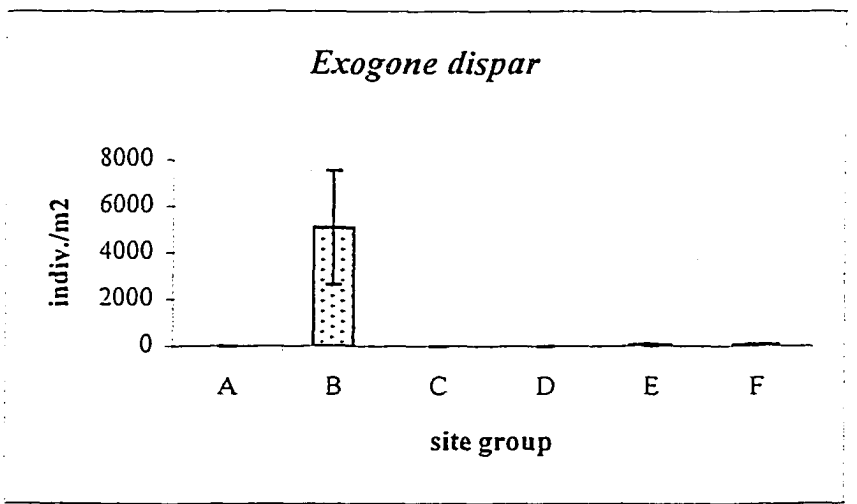

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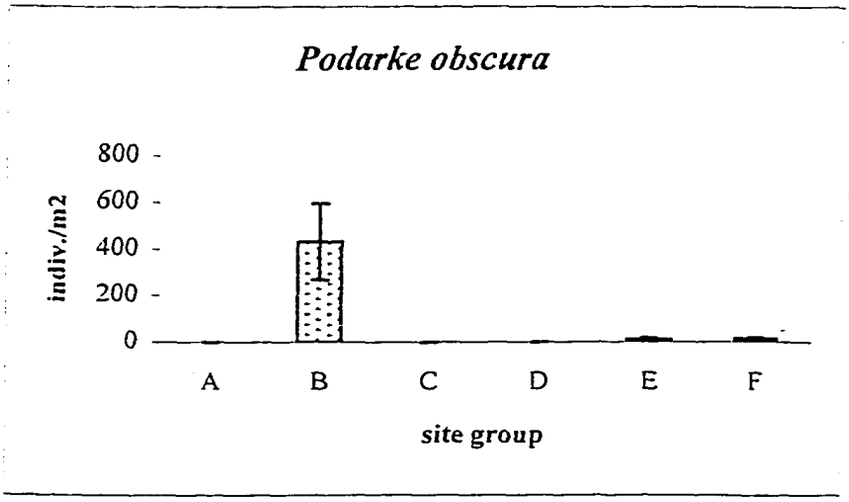

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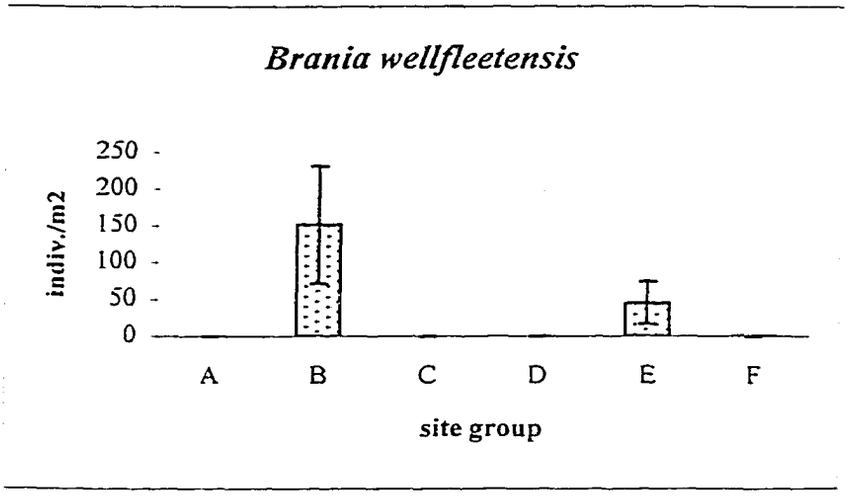

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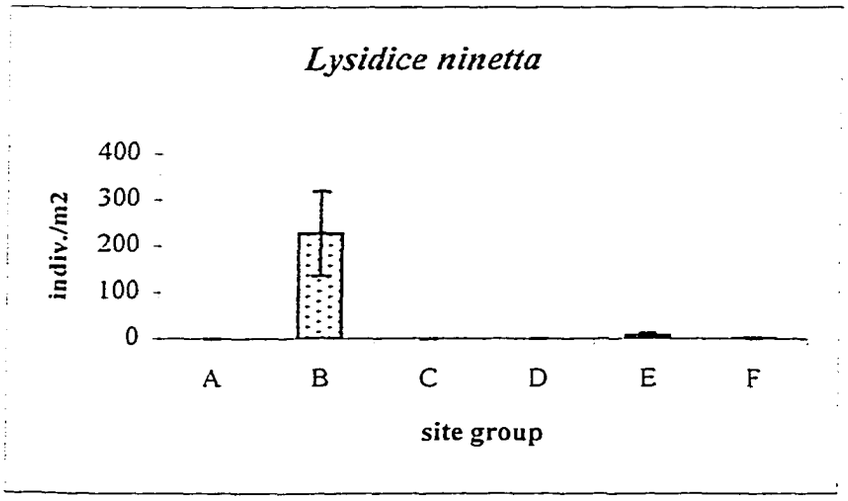

Figure 10 (cont.)

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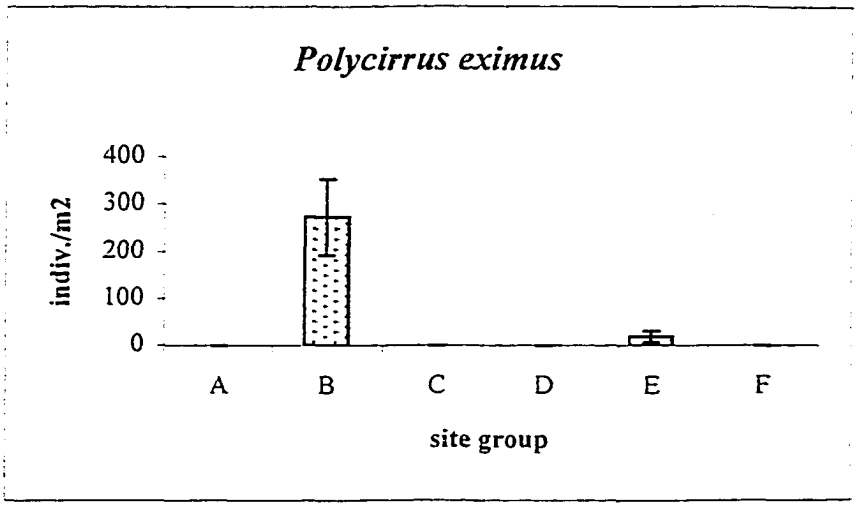

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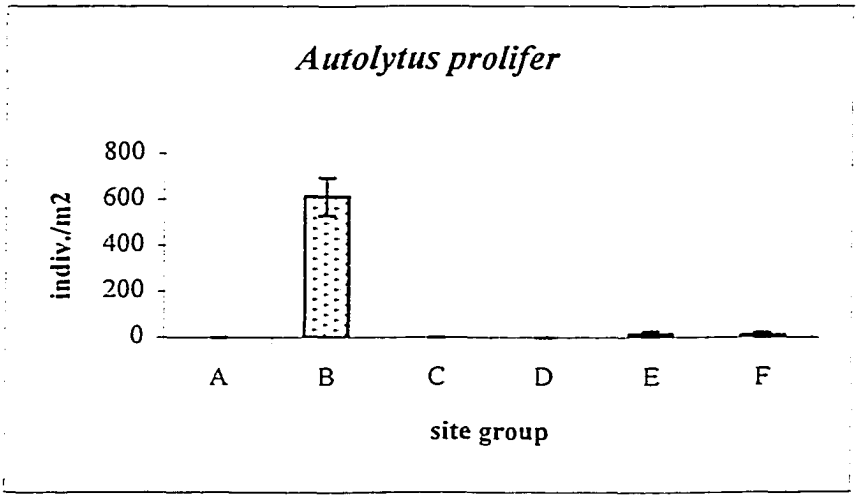

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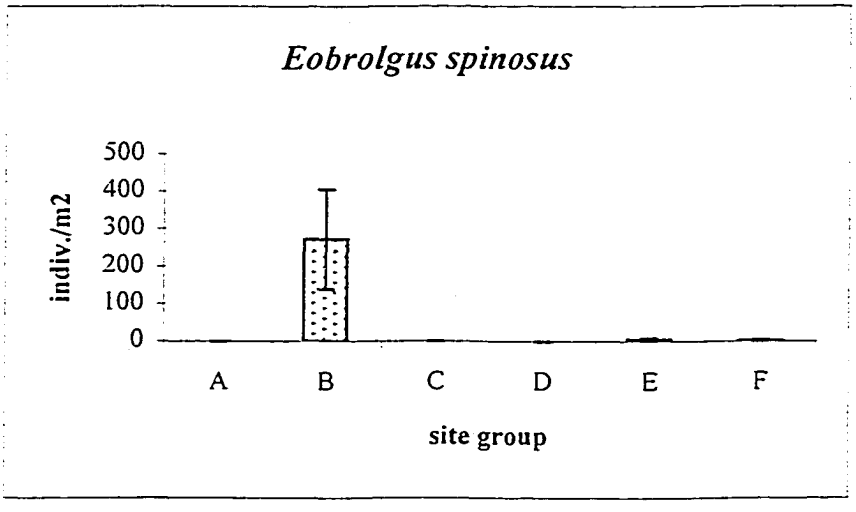

Figure 10 (cont.)

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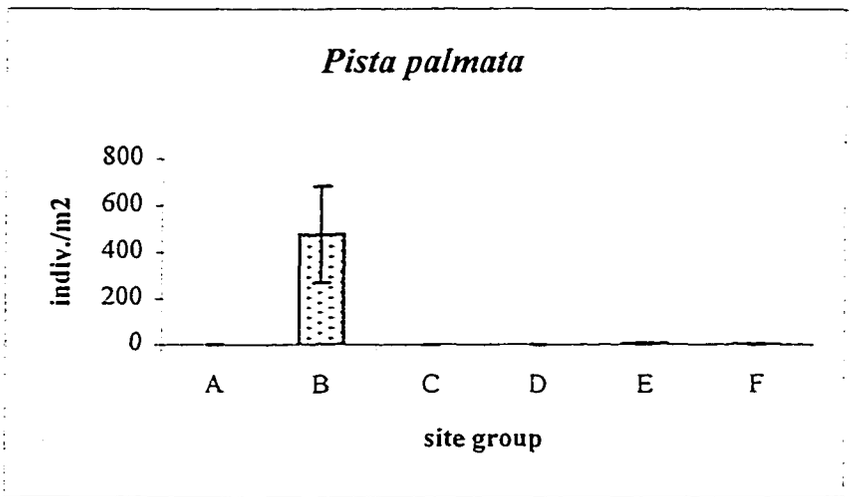

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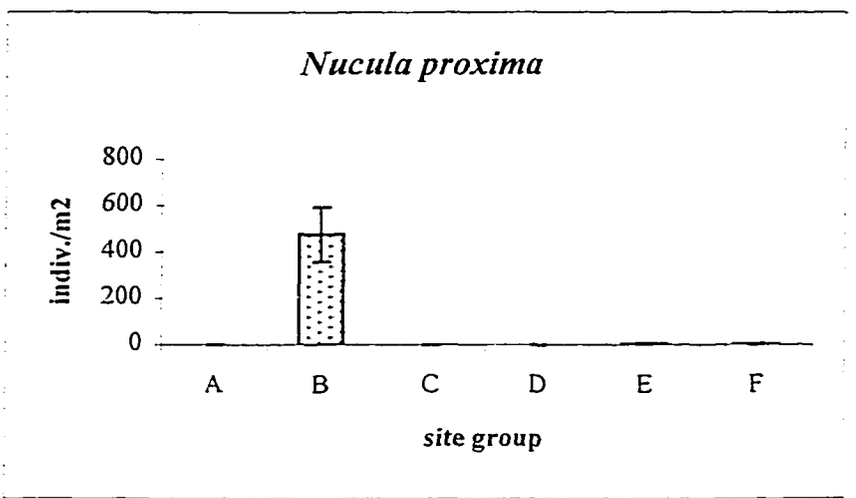

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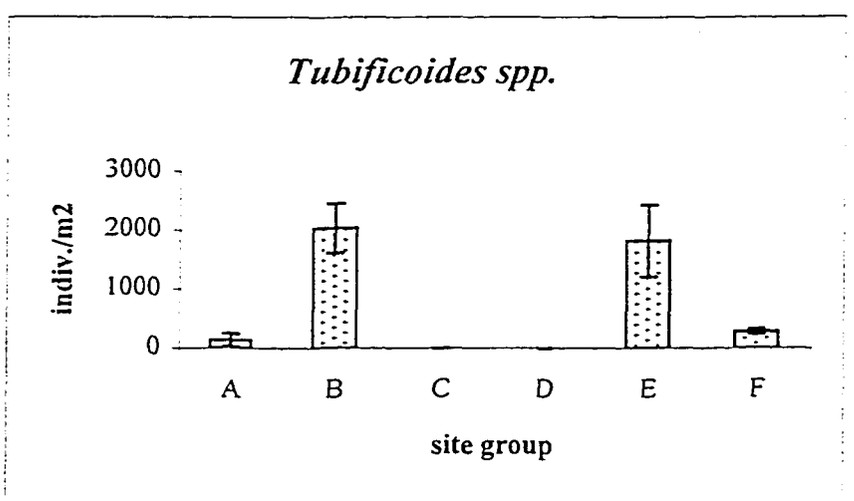

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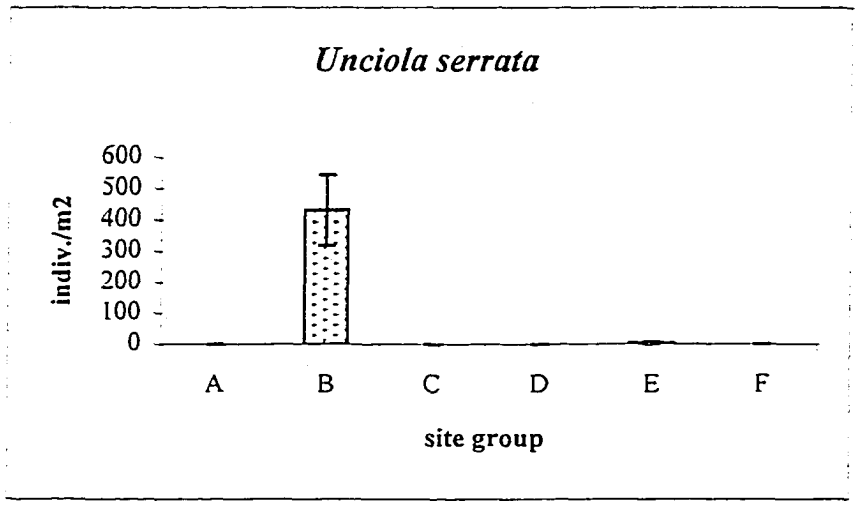

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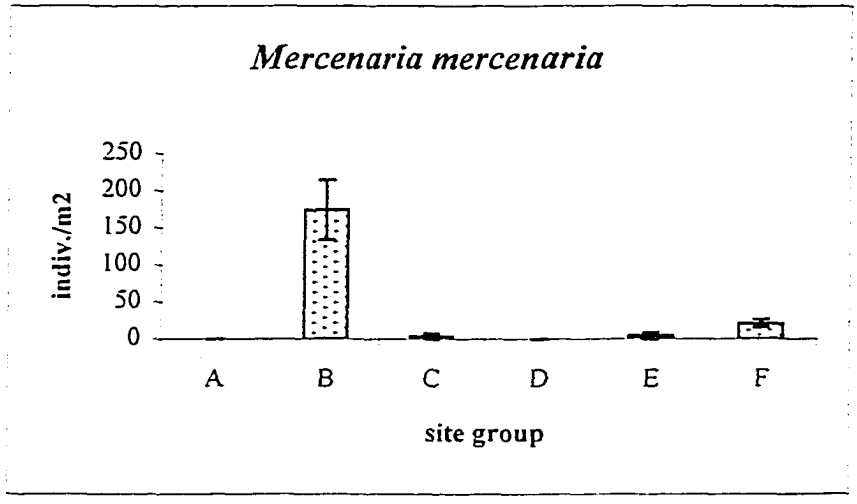

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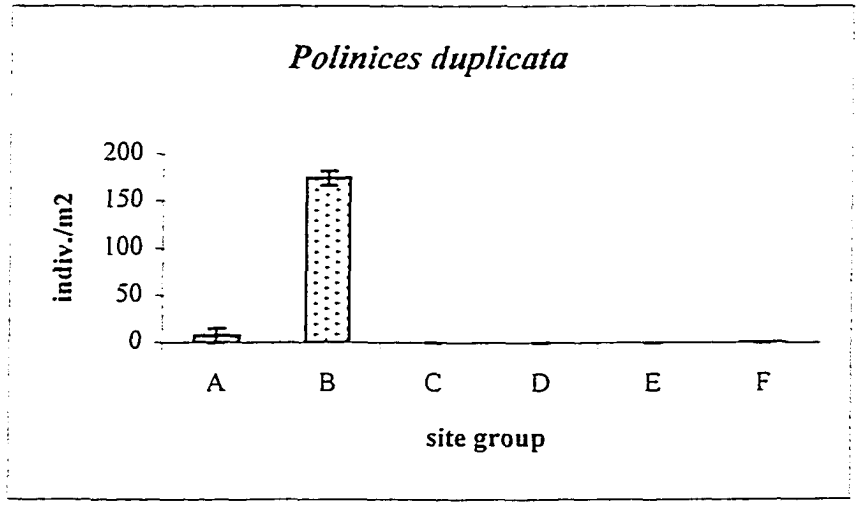
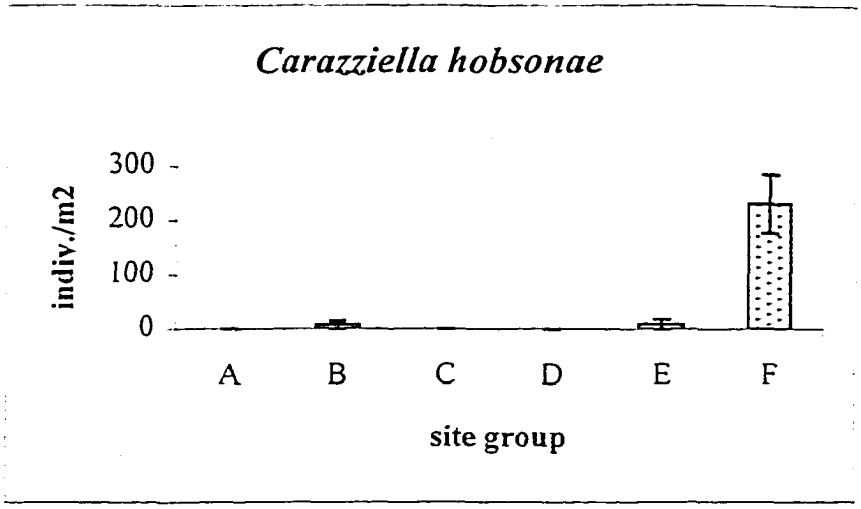


a.



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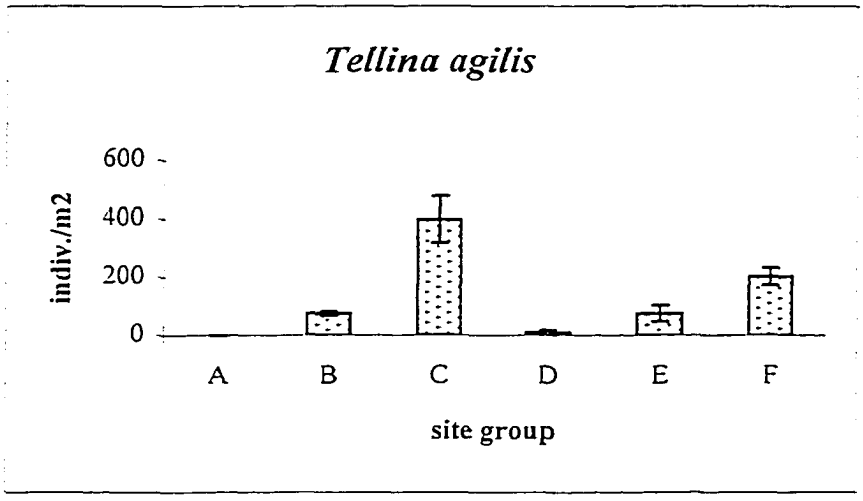

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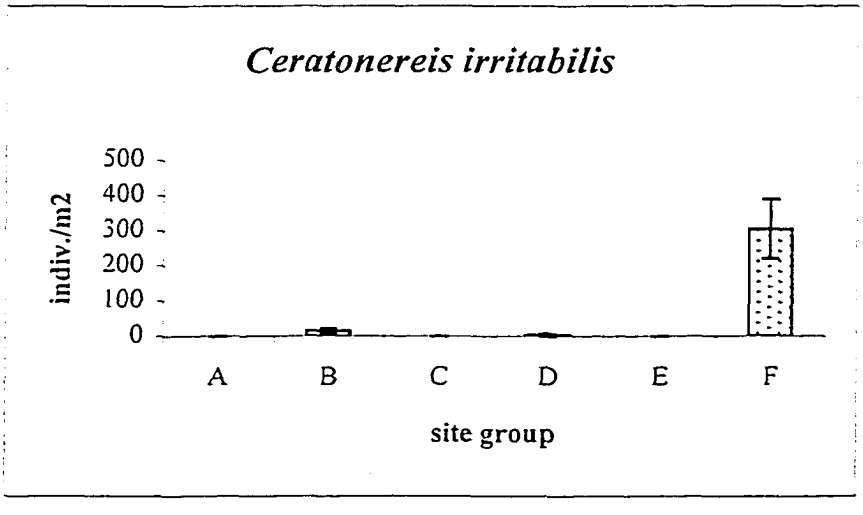

Figure 11a-f. Mean abundance values (indiv./m2) for the remaining top 10 dominant taxa (table 1) that were not selected as important in defining the separation of site groups.

Figure 11. (cont.)

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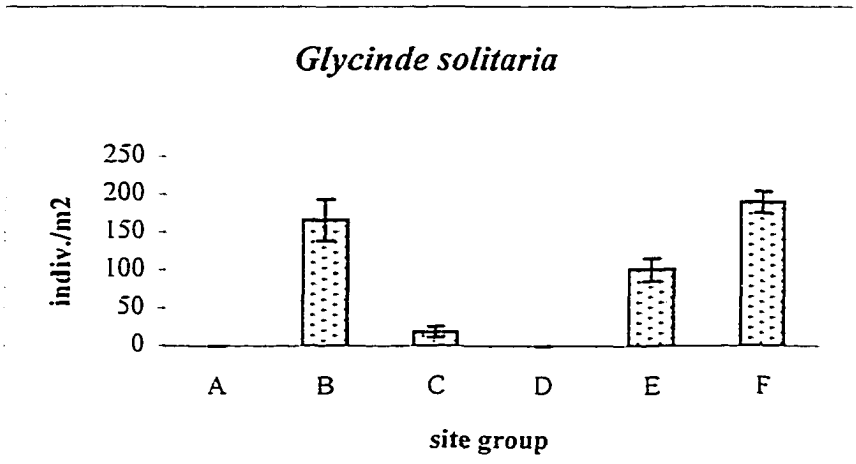

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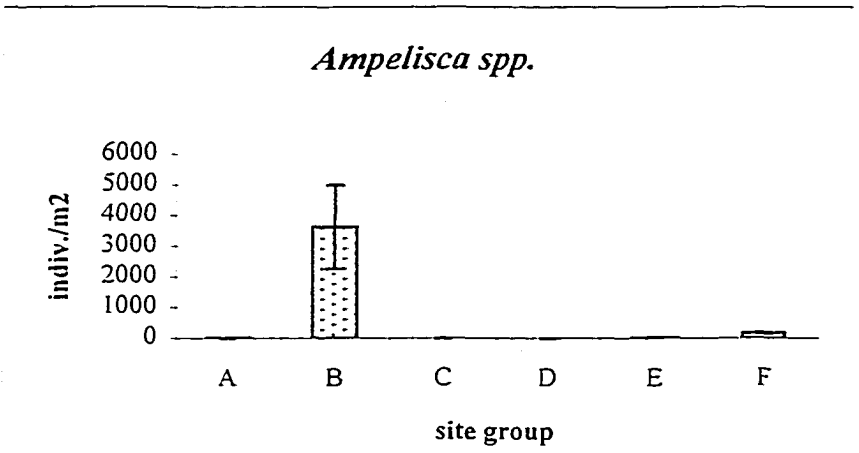

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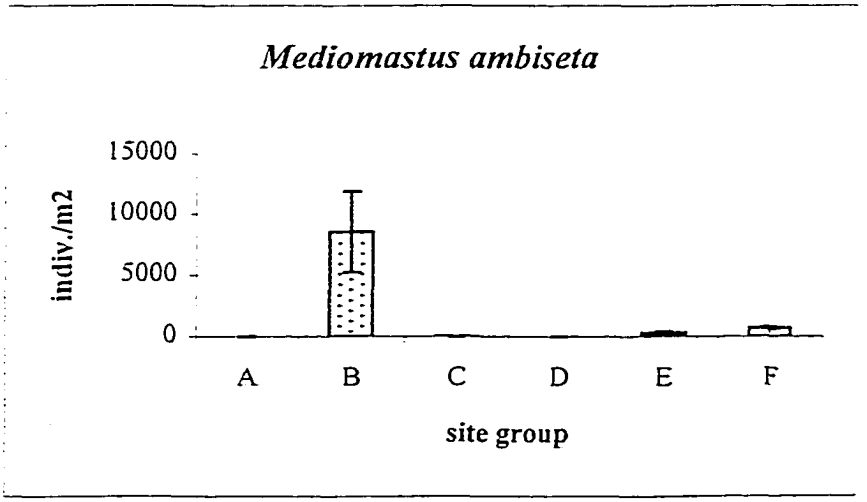

III-H. B-IBI scores are calculated across all metrics and presented in Appendix III-I as both a replicate value and a site value. A habitat status of either "good" or "bad" is assigned to each site based on site values. Three channel sites and two flat sites were characterized as degraded in terms of the B-IBI (Fig. 12). The two subtidal sampling strata, channel and flats, represent 11.28% and 88.72% of the study area respectively. An area-weighted estimate of degraded subtidal benthos throughout the study area revealed a value of 12.25%.

EMAP Benthic Index

EMAP index scores were assigned to each site based on mean metric values across three replicates. Results are presented in Appendix IV as mean values for each of the 3 chosen metrics and a corresponding index score used to characterize environmental health. Scores falling below zero were assigned a "bad" habitat status and scores above zero were assigned a "good" status. Four channel sites were characterized as degraded in terms of the EMAP Benthic index (Fig. 13). An area-weighted, baywide estimate of degraded benthos resulted in a value of 4.51%.

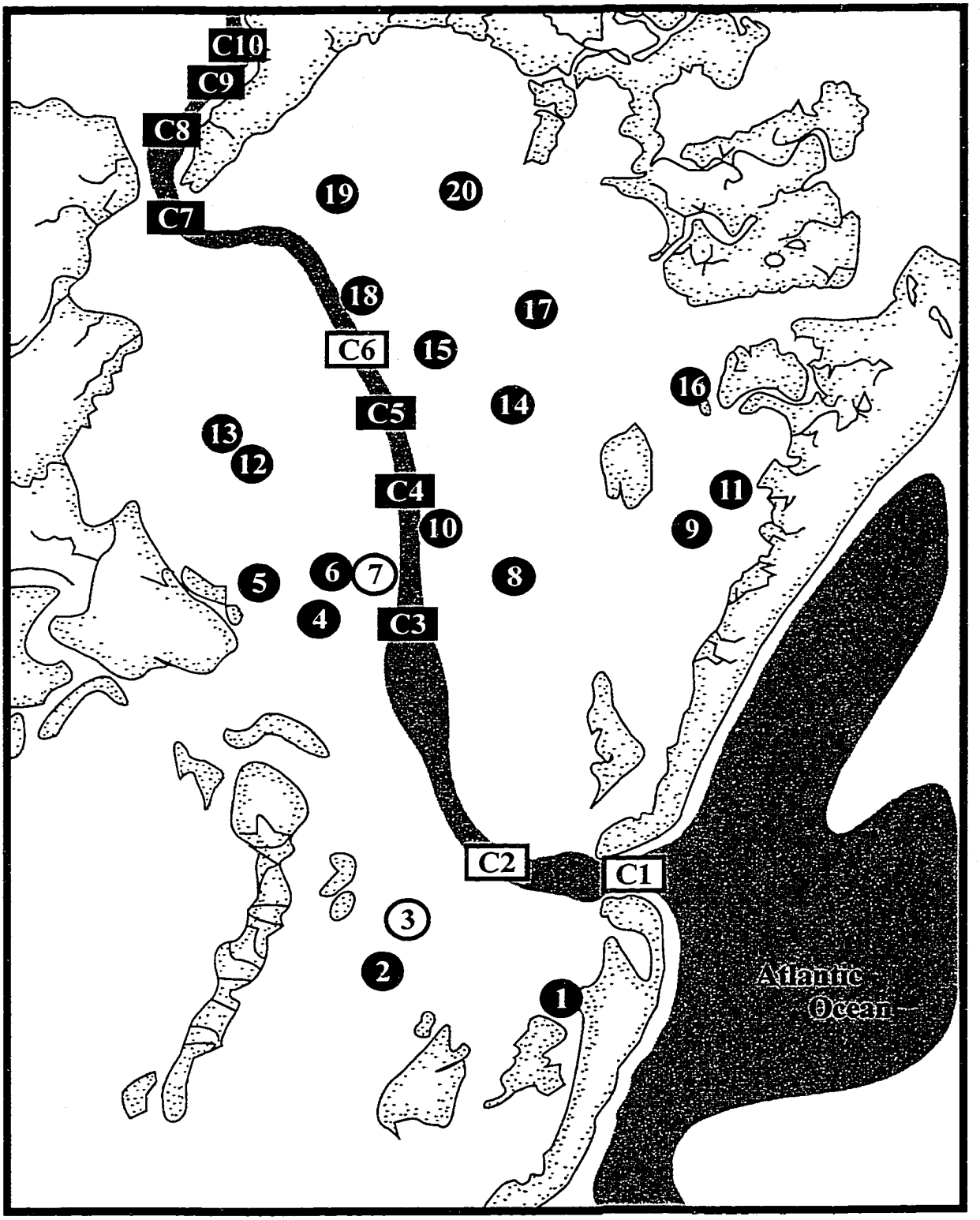

Fig. 12. Map showing the sample sites of Hog Island Bay and indicating degraded sites (white tags outlined in black), as determined by the B-IBI.

