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SEGMENT NO.: 1

PROJECT TITLE: INVENTORY OF NEW JERSEY'S ESTUARINE SHELLFISH RESOURCES

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ABSTRACT

The inventory program initiated in 1983 continued. During Segment 1, 304 stations were sampled in Barnegat Bay from Mantoloking to Manahawkin. Only the hard clam, Mercenaria mercenaria, was collected in significant numbers. The hard clam resource within the surveyed area of Barnegat Bay was estimated at 156 million clams. Inventories of St. George's Thorofare in Atlantic County and Delaware Bay were also conducted. Charts delineating the distribution and abundance of the shellfish resources within these areas were prepared.

The moratorium on lease ground applications which was imposed during Segment 4 of the previous project (3-332-R) continued during Segment 1. Consequently, only two lease ground investigations were performed. The moratorium has recently been lifted and the field work associated with this activity will proceed as time permits in Segment 2.

The hard clam relay program continued to operate in Monmouth County. The reported harvest for Segment 1 was 5.7 million clams, an increase of approximately 47% over the previous segment. The acquisition of an IBM pc has greatly improved the ability to monitor relay harvest from specific relay areas thereby facilitating improved resource management.

The Mullica River oyster beds were monitored for setting success, survival and overall bed condition. Both the seed and market beds were found to be in comparatively poor condition.

Samples sent the Rutgers Oyster Research Laboratory in Bivalve, New Jersey for histological examination indicated that MSX infection was a major contribution to the observed decline in bed condition.

JOB NO. 1 SHELLFISH INVENTORY

The long term goal of the Shellfish Inventory project has been to determine the distribution and abundance of commercially valuable molluscan shellfish within New Jersey's coastal estuaries. The last inventory of New Jersey's estuarine shellfish resource was completed in 1963 and the information is seriously antiquated. To provide the current data necessary to manage the State's estuarine shellfish resources, a comprehensive inventory was initiated in 1983 during the previous project (3-332-R).

During Segment 1 the shellfish inventory program concentrated its effort in Barnegat Bay. As in the previous project, the sampling program was designed primarily to sample the hard clam, Mercenaria mercenaria, since this is the most abundant and widely distributed molluscan species within the estuaries along the Atlantic Coast of New Jersey. The sampling procedure consists of towing a miniature hydraulic clam dredge (knife width of one foot) from a 32 foot research vessel to collect adult shellfish. The dredge is constructed to collect all hard clams 30 millimeters in length or greater. Sampling efficiency for other shellfish species varies according to the size of the organism.

Stations were established at half-mile intervals in upper Barnegat Bay as this region has historically been a poor hard clam producing area. In the southern half of Barnegat Bay stations were established at approximately quarter mile interevals. Stations were located by one or more methods including a three point sextant fix, hand bearing compass reading or LORAN C coordinates. After

station position was established a buoy was placed overboard to insure the maintenance of the boat's position throughout sampling operations at each station. Following deployment of the buoy, air and water temperatures were recorded. Water samples were collected for later analysis of dissolved oxygen, salinity, and pH. Dissolved oxygen was determined by Winkler titration. Salinities were determined by a hand held refractometer and pH readings were obtained with a Taylor slide comparator.

Following collection of the water samples, one benthic sample was collected by use of a Petersen dredge. A portion of this sample was retained for later sediment analysis following procedures outlined in ASTM Standard D422-51 (modified). Using the Wentworth grain size classification, any sediment retained on a 2.0 millimeter sieve is considered gravel and any sediment passing through a 63 micron sieve is classified as mud. Results were expressed as percentages of gravel, sand and mud. Figure 3 (Attachment A) depicts sediment classifications for upper Barnegat Bay. Sediments for stations south of Toms River await analysis. The remainder of the sediment sample was washed through a 1.0 millimeter sieve and all material and organisms retained on the sieve were preserved in 10% formalin. These samples were then transferred to isopropyl (70%) alcohol for later identification and enumeration of all benthic invertebrates. Benthic invertebrates are currently awaiting sorting, identification and enumeration.

The water depth of the area was recorded and the tow line length determined utilizing a tow line length to depth ratio of

4:1. In some situations in areas of deeper water the tow line length to depth ratio was reduced to 3:1. In no instance, however, did this ratio fall below 3:1.

Two 100 foot tows were made, one on each side of the buoy, into the prevailing current. The 100 foot distance was measured by paying out a marked line while towing the dredge. In bottoms with a high percentage of clay and old oyster shell it was not posssible to tow the entire 100 feet because the dredge would become clogged. Therefore, individual tows were shortened to 50 feet in this type of substrate. At the end of the measured tow the vessel was held as stationary as possible until the dredge was raised off the bottom to prevent sampling more than the desired area. The number of clams collected on each tow was recorded and the mean density determined by utilizing the average of the two tows. Mean hard clam densites (other species also) are expressed in terms of number per square foot.

All hard clams and paired hard clam valves collected were measured to the nearest millimeter. A size-frequency distribution was constructed at all stations where a sufficient number of clams were collected (at least 100 clams). In all cases the hard clams collected were graded into the following size categories:

Seed (SL)	30-37 mm in length
Littlenecks (LN)	38-55 mm in length
Cherrystones (CS)	56-76 mm in length
Chowders (CH)	> 76 mm in length

A size-frequency distribution was constructed for the single station (BB85-1) which contained commercial soft clam (Mya arenaria) densities. Since over 4600 soft clams were collected at this station, a subsample was measured to determine the size distribution of this population.

Natural hard clam mortality at each station was determined. This mortality was based upon the percentage of empty paired valves in the entire sample of paired valves and live clams. Paired valves were also examined in an attempt to determine the cause of death.

Detailed results of clam density, water quality, size-frequency distributions and densities of associated benthic organisms can be found in Attachment A (Table 1). A total of 304 stations were sampled in Barnegat Bay from Mantoloking to Manahawkin. Like most of New Jersey's estuarine areas, many areas in Barnegat Bay were too shallow to be sampled even at high water. Charts showing station locations are contained in Attachment A (Figure 1).

The commercially important shellfish species collected during the inventory of Barnegat Bay include the soft clam (Mya arenaria), blue mussel (Mytilus edulis) and the hard clam (M. mercenaria). Soft clams were collected in siginificant quantities at only one station and these individuals collected were small in size ($\bar{X}$=31.5 mm). Blue mussels were collected at a number of stations in sparse quantities. Since most of the soft clams and blue mussels were too small to be efficiently retained by the dredge, quantitative estimates for these species were not performed.

Charts delineating the distribution and abundance of hard and soft clams in Barnegat Bay are shown in Figure 2 (Attachment A).

HARD CLAMS

As previously mentioned, the sampling program was designed primarily to sample hard clam populations in a variety of substrate types. The inventory program provided information not only on the distribution and abundance of hard clams but also data on mortality, recruitment, and year class strength.

The hard clam was the most widely distributed shellfish species throughout Barnegat Bay. For the purpose of delineating the general abundance patterns of the hard clam resource the three classifications of occurrence, moderate density, and high density were established and assigned density values of 0.01-0.19, 0.20-0.49 and $\geq$ 0.50 hard clams per square foot, respectively. The density categories selected resulted from a comparison of the densities observed during the sampling program and densities reported by other researchers.

In order to develop an estimate of the hard clam resource within a particular estuary, it is necessary to make some basic assumptions. One assumption is that the dredge is 100% efficient. Although we are confident that the dredge is relatively efficient, in actuality it is probably something less than 100% efficient. Our estimate of the hard clam resource is therefore a conservative one. The other assumption that we must take into consideration is that the density observed at each station is representative of a

much larger area than that sampled. This may not be the case, however, as previous work by the Bureau of Shellfisheries and others has commonly shown hard clams to be rather gregarious, exhibiting a clustered distribution. This source of estimation error was minimized to the maximum extent practicable by increasing sampling frequency in areas with moderate or high densities.

Hard clam densities ranged from 0 to 0.65 clams per square foot. For the purpose of calculating estimates of the hard clam resource the following density classifications were established:

Number of clams per square foot
$< .05$
.06-.11
.12-.49
$\geq .50$

Adjacent stations with the same density category listed above were grouped together and a mean density for that area determined by utilizing the hard clam density means of the individual stations. A planimeter was utilized to estimate the size of the individual areas. The mean density was then applied to the size of the area to yield the standing stock estimate for that particular area. By summing the small areas a resource estimate of Barnegat Bay was developed. The hard clam resource was distributed over 22,185 acres within Barnegat Bay. The estimated standing stock of hard clams in the surveyed area of Barnegat Bay is 156 million clams.

YEAR CLASS STRENGTH

Due to the paucity of hard clams in much of Barnegat Bay, size-frequency distributions for the hard clam (M. mercenaria) were constructed for only seven of the 304 stations sampled (Figure 4, Attachment A). Analysis of the size-frequency distribution for these stations where sufficient numbers of hard clams were collected indicates that only two to six year classes are represented in many areas of Barnegat Bay. While a few younger year classes are represented, the general hard clam population in Barnegat Bay is dominated by a few large, older year classes. Given the few number of clams measured and size-frequency distributions constructed, however, it is difficult to determine the actual year class strength in Barnegat Bay with any degree of validity.

RECRUITMENT

Recruitment is defined as the percentage of clams entering the fishery at the legal size of 38 mm in length. To determine annual recruitment rates it was assumed that the seed collected between 30 and 37 mm represented a single year class and would thus be expected to be recruited into the fishery within the coming year.

The dominance of the Barnegat Bay hard clam population by a few older year classes, as exhibited in the size-frequency distributions, was documented further by examination of recruitment rates for various areas. Recruitment rates ranged from 0.0 to

11.1 percent with an average of 2.03% for all stations where hard clams were collected. Those areas with the highest recruitment rates occurred in the lower third of Barnegat Bay within a few miles of Barnegat Inlet. Within this general area, however, there is no distinguishable pattern to the recruitment rates.

HARD CLAM MORTALITY

Natural adult ($\geq$ 30 mm) hard clam mortalities varied considerably from station to station. The average total mortality for Barnegat Bay was 13.2 percent. Predation associated mortality of adult clams was insignificant in all areas sampled. Observed abundance of the common clam predators such as: conchs, Busycon carica, and B. canaliculatum; moon snails, Polinices duplicatus and Lunatia heros; oyster drills, Urosalpinx cinerea and Eupleura caudata; horseshoe crabs, Limulus polyphemus and starfish, Asterias forbesii was relatively low.

During Segment 2, sampling will be conducted in Little Egg Harbor Bay and proceed southward as time allows. The inventory program is scheduled to continue sampling New Jersey estuaries that have not been recently inventoried until all estuaries have been completed and the distribution of the shellfish within these estuaries delineated. Collection of the related data of recruitment and mortality rates, year class strength, sediment types and associated benthic invertebrates will hopefully result in the development of management plans for the various species.

INVENTORY OF ST. GEORGE'S THOROFARE

St. George's Thorofare is a dead-end lagoon off Absecon Inlet on the southern end of Brigantine Island. Shellfish distribution charts compiled in 1963 rated St. George's Thorofare as having a high commercial value with respect to hard clams. Although being condemned for the direct market harvest of shellfish for over 30 years, St. George's Thorofare has been one of the designated harvest sites of the Atlantic County Relay Program from 1979 to 1983.

St. George's Thorofare was sampled via the sampling methods described previously. Stations were established so as to adequately cover all areas of this 133 acre water body. Sampling was conducted June 3-5, 1985, but due to time restrictions the survey results were not reported in the completion report for project 3-332-R. Twenty-two stations were sampled between Rum Point and the northerly end of the thorofare, an area of approximately 126 acres. The two lagoons on the south side of St. George's Thorofare were not sampled since these confined areas precluded vessel maneuverability. Exact station locations are shown on Figure 5 (Attachment A). All field data, including depth, water quality analysis, sediment composition, clam density, and clam size, is listed by station in Table 2 of Attachment A.

Distribution and Abundance

The hard clam, M. mercenaria, was the most abundant and widely distributed molluscan species collected within St. George's Thorofare. Based on the mean hard clam density, each station was classified as being an area of occurrence, moderate density, or high density as

described previously. Figure 6 (Attachment A) graphically presents the distribution and abundance of hard clams according to the above classifications.

Hard clam densities ranged from 0.0-5.13 clams per square foot with an overall average of 0.97 clams per square foot. The hard clam resource within St. George's Thorofare, which was calculated via the procedure initially described in the inventory methods section, was estimated to be 6.2 million clams.

Year Class Strength

Size-frequency distributions for the hard clam were constructed for twelve of the twenty-two stations sampled and are presented in Figure 8 of Attachment A. Nine to thirteen year classes are represented in St. George's Thorofare. From review of the size frequency distributions it is apparent that this area has experienced successful spawning, setting, and survival on a fairly regular basis.

Recruitment

The average recruitment rate of St. George's Thorofare was determined by the same procedure used for other inventoried areas. Recruitment rates ranged from 2.6 to 16.7 percent with a mean of 7.8 percent. Unlike most other areas inventoried, recruitment rates within St. George's Thorofare exhibited less variation between stations, although this observation may be the result of greater sampling frequency.

Benthic Invertebrates

Table 3 presents the densities of organisms collected by the hydraulic clam dredge. Thirteen species of benthic invertebrates were collected by the dredge, which, due to its design, collects benthic invertebrates at varying rates of collection efficiency. Estimates of invertebrate density were calculated when possible. The hard clam was the most abundant and widely distributed species collected by the hydraulic dredge, occurring at 19 of the 22 stations (86.4%) sampled. Razor clams (Ensis directus), blood arks (Anadara ovalis), and pitar clams (Pitar morrhuanus) were the next most abundant species with the remaining species being distributed throughout St. George's Thorofare in reduced densities.

Benthic samples were also collected with a Petersen bottom grab. However, in an effort to expedite the sorting and identification of these samples, only molluscan intertebrates were identified.

Eight species of molluscan invertebrates were collected in 22 grab samples. The small bivalve Tellina sp. was the most abundant and widely distributed species occurring at 50% of all stations. As exhibited in Table 3, the remaining species were distributed throughout St. George's Thorofare.

Juvenile hard clams were collected at four of the 22 stations sampled (stations 1, 2, 3, and 5). An estimated 1.8 million juvenile hard clams (1984 set) exist within the surveyed areas of stations 1, 2, 3, and 5. These juveniles ranged in size from 1.7 to 9.3 mm, with this wide variation probably the result of multiple

spawnings in 1984 as well as environmental factors affecting growth. While juvenile hard clams are subject to great predation pressure following settlement, their abundance at these stations up to one year later was a propitious finding of the resource survey. The occurrence of juveniles in conjunction with the abundance of adult hard clams of many size classes is a further indication of the vitality of the resource within St. George's Thorofare.

Given that it is still under review by State personnel, the report on the resource survey of St. George's Thorofare is not included as an attachment to this publication. However, tables and figures presenting survey results are included in Attachment A.

INVENTORY OF LOWER DELAWARE BAY

During the spring of 1986, the Bureau of Shellfisheries was presented with the opportunity to extend its shellfish inventory project into Delaware Bay. The systematic inventory program, which was initiated in Raritan and Sandy Hook Bays in 1983, has proceeded southward completing stock assessments for all estuaries as far south as Manahawkin. Because of this systematic approach, the Delaware Bay segment of the project would not have been initiated for several years had it not been for the fortuitous interest of a couple of oyster companies in determining the availability of commercial concentrations of soft clams, Mya arenaria, and/or hard clams, Mercenaria mercenaria, in this bay. The interest of Mr. Robert Morgan of Port Norris Oyster Company and Mr. Lee Robbins of Robbins Brothers, Inc. provided th Bureau's personnel with a unique opportunity to develop a baseline survey for determining a resource inventory in the lower Dealawre Bay. Since these individuals were also interested in utilizing available commercial gear, i.e. an escalator dredge, the Bureau was able to perform the survey without diverting equipment or essential personnel from its established work schedule. The vessel and operator were provided by these individuals, while the Bureau provided logistical support and the personnel required for the survey.

AREA

The area for this survey encompassed the lower Delaware Bay, from the Cape May Canal to the Southwest Line. This area and

sampling stations are illustrated in Figure 9. Because most of this area has been leased for oyster cultivation (Figure 10) every attempt was made to select stations which did not infringe upon leased areas, except for leases held by Mr. Morgan or Mr. Robbins. Although it was the intention of the survey personnel to establish the stations systematically, a number of constraints required alterations to the systematic approach. These constraints included: operational limitations of the harvesting gear and vessel, bottom topography, leased ground arrangements, and the parochial interests of the individuals sponsoring this effort. A sampling regime was developed to provide the most comprehensive information within the available time frame. The survey effort was influenced to a large extent by the suggestive evidence, yielded from oyster harvesting activities, of potential concentrations of clams. An effort was made to establish transects in an offshore/inshore and upbay/downbay direction.

Certain areas were not included in the sampling regime because of substrate composition. The New Jersey side of lower Delaware is comprised of extensive, shallow flats which are characterized by soft, fluid muds. These areas exhibited very little biological activity and by necessity were quickly discounted as sample sites. Likewise, areas which were composed of packed sand or a sand-peat combination had to be discounted. These substrates proved difficult for the dredge to penetrate and as a result, the dredge was grossly inefficient. This condition was found, primarily, along the shoreline adjacent to Cape May County (Figure 10).

The dredge was the most efficient in bottoms having a composition of sand, shell, and mud; a loosely packed but somewhat stable bottom. This type of substrate was usually found adjoining leased areas, so most of the sampling effort took place along the perimeter of the leased grounds.

METHODS

As previously noted, the vessel and harvesting gear for this segment of the Shellfish Inventory Project were furnished by Mr. Morgan and Mr. Robbins. The vessel was an escalator dredge boat which was active in the Chesapeake Bay soft clam fishery and leased for this survey. This vessel was selected because of the captain's experience with the soft clam fishery and the perception that fishery gear available locally was inadequate to evaluate the commercial status of the targeted species.

The dredge was an integrated unit operated hydraulically by the captain from the aft area of the vessel. Angle of the dredge water pressure, flow rate to the water manifold, and speed of the conveyor system were conveniently controlled from this location. Materials collected were transported by the conveyor system past this control area for culling. This arrangement provided for an operation that could be handled by a single individual under routine operating conditions.

The dredge used a 91 cm cutting bar with a water manifold and series of digging nozzles, arranged approximately 25 to 30 cm above the cutting bar. Materials collected by the dredge were

moved along a 1.9 cm mesh conveyor system to the culling area. Target species were removed from the conveyor, counted, and measured. Notation was made for associated species collected. Assessment of the bottom penetration by the dredge was based on the captain's experience and the system's operating angle. A penetration of 15 to 20 cm was thought to be typical. The harvesting efficiency was affected by water depth and declination of the dredging system to the bottom. The maximum operating depth ranged from 15-18 feet. A critical operating angle was reached when the angle of declination began to exceed, approximately, 50 degrees. Beyond these limits, the system failed to carry materials past the surface of the water. The optimum operating depth was 10 to 12 feet.

The sampling interval at each station was 10 minutes. During this period all materials collected were observed and pertinent information was recorded. Boxes were collected and used to provide a measure of recent mortality. Salinity, temperature, and sediment samples were not taken during this phase of the project.

The position of each station was determined by using Del Norte Technology, Inc.'s 520 DDMU Transponder system. This horizontal positioning system utilizes frequencies in the microwave range and provides an accuracy of $\pm$ 1 m over an operating distance of 80 kms. The New Jersey Plane Coordinate System was the horizontal control data base for conversion of the distance measurements. The location of each station was converted to a position of latitude-longitude, using the formulas for computing geodetic position from Transverse Mercator coordinates.

The distance traveled during each sample interval was calculated by recording position information at the beginning and end of each station. This data was mathematically manipulated to provide the distance between end points. These values were used to determine the area of coverage and the density of clams per square foot. The mean linear distance for these measurements was 657 feet. The range for the measurements was 172 to 1506 feet. Density values for clams were determined by dividing the number of clams harvested by the area covered during each sample interval. Because of the vagaries of the currents, winds, and the effect of the dredge on the course taken by the vessel, the dredge path was usually sigmoidal in shape. The density values, shown in Attachment A (Table 4), are, therefore, considered to be liberally skewed. To obtain a more accurate perspective of the distance covered during each sampling effort, a series of measurements was taken at 10 second intervals during several different tows. The mean value for these measurements was 1027 feet or nearly twice the mean linear distance computed from the distance measurements of the individual intervals. This would imply that clam densities are considerably lower than computed for the individual stations.

All clams collected, as well as paried valves, were measured to the nearest millimeter. A size frequency distribution was constructed for each station when a sufficient number of clams was collected (N=100). When an excessive number of clams was collected, a subsample was used for the size frequency distribution graph. This situation occurred at only one station, #44,

when 323 clams were collected. The subsample used for the size frequency distribution was 178. This information is also included in Attachment A.

Hard clams collected were graded into size categories according to their relative commercial importance and are presented in Attachment A as a percentage of the total collected. These categories are as follows:

Type	Length(mm)
Seed	30-37
Little Necks	38-55
Cherrystones	56-76
Chowders	>76

RESULTS

The objective of this project was to define and delineate the shellfish resource of lower Delaware Bay, in particular, exploitable concentrations of the hard clam, Mercenaria mercenaria and the soft clam, Mya arenaria. For a number of years, dredging activities on leased oyster grounds have yielded small numbers of hard clams and some evidence of the occurrence of soft clams. A study conducted by the University of Delaware had indicated that, although hard clams did occur in the Delaware Bay, the resource's potential for exploitation was marginal (Keck, 1974). This report did not indicate the presence of any soft clams in the bay. Shell material excavated from the bay bottom during this project contained soft clam valves indicating that the

species possibly did occur in the region at one time.

A total of 49 stations yielded 1515 hard clams. The abundance and distribution of hard clams found in this survey can be found in Attachment A. In previous reports, McCloy and Joseph (1984, 1985) had established three classifications for the relative abundance of hard clams. These classifications are as follows:

Clams per square foot	Density Classification
0.01 - 0.19	Low
0.20 - 0.49	Moderate
>.50	High

These standards were established after evaluating survey results previously acquired under earlier phases of this project and the reported results of other researchers.

Assuming that these classifications have relative value to a commercial fishery, the hard clam resource of Delaware Bay appears to be insignificant. Density values ranged from 0.0017 to .422 clams per square foot. Twenty-four stations had densities between 0.01-0.19 clams per square foot and would be considered low density areas. Moderate densities were found at only two stations (46 and 37), while no station yielded sufficient quantities to attain a higher classification. It should be remembered that these density values were based on the linear distance computed for each sample interval. The computed values are probably considerably higher than what actually occurs in the bay.

The number of clams, mean, and range measurements, as well as mortality estimates, are presented in Attachment A. The mean size for the hard clam seems to increase in both an inshore and upbay direction. Similar findings were reported in the University of Delaware's hard clam survey (Keck, 1974). In addition to the relative low densities of clams found, the available resource appears to have very little commercial value. Ninety-two percent of the clams collected exceeded the current market limit of 56mm for the valuable little neck clam, while 70.8% exceeded 76mm, the market limit for cherrystone clams. Eight stations had a predominance of cherrystones (56-76mm). For those stations where size frequency information was recorded, thirty-four were dominated by chowder size clam, length >76mm. Seventy-three percent of the clams collected were taken at only 7 stations. Size frequency distributions have been provided for these stations in Figure 11. The mean length of the clams taken was 83.2mm (s.d. 20.8mm).

AGE OF RESOURCE

The results of this survey imply that the hard clam resource of lower Delaware Bay is relatively old, with very little annual recruitment. A number of studies have been conducted over the years to determine the annual incremental growth rate for the hard clam. Haskin (1952-1954) in Delaware Bay, Haven & Loesch (1970) in Chesapeake Bay, and Fritz (pers. comm. 1986) seem to agree that under normal growing conditions, hard clams will attain a size of 60-70mm after 6 to 8 years. Growth rates apparently slow considerably after this stage of development and

thereafter the annual increment may only be a millimeter or two. Several clams collected during this survey were aged by personnel at the Rutgers Shellfish Research Laboratory and found to have an estimated age in excess of 40 years. It should be noted that these clams were some of the larger ones collected. According to the aging data available, approximately 84% of the clams collected in this survey probably were at least 8 years of age or older.

DISTRIBUTION OF RESOURCES

The lack of sizeable hard clam resource in Delaware Bay may be due to substrate composition. Because bottom salinities are usually above 20 ppt in the lower bay, salinity is not considered to be a limiting factor. Several researchers have reported that substrate appears to be an influencing factor. Keck (1974) found that clam densities were highest in areas with a composition of silt and sand. Ropes and Martin (1960) reported that the hard clam seems to prefer a substrate mixture of sand and mud. Loesch and Haven (1972) found that clam densities were lower in soft, unstable bottom. The highest densities of clams were found in areas having a relatively stable bottom with a composition of sand, shell, mud or silt. This condition is descriptive of those areas adjoining the leased oyster grounds in the bay. The most productive clam areas were, in fact, situated along the periphery of leased grounds. A number of researchers have indicated that aggregrate materials (shell, gravel, etc.) may deter predators, thus offering protection to small clams. The accumulated shell

deposits may offer the clams protection by making it more difficult for predators to reach the burrowed clam. Major clam predators in the bay are: the blue crab, Callinectes sapidus; the horseshoe crab, Limulus polyphemus; xanthid crabs; the whelks, Busycon carica and B. canaliculatum; the spider crab, Libinia emarginata; and the snail, Polinices duplicatus. Limulus and Polinices were the most common predators collected. Areas where mud (Stations 14-21) or hard pack sands (Stations 26-30) occurred, clam density was either extremely low or no clams were collected. Densities were usually higher, as already noted, in aggregate bottom. The most productive stations were 32 through 39, where shell material was in abundance. The greatest number of predators was also found at these stations.

RECRUITMENT

For purposes of this project, McCloy and Joseph (1985) have defined the recruitment class as being those clams between 30 and 37 mm in length. It is their supposition that these individuals comprise a single year class and would be expected to be recruited into the fishery within the coming year. Haskin (1952, 1954) had previously indicated that the annual growth for hard clams along the Cape May shoreline of Delaware Bay was approximately 10-12 mm during their first several years of development. The definition is, apparently, applicable for this survey, as clams in the 30 to 37 mm range could be expected to enter the fishery within the same year. Based upon the results of this survey, the percentage of recruitment size clams available to the fishery was 0.9%. For comparison, McCloy and Joseph (1985) found the

is a composition of shell, sand, and mud. There is sufficient evidence in the literature to suggest that the composition of the bottom is of significant importance to the survival rates of juvenile clams. Unfortunately, most areas in lower Delawre Bay do not seem compatible for the development of commercially exploitable concentrations of hard clams.

average recruitment rates for the Manasquan and Shark Rivers to to be 11.9 and 4.8 percent, respectively. All the recruitment size clams taken in this survey were found at stations 33, 34, 39, and 40. These stations are also those which yielded the largest numbers of older clams. This finding would further support previous works that stated aggregate substrates afforded the greatest protection from predators.

Hydrographic conditions in the bay may also influence recruitment. The general counter clockwise circulation pattern in the lower bay may disperse larvae beyond the range of the best setting areas. Juvenile clams setting in areas without the aggregate substrates would become easy prey for the bottom foraging blue or horseshoe crabs, which are in abundance in the lower bay during certain times of the year. Loss of larvae from the system, inadequate phytoplankton production, and unstable bottom are also potential factors for the limited availability of recruitment size clams.

SUMMARY

This survey has supported data collected during previous surveys that indicated the existence of only marginal populations of hard clams in Delaware Bay. Although valves of the soft clam, Mya arenaria, were collected, there was no evidence to suggest that this species occurs in the bay. The available hard clam resource appears to be relatively old, with limited annual recruitment. Most of the resource was found in areas adjacent to producing or formerly producing oyster bottom where the substrate

JOB NO. 2 INVESTIGATION OF LEASE APPLICATIONS

Commercial shellfishermen requiring areas of bay bottom for planting seed oysters and clams or as layout grounds submit lease applications to the Atlantic Coast Shellfish Council for their review. Following this review process, the Council makes recommendations to the Commissioner of the Department of Environmental Protection whether the lease should be granted or remain open for public use. The current philosophy of both the Atlantic Coast Shellfish Council and the New Jersey Bureau of Shellfisheries is to discourage leasing of productive habitat so that the resources of such areas remain available for public (commercial and recreational) utilization.

In order to assist the Council in their decision, each lease application is investigated for shellfish productivity with a biological report being submitted to each councilman prior to the monthly meeting of the Council. The application is considered and discussed at the first meeting with the final decision being rendered at the meeting the following month.

The biological investigation of each lease application yields data on the present shellfish density of the area, year class strength and recruitment, mortality, associated organisms, substrate type and basic water quality (i.e. dissolved oxygen, salinity, pH, depth, and temperature). This information, in addition to the history of the area, is used to determine the productivity of the area.

Each prospective lease is classified as productive, potentially

productive or nonproductive shellfish habitat depending on the results of the biological investigation. Productive habitat is defined as an area that is and/or has been a regular producer of various shellfish species, although the classification is generally associated with hard and soft clams and oysters. An area can be productive habitat for one species and nonproductive for another. The Mullica River oyster seed beds, for example, are extremely productive oyster habitat but nonproductive with respect to hard clam habitat. Areas are classified as nonproductive when there is no regular natural recruitment. However, many of these areas are excellent for growth making them favorable for aquacultural use. Areas with biological data insufficient to classify them as productive or nonproductive are termed potentially productive.

The intensive sampling program of Job I has involved the entire staff on a full time basis, greatly reducing the manpower available to perform lease ground investigations. This resulted in a backlog of lease applications which necessitated the implementation of a moratorium on all lease applications. This moratorium, which was announced during Segment IV of the previous project (3-332-R), remained in effect during Segment I of the current project.

In light of the above, only two lease ground investigations were performed during Segment I. An investigation of the two lease applications, both of which were located in Little Egg Harbor Bay, found them to be productive in terms of natural hard clam recruitment. Following a review of the biological reports submitted for these lease applications, the Atlantic Coast Shellfish Council

denied both leases so that these areas could remain available for public use. Seven other applications were cancelled due to the applicants' noncompliance with the policy of the Atlantic Coast Shellfish Council requiring the staking of all lots within six months of the date of application.

Although originally scheduled to be lifted in the spring of 1986, the moratorium on lease applications was not lifted until October 1986. It may be necessary, however, to reinstate the moratorium since the staff of the Bureau of Shellfisheries is more limited than in previous years.

JOB NO. 3 HARD CLAM RELAY MONITORING

The relay program consists of transferring hard clams, Mercenaria mercenaria, from condemned areas onto leased lots in approved water. Following a thirty day purification period, samples are analyzed for bacterial contamination and if the analysis reveals the elimination of harmful bacteria the lots are opened for harvest. Since the inception of the relay program in 1970, over 71 million clams have been utilized from condemned waters.

The intensive sampling program of the Inventory Program (Job I) required that all available personnel devote most of their time to this activity. Consequently, relay monitoring was limited to the tabulation of harvest and catch per effort data obtained from the harvest receipts submitted by each relay participant.

During Segment I, the relay program continued in the waters of Raritan and Sandy Hook Bays as well as the Navesink, Shrewsbury, Manasquan and Shark Rivers in Monmouth County. Harvest and catch per effort data by area are included in Attachment B.

Table I (Attachment B) includes the relay summary data for 1985 as well as the first six months of 1986. Harvest data for specific relay harvest areas (i.e. 1-11, W, X, Y, Z) are not included for the 1985 data as staffing limitations prevented the extraction of that information from the relay harvest receipts. However, the recent acquisition of an IBM personal computer has greatly ameliorated this arduous task and has facilitated improved monitoring of harvest from specific relay areas. The continued use

of the IBM pc will improve the management of the hard clam stocks associated with this program.

The total reported harvest for all relay areas in 1985 was 5,144,862 clams. Those previously mentioned areas of northern Monmouth County (excluding the Manasquan and Shark Rivers) received the most activity with 3,646 man-days of effort and a resultant harvest of 4,855,254 clams (over 94% of the total 1985 relay harvest). The mean catch per effort for all relay areas in 1985 was 1316 clams/man/day, which is up 12.9% from the 1984 figure. It is unknown whether this increase is due to an actual increase in harvest or more accurate reporting by participating shellfishermen.

The harvest data of the first six months of 1986, as shown on Table I (Attachment B), provides a more precise representation of the relay harvest. During this period, 1797 man-days of effort yielded a total reported harvest of 2,422,730 clams and a mean catch per effort of 1348 clams/man/day. Section 11 in Raritan Bay yielded the highest catch per effort (1,675 clams/man/day), but contributed only 22,343 clams to the total harvest for the first half of 1986. Shark River had the lowest catch per effort during this period (963 clams/man/day), although this figure is up approximately 19% from the Shark River catch per effort figures for 1984 and 1985.

Relay totals for Segment I are up substantially from those of Segment V of the previous project (3-332-R). The reported relay harvest for Segment I was 5,747,953 clams, up 47.2% from the previous segment. Effort (4322 man-days) and catch per effort (1330 clams/man/day) were up 26% and 16.9%, respectively, in comparison

to the previous segment. The factors contributing to these increased figures are unknown, and speculation on the matter would be of little merit.

JOB NO. 4 OYSTER RESEARCH, INVENTORY, AND MANAGEMENT

The management of the Mullica River oyster beds is conducted with the objective of providing market size oysters for harvest while at the same time ensuring that the seed beds are not excessively depleted. To this end, the oyster beds were monitored to evaluate the oyster spawning season, seed oyster transplant program, bed condition, and oyster mortality.

The regular monitoring of the seed and market beds continued to determine setting success, mortality and overall bed condition. Numerous one bushel samples of oyster and shell were collected from each bed. Bed condition was evaluated in terms of the percentage of oyster within each sampled. Mortality was determined by calculating the percentage of gapers and boxes (paired valves) within a total sample of live oysters, gapers and boxes. Year class structure was determined by dividing samples into the age categories of spat, yearlings, and older oysters. The percentage of spat in each sample is an indication of the successful settlement and survival of young of the year oysters.

