EFFECT OF FRESHWATER INFLOW ON MACROBENTHOS PRODUCTIVITY AND NITROGEN LOSSES IN TEXAS ESTUARIES

Paul A. Montagna, Principal Investigator
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FINAL REPORT

EFFECT OF FRESHWATER INFLOW ON MACROBENTHOS PRODUCTIVITY AND NITROGEN LOSSES IN TEXAS ESTUARIES

by

Paul A. Montagna, Principal Investigator

from

University of Texas at Austin
Marine Science Institute
P.O. Box 1267
Port Aransas, Texas 78373

to

Texas Water Development Board
611 South Congress Avenue, Suite 116
Austin, Texas 78704-1736

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Montagna, P.A., Stockwell, D.A., and Kalke, R.D. 1993. Dwarf surfclam *Mulinia lateralis* (Say, 1882) populations and feeding during the Texas brown tide event. *Journal of Shellfish Research* 12:433-442.

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*Invited Workshops (*indicates invited presentation)*

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Montagna, P.A. "Benthic communities and dredging." Lower Laguna Madre Conference. Harlingen, Texas. November 20, 1994.

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Montagna, P.A. "Life in the mud of Texas Bays." Dean's Scholars Workshop. Port Aransas, Texas. October 30, 1993.

Montagna, P.A. "Estuarine and Benthic Research." Minorities in Marine Science Workshop. Port Aransas, Texas. September 11, 1993.

Contributed Oral Presentations at National Meetings

Martin, C. and Montagna, P.A. LaQuinta Channel environmental monitoring project: benthic diversity. South Texas Bays and Estuaries Meeting. Port Aransas, Texas. April 1, 1994.

PREFACE

The primary goal of the current research program is to define quantitative relationships between marine resource populations and freshwater inflows to the State's bays and estuaries. However, we know that there is year-to-year variability in the population densities and successional events of estuarine communities. This year-to-year variability is apparently driven by long-term, and global-scale climatic events that affect the rates of freshwater inflow. Therefore, this report documents long-term changes in populations and communities that are influenced by freshwater inflow. The best indicator of productivity is the change in biomass of the community.

A Secondary goal of the current research program is to quantify the loss of nitrogen in Texas estuaries. Nitrogen is the key element that limits productivity. A simple budget would account for nitrogen entering the bay via freshwater inflow, how it is captured and transformed into biomass, and finally how it is lost from the ecosystem. One aspect of nitrogen loss is very poorly understood: "How much nitrogen is buried and lost from the system?" We report here nitrogen content changes with respect to sediment depth. Presumably nitrogen is labile in the upper, biologically active, layers of sediment, and refractory at depth. Therefore, it is important to determine the sediment depth at which nitrogen content is at a low and constant value.

This study is a continuation of freshwater inflow studies that began in 1984. The goals have evolved over the years to reflect the synthesis of new information and the management needs of the Texas Water Development Board. The original studies (1984-1986) were designed to determine the effect of inflow on Lavaca Bay. One station used during that study is still being sampled. San Antonio Bay was studied in 1987, and the Nueces Estuary (Nueces and Corpus Christi Bays) were studied in 1988. Long-term studies of the Lavaca-Colorado and Guadalupe Estuaries began in 1990. This research has been supplemented by other projects. For example, studies of the Laguna Madre were made possible by a program funded by the Texas Advanced Technology Program. The Lower Colorado River Authority recently supplemented the long-term study in Matagorda Bay by adding funding to sample additional stations in the Eastern arm of Matagorda Bay to study the effects of the diversion of the Colorado River. Long-term studies on the Nueces Estuary have been recently funded by the Texas Sea Grant Program. The new Sea Grant project is utilizing stations originally established by the Texas Water Development Board projects in 1988. The primary focus of the Sea Grant program is to determine the role of climatic variability in controlling productivity in estuaries. Although, there is ten years worth of data in some cases, we have not sampled over two entire wet-dry cycles. We have sampled over one and one-half cycles. We are currently beginning to enter a dry cycle. The completion of this research will take about two more years and should end when we enter the next wet cycle, which will be heralded by the next El Niño event.

The structure of this report is as follows. Chapter one is a manuscript which has been submitted for publication in the *American Malacological Bulletin*. This manuscript summarizes all biological data on mollusks taken to date and synthesizes current information on the biological effects of freshwater inflow on a key indicator taxonomic group. Chapter two is a compilation of biological and hydrographical data obtained during the last two years. Chapter three is a compilation of all the sediment data on nitrogen losses that has been collected to date. Chapter three also contains a brief narrative describing the data and drawing preliminary conclusions.

ACKNOWLEDGEMENTS

I must acknowledge the significant contributions of Mr. Rick Kalke. Rick began the first sampling study of Lavaca Bay in 1984. He is an outstanding field person and taxonomist. The work reported on in this study could not have been performed without him. Carroll Simanek also provided significant help in data management. We obviously are collecting and processing a large amount of data. Input, proof-reading and maintenance of this large data set is a daunting task that Carroll handles very well.

This work has also benefitted by discussions with colleagues at agencies. Gary Powell, William Longley, and David Brock of the Texas Water Development Board have provided much help and guidance. Recently, Cynthia Gorham of the Lower Colorado River Authority has also been supplying us with help on the Matagorda Bay study area.

ECOLOGY OF INFAUNAL MOLLUSCA IN SOUTH TEXAS ESTUARIES

by

Paul A. Montagna
and
Richard D. Kalke

Abstract: The ecology of Texas estuaries is strongly influenced by latitudinal ecotones that exist along the Northwestern Gulf of Mexico coastline. Long-term studies have been conducted in four of the seven major estuarine ecosystems in Texas. The objective is to determine the role of climatic variability and concordant differences in freshwater inflow among the ecosystems in structuring benthic infaunal communities and maintaining secondary production. Mollusks are prominent members of the infauna in all benthic habitats of Texas estuaries. The abundance, biomass and community structure of mollusks was measured along salinity gradients within the four south Texas estuaries. Overall, a Texas estuary has on average 14 species of mollusks, with an average abundance of 7,500 individuals$\cdot m^{-2}$, and an average biomass of 2.4 $g\cdot m^{-2}$. Freshwater inflow is the dominant factor regulating variability of molluscan communities. Salinity is a surrogate for inflow, therefore, there are within and among estuarine zoogeographic patterns related to salinity patterns. There are seasonal, interannual and latitudinal patterns of inflow, and these patterns are apparently regulating community structure, population dynamics and secondary production in Texas estuaries. Recent water projects to enhance the amount of freshwater flowing into estuaries appear to have had an effect and have increased the number of mollusks in those areas. However the projects occurred during a naturally wet period, so it is difficult to differentiate natural versus anthropogenic changes. The response of mollusks to natural gradients and man-induced changes of freshwater inflow demonstrate the importance of this factor in regulating benthic communities.

A major component of benthic ecosystems in Texas estuaries, as is true elsewhere, are the Mollusca. Molluscan biomass dominates the macroinfauna in Lavaca, San Antonio Corpus Christi, and Nueces Bays (Kalke and Montagna, 1991; Montagna and Kalke, 1992). During peak recruitment events, mollusca can also dominate population abundance. However, differences in population size and community structure exists within and among Texas Bays.

There are seven major estuarine systems along 373 linear miles of coastline. The estuaries of Texas are remarkably diverse in spite of similar physiography (Fig. 1). This is due to a climatic gradient, which influences freshwater inflow. The gradient of decreasing rainfall, and concomitant freshwater inflow, from north to south, is the most distinctive feature of the coastline (Table 1). Along this gradient, rainfall decreases by a factor of two, but inflow balance decreases by almost two orders of magnitude. The inflow patterns appear to group into four distinct types of estuaries that vary by about an order of magnitude each (Table 1). Each estuary-type also has distinctly different timing of peak inflow events. The northern estuaries receive peak inflow during the spring, the central estuaries are bimodal receiving peak inflows during the spring and fall, and the southern most estuaries receive peak inflows during the fall (Texas Dept. Water Resources, 1982). These distinct patterns are very important, since growth, reproduction, and migration of many species is keyed to seasonal events. The timing and magnitude of inundation is believed to regulate finfish and shellfish production (Texas Dept. Water Resources, 1982).

We have been conducting long-term studies in four of the seven estuaries to determine the role of freshwater inflow in maintaining benthic productivity. The primary purpose of the current study is to determine the degree of influence of freshwater inflow in regulating zoogeographic differences of molluscan population size and community structure within and among Texas estuaries. The secondary purpose of this study is to assess the effects of two major water projects designed to increase freshwater inflows to estuaries to maintain or enhance productivity. One project is a mandated freshwater release schedule from a dam and the other is a diversion of river water to an estuary. The focus in this manuscript is on the infaunal mollusks.

METHODS

All seven Texas estuaries have similarities in their structure and physiography (Fig. 1). A barrier island runs parallel with the entire length of the coast. Between the island and the mainland there are lagoons. The lagoons are interrupted with drowned river valleys which form the bay and estuarine systems. There is a Gulf inlet through the barrier island, connecting the sea with the lagoon behind the island. The lagoon opens to a large **primary bay**. There is a constriction between the primary bay and the smaller **secondary bay**. The river flows into the secondary bay. Primary bays have greater marine influence and secondary bays have greater freshwater influence. So, as well as a latitudinal climatic gradient, there is a longitudinal salinity gradient within each estuary.

The similarity of the Texas estuaries allows us to design a sampling program where we can use statistical control on confounding factors, e.g., Gulf exchange, circulation patterns, and alterations by man. Four to six stations were chosen in each estuary (Table 2, Fig. 1), employing the same spatial sampling design I have employed in previous studies of Texas estuaries (e.g., Montagna and Kalke, 1992). Two replicate stations (A and B) are in the secondary bay where freshwater influences are greatest. Two other replicate stations (C and D) are in the primary bay where marine influences are greatest. By using two stations in the freshwater influenced zone and two stations in the marine influenced zone we are replicating effects at the treatment level and avoiding pseudoreplication (Hurlbert, 1984). There has been a diversion of the Colorado River into the east arm of Matagorda Bay, so we have located two additional station (E and F) there. The stations in Laguna Madre are located using a similar strategy. Two stations are located in Baffin Bay (6 and 24), and two station are located in Laguna Madre in a seagrass bed (189G) and an unvegetated sand patch (189S) (Fig. 1).

Two major water projects were initiated during the course of this study. The purpose of both projects was to increase freshwater inflows to bays in order to enhance secondary productivity. In 1990, the Texas Water Commission ordered The City of Corpus Christi to release 151,000 ac-ft/y (1.86×10^8 $m^3 \cdot y^{-1}$) to the Nueces Estuary from the Choke Canyon/Lake Corpus Christi reservoir system. The releases were mandated, because The City had not been releasing water. Stations A and B in Nueces Bay are used to assess the effects of this project (Fig. 1). The Colorado River was diverted into the eastern arm of Matagorda Bay by the creation of a flood diversion channel in 1991 and a dam in the river channel below the point of diversion in 1992. This project has diverted Colorado River water from the Gulf of Mexico into the eastern arm of Matagorda Bay. Stations E and F were sampled to assess the effect of this diversion into Matagorda Bay (Fig. 1). The current study is not a complete assessment of the efficacy of these two projects.

Three replicate sediment samples were taken within a 2 m radius at each of the stations in each estuary four times per year. Abundance and community structure were measured using the standard techniques that we (Montagna and Kalke, 1992) have been using since 1984. This includes sectioning 6.715 cm diameter cores (at 0-3 cm, and 3-10 cm) to examine the vertical distribution of infauna. Animals are then extracted using a 0.5 mm sieve, enumerated, and identified. The taxonomic authorities were Abbott (1974) and Andrews (1992). Principal components analysis was performed on all data sets to determine the relationship among stations in terms of species composition. Hydrographic data was recorded at each station using a Hydrolab Surveyor II. These measurements include: salinity, conductivity, temperature, dissolved oxygen, ORP, pH, and depth.

RESULTS

SALINITY REGIMES

There are large differences in salinity from year to year in all the estuaries (Figs.

2-5). 1985-1986 and 1992-1993 were wet periods with concordant low salinities. These wet periods occur during periods when an El Niño is occurring in the western Pacific Ocean. The intervening time between El Niño events is dry. Texas suffers through a series of flood and drought periods, which is being regulated by global climatic events. Seasonality exists. Within each year, there are generally lower salinities in the spring and higher in the summer.

Salinity in the Lavaca-Colorado Estuary ranges from 0-36 psu (Fig. 2). The lowest salinities always occur in the secondary bay at stations A and B. After the diversion of the Colorado River, Stations E and F exhibited low salinities that are more typical of the secondary bay.

Salinity in the Guadalupe Estuary ranges from 0-32 psu (Fig. 3). During flood periods, this estuary is uniformly low (0-10 psu) in salinity. This is unusual compared to other Texas estuaries. It is caused by the high rate of inflow into a relatively small estuary (Table 1). The high turnover rate and low rate of exchange of marine water with the Gulf of Mexico exacerbate this trend. During extreme flooding the entire estuary can be at or near 0 psu. During drought periods, there can be a gradient of salinity.

Salinity in the Nueces Estuary ranges from 2-45 psu (Fig. 4). Prior to 1991, salinities in the estuary were uniform and high. In 1991, a series of mandated freshwater releases began. This resulted in lowered salinities in the secondary bay. Salinities in the secondary bay were much lower than in the primary bay, where they had be similiar in 1987-1988. Heavy rain in 1992-1993 reduced salinity further.

Salinity in the Laguna-Baffin Estuary range from 10-60 psu (Fig. 5). Seasonal fluctuations is less evident in the system. Changes occur system-wide when there are large climatic events, e.g., the 1992-1993 El Niño. There is little salinity gradient in this ecosystem, because freshwater inflow and exchange with the Gulf of Mexico is restricted.

COMMUNITY STRUCTURE

In the Lavaca-Colorado Estuary, stations A and B are almost identical (Fig. 6).

Station F, at the mouth of the river diversion is also similar to A and B. Stations C and E are similar, and both these stations are nearly equi-distant from freshwater input and Gulf exchange. Station D, near the pass, is the most different station of all. The pattern elucidated in the principal components analysis is driven by the greater number of species that were found in station D, near the Gulf pass (Table 3). Also, species dominance patterns are different. The dominant pelecypods are from the genus *Periploma* at stations C and D, whereas *Mulinia lateralis* is the dominant at stations A, B, E and F where there is freshwater influence. Gastropod species are more uniformly distributed throughout the estuary. The dominant gastropods were *Nassarius acutus* and *Acteocina candei.* Pelecypods were always dominant over gastropods. Gastropods were most common in Lavaca Bay where they constituted 32% of the population at station A and 49% at B. In contrast, gastropods represented only 24% in C, 14% in D, 16% in E and 20% in F.

In the Guadalupe Estuary, all of the stations are somewhat alike in terms of community structure (Fig. 7). There is more of a gradient from stations A to B to C to D in terms of abundance of individual species (Table 4). This is true for the dominant species, e.g., *Texadina sphinctostoma, Acteocina candei,* and *Mulinia lateralis*. The brackish species, *Rangia cuneata* only occurs in stations A and B. In general, there are more species in the marine end of the estuary where stations C and D are located. However, there are much higher abundances of species in the freshwater end of the estuary where stations A and B are located (Table 4). In spite of these trends, The principal components analysis indicates that there may be more affinity between stations A and C, and stations B and D may be more alike (Fig. 7). This trend may be explained by the unusual circulation pattern in San Antonio Bay. Freshwater enters the estuary near station A, and travels southwest along the shoreline toward station C. Marine water enters the Bay near station D and travels north toward station B. The species community pattern in the principal components analysis is driven by the number of Gastropods versus the number of pelecypods. Gastropods were most common at station A (80% of the population) and station C (58%). In contrast, gastropods represented only 41% in B and 30% in D.

In the Nueces Estuary, stations A and B in Nueces Bay are almost identical (Fig. 8). Stations D and E are very similar, and station C is somewhat different from all other stations. Stations D and E are nearest the Aransas Pass in Corpus Christi Bay. Station C is in the upper part of Corpus Christi Bay. The pattern elucidated in the principal components analysis is driven by the greater number of species that were found in stations D and E, near the Gulf pass (Table 5), and some species unique to station C. In stations A and B, the dominant species are the pelecypods, *Mulinia lateralis* and *Macoma mitchelli*. In contrast, at stations D and E, gastropods were always dominant, where they constituted 46% of the population at station D and 33% at E. Gastropods represented only 7% in A and B, and 16% in C. Station C was different from the rest in that the dominant pelecypods were from the family Nuculanidae (Table 5).

The Laguna Madre-Baffin Bay system exhibited the most varied molluscan communities within an ecosystem (Fig. 9). This trend was due to the difference caused by the seagrass habitats of Laguna Madre, versus the open Bay habitats characteristic of Baffin Bay. Stations 189G and 189S were identical, and stations 6 and 24 were identical (Fig. 9). Gastropods are rich in Laguna Madre (13 species in stations 189G and 11 species in 189S), but few in Baffin Bay (3 species at station 6 and 24) (Table 6). Only one pelecypod species, *Mulinia lateralis*, was ever found in Baffin Bay. In contrast, 11 species were found in station 189G and 9 species were found in station 189S. Because of the concomitant low numbers of individuals found in Baffin Bay, the proportion of each class was similar. Gastropods dominate this ecosystem, 77% at station 189G, 71% at 189S, 67% at 6 and 38% at 24.

Community characteristics vary among the estuaries as well as within the estuaries (Table 7). Salinity generally increases from north to south. The lowest salinity, open bay station (A in the Guadalupe) has the highest abundance and biomass indicating high productivity. The only high salinity station with high abundance and biomass is the seagrass habitat of Laguna Madre (station 189G). The hypersaline environments of Baffin Bay have the lowest abundances and biomasses. Diversity is generally highest near Gulf passes and in the seagrass habitats. Overall, a Texas estuary has on average 14 species of mollusks, with an average abundance of 7,500 individuals·m^{-2}, and 2.4 g·m^{-2}.

The molluscan community in Texas estuaries is dominated by the dwarf surf clam, *Mulinia lateralis* (Table 8). *Mulinia lateralis* populations are more abundant in the fresher bays of the northern part of the study area. Only in Laguna Madre, which is dominated by seagrass beds, were other species found to dominate. Salinity alone is not the only determining factor. Estuarine physiography is also very important. For example, *Mulinia lateralis* is found in Lavaca Bay and Matagorda Bay, but is at highest density in stations C and E, which have moderate inflow influence, and moderate average salinities near 23 psu (Table 3). But, in the higher salinity Baffin Bay (about 41 psu), it is still the dominant species (Table 6). *Mulinia lateralis* is abundant in the Guadalupe Estuary where salinities range from 7-16 psu, but is most abundant in stations A and B where the saliinity is low, about 9 psu (Table 4). *Mulinia lateralis* is also equally present in most stations in the Nueces Estuary, where average salinities range from 23 to 32 psu (Table 5). On average, *Mulinia lateralis* is more dense in the secondary bays than in the primary bays from San Antonio Bay south to Baffin Bay. The only exception is in the Matagorda Bay, but here it also occurs nearer the freshwater inflow sources, and is rare near the Gulf pass.

There is a great deal of temporal variability with respect to the densities of all these organisms. However, it is most exemplified by *Mulinia lateralis* (Fig. 10). The temporal patterns within estuaries are similar, but are of different magnitude. 1987-1988 and 1992-1993 were good years for *Mulinia lateralis* in the central estuaries (Fig. 10A). This pattern was not as distinct in the southern estuaries (Fig. 10B). The good years correspond to wet years which followed, or occurred during El Niño events. *Mulinia lateralis* practically disappeared from Baffin Bay during 1990-1992 corresponding to the occurrence of a severe brown tide bloom. Large-scale climatic events seem to be controlling *Mulinia lateralis* populations.

DISCUSSION

On one hand, there appears to be a typical open bay "Texas molluscan" community. The community is dominated by small bivalves. Typically the small bivalves represent two-thirds of the community. The dominant species are *Mulinia lateralis* and *Macoma mitchelli*. The estuarine-wide pattern is influenced by the patterns near the river mouth, where bivalves can be as high as 90% of the population. The dominance of these clams is important to the entire trophic structure of Texas estuaries, because *M. lateralis* is the predominant food source for black drum, *Pogonias cromis* (Martin, 1979).

There are two exceptions to this "generalized Texas community," where gastropods are dominant: San Antonio Bay and Laguna Madre. Laguna Madre is dominated by seagrass bed habitats, and diversity and standing stocks are generally very high. This is a direct result of the value of the seagrass habitats. San Antonio Bay is unusuall in that it is dominated by freshwater inflow. This is due to high turnover rates of water and low rates of marine exchange. It appears that hydrography and physiography are responsible for the different kind of community found in San Antonio Bay.

During the entire current study period, except for 1989, there has been a continuous brown tide bloom in Laguna Madre and Baffin Bay (Stockwell *et al.*, 1993). Other brown tide blooms have had catastrophic effects on bivalves (Shumway, 1990). Effects have ranged from reproductive or recruitment failures (Bricelj *et al.*, 1987; Tracey, 1988), to adverse effects on feeding (Bricelj and Kuenstner, 1989; Tracey, 1988, Tracey *et al.*, 1988) to a toxic effect (Draper *et al.*, 1989; Tracey *et al.*, 1990; Gainey and Shumway, 1991). So, it is possible that the trend reported here is not normal, and may be due to the effects of a brown tide. We know that *M. lateralis* feeds on brown tide (Montagna *et al.,* 1993), so it is likely that the changes in Baffin Bay are related to an effect on larvae, reproduction, or are completely unrelated to brown tide. If the brown tide has had an effect on bivalves in Laguna Madre, then the conclusion that gastropods dominate in the Laguna is not a generality, but simply a temporary event caused by the brown tide.

Brown tide is not a possible explanation of the dominance by gastropods in San Antonio Bay. In fact, San Antonio Bay has a large population of *M. lateralis* (Fig. 10). It is just that the population of *Texadina sphinctostoma* is enormous at the mouth of the Guadalupe River (Table 4). The undentified gastropods in these samples are all very small juveniles, and are also likely to be *Texadina sphinctostoma*. San Antonio Bay is also less like other Texas bays in terms of physiography. The demarcation between the primary and secondary bay is less distinct (Fig. 1), and there is very indirect exchange between the Bay and the Gulf of Mexico. In San Antonio Bay most living freshwater species are found in the upper bay and along the west shoreline being conspicuously absent from the eastern shore (Parker, 1959). The distribution of *Rangia cuneata* in upper San Antonio Bay and along the west shoreline conforms with the dominant freshwater flow pattern (Ladd, 1951). In general, the average pattern in the Guadalupe Estuary is masked by an unusual pattern of freshwater species near the River and the circulation pattern.

Ecological studies over the years have demonstrated the importance of salinity as a factor in affecting the distribution of marine and estuarine organisms. The number of species, but not necessarily the observed total biomass increases as one proceeds along a salinity gradient from the freshwater side of a large estuary to the open sea (Springer and Woodburn, 1960; Gunter, 1961). This trend is also evident among Texas Mollusca (Table 7). The dominant species found in the current study are *Mulinia lateralis* and *Texadina sphinctostoma* (Table 8). The distribution of these species is strongly linked to long term environmental conditions, although responses to flood conditions may result in rapid population changes.

Texadina sphinctostoma, a gastropod, populations increase following peaks in freshwater inflow (Harper, 1973; Matthews *et al*., 1974). This is apparently a breeding response caused by a salinity decline (Harper, 1973). *Texadina* carries its eggs on the shell and undergoes direct development with the young ready to assume adult existence upon emerging from the egg. *Texadina sphinctostoma* is commonly reported as one of the most dominant gastropod inhabitants of the river influenced upper bays of the Texas coast (Ladd, 1951; Ladd et al., 1957; Parker, 1959; Harper, 1973; Matthews *et al.*, 1974; Gilmore *et al.*, 1976; White *et al.*, 1983; 1989; Staff *et al.*, 1985).

Mulinia lateralis is an extremely hardy species, ranging from Prince Edward Island, Canada to Yucatan, Mexico and in salinities from 5 ppt to 80 ppt (Parker, 1975). It is an opportunist of adversity because it can colonize rapidly after a disturbance event such as dredging or heavy rain (Flint and Younk, 1983; Flint *et al.*, 1981). It is one of the more abundant mollusks in the low salinity bay heads of the Gulf coast (Hopkins *et al.*, 1973). In San Antonio Bay Matthews *et al.* (1974) and Harper (1973) reported *Mulinia* widely distributed from the brackish water to higher salinity as found here. Both authors indicated that the close resemblance of *Rangia* juveniles and *Mulinia lateralis* may have resulted in numerous misidentifications at the low salinity stations. In the Laguna Madre (Alazan Bay) *Mulinia lateralis* was the most abundant and widespread mollusc (Martin 1979, Cornelius 1984). *Mulinia lateralis* is widely reported from other bays around the globe. Spawning was observed in the Tred Avon River, Maryland and Chesapeake Bay where it was observed to have a continuous period of setting from a single spawning cycle from May through November (Shaw, 1965; Holland *et al.*, 1977). In Alazan Bay, Texas Cornelius (1984) observed juveniles in all months except December, and Poff (1973) observed year round spawning in Trinity Bay, Texas. *Mulinia lateralis* has a very short generation time and is capable of successfully spawning at 3 mm in length which is approximately 60 days old (Calabrese, 1969a). Embryo survival and development for *Mulinia* as it is with *Rangia cuneata* is dependent on certain salinity and temperature ranges. *Mulinia lateralis* developed into normal larvae throughout the salinity range of 15 to 35 ppt and the temperature range of 10 to 30°C (Calabrese, 1969b). This clam is an important food item to bottom feeding organisms, i.e., the black drum (Pearson, 1929; Breuer, 1957; Simmons and Breuer, 1962; Martin, 1979) and to the greater and lesser scaup ducks (Cronan, 1957). Large rafts of scaup ducks were observed in upper San Antonio Bay in November 1988 corresponding to high densities of *Mulinia lateralis* (personal observation).

Man has had an enormous impact on coastal ecosystems in general, and Texas is no exception. Recently, intervention has been attempted by State agencies to try and conserve or enhance natural resources. Two projects occurred during the current study: a mandated freshwater release schedule in Nueces Bay, and a diversion of the Colorado River to the east arm of Matagorda Bay. Both projects appear to have had a desirable effect, if this is defined as enhanced molluscan communities. The physical effect of both projects is obvious from the lowered salinity values that have occurred (Figs. 2 and 4). In the Nueces Estuary, the stations A and B, had very high salinities, and no longer exhibit this characteristic. There were generally, low abundances and diversity prior to the mandated releases, and there is now a productive community. In the Lavaca-Colorado Estuary station F is now very much like Station A in terms of salinity and species composition. Both projects appear to have had the desired effects. However, there are two caveats. The changes that have occurred in the Nueces Estuary happened during an El Niño event, and therefore may have occurred without the releases. The changes that have occurred in the Lavaca-Colorado Estuary are also being mitigate by siltation, which threatens to close the diversion or restrict freshwater inflow. Only after several more years of sampling, to determine the long-term effect, can we be certain that these two projects will have lasting value.

Freshwater inflow has obvious benefits to estuaries. Only Texas estuaries with high freshwater inflow rates support a productive shellfish industry (Table 1). The distribution and abundance of *M. lateralis* demonstrates the importance of inflow and the physical characteristics of estuaries. The variability of salinity patterns is more important than the absolute salinity values. *Mulinia lateralis* occurs most frequently in Baffin Bay, which is hypersaline, and Lavaca Bay and San Antonio Bay, which are both low salinity regions. However, all three bays are secondary bays. This means that freshets have large impacts on these systems, and salinity values change rapidly. If only absolute values of salinity were important, then these patterns would not exist. It is more likely that recruitment events for *M. lateralis* are initiated by a large change in the salinity value, which predominantly occur in secondary bays. *Mulinia lateralis* is apparently a good indicator species of freshwater inflow effects.

In the present study, we have concentrated on the effects of physical factors, e.g., freshwater inflow, estuarine physiography, and time. Obviously, biological interactions are also occurring. However, we have little information to determine how to separate effects due to physical factors and biological interactions, e.g., competition and predation.

There are obviously interactions among three geophysical factors, which regulate and control the structure and function of molluscan communities in Texas estuaries. These factors are: climate (which regulates rates of freshwater inflow), estuarine physiography (which regulates circulation patterns and the degree of marine exchange), and the presence of specific habitats (particularly seagrass beds). These factors control the landscape of the estuary and this determines both the makeup and productivity of the molluscan community. Climate and physiography interact to control the salinity patterns among and within the estuaries. The salinity patterns are good surrogates for indicating the effects of climate and physiography, but salinity itself is not the controlling factor. It is clear that freshwater inflow is very important in maintaining estuarine productivity. The potential for enhancing marine resources by water management projects appears to be a fruitful endeavor, but this must be confirmed with long-term ecosystem level research.

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Table 1. Gradient in Texas Estuaries. Listed from north to south: area at mean low tide (Diener, 1975), average annual precipitation (1951-1980; Larkin and Bomar, 1983), average annual freshwater inflow balance (1941-1976; Texas Department of Water Resources, 1982), and average annual commercial harvest (1962-1987; Texas Parks and Wildlife Department, 1988).

				Commercial Harvest	
Estuary	Area (km^2)	Rainfall ($cm\ y^{-1}$)	Inflow ($10^6\ m^3\ y^{-1}$)	Finfish ($10^3\ kg\ y^{-1}$)	Shellfish ($10^3\ kg\ y^{-1}$)
Sabine-Neches	183	142	16,107	5	332
Trinity-San Jacinto	1,416	112	12,284	190	4,060
Lavaca-Colorado	1,158	102	3,242	100	2,076
Guadalupe	551	91	2,545	80	1,545
Mission-Aransas	453	81	190	207	1,453
Nueces	433	76	509	151	544
Laguna Madre	1,139	69	-947	834	147

Table 2. Location of sampling stations and sampling periods. Table gives estuary name, bay type, bay name, stations and years of the sampling.

Estuary	Bay	Name	Stations	Period
Lavaca-Colorado	Secondary	Lavaca Bay	A	1984-1994
	Secondary	Lavaca Bay	B	1988-1994
	Primary	Matagorda Bay	C, D	1988-1994
	Diversion	East Matagorda	E, F	1993-1994
Guadalupe	Secondary	Upper San Antonio Bay	A, B	1987-1994
	Primary	Lower San Antonio Bay	C, D	1987-1994
Nueces	Secondary	Nueces Bay	A, B	1988-1994
	Primary	Corpus Christi Bay	C, D	1988-1994
	Primary	Corpus Christi Bay	E	1990-1994
Laguna Madre	Secondary	Baffin Bay	6, 24	1989-1993
	Primary	Laguna Madre	189G, 189S	1989-1993

Table 3. Lavaca-Colorado Estuary Mollusca distribution. Average number·m^{-2} for entire study period (1984-1994).

Taxa	A	B	C	D	E	F
Gastropoda Cuvier, 1797						
Gastropoda (unidentified)	95	95	95	0	0	0
Ctenobranchia Schweigger, 1820						
Hydrobiidae Troschel, 1857						
Texadina sphinctostoma (Abbott & Ladd, 1951)	189	189	0	0	0	0
Caecidae Gray, 1850						
Caecum pulchellum Stimpson, 1851	0	0	0	0	0	95
Caecum johnsoni Winkley, 1908	0	0	165	95	95	0
Calyptraeidae Blainville, 1824						
Crepidula fornicata (Linné, 1758)	0	0	0	284	0	0
Nassariidae Iredale, 1916						
Nassarius acutus (Say, 1822)	189	158	113	189	189	95
Nassarius vibex (Say, 1822)	0	0	0	189	0	0
Columbellidae Swainson, 1840						
Mitrella lunata (Say, 1826)	0	0	95	0	0	0
Pleurobranchia Von Ihering, 1922						
Acteocinidae Pilsbry, 1921						
Acteocina candei (d'Orbigny, 1841)	321	662	95	189	591	284
Atyidae Thiele, 1926						
Haminoea succinea (Conrad, 1846)	0	0	0	0	189	0
Entomotaeniata Cossman, 1896						
Pyramidellidae Gray, 1840						
Odostomia cf. *gibbosa* (Bush, 1909)	155	0	0	0	0	0

Odostomia sp. Fleming, 1813	284	189	0	0	0	0
Pyrgiscus sp. Philippi, 1841	0	142	138	95	0	0
Eulimastoma teres (Bush, 1885)	142	307	189	0	284	95
Eulimostoma sp. Bartsch, 1916	0	0	0	0	189	0
Bivalvia Linné, 1758 =[Pelecypoda Goldfuss, 1820]						
Pelecypoda (unidentified)	158	142	118	701	0	95
Nuculoidea Dall, 1889						
Nuculanidae H. & A. Adams, 1858						
Nuculana acuta (Conrad, 1831)	95	0	95	252	725	0
Nuculana concentrica Say, 1824	142	284	221	142	95	0
Arcoidea Stoliczka, 1871						
Arcidae Lamarck, 1809						
Anadara ovalis (Bruguière, 1879)	0	0	0	95	0	0
Mytiloidea Férussac, 1822						
Mytilidae Rafinesque, 1815						
Brachidontes exustus (Linné, 1758)	95	95	0	0	0	95
Pterioidea Newell, 1965						
Ostreidae Rafinesque, 1815						
Crassostrea virginica (Gmelin, 1791)	0	95	0	0	0	0
Hippuritoidea Newell, 1965						
Kelliidae Forbes & Hanley, 1848						
Aligena texasiana Harry, 1969	0	0	95	95	0	0
Montacutidae Clark, 1855						
Mysella planulata (Stimpson, 1851)	378	142	95	95	0	0
Mactridae Lamarck, 1809						
Mulinia lateralis (Say, 1822)	714	544	1429	260	7162	993
Cultellidae Davis, 1935						
Ensis minor Dall, 1900	350	0	0	0	0	0
Tellinidae Blainville, 1824						
Tellina sp Linné, 1758	378	284	0	95	0	0

Tellina texana Dall, 1900	0	0	0	95	0	0
Macoma tenta (Say, 1834)	0	0	0	95	0	0
Macoma mitchelli Dall, 1895	464	228	95	236	189	1059
Semelidae Stoliczka, 1870						
Abra aequalis (Say, 1822)	0	0	0	176	0	0
Solecurtidae Orbigny, 1846						
Tagelus plebeius (Lightfoot, 1786)	433	0	0	0	0	0
Veneridae Rafinesque, 1815						
Mercenaria campechiensis (Gmelin, 1791)	0	0	0	95	0	0
Myoidea Stoliczka, 1870						
Myidae Lamarck, 1809						
Paramya subovata (Conrad, 1845)	0	0	0	700	0	0
Corbulidae Lamarck, 1818						
Corbula contracta Say, 1822	0	0	0	819	0	0
Hiatellidae Gray, 1824						
Hiatella arctica (Linné, 1767)	0	0	0	536	0	0
Pholadomyoidea Newell, 1965						
Pandoridae Rafinesque, 1815						
Pandora trilineata Say, 1822	0	95	0	95	0	0
Lyonsiidae Fischer, 1877						
Lyonsia floridana Conrad, 1848	0	0	95	0	0	0
Periplomatidae Dall, 1895						
Periploma cf. *orbiculare* Guppy, 1878	0	0	378	1179	0	0
Periploma margaritaceum (Lamarck, 1801)	0	0	425	1182	0	0
Scaphopoda Bronn, 1862						
Dentaliidae Gray, 1834						
Dentalium texasianum Philippi, 1849	0	0	0	95	0	0

Table 4. Guadalupe Estuary Mollusca distribution. Average number·m^{-2} for entire study period (1987-1994).

Taxa	A	B	C	D
Gastropoda Cuvier, 1797				
Gastropoda (unidentified)	12478	0	0	284
Ctenobranchia Schweigger, 1820				
Hydrobiidae Troschel, 1857				
Texadina sphinctostoma (Abbott & Ladd, 1951)	14683	5138	4781	934
Vitrinellidae Bush, 1897				
Vitrinellid (unidentified)	0	0	0	142
Caecidae Gray, 1850				
Caecum pulchellum Stimpson, 1851	0	95	0	95
Caecum johnsoni Winkley, 1908	0	0	95	95
Calytraeidae Blainville, 1824				
Crepidula fornicata (Linné, 1758)	0	0	95	0
Nassariidae Iredale, 1916				
Nassarius acutus (Say, 1822)	0	0	95	0
Pleurobranchia Von Ihering, 1922				
Acteocinidae Pilsbry, 1921				
Acteocina candei (d'Orbigny, 1841)	95	189	189	216
Entomotaeniata Cossmann, 1896				
Pyramidellidae Gray, 1840				
Odostomia sp. Fleming, 1813	0	0	95	0
Pyrgiscus sp. Philippi, 1841	0	0	189	165
Eulimastoma teres (Bush, 1885)	95	95	95	142
Eulimastoma sp. Bartsch, 1916	567	95	0	126

Bivalvia Linné, 1758 =[Pelecypoda Goldfuss, 1820]				
Pelecypoda (unidentified)	0	0	189	662
Nuculoidea Dall, 1889				
Nuculanidae H. & A. Adams, 1858				
Nuculana acuta (Conrad, 1831)	0	0	0	95
Nuculana concentrica Say, 1824	0	0	0	95
Mytiloidea Férussac, 1822				
Mytilidae Rafinesque, 1815				
Brachidontes exustus (Linné, 1758)	0	378	0	0
Hippuritoidea Newell, 1965				
Kelliidae Forbes & Hanley, 1848				
Aligena texasiana Harry, 1969	0	0	95	246
Montacutidae Clark, 1855				
Mysella planulata (Stimpson, 1855)	0	0	0	643
Mactridae Lamarck, 1809				
Mulinia lateralis (Say, 1822)	6145	6802	2920	1642
Rangia cuneata (Gray, 1831)	578	142	0	0
Cultellidae Davis, 1935				
Ensis minor Dall, 1900	0	95	95	473
Tellinidae Blainville, 1824				
Tellina sp. Linné, 1758	0	95	0	95
Macoma tenta (Say, 1834)	0	0	0	95
Macoma mitchelli Dall, 1895	431	441	244	490
Solecurtidae Orbigny, 1846				
Tagelus plebeius (Lightfoot, 1786)	0	0	189	189
Veneridae Rafinesque, 1815				
Mercenaria campechiensis (Gmelin, 1791)	0	0	95	95
Pholadomyoidea Newell, 1965				
Pandoridae Rafinesque, 1815				

Pandora trilineata Say, 1822	0	0	0	95
Lyonsiidae Fisher, 1877				
Lyonsia floridana Conrad, 1848	0	0	95	0
Periplomatidae Dall, 1895				
Periploma cf. *orbiculare* Guppy, 1878	0	0	0	315
Periploma margaritaceum (Lamarck, 1801)	0	0	95	0

Table 5. Nueces Estuary Mollusca distribution. Average number·m^{-2} for entire study period (1988-1994).

Taxa	A	B	C	D	E
Mollusca Cuvier, 1795					
Mollusca (unidentified)	0	0	0	95	95
Gastropoda Cuvier, 1797					
Gastropoda (unidentified)	0	0	0	95	0
Ctenobranchia Schweigger, 1820					
Vitrinellidae Bush, 1897					
Vitrinella floridana Pilsbry & McGinty, 1946	0	0	0	0	95
Vitrinellidae (unidentified)	0	0	0	662	0
Caecidae Gray, 1850					
Caecum johnsoni Winkley, 1908	0	0	236	425	95
Epitoniidae ss. Berry, 1910					
Epitonium sp. Röding, 1798	0	0	0	95	0
Calyptraeidae Blainville, 1824					
Crepidula plana Say, 1822	0	0	95	95	0
Nassariidae Iredale, 1916					
Nassarius acutus (Say, 1822)	0	0	189	95	95
Columbellidae Swainson, 1840					
Anachis ostreiocola Sowerby, 1882	0	0	95	0	0
Pleurobranchia Von Ihering, 1922					
Acteonidae Orbigny, 1835					
Acteon punctostriatus (C.B. Adams, 1840)	0	0	0	1135	473
Acteocinidae Pilsbry, 1921					

Acteocina candei (d'Orbigny, 1841)	95	236	0	113	0
Entomotaeniata Cassmann, 1896					
Pyramidellidae Gray, 1840					
Pyrgiscus sp. Philippi, 1841	0	0	189	284	378
Eulimastoma teres (Bush, 1885)	0	95	0	0	0
Eulimastoma sp. Bartsch, 1916	95	0	0	236	0
Bivalvia Linné, 1758 =[Pelecypoda (Goldfuss, 1820)]					
Pelecypoda (unidentified)	0	0	189	189	0
Nuculoidea Dall, 1889					
Nuculanidae H. & A. Adams, 1858					
Nuculana acuta (Conrad, 1831)	0	95	851	284	252
Nuculana concentrica Say, 1824	0	0	473	0	0
Arcoidea Stoliczka, 1871					
Arcidae Lamarck, 1809					
Anadara transversa (Say, 1822)	0	0	0	0	95
Hippuritoidea Newell, 1965					
Kelliidae Forbes & Hanley, 1848					
Aligena texasiana Harry, 1969	0	95	0	605	378
Montacutidae Clark, 1855					
Mysella planulata (Stimpson, 1851)	0	95	331	0	0
Crassatellidae Férussac, 1821					
Crassinella lunulata (Conrad, 1834)	0	0	189	0	0
Mactridae Lamarck, 1809					
Mulinia lateralis (Say, 1822)	1377	2902	697	1721	615
Solenidae Lamarck, 1809					
Solen viridis Say, 1822	0	0	0	189	0
Cultellidae Davis, 1935					
Ensis minor Dall, 1900	0	95	0	0	0
Tellinidae Blainville, 1824					
Tellina sp. Linné, 1758	0	0	425	189	378

Tellidora cristata H. & A. Adams, 1856	0	0	0	0	95
Macoma tenta (Say, 1834)	0	0	189	189	189
Macoma brevifrons (Say, 1834)	0	0	0	95	0
Macoma mitchelli Dall, 1895	1305	977	95	0	0
Semelidae Stoliczka, 1870					
Abra aequalis (Say, 1822)	0	0	95	0	189
Solecurtidae Orbigny, 1846					
Tagelus divisus (Spengler, 1794)	0	0	284	0	0
Veneridae Rafinesque, 1815					
Mercenaria campechiensis (Gmelin, 1791)	0	0	0	95	0
Pholadomyoidea Newell, 1965					
Lyonsiidae Fischer, 1877					
Lyonsia floridana Conrad, 1848	0	189	95	189	0
Periplomatidae Dall, 1895					
Periploma cf. *orbiculare* Guppy, 1878	0	0	268	126	95

Table 6. Laguna Madre-Baffin Bay Estuary Mollusca distribution. Average number·m^{-2} for entire study period (1989-1994).