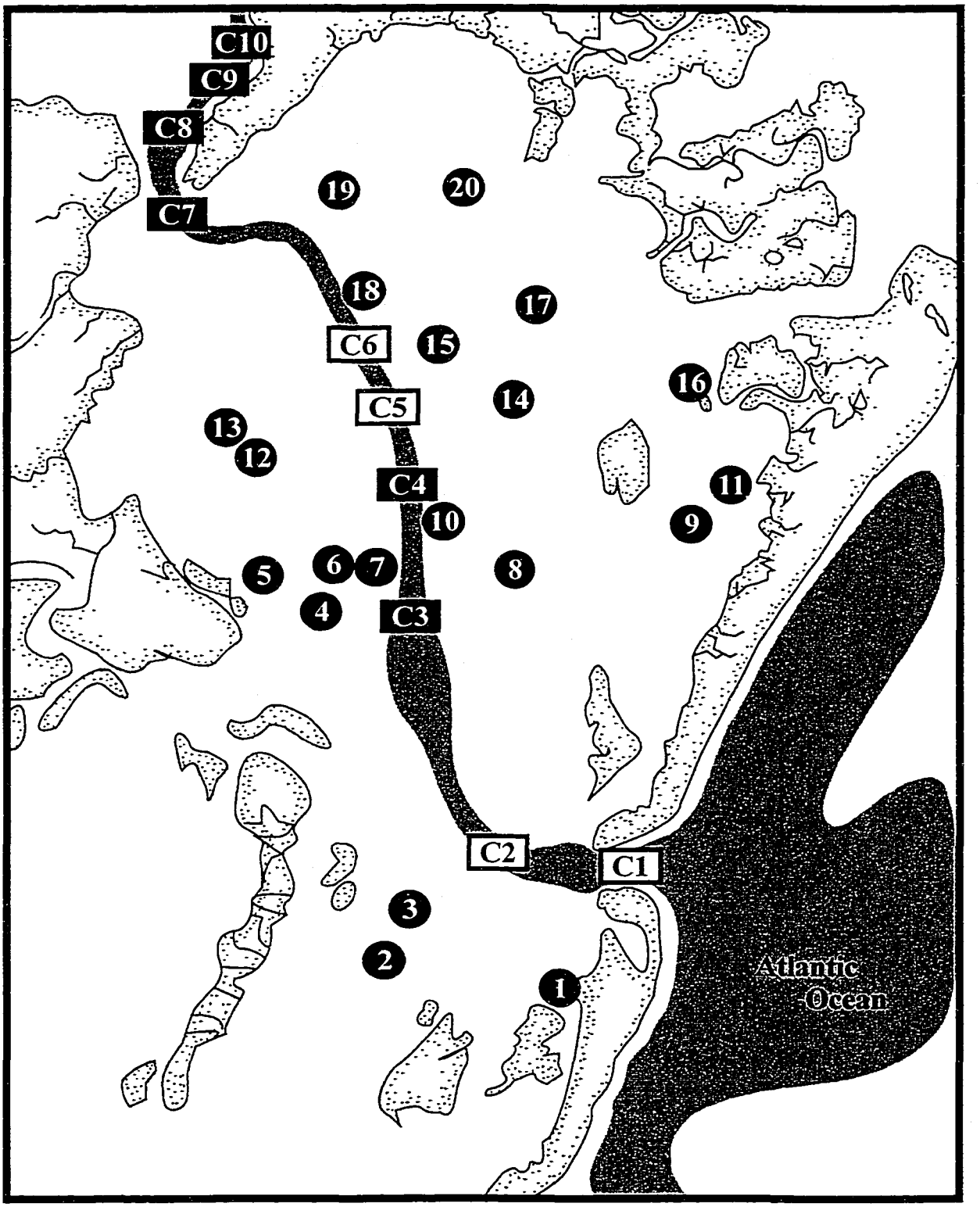

Fig 13. Map showing the sample sites of Hog Island Bay and indicating degraded sites (white tags outlined in black), as determined by the EMAP Benthic Index.

CONCLUSIONS

The ecological condition of Hog Island Bay appears to be largely defined by its geographic location and by physical processes acting along a coastal zone. Great Machipongo channel represents approximately 10% of subtidal areas throughout the study site, while the remaining 90% is predominately shallow flats. Consistently high salinity and bottom water dissolved oxygen values and a 1.62 m semidiurnal tidal range at the time of sampling, indicate a high degree of oceanic flushing via Great Machipongo Inlet.

Millet & Guelorget (1994) demonstrate the importance of wind and tidal forcing in controlling hydrodynamic processes and sediment features occurring throughout a shallow Mediterranean lagoon. The vicinity of the sea inlet was a high energy regime dominated by coarse sediments, whereas landward portions of the lagoon offered a lower energy setting conducive to fine sediment deposition and organics accumulation. A similar pattern was found in both Cobb Bay (Oertel et al. 1989) and Delaware Bay (Maurer et al. 1978; Maurer & Aprill 1979), where coarse sediments were dominant at the bay mouth and in areas of eroded headlands. In the present study, sites C1 and C2 are in closest proximity to Great Machipongo Inlet and also have the highest sand component of all sites. Organic content of sediments was generally higher in sediments having an increasing silt-clay component, although there lacks any distinctive spatial pattern outside of the inlet vicinity.

Community abundance and biomass values for sites sampled August 31 and September 1, 1995 may be compared with the following data collected from bays and estuaries within the Virginian Province; the EMAP Maryland and Delaware coastal bays

summer sampling program of 1993 (Chaillou et al. 1996), and the Virginia Chesapeake Bay Monitoring Program, summer, 1996 (Dauer 1996). The mean abundance value obtained for all sites sampled throughout Hog Island Bay was 4,553 indiv./m^2. Area-weighted mean abundance values for each of the four major subsystems within Maryland and Delaware coastal bays, Rehoboth Bay, Indian River Bay, Assawoman Bay and Chincoteague Bay are listed in respective order; 17,556, 34,889, 13,646 and 15,478. The mean abundance value obtained across all polyhaline sites sampled in Chesapeake Bay during its 1996 probability-based sampling program was 4,482 indiv/m^2. The mean biomass value for Hog Island bay sites was 4.50 g/m^2, while values obtained for each of the mentioned subsystems within Maryland and Delaware coastal bays are listed in respective order; 10.72, 5.05, 5.19 and 13.97. The mean biomass value obtained from Chesapeake Bay was 4.17 g/m^2.

Measures of benthic biodiversity may also be compared among the previously mentioned sampling programs. The mean number of species identified per Young grab during the present study was 26.57, while the mean numbers identified from Rehoboth, Indian River, Assawoman and Chincoteague Bays are listed in respective order; 18.73, 17.30, 20.53 and 27.58. The mean number of species identified in Chesapeake Bay was 25.68. The Shannon index value calculated for Hog Island Bay (3.44) was highest out of all barrier systems being compared within the Virginian Province. Shannon index values for each of the mentioned subsystems within Maryland and Delaware coastal bays are listed in respective order; 2.41, 1.79, 2.85, and 3.02. The infaunal species found in Hog Island Bay were not markedly different from those found in other polyhaline systems being compared. However, Hog Island Bay and Chesapeake Bay are dominated by

polychaetes, while the Maryland and Delaware coastal bays are dominated by amphipods. In summary, community attributes measured for Hog Island Bay were most similar to those of polyhaline sites sampled in Chesapeake Bay. It may therefore be interpreted that the structure of Virginia's polyhaline benthic communities is different from that occurring north of Virginia.

Soft-sediment infauna typically exhibit a patchy distribution which is maintained over a wide range of spatial scales (Morrisey et al. 1992). Species assemblages occupying temperate estuaries may have poorly developed boundaries as a result of diurnal and seasonal fluctuations, therefore the segregation of fauna into groups is a function of scale and intuition of the investigator (Maurer et al. 1978). The spatial distribution of species assemblages occurring throughout Hog Island Bay may be interpreted from the multivariate procedure. Abundance values for those species selected as most important in defining group separation, reveal consistent patterns for site group F along discriminate function 1 and group B along discriminate function 2. This suggests that groups F and B comprise somewhat unique species assemblages relative to other site groups. Confidence ellipse plots support the separation of site group B, however, group F was plotted in close proximity to groups C, E and A. This tight clustering of ellipses indicates that although statistical differences between these groups existed, their respective species compositions were similar.

Site groups E and F, comprising 24 of the 30 sites, exhibit a broad range of values among benthic parameters and therefore fail to reveal any definitive patterns. Benthic parameters observed among the remaining site groups A, B, C, and D, display some distinctive qualities which will be described in detail. Site group A exhibits the

lowest species abundance, biomass and biodiversity values, with the oligochaete *Tubificoides* spp. comprising nearly 50% of the total number of individuals (35) collected across three replicates. While having the highest percentages of both silt/clay content and volatile organics, sediments of this group appear to have a strong influence on resident benthic communities. Benthic studies off the South Texas Coast of the Gulf of Mexico by Flint (1981) and Flint and Holland (1980), revealed that sampling locations which had high percentages of silt were characterized by low numbers of species with high densities. These authors concluded that high percentages of silt present an unstable, homogenous substrate with fewer ecological niches. Therefore, few species will be adaptive in such an environment characterized by swift water currents and periodic storm events.

The species composition occurring at group B may be highly influenced by the structural complexity of the sediment. This group includes the most upstream channel site and contains sediments which appear to have been derived from dredged materials or eroded headlands. The substrate may be described as very poorly sorted, pebble and cobble size materials. This situation lends to an increasing surface area for epifaunal attachment and large interstitial spacing for infaunal refugia. During laboratory processing, an average of 309 *Crepidula fornicata* and 200 *Sabellaria vulgaris* individuals were identified per replicate sample. The presence of biogenic structure such as chaetopterid tubes (Morrisey 1992; Schaffner 1990), oyster shells (Dauer et al. 1982b), blue mussels and surpulid tubes (Maurer et al. 1979b) facilitate the presence of other animals. Infaunal species observed in large abundances included *Ampelisca* spp.(160

indiv./rep.) and the small burrowing annelids; *Mediomastus ambiseta* (377). *Exogone dispar* (224) and *Tubificoides* spp. (90).

Plots of confidence ellipses suggest that the species composition of site group C is similar to that of the largest 2 site groups, E and F. However, the two sites comprising this group reveal markedly similar values for both physical and biological parameters. The three species, *Tellina agilis*, *Rhepoxynius hudsoni*, and *Apoprionospio pygmaea*, otherwise found to be ubiquitous throughout the study area, exhibit a similar dominance pattern at both sites.

Species assemblages of group D appear to be determined by their proximity to Great Machipongo Inlet. Species dominating this group are adapted for life in a high energy environment having swift currents and shifting sands. The amphipod, *Parahaustorius longimerus*, is the dominant species occurring within this group averaging 46 individuals identified per replicate sample. Haustoriid amphipods have adaptations for burrowing quickly into coarse sands and dominate in similar settings occurring from Maine to South Carolina (Maurer & Aprill 1979a, Maurer et al. 1979b).

In terms of both the B-IBI and the EMAP index, Hog Island Bay has a low percentage of degradation, with the majority being confined to Great Machipongo Channel. Although their estimated percentages of degraded subtidal benthos were within 8% of one another, the accuracy of each index is subject to criticism. Benthic data from Virginia's barrier lagoons was not available for developing the two indices. Therefore, one must assume that estuaries and bays occurring throughout the Virginian Province exhibit a high degree of likeness, allowing these two indices to be universally applied.

The B-IBI identified site groups A, C, and D as having stations with degraded benthos. Group A received a score of 1 on all metrics except *biomass of pollution indicative taxa*. Of the two sites comprising group C (3 & 7), both received a score of 1 for the metrics, *species biomass* and *abundance of deep deposit feeders*. In addition, site 3 scored 1 for *abundance of pollution sensitive taxa*. Group D also received a score of 1 on all metrics except *biomass of pollution indicative taxa*. There exists some difficulty in applying such an index which was developed using data collected from Chesapeake Bay sampling programs. Although there is some overlap in species composition, many species occurring in Hog Island Bay have not been assigned either a feeding guild or a pollution tolerance status. Maurer & Aprill (1979a) and Maurer et al. (1979b) argue that the assignment of feeding classifications is inappropriate due to the generalist feeding habits of many benthic species and that significant analytical problems arise as a result of insufficient data regarding individual feeding habits. The B-IBI does develop threshold values for polyhaline sands, although this does not encompass conditions of high energy as they exist at Great Machopongo Inlet. Resident species assemblages of such a habitat may be falsely characterized as degraded in terms of an index developed for a much lower energy regime.

The EMAP Index characterized site groups A and D as degraded, as well as site C5 from group E. This index was developed using data collected from Maryland and Delaware coastal bays, as well as Chesapeake Bay data collected during the same program. Data from Virginia's coastal lagoons, however, was not a component of the development, nor the validation of the EMAP Index. Logistical constraints to comparing Virginia's coastal lagoons with those occurring in Maryland and Delaware may include

factors related to species composition as a result of geological setting. Finkelstein and & Ferland (1987) demonstrate that the depositional floor of Delaware Bay is dominated by coarse sediments in response to a net influx of sand, while Virginia's barrier system is starved of sand and offers a lower energy setting conducive to fine sediment deposition. Maurer et al. (1978) suggests that the active transport of sediments, such as that occurring in Delaware Bay, may impart pressure on indigenous populations, and therefore alter infaunal composition.

Regardless of constraints of each index, they should be viewed with a degree of confidence considering the overlap in 3 out of 6 sites characterized as degraded by both indices. The index values obtained from Hog Island Bay may be compared with other bays and estuaries occurring within the Virginian Province. The B-IBI characterized 12% of Hog Island Bay and 46% of the tidal Chesapeake Bay as degraded (Dauer 1997). The EMAP index characterized 5% of Hog Island Bay as degraded as compared with Rehoboth Bay (40%), Indian River (77%), Assawoman Bay (27%) Chincoteague Bay (11%) and the entire area of the major subsystems of the Maryland and Delaware coastal bays (28%) (Chaillou et al. 1996). Based on data collected between 1990 and 1993 (Strobel et al. 1995), the EMAP index characterized 16% of Delaware Bay and 26% of Chesapeake Bay as degraded. The benthic community health of Hog Island Bay may be viewed as exceptional when compared with other estuaries and bays occurring in the Virginian Province.

The site groups occurring throughout Hog Island Bay are characterized as having subtle boundaries and a high degree of internal similarity in the way of resident benthic assemblages. There are also no convincing differences between channel and flat sites

other than the sharp community transition existing in the vicinity of Great Machipongo Inlet. The infaunal species are not unlike those occurring throughout the Virginian Province and their patchy distribution is typical of temperate estuaries.

The BIBI and the EMAP index have proven useful in regional comparisons of benthic community health. However, to insure a high level of competence, data from Virginia's barrier systems must be a component of their ongoing development.

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APPENDICES

APPENDIX 1. PHYSICAL PARAMETERS

A. WATER QUALITY

	Latitude	Longitude	Depth (m)	Sal.(‰)	Temp.(°C)	D.O.(‰)
1	37°20.30'	75°45.00'	1.52	26.50	25.50	6.60
2	37°21.10'	75°45.80'	1.83	26.50	25.60	6.80
3	37°21.50'	75°45.40'	1.22	27.00	25.30	6.90
4	37°24.30'	75°46.30'	2.13	27.00	25.50	6.50
5	37°25.00'	75°47.30'	1.83	28.50	25.90	6.80
6	37°24.60'	75°46.10'	2.44	27.00	25.90	6.50
7	37°24.60'	75°45.90'	1.22	27.00	26.10	6.90
8	37°24.70'	75°44.70'	1.83	27.50	25.40	6.80
9	37°25.00'	75°42.50'	1.52	27.50	25.30	6.50
10	37°25.40'	75°45.40'	1.52	28.00	25.30	6.90
11	37°25.20'	75°42.10'	1.52	27.50	25.30	5.90
12	37°25.60'	75°47.30'	0.91	27.50	27.20	7.30
13	37°25.80'	75°47.50'	0.91	28.00	26.80	6.80
14	37°26.20'	75°44.80'	1.52	27.50	25.80	6.40
15	37°26.60'	75°45.50'	1.52	28.00	25.20	6.00
16	37°26.40'	75°42.70'	1.22	27.50	25.40	6.70
17	37°26.90'	75°44.50'	1.22	28.00	25.50	6.00
18	37°27.00'	75°46.30'	1.22	27.50	25.40	6.80
19	37°28.20'	75°46.50'	1.52	27.00	25.00	5.70
20	37°28.20'	75°45.30'	1.83	26.00	25.20	6.00
C1	37°21.90'	75°43.50'	17.37	28.50	25.20	6.80
C2	37°22.00'	75°44.70'	5.18	28.50	25.40	6.60
C3	37°24.30'	75°45.50'	14.94	29.25	25.90	6.20
C4	37°25.40'	75°45.70'	9.14	27.00	25.30	6.10
C5	37°26.00'	75°45.80'	10.05	27.50	25.20	5.70
C6	37°26.50'	75°46.10'	9.45	27.50	25.20	5.70
C7	37°27.90'	75°48.40'	4.57	27.00	25.90	5.10
C8	37°28.70'	75°48.40'	6.10	27.50	25.50	4.80
C9	37°29.10'	75°48.00'	8.53	28.00	25.70	4.80
C10	37°29.20'	75°47.80'	12.19	28.50	25.80	4.60
Mean			4.27	27.54	25.59	6.24

B. SEDIMENT PROPERTIES

	%Sand	%Silt	%Clay	Mean Phi	Sorting	%Volatile
1	89.99	6.35	3.66	3.17	1.03	0.93
2	90.11	5.87	4.02	3.17	1.12	0.91
3	97.55	0.97	1.47	2.77	0.58	0.60
4	79.73	16.91	3.36	2.14	2.87	2.35
5	66.38	28.19	5.42	3.96	1.36	1.90
6	82.29	12.96	4.75	3.48	1.23	1.19
7	96.56	1.84	1.60	3.20	0.61	0.88
8	73.46	20.78	5.76	3.79	1.43	1.36
9	66.31	27.09	6.60	4.19	1.70	1.93
10	62.95	30.91	6.14	4.09	1.46	2.01
11	16.17	73.34	10.50	5.63	2.06	4.07
12	62.80	31.20	5.99	4.05	1.42	1.92
13	52.42	40.87	6.71	4.55	2.14	2.94
14	80.16	16.53	3.31	3.63	1.09	1.25
15	59.17	33.69	7.14	4.33	1.77	1.94
16	91.94	4.78	3.27	2.89	0.90	0.77
17	79.98	15.06	4.96	3.49	1.36	1.35
18	71.37	22.80	5.83	3.87	1.39	1.62
19	15.97	71.20	12.84	5.63	2.20	3.95
20	39.99	53.45	6.56	4.92	1.88	3.25
C1	98.91	0.11	0.98	2.51	0.41	0.38
C2	98.92	0.11	0.97	2.14	0.63	0.39
C3	91.12	6.18	2.70	1.49	2.46	1.69
C4	39.61	51.21	9.19	5.07	2.18	3.91
C5	76.33	21.31	2.36	3.33	2.38	2.20
C6	11.53	77.28	11.19	5.99	2.08	4.56
C7	24.95	61.75	13.29	5.61	2.54	3.80
C8	64.89	30.28	4.83	3.48	2.71	2.38
C9	95.27	2.33	2.40	0.64	1.74	0.76
C10	90.90	5.66	3.43	-0.21	2.24	0.97
Mean	68.92	25.70	5.37	3.57	1.63	1.94

APPENDIX II. BENTHIC COMMUNITY PARAMETERS

A. SPECIES ABUNDANCE TOTALS

SUM OF ABUNDANCE		
PHYLUM	**TAXON**	**Total**
Annelida: Oligochaeta	*Tubificoides sp. A*	10
	Tubificoides spp.	2202
	Tubificoides wasselli	97
Annelida: Oligochaeta Total		2309
Annelida: Polychaeta	*Aglaophamus verrilli*	2
	Amastigos caperatus	6
	Ampharetidae spp.	1
	Ancistrosyllis hartmanae	6
	Ancistrosyllis jonesi	1
	Ancistrosyllis spp.	1
	Apoprionospio pygmaea	187
	Arabella iricolor-multidentata complex	48
	Aricidea catherinae	13
	Aricidea cerrutii	15
	Aricidea fragilis	111
	Autolytus prolifer	120
	Bhawania heteroseta	45
	Boccardia hamata	7
	Brania clavata	2
	Brania wellfleetensis	51
	Cabira incerta	4
	Capitella capitata complex	6
	Carazziella hobsonae	587
	Caulleriella sp. B (Blake)	121
	Ceratonereis irritabilis	766
	Chaetozone setosa	2
	Clymenella torquata	216
	Cossura soyeri	1
	Diopatra cuprea	8
	Dorvillea rudolphi	69
	Drilonereis longa	21
	Drilonereis spp.	2
	Eteone heteropoda	13
	Exogone dispar	906
	Flabelligeridae spp.	1
	Glycera americana	36
	Glycera dibranchiata	21
	Glycera sphyrabrancha	9
	Glycinde solitaria	572
	Heteromastus filiformis	11
	Leitoscoloplos spp.	172
	Lepidametria commensalis	1
	Lepidonotus sublevis	1

Annelida: Polychaeta (cont.)	*Lepidonotus variabilis*	23
	Loimia medusa	31
	Lysidice ninetta	41
	Lysilla alba	8
	Macroclymene zonalis	4
	Magelona spp.	35
	Marphysa sanguinea	13
	Mediomastus ambiseta	3171
	Melinna maculata	11
	Monticellina baptisteae-dorsobranchialis complex	93
	Neanthes arenaceodentata	18
	Neanthes succinea	10
	Nephtys picta	14
	Notocirrus spiniferus	4
	Notomastus spp.	121
	Onuphidae spp.	1
	Owenia fusiformis	67
	Paraonidae spp.	1
	Parapionosyllis longicirrata	186
	Paraprionospio pinnata	90
	Pectinaria gouldii	3
	Phyllodoce arenae	26
	Piromis roberti	4
	Pista palmata	71
	Podarke obscura	107
	Podarkeopsis levifuscina	29
	Polychaeta: Unidentified & fragments	3
	Polycirrus eximius	49
	Polydora cornuta	54
	Polydora socialis	135
	Polydora spp.	1
	Prionospio perkinsi	23
	Pseudeurythoe ambigua	1
	Pseudopotamilla reniformis	54
	Sabaco elongatus	7
	Scolelepis spp.	1
	Scolelepis texana	5
	Scoletoma tenuis	327
	Scoloplos rubra	19
	Sigambra tentaculata	48
	Spio spp.	1
	Spiochaetopterus costarum	158
	Spiophanes bombyx	2
	Sthenelais boa	7
	Streblospio benedicti	17
	Streptospinigera heteroseta	4
	Streptosyllis arenae	2
	Terebellidae spp.	1
Annelida: Polychaeta Total		9263

Arthropoda: Amphipoda	*Acanthohaustorius spinosus*	1
	Ameroculodes species complex	3
	Ampelisca spp.	959
	Ampelisca verrilli	634
	Ampithoidae spp.	1
	Batea catharinensis	17
	Cerapus tubularis	93
	Corophium acherusicum	22
	Corophium simile	4
	Corophium tuberculatum	23
	Elasmopus levis	25
	Eobrolgus spinosus	45
	Idunella bowenae	1
	Lembos websteri	1
	Listriella barnardi	575
	Listriella clymenellae	6
	Lysianassidae spp.	1
	Melita nitida	11
	Microprotopus raneyi	22
	Parahaustorius holmesi	44
	Parahaustorius longimerus	275
	Photis macrocoxa	1
	Photis reinhardi	2
	Rhepoxynius hudsoni	116
	Unciola serrata	61
Arthropoda: Amphipoda Total		2943
Arthropoda: Cumacea	*Cyclaspis varians*	1
	Leucon americanus	426
	Oxyurostylis smithi	10
Arthropoda: Cumacea Total		437
Arthropoda: Decapoda	*Biffarius biformis*	21
	Callianassa atlantica	1
	Eurypanopeus depressus	5
	Hexapanopeus angustifrons	1
	Lepidopa websteri	1
	Ogyrides alphaerostris	4
	Pagurus annulipes	1
	Pagurus longicarpus	1
	Pagurus pubescens	2
	Panopeus herbstii	1
	Pinnixa chaetopterana	126
	Thalassinidea	8
	Upogebia affinis	3
	Xanthidae	3
Arthropoda: Decapoda Total		178
Arthropoda: Isopoda	*Chiridotea spp.*	2
	Cyathura burbanki	53
	Erichsonella filiformis	5
	Idotea spp.	1

Arthropoda: Isopoda (cont.)	*Ptilanthura tenuis*	18
	Stegophryxus hyptius	2
Arthropoda: Isopoda Total		81
Arthropoda: Pycnogonida	*Anoplodactylus petiolatus*	10
	Pycnogonida	2
Arthropoda: Pycnogonida Total		12
Arthropoda: Tanaidacea	*Leptognatha caeca*	1
Arthropoda: Tanaidacea Total		1
Chordata: Cephalochordata	*Branchiostoma caribaeum*	4
Chordata: Cephalochordata Total		4
Chordata: Hemichordata	*Hemichordata*	211
Chordata: Hemichordata Total		211
Cnidaria: Anthozoa	*Anthozoa*	18
	Ceriantheopsis americanus	2
	Edwardsia elegans	15
Cnidaria: Anthozoa Total		35
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	49
Echinodermata: Holothuroidea Total		49
Echinodermata: Ophiuroidea	*Microphiopholis atra*	8
Echinodermata: Ophiuroidea Total		8
Mollusca: Bivalvia	*Abra aequalis*	7
	Aligena elevata	40
	Anadara ovalis	68
	Anadara transversa	2
	Bivalvia: Unidentified	46
	Crassostrea virginica	1
	Cumingia tellinoides	1
	Cyrtopleura costata	1
	Donax variabilis	25
	Ensis directus	12
	Lyonsia hyalina	3
	Macoma tenta	15
	Mercenaria mercenaria	80
	Mulinia lateralis	96
	Mysella planulata	18
	Neotia ponderosa	21
	Nucula proxima	73
	Petricola pholadiformis	1
	Solen viridis	1
	Tagelus divisus	52
	Tellina agilis	679
	Tellina spp.	1
	Tellinidae	12
Mollusca: Bivalvia Total		1255
Mollusca: Gastropoda	*Acteocina canaliculata*	492
	Anachis avara	2
	Anachis obesa	4
	Astyris lunata	136
	Boonea impressa	5

Mollusca: Gastropoda (cont.)	*Boreotrophon spp.*	1
	Busycon sp. (juveniles)	2
	Cerithiidae spp.	7
	Cylichnella bidentata	10
	Gastropoda	21
	Mangelia plicosa	3
	Marginella spp.	1
	Melanella spp.	2
	Nassarius trivittatus	1
	Nassarius vibex	1
	Odostomia spp.	12
	Pisania tincta	1
	Polinices duplicata	25
	Pyramidella crenulata	1
	Pyramidella spp.	1
	Rictaxis punctostriatus	1
	Seila adamsi	3
	Turbonilla spp.	42
	Turridae	9
Mollusca: Gastropoda Total		783
Nemertea	*Nemertinea*	332
Nemertea Total		332
Phoronida	*Phoronis spp.*	99
Phoronida Total		99
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	23
Platyhelminthes: Turbellaria Total		23
Sipuncula	*Phascolion strombi*	3
	Sipuncula	2
Sipuncula Total		5
Grand Total		**18028**

Appendix II. Benthic Community Parameters

B. SPECIES BIOMASS TOTALS

SUM OF ABUNDANCE		
PHYLUM	**TAXON**	**Total**
Annelida: Oligochaeta	*Tubificoides sp. A*	0.001
	Tubificoides spp.	0.076
	Tubificoides wasselli	0.014
Annelida: Oligochaeta Total		0.091
Annelida: Polychaeta	*Aglaophamus verrilli*	0.016
	Amastigos caperatus	0.003
	Ampharetidae spp.	0.001
	Ancistrosyllis hartmanae	0.004
	Ancistrosyllis jonesi	0.001
	Ancistrosyllis spp.	0.001
	Apoprionospio pygmaea	0.024
	Arabella iricolor-multidentata complex	0.793
	Aricidea catherinae	0.006
	Aricidea cerrutii	0.002
	Aricidea fragilis	0.041
	Autolytus prolifer	0.011
	Bhawania heteroseta	0.017
	Boccardia hamata	0.001
	Brania clavata	0.002
	Brania wellfleetensis	0.006
	Cabira incerta	0.003
	Capitella capitata complex	0.003
	Carazziella hobsonae	0.034
	Caulleriella sp. B (Blake)	0.037
	Ceratonereis irritabilis	0.613
	Chaetozone setosa	0.002
	Clymenella torquata	0.577
	Cossura soyeri	0.001
	Diopatra cuprea	0.132
	Dorvillea rudolphi	0.027
	Drilonereis longa	0.076
	Drilonereis spp.	0.002
	Eteone heteropoda	0.013
	Exogone dispar	0.043
	Flabelligeridae spp.	0.001
	Glycera americana	0.371
	Glycera dibranchiata	0.229
	Glycera sphyrabrancha	0.005
	Glycinde solitaria	0.099
	Heteromastus filiformis	0.009
	Leitoscoloplos spp.	0.106
	Lepidametria commensalis	0.013
	Lepidonotus sublevis	0.001

