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UNITED STATES
DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT

STATE: NEW JERSEY

PROJECT NO.: 3-332-R

SEGMENT NO.: 4

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

GRANT NO.: NA83FAD NJDB

PERIOD COVERED: JULY 1, 1983 - June 30, 1984

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DATE: SEPTEMBER 30, 1984

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ABSTRACT

The inventory program initiated in 1983 continued. During Segment 4 the shellfish inventory of Sandy Hook and Raritan Bays was completed and the inventory of the Manasquan River was initiated. In Raritan and Sandy Hook Bays over 200 stations were sampled and the principal molluscan species collected included the hard clam, soft clam, surf clam, blue mussel and oyster. Charts delineating the distribution and abundance of the various species were prepared.

Fifty-four applications for leased shellfish grounds were received. However, only two biological investigations were performed due to personnel restrictions. The backlog of lease ground applications necessitated the enactment of a moratorium on the filing of lease applications until biological investigations are conducted for all pending applications.

In 1983 the hard clam relay program was expanded to include areas in northern Monmouth County. In addition, the State's first hard clam depuration plant opened during the period, which contributed to the utilization of over seven million clams from polluted waters. Continued monitoring of the relay program indicated that although a few areas have shown marked reductions in hard clam densities, the overall standing stock has not been significantly reduced.

The Mullica River oyster beds were monitored for setting success, survival and overall bed condition. Insufficient funds prevented the transplanting of seed oyster again in 1983. The seed beds were found to be in relatively good condition after receiving a respectable set in 1983 and not having anything harvested since 1981. Histological studies examining market bed oysters indicated that MSX is apparently contributing significantly to the total mortality. An alternative management program for this resource is currently under investigation.

JOB NO. 1 SHELLFISH INVENTORY

During Segment 4 the shellfish inventory program concentrated its effort in Sandy Hook and Raritan Bays. As in the previous segment, the sampling program was designed primarily to sample the hard clam, *Mercenaria mercenaria*, since this species is the most abundant and widely distributed 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. Some stations were also sampled by a conventional style 30 tooth oyster dredge where appropriate bottom conditions existed.

Stations were established at approximately quarter mile intervals in the bays where the water depth was less than 12 feet. In the deeper water stations were established at half mile intervals. Stations were located by one or more methods including a three point sextant fix, hand bearing compass readings 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. 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 several instances in the deeper water it was not possible to maintain the tow line length to depth ratio of 4:1 because of the limitations (100 ft.) of the water supply hose. In any case the tow line length to depth ratio was never less than 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 possible 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 densities (other species also) are expressed in terms of number per square foot.

In a few instances the number of clams collected in the two tows varied considerably. When this occurred an additional tow was taken on each side the buoy to determine if the observed discrepancy was due to actual variation in abundance on each side of the buoy or if the dredge was not operating properly. In all cases where this occurred it was evident that the dredge was working efficiently and that there was a significant difference in hard clam abundance depending upon which side of the buoy was sampled.

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 catagories:

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

In instances where several hundred hard clams were collected at a station a subsample was measured to determine size distribution of the population.

Stations where commercial densities of soft clams, Mya arenaria, and surf clams, Spisula solidissima, were encountered also presented an opportunity to determine year class structure of the population. Therefore a subsample of clams were also measured to the nearest millimeter and size frequency distributions constructed.

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 to try and determine 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. A total of 100 stations were sampled in Sandy Hook Bay and 107 in Raritan Bay. A chart showing station locations may be found in Attachment A. No sampling was conducted in the main shipping channels in Raritan Bay because the depth exceeded that which could be sampled with the available gear.

The commercially important shellfish species collected during the 1983 inventory of the Raritan and Sandy Hook Bays include the oyster, *Crassostrea virginica*, the blue mussel, *Mytilus edulis*, the surf clam, *Spisula solidissima*, the soft clam, *Mya arenaria* and the hard clam, *Mercenaria mercenaria*. The two principal species collected in this area were the soft clam and hard clam. Charts delineating the distribution and abundance of the various species may be found in Attachment A.

OYSTER

Oyster beds were only encountered in Raritan Bay. Based upon the data collected none of these areas would be considered commercially viable populations. The oysters collected in these areas were mostly adults and there was very little evidence of recent recruitment.

The sampling also revealed extensive areas in Raritan Bay that at one time must have been productive oyster beds judging from the volume of buried oyster shell that was collected. In these areas an occasional live oyster was collected.

BLUE MUSSELS

Fairly extensive beds of blue mussels are present in Raritan and Sandy Hook Bays. Quantitative estimates of mussel densities are not provided because of the time associated with processing each sample. A determination was made based upon the dredge volume of live mussels as to whether the area could be important commercially if harvesting were permitted. Areas that were considered to have commercial potential were designated as mussel beds.

SURF CLAMS

Surf clams, being an oceanic species, were not expected to be found in great abundance in the estuarine areas sampled. However, one commercially significant bed was encountered north northwest of the tip of Sandy Hook on a shoal commonly known as Flynn's Knoll. The highest density of surf clams observed within this bed was 42.3 clams per square foot.

Size-frequency distributions were constructed for two of the stations representing the major portion of the bed. The entire population appears to be the result of a single year class with a mean size of 36.8 millimeters. We estimate these clams in Raritan Bay to be one year old at the time of sampling and thus representatives of the 1982 year class. No evidence of older individuals in this population exists.

SOFT CLAMS

Soft clams are present in both Sandy Hook and Raritan Bays. Quantitative estimates of soft clams are not provided because many market size and juvenile soft clams were observed to pass through the dredge basket.

The distribution of soft clams in Raritan and Sandy Hook Bays were based upon adult densities observed in the clam dredge as well as densities

of juveniles collected in the Petersen dredge. Although time has not permitted identification and enumeration of organisms collected in the Petersen dredge it was evident at certain stations that a significant set of soft clams had occurred in various areas. Although these soft clam juveniles are subject to predation pressure it indicates that the area is capable of producing significant populations of soft clams and was thus included when delineating the distribution of this species.

Size-frequency distributions for soft clams were constructed for five of the stations sampled. At one station a maximum of four year classes were represented with the bulk of the population being comprised of one to two year classes. At the other stations a single year class comprised the majority of the population.