Taxa	189G	189S	6	24
Gastropoda Cuvier, 1797				
Gastropoda (unidentified)	221	95	0	95
Ctenobranchia Schweigger, 1820				
Littorinidae Gray, 1840				
Littorina ziczac (Gmelin, 1791)	0	95	0	0
Caecidae Gray, 1850				
Caecum pulchellum Stimpson, 1851	2518	1395	0	0
Cerithiidae Fleming, 1822				
Diastoma varium (Pfieffer, 1840)	359	95	0	0
Ceritheum lutosum (Menke, 1828)	303	221	0	0
Calyptraeidae Blainville, 1824				
Crepidula fornicata (Linné, 1758)	265	142	95	0
Nassariidae Iredale, 1916				
Nassarius acutus (Say, 1822)	95	0	0	0
Nassarius vibex (Say, 1822)	95	0	0	0
Columbellidae Swainson, 1840				
Anachis semiplicata Stearns, 1873	158	0	0	0
Anachis ostreicola Sowerby 1882	95	0	0	0
Pleurobranchia Von Iheing, 1922				
Acteonidae Orbigny, 1835				
Rictaxis punctostriatus (C.B. Adams, 1840)	0	0	529	511
Acteocinidae Pilsbry, 1921				

Acteocina candei (d'Orbigny, 1841)	0	0	95	95
Atyidae Thiele, 1926				
Haminoea antillarum (Orbigny, 1841)	5578	1418	0	0
Entomotaeniata Cossman, 1896				
Pyramidellidae Gray, 1840				
Pyrgiscus sp. Philippi, 1841	340	425	0	0
Pyramidella crenulata (Holmes, 1859)	189	95	0	0
Sayella crosseana (Dall, 1885)	189	118	0	0
Boonea impressa (Say, 1822)	0	95	0	0
Bivalia Linné, 1758 =[Pelecypoda Goldfuss, 1820]				
Pelecypoda (unidentified)	95	0	0	0
Mytiloidea Férussac, 1822				
Mytilidae Rafinesque, 1815				
Amygdalum papyria (Conrad, 1846)	265	95	0	0
Brachidontes exustus (Linné, 1758)	520	95	0	0
Hippuritoidea Newell, 1965				
Cardiidae Lamarck, 1809				
Laevicardium mortoni (Conrad, 1830)	126	95	0	0
Mactridae Lamarck, 1809				
Mactra fragilis Gmelin, 1791	359	95	0	0
Mulinia lateralis (Say, 1822)	95	315	352	1150
Tellinidae Blainville, 1824				
Tellina sp. Linné, 1758	189	0	0	0
Tellina texana Dall, 1900	95	95	0	0
Tellina tampaensis Conrad, 1866	95	95	0	0

Veneridae Rafinesque, 1815				
Anomalocardia auberiana (Orbigny, 1842)	189	662	0	0
Chione cancellata (Linné, 1767)	993	165	0	0

Table 7. Summary of zoogeographic distributions and estuarine characteristics. Average salinity (PSU), number of species, abundance ($n \cdot m^{-2}$), and biomass ($g \cdot m^{-2}$) for each station over the entire study period.

Estuary	Station	Salinity	Species	Abundance	Biomass
Lavaca-Colorado	A	15	18	4,700	1.13
	B	19	18	3,800	0.40
	C	24	18	4,000	0.40
	D	29	26	8,100	1.99
	E	22	10	9,700	1.38
	F	17	8	2,800	2.02
Guadalupe	A	7	8	35,000	5.93
	B	11	11	13,600	2.95
	C	15	17	9,700	1.65
	D	16	23	7,400	8.43
Nueces	A	23	4	2,900	1.05
	B	27	9	4,800	2.61
	C	31	8	5,000	0.92
	D	32	22	7,200	0.55
	E	28	15	3,500	0.77
Laguna Madre	189G	38	24	13,000	10.41
	189S	38	20	5,000	1.34
Baffin Bay	6	40	4	1,900	0.25
	24	42	4	1,100	1.00

Table 8. Dominant species in each estuary with overall average ($n \cdot m^{-2}$) in parentheses.

Estuary	1st Dominant	2nd Dominant	3rd Dominant
Lavaca-Colorado	*Mulinia lateralis* (1900)	*Macoma mitchelli* (400)	*Acteocina canaliculata* (400)
Guadalupe	*Texadina sphinctostoma (6400)*	*Mulinia lateralis* (4400)	*Macoma mitchelli* (400)
Nueces	*Mulinia lateralis* (150)	*Macoma mitchelli* (50)	Rictaxis punctostriatus (300)
Laguna Madre	*Haminoea antillarum* (400)	*Caecum pulchellum* (500)	*Chinoe cancellata* (600)
Baffin Bay	*Mulinia lateralis* (800)	*Rictaxis punctostriatus* (500)	*Acteocina canaliculata* (100)

FIGURE LEGENDS

Fig. 1. Location of south Texas estuaries and sampling stations.

Fig 2. Bottom salinity values at each station during each sampling period in the Lavaca-Colorado Estuary.

Fig 3. Bottom salinity values at each station during each sampling period in the Guadalupe Estuary.

Fig 4. Bottom salinity values at each station during each sampling period in the Nueces Estuary.

Fig 5. Bottom salinity values at each station during each sampling period in the Laguna Madre-Baffin Bay Estuary.

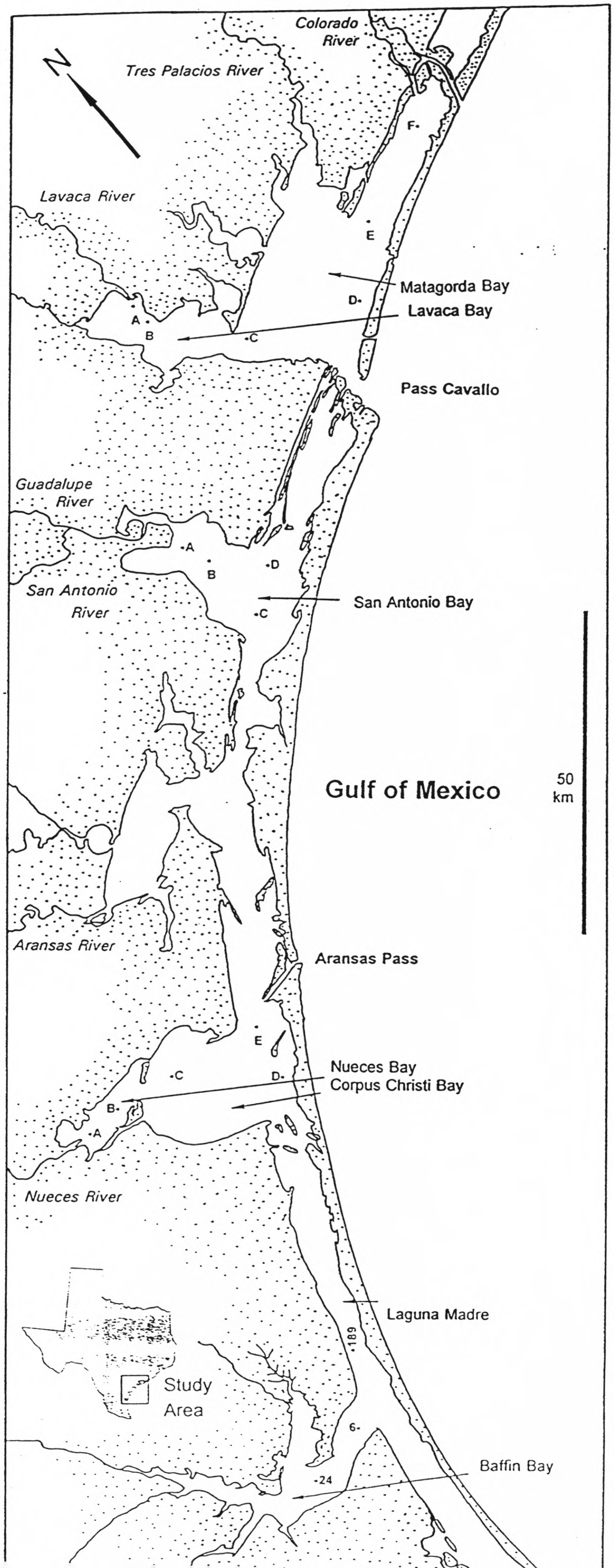
Fig 6. Principal components analysis of molluscan communities at each station over the entire study period in the Lavaca-Colorado Estuary.

Fig 7. Principal components analysis of molluscan communities at each station over the entire study period in the Guadalupe Estuary.

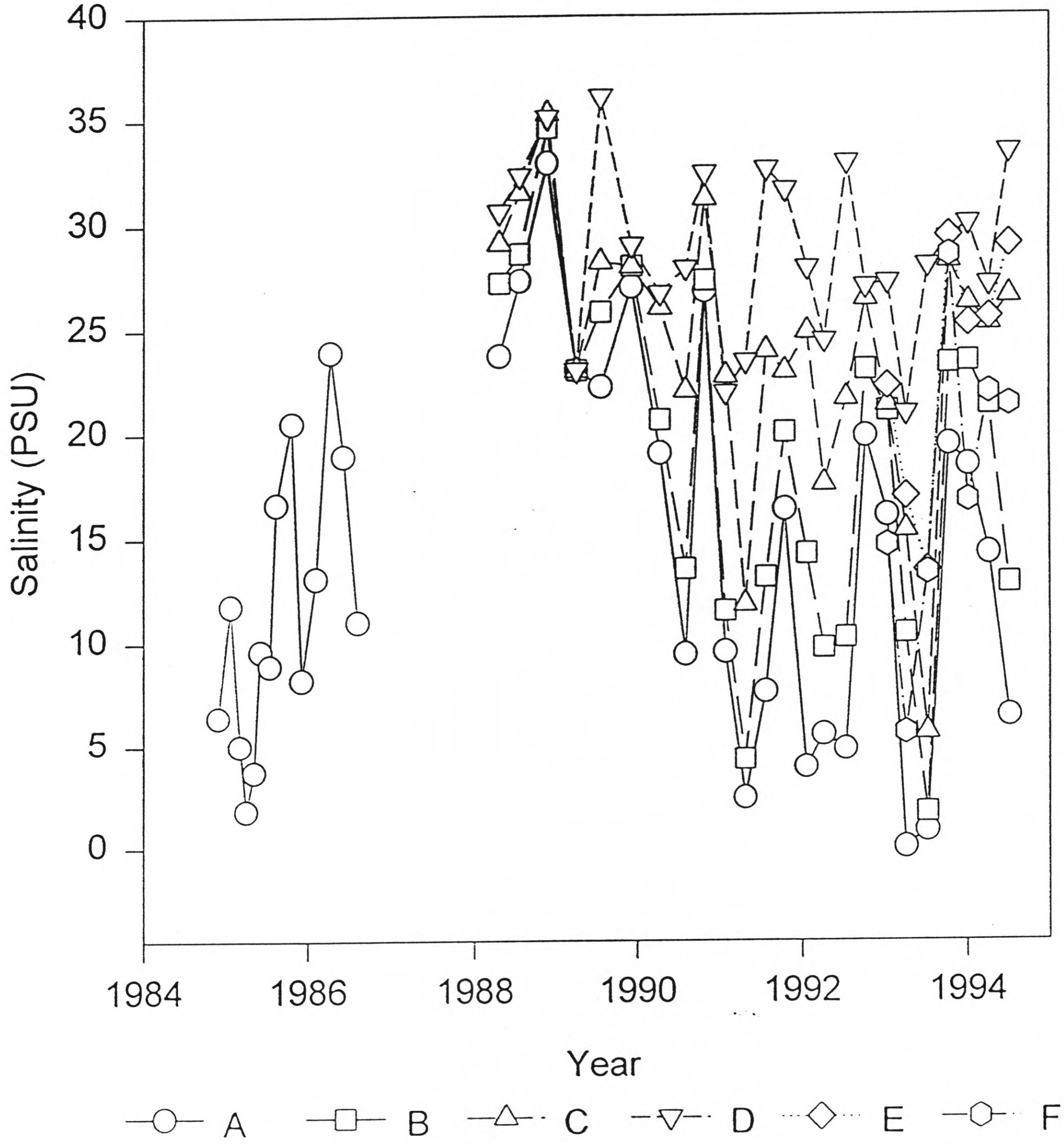
Fig 8. Principal components analysis of molluscan communities at each station over the entire study period in the Nueces Estuary.

Fig 9. Principal components analysis of molluscan communities at each station over the entire study period in the Laguna Madre-Baffin Bay Estuary.

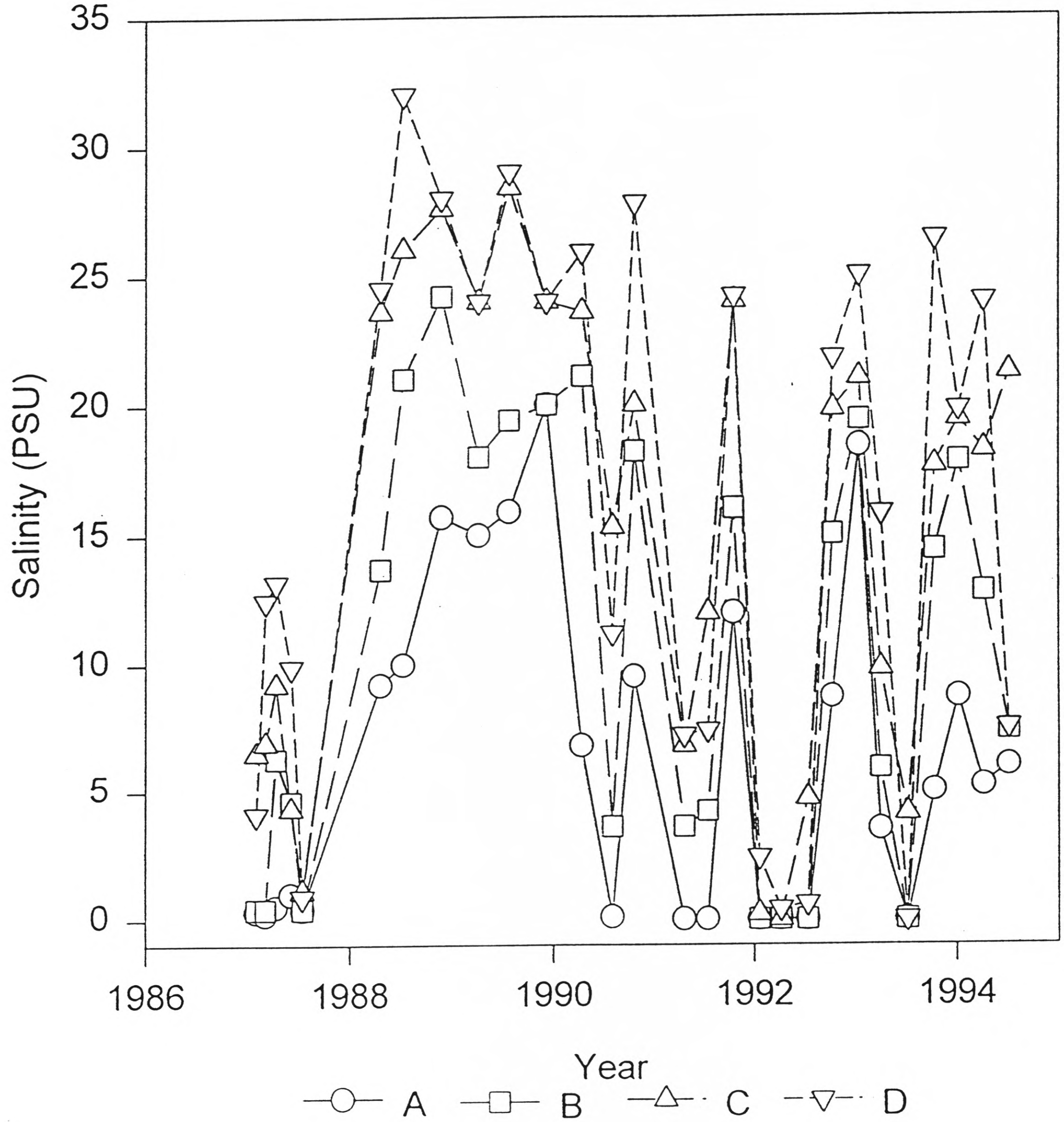
Fig 10. *Mulinia lateralis* average population abundance over entire estuary at each study period. A) In the Lavaca-Colorado (LC) and Guadalupe (GE) Estuaries. B) In the Nueces Estuary (NC) and Baffin Bay (BB).

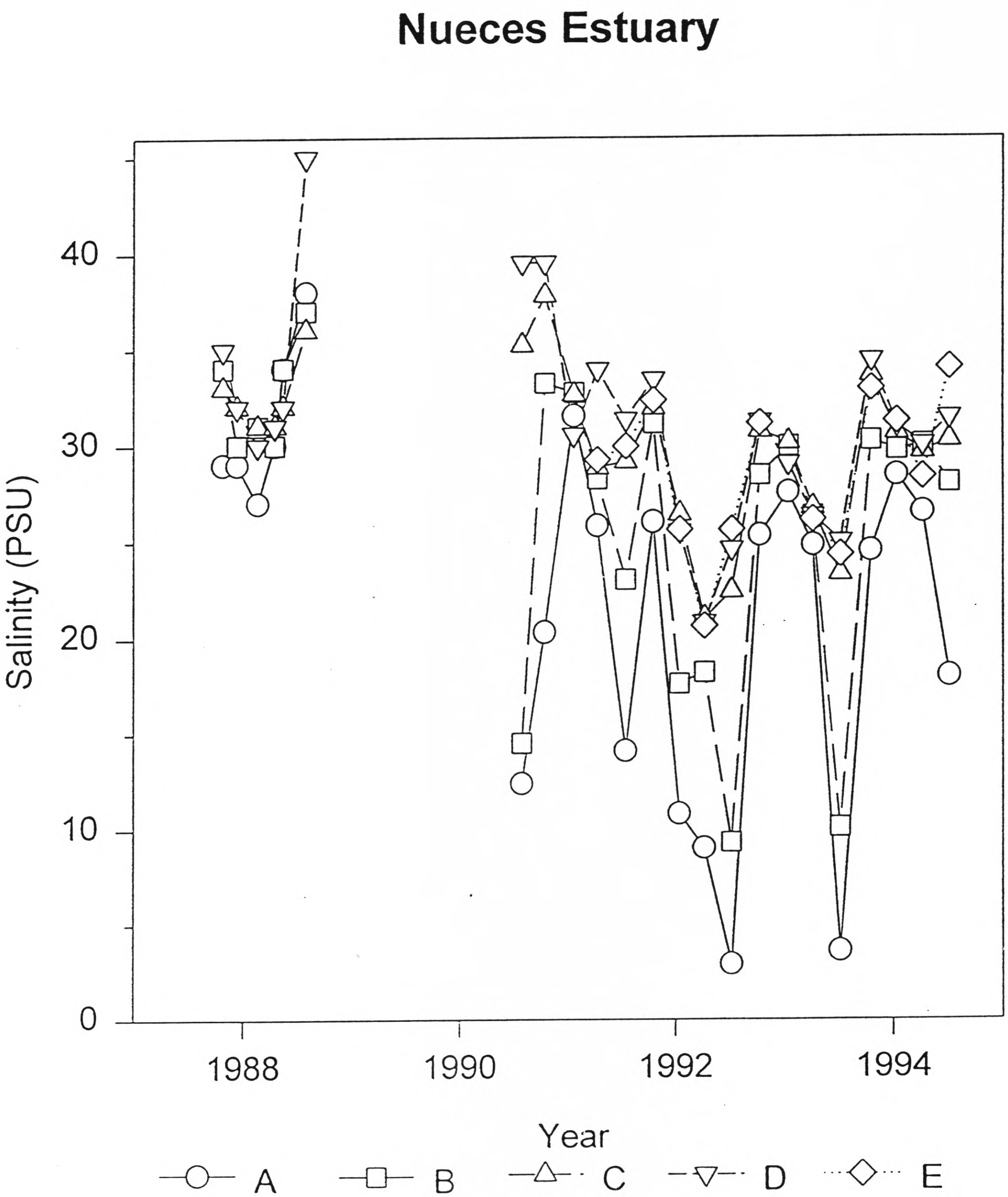

N
Colorado River
Tres Palacios River
Lavaca River
F
E
Matagorda Bay
D
Lavaca Bay
A
B
C
Pass Cavallo
Guadalupe River
A
B
D
San Antonio River
San Antonio Bay
C
Gulf of Mexico
50 km
Aransas River
Aransas Pass
E
C
D
Nueces Bay
Corpus Christi Bay
B
A
Nueces River
Laguna Madre
189
Study Area
6
24
Baffin Bay

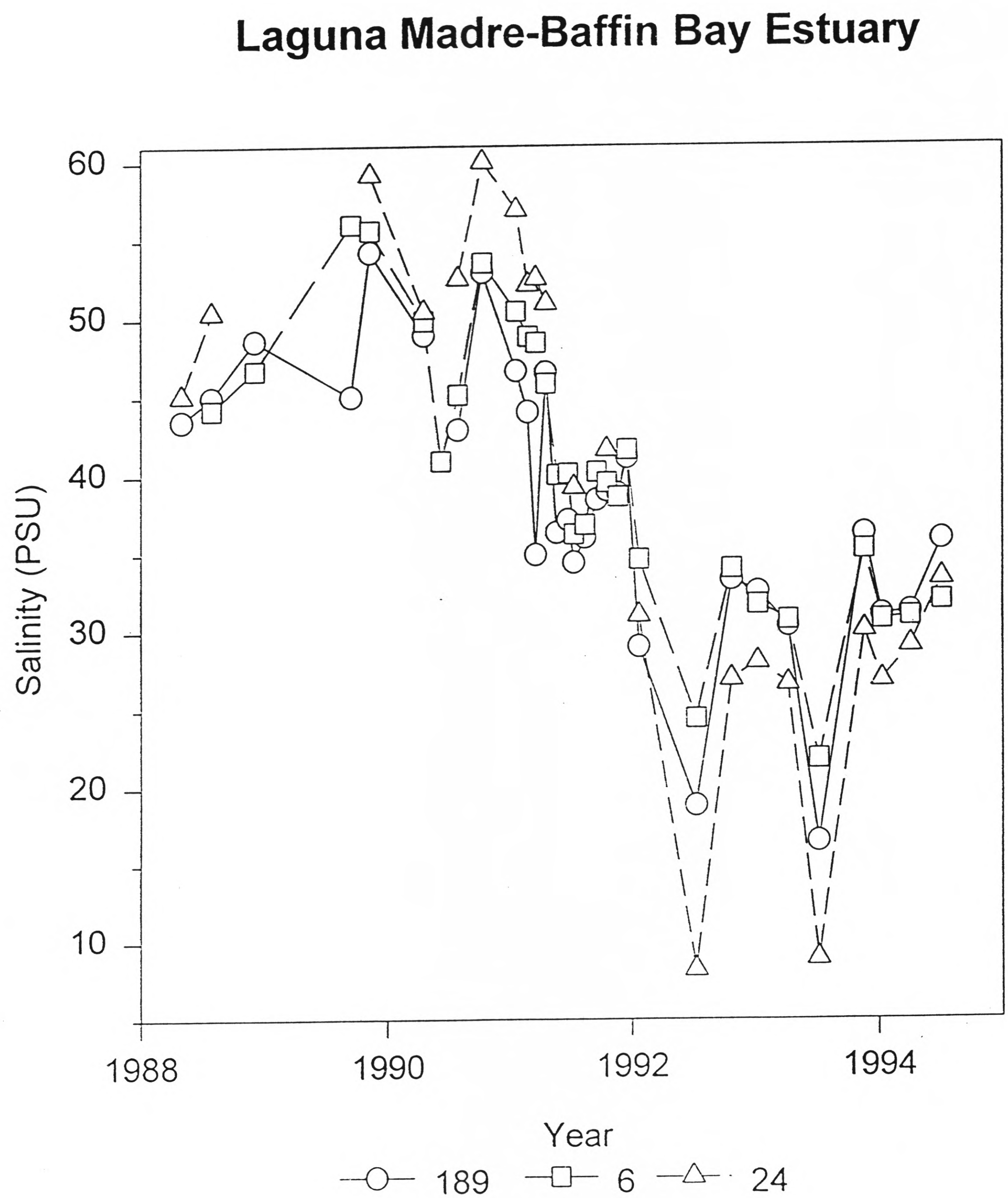
Lavaca-Colorado Estuary



Guadalupe Estuary

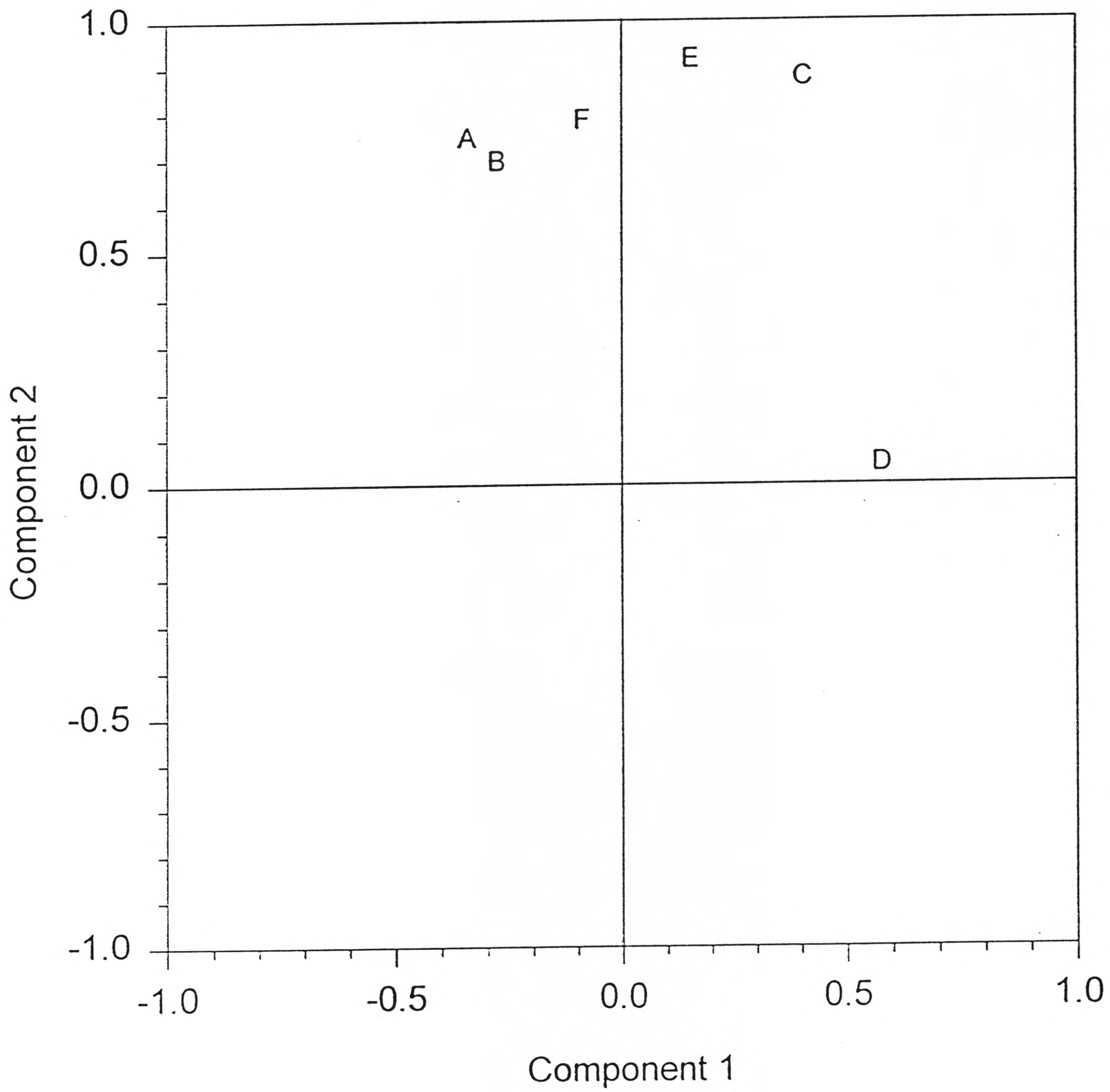



Nueces Estuary
Salinity (PSU)
0
10
20
30
40
1988
1990
1992
1994
Year
A
B
C
D
E

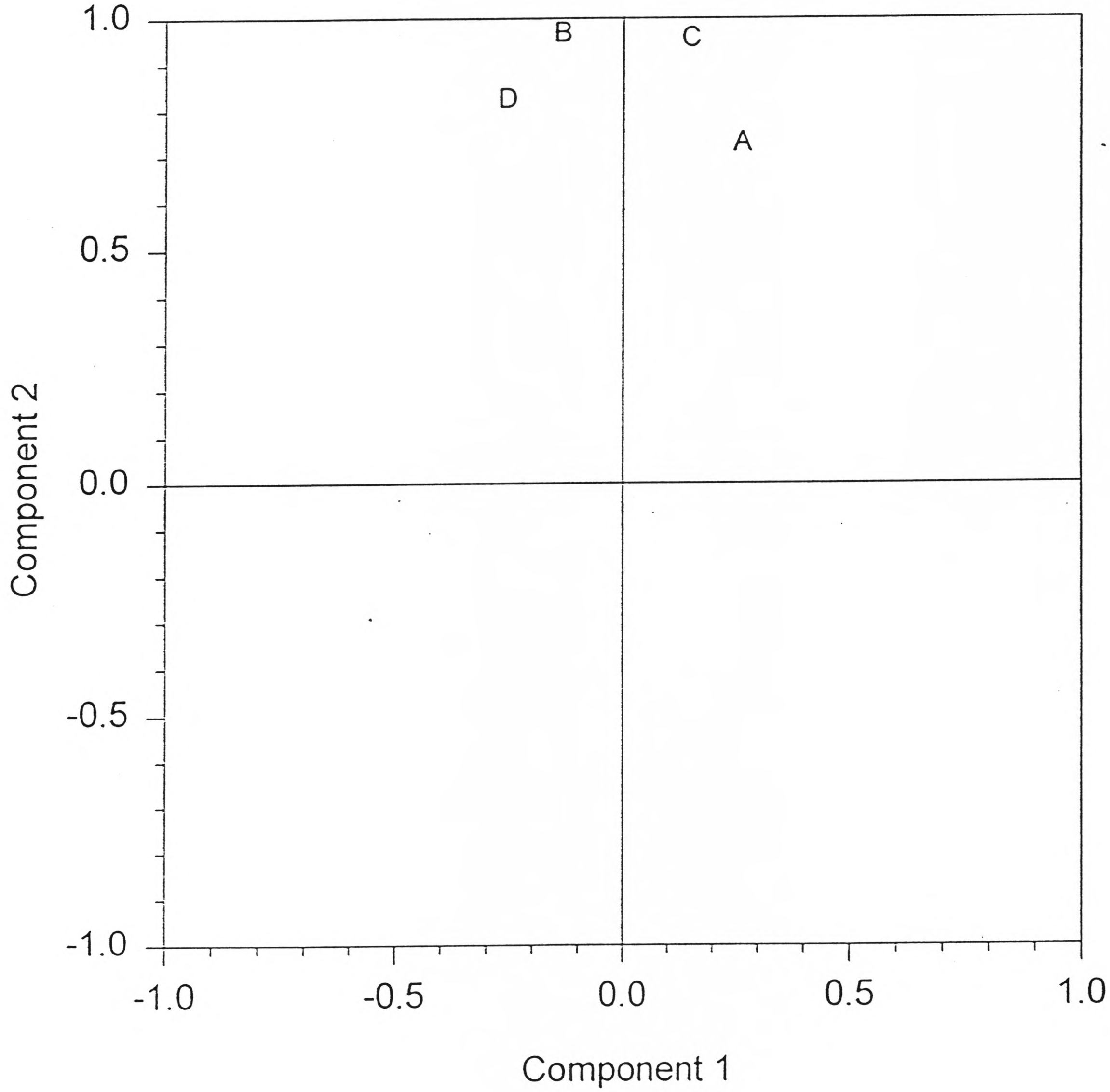


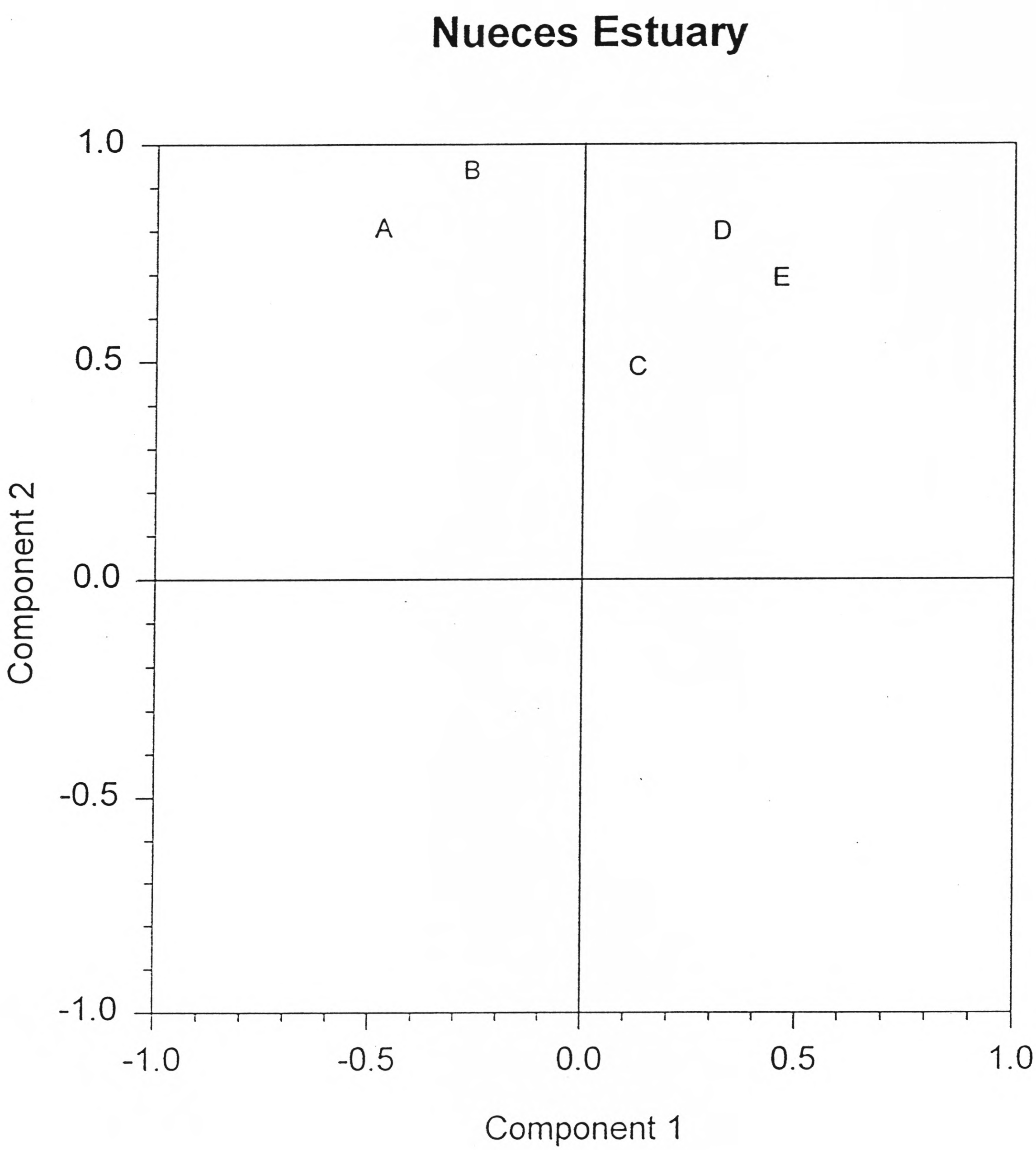
Laguna Madre-Baffin Bay Estuary
Salinity (PSU)
60
50
40
30
20
10
1988
1990
1992
1994
Year
189
6
24

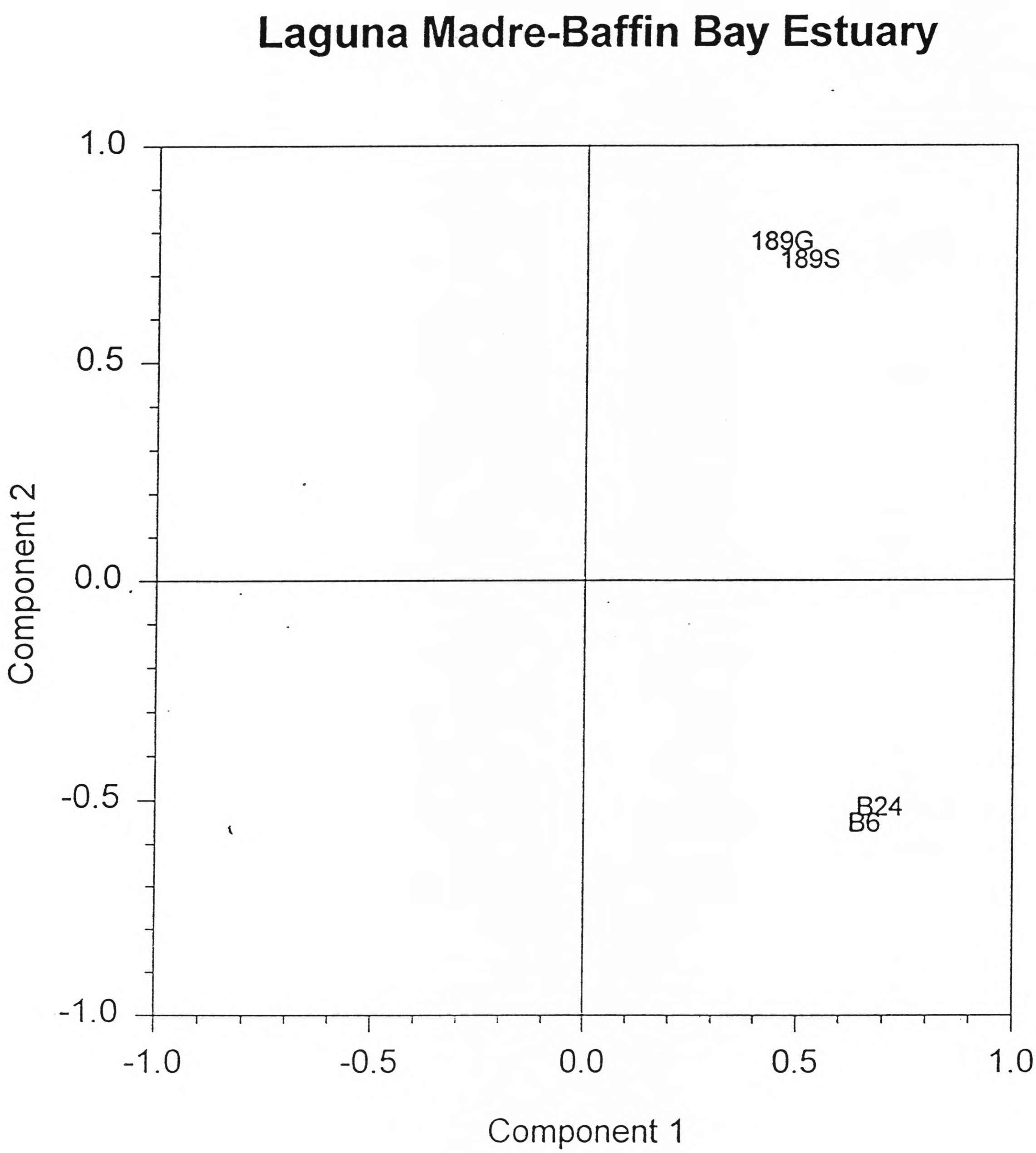
Lavaca-Colorado Estuary



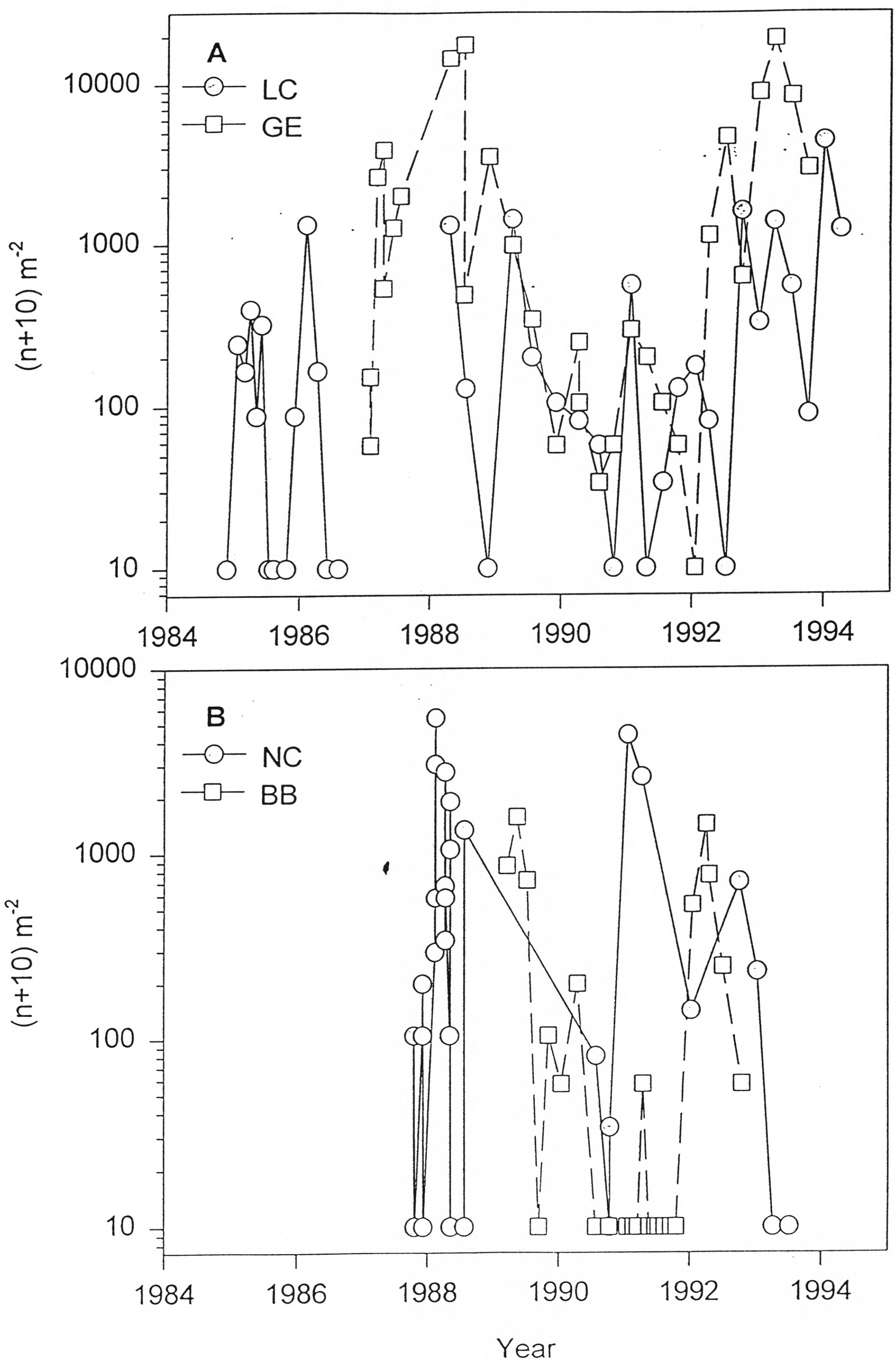
Guadalupe Estuary




Nueces Estuary
1.0
0.5
0.0
-0.5
-1.0
Component 2
B
A
D
E
C
-1.0
-0.5
0.0
0.5
1.0
Component 1


Laguna Madre-Baffin Bay Estuary
1.0
0.5
0.0
-0.5
-1.0
Component 2
189G
189S
B24
B6
-1.0
-0.5
0.0
0.5
1.0
Component 1

Mulinia lateralis



RECENT BIOLOGICAL DATA COLLECTIONS

Data taken from 1984-1992 can be found in the most recent comprehensive report (Montagna, P.A. 1992. Predicting long-term effects of freshwater inflow on macrobenthos in the Lavaca-Colorado and Guadalupe Estuaries. Year 2. Final Report to Texas Water Development Board. Technical Report No. TR/92-001, Marine Science Institute, The University of Texas, Port Aransas, TX, 105 pp.). The purpose of this data report is to transmit all data taken since that last report.