The regular sampling of the seed beds revealed both French's Point and Moss Point beds to be in relatively poor condition in comparison to 1984 figures. French's Point consisted of 65.8% oyster with a mean annual mortality of 34.6%. Moss Point data was nearly identical, being composed of 65.5% oyster with a mean annual mortality of 36.6 percent. In contrast, French's Point and Moss Point beds consisted of 85.3% and 94.8% oyster (respectively) in 1984 and had annual mortalities of three percent or less. Although

showing a decline in bed condition, both seed beds experienced a good set in 1985. The age composition of French's Point consisted of 59.9% spat with Moss Point consisting of 39.3% spat.

The Mullica River market beds, with infrequent natural set, greater disease and predation pressure, and periodic harvest, continued to exhibit a decline in bed condition since being planted during the transplant programs of 1979-1981. The annual sampling of the market beds indicated that the Fitney Bit bed was composed of only 16.8% oyster and had a total mortality of 46.1 percent. The Reef Bed consisted of virtually 100% shell as only nine live oysters were collected in nearly seven bushels of shell. The estimated mortality was 52.6%, although the sample size was minimal.

Samples of oysters collected from the seed and market beds were sent to the Rutgers Oyster Research Laboratory in Bivalve, New Jersey for histoligical examination. Sample analysis confirmed that the parasite Haplospordium nelsoni (MSX) is at least partly responsible for the high mortalities observed on all beds. In addition, the protistan parasite Perknsus marinus ("Dermo") was detected in three oysters collected from the Moss Point bed and was determined to have caused the death of one gaper examined. The extensive oyster mortalities experienced in the Mullica River estuary during Segment I were comparable to those experienced in Delaware Bay during the same period.

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ATTACHMENT A

ATTACHMENT A

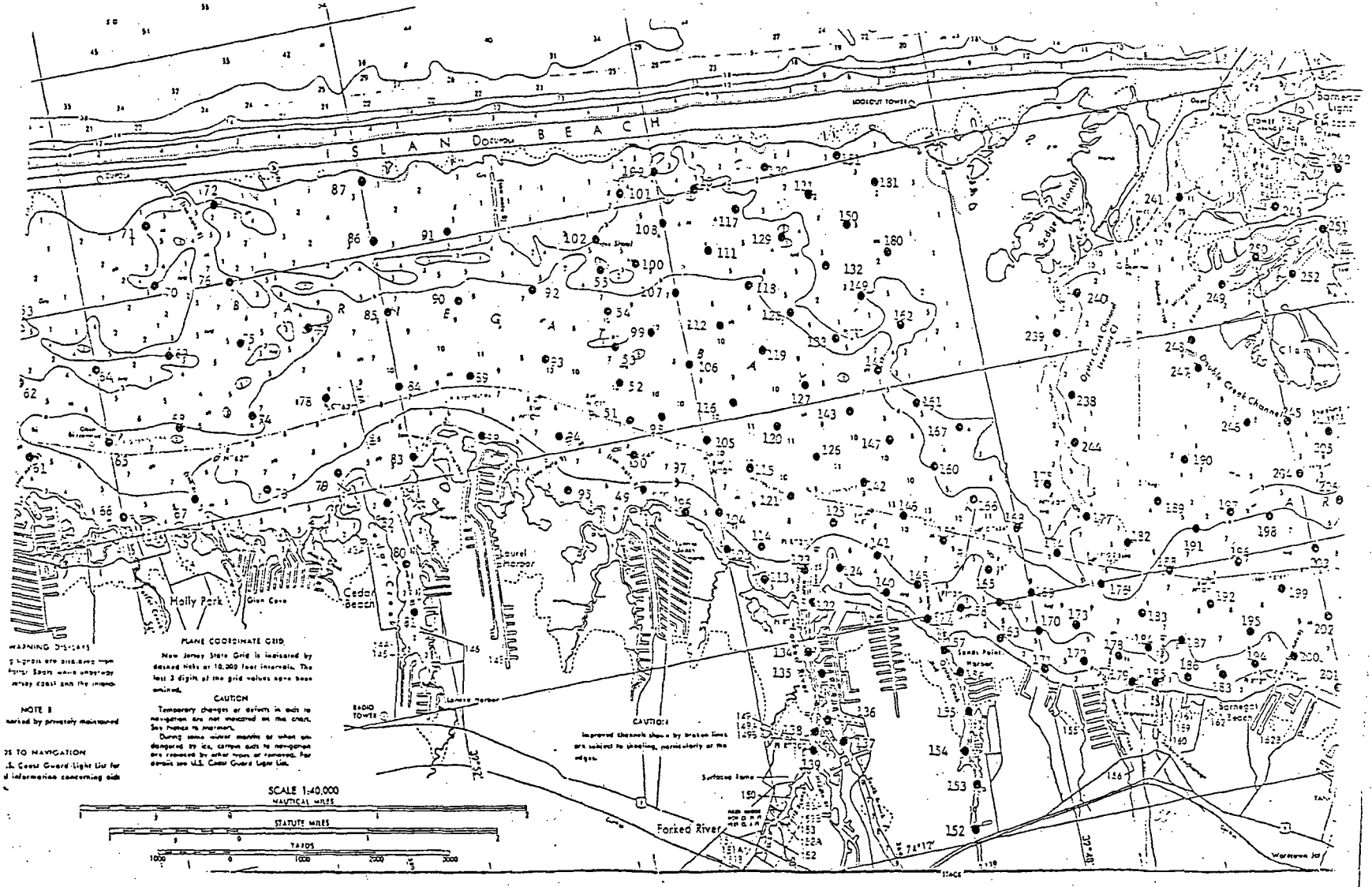
CONTENTS

ATTACHMENT A (cont.)

CONTENTS

SHELLFISH INVENTORY
BARNEGAT BAY
STATION LOCATION

FIGURE 1
SHELLFISH INVENTORY
BARNEGAT BAY
STATION LOCATION



SHELLFISH INVENTORY

BARNEGAT BAY

STATION LOCATION

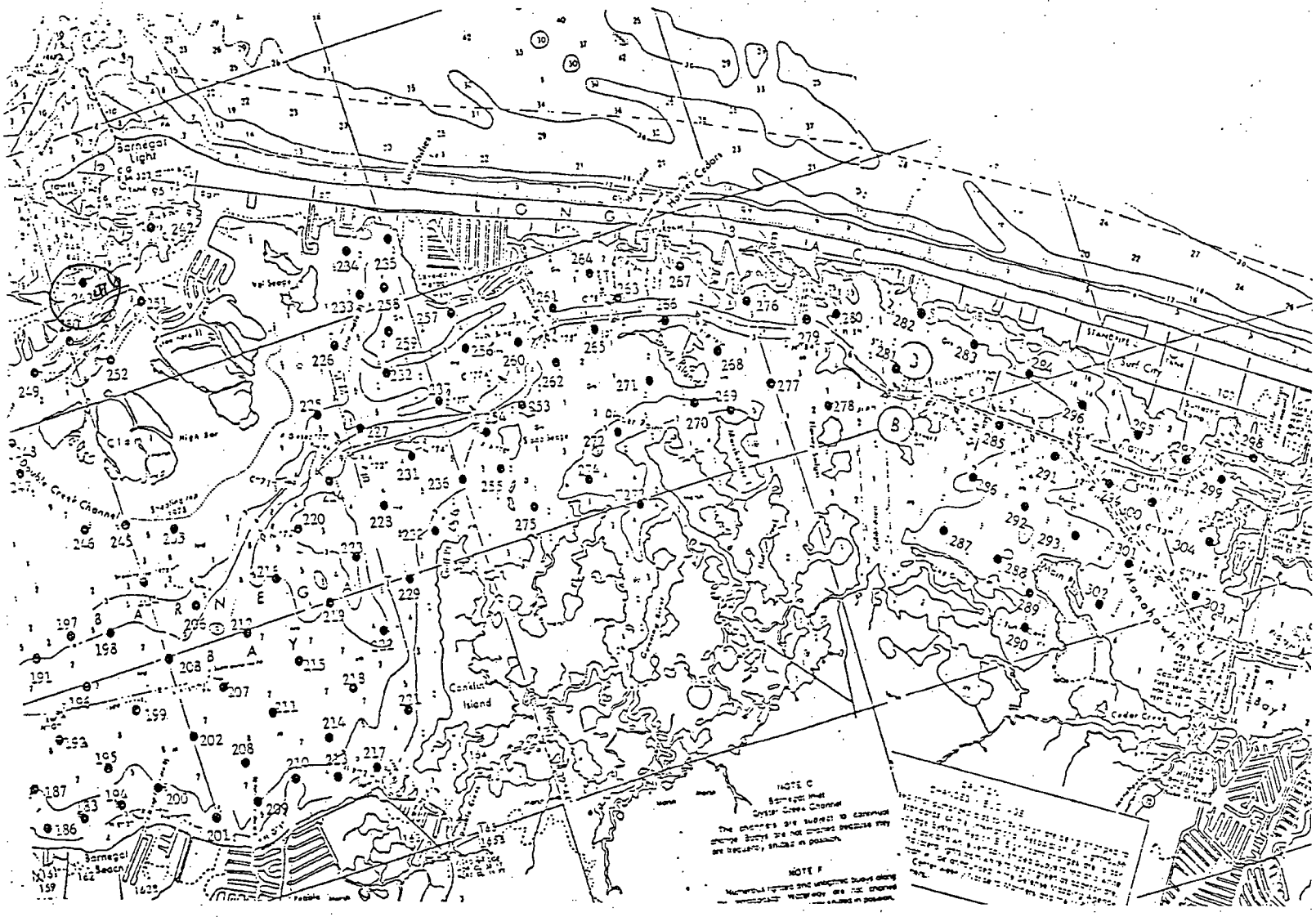
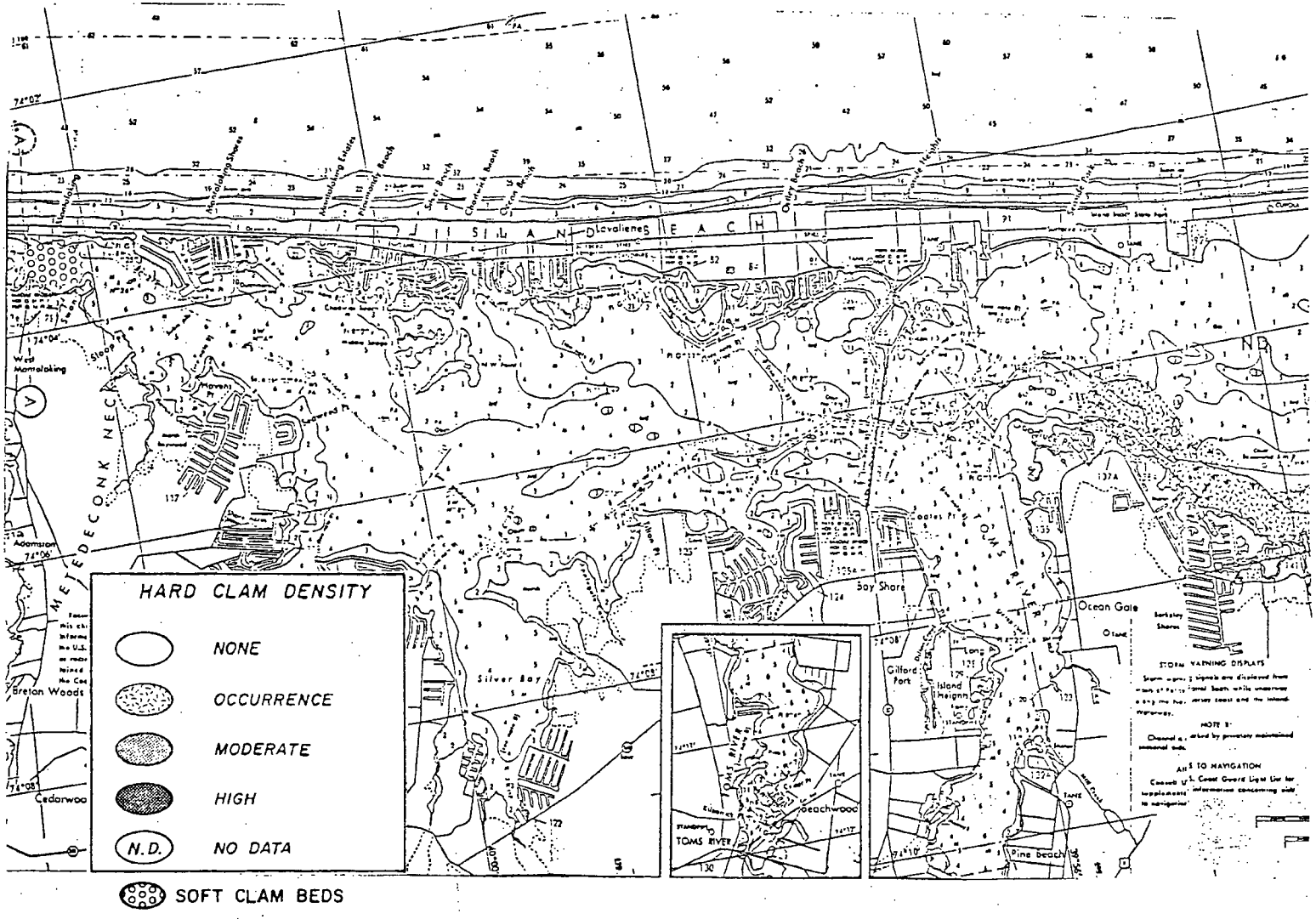


FIGURE 2
SHELLFISH INVENTORY
BARNEGAT BAY
DISTRIBUTION AND ABUNDANCE OF THE
HARD CLAM, MERCENARIA MERCENARIA



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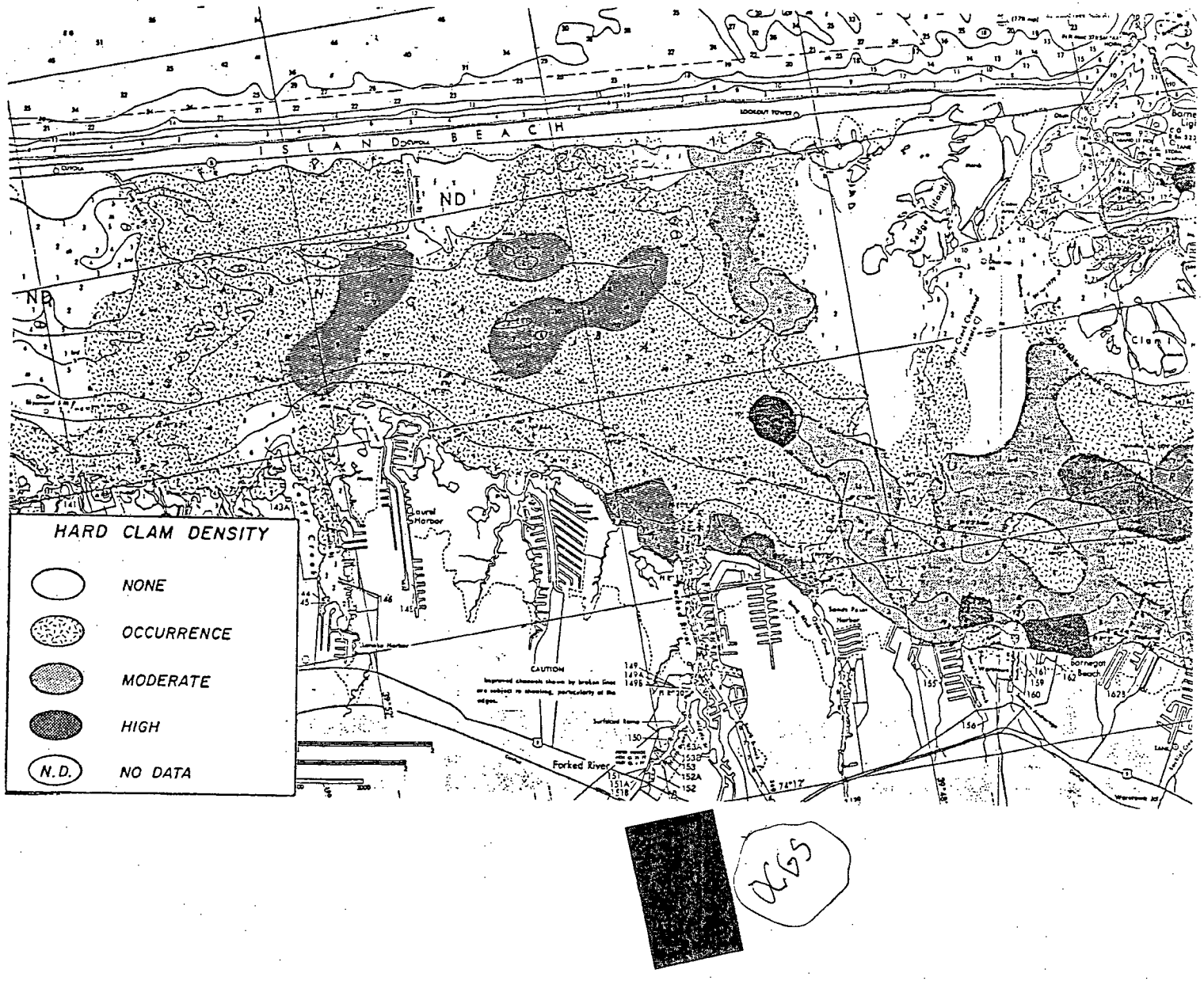
BARNEGAT BAY
DISTRIBUTION AND ABUNDANCE OF THE
HARD CLAM, MERCENARIA MERCENARIA



SHELLFISH INVENTORY

BARNEGAT BAY

DISTRIBUTION AND ABUNDANCE OF THE

HARD CLAM, MERCENARIA MERCENARIA

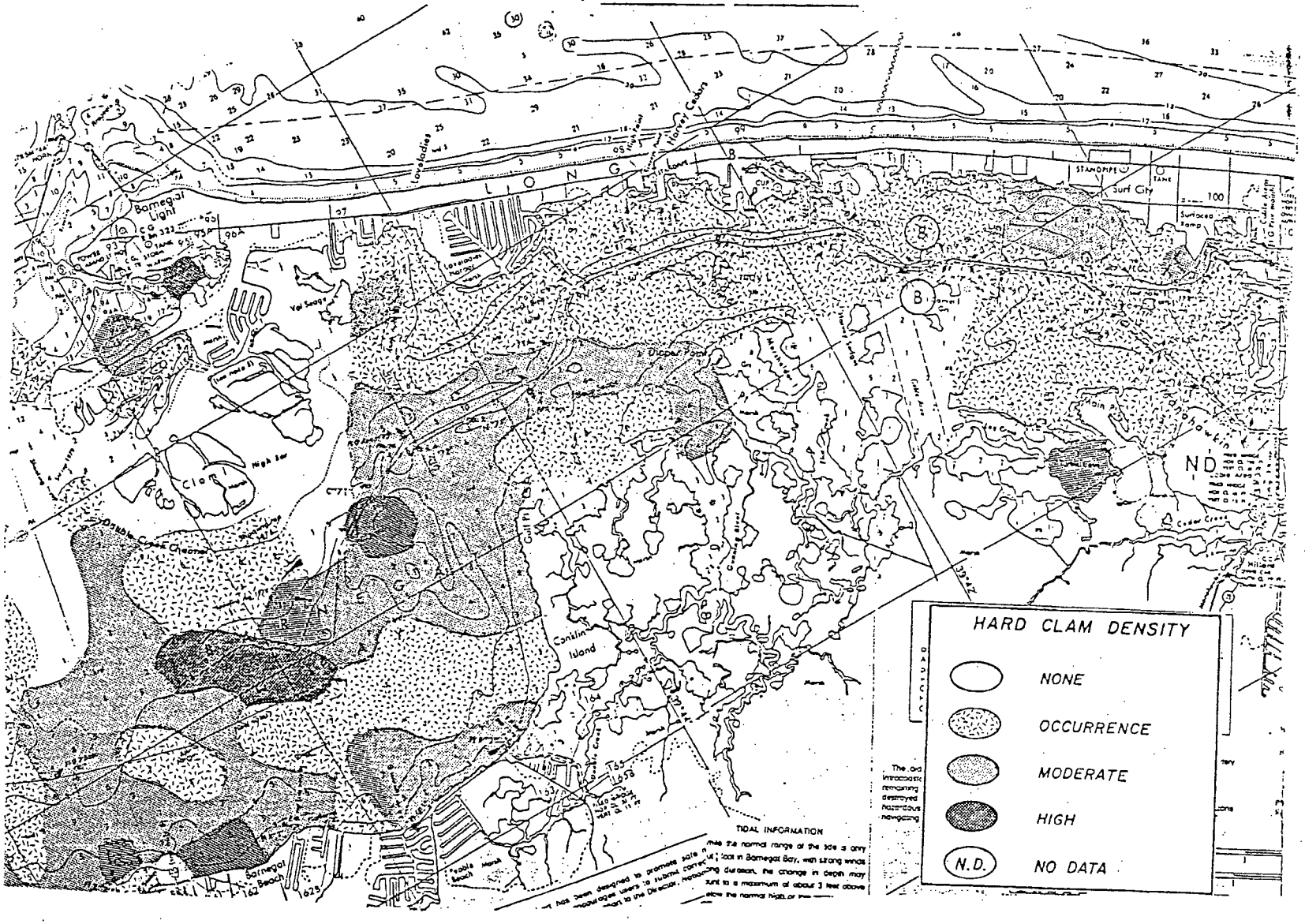
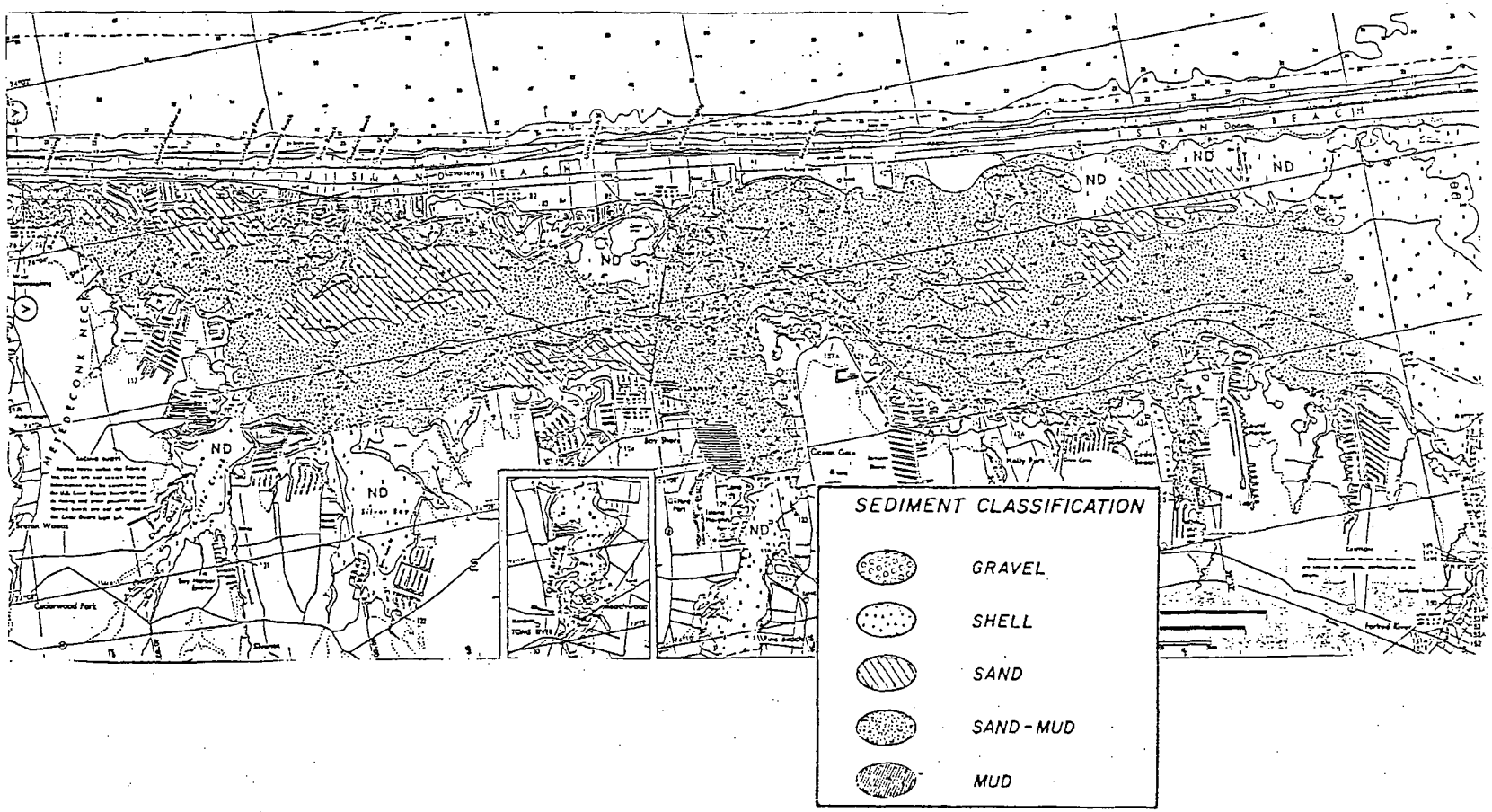
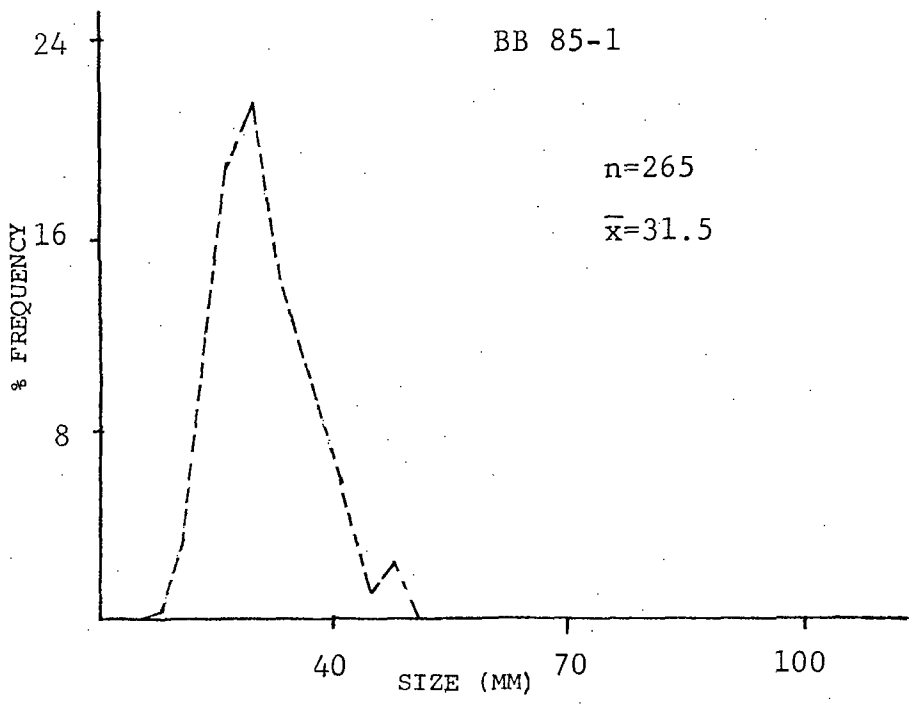


FIGURE 3
SHELLFISH INVENTORY
BARNEGAT BAY
SEDIMENT CLASSIFICATION



SIZE FREQUENCY DISTRIBUTION OF:
Mercenaria mercenaria ——
Mya arenaria ---



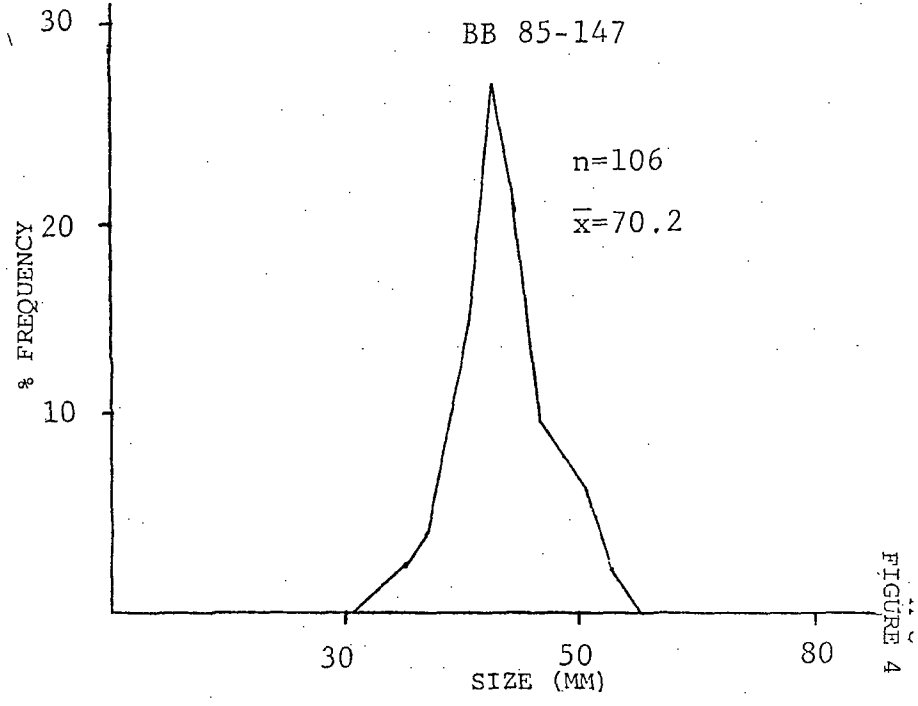
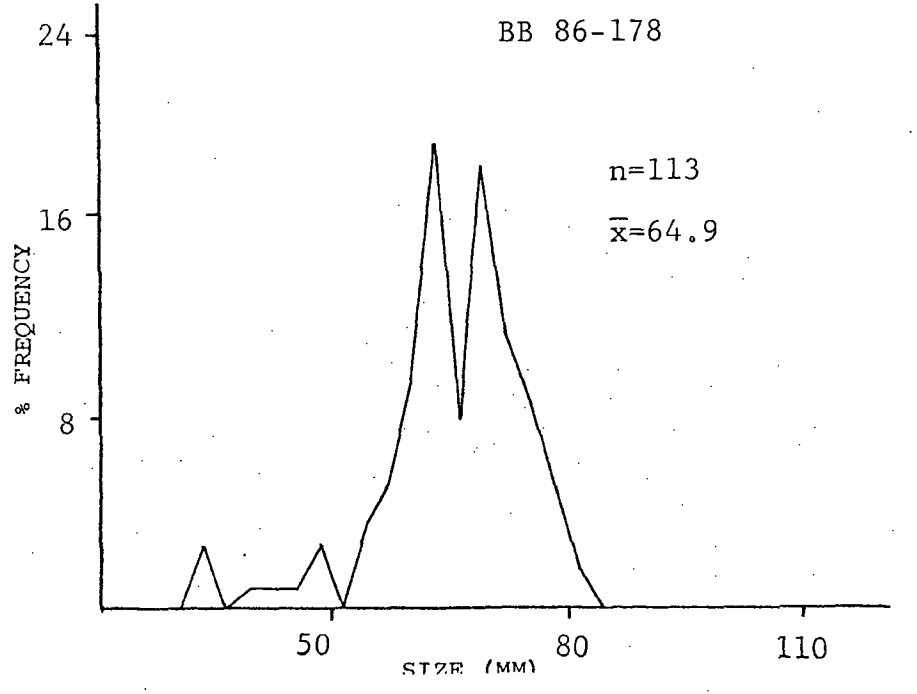
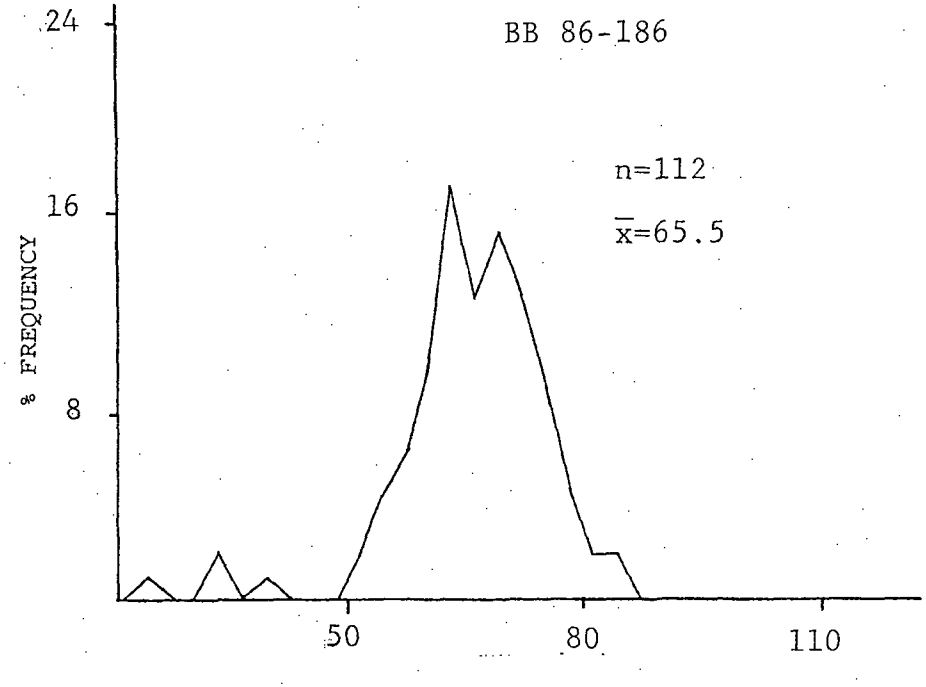
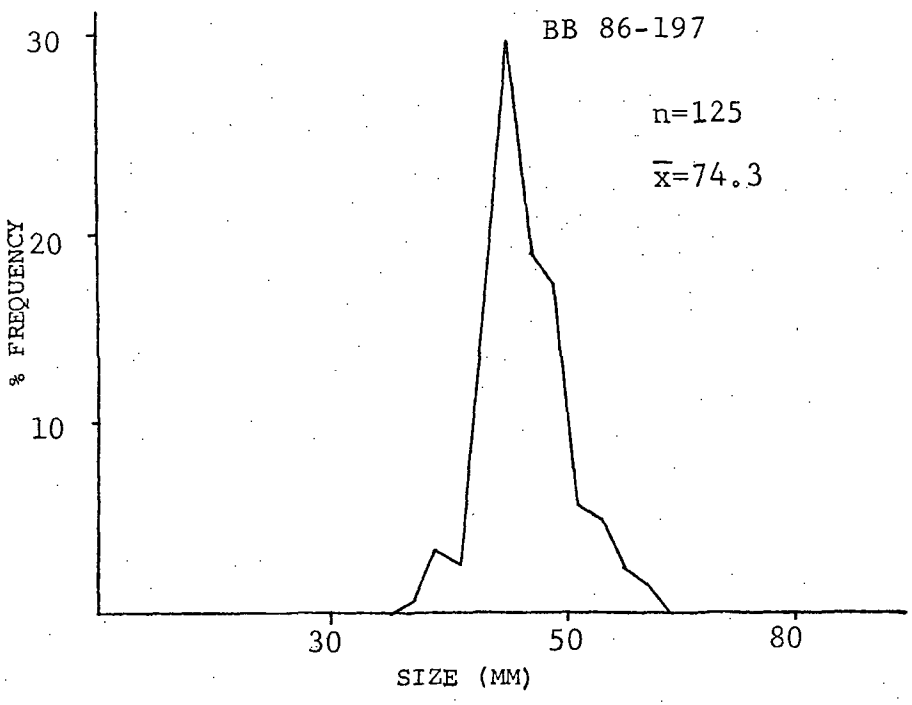