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 Raritan and Sandy Hook Bays. For the purpose of delineating the general abundance patterns of the hard clam resource we established three classifications of occurrence, moderate density, and high density and assigned them density values of 0.01-0.19, 0.20-0.49 and $\geq$ 0.50 hard clams per square foot, respectively. These density catagories 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 of these estuaries 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 fairly efficient it probably does miss a few clams in its path. 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 is not necessarily the case, as evidenced in instances where significantly different results were obtained depending upon which side of the buoy was dredged. However, since the sampling procedure is able to identify some of these areas, it is an indication that the procedure being utilized is as efficient and accurate as can be expected.

Hard clam densities ranged from 0 to 2.73 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
$\leq$ .05
.06-.11
.12-.49
.50-.99
1.00-1.99
$\geq$ 2.0

Adjacent stations within the same density catagory 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 each bay was developed. Estimates of the hard clam resource in Raritan and Sandy Hook Bays are 195.0 and 151.0 million clams, respectively.

YEAR CLASS STRENGTH

Size-frequency distributions for the hard clam, Mercenaria mercenaria, were constructed for 54 of the 207 stations sampled. Initial analysis of the size-frequency distributions for hard clams indicate that a range of approximately four to eleven year classes are represented in Sandy Hook Bay but only five to nine in Raritan Bay. Approximately half of the stations where sufficient numbers of hard clams were collected exhibit a stationary population (even distribution of ages) while the other half exhibit a declining population. Very few stations exhibited evidence of an increasing population (large number of young individuals).

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 we estimated 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.

Recruitment rates were extremely variable between stations. However, a comparison of the mean recruitment rate was made between the various areas in an effort to determine which areas hold the most potential. The mean recruitment rate of the various areas was determined by utilizing the data from only the moderate to high density areas. Utilization of data from areas of occurrence was not deemed valuable and was therefore not taken into consideration when analyzing recruitment rates.

Estimates of the mean annual recruitment for Raritan and Sandy Hook Bays are 5.0 percent and 1.2 percent, respectively. With the exception of two isolated areas in Raritan Bay there is no distinguishable pattern to the recruitment rates.

The two areas in Raritan Bay that exhibited significantly higher percentages of seed included an area between Chapel Hill Channel South and Sandy Hook Channel (18.8%) and another area approximately 2-2.5 miles northeast of Point Comfort in Keansburg (24.4%). The data analyzed thus far does not provide enough information to speculate as to why these areas have significantly higher concentrations of seed than other areas in Raritan Bay or Sandy Hook Bay.

HARD CLAM MORTALITY

Natural adult ($\geq$ 30 mm) hard clam mortalities varied considerably from station to station. For the purpose of comparison, average hard clam mortalities for Raritan and Sandy Hook Bays were 20.9 and 8.7 percent, respectively.

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. One predator that was collected in great numbers in Raritan and Sandy Hook Bays was the lady crab, *Ovalipes ocellatus*. This crab was abundant at practically all stations where significant quantities of juvenile soft clams were collected.

Following this initial inventory selected areas in Sandy Hook Bay

were opened for harvesting in conjunction with the hard clam relay and depuration programs. During the later part of Segment Four monitoring of several harvest areas was conducted to evaluate the impact of the harvest upon the available resources. Discussion of the results is covered under Job 3.

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.

JOB NO. 2 INVESTIGATION OF LEASE APPLICATIONS

All applications for leased ground on the Atlantic Coast are reviewed by the Atlantic Coast Shellfish Council. The Council then recommends to the Commissioner whether the area should be leased to an individual or remain open for public use. The majority of the lease applications received are from commercial shellfishermen who require an area for planting seed clams and oysters or as layout grounds.

In order to assist the Council in their decision, each lease application is investigated for shellfish productivity and a biological report submitted to each Council member prior to the monthly meeting. The application is considered and discussed at the first meeting and a decision is rendered at the following months's meeting.

The productivity of an area is based upon the history of the area, present shellfish density, number of year classes, recent recruitment, substrate type and basic water quality parameters such as: dissolved oxygen, salinity, pH, depth, and temperature. Other organisms collected are also identified.

Depending on the results of the survey, the area is classified as productive, potentially productive or non-productive shellfish habitat. Productive habitat can be defined as an area that is and/or has been a regular producer of various shellfish. An area can be productive habitat for one shellfish species and non-productive for another. An example of this would be the Mullica River oyster seed beds. They are extremely productive oyster habitat but non-productive in terms of hard clam habitat. A non-productive habitat classification does not necessarily mean that a certain species will not survive in that area. In fact, many non-productive

areas are excellent for growth. It is considered to be a non-productive area because there is no regular natural recruitment. Initially, only these two classifications (productive and non-productive) were utilized. However, some areas did not provide enough biological information to classify them as productive or non-productive. Therefore, the term potentially productive was used to cover these intermediate areas.

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 the present and future resources of the area will be available for public (commercial and recreational) utilization.

During the fourth segment of Project 3-332-R, 54 applications for leased shellfish habitat were received. Great Bay received the most lease applications with 17, followed by Little Egg Harbor Bay (14), Dry Bay (6), Absecon Bay (4), Peck Bay and Reed Bay (3 each), Barnegat Bay, Great Egg Harbor Bay, and Obes Thorofare (2 each), and Widgeon Bay (1). Of the total applications received, fifteen 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 applications.

Since the scope of the Inventory Program (Job 1) required all available personnel throughout most of Segment 4, only two biological investigations were performed during the period. An investigation of an application in Great Bay found the lot to be potentially productive while an application in Little Egg Harbor Bay was determined 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

approved the potentially productive lease in Great Bay but denied the productive lease in Little Egg Harbor Bay so that the area could remain available for public use.

The backlog of lease ground applications resulting from manpower restrictions necessitated the promulgation of a moratorium on all lease applications until the Bureau of Shellfisheries performs the biological investigations of the lease applications presently on file.