HYDROGRAPHIC DATA

Hydrographic measurements. Abbreviations: STA=Station, Z=Depth, SAL(R)=Salinity by refractometer, SAL(M)=Salinity by meter, COND=Conductivity, TEMP=Temperature, DO=dissolved oxygen, and ORP=oxidation redox potential. Missing values show with a period.

Lavaca-Colorado Estuary

Date	STA	z	SAL(R)	SAL(M)	COND	TEMP	pH	DO	ORP
06OCT92	A	0.00	22	19.6	31.70	25.28	8.99	8.25	0.186
06OCT92	A	1.40	22	19.8	32.00	25.23	9.01	8.10	0.186
06OCT92	B	0.00	25	23.0	36.50	24.66	8.56	7.73	0.190
06OCT92	B	2.20	25	23.0	36.50	24.60	8.84	7.54	0.187
06OCT92	C	0.00	28	25.9	40.40	24.52	8.46	7.35	0.187
06OCT92	C	3.50	28	26.4	41.30	24.37	8.51	6.37	0.192
06OCT92	D	0.00	31	27.0	42.10	24.27	8.18	6.80	0.201
06OCT92	D	4.60	31	27.0	42.00	24.22	8.38	6.52	0.206
12JAN93	A	0.00	2	2.9	6.07	11.49	7.78	11.33	0.318
12JAN93	A	1.10	2	16.0	27.00	12.07	7.62	8.77	0.330
12JAN93	B	0.00	5	7.5	13.52	10.88	7.76	11.52	0.305
12JAN93	B	1.70	5	21.0	34.00	12.81	7.66	9.03	0.312
12JAN93	C	0.00	20	20.3	32.20	11.69	7.72	10.44	0.306
12JAN93	C	2.80	20	21.3	33.90	11.90	7.70	9.62	0.307
12JAN93	D	0.00	22	23.2	36.60	12.53	7.85	10.30	0.294
12JAN93	D	4.00	22	27.2	42.10	14.30	7.73	7.92	0.297
12JAN93	E	0.00	18	20.1	32.00	14.42	8.34	9.30	0.175
12JAN93	E	3.10	18	22.2	35.20	14.46	8.38	8.16	0.195
12JAN93	F	0.00	12	13.9	22.90	15.93	8.70	10.08	0.168
12JAN93	F	1.20	12	14.6	24.00	15.99	8.74	9.37	0.187
05APR93	A	0.00	0	0.0	0.69	17.41	7.98	10.16	0.191

05APR93	A	1.10	0	0.0	0.70	17.38	8.01	10.06	0.194
05APR93	B	0.00	8	8.3	14.74	17.82	7.77	9.74	0.266
05APR93	B	1.80	8	10.4	18.30	17.72	7.78	8.88	0.266
05APR93	C	0.00	15	15.2	25.50	18.84	7.76	9.30	0.267
05APR93	C	2.80	15	15.3	25.50	18.85	7.78	8.83	0.265
05APR93	D	0.00	0	20.0	31.90	19.16	7.91	9.05	0.257
05APR93	D	3.90	0	20.9	33.50	19.02	7.91	8.35	0.257
05APR93	E	0.00	16	15.6	26.00	19.69	7.92	9.60	0.258
05APR93	E	3.20	16	16.9	27.70	19.22	7.90	8.40	0.259
05APR93	F	0.00	4	1.6	4.06	18.63	8.23	10.66	0.241
05APR93	F	1.00	4	5.6	11.48	17.55	7.97	9.32	0.256
09JUL93	A	0.00	3	0.8	2.45	28.09	8.03	7.03	0.216
09JUL93	A	1.10	3	0.8	2.51	28.12	8.12	6.85	0.218
09JUL93	B	0.00	2	0.0	1.05	28.37	7.78	6.85	0.239
09JUL93	B	1.80	2	1.7	4.20	28.12	8.08	6.53	0.230
09JUL93	C	0.00	8	5.6	10.44	28.60	7.95	6.88	0.230
09JUL93	C	2.90	8	5.6	10.46	28.59	7.97	6.75	0.229
09JUL93	D	0.00	13	11.3	19.40	28.53	8.10	7.27	0.232
09JUL93	D	4.10	13	28.0	43.70	27.80	7.35	1.92	0.264
09JUL93	E	0.00	12	11.0	18.80	29.18	8.04	7.30	0.219
09JUL93	E	3.30	12	13.4	22.90	28.94	7.80	4.57	0.231
09JUL93	F	0.00	12	10.4	18.00	29.69	8.02	7.29	0.225
09JUL93	F	1.10	12	13.3	23.60	28.27	7.90	5.94	0.235
11OCT93	A	0.00	18	16.6	27.10	23.37	8.06	7.05	0.230
11OCT93	A	1.30	18	19.4	31.80	24.31	8.04	6.07	0.235
11OCT93	B	0.00	22	20.4	32.80	23.74	8.03	7.64	0.241
11OCT93	B	2.20	22	23.3	37.00	24.96	8.11	6.34	0.260
11OCT93	C	0.00	28	26.1	40.90	25.06	8.10	7.03	0.262
11OCT93	C	3.20	28	28.2	43.80	25.90	8.10	5.56	0.269
11OCT93	D	0.00	28	26.9	42.00	26.11	8.03	7.23	0.224
11OCT93	D	4.60	28	29.3	45.20	25.49	8.11	6.09	0.241
11OCT93	E	0.00	32	29.3	45.10	25.64	8.18	6.41	0.228
11OCT93	E	3.70	32	29.4	45.40	25.48	8.18	5.97	0.230
11OCT93	F	0.00	28	26.1	40.90	24.90	8.20	7.50	0.232
11OCT93	F	1.60	28	28.5	44.50	25.04	8.20	6.74	0.234
05JAN94	A	0.00	18	18.4	30.00	11.24	8.17	9.61	0.266
05JAN94	A	0.80	18	18.4	30.00	11.24	8.17	9.29	0.266
05JAN94	B	0.00	22	22.6	35.80	11.47	8.16	9.50	0.246
05JAN94	B	1.40	22	23.4	37.10	11.57	8.09	8.79	0.248
05JAN94	C	0.00	25	26.2	40.90	11.97	8.07	9.14	0.234
05JAN94	C	2.60	25	26.2	41.00	11.96	8.06	8.95	0.234
05JAN94	D	0.00	27	27.3	42.30	12.84	8.05	8.91	0.226
05JAN94	D	3.90	27	30.0	46.10	13.71	8.00	7.88	0.227
05JAN94	E	0.00	25	25.2	39.40	12.17	8.09	9.24	0.220

05JAN94	E	2.00	25	25.2	39.50	12.08	8.07	8.76	0.207
05JAN94	F	0.00	18	16.6	27.20	13.12	8.33	10.64	0.208
05JAN94	F	1.00	18	16.7	27.40	13.00	8.32	10.47	0.210
07APR94	A	0.00	15	14.0	23.80	15.61	7.66	8.88	0.091
07APR94	A	1.30	15	14.2	24.00	15.74	7.77	8.65	0.094
07APR94	B	0.00	20	20.1	33.50	16.73	7.38	9.29	0.085
07APR94	B	2.00	20	21.3	34.20	16.80	7.78	7.95	0.098
07APR94	C	0.00	25	24.9	39.00	17.60	7.71	7.77	0.127
07APR94	C	3.00	25	25.2	39.60	17.78	7.86	7.42	0.131
07APR94	D	0.00	26	25.9	40.50	17.81	7.74	8.05	0.149
07APR94	D	4.30	26	27.1	42.20	17.79	7.94	7.08	0.154
07APR94	E	0.00	26	25.4	39.80	17.95	7.68	8.55	0.159
07APR94	E	3.50	26	25.5	40.00	17.70	7.81	7.63	0.166
07APR94	F	0.00	22	19.7	32.10	17.32	7.68	9.75	0.193
07APR94	F	1.40	22	21.9	35.60	16.46	7.76	8.03	0.199
07JUL94	A	1.10	10	6.4	11.83	29.06	8.07	10.42	0.140
07JUL94	A	6.40	10	.	0.14	29.06	10.4	11.83	1.100
07JUL94	B	0.00	14	12.2	20.80	29.35	8.09	10.25	0.129
07JUL94	B	1.80	14	12.8	21.10	29.33	8.07	8.45	0.138
07JUL94	C	0.00	28	26.0	40.00	29.26	8.09	9.81	0.136
07JUL94	C	2.80	28	26.5	40.40	29.28	8.10	8.55	0.131
07JUL94	D	0.00	32	31.5	47.90	28.82	7.96	9.20	0.140
07JUL94	D	3.90	32	33.4	51.40	28.05	7.70	4.56	0.112
07JUL94	E	0.00	25	24.1	38.00	30.09	8.13	9.80	0.134
07JUL94	E	3.40	25	29.0	45.10	29.06	7.56	3.90	0.120
07JUL94	F	0.00	22	21.3	34.00	30.78	7.94	7.20	0.132
07JUL94	F	1.30	22	21.3	34.00	30.72	7.96	6.92	0.134

Guadalupe Estuary

07OCT92	D	0.00	26	21.7	34.80	24.37	8.49	6.89	0.196
07OCT92	D	1.40	26	21.8	34.80	24.38	8.59	6.46	0.198
07OCT92	C	0.00	22	19.8	31.90	24.42	8.60	7.37	0.193
07OCT92	C	1.90	22	19.8	31.90	24.43	8.71	6.75	0.195
07OCT92	B	0.00	15	14.5	24.20	24.50	8.97	7.80	0.182
07OCT92	B	1.50	15	15.0	25.00	24.53	8.94	6.95	0.174
07OCT92	A	0.00	10	8.6	15.40	24.95	8.69	8.16	0.182
07OCT92	A	1.20	10	8.7	15.10	24.93	8.97	7.63	0.183
12JAN93	A	0.00	10	10.2	17.10	11.79	8.11	14.20	0.260
12JAN93	A	1.20	10	18.4	29.60	12.43	8.07	8.64	0.275
12JAN93	B	0.00	12	12.6	20.90	12.13	8.27	12.60	0.273
12JAN93	B	1.70	12	19.4	31.10	11.68	8.13	9.67	0.283
12JAN93	C	0.00	15	15.2	24.90	12.20	8.40	12.70	0.269

12JAN93	C	1.90	15	21.0	33.60	11.92	8.09	9.46	0.285
12JAN93	D	0.00	22	22.0	35.00	12.37	8.02	10.79	0.284
12JAN93	D	1.60	22	25.0	39.20	12.01	7.95	9.84	0.291
05APR93	A	0.00	2	0.8	2.47	21.37	8.17	10.31	0.246
05APR93	A	0.90	2	3.5	7.86	19.52	7.71	8.55	0.266
05APR93	B	0.00	5	4.6	8.81	23.00	8.15	11.58	0.250
05APR93	B	1.50	5	5.9	10.76	18.91	7.84	8.25	0.260
05APR93	C	0.00	10	9.7	16.90	20.43	7.86	9.67	0.260
05APR93	C	1.70	10	9.8	17.10	18.96	7.60	7.66	0.270
05APR93	D	0.00	14	14.1	23.00	20.27	7.89	10.61	0.257
05APR93	D	1.30	14	15.8	26.10	19.23	7.74	8.45	0.262
09JUL93	D	0.00	2	0.0	0.77	29.95	7.76	7.43	0.227
09JUL93	D	1.20	2	0.0	0.92	29.79	7.89	6.95	0.228
09JUL93	C	0.00	4	1.1	2.91	29.98	8.02	7.40	0.217
09JUL93	C	1.70	4	4.1	8.35	29.17	7.95	6.35	0.228
09JUL93	B	0.00	1	0.0	0.98	30.17	7.86	6.95	0.230
09JUL93	B	1.50	1	0.0	0.95	30.02	7.89	6.64	0.234
09JUL93	A	0.00	1	0.0	0.60	30.39	7.69	6.76	0.232
09JUL93	A	1.10	1	0.0	0.60	30.41	7.80	6.54	0.234
11OCT93	D	0.00	28	26.4	41.20	25.85	8.01	7.86	0.250
11OCT93	D	2.00	28	26.4	41.30	25.81	8.17	7.52	0.257
11OCT93	C	0.00	20	17.2	28.10	25.78	8.04	8.34	0.264
11OCT93	C	2.20	20	17.6	28.60	25.76	8.17	7.86	0.264
11OCT93	B	0.00	15	14.2	23.60	25.38	8.28	8.60	0.266
11OCT93	B	2.20	15	14.4	26.20	25.51	8.22	8.31	0.270
11OCT93	A	0.00	8	5.0	9.52	25.70	8.45	9.63	0.257
11OCT93	A	1.70	8	5.0	9.52	25.69	8.47	9.31	0.261
05JAN94	D	0.00	20	19.8	31.90	14.01	8.27	11.26	0.209
05JAN94	D	0.90	20	19.8	31.90	13.97	8.29	10.24	0.210
05JAN94	C	0.00	20	19.4	31.40	13.90	8.39	10.69	0.208
05JAN94	C	1.30	20	19.4	31.40	13.82	8.37	10.31	0.209
05JAN94	B	0.00	19	17.8	29.10	13.54	8.59	13.20	0.202
05JAN94	B	1.20	19	17.8	29.10	13.51	8.57	13.05	0.203
05JAN94	A	0.00	10	8.7	15.30	14.26	8.28	10.50	0.211
05JAN94	A	0.70	10	8.7	15.30	14.19	8.27	10.30	0.212
07APR94	D	0.00	25	23.8	36.90	18.89	7.89	9.72	0.176
07APR94	D	1.40	25	24.0	37.00	18.93	7.96	9.05	0.178
07APR94	C	0.00	18	18.1	29.30	19.18	7.93	9.02	0.173
07APR94	C	2.00	18	18.2	29.40	18.77	7.94	7.82	0.175
07APR94	B	0.00	14	12.8	21.70	19.06	8.11	9.55	0.153
07APR94	B	1.60	14	12.8	21.70	19.07	8.17	9.47	0.155
07APR94	A	0.00	6	5.2	9.74	18.58	8.10	9.25	0.147
07APR94	A	1.50	6	5.2	9.76	18.60	8.18	9.19	0.151
07JUL94	D	0.00	10	7.5	13.30	30.29	8.31	11.84	0.107

07JUL94	D	1.20	10	7.5	13.37	30.25	8.44	11.77	0.109
07JUL94	C	0.00	22	20.8	32.60	30.28	8.00	10.65	0.132
07JUL94	C	1.60	22	21.2	33.20	30.29	8.06	9.97	0.137
07JUL94	B	0.00	10	7.4	13.32	30.38	8.47	9.60	0.101
07JUL94	B	1.50	10	7.4	13.32	30.38	8.48	9.52	0.087
07JUL94	A	0.00	10	5.5	10.60	30.43	8.40	10.46	0.102
07JUL94	A	1.10	10	6.0	11.20	30.43	8.40	10.23	0.102

NUTRIENT CONCENTRATIONS

Nutrient measurements take during sampling. Water depth is in m. Nutrient concentrations are in umol/l.

Lavaca-Colorado Estuary

Date	Station	Depth	PO_4	SIO_4	NO_2	NO_3	NH_4
05OCT92	A	0	1.089	134	.262	.329	.306
05OCT92	A	1.4	1.096	132	.326	.409	.390
05OCT92	B	0	1.010	118	.249	.353	.177
05OCT92	B	2.2	1.526	157	.399	.407	.261
05OCT92	C	0	.887	73.	.164	.329	.048
05OCT92	C	3.5	.970	73.	.192	.326	.131
05OCT92	D	0	.624	54.	.150	.353	.084
05OCT92	D	4.6	0	0	0	0	0
12JAN93	A	0	.493	135	.334	12.343	2.115
12JAN93	A	1.1	.678	39.	.524	7.314	6.578
12JAN93	B	0	.429	84.	.299	9.075	2.467
12JAN93	B	1.7	.275	43.	.398	2.402	4.583
12JAN93	C	0	.262	45.	.221	.153	.830
12JAN93	C	2.8	.237	28.	.238	.187	.989
12JAN93	D	0	.397		.593	4.648	6.137
12JAN93	D	4.	.230		.174	.165	1.145
12JAN93	E	0	.205	43.	.274	1.540	1.729
12JAN93	E	3.1	.230	53.	.325	2.281	2.671
12JAN93	F	0	.333	50.	.480	.877	1.689
12JAN93	F	1.2	.256	70.	.517	1.199	5.043
05APR93	A	0	.194	143	.372	19.178	1.440
05APR93	A	1.1	.183	146	.403	19.190	1.393
05APR93	B	0	.162	53.	.525	7.107	2.368
05APR93	B	1.8	.151	44.	.540	4.745	3.111
05APR93	C	0	.172	36.	.111	.272	.557
05APR93	C	2.8	.151	21.	.195	.063	1.579
05APR93	D	0	.226	33.	.126	.008	.604
05APR93	D	3.9	.291	26.	.325	.019	1.393
05APR93	E	0	.162	39.	.149	.627	1.161
05APR93	E	3.2	.226	37.	.240	.133	1.300
05APR93	F	0	.151	136	.654	37.494	2.229
05APR93	F	1.0					
11OCT93	A	0	.99	82.	.93	.79	4.07
11OCT93	A	1.3	1.13	65.	1.05	.79	3.12
11OCT93	B	0	0.77	61.	0.67	.66	2.07

11OCT93	B	2.2	1.14	65.	0.94	0.79	2.55
11OCT93	C	0	0.71	53.	0.77	0.73	1.92
11OCT93	C	3.2	0.83	25.	0.83	0.70	2.76
11OCT93	D	0	0.59	5.4	0.73	0.70	2.33
11OCT93	D	4.6	.70	9.9	0.78	0.68	3.25
11OCT93	E	0	.76	4.2	0.69	0.65	2.18
11OCT93	E	3.7	1.23	6.6	0.74	0.59	2.50
11OCT93	F	0	0.80	48.	0.65	0.57	2.21
11OCT93	F	1.6	0.93	54.	5.54	5.28	4.40
07APR94	A	0	.294	45.	1.018	2.079	1.704
07APR94	A	1.3	.392	45.	1.280	2.664	1.848
07APR94	B	0	.441	36.	1.242	4.010	5.232
07APR94	B	2.0	1.078	41.	1.805	3.835	7.200
07APR94	C	0	.686	18.	.800	.625	4.656
07APR94	C	3.0	2.744	26.	1.894	0.000	11.520
07APR94	D	0	.392	17.	.371	0.000	1.296
07APR94	D	4.3	.882	15.	.730	0.000	3.600
07APR94	E	0	.441	17.	.282	0.000	1.272
07APR94	E	3.5	.588	20.	.422	0.000	1.872
07APR94	F	0	1.078	48.	.384	4.747	6.240
07APR94	F	1.4	1.176	38.	.768	.532	3.576

Guadalupe Estuary

07OCT92	A	0	4.058	205	.359	.911	24.728
07OCT92	A	1.2	3.437	196	.337	18.251	1.223
07OCT92	B	0	1.791	178	.245	.673	.300
07OCT92	B	1.5	2.026	178	.439	.625	.676
07OCT92	C	0	1.539	172	.253	.616	.158
07OCT92	C	1.9	1.384	156	.289	.665	.229
07OCT92	D	0	.800	119	.204	.377	.169
07OCT92	D	1.4	.882	116	.240	.486	.227
12JAN93	A		63.373	.68	2.070		28.80
12JAN93	A	0	.448	83.	.700		1.519
12JAN93	B	0	.454	61.	14.371	13.887	1.088
12JAN93	B	1.7	.448	30.	.556	7.365	1.900
12JAN93	C	0	.256		.296	.247	1.342
12JAN93	C	1.9	.384		.361	.356	2.479
12JAN93	D	0	.288		.247	.026	1.074
12JAN93	D	1.6	.333		.215	.046	1.038
05APR93	A	0	2.630	145	.959	98.602	3.111
05APR93	A	0.9	1.229	121	.790	80.975	5.851
05APR93	B	0	.647	117	20.510	19.835	9.288

05APR93	B	1.5	1.056	134	.783	25.383	1.393
05APR93	C	0	.151	68.	.232	.577	4.180
05APR93	C	1.7	.172	55.	.377	.752	8.220
05APR93	D	0	.172	40.	.293	1.653	1.068
05APR93	D	1.3	.162	38.	.247	.519	2.043
11OCT93	A	0	3.32	135	18.17	17.83	2.13
11OCT93	A	1.7	3.28	131	20.97	20.57	2.25
11OCT93	B	0	3.14	115	0.60	0.60	2.40
11OCT93	B	2.2	3.58	120	1.59	1.51	2.50
11OCT93	C	0	1.95	81.	0.64	0.62	2.60
11OCT93	D	0	1.81	81.	0.68	0.60	2.19
11OCT93	D	2.0	1.59	73.	0.59	0.52	2.14
07APR94	A	0	4.312	127	1.472	71.64	1.536
07APR94	A	1.5	5.390	127	1.536	87.98	1.968
07APR94	B	0	1.862	94.	2.208	14.52	1.344
07APR94	B	1.5	2.058	99.	2.278	14.07	2.448
07APR94	C	0	.980	57.	.947	4.507	3.192
07APR94	C	2.0	1.568	64.	1.523	4.702	6.336
07APR94	D	0	.441	41.	2.496	0.000	.960
07APR94	D	1.4	.372	41.	.160	0.000	.792

BIOMASS DATA

Biomass is measured for taxonomic groupings. Number and biomass per core, where a core is multiplied by 183 to get number or biomass per m^2.

Lavaca-Colorado Estuary

Date	STA	REP	SEC	Taxa	n	mg
06OCT92	A	1	3	Crustacea	1	0.02
06OCT92	A	1	3	Polychaeta	14	0.21
06OCT92	A	1	10	Rhynchocoela	1	0.03
06OCT92	A	1	10	Polychaeta	10	0.48
06OCT92	A	2	3	Polychaeta	17	0.14
06OCT92	A	2	10	Polychaeta	0	0
06OCT92	A	3	3	Polychaeta	28	0.44
06OCT92	A	3	10	Chironomid larvae	1	0.17
06OCT92	A	3	10	Rhynchocoela	1	0.18
06OCT92	A	3	10	Polychaeta	12	0.86
06OCT92	B	1	3	Mollusca	1	0.04
06OCT92	B	1	3	Polychaeta	19	0.44
06OCT92	B	1	10	Polychaeta	6	0.4
06OCT92	B	2	3	Polychaeta	19	0.38
06OCT92	B	2	10	Polychaeta	4	1.07
06OCT92	B	3	3	Polychaeta	3	0.16
06OCT92	B	3	10	Polychaeta	2	0.25
06OCT92	C	1	3	Mollusca	31	18.82
06OCT92	C	1	3	Rhynchocoela	1	0.02
06OCT92	C	1	3	Ophiuroidea	2	0.02
06OCT92	C	1	3	Polychaeta	50	2.16
06OCT92	C	1	10	Crustacea	1	0.05
06OCT92	C	1	10	Rhynchocoela	1	0.03
06OCT92	C	1	10	Polychaeta	24	1.9
06OCT92	C	2	3	Mollusca	17	10.96
06OCT92	C	2	3	Polychaeta	37	1.42
06OCT92	C	2	10	Rhynchocoela	2	0.28
06OCT92	C	2	10	Polychaeta	13	1.3
06OCT92	C	3	3	Mollusca	22	13.12
06OCT92	C	3	3	Rhynchocoela	2	0.03
06OCT92	C	3	3	Polychaeta	27	0.74
06OCT92	C	3	10	Rhynchocoela	2	0.02
06OCT92	C	3	10	Polychaeta	11	1.38

06OCT92	D	1	3	Mollusca	1	0.05
06OCT92	D	1	3	Ophiuroidea	1	0.05
06OCT92	D	1	3	Polychaeta	38	0.97
06OCT92	D	1	10	Crustacea	3	1.66
06OCT92	D	1	10	Mollusca	5	1.51
06OCT92	D	1	10	Rhynchocoela	3	0.17
06OCT92	D	1	10	Ophiuroidea	1	4.8
06OCT92	D	1	10	Polychaeta	6	0.72
06OCT92	D	2	3	Mollusca	2	0.28
06OCT92	D	2	3	Polychaeta	58	1.54
06OCT92	D	2	10	Mollusca	1	0.01
06OCT92	D	2	10	Rhynchocoela	1	0.24
06OCT92	D	2	10	Ophiuroidea	1	9.2
06OCT92	D	2	10	Polychaeta	15	0.84
06OCT92	D	3	3	Mollusca	1	0.1
06OCT92	D	3	3	Polychaeta	38	1.56
06OCT92	D	3	10	Mollusca	8	0.26
06OCT92	D	3	10	Rhynchocoela	2	0.02
06OCT92	D	3	10	Ophiuroidea	2	13.54
06OCT92	D	3	10	Polychaeta	12	2.19
12JAN93	A	1	3	Chironomid larvae	1	0.07
12JAN93	A	1	3	Mollusca	4	0.28
12JAN93	A	1	3	Polychaeta	42	1.21
12JAN93	A	1	10	Polychaeta	1	0.1
12JAN93	A	2	3	Mollusca	3	0.21
12JAN93	A	2	3	Polychaeta	82	1.29
12JAN93	A	2	10	Mollusca	1	0.18
12JAN93	A	2	10	Polychaeta	3	1.4
12JAN93	A	3	3	Mollusca	3	0.2
12JAN93	A	3	3	Polychaeta	32	0.58
12JAN93	A	3	10	Polychaeta	0	0
12JAN93	B	1	3	Mollusca	3	0.15
12JAN93	B	1	3	Polychaeta	17	0.46
12JAN93	B	1	10	Polychaeta	2	0.06
12JAN93	B	2	3	Mollusca	3	0.11
12JAN93	B	2	3	Rhynchocoela	1	0.02
12JAN93	B	2	3	Polychaeta	39	0.58
12JAN93	B	2	10	Polychaeta	4	0.32
12JAN93	B	3	3	Crustacea	1	0.12
12JAN93	B	3	3	Mollusca	1	0.03
12JAN93	B	3	3	Polychaeta	33	0.85
12JAN93	B	3	10	Polychaeta	2	0.02
12JAN93	C	1	3	Crustacea	2	0.11
12JAN93	C	1	3	Mollusca	3	3.11

12JAN93	C	1	3	Rhynchocoela	1	0.08
12JAN93	C	1	3	Ophiuroidea	3	0.06
12JAN93	C	1	3	Polychaeta	85	0.74
12JAN93	C	1	10	Other	1	4.45
12JAN93	C	1	10	Polychaeta	18	3.88
12JAN93	C	2	3	Crustacea	2	0.06
12JAN93	C	2	3	Rhynchocoela	1	0.03
12JAN93	C	2	3	Polychaeta	51	2.51
12JAN93	C	2	10	Polychaeta	8	4.6
12JAN93	C	3	3	Mollusca	1	0.05
12JAN93	C	3	3	Rhynchocoela	2	0.04
12JAN93	C	3	3	Ophiuroidea	3	3.55
12JAN93	C	3	3	Polychaeta	49	1.24
12JAN93	C	3	3	Sipunculida	1	2.36
12JAN93	C	3	10	Rhynchocoela	2	0.26
12JAN93	C	3	10	Polychaeta	12	2.01
12JAN93	D	1	3	Crustacea	1	0.02
12JAN93	D	1	3	Mollusca	10	0.56
12JAN93	D	1	3	Rhynchocoela	3	0.05
12JAN93	D	1	3	Ophiuroidea	11	21.38
12JAN93	D	1	3	Polychaeta	55	5.14
12JAN93	D	1	10	Ophiuroidea	1	2.53
12JAN93	D	1	10	Polychaeta	4	1.05
12JAN93	D	2	3	Rhynchocoela	1	0.05
12JAN93	D	2	3	Polychaeta	13	2.63
12JAN93	D	2	10	Polychaeta	5	0.5
12JAN93	D	3	3	Crustacea	2	1.4
12JAN93	D	3	3	Rhynchocoela	2	0.04
12JAN93	D	3	3	Other	1	0.09
12JAN93	D	3	3	Ophiuroidea	1	0.2
12JAN93	D	3	3	Polychaeta	23	1.23
12JAN93	D	3	10	Polychaeta	6	6.77
12JAN93	E	1	3	Mollusca	2	0.06
12JAN93	E	1	3	Rhynchocoela	2	0.05
12JAN93	E	1	3	Ophiuroidea	1	0.02
12JAN93	E	1	3	Polychaeta	61	9.06
12JAN93	E	1	10	Rhynchocoela	1	0.03
12JAN93	E	1	10	Ophiuroidea	1	0.03
12JAN93	E	1	10	Polychaeta	8	4.91
12JAN93	E	2	3	Mollusca	2	0.1
12JAN93	E	2	3	Polychaeta	42	1.79
12JAN93	E	2	10	Polychaeta	12	17.5
12JAN93	E	3	3	Ophiuroidea	1	0.01
12JAN93	E	3	3	Polychaeta	31	3.65

12JAN93	E	3	10	Polychaeta	7	8.68
12JAN93	F	1	3	Mollusca	4	0.1
12JAN93	F	1	3	Polychaeta	26	2.01
12JAN93	F	1	10	Polychaeta	3	6.96
12JAN93	F	2	3	Mollusca	9	2.37
12JAN93	F	2	3	Mollusca	1	0.9
12JAN93	F	2	3	Other	2	0.39
12JAN93	F	2	3	Polychaeta	60	3.28
12JAN93	F	2	10	Rhynchocoela	2	7.94
12JAN93	F	2	10	Polychaeta	3	5.49
12JAN93	F	3	3	Mollusca	6	0.74
12JAN93	F	3	3	Polychaeta	38	1.76
12JAN93	F	3	10	Polychaeta	4	2.41
05APR93	A	1	3	Mollusca	1	0.22
05APR93	A	1	3	Rhynchocoela	1	0.05
05APR93	A	1	3	Other	1	0.06
05APR93	A	1	3	Polychaeta	48	0.92
05APR93	A	1	10	Mollusca	1	3.95
05APR93	A	1	10	Polychaeta	4	0.16
05APR93	A	2	3	Polychaeta	13	0.48
05APR93	A	2	10	Mollusca	1	2.43
05APR93	A	2	10	Polychaeta	1	0.04
05APR93	A	3	3	Rhynchocoela	5	0.19
05APR93	A	3	3	Polychaeta	43	0.74
05APR93	A	3	10	Mollusca	1	10.53
05APR93	A	3	10	Polychaeta	10	0.37
05APR93	B	1	3	Mollusca	7	4.64
05APR93	B	1	3	Polychaeta	60	2.44
05APR93	B	1	10	Mollusca	1	3.1
05APR93	B	1	10	Rhynchocoela	1	0.79
05APR93	B	1	10	Polychaeta	16	1.75
05APR93	B	2	3	Mollusca	2	3.96
05APR93	B	2	3	Rhynchocoela	1	1.93
05APR93	B	2	3	Polychaeta	41	3.6
05APR93	B	2	10	Rhynchocoela	1	7.02
05APR93	B	2	10	Other	4	0.45
05APR93	B	2	10	Polychaeta	8	0.49
05APR93	B	3	3	Polychaeta	11	3.86
05APR93	B	3	10	Rhynchocoela	2	0.58
05APR93	B	3	10	Polychaeta	9	10.22
05APR93	C	1	3	Crustacea	1	0.07
05APR93	C	1	3	Mollusca	33	10.19
05APR93	C	1	3	Polychaeta	4	0.71
05APR93	C	1	10	Mollusca	2	0.13

05APR93	C	1	10	Polychaeta	4	0.58
05APR93	C	2	3	Crustacea	5	0.15
05APR93	C	2	3	Mollusca	11	2.51
05APR93	C	2	3	Polychaeta	7	0.6
05APR93	C	2	10	Mollusca	1	0.1
05APR93	C	2	10	Polychaeta	8	5.56
05APR93	C	3	3	Crustacea	2	0.09
05APR93	C	3	3	Mollusca	10	5.18
05APR93	C	3	3	Polychaeta	3	0.65
05APR93	C	3	10	Polychaeta	4	1.41
05APR93	D	1	3	Crustacea	1	0.02
05APR93	D	1	3	Mollusca	1	0.02
05APR93	D	1	3	Rhynchocoela	1	0.04
05APR93	D	1	3	Other	1	0.12
05APR93	D	1	3	Polychaeta	85	3.96
05APR93	D	1	10	Rhynchocoela	1	0.74
05APR93	D	1	10	Ophiuroidea	4	25.38
05APR93	D	1	10	Polychaeta	12	9.5
05APR93	D	2	3	Rhynchocoela	1	0.23
05APR93	D	2	3	Other	2	0.54
05APR93	D	2	3	Ophiuroidea	1	0.1
05APR93	D	2	3	Polychaeta	72	2.81
05APR93	D	2	3	Sipunculida	1	0.06
05APR93	D	2	10	Rhynchocoela	4	13.58
05APR93	D	2	10	Polychaeta	7	4.2
05APR93	D	3	3	Crustacea	1	0.02
05APR93	D	3	3	Mollusca	1	0.04
05APR93	D	3	3	Polychaeta	51	1.56
05APR93	D	3	10	Other	1	183.6
05APR93	D	3	10	Polychaeta	12	7.36
05APR93	E	1	3	Crustacea	1	0.04
05APR93	E	1	3	Mollusca	2	1.25
05APR93	E	1	3	Rhynchocoela	3	0.57
05APR93	E	1	3	Polychaeta	37	2.11
05APR93	E	1	10	Polychaeta	5	2.54
05APR93	E	2	3	Mollusca	5	1.49
05APR93	E	2	3	Rhynchocoela	1	0.22
05APR93	E	2	3	Polychaeta	34	2.33
05APR93	E	2	10	Other	1	0.98
05APR93	E	2	10	Polychaeta	6	0.41
05APR93	E	3	3	Crustacea	1	0.07
05APR93	E	3	3	Mollusca	5	2.13
05APR93	E	3	3	Ophiuroidea	1	0.34
05APR93	E	3	3	Polychaeta	44	5.81

05APR93	E	3	10	Rhynchocoela	3	0.41
05APR93	E	3	10	Polychaeta	8	3.6
05APR93	F	1	3	Mollusca	12	6.72
05APR93	F	1	3	Other	4	0.07
05APR93	F	1	3	Polychaeta	47	1.78
05APR93	F	1	10	Mollusca	2	29.29
05APR93	F	1	10	Rhynchocoela	2	1.7
05APR93	F	1	10	Other	2	0.03
05APR93	F	1	10	Polychaeta	12	8.77
05APR93	F	2	3	Mollusca	8	3.68
05APR93	F	2	3	Rhynchocoela	1	0.12
05APR93	F	2	3	Polychaeta	46	1.76
05APR93	F	2	10	Rhynchocoela	3	4.8
05APR93	F	2	10	Polychaeta	9	5.28
05APR93	F	3	3	Mollusca	7	3.02
05APR93	F	3	3	Polychaeta	77	3.05
05APR93	F	3	10	Mollusca	2	20.48
05APR93	F	3	10	Rhynchocoela	1	0.01
05APR93	F	3	10	Polychaeta	4	5.76
09JUL93	A	1	3	Mollusca	3	0.17
09JUL93	A	1	3	Polychaeta	15	0.2
09JUL93	A	1	10	Chironomid larvae	1	0.08
09JUL93	A	2	3	Chironomid larvae	1	0.06
09JUL93	A	2	3	Mollusca	5	0.62
09JUL93	A	2	3	Polychaeta	25	0.36
09JUL93	A	2	10	Mollusca	1	5.92
09JUL93	A	2	10	Polychaeta	2	0.03
09JUL93	A	3	3	Mollusca	1	0.12
09JUL93	A	3	3	Polychaeta	21	0.17
09JUL93	A	3	10	Mollusca	1	6.75
09JUL93	A	3	10	Polychaeta	4	0.16
09JUL93	B	1	3	Chironomid larvae	1	0.07
09JUL93	B	1	3	Polychaeta	4	0.3
09JUL93	B	1	10	Polychaeta	2	0.44
09JUL93	B	2	3	Mollusca	3	0.2
09JUL93	B	2	10	Polychaeta	7	1.28
09JUL93	B	3	3	Polychaeta	6	0.28
09JUL93	B	3	10	Polychaeta	10	1.1
09JUL93	C	1	3	Polychaeta	12	0.73
09JUL93	C	1	10	Polychaeta	1	0.34
09JUL93	C	2	3	Mollusca	2	0.98
09JUL93	C	2	3	Polychaeta	11	0.53
09JUL93	C	2	10	Polychaeta	5	0.73
09JUL93	C	3	3	Mollusca	2	1.72

09JUL93	C	3	3	Polychaeta	22	1.12
09JUL93	C	3	10	Mollusca	4	0.53
09JUL93	C	3	10	Rhynchocoela	1	0.08
09JUL93	C	3	10	Polychaeta	5	9.74
09JUL93	D	1	3	Crustacea	1	0.02
09JUL93	D	1	3	Mollusca	1	0.02
09JUL93	D	1	3	Other	1	0.12
09JUL93	D	1	3	Polychaeta	7	0.48
09JUL93	D	1	10	Crustacea	2	1.98
09JUL93	D	1	10	Mollusca	1	0.08
09JUL93	D	1	10	Polychaeta	5	2.09
09JUL93	D	2	3	Crustacea	4	0.03
09JUL93	D	2	3	Polychaeta	3	0.11
09JUL93	D	2	10	Crustacea	1	0.54
09JUL93	D	2	10	Mollusca	2	0.06
09JUL93	D	2	10	Rhynchocoela	1	0.26
09JUL93	D	2	10	Polychaeta	7	0.29
09JUL93	D	3	3	Mollusca	1	0.57
09JUL93	D	3	3	Polychaeta	15	0.79
09JUL93	D	3	10	Mollusca	3	0.31
09JUL93	D	3	10	Rhynchocoela	1	0.72
09JUL93	D	3	10	Ophiuroidea	1	4.66
09JUL93	D	3	10	Polychaeta	5	2.03
09JUL93	E	1	3	Mollusca	11	0.28
09JUL93	E	1	3	Polychaeta	10	2.33
09JUL93	E	1	10	Polychaeta	5	0.62
09JUL93	E	2	3	Mollusca	14	2.68
09JUL93	E	2	3	Polychaeta	11	0.24
09JUL93	E	2	10	Polychaeta	7	4
09JUL93	E	3	3	Mollusca	5	0.71
09JUL93	E	3	3	Rhynchocoela	1	0.04
09JUL93	E	3	3	Polychaeta	8	0.19
09JUL93	E	3	10	Polychaeta	7	3.26
09JUL93	F	1	3	Rhynchocoela	1	0.23
09JUL93	F	1	3	Polychaeta	15	1.69
09JUL93	F	1	10	Polychaeta	19	4.56
09JUL93	F	2	3	Polychaeta	7	1.45
09JUL93	F	2	10	Polychaeta	20	5.82
09JUL93	F	3	3	Mollusca	1	0.02
09JUL93	F	3	3	Polychaeta	26	2.58
09JUL93	F	3	10	Polychaeta	14	2.68
11OCT93	A	1	3	Polychaeta	5	0.13
11OCT93	A	1	10	Polychaeta	0	0
11OCT93	A	2	3	Polychaeta	7	0.22

11OCT93	A	2	10	Polychaeta	0	0
11OCT93	A	3	3	Polychaeta	0	0
11OCT93	A	3	10	Polychaeta	0	0
11OCT93	B	1	3	Mollusca	1	0.01
11OCT93	B	1	3	Polychaeta	1	0.01
11OCT93	B	1	10	Polychaeta	3	0.87
11OCT93	B	2	3	Rhynchocoela	2	0.04
11OCT93	B	2	3	Polychaeta	3	0.24
11OCT93	B	2	10	Polychaeta	6	1.29
11OCT93	B	3	3	Polychaeta	1	0.11
11OCT93	B	3	10	Polychaeta	3	0.28
11OCT93	C	1	3	Rhynchocoela	1	0.13
11OCT93	C	1	3	Ophiuroidea	1	0.02
11OCT93	C	1	3	Polychaeta	16	1.27
11OCT93	C	1	10	Polychaeta	12	1.44
11OCT93	C	2	3	Mollusca	2	0.04
11OCT93	C	2	3	Ophiuroidea	2	0.04
11OCT93	C	2	3	Polychaeta	23	1.7
11OCT93	C	2	10	Rhynchocoela	1	0.07
11OCT93	C	2	10	Polychaeta	17	2.79
11OCT93	C	3	3	Mollusca	2	0.22
11OCT93	C	3	3	Other	1	0.69
11OCT93	C	3	3	Ophiuroidea	1	0.01
11OCT93	C	3	3	Polychaeta	6	1.47
11OCT93	C	3	10	Polychaeta	2	1.12
11OCT93	D	1	3	Rhynchocoela	1	0.01
11OCT93	D	1	3	Polychaeta	8	0.79
11OCT93	D	1	10	Crustacea	1	0.02
11OCT93	D	1	10	Rhynchocoela	2	0.71
11OCT93	D	1	10	Ophiuroidea	1	18.51
11OCT93	D	1	10	Polychaeta	10	2.75
11OCT93	D	2	3	Mollusca	4	0.18
11OCT93	D	2	3	Rhynchocoela	2	0.72
11OCT93	D	2	3	Ophiuroidea	1	11.6
11OCT93	D	2	3	Polychaeta	10	0.22
11OCT93	D	2	10	Mollusca	3	0.26
11OCT93	D	2	10	Rhynchocoela	2	0.03
11OCT93	D	2	10	Ophiuroidea	1	6.84
11OCT93	D	2	10	Polychaeta	6	0.31
11OCT93	D	3	3	Mollusca	5	0.3
11OCT93	D	3	3	Polychaeta	4	0.18
11OCT93	D	3	10	Mollusca	2	0.04
11OCT93	D	3	10	Rhynchocoela	1	0.01
11OCT93	D	3	10	Ophiuroidea	1	2.22