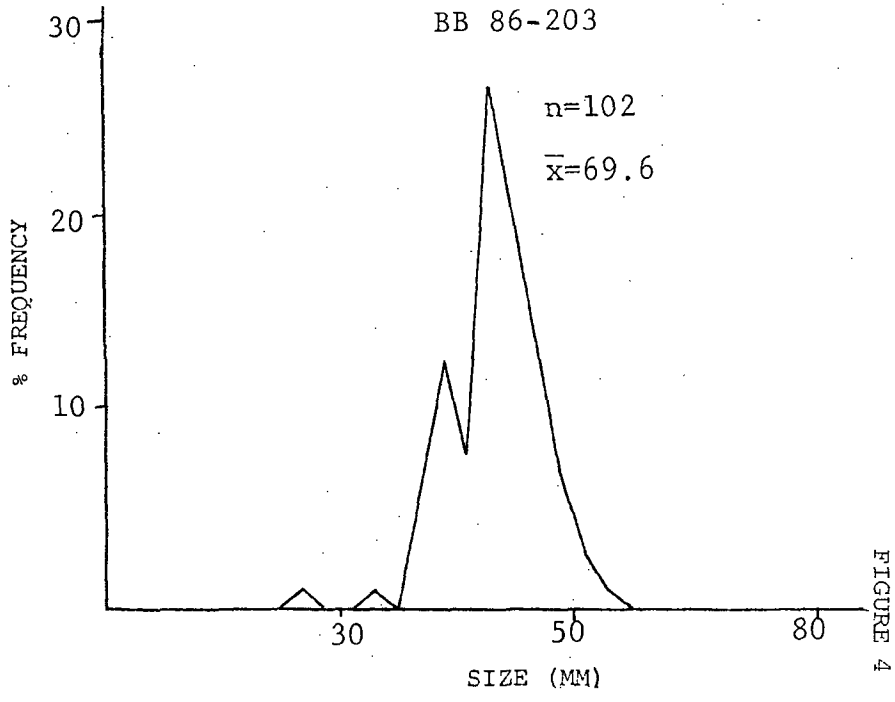
FIGURE 4





Mercenaria mercenaria
Mya arenaria





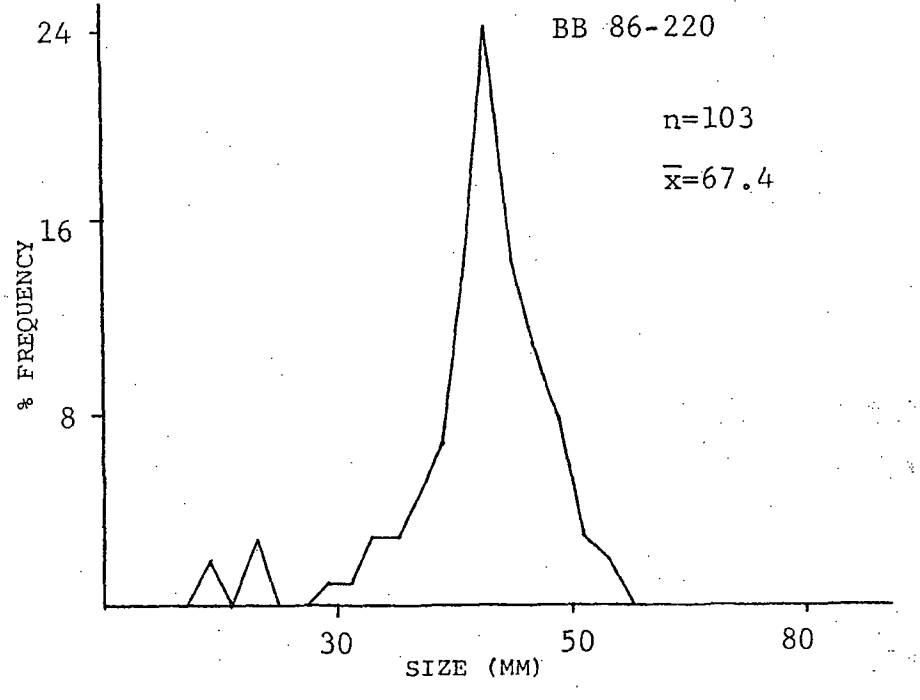


FIGURE 4

FIGURE 5

1985 SHELLFISH INVENTORY
ST. GEORGE'S THOROFARE
STATION LOCATIONS

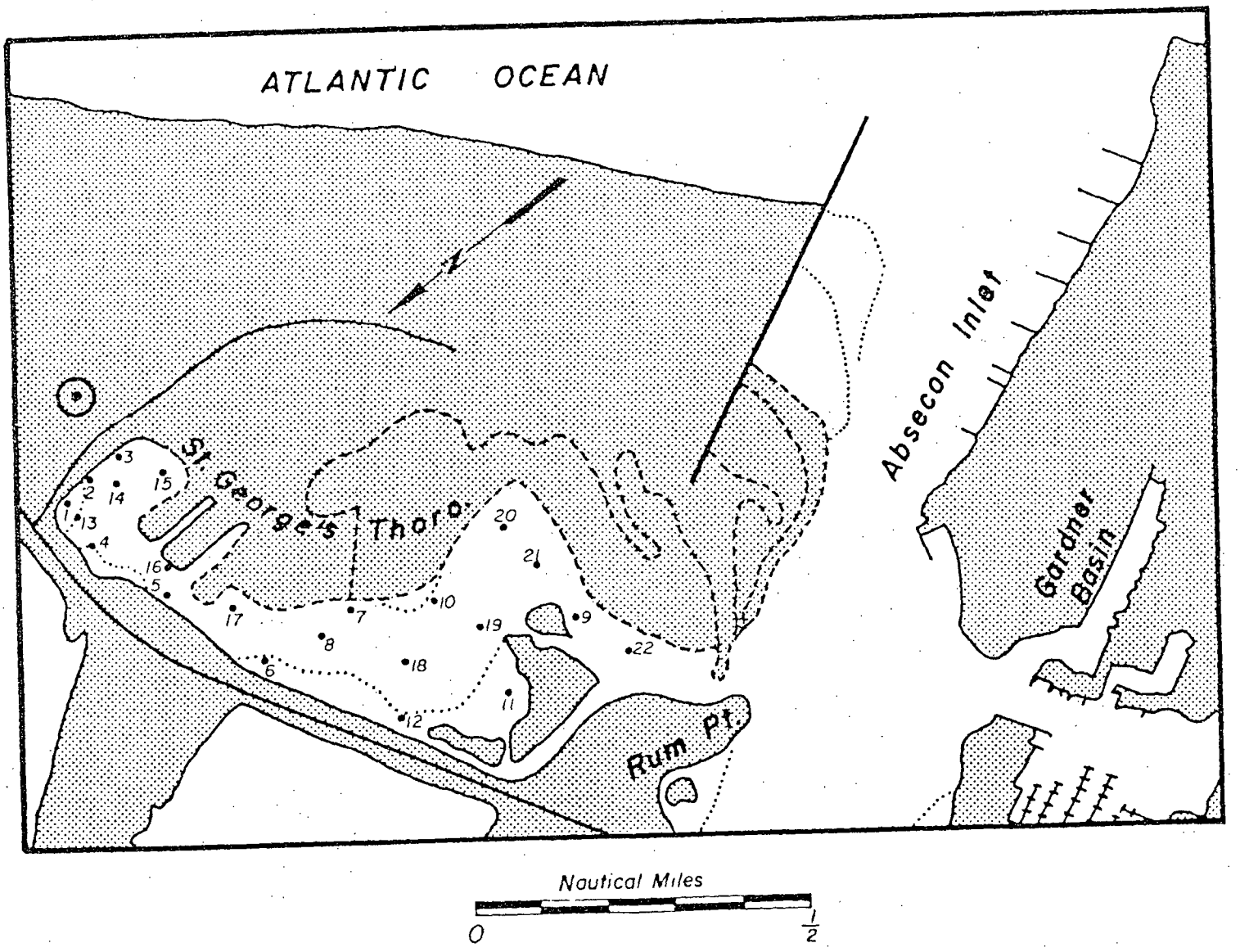


FIGURE 6

1985 SHELLFISH INVENTORY
ST. GEORGE'S THOROFARE
DISTRIBUTION AND ABUNDANCE OF THE HARD CLAM, *Mercenaria mercenaria*

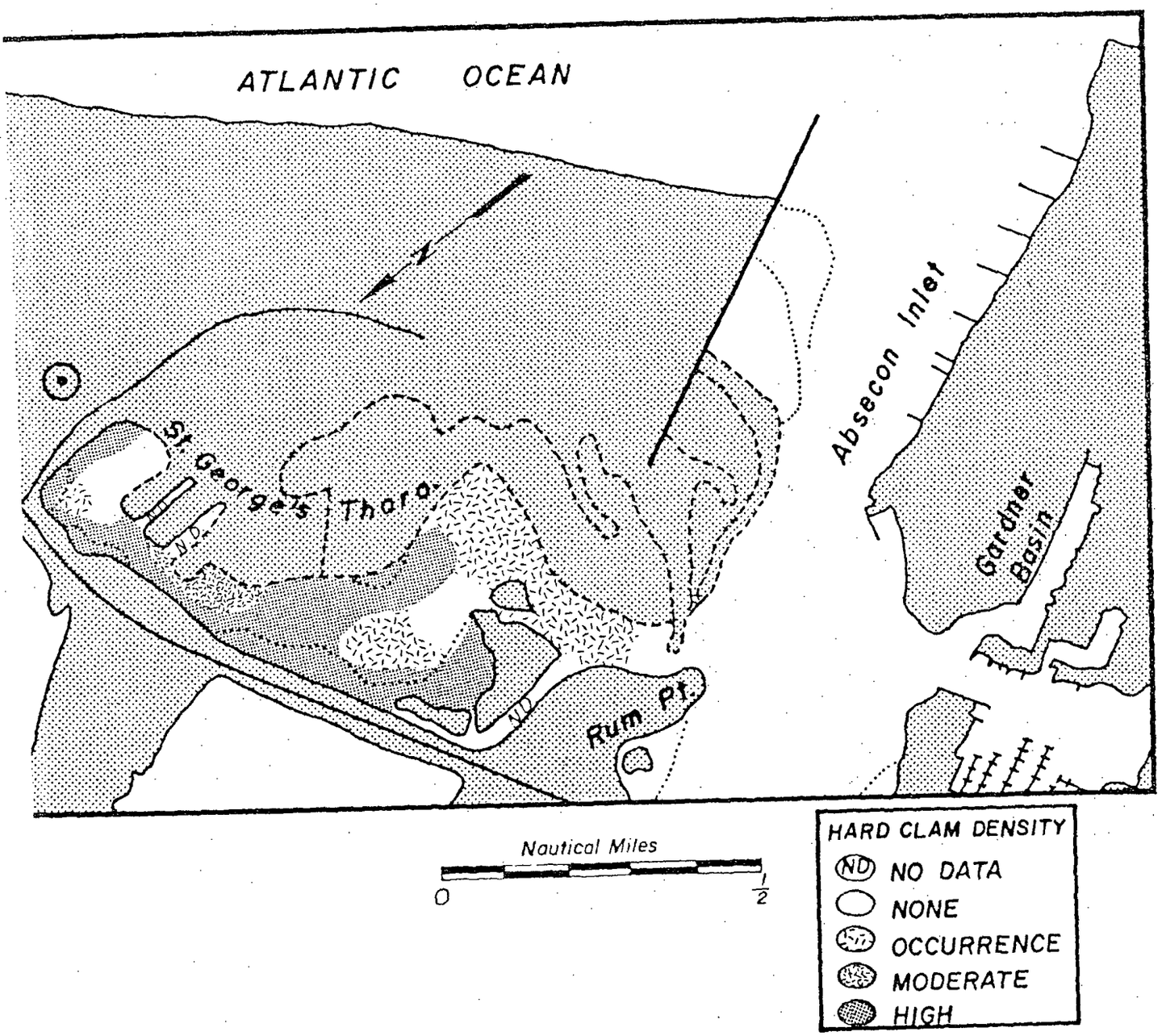
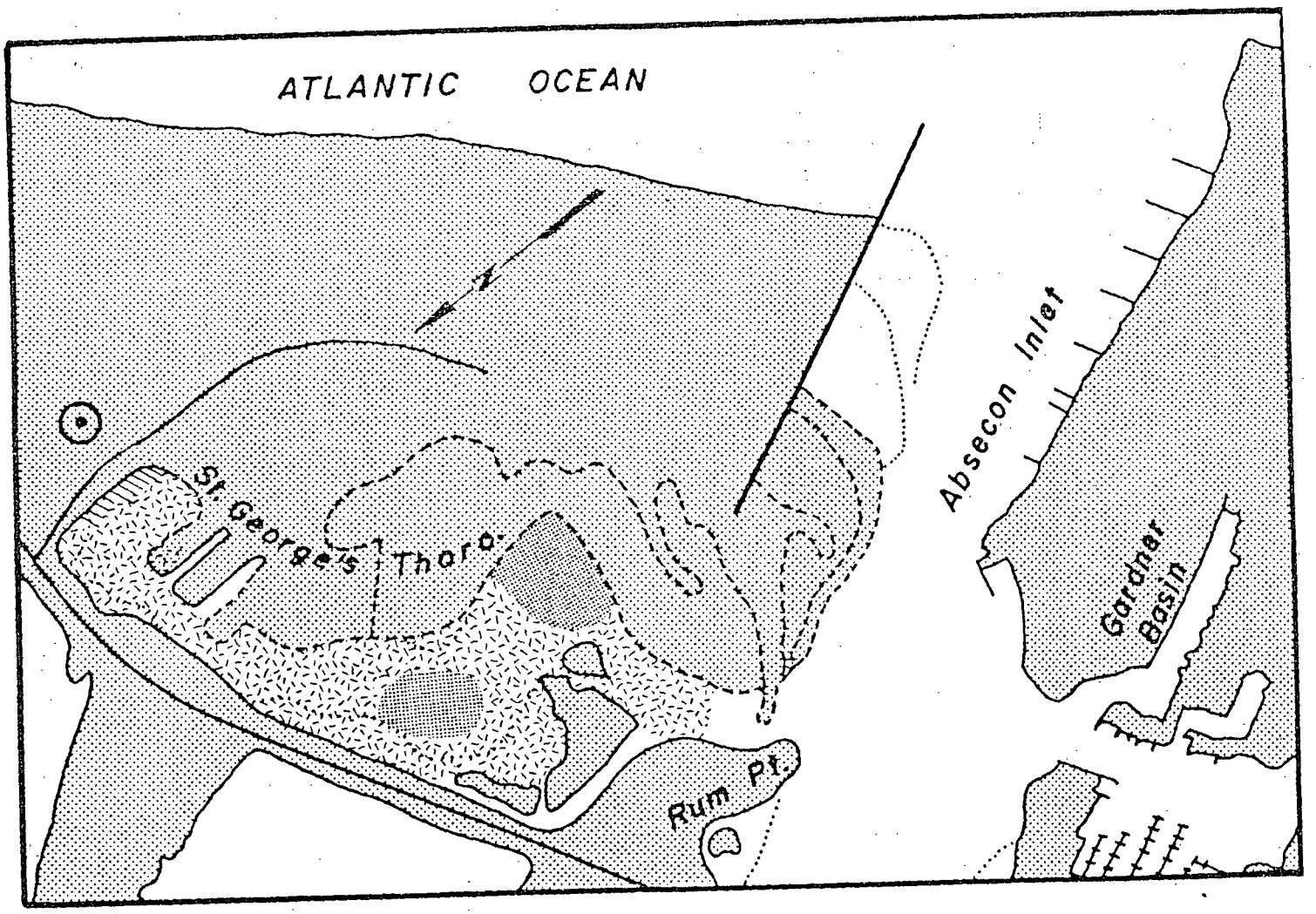


FIGURE 7-

1985 SHELLFISH INVENTORY
ST. GEORGE'S THOROFARE
SEDIMENT CLASSIFICATION



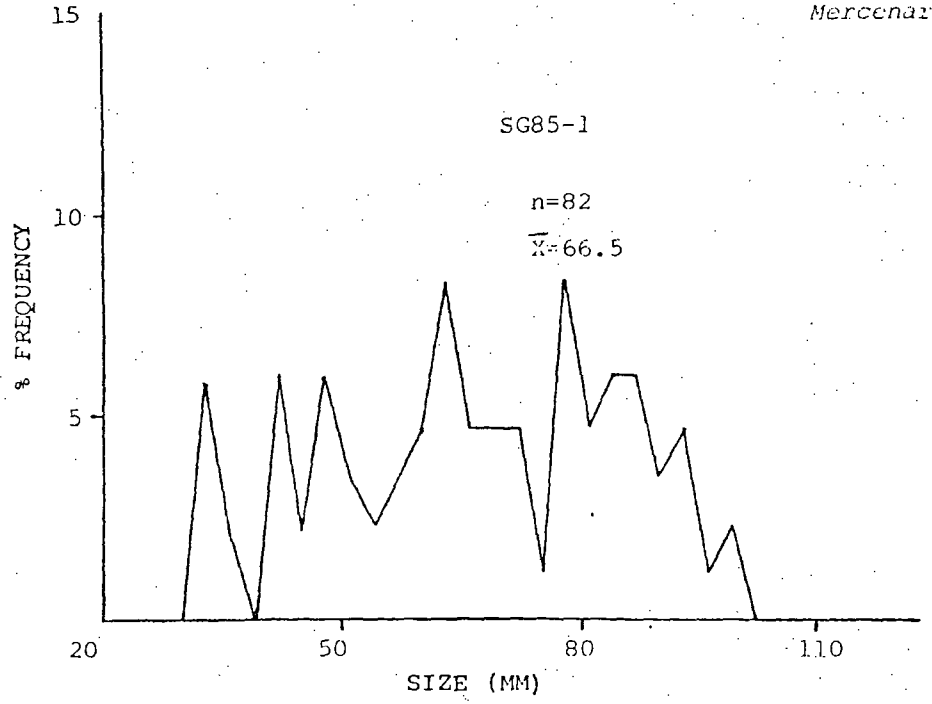
Nautical Miles

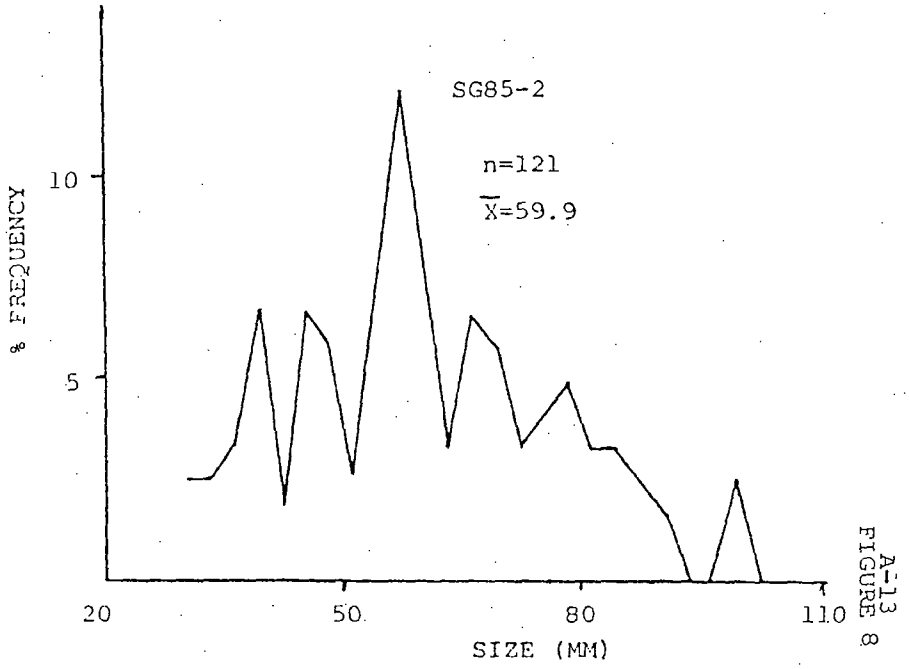
0 1/2

Sediment Classification

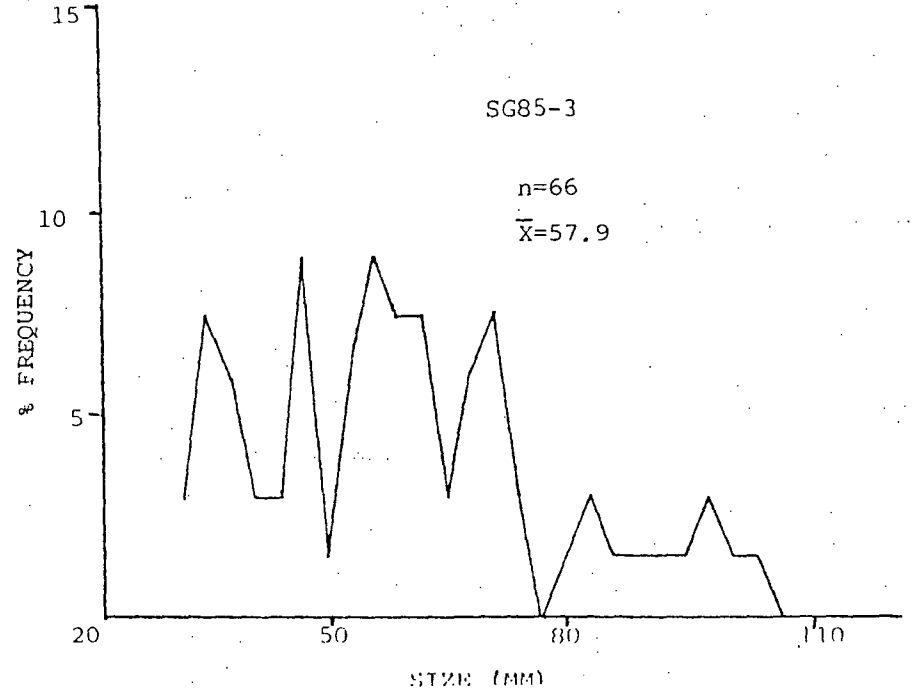
- Sand
- Sand Mud Mixture
- Mud

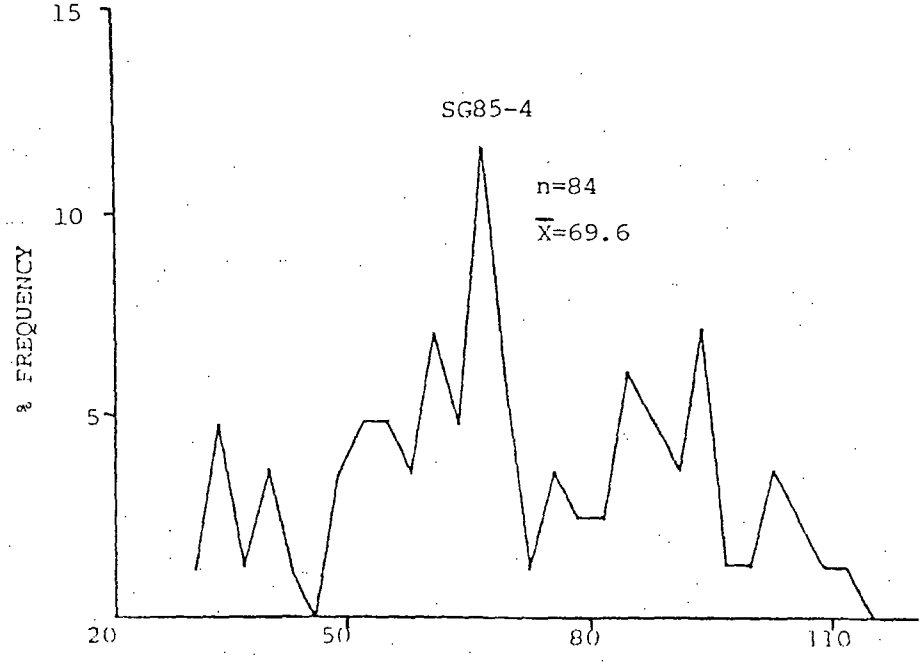
SIZE FREQUENCY DISTRIBUTIONS OF:
Mercenaria mercenaria



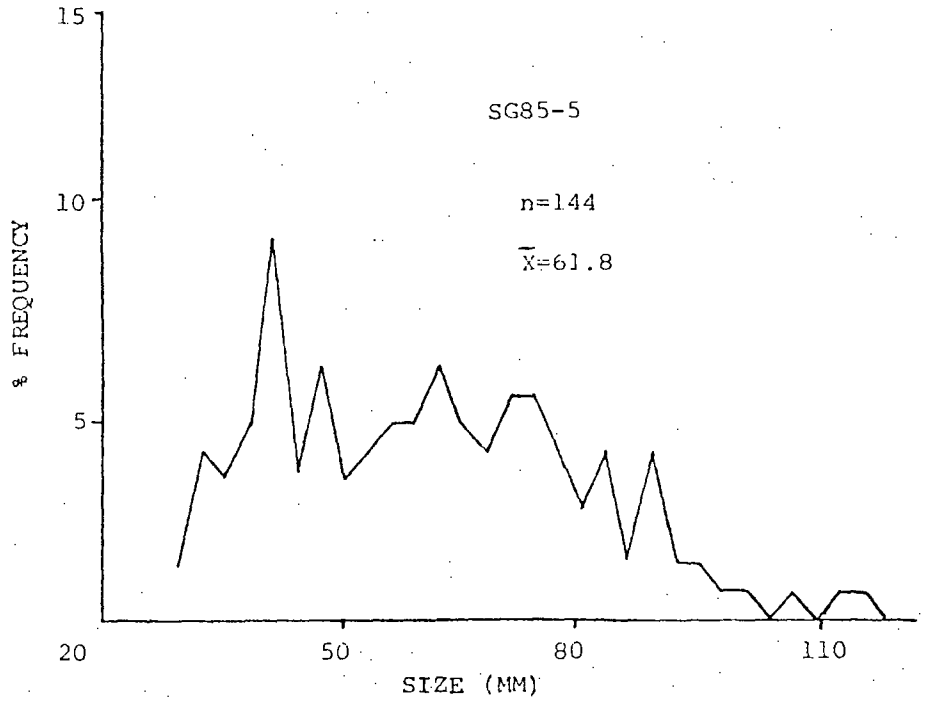


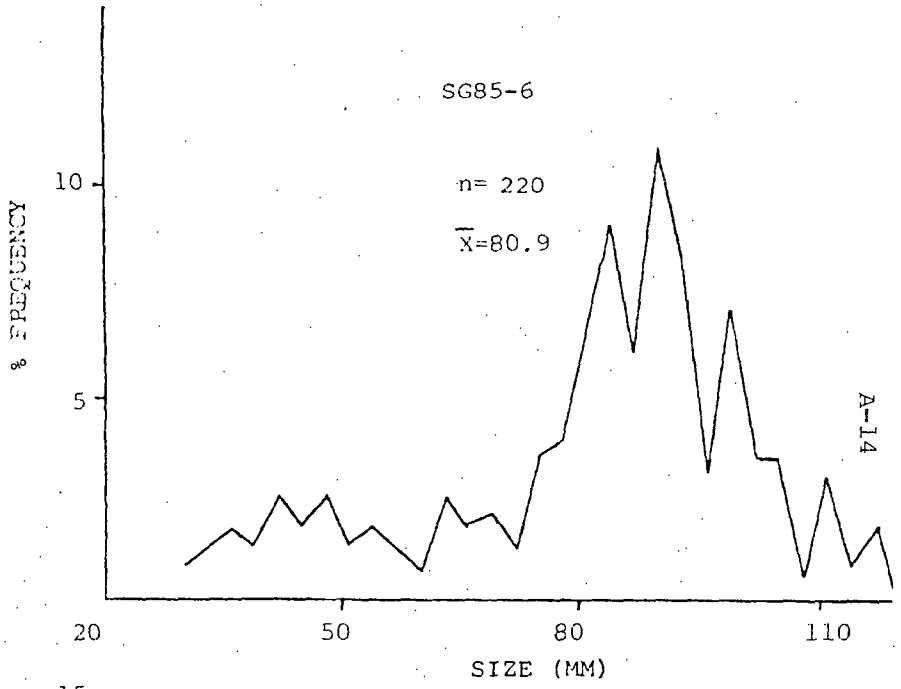
A-13
FIGURE 8

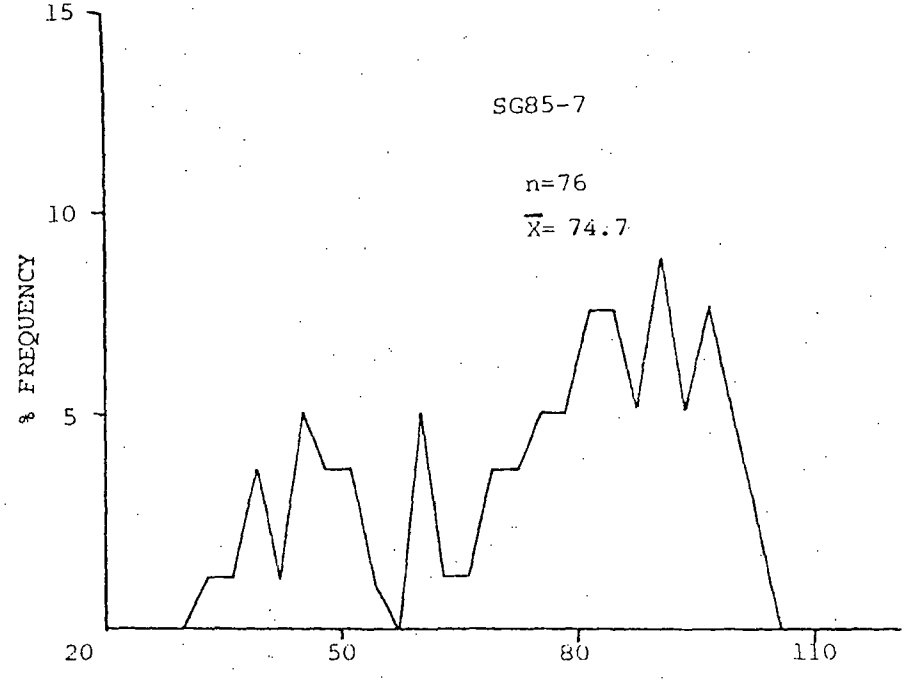




SIZE FREQUENCY DISTRIBUTIONS OF:
Mercenaria mercenaria







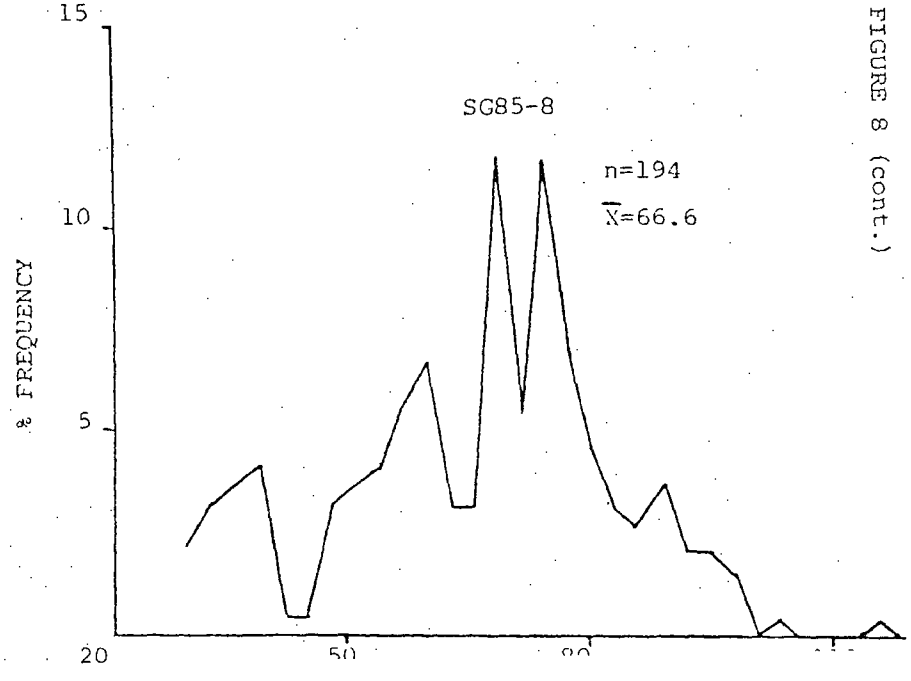


FIGURE 8 (cont.)