Annelida: Polychaeta (cont.)	*Lepidonotus variabilis*	0.016
	Loimia medusa	0.17
	Lysidice ninetta	0.017
	Lysilla alba	0.008
	Macroclymene zonalis	0.009
	Magelona spp.	0.01
	Marphysa sanguinea	0.099
	Mediomastus ambiseta	0.124
	Melinna maculata	0.017
	Monticellina baptisteae-dorsobranchialis complex	0.027
	Neanthes arenaceodentata	0.005
	Neanthes succinea	0.008
	Nephtys picta	0.072
	Notocirrus spiniferus	0.023
	Notomastus spp.	0.562
	Onuphidae spp.	0.001
	Owenia fusiformis	0.084
	Paraonidae spp.	0.001
	Parapionosyllis longicirrata	0.013
	Paraprionospio pinnata	0.059
	Pectinaria gouldii	0.007
	Phyllodoce arenae	0.02
	Piromis roberti	0.015
	Pista palmata	0.13
	Podarke obscura	0.031
	Podarkeopsis levifuscina	0.016
	Polychaeta: Unidentified & fragments	0.002
	Polycirrus eximius	0.006
	Polydora cornuta	0.01
	Polydora socialis	0.025
	Polydora spp.	0.001
	Prionospio perkinsi	0.013
	Pseudeurythoe ambigua	0.001
	Pseudopotamilla reniformis	0.009
	Sabaco elongatus	0.007
	Scolelepis spp.	0.001
	Scolelepis texana	0.004
	Scoletoma tenuis	0.288
	Scoloplos rubra	0.02
	Sigambra tentaculata	0.019
	Spio spp.	0.001
	Spiochaetopterus costarum	0.139
	Spiophanes bombyx	0.002
	Sthenelais boa	0.06
	Streblospio benedicti	0.008
	Streptospinigera heteroseta	0.003
	Streptosyllis arenae	0.002
	Terebellidae spp.	0.001
Annelida: Polychaeta Total		5.492

Arthropoda: Amphipoda	*Acanthohaustorius spinosus*	0.001
	Ameroculodes species complex	0.003
	Ampelisca spp.	0.09
	Ampelisca verrilli	0.115
	Ampithoidae spp.	0.001
	Batea catharinensis	0.011
	Cerapus tubularis	0.035
	Corophium acherusicum	0.007
	Corophium simile	0.001
	Corophium tuberculatum	0.01
	Elasmopus levis	0.003
	Eobrolgus spinosus	0.009
	Idunella bowenae	0.001
	Lembos websteri	0.001
	Listriella barnardi	0.057
	Listriella clymenellae	0.005
	Lysianassidae spp.	0.001
	Melita nitida	0.003
	Microprotopus raneyi	0.004
	Parahaustorius holmesi	0.009
	Parahaustorius longimerus	0.078
	Photis macrocoxa	0.001
	Photis reinhardi	0.001
	Rhepoxynius hudsoni	0.013
	Unciola serrata	0.008
Arthropoda: Amphipoda Total		0.468
Arthropoda: Cumacea	*Cyclaspis varians*	0.001
	Leucon americanus	0.027
	Oxyurostylis smithi	0.008
Arthropoda: Cumacea Total		0.036
Arthropoda: Decapoda	*Biffarius biformis*	0.017
	Callianassa atlantica	0.001
	Eurypanopeus depressus	0.024
	Hexapanopeus angustifrons	0.017
	Lepidopa websteri	0.001
	Ogyrides alphaerostris	0.007
	Pagurus annulipes	0.001
	Pagurus longicarpus	0.001
	Pagurus pubescens	0.024
	Panopeus herbstii	0.737
	Pinnixa chaetopterana	0.1
	Thalassinidea	0.007
	Upogebia affinis	0.008
	Xanthidae	0.003
Arthropoda: Decapoda Total		0.948
Arthropoda: Isopoda	*Chiridotea spp.*	0.001
	Cyathura burbanki	0.037
	Erichsonella filiformis	0.003
	Idotea spp.	0.001

Arthropoda: Isopoda (cont.)	*Ptilanthura tenuis*	0.01
	Stegophryxus hyptius	0.001
Arthropoda: Isopoda Total		0.053
Arthropoda: Pycnogonida	*Anoplodactylus petiolatus*	0.006
	Pycnogonida	0.002
Arthropoda: Pycnogonida Total		0.008
Arthropoda: Tanaidacea	*Leptognatha caeca*	0.001
Arthropoda: Tanaidacea Total		0.001
Chordata: Cephalochordata	*Branchiostoma caribaeum*	0.005
Chordata: Cephalochordata Total		0.005
Chordata: Hemichordata	*Hemichordata*	0.041
Chordata: Hemichordata Total		0.041
Cnidaria: Anthozoa	*Anthozoa*	0.061
	Ceriantheopsis americanus	0.002
	Edwardsia elegans	0.014
Cnidaria: Anthozoa Total		0.077
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	0.072
Echinodermata: Holothuroidea Total		0.072
Echinodermata: Ophiuroidea	*Microphiopholis atra*	0.032
Echinodermata: Ophiuroidea Total		0.032
Mollusca: Bivalvia	*Abra aequalis*	0.027
	Aligena elevata	0.015
	Anadara ovalis	1.279
	Anadara transversa	0.002
	Bivalvia: Unidentified	0.105
	Crassostrea virginica	0.06
	Cumingia tellinoides	0.001
	Cyrtopleura costata	0.001
	Donax variabilis	0.009
	Ensis directus	0.403
	Lyonsia hyalina	0.002
	Macoma tenta	0.071
	Mercenaria mercenaria	5.218
	Mulinia lateralis	0.036
	Mysella planulata	0.01
	Neotia ponderosa	1.722
	Nucula proxima	0.065
	Petricola pholadiformis	0.001
	Solen viridis	0.001
	Tagelus divisus	0.815
	Tellina agilis	0.106
	Tellina spp.	0.001
	Tellinidae	0.028
Mollusca: Bivalvia Total		9.978
Mollusca: Gastropoda	*Acteocina canaliculata*	0.082
	Anachis avara	0.006
	Anachis obesa	0.005
	Astyris lunata	0.064
	Boonea impressa	0.003

Mollusca: Gastropoda (cont.)	*Boreotrophon spp.*	0.001
	Busycon sp. (juveniles)	0.007
	Cerithiidae spp.	0.001
	Cylichnella bidentata	0.007
	Gastropoda	0.012
	Mangelia plicosa	0.001
	Marginella spp.	0.001
	Melanella spp.	0.001
	Nassarius trivittatus	0.001
	Nassarius vibex	0.041
	Odostomia spp.	0.005
	Pisania tincta	0.001
	Polinices duplicata	0.028
	Pyramidella crenulata	0.001
	Pyramidella spp.	0.001
	Rictaxis punctostriatus	0.001
	Seila adamsi	0.001
	Turbonilla spp.	0.023
	Turridae	0.007
Mollusca: Gastropoda Total		0.301
Nemertea	*Nemertinea*	0.206
Nemertea Total		0.206
Phoronida	*Phoronis spp.*	0.039
Phoronida Total		0.039
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	0.018
Platyhelminthes: Turbellaria Total		0.018
Sipuncula	*Phascolion strombi*	0.003
	Sipuncula	0.002
Sipuncula Total		0.005
Grand Total		17.871

C. TOTAL ABUNDANCE AND BIOMASS PER REPLICATE

	Species Abundance (indiv./m^2)				Ash-Free Dry Weight Biomass (g/m^2)			
	Rep #1	Rep #2	Rep #3	Site Mean	Rep #1	Rep #2	Rep #3	Site Mean
1	1840.89	2818.19	3000.00	2553.03	1.02	0.82	0.91	0.92
2	2863.64	2954.55	2681.82	2833.34	0.80	1.55	0.84	1.06
3	1181.82	2204.55	2227.28	1871.21	0.48	1.32	0.66	0.82
4	3863.64	5772.73	1545.46	3727.28	4.95	3.93	1.39	3.42
5	4045.46	3477.28	3409.10	3643.94	2.05	4.00	3.05	3.03
6	1454.55	4159.10	5568.19	3727.28	1.16	42.77	1.77	15.23
7	2272.73	2068.18	1954.55	2098.49	0.52	1.77	0.50	0.93
8	3840.91	5386.37	3681.82	4303.04	2.61	3.82	2.43	2.95
9	4250.01	5022.73	6863.64	5378.79	2.68	1.86	3.05	2.53
10	4136.37	2386.37	2931.82	3151.52	3.61	4.16	2.89	3.55
11	7477.28	5454.55	5136.37	6022.73	3.77	3.09	2.41	3.09
12	8090.92	9204.56	7909.10	8401.53	3.43	48.20	3.98	18.54
13	9363.65	9659.10	9431.83	9484.86	6.52	4.59	7.09	6.07
14	3636.37	4454.55	3954.55	4015.16	3.34	2.23	1.18	2.25
15	3409.10	3090.91	3386.37	3295.46	1.59	79.41	1.02	27.34
16	3409.10	3272.73	4295.46	3659.10	0.66	0.48	0.66	0.60
17	5113.64	4795.46	3022.73	4310.61	1.34	8.36	2.00	3.90
18	2977.28	2431.82	3181.82	2863.64	2.70	2.84	3.45	3.00
19	2886.37	5250.01	5250.01	4462.13	1.68	1.66	1.43	1.59
20	2454.55	2590.91	3568.19	2871.22	1.16	3.39	1.61	2.05
C1	1068.18	1840.91	1886.37	1598.49	1.89	0.59	0.61	1.03
C2	1250.00	1045.46	1500.00	1265.15	0.30	0.36	0.70	0.45
C3	4181.82	3386.37	2727.28	3431.82	7.45	3.39	1.20	4.02
C4	1659.09	6500.01	3250.00	3803.03	0.91	3.89	0.75	1.85
C5	7954.56	14545.47	2295.46	8265.16	0.55	27.80	1.36	9.90
C6	45.45	204.55	545.46	265.15	0.05	0.11	0.25	0.14
C7	2727.28	2386.37	1500.00	2204.55	0.66	1.43	0.93	1.01
C8	2772.73	2840.91	2159.09	2590.91	3.89	1.50	0.82	2.07
C9	2159.09	4931.82	5613.64	4234.85	0.77	2.00	1.27	1.35
C10	25204.58	17318.20	36204.59	26242.46	2.48	5.73	22.89	10.36
Mean				4552.53				4.50

D. SUMMARY OF SPECIES ABUNDANCE PER REPLICATE

SITE C1 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Polychaeta	*Amastigos caperatus*		3		3
	Apoprionospio pygmaea		2	1	3
	Ceratonereis irritabilis		1		1
	Glycera dibranchiata	1	1		2
	Magelona spp.		22	2	24
	Polydora spp.	1			1
	Scoletoma tenuis	1			1
Arthropoda: Amphipoda	*Batea catharinensis*	2		1	3
	Microprotopus raneyi	16	2		18
	Parahaustorius longimerus	24	48	73	145
Arthropoda: Decapoda	*Lepidopa websteri*		1		1
	Pagurus pubescens			1	1
	Upogebia affinis			1	1
Arthropoda: Isopoda	*Idotea spp.*		1		1
Mollusca: Bivalvia	*Donax variabilis*	1		1	2
	Tellina agilis			2	2
Mollusca: Gastropoda	*Astyris lunata*	1			1
Nemertea	*Nemertinea*			1	1
Grand Total		**47**	**81**	**83**	**211**

SITE C2 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Polychaeta	*Magelona spp.*		3	4	7
	Nephtys picta			1	1
Arthropoda: Amphipoda	*Ameroculodes species complex*			1	1
	Cerapus tubularis	1			1
	Microprotopus raneyi	3			3
	Parahaustorius longimerus	32	41	57	130
Arthropoda: Isopoda	*Chiridotea spp.*	2			2
Arthropoda: Tanaidacea	*Leptognatha caeca*			1	1
Mollusca: Bivalvia	*Donax variabilis*	15	1		16
	Tellina agilis			1	1
Nemertea	*Nemertinea*	2	1	1	4
Grand Total		**55**	**46**	**66**	**167**

SITE C3 - ABUNDANCE		REP			
PHYLUM	**TAXON**	**1**	**2**	**3**	**Grand Total**
Annelida: Oligochaeta	*Tubificoides spp.*	24	24	4	52
	Tubificoides wasselli	3		1	4
Annelida: Polychaeta	*Ancistrosyllis hartmanae*		1		1
	Ancistrosyllis spp.	1			1
	Carazziella hobsonae		6		6
	Caulleriella sp. B (Blake)	2	1	1	4
	Drilonereis longa		1		1
	Glycera americana	1	2	1	4
	Glycinde solitaria	9	2	4	15
	Magelona spp.		1		1
	Mediomastus ambiseta	58	7	1	66
	Notocirrus spiniferus		1		1
	Paraonidae spp.	1			1
	Paraprionospio pinnata	1	6	2	9
	Prionospio perkinsi	1	4		5
	Pseudopotamilla reniformis			19	19
	Sigambra tentaculata	1	1	4	6
	Streblospio benedicti		2		2
Arthropoda: Amphipoda	*Ampelisca spp.*	1	3	1	5
	Batea catharinensis		1		1
	Cerapus tubularis		1		1
	Listriella barnardi		3		3
Arthropoda: Cumacea	*Leucon americanus*	51	71	67	189
Arthropoda: Decapoda	*Pinnixa chaetopterana*	3		5	8
Echinodermata: Ophiuroidea	*Microphiopholis atra*		1		1
Mollusca: Bivalvia	*Anadara ovalis*	1			1
	Donax variabilis	1			1
	Ensis directus	2	1	1	4
	Nucula proxima		1		1
	Tellina agilis	16	5	8	29
Mollusca: Gastropoda	*Astyris lunata*	3	1		4
Nemertea	*Nemertinea*	3	2	1	6
Phoronida	*Phoronis spp.*	1			1
Grand Total		**184**	**149**	**120**	**453**

SITE C4 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	44	183	82	309
	Tubificoides wasselli	2	10	3	15
Annelida: Polychaeta	*Bhawania heteroseta*	1	13	9	23
	Cabira incerta	1		2	3
	Caulleriella sp. B (Blake)			1	1
	Diopatra cuprea		2		2
	Dorvillea rudolphi		3	1	4
	Glycera americana		1	2	3
	Glycinde solitaria	2	8	4	14
	Loimia medusa		2		2
	Mediomastus ambiseta	2	3	2	7
	Monticellina baptisteae-dorsobranchialis	1			1
	Notocirrus spiniferus		1		1
	Paraprionospio pinnata	2	9	2	13
	Podarkeopsis levifuscina		1		1
	Polydora cornuta		1		1
	Polydora socialis		1		1
	Prionospio perkinsi	1	1	2	4
	Scoletoma tenuis		4		4
	Sigambra tentaculata	2	11	10	23
Arthropoda: Amphipoda	*Ampelisca spp.*		2	1	3
	Cerapus tubularis		1		1
	Listriella barnardi	2	3	2	7
Arthropoda: Cumacea	*Leucon americanus*	3		2	5
Arthropoda: Decapoda	*Biffarius biformis*	1			1
	Pinnixa chaetopterana		1		1
Chordata: Hemichordata	*Hemichordata*		1	1	2
Cnidaria: Anthozoa	*Anthozoa*		1		1
	Edwardsia elegans		2		2
Echinodermata: Ophiuroidea	*Microphiopholis atra*		1		1
Mollusca: Bivalvia	*Abra aequalis*		2	1	3
	Anadara ovalis	1	1		2
	Donax variabilis	1	2	1	4
	Macoma tenta		3		3
Mollusca: Gastropoda	*Acteocina canaliculata*	2	1	2	5
	Astyris lunata	1	3	1	5
	Cylichnella bidentata			2	2
	Nassarius trivittatus			1	1
Nemertea	*Nemertinea*	4	6	7	17
Phoronida	*Phoronis spp.*		1	2	3
Platyhelminthes: Turbellaria	*Stylochus ellipticus*		1		1
Grand Total		73	286	143	502

SITE C5 - ABUNDANCE		REP			
PHYLUM	**TAXON**	**1**	**2**	**3**	**Grand Total**
Annelida: Oligochaeta	*Tubificoides sp. A*		10		10
	Tubificoides spp.	251	360	33	644
	Tubificoides wasselli	18	32	7	57
Annelida: Polychaeta	*Ancistrosyllis hartmanae*		1	3	4
	Arabella iricolor-multidentata complex		1		1
	Bhawania heteroseta			2	2
	Brania clavata		1		1
	Caulleriella sp. B (Blake)		5	1	6
	Diopatra cuprea		2		2
	Drilonereis longa		1		1
	Exogone dispar		2		2
	Glycera americana	1	1		2
	Glycinde solitaria	7	3	4	14
	Heteromastus filiformis		3	1	4
	Leitoscoloplos spp.	1	1	1	3
	Mediomastus ambiseta	2	7	1	10
	Neanthes succinea		2		2
	Notomastus spp.	1			1
	Paraprionospio pinnata	9		5	14
	Pista palmata		1		1
	Podarke obscura		1		1
	Prionospio perkinsi		2		2
	Scoletoma tenuis		2	1	3
	Sigambra tentaculata	3		3	6
	Sthenelais boa		1		1
Arthropoda: Amphipoda	*Ampelisca spp.*	1	2	1	4
	Ampelisca verrilli	1			1
	Batea catharinensis		2		2
	Elasmopus levis		24		24
	Eobrolgus spinosus		1		1
	Listriella barnardi		2	2	4
Arthropoda: Cumacea	*Leucon americanus*	46	32	18	96
Arthropoda: Decapoda	*Ogyrides alphaerostris*	1			1
	Pagurus longicarpus		1		1
	Pinnixa chaetopterana			3	3
Arthropoda: Isopoda	*Erichsonella filiformis*		1		1
Cnidaria: Anthozoa	*Edwardsia elegans*	2		1	3
Mollusca: Bivalvia	*Abra aequalis*			1	1
	Anadara ovalis		58	1	59
	Anadara transversa		1		1
	Donax variabilis			2	2
	Nucula proxima		1	1	2
	Tellina agilis	1	10		11
	Tellinidae		2		2
Mollusca: Gastropoda	*Acteocina canaliculata*		2	1	3
	Anachis avara		1		1
	Astyris lunata		46	5	51
Nemertea	*Nemertinea*	4	15	3	22
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	1			1
Grand Total		**350**	**640**	**101**	**1091**

SITE C6 - ABUNDANCE		REP			
PHYLUM	**TAXON**	**1**	**2**	**3**	**Grand Total**
Annelida: Oligochaeta	*Tubificoides spp.*	1	2	16	19
Annelida: Polychaeta	*Eteone heteropoda*		1		1
	Mediomastus ambiseta			1	1
	Notomastus spp.			1	1
	Paraprionospio pinnata			1	1
Arthropoda: Amphipoda	*Ampelisca spp.*		1		1
	Cerapus tubularis		1		1
Arthropoda: Cumacea	*Leucon americanus*	1	4	1	6
Mollusca: Gastropoda	*Astyris lunata*			1	1
	Polinices duplicata			1	1
Nemertea	*Nemertinea*			2	2
Grand Total		**2**	**9**	**24**	**35**

SITE C7 - ABUNDANCE		REP			
PHYLUM	**TAXON**	**1**	**2**	**3**	**Grand Total**
Annelida: Oligochaeta	*Tubificoides spp.*	24	12	9	45
Annelida: Polychaeta	*Bhawania heteroseta*	1		1	2
	Diopatra cuprea		1		1
	Dorvillea rudolphi		2	1	3
	Drilonereis longa		1		1
	Exogone dispar		10		10
	Glycera americana			1	1
	Glycinde solitaria		6	3	9
	Leitoscoloplos spp.	3	4	5	12
	Lepidonotus variabilis		1		1
	Mediomastus ambiseta	9	16	4	29
	Monticellina baptisteae-dorsobranchialis	4	4	2	10
	Parapionosyllis longicirrata		1		1
	Paraprionospio pinnata		1		1
	Podarkeopsis levifuscina	1			1
	Pseudopotamilla reniformis		1		1
	Scoletoma tenuis	1	1		2
	Spiochaetopterus costarum		1		1
Arthropoda: Amphipoda	*Ampelisca spp.*	3	1		4
	Cerapus tubularis		3	2	5
	Listriella barnardi	2		1	3
Arthropoda: Cumacea	*Leucon americanus*	64	24	29	117
Mollusca: Bivalvia	*Anadara ovalis*		2		2
	Macoma tenta	1		1	2
	Neotia ponderosa		1		1
	Tellina agilis	1	2		3
	Tellinidae		1		1
Mollusca: Gastropoda	*Acteocina canaliculata*	2		1	3
	Anachis obesa	1			1
	Astyris lunata	1	3	2	6
	Turbonilla spp.			1	1
Nemertea	*Nemertinea*	2	6	3	11
Grand Total		**120**	**105**	**66**	**291**

SITE C8 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	3	2		5
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*	2			2
	Bhawania heteroseta	7			7
	Clymenella torquata	1	2	2	5
	Cossura soyeri	1			1
	Dorvillea rudolphi	5	4		9
	Exogone dispar	7	10	2	19
	Glycinde solitaria	6	5	6	17
	Leitoscoloplos spp.		1		1
	Lepidonotus variabilis		1		1
	Mediomastus ambiseta	8	8	3	19
	Neanthes succinea		1		1
	Notomastus spp.		1		1
	Parapionosyllis longicirrata	1	2		3
	Phyllodoce arenae	2	2	2	6
	Pista palmata			2	2
	Podarke obscura		3	2	5
	Polydora socialis		2		2
	Pseudopotamilla reniformis	3	4		7
	Scoletoma tenuis	1		1	2
	Sigambra tentaculata			1	1
	Spiochaetopterus costarum	4		1	5
	Terebellidae spp.		1		1
Arthropoda: Amphipoda	*Ampelisca spp.*	11	14	16	41
	Ampelisca verrilli	1			1
	Batea catharinensis		1		1
	Cerapus tubularis	18	14	6	38
	Listriella barnardi	3			3
	Unciola serrata			1	1
Arthropoda: Cumacea	*Leucon americanus*		1	1	2
Arthropoda: Decapoda	*Ogyrides alphaerostris*	1			1
Arthropoda: Pycnogonida	*Anoplodactylus petiolatus*		2	4	6
Chordata: Hemichordata	*Hemichordata*		2		2
Cnidaria: Anthozoa	*Anthozoa*	1			1
Echinodermata: Holothuroidea	*Leptosynapta tenuis*		2		2
Echinodermata: Ophiuroidea	*Microphiopholis atra*	1			1
Mollusca: Bivalvia	*Abra aequalis*			1	1
	Aligena elevata		1		1
	Lyonsia hyalina	2			2
	Mercenaria mercenaria	5	7	6	18
	Neotia ponderosa		1		1
	Nucula proxima	3		4	7
	Tagelus divisus	1			1
	Tellina agilis	6	5	5	16
	Tellinidae			2	2
Mollusca: Gastropoda	*Acteocina canaliculata*	6	13	23	42
	Astyris lunata		3		3
	Turbonilla spp.	3	1		4
Nemertea	*Nemertinea*	7	7	4	18
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	2	1		3
Sipuncula	*Phascolion strombi*		1		1
Grand Total		**122**	**125**	**95**	**342**

SITE C9 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	28	78	47	153
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*	1	5	3	9
	Aricidea catherinae	1	1	7	9
	Autolytus prolifer		4	6	10
	Brania wellfleetensis	4	17	9	30
	Caulleriella sp. B (Blake)	2	5	5	12
	Dorvillea rudolphi	4	4	3	11
	Drilonereis longa	1	1		2
	Exogone dispar		8	23	31
	Glycera dibranchiata			1	1
	Glycinde solitaria	7	3	5	15
	Lysidice ninetta	1	3	1	5
	Marphysa sanguinea		1		1
	Mediomastus ambiseta	21	41	44	106
	Monticellina baptisteae-dorsobranchialis	3	1	3	7
	Notomastus spp.	1			1
	Parapionosyllis longicirrata	3	22	39	64
	Pista palmata	1	1	1	3
	Podarke obscura	1	1	5	7
	Polycirrus eximius	2	4	7	13
	Polydora socialis		1	1	2
	Scoletoma tenuis	1		2	3
	Scoloplos rubra	1	4	2	7
	Spiochaetopterus costarum			1	1
	Sthenelais boa			1	1
	Streblospio benedicti		1		1
	Streptospinigera heteroseta		1	2	3
	Streptosyllis arenae	1	1		2
Arthropoda: Amphipoda	*Ampelisca spp.*	3		4	7
	Ampelisca verrilli			1	1
	Eobrolgus spinosus		1	2	3
	Lysianassidae spp.			1	1
	Unciola serrata		1	2	3
Arthropoda: Decapoda	*Biffarius biformis*			1	1
Cnidaria: Anthozoa	*Anthozoa*		1		1
Mollusca: Bivalvia	*Anadara transversa*			1	1
	Bivalvia: Unidentified	2			2
	Lyonsia hyalina			1	1
	Mercenaria mercenaria	3			3
	Mysella planulata			3	3
	Tellina agilis	1		6	7
Mollusca: Gastropoda	*Marginella spp.*			1	1
Nemertea	*Nemertinea*	2	6	5	13
Platyhelminthes: Turbellaria	*Stylochus ellipticus*			1	1
Grand Total		95	217	247	559

SITE C10 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	104	112	53	269
	Tubificoides wasselli	6	5	4	15
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*	3	5	6	14
	Aricidea catherinae	2	1	1	4
	Autolytus prolifer	32	20	29	81
	Brania wellfleetensis	8		12	20
	Cara=iella hobsonae		1		1
	Ceratonereis irritabilis		1	1	2
	Dorvillea rudolphi	7	4	4	15
	Drilonereis longa		1		1
	Eteone heteropoda			1	1
	Exogone dispar	175	67	430	672
	Glycinde solitaria	9	5	8	22
	Lepidametria commensalis			1	1
	Lepidonotus variabilis	6		15	21
	Lysidice ninetta	13	2	15	30
	Marphysa sanguinea	1	3		4
	Mediomastus ambiseta	426	103	603	1132
	Melinna maculata	1			1
	Monticellina baptisteae-dorsobranchialis	8	5		13
	Parapionosyllis longicirrata	39	37	36	112
	Paraprionospio pinnata		1		1
	Piromis roberti	1	2		3
	Pista palmata	14	10	39	63
	Podarke obscura	15	9	33	57
	Podarkeopsis levifuscina			2	2
	Polycirrus eximius	8	9	19	36
	Polydora socialis	12	1	9	22
	Pseudopotamilla reniformis	9			9
	Scoletoma tenuis	2	3	1	6
	Scoloplos rubra	2	3	2	7
	Sthenelais boa	2		1	3
	Streptospinigera heteroseta	1			1
Arthropoda: Amphipoda	*Ampelisca spp.*	75	276	130	481
	Batea catharinensis	3		2	5
	Cerapus tubularis	2	2	1	5
	Corophium simile			4	4
	Corophium tuberculatum	2	4	1	7
	Eobrolgus spinosus	14	1	21	36
	Melita nitida	4	3	4	11
	Photis reinhardi	2			2
	Unciola serrata	28	18	11	57
Arthropoda: Decapoda	*Biffarius biformis*	1		2	3
	Eurypanopeus depressus		1	4	5
	Panopeus herbstii			1	1
Arthropoda: Pycnogonida	*Pycnogonida*	1	1		2
Mollusca: Bivalvia	*Anadara ovalis*			1	1
	Cumingia tellinoides	1			1
	Ensis directus		1		1
	Mercenaria mercenaria	7	5	11	23
	Neotia ponderosa	10	3	4	17
	Nucula proxima	21	12	30	63
	Tellina agilis	3	4	3	10
	Tellinidae	1			1
Mollusca: Gastropoda	*Astyris lunata*	8	3	7	18
	Boonea impressa	1	2	2	5
	Boreotrophon spp.			1	1
	Cerithiidae spp.			7	7
	Gastropoda	2	1		3
	Odostomia spp.	1		7	8
	Polinices duplicata	7	8	8	23
Nemertea	*Nemertinea*	9	7	6	22
Grand Total		1109	762	1593	3464

SITE 1 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	1	3	2	6
Annelida: Polychaeta	*Apoprionospio pygmaea*	5	16	7	28
	Aricidea fragilis		4	2	6
	Autolytus prolifer			2	2
	Carazziella hobsonae		1		1
	Caulleriella sp. B (Blake)			1	1
	Ceratonereis irritabilis	4	3	11	18
	Exogone dispar			1	1
	Glycinde solitaria	6	6	5	17
	Mediomastus ambiseta	24	16	42	82
	Notocirrus spiniferus	1			1
	Owenia fusiformis	1			1
	Paraprionospio pinnata	3	3	2	8
	Pectinaria gouldii	1			1
	Polydora cornuta			4	4
	Prionospio perkinsi		1		1
	Scoletoma tenuis	3	2		5
	Spiochaetopterus costarum			1	1
	Streblospio benedicti			2	2
Arthropoda: Amphipoda	*Ampelisca spp.*	4	3	6	13
	Ampelisca verrilli	10	21	4	35
	Batea catharinensis	1			1
	Cerapus tubularis			2	2
	Listriella barnardi	2	7	2	11
Arthropoda: Cumacea	*Oxyurostylis smithi*	1		1	2
Arthropoda: Decapoda	*Biffarius biformis*	1		1	2
	Pinnixa chaetopterana		2	1	3
Arthropoda: Isopoda	*Ptilanthura tenuis*		1	1	2
Chordata: Hemichordata	*Hemichordata*	1	3	2	6
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	2	2	2	6
Mollusca: Bivalvia	*Bivalvia: Unidentified*			1	1
	Mercenaria mercenaria		2	3	5
	Mulinia lateralis	1	4	1	6
	Mysella planulata	1	2	1	4
	Tellina agilis	2	5	9	16
Mollusca: Gastropoda	*Acteocina canaliculata*		2	5	7
	Astyris lunata			1	1
	Cylichnella bidentata	1	1		2
	Gastropoda	2			2
	Turbonilla spp.	1		2	3
	Turridae		3		3
Nemertea	*Nemertinea*	1	6	2	9
Phoronida	*Phoronis spp.*	1	5	3	9
Grand Total		**81**	**124**	**132**	**337**