JOB NO. 3 HARD CLAM RELAY MONITORING

During the 1983 hard clam relay program clams were harvested from Sandy Hook Bay, the Navesink, Shrewsbury and Shark Rivers as well as specific areas in Atlantic County. The program consists of relaying hard clams, *Mercenaria mercenaria*, from condemned areas onto leased lots in approved water. Following a 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 initiation of the hard clam relay program in 1970, nearly sixty-three million clams have been utilized from condemned waters.

In addition to the relaying of clams, New Jersey's first hard clam depuration plant began operation on July 11, 1983 in northern Monmouth County, thereby providing another means to utilize hard clams from polluted waters. Clams harvested from the polluted waters of the Navesink and Shrewsbury Rivers and Sandy Hook Bay can be purified in 48 hours under the controlled conditions of the depuration plant. The relay and depuration programs have facilitated the first harvest of hard clams from these waters since they were closed to clamming in 1961 due to pollution. During the period July 1, 1983 to June 30, 1984 over 10.4 million clams have been harvested from the above waters via these programs.

In conjunction with the Inventory Program (Job 1), a resource survey of all of the relay/depuration harvest areas in the Navesink and Shrewsbury Rivers and Sandy Hook Bay was conducted to determine the extent of the resource prior to the commencement of these programs. The magnitude of this resource survey precluded a similar survey of Atlantic County relay harvest areas.

The opening of these northern Monmouth County waters to relay and

depuration harvest was well received by clammers throughout the State who were eager to take advantage of the hard clam resource which had been unavailable for over twenty years. Consequently, participation and resulting harvest greatly exceeded that of recent years. Over 7.4 million clams were harvested from condemned or special restricted waters throughout the State in 1983. In comparison, only 462,688 clams were harvested from such waters in 1982.

The newly opened waters of the Navesink and Shrewsbury Rivers and Sandy Hook Bay provided the majority of the 1983 harvest. Participants in the relay and depuration program had a reported harvest of 6,627,937 clams during the 3900 man-days of fishing effort, and a resultant catch per effort of 1,699 clams/man/day. For harvest information of specific areas in northern Monmouth County, see Attachment B.

Relay areas in Shark River and Atlantic County yielded a substantially lower harvest and catch per effort, due primarily to reduced participation and hard clam resources in these areas. The reported 1983 relay harvest for Shark River was 320,050 clams during 397 man-days of fishing effort. Atlantic County waters, with 339 man-days of fishing effort, yielded a reported relay harvest of 460,860 clams. The catch per effort for Atlantic County was 1,359 clams/man/day while for Shark River, this figure was only 806 clams/man/day. Shark River has been worked extensively during the relay program since 1980, which is the probable reason for the low yield in 1983.

In the spring of 1984, 45 stations within the primary harvest areas of northern Monmouth County, which were inventoried prior to the initiation of the 1983 relay and depuration programs, were resampled to determine

if the resource was being over-fished. The data obtained indicate that although a few stations did exhibit substantial reductions in hard clam density, the harvest has not had a significant impact on the overall standing stock.

In response to shellfishermen wishing to expand the relay program into year-round operation, an experimental winter relay program was conducted to determine if significant clam mortalities would result from this operation (transplanting of clams during periods of cold temperatures). Three separate plantings were conducted during February when water temperatures ranged from -1.5°C to 5.5°C. The clams were reharvested in the spring simulating actual relay conditions. Mortalities observed ranged from a low of 5.8 percent to a high of 10.6 percent. This is not considered a significantly high mortality considering that three to five percent is a "normal" summer relay mortality. The data indicates that there is a definite correlation between temperature and mortality. As the water temperature decreased, the mortalities observed increased. The results of this study indicate that a hard clam relay program could be conducted during the winter months without experiencing excessive mortalities. However, the data obtained do not allow for the extrapolation of hard clam mortality rates beyond the temperatures observed during the study period. It is therefore possible that higher mortalities might be observed for clams relayed during severly cold winters. Given the experimental results and the interest expressed by shellfishermen, it is expected that the relay program will continue into the winter months and may, in fact, operate on a year-round basis (conditions permitting).

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 Mullica River Seed Oyster Transplant Program, which was conducted in 1979, 1980, and 1981, has not been conducted since. The program, which involves the dredging of seed oysters from the State seed beds in the Mullica River and transplanting them onto the market beds in Great Bay, maintains market bed condition and provides direct economic benefits to area shellfishermen. Unfortunately, sufficient funds were not available to conduct the transplant program in 1983.

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 sample. 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 good condition. The French's Point Bed was composed of 78.2% oyster and had a total annual mortality of 11.9 percent. The Moss Point Bed yielded a higher percentage of

oyster (81.4%) and had a total annual mortality of 11.3 percent. Compared to the 1982 figures, French's Point exhibited the greatest change in bed condition (down from 94.7% oyster) and mortality (up from 2.2%). Both seed beds received an average set in 1983 with the percentages of spat being 28.9% for Moss Point and 18.6% for French's Point.

The Mullica River market beds, with greater predation pressure and periodic harvest seasons, exhibited much lower percentages of oyster. The Reef Bed, planted in 1979 and 1980 was comprised of 8.5% oyster and had a total mortality of 37.8 percent (7.1% of which was attributed to drill predation). Fitney Bit Bed, which was planted during the 1981 transplant program, was comprised of 30.6% oyster and had a total mortality of 30.7% (9.0% of which was attributed to drill predation). Oysterbed Point Bed, which has not received a planting since 1974, was virtually 100% shell with only two live oysters being collected. Although in Segment 4 no oysters were sent to the Rutgers Oyster Research Laboratory in Bivalve, New Jersey for histological examination to determine the extent of infection by Haplosporidium nelsoni (MSX), correspondence from personnel at that facility indicate that, as in the past, MSX may cause light mortality at Moss Point and appears to be routinely implicated in oyster mortalities on the market beds.

Since a regular source of funds has not been available to support the Mullica River Seed Oyster Transplant Program (which last operated in 1981), an alternate management strategy is currently being developed for the Mullica River oyster resource. The proposed program would allow the oystermen (under specific harvest and gear restrictions) to harvest and transplant oysters from the seed beds to their own leased grounds. It is hoped that this program will be less costly to the State and provide for better utilization of the resource.