SIZE FREQUENCY DISTRIBUTIONS OF:
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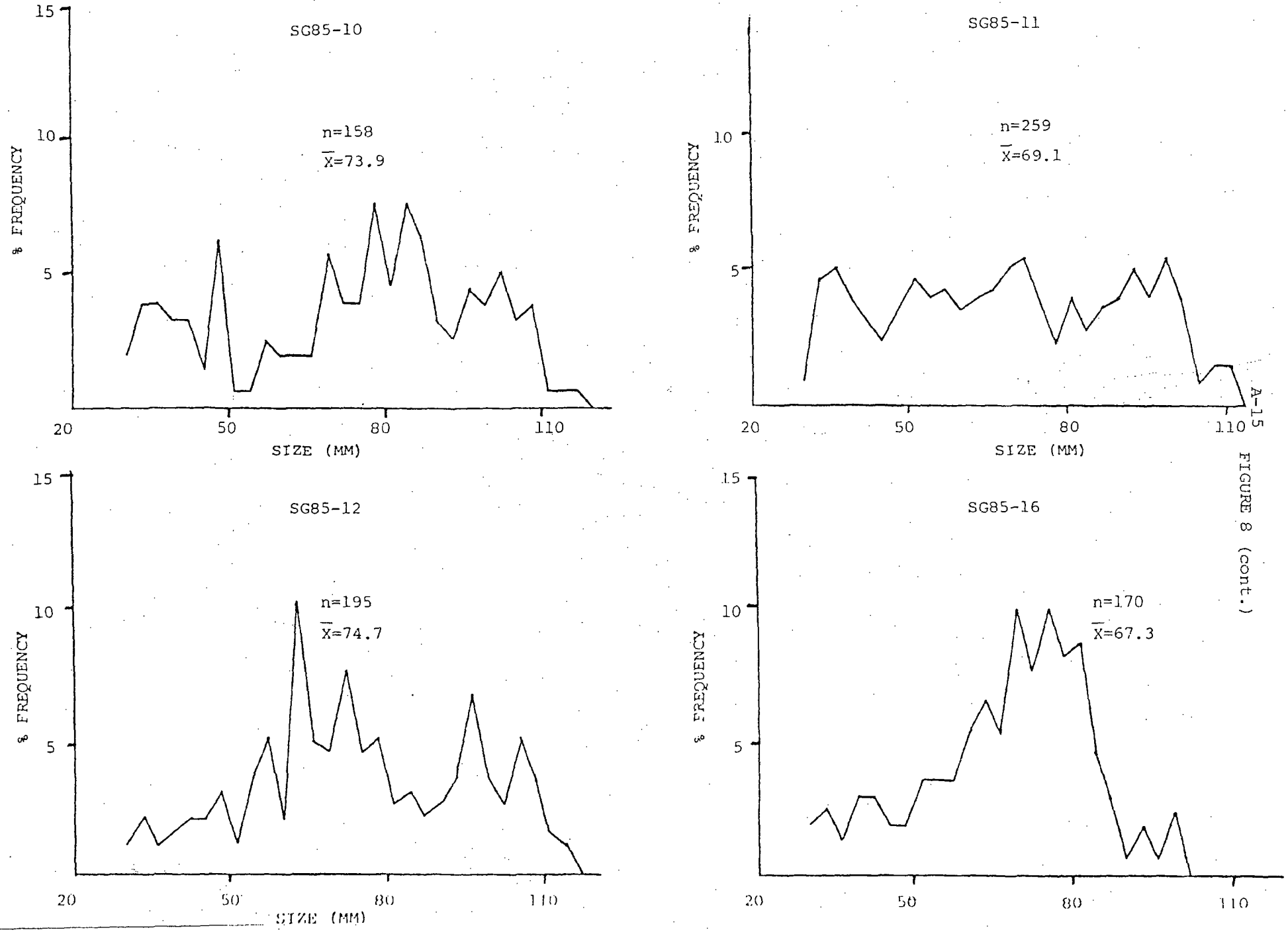

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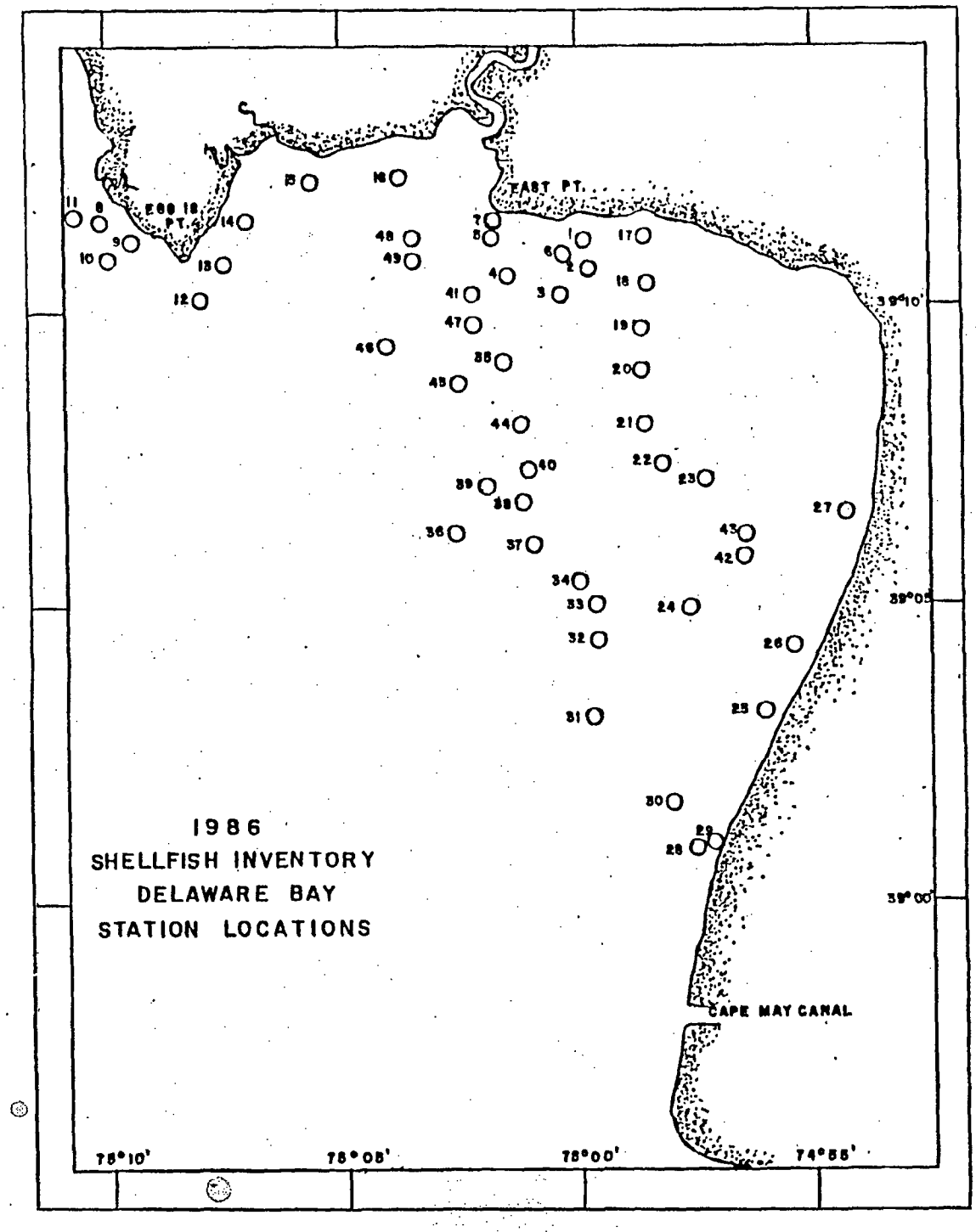

1986
SHELLFISH INVENTORY
DELAWARE BAY
STATION LOCATIONS
EAST PT.
EGG IS. PT.
CAPE MAY CANAL
39°10'
39°05'
39°00'
75°10'
75°05'
75°00'
74°55'

Figure 9

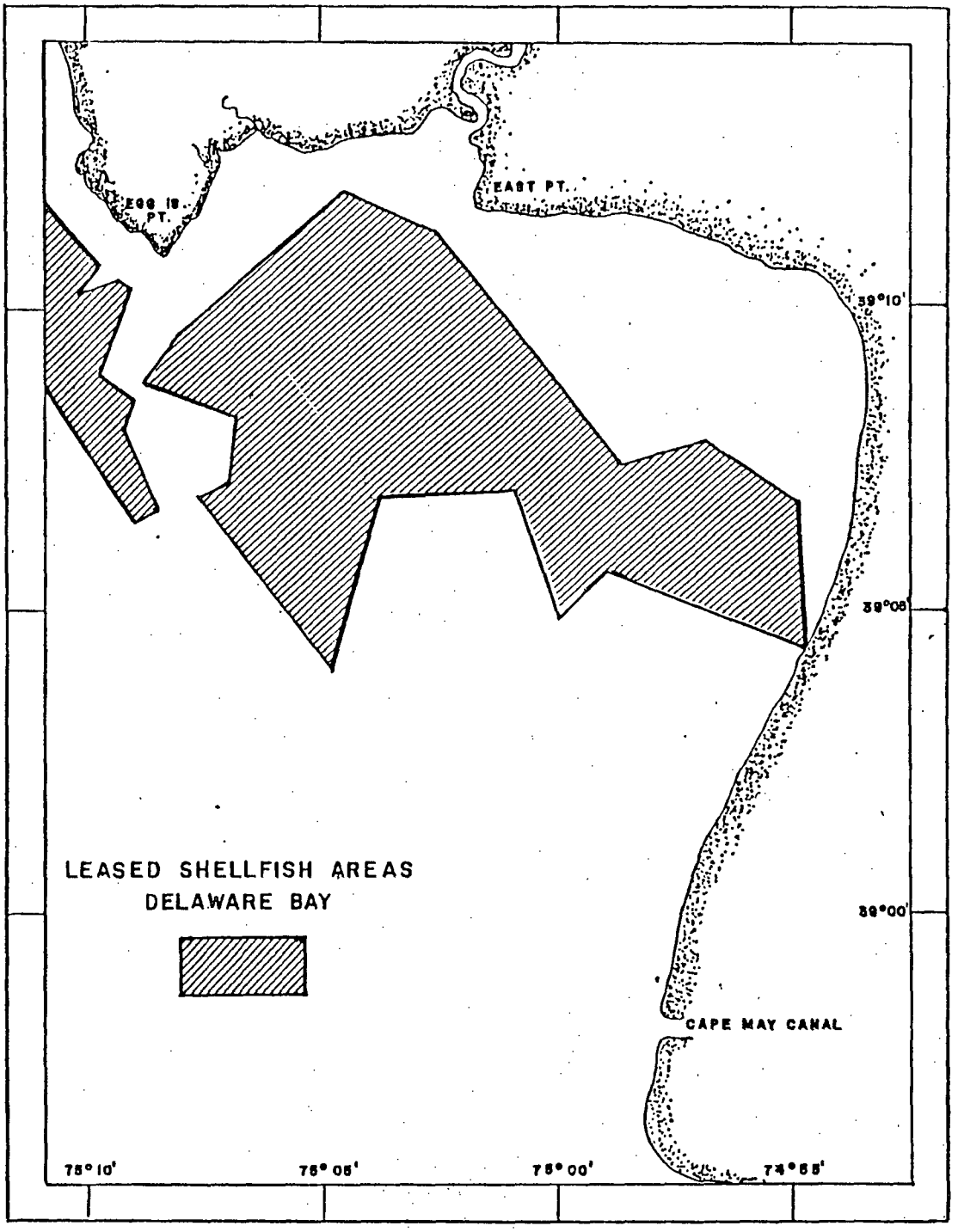
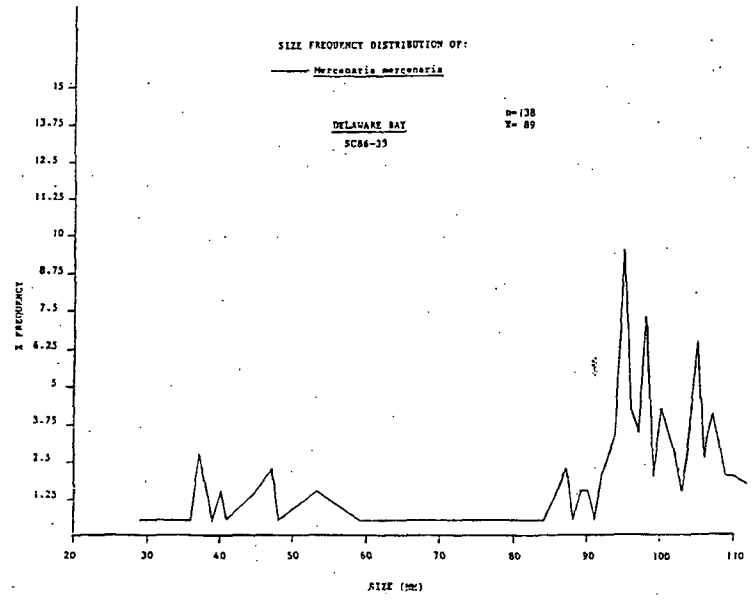

EGG IS. PT.
EAST PT.
39°10'
39°05'
39°00'
LEASED SHELLFISH AREAS
DELAWARE BAY
CAPE MAY CANAL
75° 10'
75° 05'
75° 00'
74° 55'

Figure 10


SIZE FREQUENCY DISTRIBUTION OF:
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DELAWARE BAY
SC86-35
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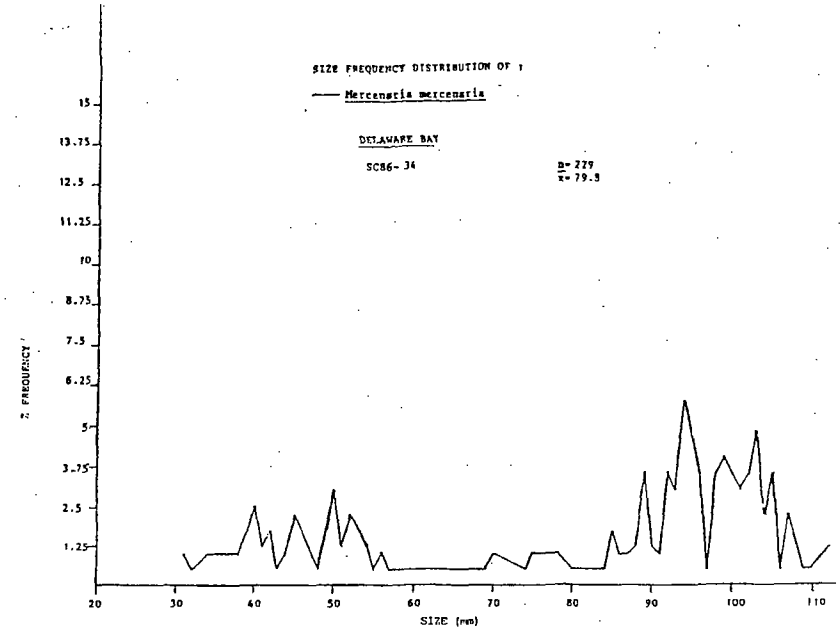
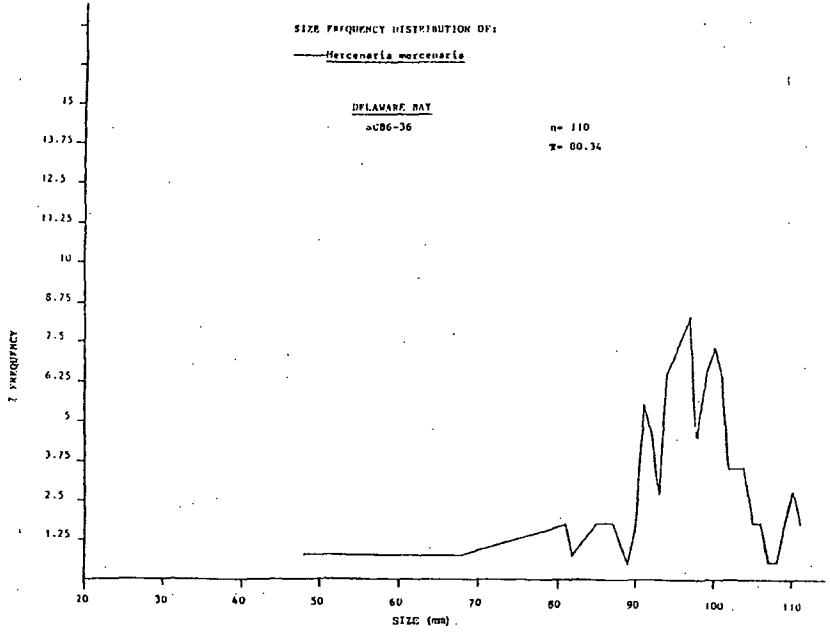
x= 89
% FREQUENCY
SIZE (mm)


SIZE FREQUENCY DISTRIBUTION OF
Mercenaria mercenaria
DELAWARE BAY
SC86-34
n= 229
x= 79.9
% FREQUENCY
SIZE (mm)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DELAWARE BAY
SC86-36
n= 110
x= 80.34
% FREQUENCY
SIZE (mm)

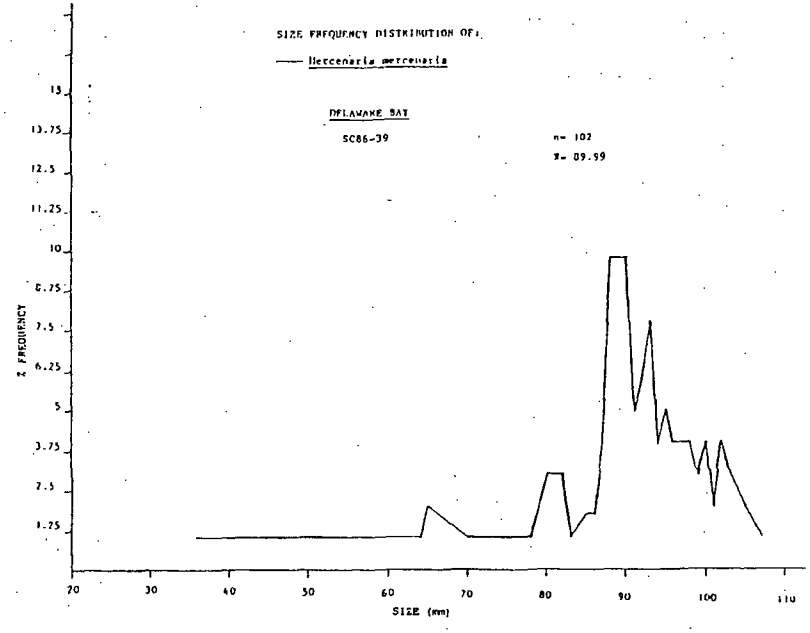

SIZE FREQUENCY DISTRIBUTION OF:
Mercenaria mercenaria
DELAWARE BAY
SC86-39
n= 102
x= 89.59
% FREQUENCY
SIZE (mm)

FIGURE 11

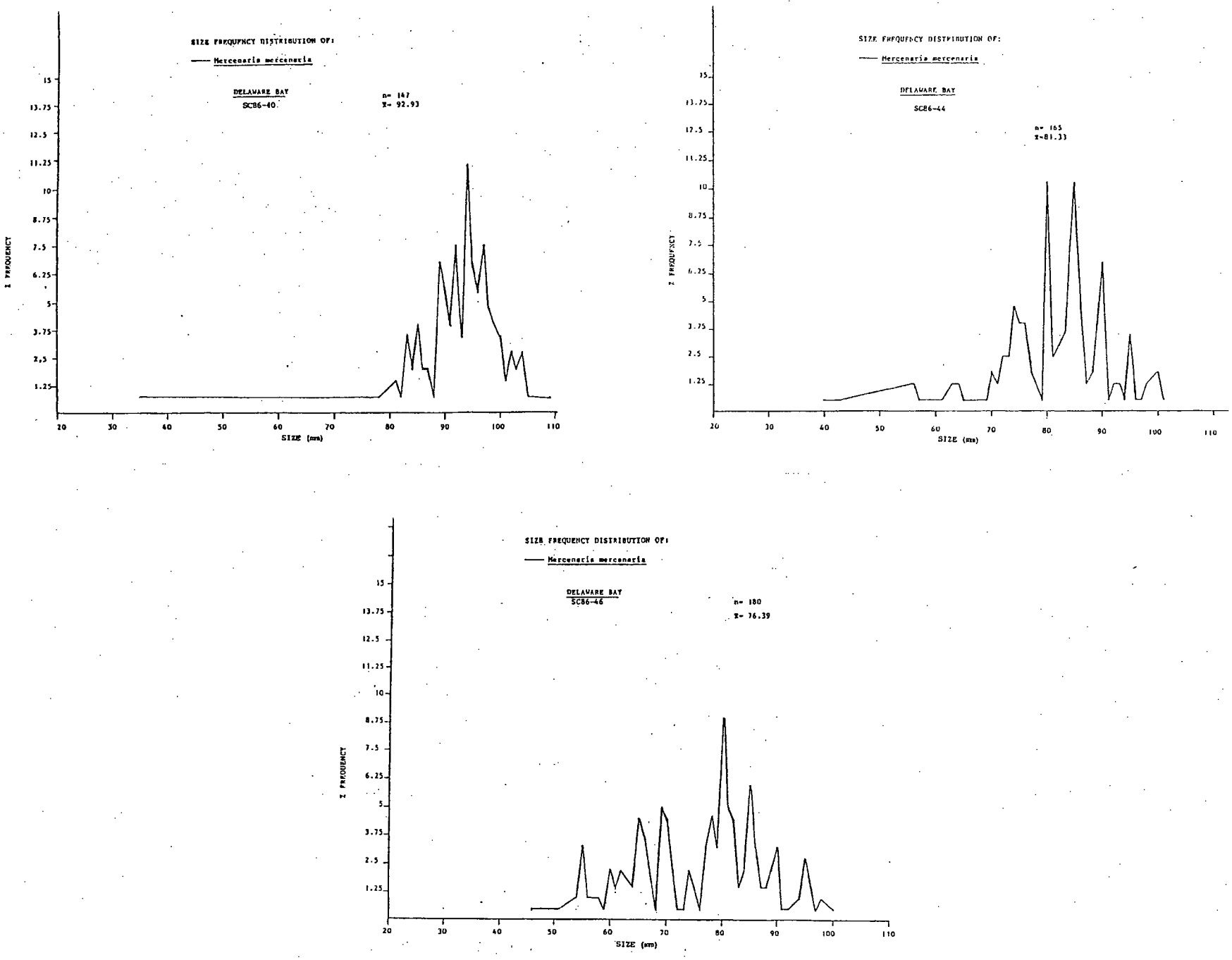

SIZE FREQUENCY DISTRIBUTION OF:
Mercenaria mercenaria
DELAWARE BAY
SCB6-40
n= 147
x= 92.93
SIZE FREQUENCY DISTRIBUTION OF:
Mercenaria mercenaria
DELAWARE BAY
SCB6-44
n= 165
x=81.33
SIZE FREQUENCY DISTRIBUTION OF:
Mercenaria mercenaria
DELAWARE BAY
SCB6-46
n= 180
x= 76.39
% FREQUENCY
SIZE (mm)

FIGURE 11

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-1	BB85-2	BB85-3	BB85-4	BB85-5
LATITUDE N			40°02.25'	40°02.00'	40°01.75'	40°01.50'	40°01.50'
LONGITUDE W			74°03.36'	74°03.36'	74°03.68'	74°04.00'	74°04.22'
COLLECTION DATE			5/22/85	5/22/85	5/22/85	5/22/85	5/22/85
TIDE AND HOURS			High + 4.0	High + 5.0	High + 5.5	Low + 0.0	Low + 0.0
TEMPERATURE °C	AIR		12.0	12.0	18.0	19.0	21.0
	WATER	S	18.2	ND	ND	ND	18.4
		B	18.0	ND	ND	ND	18.4
D.O. (ppm)	S		8.1	ND	ND	ND	9.3
	B		8.3	ND	ND	ND	9.4
SALINITY (ppt)	S		20.0	ND	ND	ND	20.0
	B		20.0	ND	ND	ND	20.0
pH	S		7.7	ND	ND	ND	7.7
	B		7.7	ND	ND	ND	7.7
DEPTH (ft)			5'	6'	5'	6'	7'
SUBSTRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		94.8	81.4	92.2	84.4	60.2
	% MUD		5.2	18.6	7.8	15.6	39.8
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.0	0.0	0.0	0.0	0.0
% COMMERCIAL SIZES		SL	ND	ND	ND	ND	ND
		LN	ND	ND	ND	ND	ND
		CS	ND	ND	ND	ND	ND
		CH	ND	ND	ND	ND	ND
NUMBER CLAMS COLLECTED			0.0	0.0	0.0	0.0	0.0
SIZE RANGE (mm)			ND	ND	ND	ND	ND
MEAN SIZE (mm)			ND	ND	ND	ND	ND
% MORTALITY			0.0	0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-6	BB85-7	BB85-8	BB85-9	BB85-10
ITUDE N			40°01.75'	40°01.75'	40°02.25'	40°01.25'	40°01.25'
GITUDE W			74°04.32'	74°04.00'	74°03.68'	74°04.32'	74°04.64'
LECTION DATE			5/22/85	5/22/85	5/22/85	7/9/85	7/9/85
E AND HOURS			Low +1	Low + 1	Low + 1	High + 1	High + 4.5
PERATURE	AIR		21.0	21.0	21.0	23.0	24.0
°C	WATER	S	ND	ND	ND	22.8	ND
		B	ND	ND	ND	23.5	ND
.O.	S		ND	ND	ND	7.1	ND
ppm)	B		ND	ND	ND	6.6	ND
INITY	S		ND	ND	ND	20.5	ND
ppt)	B		ND	ND	ND	20.5	ND
I	S		ND	ND	ND	7.7	ND
	B		ND	ND	ND	7.7	ND
H (ft)			6'	6'	5'	7'	5'
STRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.2
	% SAND		38.0	49.0	14.8	38.6	35.8
	% MUD		62.0	51.0	85.2	61.4	64.0
IMATED HARD CLAM ITY (#/ft^2)			0.0	0.0	0.0	0.0	0.0
%	SL		ND	ND	ND	ND	ND
MERCIAL	LN		ND	ND	ND	ND	ND
ZES	CS		ND	ND	ND	ND	ND
	CH		ND	ND	ND	ND	ND
ER CLAMS COLLECTED			0.0	0.0	0.0	0.0	0.0
RANGE (mm)			ND	ND	ND	ND	ND
ZE (mm)			ND	ND	ND	ND	ND
RTALITY			0.0	0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-11	BB85-12	BB85-13	BB85-14	BB85-15
LATITUDE N			40°01.00'	40°00.50'	40°00.00'	40°01.00'	40°00.50'
LONGITUDE W			74°04.64'	74°04.64'	74°04.64'	74°04.00'	74°04.00'
COLLECTION DATE			7/9/85	7/9/85	7/9/85	7/22/85	7/22/85
TIDE AND HOURS			High + 5.0	High + 5.5	Low + 0.0	Low + 3.5	Low + 4
TEMPERATURE	AIR		24.0	26.0	26.0	25.0	25.5
°C	WATER	S	ND	ND	ND	24.9	ND
		B	ND	ND	ND	24.9	ND
D.O.	S		ND	ND	ND	6.8	ND
(ppm)	B		ND	ND	ND	6.7	ND
SALINITY	S		ND	ND	ND	20.0	ND
(ppt)	B		ND	ND	ND	20.0	ND
pH	S		ND	ND	ND	8.1	ND
	B		ND	ND	ND	8.1	ND
DEPTH (ft)			6'	8'	6'	5'	5'
SUBSTRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		36.6	55.6	87.0	93.2	92.4
	% MUD		63.4	44.4	13.0	6.8	7.6
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.0	0.0	0.0	0.0	0.0
%	SL		ND	ND	ND	ND	ND
COMMERCIAL	LN		ND	ND	ND	ND	ND
SIZES	CS		ND	ND	ND	ND	ND
	CH		ND	ND	ND	ND	ND
NUMBER CLAMS COLLECTED			0.0	0.0	0.0	0.0	0.0
SIZE RANGE (mm)			ND	ND	ND	ND	ND
MEAN SIZE (mm)			ND	ND	ND	ND	ND
% MORTALITY				0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-16	BB85-17	BB85-18	BB85-19	BB85-20
ITUDE N			40°00.75'	40°00.50'	40°00.50'	40°00.00'	40°00.00'
GITUDE W			74°03.68'	74°05.28'	74°05.91'	74°05.28'	74°05.91'
LECTION DATE			7/22/85	7/22/85	7/22/85	7/23/85	7/23/85
E AND HOURS			Low + 5.0	High + 0.0	High + 0.5	High + 3.5	High + 4.0
PERATURE	AIR		27.5	30.0	31.0	23.0	22.5
°C	WATER	S	ND	ND	25.3	24.2	ND
		B	ND	ND	24.9	24.2	ND
.O.	S		ND	ND	7.2	ND	ND
ppm)	B		ND	ND	7.2	7.1	ND
NITY	S		ND	ND	20.0	ND	ND
ppt)	B		ND	ND	20.0	20.0	ND
	S		ND	ND	7.9	ND	ND
	B		ND	ND	8.1	8.1	ND
H (ft)			4'	7'	7'	4'	7'
TRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		92.4	36.8	39.0	92.8	68.8
	% MUD		7.6	63.2	61.0	7.2	31.2
MATED HARD CLAM ITY (#/ft^2)			0.0	0.0	0.0	0.0	0.0
% ERCIAL ZES	SL		ND	ND	ND	ND	ND
	LN		ND	ND	ND	ND	ND
	CS		ND	ND	ND	ND	ND
	CH		ND	ND	ND	ND	ND
ER CLAMS COLLECTED			0.0	0.0	0.0	0.0	0.0
RANGE (mm)			ND	ND	ND	ND	ND
ZE (mm)			ND	ND	ND	ND	ND
RTALITY			0.0	0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TATION NUMBER			BB85-21	BB85-22	BB85-23	BB85-24	BB85-25
ATITUDE N			40°00.00'	39°59.50'	39°59.50'	39°59.50'	39°59.50'
ONGITUDE W			74°06.55'	74°06.55'	74°05.91'	74°05.28'	74°04.64'
OLLECTION DATE			7/23/85	7/23/85	7/23/85	7/23/85	7/23/85
IDE AND HOURS			High + 4.5	High +.5.0	High + 5.5	Low + 0.0	Low + 0.5
EMPERATURE	AIR		24.0	21.5	23.0	23.0	24.5
°C	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O.	S		ND	ND	ND	ND	ND
(ppm)	B		ND	ND	ND	ND	ND
ALINITY	S		ND	ND	ND	ND	ND
(ppt)	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
EPTH (ft)			6'	6'	7'	4'	4'
UBSTRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		60.8	61.2	65.6	91.4	67.8
	% MUD		39.2	38.8	34.4	8.6	32.2
STIMATED HARD CLAM ENSITY (#/ft^2)			0.0	0.0	0.0	0.0	0.0
%	SL		ND	ND	ND	ND	ND
OMMERCIAL	LN		ND	ND	ND	ND	ND
SIZES	CS		ND	ND	ND	ND	ND
	CH		ND	ND	ND	ND	ND
UMBER CLAMS COLLECTED			0.0	0.0	0.0	0.0	0.0
IZE RANGE (mm)			ND	ND	ND	ND	ND
SIZE (mm)			ND	ND	ND	ND	ND
MORTALITY			0.0	0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