SITE 2 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	1		1	2
Annelida: Polychaeta	*Aglaophamus verrilli*		1		1
	Apoprionospio pygmaea	8	12	11	31
	Autolytus prolifer	4			4
	Brania wellfleetensis	1			1
	Carazziella hobsonae		1		1
	Caulleriella sp. B (Blake)	4	7	11	22
	Drilonereis longa		1		1
	Glycera americana			1	1
	Glycera dibranchiata		1	2	3
	Glycinde solitaria	5	3	3	11
	Leitoscoloplos spp.		2	1	3
	Loimia medusa	1	1		2
	Mediomastus ambiseta	21	48	24	93
	Neanthes arenaceodentata		3		3
	Neanthes succinea	1			1
	Nephtys picta	1			1
	Paraprionospio pinnata	2	4	1	7
	Phyllodoce arenae	1			1
	Polydora cornuta	14			14
	Polydora socialis	8			8
	Prionospio perkinsi	2		3	5
	Pseudopotamilla reniformis	1			1
	Sigambra tentaculata		1	1	2
	Spiochaetopterus costarum		1	3	4
Arthropoda: Amphipoda	*Ampelisca verrilli*	5	5	2	12
	Corophium tuberculatum	1			1
	Listriella barnardi			4	4
	Parahaustorius holmesi		1		1
Arthropoda: Cumacea	*Oxyurostylis smithi*		1	1	2
Arthropoda: Decapoda	*Pinnixa chaetopterana*		1	2	3
Arthropoda: Isopoda	*Ptilanthura tenuis*			1	1
Chordata: Cephalochordata	*Branchiostoma caribaeum*		1	1	2
Chordata: Hemichordata	*Hemichordata*			1	1
Cnidaria: Anthozoa	*Anthozoa*			1	1
	Edwardsia elegans		1	1	2
Echinodermata: Holothuroidea	*Leptosynapta tenuis*			3	3
Mollusca: Bivalvia	*Anadara ovalis*	3			3
	Ensis directus	1	1	1	3
	Mercenaria mercenaria	1			1
	Mulinia lateralis	8	7		15
	Mysella planulata			3	3
	Tellina agilis	30	16	26	72
	Tellinidae			1	1
Mollusca: Gastropoda	*Acteocina canaliculata*	1	3	5	9
	Busycon sp. (juveniles)		1		1
	Cylichnella bidentata		3		3
Nemertea	*Nemertinea*	1	2	3	6
Platyhelminthes: Turbellaria	*Stylochus ellipticus*		1		1
Grand Total		**126**	**130**	**118**	**374**

SITE 3 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Polychaeta	*Amastigos caperatus*		2	1	3
	Apoprionospio pygmaea	19	38	15	72
	Caulleriella sp. B (Blake)		1		1
	Drilonereis longa		1	1	2
	Glycera dibranchiata			1	1
	Glycinde solitaria		1	1	2
	Leitoscoloplos spp.	2	6	5	13
	Magelona spp.		1		1
	Mediomastus ambiseta		1	1	2
	Nephtys picta	2	2	1	5
	Scolelepis texana		2	1	3
Arthropoda: Amphipoda	*Ameroculodes species complex*		1		1
	Ampelisca verrilli	2	2		4
	Parahaustorius holmesi	6	18	19	43
	Rhepoxynius hudsoni	3	5	17	25
Arthropoda: Cumacea	*Leucon americanus*		1		1
	Oxyurostylis smithi		1		1
Arthropoda: Decapoda	*Biffarius biformis*	1	1		2
	Pinnixa chaetopterana	2	1	3	6
Arthropoda: Isopoda	*Cyathura burbanki*			2	2
Chordata: Cephalochordata	*Branchiostoma caribaeum*			2	2
Mollusca: Bivalvia	*Bivalvia: Unidentified*	1			1
	Ensis directus	1		1	2
	Mulinia lateralis	1	1	3	5
	Tellina agilis	9	10	19	38
Mollusca: Gastropoda	*Acteocina canaliculata*			1	1
	Busycon sp. (juveniles)	1			1
	Gastropoda	2			2
Nemertea	*Nemertinea*		1	3	4
Platyhelminthes: Turbellaria	*Stylochus ellipticus*			1	1
Grand Total		52	97	98	247

SITE 4 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	7		1	8
Annelida: Polychaeta	*Ancistrosyllis jonesi*		1		1
	Arabella iricolor-multidentata complex	2	3	1	6
	Aricidea fragilis	2	2		4
	Autolytus prolifer		21		21
	Bhawania heteroseta		3	1	4
	Boccardia hamata		7		7
	Brania clavata		1		1
	Cabira incerta		1		1
	Caulleriella sp. B (Blake)	2	3	2	7
	Ceratonereis irritabilis		1		1
	Chaetozone setosa		1	1	2
	Clymenella torquata	1			1
	Dorvillea rudolphi	7	2		9
	Eteone heteropoda		1		1
	Exogone dispar		6		6
	Glycera americana	1			1
	Glycera dibranchiata	1			1
	Glycera sphyrabrancha	2	2		4
	Glycinde solitaria	5	6	9	20
	Leitoscoloplos spp.			1	1
	Loimia medusa	4			4
	Macroclymene zonalis		1		1
	Marphysa sanguinea	1			1
	Mediomastus ambiseta	45	41	6	92
	Neanthes succinea		3		3
	Notomastus spp.	2	1		3
	Owenia fusiformis	6	4		10
	Paraprionospio pinnata			3	3
	Pectinaria gouldii			1	1
	Phyllodoce arenae	1	1		2
	Podarke obscura	1	2	1	4
	Polychaeta: Unidentified & fragments		2		2
	Polydora socialis		30		30
	Prionospio perkinsi	3		1	4
	Pseudeurythoe ambigua		1		1
	Scolelepis sp.		1		1
	Scoletoma tenuis	1	11	6	18
	Scoloplos rubra	2			2
	Sigambra tentaculata	3	1	1	5
	Spiochaetopterus costarum	1			1
	Sthenelais boa			1	1

Arthropoda: Amphipoda	*Ampelisca spp.*	5	7	4	16
	Ampelisca verrilli		3		3
	Batea catharinensis		2	1	3
	Cerapus tubularis		1		1
	Eobrolgus spinosus		2		2
	Listriella barnardi		1		1
	Photis macrocoxa		1		1
	Rhepoxynius hudsoni	1			1
Arthropoda: Decapoda	*Pinnixa chaetopterana*	1			1
Arthropoda: Isopoda	*Ptilanthura tenuis*	1			1
Chordata: Hemichordata	*Hemichordata*	10	5		15
Cnidaria: Anthozoa	*Anthozoa*	2		1	3
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	5	2	1	8
Mollusca: Bivalvia	*Aligena elevata*	3	1		4
	Bivalvia: Unidentified			1	1
	Cyrtopleura costata		1		1
	Mulinia lateralis	5	3	2	10
	Mysella planulata		1		1
	Petricola pholadiformis	1			1
	Tagelus divisus	3	2	2	7
	Tellina agilis	12		3	15
Mollusca: Gastropoda	*Acteocina canaliculata*	7	3	3	13
	Astyris lunata	3	12	3	18
	Cylichnella bidentata	1			1
	Melanella spp.			2	2
	Turbonilla spp.	3			3
	Turridae	1			1
Nemertea	*Nemertinea*	6	15	6	27
Phoronida	*Phoronis spp.*		31	3	34
Platyhelminthes: Turbellaria	*Stylochus ellipticus*		1		1
Grand Total		170	254	68	492

SITE 5 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	18	7	12	37
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*		1	1	2
	Aricidea fragilis	11	3	1	15
	Ceratonereis irritabilis	3	1	2	6
	Clymenella torquata	2		2	4
	Dorvillea rudolphi			2	2
	Drilonereis longa	1	1	1	3
	Exogone dispar	4		4	8
	Glycera americana	1	1		2
	Glycera sphyrabrancha	2			2
	Glycinde solitaria	9	15	11	35
	Heteromastus filiformis			1	1
	Leitoscoloplos spp.	1		2	3
	Loimia medusa		1		1
	Lysidice ninetta	1			1
	Marphysa sanguinea	1			1
	Mediomastus ambiseta	21	8	17	46
	Melinna maculata		1		1
	Monticellina baptisteae-dorsobranchialis	10	3	1	14
	Notomastus spp.		3	1	4
	Owenia fusiformis	4	20	6	30
	Parapionosyllis longicirrata			1	1
	Paraprionospio pinnata			2	2
	Podarke obscura	1	1		2
	Sabaco elongatus		1		1
	Scoletoma tenuis	10	2	5	17
	Scoloplos rubra			1	1
	Spiochaetopterus costarum	18	18	16	52
Arthropoda: Amphipoda	*Ampelisca spp.*	5	2	8	15
	Ampelisca verrilli	7	24	7	38
	Cerapus tubularis	1	1	2	4
	Corophium acherusicum	1			1
	Elasmopus levis	1			1
	Eobrolgus spinosus	2			2
	Listriella barnardi	1	2		3
Arthropoda: Decapoda	*Thalassinidea*			1	1
	Xanthidae	1			1
Arthropoda: Isopoda	*Ptilanthura tenuis*		1		1
Chordata: Hemichordata	*Hemichordata*	8	14	17	39
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	1	1	2	4
Echinodermata: Ophiuroidea	*Microphiopholis atra*		1		1
Mollusca: Bivalvia	*Bivalvia: Unidentified*			2	2
	Mercenaria mercenaria		1	1	2
	Tagelus divisus	1	4	2	7
	Tellina agilis	4		5	9
	Tellinidae		1		1
Mollusca: Gastropoda	*Acteocina canaliculata*	8	10	7	25
	Anachis obesa		1	2	3
	Astyris lunata	8			8
	Cylichnella bidentata			1	1
	Nassarius vibex		1		1
	Pyramidella spp.		1		1
	Seila adamsi	3			3
	Turbonilla spp.	1			1
Nemertea	*Nemertinea*	6	1	3	10
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	1			1
Sipuncula	*Sipuncula*			1	1
Grand Total		178	153	150	481

SITE 6 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	6	33	35	74
	Tubificoides wasselli		3	2	5
Annelida: Polychaeta	*Ancistrosyllis hartmanae*			1	1
	Apoprionospio pygmaea		1	7	8
	Arabella iricolor-multidentata complex	1	2	1	4
	Aricidea cerrutii	2		13	15
	Aricidea fragilis		2	3	5
	Bhawania heteroseta	1			1
	Caraziella hobsonae		4	15	19
	Caulleriella sp. B (Blake)		2	2	4
	Clymenella torquata	1			1
	Dorvillea rudolphi	1			1
	Drilonereis longa	1			1
	Eteone heteropoda			2	2
	Exogone dispar			4	4
	Glycera dibranchiata		2	1	3
	Glycinde solitaria	5	8	6	19
	Lysidice ninetta		2		2
	Marphysa sanguinea			2	2
	Mediomastus ambiseta	6	40	62	108
	Nephtys picta	1	1	1	3
	Owenia fusiformis		2	2	4
	Paraprionospio pinnata		3		3
	Phyllodoce arenae	1			1
	Pista palmata		2		2
	Podarke obscura		1		1
	Podarkeopsis levifuscina			4	4
	Polydora cornuta		1		1
	Polydora socialis		1	1	2
	Prionospio perkinsi		1		1
	Scoloplos rubra		1		1
	Sigambra tentaculata		1	1	2
	Spiochaetopterus costarum		2	1	3
	Spiophanes bombyx			1	1
Arthropoda: Amphipoda	*Ampelisca spp.*	2	5	1	8
	Ampelisca verrilli	1	3	4	8
	Idunella bowenae		1		1
	Listriella barnardi		3	4	7
	Listriella clymenellae	1			1
	Rhepoxynius hudsoni	1		5	6

Arthropoda: Cumacea	*Cyclaspis varians*		1		1
	Oxyurostylis smithi			1	1
Arthropoda: Decapoda	*Biffarius biformis*		1	3	4
	Callianassa atlantica			1	1
	Ogyrides alphaerostris		1		1
	Pinnixa chaetopterana		13	5	18
	Upogebia affinis		1		1
	Xanthidae			1	1
Chordata: Hemichordata	*Hemichordata*		1	2	3
Cnidaria: Anthozoa	*Ceriantheopsis americanus*		1		1
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	2		2	4
Echinodermata: Ophiuroidea	*Microphiopholis atra*		1		1
Mollusca: Bivalvia	*Bivalvia: Unidentified*	3	2	2	7
	Ensis directus			1	1
	Macoma tenta	1			1
	Mercenaria mercenaria	1		1	2
	Neotia ponderosa		2		2
	Tellina agilis	16	22	40	78
	Tellinidae		1		1
Mollusca: Gastropoda	*Acteocina canaliculata*	6	2		8
	Cylichnella bidentata			1	1
	Polinices duplicata		1		1
	Turridae	1			1
Nemertea	*Nemertinea*	2	5	3	10
Phoronida	*Phoronis spp.*			1	1
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	1	1		2
Grand Total		**64**	**183**	**245**	**492**

SITE 7 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Polychaeta	*Apoprionospio pygmaea*	11	12	5	28
	Arabella iricolor-multidentata complex		1		1
	Caulleriella sp. B (Blake)	1		3	4
	Eteone heteropoda	1			1
	Glycera dibranchiata	1			1
	Glycinde solitaria		2	1	3
	Leitoscoloplos spp.		2	3	5
	Lepidonotus sublevis		1		1
	Magelona spp.			1	1
	Mediomastus ambiseta		1	1	2
	Nephtys picta		2	2	4
	Scolelepis texana			1	1
	Spio spp.			1	1
Arthropoda: Amphipoda	*Acanthohaustorius spinosus*			1	1
	Ameroculodes species complex		1		1
	Ampelisca verrilli		1	1	2
	Listriella barnardi			1	1
	Rhepoxynius hudsoni	31	21	32	84
Arthropoda: Decapoda	*Biffarius biformis*	2	3	2	7
	Pagurus pubescens		1		1
	Pinnixa chaetopterana	16	16	7	39
Arthropoda: Isopoda	*Stegophryxus hyptius*		2		2
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	2	1		3
Mollusca: Bivalvia	*Aligena elevata*			1	1
	Bivalvia: Unidentified	2	5	3	10
	Mercenaria mercenaria		1		1
	Mulinia lateralis		1	2	3
	Tellina agilis	33	16	18	67
Nemertea	*Nemertinea*		1		1
Grand Total		**100**	**91**	**86**	**277**

SITE 8 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	3	11	4	18
Annelida: Polychaeta	*Ampharetidae spp.*	1			1
	Arabella iricolor-multidentata complex	1			1
	Aricidea fragilis	4	2	1	7
	Bhawania heteroseta			1	1
	Caulleriella sp. B (Blake)		1		1
	Ceratonereis irritabilis	2	3	3	8
	Clymenella torquata	1	4		5
	Dorvillea rudolphi			2	2
	Exogone dispar	8	3	3	14
	Glycera americana	1			1
	Glycera dibranchiata	1	1		2
	Glycera sphyrabrancha		2	1	3
	Glycinde solitaria	11	12	7	30
	Leitoscoloplos spp.	2	1	3	6
	Loimia medusa	1		1	2
	Mediomastus ambiseta	20	20	15	55
	Onuphidae spp.		1		1
	Owenia fusiformis		2		2
	Paraprionospio pinnata	1			1
	Polychaeta: Unidentified & fragments			1	1
	Polydora socialis	1	5	7	13
	Scoletoma tenuis	6	7	5	18
	Spiochaetopterus costarum	2	3	4	9
Arthropoda: Amphipoda	*Ampelisca spp.*	12	18	22	52
	Ampelisca verrilli	24	70	33	127
	Cerapus tubularis		1	1	2
	Corophium acherusicum	1			1
	Lembos websteri		1		1
Arthropoda: Cumacea	*Oxyurostylis smithi*			1	1
Arthropoda: Decapoda	*Biffarius biformis*		1		1
	Pinnixa chaetopterana	1		1	2
	Thalassinidea	1	2	1	4
Chordata: Hemichordata	*Hemichordata*		2		2
Cnidaria: Anthozoa	*Anthozoa*	1			1
Mollusca: Bivalvia	*Abra aequalis*			1	1
	Crassostrea virginica			1	1
	Macoma tenta		1		1
	Mercenaria mercenaria	1	1		2
	Mulinia lateralis	3	1	1	5
	Tagelus divisus	1	1		2
	Tellina agilis	18	14	6	38
	Tellinidae		1		1
Mollusca: Gastropoda	*Acteocina canaliculata*	33	28	24	85
	Astyris lunata		2		2
	Mangelia plicosa			3	3
	Turbonilla spp.	3	3		6
	Turridae	1			1
Nemertea	*Nemertinea*	3	4	7	14
Phoronida	*Phoronis spp.*		6	2	8
Platyhelminthes: Turbellaria	*Stylochus ellipticus*		2		2
Grand Total		169	237	162	568

SITE 9 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	7	23	12	42
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*		1		1
	Aricidea fragilis	4	5	7	16
	Carazziella hobsonae		2	7	9
	Ceratonereis irritabilis	6	17	10	33
	Clymenella torquata	20	1	4	25
	Dorvillea rudolphi		2		2
	Drilonereis longa			1	1
	Eteone heteropoda			1	1
	Exogone dispar	4	39	9	52
	Glycera americana			1	1
	Glycinde solitaria	10	13	17	40
	Leitoscoloplos spp.	4	10	6	20
	Macroclymene zonalis	1			1
	Mediomastus ambiseta	41	23	127	191
	Melinna maculata		2	1	3
	Monticellina baptisteae-dorsobranchialis			1	1
	Notomastus spp.	15	7	16	38
	Owenia fusiformis	1		1	2
	Pectinaria gouldii		1		1
	Phyllodoce arenae	2			2
	Podarke obscura	2		1	3
	Podarkeopsis levifuscina		2	1	3
	Sabaco elongatus	1		1	2
	Scoletoma tenuis	5	6	9	20
	Spiochaetopterus costarum	1			1
Arthropoda: Amphipoda	*Ampelisca spp.*	5	4	4	13
	Ampelisca verrilli	2	3	4	9
	Cerapus tubularis	1	2		3
	Eobrolgus spinosus		1		1
	Listriella barnardi	17	21	28	66
	Microprotopus raneyi		1		1
Arthropoda: Decapoda	*Pinnixa chaetopterana*	1		1	2
Arthropoda: Isopoda	*Cyathura burbanki*	4	3	4	11
	Erichsonella filiformis		1		1
Chordata: Hemichordata	*Hemichordata*	2	1	6	9
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	1	1		2
Mollusca: Bivalvia	*Aligena elevata*			1	1
	Bivalvia: Unidentified	7		1	8
	Mulinia lateralis	2	3	1	6
	Tagelus divisus		2	1	3
	Tellina agilis	11	14	8	33
	Tellinidae		1		1
Mollusca: Gastropoda	*Acteocina canaliculata*	1	2	3	6
	Astyris lunata		1		1
	Gastropoda	3	2	2	7
	Turbonilla spp.	2			2
Nemertea	*Nemertinea*	4	4	5	13
Grand Total		**187**	**221**	**302**	**710**

SITE 10 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	6	13	10	29
Annelida: Polychaeta	*Apoprionospio pygmaea*			1	1
	Arabella iricolor-multidentata complex		1	1	2
	Aricidea fragilis	2	1	1	4
	Bhawania heteroseta		1	1	2
	Caraziella hobsonae	1		2	3
	Caulleriella sp. B (Blake)	1	1		2
	Ceratonereis irritabilis	1		2	3
	Clymenella torquata	2	1	1	4
	Diopatra cuprea		1		1
	Drilonereis longa	1	1		2
	Glycera americana	2	2	1	5
	Glycinde solitaria	3	9	9	21
	Leitoscoloplos spp.	2	5	2	9
	Loimia medusa	1	5	8	14
	Mediomastus ambiseta	41	9	9	59
	Neanthes succinea		1		1
	Notomastus spp.		3		3
	Owenia fusiformis	2	1	2	5
	Paraprionospio pinnata	1	2	5	8
	Piromis roberti		1		1
	Polydora cornuta	16	2		18
	Polydora socialis	11	2		13
	Pseudopotamilla reniformis	16	1		17
	Scoletoma tenuis	10	7	4	21
	Sigambra tentaculata		1		1
	Spiochaetopterus costarum	1			1
	Spiophanes bombyx	1			1
	Sthenelais boa		1		1
Arthropoda: Amphipoda	*Ampelisca spp.*	3	3	5	11
	Ampelisca verrilli	7		1	8
	Cerapus tubularis		1		1
	Corophium tuberculatum	3	1		4
	Listriella barnardi	3	5	9	17
Arthropoda: Decapoda	*Hexapanopeus angustifrons*	1			1
	Pinnixa chaetopterana		2	7	9
Chordata: Hemichordata	*Hemichordata*	5	4	11	20
Cnidaria: Anthozoa	*Anthozoa*	2		1	3
	Edwardsia elegans	2	3	1	6
Echinodermata: Holothuroidea	*Leptosynapta tenuis*		2	1	3
Mollusca: Bivalvia	*Bivalvia: Unidentified*	1	1	1	3
	Macoma tenta	1		4	5
	Mercenaria mercenaria	1			1
	Mulinia lateralis	3	2	3	8
	Mysella planulata		2	1	3
	Tagelus divisus	5			5
	Tellina agilis	1			1
Mollusca: Gastropoda	*Acteocina canaliculata*		2	7	9
	Astyris lunata	1			1
	Turridae			1	1
Nemertea	*Nemertinea*	19	4	8	31
Phoronida	*Phoronis spp.*	2	1	8	11
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	1		1	2
Grand Total		**182**	**105**	**129**	**416**

SITE 11 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	21	8	28	57
Annelida: Polychaeta	*Aricidea fragilis*	1	2	1	4
	Carazziella hobsonae	27	5	27	59
	Ceratonereis irritabilis	70	69	40	179
	Clymenella torquata		1	1	2
	Dorvillea rudolphi	1	1		2
	Drilonereis longa	1			1
	Eteone heteropoda		1		1
	Exogone dispar	2	6	2	10
	Glycinde solitaria	9	7	9	25
	Heteromastus filiformis	1			1
	Leitoscoloplos spp.	7	3	1	11
	Lysidice ninetta		2		2
	Lysilla alba	3		5	8
	Marphysa sanguinea		1		1
	Mediomastus ambiseta	45	39	40	124
	Melinna maculata	1	3		4
	Monticellina baptisteae-dorsobranchialis	10		1	11
	Notomastus spp.	12	9	6	27
	Parapionosyllis longicirrata		1		1
	Podarke obscura	7	1	3	11
	Podarkeopsis levifuscina	2	2	5	9
	Polydora socialis		2		2
	Sabaco elongatus		2		2
	Scoletoma tenuis	8	4	9	21
Arthropoda: Amphipoda	*Ampelisca spp.*	5	3	3	11
	Cerapus tubularis	1			1
	Corophium acherusicum		2		2
	Listriella barnardi	66	44	22	132
Arthropoda: Decapoda	*Pinnixa chaetopterana*	1	2		3
Arthropoda: Isopoda	*Cyathura burbanki*	1	1	2	4
Chordata: Hemichordata	*Hemichordata*			1	1
Mollusca: Bivalvia	*Abra aequalis*		1		1
	Aligena elevata		1	3	4
	Bivalvia: Unidentified			2	2
	Macoma tenta	1			1
	Mercenaria mercenaria			1	1
	Mulinia lateralis	5	1		6
	Tagelus divisus		1	1	2
	Tellina agilis	8	3	5	16
Mollusca: Gastropoda	*Acteocina canaliculata*	8	7	6	21
	Gastropoda		1		1
	Turbonilla spp.	1			1
Nemertea	*Nemertinea*	3	4	2	9
Phoronida	*Phoronis spp.*	1			1
Grand Total		329	240	226	795

SITE 12 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	59	45	57	161
Annelida: Polychaeta	*Aricidea fragilis*	3	3	3	9
	Carazziella hobsonae	19	43	37	99
	Ceratonereis irritabilis	45	69	31	145
	Clymenella torquata	10	17	12	39
	Dorvillea rudolphi	1			1
	Eteone heteropoda	1		1	2
	Exogone dispar	5	7	2	14
	Glycera americana	2	1	2	5
	Glycinde solitaria	10	8	12	30
	Heteromastus filiformis		1	1	2
	Leitoscoloplos spp.	5	10	5	20
	Macroclymene zonalis	1			1
	Marphysa sanguinea	1			1
	Mediomastus ambiseta	40	72	55	167
	Monticellina baptisteae-dorsobranchialis		1		1
	Notomastus spp.		1	1	2
	Owenia fusiformis	1			1
	Paraprionospio pinnata	1	1	1	3
	Phyllodoce arenae	2	1	1	4
	Podarke obscura	4	1		5
	Podarkeopsis levifuscina		1		1
	Polydora socialis	6	7	10	23
	Scoletoma tenuis	4	9	11	24
	Sigambra tentaculata	1			1
	Spiochaetopterus costarum	12	9	10	31
Arthropoda: Amphipoda	*Ampelisca spp.*	11	12	10	33
	Ampelisca verrilli	24	8	6	38
	Cerapus tubularis	1	3		4
	Listriella barnardi	24	35	19	78
	Listriella clymenellae	2		1	3
Arthropoda: Cumacea	*Leucon americanus*			1	1
Arthropoda: Decapoda	*Pagurus annulipes*			1	1
	Pinnixa chaetopterana		1	3	4
	Xanthidae		1		1
Arthropoda: Isopoda	*Cyathura burbanki*	2			2
Chordata: Hemichordata	*Hemichordata*	9	4	12	25
Echinodermata: Ophiuroidea	*Microphiopholis atra*	1			1
Mollusca: Bivalvia	*Aligena elevata*		2	1	3
	Macoma tenta		1		1
	Mercenaria mercenaria		1		1
	Mulinia lateralis	1			1
	Tagelus divisus	3	1	1	5
	Tellina agilis	15	5	13	33
Mollusca: Gastropoda	*Acteocina canaliculata*	22	16	22	60
	Anachis avara		1		1
	Astyris lunata	3	3		6
	Odostomia spp.	1			1
	Turbonilla spp.	1			1
Nemertea	*Nemertinea*	3	3	5	11
Phoronida	*Phoronis spp.*			1	1
Sipuncula	*Sipuncula*		1		1
Grand Total		356	405	348	1109

SITE 13 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	13	9	15	37
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*	1			1
	Aricidea fragilis	1	2	3	6
	Caraziella hobsonae	38	56	59	153
	Ceratonereis irritabilis	119	113	85	317
	Clymenella torquata	5	25	24	54
	Dorvillea rudolphi			2	2
	Drilonereis longa			1	1
	Exogone dispar	26	13	10	49
	Flabelligeridae spp.	1			1
	Glycera americana	1	1	1	3
	Glycinde solitaria	7	11	8	26
	Leitoscoloplos spp.	4	5	7	16
	Lysidice ninetta	1			1
	Marphysa sanguinea			1	1
	Mediomastus ambiseta	52	38	49	139
	Monticellina baptisteae-dorsobranchialis	1			1
	Parapionosyllis longicirrata	1		3	4
	Phyllodoce arenae	1			1
	Podarke obscura			5	5
	Podarkeopsis levifuscina	1			1
	Polydora socialis	7			7
	Scoletoma tenuis	12	16	13	41
	Spiochaetopterus costarum	3	5	7	15
Arthropoda: Amphipoda	*Ampelisca spp.*	23	26	19	68
	Ampelisca verrilli	18	6	13	37
	Cerapus tubularis	7	4		11
	Corophium acherusicum	1	13	2	16
	Listriella barnardi	38	58	40	136
	Listriella clymenellae			1	1
Arthropoda: Decapoda	*Pinnixa chaetopterana*			3	3
	Thalassinidea		1		1
	Upogebia affinis			1	1
Arthropoda: Isopoda	*Cyathura burbanki*	2	2		4
	Ptilanthura tenuis	1			1
Chordata: Hemichordata	*Hemichordata*		1		1
Cnidaria: Anthozoa	*Anthozoa*			1	1
Echinodermata: Ophiuroidea	*Microphiopholis atra*			1	1
Mollusca: Bivalvia	*Aligena elevata*		3	10	13
	Bivalvia: Unidentified			2	2
	Tagelus divisus	2		1	3
	Tellina agilis	4		9	13
Mollusca: Gastropoda	*Acteocina canaliculata*	13	11	9	33
	Astyris lunata	2	1		3
	Gastropoda	1	2	2	5
	Odostomia spp.	1			1
	Turbonilla spp.			3	3
	Turridae			1	1
Nemertea	*Nemertinea*	3	3	2	8
Platyhelminthes: Turbellaria	*Stylochus ellipticus*			1	1
Sipuncula	*Phascolion strombi*	1		1	2
Grand Total		**412**	**425**	**415**	**1252**

SITE 14 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	4	12	25	41
Annelida: Polychaeta	*Aglaophamus verrilli*			1	1
	Apoprionospio pygmaea		1		1
	Aricidea fragilis	3	1	1	5
	Capitella capitata complex		3		3
	Caraziella hobsonae	1	2	10	13
	Caulleriella sp. B (Blake)		1	1	2
	Ceratonereis irritabilis	2	2	2	6
	Clymenella torquata		1		1
	Dorvillea rudolphi	1			1
	Drilonereis longa		1		1
	Eteone heteropoda	1	1		2
	Exogone dispar		1		1
	Glycera dibranchiata	1	2	1	4
	Glycinde solitaria	7	2	3	12
	Leitoscoloplos spp.	1	2	1	4
	Mediomastus ambiseta	9	9	14	32
	Neanthes arenaceodentata	8	1	1	10
	Notomastus spp.	2			2
	Owenia fusiformis			1	1
	Paraprionospio pinnata	1	1		2
	Phyllodoce arenae			1	1
	Podarkeopsis levifuscina		1		1
	Polydora cornuta		1		1
	Polydora socialis	1			1
	Prionospio perkinsi		1		1
	Scoletoma tenuis	3		1	4
	Sigambra tentaculata	1			1
	Spiochaetopterus costarum	3	6	6	15
	Streblospio benedicti	1	3	2	6
Arthropoda: Amphipoda	*Ampelisca spp.*	12	20	15	47
	Ampelisca verrilli	41	65	44	150
	Cerapus tubularis	1		1	2
	Corophium tuberculatum	2			2
	Listriella barnardi	4		1	5
Arthropoda: Cumacea	*Leucon americanus*		1		1
Arthropoda: Decapoda	*Pinnixa chaetopterana*	1	1	3	5
	Thalassinidea	1			1
Arthropoda: Isopoda	*Ptilanthura tenuis*		2		2
Chordata: Hemichordata	*Hemichordata*	2		3	5
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	3	3	1	7
Mollusca: Bivalvia	*Bivalvia: Unidentified*	1			1
	Macoma tenta		1		1
	Mercenaria mercenaria		1	2	3
	Mulinia lateralis	1	3	1	5
	Mysella planulata	2	2		4
	Solen viridis		1		1
	Tellina agilis	9	12	5	26
	Tellina spp.	1			1
Mollusca: Gastropoda	*Acteocina canaliculata*	23	20	25	68
	Astyris lunata		1		1
	Turbonilla spp.		1		1
Nemertea	*Nemertinea*	5	5	1	11
Phoronida	*Phoronis spp.*	1	2	1	4
Grand Total		**160**	**196**	**174**	**530**