ATTACHMENT

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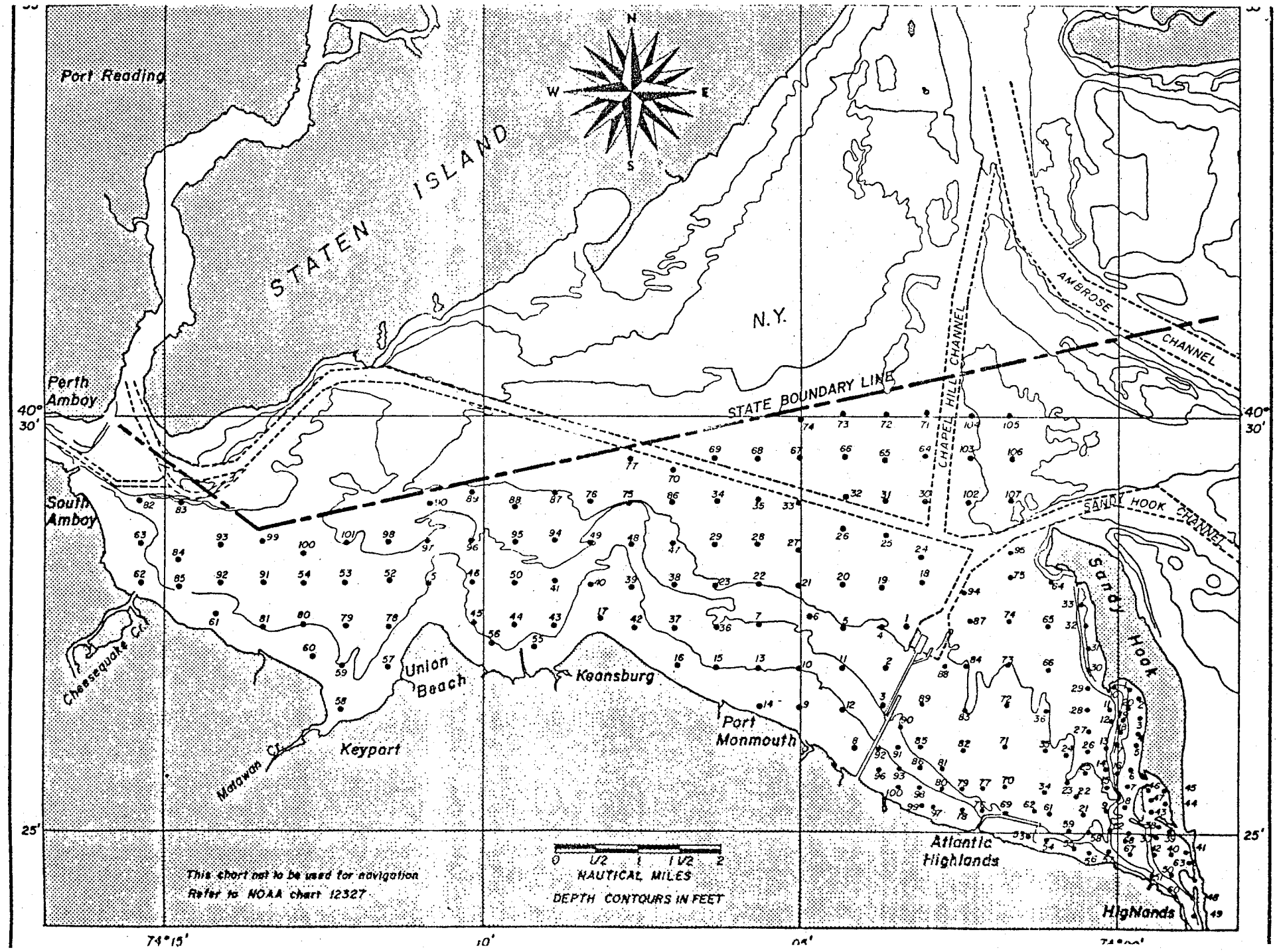
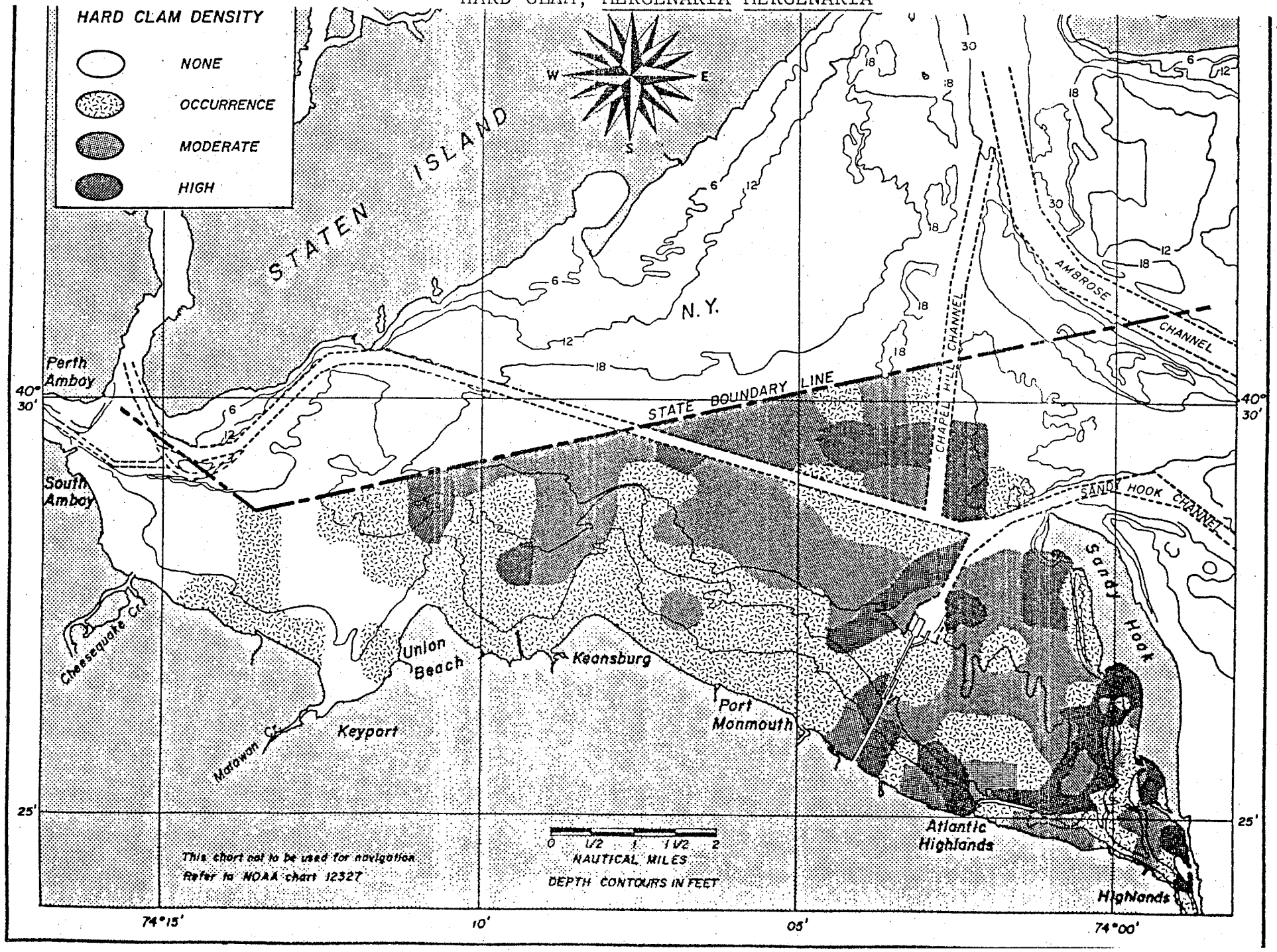