11OCT93	D	3	10	Polychaeta	8	0.2
11OCT93	E	1	3	Mollusca	2	0.75
11OCT93	E	1	3	Polychaeta	10	0.33
11OCT93	E	1	10	Polychaeta	9	4.41
11OCT93	E	2	3	Mollusca	1	0.07
11OCT93	E	2	3	Polychaeta	13	0.51
11OCT93	E	2	10	Mollusca	1	0.07
11OCT93	E	2	10	Polychaeta	12	4.33
11OCT93	E	3	3	Mollusca	1	0.11
11OCT93	E	3	3	Polychaeta	7	0.24
11OCT93	E	3	10	Polychaeta	7	6.35
11OCT93	F	1	3	Crustacea	4	0.36
11OCT93	F	1	3	Polychaeta	6	0.46
11OCT93	F	1	10	Polychaeta	5	3.84
11OCT93	F	2	3	Crustacea	3	0.33
11OCT93	F	2	3	Rhynchocoela	1	0.01
11OCT93	F	2	3	Polychaeta	12	0.35
11OCT93	F	2	10	Polychaeta	3	0.94
11OCT93	F	3	3	Crustacea	1	0.09
11OCT93	F	3	3	Mollusca	1	0.05
11OCT93	F	3	3	Rhynchocoela	1	0.01
11OCT93	F	3	3	Polychaeta	9	0.45
11OCT93	F	3	10	Polychaeta	0	0
05JAN94	A	1	3	Crustacea	1	0.01
05JAN94	A	1	3	Mollusca	3	0.47
05JAN94	A	1	3	Polychaeta	29	0.93
05JAN94	A	1	10	Polychaeta	1	0.02
05JAN94	A	2	3	Crustacea	3	0.07
05JAN94	A	2	3	Mollusca	5	0.16
05JAN94	A	2	3	Rhynchocoela	1	0.39
05JAN94	A	2	3	Polychaeta	35	1.68
05JAN94	A	2	10	Polychaeta	2	0.02
05JAN94	A	3	3	Mollusca	11	0.88
05JAN94	A	3	3	Polychaeta	23	0.36
05JAN94	A	3	10	Polychaeta	0	0
05JAN94	B	1	3	Mollusca	7	0.11
05JAN94	B	1	3	Polychaeta	7	0.21
05JAN94	B	1	10	Crustacea	1	4.89
05JAN94	B	1	10	Polychaeta	5	5.23
05JAN94	B	2	3	Mollusca	6	1.74
05JAN94	B	2	3	Polychaeta	11	0.84
05JAN94	B	2	10	Polychaeta	1	0.25
05JAN94	B	3	3	Mollusca	7	0.18
05JAN94	B	3	3	Polychaeta	13	1.65

05JAN94	B	3	10	Mollusca	2	6.65
05JAN94	B	3	10	Polychaeta	4	24.81
05JAN94	C	1	3	Crustacea	1	0.01
05JAN94	C	1	3	Polychaeta	11	2.67
05JAN94	C	1	10	Rhynchocoela	1	0.31
05JAN94	C	1	10	Polychaeta	3	5.78
05JAN94	C	2	3	Mollusca	1	0.61
05JAN94	C	2	3	Rhynchocoela	2	0.45
05JAN94	C	2	3	Ophiuroidea	1	0.01
05JAN94	C	2	3	Polychaeta	26	1.8
05JAN94	C	2	10	Rhynchocoela	1	0.35
05JAN94	C	2	10	Polychaeta	6	1.32
05JAN94	C	3	3	Rhynchocoela	2	0.13
05JAN94	C	3	3	Polychaeta	21	2.98
05JAN94	C	3	10	Polychaeta	4	0.54
05JAN94	D	1	3	Crustacea	2	1.67
05JAN94	D	1	3	Mollusca	2	0.16
05JAN94	D	1	3	Rhynchocoela	1	0.01
05JAN94	D	1	3	Ophiuroidea	1	0.97
05JAN94	D	1	3	Polychaeta	21	5.73
05JAN94	D	1	10	Ophiuroidea	1	1.68
05JAN94	D	2	3	Crustacea	4	0.05
05JAN94	D	2	3	Other	3	0.1
05JAN94	D	2	3	Ophiuroidea	1	1.19
05JAN94	D	2	3	Polychaeta	21	1.61
05JAN94	D	2	10	Mollusca	1	0.05
05JAN94	D	2	10	Rhynchocoela	2	0.48
05JAN94	D	2	10	Ophiuroidea	1	4.54
05JAN94	D	2	10	Polychaeta	18	4.61
05JAN94	D	3	3	Crustacea	1	0.01
05JAN94	D	3	3	Mollusca	1	0.01
05JAN94	D	3	3	Rhynchocoela	2	0.15
05JAN94	D	3	3	Other	4	0.46
05JAN94	D	3	3	Ophiuroidea	1	0.03
05JAN94	D	3	3	Polychaeta	26	1.58
05JAN94	D	3	10	Crustacea	4	4.1
05JAN94	D	3	10	Mollusca	7	0.2
05JAN94	D	3	10	Rhynchocoela	2	4.15
05JAN94	D	3	10	Ophiuroidea	1	2.76
05JAN94	D	3	10	Polychaeta	21	5.28
05JAN94	E	1	3	Mollusca	73	11.45
05JAN94	E	1	3	Ophiuroidea	1	0.02
05JAN94	E	1	3	Polychaeta	41	3.54
05JAN94	E	1	10	Polychaeta	23	13.64

05JAN94	E	2	3	Crustacea	2	0.24
05JAN94	E	2	3	Mollusca	76	8.81
05JAN94	E	2	3	Other	1	0.04
05JAN94	E	2	3	Polychaeta	17	1.44
05JAN94	E	2	10	Mollusca	1	0.09
05JAN94	E	2	10	Rhynchocoela	1	0.07
05JAN94	E	2	10	Polychaeta	26	9.29
05JAN94	E	3	3	Crustacea	1	0.02
05JAN94	E	3	3	Mollusca	106	8.17
05JAN94	E	3	3	Other	2	0.13
05JAN94	E	3	3	Ophiuroidea	1	0.01
05JAN94	E	3	3	Polychaeta	22	2.29
05JAN94	E	3	10	Mollusca	2	2.71
05JAN94	E	3	10	Polychaeta	36	8.09
05JAN94	F	1	3	Crustacea	1	5.64
05JAN94	F	1	3	Mollusca	10	7.99
05JAN94	F	1	3	Other	1	0.46
05JAN94	F	1	3	Polychaeta	12	0.32
05JAN94	F	1	10	Other	1	0.79
05JAN94	F	2	3	Crustacea	1	0.13
05JAN94	F	2	3	Mollusca	13	3.24
05JAN94	F	2	3	Rhynchocoela	1	0.18
05JAN94	F	2	3	Polychaeta	16	4.65
05JAN94	F	2	10	Polychaeta	1	3.99
05JAN94	F	3	3	Mollusca	16	4.97
05JAN94	F	3	3	Polychaeta	14	1.27
05JAN94	F	3	10	Mollusca	7	4.37
05JAN94	F	3	10	Rhynchocoela	1	0.07
05JAN94	F	3	10	Polychaeta	3	0.68
07APR94	A	1	3	Crustacea	1	0.14
07APR94	A	1	3	Mollusca	8	2.4
07APR94	A	1	3	Polychaeta	24	1.12
07APR94	A	1	10	Rhynchocoela	1	0.87
07APR94	A	1	10	Polychaeta	7	1.44
07APR94	A	2	3	Crustacea	2	0.02
07APR94	A	2	3	Mollusca	9	0.82
07APR94	A	2	3	Polychaeta	25	2.21
07APR94	A	2	10	Crustacea	1	0.01
07APR94	A	2	10	Mollusca	1	12.18
07APR94	A	2	10	Polychaeta	14	1.93
07APR94	A	3	3	Crustacea	1	0.05
07APR94	A	3	3	Mollusca	10	3.54
07APR94	A	3	3	Polychaeta	38	1.85
07APR94	A	3	10	Mollusca	1	3.06

07APR94	A	3	10	Polychaeta	19	4.35
07APR94	B	1	3	Other	1	0.13
07APR94	B	1	3	Polychaeta	31	3.14
07APR94	B	1	10	Mollusca	1	8.36
07APR94	B	1	10	Polychaeta	6	4.45
07APR94	B	2	3	Mollusca	3	1.03
07APR94	B	2	3	Polychaeta	28	1.62
07APR94	B	2	10	Rhynchocoela	1	0.18
07APR94	B	2	10	Polychaeta	3	5.03
07APR94	B	3	3	Mollusca	4	0.32
07APR94	B	3	3	Rhynchocoela	1	0.49
07APR94	B	3	3	Polychaeta	13	0.72
07APR94	B	3	10	Rhynchocoela	1	0.05
07APR94	B	3	10	Polychaeta	4	1.49
07APR94	C	1	3	Rhynchocoela	1	0.39
07APR94	C	1	3	Polychaeta	6	2.06
07APR94	C	1	10	Polychaeta	3	0.37
07APR94	C	2	3	Polychaeta	4	1.57
07APR94	C	2	10	Polychaeta	7	1.23
07APR94	C	3	3	Polychaeta	4	0.73
07APR94	C	3	10	Polychaeta	6	1.13
07APR94	D	1	3	Crustacea	3	0.07
07APR94	D	1	3	Rhynchocoela	1	0.07
07APR94	D	1	3	Other	2	0.2
07APR94	D	1	3	Polychaeta	18	0.81
07APR94	D	1	10	Rhynchocoela	2	2.91
07APR94	D	1	10	Ophiuroidea	1	6.19
07APR94	D	1	10	Polychaeta	29	5.47
07APR94	D	2	3	Other	1	0.05
07APR94	D	2	3	Polychaeta	10	0.94
07APR94	D	2	10	Ophiuroidea	1	2.08
07APR94	D	2	10	Polychaeta	13	17.16
07APR94	D	3	3	Crustacea	1	0.86
07APR94	D	3	3	Mollusca	2	0.91
07APR94	D	3	3	Rhynchocoela	1	0.2
07APR94	D	3	3	Ophiuroidea	1	3.21
07APR94	D	3	3	Polychaeta	17	0.79
07APR94	D	3	10	Crustacea	1	0.01
07APR94	D	3	10	Mollusca	2	0.05
07APR94	D	3	10	Ophiuroidea	1	3.36
07APR94	D	3	10	Polychaeta	12	18.22
07APR94	E	1	3	Mollusca	30	11.55
07APR94	E	1	3	Ophiuroidea	1	0.32
07APR94	E	1	3	Polychaeta	18	0.49

07APR94	E	1	10	Mollusca	1	0.72
07APR94	E	1	10	Ophiuroidea	2	0.11
07APR94	E	1	10	Polychaeta	21	10.83
07APR94	E	2	3	Crustacea	4	0.07
07APR94	E	2	3	Mollusca	1	16.1
07APR94	E	2	3	Polychaeta	26	1.83
07APR94	E	2	10	Mollusca	1	0.66
07APR94	E	2	10	Rhynchocoela	1	0.35
07APR94	E	2	10	Polychaeta	25	13.12
07APR94	E	3	3	Crustacea	6	0.7
07APR94	E	3	3	Mollusca	34	17.77
07APR94	E	3	3	Other	1	0.04
07APR94	E	3	3	Ophiuroidea	1	0.13
07APR94	E	3	3	Polychaeta	34	1.13
07APR94	E	3	10	Polychaeta	25	9.01
07APR94	F	1	3	Crustacea	1	0.02
07APR94	F	1	3	Mollusca	4	5.28
07APR94	F	1	3	Polychaeta	8	0.65
07APR94	F	1	10	Mollusca	1	4.94
07APR94	F	2	3	Crustacea	2	0.01
07APR94	F	2	3	Mollusca	4	2.65
07APR94	F	2	3	Polychaeta	9	0.55
07APR94	F	2	10	Mollusca	3	26.55
07APR94	F	2	10	Polychaeta	5	6.89
07APR94	F	3	3	Crustacea	5	0.13
07APR94	F	3	3	Mollusca	3	1.08
07APR94	F	3	3	Polychaeta	5	3.35
07APR94	F	3	10	Polychaeta	4	4.94

07OCT92	A	1	3	Chironomid larvae	1	0.11
07OCT92	A	1	3	Mollusca	82	41.52
07OCT92	A	1	3	Polychaeta	2	0.19
07OCT92	A	1	10	Mollusca	1	0.2
07OCT92	A	2	3	Chironomid larvae	2	0.3
07OCT92	A	2	3	Mollusca	15	9.16
07OCT92	A	2	3	Polychaeta	2	0.13
07OCT92	A	2	10	Chironomid larvae	1	0.19
07OCT92	A	2	10	Polychaeta	3	0.79
07OCT92	A	3	3	Mollusca	116	78.81
07OCT92	A	3	3	Polychaeta	4	0.64
07OCT92	A	3	10	Polychaeta	0	0
07OCT92	B	1	3	Mollusca	1	0.11
07OCT92	B	1	3	Polychaeta	83	3.75
07OCT92	B	1	10	Polychaeta	23	8.37
07OCT92	B	2	3	Polychaeta	74	3.86
07OCT92	B	2	10	Chironomid larvae	1	0.16
07OCT92	B	2	10	Rhynchocoela	1	0.85
07OCT92	B	2	10	Polychaeta	24	4.76
07OCT92	B	3	3	Chironomid larvae	1	0.03
07OCT92	B	3	3	Mollusca	3	6.82
07OCT92	B	3	3	Polychaeta	109	5.44
07OCT92	B	3	10	Rhynchocoela	1	1.54
07OCT92	B	3	10	Polychaeta	22	5.69
07OCT92	C	1	3	Polychaeta	27	1.42
07OCT92	C	1	10	Crustacea	1	1.2
07OCT92	C	1	10	Rhynchocoela	2	0.26
07OCT92	C	1	10	Polychaeta	4	0.63
07OCT92	C	2	3	Polychaeta	18	1.2
07OCT92	C	2	10	Crustacea	1	0.24
07OCT92	C	2	10	Rhynchocoela	5	0.69
07OCT92	C	2	10	Polychaeta	16	2.32
07OCT92	C	3	3	Mollusca	1	0.02
07OCT92	C	3	3	Rhynchocoela	2	0.63
07OCT92	C	3	3	Polychaeta	29	1.62
07OCT92	C	3	10	Rhynchocoela	2	0.47
07OCT92	C	3	10	Polychaeta	7	0.95
07OCT92	D	1	3	Crustacea	1	0.15
07OCT92	D	1	3	Mollusca	1	4.61
07OCT92	D	1	3	Polychaeta	7	0.57
07OCT92	D	1	10	Polychaeta	3	0.59
07OCT92	D	2	3	Crustacea	1	0.02

07OCT92	D	2	3	Mollusca	1	0.12
07OCT92	D	2	3	Rhynchocoela	2	2.53
07OCT92	D	2	3	Polychaeta	12	0.85
07OCT92	D	2	10	Other	1	0.07
07OCT92	D	2	10	Polychaeta	3	0.15
07OCT92	D	3	3	Mollusca	1	0.14
07OCT92	D	3	3	Rhynchocoela	1	0.02
07OCT92	D	3	3	Polychaeta	8	0.33
07OCT92	D	3	10	Polychaeta	3	0.76
12JAN93	A	1	3	Mollusca	138	31.84
12JAN93	A	1	3	Rhynchocoela	2	0.12
12JAN93	A	1	3	Polychaeta	6	0.18
12JAN93	A	1	10	Chironomid larvae	1	0.57
12JAN93	A	1	10	Polychaeta	1	0.58
12JAN93	A	2	3	Mollusca	156	34.69
12JAN93	A	2	3	Rhynchocoela	1	0.06
12JAN93	A	2	3	Polychaeta	10	0.38
12JAN93	A	2	10	Rhynchocoela	1	0.15
12JAN93	A	2	10	Polychaeta	1	0.06
12JAN93	A	3	3	Crustacea	1	0.01
12JAN93	A	3	3	Mollusca	134	29.76
12JAN93	A	3	3	Rhynchocoela	1	0.01
12JAN93	A	3	3	Polychaeta	11	0.43
12JAN93	A	3	10	Polychaeta	1	0.16
12JAN93	B	1	3	Mollusca	55	5.7
12JAN93	B	1	3	Rhynchocoela	1	0.01
12JAN93	B	1	3	Polychaeta	33	4.05
12JAN93	B	1	10	Polychaeta	5	2.31
12JAN93	B	2	3	Mollusca	87	3.43
12JAN93	B	2	3	Polychaeta	41	2.74
12JAN93	B	2	10	Mollusca	1	0.31
12JAN93	B	2	10	Polychaeta	1	0.1
12JAN93	B	3	3	Mollusca	63	0.96
12JAN93	B	3	3	Rhynchocoela	1	0.05
12JAN93	B	3	3	Polychaeta	18	1.22
12JAN93	B	3	10	Rhynchocoela	1	0.03
12JAN93	B	3	10	Polychaeta	10	1.56
12JAN93	C	1	3	Crustacea	2	0.04
12JAN93	C	1	3	Mollusca	5	1.52
12JAN93	C	1	3	Polychaeta	44	2.99
12JAN93	C	1	10	Rhynchocoela	2	0.28
12JAN93	C	1	10	Polychaeta	6	0.98
12JAN93	C	2	3	Crustacea	4	0.06
12JAN93	C	2	3	Mollusca	1	0.03

12JAN93	C	2	3	Polychaeta	25	4.04
12JAN93	C	2	10	Polychaeta	5	0.73
12JAN93	C	3	3	Crustacea	3	0.09
12JAN93	C	3	3	Mollusca	4	0.4
12JAN93	C	3	3	Rhynchocoela	1	0.06
12JAN93	C	3	3	Polychaeta	30	2.12
12JAN93	C	3	10	Polychaeta	1	0.14
12JAN93	D	1	3	Mollusca	15	0.95
12JAN93	D	1	3	Polychaeta	37	4.09
12JAN93	D	1	10	Polychaeta	1	0.1
12JAN93	D	2	3	Mollusca	42	5.02
12JAN93	D	2	3	Other	1	3.8
12JAN93	D	2	3	Polychaeta	31	2.45
12JAN93	D	2	10	Mollusca	2	0.06
12JAN93	D	2	10	Rhynchocoela	1	0.02
12JAN93	D	2	10	Polychaeta	2	0.13
12JAN93	D	3	3	Mollusca	68	11.77
12JAN93	D	3	3	Rhynchocoela	3	0.3
12JAN93	D	3	3	Polychaeta	17	1.02
12JAN93	D	3	10	Polychaeta	3	0.24
05APR93	A	1	3	Chironomid larvae	1	0.58
05APR93	A	1	3	Mollusca	162	16.81
05APR93	A	1	3	Polychaeta	11	1.82
05APR93	A	1	10	Mollusca	3	0.35
05APR93	A	1	10	Polychaeta	2	0.42
05APR93	A	2	3	Mollusca	180	24.78
05APR93	A	2	3	Rhynchocoela	1	0.47
05APR93	A	2	3	Polychaeta	20	2.5
05APR93	A	2	10	Mollusca	1	0.29
05APR93	A	2	10	Polychaeta	3	0.82
05APR93	A	3	3	Mollusca	120	13.43
05APR93	A	3	3	Polychaeta	8	2.23
05APR93	A	3	10	Mollusca	5	0.56
05APR93	A	3	10	Rhynchocoela	1	0.47
05APR93	A	3	10	Polychaeta	3	0.39
05APR93	B	1	3	Mollusca	110	12.91
05APR93	B	1	3	Polychaeta	119	12.15
05APR93	B	1	10	Mollusca	1	6.88
05APR93	B	1	10	Polychaeta	14	4.34
05APR93	B	2	3	Mollusca	41	3.52
05APR93	B	2	3	Polychaeta	141	11.5
05APR93	B	2	10	Mollusca	3	0.24
05APR93	B	2	10	Polychaeta	16	3.08
05APR93	B	3	3	Mollusca	100	15.62

05APR93	B	3	3	Polychaeta	91	9.27
05APR93	B	3	10	Mollusca	3	20.71
05APR93	B	3	10	Rhynchocoela	1	0.39
05APR93	B	3	10	Polychaeta	14	2.19
05APR93	C	1	3	Mollusca	95	20.36
05APR93	C	1	3	Polychaeta	68	4.53
05APR93	C	1	10	Polychaeta	4	0.56
05APR93	C	2	3	Mollusca	160	34.91
05APR93	C	2	3	Polychaeta	98	5.3
05APR93	C	2	10	Polychaeta	1	0.27
05APR93	C	3	3	Mollusca	43	9.16
05APR93	C	3	3	Rhynchocoela	1	0.51
05APR93	C	3	3	Polychaeta	63	3.9
05APR93	C	3	10	Rhynchocoela	2	3.41
05APR93	C	3	10	Polychaeta	15	3.17
05APR93	D	1	3	Mollusca	39	17.21
05APR93	D	1	3	Polychaeta	36	2.8
05APR93	D	1	10	Mollusca	1	0.22
05APR93	D	1	10	Rhynchocoela	1	0.14
05APR93	D	1	10	Polychaeta	11	1.1
05APR93	D	2	3	Crustacea	1	0.1
05APR93	D	2	3	Mollusca	31	16.96
05APR93	D	2	3	Rhynchocoela	1	0.06
05APR93	D	2	3	Polychaeta	36	1.7
05APR93	D	2	10	Mollusca	3	0.06
05APR93	D	2	10	Other	1	1.29
05APR93	D	2	10	Polychaeta	1	0.95
05APR93	D	3	3	Crustacea	3	0.03
05APR93	D	3	3	Mollusca	25	12.97
05APR93	D	3	3	Polychaeta	58	2.69
05APR93	D	3	10	Polychaeta	6	0.6
09JUL93	A	1	3	Chironomid larvae	3	0.1
09JUL93	A	1	3	Mollusca	49	6.94
09JUL93	A	1	3	Polychaeta	7	0.16
09JUL93	A	1	10	Polychaeta	3	0.11
09JUL93	A	2	3	Mollusca	100	11.56
09JUL93	A	2	3	Polychaeta	4	0.08
09JUL93	A	2	10	Mollusca	1	0.05
09JUL93	A	3	3	Mollusca	91	13.31
09JUL93	A	3	3	Polychaeta	8	0.07
09JUL93	A	3	10	Polychaeta	1	0.01
09JUL93	B	1	3	Mollusca	70	7.24
09JUL93	B	1	3	Polychaeta	2	0.02
09JUL93	B	1	10	Mollusca	5	0.59

09JUL93	B	1	10	Polychaeta	9	1.1
09JUL93	B	2	3	Mollusca	39	5.49
09JUL93	B	2	3	Polychaeta	5	0.25
09JUL93	B	2	10	Mollusca	7	0.82
09JUL93	B	2	10	Polychaeta	22	3.42
09JUL93	B	3	3	Mollusca	55	6.87
09JUL93	B	3	3	Polychaeta	8	2.77
09JUL93	B	3	10	Mollusca	1	0.07
09JUL93	B	3	10	Polychaeta	21	1.83
09JUL93	C	1	3	Mollusca	2	0.23
09JUL93	C	1	3	Polychaeta	4	3.42
09JUL93	C	1	10	Polychaeta	17	5.22
09JUL93	C	2	3	Crustacea	1	0.08
09JUL93	C	2	3	Mollusca	13	4.44
09JUL93	C	2	3	Polychaeta	11	3.6
09JUL93	C	2	10	Mollusca	3	1.25
09JUL93	C	2	10	Polychaeta	33	6.47
09JUL93	C	3	3	Mollusca	26	6.54
09JUL93	C	3	3	Polychaeta	16	2.28
09JUL93	C	3	10	Rhynchocoela	1	1.3
09JUL93	C	3	10	Polychaeta	16	2.45
09JUL93	D	1	3	Mollusca	3	0.42
09JUL93	D	1	3	Polychaeta	5	0.43
09JUL93	D	1	10	Polychaeta	10	2.41
09JUL93	D	2	3	Polychaeta	8	0.28
09JUL93	D	2	10	Polychaeta	0	0
09JUL93	D	3	3	Polychaeta	17	0.89
09JUL93	D	3	10	Polychaeta	3	0.56
11OCT93	A	1	3	Mollusca	25	16.99
11OCT93	A	1	3	Polychaeta	15	0.69
11OCT93	A	1	10	Polychaeta	0	0
11OCT93	A	2	3	Mollusca	21	14.82
11OCT93	A	2	3	Polychaeta	11	0.63
11OCT93	A	2	10	Polychaeta	2	0.36
11OCT93	A	3	3	Mollusca	20	9.86
11OCT93	A	3	3	Other	1	0.02
11OCT93	A	3	3	Polychaeta	9	0.96
11OCT93	A	3	10	Polychaeta	1	0.2
11OCT93	B	1	3	Mollusca	2	2.26
11OCT93	B	1	3	Polychaeta	3	0.81
11OCT93	B	1	10	Polychaeta	8	2.6
11OCT93	B	2	3	Mollusca	7	6.66
11OCT93	B	2	3	Polychaeta	7	1.59
11OCT93	B	2	10	Polychaeta	6	1.17

11OCT93	B	3	3	Mollusca	17	15.59
11OCT93	B	3	3	Rhynchocoela	1	0.47
11OCT93	B	3	3	Other	1	0.03
11OCT93	B	3	3	Polychaeta	11	0.81
11OCT93	B	3	10	Polychaeta	16	2.99
11OCT93	C	1	3	Crustacea	15	4
11OCT93	C	1	3	Mollusca	63	152.97
11OCT93	C	1	3	Rhynchocoela	1	0.22
11OCT93	C	1	3	Polychaeta	15	1.07
11OCT93	C	1	10	Polychaeta	6	0.59
11OCT93	C	2	3	Mollusca	14	3.82
11OCT93	C	2	3	Other	1	0.2
11OCT93	C	2	3	Polychaeta	11	0.92
11OCT93	C	2	10	Polychaeta	22	3.56
11OCT93	C	3	3	Mollusca	6	9.02
11OCT93	C	3	3	Polychaeta	6	0.53
11OCT93	C	3	10	Polychaeta	3	0.11
11OCT93	D	1	3	Crustacea	1	0.01
11OCT93	D	1	3	Rhynchocoela	2	0.24
11OCT93	D	1	3	Polychaeta	8	0.94
11OCT93	D	1	10	Polychaeta	6	0.9
11OCT93	D	2	3	Mollusca	4	0.61
11OCT93	D	2	3	Rhynchocoela	1	0.05
11OCT93	D	2	3	Polychaeta	8	0.41
11OCT93	D	2	10	Mollusca	1	0.18
11OCT93	D	2	10	Polychaeta	2	0.26
11OCT93	D	3	3	Rhynchocoela	1	0.05
11OCT93	D	3	3	Other	1	0.11
11OCT93	D	3	3	Polychaeta	7	0.95
11OCT93	D	3	10	Mollusca	1	0.12
11OCT93	D	3	10	Polychaeta	1	0.04
05JAN94	A	1	3	Mollusca	19	4.5
05JAN94	A	1	3	Other	4	0.02
05JAN94	A	1	3	Polychaeta	8	2.53
05JAN94	A	1	10	Polychaeta	1	0.58
05JAN94	A	2	3	Mollusca	12	7.96
05JAN94	A	2	3	Polychaeta	14	1.81
05JAN94	A	2	10	Polychaeta	5	8.61
05JAN94	A	3	3	Chironomid larvae	1	0.14
05JAN94	A	3	3	Mollusca	11	20.37
05JAN94	A	3	3	Other	1	0.01
05JAN94	A	3	3	Polychaeta	6	0.53
05JAN94	A	3	10	Chironomid larvae	1	0.37
05JAN94	A	3	10	Polychaeta	2	0.46

05JAN94	B	1	3	Polychaeta	15	1.81
05JAN94	B	1	10	Polychaeta	4	14.54
05JAN94	B	2	3	Mollusca	3	7.42
05JAN94	B	2	3	Other	1	0.01
05JAN94	B	2	3	Polychaeta	16	1.57
05JAN94	B	2	10	Polychaeta	2	1.4
05JAN94	B	3	3	Chironomid larvae	1	0.18
05JAN94	B	3	3	Polychaeta	19	1.41
05JAN94	B	3	10	Polychaeta	6	1.72
05JAN94	C	1	3	Mollusca	7	4.22
05JAN94	C	1	3	Rhynchocoela	3	1.2
05JAN94	C	1	3	Polychaeta	19	1.81
05JAN94	C	1	10	Polychaeta	3	0.74
05JAN94	C	2	3	Crustacea	2	0.06
05JAN94	C	2	3	Mollusca	13	8.16
05JAN94	C	2	3	Rhynchocoela	2	0.07
05JAN94	C	2	3	Other	1	0.01
05JAN94	C	2	3	Polychaeta	34	2.34
05JAN94	C	2	10	Mollusca	1	0.2
05JAN94	C	2	10	Polychaeta	1	0.25
05JAN94	C	3	3	Mollusca	13	8
05JAN94	C	3	3	Polychaeta	43	2.72
05JAN94	C	3	10	Polychaeta	1	0.14
05JAN94	D	1	3	Mollusca	6	0.84
05JAN94	D	1	3	Rhynchocoela	1	0.29
05JAN94	D	1	3	Polychaeta	27	2.92
05JAN94	D	1	10	Polychaeta	2	0.24
05JAN94	D	2	3	Crustacea	1	0.26
05JAN94	D	2	3	Mollusca	1	0.23
05JAN94	D	2	3	Rhynchocoela	2	0.22
05JAN94	D	2	3	Other	1	0.24
05JAN94	D	2	3	Polychaeta	26	2.79
05JAN94	D	2	10	Polychaeta	4	0.97
05JAN94	D	3	3	Other	1	0.09
05JAN94	D	3	3	Polychaeta	26	2.96
05JAN94	D	3	10	Polychaeta	4	2.97
07APR94	A	1	3	Crustacea	3	0.09
07APR94	A	1	3	Mollusca	19	5.07
07APR94	A	1	3	Polychaeta	99	8.16
07APR94	A	1	10	Polychaeta	6	3.85
07APR94	A	2	3	Crustacea	3	0.21
07APR94	A	2	3	Mollusca	25	3.87
07APR94	A	2	3	Polychaeta	59	4.73
07APR94	A	2	10	Polychaeta	2	2.4

07APR94	A	3	3	Chironomid larvae	1	0.29
07APR94	A	3	3	Mollusca	22	4.2
07APR94	A	3	3	Polychaeta	44	4.71
07APR94	A	3	10	Polychaeta	2	3.98
07APR94	B	1	3	Mollusca	10	0.39
07APR94	B	1	3	Polychaeta	99	5.57
07APR94	B	1	10	Polychaeta	9	3.4
07APR94	B	2	3	Mollusca	4	0.25
07APR94	B	2	3	Polychaeta	138	8.76
07APR94	B	2	10	Polychaeta	15	5.63
07APR94	B	3	3	Crustacea	1	0.05
07APR94	B	3	3	Mollusca	4	0.12
07APR94	B	3	3	Rhynchocoela	1	0.01
07APR94	B	3	3	Other	1	0.1
07APR94	B	3	3	Polychaeta	106	7.67
07APR94	B	3	10	Polychaeta	3	2.01
07APR94	C	1	3	Crustacea	3	0.04
07APR94	C	1	3	Mollusca	14	12.82
07APR94	C	1	3	Polychaeta	51	4.96
07APR94	C	1	10	Polychaeta	9	2.12
07APR94	C	2	3	Crustacea	3	0.15
07APR94	C	2	3	Mollusca	11	5.75
07APR94	C	2	3	Polychaeta	49	5.82
07APR94	C	2	10	Polychaeta	16	3.27
07APR94	C	3	3	Crustacea	3	0.05
07APR94	C	3	3	Mollusca	13	2.39
07APR94	C	3	3	Polychaeta	42	2.67
07APR94	C	3	10	Mollusca	1	14.25
07APR94	C	3	10	Polychaeta	2	1.31
07APR94	D	1	3	Crustacea	2	0.05
07APR94	D	1	3	Mollusca	1	0.2
07APR94	D	1	3	Polychaeta	18	1.23
07APR94	D	1	10	Polychaeta	8	5.06
07APR94	D	2	3	Polychaeta	22	3.61
07APR94	D	2	10	Polychaeta	6	6.61
07APR94	D	3	3	Rhynchocoela	1	0.14
07APR94	D	3	3	Other	1	0.02
07APR94	D	3	3	Polychaeta	50	3.42
07APR94	D	3	10	Polychaeta	6	0.28

SPECIES DATA

Macrofauna species found in biological samples. Number per core, multiply by 183 to obtain number per m^2.

Lavaca-Colorado Estuary

Date	STA	REP	SEC	Species	n
06OCT92	A	1	3	Pseudodiaptomus coronatus	1
06OCT92	A	1	3	Mediomastus ambiseta	14
06OCT92	A	1	10	Rhynchocoel (unidentified)	1
06OCT92	A	1	10	Mediomastus ambiseta	10
06OCT92	A	2	3	Streblospio benedicti	3
06OCT92	A	2	3	Mediomastus ambiseta	14
06OCT92	A	2	10	No species observed	0
06OCT92	A	3	3	Streblospio benedicti	2
06OCT92	A	3	3	Mediomastus ambiseta	26
06OCT92	A	3	10	Rhynchocoel (unidentified)	1
06OCT92	A	3	10	Oligochaetes (unidentified)	1
06OCT92	A	3	10	Streblospio benedicti	1
06OCT92	A	3	10	Chironomid larvae	1
06OCT92	A	3	10	Parandalia ocularis	1
06OCT92	A	3	10	Mediomastus ambiseta	9
06OCT92	B	1	3	Streblospio benedicti	3
06OCT92	B	1	3	Mulinia lateralis	1
06OCT92	B	1	3	Mediomastus ambiseta	16
06OCT92	B	1	10	Mediomastus ambiseta	6
06OCT92	B	2	3	Streblospio benedicti	3
06OCT92	B	2	3	Mediomastus ambiseta	16
06OCT92	B	2	10	Glycinde solitaria	1
06OCT92	B	2	10	Mediomastus ambiseta	3
06OCT92	B	3	3	Streblospio benedicti	1
06OCT92	B	3	3	Mediomastus ambiseta	2
06OCT92	B	3	10	Paraprionospio pinnata	1
06OCT92	B	3	10	Mediomastus ambiseta	1
06OCT92	C	1	3	Rhynchocoel (unidentified)	1
06OCT92	C	1	3	Anaitides erythrophyllus	1
06OCT92	C	1	3	Streblospio benedicti	4
06OCT92	C	1	3	Paraprionospio pinnata	1
06OCT92	C	1	3	Pectinaria gouldii	1
06OCT92	C	1	3	Mulinia lateralis	28
06OCT92	C	1	3	Ophiuroidea (unidentified)	2
06OCT92	C	1	3	Macoma mitchelli	1

06OCT92	C	1	3	Pyramidella sp.	1
06OCT92	C	1	3	Mediomastus ambiseta	44
06OCT92	C	1	10	Rhynchocoel (unidentified)	1
06OCT92	C	1	10	Oligochaetes (unidentified)	1
06OCT92	C	1	10	Glycinde solitaria	1
06OCT92	C	1	10	Paraprionospio pinnata	2
06OCT92	C	1	10	Haploscoloplos foliosus	2
06OCT92	C	1	10	Pinnotheridae (unidentified)	1
06OCT92	C	1	10	Mediomastus ambiseta	18
06OCT92	C	2	3	Oligochaetes (unidentified)	1
06OCT92	C	2	3	Streblospio benedicti	2
06OCT92	C	2	3	Paraprionospio pinnata	2
06OCT92	C	2	3	Cossura delta	1
06OCT92	C	2	3	Clymenella torquata	1
06OCT92	C	2	3	Nuculana acuta	1
06OCT92	C	2	3	Mulinia lateralis	16
06OCT92	C	2	3	Ancistrosyllis groenlandica	1
06OCT92	C	2	3	Mediomastus ambiseta	29
06OCT92	C	2	10	Rhynchocoel (unidentified)	2
06OCT92	C	2	10	Streblospio benedicti	1
06OCT92	C	2	10	Ancistrosyllis groenlandica	1
06OCT92	C	2	10	Mediomastus ambiseta	11
06OCT92	C	3	3	Rhynchocoel (unidentified)	2
06OCT92	C	3	3	Streblospio benedicti	4
06OCT92	C	3	3	Paraprionospio pinnata	1
06OCT92	C	3	3	Pectinaria gouldii	1
06OCT92	C	3	3	Mulinia lateralis	22
06OCT92	C	3	3	Mediomastus ambiseta	21
06OCT92	C	3	10	Rhynchocoel (unidentified)	2
06OCT92	C	3	10	Gyptis vittata	2
06OCT92	C	3	10	Paraprionospio pinnata	2
06OCT92	C	3	10	Mediomastus ambiseta	7
06OCT92	D	1	3	Oligochaetes (unidentified)	1
06OCT92	D	1	3	Sigambra tentaculata	1
06OCT92	D	1	3	Streblospio benedicti	3
06OCT92	D	1	3	Minuspio cirrifera	3
06OCT92	D	1	3	Cossura delta	11
06OCT92	D	1	3	Nuculana acuta	1
06OCT92	D	1	3	Ophiuroidea (unidentified)	1
06OCT92	D	1	3	Mediomastus ambiseta	19
06OCT92	D	1	10	Rhynchocoel (unidentified)	3
06OCT92	D	1	10	Oligochaetes (unidentified)	1
06OCT92	D	1	10	Gyptis vittata	1
06OCT92	D	1	10	Minuspio cirrifera	2

06OCT92	D	1	10	Corbula contracta	1
06OCT92	D	1	10	Paraonidae Grp. B	1
06OCT92	D	1	10	Ophiuroidea (unidentified)	1
06OCT92	D	1	10	Apseudes sp. A	3
06OCT92	D	1	10	Naineris sp. A	1
06OCT92	D	1	10	Paramya subovata	4
06OCT92	D	2	3	Drilonereis magna	2
06OCT92	D	2	3	Streblospio benedicti	2
06OCT92	D	2	3	Paraprionospio pinnata	1
06OCT92	D	2	3	Cossura delta	10
06OCT92	D	2	3	Melinna maculata	1
06OCT92	D	2	3	Nuculana concentrica	1
06OCT92	D	2	3	Mediomastus ambiseta	42
06OCT92	D	2	3	Paramya subovata	1
06OCT92	D	2	10	Rhynchocoel (unidentified)	1
06OCT92	D	2	10	Oligochaetes (unidentified)	1
06OCT92	D	2	10	Paraprionospio pinnata	1
06OCT92	D	2	10	Minuspio cirrifera	1
06OCT92	D	2	10	Cossura delta	5
06OCT92	D	2	10	Paraonidae Grp. B	1
06OCT92	D	2	10	Ophiuroidea (unidentified)	1
06OCT92	D	2	10	Mediomastus ambiseta	6
06OCT92	D	2	10	Paramya subovata	1
06OCT92	D	3	3	Streblospio benedicti	5
06OCT92	D	3	3	Paraprionospio pinnata	1
06OCT92	D	3	3	Minuspio cirrifera	1
06OCT92	D	3	3	Cossura delta	2
06OCT92	D	3	3	Nuculana concentrica	1
06OCT92	D	3	3	Mediomastus ambiseta	29
06OCT92	D	3	10	Rhynchocoel (unidentified)	2
06OCT92	D	3	10	Sigambra tentaculata	1
06OCT92	D	3	10	Minuspio cirrifera	3
06OCT92	D	3	10	Ophiuroidea (unidentified)	2
06OCT92	D	3	10	Periploma cf. orbiculare	1
06OCT92	D	3	10	Mediomastus ambiseta	8
06OCT92	D	3	10	Paramya subovata	7
12JAN93	A	1	3	Streblospio benedicti	7
12JAN93	A	1	3	Cossura delta	1
12JAN93	A	1	3	Capitella capitata	1
12JAN93	A	1	3	Mulinia lateralis	1
12JAN93	A	1	3	Chironomid larvae	1
12JAN93	A	1	3	Macoma mitchelli	3
12JAN93	A	1	3	Mediomastus ambiseta	33
12JAN93	A	1	10	Glycinde solitaria	1

12JAN93	A	2	3	Diopatra cuprea	1
12JAN93	A	2	3	Streblospio benedicti	4
12JAN93	A	2	3	Cossura delta	1
12JAN93	A	2	3	Capitella capitata	3
12JAN93	A	2	3	Mulinia lateralis	1
12JAN93	A	2	3	Macoma mitchelli	2
12JAN93	A	2	3	Mediomastus ambiseta	73
12JAN93	A	2	10	Glycinde solitaria	1
12JAN93	A	2	10	Mulinia lateralis	1
12JAN93	A	2	10	Laeonereis culveri	1
12JAN93	A	2	10	Mediomastus ambiseta	1
12JAN93	A	3	3	Streblospio benedicti	6
12JAN93	A	3	3	Mulinia lateralis	1
12JAN93	A	3	3	Macoma mitchelli	2
12JAN93	A	3	3	Mediomastus ambiseta	26
12JAN93	A	3	10	No species observed	0
12JAN93	B	1	3	Streblospio benedicti	4
12JAN93	B	1	3	Haploscoloplos foliosus	1
12JAN93	B	1	3	Cossura delta	1
12JAN93	B	1	3	Mulinia lateralis	2
12JAN93	B	1	3	Pyramidella sp.	1
12JAN93	B	1	3	Mediomastus ambiseta	11
12JAN93	B	1	10	Mediomastus ambiseta	2
12JAN93	B	2	3	Rhynchocoel (unidentified)	1
12JAN93	B	2	3	Glycinde solitaria	1
12JAN93	B	2	3	Streblospio benedicti	8
12JAN93	B	2	3	Cossura delta	2
12JAN93	B	2	3	Macoma mitchelli	3
12JAN93	B	2	3	Mediomastus ambiseta	28
12JAN93	B	2	10	Mediomastus ambiseta	4
12JAN93	B	3	3	Streblospio benedicti	5
12JAN93	B	3	3	Haploscoloplos foliosus	1
12JAN93	B	3	3	Cossura delta	4
12JAN93	B	3	3	Monoculodes sp.	1
12JAN93	B	3	3	Macoma mitchelli	1
12JAN93	B	3	3	Mediomastus ambiseta	23
12JAN93	B	3	10	Cossura delta	1
12JAN93	B	3	10	Mediomastus ambiseta	1
12JAN93	C	1	3	Rhynchocoel (unidentified)	1
12JAN93	C	1	3	Glycinde solitaria	6
12JAN93	C	1	3	Streblospio benedicti	2
12JAN93	C	1	3	Haploscoloplos foliosus	1
12JAN93	C	1	3	Cossura delta	3
12JAN93	C	1	3	Axiothella mucosa	1

12JAN93	C	1	3	Mulinia lateralis	1
12JAN93	C	1	3	Lyonsia hyalina floridana	1
12JAN93	C	1	3	Pseudodiaptomus coronatus	1
12JAN93	C	1	3	Cyclaspis varians	1
12JAN93	C	1	3	Nassarius acutus	1
12JAN93	C	1	3	Sigalionidae (unidentified)	1
12JAN93	C	1	3	Ophiuroidea (unidentified)	3
12JAN93	C	1	3	Mediomastus ambiseta	71
12JAN93	C	1	10	Glycinde solitaria	1
12JAN93	C	1	10	Haploscoloplos foliosus	4
12JAN93	C	1	10	Cossura delta	2
12JAN93	C	1	10	Turbellaria (unidentified)	1
12JAN93	C	1	10	Mediomastus ambiseta	11
12JAN93	C	2	3	Rhynchocoel (unidentified)	1
12JAN93	C	2	3	Oligochaetes (unidentified)	1
12JAN93	C	2	3	Eteone heteropoda	1
12JAN93	C	2	3	Gyptis vittata	1
12JAN93	C	2	3	Glycinde solitaria	6
12JAN93	C	2	3	Haploscoloplos foliosus	2
12JAN93	C	2	3	Cossura delta	1
12JAN93	C	2	3	Axiothella mucosa	1
12JAN93	C	2	3	Pectinaria gouldii	1
12JAN93	C	2	3	Cyclaspis varians	1
12JAN93	C	2	3	Oxyurostylis sp.	1
12JAN93	C	2	3	Mediomastus ambiseta	37
12JAN93	C	2	10	Glycinde solitaria	1
12JAN93	C	2	10	Haploscoloplos foliosus	2
12JAN93	C	2	10	Cossura delta	1
12JAN93	C	2	10	Paraonidae Grp. A	1
12JAN93	C	2	10	Mediomastus ambiseta	3
12JAN93	C	3	3	Rhynchocoel (unidentified)	2
12JAN93	C	3	3	Gyptis vittata	1
12JAN93	C	3	3	Glycinde solitaria	3
12JAN93	C	3	3	Streblospio benedicti	2
12JAN93	C	3	3	Cossura delta	3
12JAN93	C	3	3	Pectinaria gouldii	1
12JAN93	C	3	3	Mulinia lateralis	1
12JAN93	C	3	3	Phascolion strombi	1
12JAN93	C	3	3	Ophiuroidea (unidentified)	3
12JAN93	C	3	3	Mediomastus ambiseta	39
12JAN93	C	3	10	Rhynchocoel (unidentified)	2
12JAN93	C	3	10	Cossura delta	4
12JAN93	C	3	10	Mediomastus ambiseta	8
12JAN93	D	1	3	Rhynchocoel (unidentified)	3