SITE 15 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	7	18	5	30
Annelida: Polychaeta	*Aricidea fragilis*	3	1	4	8
	Bhawania heteroseta		2		2
	Carazziella hobsonae		5	1	6
	Ceratonereis irritabilis	2	2	10	14
	Clymenella torquata	4	3	3	10
	Eteone heteropoda			1	1
	Glycera americana	1	1	1	3
	Glycinde solitaria	8	10	11	29
	Leitoscoloplos spp.	1	8	2	11
	Loimia medusa	1			1
	Mediomastus ambiseta	31	8	20	59
	Monticellina baptisteae-dorsobranchialis	3	3	2	8
	Notomastus spp.	2	7		9
	Owenia fusiformis	1			1
	Paraprionospio pinnata	3	1	1	5
	Phyllodoce arenae	1	1		2
	Podarkeopsis levifuscina	1			1
	Polydora socialis			2	2
	Scoletoma tenuis	7	9	12	28
	Spiochaetopterus costarum			1	1
Arthropoda: Amphipoda	*Ampelisca spp.*	18	14	16	48
	Ampelisca verrilli	11	10	17	38
	Corophium acherusicum		2		2
	Listriella barnardi	8	6	7	21
	Listriella clymenellae	1			1
Arthropoda: Decapoda	*Pinnixa chaetopterana*	2		1	3
Arthropoda: Isopoda	*Cyathura burbanki*	1	2	1	4
Arthropoda: Pycnogonida	*Anoplodactylus petiolatus*	1		1	2
Chordata: Hemichordata	*Hemichordata*	7	2	7	16
Mollusca: Bivalvia	*Bivalvia: Unidentified*			1	1
	Mercenaria mercenaria		1		1
	Mulinia lateralis	1	4		5
	Tagelus divisus		2		2
	Tellina agilis	1	3	2	6
Mollusca: Gastropoda	*Acteocina canaliculata*	18	7	13	38
	Odostomia spp.			2	2
	Turbonilla spp.		1	2	3
	Turridae			1	1
Nemertea	*Nemertinea*	2		1	3
Phoronida	*Phoronis spp.*	3	3	1	7
Grand Total		150	136	149	435

SITE 16 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	1		2	3
	Tubificoides wasselli		1		1
Annelida: Polychaeta	*Apoprionospio pygmaea*	4	3	5	12
	Capitella capitata complex			2	2
	Caulleriella sp. B (Blake)	8	26	19	53
	Diopatra cuprea	1			1
	Exogone dispar	2			2
	Glycera americana	1			1
	Glycera dibranchiata			1	1
	Glycinde solitaria	7	6	7	20
	Magelona spp.			1	1
	Mediomastus ambiseta	42	43	74	159
	Neanthes succinea	1	1		2
	Owenia fusiformis	1		2	3
	Paraprionospio pinnata	3			3
	Phyllodoce arenae			1	1
	Polydora cornuta	3			3
	Scolelepis texana			1	1
	Spiochaetopterus costarum			1	1
	Streblospio benedicti	3		3	6
Arthropoda: Amphipoda	*Ampelisca spp.*	2	1		3
	Ampelisca verrilli	5	9	30	44
	Ampithoidae spp.	1			1
	Cerapus tubularis	2			2
	Corophium tuberculatum	1			1
	Listriella barnardi			1	1
Arthropoda: Cumacea	*Oxyurostylis smithi*		3		3
Cnidaria: Anthozoa	*Edwardsia elegans*	1	1		2
Echinodermata: Holothuroidea	*Leptosynapta tenuis*			1	1
Mollusca: Bivalvia	*Ensis directus*		1		1
	Mercenaria mercenaria	6	5	4	15
	Mulinia lateralis	7	2	4	13
	Tellina agilis	43	35	24	102
Mollusca: Gastropoda	*Acteocina canaliculata*	2	2		4
	Gastropoda	1			1
	Rictaxis punctostriatus			1	1
Nemertea	*Nemertinea*	2	4	5	11
Phoronida	*Phoronis spp.*		1		1
Grand Total		150	144	189	483

SITE 17 - ABUNDANCE		REP			
PHYLUM	**TAXON**	**1**	**2**	**3**	**Grand Total**
Annelida: Oligochaeta	*Tubificoides spp.*	13	15	4	32
Annelida: Polychaeta	*Apoprionospio pygmaea*			1	1
	Arabella iricolor-multidentata complex		1		1
	Aricidea fragilis	2	11	3	16
	Autolytus prolifer			1	1
	Carazziella hobsonae	24	41	1	66
	Ceratonereis irritabilis	1	9	5	15
	Clymenella torquata	9	12	8	29
	Dorvillea rudolphi		1		1
	Drilonereis longa		1		1
	Exogone dispar	1	2		3
	Glycinde solitaria	1	4	2	7
	Leitoscoloplos spp.	1	1	2	4
	Marphysa sanguinea		1		1
	Mediomastus ambiseta	109	46	46	201
	Melinna maculata		1	1	2
	Neanthes arenaceodentata	5			5
	Notocirrus spiniferus			1	1
	Notomastus spp.	3	3	3	9
	Owenia fusiformis		1		1
	Phyllodoce arenae			1	1
	Podarkeopsis levifuscina	2	2		4
	Polydora cornuta	10			10
	Polydora socialis	1	6		7
	Scoletoma tenuis	6	11	12	29
Arthropoda: Amphipoda	*Ampelisca spp.*	1	5	10	16
	Ampelisca verrilli	9	16	14	39
	Batea catharinensis	1			1
	Cerapus tubularis	4		1	5
	Corophium tuberculatum		5	3	8
	Listriella barnardi	2	1	5	8
Arthropoda: Decapoda	*Pinnixa chaetopterana*	1	1		2
	Thalassinidea		1		1
Arthropoda: Isopoda	*Erichsonella filiformis*	3			3
Chordata: Hemichordata	*Hemichordata*			2	2
Cnidaria: Anthozoa	*Anthozoa*	1			1
Mollusca: Bivalvia	*Aligena elevata*	1			1
	Mercenaria mercenaria	1			1
	Mulinia lateralis		1		1
	Tagelus divisus		1	1	2
	Tellina agilis	4	4	3	11
Mollusca: Gastropoda	*Acteocina canaliculata*	2	2	1	5
	Astyris lunata	1	3		4
	Turbonilla spp.	1	1		2
Nemertea	*Nemertinea*	4		1	5
Phoronida	*Phoronis spp.*	1	1	1	3
Grand Total		**225**	**211**	**133**	**569**

SITE 18 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	2	4	2	8
Annelida: Polychaeta	*Apoprionospio pygmaea*			2	2
	Arabella iricolor-multidentata complex		1	1	2
	Aricidea fragilis	1			1
	Autolytus prolifer			1	1
	Bhawania heteroseta		1		1
	Capitella capitata complex			1	1
	Carazziella hobsonae			1	1
	Caulleriella sp. B (Blake)	1			1
	Clymenella torquata	5	3	4	12
	Diopatra cuprea	1			1
	Dorvillea rudolphi			2	2
	Drilonereis spp.	1	1		2
	Exogone dispar	1	3	1	5
	Glycera americana		1	1	2
	Glycera dibranchiata			1	1
	Glycinde solitaria	4	7	6	17
	Leitoscoloplos spp.	3		1	4
	Loimia medusa	2	3		5
	Mediomastus ambiseta	7	5	9	21
	Monticellina baptisteae-dorsobranchialis			1	1
	Notomastus spp.	4	2	5	11
	Owenia fusiformis	4		2	6
	Paraprionospio pinnata		1		1
	Podarke obscura			1	1
	Polydora cornuta	2			2
	Scoletoma tenuis	13	6	8	27
	Scoloplos rubra			1	1
	Spiochaetopterus costarum	5	4	3	12
Arthropoda: Amphipoda	*Ampelisca spp.*	6	5	5	16
	Ampelisca verrilli	7	1	3	11
	Listriella barnardi	4	4	4	12
Arthropoda: Cumacea	*Leucon americanus*			1	1
Arthropoda: Decapoda	*Pinnixa chaetopterana*	1	2		3
Arthropoda: Isopoda	*Ptilanthura tenuis*	6	2	2	10
Chordata: Hemichordata	*Hemichordata*	12	12	28	52
Cnidaria: Anthozoa	*Anthozoa*	1	1	3	5
	Ceriantheopsis americanus			1	1
Echinodermata: Holothuroidea	*Leptosynapta tenuis*		2	4	6
Echinodermata: Ophiuroidea	*Microphiopholis atra*	1			1
Mollusca: Bivalvia	*Aligena elevata*	2			2
	Bivalvia: Unidentified			2	2
	Mulinia lateralis		4	3	7
	Tagelus divisus	2	3	4	9
	Tellina agilis	5	5	9	19
Mollusca: Gastropoda	*Acteocina canaliculata*	7	14	8	29
	Astyris lunata	2			2
	Turbonilla spp.	5	2		7
Nemertea	*Nemertinea*	8	3	6	17
Phoronida	*Phoronis spp.*	6	5	2	13
Platyhelminthes: Turbellaria	*Stylochus ellipticus*			1	1
Grand Total		**131**	**107**	**140**	**378**

SITE 19 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	6	18	46	70
Annelida: Polychaeta	*Aricidea fragilis*	1			1
	Carazziella hobsonae	13	42	76	131
	Ceratonereis irritabilis	1	1	2	4
	Clymenella torquata	4	6	9	19
	Dorvillea rudolphi		1		1
	Drilonereis longa	1			1
	Exogone dispar	1	1		2
	Glycera americana	1			1
	Glycinde solitaria	19	25	9	53
	Heteromastus filiformis		1		1
	Leitoscoloplos spp.	1	4	5	10
	Macroclymene zonalis			1	1
	Mediomastus ambiseta	31	61	37	129
	Monticellina baptisteae-dorsobranchialis	2	3	3	8
	Notomastus spp.	5	3	1	9
	Paraprionospio pinnata		1	1	2
	Podarke obscura			2	2
	Podarkeopsis levifuscina	1			1
	Sabaco elongatus	2			2
	Scoletoma tenuis	5	12	4	21
	Spiochaetopterus costarum	1	2	1	4
Arthropoda: Amphipoda	*Ampelisca spp.*	7	4	6	17
	Ampelisca verrilli			2	2
	Cerapus tubularis		1	1	2
	Listriella barnardi	4	21	9	34
Arthropoda: Cumacea	*Leucon americanus*			2	2
Arthropoda: Decapoda	*Ogyrides alphaerostris*		1		1
	Pinnixa chaetopterana		2	1	3
Arthropoda: Isopoda	*Cyathura burbanki*	6	5	4	15
Arthropoda: Pycnogonida	*Anoplodactylus petiolatus*		1	1	2
Chordata: Hemichordata	*Hemichordata*			1	1
Mollusca: Bivalvia	*Aligena elevata*	4	6		10
	Tagelus divisus		1	1	2
	Tellina agilis	2	3	1	6
Mollusca: Gastropoda	*Acteocina canaliculata*	5	1	1	7
	Pisania tincta	1			1
	Pyramidella crenulata	1			1
	Turbonilla spp.		2	2	4
Nemertea	*Nemertinea*	2	2	2	6
Grand Total		**127**	**231**	**231**	**589**

SITE 20 - ABUNDANCE		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	20	13	18	51
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*			1	1
	Aricidea fragilis		2	2	4
	Carazziella hobsonae	1	3	15	19
	Ceratonereis irritabilis	4	5	5	14
	Clymenella torquata		3	2	5
	Dorvillea rudolphi			1	1
	Exogone dispar			1	1
	Glycera dibranchiata	1			1
	Glycinde solitaria	15	16	18	49
	Heteromastus filiformis			2	2
	Leitoscoloplos spp.	4	5	7	16
	Mediomastus ambiseta	7	10	23	40
	Monticellina baptisteae-dorsobranchialis	6	3	8	17
	Paraprionospio pinnata	1		2	3
	Phyllodoce arenae	1	3		4
	Podarke obscura	1	1	1	3
	Scoletoma tenuis	5	4	3	12
Arthropoda: Amphipoda	*Ampelisca spp.*	8	11	7	26
	Ampelisca verrilli	11	7	8	26
	Cerapus tubularis	1			1
	Listriella barnardi	6	6	6	18
Arthropoda: Cumacea	*Leucon americanus*	4		1	5
Arthropoda: Decapoda	*Pinnixa chaetopterana*	1	2	2	5
Arthropoda: Isopoda	*Cyathura burbanki*	1	4	6	11
Chordata: Hemichordata	*Hemichordata*		6	3	9
Mollusca: Bivalvia	*Bivalvia: Unidentified*			3	3
	Tagelus divisus		2		2
	Tellina agilis		1		1
	Tellinidae	1			1
Mollusca: Gastropoda	*Acteocina canaliculata*		4	7	11
Nemertea	*Nemertinea*	5	2	3	10
Phoronida	*Phoronis spp.*		1	1	2
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	4		1	5
Grand Total		**108**	**114**	**157**	**379**

E. SUMMARY OF SPECIES BIOMASS PER REPLICATE

SITE C1 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Polychaeta	*Amastigos caperatus*		0.001		0.001
	Apoprionospio pygmaea		0.001	0.001	0.002
	Ceratonereis irritabilis		0.001		0.001
	Glycera dibranchiata	0.068	0.001		0.069
	Magelona spp.		0.003	0.001	0.004
	Polydora spp.	0.001			0.001
	Scoletoma tenuis	0.001			0.001
Arthropoda: Amphipoda	*Batea catharinensis*	0.001		0.001	0.002
	Microprotopus raneyi	0.001	0.001		0.002
	Parahaustorius longimerus	0.009	0.016	0.018	0.043
Arthropoda: Decapoda	*Lepidopa websteri*		0.001		0.001
	Pagurus pubescens			0.002	0.002
	Upogebia affinis			0.001	0.001
Arthropoda: Isopoda	*Idotea spp.*		0.001		0.001
Mollusca: Bivalvia	*Donax variabilis*	0.001		0.001	0.002
	Tellina agilis			0.001	0.001
Mollusca: Gastropoda	*Astyris lunata*	0.001			0.001
Nemertea	*Nemertinea*			0.001	0.001
Grand Total		**0.083**	**0.026**	**0.027**	**0.136**

SITE C2 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Polychaeta	*Magelona spp.*		0.001	0.001	0.002
	Nephtys picta			0.012	0.012
Arthropoda: Amphipoda	*Ameroculodes species complex*			0.001	0.001
	Cerapus tubularis	0.001			0.001
	Microprotopus raneyi	0.001			0.001
	Parahaustorius longimerus	0.008	0.013	0.014	0.035
Arthropoda: Isopoda	*Chiridotea spp.*	0.001			0.001
Arthropoda: Tanaidacea	*Leptognatha caeca*			0.001	0.001
Mollusca: Bivalvia	*Donax variabilis*	0.001	0.001		0.002
	Tellina agilis			0.001	0.001
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Grand Total		**0.013**	**0.016**	**0.031**	**0.06**

SITE C3 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
	Tubificoides wasselli	0.001		0.001	0.002
Annelida: Polychaeta	*Ancistrosyllis hartmanae*		0.001		0.001
	Ancistrosyllis spp.	0.001			0.001
	Carazziella hobsonae		0.001		0.001
	Caulleriella sp. B (Blake)	0.001	0.001	0.001	0.003
	Drilonereis longa		0.001		0.001
	Glycera americana	0.001	0.038	0.001	0.04
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Magelona spp.		0.001		0.001
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Notocirrus spiniferus		0.006		0.006
	Paraonidae spp.	0.001			0.001
	Paraprionospio pinnata	0.001	0.001	0.001	0.003
	Prionospio perkinsi	0.001	0.001		0.002
	Pseudopotamilla reniformis			0.002	0.002
	Sigambra tentaculata	0.001	0.001	0.001	0.003
	Streblospio benedicti		0.001		0.001
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Batea catharinensis		0.001		0.001
	Cerapus tubularis		0.001		0.001
	Listriella barnardi		0.001		0.001
Arthropoda: Cumacea	*Leucon americanus*	0.002	0.002	0.002	0.006
Arthropoda: Decapoda	*Pinnixa chaetopterana*	0.001		0.004	0.005
Echinodermata: Ophiuroidea	*Microphiopholis atra*		0.017		0.017
Mollusca: Bivalvia	*Anadara ovalis*	0.073			0.073
	Donax variabilis	0.001			0.001
	Ensis directus	0.231	0.053	0.034	0.318
	Nucula proxima		0.013		0.013
	Tellina agilis	0.005	0.002	0.001	0.008
Mollusca: Gastropoda	*Astyris lunata*	0.001	0.001		0.002
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Phoronida	*Phoronis spp.*	0.001			0.001
Grand Total		0.328	0.149	0.053	0.53

SITE C4 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
	Tubificoides wasselli	0.001	0.001	0.001	0.003
Annelida: Oligochaeta Total		0.002	0.002	0.002	0.006
Annelida: Polychaeta	*Bhawania heteroseta*	0.001	0.002	0.001	0.004
	Cabira incerta	0.001		0.001	0.002
	Caulleriella sp. B (Blake)			0.001	0.001
	Diopatra cuprea		0.012		0.012
	Dorvillea rudolphi		0.001	0.001	0.002
	Glycera americana		0.001	0.002	0.003
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Loimia medusa		0.019		0.019
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Monticellina baptisteae-dorsobranchialis	0.001			0.001
	Notocirrus spiniferus		0.002		0.002
	Paraprionospio pinnata	0.001	0.005	0.001	0.007
	Podarkeopsis levifuscina		0.001		0.001
	Polydora cornuta		0.001		0.001
	Polydora socialis		0.001		0.001
	Prionospio perkinsi	0.001	0.001	0.001	0.003
	Scoletoma tenuis		0.001		0.001
	Sigambra tentaculata	0.001	0.001	0.001	0.003
Annelida: Polychaeta Total		0.008	0.05	0.011	0.069
Arthropoda: Amphipoda	*Ampelisca spp.*		0.001	0.001	0.002
	Cerapus tubularis		0.001		0.001
	Listriella barnardi	0.001	0.001	0.001	0.003
Arthropoda: Amphipoda Total		0.001	0.003	0.002	0.006
Arthropoda: Cumacea	*Leucon americanus*	0.001		0.001	0.002
Arthropoda: Cumacea Total		0.001		0.001	0.002
Arthropoda: Decapoda	*Biffarius biformis*	0.001			0.001
	Pinnixa chaetopterana		0.004		0.004
Arthropoda: Decapoda Total		0.001	0.004		0.005
Chordata: Hemichordata	*Hemichordata*		0.001	0.001	0.002
Chordata: Hemichordata Total			0.001	0.001	0.002
Cnidaria: Anthozoa	*Anthozoa*		0.001		0.001
	Edwardsia elegans		0.002		0.002
Cnidaria: Anthozoa Total			0.003		0.003
Echinodermata: Ophiuroidea	*Microphiopholis atra*		0.001		0.001
Echinodermata: Ophiuroidea Total			0.001		0.001
Mollusca: Bivalvia	*Abra aequalis*		0.008	0.003	0.011
	Anadara ovalis	0.022	0.085		0.107
	Donax variabilis	0.001	0.001	0.001	0.003
	Macoma tenta		0.008		0.008
Mollusca: Bivalvia Total		0.023	0.102	0.004	0.129
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.001	0.003
	Astyris lunata	0.001	0.001	0.001	0.003
	Cylichnella bidentata			0.001	0.001
	Nassarius trivittatus			0.001	0.001
Mollusca: Gastropoda Total		0.002	0.002	0.004	0.008
Nemertea	*Nemertinea*	0.002	0.001	0.006	0.009
Nemertea Total		0.002	0.001	0.006	0.009
Phoronida	*Phoronis spp.*		0.001	0.002	0.003
Phoronida Total			0.001	0.002	0.003
Platyhelminthes: Turbellaria	*Stylochus ellipticus*		0.001		0.001
Platyhelminthes: Turbellaria Total			0.001		0.001
Grand Total		**0.04**	**0.171**	**0.033**	**0.244**

SITE C5 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides sp. A*		0.001		0.001
	Tubificoides spp.	0.001	0.002	0.001	0.004
	Tubificoides wasselli	0.001	0.001	0.001	0.003
Annelida: Oligochaeta Total		0.002	0.004	0.002	0.008
Annelida: Polychaeta	*Ancistrosyllis hartmanae*		0.001	0.001	0.002
	Arabella iricolor-multidentata complex		0.012		0.012
	Bhawania heteroseta			0.001	0.001
	Brania clavata		0.001		0.001
	Caulleriella sp. B (Blake)		0.001	0.001	0.002
	Diopatra cuprea		0.085		0.085
	Drilonereis longa		0.003		0.003
	Exogone dispar		0.001		0.001
	Glycera americana	0.001	0.001		0.002
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Heteromastus filiformis		0.002	0.001	0.003
	Leitoscoloplos spp.	0.001	0.001	0.002	0.004
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Neanthes succinea		0.001		0.001
	Notomastus spp.	0.001			0.001
	Paraprionospio pinnata	0.006		0.001	0.007
	Pista palmata		0.002		0.002
	Podarke obscura		0.001		0.001
	Prionospio perkinsi		0.001		0.001
	Scoletoma tenuis		0.002	0.004	0.006
	Sigambra tentaculata	0.001		0.001	0.002
	Sthenelais boa		0.019		0.019
Annelida: Polychaeta Total		0.012	0.136	0.014	0.162
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.001			0.001
	Batea catharinensis		0.001		0.001
	Elasmopus levis		0.002		0.002
	Eobrolgus spinosus		0.001		0.001
	Listriella barnardi		0.001	0.001	0.002
Arthropoda: Amphipoda Total		0.002	0.006	0.002	0.01
Arthropoda: Cumacea	*Leucon americanus*	0.001	0.001	0.001	0.003
Arthropoda: Cumacea Total		0.001	0.001	0.001	0.003
Arthropoda: Decapoda	*Ogyrides alphaerostris*	0.003			0.003
	Pagurus longicarpus		0.001		0.001
	Pinnixa chaetopterana			0.001	0.001
Arthropoda: Decapoda Total		0.003	0.001	0.001	0.005
Arthropoda: Isopoda	*Erichsonella filiformis*		0.001		0.001
Arthropoda: Isopoda Total			0.001		0.001
Cnidaria: Anthozoa	*Edwardsia elegans*	0.001		0.003	0.004
Cnidaria: Anthozoa Total		0.001		0.003	0.004
Mollusca: Bivalvia	*Abra aequalis*			0.002	0.002
	Anadara ovalis		1.042	0.029	1.071
	Anadara transversa		0.001		0.001
	Donax variabilis			0.001	0.001
	Nucula proxima		0.001	0.001	0.002
	Tellina agilis	0.001	0.001		0.002
	Tellinidae		0.001		0.001
Mollusca: Bivalvia Total		0.001	1.046	0.033	1.08
Mollusca: Gastropoda	*Acteocina canaliculata*		0.001	0.001	0.002
	Anachis avara		0.005		0.005
	Astyris lunata		0.021	0.002	0.023
Mollusca: Gastropoda Total			0.027	0.003	0.03
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Nemertea Total		0.001	0.001	0.001	0.003
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	0.001			0.001
Platyhelminthes: Turbellaria Total		0.001			0.001
Grand Total		**0.024**	**1.223**	**0.06**	**1.307**

SITE C6 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Eteone heteropoda*		0.001		0.001
	Mediomastus ambiseta			0.001	0.001
	Notomastus spp.			0.004	0.004
	Paraprionospio pinnata			0.001	0.001
Arthropoda: Amphipoda	*Ampelisca spp.*		0.001		0.001
	Cerapus tubularis		0.001		0.001
Arthropoda: Cumacea	*Leucon americanus*	0.001	0.001	0.001	0.003
Mollusca: Gastropoda	*Astyris lunata*			0.001	0.001
	Polinices duplicata			0.001	0.001
Nemertea	*Nemertinea*			0.001	0.001
Grand Total		**0.002**	**0.005**	**0.011**	**0.018**

SITE C7 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Bhawania heteroseta*	0.001		0.001	0.002
	Diopatra cuprea		0.026		0.026
	Dorvillea rudolphi		0.001	0.001	0.002
	Drilonereis longa		0.001		0.001
	Exogone dispar		0.001		0.001
	Glycera americana			0.02	0.02
	Glycinde solitaria		0.001	0.001	0.002
	Leitoscoloplos spp.	0.001	0.001	0.003	0.005
	Lepidonotus variabilis		0.001		0.001
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Monticellina baptisteae-dorsobranchialis	0.001	0.001	0.001	0.003
	Parapionosyllis longicirrata		0.001		0.001
	Paraprionospio pinnata		0.001		0.001
	Podarkeopsis levifuscina	0.001			0.001
	Pseudopotamilla reniformis		0.001		0.001
	Scoletoma tenuis	0.001	0.001		0.002
	Spiochaetopterus costarum		0.001		0.001
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001		0.002
	Cerapus tubularis		0.001	0.001	0.002
	Listriella barnardi	0.001		0.001	0.002
Arthropoda: Cumacea	*Leucon americanus*	0.001	0.002	0.001	0.004
Mollusca: Bivalvia	*Anadara ovalis*		0.014		0.014
	Macoma tenta	0.013		0.005	0.018
	Neotia ponderosa		0.001		0.001
	Tellina agilis	0.001	0.001		0.002
	Tellinidae		0.001		0.001
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001		0.001	0.002
	Anachis obesa	0.002			0.002
	Astyris lunata	0.001	0.001	0.001	0.003
	Turbonilla spp.			0.001	0.001
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Grand Total		**0.029**	**0.063**	**0.041**	**0.133**

SITE C8 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001		0.002
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*	0.109			0.109
	Bhawania heteroseta	0.002			0.002
	Clymenella torquata	0.001	0.008	0.002	0.011
	Cossura soyeri	0.001			0.001
	Dorvillea rudolphi	0.001	0.001		0.002
	Exogone dispar	0.001	0.001	0.001	0.003
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Leitoscoloplos spp.		0.001		0.001
	Lepidonotus variabilis		0.001		0.001
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Neanthes succinea		0.001		0.001
	Notomastus spp.		0.019		0.019
	Parapionosyllis longicirrata	0.001	0.001		0.002
	Phyllodoce arenae	0.001	0.001	0.001	0.003
	Pista palmata			0.003	0.003
	Podarke obscura		0.001	0.001	0.002
	Polydora socialis		0.001		0.001
	Pseudopotamilla reniformis	0.001	0.001		0.002
	Scoletoma tenuis	0.001		0.002	0.003
	Sigambra tentaculata			0.001	0.001
	Spiochaetopterus costarum	0.002		0.001	0.003
	Terebellidae spp.		0.001		0.001
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.001			0.001
	Batea catharinensis		0.001		0.001
	Cerapus tubularis	0.001	0.001	0.001	0.003
	Listriella barnardi	0.001			0.001
	Unciola serrata			0.001	0.001
Arthropoda: Cumacea	*Leucon americanus*		0.001	0.001	0.002
Arthropoda: Decapoda	*Ogyrides alphaerostris*	0.001			0.001
Arthropoda: Pycnogonida	*Anoplodactylus petiolatus*		0.001	0.001	0.002
Chordata: Hemichordata	*Hemichordata*		0.001		0.001
Cnidaria: Anthozoa	*Anthozoa*	0.015			0.015
Echinodermata: Holothuroidea	*Leptosynapta tenuis*		0.001		0.001
Echinodermata: Ophiuroidea	*Microphiopholis atra*	0.001			0.001
Mollusca: Bivalvia	*Abra aequalis*			0.008	0.008
	Aligena elevata		0.001		0.001
	Lyonsia hyalina	0.001			0.001
	Mercenaria mercenaria	0.001	0.001	0.001	0.003
	Neotia ponderosa		0.001		0.001
	Nucula proxima	0.001		0.001	0.002
	Tagelus divisus	0.018			0.018
	Tellina agilis	0.001	0.001	0.001	0.003
	Tellinidae			0.002	0.002
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.003	0.005
	Astyris lunata		0.001		0.001
	Turbonilla spp.	0.001	0.001		0.002
Nemertea	*Nemertinea*	0.001	0.009	0.001	0.011
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	0.001	0.001		0.002
Sipuncula	*Phascolion strombi*		0.001		0.001
Grand Total		**0.171**	**0.066**	**0.036**	**0.273**