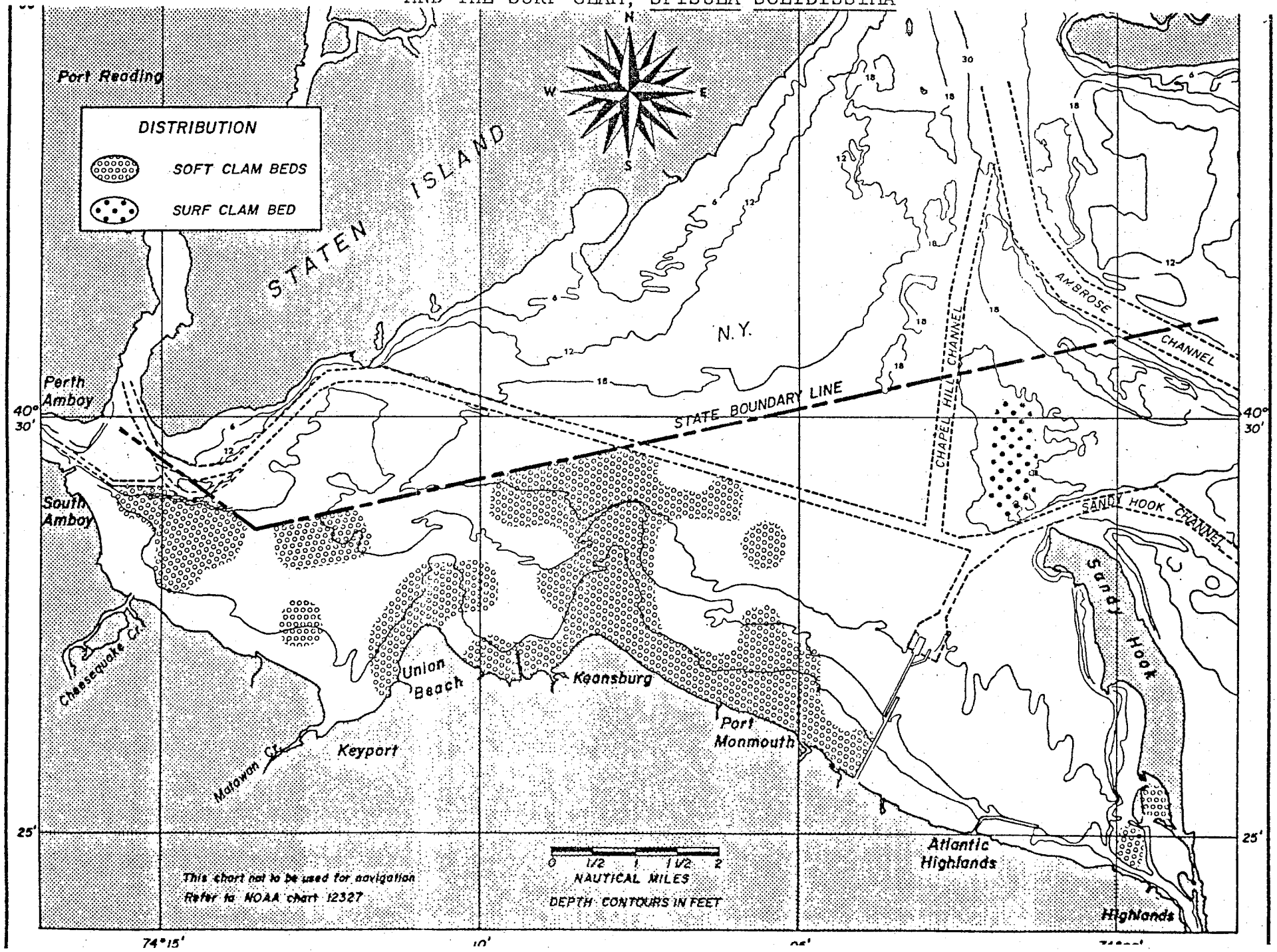
1983 SHELLFISH INVENTORY
RARITAN AND SANDY HOOK BAYS
STATION LOCATIONS