12JAN93	D	1	3	Eunoe cf. nodulosa	1
12JAN93	D	1	3	Sthenelais boa	1
12JAN93	D	1	3	Glycinde solitaria	2
12JAN93	D	1	3	Streblospio benedicti	1
12JAN93	D	1	3	Minuspio cirrifera	4
12JAN93	D	1	3	Cossura delta	3
12JAN93	D	1	3	Pectinaria gouldii	1
12JAN93	D	1	3	Melinna maculata	1
12JAN93	D	1	3	Corbula contracta	1
12JAN93	D	1	3	Nuculana concentrica	1
12JAN93	D	1	3	Ophiuroidea (unidentified)	11
12JAN93	D	1	3	Pelecypoda (unidentified)	8
12JAN93	D	1	3	Mediomastus ambiseta	41
12JAN93	D	1	3	Munna sp.	1
12JAN93	D	1	10	Sigambra tentaculata	1
12JAN93	D	1	10	Ophiuroidea (unidentified)	1
12JAN93	D	1	10	Mediomastus ambiseta	3
12JAN93	D	2	3	Rhynchocoel (unidentified)	1
12JAN93	D	2	3	Sthenelais boa	1
12JAN93	D	2	3	Sigambra tentaculata	1
12JAN93	D	2	3	Glycinde solitaria	2
12JAN93	D	2	3	Mediomastus ambiseta	9
12JAN93	D	2	10	Naineris sp. A	3
12JAN93	D	2	10	Mediomastus ambiseta	2
12JAN93	D	3	3	Anthozoa (unidentified)	1
12JAN93	D	3	3	Rhynchocoel (unidentified)	2
12JAN93	D	3	3	Oligochaetes (unidentified)	1
12JAN93	D	3	3	Glycinde solitaria	2
12JAN93	D	3	3	Drilonereis magna	1
12JAN93	D	3	3	Cossura delta	5
12JAN93	D	3	3	Ophiuroidea (unidentified)	1
12JAN93	D	3	3	Apseudes sp. A	2
12JAN93	D	3	3	Mediomastus ambiseta	14
12JAN93	D	3	10	Clymenella torquata	1
12JAN93	D	3	10	Owenia fusiformis	1
12JAN93	D	3	10	Sigambra cf. wassi	1
12JAN93	D	3	10	Mediomastus ambiseta	3
12JAN93	E	1	3	Rhynchocoel (unidentified)	2
12JAN93	E	1	3	Oligochaetes (unidentified)	1
12JAN93	E	1	3	Gyptis vittata	1
12JAN93	E	1	3	Streblospio benedicti	10
12JAN93	E	1	3	Paraprionospio pinnata	2
12JAN93	E	1	3	Nuculana concentrica	1
12JAN93	E	1	3	Ophiuroidea (unidentified)	1

12JAN93	E	1	3	Pyramidella crenulata	1
12JAN93	E	1	3	Mediomastus ambiseta	47
12JAN93	E	1	10	Rhynchocoel (unidentified)	1
12JAN93	E	1	10	Gyptis vittata	1
12JAN93	E	1	10	Streblospio benedicti	1
12JAN93	E	1	10	Paraprionospio pinnata	2
12JAN93	E	1	10	Cossura delta	2
12JAN93	E	1	10	Ophiuroidea (unidentified)	1
12JAN93	E	1	10	Mediomastus ambiseta	2
12JAN93	E	2	3	Oligochaetes (unidentified)	1
12JAN93	E	2	3	Streblospio benedicti	7
12JAN93	E	2	3	Cossura delta	2
12JAN93	E	2	3	Asychis sp.	1
12JAN93	E	2	3	Pyramidella crenulata	2
12JAN93	E	2	3	Mediomastus ambiseta	31
12JAN93	E	2	10	Gyptis vittata	2
12JAN93	E	2	10	Glycinde solitaria	1
12JAN93	E	2	10	Paraprionospio pinnata	8
12JAN93	E	2	10	Paraonidae Grp. A	1
12JAN93	E	3	3	Glycinde solitaria	3
12JAN93	E	3	3	Streblospio benedicti	4
12JAN93	E	3	3	Paraprionospio pinnata	4
12JAN93	E	3	3	Paraonidae Grp. B	1
12JAN93	E	3	3	Ophiuroidea (unidentified)	1
12JAN93	E	3	3	Mediomastus ambiseta	19
12JAN93	E	3	10	Glycinde solitaria	3
12JAN93	E	3	10	Streblospio benedicti	1
12JAN93	E	3	10	Paraprionospio pinnata	1
12JAN93	E	3	10	Paraonidae Grp. A	1
12JAN93	E	3	10	Mediomastus ambiseta	1
12JAN93	F	1	3	Streblospio benedicti	1
12JAN93	F	1	3	Mulinia lateralis	2
12JAN93	F	1	3	Macoma mitchelli	2
12JAN93	F	1	3	Mediomastus ambiseta	25
12JAN93	F	1	10	Paraprionospio pinnata	1
12JAN93	F	1	10	Cossura delta	1
12JAN93	F	1	10	Mediomastus ambiseta	1
12JAN93	F	2	3	Anthozoa (unidentified)	1
12JAN93	F	2	3	Rhynchocoel (unidentified)	1
12JAN93	F	2	3	Streblospio benedicti	3
12JAN93	F	2	3	Haploscoloplos foliosus	2
12JAN93	F	2	3	Mulinia lateralis	6
12JAN93	F	2	3	Macoma mitchelli	3
12JAN93	F	2	3	Turbellaria (unidentified)	1

12JAN93	F	2	3	Mediomastus ambiseta	55
12JAN93	F	2	10	Rhynchocoel (unidentified)	2
12JAN93	F	2	10	Gyptis vittata	1
12JAN93	F	2	10	Paraprionospio pinnata	1
12JAN93	F	2	10	Mediomastus ambiseta	1
12JAN93	F	3	3	Streblospio benedicti	7
12JAN93	F	3	3	Paraprionospio pinnata	1
12JAN93	F	3	3	Mulinia lateralis	4
12JAN93	F	3	3	Macoma mitchelli	2
12JAN93	F	3	3	Mediomastus ambiseta	30
12JAN93	F	3	10	Oligochaetes (unidentified)	1
12JAN93	F	3	10	Paraprionospio pinnata	1
12JAN93	F	3	10	Mediomastus ambiseta	2
05APR93	A	1	3	Anthozoa (unidentified)	1
05APR93	A	1	3	Rhynchocoel (unidentified)	1
05APR93	A	1	3	Streblospio benedicti	4
05APR93	A	1	3	Mulinia lateralis	1
05APR93	A	1	3	Mediomastus ambiseta	44
05APR93	A	1	10	Macoma mitchelli	1
05APR93	A	1	10	Mediomastus ambiseta	4
05APR93	A	2	3	Streblospio benedicti	4
05APR93	A	2	3	Mediomastus ambiseta	9
05APR93	A	2	10	Macoma mitchelli	1
05APR93	A	2	10	Mediomastus ambiseta	1
05APR93	A	3	3	Rhynchocoel (unidentified)	5
05APR93	A	3	3	Streblospio benedicti	4
05APR93	A	3	3	Hobsonia florida	1
05APR93	A	3	3	Mediomastus ambiseta	38
05APR93	A	3	10	Macoma mitchelli	1
05APR93	A	3	10	Mediomastus ambiseta	10
05APR93	B	1	3	Streblospio benedicti	7
05APR93	B	1	3	Cossura delta	2
05APR93	B	1	3	Capitella capitata	1
05APR93	B	1	3	Mulinia lateralis	6
05APR93	B	1	3	Brachidontes exustus	1
05APR93	B	1	3	Mediomastus ambiseta	50
05APR93	B	1	10	Rhynchocoel (unidentified)	1
05APR93	B	1	10	Glycinde solitaria	1
05APR93	B	1	10	Cossura delta	8
05APR93	B	1	10	Macoma mitchelli	1
05APR93	B	1	10	Mediomastus ambiseta	7
05APR93	B	2	3	Rhynchocoel (unidentified)	1
05APR93	B	2	3	Sigambra bassi	1
05APR93	B	2	3	Streblospio benedicti	2

05APR93	B	2	3	Mulinia lateralis	2
05APR93	B	2	3	Mediomastus ambiseta	38
05APR93	B	2	10	Rhynchocoel (unidentified)	1
05APR93	B	2	10	Cossura delta	1
05APR93	B	2	10	Turbellaria (unidentified)	4
05APR93	B	2	10	Mediomastus ambiseta	7
05APR93	B	3	3	Cossura delta	1
05APR93	B	3	3	Mediomastus ambiseta	10
05APR93	B	3	10	Rhynchocoel (unidentified)	2
05APR93	B	3	10	Paraprionospio pinnata	1
05APR93	B	3	10	Cossura delta	4
05APR93	B	3	10	Mediomastus ambiseta	4
05APR93	C	1	3	Glycinde solitaria	2
05APR93	C	1	3	Mulinia lateralis	32
05APR93	C	1	3	Edotea montosa	1
05APR93	C	1	3	Nuculana concentrica	1
05APR93	C	1	3	Mediomastus ambiseta	2
05APR93	C	1	10	Glycinde solitaria	1
05APR93	C	1	10	Cossura delta	2
05APR93	C	1	10	Mulinia lateralis	1
05APR93	C	1	10	Lyonsia hyalina floridana	1
05APR93	C	1	10	Mediomastus ambiseta	1
05APR93	C	2	3	Capitella capitata	1
05APR93	C	2	3	Pectinaria gouldii	1
05APR93	C	2	3	Mulinia lateralis	11
05APR93	C	2	3	Cyclaspis varians	4
05APR93	C	2	3	Oxyurostylis sp.	1
05APR93	C	2	3	Mediomastus ambiseta	5
05APR93	C	2	10	Sigambra tentaculata	1
05APR93	C	2	10	Streblospio benedicti	1
05APR93	C	2	10	Mulinia lateralis	1
05APR93	C	2	10	Dorvilleidae	2
05APR93	C	2	10	Mediomastus ambiseta	4
05APR93	C	3	3	Glycinde solitaria	1
05APR93	C	3	3	Haploscoloplos foliosus	1
05APR93	C	3	3	Mulinia lateralis	9
05APR93	C	3	3	Cyclaspis varians	1
05APR93	C	3	3	Nuculana concentrica	1
05APR93	C	3	3	Oxyurostylis sp.	1
05APR93	C	3	3	Mediomastus ambiseta	1
05APR93	C	3	10	Sigambra bassi	1
05APR93	C	3	10	Gyptis vittata	1
05APR93	C	3	10	Mediomastus ambiseta	2
05APR93	D	1	3	Anthozoa (unidentified)	1

05APR93	D	1	3	Rhynchocoel (unidentified)	1
05APR93	D	1	3	Oligochaetes (unidentified)	4
05APR93	D	1	3	Glycinde solitaria	5
05APR93	D	1	3	Streblospio benedicti	1
05APR93	D	1	3	Minuspio cirrifera	4
05APR93	D	1	3	Cossura delta	6
05APR93	D	1	3	Branchioasychis americana	1
05APR93	D	1	3	Clymenella torquata	1
05APR93	D	1	3	Pectinaria gouldii	5
05APR93	D	1	3	Aligena texasiana	1
05APR93	D	1	3	Caprellid	1
05APR93	D	1	3	Hobsonia florida	6
05APR93	D	1	3	Mediomastus ambiseta	52
05APR93	D	1	10	Rhynchocoel (unidentified)	1
05APR93	D	1	10	Oligochaetes (unidentified)	1
05APR93	D	1	10	Sigambra tentaculata	1
05APR93	D	1	10	Diopatra cuprea	1
05APR93	D	1	10	Lumbrineris parvapedata	1
05APR93	D	1	10	Minuspio cirrifera	4
05APR93	D	1	10	Ophiuroidea (unidentified)	4
05APR93	D	1	10	Mediomastus ambiseta	4
05APR93	D	2	3	Anthozoa (unidentified)	2
05APR93	D	2	3	Rhynchocoel (unidentified)	1
05APR93	D	2	3	Minuspio cirrifera	2
05APR93	D	2	3	Cossura delta	7
05APR93	D	2	3	Phascolion strombi	1
05APR93	D	2	3	Ancistrosyllis groenlandica	1
05APR93	D	2	3	Ophiuroidea (unidentified)	1
05APR93	D	2	3	Hobsonia florida	1
05APR93	D	2	3	Mediomastus ambiseta	61
05APR93	D	2	10	Rhynchocoel (unidentified)	4
05APR93	D	2	10	Oligochaetes (unidentified)	1
05APR93	D	2	10	Gyptis vittata	1
05APR93	D	2	10	Minuspio cirrifera	2
05APR93	D	2	10	Naineris sp. A	1
05APR93	D	2	10	Mediomastus ambiseta	2
05APR93	D	3	3	Paranaitis speciosa	1
05APR93	D	3	3	Streblospio benedicti	4
05APR93	D	3	3	Minuspio cirrifera	1
05APR93	D	3	3	Cossura delta	8
05APR93	D	3	3	Pelecypoda (unidentified)	1
05APR93	D	3	3	Microprotopus spp.	1
05APR93	D	3	3	Hobsonia florida	1
05APR93	D	3	3	Mediomastus ambiseta	36

05APR93	D	3	10	Sigambra bassi	1
05APR93	D	3	10	Sigambra tentaculata	1
05APR93	D	3	10	Magelona phyllisae	1
05APR93	D	3	10	Cossura delta	3
05APR93	D	3	10	Holothuroid (unidentified)	1
05APR93	D	3	10	Mediomastus ambiseta	6
05APR93	E	1	3	Rhynchocoel (unidentified)	3
05APR93	E	1	3	Paranaitis speciosa	1
05APR93	E	1	3	Glycinde solitaria	1
05APR93	E	1	3	Streblospio benedicti	1
05APR93	E	1	3	Paraprionospio pinnata	1
05APR93	E	1	3	Mulinia lateralis	1
05APR93	E	1	3	Monoculodes sp.	1
05APR93	E	1	3	Acteocina canaliculata	1
05APR93	E	1	3	Hobsonia florida	8
05APR93	E	1	3	Mediomastus ambiseta	25
05APR93	E	1	10	Gyptis vittata	1
05APR93	E	1	10	Paraprionospio pinnata	2
05APR93	E	1	10	Paraonidae Grp. A	1
05APR93	E	1	10	Hobsonia florida	1
05APR93	E	2	3	Rhynchocoel (unidentified)	1
05APR93	E	2	3	Oligochaetes (unidentified)	1
05APR93	E	2	3	Gyptis vittata	1
05APR93	E	2	3	Diopatra cuprea	1
05APR93	E	2	3	Cossura delta	1
05APR93	E	2	3	Nuculana acuta	2
05APR93	E	2	3	Mulinia lateralis	1
05APR93	E	2	3	Acteocina canaliculata	1
05APR93	E	2	3	Nereidae (unidentified)	1
05APR93	E	2	3	Pectinariidae	1
05APR93	E	2	3	Hobsonia florida	12
05APR93	E	2	3	Mediomastus ambiseta	17
05APR93	E	2	10	Anthozoa (unidentified)	1
05APR93	E	2	10	Sigambra tentaculata	1
05APR93	E	2	10	Cossura delta	1
05APR93	E	2	10	Mediomastus ambiseta	4
05APR93	E	3	3	Oligochaetes (unidentified)	2
05APR93	E	3	3	Paranaitis speciosa	2
05APR93	E	3	3	Streblospio benedicti	2
05APR93	E	3	3	Paraprionospio pinnata	3
05APR93	E	3	3	Cossura delta	1
05APR93	E	3	3	Pectinaria gouldii	1
05APR93	E	3	3	Nuculana acuta	1
05APR93	E	3	3	Mulinia lateralis	1

05APR93	E	3	3	Ophiuroidea (unidentified)	1
05APR93	E	3	3	Pyramidella crenulata	3
05APR93	E	3	3	Hobsonia florida	13
05APR93	E	3	3	Oxyurostylis sp.	1
05APR93	E	3	3	Mediomastus ambiseta	20
05APR93	E	3	10	Rhynchocoel (unidentified)	3
05APR93	E	3	10	Lumbrineris parvapedata	1
05APR93	E	3	10	Paraprionospio pinnata	2
05APR93	E	3	10	Cossura delta	2
05APR93	E	3	10	Mediomastus ambiseta	3
05APR93	F	1	3	Streblospio benedicti	13
05APR93	F	1	3	Mulinia lateralis	9
05APR93	F	1	3	Acteocina canaliculata	1
05APR93	F	1	3	Pelecypoda (unidentified)	1
05APR93	F	1	3	Macoma mitchelli	1
05APR93	F	1	3	Turbellaria (unidentified)	4
05APR93	F	1	3	Mediomastus ambiseta	34
05APR93	F	1	10	Rhynchocoel (unidentified)	2
05APR93	F	1	10	Gyptis vittata	1
05APR93	F	1	10	Streblospio benedicti	1
05APR93	F	1	10	Paraprionospio pinnata	3
05APR93	F	1	10	Macoma mitchelli	2
05APR93	F	1	10	Turbellaria (unidentified)	2
05APR93	F	1	10	Mediomastus ambiseta	7
05APR93	F	2	3	Rhynchocoel (unidentified)	1
05APR93	F	2	3	Streblospio benedicti	8
05APR93	F	2	3	Capitella capitata	1
05APR93	F	2	3	Mulinia lateralis	5
05APR93	F	2	3	Pyramidella crenulata	1
05APR93	F	2	3	Brachidontes exustus	1
05APR93	F	2	3	Macoma mitchelli	1
05APR93	F	2	3	Mediomastus ambiseta	37
05APR93	F	2	10	Rhynchocoel (unidentified)	3
05APR93	F	2	10	Gyptis vittata	1
05APR93	F	2	10	Capitella capitata	3
05APR93	F	2	10	Mediomastus ambiseta	5
05APR93	F	3	3	Streblospio benedicti	17
05APR93	F	3	3	Capitella capitata	1
05APR93	F	3	3	Mulinia lateralis	7
05APR93	F	3	3	Mediomastus ambiseta	59
05APR93	F	3	10	Rhynchocoel (unidentified)	1
05APR93	F	3	10	Paraprionospio pinnata	1
05APR93	F	3	10	Capitella capitata	1
05APR93	F	3	10	Macoma mitchelli	2

05APR93	F	3	10	Mediomastus ambiseta	2
09JUL93	A	1	3	Streblospio benedicti	1
09JUL93	A	1	3	Mulinia lateralis	2
09JUL93	A	1	3	Littoridina sphinctostoma	1
09JUL93	A	1	3	Mediomastus ambiseta	14
09JUL93	A	1	10	Chironomid larvae	1
09JUL93	A	2	3	Streblospio benedicti	2
09JUL93	A	2	3	Mulinia lateralis	2
09JUL93	A	2	3	Chironomid larvae	1
09JUL93	A	2	3	Littoridina sphinctostoma	3
09JUL93	A	2	3	Mediomastus ambiseta	23
09JUL93	A	2	10	Macoma mitchelli	1
09JUL93	A	2	10	Mediomastus ambiseta	2
09JUL93	A	3	3	Mulinia lateralis	1
09JUL93	A	3	3	Mediomastus ambiseta	21
09JUL93	A	3	10	Capitella capitata	1
09JUL93	A	3	10	Macoma mitchelli	1
09JUL93	A	3	10	Mediomastus ambiseta	3
09JUL93	B	1	3	Streblospio benedicti	1
09JUL93	B	1	3	Chironomid larvae	1
09JUL93	B	1	3	Mediomastus ambiseta	3
09JUL93	B	1	10	Mediomastus ambiseta	2
09JUL93	B	2	3	Macoma mitchelli	1
09JUL93	B	2	3	Littoridina sphinctostoma	2
09JUL93	B	2	10	Mediomastus ambiseta	7
09JUL93	B	3	3	Streblospio benedicti	1
09JUL93	B	3	3	Mediomastus ambiseta	5
09JUL93	B	3	10	Mediomastus ambiseta	10
09JUL93	C	1	3	Streblospio benedicti	12
09JUL93	C	1	10	Capitella capitata	1
09JUL93	C	2	3	Streblospio benedicti	9
09JUL93	C	2	3	Cossura delta	1
09JUL93	C	2	3	Capitella capitata	1
09JUL93	C	2	3	Mulinia lateralis	1
09JUL93	C	2	3	Macoma mitchelli	1
09JUL93	C	2	10	Oligochaetes (unidentified)	1
09JUL93	C	2	10	Streblospio benedicti	1
09JUL93	C	2	10	Cossura delta	2
09JUL93	C	2	10	Mediomastus ambiseta	1
09JUL93	C	3	3	Streblospio benedicti	18
09JUL93	C	3	3	Mulinia lateralis	2
09JUL93	C	3	3	Parandalia ocularis	1
09JUL93	C	3	3	Mediomastus ambiseta	3
09JUL93	C	3	10	Rhynchocoel (unidentified)	1

09JUL93	C	3	10	Haploscoloplos foliosus	1
09JUL93	C	3	10	Capitella capitata	1
09JUL93	C	3	10	Axiothella mucosa	1
09JUL93	C	3	10	Ancistrosyllis groenlandica	1
09JUL93	C	3	10	Caecum johnsoni	4
09JUL93	C	3	10	Mediomastus ambiseta	1
09JUL93	D	1	3	Anthozoa (unidentified)	1
09JUL93	D	1	3	Paraprionospio pinnata	1
09JUL93	D	1	3	Minuspio cirrifera	1
09JUL93	D	1	3	Cossura delta	1
09JUL93	D	1	3	Periploma cf. orbiculare	1
09JUL93	D	1	3	Mediomastus ambiseta	4
09JUL93	D	1	3	Eudorella sp.	1
09JUL93	D	1	10	Oligochaetes (unidentified)	2
09JUL93	D	1	10	Gyptis vittata	1
09JUL93	D	1	10	Abra aequalis	1
09JUL93	D	1	10	Apseudes sp. A	2
09JUL93	D	1	10	Naineris sp. A	1
09JUL93	D	1	10	Mediomastus ambiseta	1
09JUL93	D	2	3	Diopatra cuprea	1
09JUL93	D	2	3	Paraprionospio pinnata	1
09JUL93	D	2	3	Microprotopus spp.	1
09JUL93	D	2	3	Apseudes sp. A	3
09JUL93	D	2	3	Mediomastus ambiseta	1
09JUL93	D	2	10	Rhynchocoel (unidentified)	1
09JUL93	D	2	10	Oligochaetes (unidentified)	3
09JUL93	D	2	10	Apseudes sp. A	1
09JUL93	D	2	10	Periploma cf. orbiculare	2
09JUL93	D	2	10	Naineris sp. A	1
09JUL93	D	2	10	Mediomastus ambiseta	3
09JUL93	D	3	3	Cossura delta	5
09JUL93	D	3	3	Corbula contracta	1
09JUL93	D	3	3	Mediomastus ambiseta	10
09JUL93	D	3	10	Rhynchocoel (unidentified)	1
09JUL93	D	3	10	Oligochaetes (unidentified)	1
09JUL93	D	3	10	Minuspio cirrifera	1
09JUL93	D	3	10	Cossura delta	1
09JUL93	D	3	10	Corbula contracta	1
09JUL93	D	3	10	Ophiuroidea (unidentified)	1
09JUL93	D	3	10	Periploma cf. orbiculare	2
09JUL93	D	3	10	Naineris sp. A	1
09JUL93	D	3	10	Mediomastus ambiseta	1
09JUL93	E	1	3	Glycinde solitaria	1
09JUL93	E	1	3	Streblospio benedicti	1

09JUL93	E	1	3	Paraprionospio pinnata	1
09JUL93	E	1	3	Cossura delta	2
09JUL93	E	1	3	Mulinia lateralis	10
09JUL93	E	1	3	Macoma mitchelli	1
09JUL93	E	1	3	Mediomastus ambiseta	5
09JUL93	E	1	10	Gyptis vittata	3
09JUL93	E	1	10	Paraprionospio pinnata	1
09JUL93	E	1	10	Mediomastus ambiseta	1
09JUL93	E	2	3	Glycinde solitaria	2
09JUL93	E	2	3	Streblospio benedicti	1
09JUL93	E	2	3	Cossura delta	1
09JUL93	E	2	3	Mulinia lateralis	11
09JUL93	E	2	3	Acteocina canaliculata	1
09JUL93	E	2	3	Pyramidella crenulata	2
09JUL93	E	2	3	Macoma mitchelli	1
09JUL93	E	2	3	Mediomastus ambiseta	6
09JUL93	E	2	10	Oligochaetes (unidentified)	2
09JUL93	E	2	10	Gyptis vittata	1
09JUL93	E	2	10	Paraprionospio pinnata	3
09JUL93	E	2	10	Paraonidae Grp. B	1
09JUL93	E	3	3	Rhynchocoel (unidentified)	1
09JUL93	E	3	3	Streblospio benedicti	2
09JUL93	E	3	3	Cossura delta	1
09JUL93	E	3	3	Mulinia lateralis	5
09JUL93	E	3	3	Mediomastus ambiseta	5
09JUL93	E	3	10	Oligochaetes (unidentified)	3
09JUL93	E	3	10	Gyptis vittata	1
09JUL93	E	3	10	Paraprionospio pinnata	2
09JUL93	E	3	10	Mediomastus ambiseta	1
09JUL93	F	1	3	Rhynchocoel (unidentified)	1
09JUL93	F	1	3	Gyptis vittata	1
09JUL93	F	1	3	Streblospio benedicti	2
09JUL93	F	1	3	Mediomastus ambiseta	12
09JUL93	F	1	10	Paraprionospio pinnata	3
09JUL93	F	1	10	Mediomastus ambiseta	16
09JUL93	F	2	3	Gyptis vittata	1
09JUL93	F	2	3	Paraprionospio pinnata	2
09JUL93	F	2	3	Mediomastus ambiseta	4
09JUL93	F	2	10	Glycinde solitaria	1
09JUL93	F	2	10	Paraprionospio pinnata	1
09JUL93	F	2	10	Mediomastus ambiseta	18
09JUL93	F	3	3	Streblospio benedicti	2
09JUL93	F	3	3	Paraprionospio pinnata	2
09JUL93	F	3	3	Macoma mitchelli	1

09JUL93	F	3	3	Mediomastus ambiseta	22
09JUL93	F	3	10	Glycinde solitaria	1
09JUL93	F	3	10	Mediomastus ambiseta	13
11OCT93	A	1	3	Streblospio benedicti	3
11OCT93	A	1	3	Mediomastus ambiseta	2
11OCT93	A	1	10	No species observed	0
11OCT93	A	2	3	Streblospio benedicti	6
11OCT93	A	2	3	Mediomastus ambiseta	1
11OCT93	A	2	10	No species observed	0
11OCT93	A	3	3	No species observed	0
11OCT93	A	3	10	No species observed	0
11OCT93	B	1	3	Mulinia lateralis	1
11OCT93	B	1	3	Mediomastus ambiseta	1
11OCT93	B	1	10	Glycinde solitaria	1
11OCT93	B	1	10	Mediomastus ambiseta	2
11OCT93	B	2	3	Rhynchocoel (unidentified)	2
11OCT93	B	2	3	Parandalia ocularis	2
11OCT93	B	2	3	Mediomastus ambiseta	1
11OCT93	B	2	10	Mediomastus ambiseta	6
11OCT93	B	3	3	Mediomastus ambiseta	1
11OCT93	B	3	10	Mediomastus ambiseta	3
11OCT93	C	1	3	Rhynchocoel (unidentified)	1
11OCT93	C	1	3	Streblospio benedicti	1
11OCT93	C	1	3	Paraprionospio pinnata	1
11OCT93	C	1	3	Spiochaetopterus costarum	2
11OCT93	C	1	3	Haploscoloplos foliosus	1
11OCT93	C	1	3	Ophiuroidea (unidentified)	1
11OCT93	C	1	3	Mediomastus ambiseta	11
11OCT93	C	1	10	Spiochaetopterus costarum	1
11OCT93	C	1	10	Cossura delta	2
11OCT93	C	1	10	Mediomastus ambiseta	9
11OCT93	C	2	3	Streblospio benedicti	2
11OCT93	C	2	3	Paraprionospio pinnata	1
11OCT93	C	2	3	Spiochaetopterus costarum	1
11OCT93	C	2	3	Mulinia lateralis	2
11OCT93	C	2	3	Ophiuroidea (unidentified)	2
11OCT93	C	2	3	Mediomastus ambiseta	19
11OCT93	C	2	10	Rhynchocoel (unidentified)	1
11OCT93	C	2	10	Sigambra bassi	1
11OCT93	C	2	10	Gyptis vittata	2
11OCT93	C	2	10	Paraprionospio pinnata	1
11OCT93	C	2	10	Haploscoloplos foliosus	1
11OCT93	C	2	10	Cossura delta	1
11OCT93	C	2	10	Mediomastus ambiseta	11

11OCT93	C	3	3	Anthozoa (unidentified)	1
11OCT93	C	3	3	Spiochaetopterus costarum	1
11OCT93	C	3	3	Mulinia lateralis	2
11OCT93	C	3	3	Ophiuroidea (unidentified)	1
11OCT93	C	3	3	Mediomastus ambiseta	5
11OCT93	C	3	10	Spiochaetopterus costarum	1
11OCT93	C	3	10	Mediomastus ambiseta	1
11OCT93	D	1	3	Rhynchocoel (unidentified)	1
11OCT93	D	1	3	Sigambra tentaculata	1
11OCT93	D	1	3	Paraprionospio pinnata	1
11OCT93	D	1	3	Cossura delta	2
11OCT93	D	1	3	Armandia maculata	1
11OCT93	D	1	3	Mediomastus ambiseta	3
11OCT93	D	1	10	Rhynchocoel (unidentified)	2
11OCT93	D	1	10	Oligochaetes (unidentified)	1
11OCT93	D	1	10	Lumbrineris parvapedata	1
11OCT93	D	1	10	Minuspio cirrifera	2
11OCT93	D	1	10	Cossura delta	3
11OCT93	D	1	10	Ophiuroidea (unidentified)	1
11OCT93	D	1	10	Apseudes sp. A	1
11OCT93	D	1	10	Naineris sp. A	1
11OCT93	D	1	10	Mediomastus ambiseta	2
11OCT93	D	2	3	Rhynchocoel (unidentified)	2
11OCT93	D	2	3	Streblospio benedicti	2
11OCT93	D	2	3	Paraprionospio pinnata	1
11OCT93	D	2	3	Minuspio cirrifera	3
11OCT93	D	2	3	Periploma margaritaceum	4
11OCT93	D	2	3	Ophiuroidea (unidentified)	1
11OCT93	D	2	3	Mediomastus ambiseta	4
11OCT93	D	2	10	Rhynchocoel (unidentified)	2
11OCT93	D	2	10	Oligochaetes (unidentified)	1
11OCT93	D	2	10	Paleanotus heteroseta	1
11OCT93	D	2	10	Cossura delta	2
11OCT93	D	2	10	Periploma margaritaceum	2
11OCT93	D	2	10	Ophiuroidea (unidentified)	1
11OCT93	D	2	10	Periploma cf. orbiculare	1
11OCT93	D	2	10	Mediomastus ambiseta	2
11OCT93	D	3	3	Minuspio cirrifera	2
11OCT93	D	3	3	Periploma margaritaceum	5
11OCT93	D	3	3	Mediomastus ambiseta	2
11OCT93	D	3	10	Rhynchocoel (unidentified)	1
11OCT93	D	3	10	Minuspio cirrifera	7
11OCT93	D	3	10	Periploma margaritaceum	2
11OCT93	D	3	10	Ophiuroidea (unidentified)	1

11OCT93	D	3	10	Mediomastus ambiseta	1
11OCT93	E	1	3	Streblospio benedicti	2
11OCT93	E	1	3	Nassarius acutus	1
11OCT93	E	1	3	Pyramidella crenulata	1
11OCT93	E	1	3	Mediomastus ambiseta	8
11OCT93	E	1	10	Oligochaetes (unidentified)	2
11OCT93	E	1	10	Streblospio benedicti	2
11OCT93	E	1	10	Paraprionospio pinnata	2
11OCT93	E	1	10	Mediomastus ambiseta	3
11OCT93	E	2	3	Streblospio benedicti	8
11OCT93	E	2	3	Paraprionospio pinnata	1
11OCT93	E	2	3	Pyramidella crenulata	1
11OCT93	E	2	3	Mediomastus ambiseta	4
11OCT93	E	2	10	Gyptis vittata	2
11OCT93	E	2	10	Streblospio benedicti	1
11OCT93	E	2	10	Paraprionospio pinnata	2
11OCT93	E	2	10	Ancistrosyllis groenlandica	1
11OCT93	E	2	10	Paraonidae Grp. A	1
11OCT93	E	2	10	Caecum johnsoni	1
11OCT93	E	2	10	Mediomastus ambiseta	5
11OCT93	E	3	3	Streblospio benedicti	4
11OCT93	E	3	3	Nassarius acutus	1
11OCT93	E	3	3	Mediomastus ambiseta	3
11OCT93	E	3	10	Paraprionospio pinnata	4
11OCT93	E	3	10	Cossura delta	1
11OCT93	E	3	10	Mediomastus ambiseta	2
11OCT93	F	1	3	Streblospio benedicti	4
11OCT93	F	1	3	Paraprionospio pinnata	1
11OCT93	F	1	3	Ampelisca abdita	4
11OCT93	F	1	3	Mediomastus ambiseta	1
11OCT93	F	1	10	Streblospio benedicti	1
11OCT93	F	1	10	Paraprionospio pinnata	1
11OCT93	F	1	10	Parandalia ocularis	2
11OCT93	F	1	10	Mediomastus ambiseta	1
11OCT93	F	2	3	Rhynchocoel (unidentified)	1
11OCT93	F	2	3	Streblospio benedicti	6
11OCT93	F	2	3	Paraprionospio pinnata	1
11OCT93	F	2	3	Ampelisca abdita	2
11OCT93	F	2	3	Megalops	1
11OCT93	F	2	3	Mediomastus ambiseta	5
11OCT93	F	2	10	Cossura delta	1
11OCT93	F	2	10	Mediomastus ambiseta	2
11OCT93	F	3	3	Rhynchocoel (unidentified)	1
11OCT93	F	3	3	Streblospio benedicti	3

11OCT93	F	3	3	Spiochaetopterus costarum	1
11OCT93	F	3	3	Ampelisca abdita	1
11OCT93	F	3	3	Nassarius acutus	1
11OCT93	F	3	3	Mediomastus ambiseta	5
11OCT93	F	3	10	No species observed	0
05JAN94	A	1	3	Polydora websteri	2
05JAN94	A	1	3	Streblospio benedicti	6
05JAN94	A	1	3	Haploscoloplos foliosus	1
05JAN94	A	1	3	Capitella capitata	3
05JAN94	A	1	3	Capitellides jonesi	2
05JAN94	A	1	3	Notomastus latericeus	1
05JAN94	A	1	3	Mulinia lateralis	2
05JAN94	A	1	3	Cyclaspis varians	1
05JAN94	A	1	3	Macoma mitchelli	1
05JAN94	A	1	3	Mediomastus ambiseta	14
05JAN94	A	1	10	Mediomastus ambiseta	1
05JAN94	A	2	3	Rhynchocoel (unidentified)	1
05JAN94	A	2	3	Streblospio benedicti	11
05JAN94	A	2	3	Capitella capitata	1
05JAN94	A	2	3	Mulinia lateralis	4
05JAN94	A	2	3	Cyclaspis varians	3
05JAN94	A	2	3	Macoma mitchelli	1
05JAN94	A	2	3	Mediomastus ambiseta	23
05JAN94	A	2	10	Mediomastus ambiseta	2
05JAN94	A	3	3	Streblospio benedicti	6
05JAN94	A	3	3	Mulinia lateralis	8
05JAN94	A	3	3	Brachidontes exustus	1
05JAN94	A	3	3	Macoma mitchelli	2
05JAN94	A	3	3	Mediomastus ambiseta	17
05JAN94	A	3	10	No species observed	0
05JAN94	B	1	3	Streblospio benedicti	5
05JAN94	B	1	3	Mulinia lateralis	5
05JAN94	B	1	3	Macoma mitchelli	2
05JAN94	B	1	3	Mediomastus ambiseta	2
05JAN94	B	1	10	Neanthes succinea	1
05JAN94	B	1	10	Ogyrides limicola	1
05JAN94	B	1	10	Mediomastus ambiseta	4
05JAN94	B	2	3	Streblospio benedicti	4
05JAN94	B	2	3	Haploscoloplos foliosus	2
05JAN94	B	2	3	Mulinia lateralis	5
05JAN94	B	2	3	Macoma mitchelli	1
05JAN94	B	2	3	Mediomastus ambiseta	5
05JAN94	B	2	10	Mediomastus ambiseta	1
05JAN94	B	3	3	Glycinde solitaria	1

05JAN94	B	3	3	Haploscoloplos foliosus	2
05JAN94	B	3	3	Mulinia lateralis	7
05JAN94	B	3	3	Mediomastus ambiseta	10
05JAN94	B	3	10	Paraprionospio pinnata	1
05JAN94	B	3	10	Capitellidae (unidentified)	1
05JAN94	B	3	10	Macoma mitchelli	2
05JAN94	B	3	10	Mediomastus ambiseta	2
05JAN94	C	1	3	Sigambra bassi	1
05JAN94	C	1	3	Paraprionospio pinnata	1
05JAN94	C	1	3	Haploscoloplos foliosus	1
05JAN94	C	1	3	Diastylis sp.	1
05JAN94	C	1	3	Mediomastus ambiseta	8
05JAN94	C	1	10	Rhynchocoel (unidentified)	1
05JAN94	C	1	10	Spiochaetopterus costarum	1
05JAN94	C	1	10	Mediomastus ambiseta	2
05JAN94	C	2	3	Rhynchocoel (unidentified)	2
05JAN94	C	2	3	Glycinde solitaria	1
05JAN94	C	2	3	Streblospio benedicti	1
05JAN94	C	2	3	Haploscoloplos foliosus	3
05JAN94	C	2	3	Nuculana acuta	1
05JAN94	C	2	3	Ophiuroidea (unidentified)	1
05JAN94	C	2	3	Mediomastus ambiseta	21
05JAN94	C	2	10	Rhynchocoel (unidentified)	1
05JAN94	C	2	10	Glycinde solitaria	1
05JAN94	C	2	10	Paraprionospio pinnata	1
05JAN94	C	2	10	Cossura delta	1
05JAN94	C	2	10	Mediomastus ambiseta	3
05JAN94	C	3	3	Rhynchocoel (unidentified)	2
05JAN94	C	3	3	Neanthes succinea	1
05JAN94	C	3	3	Glycinde solitaria	1
05JAN94	C	3	3	Haploscoloplos foliosus	3
05JAN94	C	3	3	Polychaete juv. (unidentified)	1
05JAN94	C	3	3	Mediomastus ambiseta	15
05JAN94	C	3	10	Streblospio benedicti	1
05JAN94	C	3	10	Maldanidae (unidentified)	1
05JAN94	C	3	10	Polychaete juv. (unidentified)	1
05JAN94	C	3	10	Mediomastus ambiseta	1
05JAN94	D	1	3	Rhynchocoel (unidentified)	1
05JAN94	D	1	3	Podarke obscura	1
05JAN94	D	1	3	Glycinde solitaria	1
05JAN94	D	1	3	Diopatra cuprea	1
05JAN94	D	1	3	Paraprionospio pinnata	1
05JAN94	D	1	3	Mulinia lateralis	2
05JAN94	D	1	3	Ophiuroidea (unidentified)	1

05JAN94	D	1	3	Armandia maculata	1
05JAN94	D	1	3	Apseudes sp. A	2
05JAN94	D	1	3	Mediomastus ambiseta	16
05JAN94	D	1	10	Ophiuroidea (unidentified)	1
05JAN94	D	2	3	Anthozoa (unidentified)	1
05JAN94	D	2	3	Diopatra cuprea	2
05JAN94	D	2	3	Lumbrineris latreilli	1
05JAN94	D	2	3	Minuspio cirrifera	2
05JAN94	D	2	3	Cossura delta	1
05JAN94	D	2	3	Phoronis architecta	1
05JAN94	D	2	3	Listriella barnardi	1
05JAN94	D	2	3	Ophiuroidea (unidentified)	1
05JAN94	D	2	3	Hemicyclops sp.	1
05JAN94	D	2	3	Turbellaria (unidentified)	1
05JAN94	D	2	3	Apseudes sp. A	2
05JAN94	D	2	3	Mediomastus ambiseta	15
05JAN94	D	2	10	Rhynchocoel (unidentified)	2
05JAN94	D	2	10	Minuspio cirrifera	7
05JAN94	D	2	10	Mulinia lateralis	1
05JAN94	D	2	10	Lumbrineris tenuis	1
05JAN94	D	2	10	Ophiuroidea (unidentified)	1
05JAN94	D	2	10	Mediomastus ambiseta	10
05JAN94	D	3	3	Anthozoa (unidentified)	2
05JAN94	D	3	3	Rhynchocoel (unidentified)	2
05JAN94	D	3	3	Eteone heteropoda	1
05JAN94	D	3	3	Glycinde solitaria	1
05JAN94	D	3	3	Lumbrineris latreilli	3
05JAN94	D	3	3	Paraprionospio pinnata	2
05JAN94	D	3	3	Minuspio cirrifera	5
05JAN94	D	3	3	Notomastus latericeus	1
05JAN94	D	3	3	Phoronis architecta	1
05JAN94	D	3	3	Ophiuroidea (unidentified)	1
05JAN94	D	3	3	Pelecypoda (unidentified)	1
05JAN94	D	3	3	Turbellaria (unidentified)	1
05JAN94	D	3	3	Mediomastus ambiseta	13
05JAN94	D	3	3	Eudorella sp.	1
05JAN94	D	3	10	Rhynchocoel (unidentified)	2
05JAN94	D	3	10	Podarke obscura	2
05JAN94	D	3	10	Minuspio cirrifera	2
05JAN94	D	3	10	Haploscoloplos foliosus	1
05JAN94	D	3	10	Cossura delta	3
05JAN94	D	3	10	Mulinia lateralis	5
05JAN94	D	3	10	Ophiuroidea (unidentified)	1
05JAN94	D	3	10	Macoma mitchelli	2