SITE C9 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Oligochaeta Total		0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*	0.009	0.06	0.011	0.08
	Aricidea catherinae	0.001	0.001	0.001	0.003
	Autolytus prolifer		0.001	0.001	0.002
	Brania wellfleetensis	0.001	0.001	0.001	0.003
	Caulleriella sp. B (Blake)	0.001	0.002	0.001	0.004
	Dorvillea rudolphi	0.001	0.001	0.001	0.003
	Drilonereis longa	0.002	0.001		0.003
	Exogone dispar		0.001	0.001	0.002
	Glycera dibranchiata			0.002	0.002
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Lysidice ninetta	0.001	0.001	0.001	0.003
	Marphysa sanguinea		0.001		0.001
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Monticellina baptisteae-dorsobranchialis	0.001	0.001	0.001	0.003
	Notomastus spp.	0.001			0.001
	Parapionosyllis longicirrata	0.001	0.001	0.001	0.003
	Pista palmata	0.001	0.001	0.002	0.004
	Podarke obscura	0.001	0.001	0.001	0.003
	Polycirrus eximius	0.001	0.001	0.001	0.003
	Polydora socialis		0.001	0.001	0.002
	Scoletoma tenuis	0.001		0.001	0.002
	Scoloplos rubra	0.002	0.002	0.003	0.007
	Spiochaetopterus costarum			0.001	0.001
	Sthenelais boa			0.005	0.005
	Streblospio benedicti		0.001		0.001
	Streptospinigera heteroseta		0.001	0.001	0.002
	Streptosyllis arenae	0.001	0.001		0.002
Annelida: Polychaeta Total		0.028	0.083	0.04	0.151
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001		0.001	0.002
	Ampelisca verrilli			0.001	0.001
	Eobrolgus spinosus		0.001	0.001	0.002
	Lysianassidae spp.			0.001	0.001
	Unciola serrata		0.001	0.001	0.002
Arthropoda: Amphipoda Total		0.001	0.002	0.005	0.008
Arthropoda: Decapoda	*Biffarius biformis*			0.001	0.001
Arthropoda: Decapoda Total				0.001	0.001
Cnidaria: Anthozoa	*Anthozoa*		0.001		0.001
Cnidaria: Anthozoa Total			0.001		0.001
Mollusca: Bivalvia	*Anadara transversa*			0.001	0.001
	Bivalvia: Unidentified	0.001			0.001
	Lyonsia hyalina			0.001	0.001
	Mercenaria mercenaria	0.001			0.001
	Mysella planulata			0.001	0.001
	Tellina agilis	0.001		0.001	0.002
Mollusca: Bivalvia Total		0.003		0.004	0.007
Mollusca: Gastropoda	*Marginella spp.*			0.001	0.001
Mollusca: Gastropoda Total				0.001	0.001
Nemertea	*Nemertinea*	0.001	0.001	0.003	0.005
Nemertea Total		0.001	0.001	0.003	0.005
Platyhelminthes: Turbellaria	*Stylochus ellipticus*			0.001	0.001
Platyhelminthes: Turbellaria Total				0.001	0.001
Grand Total		**0.034**	**0.088**	**0.056**	**0.178**

SITE C10 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.002	0.001	0.004
	Tubificoides wasselli	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*	0.009	0.05	0.038	0.097
	Aricidea catherinae	0.001	0.001	0.001	0.003
	Autolytus prolifer	0.001	0.001	0.002	0.004
	Brania wellfleetensis	0.001		0.001	0.002
	Caraziella hobsonae		0.001		0.001
	Ceratonereis irritabilis		0.001	0.001	0.002
	Dorvillea rudolphi	0.001	0.001	0.001	0.003
	Drilonereis longa		0.002		0.002
	Eteone heteropoda			0.001	0.001
	Exogone dispar	0.001	0.001	0.004	0.006
	Glycinde solitaria	0.002	0.001	0.001	0.004
	Lepidametria commensalis			0.013	0.013
	Lepidonotus variabilis	0.003		0.011	0.014
	Lysidice ninetta	0.001	0.001	0.008	0.01
	Marphysa sanguinea	0.004	0.027		0.031
	Mediomastus ambiseta	0.016	0.004	0.014	0.034
	Melinna maculata	0.001			0.001
	Monticellina baptisteae-dorsobranchialis	0.001	0.001		0.002
	Parapionosyllis longicirrata	0.001	0.001	0.001	0.003
	Paraprionospio pinnata		0.001		0.001
	Piromis roberti	0.001	0.013		0.014
	Pista palmata	0.033	0.014	0.068	0.115
	Podarke obscura	0.001	0.001	0.004	0.006
	Podarkeopsis levifuscina			0.001	0.001
	Polycirrus eximius	0.001	0.001	0.001	0.003
	Polydora socialis	0.001	0.001	0.001	0.003
	Pseudopotamilla reniformis	0.001			0.001
	Scoletoma tenuis	0.001	0.004	0.001	0.006
	Scoloplos rubra	0.001	0.001	0.003	0.005
	Sthenelais boa	0.016		0.011	0.027
	Streptospinigera heteroseta	0.001			0.001
Arthropoda: Amphipoda	*Ampelisca spp.*	0.004	0.011	0.006	0.021
	Batea catharinensis	0.001		0.001	0.002
	Cerapus tubularis	0.001	0.001	0.001	0.003
	Corophium simile			0.001	0.001
	Corophium tuberculatum	0.001	0.001	0.001	0.003
	Eobrolgus spinosus	0.001	0.001	0.001	0.003
	Melita nitida	0.001	0.001	0.001	0.003
	Photis reinhardi	0.001			0.001
	Unciola serrata	0.003	0.001	0.001	0.005
Arthropoda: Decapoda	*Biffarius biformis*	0.001		0.001	0.002
	Eurypanopeus depressus		0.003	0.021	0.024
	Panopeus herbstii			0.737	0.737
Arthropoda: Pycnogonida	*Pycnogonida*	0.001	0.001		0.002
Mollusca: Bivalvia	*Anadara ovalis*			0.013	0.013
	Cumingia tellinoides	0.001			0.001
	Ensis directus		0.078		0.078
	Mercenaria mercenaria	0.001	0.001	0.001	0.003
	Neotia ponderosa	0.003	0.001	0.002	0.006
	Nucula proxima	0.02	0.008	0.02	0.048
	Tellina agilis	0.001	0.001	0.001	0.003
	Tellinidae	0.001			0.001
Mollusca: Gastropoda	*Astyris lunata*	0.004	0.002	0.003	0.009
	Boonea impressa	0.001	0.001	0.001	0.003
	Boreotrophon spp.			0.001	0.001
	Cerithiidae spp.			0.001	0.001
	Gastropoda	0.001	0.001		0.002
	Odostomia spp.	0.001		0.001	0.002
	Polinices duplicata	0.001	0.001	0.001	0.003
Nemertea	*Nemertinea*	0.001	0.006	0.001	0.008
Grand Total		0.153	0.252	1.007	1.412

SITE 1 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Apoprionospio pygmaea*	0.001	0.001	0.001	0.003
	Aricidea fragilis		0.001	0.001	0.002
	Autolytus prolifer			0.001	0.001
	Carazziella hobsonae		0.001		0.001
	Caulleriella sp. B (Blake)			0.001	0.001
	Ceratonereis irritabilis	0.001	0.001	0.007	0.009
	Exogone dispar			0.001	0.001
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Notocirrus spiniferus	0.014			0.014
	Owenia fusiformis	0.002			0.002
	Paraprionospio pinnata	0.001	0.002	0.002	0.005
	Pectinaria gouldii	0.001			0.001
	Polydora cornuta			0.001	0.001
	Prionospio perkinsi		0.001		0.001
	Scoletoma tenuis	0.005	0.004		0.009
	Spiochaetopterus costarum			0.001	0.001
	Streblospio benedicti			0.001	0.001
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.002	0.004	0.001	0.007
	Batea catharinensis	0.001			0.001
	Cerapus tubularis			0.001	0.001
	Listriella barnardi	0.001	0.001	0.001	0.003
Arthropoda: Cumacea	*Oxyurostylis smithi*	0.001		0.001	0.002
Arthropoda: Decapoda	*Biffarius biformis*	0.001		0.001	0.002
	Pinnixa chaetopterana		0.002	0.001	0.003
Arthropoda: Isopoda	*Ptilanthura tenuis*		0.001	0.001	0.002
Chordata: Hemichordata	*Hemichordata*	0.001	0.001	0.001	0.003
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	0.001	0.002	0.001	0.004
Mollusca: Bivalvia	*Bivalvia: Unidentified*			0.001	0.001
	Mercenaria mercenaria		0.001	0.001	0.002
	Mulinia lateralis	0.001	0.001	0.001	0.003
	Mysella planulata	0.001	0.001	0.001	0.003
	Tellina agilis	0.001	0.001	0.001	0.003
Mollusca: Gastropoda	*Acteocina canaliculata*		0.001	0.001	0.002
	Astyris lunata			0.001	0.001
	Cylichnella bidentata	0.001	0.001		0.002
	Gastropoda	0.001			0.001
	Turbonilla spp.	0.001		0.001	0.002
	Turridae		0.001		0.001
Nemertea	*Nemertinea*	0.001	0.002	0.001	0.004
Phoronida	*Phoronis spp.*	0.001	0.001	0.001	0.003
Grand Total		0.045	0.036	0.04	0.121

SITE 2 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001		0.001	0.002
Annelida: Oligochaeta Total		0.001		0.001	0.002
Annelida: Polychaeta	*Aglaophamus verrilli*		0.015		0.015
	Apoprionospio pygmaea	0.001	0.001	0.001	0.003
	Autolytus prolifer	0.001			0.001
	Brania wellfleetensis	0.001			0.001
	Caraziella hobsonae		0.001		0.001
	Caulleriella sp. B (Blake)	0.001	0.001	0.001	0.003
	Drilonereis longa		0.001		0.001
	Glycera americana			0.001	0.001
	Glycera dibranchiata		0.002	0.004	0.006
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Leitoscoloplos spp.		0.006	0.002	0.008
	Loimia medusa	0.005	0.017		0.022
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Neanthes arenaceodentata		0.001		0.001
	Neanthes succinea	0.002			0.002
	Nephtys picta	0.006			0.006
	Paraprionospio pinnata	0.001	0.004	0.002	0.007
	Phyllodoce arenae	0.001			0.001
	Polydora cornuta	0.001			0.001
	Polydora socialis	0.001			0.001
	Prionospio perkinsi	0.001		0.001	0.002
	Pseudopotamilla reniformis	0.001			0.001
	Sigambra tentaculata		0.001	0.001	0.002
	Spiochaetopterus costarum		0.001	0.001	0.002
Annelida: Polychaeta Total		0.025	0.053	0.016	0.094
Arthropoda: Amphipoda	*Ampelisca verrilli*	0.001	0.002	0.001	0.004
	Corophium tuberculatum	0.001			0.001
	Listriella barnardi			0.001	0.001
	Parahaustorius holmesi		0.001		0.001
Arthropoda: Amphipoda Total		0.002	0.003	0.002	0.007
Arthropoda: Cumacea	*Oxyurostylis smithi*		0.001	0.001	0.002
Arthropoda: Cumacea Total			0.001	0.001	0.002
Arthropoda: Decapoda	*Pinnixa chaetopterana*		0.001	0.001	0.002
Arthropoda: Decapoda Total			0.001	0.001	0.002
Arthropoda: Isopoda	*Ptilanthura tenuis*			0.001	0.001
Arthropoda: Isopoda Total				0.001	0.001
Chordata: Cephalochordata	*Branchiostoma caribaeum*		0.001	0.001	0.002
Chordata: Cephalochordata Total			0.001	0.001	0.002
Chordata: Hemichordata	*Hemichordata*			0.001	0.001
Chordata: Hemichordata Total				0.001	0.001
Cnidaria: Anthozoa	*Anthozoa*			0.001	0.001
	Edwardsia elegans		0.001	0.001	0.002
Cnidaria: Anthozoa Total			0.001	0.002	0.003
Echinodermata: Holothuroidea	*Leptosynapta tenuis*			0.005	0.005
Echinodermata: Holothuroidea Total				0.005	0.005
Mollusca: Bivalvia	*Anadara ovalis*	0.001			0.001
	Ensis directus	0.001	0.001	0.001	0.003
	Mercenaria mercenaria	0.001			0.001
	Mulinia lateralis	0.001	0.001		0.002
	Mysella planulata			0.001	0.001
	Tellina agilis	0.001	0.001	0.001	0.003
	Tellinidae			0.001	0.001
Mollusca: Bivalvia Total		0.005	0.003	0.004	0.012
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.001	0.003
	Busycon sp. (juveniles)		0.001		0.001
	Cylichnella bidentata		0.001		0.001
Mollusca: Gastropoda Total		0.001	0.003	0.001	0.005
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Nemertea Total		0.001	0.001	0.001	0.003
Platyhelminthes: Turbellaria	*Stylochus ellipticus*		0.001		0.001
Platyhelminthes: Turbellaria Total			0.001		0.001
Grand Total		0.035	0.068	0.037	0.14

SITE 3 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Polychaeta	*Amastigos caperatus*		0.001	0.001	0.002
	Apoprionospio pygmaea	0.001	0.002	0.001	0.004
	Caulleriella sp. B (Blake)		0.001		0.001
	Drilonereis longa		0.001	0.004	0.005
	Glycera dibranchiata			0.001	0.001
	Glycinde solitaria		0.001	0.001	0.002
	Leitoscoloplos spp.	0.001	0.027	0.001	0.029
	Magelona spp.		0.001		0.001
	Mediomastus ambiseta		0.001	0.001	0.002
	Nephtys picta	0.001	0.009	0.001	0.011
	Scolelepis texana		0.001	0.001	0.002
Annelida: Polychaeta Total		0.003	0.045	0.012	0.06
Arthropoda: Amphipoda	*Ameroculodes species complex*		0.001		0.001
	Ampelisca verrilli	0.001	0.001		0.002
	Parahaustorius holmesi	0.003	0.003	0.002	0.008
	Rhepoxynius hudsoni	0.001	0.001	0.002	0.004
Arthropoda: Amphipoda Total		0.005	0.006	0.004	0.015
Arthropoda: Cumacea	*Leucon americanus*		0.001		0.001
	Oxyurostylis smithi		0.001		0.001
Arthropoda: Cumacea Total			0.002		0.002
Arthropoda: Decapoda	*Biffarius biformis*	0.001	0.001		0.002
	Pinnixa chaetopterana	0.001	0.001	0.001	0.003
Arthropoda: Decapoda Total		0.002	0.002	0.001	0.005
Arthropoda: Isopoda	*Cyathura burbanki*			0.001	0.001
Arthropoda: Isopoda Total				0.001	0.001
Chordata: Cephalochordata	*Branchiostoma caribaeum*			0.003	0.003
Chordata: Cephalochordata Total				0.003	0.003
Mollusca: Bivalvia	*Bivalvia: Unidentified*	0.001			0.001
	Ensis directus	0.001		0.001	0.002
	Mulinia lateralis	0.001	0.001	0.001	0.003
	Tellina agilis	0.001	0.001	0.001	0.003
Mollusca: Bivalvia Total		0.004	0.002	0.003	0.009
Mollusca: Gastropoda	*Acteocina canaliculata*			0.001	0.001
	Busycon sp. (juveniles)	0.006			0.006
	Gastropoda	0.001			0.001
Mollusca: Gastropoda Total		0.007		0.001	0.008
Nemertea	*Nemertinea*		0.001	0.003	0.004
Nemertea Total			0.001	0.003	0.004
Platyhelminthes: Turbellaria	*Stylochus ellipticus*			0.001	0.001
Platyhelminthes: Turbellaria Total				0.001	0.001
Grand Total		**0.021**	**0.058**	**0.029**	**0.108**

SITE 4 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001		0.001	0.002
Annelida: Oligochaeta Total		0.001		0.001	0.002
Annelida: Polychaeta	*Ancistrosyllis jonesi*		0.001		0.001
	Arabella iricolor-multidentata complex	0.05	0.05	0.005	0.105
	Aricidea fragilis	0.001	0.001		0.002
	Autolytus prolifer		0.001		0.001
	Bhawania heteroseta		0.001	0.001	0.002
	Boccardia hamata		0.001		0.001
	Brania clavata		0.001		0.001
	Cabira incerta		0.001		0.001
	Caulleriella sp. B (Blake)	0.001	0.001	0.001	0.003
	Ceratonereis irritabilis		0.001		0.001
	Chaetozone setosa		0.001	0.001	0.002
	Clymenella torquata	0.001			0.001
	Dorvillea rudolphi	0.001	0.001		0.002
	Eteone heteropoda		0.001		0.001
	Exogone dispar		0.001		0.001
	Glycera americana	0.031			0.031
	Glycera dibranchiata	0.001			0.001
	Glycera sphyrabrancha	0.001	0.001		0.002
	Glycinde solitaria	0.001	0.001	0.002	0.004
	Leitoscoloplos spp.			0.001	0.001
	Loimia medusa	0.03			0.03
	Macroclymene zonalis		0.005		0.005
	Marphysa sanguinea	0.001			0.001
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Neanthes succinea		0.001		0.001
	Notomastus spp.	0.01	0.008		0.018
	Owenia fusiformis	0.006	0.004		0.01
	Paraprionospio pinnata			0.001	0.001
	Pectinaria gouldii			0.005	0.005
	Phyllodoce arenae	0.001	0.001		0.002
	Podarke obscura	0.001	0.001	0.001	0.003
	Polychaeta: Unidentified & fragments		0.001		0.001
	Polydora socialis		0.001		0.001
	Prionospio perkinsi	0.001		0.001	0.002
	Pseudeurythoe ambigua		0.001		0.001
	Scolelepis sp.		0.001		0.001
	Scoletoma tenuis	0.001	0.004	0.004	0.009
	Scoloplos rubra	0.001			0.001
	Sigambra tentaculata	0.001	0.001	0.001	0.003
	Spiochaetopterus costarum	0.001			0.001
	Sthenelais boa			0.003	0.003
Annelida: Polychaeta Total		0.143	0.095	0.028	0.266

Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli		0.001		0.001
	Batea catharinensis		0.001	0.001	0.002
	Cerapus tubularis		0.001		0.001
	Eobrolgus spinosus		0.001		0.001
	Listriella barnardi		0.001		0.001
	Photis macrocoxa		0.001		0.001
	Rhepoxynius hudsoni	0.001			0.001
Arthropoda: Amphipoda Total		0.002	0.007	0.002	0.011
Arthropoda: Decapoda	*Pinnixa chaetopterana*	0.001			0.001
Arthropoda: Decapoda Total		0.001			0.001
Arthropoda: Isopoda	*Ptilanthura tenuis*	0.001			0.001
Arthropoda: Isopoda Total		0.001			0.001
Chordata: Hemichordata	*Hemichordata*	0.001	0.001		0.002
Chordata: Hemichordata Total		0.001	0.001		0.002
Cnidaria: Anthozoa	*Anthozoa*	0.001		0.001	0.002
Cnidaria: Anthozoa Total		0.001		0.001	0.002
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	0.001	0.001	0.001	0.003
Echinodermata: Holothuroidea Total		0.001	0.001	0.001	0.003
Mollusca: Bivalvia	*Aligena elevata*	0.001	0.001		0.002
	Bivalvia: Unidentified			0.001	0.001
	Cyrtopleura costata		0.001		0.001
	Mulinia lateralis	0.001	0.001	0.001	0.003
	Mysella planulata		0.001		0.001
	Petricola pholadiformis	0.001			0.001
	Tagelus divisus	0.057	0.048	0.02	0.125
	Tellina agilis	0.001		0.001	0.002
Mollusca: Bivalvia Total		0.061	0.052	0.023	0.136
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.001	0.003
	Astyris lunata	0.001	0.006	0.001	0.008
	Cylichnella bidentata	0.001			0.001
	Melanella spp.			0.001	0.001
	Turbonilla spp.	0.001			0.001
	Turridae	0.001			0.001
Mollusca: Gastropoda Total		0.005	0.007	0.003	0.015
Nemertea	*Nemertinea*	0.001	0.002	0.001	0.004
Nemertea Total		0.001	0.002	0.001	0.004
Phoronida	*Phoronis spp.*		0.007	0.001	0.008
Phoronida Total			0.007	0.001	0.008
Platyhelminthes: Turbellaria	*Stylochus ellipticus*		0.001		0.001
Platyhelminthes: Turbellaria Total			0.001		0.001
Grand Total		**0.218**	**0.173**	**0.061**	**0.452**

SITE 5 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*		0.015	0.024	0.039
	Aricidea fragilis	0.001	0.001	0.001	0.003
	Ceratonereis irritabilis	0.001	0.001	0.001	0.003
	Clymenella torquata	0.007		0.006	0.013
	Dorvillea rudolphi			0.001	0.001
	Drilonereis longa	0.004	0.001	0.004	0.009
	Exogone dispar	0.001		0.001	0.002
	Glycera americana	0.004	0.012		0.016
	Glycera sphyrabrancha	0.001			0.001
	Glycinde solitaria	0.001	0.002	0.003	0.006
	Heteromastus filiformis			0.001	0.001
	Leitoscoloplos spp.	0.001		0.001	0.002
	Loimia medusa		0.001		0.001
	Lysidice ninetta	0.001			0.001
	Marphysa sanguinea	0.011			0.011
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Melinna maculata		0.002		0.002
	Monticellina baptisteae-dorsobranchialis	0.001	0.001	0.001	0.003
	Notomastus spp.		0.01	0.013	0.023
	Owenia fusiformis	0.001	0.013	0.002	0.016
	Parapionosyllis longicirrata			0.001	0.001
	Paraprionospio pinnata			0.002	0.002
	Podarke obscura	0.001	0.001		0.002
	Sabaco elongatus		0.002		0.002
	Scoletoma tenuis	0.008	0.002	0.006	0.016
	Scoloplos rubra			0.003	0.003
	Spiochaetopterus costarum	0.014	0.01	0.02	0.044
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.001	0.005	0.002	0.008
	Cerapus tubularis	0.001	0.001	0.001	0.003
	Corophium acherusicum	0.001			0.001
	Elasmopus levis	0.001			0.001
	Eobrolgus spinosus	0.001			0.001
	Listriella barnardi	0.001	0.001		0.002
Arthropoda: Decapoda	*Thalassinidea*			0.001	0.001
	Xanthidae	0.001			0.001
Arthropoda: Isopoda	*Ptilanthura tenuis*		0.001		0.001
Chordata: Hemichordata	*Hemichordata*	0.001	0.001	0.001	0.003
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	0.001	0.001	0.001	0.003
Echinodermata: Ophiuroidea	*Microphiopholis atra*		0.004		0.004
Mollusca: Bivalvia	*Bivalvia: Unidentified*			0.001	0.001
	Mercenaria mercenaria		0.001	0.001	0.002
	Tagelus divisus	0.009	0.038	0.017	0.064
	Tellina agilis	0.005		0.006	0.011
	Tellinidae		0.001		0.001
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.001	0.003
	Anachis obesa		0.001	0.002	0.003
	Astyris lunata	0.001			0.001
	Cylichnella bidentata			0.001	0.001
	Nassarius vibex		0.041		0.041
	Pyramidella spp.		0.001		0.001
	Seila adamsi	0.001			0.001
	Turbonilla spp.	0.001			0.001
Nemertea	*Nemertinea*	0.001	0.001	0.004	0.006
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	0.001			0.001
Sipuncula	*Sipuncula*			0.001	0.001
Grand Total		0.09	0.176	0.134	0.4

SITE 6 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
	Tubificoides wasselli		0.001	0.001	0.002
Annelida: Oligochaeta Total		0.001	0.002	0.002	0.005
Annelida: Polychaeta	*Ancistrosyllis hartmanae*			0.001	0.001
	Apoprionospio pygmaea		0.001	0.001	0.002
	Arabella iricolor-multidentata complex	0.001	0.056	0.007	0.064
	Aricidea cerrutii	0.001		0.001	0.002
	Aricidea fragilis		0.001	0.001	0.002
	Bhawania heteroseta	0.001			0.001
	Carazziella hobsonae		0.001	0.001	0.002
	Caulleriella sp. B (Blake)		0.001	0.001	0.002
	Clymenella torquata	0.003			0.003
	Dorvillea rudolphi	0.001			0.001
	Drilonereis longa	0.009			0.009
	Eteone heteropoda			0.001	0.001
	Exogone dispar			0.001	0.001
	Glycera dibranchiata		0.002	0.001	0.003
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Lysidice ninetta		0.001		0.001
	Marphysa sanguinea			0.016	0.016
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Nephtys picta	0.018	0.007	0.01	0.035
	Owenia fusiformis		0.011	0.003	0.014
	Paraprionospio pinnata		0.001		0.001
	Phyllodoce arenae	0.001			0.001
	Pista palmata		0.006		0.006
	Podarke obscura		0.001		0.001
	Podarkeopsis levifuscina			0.001	0.001
	Polydora cornuta		0.001		0.001
	Polydora socialis		0.001	0.001	0.002
	Prionospio perkinsi		0.001		0.001
	Scoloplos rubra		0.003		0.003
	Sigambra tentaculata		0.001	0.001	0.002
	Spiochaetopterus costarum		0.001	0.004	0.005
	Spiophanes bombyx			0.001	0.001
Annelida: Polychaeta Total		0.037	0.099	0.055	0.191
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.001	0.001	0.001	0.003
	Idunella bowenae		0.001		0.001
	Listriella barnardi		0.001	0.001	0.002
	Listriella clymenellae	0.001			0.001
	Rhepoxynius hudsoni	0.001		0.001	0.002
Arthropoda: Amphipoda Total		0.004	0.004	0.004	0.012

Arthropoda: Cumacea	*Cyclaspis varians*		0.001		0.001
	Oxyurostylis smithi			0.001	0.001
Arthropoda: Cumacea Total			0.001	0.001	0.002
Arthropoda: Decapoda	*Biffarius biformis*		0.002	0.001	0.003
	Callianassa atlantica			0.001	0.001
	Ogyrides alphaerostris		0.001		0.001
	Pinnixa chaetopterana		0.015	0.004	0.019
	Upogebia affinis		0.006		0.006
	Xanthidae			0.001	0.001
Arthropoda: Decapoda Total			0.024	0.007	0.031
Chordata: Hemichordata	*Hemichordata*		0.001	0.001	0.002
Chordata: Hemichordata Total			0.001	0.001	0.002
Cnidaria: Anthozoa	*Ceriantheopsis americanus*		0.001		0.001
Cnidaria: Anthozoa Total			0.001		0.001
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	0.001		0.001	0.002
Echinodermata: Holothuroidea Total		0.001		0.001	0.002
Echinodermata: Ophiuroidea	*Microphiopholis atra*		0.006		0.006
Echinodermata: Ophiuroidea Total			0.006		0.006
Mollusca: Bivalvia	*Bivalvia: Unidentified*	0.001	0.001	0.001	0.003
	Ensis directus			0.001	0.001
	Macoma tenta	0.001			0.001
	Mercenaria mercenaria	0.001		0.001	0.002
	Neotia ponderosa		1.714		1.714
	Tellina agilis	0.001	0.001	0.001	0.003
	Tellinidae		0.001		0.001
Mollusca: Bivalvia Total		0.004	1.717	0.004	1.725
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001		0.002
	Cylichnella bidentata			0.001	0.001
	Polinices duplicata		0.024		0.024
	Turridae	0.001			0.001
Mollusca: Gastropoda Total		0.002	0.025	0.001	0.028
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Nemertea Total		0.001	0.001	0.001	0.003
Phoronida	*Phoronis spp.*			0.001	0.001
Phoronida Total				0.001	0.001
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	0.001	0.001		0.002
Platyhelminthes: Turbellaria Total		0.001	0.001		0.002
Grand Total		**0.051**	**1.882**	**0.078**	**2.011**

SITE 7 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Polychaeta	*Apoprionospio pygmaea*	0.001	0.001	0.001	0.003
	Arabella iricolor-multidentata complex		0.016		0.016
	Caulleriella sp. B (Blake)	0.001		0.001	0.002
	Eteone heteropoda	0.002			0.002
	Glycera dibranchiata	0.001			0.001
	Glycinde solitaria		0.001	0.001	0.002
	Leitoscoloplos spp.		0.003	0.002	0.005
	Lepidonotus sublevis		0.001		0.001
	Magelona spp.			0.001	0.001
	Mediomastus ambiseta		0.001	0.001	0.002
	Nephtys picta		0.007	0.001	0.008
	Scolelepis texana			0.001	0.001
	Spio spp.			0.001	0.001
Arthropoda: Amphipoda	*Acanthohaustorius spinosus*			0.001	0.001
	Ameroculodes species complex		0.001		0.001
	Ampelisca verrilli		0.001	0.001	0.002
	Listriella barnardi			0.001	0.001
	Rhepoxynius hudsoni	0.002	0.002	0.002	0.006
Arthropoda: Decapoda	*Biffarius biformis*	0.001	0.003	0.001	0.005
	Pagurus pubescens		0.022		0.022
	Pinnixa chaetopterana	0.012	0.012	0.002	0.026
Arthropoda: Isopoda	*Stegophryxus hyptius*		0.001		0.001
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	0.001	0.001		0.002
Mollusca: Bivalvia	*Aligena elevata*			0.001	0.001
	Bivalvia: Unidentified	0.001	0.001	0.001	0.003
	Mercenaria mercenaria		0.001		0.001
	Mulinia lateralis		0.001	0.001	0.002
	Tellina agilis	0.001	0.001	0.001	0.003
Nemertea	*Nemertinea*		0.001		0.001
Grand Total		**0.023**	**0.078**	**0.022**	**0.123**

SITE 8 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Ampharetidae spp.*	0.001			0.001
	Arabella iricolor-multidentata complex	0.001			0.001
	Aricidea fragilis	0.001	0.001	0.001	0.003
	Bhawania heteroseta			0.001	0.001
	Caulleriella sp. B (Blake)		0.001		0.001
	Ceratonereis irritabilis	0.001	0.001	0.001	0.003
	Clymenella torquata	0.001	0.012		0.013
	Dorvillea rudolphi			0.001	0.001
	Exogone dispar	0.001	0.001	0.001	0.003
	Glycera americana	0.006			0.006
	Glycera dibranchiata	0.001	0.101		0.102
	Glycera sphyrabrancha		0.001	0.001	0.002
	Glycinde solitaria	0.001	0.001	0.002	0.004
	Leitoscoloplos spp.	0.001	0.001	0.002	0.004
	Loimia medusa	0.001		0.001	0.002
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Onuphidae spp.		0.001		0.001
	Owenia fusiformis		0.004		0.004
	Paraprionospio pinnata	0.001			0.001
	Polychaeta: Unidentified & fragments			0.001	0.001
	Polydora socialis	0.001	0.001	0.001	0.003
	Scoletoma tenuis	0.004	0.006	0.004	0.014
	Spiochaetopterus costarum	0.001	0.001	0.002	0.004
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.003	0.005
	Ampelisca verrilli	0.004	0.006	0.004	0.014
	Cerapus tubularis		0.001	0.001	0.002
	Corophium acherusicum	0.001			0.001
	Lembos websteri		0.001		0.001
Arthropoda: Cumacea	*Oxyurostylis smithi*			0.001	0.001
Arthropoda: Decapoda	*Biffarius biformis*		0.001		0.001
	Pinnixa chaetopterana	0.005		0.001	0.006
	Thalassinidea	0.001	0.001	0.001	0.003
Chordata: Hemichordata	*Hemichordata*		0.001		0.001
Cnidaria: Anthozoa	*Anthozoa*	0.001			0.001
Mollusca: Bivalvia	*Abra aequalis*			0.005	0.005
	Crassostrea virginica			0.06	0.06
	Macoma tenta		0.001		0.001
	Mercenaria mercenaria	0.001	0.001		0.002
	Mulinia lateralis	0.001	0.001	0.001	0.003
	Tagelus divisus	0.067	0.008		0.075
	Tellina agilis	0.001	0.001	0.002	0.004
	Tellinidae		0.001		0.001
Mollusca: Gastropoda	*Acteocina canaliculata*	0.004	0.003	0.003	0.01
	Astyris lunata		0.001		0.001
	Mangelia plicosa			0.001	0.001
	Turbonilla spp.	0.001	0.001		0.002
	Turridae	0.001			0.001
Nemertea	*Nemertinea*	0.001	0.001	0.002	0.004
Phoronida	*Phoronis spp.*		0.001	0.001	0.002
Platyhelminthes: Turbellaria	*Stylochus ellipticus*		0.001		0.001
Grand Total		**0.115**	**0.168**	**0.107**	**0.39**