.TION NUMBER			BB85-26	BB85-27	BB85-28	BB85-29	BB85-30
'ITUDE N			$39^{o}59.00'$	$39^{o}59.00'$	$39^{o}59.00'$	$39^{o}59.00'$	$39^{o}58.50'$
'GITUDE W			$74^{o}04.64'$	$74^{o}06.55'$	$74^{o}05.91'$	$74^{o}05.28'$	$74^{0}04.64'$
LECTION DATE			7/23/85	7/24/85	7/24/85	7/24/85	7/24/85
E AND HOURS			Low + 1.5	High + 3.5	High + 4.5	High + 5.0	Low + 0.0
PERATURE	AIR		24.0	26.0	26.5	25.0	26.5
^{o}C	WATER	S	24.7	24.3	ND	ND	25.1
		B	24.7	24.1	ND	ND	25.1
.O.	S		ND	6.7	ND	ND	ND
ppm)	B		8.3	6.7	ND	ND	7.8
INITY	S		ND	21.0	ND	ND	ND
ppt)	B		20.0	21.0	ND	ND	21.5
H	S		ND	7.9	ND	ND	ND
	B		8.1	8.1	ND	ND	8.1
TH (ft)			4'	6'	5'	6'	4'
	% GRAVEL		0.0	0.0	0.0	0.0	0.0
STRATE	% SAND		94.8	66.2	88.8	90.0	74.4
	% MUD		5.2	33.8	11.2	10.0	25.6
IMATED HARD CLAM SITY (#/ft^2)			0.0	0.0	0.0	0.0	0.0
%	SL		ND	ND	ND	ND	ND
MERCIAL	LN		ND	ND	ND	ND	ND
IZES	CS		ND	ND	ND	ND	ND
	CH		ND	ND	ND	ND	ND
BER CLAMS COLLECTED			0.0	0.0	0.0	0.0	0.0
E RANGE (mm)			ND	ND	ND	ND	ND
IZE (mm)			ND	ND	ND	ND	ND
ORTALITY			0.0	0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-31	BB85-32	BB85-33	BB85-34	BB85-35
LATITUDE N			39°58.50'	39°58.00'	39°58.00'	39°57.50'	39°57.50'
LONGITUDE W			74°06.55'	74°06.55'	74°05.97'	74°06.55'	74°05.91'
COLLECTION DATE			7/25/85	7/25/85	7/30/85	7/30/85	7/30/85
TIDE AND HOURS			High + 2.0	High + 3.0	Low + 3.5	Low + 4.5	Low + 4.5
TEMPERATURE °C	AIR		25.5	ND	26.0	27.5	27.5
	WATER	S	24.5	ND	24.0	ND	ND
		B	24.7	ND	24.0	ND	ND
D.O. (ppm)	S		6.3	ND	7.2	ND	ND
	B		6.4	ND	7.1	ND	ND
SALINITY (ppt)	S		20.5	ND	20.5	ND	ND
	B		20.5	ND	21.0	ND	ND
pH	S		8.1	ND	8.1	ND	ND
	B		8.1	ND	8.3	ND	ND
DEPTH (ft)			6'	6'	6'	5'	4'
SUBSTRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		90.0	94.0	78.2	91.0	87.0
	% MUD		10.0	6.0	21.8	9.0	13.0
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.0	0.0	0.0	0.0	0.0
% COMMERCIAL SIZES	SL		ND	ND	ND	ND	ND
	LN		ND	ND	ND	ND	ND
	CS		ND	ND	ND	ND	ND
	CH		ND	ND	ND	ND	ND
NUMBER CLAMS COLLECTED			0.0	0.0	0.0	0.0	0.0
SIZE RANGE (mm)			ND	ND	ND	ND	ND
MEAN SIZE (mm)			ND	ND	ND	ND	ND
% MORTALITY			0.0	0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-36	BB85-37	BB85-38	BB85-39	BB85-40
ITUDE N			39°57.50'	39°58.50'	39°58.50'	39°57.00'	39°57.00'
GITUDE W			74°05.28'	74°05.91'	74°05.28'	74°06.55'	74.05.91'
LECTION DATE			7/30/85	7/31/85	7/31/85	7/31/85	7/31/85
E AND HOURS			High + 0.0	Low + 2.0	Low + 2.5	Low + 3.5	Low + 5.5
PERATURE	AIR		27.5	25.5	26.5	27.0	27.0
°C	WATER	S	24.2	25.3	ND	ND	26.5
		B	24.2	25.1	ND	ND	26.5
.O.	S		ND	7.2	ND	ND	7.0
ppm)	B		7.2	6.9	ND	ND	6.2
INITY	S		ND	21.0	ND	ND	20.0
ppt)	B		22.0	21.0	ND	ND	21.0
H	S		ND	8.1	ND	ND	8.1
	B		8.1	8.1	ND	ND	8.1
TH (ft)			4'	6'	5'	6'	5'
STRATE	% GRAVEL		0.0	0.0	0.0	2.0	0.0
	% SAND		52.8	86.4	94.2	95.8	84.6
	% MUD		47.2	13.6	5.8	2.2	15.4
IMATED HARD CLAM SITY (#/ft²)			0.0	0.0	0.0	0.0	0.0
%	SL		ND	ND	ND	ND	ND
MERCIAL	LN		ND	ND	ND	ND	ND
IZES	CS		ND	ND	ND	ND	ND
	CH		ND	ND	ND	ND	ND
BER CLAMS COLLECTED			0.0	0.0	0.0	0.0	0.0
RANGE (mm)			ND	ND	ND	ND	ND
IZE (mm)			ND	ND	ND	ND	ND
ORTALITY			0.0	0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-41	BB85-42	BB85-43	BB85-44	BB85-45
LATITUDE N			$39^{o}56.50'$	$39^{o}56.50'$	$39^{o}56.50'$	$39^{o}56.00'$	$39^{o}56.00'$
LONGITUDE W			$74^{o}07.83'$	$74^{o}07.19'$	$74^{o}06.55'$	$74^{o}05.28'$	$74^{o}06.00'$
COLLECTION DATE			8/5/85	8/5/85	8/5/85	8/5/85	8/5/85
TIDE AND HOURS			High + 4.5	High + 5.5	Low + 0.0	Low + 0.5	Low + 1.0
TEMPERATURE ^{o}C	AIR		23.0	27.0	27.0	26.0	26.5
	WATER	S	23.3	ND	ND	ND	ND
		B	24.0	ND	ND	ND	ND
D.O. (ppm)	S		7.4	ND	ND	ND	ND
	B		5.0	ND	ND	ND	ND
SALINITY (ppt)	S		20.0	ND	ND	ND	ND
	B		20.0	ND	ND	ND	ND
pH	S		8.1	ND	ND	ND	ND
	B		8.1	ND	ND	ND	ND
DEPTH (ft)			6'	7'	6'	6'	6'
SUBSTRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		6.0	19.0	50.6	86.5	77.8
	% MUD		94.0	81.0	49.4	13.5	22.2
ESTIMATED HARD CLAM DENSITY (#/ft^{2})			0.0	0.0	0.0	0.0	0.0
% COMMERCIAL SIZES	SL		ND	ND	ND	ND	ND
	LN		ND	ND	ND	ND	ND
	CS		ND	ND	ND	ND	ND
	CH		ND	ND	ND	ND	ND
NUMBER CLAMS COLLECTED			0.0	0.0	0.0	0.0	0.0
SIZE RANGE (mm)			ND	ND	ND	ND	ND
SIZE (mm)			ND	ND	ND	ND	ND
MORTALITY			0.0	0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-46	BB85-47	BB85-48	BB85-49	BB85-50
ITUDE N			39°56.00'	39°56.00'	39°56.00'	39°50.50'	39°50.50'
GITUDE W			74°06.55'	74°07.19'	74°07.83'	74°08.47'	74°08.15'
LECTION DATE			8/5/85	8/5/85	8/5/85	9/9/85	9/9/85
E AND HOURS			Low + 1.5	Low + 2.0	Low + 2.5	High + 1.5	High + 2.0
PERATURE	AIR		26.5	25.5	26.0	25.0	26.5
°C	WATER	S	ND	ND	ND	24.5	ND
		B	ND	ND	ND	24.9	ND
.O.	S		ND	ND	ND	ND	ND
ppm)	B		ND	ND	ND	ND	ND
INITY	S		ND	ND	ND	27.0	ND
ppt)	B		ND	ND	ND	27.0	ND
H	S		ND	ND	ND	8.3	ND
	B		ND	ND	ND	8.3	ND
TH (ft)			6'	8'	7'	8'	9'
STRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		76.0	34.2	26.6	20.2	25.8
	% MUD		24.0	65.8	73.4	79.8	74.2
IMATED HARD CLAM SITY (#/ft^2)			0.0	0.0	0.0	0.14	0.03
%	SL		ND	ND	ND	7.1	0.0
MERCIAL	LN		ND	ND	ND	14.3	0.0
IZES	CS		ND	ND	ND	78.6	66.7
	CH		ND	ND	ND	0.0	33.3
BER CLAMS COLLECTED			0.0	0.0	0.0	14	6
RANGE (mm)			ND	ND	ND	37-76	71-80
IZE (mm)			ND	ND	ND	62.1	75.5
ORTALITY			100	0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TATION NUMBER			BB85-51	BB85-52	BB85-53	BB85-54	BB85-55
ATITUDE N			39°50.50'	39°50.50'	39°50.50'	39°50.50'	39°50.50'
ONGITUDE W			74°07.83'	74°07.51'	74°07.19'	74°06.87'	74°06.55'
OLLECTION DATE			9/9/85	9/9/85	9/9/85	9/9/85	9/9/85
IDE AND HOURS			High + 2.0	High + 2.5	High + 3.0	High + 3.5	High + 4.0
EMPERATURE	AIR		28.0	29.0	29.5	28.5	28.5
°C	WATER	S	ND	ND	ND	ND	25.7
		B	ND	ND	ND	ND	24.9
D.O.	S		ND	ND	ND	ND	ND
(ppm)	B		ND	ND	ND	ND	ND
ALINITY	S		ND	ND	ND	ND	27.0
(ppt)	B		ND	ND	ND	ND	27.0
pH	S		ND	ND	ND	ND	8.3
	B		ND	ND	ND	ND	8.3
EPTH (ft)			11'	9'	8'	9'	7'
UBSTRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		13.4	68.0	84.2	59.6	84.8
	% MUD		86.6	32.0	15.8	40.4	15.2
STIMATED HARD CLAM ENSITY (#/ft²)			0.05	0.35	0.25	0.01	0.22
%	SL		0.0	3.3	0.0	0.0	0.0
OMMERCIAL	LN		10.0	3.3	2.0	9.1	12.2
SIZES	CS		90.0	85.2	85.7	86.4	75.6
	CH		10.0	8.2	12.3	4.5	12.2
UMBER CLAMS COLLECTED			10	69	49	22	43
IZE RANGE (mm)			56-80	29-79	55-81	44-77	43-80
SIZE (mm)			68.9	66.7	69.1	64.6	65.4
MORTALITY			16.6	25.0	18.3	8.3	0.14

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-56	BB85-57	BB85-58	BB85-59	BB85-60
ITUDE N			39°55.50'	39°55.50'	39°55.00'	39°54.50'	39°55.00'
GITUDE W			74°06.00'	74°05.28'	74°05.28'	74°05.28'	74°06.55'
LECTION DATE			9/10/85	9/10/85	9/10/85	9/10/85	9/10/85
E AND HOURS			High + 0.0	High + 1.0	High + 1.5	High + 2.0	High + 3.0
PERATURE	AIR		23.5	24.0	25.0	25.0	26.0
°C	WATER	S	24.3	ND	ND	ND	ND
		B	25.0	ND	ND	ND	ND
.O.	S		ND	ND	ND	ND	ND
ppm)	B		ND	ND	ND	ND	ND
INITY	S		20.5	ND	ND	ND	ND
ppt)	B		22.5	ND	ND	ND	ND
I	S		8.2	ND	ND	ND	ND
	B		8.1	ND	ND	ND	ND
H (ft)			7'	7'	6'	7'	8'
	% GRAVEL		0.0	0.0	0.0	0.0	0.0
TRATE	% SAND		72.0	78.4	88.2	72.2	77.4
	% MUD		28.0	21.6	11.8	27.8	22.6
MATED HARD CLAM ITY (#/ft^2)			0.0	0.0	0.0	0.0	0.01
%	SL		ND	ND	ND	ND	0.0
ERCIAL	LN		ND	ND	ND	ND	100
ZES	CS		ND	ND	ND	ND	0.0
	CH		ND	ND	ND	ND	0.0
ER CLAMS COLLECTED			0.0	0.0	0.0	0.0	1
RANGE (mm)			ND	ND	ND	ND	-55-
ZE (mm)			ND	ND	ND	ND	55.0
RTALITY			0.0	0.0	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-61	BB85-62	BB85-63	BB85-64	BB85-65
LATITUDE N			$39^{o}54.50'$	$39^{o}54.50'$	$39^{o}54.50'$	$39^{o}54.00'$	$39^{o}54.00'$
LONGITUDE W			$74^{o}07.19'$	$74^{o}06.55'$	$74^{o}05.91'$	$74^{o}06.55'$	$74^{o}07.19'$
COLLECTION DATE			9/16/85	9/16/85	9/16/85	9/16/85	9/16/85
TIDE AND HOURS			Low + 1.0	Low + 1.5	Low + 2.0	Low + 3.0	Low + 3.5
TEMPERATURE ^{o}C	AIR		20.5	19.0	ND	22.0	20.0
	WATER	S	17.2	ND	ND	ND	ND
		B	18.1	ND	ND	ND	ND
D.O. (ppm)	S		8.5	ND	ND	ND	ND
	B		7.3	ND	ND	ND	ND
SALINITY (ppt)	S		22.5	ND	ND	ND	ND
	B		24.0	ND	ND	ND	ND
pH	S		8.2	ND	ND	ND	ND
	B		8.2	ND	ND	ND	ND
DEPTH (ft)			7'	4'	4'	4'	8'
SUBSTRATE	% GRAVEL		0.0	0.0	62.0	0.0	0.0
	% SAND		55.0	86.6	35.0	88.0	44.2
	% MUD		45.0	13.4	3.0	12.0	55.8
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.01	0.0	0.0	0.0	0.0
% COMMERCIAL SIZES	SL		0.0	ND	ND	ND	ND
	LN		100	ND	ND	ND	ND
	CS		0.0	ND	ND	ND	ND
	CH		0.0	ND	ND	ND	ND
NUMBER CLAMS COLLECTED			1.	0.0	0.0	0.0	0.0
SIZE RANGE (mm)			-42-	ND	ND	ND	ND
SIZE (mm)			42.0	ND	ND	ND	ND
MORTALITY			0.0	0.0	0.0	0.0	100

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-66	BB85-67	BB85-68	BB85-69	BB85-70
ITUDE N			$39^{o}54.00'$	$39^{o}53.50'$	$39^{o}53.50'$	$39^{o}53.50'$	$39^{o}53.50'$
GITUDE W			$74^{o}07.83'$	$74^{o}07.83'$	$74^{o}07.19'$	$74^{o}06.55'$	$74^{o}05.91'$
LECTION DATE			9/16/85	9/18/85	9/18/85	9/18/85	9/18/85
E AND HOURS			Low + 4.0	High + 5.5	Low + 0.0	Low + 1.0	Low + 1.5
PERATURE	AIR		22.0	19.5	20.0	23.0	23.0
°C	WATER	S	ND	18.0	ND	ND	ND
		B	ND	18.6	ND	ND	ND
.O.	S		ND	8.3	ND	ND	ND
ppm)	B		ND	7.7	ND	ND	ND
INITY	S		ND	24.0	ND	ND	ND
ppt)	B		ND	25.0	ND	ND	ND
I	S		ND	8.2	ND	ND	ND
	B		ND	8.2	ND	ND	ND
H (ft)			7'	7'	8'	6'	3'
	% GRAVEL		0.0	0.0	0.0	0.0	0.0
TRATE	% SAND		32.0	89.6	79.6	96.2	87.8
	% MUD		68.0	10.4	20.4	3.8	12.2
MATED HARD CLAM ITY (#/ft^2)			0.01	0.06	0.04	0.01	0.0
%	SL		0.0	10.0	0.0	0.0	ND
ERCIAL	LN		0.0	10.0	0.0	0.0	ND
ZES	CS		100	80.0	100	100	ND
	CH		0.0	0.0	0.0	0.0	ND
ER CLAMS COLLECTED			1	11	4	2	0.0
RANGE (mm)			-57-	28-68	58-73	68-72	ND
ZE (mm)			57.0	58.9	63.0	70.0	ND
RTALITY			0.0	8.3	20.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-71	BB85-72	BB85-73	BB85-74	BB85-75
LATITUDE N			$39^{o}53.50'$	$39^{o}53.00'$	$39^{o}53.00'$	$39^{o}53.00'$	$39^{o}53.00'$
LONGITUDE W			$74^{o}05.44'$	$74^{o}05.36'$	$74^{o}07.83'$	$74^{o}07.19'$	$74^{o}06.55'$
COLLECTION DATE			9/18/85	9/18/85	9/30/85	9/30/85	9/30/85
TIDE AND HOURS			Low + 2.5	Low + 3.0	Low + 1.0	Low + 2.0	Low + 2.5
TEMPERATURE	AIR		23.0	23.0	18.0	19.0	23.0
^{o}C	WATER	S	ND	19.5	18.4	ND	ND
		B	ND	18.0	18.8	ND	ND
D.O.	S		ND	8.7	ND	ND	ND
(ppm)	B		ND	8.4	ND	ND	ND
SALINITY	S		ND	24.0	22.0	ND	ND
(ppt)	B		ND	25.0	24.0	ND	ND
pH	S		ND	8.2	8.1	ND	ND
	B		ND	8.2	7.9	ND	ND
DEPTH (ft)			7'	8'	8'	8'	7'
SUBSTRATE	% GRAVEL		0.0	0.0	1.2	0.0	0.0
	% SAND		23.2	86.2	19.2	69.0	89.0
	% MUD		76.8	13.8	79.6	31.0	11.0
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.0	0.01	0.01	0.01	0.08
% COMMERCIAL SIZES	SL		ND	0.0	0.0	0.0	0.0
	LN		ND	0.0	0.0	0.0	40.0
	CS		ND	100	100	0.0	60.0
	CH		ND	0.0	0.0	100	0.0
NUMBER CLAMS COLLECTED			0.0	1	1	1	15
SIZE RANGE (mm)			ND	-58-	-60-	-80-	51-70
MAX SIZE (mm)			ND	58.0	60.0	80.0	59.9
% MORTALITY			0.0	66.7	50.0	0.0	11.8

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-76	BB85-77	BB85-78	BB85-79	BB85-80
ITUDE N			$39^{o}53.00'$	$39^{o}52.50'$	$39^{o}52.50'$	$39^{o}52.50'$	$39^{o}52.12'$
GITUDE W			$74^{o}05.91'$	$74^{o}06.55'$	$74^{o}07.19'$	$74^{o}07.83'$	$74^{o}08.69'$
LECTION DATE			9/30/85	9/30/85	9/30/85	9/30/85	10/7/85
E AND HOURS			Low + 3.0	Low + 4.0	Low + 4.5	Low + 5.0	High + 3.0
PERATURE	AIR		23.0	23.0	21.0	22.0	18.0
^{o}C	WATER	S	ND	ND	ND	ND	16.6
		B	ND	ND	ND	ND	17.6
.O.	S		ND	ND	ND	ND	7.1
ppm)	B		ND	ND	ND	ND	7.0
INITY	S		ND	ND	ND	ND	19.0
ppt)	B		ND	ND	ND	ND	19.5
H	S		ND	ND	ND	ND	7.9
	B		ND	ND	ND	ND	7.9
TH (ft)			8'	6'	9'	8'	4'
STRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		85.4	94.4	54.0	10.0	12.2
	% MUD		14.6	5.6	46.0	90.0	87.8
IMATED HARD CLAM SITY ($\#/ft^2$)			0.01	0.12	0.01	0.0	0.01
%	SL		0.0	0.0	0.0	ND	0.0
MERCIAL	LN		0.0	8.3	33.3	ND	0.0
IZES	CS		100	87.5	66.7	ND	0.0
	CH		0.0	4.2	0.0	ND	0.0
BER CLAMS COLLECTED			2	24	3	0.0	1
E RANGE (mm)			69-74	53-78	45-65	ND	-68-
IZE (mm)			71.5	65.2	57.0	ND	68.0
ORTALITY			0.0	17.2	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-81	BB85-82	BB85-83	BB85-84	BB85-85
LATITUDE N			39°52.12'	39°52.25'	39°52.00'	39°52.00'	39°52.00'
LONGITUDE W			74°09.11'	74°08.15'	74°07.83'	74°07.19'	74°06.55'
COLLECTION DATE			10/7/85	10/7/85	10/7/85	10/7/85	10/7/85
TIDE AND HOURS			High + 3.5	High + 4.0	High + 4.0	High + 4.5	High + 5.0
TEMPERATURE °C	AIR		16.0	ND	16.0	15.0	16.0
	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O. (ppm)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
SALINITY (ppt)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
DEPTH (ft)			4'	4'	6'	8'	9'
SUBSTRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		15.0	26.0	22.8	84.2	44.2
	% MUD		85.0	74.0	77.2	15.8	55.8
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.0	0.05	0.03	0.27	0.05
% COMMERCIAL SIZES	SL		ND	0.0	0.0	2.0	0.0
	LN		ND	40.0	0.0	17.0	11.1
	CS		ND	40.0	66.7	73.5	88.9
	CH		ND	20.0	33.3	7.5	0.0
NUMBER CLAMS COLLECTED			0.0	5	3	53	10
SIZE RANGE (mm)			ND	42-83	58-81	30-82	56-74
MEAN SIZE (mm)			ND	63.6	70.3	65.4	65.7
% MORTALITY			0.0	0.0	0.0	1.9	16.7

TABLE 1
SHELLFISH INVENTORY SUMMARY

ATION NUMBER			BB85-86	BB85-87	BB85-88	BB85-89	BB85-90
ITUDE N			39°52.00'	39°52.00'	39°51.50'	39°51.50'	39°51.50'
GITUDE W			74°05.91'	74°05.60'	74°07.75'	74°07.19'	74°06.55'
LECTION DATE			10/7/85	10/7/85	10/8/85	10/8/85	10/8/85
E AND HOURS			Low + 0.0	Low + 0.5	High + 1.5	High + 2.5	High + 2.5
PERATURE	AIR		16.5	17.0	16.0	16.5	17.5
°C	WATER	S	ND	15.5	14.7	ND	ND
		B	ND	15.4	15.3	ND	ND
.O.	S		ND	9.4	9.0	ND	ND
ppm)	B		ND	9.2	8.9	ND	ND
INITY	S		ND	21.5	21.5	ND	ND
ppt)	B		ND	23.5	21.5	ND	ND
H	S		ND	8.3	8,0	ND	ND
	B		ND	8.3	8.0	ND	ND
TH (ft)			4'	5'	5'	10'	9'
STRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		92.6	88.2	69.0	14.0	53.8
	% MUD		7.4	11.8	31.0	86.0	46.2
IMATED HARD CLAM SITY (#/ft²)			0.04	0.01	0.18	0.02	0.49
%	SL		0.0	0.0	11.1	0.0	0.0
MERCIAL	LN		33.3	0.0	33.3	0.0	28.6
IZES	CS		66.7	100	50.0	100	71.4
	CH		0.0	0.0	5.6	0.0	0.0
BER CLAMS COLLECTED			6	2	18	2	49
RANGE (mm)			48-72	59-67	32-77	65-73	39-75
ZE (mm)			61.0	63.0	54.3	69.0	61.4
ORTALITY			14.3	50.0	0.0	0.0	2.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-91	BB85-92	BB85-93	BB85-94	BB85-95
LATITUDE N			39°51.50'	39°51.00'	39°51.00'	39°51.00'	39°51.00'
LONGITUDE W			74°05.91'	74°06.55'	74°07.19'	74°07.83'	74°08.37'
COLLECTION DATE			10/8/85	10/8/85	10/8/85	10/8/85	10/8/85
TIDE AND HOURS			High + 3.5	High + 4.5	High + 5.0	High + 5.0	Low + 0.0
TEMPERATURE °C	AIR		19.0	ND	19.0	19.0	19.0
	WATER	S	15.2	ND	ND	ND	ND
		B	16.1	ND	ND	ND	ND
D.O. (ppm)	S		10.2	ND	ND	ND	ND
	B		9.8	ND	ND	ND	ND
SALINITY (ppt)	S		20.5	ND	ND	ND	ND
	B		20.5	ND	ND	ND	ND
pH	S		8.0	ND	ND	ND	ND
	B		8.0	ND	ND	ND	ND
DEPTH (ft)			5'	8'	10'	10'	7'
SUBSTRATE	% GRAVEL		0.0	0.0	0.0	0.0	0.0
	% SAND		92.4	87.0	49.2	49.6	33.0
	% MUD		7.6	13.0	50.8	50.4	67.0
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.05	0.19	0.15	0.13	0.05
% COMMERCIAL SIZES	SL		0.0	0.0	0.0	0.0	0.0
	LN		0.0	5.3	10.7	7.7	28.6
	CS		100	84.2	82.2	76.9	71.4
	CH		0.0	10.5	7.1	15.4	0.0
NUMBER CLAMS COLLECTED			7	19	29	13	7
SIZE RANGE (mm)			59-74	54-78	38-81	54-81	41-72
MEAN SIZE (mm)			65.7	70.2	66.8	68.5	62.0
MORTALITY			12.5	5.0	3.3	7.1	12.5

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-96	BB85-97	BB85-98	BB85-99	BB85-100
ITUDE N			39°50.26'	39°50.25'	39°50.25'	39°50.25'	39°50.25'
GITUDE W			74°08.67'	74°08.47'	74°07.83'	74°07.19'	74°06.55'
LECTION DATE			10/9/85	10/9/85	10/9/85	10/9/85	10/9/85
E AND HOURS			High + 0.0	High + 1.0	High + 1.5	High + 2.0	High + 2.5
PERATURE	AIR		22.0	19.0	20.0	20.0	21.0
°C	WATER	S	16.2	ND	ND	ND	ND
		B	16.8	ND	ND	ND	ND
.O.	S		9.0	ND	ND	ND	ND
ppm)	B		8.3	ND	ND	ND	ND
INITY	S		23.5	ND	ND	ND	ND
ppt)	B		23.5	ND	ND	ND	ND
H	S		8.3	ND	ND	ND	ND
	B		8.3	ND	ND	ND	ND
TH (ft)			5'	7'	11'	9'	8'
TRATE	% GRAVEL		0.2	*	*	*	*
	% SAND		44.8	*	*	*	*
	% MUD		55.0	*	*	*	*
MATED HARD CLAM ITY (#/ft²)			0.03	0.16	0.05	0.39	0.25
%	SL		0.0	3.3	0.0	3.7	0.0
MERCIAL	LN		0.0	20.0	0.0	1.2	2.0
ZES	CS		100	73.4	62.5	82.7	78.0
	CH		0.0	3.3	37.5	12.4	20.0
ER CLAMS COLLECTED			3	32	8	66	49
RANGE (mm)			65-72	36-78	64-81	32-82	52-83
ZE (mm)			67.7	63.0	72.0	68.0	71.0
RTALITY			0.0	8.6	11.1	10.8	18.3

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-101	BB85-102	BB85-103	BB85-104	BB85-105
LATITUDE N			39°50.25'	39°50.50'	39°50.00'	39°50.00'	39°50.00'
LONGITUDE W			74°05.91'	74°06.23'	74°09.11'	74°08.79'	74°08.15'
COLLECTION DATE			10/9/85	10/9/85	10/16/85	10/16/85	10/18/85
TIDE AND HOURS			High + 3.5	High + 5.0	High + 6.0	Low + 1.0	Low + 5.5
TEMPERATURE °C	AIR		21.0	23.5	21.0	17.0	17.5
	WATER	S	17.0	ND	18.8	ND	ND
		B	16.5	ND	18.8	ND	ND
D.O. (ppm)	S		9.7	ND	7.2	ND	ND
	B		9.5	ND	6.4	ND	ND
SALINITY (ppt)	S		24.5	ND	26.5	ND	ND
	B		25.0	ND	26.5	ND	ND
pH	S		8.3	ND	8.3	ND	ND
	B		8.3	ND	8.3	ND	ND
DEPTH (ft)			5'	6'	7'	9'	10'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.12	0.17	0.24	0.07	0.05
% COMMERCIAL SIZES	SL		0.0	0.0	4.4	0.0	0.0
	LN		36.8	9.1	17.4	0.0	0.0
	CS		63.2	75.8	65.2	44.4	62.5
	CH		0.0	15.1	13.0	55.6	37.5
NUMBER CLAMS COLLECTED			18	34	24	7	8
SIZE RANGE (mm)			49-70	50-82	34-82	69-88	70-87
MEAN SIZE (mm)			54.2	68.9	64.9	77.1	75.8
% MORTALITY			21.7	8.1	4.0	0.0	20.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-106	BB85-107	BB85-108	BB85-109	BB85-110
ITUDE N			39°50.00'	39°50.00'	39°50.00'	39°50.00'	39°49.75'
GITUDE W			74°07.51'	74°06.87'	74°06.23'	74°05.91'	74°06.00'
LECTION DATE			10/18/85	10/18/85	10/18/85	10/18/85	10/18/85
E AND HOURS			High + 6.0	Low + 0.5	Low + 1.0	Low + 2.5	Low + 2.0
PERATURE	AIR		16.5	17.0	17.0	17.5	19.0
°C	WATER	S	ND	ND	ND	16.0	ND
		B	ND	ND	ND	16.0	ND
.O.	S		ND	ND	ND	ND	ND
ppm)	B		ND	ND	ND	9.3	ND
INITY	S		ND	ND	ND	ND	ND
ppt)	B		ND	ND	ND	25.0	ND
	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	8.5	ND
CH (ft)			10'	6'	6'	4'	5'
TRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
MATED HARD CLAM ITY (#/ft^2)			0.12	0.19	0 15	0.17	0.05
%	SL		0.0	0.0	0.0	5.9	0.0
MERCIAL	LN		25.0	5.4	6.5	41.2	23.5
ZES	CS		66.7	70.3	87.1	52.9	76.5
	CH		8.3	24.3	6.4	0.0	0.0
ER CLAMS COLLECTED			12	37	30	17	17
RANGE (mm)			40-80	38-85	49-81	36-74	46-73
ZE (mm)			64.8	71.2	66.6	51.4	60.0
RTALITY			0.0	15.9	9.1	26.1	22.7

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-111	BB85-112	BB85-113	BB85-114	BB85-115
LATITUDE N			39°49.75'	39°49.75'	39°49.75'	39°49.75'	39°49.75'
LONGITUDE W			74°06.55'	74°07.19'	74°09.43'	74°09.11'	74°08.47'
COLLECTION DATE			10/18/85	10/18/85	10/30/85	10/30/85	10/30/85
TIDE AND HOURS			Low + 2.5	Low + 3.0	Low + 0.5	Low + 1.5	Low + 2.0
TEMPERATURE °C	AIR		18.5	19.0	14.0	15.5	17.0
	WATER	S	ND	ND	11.0	ND	ND
		B	ND	ND	11.2	ND	ND
D.O. (ppm)	S		ND	ND	9.2	ND	ND
	B		ND	ND	9.1	ND	ND
SALINITY (ppt)	S		ND	ND	27.0	ND	ND
	B		ND	ND	27.0	ND	ND
pH	S		ND	ND	8.5	ND	ND
	B		ND	ND	8.5	ND	ND
DEPTH (ft)			5'	9'	6'	8'	10'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.14	0.27	0.29	0.33	0.05
% COMMERCIAL SIZES	SL		0.0	0.0	3.6	3.1	0.0
	LN		14.3	2.7	7.1	0.0	0.0
	CS		85.7	78.4	78.6	78.1	62.5
	CH		0.0	18.9	10.7	18.8	37.5
NUMBER CLAMS COLLECTED			14	27	29	33	9
SIZE RANGE (mm)			47-71	53-79	30-79	31-84	64-82
MEAN SIZE (mm)			62.4	70.8	65.9	69.4	75.3
% MORTALITY			0.0	20.6	0.0	2.9	43.7

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-116	BB85-117	BB85-118	BB85-119	BB85-120
ITUDE N			39°49.75'	39°49.50'	39°49.50'	39°49.50'	39°49.50'
GITUDE W			74°07.83'	74°06.73'	74°06.87'	74°07.51'	74°08.15'
LECTION DATE			10/30/85	10/30/85	10/30/85	10/30/85	10/30/85
E AND HOURS			Low + 3.0	Low + 4.0	Low + 4.5	Low + 5.0	Low + 5.5
PERATURE	AIR		17.5	18.0	19.0	16.0	16.0
°C	WATER	S	ND	10.0	ND	ND	ND
		B	ND	10.2	ND	ND	ND
.O.	S		ND	10.4	ND	ND	ND
ppm)	B		ND	10.1	ND	ND	ND
INITY	S		ND	24.0	ND	ND	ND
ppt)	B		ND	24.0	ND	ND	ND
H	S		ND	8.5	ND	ND	ND
	B		ND	8.5	ND	ND	ND
TH (ft)			11'	5'	6'	10'	11'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY (#/ft²)			0.06	0.06	0.23	0.08	0.02
%	SL		0.0	0.0	0.0	0.0	0.0
MERCIAL	LN		8.3	25.0	7.0	0.0	0.0
IZES	CS		83.4	75.0	74.4	80.0	93.3
	CH		8.3	0.0	18.6	20.0	6.7
BER CLAMS COLLECTED			12	12	46	15	15
E RANGE (mm)			53-79	45-70	49-80	58-81	65-81
IZE (mm)			70.6	59.7	69.1	69.5	71.2
ORTALITY			0.0	25.0	22.0	16.7	31.8

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-121	BB85-122	BB85-123	BB85-124	BB85-125
LATITUDE N			$39^{o}49.50'$	$39^{o}49.50'$	$39^{o}49.50'$	$39^{o}49.25'$	$39^{o}49.25'$
LONGITUDE W			$74^{o}08.79'$	$74^{o}09.75'$	$74^{o}09.43'$	$74^{o}09.43'$	$74^{o}09.17'$
COLLECTION DATE			10/30/85	11/6/85	11/6/85	11/6/85	11/6/85
TIDE AND HOURS			High + 0.0	High + 4.5	High + 5.0	High + 5.5	Low + 0.0
TEMPERATURE	AIR		19.0	13.5	14.0	14.0	15.0
^{o}C	WATER	S	ND	12.1	ND	ND	ND
		B	ND	12.3	ND	ND	ND
D.O.	S		ND	8.9	ND	ND	ND
(ppm)	B		ND	8.6	ND	ND	ND
SALINITY	S		ND	26.0	ND	ND	ND
(ppt)	B		ND	28.0	ND	ND	ND
pH	S		ND	7.6	ND	ND	ND
	B		ND	7.6	ND	ND	ND
DEPTH (ft)			10'	7'	9'	6'	8'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY ($\#/ft^2$)			0.08	0.11	0.14	0.35	0.18
% COMMERCIAL SIZES	SL		0.0	0.0	0.0	7.3	9.8
	LN		0.0	0.0	7.7	16.2	20.7
	CS		60.0	81.8	76.9	61.8	41.5
	CH		40.0	18.2	15.4	14.7	28.0
NUMBER CLAMS COLLECTED			16	11	14	70	36
SIZE RANGE (mm)			65-82	58-84	44-82	30-84	29-92
SIZE (mm)			75.5	68.7	74.8	63.2	64.7
MORTALITY			5.9	0.0	12.5	1.4	5.3