05JAN94	D	3	10	Apseudes sp. A	4
05JAN94	D	3	10	Mediomastus ambiseta	13
05JAN94	E	1	3	Podarke obscura	2
05JAN94	E	1	3	Glycinde solitaria	1
05JAN94	E	1	3	Streblospio benedicti	1
05JAN94	E	1	3	Paraprionospio pinnata	2
05JAN94	E	1	3	Minuspio cirrifera	1
05JAN94	E	1	3	Cossura delta	2
05JAN94	E	1	3	Nuculana acuta	1
05JAN94	E	1	3	Mulinia lateralis	68
05JAN94	E	1	3	Acteocina canaliculata	1
05JAN94	E	1	3	Ophiuroidea (unidentified)	1
05JAN94	E	1	3	Pyramidella crenulata	3
05JAN94	E	1	3	Mediomastus ambiseta	32
05JAN94	E	1	10	Gyptis vittata	1
05JAN94	E	1	10	Paraprionospio pinnata	2
05JAN94	E	1	10	Apoprionospio pygmaea	1
05JAN94	E	1	10	Haploscoloplos foliosus	4
05JAN94	E	1	10	Cossura delta	4
05JAN94	E	1	10	Paraonidae Grp. A	1
05JAN94	E	1	10	Mediomastus ambiseta	9
05JAN94	E	1	10	Glycinde nordmanni	1
05JAN94	E	2	3	Streblospio benedicti	4
05JAN94	E	2	3	Cossura delta	2
05JAN94	E	2	3	Haminoea succinea	1
05JAN94	E	2	3	Nuculana acuta	1
05JAN94	E	2	3	Mulinia lateralis	71
05JAN94	E	2	3	Acteocina canaliculata	2
05JAN94	E	2	3	Microprotopus spp.	1
05JAN94	E	2	3	Pyramidella crenulata	1
05JAN94	E	2	3	Turbellaria (unidentified)	1
05JAN94	E	2	3	Oxyurostylis smithi	1
05JAN94	E	2	3	Mediomastus ambiseta	11
05JAN94	E	2	10	Rhynchocoel (unidentified)	1
05JAN94	E	2	10	Podarke obscura	1
05JAN94	E	2	10	Paraprionospio pinnata	8
05JAN94	E	2	10	Minuspio cirrifera	1
05JAN94	E	2	10	Haploscoloplos foliosus	1
05JAN94	E	2	10	Mulinia lateralis	1
05JAN94	E	2	10	Hobsonia florida	1
05JAN94	E	2	10	Mediomastus ambiseta	14
05JAN94	E	3	3	Glycinde solitaria	1
05JAN94	E	3	3	Streblospio benedicti	1
05JAN94	E	3	3	Paraprionospio pinnata	2

05JAN94	E	3	3	Cossura delta	3
05JAN94	E	3	3	Nuculana acuta	4
05JAN94	E	3	3	Mulinia lateralis	96
05JAN94	E	3	3	Balanus eburneus	1
05JAN94	E	3	3	Acteocina canaliculata	5
05JAN94	E	3	3	Ophiuroidea (unidentified)	1
05JAN94	E	3	3	Pyramidella crenulata	1
05JAN94	E	3	3	Turbellaria (unidentified)	2
05JAN94	E	3	3	Mediomastus ambiseta	15
05JAN94	E	3	10	Podarke obscura	3
05JAN94	E	3	10	Paraprionospio pinnata	5
05JAN94	E	3	10	Haploscoloplos foliosus	1
05JAN94	E	3	10	Cossura delta	3
05JAN94	E	3	10	Haminoea succinea	1
05JAN94	E	3	10	Acteocina canaliculata	1
05JAN94	E	3	10	Mediomastus ambiseta	24
05JAN94	F	1	3	Streblospio benedicti	7
05JAN94	F	1	3	Mulinia lateralis	1
05JAN94	F	1	3	Ogyrides limicola	1
05JAN94	F	1	3	Phoronis architecta	1
05JAN94	F	1	3	Pelecypoda (unidentified)	1
05JAN94	F	1	3	Macoma mitchelli	8
05JAN94	F	1	3	Mediomastus ambiseta	5
05JAN94	F	1	10	Phoronis architecta	1
05JAN94	F	2	3	Rhynchocoel (unidentified)	1
05JAN94	F	2	3	Streblospio benedicti	5
05JAN94	F	2	3	Haploscoloplos foliosus	1
05JAN94	F	2	3	Mulinia lateralis	1
05JAN94	F	2	3	Ampelisca abdita	1
05JAN94	F	2	3	Acteocina canaliculata	1
05JAN94	F	2	3	Macoma mitchelli	11
05JAN94	F	2	3	Mediomastus ambiseta	9
05JAN94	F	2	3	Glycinde nordmanni	1
05JAN94	F	2	10	Paraprionospio pinnata	1
05JAN94	F	3	3	Podarke obscura	1
05JAN94	F	3	3	Streblospio benedicti	4
05JAN94	F	3	3	Haploscoloplos foliosus	2
05JAN94	F	3	3	Mulinia lateralis	1
05JAN94	F	3	3	Acteocina canaliculata	2
05JAN94	F	3	3	Macoma mitchelli	13
05JAN94	F	3	3	Mediomastus ambiseta	7
05JAN94	F	3	10	Rhynchocoel (unidentified)	1
05JAN94	F	3	10	Haploscoloplos foliosus	1
05JAN94	F	3	10	Cossura delta	1

05JAN94	F	3	10	Acteocina canaliculata	2
05JAN94	F	3	10	Macoma mitchelli	5
05JAN94	F	3	10	Mediomastus ambiseta	1
07APR94	A	1	3	Eteone heteropoda	2
07APR94	A	1	3	Streblospio benedicti	7
07APR94	A	1	3	Notomastus latericeus	1
07APR94	A	1	3	Nuculana acuta	1
07APR94	A	1	3	Mulinia lateralis	7
07APR94	A	1	3	Ampelisca abdita	1
07APR94	A	1	3	Mediomastus ambiseta	13
07APR94	A	1	3	Glycinde nordmanni	1
07APR94	A	1	10	Rhynchocoel (unidentified)	1
07APR94	A	1	10	Mediomastus ambiseta	7
07APR94	A	2	3	Streblospio benedicti	11
07APR94	A	2	3	Mulinia lateralis	9
07APR94	A	2	3	Cyclaspis varians	2
07APR94	A	2	3	Mediomastus ambiseta	14
07APR94	A	2	10	Mysidopsis sp.	1
07APR94	A	2	10	Macoma mitchelli	1
07APR94	A	2	10	Mediomastus ambiseta	14
07APR94	A	3	3	Oligochaetes (unidentified)	4
07APR94	A	3	3	Streblospio benedicti	15
07APR94	A	3	3	Capitella capitata	1
07APR94	A	3	3	Mulinia lateralis	10
07APR94	A	3	3	Cyclaspis varians	1
07APR94	A	3	3	Mediomastus ambiseta	18
07APR94	A	3	10	Macoma mitchelli	1
07APR94	A	3	10	Mediomastus ambiseta	18
07APR94	A	3	10	Glycinde nordmanni	1
07APR94	B	1	3	Cossura delta	1
07APR94	B	1	3	Turbellaria (unidentified)	1
07APR94	B	1	3	Mediomastus ambiseta	26
07APR94	B	1	3	Glycinde nordmanni	4
07APR94	B	1	10	Haploscoloplos foliosus	1
07APR94	B	1	10	Macoma mitchelli	1
07APR94	B	1	10	Mediomastus ambiseta	5
07APR94	B	2	3	Streblospio benedicti	4
07APR94	B	2	3	Mulinia lateralis	3
07APR94	B	2	3	Mediomastus ambiseta	20
07APR94	B	2	3	Glycinde nordmanni	4
07APR94	B	2	10	Rhynchocoel (unidentified)	1
07APR94	B	2	10	Haploscoloplos foliosus	1
07APR94	B	2	10	Parandalia ocularis	1
07APR94	B	2	10	Mediomastus ambiseta	1

07APR94	B	3	3	Rhynchocoel (unidentified)	1
07APR94	B	3	3	Streblospio benedicti	3
07APR94	B	3	3	Mulinia lateralis	4
07APR94	B	3	3	Nereidae (unidentified)	1
07APR94	B	3	3	Mediomastus ambiseta	9
07APR94	B	3	10	Rhynchocoel (unidentified)	1
07APR94	B	3	10	Haploscoloplos foliosus	1
07APR94	B	3	10	Mediomastus ambiseta	3
07APR94	C	1	3	Rhynchocoel (unidentified)	1
07APR94	C	1	3	Podarke obscura	1
07APR94	C	1	3	Haploscoloplos foliosus	2
07APR94	C	1	3	Mediomastus ambiseta	2
07APR94	C	1	3	Glycinde nordmanni	1
07APR94	C	1	10	Mediomastus ambiseta	2
07APR94	C	1	10	Glycinde nordmanni	1
07APR94	C	2	3	Gyptis vittata	1
07APR94	C	2	3	Haploscoloplos foliosus	2
07APR94	C	2	3	Mediomastus ambiseta	1
07APR94	C	2	10	Paraonidae Grp. B	1
07APR94	C	2	10	Mediomastus ambiseta	6
07APR94	C	3	3	Paraonidae Grp. A	1
07APR94	C	3	3	Mediomastus ambiseta	3
07APR94	C	3	10	Sigambra tentaculata	1
07APR94	C	3	10	Haploscoloplos foliosus	1
07APR94	C	3	10	Mediomastus ambiseta	3
07APR94	C	3	10	Glycinde nordmanni	1
07APR94	D	1	3	Anthozoa (unidentified)	2
07APR94	D	1	3	Rhynchocoel (unidentified)	1
07APR94	D	1	3	Oligochaetes (unidentified)	1
07APR94	D	1	3	Glycera americana	1
07APR94	D	1	3	Minuspio cirrifera	3
07APR94	D	1	3	Haploscoloplos foliosus	1
07APR94	D	1	3	Cyclaspis varians	2
07APR94	D	1	3	Ampelisca abdita	1
07APR94	D	1	3	Sphaerosyllis sp. A	1
07APR94	D	1	3	Mediomastus ambiseta	11
07APR94	D	1	10	Rhynchocoel (unidentified)	2
07APR94	D	1	10	Oligochaetes (unidentified)	1
07APR94	D	1	10	Paleanotus heteroseta	1
07APR94	D	1	10	Minuspio cirrifera	21
07APR94	D	1	10	Cossura delta	1
07APR94	D	1	10	Ophiuroidea (unidentified)	1
07APR94	D	1	10	Naineris sp. A	3
07APR94	D	1	10	Mediomastus ambiseta	2

07APR94	D	2	3	Cossura delta	1
07APR94	D	2	3	Turbellaria (unidentified)	1
07APR94	D	2	3	Mediomastus ambiseta	9
07APR94	D	2	10	Oligochaetes (unidentified)	3
07APR94	D	2	10	Onuphis sp.	1
07APR94	D	2	10	Minuspio cirrifera	3
07APR94	D	2	10	Ophiuroidea (unidentified)	1
07APR94	D	2	10	Naineris sp. A	3
07APR94	D	2	10	Mediomastus ambiseta	3
07APR94	D	3	3	Rhynchocoel (unidentified)	1
07APR94	D	3	3	Oligochaetes (unidentified)	2
07APR94	D	3	3	Ancistrosyllis papillosa	1
07APR94	D	3	3	Minuspio cirrifera	2
07APR94	D	3	3	Cossura delta	3
07APR94	D	3	3	Ophiuroidea (unidentified)	1
07APR94	D	3	3	Apseudes sp. A	1
07APR94	D	3	3	Periploma cf. orbiculare	2
07APR94	D	3	3	Sigambra cf. wassi	1
07APR94	D	3	3	Mediomastus ambiseta	8
07APR94	D	3	10	Oligochaetes (unidentified)	1
07APR94	D	3	10	Diopatra cuprea	1
07APR94	D	3	10	Lumbrineris parvapedata	1
07APR94	D	3	10	Minuspio cirrifera	7
07APR94	D	3	10	Cyclaspis varians	1
07APR94	D	3	10	Ophiuroidea (unidentified)	1
07APR94	D	3	10	Periploma cf. orbiculare	2
07APR94	D	3	10	Mediomastus ambiseta	2
07APR94	E	1	3	Cossura delta	2
07APR94	E	1	3	Nuculana acuta	7
07APR94	E	1	3	Mulinia lateralis	16
07APR94	E	1	3	Acteocina canaliculata	6
07APR94	E	1	3	Ophiuroidea (unidentified)	1
07APR94	E	1	3	Eulimostoma sp.	1
07APR94	E	1	3	Mediomastus ambiseta	16
07APR94	E	1	10	Podarke obscura	1
07APR94	E	1	10	Paraprionospio pinnata	3
07APR94	E	1	10	Cossura delta	4
07APR94	E	1	10	Nuculana acuta	1
07APR94	E	1	10	Ophiuroidea (unidentified)	2
07APR94	E	1	10	Mediomastus ambiseta	13
07APR94	E	2	3	Eteone heteropoda	2
07APR94	E	2	3	Streblospio benedicti	1
07APR94	E	2	3	Paraprionospio pinnata	2
07APR94	E	2	3	Cossura delta	4

07APR94	E	2	3	Balanus eburneus	3
07APR94	E	2	3	Eulimostoma sp.	1
07APR94	E	2	3	Asychis elongata	1
07APR94	E	2	3	Oxyurostylis smithi	1
07APR94	E	2	3	Mediomastus ambiseta	16
07APR94	E	2	10	Rhynchocoel (unidentified)	1
07APR94	E	2	10	Oligochaetes (unidentified)	1
07APR94	E	2	10	Podarke obscura	2
07APR94	E	2	10	Paraprionospio pinnata	3
07APR94	E	2	10	Scolelepis texana	1
07APR94	E	2	10	Haploscoloplos foliosus	1
07APR94	E	2	10	Cossura delta	5
07APR94	E	2	10	Nuculana acuta	1
07APR94	E	2	10	Mediomastus ambiseta	11
07APR94	E	2	10	Glycinde nordmanni	1
07APR94	E	3	3	Anthozoa (unidentified)	1
07APR94	E	3	3	Oligochaetes (unidentified)	1
07APR94	E	3	3	Podarke obscura	2
07APR94	E	3	3	Streblospio benedicti	1
07APR94	E	3	3	Cossura delta	7
07APR94	E	3	3	Nuculana acuta	5
07APR94	E	3	3	Mulinia lateralis	22
07APR94	E	3	3	Balanus eburneus	6
07APR94	E	3	3	Acteocina canaliculata	7
07APR94	E	3	3	Ophiuroidea (unidentified)	1
07APR94	E	3	3	Asychis elongata	1
07APR94	E	3	3	Mediomastus ambiseta	22
07APR94	E	3	10	Lumbrineris parvapedata	2
07APR94	E	3	10	Paraprionospio pinnata	3
07APR94	E	3	10	Haploscoloplos foliosus	2
07APR94	E	3	10	Cossura delta	3
07APR94	E	3	10	Paraonidae Grp. A	2
07APR94	E	3	10	Mediomastus ambiseta	12
07APR94	E	3	10	Glycinde nordmanni	1
07APR94	F	1	3	Streblospio benedicti	3
07APR94	F	1	3	Haploscoloplos foliosus	1
07APR94	F	1	3	Mulinia lateralis	1
07APR94	F	1	3	Corophium louisianum	1
07APR94	F	1	3	Acteocina canaliculata	2
07APR94	F	1	3	Macoma mitchelli	1
07APR94	F	1	3	Mediomastus ambiseta	4
07APR94	F	1	10	Macoma mitchelli	1
07APR94	F	2	3	Streblospio benedicti	2
07APR94	F	2	3	Mulinia lateralis	2

07APR94	F	2	3	Cyclaspis varians	2
07APR94	F	2	3	Acteocina canaliculata	1
07APR94	F	2	3	Macoma mitchelli	1
07APR94	F	2	3	Mediomastus ambiseta	7
07APR94	F	2	10	Gyptis vittata	2
07APR94	F	2	10	Paraprionospio pinnata	1
07APR94	F	2	10	Haploscoloplos foliosus	1
07APR94	F	2	10	Caecum pulchellum	1
07APR94	F	2	10	Macoma mitchelli	2
07APR94	F	2	10	Parandalia ocularis	1
07APR94	F	3	3	Streblospio benedicti	1
07APR94	F	3	3	Paraprionospio pinnata	1
07APR94	F	3	3	Mulinia lateralis	3
07APR94	F	3	3	Corophium louisianum	5
07APR94	F	3	3	Mediomastus ambiseta	3
07APR94	F	3	10	Paraprionospio pinnata	1
07APR94	F	3	10	Haploscoloplos foliosus	1
07APR94	F	3	10	Cossura delta	1
07APR94	F	3	10	Glycinde nordmanni	1

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07OCT92	A	1	3	Streblospio benedicti	1
07OCT92	A	1	3	Mulinia lateralis	8
07OCT92	A	1	3	Chironomid larvae	1
07OCT92	A	1	3	Hobsonia florida	1
07OCT92	A	1	3	Littoridina sphinctostoma	74
07OCT92	A	1	10	Littoridina sphinctostoma	1
07OCT92	A	2	3	Mulinia lateralis	3
07OCT92	A	2	3	Chironomid larvae	2
07OCT92	A	2	3	Hobsonia florida	2
07OCT92	A	2	3	Littoridina sphinctostoma	12
07OCT92	A	2	10	Oligochaetes (unidentified)	1
07OCT92	A	2	10	Chironomid larvae	1
07OCT92	A	2	10	Hobsonia florida	2
07OCT92	A	3	3	Streblospio benedicti	1
07OCT92	A	3	3	Mulinia lateralis	9
07OCT92	A	3	3	Hobsonia florida	3
07OCT92	A	3	3	Rangia cuneata	1
07OCT92	A	3	3	Littoridina sphinctostoma	106
07OCT92	A	3	10	No species observed	0
07OCT92	B	1	3	Streblospio benedicti	74
07OCT92	B	1	3	Mulinia lateralis	1

07OCT92	B	1	3	Mediomastus ambiseta	9
07OCT92	B	1	10	Streblospio benedicti	4
07OCT92	B	1	10	Mediomastus ambiseta	19
07OCT92	B	2	3	Streblospio benedicti	65
07OCT92	B	2	3	Mediomastus ambiseta	9
07OCT92	B	2	10	Rhynchocoel (unidentified)	1
07OCT92	B	2	10	Streblospio benedicti	4
07OCT92	B	2	10	Chironomid larvae	1
07OCT92	B	2	10	Hobsonia florida	1
07OCT92	B	2	10	Mediomastus ambiseta	19
07OCT92	B	3	3	Streblospio benedicti	86
07OCT92	B	3	3	Mulinia lateralis	3
07OCT92	B	3	3	Paraonidae Grp. B	1
07OCT92	B	3	3	Hobsonia florida	1
07OCT92	B	3	3	Mediomastus ambiseta	22
07OCT92	B	3	10	Rhynchocoel (unidentified)	1
07OCT92	B	3	10	Streblospio benedicti	1
07OCT92	B	3	10	Capitella capitata	2
07OCT92	B	3	10	Mediomastus ambiseta	19
07OCT92	C	1	3	Streblospio benedicti	11
07OCT92	C	1	3	Mediomastus ambiseta	16
07OCT92	C	1	10	Rhynchocoel (unidentified)	2
07OCT92	C	1	10	Callianassa sp.	1
07OCT92	C	1	10	Parandalia ocularis	1
07OCT92	C	1	10	Mediomastus ambiseta	3
07OCT92	C	2	3	Streblospio benedicti	4
07OCT92	C	2	3	Mediomastus ambiseta	14
07OCT92	C	2	10	Rhynchocoel (unidentified)	5
07OCT92	C	2	10	Callianassa sp.	1
07OCT92	C	2	10	Parandalia ocularis	2
07OCT92	C	2	10	Mediomastus ambiseta	14
07OCT92	C	3	3	Rhynchocoel (unidentified)	2
07OCT92	C	3	3	Streblospio benedicti	13
07OCT92	C	3	3	Mulinia lateralis	1
07OCT92	C	3	3	Mediomastus ambiseta	16
07OCT92	C	3	10	Rhynchocoel (unidentified)	2
07OCT92	C	3	10	Streblospio benedicti	1
07OCT92	C	3	10	Mediomastus ambiseta	6
07OCT92	D	1	3	Glycinde solitaria	1
07OCT92	D	1	3	Streblospio benedicti	1
07OCT92	D	1	3	Mulinia lateralis	1
07OCT92	D	1	3	Ogyrides limicola	1
07OCT92	D	1	3	Mediomastus ambiseta	5
07OCT92	D	1	10	Parandalia ocularis	2

07OCT92	D	1	10	Mediomastus ambiseta	1
07OCT92	D	2	3	Rhynchocoel (unidentified)	2
07OCT92	D	2	3	Streblospio benedicti	1
07OCT92	D	2	3	Paraprionospio pinnata	1
07OCT92	D	2	3	Monoculodes sp.	1
07OCT92	D	2	3	Littoridina sphinctostoma	1
07OCT92	D	2	3	Mediomastus ambiseta	10
07OCT92	D	2	10	Thompsonula sp.	1
07OCT92	D	2	10	Mediomastus ambiseta	3
07OCT92	D	3	3	Rhynchocoel (unidentified)	1
07OCT92	D	3	3	Streblospio benedicti	1
07OCT92	D	3	3	Littoridina sphinctostoma	1
07OCT92	D	3	3	Mediomastus ambiseta	7
07OCT92	D	3	10	Mediomastus ambiseta	3
12JAN93	A	1	3	Rhynchocoel (unidentified)	2
12JAN93	A	1	3	Streblospio benedicti	2
12JAN93	A	1	3	Mulinia lateralis	13
12JAN93	A	1	3	Littoridina sphinctostoma	125
12JAN93	A	1	3	Mediomastus ambiseta	4
12JAN93	A	1	10	Chironomid larvae	1
12JAN93	A	1	10	Mediomastus ambiseta	1
12JAN93	A	2	3	Rhynchocoel (unidentified)	1
12JAN93	A	2	3	Streblospio benedicti	3
12JAN93	A	2	3	Mulinia lateralis	9
12JAN93	A	2	3	Littoridina sphinctostoma	147
12JAN93	A	2	3	Mediomastus ambiseta	7
12JAN93	A	2	10	Rhynchocoel (unidentified)	1
12JAN93	A	2	10	Pieces	1
12JAN93	A	3	3	Rhynchocoel (unidentified)	1
12JAN93	A	3	3	Eteone heteropoda	1
12JAN93	A	3	3	Streblospio benedicti	3
12JAN93	A	3	3	Mulinia lateralis	17
12JAN93	A	3	3	Monoculodes sp.	1
12JAN93	A	3	3	Littoridina sphinctostoma	117
12JAN93	A	3	3	Mediomastus ambiseta	7
12JAN93	A	3	10	Capitella capitata	1
12JAN93	B	1	3	Rhynchocoel (unidentified)	1
12JAN93	B	1	3	Diopatra cuprea	1
12JAN93	B	1	3	Streblospio benedicti	4
12JAN93	B	1	3	Capitella capitata	1
12JAN93	B	1	3	Mulinia lateralis	53
12JAN93	B	1	3	Brachidontes exustus	1
12JAN93	B	1	3	Macoma mitchelli	1
12JAN93	B	1	3	Mediomastus ambiseta	27

12JAN93	B	1	10	Capitella capitata	2
12JAN93	B	1	10	Mediomastus ambiseta	3
12JAN93	B	2	3	Streblospio benedicti	7
12JAN93	B	2	3	Capitella capitata	2
12JAN93	B	2	3	Mulinia lateralis	85
12JAN93	B	2	3	Macoma mitchelli	2
12JAN93	B	2	3	Mediomastus ambiseta	32
12JAN93	B	2	10	Mulinia lateralis	1
12JAN93	B	2	10	Mediomastus ambiseta	1
12JAN93	B	3	3	Rhynchocoel (unidentified)	1
12JAN93	B	3	3	Streblospio benedicti	3
12JAN93	B	3	3	Mulinia lateralis	63
12JAN93	B	3	3	Mediomastus ambiseta	15
12JAN93	B	3	10	Rhynchocoel (unidentified)	1
12JAN93	B	3	10	Glycinde solitaria	1
12JAN93	B	3	10	Capitella capitata	2
12JAN93	B	3	10	Mediomastus ambiseta	7
12JAN93	C	1	3	Glycinde solitaria	1
12JAN93	C	1	3	Lysidice ninetta	35
12JAN93	C	1	3	Streblospio benedicti	7
12JAN93	C	1	3	Mulinia lateralis	5
12JAN93	C	1	3	Monoculodes sp.	2
12JAN93	C	1	3	Parandalia ocularis	1
12JAN93	C	1	10	Rhynchocoel (unidentified)	2
12JAN93	C	1	10	Lysidice ninetta	5
12JAN93	C	1	10	Parandalia ocularis	1
12JAN93	C	2	3	Glycinde solitaria	1
12JAN93	C	2	3	Lysidice ninetta	22
12JAN93	C	2	3	Streblospio benedicti	2
12JAN93	C	2	3	Mulinia lateralis	1
12JAN93	C	2	3	Monoculodes sp.	4
12JAN93	C	2	10	Lysidice ninetta	3
12JAN93	C	2	10	Parandalia ocularis	2
12JAN93	C	3	3	Rhynchocoel (unidentified)	1
12JAN93	C	3	3	Lysidice ninetta	27
12JAN93	C	3	3	Streblospio benedicti	2
12JAN93	C	3	3	Mulinia lateralis	2
12JAN93	C	3	3	Monoculodes sp.	3
12JAN93	C	3	3	Pyramidella crenulata	1
12JAN93	C	3	3	Macoma mitchelli	2
12JAN93	C	3	10	Lysidice ninetta	1
12JAN93	D	1	3	Streblospio benedicti	7
12JAN93	D	1	3	Paraprionospio pinnata	1
12JAN93	D	1	3	Mulinia lateralis	14

12JAN93	D	1	3	Macoma mitchelli	1
12JAN93	D	1	3	Mediomastus ambiseta	29
12JAN93	D	1	10	Mediomastus ambiseta	1
12JAN93	D	2	3	Glycinde solitaria	5
12JAN93	D	2	3	Streblospio benedicti	3
12JAN93	D	2	3	Mulinia lateralis	41
12JAN93	D	2	3	Acteocina canaliculata	1
12JAN93	D	2	3	Molgula manhattensis	1
12JAN93	D	2	3	Mediomastus ambiseta	23
12JAN93	D	2	10	Rhynchocoel (unidentified)	1
12JAN93	D	2	10	Mulinia lateralis	2
12JAN93	D	2	10	Mediomastus ambiseta	2
12JAN93	D	3	3	Rhynchocoel (unidentified)	3
12JAN93	D	3	3	Diopatra cuprea	1
12JAN93	D	3	3	Mulinia lateralis	67
12JAN93	D	3	3	Macoma mitchelli	1
12JAN93	D	3	3	Hobsonia florida	1
12JAN93	D	3	3	Mediomastus ambiseta	15
12JAN93	D	3	10	Minuspio cirrifera	1
12JAN93	D	3	10	Mediomastus ambiseta	2
05APR93	A	1	3	Capitella capitata	1
05APR93	A	1	3	Mulinia lateralis	112
05APR93	A	1	3	Chironomid larvae	1
05APR93	A	1	3	Hobsonia florida	1
05APR93	A	1	3	Littoridina sphinctostoma	50
05APR93	A	1	3	Mediomastus ambiseta	9
05APR93	A	1	10	Oligochaetes (unidentified)	1
05APR93	A	1	10	Mulinia lateralis	2
05APR93	A	1	10	Littoridina sphinctostoma	1
05APR93	A	1	10	Mediomastus ambiseta	1
05APR93	A	2	3	Rhynchocoel (unidentified)	1
05APR93	A	2	3	Streblospio benedicti	7
05APR93	A	2	3	Capitella capitata	1
05APR93	A	2	3	Mulinia lateralis	101
05APR93	A	2	3	Hobsonia florida	1
05APR93	A	2	3	Littoridina sphinctostoma	79
05APR93	A	2	3	Mediomastus ambiseta	11
05APR93	A	2	10	Oligochaetes (unidentified)	1
05APR93	A	2	10	Littoridina sphinctostoma	1
05APR93	A	2	10	Mediomastus ambiseta	2
05APR93	A	3	3	Mulinia lateralis	70
05APR93	A	3	3	Hobsonia florida	1
05APR93	A	3	3	Littoridina sphinctostoma	50
05APR93	A	3	3	Mediomastus ambiseta	7

05APR93	A	3	10	Rhynchocoel (unidentified)	1
05APR93	A	3	10	Capitella capitata	1
05APR93	A	3	10	Mulinia lateralis	4
05APR93	A	3	10	Littoridina sphinctostoma	1
05APR93	A	3	10	Mediomastus ambiseta	2
05APR93	B	1	3	Streblospio benedicti	47
05APR93	B	1	3	Capitella capitata	4
05APR93	B	1	3	Mulinia lateralis	106
05APR93	B	1	3	Littoridina sphinctostoma	4
05APR93	B	1	3	Mediomastus ambiseta	68
05APR93	B	1	10	Capitella capitata	1
05APR93	B	1	10	Macoma mitchelli	1
05APR93	B	1	10	Mediomastus ambiseta	13
05APR93	B	2	3	Streblospio benedicti	52
05APR93	B	2	3	Capitella capitata	1
05APR93	B	2	3	Mulinia lateralis	41
05APR93	B	2	3	Mediomastus ambiseta	88
05APR93	B	2	10	Streblospio benedicti	2
05APR93	B	2	10	Capitella capitata	1
05APR93	B	2	10	Mulinia lateralis	3
05APR93	B	2	10	Mediomastus ambiseta	13
05APR93	B	3	3	Eteone heteropoda	4
05APR93	B	3	3	Neanthes succinea	1
05APR93	B	3	3	Streblospio benedicti	36
05APR93	B	3	3	Capitella capitata	1
05APR93	B	3	3	Mulinia lateralis	100
05APR93	B	3	3	Mediomastus ambiseta	49
05APR93	B	3	10	Rhynchocoel (unidentified)	1
05APR93	B	3	10	Gyptis vittata	2
05APR93	B	3	10	Capitella capitata	1
05APR93	B	3	10	Mulinia lateralis	2
05APR93	B	3	10	Littoridina sphinctostoma	1
05APR93	B	3	10	Mediomastus ambiseta	11
05APR93	C	1	3	Glycinde solitaria	1
05APR93	C	1	3	Streblospio benedicti	15
05APR93	C	1	3	Capitella capitata	4
05APR93	C	1	3	Mulinia lateralis	67
05APR93	C	1	3	Littoridina sphinctostoma	28
05APR93	C	1	3	Mediomastus ambiseta	48
05APR93	C	1	10	Capitella capitata	1
05APR93	C	1	10	Mediomastus ambiseta	3
05APR93	C	2	3	Eteone heteropoda	1
05APR93	C	2	3	Streblospio benedicti	32
05APR93	C	2	3	Capitella capitata	4

05APR93	C	2	3	Pectinaria gouldii	2
05APR93	C	2	3	Mulinia lateralis	100
05APR93	C	2	3	Littoridina sphinctostoma	60
05APR93	C	2	3	Mediomastus ambiseta	59
05APR93	C	2	10	Mediomastus ambiseta	1
05APR93	C	3	3	Rhynchocoel (unidentified)	1
05APR93	C	3	3	Streblospio benedicti	10
05APR93	C	3	3	Capitella capitata	2
05APR93	C	3	3	Pectinaria gouldii	2
05APR93	C	3	3	Mulinia lateralis	35
05APR93	C	3	3	Littoridina sphinctostoma	8
05APR93	C	3	3	Mediomastus ambiseta	49
05APR93	C	3	10	Rhynchocoel (unidentified)	2
05APR93	C	3	10	Parandalia ocularis	1
05APR93	C	3	10	Mediomastus ambiseta	14
05APR93	D	1	3	Glycinde solitaria	3
05APR93	D	1	3	Streblospio benedicti	3
05APR93	D	1	3	Mulinia lateralis	32
05APR93	D	1	3	Littoridina sphinctostoma	7
05APR93	D	1	3	Parandalia ocularis	1
05APR93	D	1	3	Mediomastus ambiseta	29
05APR93	D	1	10	Rhynchocoel (unidentified)	1
05APR93	D	1	10	Glycinde solitaria	1
05APR93	D	1	10	Mulinia lateralis	1
05APR93	D	1	10	Mediomastus ambiseta	10
05APR93	D	2	3	Rhynchocoel (unidentified)	1
05APR93	D	2	3	Streblospio benedicti	4
05APR93	D	2	3	Mulinia lateralis	23
05APR93	D	2	3	Macoma mitchelli	1
05APR93	D	2	3	Littoridina sphinctostoma	7
05APR93	D	2	3	Oxyurostylis sp.	1
05APR93	D	2	3	Mediomastus ambiseta	32
05APR93	D	2	10	Spiochaetopterus costarum	1
05APR93	D	2	10	Littoridina sphinctostoma	3
05APR93	D	2	10	Thompsonula sp.	1
05APR93	D	3	3	Streblospio benedicti	8
05APR93	D	3	3	Mulinia lateralis	17
05APR93	D	3	3	Littoridina sphinctostoma	8
05APR93	D	3	3	Oxyurostylis sp.	3
05APR93	D	3	3	Mediomastus ambiseta	50
05APR93	D	3	10	Glycinde solitaria	1
05APR93	D	3	10	Polydora caulleryi	1
05APR93	D	3	10	Mediomastus ambiseta	4
09JUL93	A	1	3	Mulinia lateralis	39

09JUL93	A	1	3	Chironomid larvae	3
09JUL93	A	1	3	Rangia cuneata	7
09JUL93	A	1	3	Littoridina sphinctostoma	3
09JUL93	A	1	3	Mediomastus ambiseta	7
09JUL93	A	1	10	Mediomastus ambiseta	3
09JUL93	A	2	3	Oligochaetes (unidentified)	1
09JUL93	A	2	3	Mulinia lateralis	48
09JUL93	A	2	3	Rangia cuneata	20
09JUL93	A	2	3	Littoridina sphinctostoma	32
09JUL93	A	2	3	Mediomastus ambiseta	3
09JUL93	A	2	10	Mulinia lateralis	1
09JUL93	A	3	3	Mulinia lateralis	74
09JUL93	A	3	3	Rangia cuneata	10
09JUL93	A	3	3	Littoridina sphinctostoma	7
09JUL93	A	3	3	Mediomastus ambiseta	8
09JUL93	A	3	10	Oligochaetes (unidentified)	1
09JUL93	B	1	3	Mulinia lateralis	70
09JUL93	B	1	3	Mediomastus ambiseta	2
09JUL93	B	1	10	Capitella capitata	3
09JUL93	B	1	10	Mulinia lateralis	3
09JUL93	B	1	10	Littoridina sphinctostoma	2
09JUL93	B	1	10	Mediomastus ambiseta	6
09JUL93	B	2	3	Mulinia lateralis	38
09JUL93	B	2	3	Littoridina sphinctostoma	1
09JUL93	B	2	3	Mediomastus ambiseta	5
09JUL93	B	2	10	Neanthes succinea	1
09JUL93	B	2	10	Capitella capitata	2
09JUL93	B	2	10	Mulinia lateralis	5
09JUL93	B	2	10	Littoridina sphinctostoma	2
09JUL93	B	2	10	Mediomastus ambiseta	19
09JUL93	B	3	3	Neanthes succinea	1
09JUL93	B	3	3	Mulinia lateralis	54
09JUL93	B	3	3	Littoridina sphinctostoma	1
09JUL93	B	3	3	Mediomastus ambiseta	7
09JUL93	B	3	10	Mulinia lateralis	1
09JUL93	B	3	10	Mediomastus ambiseta	21
09JUL93	C	1	3	Littoridina sphinctostoma	2
09JUL93	C	1	3	Mediomastus ambiseta	4
09JUL93	C	1	10	Mediomastus ambiseta	17
09JUL93	C	2	3	Streblospio benedicti	5
09JUL93	C	2	3	Mulinia lateralis	9
09JUL93	C	2	3	Monoculodes sp.	1
09JUL93	C	2	3	Littoridina sphinctostoma	4
09JUL93	C	2	3	Mediomastus ambiseta	6

09JUL93	C	2	10	Streblospio benedicti	1
09JUL93	C	2	10	Capitella capitata	1
09JUL93	C	2	10	Mulinia lateralis	2
09JUL93	C	2	10	Littoridina sphinctostoma	1
09JUL93	C	2	10	Mediomastus ambiseta	31
09JUL93	C	3	3	Streblospio benedicti	3
09JUL93	C	3	3	Capitella capitata	1
09JUL93	C	3	3	Mulinia lateralis	8
09JUL93	C	3	3	Littoridina sphinctostoma	18
09JUL93	C	3	3	Mediomastus ambiseta	12
09JUL93	C	3	10	Rhynchocoel (unidentified)	1
09JUL93	C	3	10	Capitella capitata	1
09JUL93	C	3	10	Mediomastus ambiseta	15
09JUL93	D	1	3	Mulinia lateralis	2
09JUL93	D	1	3	Littoridina sphinctostoma	1
09JUL93	D	1	3	Mediomastus ambiseta	5
09JUL93	D	1	10	Parandalia ocularis	3
09JUL93	D	1	10	Mediomastus ambiseta	7
09JUL93	D	2	3	Mediomastus ambiseta	8
09JUL93	D	2	10	No species observed	0
09JUL93	D	3	3	Streblospio benedicti	1
09JUL93	D	3	3	Mediomastus ambiseta	16
09JUL93	D	3	10	Mediomastus ambiseta	3
11OCT93	A	1	3	Polydora websteri	4
11OCT93	A	1	3	Streblospio benedicti	3
11OCT93	A	1	3	Mulinia lateralis	16
11OCT93	A	1	3	Hobsonia florida	2
11OCT93	A	1	3	Rangia cuneata	5
11OCT93	A	1	3	Littoridina sphinctostoma	4
11OCT93	A	1	3	Mediomastus ambiseta	6
11OCT93	A	1	10	No species observed	0
11OCT93	A	2	3	Anthozoa (unidentified)	1
11OCT93	A	2	3	Polydora websteri	7
11OCT93	A	2	3	Streblospio benedicti	1
11OCT93	A	2	3	Mulinia lateralis	14
11OCT93	A	2	3	Hobsonia florida	1
11OCT93	A	2	3	Rangia cuneata	2
11OCT93	A	2	3	Littoridina sphinctostoma	5
11OCT93	A	2	3	Mediomastus ambiseta	1
11OCT93	A	2	10	Mediomastus ambiseta	2
11OCT93	A	3	3	Anthozoa (unidentified)	1
11OCT93	A	3	3	Oligochaetes (unidentified)	1
11OCT93	A	3	3	Mulinia lateralis	8
11OCT93	A	3	3	Hobsonia florida	4

11OCT93	A	3	3	Rangia cuneata	1
11OCT93	A	3	3	Littoridina sphinctostoma	11
11OCT93	A	3	3	Mediomastus ambiseta	4
11OCT93	A	3	10	Mediomastus ambiseta	1
11OCT93	B	1	3	Streblospio benedicti	1
11OCT93	B	1	3	Mulinia lateralis	2
11OCT93	B	1	3	Mediomastus ambiseta	2
11OCT93	B	1	10	Mediomastus ambiseta	8
11OCT93	B	2	3	Streblospio benedicti	5
11OCT93	B	2	3	Mulinia lateralis	7
11OCT93	B	2	3	Mediomastus ambiseta	2
11OCT93	B	2	10	Mediomastus ambiseta	6
11OCT93	B	3	3	Anthozoa (unidentified)	1
11OCT93	B	3	3	Rhynchocoel (unidentified)	1
11OCT93	B	3	3	Polydora websteri	1
11OCT93	B	3	3	Streblospio benedicti	6
11OCT93	B	3	3	Capitella capitata	2
11OCT93	B	3	3	Mulinia lateralis	16
11OCT93	B	3	3	Littoridina sphinctostoma	1
11OCT93	B	3	3	Mediomastus ambiseta	2
11OCT93	B	3	10	Mediomastus ambiseta	16
11OCT93	C	1	3	Rhynchocoel (unidentified)	1
11OCT93	C	1	3	Polydora websteri	1
11OCT93	C	1	3	Streblospio benedicti	5
11OCT93	C	1	3	Capitella capitata	1
11OCT93	C	1	3	Mulinia lateralis	56
11OCT93	C	1	3	Balanus eburneus	15
11OCT93	C	1	3	Littoridina sphinctostoma	7
11OCT93	C	1	3	Mediomastus ambiseta	8
11OCT93	C	1	10	Streblospio benedicti	1
11OCT93	C	1	10	Mediomastus ambiseta	5
11OCT93	C	2	3	Streblospio benedicti	4
11OCT93	C	2	3	Mulinia lateralis	3
11OCT93	C	2	3	Turbellaria (unidentified)	1
11OCT93	C	2	3	Littoridina sphinctostoma	11
11OCT93	C	2	3	Mediomastus ambiseta	7
11OCT93	C	2	10	Mediomastus ambiseta	22
11OCT93	C	3	3	Streblospio benedicti	3
11OCT93	C	3	3	Mulinia lateralis	3
11OCT93	C	3	3	Littoridina sphinctostoma	3
11OCT93	C	3	3	Mediomastus ambiseta	3
11OCT93	C	3	10	Streblospio benedicti	1
11OCT93	C	3	10	Mediomastus ambiseta	2
11OCT93	D	1	3	Rhynchocoel (unidentified)	2

11OCT93	D	1	3	Streblospio benedicti	1
11OCT93	D	1	3	Monoculodes sp.	1
11OCT93	D	1	3	Mediomastus ambiseta	7
11OCT93	D	1	10	Parandalia ocularis	2
11OCT93	D	1	10	Mediomastus ambiseta	4
11OCT93	D	2	3	Rhynchocoel (unidentified)	1
11OCT93	D	2	3	Streblospio benedicti	3
11OCT93	D	2	3	Littoridina sphinctostoma	4
11OCT93	D	2	3	Mediomastus ambiseta	5
11OCT93	D	2	10	Littoridina sphinctostoma	1
11OCT93	D	2	10	Mediomastus ambiseta	2
11OCT93	D	3	3	Rhynchocoel (unidentified)	1
11OCT93	D	3	3	Streblospio benedicti	2
11OCT93	D	3	3	Turbellaria (unidentified)	1
11OCT93	D	3	3	Mediomastus ambiseta	5
11OCT93	D	3	10	Littoridina sphinctostoma	1
11OCT93	D	3	10	Mediomastus ambiseta	1
05JAN94	A	1	3	Streblospio benedicti	5
05JAN94	A	1	3	Mulinia lateralis	2
05JAN94	A	1	3	Littoridina sphinctostoma	17
05JAN94	A	1	3	Thompsonula sp.	4
05JAN94	A	1	3	Mediomastus ambiseta	3
05JAN94	A	1	10	Mediomastus ambiseta	1
05JAN94	A	2	3	Eteone heteropoda	1
05JAN94	A	2	3	Streblospio benedicti	7
05JAN94	A	2	3	Mulinia lateralis	4
05JAN94	A	2	3	Littoridina sphinctostoma	8
05JAN94	A	2	3	Mediomastus ambiseta	6
05JAN94	A	2	10	Neanthes succinea	1
05JAN94	A	2	10	Hobsonia florida	1
05JAN94	A	2	10	Mediomastus ambiseta	3
05JAN94	A	3	3	Streblospio benedicti	6
05JAN94	A	3	3	Mulinia lateralis	2
05JAN94	A	3	3	Chironomid larvae	1
05JAN94	A	3	3	Rangia cuneata	2
05JAN94	A	3	3	Littoridina sphinctostoma	7
05JAN94	A	3	3	Thompsonula sp.	1
05JAN94	A	3	10	Capitella capitata	2
05JAN94	A	3	10	Chironomid larvae	1
05JAN94	B	1	3	Streblospio benedicti	2
05JAN94	B	1	3	Capitella capitata	1
05JAN94	B	1	3	Mediomastus ambiseta	11
05JAN94	B	1	3	Glycinde nordmanni	1
05JAN94	B	1	10	Neanthes succinea	1