SITE 9 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Oligochaeta Total		0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*		0.005		0.005
	Aricidea fragilis	0.001	0.001	0.001	0.003
	Caraziella hobsonae		0.001	0.001	0.002
	Ceratonereis irritabilis	0.002	0.002	0.01	0.014
	Clymenella torquata	0.029	0.003	0.011	0.043
	Dorvillea rudolphi		0.001		0.001
	Drilonereis longa			0.012	0.012
	Eteone heteropoda			0.001	0.001
	Exogone dispar	0.001	0.001	0.001	0.003
	Glycera americana			0.005	0.005
	Glycinde solitaria	0.001	0.002	0.003	0.006
	Leitoscoloplos spp.	0.001	0.003	0.002	0.006
	Macroclymene zonalis	0.002			0.002
	Mediomastus ambiseta	0.001	0.001	0.003	0.005
	Melinna maculata		0.001	0.002	0.003
	Monticellina baptisteae-dorsobranchialis			0.001	0.001
	Notomastus spp.	0.055	0.026	0.045	0.126
	Owenia fusiformis	0.001		0.001	0.002
	Pectinaria gouldii		0.001		0.001
	Phyllodoce arenae	0.001			0.001
	Podarke obscura	0.001		0.001	0.002
	Podarkeopsis levifuscina		0.001	0.001	0.002
	Sabaco elongatus	0.001		0.001	0.002
	Scoletoma tenuis	0.003	0.006	0.005	0.014
	Spiochaetopterus costarum	0.002			0.002
Annelida: Polychaeta Total		0.102	0.055	0.107	0.264
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.001	0.001	0.001	0.003
	Cerapus tubularis	0.001	0.001		0.002
	Eobrolgus spinosus		0.001		0.001
	Listriella barnardi	0.001	0.001	0.001	0.003
	Microprotopus raneyi		0.001		0.001
Arthropoda: Amphipoda Total		0.004	0.006	0.003	0.013
Arthropoda: Decapoda	*Pinnixa chaetopterana*	0.001		0.002	0.003
Arthropoda: Decapoda Total		0.001		0.002	0.003
Arthropoda: Isopoda	*Cyathura burbanki*	0.001	0.001	0.002	0.004
	Erichsonella filiformis		0.001		0.001
Arthropoda: Isopoda Total		0.001	0.002	0.002	0.005
Chordata: Hemichordata	*Hemichordata*	0.001	0.001	0.001	0.003
Chordata: Hemichordata Total		0.001	0.001	0.001	0.003
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	0.001	0.001		0.002
Echinodermata: Holothuroidea Total		0.001	0.001		0.002
Mollusca: Bivalvia	*Aligena elevata*			0.001	0.001
	Bivalvia: Unidentified	0.001		0.011	0.012
	Mulinia lateralis	0.001	0.001	0.001	0.003
	Tagelus divisus		0.007	0.001	0.008
	Tellina agilis	0.001	0.002	0.001	0.004
	Tellinidae		0.001		0.001
Mollusca: Bivalvia Total		0.003	0.011	0.015	0.029
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.001	0.003
	Astyris lunata		0.001		0.001
	Gastropoda	0.001	0.001	0.001	0.003
	Turbonilla spp.	0.001			0.001
Mollusca: Gastropoda Total		0.003	0.003	0.002	0.008
Nemertea	*Nemertinea*	0.001	0.002	0.001	0.004
Nemertea Total		0.001	0.002	0.001	0.004
Grand Total		**0.118**	**0.082**	**0.134**	**0.334**

SITE 10 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Apoprionospio pygmaea*			0.001	0.001
	Arabella iricolor-multidentata complex		0.051	0.032	0.083
	Aricidea fragilis	0.001	0.001	0.001	0.003
	Bhawania heteroseta		0.001	0.001	0.002
	Carazziella hobsonae	0.001		0.001	0.002
	Caulleriella sp. B (Blake)	0.001	0.001		0.002
	Ceratonereis irritabilis	0.001		0.001	0.002
	Clymenella torquata	0.002	0.003	0.001	0.006
	Diopatra cuprea		0.003		0.003
	Drilonereis longa	0.001	0.001		0.002
	Glycera americana	0.005	0.02	0.001	0.026
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Leitoscoloplos spp.	0.001	0.001	0.001	0.003
	Loimia medusa	0.003	0.042	0.042	0.087
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Neanthes succinea		0.001		0.001
	Notomastus spp.		0.022		0.022
	Owenia fusiformis	0.001	0.002	0.001	0.004
	Paraprionospio pinnata	0.001	0.001	0.003	0.005
	Piromis roberti		0.001		0.001
	Polydora cornuta	0.001	0.001		0.002
	Polydora socialis	0.001	0.001		0.002
	Pseudopotamilla reniformis	0.001	0.001		0.002
	Scoletoma tenuis	0.004	0.004	0.001	0.009
	Sigambra tentaculata		0.001		0.001
	Spiochaetopterus costarum	0.001			0.001
	Spiophanes bombyx	0.001			0.001
	Sthenelais boa		0.006		0.006
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.001		0.001	0.002
	Cerapus tubularis		0.001		0.001
	Corophium tuberculatum	0.001	0.001		0.002
	Listriella barnardi	0.001	0.001	0.001	0.003
Arthropoda: Decapoda	*Hexapanopeus angustifrons*	0.017			0.017
	Pinnixa chaetopterana		0.001	0.003	0.004
Chordata: Hemichordata	*Hemichordata*	0.001	0.001	0.004	0.006
Cnidaria: Anthozoa	*Anthozoa*	0.032		0.001	0.033
	Edwardsia elegans	0.001	0.002	0.001	0.004
Echinodermata: Holothuroidea	*Leptosynapta tenuis*		0.001	0.001	0.002
Mollusca: Bivalvia	*Bivalvia: Unidentified*	0.001	0.001	0.001	0.003
	Macoma tenta	0.001		0.016	0.017
	Mercenaria mercenaria	0.001			0.001
	Mulinia lateralis	0.001	0.001	0.001	0.003
	Mysella planulata		0.001	0.001	0.002
	Tagelus divisus	0.065			0.065
	Tellina agilis	0.001			0.001
Mollusca: Gastropoda	*Acteocina canaliculata*		0.001	0.001	0.002
	Astyris lunata	0.001			0.001
	Turridae			0.001	0.001
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Phoronida	*Phoronis spp.*	0.001	0.001	0.001	0.003
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	0.001		0.001	0.002
Grand Total		**0.159**	**0.183**	**0.127**	**0.469**

SITE 11 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Aricidea fragilis*	0.001	0.001	0.001	0.003
	Carazziella hobsonae	0.001	0.001	0.001	0.003
	Ceratonereis irritabilis	0.042	0.027	0.023	0.092
	Clymenella torquata		0.002	0.003	0.005
	Dorvillea rudolphi	0.001	0.001		0.002
	Drilonereis longa	0.019			0.019
	Eteone heteropoda		0.001		0.001
	Exogone dispar	0.001	0.001	0.001	0.003
	Glycinde solitaria	0.002	0.001	0.001	0.004
	Heteromastus filiformis	0.001			0.001
	Leitoscoloplos spp.	0.001	0.001	0.001	0.003
	Lysidice ninetta		0.001		0.001
	Lysilla alba	0.001		0.007	0.008
	Marphysa sanguinea		0.022		0.022
	Mediomastus ambiseta	0.002	0.001	0.001	0.004
	Melinna maculata	0.001	0.008		0.009
	Monticellina baptisteae-dorsobranchialis	0.001		0.001	0.002
	Notomastus spp.	0.053	0.045	0.038	0.136
	Parapionosyllis longicirrata		0.001		0.001
	Podarke obscura	0.001	0.001	0.001	0.003
	Podarkeopsis levifuscina	0.001	0.001	0.001	0.003
	Polydora socialis		0.001		0.001
	Sabaco elongatus		0.002		0.002
	Scoletoma tenuis	0.003	0.002	0.012	0.017
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Cerapus tubularis	0.001			0.001
	Corophium acherusicum		0.001		0.001
	Listriella barnardi	0.003	0.002	0.001	0.006
Arthropoda: Decapoda	*Pinnixa chaetopterana*	0.001	0.001		0.002
Arthropoda: Isopoda	*Cyathura burbanki*	0.001	0.001	0.001	0.003
Chordata: Hemichordata	*Hemichordata*			0.001	0.001
Mollusca: Bivalvia	*Abra aequalis*		0.001		0.001
	Aligena elevata		0.001	0.001	0.002
	Bivalvia: Unidentified			0.001	0.001
	Macoma tenta	0.02			0.02
	Mercenaria mercenaria			0.001	0.001
	Mulinia lateralis	0.001	0.001		0.002
	Tagelus divisus		0.001	0.001	0.002
	Tellina agilis	0.001	0.001	0.001	0.003
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.001	0.003
	Gastropoda		0.001		0.001
	Turbonilla spp.	0.001			0.001
Nemertea	*Nemertinea*	0.001	0.001	0.003	0.005
Phoronida	*Phoronis spp.*	0.001			0.001
Grand Total		**0.166**	**0.136**	**0.106**	**0.408**

SITE 12 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Aricidea fragilis*	0.001	0.001	0.001	0.003
	Carazziella hobsonae	0.001	0.001	0.001	0.003
	Ceratonereis irritabilis	0.034	0.074	0.034	0.142
	Clymenella torquata	0.032	0.087	0.053	0.172
	Dorvillea rudolphi	0.001			0.001
	Eteone heteropoda	0.001		0.001	0.002
	Exogone dispar	0.001	0.001	0.001	0.003
	Glycera americana	0.003	0.016	0.029	0.048
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Heteromastus filiformis		0.001	0.001	0.002
	Leitoscoloplos spp.	0.002	0.002	0.002	0.006
	Macroclymene zonalis	0.001			0.001
	Marphysa sanguinea	0.003			0.003
	Mediomastus ambiseta	0.001	0.002	0.002	0.005
	Monticellina baptisteae-dorsobranchialis		0.001		0.001
	Notomastus spp.		0.004	0.004	0.008
	Owenia fusiformis	0.004			0.004
	Paraprionospio pinnata	0.001	0.001	0.001	0.003
	Phyllodoce arenae	0.001	0.001	0.001	0.003
	Podarke obscura	0.001	0.001		0.002
	Podarkeopsis levifuscina		0.001		0.001
	Polydora socialis	0.001	0.001	0.001	0.003
	Scoletoma tenuis	0.004	0.007	0.014	0.025
	Sigambra tentaculata	0.001			0.001
	Spiochaetopterus costarum	0.001	0.004	0.006	0.011
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.006	0.002	0.001	0.009
	Cerapus tubularis	0.001	0.001		0.002
	Listriella barnardi	0.001	0.001	0.001	0.003
	Listriella clymenellae	0.001		0.001	0.002
Arthropoda: Cumacea	*Leucon americanus*			0.001	0.001
Arthropoda: Decapoda	*Pagurus annulipes*			0.001	0.001
	Pinnixa chaetopterana		0.001	0.001	0.002
	Xanthidae		0.001		0.001
Arthropoda: Isopoda	*Cyathura burbanki*	0.001			0.001
Chordata: Hemichordata	*Hemichordata*	0.001	0.001	0.001	0.003
Echinodermata: Ophiuroidea	*Microphiopholis atra*	0.001			0.001
Mollusca: Bivalvia	*Aligena elevata*		0.001	0.001	0.002
	Macoma tenta		0.005		0.005
	Mercenaria mercenaria		1.871		1.871
	Mulinia lateralis	0.001			0.001
	Tagelus divisus	0.026	0.021	0.007	0.054
	Tellina agilis	0.006	0.001	0.001	0.008
Mollusca: Gastropoda	*Acteocina canaliculata*	0.004	0.002	0.002	0.008
	Anachis avara		0.001		0.001
	Astyris lunata	0.001	0.001		0.002
	Odostomia spp.	0.001			0.001
	Turbonilla spp.	0.001			0.001
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Phoronida	*Phoronis spp.*			0.001	0.001
Sipuncula	*Sipuncula*		0.001		0.001
Grand Total		**0.151**	**2.121**	**0.175**	**2.447**

SITE 13 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*	0.001			0.001
	Aricidea fragilis	0.001	0.002	0.001	0.004
	Caraziella hobsonae	0.001	0.001	0.001	0.003
	Ceratonereis irritabilis	0.099	0.112	0.092	0.303
	Clymenella torquata	0.014	0.029	0.1	0.143
	Dorvillea rudolphi			0.001	0.001
	Drilonereis longa			0.006	0.006
	Exogone dispar	0.001	0.001	0.001	0.003
	Flabelligeridae spp.	0.001			0.001
	Glycera americana	0.043	0.016	0.034	0.093
	Glycinde solitaria	0.001	0.002	0.002	0.005
	Leitoscoloplos spp.	0.001	0.001	0.002	0.004
	Lysidice ninetta	0.001			0.001
	Marphysa sanguinea			0.013	0.013
	Mediomastus ambiseta	0.002	0.001	0.001	0.004
	Monticellina baptisteae-dorsobranchialis	0.001			0.001
	Parapionosyllis longicirrata	0.001		0.001	0.002
	Phyllodoce arenae	0.001			0.001
	Podarke obscura			0.001	0.001
	Podarkeopsis levifuscina	0.001			0.001
	Polydora socialis	0.001			0.001
	Scoletoma tenuis	0.011	0.01	0.015	0.036
	Spiochaetopterus costarum	0.002	0.009	0.008	0.019
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.002	0.001	0.004
	Ampelisca verrilli	0.001	0.001	0.001	0.003
	Cerapus tubularis	0.001	0.001		0.002
	Corophium acherusicum	0.001	0.001	0.001	0.003
	Listriella barnardi	0.001	0.002	0.002	0.005
	Listriella clymenellae			0.001	0.001
Arthropoda: Decapoda	*Pinnixa chaetopterana*			0.001	0.001
	Thalassinidea		0.001		0.001
	Upogebia affinis			0.001	0.001
Arthropoda: Isopoda	*Cyathura burbanki*	0.001	0.002		0.003
	Ptilanthura tenuis	0.001			0.001
Chordata: Hemichordata	*Hemichordata*		0.001		0.001
Cnidaria: Anthozoa	*Anthozoa*			0.001	0.001
Echinodermata: Ophiuroidea	*Microphiopholis atra*			0.001	0.001
Mollusca: Bivalvia	*Aligena elevata*		0.001	0.001	0.002
	Bivalvia: Unidentified			0.001	0.001
	Tagelus divisus	0.001		0.004	0.005
	Tellina agilis	0.001		0.007	0.008
Mollusca: Gastropoda	*Acteocina canaliculata*	0.002	0.002	0.002	0.006
	Astyris lunata	0.001	0.001		0.002
	Gastropoda	0.001	0.001	0.001	0.003
	Odostomia spp.	0.001			0.001
	Turbonilla spp.			0.002	0.002
	Turridae			0.001	0.001
Nemertea	*Nemertinea*	0.087	0.001	0.001	0.089
Platyhelminthes: Turbellaria	*Stylochus ellipticus*			0.001	0.001
Sipuncula	*Phascolion strombi*	0.001		0.001	0.002
Grand Total		**0.287**	**0.202**	**0.312**	**0.801**

SITE 14 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Aglaophamus verrilli*			0.001	0.001
	Apoprionospio pygmaea		0.001		0.001
	Aricidea fragilis	0.001	0.001	0.001	0.003
	Capitella capitata complex		0.001		0.001
	Caraziella hobsonae	0.001	0.001	0.001	0.003
	Caulleriella sp. B (Blake)		0.001	0.001	0.002
	Ceratonereis irritabilis	0.001	0.001	0.001	0.003
	Clymenella torquata		0.001		0.001
	Dorvillea rudolphi	0.001			0.001
	Drilonereis longa		0.001		0.001
	Eteone heteropoda	0.001	0.001		0.002
	Exogone dispar		0.001		0.001
	Glycera dibranchiata	0.005	0.033	0.001	0.039
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Leitoscoloplos spp.	0.001	0.001	0.002	0.004
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Neanthes arenaceodentata	0.001	0.001	0.001	0.003
	Notomastus spp.	0.012			0.012
	Owenia fusiformis			0.003	0.003
	Paraprionospio pinnata	0.001	0.002		0.003
	Phyllodoce arenae			0.001	0.001
	Podarkeopsis levifuscina		0.001		0.001
	Polydora cornuta		0.001		0.001
	Polydora socialis	0.001			0.001
	Prionospio perkinsi		0.001		0.001
	Scoletoma tenuis	0.002		0.001	0.003
	Sigambra tentaculata	0.001			0.001
	Spiochaetopterus costarum	0.001	0.001	0.002	0.004
	Streblospio benedicti	0.001	0.001	0.001	0.003
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.007	0.012	0.009	0.028
	Cerapus tubularis	0.001		0.001	0.002
	Corophium tuberculatum	0.001			0.001
	Listriella barnardi	0.001		0.001	0.002
Arthropoda: Cumacea	*Leucon americanus*		0.001		0.001
Arthropoda: Decapoda	*Pinnixa chaetopterana*	0.001	0.001	0.005	0.007
	Thalassinidea	0.001			0.001
Arthropoda: Isopoda	*Ptilanthura tenuis*		0.001		0.001
Chordata: Hemichordata	*Hemichordata*	0.001		0.001	0.002
Echinodermata: Holothuroidea	*Leptosynapta tenuis*	0.018	0.012	0.005	0.035
Mollusca: Bivalvia	*Bivalvia: Unidentified*	0.074			0.074
	Macoma tenta		0.001		0.001
	Mercenaria mercenaria		0.001	0.001	0.002
	Mulinia lateralis	0.001	0.001	0.001	0.003
	Mysella planulata	0.001	0.001		0.002
	Solen viridis		0.001		0.001
	Tellina agilis	0.001	0.002	0.001	0.004
	Tellina spp.	0.001			0.001
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.003	0.004	0.008
	Astyris lunata		0.001		0.001
	Turbonilla spp.		0.001		0.001
Nemertea	*Nemertinea*	0.001	0.002	0.001	0.004
Phoronida	*Phoronis spp.*	0.001	0.001	0.001	0.003
Grand Total		**0.147**	**0.098**	**0.052**	**0.297**

SITE 15 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Aricidea fragilis*	0.001	0.001	0.001	0.003
	Bhawania heteroseta		0.001		0.001
	Caraziella hobsonae		0.001	0.001	0.002
	Ceratonereis irritabilis	0.003	0.001	0.001	0.005
	Clymenella torquata	0.016	0.004	0.003	0.023
	Eteone heteropoda			0.001	0.001
	Glycera americana	0.001	0.059	0.001	0.061
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Leitoscoloplos spp.	0.001	0.003	0.001	0.005
	Loimia medusa	0.001			0.001
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Monticellina baptisteae-dorsobranchialis	0.001	0.001	0.001	0.003
	Notomastus spp.	0.021	0.038		0.059
	Owenia fusiformis	0.001			0.001
	Paraprionospio pinnata	0.002	0.001	0.001	0.004
	Phyllodoce arenae	0.001	0.001		0.002
	Podarkeopsis levifuscina	0.001			0.001
	Polydora socialis			0.001	0.001
	Scoletoma tenuis	0.004	0.014	0.008	0.026
	Spiochaetopterus costarum			0.001	0.001
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.001	0.003	0.002	0.006
	Corophium acherusicum		0.001		0.001
	Listriella barnardi	0.001	0.001	0.001	0.003
	Listriella clymenellae	0.001			0.001
Arthropoda: Decapoda	*Pinnixa chaetopterana*	0.001		0.001	0.002
Arthropoda: Isopoda	*Cyathura burbanki*	0.001	0.001	0.001	0.003
Arthropoda: Pycnogonida	*Anoplodactylus petiolatus*	0.001		0.001	0.002
Chordata: Hemichordata	*Hemichordata*	0.001	0.001	0.001	0.003
Mollusca: Bivalvia	*Bivalvia: Unidentified*			0.001	0.001
	Mercenaria mercenaria		3.322		3.322
	Mulinia lateralis	0.001	0.001		0.002
	Tagelus divisus		0.031		0.031
	Tellina agilis	0.001	0.001	0.001	0.003
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.001	0.003
	Odostomia spp.			0.001	0.001
	Turbonilla spp.		0.001	0.001	0.002
	Turridae			0.001	0.001
Nemertea	*Nemertinea*	0.001		0.006	0.007
Phoronida	*Phoronis spp.*	0.001	0.001	0.001	0.003
Grand Total		0.07	3.494	0.045	3.609

SITE 16 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001		0.001	0.002
	Tubificoides wasselli		0.001		0.001
Annelida: Polychaeta	*Apoprionospio pygmaea*	0.001	0.001	0.001	0.003
	Capitella capitata complex			0.001	0.001
	Caulleriella sp. B (Blake)	0.002	0.004	0.003	0.009
	Diopatra cuprea	0.001			0.001
	Exogone dispar	0.001			0.001
	Glycera americana	0.001			0.001
	Glycera dibranchiata			0.002	0.002
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Magelona spp.			0.001	0.001
	Mediomastus ambiseta	0.002	0.002	0.003	0.007
	Neanthes succinea	0.001	0.001		0.002
	Owenia fusiformis	0.001		0.001	0.002
	Paraprionospio pinnata	0.002			0.002
	Phyllodoce arenae			0.001	0.001
	Polydora cornuta	0.001			0.001
	Scolelepis texana			0.001	0.001
	Spiochaetopterus costarum			0.001	0.001
	Streblospio benedicti	0.001		0.001	0.002
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001		0.002
	Ampelisca verrilli	0.001	0.001	0.004	0.006
	Ampithoidae spp.	0.001			0.001
	Cerapus tubularis	0.001			0.001
	Corophium tuberculatum	0.001			0.001
	Listriella barnardi			0.001	0.001
Arthropoda: Cumacea	*Oxyurostylis smithi*		0.001		0.001
Cnidaria: Anthozoa	*Edwardsia elegans*	0.001	0.001		0.002
Echinodermata: Holothuroidea	*Leptosynapta tenuis*			0.001	0.001
Mollusca: Bivalvia	*Ensis directus*		0.001		0.001
	Mercenaria mercenaria	0.001	0.001	0.001	0.003
	Mulinia lateralis	0.001	0.001	0.001	0.003
	Tellina agilis	0.002	0.001	0.001	0.004
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001		0.002
	Gastropoda	0.001			0.001
	Rictaxis punctostriatus			0.001	0.001
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Phoronida	*Phoronis spp.*		0.001		0.001
Grand Total		0.029	0.021	0.029	0.079

SITE 17 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Oligochaeta Total		0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Apoprionospio pygmaea*			0.001	0.001
	Arabella iricolor-multidentata complex		0.14		0.14
	Aricidea fragilis	0.001	0.001	0.001	0.003
	Autolytus prolifer			0.001	0.001
	Caraziella hobsonae	0.001	0.001	0.001	0.003
	Ceratonereis irritabilis	0.001	0.001	0.001	0.003
	Clymenella torquata	0.012	0.019	0.024	0.055
	Dorvillea rudolphi		0.001		0.001
	Drilonereis longa		0.001		0.001
	Exogone dispar	0.001	0.001		0.002
	Glycinde solitaria	0.001	0.001	0.001	0.003
	Leitoscoloplos spp.	0.001	0.001	0.001	0.003
	Marphysa sanguinea		0.001		0.001
	Mediomastus ambiseta	0.004	0.001	0.001	0.006
	Melinna maculata		0.001	0.001	0.002
	Neanthes arenaceodentata	0.001			0.001
	Notocirrus spiniferus			0.001	0.001
	Notomastus spp.	0.007	0.016	0.023	0.046
	Owenia fusiformis		0.004		0.004
	Phyllodoce arenae			0.001	0.001
	Podarkeopsis levifuscina	0.001	0.001		0.002
	Polydora cornuta	0.001			0.001
	Polydora socialis	0.001	0.001		0.002
	Scoletoma tenuis	0.009	0.007	0.011	0.027
Annelida: Polychaeta Total		0.042	0.199	0.069	0.31
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.001	0.002	0.001	0.004
	Batea catharinensis	0.001			0.001
	Cerapus tubularis	0.001		0.001	0.002
	Corophium tuberculatum		0.001	0.001	0.002
	Listriella barnardi	0.001	0.001	0.001	0.003
Arthropoda: Amphipoda Total		0.005	0.005	0.005	0.015
Arthropoda: Decapoda	*Pinnixa chaetopterana*	0.001	0.001		0.002
	Thalassinidea		0.001		0.001
Arthropoda: Decapoda Total		0.001	0.002		0.003
Arthropoda: Isopoda	*Erichsonella filiformis*	0.001			0.001
Arthropoda: Isopoda Total		0.001			0.001
Chordata: Hemichordata	*Hemichordata*			0.001	0.001
Chordata: Hemichordata Total				0.001	0.001
Cnidaria: Anthozoa	*Anthozoa*	0.001			0.001
Cnidaria: Anthozoa Total		0.001			0.001
Mollusca: Bivalvia	*Aligena elevata*	0.001			0.001
	Mercenaria mercenaria	0.001			0.001
	Mulinia lateralis		0.001		0.001
	Tagelus divisus		0.155	0.007	0.162
	Tellina agilis	0.001	0.001	0.001	0.003
Mollusca: Bivalvia Total		0.003	0.157	0.008	0.168
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.001	0.003
	Astyris lunata	0.001	0.001		0.002
	Turbonilla spp.	0.001	0.001		0.002
Mollusca: Gastropoda Total		0.003	0.003	0.001	0.007
Nemertea	*Nemertinea*	0.001		0.001	0.002
Nemertea Total		0.001		0.001	0.002
Phoronida	*Phoronis spp.*	0.001	0.001	0.001	0.003
Phoronida Total		0.001	0.001	0.001	0.003
Grand Total		0.059	0.368	0.087	0.514

SITE 18 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Apoprionospio pygmaea*			0.001	0.001
	Arabella iricolor-multidentata complex		0.02	0.02	0.04
	Aricidea fragilis	0.001			0.001
	Autolytus prolifer			0.001	0.001
	Bhawania heteroseta		0.001		0.001
	Capitella capitata complex			0.001	0.001
	Carazziella hobsonae			0.001	0.001
	Caulleriella sp. B (Blake)	0.001			0.001
	Clymenella torquata	0.013	0.002	0.001	0.016
	Diopatra cuprea	0.005			0.005
	Dorvillea rudolphi			0.001	0.001
	Drilonereis spp.	0.001	0.001		0.002
	Exogone dispar	0.001	0.001	0.001	0.003
	Glycera americana		0.016	0.001	0.017
	Glycera dibranchiata			0.001	0.001
	Glycinde solitaria	0.001	0.003	0.001	0.005
	Leitoscoloplos spp.	0.001		0.001	0.002
	Loimia medusa	0.004	0.004		0.008
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Monticellina baptisteae-dorsobranchialis			0.001	0.001
	Notomastus spp.	0.009	0.01	0.035	0.054
	Owenia fusiformis	0.013		0.005	0.018
	Paraprionospio pinnata		0.001		0.001
	Podarke obscura			0.001	0.001
	Polydora cornuta	0.001			0.001
	Scoletoma tenuis	0.012	0.005	0.008	0.025
	Scoloplos rubra			0.001	0.001
	Spiochaetopterus costarum	0.014	0.009	0.004	0.027
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.001	0.001	0.001	0.003
	Listriella barnardi	0.001	0.001	0.001	0.003
Arthropoda: Cumacea	*Leucon americanus*			0.001	0.001
Arthropoda: Decapoda	*Pinnixa chaetopterana*	0.001	0.001		0.002
Arthropoda: Isopoda	*Ptilanthura tenuis*	0.001	0.001	0.001	0.003
Chordata: Hemichordata	*Hemichordata*	0.001	0.001	0.001	0.003
Cnidaria: Anthozoa	*Anthozoa*	0.001	0.001	0.003	0.005
	Ceriantheopsis americanus			0.001	0.001
Echinodermata: Holothuroidea	*Leptosynapta tenuis*		0.003	0.009	0.012
Echinodermata: Ophiuroidea	*Microphiopholis atra*	0.001			0.001
Mollusca: Bivalvia	*Aligena elevata*	0.001			0.001
	Bivalvia: Unidentified			0.001	0.001
	Mulinia lateralis		0.001	0.001	0.002
	Tagelus divisus	0.024	0.034	0.032	0.09
	Tellina agilis	0.001	0.001	0.006	0.008
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.001	0.003
	Astyris lunata	0.001			0.001
	Turbonilla spp.	0.001	0.001		0.002
Nemertea	*Nemertinea*	0.002	0.001	0.001	0.004
Phoronida	*Phoronis spp.*	0.001	0.001	0.002	0.004
Platyhelminthes: Turbellaria	*Stylochus ellipticus*			0.001	0.001
Grand Total		**0.119**	**0.125**	**0.152**	**0.396**