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-126	BB85-127	BB85-128	BB85-129	BB85-130
ITUDE N			$39^{o}49.25'$	$39^{o}49.25'$	$39^{o}49.25'$	$39^{o}49.25'$	$39^{o}49.25'$
GITUDE W			$74^{o}08.47'$	$74^{o}07.83'$	$74^{o}07.19'$	$74^{o}06.55'$	$74^{o}05.91'$
LECTION DATE			11/6/85	11/7/85	11/7/85	11/7/85	11/7/85
E AND HOURS			Low + 0.5	High + 3.5	High + 4.5	High + 5.0	High + 5.5
ERATURE	AIR		14.0	14.5	13.5	13.0	14.5
°C	WATER	S	ND	11.5	ND	ND	11.8
		B	ND	11.8	ND	ND	11.5
.O.	S		ND	8.9	ND	ND	ND
ppm)	B		ND	8.7	ND	ND	9.1
INITY	S		ND	26.0	ND	ND	ND
ppt)	B		ND	28.0	ND	ND	27.0
I	S		ND	7.5	ND	ND	ND
	B		ND	7.7	ND	ND	7.3
H (ft)			12'	10'	6'	5'	5'
TRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
MATED HARD CLAM ITY (#/ft^2)			0.04	0.12	0.07	0.03	0.0
%	SL		0.0	0.0	0.0	0.0	ND
IERCIAL	LN		0.0	0.0	0.0	0.0	ND
ZES	CS		28.6	10.0	63.6	10.0	ND
	CH		71.4	0.0	36.4	0.0	ND
ER CLAMS COLLECTED			7	12	11	3	0.0
RANGE (mm)			67-84	59-76	62-89	65-73	ND
ZE (mm)			78.9	70.8	73.2	68.0	ND
RTALITY			0.0	20.0	42.1	25.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-131	BB85-132	BB85-133	BB85-134	BB85-135
LATITUDE N			39°49.00'	39°49.00'	39°49.00'	39°49.62'	39°49.62'
LONGITUDE W			74°06.23'	74°06.87'	74°07.51'	74°10.15'	74°10.39'
COLLECTION DATE			11/7/85	11/7/85	11/7/85	11/13/85	11/13/85
TIDE AND HOURS			Low + 0.0	Low + 0.5	Low + 1.0	Low + 4.0	Low + 4.5
TEMPERATURE °C	AIR		16.0	16.0	15.0	16.5	18.0
	WATER	S	ND	ND	ND	12.7	ND
		B	ND	ND	ND	12.5	ND
D.O. (ppm)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	8.3	ND
SALINITY (ppt)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	27.0	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	7.8	ND
DEPTH (ft)			5'	5'	7'	4'	4'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.09	0.10	0.19	0.01	0.05
% COMMERCIAL SIZES	SL		0.0	0.0	0.0	0.0	20.0
	LN		44.4	0.0	0.0	0.0	40.0
	CS		55.6	100	56.7	100	20.0
	CH		0.0	0.0	43.3	0.0	20.0
NUMBER CLAMS COLLECTED			9	10	32	1	5
SIZE RANGE (mm)			51-72	62-75	61-85	-60-	34-77
MEAN SIZE (mm)			59.4	69.5	75.6	60.0	54.8
MORTALITY			25.0	23.1	17.9	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-136	BB85-137	BB85-138	BB85-139	BB85-140
ITUDE N			39°49.56'	39°49.41'	39°49.62'	39°49.66'	39°49.00'
GITUDE W			74°10.82'	74°11.03'	74°10.86'	74°11.03'	74°09.75'
LECTION DATE			11/13/85	11/13/85	11/13/85	11/13/85	11/14/85
E AND HOURS			Low +.5.0	Low + 6.0	High + 0.5	High + 1.0	Low + 3.0
PERATURE	AIR		19.5	20.5	21.0	21.0	14.0
°C	WATER	S	ND	ND	ND	14.0	13.0
		B	ND	ND	ND	12.9	13.2
.O.	S		ND	ND	ND	ND	9.4
ppm)	B		ND	ND	ND	8.6	9.2
INITY	S		ND	ND	ND	ND	26.0
ppt)	B		ND	ND	ND	24.0	26.0
I	S		ND	ND	ND	ND	7.9
	B		ND	ND	ND	7.7	7.8
TH (ft)			7'	5'	6'	4'	7'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
MATED HARD CLAM ITY (#/ft²)			0.01	0.0	0.0	0.0	0.51
%	SL		0.0	ND	ND	ND	2.0
MERCIAL	LN		0.0	ND	ND	ND	3.9
ZES	CS		100	ND	ND	ND	68.6
	CH		0.0	ND	ND	ND	25.5
ER CLAMS COLLECTED			1	0.0	0.0	0.0	51
RANGE (mm)			-60-	ND	ND	ND	32-85
ZE (mm)			60.0	ND	ND	ND	68.9
RTALITY			0.0	0.0	0.0	0.0	5.6

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-141	BB85-142	BB85-143	BB85-144	BB85-145
LATITUDE N			$39^{o}49.25'$	$39^{o}49.00'$	$39^{o}49.00'$	$39^{o}48.75'$	$39^{o}48.75'$
LONGITUDE W			$74^{o}09.75'$	$74^{o}08.79'$	$74^{o}08.15'$	$74^{o}10.07'$	$74^{o}09.75'$
COLLECTION DATE			11/14/85	11/14/85	11/14/85	11/20/85	11/20/85
TIDE AND HOURS			Low + 4.0	Low + 4.5	Low + 5.0	High + 4.0	High + 5.0
TEMPERATURE ^{o}C	AIR		14.5	15.5	15.0	20.0	21.0
	WATER	S	ND	ND	13.3	16.2	ND
		B	ND	ND	13.3	12.7	ND
D.O. (ppm)	S		ND	ND	9.5	9.1	ND
	B		ND	ND	7.1	8.9	ND
SALINITY (ppt)	S		ND	ND	26.0	25.0	ND
	B		ND	ND	30.0	26.0	ND
pH	S		ND	ND	7.9	ND	ND
	B		ND	ND	7.8	ND	ND
DEPTH (ft)			10'	12'	10'	7'	8'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY ($\#/ft^2$)			0.08	0.04	0.12	0.38	0.10
% COMMERCIAL SIZES	SL		12.5	0.0	0.0	5.1	0.0
	LN		0.0	0.0	0.0	25.7	0.0
	CS		25.0	0.0	87.0	69.2	55.6
	CH		62.5	100	13.0	0.0	44.4
NUMBER CLAMS COLLECTED			8	7	24	75	10
SIZE RANGE (mm)			36-82	78-88	63-83	31-75	69-85
MEAN SIZE (mm)			70.9	80.7	72.0	59.5	75.3
% MORTALITY			33.3	0.0	4.0	8.5	23.1

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB85-146	BB85-147	BB85-148	BB85-149	BB85-150
LATITUDE N			$39^{o}48.75'$	$39^{o}48.75'$	$39^{o}48.75'$	$39^{o}48.75'$	$39^{o}48.75'$
LONGITUDE W			$74^{0}09.11'$	$74^{o}08.47'$	$74^{o}07.83'$	$74^{o}07.19'$	$74^{o}06.55'$
COLLECTION DATE			11/25/85	11/25/85	11/25/85	11/25/85	11/25/85
TIDE AND HOURS			High + 0.0	High + 1.0	High + 1.5	High + 2.0	High + 3.0
TEMPERATURE	AIR		7.0	7.5	8.0	9.0	8.0
^{o}C	WATER	S	9.0	ND	ND	ND	ND
		B	10.8	ND	ND	ND	ND
D.O.	S		9.5	ND	ND	ND	ND
(ppm)	B		9.2	ND	ND	ND	ND
SALINITY	S		26.0	ND	ND	ND	ND
(ppt)	B		28.0	ND	ND	ND	ND
pH	S		7.5	ND	ND	ND	ND
	B		7.7	ND	ND	ND	ND
DEPTH (ft)			12'	9'	7'	6'	5'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY ($\#/ft^2$)			0.03	0.54	0.18	0.27	0.29
%	SL		0.0	0.0	0.0	0.0	0.0
COMMERCIAL	LN		0.0	0.9	0.0	7.1	28.6
SIZES	CS		33.3	84.0	37.1	78.6	71.4
	CH		66.7	15.1	62.9	14.3	0.0
NUMBER CLAMS COLLECTED			3	107	36	27	29
SIZE RANGE (mm)			75-81	55-85	65-90	56-88	52-72
MEAN SIZE (mm)			77.7	70.2	78.2	69.4	62.5
% MORTALITY			40.0	16.4	29.4	20.6	6.5

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB85-151				
ITUDE N			39°48.75'				
GITUDE W			74°06.00'				
LECTION DATE			11/25/85				
E AND HOURS			High + 3.5				
PERATURE	AIR		7.5				
°C	WATER	S	7.2				
		B	7.4				
.O.	S		10.4				
ppm)	B		10.3				
INITY	S		22.0				
ppt)	B		22.0				
H	S		7.7				
	B		7.8				
TH (ft)			5'				
STRATE	% GRAVEL		*				
	% SAND		*				
	% MUD		*				
IMATED HARD CLAM ITY (#/ft²)			0.20				
%	SL		0.0				
MERCIAL	LN		10.0				
ZES	CS		90.0				
	CH		0.0				
ER CLAMS COLLECTED			20				
RANGE (mm)			53-74				
ZE (mm)			63.6				
RTALITY			16.7				

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-152	BB86-153	BB86-154	BB86-155	BB86-156
LATITUDE N			$39^{o}48.60'$	$39^{o}48.10'$	$39^{o}48.65'$	$39^{o}48.58'$	$39^{o}48.60'$
LONGITUDE W			$74^{o}11.99'$	$74^{o}11.65'$	$74^{o}11.30'$	$74^{o}10.95'$	$74^{o}10.59'$
COLLECTION DATE			4/28/86	4/28/86	4/28/86	4/28/86	4/28/86
TIDE AND HOURS			Low + 1.0	Low + 1.5	Low + 2.0	Low + 2.5	Low + 3.0
TEMPERATURE	AIR		22.0	21.0	20.5	21.0	19.5
^{o}C	WATER	S	12.3	ND	ND	ND	ND
		B	10.7	ND	ND	ND	ND
D.O.	S		8.7	ND	ND	ND	ND
(ppm)	B		8.7	ND	ND	ND	ND
SALINITY	S		16.0	ND	ND	ND	ND
(ppt)	B		22.0	ND	ND	ND	ND
pH	S		7.5	ND	ND	ND	ND
	B		7.8	ND	ND	ND	ND
DEPTH (ft)			10'	10'	7'	7'	8'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY ($\#/ft^2$)			0.17	0.11	0.0	0.0	0.03
% COMMERCIAL SIZES	SL		0.0	4.8	ND	ND	0.0
	LN		48.5	52.4	ND	ND	33.3
	CS		51.5	33.3	ND	ND	66.7
	CH		0.0	9.5	ND	ND	0.0
NUMBER CLAMS COLLECTED			34	21	0.0	0.0	3
SIZE RANGE (mm)			44-72	32-83	ND	ND	42-67
SIZE (mm)			57.8	58.2	ND	ND	58.0
MORTALITY			2.9	4.5	100	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

,TION NUMBER			BB86-157	BB86-158	BB86-159	BB86-160	BB86-161
'ITUDE N			$39^{o}48.65'$	$39^{o}48.50'$	$39^{o}48.50'$	$39^{o}48.50'$	$39^{o}48.50'$
GITUDE W			$74^{o}10.35'$	$74^{o}10.07'$	$74^{o}09.43'$	$74^{o}08.79'$	$74^{o}08.15'$
LECTION DATE			4/28/86	4/28/86	4/28/86	4/28/86	4/28/86
E AND HOURS			Low + 3.0	Low + 4.0	Low + 4.5	Low + 5.5	High + 0.0
PERATURE	AIR		20.0	19.0	19.5	22.0	21.5
^{o}C	WATER	S	ND	13.3	ND	ND	ND
		B	ND	ND	ND	ND	ND
.O.	S		ND	9.8	ND	ND	ND
ppm)	B		ND	ND	ND	ND	ND
INITY	S		ND	20.5	ND	ND	ND
ppt)	B		ND	ND	ND	ND	ND
H	S		ND	8.0	ND	ND	ND
	B		ND	ND	ND	ND	ND
TH (ft)			6'	5'	10'	8'	5'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY ($\#/ft^2$)			0.0	0.19	0.08	0.29	0.07
%	SL		ND	2.6	0.0	0.0	0.0
MERCIAL	LN		ND	5.3	0.0	0.0	0.0
IZES	CS		ND	65.8	63.6	28.1	53.8
	CH		ND	26.3	36.4	71.9	46.2
BER CLAMS COLLECTED			0.0	38	12	57	13
E RANGE (mm)			ND	34-84	66-80	66-96	63-84
IZE (mm)			ND	69.2	73.3	79.1	74.8
ORTALITY			0.0	0.0	33.3	26.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-162	BB86-163	BB86-164	BB86-165	BB86-166
LATITUDE N			$39^{o}48.50'$	$39^{o}48.25'$	$39^{o}48.25'$	$39^{o}48.25'$	$39^{o}48.25'$
LONGITUDE W			$74^{o}07.51'$	$74^{o}10.39'$	$74^{o}10.07'$	$74^{o}09.75'$	$74^{o}09.11'$
COLLECTION DATE			4/28/86	4/30/86	4/30/86	4/30/86	4/30/86
TIDE AND HOURS			High + 0.5	High + 5.0	High + 5.5	Low + 0.0	Low + 0.5
TEMPERATURE	AIR		23.5	20.0	17.0	16.0	17.0
^{o}C	WATER	S	14.6	13.0	ND	ND	ND
		B	10.0	13.0	ND	ND	ND
D.O.	S		11.3	8.6	ND	ND	ND
(ppm)	B		10.7	8.6	ND	ND	ND
SALINITY	S		22.0	23.0	ND	ND	ND
(ppt)	B		24.0	23.0	ND	ND	ND
pH	S		8.2	8.1	ND	ND	ND
	B		8.2	8.1	ND	ND	ND
DEPTH (ft)			8'	6'	7'	10'	8'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft^{2})			0.36	0.35	0.45	0.21	0.47
% COMMERCIAL SIZES	SL		0.0	2.9	0.0	0.0	0.0
	LN		0.0	4.3	9.6	0.0	0.0
	CS		61.0	77.1	77.4	75.6	39.6
	CH		39.0	15.7	13.0	24.4	60.4
NUMBER CLAMS COLLECTED			72	69	90	41	93
SIZE RANGE (mm)			60-89	31-83	40-82	63-84	68-92
MEAN SIZE (mm)			74.3	68.1	67.5	73.3	78.2
% MORTALITY			8.9	6.8	10.9	22.6	6.1

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-167	BB86-168	BB86-169	BB86-170	BB86-171
ITUDE N			39°48.25'	39°48.00'	39°48.00'	39°48.00'	39°48.00'
GITUDE W			74°08.47'	74°09.43'	74°10.01'	74°10.39'	74°10.71'
LECTION DATE			4/30/86	4/30/86	4/30/86	4/30/86	4/30/86
E AND HOURS			Low + 1.0	Low + 2.0	Low + 3.0	Low + 3.5	Low + 4.0
PERATURE	AIR		18.0	18.0	16.0	16.5	17.0
°C	WATER	S	ND	ND	ND	ND	15.3
		B	ND	ND	ND	ND	15.0
.O.	S		ND	ND	ND	ND	9.8
ppm)	B		ND	ND	ND	ND	9.8
INITY	S		ND	ND	ND	ND	23.0
ppt)	B		ND	ND	ND	ND	23.5
H	S		ND	ND	ND	ND	8.3
	B		ND	ND	ND	ND	8.2
IH (ft)			5'	9'	10'	10'	6'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM GITY (#/ft²)			0.17	0.36	0.11	0.08	0.23
%	SL		0.0	0.0	0.0	0.0	0.0
MERCIAL	LN		0.0	0.0	0.0	14.3	8.9
IZES	CS		32.3	45.6	81.0	78.6	86.7
	CH		67.7	54.4	19.0	7.1	4.4
BER CLAMS COLLECTED			33	72	21	15	45
E RANGE (mm)			59-90	57-95	67-80	50-78	38-82
IZE (mm)			78.5	77.4	72.8	65.1	66.1
ORTALITY			8.3	12.2	27.6	28.6	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-172	BB86-173	BB86-174	BB86-175	BB86-176
LATITUDE N			39°47.75'	39°47.75'	39°47.75'	39°47.75'	39°47.50'
LONGITUDE W			74°10.71'	74°10.39'	74°09.75'	74°09.11'	74°10.07'
COLLECTION DATE			5/1/86	5/1/86	5/1/86	5/1/86	5/1/86
TIDE AND HOURS			Low + 3.0	High + 4.0	High + 4.5	High + 5.0	High + 5.5
TEMPERATURE °C	AIR		18.0	16.5	16.5	17.0	17.0
	WATER	S	14.3	ND	ND	ND	ND
		B	14.3	ND	ND	ND	ND
D.O. (ppm)	S		8.7	ND	ND	ND	ND
	B		8.4	ND	ND	ND	ND
SALINITY (ppt)	S		22.0	ND	ND	ND	ND
	B		22.0	ND	ND	ND	ND
pH	S		8.0	ND	ND	ND	ND
	B		7.9	ND	ND	ND	ND
DEPTH (ft)			7'	10'	9'	5'	9'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.39	0.35	0.14	0.01	0.34
% COMMERCIAL SIZES	SL		0.9	2.9	0.0	0.0	0.0
	LN		10.1	23.2	0.0	100	0.0
	CS		78.9	68.1	63.0	0.0	90.0
	CH		10.1	5.8	37.0	0.0	10.0
NUMBER CLAMS COLLECTED			77	70	27	1	70
SIZE RANGE (mm)			34-83	36-80	65-97	-46-	59-86
MEAN SIZE (mm)			79.6	62.0	76.6	46.0	71.1
MORTALITY			11.5	9.1	12.9	66.7	25.5

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-177	BB86-178	BB86-179	BB86-180	BB86-181
ITUDE N			$39^{o}47.50'$	$39^{o}47.50'$	$39^{o}47.41'$	$39^{o}48.50'$	$39^{o}48.50'$
GITUDE W			$74^{o}09.43'$	$74^{o}10.71'$	$74^{o}10.95'$	$74^{o}06.87'$	$74^{o}06.23'$
LECTION DATE			5/1/86	5/1/86	5/1/86	5/6/86	5/6/86
E AND HOURS			Low + 0.0	Low + 0.5	Low + 1.0	High + 0.5	High + 0.5
PERATURE	AIR		17.0	20.0	20.0	21.0	21.0
°C	WATER	S	ND	ND	ND	13.6	ND
		B	ND	ND	ND	13.6	ND
.O.	S		ND	ND	8.6	8.3	ND
ppm)	B		ND	ND	ND	ND	ND
INITY	S		ND	ND	22.0	22.0	ND
ppt)	B		ND	ND	ND	ND	ND
I	S		ND	ND	8.1	8.0	ND
	B		ND	ND	ND	ND	ND
TH (ft)			7'	7'	4'	4'	4'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY (#/ft^2)			0.32	0.57	0.16	0.16	0.03
%	SL		0.0	2.7	0.0	0.0	0.0
MERCIAL	LN		0.0	10.6	12.5	26.7	0.0
SIZES	CS		62.3	79.6	87.5	73.3	100
	CH		37.7	7.1	0.0	0.0	0.0
ER CLAMS COLLECTED			63	103	16	16	3
RANGE (mm)			60-91	32-81	48-75	52-66	29-71
ZE (mm)			74.9	64.9	65.6	59.3	56.3
RTALITY			7.4	7.4	11.1	0.0	25.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-182	BB86-183	BB86-184	BB86-185	BB86-186
LATITUDE N			$39^{o}47.25'$	$39^{o}47.25'$	$39^{o}47.25'$	$39^{o}47.25'$	$39^{o}47.00'$
LONGITUDE W			$74^{o}09.75'$	$74^{o}10.39'$	$74^{o}10.71'$	$74^{o}11.03'$	$74^{o}11.03'$
COLLECTION DATE			5/6/86	5/6/86	5/6/86	5/6/86	5/6/86
TIDE AND HOURS			High + 2.5	High + 3.0	High + 3.5	High + 4.0	High + 4..
TEMPERATURE ^{o}C	AIR		26.0	28.5	30.0	31.5	32.0
	WATER	S	ND	ND	ND	ND	15.3
		B	ND	ND	ND	ND	14.2
D.O. (ppm)	S		ND	ND	ND	ND	8.5
	B		ND	ND	ND	ND	8.1
SALINITY (ppt)	S		ND	ND	ND	ND	24.0
	B		ND	ND	ND	ND	25.0
pH	S		ND	ND	ND	ND	8.0
	B		ND	ND	ND	ND	8.0
DEPTH (ft)			9'	10'	8'	5'	6'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.36	0.26	0.44	0.0	0.56
% COMMERCIAL SIZES	SL		0.0	0.0	9.3	ND	2.7
	LN		0.0	3.8	27.9	ND	8.9
	CS		90.0	75.5	61.6	ND	80.4
	CH		10.0	20.7	1.2	ND	9.0
NUMBER CLAMS COLLECTED			36	51	87	0.0	111
SIZE RANGE (mm)			60-83	51-84	27-81	ND	23-84
MEAN SIZE (mm)			70.0	70.4	58.9	ND	65.5
% MORTALITY			30.8	15.0	7.4	100	9.8

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-187	BB86-188	BB86-189	BB86-190	BB86-191
ITUDE N			$39^{o}47.00'$	$39^{o}47.00'$	$39^{o}47.00'$	$39^{o}46.75'$	$39^{o}46.75'$
GITUDE W			$74^{o}10.71'$	$74^{o}10.07'$	$74^{o}09.43'$	$74^{o}09.11'$	$74^{o}09.75'$
LECTION DATE			5/8/86	5/8/86	5/8/86	5/8/86	5/8/86
E AND HOURS			Low + 4.0	Low + 5.0	Low + 5.5	High + 0.5	High + 1.0
PERATURE	AIR		18.0	18.5	19.0	19.0	18.5
^{o}C	WATER	S	15.7	ND	ND	ND	ND
		B	15.7	ND	ND	ND	ND
.O.	S		8.1	ND	ND	ND	ND
ppm)	B		7.8	ND	ND	ND	ND
INITY	S		24.0	ND	DN	ND	ND
ppt)	B		24.0	ND	ND	ND	ND
H	S		7.9	ND	ND	ND	ND
	B		8.0	ND	ND	ND	ND
TH (ft)			9'	9'	9'	5'	9'
	% GRAVEL		*	*	*	*	*
STRATE	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY ($\#/ft^2$)			0.42	0.13	0.35	0.29	0.37
%	SL		6.1	0.0	0.0	0.0	0.0
MERCIAL	LN		15.9	0.0	4.5	3.4	2.6
IZES	CS		72.0	82.1	89.4	69.0	79.0
	CH		6.0	17.9	6.1	27.6	18.4
BER CLAMS COLLECTED			84	26	69	29	56
E RANGE (mm)			28-87	59-88	53-79	51-89	55-82
IZE (mm)			62.1	70.5	68.7	72.3	70.7
ORTALITY			21.5	43.5	26.6	9.4	21.1

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-192	BB86-193	BB86-194	BB86-195	BB86-196
LATITUDE N			$39^{o}46.75'$	$39^{o}46.75'$	$39^{o}46.50'$	$39^{o}46.50'$	$39^{o}46.50'$
LONGITUDE W			$74^{o}10.39'$	$74^{o}11.03'$	$74^{o}11.03'$	$74^{o}10.71'$	$74^{o}10.07'$
COLLECTION DATE			5/8/86	5/12/86	5/12/86	5/12/86	5/12/86
TIDE AND HOURS			High + 2.0	Low + 1.5	Low + 2.0	Low + 2.5	Low + 3.0
TEMPERATURE	AIR		17.5	16.0	13.0	13.0	13.5
^{o}C	WATER	S	ND	13.3	ND	ND	ND
		B	ND	13.3	ND	ND	ND
D.O.	S		DN	8.3	ND	ND	ND
(ppm)	B		ND	7.9	ND	ND	ND
SALINITY	S		ND	25.0	ND	ND	ND
(ppt)	B		ND	25.0	ND	ND	ND
pH	S		ND	8.1	ND	ND	ND
	B		ND	8.2	ND	ND	ND
DEPTH (ft)			10'	7'	5'	9'	10'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.19	0.51	0.33	0.37	0.36
%	SL		0.0	1.0	2.9	5.4	0.0
COMMERCIAL	LN		2.7	12.2	17.4	21.6	0.0
SIZES	CS		73.0	77.6	69.6	70.3	87.3
	CH		24.3	9.2	10.1	2.7	12.7
NUMBER CLAMS COLLECTED			37	102	66	74	72
SIZE RANGE (mm)			56-84	29-85	31-81	32-83	58-84
MEAN SIZE (mm)			70.7	65.1	63.3	61.2	70.1
% MORTALITY			21.3	10.5	9.6	10.8	24.2

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-197	BB86-198	BB86-199	BB86-200	BB86-201
ITUDE N			39°46.50'	39°46.25'	39°46.25'	39°46.25'	39°46.25'
GITUDE W			74°09.75'	74°09.75'	74°10.39'	74°11.03'	74°11.35'
LECTION DATE			5/12/86	5/12/86	5/12/86	5/12/86	5/12/86
E AND HOURS			Low + 4.0	Low + 4.5	Low + 6.0	High + 0.0	High + 1.0
PERATURE	AIR		14.5	13.0	15.0	16.0	15.0
°C	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
.O.	S		ND	ND	ND	ND	ND
ppm)	B		ND	ND	ND	ND	ND
INITY	S		ND	ND	ND	ND	ND
ppt)	B		ND	ND	ND	ND	ND
H	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
TH (ft)			8'	9'	10'	7'	8'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY (#/ft²)			0.65	0.51	0.17	0.44	0.12
%	SL		0.0	0.0	0.0	0.0	0.0
MERCIAL	LN		0.0	2.1	3.0	5.0	5.9
IZES	CS		68.8	79.6	75.8	84.0	70.6
	CH		31.2	18.3	21.2	1.0	23.5
BER CLAMS COLLECTED			129	95	34	87	12
E RANGE (mm)			60-89	56-81	39-83	42-87	45-87
ZE (mm)			74.3	71.3	71.7	68.1	70.8
RTALITY			19.4	22.8	24.4	8.4	7.7

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-202	BB86-203	BB86-204	BB86-205	BB86-206
LATITUDE N			$39^{o}46.00'$	$39^{o}46.00'$	$39^{o}46.00'$	$39^{o}45.75'$	$39^{o}45.75'$
LONGITUDE W			$74^{o}10.71'$	$74^{o}10.07'$	$74^{o}09.43'$	$74^{o}09.11'$	$74^{o}09.75'$
COLLECTION DATE			5/12/86	5/13/86	5/13/86	5/13/86	5/13/86
TIDE AND HOURS			High + 2.0	Low + 1.0	Low + 2.0	Low + 2.5	Low + 3.0
TEMPERATURE ^{o}C	AIR		18.5	14.5	15.0	15.0	15.0
	WATER	S	14.4	14.0	ND	ND	ND
		B	14.3	13.7	ND	ND	ND
D.O. (ppm)	S		8.6	8.2	ND	ND	ND
	B		8.4	8.2	ND	ND	ND
SALINITY (ppt)	S		25.0	25.0	ND	ND	ND
	B		25.0	28.0	ND	ND	ND
pH	S		8.1	8.1	ND	ND	ND
	B		8.2	8.2	ND	ND	ND
DEPTH (ft)			10'	10'	5'	4'	7'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft^{2})			0.13	0.52	0.12	0.01	0.33
% COMMERCIAL SIZES	SL		0.0	0.0	0.0	0.0	1.5
	LN		0.0	2.0	18.2	0.0	1.5
	CS		76.9	87.3	54.5	100	56.1
	CH		23.1	10.7	27.3	0.0	40.9
NUMBER CLAMS COLLECTED			13	103	12	1	66
SIZE RANGE (mm)			63-82	44-83	48-83	-73-	36-93
SIZE (mm)			70.4	69.6	76.0	73.0	41.0
MORTALITY			18.8	18.9	7.7	0.0	12.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

ATION NUMBER			BB86-207	BB86-208	BB86-209	BB86-210	BB86-211
ITUDE N			$39^{o}45.75'$	$39^{o}45.75'$	$39^{o}45.75'$	$39^{o}45.50'$	$39^{o}45.50'$
GITUDE W			$74^{o}10.39'$	$74^{o}11.03'$	$74^{o}11.35'$	$74^{o}11.35'$	$74^{o}10.71'$
LECTION DATE			5/13/86	5/13/86	5/13/86	5/13/86	5/13/86
E AND HOURS			Low + 3.5	Low + 3.5	Low + 5.0	Low + 5.0	High + 0.5
PERATURE	AIR		14.5	16.5	15.0	15.5	17.0
^{o}C	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
.O.	S		ND	ND	ND	ND	ND
ppm)	B		ND	ND	ND	ND	ND
INITY	S		ND	ND	ND	ND	ND
ppt)	B		ND	ND	ND	ND	ND
H	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
TH (ft)			10'	10'	9'	6'	10'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY (#/ft^{2})			0.10	0.20	0.31	0.25	0.10
%	SL		0.0	0.0	6.7	0.0	0.0
MERCIAL	LN		0.0	0.0	3.3	8.0	0.0
IZES	CS		94.1	94.7	70.0	88.0	89.5
	CH		5.9	5.3	20.0	4.0	10.5
BER CLAMS COLLECTED			17	20	31	50	19
E RANGE (mm)			57-81	57-94	34-86	39-79	60-83
IZE (mm)			69.8	66.0	68.5	65.8	70.0
ORTALITY			22.7	20.0	11.4	5.6	9.5

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-212	BB86-213	BB86-214	BB86-215	BB86-216
LATITUDE N			$39^{o}45.50'$	$39^{o}45.25'$	$39^{0}45.25'$	$39^{o}45.25'$	$39^{o}45.25'$
LONGITUDE W			$74^{o}10.07'$	$74^{o}11.35'$	$74^{o}11.03'$	$74^{o}10.39'$	$74^{o}09.75'$
COLLECTION DATE			5/13/86	5/27/86	5/27/86	5/27/86	5/27/86
TIDE AND HOURS			High + 1.0	Low + 2.0	Low + 3.0	Low + 3.5	Low + 4.5
TEMPERATURE ^{o}C	AIR		17.5	21.0	23.0	23.5	20.0
	WATER	S	14.8	19.1	ND	ND	19.3
		B	14.8	19.0	ND	ND	19.2
D.O. (ppm)	S		8.5	7.3	ND	ND	7.7
	B		8.3	7.0	ND	ND	7.5
SALINITY (ppt)	S		26.0	22.0	ND	ND	22.0
	B		27.0	24.0	ND	ND	25.0
pH	S		8.2	8.1	ND	ND	8.1
	B		8.2	8.1	ND	ND	8.0
DEPTH (ft)			10'	7'	9'	9'	8'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.42	0.40	0.17	0.15	0.47
% COMMERCIAL SIZES	SL		6.0	1.3	0.0	4.4	1.2
	LN		6.0	11.2	0.0	13.0	1.2
	CS		75.0	77.5	83.3	65.2	77.4
	CH		13.0	10.0	16.7	17.4	20.2
NUMBER CLAMS COLLECTED			83	79	17	23	88
SIZE RANGE (mm)			31-83	37-83	64-83	31-81	36-86
MEAN SIZE (mm)			66.8	66.4	72.3	66.3	70.9
% MORTALITY			11.7	0.0	10.5	8.0	6.4

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-217	BB86-218	BB86-219	BB86-220	BB86-221
ITUDE N			39°45.00'	39°45.00'	39°45.00'	39°45.00'	39°44.75'
GITUDE W			74°11.35'	74°10.71'	74°10.07'	74°09.43'	74°11.03'
LECTION DATE			5/28/86	5/28/86	5/28/86	5/28/86	5/29/86
E AND HOURS			Low + 4.0	Low + 4.0	Low + 4.5	Low + 5.0	High + 6.0
PERATURE	AIR		25.0	25.5	27.0	27.0	23.5
°C	WATER	S	ND	ND	ND	20.2	20.1
		B	ND	ND	ND	20.2	20.0
.O.	S		ND	ND	ND	7.3	7.1
ppm)	B		ND	ND	ND	6.2	7.1
INITY	S		ND	ND	ND	25.0	26.0
ppt)	B		ND	ND	ND	24.0	25.0
H	S		ND	ND	ND	8.0	8.0
	B		ND	ND	ND	8.1	8.0
TH (ft)			7'	9'	8'	6'	7'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY (#/ft^2)			0.34	0.08	0.44	0.51	0.19
%	SL		3.0	0.0	0.0	1.9	0.0
MERCIAL	LN		6.0	6.3	10.8	7.8	5.6
IZES	CS		85.0	75.0	74.7	77.7	83.3
	CH		6.0	18.7	14.5	12.6	11.1
BER CLAMS COLLECTED			67	16	88	102	19
E RANGE (mm)			31-89	41-85	39-84	32-85	43-82
IZE (mm)			65.4	72.7	68.3	67.4	70.2
ORTALITY			17.3	0.0	2.2	6.4	5.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-222	BB86-223	BB86-224	BB86-225	BB86-226
LATITUDE N			$39^{o}45.75'$	$39^{o}44.75'$	$39^{o}44.75'$	$39^{o}44.75'$	$39^{o}44.50'$
LONGITUDE W			$74^{o}10.39'$	$74^{o}09.75'$	$74^{o}09.71'$	$74^{o}08.47'$	$74^{o}08.15'$
COLLECTION DATE			5/29/86	5/29/86	5/29/86	5/29/86	5/29/86
TIDE AND HOURS			Low + 0.0	Low + 0.5	Low + 1.0	Low + 2.0	Low + 2.5
TEMPERATURE ^{o}C	AIR		24.0	25.5	26.0	26.0	24.0
	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O. (ppm)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
SALINITY (ppt)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
DEPTH (ft)			7'	7'	7'	6'	4'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.22	0.39	0.28	0.36	0.12
% COMMERCIAL SIZES	SL		2.4	7.7	5.6	0.0	0.0
	LN		11.9	18.0	5.6	13.9	0.0
	CS		69.0	69.2	74.0	79.2	100
	CH		16.7	5.1	14.8	6.9	0.0
NUMBER CLAMS COLLECTED			44	78	56	72	12
SIZE RANGE (mm)			37-80	33-82	29-78	40-86	64-75
MEAN SIZE (mm)			68.1	62.7	66.1	66.0	68.0
% MORTALITY			6.4	2.5	5.1	4.0	7.7

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-227	BB86-228	BB86-229	BB86-230	BB86-231
ITUDE N			39°44.50'	39°44.50'	39°44.50'	39°44.25'	39°44.25'
GITUDE W			74°08.79'	74°09.43'	74°10.07'	74°09.75'	74°09.11'
LECTION DATE			5/29/86	5/29/86	5/29/86	6/3/86	6/3/86
E AND HOURS			Low + 3.0	Low + 3.5	Low + 4.0	High + 1.0	High + 2.0
PERATURE	AIR		23.5	23.0	24.5	14.5	15.0
°C	WATER	S	ND	ND	21.3	18.8	ND
		B	ND	ND	21.0	18.8	ND
.O.	S		ND	ND	7.5	7.3	ND
ppm)	B		ND	ND	7.4	7.2	ND
INITY	S		ND	ND	25.0	26.0	ND
ppt)	B		ND	ND	25.0	25.0	ND
	S		ND	ND	8.1	8.1	ND
	B		ND	ND	8.0	8.0	ND
H (ft)			6'	6'	5'	5'	6'
TRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
MATED HARD CLAM ITY (#/ft²)			0.29	0.25	0.23	0.32	0.33
%	SL		3.4	4.2	6.7	3.2	0.0
ERCIAL	LN		3.4	8.3	8.9	9.7	10.8
ZES	CS		74.2	79.2	71.1	77.4	84.6
	CH		19.0	8.3	13.3	9.7	4.6
ER CLAMS COLLECTED			57	49	46	63	65
RANGE (mm)			29-89	32-83	29-81	31-84	38-84
ZE (mm)			69.2	65.0	65.8	65.8	64.9
RTALITY			8.1	7.5	2.1	0.0	4.4