05JAN94	B	1	10	Parandalia ocularis	1
05JAN94	B	1	10	Mediomastus ambiseta	1
05JAN94	B	1	10	Glycinde nordmanni	1
05JAN94	B	2	3	Streblospio benedicti	8
05JAN94	B	2	3	Mulinia lateralis	2
05JAN94	B	2	3	Littoridina sphinctostoma	1
05JAN94	B	2	3	Thompsonula sp.	1
05JAN94	B	2	3	Mediomastus ambiseta	7
05JAN94	B	2	3	Glycinde nordmanni	1
05JAN94	B	2	10	Capitella capitata	1
05JAN94	B	2	10	Glycinde nordmanni	1
05JAN94	B	3	3	Streblospio benedicti	3
05JAN94	B	3	3	Capitella capitata	1
05JAN94	B	3	3	Chironomid larvae	1
05JAN94	B	3	3	Mediomastus ambiseta	15
05JAN94	B	3	10	Capitella capitata	1
05JAN94	B	3	10	Parandalia ocularis	1
05JAN94	B	3	10	Mediomastus ambiseta	4
05JAN94	C	1	3	Rhynchocoel (unidentified)	3
05JAN94	C	1	3	Streblospio benedicti	2
05JAN94	C	1	3	Mulinia lateralis	1
05JAN94	C	1	3	Macoma mitchelli	1
05JAN94	C	1	3	Littoridina sphinctostoma	5
05JAN94	C	1	3	Mediomastus ambiseta	17
05JAN94	C	1	10	Mediomastus ambiseta	3
05JAN94	C	2	3	Rhynchocoel (unidentified)	2
05JAN94	C	2	3	Diopatra cuprea	1
05JAN94	C	2	3	Streblospio benedicti	5
05JAN94	C	2	3	Mulinia lateralis	3
05JAN94	C	2	3	Cyclaspis varians	2
05JAN94	C	2	3	Littoridina sphinctostoma	10
05JAN94	C	2	3	Thompsonula sp.	1
05JAN94	C	2	3	Mediomastus ambiseta	28
05JAN94	C	2	10	Littoridina sphinctostoma	1
05JAN94	C	2	10	Mediomastus ambiseta	1
05JAN94	C	3	3	Streblospio benedicti	11
05JAN94	C	3	3	Pectinaria gouldii	1
05JAN94	C	3	3	Mulinia lateralis	4
05JAN94	C	3	3	Littoridina sphinctostoma	9
05JAN94	C	3	3	Mediomastus ambiseta	31
05JAN94	C	3	10	Mediomastus ambiseta	1
05JAN94	D	1	3	Rhynchocoel (unidentified)	1
05JAN94	D	1	3	Streblospio benedicti	7
05JAN94	D	1	3	Paraprionospio pinnata	1

05JAN94	D	1	3	Spiochaetopterus costarum	2
05JAN94	D	1	3	Littoridina sphinctostoma	6
05JAN94	D	1	3	Mediomastus ambiseta	16
05JAN94	D	1	3	Glycinde nordmanni	1
05JAN94	D	1	10	Mediomastus ambiseta	2
05JAN94	D	2	3	Anthozoa (unidentified)	1
05JAN94	D	2	3	Rhynchocoel (unidentified)	2
05JAN94	D	2	3	Streblospio benedicti	5
05JAN94	D	2	3	Scolelepis texana	1
05JAN94	D	2	3	Spiochaetopterus costarum	1
05JAN94	D	2	3	Ensis minor	1
05JAN94	D	2	3	Ampelisca abdita	1
05JAN94	D	2	3	Parandalia ocularis	1
05JAN94	D	2	3	Mediomastus ambiseta	18
05JAN94	D	2	10	Spiochaetopterus costarum	1
05JAN94	D	2	10	Mediomastus ambiseta	3
05JAN94	D	3	3	Diopatra cuprea	1
05JAN94	D	3	3	Streblospio benedicti	3
05JAN94	D	3	3	Scolelepis texana	1
05JAN94	D	3	3	Molgula manhattensis	1
05JAN94	D	3	3	Mediomastus ambiseta	21
05JAN94	D	3	10	Spiochaetopterus costarum	3
05JAN94	D	3	10	Mediomastus ambiseta	1
07APR94	A	1	3	Streblospio benedicti	94
07APR94	A	1	3	Odostomia sp.	3
07APR94	A	1	3	Mulinia lateralis	5
07APR94	A	1	3	Monoculodes sp.	3
07APR94	A	1	3	Littoridina sphinctostoma	14
07APR94	A	1	3	Mediomastus ambiseta	2
07APR94	A	1	10	Streblospio benedicti	3
07APR94	A	1	10	Mediomastus ambiseta	3
07APR94	A	2	3	Streblospio benedicti	56
07APR94	A	2	3	Capitella capitata	1
07APR94	A	2	3	Mulinia lateralis	3
07APR94	A	2	3	Monoculodes sp.	3
07APR94	A	2	3	Littoridina sphinctostoma	22
07APR94	A	2	3	Mediomastus ambiseta	2
07APR94	A	2	10	Streblospio benedicti	1
07APR94	A	2	10	Mediomastus ambiseta	1
07APR94	A	3	3	Oligochaetes (unidentified)	2
07APR94	A	3	3	Streblospio benedicti	42
07APR94	A	3	3	Chironomid larvae	1
07APR94	A	3	3	Rangia cuneata	1
07APR94	A	3	3	Littoridina sphinctostoma	21

07APR94	A	3	10	Mediomastus ambiseta	2
07APR94	B	1	3	Streblospio benedicti	86
07APR94	B	1	3	Capitella capitata	3
07APR94	B	1	3	Mulinia lateralis	1
07APR94	B	1	3	Macoma mitchelli	1
07APR94	B	1	3	Littoridina sphinctostoma	8
07APR94	B	1	3	Mediomastus ambiseta	10
07APR94	B	1	10	Streblospio benedicti	1
07APR94	B	1	10	Capitella capitata	3
07APR94	B	1	10	Mediomastus ambiseta	5
07APR94	B	2	3	Streblospio benedicti	122
07APR94	B	2	3	Capitella capitata	2
07APR94	B	2	3	Littoridina sphinctostoma	4
07APR94	B	2	3	Mediomastus ambiseta	14
07APR94	B	2	10	Capitella capitata	1
07APR94	B	2	10	Mediomastus ambiseta	14
07APR94	B	3	3	Rhynchocoel (unidentified)	1
07APR94	B	3	3	Eteone heteropoda	1
07APR94	B	3	3	Streblospio benedicti	96
07APR94	B	3	3	Capitella capitata	2
07APR94	B	3	3	Cyclaspis varians	1
07APR94	B	3	3	Nudibranchia (unidentified)	1
07APR94	B	3	3	Littoridina sphinctostoma	4
07APR94	B	3	3	Mediomastus ambiseta	7
07APR94	B	3	10	Streblospio benedicti	1
07APR94	B	3	10	Capitella capitata	1
07APR94	B	3	10	Mediomastus ambiseta	1
07APR94	C	1	3	Streblospio benedicti	18
07APR94	C	1	3	Mulinia lateralis	4
07APR94	C	1	3	Cyclaspis varians	3
07APR94	C	1	3	Littoridina sphinctostoma	10
07APR94	C	1	3	Mediomastus ambiseta	33
07APR94	C	1	10	Streblospio benedicti	1
07APR94	C	1	10	Capitella capitata	1
07APR94	C	1	10	Mediomastus ambiseta	6
07APR94	C	1	10	Glycinde nordmanni	1
07APR94	C	2	3	Streblospio benedicti	19
07APR94	C	2	3	Mulinia lateralis	3
07APR94	C	2	3	Cyclaspis varians	2
07APR94	C	2	3	Monoculodes sp.	1
07APR94	C	2	3	Pyramidella crenulata	1
07APR94	C	2	3	Littoridina sphinctostoma	7
07APR94	C	2	3	Parandalia ocularis	3
07APR94	C	2	3	Mediomastus ambiseta	27

07APR94	C	2	10	Parandalia ocularis	1
07APR94	C	2	10	Mediomastus ambiseta	15
07APR94	C	3	3	Streblospio benedicti	12
07APR94	C	3	3	Cyclaspis varians	2
07APR94	C	3	3	Littoridina sphinctostoma	13
07APR94	C	3	3	Diastylis sp.	1
07APR94	C	3	3	Mediomastus ambiseta	30
07APR94	C	3	10	Macoma mitchelli	1
07APR94	C	3	10	Mediomastus ambiseta	2
07APR94	D	1	3	Streblospio benedicti	2
07APR94	D	1	3	Mulinia lateralis	1
07APR94	D	1	3	Microprotopus spp.	1
07APR94	D	1	3	Oxyurostylis smithi	1
07APR94	D	1	3	Mediomastus ambiseta	16
07APR94	D	1	10	Spiochaetopterus costarum	1
07APR94	D	1	10	Haploscoloplos foliosus	1
07APR94	D	1	10	Mediomastus ambiseta	6
07APR94	D	2	3	Streblospio benedicti	1
07APR94	D	2	3	Spiochaetopterus costarum	2
07APR94	D	2	3	Parandalia ocularis	1
07APR94	D	2	3	Mediomastus ambiseta	16
07APR94	D	2	3	Glycinde nordmanni	2
07APR94	D	2	10	Mediomastus ambiseta	6
07APR94	D	3	3	Rhynchocoel (unidentified)	1
07APR94	D	3	3	Streblospio benedicti	3
07APR94	D	3	3	Paraprionospio pinnata	1
07APR94	D	3	3	Scolelepis texana	1
07APR94	D	3	3	Spiochaetopterus costarum	1
07APR94	D	3	3	Thompsonula sp.	1
07APR94	D	3	3	Parandalia ocularis	1
07APR94	D	3	3	Mediomastus ambiseta	43
07APR94	D	3	10	Spiochaetopterus costarum	1
07APR94	D	3	10	Parandalia ocularis	1
07APR94	D	3	10	Mediomastus ambiseta	4

NITROGEN LOSSES TO ESTUARINE SEDIMENTS

INTRODUCTION

A major goal of the Texas Water Development Board is to create nitrogen budgets for all Texas bays and estuaries. Nitrogen is the key element to controlling productivity and river inflow is a significant source of nitrogen. A simple budget would account for nitrogen entering the bay via freshwater inflow, how it is captured and transformed into biomass, and finally how it is lost to the system. One aspect of nitrogen loss is very poorly understood. How much nitrogen is buried and lost the system? Data on the nitrogen content of deep sediments can help answer this question.

METHODS

Several Estuaries have been studied. The Sabine-Neches and Trinity-San Jacinto Estuaries were sampled in 1993. The Lavaca-Colorado and Guadalupe Estuaries were sampled in 1990, and resampled in 1992. The Nueces Estuary and Baffin Bay were sampled in 1991.

The station locations for the Sabine-Neches and Trinity-San Jacinto Estuaries are given in Table 1. The standard, long-term station locations were used in the Lavaca-Colorado, Guadalupe, and Nueces Estuaries and Baffin Bay. These locations are given in chapter 1. In addition, two other stations were sampled in Baffin Bay. These stations are named for the Baffin Bay channel marker numbers at which the stations were taken.

Our approach is to take sediments cores and measure nitrogen changes with respect to sediment depth. Cores are taken to a depth of 1 m. One-cm sediment sections are taken at the depth intervals listed. The sediment is dried, ground up, and homogenized. Carbon and nitrogen content, as a percent dry weight of sediment, is measured using a CHN analyzer.

RESULTS

Nitrogen and carbon values for all measurements taken are shown in Tables 2-7. In recent sampling in the Sabine-Neches and Trinity-San Jacinto Estuaries sampling has been performed on a log-scale with respect to depth (Tables 2 and 3). Half the samples were concentrated in the upper 15 cm of sediment. In older sampling in the Lavaca-Colorado, Guadalupe, Nueces Estuaries and in Baffin Bay the samples were taken on a linear scale (Tables 4-7). All of these samples were taken at 10 cm depth intervals. The average for all samples at each depth interval is given in Table 8. In general, more N seems to be flowing into the northern estuaries, because content is higher in surface sediments of the Sabine-Neches and Trinity-San Jacinto Estuaries. One exception is Baffin Bay, where the nitrogen contents are about double any other system. This is very odd, and resampling during 1994 will be performed to confirm this trend.

The average N content at all stations sampled in the Sabine-Neches Estuary is shown in Figure 1. Stations 1-6 represent a gradient from the head of the estuary to the sea. There N profiles at each station is similar. The average N content at every depth interval at all stations is shown in Figure 2. It appears that the labile zone extends to a depth of 40 cm. The refractory zone is not really constant until a depth of 80 cm.

The average N content at all stations sampled in the Trinity-San Jacinto Estuary is shown in Figure 3. Stations 1-6 represent a gradient from the head of the estuary to the sea. There N profiles appear to be similar at all stations, except perhaps stations 3 and 4. At station 4, no trend is present. At station 3 the trend is inverse, that is it increases with depth. The average N content at every depth interval at all stations is shown in Figure 4. It appears that the labile zone extends to a depth of 15 cm. The refractory zone is constant from a depth of 20- 100 cm.

The average N content at all stations sampled in the Lavaca-Colorado Estuary is shown in Figure 5. Stations A-D represent a gradient from the head of the estuary to the sea. There N profiles appear to be similar at all stations. It appears nitrogen content decreases away from the head of the estuary. The average N content at every depth interval at all stations is shown in Figure 6. It appears that the labile zone extends to a depth of 40 cm. The refractory zone has an unusual pattern. It decreases to a depth of 60 cm, then increases to 100 cm.

The average N content at all stations sampled in the Guadalupe Estuary is shown in Figure 7. Stations A-D represent a gradient from the head of the estuary to the sea. There N profiles appear to be similar at all stations. It appears nitrogen content decreases away from the head of the estuary. The average N content at every depth interval at all stations is shown in Figure 8. It appears that the labile zone extends to a depth of 50 cm. The Labile zone has an unusual pattern. It increases to a depth of 30 cm. The Refractory zone decreases to a depth of 70 cm, and is constant to 100 cm.

The average N content at all stations sampled in the Nueces Estuary is shown in

Figure 9. Stations A-E represent a gradient from the head of the estuary to the sea. There N profiles appear to be similar at all stations. It appears nitrogen content decreases away from the head of the estuary. An exception is that the highest values occur at Station C. The average N content at every depth interval at all stations is shown in Figure 10. It appears that the labile zone extends to a depth of 50 cm. The Labile zone decreases at a low rate. The Refractory zone decreases from a depth of 50-80 cm at a low rate, and then decreases dramatically to 100 cm.

The average N content at all stations sampled in Baffin Bay is shown in Figure 11. Stations 24-6 represent a gradient from the head of the estuary to the sea. Station 24 is near the junction of the three secondary bays that empty into Baffin Bay. There N profiles appear to be similar at all stations. It appears nitrogen content decreases away from the head of the estuary. However, the values are very high, nearly double that found in other bays. The average N content at every depth interval at all stations is shown in Figure 12. It appears that the labile zone extends to a depth of 40 cm. The Refractory zone has an unusual pattern. It increases from a depth of 40 to 80 cm, then decreases to 100 cm.

DISCUSSION

If N comes into bays via the rivers and it is buried, then we would expect that there would be higher N values in the sediments at the head of estuaries. This is because the river empties into the bay, and more nitrogen could be trapped in the upper reaches of the bay. The station trends at all estuaries confirm this hypothesis (Figures 1, 3, 5, 7, 9, and 11). The only estuary where the trend is not strong is in the Sabine-Neches estuary.

If N is utilized, or transformed in the biologically active labile zone, then there should be higher values of N in upper layers of sediment and lower values at lower layers in the refractory zone. This hypothesis is confirmed by the trends seen in the estuary-wide average N content (Figures 2, 4, 6, 8, 10, and 12). The labile zone appears to be as deep as 40 cm in most estuaries. The only exception is Trinity-San Jacinto, where the level is at about 20 cm.

The finding that the refractory zone is as deep as 40 cm is surprising, but this could be due to anthropogenic influences, e.g., shrimping and dredging. It is very difficult to know how much an area being sampled is subject to these disturbances. An alternative hypothesis to a labile and refractory zone is that there is simply more N coming into bays today than at previous times. This would also explain the vertical distribution of N content in sediments.

Man can influence another key component that affects N loss. In general, it is thought that the sedimentation rate in Texas estuaries is about 1 cm/ 100 years (Behrens, 1980). However, recent water projects, particularly dams, have probably decreased this rate.

An average background level, i.e., the average content of N at about 40 cm is about 0.05% (Table 8). The average surface N content is about 0.1%, so the change is a factor of 2. This implies that half of the nitrogen arriving at the sediment surface is lost to the system via burial.

REFERENCES

Behrens, E.W. 1980. On sedimentation rates and porosity. Marine Geology Letters, 35:M11-M16.

Table 1. Locations of stations sampled in 1993.

A. Sabine-Neches Estuary.

Station	Latitude (N)	Longitude (W)
1	29.57.'13.4"	93.49.'48.4"
2	29.54'.39.9"	93.48.'46.2"
3	29.52.'29.3"	93.48.'02.0"
4	29.51.'59.6"	93.51.'31.9"
5	29.49.'59.1"	93.51.'42.0"
6	29.47.'58.9"	93.55.'03.0"

B. Trinity-San Jacinto Estuary.

Station	Latitude (N)	Longitude (W)
1	29.42.'06.7"	94.44.'37.9"
2	29.37.'45.2"	94.49.'42.4"
3	29.33.'20.8"	94.59.'44.1"
4	29.22.'59.0"	94.50.'34.4"
5	29.26.'36.1"	94.43.'10.4"

Table 2. Sabine-Neches Estuary sediment elemental composition. Depth in cm, Nitrogen and Carbon in % dry weight of sediment.

Date	Station	Depth	Nitrogen	Carbon
05OCT93	1	0	0.060	0.590
05OCT93	1	2	0.086	0.938
05OCT93	1	5	0.058	0.636
05OCT93	1	10	0.038	0.391
05OCT93	1	15	0.042	0.466
05OCT93	1	20	0.037	0.391
05OCT93	1	40	0.025	0.229
05OCT93	1	60	0.022	0.200
05OCT93	1	80	0.034	0.438
05OCT93	1	100	0.033	0.392
05OCT93	2	0	0.121	1.248
05OCT93	2	2	0.090	0.921
05OCT93	2	5	0.085	0.892
05OCT93	2	10	0.071	0.771
05OCT93	2	15	0.059	0.630
05OCT93	2	20	0.115	1.283
05OCT93	2	40	0.040	0.403
05OCT93	2	60	0.043	0.480
05OCT93	2	80	0.045	0.524
05OCT93	2	100	0.049	0.578
05OCT93	3	0	0.100	0.947
05OCT93	3	2	0.065	0.677
05OCT93	3	5	0.071	0.743
05OCT93	3	10	0.075	0.793
05OCT93	3	15	0.070	0.717
05OCT93	3	20	0.103	1.196
05OCT93	3	40	0.060	0.697
05OCT93	3	60	0.050	0.642
05OCT93	3	80	0.045	0.559

05OCT93	3	100	0.050	0.594
05OCT93	4	0	0.067	0.608
05OCT93	4	2	0.054	0.501
05OCT93	4	5	0.054	0.524
05OCT93	4	10	0.062	0.631
05OCT93	4	15	0.081	0.842
05OCT93	4	20	0.052	0.506
05OCT93	4	40	0.122	1.215
05OCT93	4	60	0.094	1.034
05OCT93	4	80	0.032	0.437
05OCT93	4	100	0.045	0.764
05OCT93	5	0	0.084	0.786
05OCT93	5	2	0.068	0.661
05OCT93	5	5	0.061	0.600
05OCT93	5	10	0.044	0.561
05OCT93	5	15	0.046	0.554
05OCT93	5	20	0.056	0.588
05OCT93	5	40	0.054	0.618
05OCT93	5	60	0.052	0.661
05OCT93	5	80	0.065	0.812
05OCT93	5	100	0.053	0.659
05OCT93	6	0	0.065	0.907
05OCT93	6	2	0.070	0.909
05OCT93	6	5	0.073	1.057
05OCT93	6	10	0.095	1.222
05OCT93	6	15	0.074	0.939
05OCT93	6	20	0.088	1.034
05OCT93	6	40	0.044	0.585
05OCT93	6	60	0.051	0.860
05OCT93	6	80	0.041	0.529
05OCT93	6	100	0.044	0.570

Table 3. Trinity-San Jacinto Estuary sediment elemental composition. Depth in cm, Nitrogen and Carbon in % dry weight of sediment.

Date	Station	Depth	Nitrogen	Carbon
05OCT93	1	0	0.112	1.020
05OCT93	1	2	0.115	1.035
05OCT93	1	5	0.099	1.014
05OCT93	1	10	0.102	1.105
05OCT93	1	15	0.102	1.177
05OCT93	1	20	0.088	1.104
05OCT93	1	40	0.090	1.234
05OCT93	1	60	0.096	1.213
05OCT93	1	80	0.088	0.859
05OCT93	1	100	0.067	0.672
05OCT93	2	0	0.157	1.328
05OCT93	2	2	0.138	1.240
05OCT93	2	5	0.133	1.255
05OCT93	2	10	0.127	1.218
05OCT93	2	15	0.120	1.230
05OCT93	2	20	0.095	0.999
05OCT93	2	40	0.095	0.986
05OCT93	2	60	0.111	1.001
05OCT93	2	80	0.117	1.163
05OCT93	2	100	0.100	1.114
05OCT93	3	0	0.144	1.241
05OCT93	3	2	0.120	1.072
05OCT93	3	5	0.112	1.032
05OCT93	3	10	0.109	1.021
05OCT93	3	15	0.090	0.887
05OCT93	3	20	0.094	0.885
05OCT93	3	40	0.139	1.234
05OCT93	3	60	0.161	1.347
05OCT93	3	80	0.153	1.233

05OCT93	3	100	0.162	1.320
05OCT93	4	0	0.045	0.478
05OCT93	4	2	0.048	0.476
05OCT93	4	5	0.056	0.599
05OCT93	4	10	0.035	0.415
05OCT93	4	15	0.038	0.470
05OCT93	4	20	0.039	0.424
05OCT93	4	40	0.051	0.551
05OCT93	4	60	0.061	0.619
05OCT93	4	80	0.028	0.403
05OCT93	4	100	0.045	0.570
05OCT93	5	0	0.168	1.314
05OCT93	5	2	0.173	1.374
05OCT93	5	5	0.092	0.861
05OCT93	5	10	0.051	0.526
05OCT93	5	15	0.085	0.818
05OCT93	5	20	0.082	0.797
05OCT93	5	40	0.050	0.489
05OCT93	5	60	0.039	0.446
05OCT93	5	80	0.030	0.349
05OCT93	5	100	0.031	0.430
05OCT93	6	0	0.171	1.638
05OCT93	6	2	0.081	1.314
05OCT93	6	5	0.083	1.359
05OCT93	6	10	0.075	0.844
05OCT93	6	15	0.076	0.803
05OCT93	6	20	0.080	0.841
05OCT93	6	40	0.058	0.629
05OCT93	6	60	0.067	0.702
05OCT93	6	80	0.063	0.695
05OCT93	6	100	0.061	0.735

Table 4. Lavaca-Colorado Estuary sediment elemental composition. Rep=replicate, Depth in cm, Nitrogen and Carbon in % dry weight of sediment.

Date	Station	Rep	Depth	Nitrogen	Carbon
23OCT90	A	1	10	0.067	0.875
23OCT90	A	1	20	0.047	0.900
23OCT90	A	1	30	0.033	1.151
23OCT90	A	1	40	0.026	1.338
23OCT90	A	2	10	0.057	0.873
23OCT90	A	2	20	0.063	1.023
23OCT90	A	2	30	0.049	0.957
23OCT90	A	2	40	0.065	1.387
23OCT90	A	2	50	0.048	1.068
23OCT90	A	2	60	0.039	0.811
23OCT90	A	2	70	0.037	0.852
23OCT90	A	2	80	0.030	0.787
23OCT90	A	2	90	0.026	0.656
23OCT90	A	2	100	0.041	1.077
23OCT90	B	1	20	0.072	1.266
23OCT90	B	1	30	0.083	1.367
23OCT90	B	1	40	0.096	1.664
23OCT90	B	1	50	0.028	1.554
23OCT90	B	1	60	0.011	1.206
23OCT90	B	1	100	0.003	1.553
23OCT90	B	2	10	0.068	1.234
23OCT90	B	2	20	0.042	1.065
23OCT90	B	2	30	0.061	1.522
23OCT90	B	2	40	0.079	1.705
23OCT90	B	2	50	0.069	1.522
23OCT90	B	2	70	0.042	1.296
23OCT90	B	2	80	0.039	0.937
23OCT90	B	2	90	0.044	1.300
23OCT90	B	2	100	0.064	1.654
23OCT90	C	1	20	0.009	1.757

23OCT90	C	1	40	0.048	1.545
23OCT90	C	1	50	0.020	1.615
23OCT90	C	1	60	0.020	1.496
23OCT90	C	1	70	0.064	1.256
23OCT90	C	1	80	0.053	1.331
23OCT90	C	1	90	0.059	1.381
23OCT90	C	1	100	0.068	1.521
23OCT90	C	2	10	0.061	2.061
23OCT90	C	2	20	0.052	2.789
23OCT90	C	2	30	0.047	1.682
23OCT90	C	2	40	0.042	1.333
23OCT90	C	2	50	0.050	1.665
23OCT90	C	2	60	0.038	1.303
23OCT90	C	2	70	0.045	1.120
23OCT90	C	2	80	0.045	1.252
23OCT90	C	2	90	0.085	1.556
23OCT90	C	2	100	0.046	1.491
23OCT90	D	1	10	0.062	1.429
23OCT90	D	1	20	0.005	0.377
23OCT90	D	1	40	0.033	0.631
23OCT90	D	1	50	0.026	0.569
23OCT90	D	1	60	0.010	0.386
23OCT90	D	1	70	0.054	1.205
23OCT90	D	1	80	0.027	0.614
23OCT90	D	1	90	0.034	0.881
23OCT90	D	1	100	0.159	0.889
23OCT90	D	2	10	0.057	1.254
23OCT90	D	2	20	0.053	1.094
23OCT90	D	2	30	0.041	0.832
23OCT90	D	2	40	0.031	0.700
23OCT90	D	2	50	0.023	0.521
23OCT90	D	2	60	0.015	0.424
23OCT90	D	2	70	0.007	0.350
23OCT90	D	2	80	0.020	0.766
23OCT90	D	2	90	0.028	0.910

23OCT90	D	2	100	0.025	0.828
06OCT92	A	1	10	0.104	1.489
06OCT92	A	1	20	0.117	1.674
06OCT92	A	1	30	0.065	1.233
06OCT92	A	1	40	0.044	1.004
06OCT92	A	1	50	0.044	1.174
06OCT92	A	1	60	0.048	1.076
06OCT92	A	1	70	0.061	1.388
06OCT92	A	1	80	0.047	1.391
06OCT92	A	1	90	0.049	1.103
06OCT92	A	1	100	0.032	0.922
06OCT92	B	1	10	0.070	1.282
06OCT92	B	1	20	0.063	1.390
06OCT92	B	1	30	0.063	1.386
06OCT92	B	1	40	0.069	1.420
06OCT92	B	1	50	0.076	1.453
06OCT92	B	1	60	0.096	1.867
06OCT92	B	1	70	0.069	1.434
06OCT92	B	1	80	0.080	1.530
06OCT92	B	1	90	0.078	1.558
06OCT92	B	1	100	0.064	1.605
06OCT92	C	1	10	0.053	1.412
06OCT92	C	1	20	0.060	1.290
06OCT92	C	1	30	0.044	1.545
06OCT92	C	1	40	0.050	1.632
06OCT92	C	1	50	0.053	1.618
06OCT92	C	1	60	0.044	1.597
06OCT92	C	1	70	0.044	2.073
06OCT92	C	1	80	0.040	1.727
06OCT92	C	1	90	0.037	1.521
06OCT92	C	1	100	0.033	1.560
06OCT92	D	1	10	0.052	1.386
06OCT92	D	1	20	0.042	1.229
06OCT92	D	1	30	0.028	0.663
06OCT92	D	1	40	0.019	0.515

06OCT92	D	1	50	0.019	0.587
06OCT92	D	1	60	0.023	0.704
06OCT92	D	1	70	0.032	0.951
06OCT92	D	1	80	0.028	0.967
06OCT92	D	1	90	0.032	1.076
06OCT92	D	1	100	0.020	0.809

Table 5. Guadalupe Estuary sediment elemental composition. Rep=replicate, Depth in cm, Nitrogen and Carbon in % dry weight of sediment.

Date	Station	Rep	Depth	Nitrogen	Carbon
19OCT90	A	1	10	0.060	3.403
19OCT90	A	1	20	0.047	3.305
19OCT90	A	1	30	0.059	3.459
19OCT90	A	1	40	0.049	3.356
19OCT90	A	1	50	0.036	4.028
19OCT90	A	1	60	0.052	4.460
19OCT90	A	1	70	0.041	4.146
19OCT90	A	1	80	0.026	3.543
19OCT90	A	1	90	0.028	3.544
19OCT90	A	1	100	0.101	3.291
19OCT90	A	2	10	0.089	3.564
19OCT90	A	2	20	0.084	3.704
19OCT90	A	2	30	0.090	3.910
19OCT90	A	2	40	0.077	3.755
19OCT90	A	2	50	0.050	3.803
19OCT90	A	2	60	0.053	3.932
19OCT90	A	2	70	0.044	4.288
19OCT90	A	2	80	0.054	3.847
19OCT90	A	2	90	0.054	3.652
19OCT90	A	2	100	0.066	2.729
19OCT90	B	1	10	0.084	3.615
19OCT90	B	1	20	0.073	3.620
19OCT90	B	1	30	0.073	3.489
19OCT90	B	1	40	0.071	3.461
19OCT90	B	1	50	0.058	3.908
19OCT90	B	1	60	0.060	3.903
19OCT90	B	1	70	0.059	3.846
19OCT90	B	1	80	0.062	2.309
19OCT90	B	1	90	0.042	2.579
19OCT90	B	1	100	0.059	3.142

19OCT90	B	2	20	0.075	3.626
19OCT90	B	2	30	0.122	3.510
19OCT90	B	2	40	0.078	3.694
19OCT90	B	2	50	0.073	4.106
19OCT90	B	2	60	0.061	3.132
19OCT90	B	2	70	0.071	3.340
19OCT90	B	2	80	0.057	3.329
19OCT90	B	2	90	0.069	3.354
19OCT90	B	2	100	0.058	3.089
19OCT90	C	1	10	0.037	2.823
19OCT90	C	1	20	0.076	2.571
19OCT90	C	1	30	0.045	2.792
19OCT90	C	1	40	0.052	2.648
19OCT90	C	1	50	0.036	2.975
19OCT90	C	1	60	0.069	3.121
19OCT90	C	1	70	0.038	2.736
19OCT90	C	1	80	0.046	2.987
19OCT90	C	1	90	0.027	3.132
19OCT90	C	1	100	0.025	4.057
19OCT90	C	2	10	0.022	2.566
19OCT90	C	2	20	0.012	2.719
19OCT90	C	2	30	0.065	3.152
19OCT90	C	2	40	0.047	3.057
19OCT90	C	2	50	0.056	2.721
19OCT90	C	2	60	0.051	3.131
19OCT90	C	2	70	0.048	2.751
19OCT90	C	2	80	0.025	3.205
19OCT90	C	2	90	0.031	3.002
19OCT90	C	2	100	0.011	3.284
19OCT90	D	1	30	0.018	0.648
19OCT90	D	1	100	0.004	3.674
19OCT90	D	2	10	0.019	0.774
19OCT90	D	2	20	0.022	0.921
19OCT90	D	2	30	0.020	0.828
19OCT90	D	2	50	0.026	0.916

19OCT90	D	2	60	0.019	0.868
19OCT90	D	2	70	0.016	0.789
19OCT90	D	2	100	0.020	0.894
07OCT92	A	1	10	0.076	3.902
07OCT92	A	1	20	0.075	3.541
07OCT92	A	1	30	0.082	3.566
07OCT92	A	1	40	0.077	3.523
07OCT92	A	1	50	0.074	4.427
07OCT92	A	1	60	0.057	3.802
07OCT92	A	1	70	0.058	3.692
07OCT92	A	1	80	0.062	2.431
07OCT92	A	1	90	0.062	3.140
07OCT92	A	1	100	0.065	3.624
07OCT92	B	1	10	0.091	4.292
07OCT92	B	1	20	0.080	3.722
07OCT92	B	1	30	0.086	3.708
07OCT92	B	1	40	0.088	3.445
07OCT92	B	1	50	0.086	3.673
07OCT92	B	1	60	0.089	3.384
07OCT92	B	1	70	0.091	3.398
07OCT92	B	1	80	0.081	3.465
07OCT92	B	1	90	0.087	3.187
07OCT92	B	1	100	0.086	3.412
07OCT92	C	1	10	0.065	2.690
07OCT92	C	1	20	0.079	2.854
07OCT92	C	1	30	0.054	2.731
07OCT92	C	1	40	0.052	2.947
07OCT92	C	1	50	0.075	2.875
07OCT92	C	1	60	0.052	3.619
07OCT92	C	1	70	0.046	3.120
07OCT92	C	1	80	0.060	2.927
07OCT92	C	1	90	0.064	3.117
07OCT92	C	1	100	0.067	2.803
07OCT92	D	1	10	0.030	0.936
07OCT92	D	1	20	0.044	1.411

07OCT92	D	1	30	0.055	1.785
07OCT92	D	1	40	0.040	1.249
07OCT92	D	1	50	0.040	1.200
07OCT92	D	1	60	0.033	1.006
07OCT92	D	1	70	0.040	1.253
07OCT92	D	1	80	0.040	1.329
07OCT92	D	1	90	0.024	1.067
07OCT92	D	1	100	0.027	1.473

Table 6. Nueces Estuary sediment elemental composition. Rep=replicate, Depth in cm, Nitrogen and Carbon in % dry weight of sediment.

Date	Station	Rep	Depth	Nitrogen	Carbon
16OCT91	A	1	10	0.055	2.112
16OCT91	A	1	20	0.050	2.036
16OCT91	A	1	30	0.050	2.243
16OCT91	A	1	40	0.055	2.354
16OCT91	A	1	50	0.053	2.324
16OCT91	A	1	60	0.054	2.339
16OCT91	A	1	70	0.063	2.071
16OCT91	A	1	80	0.060	2.288
16OCT91	A	1	90	0.064	2.167
16OCT91	A	1	100	0.057	2.131
16OCT91	B	1	10	0.034	0.738
16OCT91	B	1	20	0.029	0.930
16OCT91	B	1	30	0.033	0.870
16OCT91	B	1	40	0.031	0.991
16OCT91	B	1	50	0.027	0.846
16OCT91	B	1	60	0.032	0.918
16OCT91	B	1	70	0.034	0.913
16OCT91	B	1	80	0.038	0.967
16OCT91	B	1	90	0.033	0.947
16OCT91	B	1	100	0.029	0.784
16OCT91	C	1	10	0.088	2.378
16OCT91	C	1	20	0.087	2.436
16OCT91	C	1	30	0.099	1.889
16OCT91	C	1	40	0.111	2.258
16OCT91	C	1	50	0.100	2.956
16OCT91	C	1	60	0.089	2.048
16OCT91	C	1	70	0.089	1.889
16OCT91	C	1	80	0.089	1.827
16OCT91	E	1	10	0.056	0.943
16OCT91	E	1	20	0.052	0.804

16OCT91	E	1	30	0.043	0.698
16OCT91	E	1	40	0.033	0.588
16OCT91	E	1	50	0.027	0.679
16OCT91	E	1	60	0.025	0.489
16OCT91	E	1	70	0.024	0.603
16OCT91	E	1	80	0.024	0.694
16OCT91	E	1	90	0.023	0.641

Table 7. Baffin Bay Estuary sediment elemental composition. Rep=replicate, Depth in cm, Nitrogen and Carbon in % dry weight of sediment.

Date	Station	Rep	Depth	Nitrogen	Carbon
17OCT91	MK12	1	10	0.175	1.530
17OCT91	MK12	1	20	0.150	1.592
17OCT91	MK12	1	30	0.155	0.455
17OCT91	MK12	1	40	0.134	1.364
17OCT91	MK12	1	50	0.147	2.888
17OCT91	MK12	1	60	0.208	4.211
17OCT91	MK12	1	70	0.211	3.880
17OCT91	MK12	1	80	0.222	4.236
17OCT91	MK12	1	90	0.172	3.645
17OCT91	MK12	1	100	0.168	2.505
17OCT91	MK18	1	10	0.201	1.628
17OCT91	MK18	1	20	0.151	1.793
17OCT91	MK18	1	30	0.143	1.338
17OCT91	MK18	1	40	0.155	1.435
17OCT91	MK18	1	50	0.146	1.386
17OCT91	MK18	1	60	0.167	1.901
17OCT91	MK18	1	70	0.145	2.292
17OCT91	MK18	1	80	0.186	3.549
17OCT91	MK18	1	90	0.187	2.943
17OCT91	MK18	1	100	0.181	3.376
17OCT91	MK24	1	10	0.155	1.661
17OCT91	MK24	1	20	0.135	1.376
17OCT91	MK24	1	30	0.123	1.260
17OCT91	MK24	1	40	0.138	1.425
17OCT91	MK24	1	50	0.166	2.114
17OCT91	MK24	1	60	0.119	1.718
17OCT91	MK24	1	70	0.212	3.751
17OCT91	MK24	1	80	0.170	4.632
17OCT91	MK24	1	90	0.152	3.580
17OCT91	MK24	1	100	0.148	2.426

17OCT91	MK6	1	10	0.233	1.918
17OCT91	MK6	1	20	0.151	1.496
17OCT91	MK6	1	30	0.131	1.477
17OCT91	MK6	1	40	0.103	1.466
17OCT91	MK6	1	50	0.179	2.766
17OCT91	MK6	1	60	0.195	4.651
17OCT91	MK6	1	70	0.163	2.325
17OCT91	MK6	1	80	0.221	3.516
17OCT91	MK6	1	90	0.207	3.627
17OCT91	MK6	1	100	0.202	3.021

Table 8. Average vertical distribution of N content (%) at all stations among all estuaries studied. A. Northern estuaries. SN=Sabine-Neches and TJ=Trinity-San Jacinto. B. Southern estuaries. LC=Lavaca-Colorado, GE=Guadalupe, NC=Nueces, and BB=Baffin Bay.

A.	Depth	SN	TJ
	0	0.083	0.133
	2	0.072	0.113
	5	0.067	0.096
	10	0.064	0.083
	15	0.062	0.085
	20	0.075	0.080
	40	0.058	0.081
	60	0.052	0.089
	80	0.044	0.080
	100	0.046	0.078

B.	Depth	LC	GE	NC	BB
	10	0.065	0.057	0.058	0.191
	20	0.052	0.061	0.055	0.147
	30	0.051	0.064	0.056	0.138
	40	0.050	0.063	0.058	0.133
	50	0.041	0.055	0.052	0.160
	60	0.034	0.054	0.050	0.172
	70	0.046	0.050	0.053	0.183
	80	0.041	0.051	0.053	0.200
	90	0.047	0.049	0.040	0.180
	100	0.050	0.049	0.043	0.175

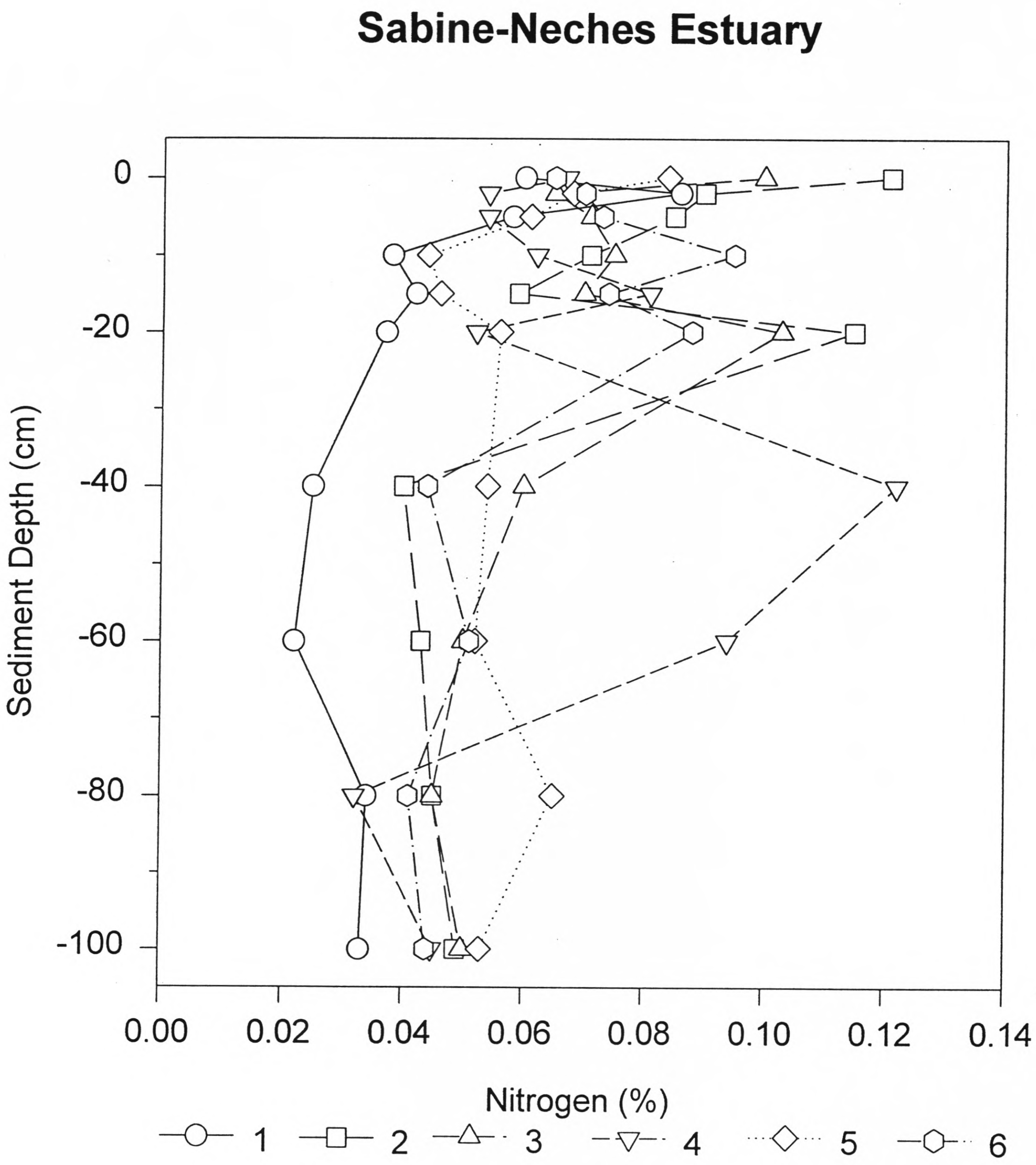

Figure 1. Vertical distribution of Nitrogen at stations in the Sabine-Neches Estuary.