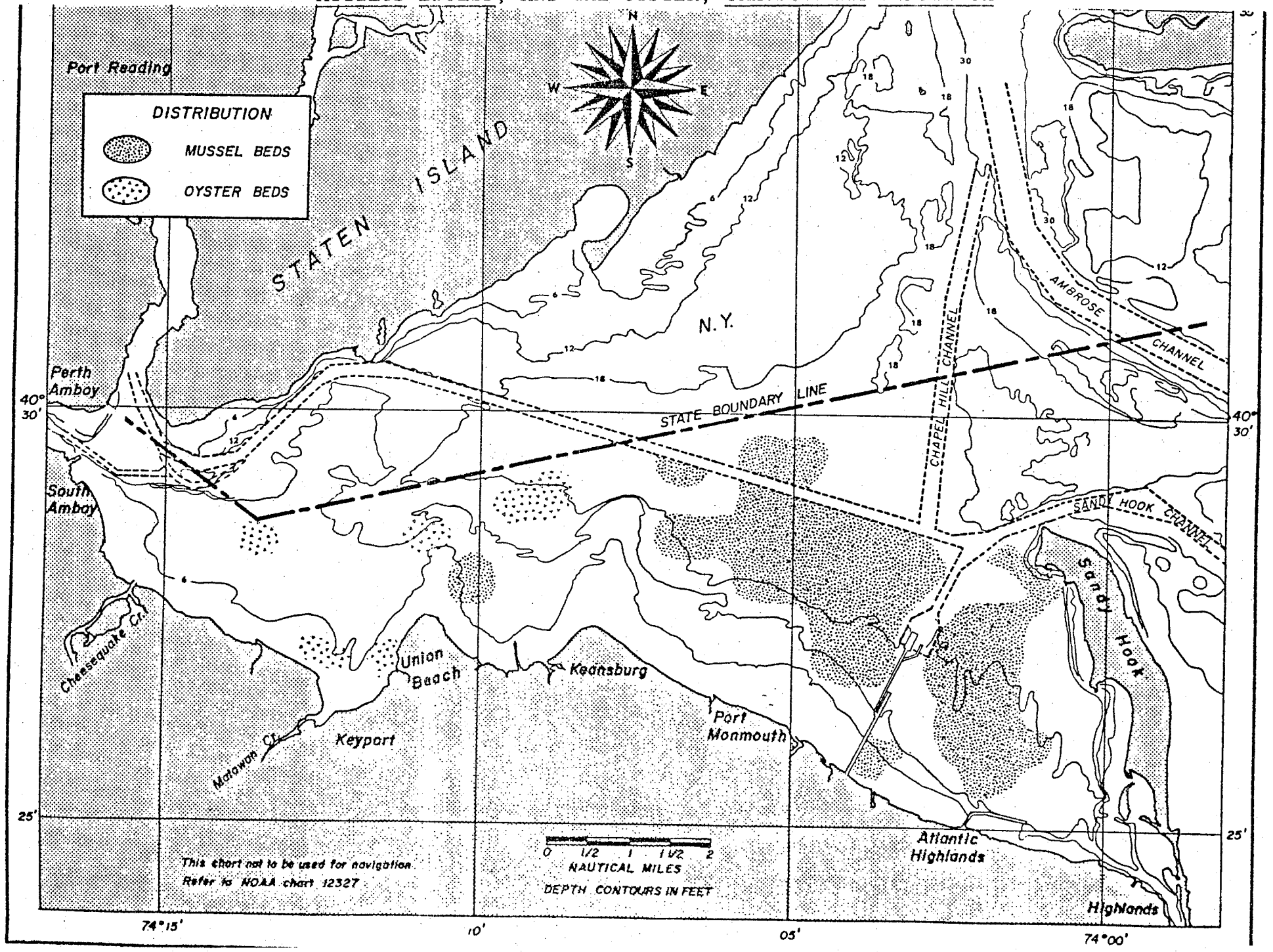
1983 SHELLFISH INVENTORY
RARITAN AND SANDY HOOK BAYS
DISTRIBUTION AND ABUNDANCE OF THE
HARD CLAM, MERCENARIA MERCENARIA