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-232	BB86-233	BB86-234	BB86-235	BB86-236
LATITUDE N			39°44.25'	39°44.25'	39°44.25'	39°44.00'	39°44.00'
LONGITUDE W			74°08.47'	74°07.83'	74°07.51'	74°07.51'	74°09.53'
COLLECTION DATE			6/3/86	6/3/86	6/3/86	6/3/86	6/5/86
TIDE AND HOURS			High + 2.5	High + 3.5	High + 4.0	High + 5.0	High + 0.5
TEMPERATURE °C	AIR		15.0	16.0	16.0	16.0	22.0
	WATER	S	ND	ND	ND	18.0	19.0
		B	ND	ND	ND	17.8	19.0
D.O. (ppm)	S		ND	ND	ND	7.1	7.2
	B		ND	ND	ND	6.9	7.2
SALINITY (ppt)	S		ND	ND	ND	25.0	22.0
	B		ND	ND	ND	26.0	25.0
pH	S		ND	ND	ND	8.1	8.1
	B		ND	ND	ND	8.1	8.1
DEPTH (ft)			5'	4'	4'	4'	7'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.18	0.21	ND	0.17	0.04
% COMMERCIAL SIZES	SL		0.0	0.0	ND	0.0	0.0
	LN		11.1	0.0	ND	7.2	0.0
	CS		77.8	85.0	ND	46.4	50.0
	CH		11.1	15.0	ND	46.4	50.0
NUMBER CLAMS COLLECTED			18	21	ND	17	4
SIZE RANGE (mm)			48-79	58-82	ND	52-92	61-78
MEAN SIZE (mm)			66.0	69.4	ND	73.9	70.3
MORTALITY			25.0	12.5	ND	5.6	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-237	BB86-238	BB86-239	BB86-240	BB86-241
ITUDE N			39°44.00'	39°47.45'	39°47.45'	39°47.30'	39°46.37'
GITUDE W			74°08.79'	74°08.40'	74°07.83'	74°07.51'	74°06.81'
LECTION DATE			6/5/86	6/9/86	6/9/86	6/9/86	6/9/86
E AND HOURS			High + 1.5	Low + 2.5	Low + 3.0	Low + 3.5	Low + 4.5
PERATURE	AIR		20.0	21.0	21.5	22.0	23.0
°C	WATER	S	ND	21.2	ND	ND	ND
		B	ND	21.2	ND	ND	ND
.O.	S		ND	ND	ND	ND	ND
ppm)	B		ND	6.4	ND	ND	ND
INITY	S		ND	ND	ND	ND	ND
ppt)	B		ND	26.0	ND	ND	ND
	S		ND	ND	ND	ND	ND
	B		ND	8.1	ND	ND	ND
TH (ft)			4'	4'	5'	7'	8'
	% GRAVEL		*	*	*	*	*
TRATE	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
MATED HARD CLAM ITY (#/ft²)			0.31	0.11	0.0	0.0	0.01
%	SL		2.4	0.0	ND	ND	0.0
ERCIAL	LN		14.3	0.0	ND	ND	0.0
ZES	CS		78.6	27.3	ND	ND	100
	CH		4.7	72.7	ND	ND	0.0
ER CLAMS COLLECTED			46	11	0.0	0.0	1
RANGE (mm)			37-80	70-86	ND	ND	-69-
ZE (mm)			64.0	79.0	ND	ND	69.0
RTALITY			4.2	8.3	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-242	BB86-243	BB86-244	BB86-245	BB86-246
LATITUDE N			$39^{o}45.30'$	$39^{o}45.80'$	$39^{o}47.48'$	$39^{o}46.00'$	$39^{o}46.25'$
LONGITUDE W			$74^{o}06.87'$	$74^{o}07.09'$	$74^{o}08.80'$	$74^{o}08.90'$	$74^{o}08.85'$
COLLECTION DATE			6/9/86	6/9/86	6/9/86	6/10/86	6/10/86
TIDE AND HOURS			High + 0.0	High + 0.5	High + 2.0	Low + 2.5	Low + 3.0
TEMPERATURE ^{o}C	AIR		23.5	25.0	24.0	21.0	22.0
	WATER	S	ND	19.2	21.8	21.0	ND
		B	ND	16.7	21.8	20.8	ND
D.O. (ppm)	S		ND	6.7	7.9	7.5	ND
	B		ND	6.3	7.8	6.6	ND
SALINITY (ppt)	S		ND	26.0	25.0	25.0	ND
	B		ND	26.0	25.0	26.0	ND
pH	S		ND	7.9	8.1	8.2	ND
	B		ND	8.0	8.1	8.2	ND
DEPTH (ft)			4'	10'	5'	4'	5'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY ($\#/ft^2$)			0.61	0.44	0.14	0.07	0.02
% COMMERCIAL SIZES	SL		0.0	4.6	0.0	0.0	0.0
	LN		5.5	36.4	0.0	14.2	0.0
	CS		32.7	50.0	25.9	42.9	50.0
	CH		61.8	9.0	74.1	42.9	50.0
NUMBER CLAMS COLLECTED			55	44	28	7	2
SIZE RANGE (mm)			39-97	30-95	63-95	53-78	76-80
X SIZE (mm)			77.9	59.0	83.1	68.9	78.0
% MORTALITY			12.7	20.0	3.4	0.0	66.7

TABLE 1
SHELLFISH INVENTORY SUMMARY

ATION NUMBER			BB86-247	BB86-248	BB86-249	BB86-250	BB86-251
ITUDE N			$39^{o}46.50'$	$39^{o}46.50'$	$39^{o}46.25'$	$39^{o}46.00'$	$39^{o}45.55'$
GITUDE W			$74^{o}08.40'$	$74^{o}08.07'$	$74^{o}07.61'$	$74^{o}07.51'$	$74^{o}07.39'$
LECTION DATE			6/10/86	6/10/86	6/10/86	6/10/86	6/10/86
E AND HOURS			Low + 4.0	Low + 4.5	High + 0.0	High + 1.0	High + 1.5
PERATURE	AIR		23.5	24.5	24.5	24.5	23.5
^{o}C	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
.O.	S		ND	ND	ND	ND	ND
ppm)	B		ND	ND	ND	ND	ND
INITY	S		ND	ND	ND	ND	ND
ppt)	B		ND	ND	ND	ND	ND
H	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
TH (ft)			5'	5'	4'	6'	7'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY (#/ft^{2})			0.20	0.07	0.0	0.13	0.03
%	SL		0.0	0.0	ND	0.0	0.0
MERCIAL	LN		10.0	0.0	ND	0.0	0.0
IZES	CS		50.0	14.3	ND	7.1	0.0
	CH		40.0	85.7	ND	92.9	100
BER CLAMS COLLECTED			20	14	0.0	13	3
E RANGE (mm)			39-97	60-99	ND	75-100	80-82
IZE (mm)			72.9	86.4	ND	87.4	81.0
ORTALITY			0.0	6.7	0.0	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-252	BB86-253	BB86-254	BB86-255	BB86-256
LATITUDE N			$39^{o}45.80'$	$39^{o}43.50'$	$39^{o}43.75'$	$39^{o}43.75'$	$39^{o}43.75'$
LONGITUDE W			$74^{o}07.70'$	$74^{o}08.94'$	$74^{o}09.11'$	$74^{o}09.43'$	$74^{o}08.47'$
COLLECTION DATE			6/10/86	6/16/86	6/16/86	6/16/86	6/16/86
TIDE AND HOURS			High + 1.5	High + 5.0	High + 5.5	High + 6.0	Low + 0.5
TEMPERATURE	AIR		24.0	24.5	25.0	25.0	25.0
^{o}C	WATER	S	21.3	23.4	ND	ND	ND
		B	20.8	23.3	ND	ND	ND
D.O.	S		7.1	6.8	ND	ND	ND
(ppm)	B		6.4	6.8	ND	ND	ND
SALINITY	S		25.0	25.0	ND	ND	ND
(ppt)	B		26.0	26.0	ND	ND	ND
pH	S		8.1	8.4	ND	ND	ND
	B		8.0	8.5	ND	ND	ND
DEPTH (ft)			5'	5'	5'	4'	4'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY ($\#/ft^2$)			0.0	0.20	0.0	0.08	0.08
% COMMERCIAL SIZES	SL		ND	0.0	ND	11.1	0.0
	LN		ND	30.0	ND	33.3	0.0
	CS		ND	70.0	ND	55.6	91.7
	CH		ND	0.0	ND	0.0	8.3
NUMBER CLAMS COLLECTED			0.0	20	0	8	12
SIZE RANGE (mm)			ND	39-73	ND	31-73	57-78
SIZE (mm)			ND	58.4	ND	56.8	69.0
MORTALITY			100	4.8	0.0	0.0	0.08

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-257	BB86-258	BB86-259	BB86-260	BB86-261
ITUDE N			$39^{o}43.75'$	$39^{o}44.10'$	$39^{o}44.15'$	$39^{o}43.40'$	$39^{o}43.20'$
GITUDE W			$74^{o}08.15'$	$74^{o}07.83'$	$74^{o}08.15'$	$74^{o}08.50'$	$74^{o}08.40'$
LECTION DATE			6/16/86	6/19/86	6/19/86	6/19/86	6/19/86
E AND HOURS			Low + 1.0	High + 2.0	High + 2.5	High + 3.5	High + 4.5
PERATURE	AIR		25.0	17.0	19.0	20.0	21.0
^{o}C	WATER	S	ND	19.8	ND	ND	ND
		B	ND	19.8	ND	ND	ND
.O.	S		ND	ND	ND	ND	ND
ppm)	B		ND	7.0	ND	ND	ND
INITY	S		ND	ND	ND	ND	ND
ppt)	B		ND	25.0	ND	ND	ND
H	S		ND	ND	ND	ND	ND
	B		ND	8.4	ND	ND	ND
TH (ft)			4'	4'	4'	4'	4'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY (#/ft^{2})			0.08	0.19	0.10	0.10	0.02
%	SL		0.0	0.0	0.0	0.0	0.0
MERCIAL	LN		0.0	0.0	20.0	40.0	33.3
IZES	CS		93.8	18.9	10.0	0.0	0.0
	CH		6.2	18.9	10.0	0.0	0.0
BER CLAMS COLLECTED			11	37	20	10	3
E RANGE (mm)			61-79	59-94	47-82	47-70	55-75
IZE (mm)			69.9	70.7	65.5	59.9	66.3
ORTALITY			0.0	5.1	0.0	16.7	25.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-262	BB86-263	BB86-264	BB86-265	BB86-266
LATITUDE N			39°43.25'	39°42.75'	39°42.90'	39°75.85'	39°42.52'
LONGITUDE W			74°08.79'	74°08.47'	74°07.20'	74°08.67'	74°08.77'
COLLECTION DATE			6/19/86	6/19/86	6/23/86	6/23/86	6/23/86
TIDE AND HOURS			High + 5.0	High + 5.5	Low + 3.5	Low + 4.0	Low + 5.0
TEMPERATURE °C	AIR		20.0	20.0	23.0	23.0	25.5
	WATER	S	ND	21.0	20.3	ND	ND
		B	ND	21.0	20.3	ND	ND
D.O. (ppm)	S		ND	ND	ND	ND	ND
	B		ND	5.4	5.3	ND	ND
SALINITY (ppt)	S		ND	ND	ND	ND	ND
	B		ND	25.0	26.0	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	8.5	8.4	ND	ND
DEPTH (ft)			4'	4'	4'	4'	4'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.03	0.07	0.09	0.02	0.01
% COMMERCIAL SIZES	SL		0.0	11.1	0.0	0.0	0.0
	LN		33.3	33.3	22.2	0.0	0.0
	CS		66.7	55.6	77.8	100	100
	CH		0.0	0.0	0.0	0.0	0.0
NUMBER CLAMS COLLECTED			3	7	9	2	1
SIZE RANGE (mm)			55-64	15-74	52-70	68-73	-69-
MEAN SIZE (mm)			60.3	54.8	54.1	65.5	69.0
% MORTALITY			40.0	0.0	18.2	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-267	BB86-268	BB86-269	BB86-270	BB86-271
ITUDE N			$39^{o}42.30'$	$39^{o}42.25'$	$39^{o}42.30'$	$39^{o}42.50'$	$39^{o}42.70'$
GITUDE W			$74^{o}08.40'$	$74^{o}09.11'$	$74^{o}09.53'$	$74^{o}09.43'$	$74^{o}09.11'$
LECTION DATE			6/23/86	6/23/86	6/23/86	6/25/86	6/25/86
E AND HOURS			High + 0.0	High + 0.5	High + 1.0	Low + 2.0	Low + 3.0
PERATURE	AIR		27.0	27.0	29.0	21.0	19.0
^{o}C	WATER	S	ND	ND	ND	20.2	ND
		B	ND	ND	ND	20.2	ND
.O.	S		ND	ND	ND	6.8	ND
ppm)	B		ND	ND	5.0	6.7	ND
INITY	S		ND	ND	ND	25.0	ND
ppt)	B		ND	ND	25.0	26.0	ND
H	S		ND	ND	ND	8.4	ND
	B		ND	ND	8.4	8.4	ND
TH (ft)			4'	4'	4'	8'	4'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY ($\#/ft^2$)			0.13	0.07	0.10	0.07	0.04
%	SL		0.0	0.0	0.0	0.0	0.0
MERCIAL	LN		0.0	57.1	50.0	0.0	0.0
IZES	CS		84.6	28.6	50.0	85.7	100
	CH		15.4	14.3	0.0	14.3	0.0
BER CLAMS COLLECTED			13	7	10	7	4
E RANGE (mm)			62-79	52-77	49-67	59-81	58-73
IZE (mm)			70.6	62.1	57.8	68.9	62.8
ORTALITY			7.1	0.0	16.7	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-272	BB86-273	BB86-274	BB86-275	BB86-276
LATITUDE N			39°43.00'	39°43.00'	39°43.25'	39°43.60'	39°42.00'
LONGITUDE W			74°09.43'	74°10.07'	74°09.75'	74°09.80'	74°08.72'
COLLECTION DATE			6/25/86	6/25/86	6/25/86	6/25/86	6/26/86
TIDE AND HOURS			Low + 3.5	Low + 4.0	Low + 5.0	High + 0.0	Low + 1.5
TEMPERATURE °C	AIR		19.0	22.0	21.5	21.0	21.5
	WATER	S	ND	ND	ND	ND	20.1
		B	ND	ND	ND	ND	19.8
D.O. (ppm)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	8.8	ND
SALINITY (ppt)	S		ND	ND	ND	ND	26.0
	B		ND	ND	ND	24.0	26.0
pH	S		ND	ND	ND	ND	8.3
	B		ND	ND	ND	8.4	8.3
DEPTH (ft)			6'	5'	5'	3'	5'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.22	0.27	0.12	0.01	0.08
% COMMERCIAL SIZES	SL		0.0	0.0	0.0	0.0	0.0
	LN		18.2	4.0	0.0	0.0	25.0
	CS		68.2	68.0	58.8	100	75.0
	CH		13.6	28.0	41.2	0.0	0.0
NUMBER CLAMS COLLECTED			22	27	12	1	8
SIZE RANGE (mm)			43-82	55-87	62-87	-67-	54-75
SIZE (mm)			66.6	70.8	73.3	67.0	63.1
MORTALITY			8.3	3.6	7.7	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-277	BB86-278	BB86-279	BB86-280	BB86-281
ITUDE N			39°42.00'	39°41.75'	39°41.70'	39°41.50'	39°41.25'
GITUDE W			74°09.44'	74°09.75'	74°09.10'	74°09.15'	74°09.60'
LECTION DATE			6/26/86	6/26/86	6/26/86	7/1/86	7/1/86
E AND HOURS			Low + 2.0	Low + 3.0	Low + 3.5	High + 4.5	High + 5.5
PERATURE	AIR		20.5	21.5	21.5	21.5	23.5
°C	WATER	S	ND	ND	ND	22.7	ND
		B	ND	ND	ND	22.2	ND
.O.	S		ND	ND	ND	6.4	ND
ppm)	B		ND	ND	ND	5.9	ND
INITY	S		ND	ND	ND	28.0	ND
ppt)	B		ND	ND	26.0	29.0	ND
H	S		ND	ND	ND	8.3	ND
	B		ND	ND	8.3	8.4	ND
TH (ft)			4'	4'	4'	10'	4'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY (#/ft²)			0.09	0.03	0.19	0.0	0.03
%	SL		11.1	0.0	0.0	ND	0.0
MERCIAL	LN		22.2	100	11.1	ND	33.3
IZES	CS		55.6	0.0	88.9	ND	66.7
	CH		11.1	0.0	0.0	ND	0.0
BER CLAMS COLLECTED			9	3	19	0.0	3
E RANGE (mm)			33-82	48-53	53-72	ND	49-66
IZE (mm)			61.4	51.3	63.3	ND	60.0
ORTALITY			0.0	0.0	17.4	100	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-282	BB86-283	BB86-284	BB86-285	BB86-286
LATITUDE N			$39^{o}41.00'$	$39^{o}40.75'$	$39^{o}40.50'$	$39^{o}40.75'$	$39^{o}41.00'$
LONGITUDE W			$74^{o}09.28'$	$74^{o}09.60'$	$74^{o}09.91'$	$74^{o}10.23'$	$74^{o}10.55'$
COLLECTION DATE			7/1/86	7/1/86	7/1/86	7/7/86	7/7/86
TIDE AND HOURS			Low + 0.0	Low + 1.0	Low + 1.0	Low + 4.0	Low + 5.0
TEMPERATURE	AIR		23.5	24.0	24.0	31.0	31.0
^{o}C	WATER	S	ND	ND	23.4	24.5	ND
		B	ND	ND	23.3	24.0	ND
D.O.	S		ND	ND	7.9	5.6	ND
(ppm)	B		ND	ND	7.8	5.3	ND
SALINITY	S		ND	ND	30.0	30.0	ND
(ppt)	B		ND	ND	30.0	29.0	ND
pH	S		ND	ND	8.4	8.4	ND
	B		ND	ND	8.4	8.1	ND
DEPTH (ft)			4'	5'	6'	30'	5'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.04	0.07	0.40	0.10	0.04
% COMMERCIAL SIZES	SL		0.0	0.0	0.0	9.1	0.0
	LN		50.0	28.6	26.8	0.0	50.0
	CS		50.0	71.4	63.4	81.8	50.0
	CH		0.0	0.0	9.8	9.1	0.0
NUMBER CLAMS COLLECTED			4	7	40	10	4
SIZE RANGE (mm)			50-61	52-68	39-84	28-80	44-68
MEAN SIZE (mm)			56.5	62.0	61.8	65.1	57.3
% MORTALITY			20.0	0.0	2.4	0.0	0.0

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-287	BB86-288	BB86-289	BB86-290	BB86-291
ITUDE N			39°41.25'	39°41.00'	39°40.87'	39°40.95'	39°40.50'
GITUDE W			74°10.87'	74°11.19'	74°11.51'	74°11.66'	74°10.55'
LECTION DATE			7/7/86	7/7/86	7/7/86	7/7/86	7/8/86
E AND HOURS			High + 0.0	High + 0.5	High + 1.5	High + 2.0	Low + 4.0
PERATURE	AIR		33.5	34.0	36.0	36.0	28.0
°C	WATER	S	ND	ND	26.5	ND	26.5
		B	ND	ND	25.0	ND	26.5
.O.	S		ND	ND	5.5	ND	5.6
pm)	B		ND	ND	4.4	ND	5.5
INITY	S		ND	ND	30.0	ND	27.0
ppt)	B		ND	ND	30.0	ND	29.0
H	S		ND	ND	8.4	ND	8.2
	B		ND	ND	8.3	ND	8.3
TH (ft)			6'	6'	6'	5'	7'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY (#/ft²)			0.12	0.16	0.12	0.24	0.16
%	SL		0.0	0.0	8.3	4.2	6.3
MERCIAL	LN		0.0	4.3	0.0	16.7	18.7
IZES	CS		83.3	60.9	75.0	33.3	75.0
	CH		16.7	34.8	16.7	45.8	0.0
BER CLAMS COLLECTED			12	24	12	24	16
RANGE (mm)			61-81	45-86	35-78	36-95	35-75
ZE (mm)			73.4	73.1	64.6	71.3	63.4
ORTALITY			0.0	0.0	7.7	0.0	0.0

TABLE 1

SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-292	BB86-293	BB86-294	BB86-295	BB86-296
LATITUDE N			39°40.75'	39°40.50'	39°40.25'	39°40.00'	39°40.25'
LONGITUDE W			74°10.87'	74°11.19'	74°10.55'	74°10.55'	74°10.23'
COLLECTION DATE			7/8/86	7/8/86	7/8/86	7/8/86	7/10/86
TIDE AND HOURS			Low + 4.5	Low + 5.0	High + 0.0	High + 1.0	Low + 3.0
TEMPERATURE °C	AIR		29.0	28.0	31.0	32.0	23.0
	WATER	S	ND	ND	ND	27.0	24.5
		B	ND	ND	ND	26.5	24.5
D.O. (ppm)	S		ND	ND	ND	6.8	5.6
	B		ND	ND	ND	6.8	5.6
SALINITY (ppt)	S		ND	ND	ND	29.0	30.0
	B		ND	ND	ND	26.0	30.0
pH	S		ND	ND	ND	8.3	8.2
	B		ND	ND	ND	8.3	8.2
DEPTH (ft)			7'	7'	6'	5'	6'
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.02	0.04	0.11	0.06	0.29
% COMMERCIAL SIZES	SL		0.0	0.0	9.1	0.0	0.0
	LN		0.0	0.0	27.3	25.0	8.8
	CS		66.7	100	63.6	75.0	71.9
	CH		33.3	0.0	0.0	0.0	19.3
NUMBER CLAMS COLLECTED			3	4	11	6	44
SIZE RANGE (mm)			58-79	60-73	37-70	56-69	48-92
MEAN SIZE (mm)			69.0	66.0	59.5	62.8	68.7
% MORTALITY			0.0	0.0	0.0	25.0	2.2

TABLE 1
SHELLFISH INVENTORY SUMMARY

TION NUMBER			BB86-297	BB86-298	BB86-299	BB86-300	BB86-301
ITUDE N			39°39.75'	39°39.35'	39°39.60'	39°40.05'	39°40.25'
GITUDE W			74°10.87'	74°10.97'	74°11.00'	74°11.10'	74°11.51'
LECTION DATE			7/10/86	7/10/86	7/10/86	7/10/86	7/28/86
E AND HOURS			Low + 3.0	Low + 4.0	Low + 5.0	High + 0.0	Low + 0.0
PERATURE	AIR		24.5	27.0	27.0	27.0	27.0
°C	WATER	S	ND	ND	ND	25.5	26.5
		B	ND	ND	ND	25.5	26.5
.O.	S		ND	ND	ND	8.5	7.8
ppm)	B		ND	ND	ND	7.7	7.3
INITY	S		ND	ND	ND	30.0	29.0
ppt)	B		ND	ND	ND	30.0	30.0
I	S		ND	ND	ND	8.4	8.1
	B		ND	ND	ND	8.2	8.1
TH (ft)			5'	9'	4'	5'	5'
STRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
IMATED HARD CLAM SITY (#/ft²)			0.37	0.14	0.05	0.10	0.06
%	SL		1.8	5.3	0.0	0.0	0.0
MERCIAL	LN		8.8	0.0	20.0	30.0	16.7
IZES	CS		77.2	52.6	80.0	70.0	83.3
	CH		12.2	42.1	0.0	0.0	0.0
ER CLAMS COLLECTED			55	19	5	10	6
RANGE (mm)			35-86	37-79	55-76	46-75	44-74
ZE (mm)			62.8	70.8	65.0	61.2	64.2
RTALITY			1.8	5.0	0.0	0.0	14.3

TABLE 1
SHELLFISH INVENTORY SUMMARY

STATION NUMBER			BB86-302	BB86-303	BB86-304		
LATITUDE N			$39^{o}40.50'$	$39^{o}39.90'$	$39^{o}39.75'$		
LONGITUDE W			$74^{o}11.70'$	$74^{o}11.89'$	$74^{o}11.50'$		
COLLECTION DATE			7/28/86	7/28/86	8/7/86		
TIDE AND HOURS			Low + 1.0	Low + 1.0	High + 0.5		
TEMPERATURE ^{o}C	AIR		26.5	27.0	28.0		
	WATER	S	ND	ND	26.8		
		B	ND	ND	26.8		
D.O. (ppm)	S		ND	ND	ND		
	B		ND	ND	6.8		
SALINITY (ppt)	S		ND	ND	ND		
	B		ND	ND	25.0		
pH	S		ND	ND	ND		
	B		ND	ND	8.0		
DEPTH (ft)			4'	4'	4'		
SUBSTRATE	% GRAVEL		*	*	*		
	% SAND		*	*	*		
	% MUD		*	*	*		
ESTIMATED HARD CLAM DENSITY ($\#/ft^2$)			0.04	0.02	0.08		
% COMMERCIAL SIZES	SL		0.0	0.0	0.0		
	LN		25.0	0.0	0.0		
	CS		75.0	10.0	87.5		
	CH		0.0	0.0	12.5		
NUMBER CLAMS COLLECTED			4	2	8		
SIZE RANGE (mm)			54-64	62-64	58-78		
MEAN SIZE (mm)			58.8	63.0	66.0		
% MORTALITY			20.0	0.0	11.1		

TABLE 2

SHELLFISH INVENTORY SUMMARY

St. Georges Thorofare
1985

'ATION NUMBER			SG85-1	SG85-2	SG85-3	SG85-4	SG85-5
.TITUDE N			39°23.60'	39°23.50'	39°23.40'	39°23.60'	39°23.60'
NGITUDE W			74°23.90'	74°23.90'	74°23.90'	74°24.10'	74°24.10'
LLECTION DATE			6/3/85	6/3/85	6/3/85	6/3/85	6/3/85
DE AND HOURS			High + 0.5	High + 1.0	High + 1.5	High + 2.0	High 2.5
MPERATURE	AIR		23.0	25.5	27.0	28.0	28.0
°C	WATER	S	19.7	ND	ND	ND	ND
		B	19.5	ND	ND	ND	ND
D.O.	S		8.6	ND	ND	ND	ND
(ppm)	B		7.8	ND	ND	ND	ND
LINITY	S		31.0	ND	ND	ND	ND
(ppt)	B		31.0	ND	ND	ND	ND
PH	S		7.9	ND	ND	ND	ND
	B		7.9	ND	ND	ND	ND
PTH (ft)			10'	10'	11'	8'	5'
BSTRATE	% GRAVEL		0	0	0.6	0	0
	% SAND		83.2	93.0	90.8	85.4	86.4
	% MUD		16.8	7.0	8.6	14.6	13.6
IMATED HARD CLAM NSITY (#/ft^2)			0.58	1.24	0.51	1.07	0.77
%	SL		8.6	8.3	16.7	7.1	9.0
MMERCIAL	LN		20.7	30.6	31.8	17.9	31.9
IZES	CS		32.9	43.0	34.8	38.1	36.1
	CH		37.8	18.1	16.7	36.9	23.0
MBER CLAMS COLLECTED			87	124	76	90	153
E RANGE (mm)			32-100	30-100	30-101	30-111	30-116
IZE (mm)			66.5	59.9	57.9	69.6	61.8
MORTALITY			3.3	6.8	3.8	1.1	6.7

ND-No Data

TABLE 2 (cont.)
SHELLFISH INVENTORY SUMMARY

St. Georges Thorofare
1985

STATION NUMBER			SG85-6	SG85-7	SG85-8	SG85-9	SG85-1(
LATITUDE N			39°23.50'	39°23.40'	39°23.35'	39°23.10'	39°23.3(
LONGITUDE W			74°24.40'	74°24.45'	74°24.48'	74°24.70'	74°24.5(
COLLECTION DATE			6/3/85	6/3/85	6/3/85	6/4/85	6/4/85
TIDE AND HOURS			High + 3.0	High + 3.5	High + 4.0	Low + 5.5	High + 0.
TEMPERATURE °C	AIR		29.0	27.0	26.0	21.0	22.0
	WATER	S	ND	ND	20.7	16.3	ND
		B	ND	ND	18.5	16.3	ND
D.O. (ppm)	S		ND	ND	10.0	8.6	ND
	B		ND	ND	10.0	8.6	ND
SALINITY (ppt)	S		ND	ND	31.0	31.5	ND
	B		ND	ND	30.0	31.5	ND
pH	S		ND	ND	7.9	8.1	ND
	B		ND	ND	7.9	8.3	ND
DEPTH (ft)			5'	4'	8'	7'	7'
SUBSTRATE	% GRAVEL		0	0	0	0	0
	% SAND		89.8	89.6	70.2	75.8	68.6
	% MUD		10.2	10.4	29.8	24.2	31.4
ESTIMATED HARD CLAM DENSITY (#/ft²)			1.90	0.78	5.13	0.18	1.57
% COMMERCIAL SIZES	SL		4.1	2.6	8.8	4.0	9.5
	LN		11.8	19.7	16.0	8.0	15.2
	CS		14.1	21.1	47.4	16.0	21.5
	CH		70.0	56.6	27.8	72.0	53.8
NUMBER CLAMS COLLECTED			380	78	513	35	157
SIZE RANGE (mm)			30-118	33-103	31-116	33-117	30-116
$\bar{X}$ SIZE (mm)			80.9	74.7	66.6	83.5	73.9
% MORTALITY			12.8	36.1	23.4	2.7	5.9

ND-No Data

TABLE 2 (cont.)
SHELLFISH INVENTORY SUMMARY

St. Georges Thorofare
1985

'ATION NUMBER			SG85-11	SG85-12	SG85-13	SG85-14	SG85-15
'TITUDE N			$39^{o}23.30'$	$39^{o}23.40'$	$39^{o}23.60'$	$39^{o}23.60'$	$39^{o}23.50'$
'NGITUDE W			$74^{o}24.70'$	$74^{o}24.60'$	$74^{o}23.90'$	$74^{o}23.85'$	$74^{o}23.95'$
'LLECTION DATE			6/4/85	6/4/85	6/4/85	6/4/85	6/4/85
DE AND HOURS			High + 1.0	High + 1.5	High + 2.0	High + 2.5	High + 3.0
MPERATURE	AIR		22.0	22.0	22.0	22.0	23.0
^{o}C	WATER	S	ND	ND	ND	19.8	ND
		B	ND	ND	ND	16.8	ND
D.O.	S		ND	ND	ND	8.7	ND
(ppm)	B		ND	ND	ND	5.6	ND
LINITY	S		ND	ND	ND	31.0	ND
(ppt)	B		ND	ND	ND	32.0	ND
'H	S		ND	ND	ND	7.9	ND
	B		ND	ND	ND	7.5	ND
'TH (ft)			4'	4'	18'	21'	16'
STRATE	% GRAVEL		0	0	0.2	0	0
	% SAND		81.4	88.6	11.0	14.0	15.0
	% MUD		18.6	11.4	88.8	86.0	85.0
IMATED HARD CLAM ISITY ($\#/ft^2$)			2.65	2.03	0.02	0	0
%	SL		10.4	4.1	33.3	ND	ND
MERCIAL	LN		21.3	13.3	0	ND	ND
IZES	CS		30.1	39.5	66.7	ND	ND
	CH		38.2	43.1	0	ND	ND
BER CLAMS COLLECTED			530	406	3	0	0
E RANGE (mm)			30-111	30-114	35-68	ND	ND
IZE (mm)			69.1	74.7	56.7	ND	ND
ORTALITY			19.0	4.9	84.2	0	0

ID-No Data

TABLE 2 (cont.)
SHELLFISH INVENTORY SUMMARY

St. Georges Thorofare

1985

STATION NUMBER			SG85-16	SG85-17	SG85-18	SG85-19	SG85-2(
LATITUDE N			$39^{o}23.45'$	$39^{o}23.50'$	$39^{o}23.35'$	$39^{o}23.25'$	$39^{o}23.1($
LONGITUDE W			$74^{o}24.20'$	$74^{o}24.30'$	$74^{o}24.55'$	$74^{o}24.60'$	$74^{o}24.4($
COLLECTION DATE			6/4/85	6/4/85	6/5/85	6/5/85	6/5/85
TIDE AND HOURS			High + 4.0	High + 5.0	Low + 4.5	Low + 5.0	Low + 5.5
TEMPERATURE	AIR		23.0	22.0	19.0	19.0	19.0
^{o}C	WATER	S	ND	ND	18.2	ND	ND
		B	ND	ND	17.7	ND	ND
D.O.	S		ND	ND	8.2	ND	ND
(ppm)	B		ND	ND	6.6	ND	ND
SALINITY	S		ND	ND	31.5	ND	ND
(ppt)	B		ND	ND	31.5	ND	ND
pH	S		ND	ND	8.0	ND	ND
	B		ND	ND	7.9	ND	ND
DEPTH (ft)			11'	16'	18'	16'	15'
SUBSTRATE	% GRAVEL		0.4	0	0	0	0
	% SAND		62.0	22.0	5.4	12.8	5.0
	% MUD		37.6	78.0	94.6	87.2	95.0
ESTIMATED HARD CLAM DENSITY ($\#/ft^2$)			2.46	0.34	0.02	0	0.01
% COMMERCIAL SIZES	SL		5.3	6.9	0	ND	0
	LN		16.5	3.4	25.0	ND	0
	CS		48.2	48.3	0	ND	100
	CH		30.0	41.4	75.0	ND	0
NUMBER CLAMS COLLECTED			172	34	4	0	2
SIZE RANGE (mm)			30-100	32-94	50-110	ND	59-62
SIZE (mm)			67.3	71.6	92.0	ND	60.5
MORTALITY			13.1	15.0	33.3	100	0

ND-No Data

TABLE 2 (cont.)
SHELLFISH INVENTORY SUMMARY
St. Georges Thorofare
1985

ATION NUMBER			SG85-21	SG85-22			
TITUDE N			$39^{o}23.20'$	$39^{o}23.10'$			
NGITUDE W			$74^{o}24.55'$	$74^{o}24.85'$			
LLECTION DATE			6/5/85	6/5/85			
DE AND HOURS			High + 0.0	High + 1.0			
MPERATURE	AIR		19.0	19.0			
^{o}C	WATER	S	ND	17.2			
		B	ND	17.2			
D.O.	S		ND	8.8			
(ppm)	B		ND	8.8			
LINITY	S		ND	31.0			
ppt)	B		ND	31.0			
H	S		ND	8.1			
	B		ND	7.9			
TH (ft)			16'	15'			
STRATE	% GRAVEL		0	0			
	% SAND		9.2	52.6			
	% MUD		90.8	47.4			
IMATED HARD CLAM SITY (#/ft^{2})			0.06	0.03			
%	SL		0	0			
MERCIAL	LN		18.2	33.3			
IZES	CS		36.4	66.7			
	CH		45.4	0			
BER CLAMS COLLECTED			11	3			
E RANGE (mm)			38-94	55-68			
IZE (mm)			72.0	63.0			
ORTALITY			0	0			

-No Data

TABLE 3

ST. GEORGE'S THOROFARE 1985

DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/sq. ft.)