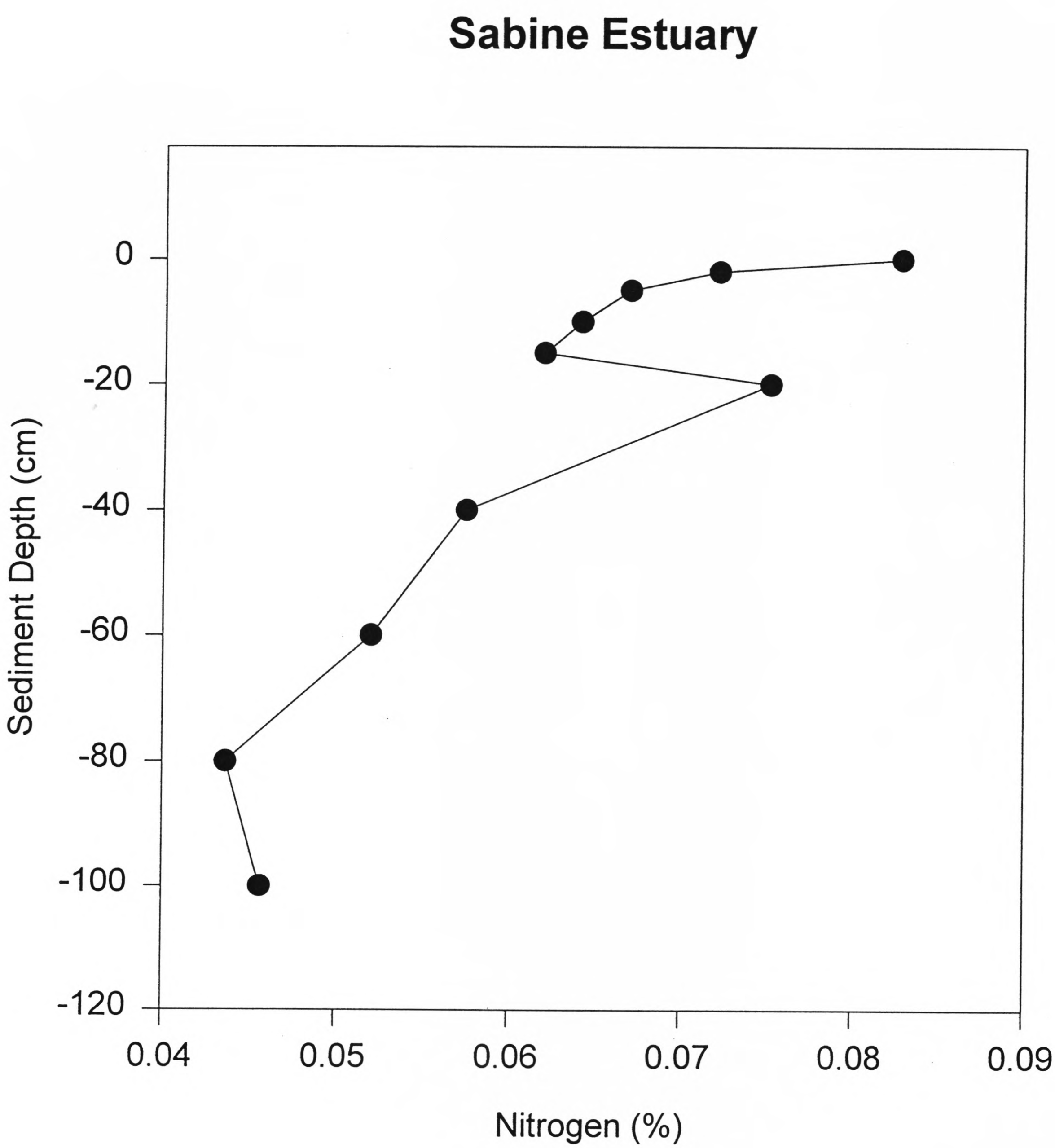

Figure 2. Vertical distribution of Nitrogen in the Sabine-Neches Estuary.

Trinity-San Jacinto Estuary

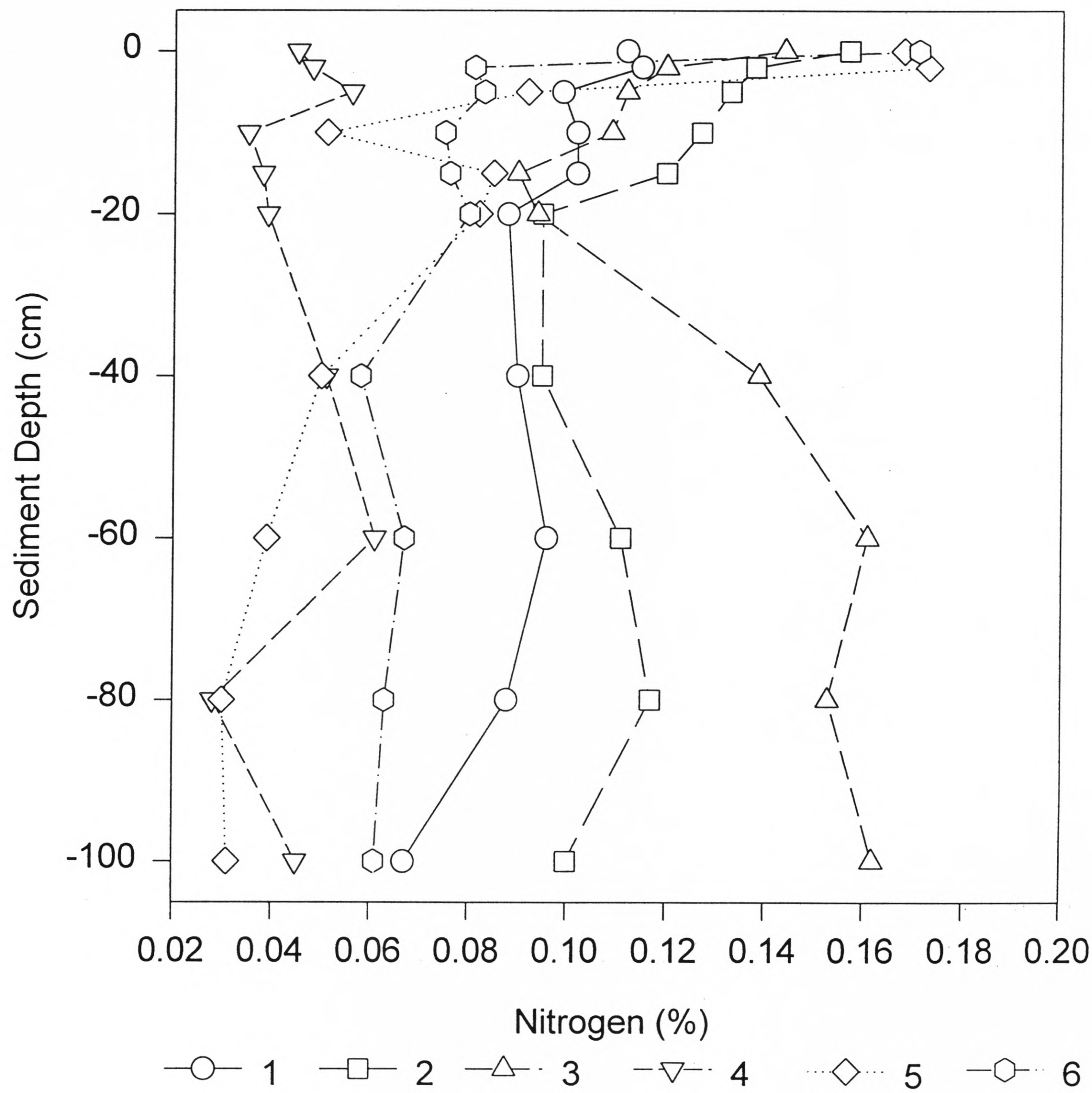

Fig. 3. Vertical distribution of Nitrogen at stations in the Trinity-San Jacinto Estuary.

Trinity-San Jacinto Estuary

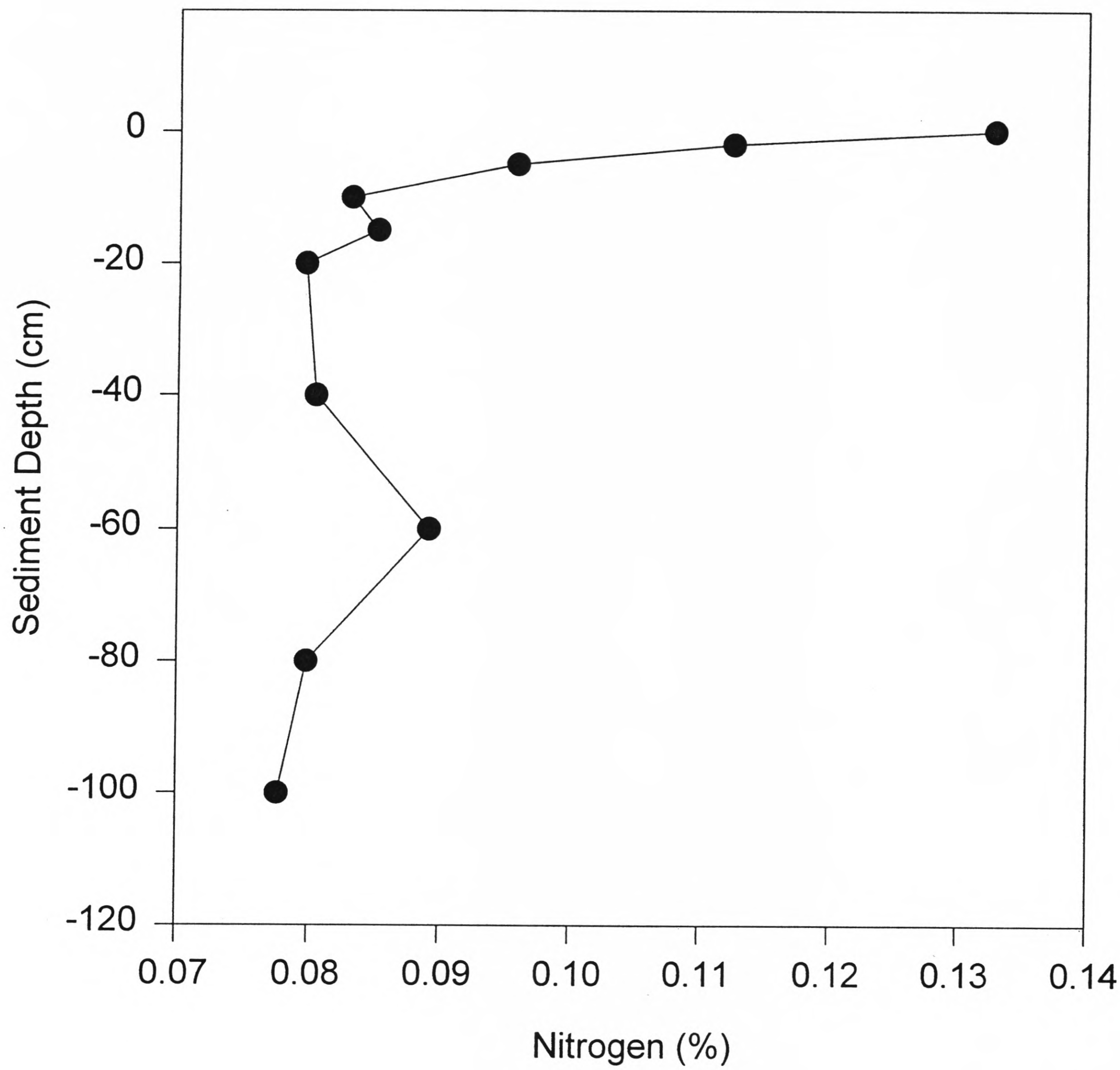

Fig. 4. Vertical distribution of Nitrogen in the Trinity-San Jacinto Estuary.

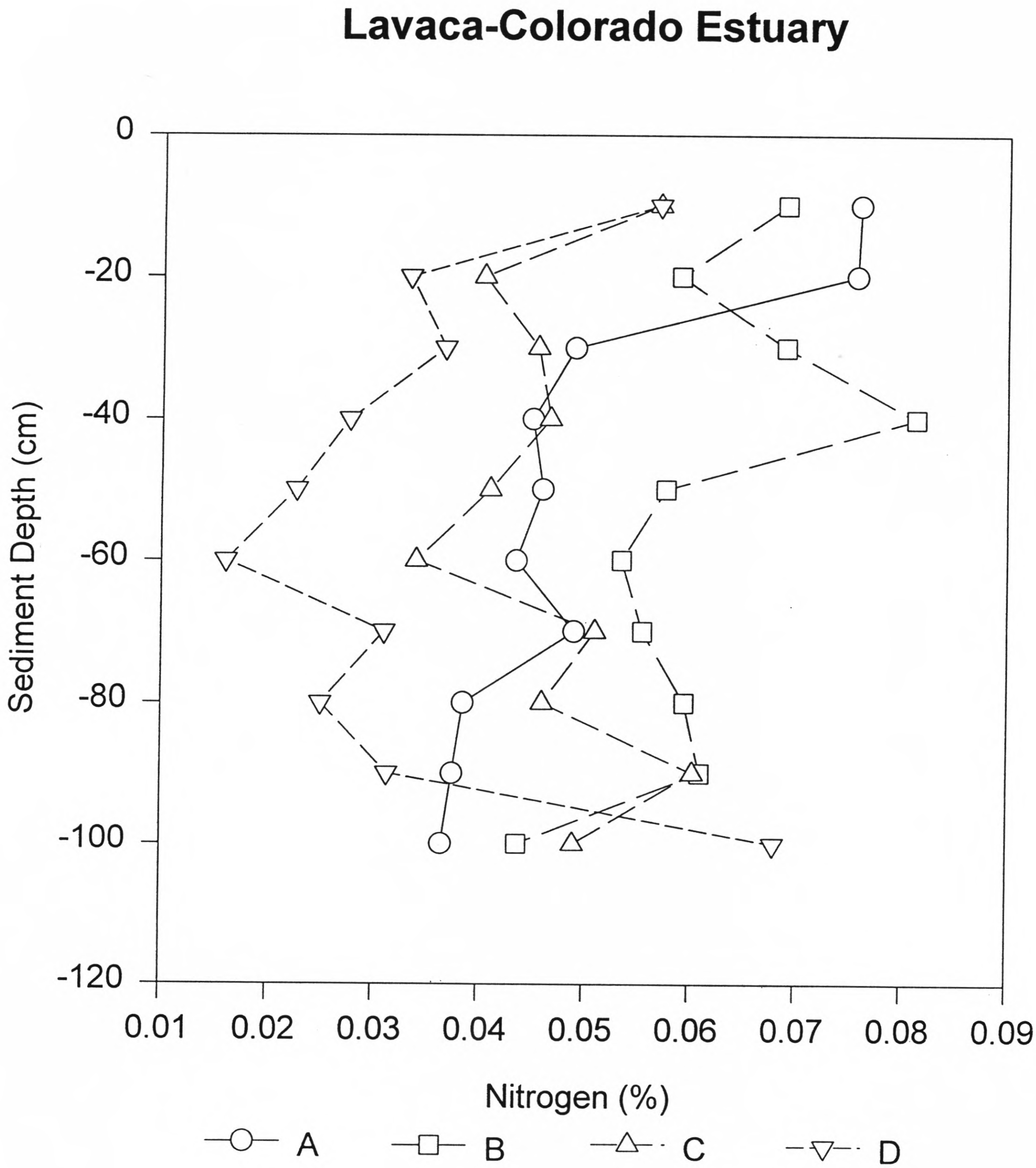

Fig. 5. Vertical distribution of Nitrogen at stations in the Lavaca-Colorado Estuary.

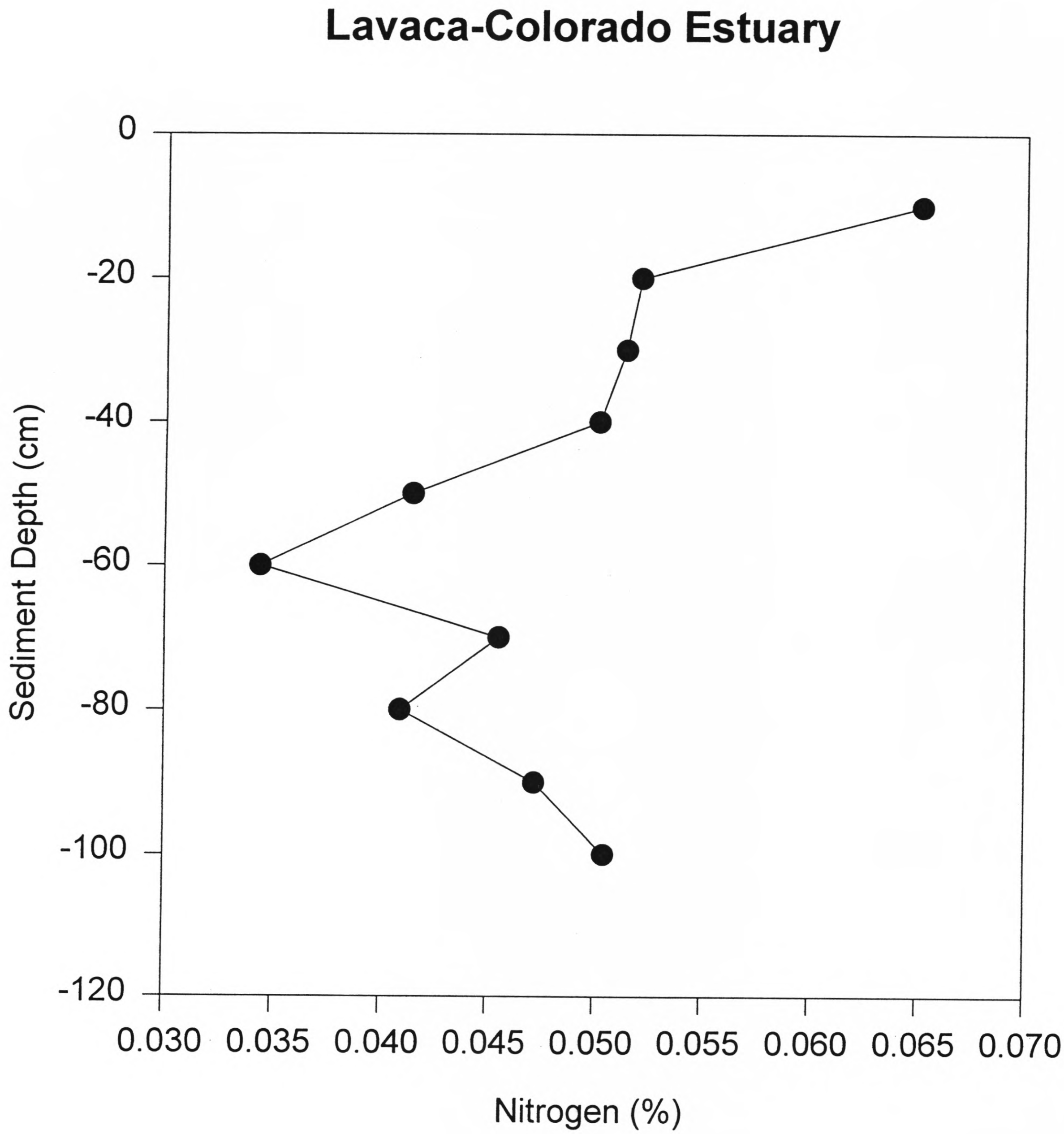

Fig. 6. Vertical distribution of Nitrogen in the Lavaca-Colorado Estuary.

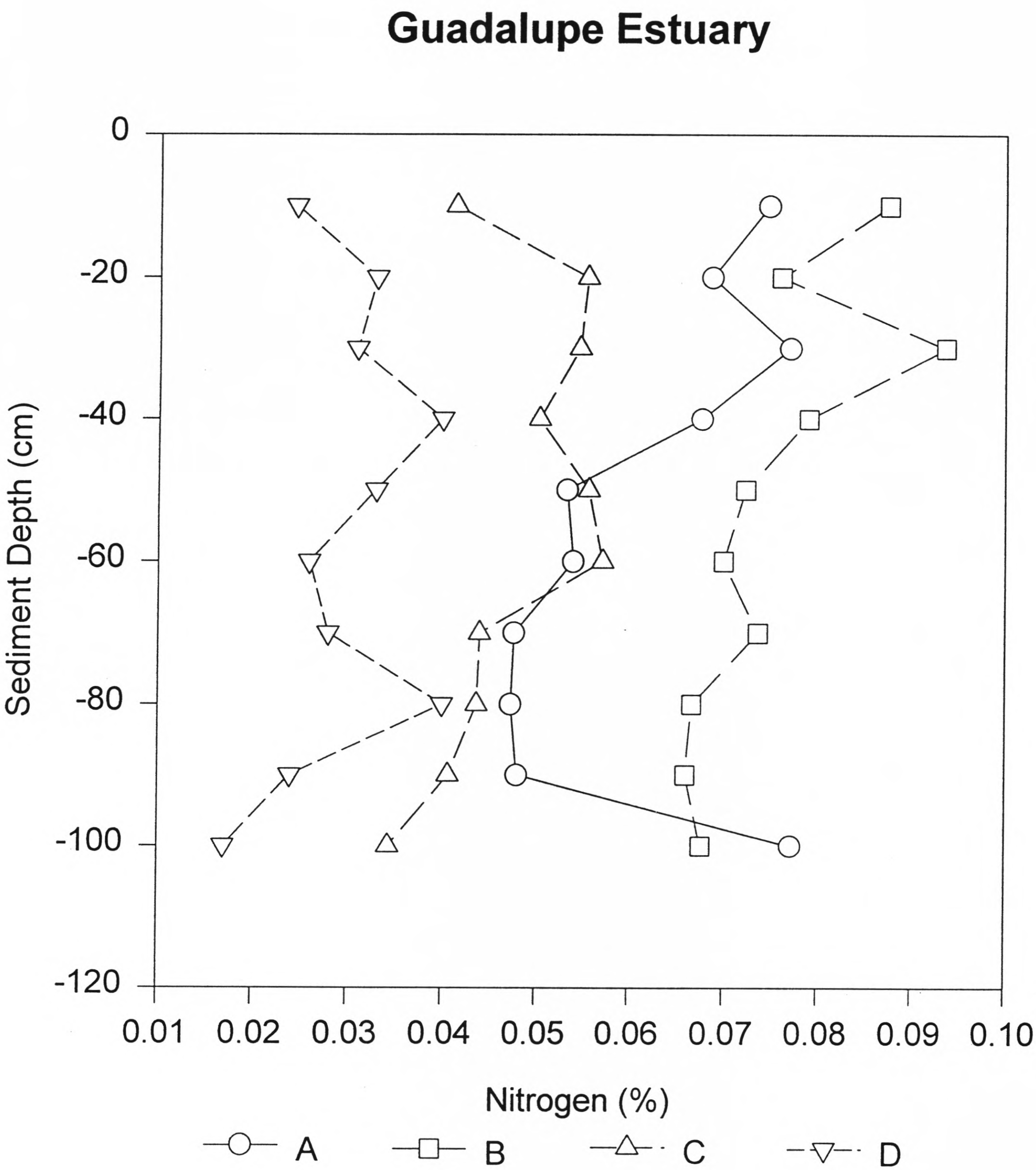

Fig. 7. Vertical distribution of Nitrogen at stations in the Guadalupe Estuary.

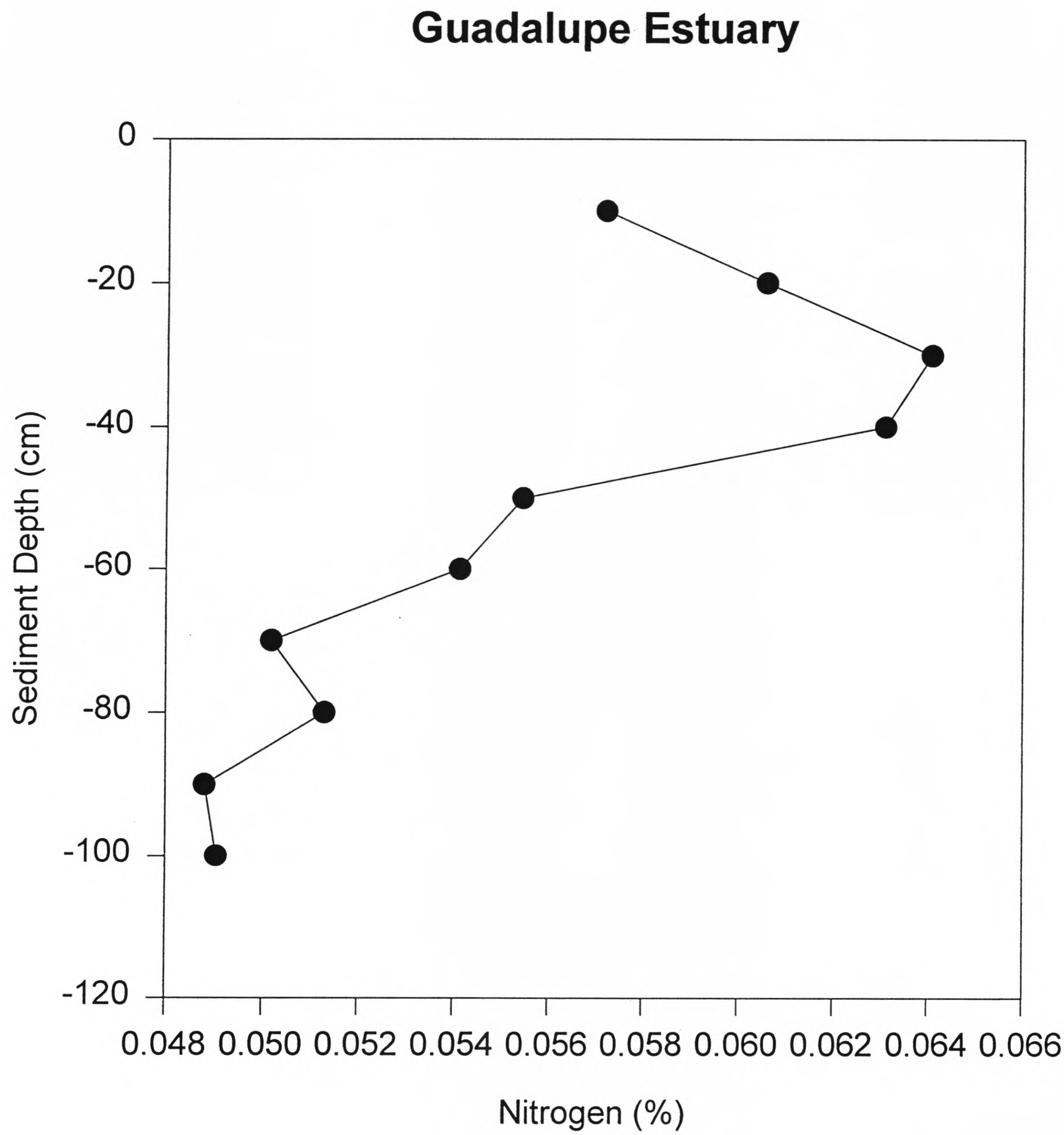

Fig. 8. Vertical distribution of Nitrogen in the Guadalupe Estuary.

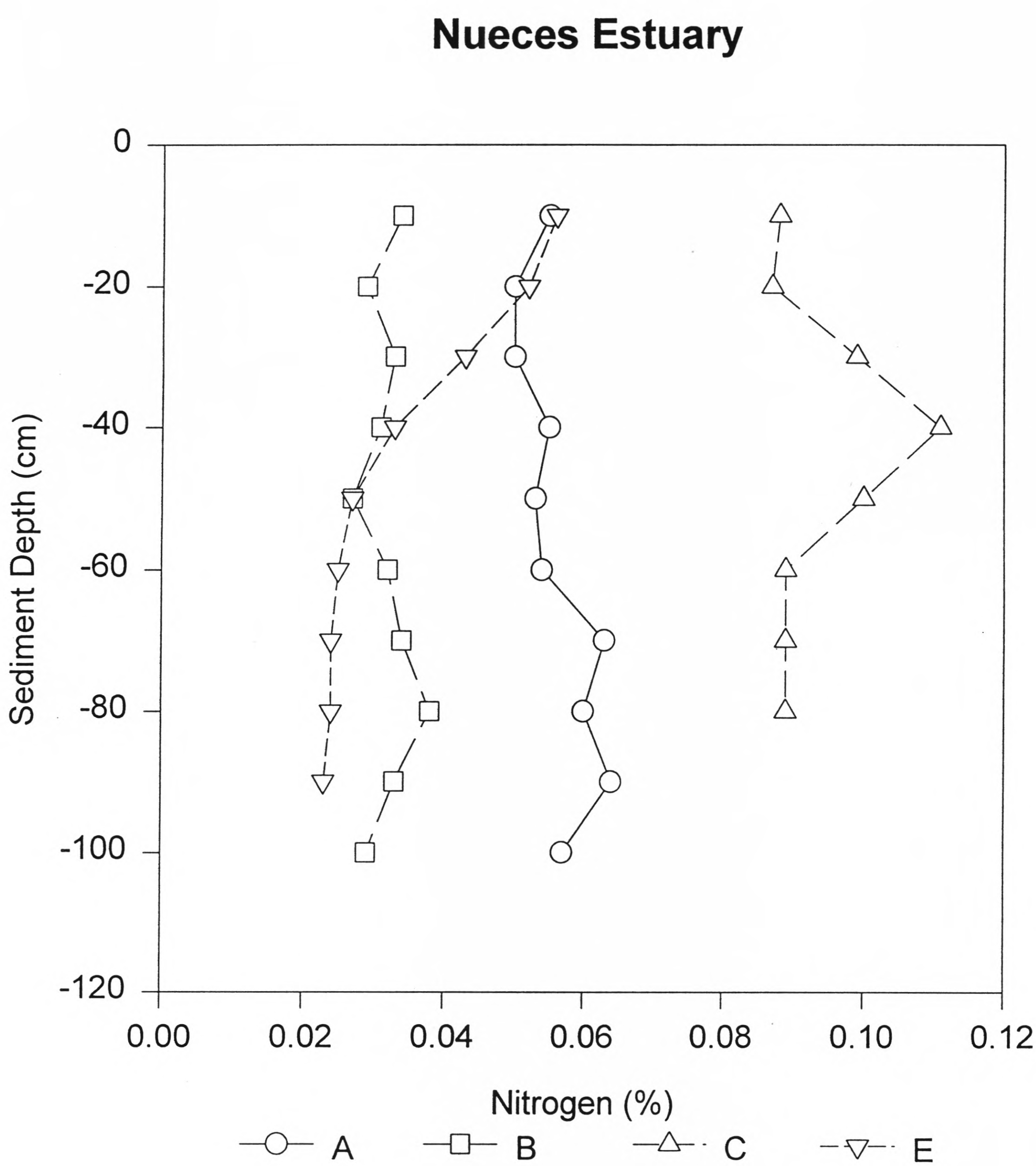

Fig. 9. Vertical distribution of Nitrogen at stations in the Nueces Estuary.

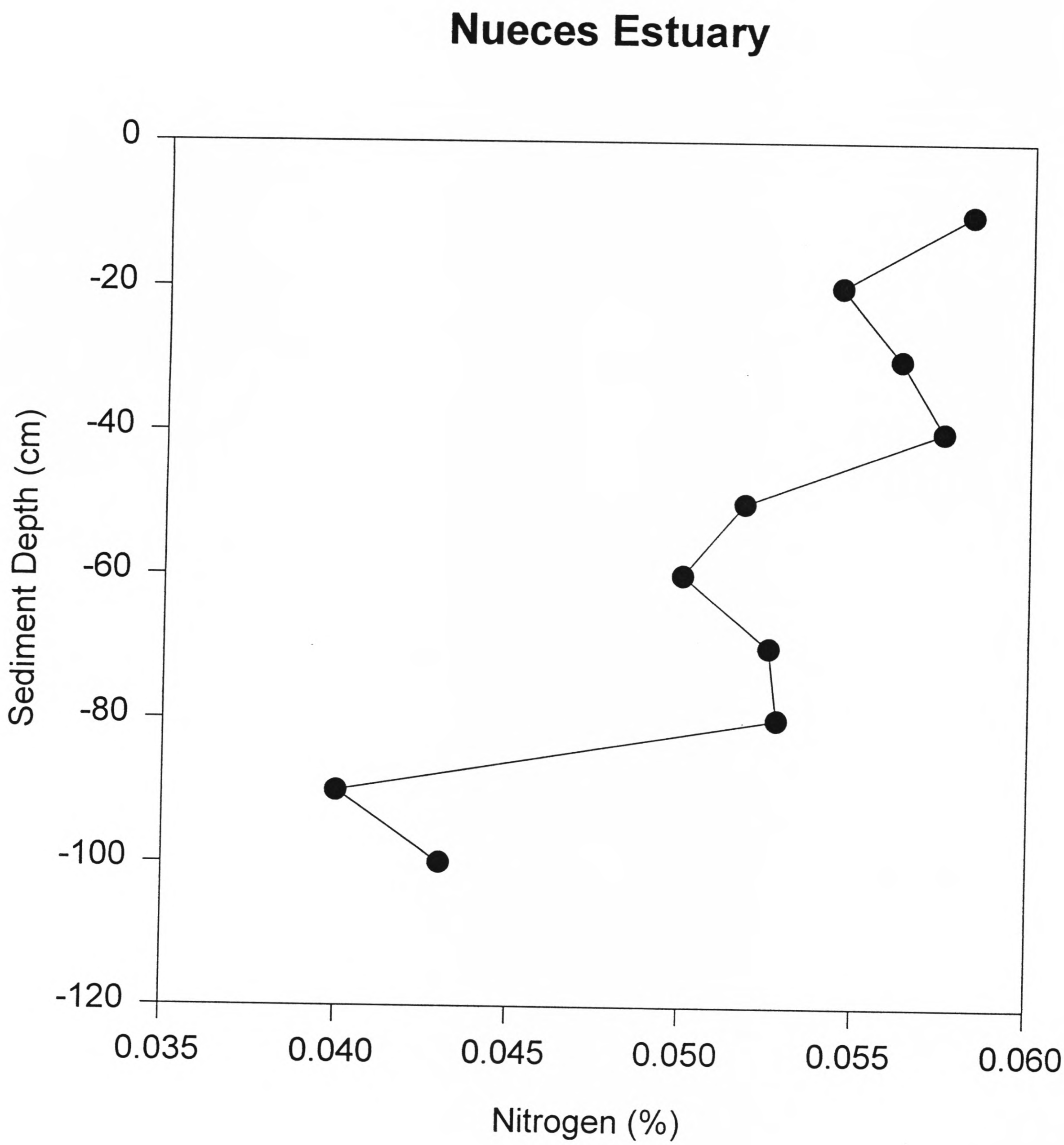

Fig. 10. Vertical distribution of Nitrogen in the Nueces Estuary.

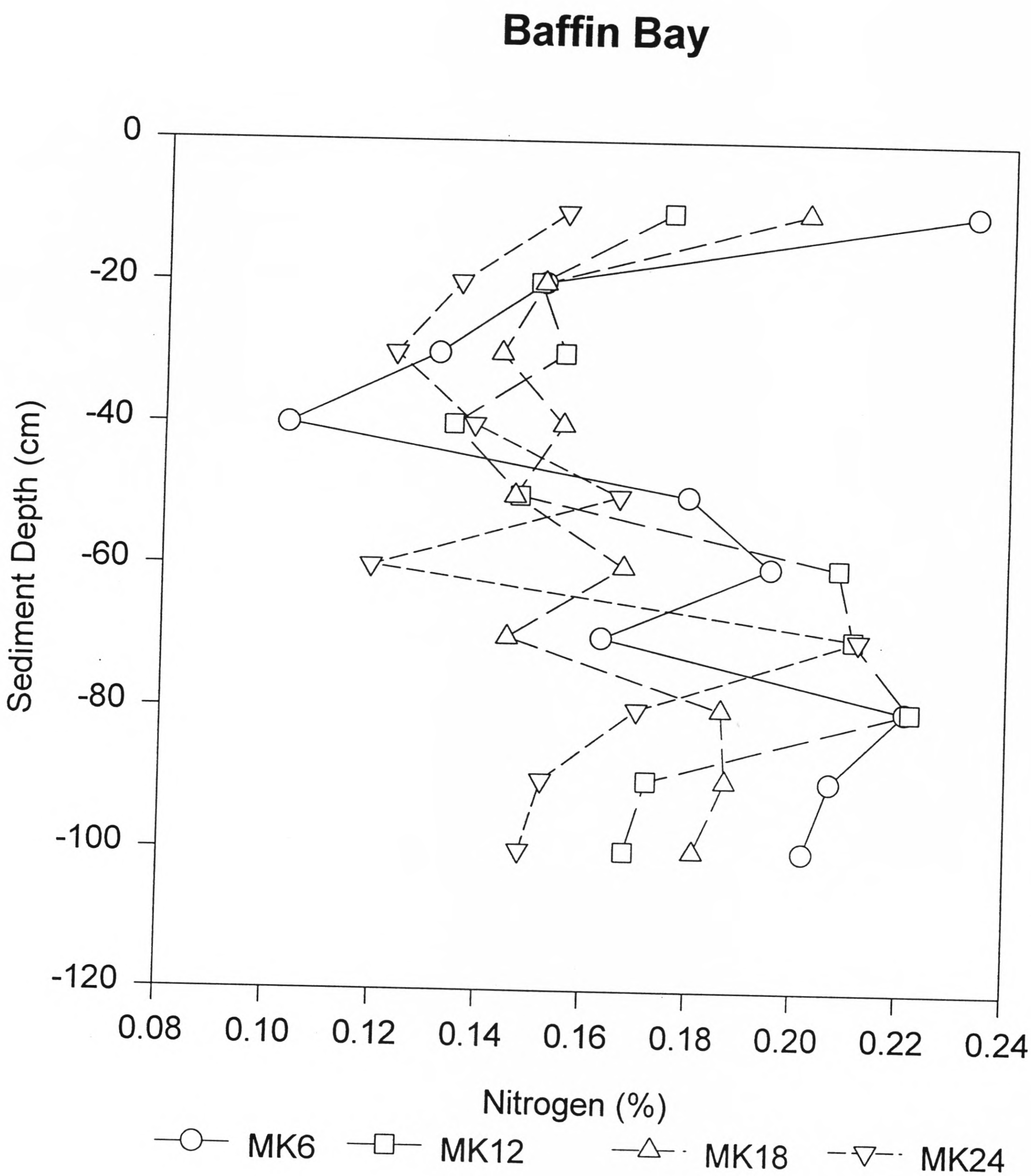

Fig. 11. Vertical distribution of Nitrogen at stations in the Baffin Bay.

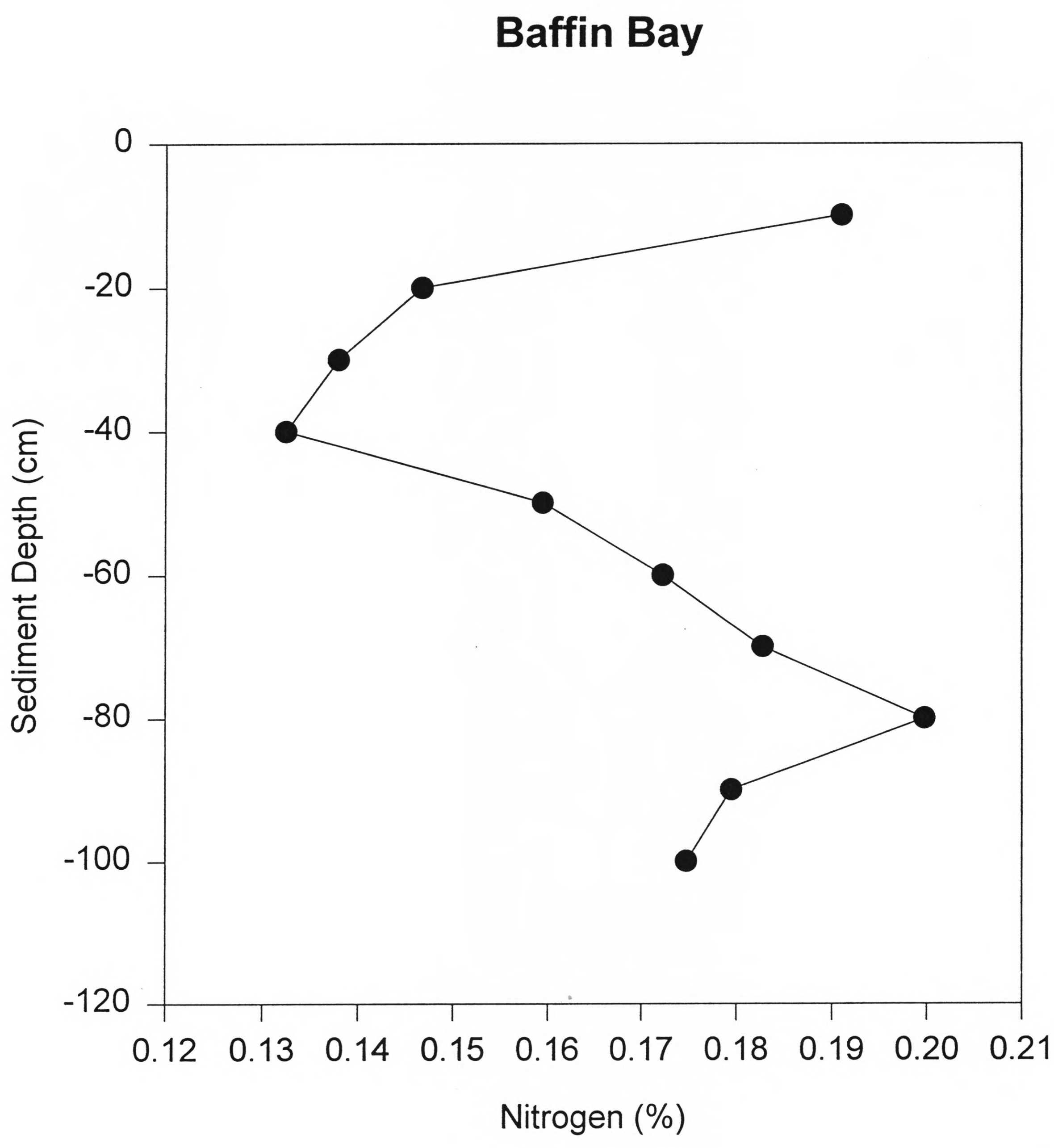

Fig. 12. Vertical distribution of Nitrogen in the Baffin Bay.