SITE 19 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Aricidea fragilis*	0.001			0.001
	Caraziella hobsonae	0.001	0.001	0.001	0.003
	Ceratonereis irritabilis	0.001	0.001	0.003	0.005
	Clymenella torquata	0.013	0.015	0.023	0.051
	Dorvillea rudolphi		0.001		0.001
	Drilonereis longa	0.001			0.001
	Exogone dispar	0.001	0.001		0.002
	Glycera americana	0.001			0.001
	Glycinde solitaria	0.002	0.003	0.001	0.006
	Heteromastus filiformis		0.001		0.001
	Leitoscoloplos spp.	0.001	0.001	0.002	0.004
	Macroclymene zonalis			0.001	0.001
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Monticellina baptisteae-dorsobranchialis	0.001	0.001	0.001	0.003
	Notomastus spp.	0.023	0.003	0.007	0.033
	Paraprionospio pinnata		0.001	0.001	0.002
	Podarke obscura			0.001	0.001
	Podarkeopsis levifuscina	0.001			0.001
	Sabaco elongatus	0.001			0.001
	Scoletoma tenuis	0.007	0.004	0.004	0.015
	Spiochaetopterus costarum	0.002	0.008	0.001	0.011
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli			0.001	0.001
	Cerapus tubularis		0.001	0.001	0.002
	Listriella barnardi	0.001	0.001	0.001	0.003
Arthropoda: Cumacea	*Leucon americanus*			0.001	0.001
Arthropoda: Decapoda	*Ogyrides alphaerostris*		0.002		0.002
	Pinnixa chaetopterana		0.001	0.001	0.002
Arthropoda: Isopoda	*Cyathura burbanki*	0.007	0.002	0.002	0.011
Arthropoda: Pycnogonida	*Anoplodactylus petiolatus*		0.001	0.001	0.002
Chordata: Hemichordata	*Hemichordata*			0.001	0.001
Mollusca: Bivalvia	*Aligena elevata*	0.001	0.001		0.002
	Tagelus divisus		0.014	0.001	0.015
	Tellina agilis	0.001	0.003	0.001	0.005
Mollusca: Gastropoda	*Acteocina canaliculata*	0.001	0.001	0.001	0.003
	Pisania tincta	0.001			0.001
	Pyramidella crenulata	0.001			0.001
	Turbonilla spp.		0.001	0.001	0.002
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Grand Total		**0.074**	**0.073**	**0.063**	**0.21**

SITE 20 - BIOMASS		REP			
PHYLUM	TAXON	1	2	3	Grand Total
Annelida: Oligochaeta	*Tubificoides spp.*	0.001	0.001	0.001	0.003
Annelida: Polychaeta	*Arabella iricolor-multidentata complex*			0.001	0.001
	Aricidea fragilis		0.001	0.001	0.002
	Carazziella hobsonae	0.001	0.001	0.001	0.003
	Ceratonereis irritabilis	0.003	0.011	0.011	0.025
	Clymenella torquata		0.008	0.013	0.021
	Dorvillea rudolphi			0.001	0.001
	Exogone dispar			0.001	0.001
	Glycera dibranchiata	0.002			0.002
	Glycinde solitaria	0.002	0.002	0.003	0.007
	Heteromastus filiformis			0.001	0.001
	Leitoscoloplos spp.	0.002	0.002	0.003	0.007
	Mediomastus ambiseta	0.001	0.001	0.001	0.003
	Monticellina baptisteae-dorsobranchialis	0.001	0.001	0.001	0.003
	Paraprionospio pinnata	0.001		0.001	0.002
	Phyllodoce arenae	0.001	0.002		0.003
	Podarke obscura	0.001	0.001	0.001	0.003
	Scoletoma tenuis	0.007	0.006	0.009	0.022
Arthropoda: Amphipoda	*Ampelisca spp.*	0.001	0.001	0.001	0.003
	Ampelisca verrilli	0.002	0.002	0.002	0.006
	Cerapus tubularis	0.001			0.001
	Listriella barnardi	0.001	0.001	0.001	0.003
Arthropoda: Cumacea	*Leucon americanus*	0.001		0.001	0.002
Arthropoda: Decapoda	*Pinnixa chaetopterana*	0.001	0.001	0.001	0.003
Arthropoda: Isopoda	*Cyathura burbanki*	0.001	0.001	0.009	0.011
Chordata: Hemichordata	*Hemichordata*		0.001	0.001	0.002
Mollusca: Bivalvia	*Bivalvia: Unidentified*			0.001	0.001
	Tagelus divisus		0.101		0.101
	Tellina agilis		0.001		0.001
	Tellinidae	0.018			0.018
Mollusca: Gastropoda	*Acteocina canaliculata*		0.001	0.001	0.002
Nemertea	*Nemertinea*	0.001	0.001	0.001	0.003
Phoronida	*Phoronis spp.*		0.001	0.001	0.002
Platyhelminthes: Turbellaria	*Stylochus ellipticus*	0.001		0.001	0.002
Grand Total		0.051	0.149	0.071	0.271

F. BENTHIC BIODIVERSITY MEASURES

	Number of Species					H'	SR	J
	Rep #1	Rep #2	Rep#3	Site Mean	Site Total	Site Mean	Site Mean	Site Mean
1	26	26	33	28.33	43	3.99	5.81	0.83
2	25	28	28	27.00	49	3.67	5.39	0.77
3	14	21	20	18.33	30	3.15	3.94	0.76
4	40	48	28	38.67	72	4.43	7.93	0.85
5	36	33	35	34.67	56	4.33	6.63	0.85
6	24	42	39	35.00	66	3.97	6.83	0.78
7	10	20	19	16.33	29	2.93	3.40	0.74
8	31	35	29	31.67	51	3.88	5.86	0.78
9	31	34	34	33.00	48	3.92	5.88	0.78
10	38	38	33	36.33	53	4.50	7.21	0.87
11	30	34	26	30.00	45	3.65	5.21	0.75
12	38	37	32	35.67	52	4.04	5.86	0.78
13	35	25	37	32.33	51	3.75	5.19	0.75
14	35	39	29	34.33	54	3.83	6.44	0.75
15	29	28	30	29.00	41	4.16	5.63	0.86
16	25	17	21	21.00	38	3.08	3.94	0.70
17	31	32	26	29.67	46	3.52	5.48	0.72
18	32	29	38	33.00	51	4.55	6.61	0.90
19	26	28	28	27.33	40	3.54	5.03	0.74
20	22	23	28	24.33	34	4.05	4.82	0.88
C1	8	9	9	8.67	18	1.47	1.82	0.47
C2	6	4	7	5.67	11	1.06	1.15	0.43
C3	21	25	15	20.33	33	2.72	3.85	0.63
C4	18	34	24	25.33	41	2.60	4.81	0.57
C5	17	38	24	26.33	49	2.59	4.48	0.56
C6	2	5	8	5.00	11	1.63	1.82	0.83
C7	16	24	16	18.67	32	3.01	3.89	0.71
C8	30	33	22	28.33	51	4.21	5.76	0.87
C9	24	27	36	29.00	45	3.56	5.41	0.74
C10	48	42	47	45.67	62	3.30	6.37	0.60
Mean				26.97	43.40	3.44	5.08	0.74

APPENDIX III. B-IBI RESTORATION GOAL ATTRIBUTES

A. SHANNON DIVERSITY INDEX

	Sediment	Rep #1	Score	Rep #2	Score	Rep #3	Score	Site	Score
1	sand	3.59	5	4.02	5	3.88	5	4.12	5
2	sand	3.66	5	3.39	3	3.81	5	4.00	5
3	sand	2.89	3	3.07	3	3.31	3	3.34	3
4	sand	4.25	5	4.31	5	4.21	5	4.80	5
5	sand	4.19	5	3.97	5	4.32	5	4.43	5
6	sand	3.78	5	4.09	5	3.86	5	4.25	5
7	sand	2.36	1	3.16	3	3.09	3	3.03	3
8	sand	3.78	5	3.68	5	3.77	5	3.89	5
9	sand	4.00	5	4.01	5	3.46	3	4.01	5
10	sand	4.09	5	4.67	5	4.47	5	4.77	5
11	mud	3.62	5	3.53	5	3.70	5	3.76	5
12	sand	4.12	5	3.82	5	3.99	5	4.06	5
13	mud	3.55	5	3.37	5	3.88	5	3.70	5
14	sand	3.97	5	3.78	5	3.59	5	3.98	5
15	mud	3.97	5	4.24	5	3.99	5	4.26	5
16	sand	3.18	3	2.92	3	2.97	3	3.21	3
17	sand	2.90	5	3.71	3	3.45	5	3.59	5
18	sand	4.52	5	4.41	5	4.54	5	4.73	5
19	mud	3.80	5	3.45	5	3.13	3	3.60	5
20	mud	3.73	5	4.13	5	4.14	5	4.21	5
C1	sand	0.88	1	1.50	1	0.71	1	1.31	1
C2	sand	1.31	1	0.64	1	0.89	1	1.17	1
C3	sand	2.80	3	2.84	3	2.33	1	3.06	3
C4	mud	2.46	3	2.43	3	2.60	3	2.60	3
C5	sand	1.58	1	2.12	1	3.40	3	2.25	1
C6	mud	1.00	1	1.75	1	1.65	1	2.07	1
C7	mud	2.25	1	3.52	5	2.64	3	3.05	3
C8	sand	4.37	5	4.16	5	3.55	5	4.43	5
C9	sand	3.52	5	3.24	3	3.90	5	3.77	5
C10	sand	3.28	3	3.20	3	2.85	3	3.24	3

B. SPECIES ABUNDANCE (# m^{-2})

	Sediment	Rep #1	Score	Rep #2	Score	Rep #3	Score	Site Mean	Score
1	sand	1727.27	3	2727.27	3	2886.36	3	2446.97	3
2	sand	2840.91	3	2863.64	3	2681.82	3	2795.46	3
3	sand	1136.36	1	2204.55	3	2204.55	3	1848.49	3
4	sand	3681.82	5	5386.36	3	1409.09	1	3492.42	5
5	sand	3659.09	5	3409.09	5	3295.45	5	3454.54	5
6	sand	1409.09	1	4136.36	5	5522.73	3	3689.39	5
7	sand	2272.73	3	1977.27	3	1954.55	3	2068.18	3
8	sand	3727.27	5	5181.82	3	3568.18	5	4159.09	5
9	sand	4113.64	5	4863.64	5	6818.18	3	5265.15	3
10	sand	4000.00	5	2340.91	3	2886.36	3	3075.76	5
11	mud	7431.82	3	5386.36	3	5136.36	3	5984.85	3
12	sand	7954.55	3	9022.73	1	7886.36	3	8287.88	1
13	mud	9090.91	1	9204.55	1	9227.27	1	9174.24	1
14	sand	3568.18	5	4409.09	5	3931.82	5	3969.70	5
15	mud	3386.36	3	3022.73	3	3250.00	3	3219.70	3
16	sand	3295.45	5	3272.73	5	4295.45	5	3621.21	5
17	sand	4886.36	5	4590.91	5	2931.82	3	4136.36	5
18	sand	2818.18	3	2386.36	3	3159.09	5	2787.88	3
19	mud	2863.64	5	5159.09	3	5159.09	3	4393.94	3
20	mud	2340.91	5	2590.91	5	3545.45	3	2825.76	5
C1	sand	636.36	1	1772.73	3	1840.91	3	1416.67	1
C2	sand	1159.09	1	1045.45	1	1500.00	3	1234.85	1
C3	sand	4113.64	5	3318.18	5	2727.27	3	3386.36	5
C4	mud	1636.36	5	6386.36	3	3181.82	3	3734.85	3
C5	sand	7931.82	3	12840.91	1	2181.82	3	7651.52	3
C6	mud	45.45	1	181.82	1	522.73	1	250.00	1
C7	mud	2681.82	5	2227.27	5	1386.36	3	2098.48	5
C8	sand	2250.00	3	2318.18	3	1931.82	3	2166.67	3
C9	sand	2159.09	3	4931.82	5	5590.91	3	4227.27	5
C10	sand	24477.27	1	16931.82	1	34931.82	1	25446.97	1

C. BIOMASS (g m^{-2})

	Sediment	Rep #1	Score	Rep #2	Score	Rep #3	Score	Site Mean	Score
1	sand	0.95	1	0.77	1	0.84	1	0.86	1
2	sand	0.77	1	1.50	3	0.84	1	1.04	3
3	sand	0.48	1	1.32	3	0.64	1	0.81	1
4	sand	4.86	3	3.70	3	1.32	3	3.30	3
5	sand	1.86	3	3.93	3	2.95	3	2.92	3
6	sand	1.11	3	42.75	3	1.73	3	15.20	5
7	sand	0.52	1	1.23	3	0.50	1	0.75	1
8	sand	2.55	3	3.70	3	1.02	3	2.42	3
9	sand	2.64	3	1.77	3	3.05	3	2.48	3
10	sand	3.16	3	4.11	3	2.84	3	3.37	3
11	mud	3.73	5	3.07	5	2.41	3	3.07	5
12	sand	3.34	3	48.11	3	3.95	3	18.47	5
13	mud	6.43	5	4.52	5	6.98	5	5.98	5
14	sand	3.30	3	2.18	3	1.16	3	2.21	3
15	mud	1.57	3	79.36	1	0.93	3	27.29	3
16	sand	0.59	1	0.48	1	0.66	1	0.58	1
17	sand	1.23	3	8.30	5	1.93	3	3.82	3
18	sand	2.66	3	2.82	3	3.43	3	2.97	3
19	mud	1.66	3	1.59	3	1.36	3	1.54	3
20	sand	1.11	3	3.39	5	1.59	3	2.03	3
C1	sand	1.82	3	0.55	1	0.55	1	0.97	1
C2	sand	0.25	1	0.36	1	0.70	1	0.44	1
C3	sand	7.43	5	3.32	3	1.20	3	3.98	3
C4	mud	0.89	3	3.82	5	0.70	3	1.80	3
C5	sand	0.52	1	27.09	3	1.32	3	9.64	5
C6	mud	0.05	1	0.09	1	0.23	1	0.12	1
C7	mud	0.59	3	1.36	3	0.86	3	0.94	3
C8	sand	3.82	3	1.34	3	0.77	1	1.98	3
C9	sand	0.77	1	2.00	3	1.25	3	1.34	3
C10	sand	3.14	3	5.50	5	5.14	5	4.59	3

D. BIOMASS OF POLLUTION-INDICATIVE TAXA (%)

	Sediment	Rep #1	Score	Rep #2	Score	Rep #3	Score	Site Mean	Score
1	sand	4.76	5	8.82	3	10.81	3	8.13	3
2	sand	5.88	3	7.58	3	5.41	3	6.29	3
3	sand	4.76	5	1.72	5	3.57	5	3.35	5
4	sand	0.47	5	1.23	5	3.45	5	1.71	5
5	sand	0.00	5	0.00	5	1.54	5	0.51	5
6	sand	0.00	5	0.05	5	1.32	5	0.46	5
7	sand	8.70	3	1.85	5	4.55	5	5.03	3
8	sand	1.79	5	0.61	5	2.22	5	1.54	5
9	sand	0.86	5	1.28	5	1.49	5	1.21	5
10	sand	1.44	5	1.11	5	3.20	5	1.91	5
11	mud	0.61	5	1.48	5	0.00	5	0.70	5
12	sand	2.04	5	0.05	5	1.15	5	1.08	5
13	mud	0.00	5	0.00	5	0.00	5	0.00	5
14	sand	2.76	5	5.21	3	3.92	5	3.96	5
15	mud	4.35	5	0.06	5	4.88	5	3.09	5
16	sand	15.38	1	4.76	5	6.90	3	9.01	3
17	sand	0.00	5	0.27	5	0.00	5	0.09	5
18	sand	0.00	5	1.61	5	0.66	5	0.76	5
19	mud	0.00	5	1.43	5	1.67	5	1.03	5
20	mud	2.04	5	0.00	5	1.43	5	1.16	5
C1	sand	0.00	5	0.00	5	0.00	5	0.00	5
C2	sand	0.00	5	0.00	5	0.00	5	0.00	5
C3	sand	0.31	5	1.37	5	1.89	5	1.19	5
C4	mud	2.56	5	2.98	5	3.23	5	2.92	5
C5	sand	26.09	1	0.00	5	1.72	5	9.27	3
C6	mud	0.00	5	25.00	1	10.00	3	11.67	3
C7	mud	0.00	5	1.67	5	0.00	5	0.56	5
C8	sand	0.00	5	0.00	5	0.00	5	0.00	5
C9	sand	0.00	5	1.14	5	0.00	5	0.38	5
C10	sand	0.00	5	0.41	5	0.44	5	0.29	5

E. ABUNDANCE OF POLLUTION-SENSITIVE TAXA (%)

	Sediment	Rep #1	Score	Rep #2	Score	Rep #3	Score	Site Mean	Score
1	sand	56.58	5	47.50	3	56.69	5	53.59	5
2	sand	55.20	5	61.90	5	55.08	5	57.40	5
3	sand	28.00	3	16.49	1	24.74	1	23.08	1
4	sand	48.77	3	37.97	3	43.55	3	43.43	3
5	sand	44.10	3	56.00	5	46.90	3	49.00	3
6	sand	62.90	3	45.05	3	48.56	3	52.17	5
7	sand	33.00	3	26.44	3	26.74	3	28.73	3
8	sand	68.90	5	69.74	5	59.24	5	65.96	5
9	sand	48.62	3	27.10	3	55.33	5	43.68	3
10	sand	38.07	3	30.10	3	35.43	3	34.53	3
12	sand	40.57	3	34.76	3	38.90	3	38.08	3
14	sand	59.24	5	60.82	5	57.80	5	59.29	5
16	sand	73.79	5	70.83	5	74.07	5	72.90	5
17	sand	63.26	5	42.57	3	58.91	5	54.91	5
18	sand	41.94	3	49.52	3	35.97	3	42.48	3
C1	sand	0.00	1	0.00	1	2.47	1	0.82	1
C2	sand	0.00	1	0.00	1	3.03	1	1.01	1
C3	sand	48.62	3	12.33	1	12.50	1	24.48	1
C5	sand	3.44	1	14.87	1	9.38	1	9.23	1
C8	sand	46.46	3	40.20	3	54.12	5	46.93	3
C9	sand	33.68	3	20.28	1	23.58	1	25.85	3
C10	sand	42.25	3	16.24	1	40.99	3	33.16	3

F. BIOMASS OF POLLUTION SENSITIVE TAXA (%)

	Sediment	Rep #1	Score	Rep #2	Score	Rep #3	Score	Site Mean	Score
11	mud	4.27	1	6.67	1	8.49	1	6.48	1
13	mud	23.67	1	30.15	3	52.44	3	35.42	3
15	mud	36.23	3	98.08	5	29.27	1	54.53	3
19	mud	30.14	3	64.29	5	51.67	3	48.70	3
20	mud	10.20	1	78.52	5	30.00	3	39.58	3
C4	mud	66.67	5	73.81	5	25.81	1	55.43	3
C6	mud	0.00	1	0.00	1	10.00	1	3.33	1
C7	mud	15.38	1	75.00	5	63.16	5	51.18	3

G. ABUNDANCE OF DEEP-DEPOSIT FEEDERS (%)

	Sediment	Rep #1	Score	Rep #2	Score	Rep #3	Score	Site Mean	Score
1	sand	35.53	5	18.33	3	36.22	5	30.03	5
2	sand	17.60	3	39.68	5	22.88	3	26.72	5
3	sand	4.00	1	9.28	1	7.22	1	6.83	1
4	sand	41.36	5	20.25	3	14.52	3	25.38	5
5	sand	31.06	5	22.00	3	36.55	5	29.87	5
6	sand	20.97	3	42.86	5	41.56	5	35.13	5
7	sand	0.00	1	3.45	1	4.65	1	2.70	1
8	sand	15.85	3	16.67	3	14.01	3	15.51	3
9	sand	50.28	5	30.84	5	57.33	5	46.15	5
10	sand	31.82	5	33.98	5	25.98	5	30.59	5
12	sand	35.43	5	37.78	5	41.21	5	38.14	5
14	sand	11.47	3	13.92	3	24.86	3	16.75	3
16	sand	29.66	5	30.56	5	41.27	5	33.83	5
17	sand	62.79	5	38.12	5	50.39	5	50.43	5
18	sand	26.61	5	24.76	3	36.69	5	29.36	5
C1	sand	0.00	1	3.85	1	0.00	1	1.28	1
C2	sand	0.00	1	0.00	1	0.00	1	0.00	1
C3	sand	46.96	5	21.92	3	5.00	1	24.63	3
C5	sand	78.22	5	73.27	5	45.83	5	65.78	5
C8	sand	16.16	3	15.69	3	10.59	3	14.15	3
C9	sand	53.68	5	56.68	5	37.80	5	49.39	5
C10	sand	51.90	5	31.54	5	45.02	5	42.82	5

H. ABUNDANCE OF CARNIVORES AND OMNIVORES (%)

	Sediment	Rep #1	Score	Rep #2	Score	Rep #3	Score	Site Mean	Score
11	mud	34.56	3	45.99	5	34.51	3	38.35	3
13	mud	47.25	5	42.22	5	35.71	3	41.73	5
15	mud	28.86	3	25.56	3	35.66	3	30.03	3
19	mud	34.13	3	22.47	1	11.01	1	22.54	1
20	mud	33.01	3	35.96	3	30.77	3	33.25	3
C4	mud	18.06	1	19.57	1	27.14	3	21.59	1
C6	mud	0.00	1	12.50	1	13.04	1	8.51	1
C7	mud	5.93	1	28.57	3	16.39	1	16.97	1

I. B-IBI VALUE

	Sediment	Rep #1	Rep #2	Rep #3	Site	Status
1	sand	4.00	3.00	3.67	3.66	good
2	sand	3.33	3.67	3.33	4.00	good
3	sand	2.33	2.66	2.33	2.33	bad
4	sand	4.33	3.66	3.33	4.33	good
5	sand	4.33	4.33	4.33	4.33	good
6	sand	3.33	4.33	4.00	5.00	good
7	sand	2.00	3.00	2.67	2.33	bad
8	sand	4.33	4.00	4.33	4.33	good
9	sand	4.33	4.33	4.00	4.00	good
10	sand	4.33	4.00	4.00	4.33	good
11	mud	3.66	4.00	3.33	3.66	good
12	sand	4.00	3.66	4.00	4.00	good
13	mud	3.66	4.00	3.66	4.00	good
14	sand	4.33	4.00	4.33	4.33	good
15	mud	3.66	3.66	3.33	3.66	good
16	sand	3.33	4.00	3.67	3.66	good
17	sand	4.33	4.66	4.00	4.66	good
18	sand	4.00	3.66	4.33	4.00	good
19	mud	4.00	3.66	3.00	3.33	good
20	mud	3.66	4.66	3.66	4.00	good
C1	sand	2.00	2.00	2.00	1.66	bad
C2	sand	1.66	1.66	2.00	1.66	bad
C3	sand	4.33	3.33	2.33	3.33	good
C4	mud	3.66	3.66	3.00	3.00	good
C5	sand	2.00	2.66	3.33	3.00	good
C6	mud	1.66	1.00	1.33	1.33	bad
C7	mud	2.66	4.33	3.33	3.33	good
C8	sand	3.66	3.66	3.66	3.66	good
C9	sand	3.66	3.66	3.66	4.33	good
C10	sand	3.33	3.33	3.66	3.33	good

APPENDIX IV. EMAP BENTHIC INDEX

	Mean Spionid Abundance #/rep	Mean Tubificid Abundance #/rep	Gleason Diversity Index	Score	Status
1	14.67	2.00	7.39	1.29	good
2	22.00	1.00	8.27	1.67	good
3	25.00	0.00	5.45	0.24	good
4	15.00	4.00	11.62	3.29	good
5	2.00	12.33	9.23	2.11	good
6	17.50	26.33	10.65	2.68	good
7	10.00	0.00	4.99	0.14	good
8	4.66	6.00	8.04	1.60	good
9	4.50	14.00	7.31	1.21	good
10	14.66	9.67	8.79	1.83	good
11	20.33	19.00	6.74	0.77	good
12	41.67	53.67	7.42	0.74	good
13	53.33	12.33	7.15	0.71	good
14	8.33	13.67	8.61	1.80	good
15	4.33	10.00	6.75	0.94	good
16	8.33	1.33	6.15	0.69	good
17	28.00	10.67	7.25	0.98	good
18	2.00	2.67	8.59	1.91	good
19	44.33	23.33	6.27	0.35	good
20	7.33	17.00	5.73	0.48	good
C1	1.33	0.00	3.36	-0.61	bad
C2	0.00	0.00	2.15	-1.18	bad
C3	7.33	18.67	5.40	0.20	good
C4	6.33	180.00	6.59	0.36	good
C5	5.33	237.00	6.86	-0.23	bad
C6	1.00	6.33	3.09	-0.75	bad
C7	1.00	15.00	5.64	0.45	good
C8	2.00	2.50	8.74	1.98	good
C9	1.50	51.00	6.96	0.84	good
C10	8.00	94.67	7.61	0.84	good

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- Ecosystems Ecology
- Marine Ecology
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- Marine Benthic Ecology
- Coastal Ecosystems
- Speciation
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- Microbiology
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- Vertebrate Zoology
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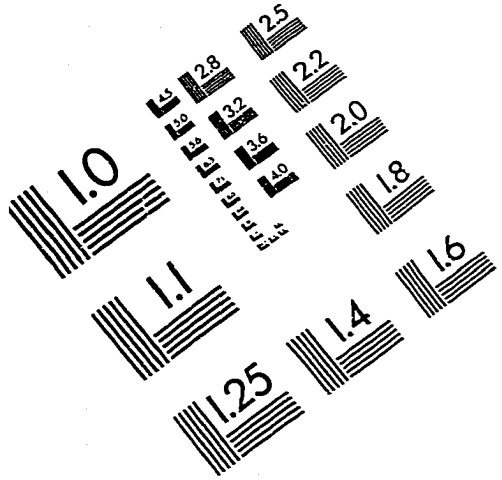
PRESENTATIONS & PUBLICATIONS

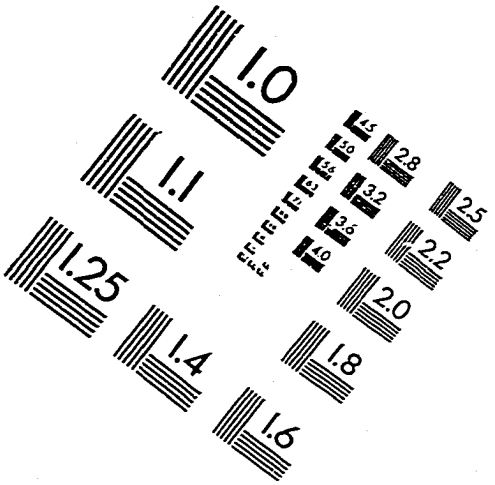
Lewis, D.J. and D.M. Dauer. "Benthic Community Analysis of Hog Island Bay, Virginia" at the 1998 Benthic Ecology Meeting & the 1998 Spring meeting of the Atlantic Estuarine Research Society.

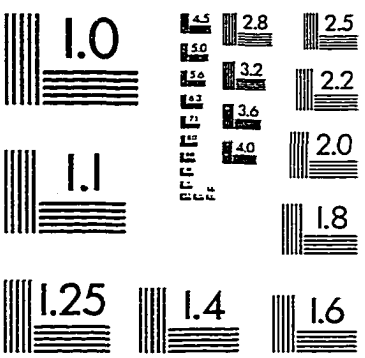
Lewis, D.J. and K.A. Phlanz. "A Comparison of Two Benthic Sampling Devices Among Several Benthic Habitat Types" at the 1996 Fall meeting of the Atlantic Estuarine Research Society & the Southeastern Estuarine Research Society.

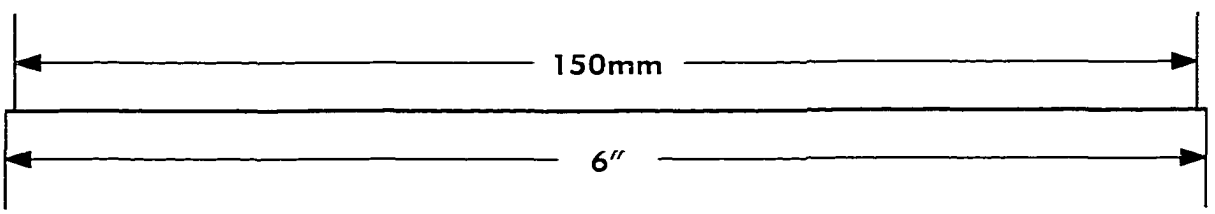
Lewis, D.J. and D.M. Dauer. 1996. Benthic Community Analysis of Hog Island Bay, pg. 101-104. *In*: R.W. Flint (ed), Natural Resource Values and Vulnerabilities: The Second Virginia Eastern Shore Natural Resources Symposium. The Eastern Shore Institute, Exmore, VA. TESI Publication #4. 156 pp.

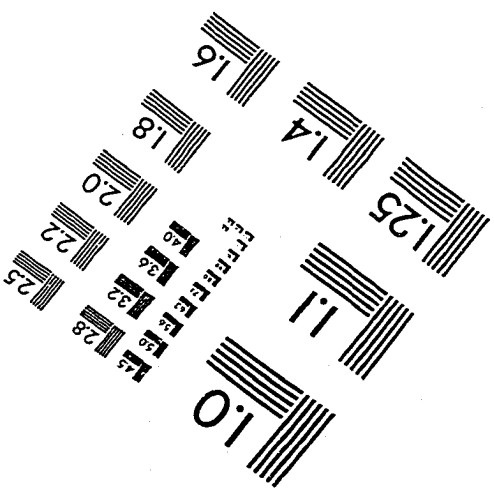
IMAGE EVALUATION TEST TARGET (QA-3)

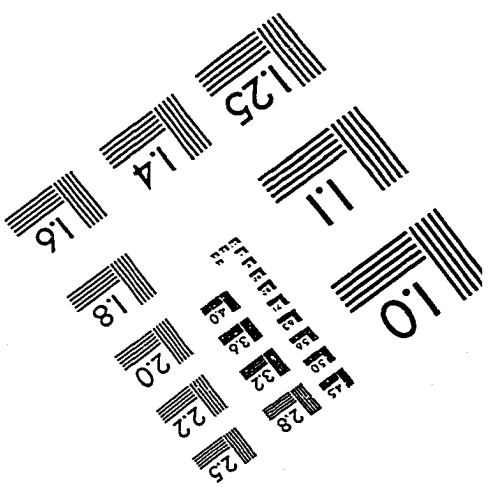












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