ORGANISM	STATIONS																					
	SG85 1	SG85 2	SG85 3	SG85 4	SG85 5	SG85 6	SG85 7	SG85 8	SG85 9	SG85 10	SG85 11	SG85 12	SG85 13	SG85 14	SG85 15	SG85 16	SG85 17	SG85 18	SG85 19	SG85 20	SG85 21	SG85 22
PHYLUM MOLLUSCA																						
CLASS GASTROPODA																						
Busycon canaliculatum	0.01		0.01		0.01																	0.01
Polinices duplicatus																				0.01		
CLASS BIVALVIA																						
Anadara ovalis						0.03	0.06	0.20		0.01						0.11	0.02					
Anomia simplex							+															
Ensis directus	0.01		0.03	0.07	0.03	0.02				0.01	0.04											
Mercenaria mercenaria	0.58	1.24	0.51	1.06	0.77	1.90	0.78	5.13	0.18	1.57	2.64	2.03	0.02			2.46	0.34	0.02		0.01	0.06	0.03
M. mercenaria notata				0.01							0.02											
Mya arenaria		0.01							0.01													
Petricola pholadiformis				0.01																		
Pitar morrhuanus				0.01				0.04	0.02	0.13							0.03				0.01	0.12
Tagelus plebeius											0.01	0.04										
PHYLUM ARTHROPODA																						
CLASS MEROSTOMATA																						
Limulus polyphemus	0.02	0.03			0.01			0.01					0.01									
CLASS CRUSTACEA																						
Ovalipes ocellatus			0.01																			
Libinia emarginata				0.01																		

+ Presence (No estimate of density)

SHELLFISH INVENTORY SUMMARY

Delaware Bay

Table 4

TATION NUMBER			DBSC86-1	DBSC86-2	DBSC86-3	DBSC86-4	DBSC86-5
ATITUDE N			39°11.1'	39°10.6'	39° 10.2'	30° 10.5	39° 11.1'
ONGITUDE W			74°59.8'	74°59.7'	75° 00.2'	75° 01.4	74° 01.7
OLLECTION DATE			4-2-86	4-2-86	4-2-86	4-2-86	4-2-86
IDE AND HOURS			Low + 4.25	Low + 4.5	Low + 5	Low + 5.5	High
EMPERATURE °C	AIR		ND	ND	ND	ND	ND
	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O. (ppm)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
ALINITY (ppt)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
EPTH (ft)			6-8	6-8	6-8	6-8	6-8
UBSTRATE	% GRAVEL		ND	ND	ND	ND	ND
	% SAND		ND	ND	ND	ND	ND
	% MUD		ND	ND	ND	ND	ND
STIMATED HARD CLAM ENSITY (#/ft²)			0.0008	0.0098	0.0195	0.00175	0.0055
% OMMERCIAL SIZES	SL		0	0	0	0	0
	LN		0	10	4.2	0	0
	CS		2	59	66.7	100	25
	CH		0	31	29.1	0	75
UMBER CLAMS COLLECTED			2	32	24	3	4
IZE RANGE (mm)			63-72	55-88	55-89	69-75	63-83
SIZE (mm)			0	70.16	70.7	71.7	76.5
MORTALITY			0	0	0	0	0

SHELLFISH INVENTORY SUMMARY

Delaware Bay

Table 4

STATION NUMBER			DBSC86-6	DBSC86-7	DBSC86-8	DBSC86-9	DBSC86-1
LATITUDE N			39° 80.8'	39° 11.3'	39° 11.4'	39° 11.1'	39° 10.8
LONGITUDE W			75° 00.1'	75° 01.6'	75° 10.2'	75° 09.4'	75° 09.9'
COLLECTION DATE			4-2-86	4-2-86	4-3-86	4-3-86	4-3-86
TIDE AND HOURS			High + .5	High + 1.0	High + 4.0	High + 4.5	High + 5.(
TEMPERATURE °C	AIR		ND	ND	ND	ND	ND
	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O. (ppm)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
SALINITY (ppt)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
DEPTH (ft)			ND	ND	10'	9'	17'
SUBSTRATE	% GRAVEL		ND	ND	ND	ND	ND
	% SAND		ND	ND	ND	ND	ND
	% MUD		ND	ND	ND	ND	ND
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.0192	–	0.00595	0.00032	0.026
% COMMERCIAL SIZES	SL		0	0	–	–	–
	LN		2	0	–	100	–
	CS		70	0	–	–	–
	CH		28	0	–	–	–
NUMBER CLAMS COLLECTED			50	0	22	NA	96
SIZE RANGE (mm)			55-85	–	–	NA	–
X SIZE (mm)			71.9	–	–	NA	77
% MORTALITY			–	–	26.7	–	7.5

SHELLFISH INVENTORY SUMMARY

Delaware Bay
Table 4

ATION NUMBER			DBSC86-11	DBSC86-12	DBSC86-13	DBSC86-14	DBSC86-15
TITUDE N			39° 11.3'	39° 10.1'	39° 10.7'	39° 11.3'	39° 11.8'
NGITUDE W			75° 10.8'	75° 08.0'	75° 07.4'	75° 06.9'	75° 05.6'
LLECTION DATE			4-3-86	4-3-86	4-3-86	4-3-86	4-3-86
DE AND HOURS			High + 5.5	High + 6.0	Low	Low + .75	Low + .75
MPERATURE	AIR		ND	ND	ND	ND	ND
°C	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O.	S		ND	ND	ND	ND	ND
(ppm)	B		ND	ND	ND	ND	ND
LINITY	S		ND	ND	ND	ND	ND
(ppt)	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
PTH (ft)			17-18	12'	9'	8'	ND
BSTRATE	% GRAVEL		ND	ND	ND	ND	ND
	% SAND		ND	ND	ND	ND	ND
	% MUD		ND	ND	ND	ND	ND
TIMATED HARD CLAM NSITY (#/ft²)			0.0022	0.0105	0.0028	0.0018	0
%	SL		-	-	-	-	-
MMERCIAL	LN		-	-	-	-	-
SIZES	CS		-	-	-	-	-
	CH		-	-	-	-	-
MBER CLAMS COLLECTED			10	30	11	5	0
ZE RANGE (mm)			-	-	-	-	-
SIZE (mm)			-	-	-	-	-
MORTALITY			9	3.2	83	16.7	-

SHELLFISH INVENTORY SUMMARY

Delaware Bay
Table 4

STATION NUMBER			DBSC86-16	DBSC86-17	DBSC86-18	DBSC86-19	DBSC86-20
LATITUDE N			39° 11.5	39° 11.1'	39° 10.4'	39° 09.6'	39° 08.9'
LONGITUDE W			75° 03.8	74° 58.4'	75° 58.4'	75° 58.5'	75° 58.5'
COLLECTION DATE			4-3-86	4-4-86	4-4-86	4-4-86	4-4-86
TIDE AND HOURS			Low + 1 25	High + 2.0	High + 2.5	High + 3.0	High + 3.5
TEMPERATURE °C	AIR		ND	ND	ND	ND	ND
	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O. (ppm)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
SALINITY (ppt)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
DEPTH (ft)			8-9	ND	ND	ND	ND
SUBSTRATE	% GRAVEL		ND	ND	ND	ND	ND
	% SAND		ND	ND	ND	ND	ND
	% MUD		ND	ND	ND	ND	ND
ESTIMATED HARD CLAM DENSITY (#/ft²)			0	0.0006	0.00017	0.0036	0.005
% COMMERCIAL SIZES	SL		–	–	–	–	0
	LN		–	–	–	–	0
	CS		–	–	–	–	6.7
	CH		–	–	–	–	33
NUMBER CLAMS COLLECTED			–	–	1	4	15
SIZE RANGE (mm)			–	–	–	–	59-94
$\bar{x}$ SIZE (mm)			–	–	–		50.7
% MORTALITY			–	50	89	56	29

SHELLFISH INVENTORY SUMMARY

Delaware Bay
Table 4

ATION NUMBER			DBSC86-21	DBSC86-22	DBSC86-23	DBSC86-24	DBSC86-25
ITITUDE N			39° 07.9'	39° 07.4'	39° 07.8'	39° 04.8'	39° 03.2'
NGITUDE W			74° 58.5'	74° 58.2'	74° 57.3'	74° 57.6	74° 56.1'
LLECTION DATE			4-4-86	4-4-86	4-4-86	4-4-86	4-4-86
DE AND HOURS			High + 4.0	High + 4.25	High + 4.5	High + 5.25	Low
MPERATURE	AIR		ND	ND	ND	ND	ND
°C	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
.O.	S		ND	ND	ND	ND	ND
ppm)	B		ND	ND	ND	ND	ND
LINITY	S		ND	ND	ND	ND	ND
ppt)	B		ND	ND	ND	ND	ND
H	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
TH (ft)			11'	9'	9'	10'	8'
STRATE	% GRAVEL		ND	ND	ND	ND	ND
	% SAND		ND	ND	ND	ND	ND
	% MUD		ND	ND	ND	ND	ND
IMATED HARD CLAM SITY (#/ft^2)			0.011	0.0086	0.0042	0.021	0.0012
%	SL		0	0	–	0	–
MERCIAL	LN		25	9.1	–	7	–
IZES	CS		40	63.6	–	3	–
	CH		35	18.2	–	90	–
ER CLAMS COLLECTED			20	11	9	29	1
RANGE (mm)			42-99	55-97	–	46-108	–
ZE (mm)			66.25	65.7	–	84.9	–
RTALITY			51	42	62.5	6.9	50

SHELLFISH INVENTORY SUMMARY

Delaware Bay

Table 4

STATION NUMBER			DBSC86-26	DBSC86-27	DBSC86-28	DBSC86-29	DBSC86-30
LATITUDE N			39° 04.3'	39° 06.5'	39° 00.9'	39° 00.9'	39° 01.7'
LONGITUDE W			74° 55.4'	74°54.4'	74°57.3'	74°57.3'	74°58.1'
COLLECTION DATE			4-4-86	4-4-86	4-7-86	4-7-86	4-7-86
TIDE AND HOURS			Low + .5	Low + 1	High + 1.5	High + 1.75	High + 2.
TEMPERATURE °C	AIR		ND	ND	ND	ND	ND
	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O. (ppm)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
SALINITY (ppt)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
DEPTH (ft)			9'	8'	10'	10'	ND
SUBSTRATE	% GRAVEL		ND	ND	ND	ND	ND
	% SAND		ND	ND	ND	ND	ND
	% MUD		ND	ND	ND	ND	ND
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.0061	tow aborted	0.0018	0.0014	0.0014
% COMMERCIAL SIZES	SL		-	-	0	-	-
	LN		-	-	100	-	-
	CS		-	-	-	-	-
	CH		-	-	-	100	100
NUMBER CLAMS COLLECTED			6	1	1	1	1
SIZE RANGE (mm)			-	-	-	-	-
$\bar{X}$ SIZE (mm)			-	-	53	104	118
% MORTALITY			14	50	50	50	91

SHELLFISH INVENTORY SUMMARY

Delaware Bay
Table 4

IATION NUMBER			DBSC86-31	DBSC86-32	DBSC86-33	DBSC86-34	DBSC86-35
ATITUDE N			39° 03.1'	39° 04.4'	39° 05.0'	39° 05.5'	39° 09.0'
ONGITUDE W			74° 59.8'	74° 59.6'	74° 59.7'	75°00'	75°01.5'
OLLECTION DATE			4-7-86	4-7-86	4-7-86	4-7-86	4-8-86
IDE AND HOURS			High + 3.0	High + 3.5	High + 4.0	High + 4.5	High + .25
EMPERATURE	AIR		ND	ND	ND	ND	ND
°C	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O.	S		ND	ND	ND	ND	ND
(ppm)	B		ND	ND	ND	ND	ND
ALINITY	S		ND	ND	ND	ND	ND
(ppt)	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
EPTH (ft)			10'	12-14'	12'	12'	13-14'
BSTRATE	% GRAVEL		ND	ND	ND	ND	ND
	% SAND		ND	ND	ND	ND	ND
	% MUD		ND	ND	ND	ND	ND
TIMATED HARD CLAM NSITY (#/ft²)			0.0028	0.029	0.055	0.073	0.0065
%	SL		0	0	4.3	3	0
MMERCIAL	LN		0	6.8	10.1	23.6	0
SIZES	CS		50	0	3.6	4.8	17.4
	CH		50	93.2	82.0	68.6	82.6
MBER CLAMS COLLECTED			2	44	138	229	23
ZE RANGE (mm)			73-111	39-131	29-113	31-119	57-103
SIZE (mm)			92	98.5	89	79.9	78.09
MORTALITY			50	6	8	2	32.3

A-94.5

SHELLFISH INVENTORY SUMMARY

STATION NUMBER			DBSC86-36	DBSC86-37	DBSC86-38	DBSC86-39	DBSC86-4
LATITUDE N			39 06.0'	39 05.9'	39 06.7'	39 06.9'	39 07.1'
LONGITUDE W			75 00.5'	75 01.0'	75 01.2'	75 01.9'	75 01.0'
COLLECTION DATE			4-8-86	4-8-86	4-8-86	4-8-86	4-8-86
TIDE AND HOURS			High + 2.0	High + 2.5	High + 2.75	High + 3.0	High +3.5
TEMPERATURE ^{o}C	AIR		ND	ND	ND	ND	ND
	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O. (ppm)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
SALINITY (ppt)	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
DEPTH (ft)			12-14	12	12	10	8-10
SUBSTRATE	% GRAVEL		ND	ND	ND	ND	ND
	% SAND		ND	ND	ND	ND	ND
	% MUD		ND	ND	ND	ND	ND
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.077	0.0084	0.067	0.055	0.12
% COMMERCIAL SIZES	SL		0	0	0	1.0	0.7
	LN		1.8	27.3	2.6	1.0	0
	CS		1.8	18.2	7.8	7.8	0.7
	CH		96.4	54.5	89.6	90.2	98.6
NUMBER CLAMS COLLECTED			110	22	77	102	147
SIZE RANGE (mm)			48-112	40-120	45-114	36-115	35-109
SIZE (mm)			89.3	71.6	100	90	92.9
MORTALITY			18.5	18.5	45.8	18.4	18.3

SHELLFISH INVENTORY SUMMARY

Delaware Bay
Table 4

TATION NUMBER			DBSC86-41	DBSC86-42	DBSC86-43	DBSC86-44	DBSC86-45
ATITUDE N			39° 10.2'	39° 05.7'	39° 06.1'	39° 08.0'	39° 08.7'
ONGITUDE W			75° 02.2'	74° 56.2'	74° 56.4'	75° 01.8	75° 02.6'
OLLECTION DATE			4-11-86	4-11-86	4-11-86	4-11-86	4-11-86
DE AND HOURS			Low + 4.0	Low + 4.6	Low + 5.0	Low + 5.5	High
EMPERATURE	AIR		ND	ND	ND	ND	ND
°C	WATER	S	ND	ND	ND	ND	ND
		B	ND	ND	ND	ND	ND
D.O.	S		ND	ND	ND	ND	ND
(ppm)	B		ND	ND	ND	ND	ND
LINITY	S		ND	ND	ND	ND	ND
(ppt)	B		ND	ND	ND	ND	ND
pH	S		ND	ND	ND	ND	ND
	B		ND	ND	ND	ND	ND
EPTH (ft)			12	10-12	10-12	10-12	10-12
BSTRATE	% GRAVEL		ND	ND	ND	ND	ND
	% SAND		ND	ND	ND	ND	ND
	% MUD		ND	ND	ND	ND	ND
TIMATED HARD CLAM NSITY (#/ft²)			-	0.018	0.065	0.075	0.0124
%	SL		0	0	0	0	0
MMERCIAL	LN		2.6	2.3	2.9	2.3	2.3
SIZES	CS		55.3	27.3	47.8	25.9	24.1
	CH		42.1	70.4	49.3	71.8	73.6
MBER CLAMS COLLECTED			38	44	69	323	87
ZE RANGE (mm)			50-92	45-94	41-104	40-101	50-114
SIZE (mm)			68.5	79.4	76.9	81.3	81.4
MORTALITY			66.4	44	41	5.3	4.4

SHELLFISH INVENTORY SUMMARY

Delaware Bay

Table 4

STATION NUMBER			DBSC86-46	DBSC86-47	DBSC86-48	DBSC86-49
LATITUDE N			39° 09.3'	39° 09.7'	39° 10.8'	39° 10.5'
LONGITUDE W			75° 04.2'	75° 02.4'	75° 03.4'	75° 04.1'
COLLECTION DATE			4-11-86	4-11-86	4-11-86	4-11-86
TIDE AND HOURS			High + .25	High + 1.0	High + 1.5	High + 2.0
TEMPERATURE °C	AIR		ND	ND	ND	ND
	WATER	S	ND	ND	ND	ND
		B	ND	ND	ND	ND
D.O. (ppm)	S		ND	ND	ND	ND
	B		ND	ND	ND	ND
SALINITY (ppt)	S		ND	ND	ND	ND
	B		ND	ND	ND	ND
pH	S		ND	ND	ND	ND
	B		ND	ND	ND	ND
DEPTH (ft)			10-12	10-12	10-12	10-12
SUBSTRATE	% GRAVEL		ND	ND	ND	ND
	% SAND		ND	ND	ND	ND
	% MUD		ND	ND	ND	ND
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.422	0.207	0.047	0.106
% COMMERCIAL SIZES	SL		0	0	0	0
	LN		5.6	2.6	12.5	3.1
	CS		35.6	24.4	41.7	46.4
	CH		58.8	73.0	45.8	50.5
NUMBER CLAMS COLLECTED			180	78	24	97
SIZE RANGE (mm)			46-100	41-100	50-95	42-99
$\bar{X}$ SIZE (mm)			75.4	80.6	66.9	72.2
% MORTALITY			6.9	11.4	7.7	10.2

Table 5
Delaware Bay Inventory
Associated Species by Station Location

Species	Stations
Ensis directus	5, 6, 10-13, 29-32, 34, 36-40
Busycon canaliculatum	32-34, 37, 38, 42
Busycon carica	24, 32-34, 37-39
Eupleura caudata	
Urosalpinx cinerea	
Polinices duplicatus	5, 8-10, 12, 13, 31, 32, 35-40
Limulus polyphemus	10-12, 19, 21, 22, 24, 28-40
Cancer irroratus	
Callinectus sapidus	10, 17, 21, 22, 24, 32-40
Tagelus plebeius	28
Ovalipes ocellatus	28, 29, 34, 37, 40
Anadara ovalis	33, 34, 40
Libinia emarginata	33

ATTACHMENT B

TABLE 1

HARD CLAM RELAY PROGRAM

HARVEST SUMMARY

YEAR	HARVEST		AREA HARVEST	CATCH PER EFFORT BY AREA (CLAMS/MAN/DAY)	EFFORT PER AREA (MAN-DAYS)	TOTAL ANNUAL RELAY HARVEST
1985	SHARK RIVER		62,150	807	77	5,144,862
	MANASQUAN RIVER		227,458	1,223	186	
	NORTHERN MONMOUTH COUNTY *		4,855,254	1,435	3,646	
1986**	SHARK RIVER		153,050	963	159	2,422,730**
	MANASQUAN RIVER		169,444	1,255	135	
	RARITAN BAY (SEC. 11)		22,343	1,675	13.34	
	SANDY HOOK BAY	SEC. 1	46,703	1,445	32.33	
		SEC. 2	69,859	1,456	47.99	
		SEC. 10	258,673	1,433	180.50	
		TOTAL SHB	375,235	1,439	260.82	
	NAVESINK RIVER	SEC. 4	505,692	1,420	356.18	
		SEC. 5	292,008	1,397	208.99	
		SEC. 6	123,026	1,516	81.15	
		TOTAL NAVESINK	920,726	1,425	646.32	
	SHREWSBURY RIVER (SEC. 3)		687,732	1,355	507.52	
	NO DATA		94,200	1,256	75	
	1986** TOTAL		2,422,730	1,348	1,797	

* Includes areas in Raritan and Sandy Hook Bays and Navesink and Shrewsbury Rivers.

** January 1 - June 30, 1986

1986 HARD CLAM RELAY

DESIGNATED NORTHERN MONMOUTH COUNTY SECTIONS

FIGURE 1

EFFECTIVE JUNE 23, 1986

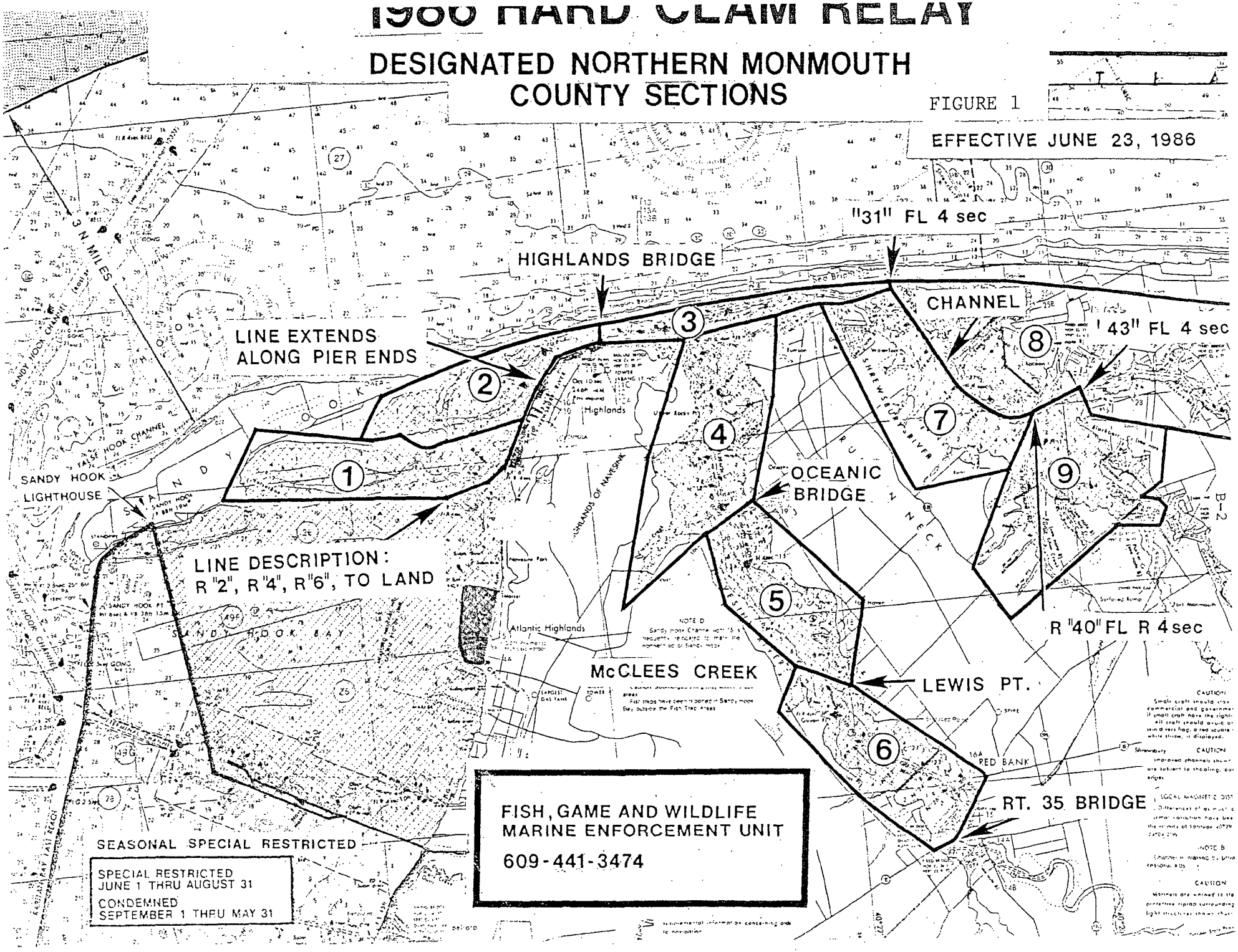


FIGURE 1

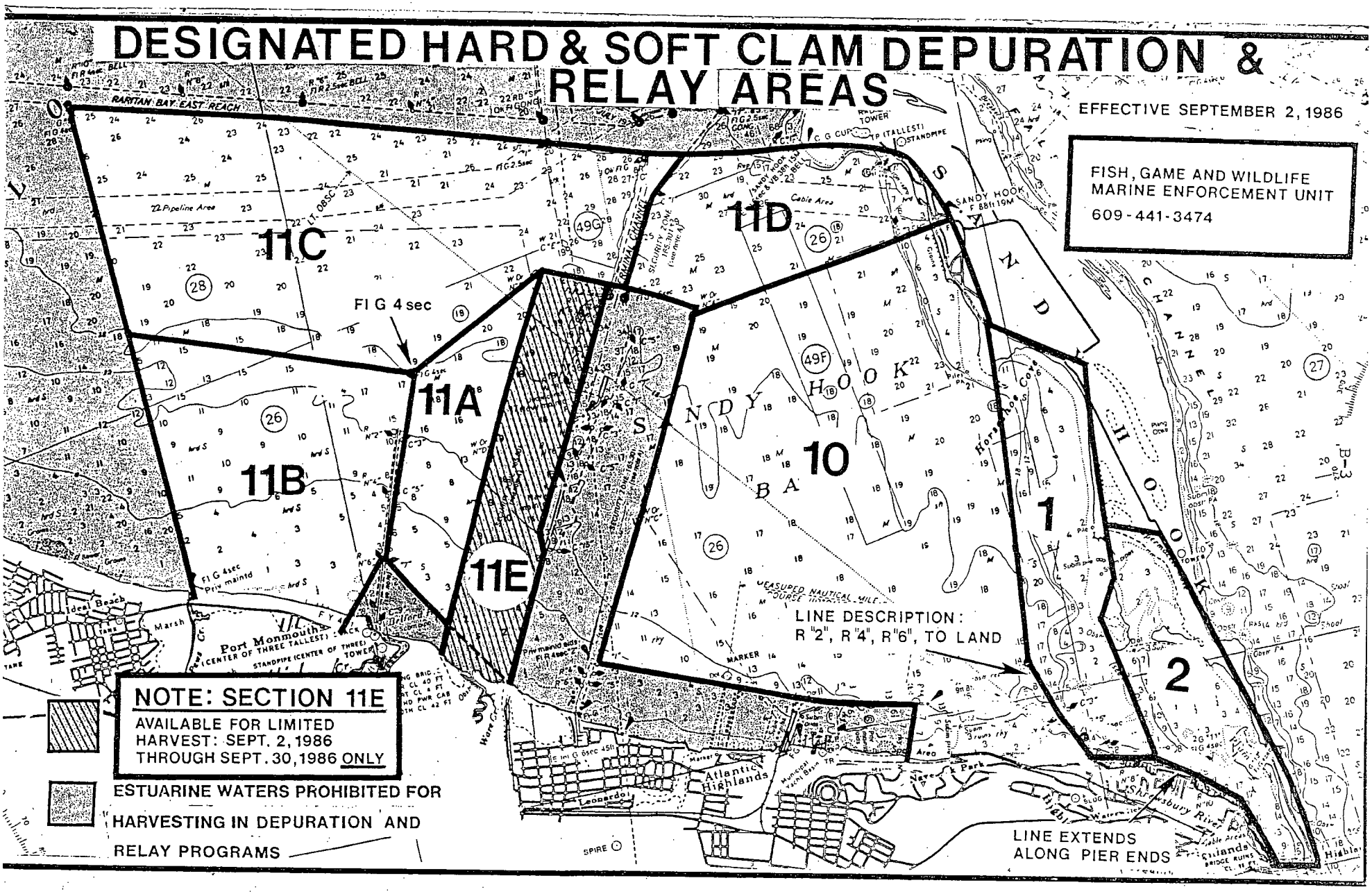
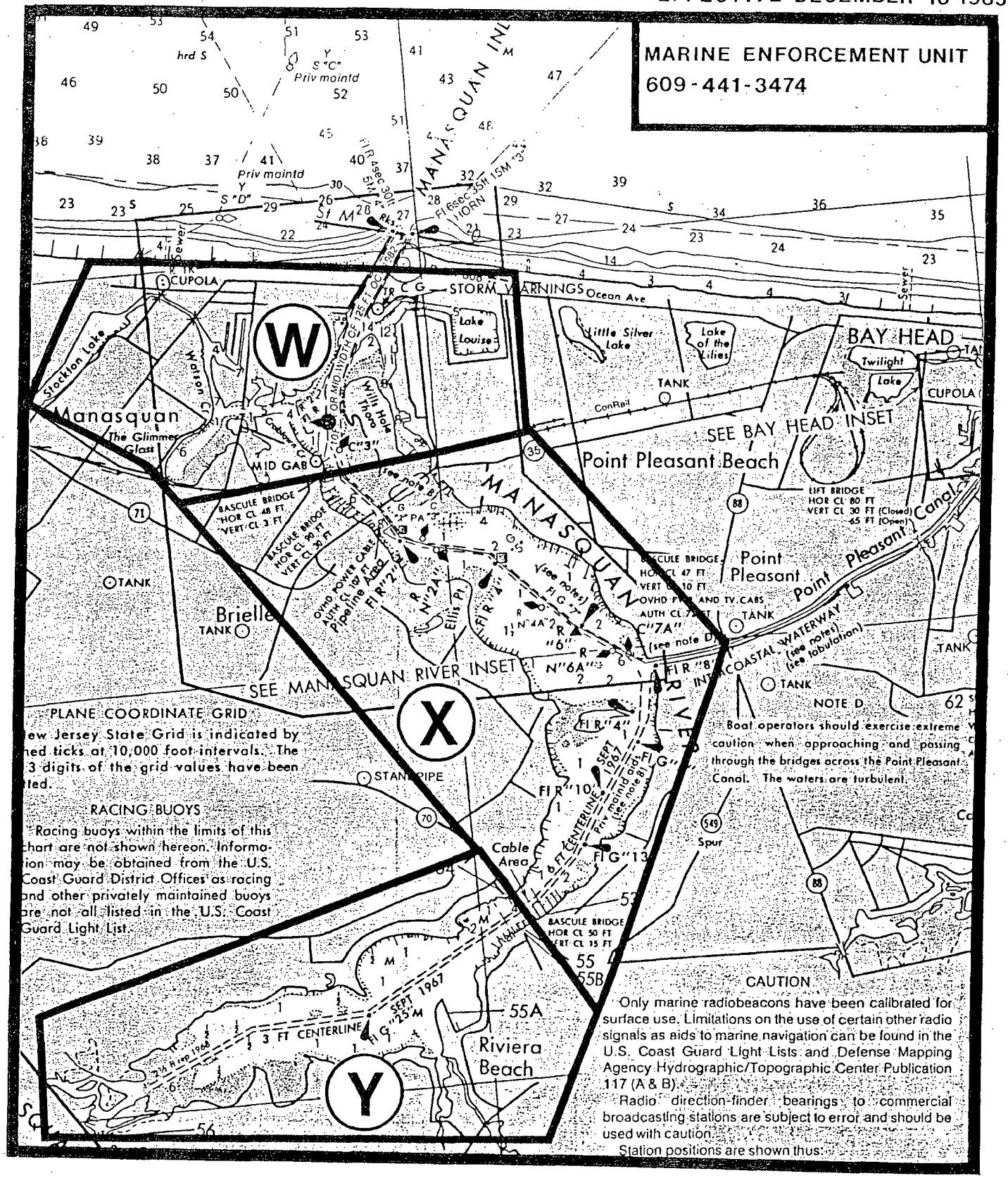

DESIGNATED HARD & SOFT CLAM DEPURATION & RELAY AREAS
EFFECTIVE SEPTEMBER 2, 1986
FISH, GAME AND WILDLIFE
MARINE ENFORCEMENT UNIT
609-441-3474
11A
11B
11C
11D
11E
10
1
2
LINE DESCRIPTION:
R "2", R "4", R "6", TO LAND
LINE EXTENDS
ALONG PIER ENDS
NOTE: SECTION 11E
AVAILABLE FOR LIMITED
HARVEST: SEPT. 2, 1986
THROUGH SEPT. 30, 1986 ONLY
ESTUARINE WATERS PROHIBITED FOR
HARVESTING IN DEPURATION AND
RELAY PROGRAMS
RARITAN BAY EAST REACH
SANDY HOOK BAY
SANDY HOOK
Port Monmouth
Atlantic Highlands
Leonardo
Sandy Hook
Fl G 4 sec

FIGURE 1

MANASQUAN RIVER HARD CLAM RELAY

EFFECTIVE DECEMBER 16 1985



1986 HARD CLAM RELAY

DESIGNATED SHARK RIVER SECTION

FIGURE 1

EFFECTIVE FEBRUARY 3 1986