1983 SHELLFISH INVENTORY
RARITAN AND SANDY HOOK BAYS
DISTRIBUTION OF THE SOFT CLAM, MYA ARENARIA AND THE SURF CLAM, SPISULA SOLIDISSIMA

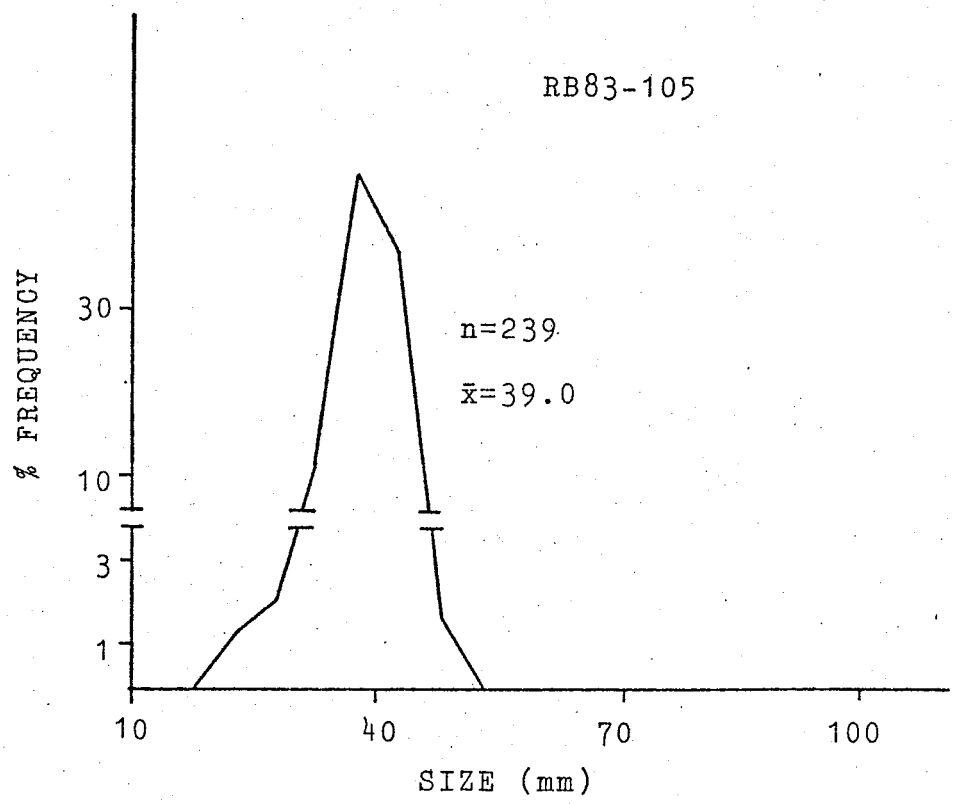


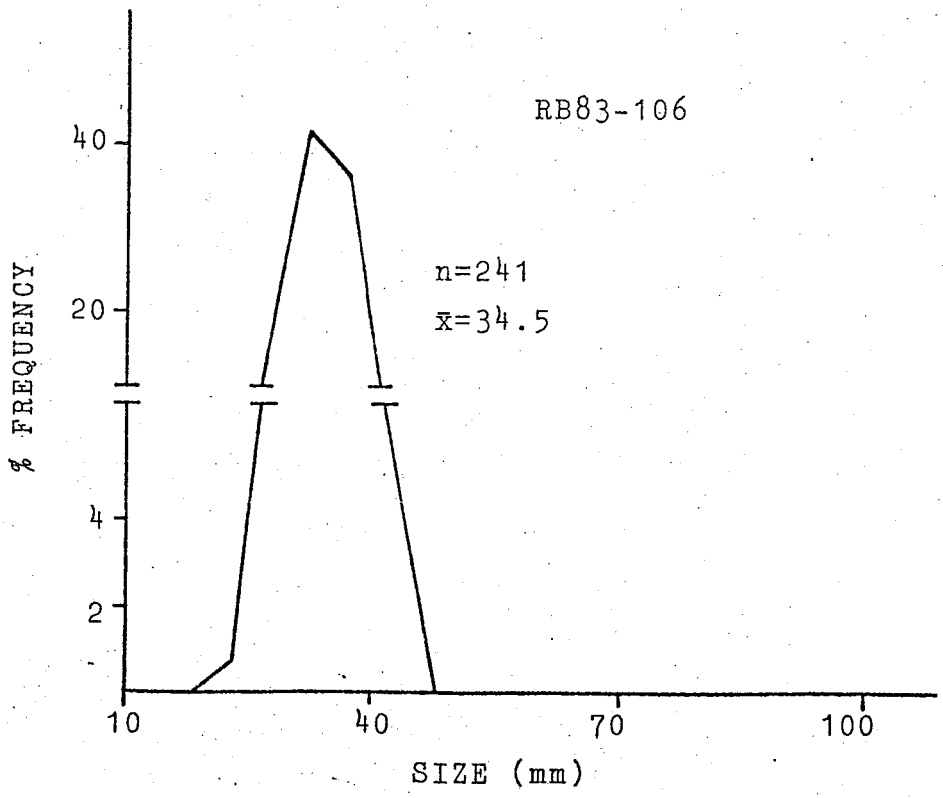
1983 SHELLFISH INVENTORY
RARITAN AND SANDY HOOK BAYS
DISTRIBUTION OF THE BLUE MUSSEL, MYTILUS EDULIS, AND THE OYSTER, CRASSOSTREA VIRGINICA



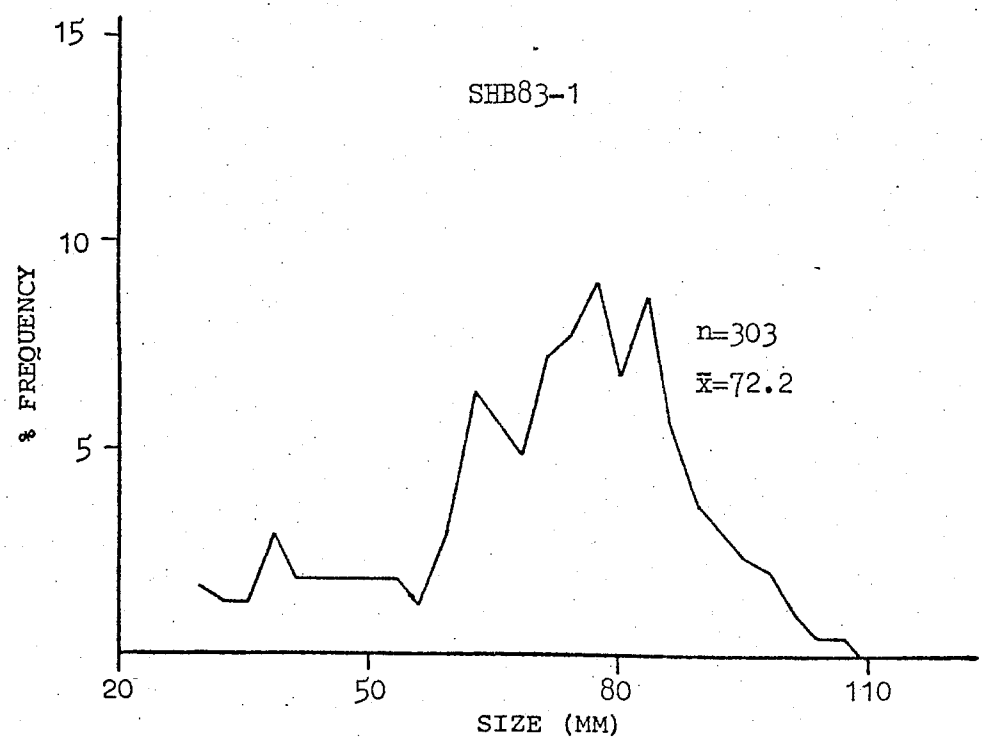
SIZE FREQUENCY DISTRIBUTION OF:

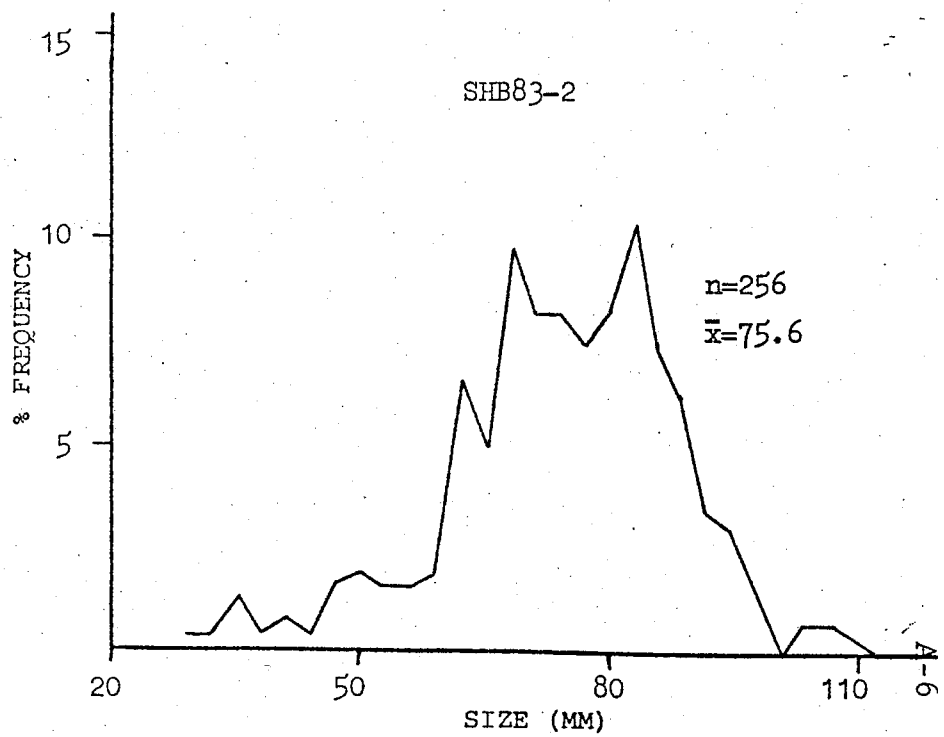
——— *Spisula solidissima*

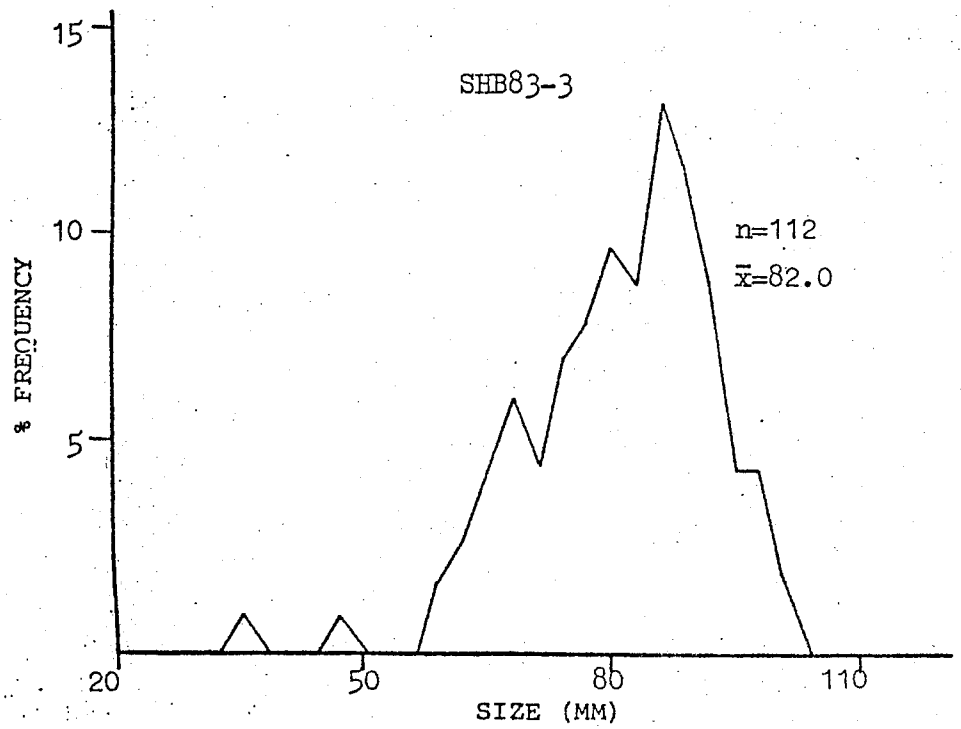


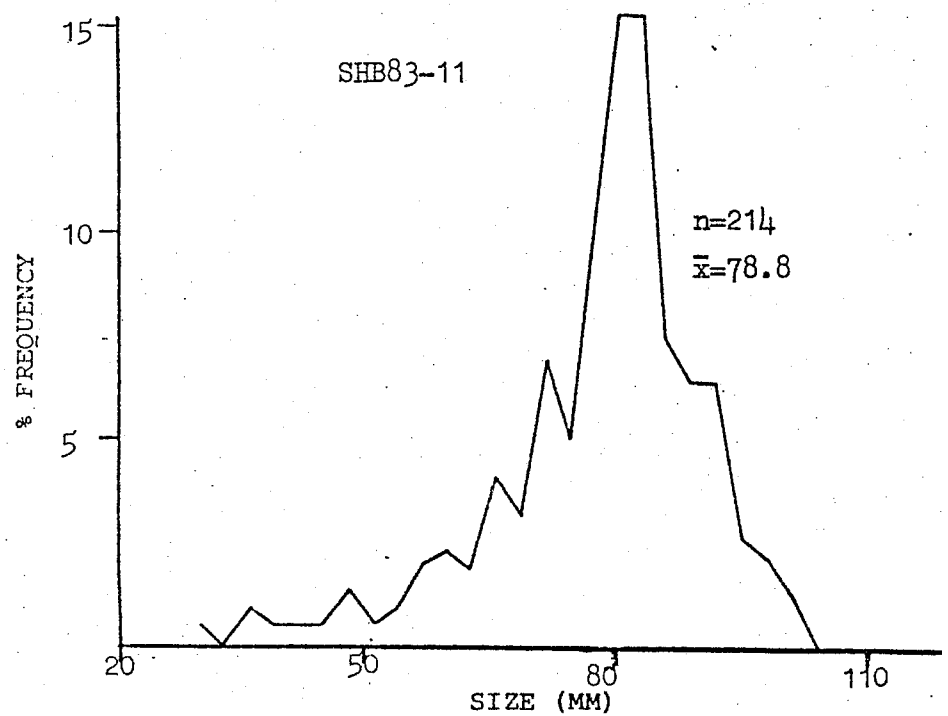


Mercenaria mercenaria
Mya arenaria

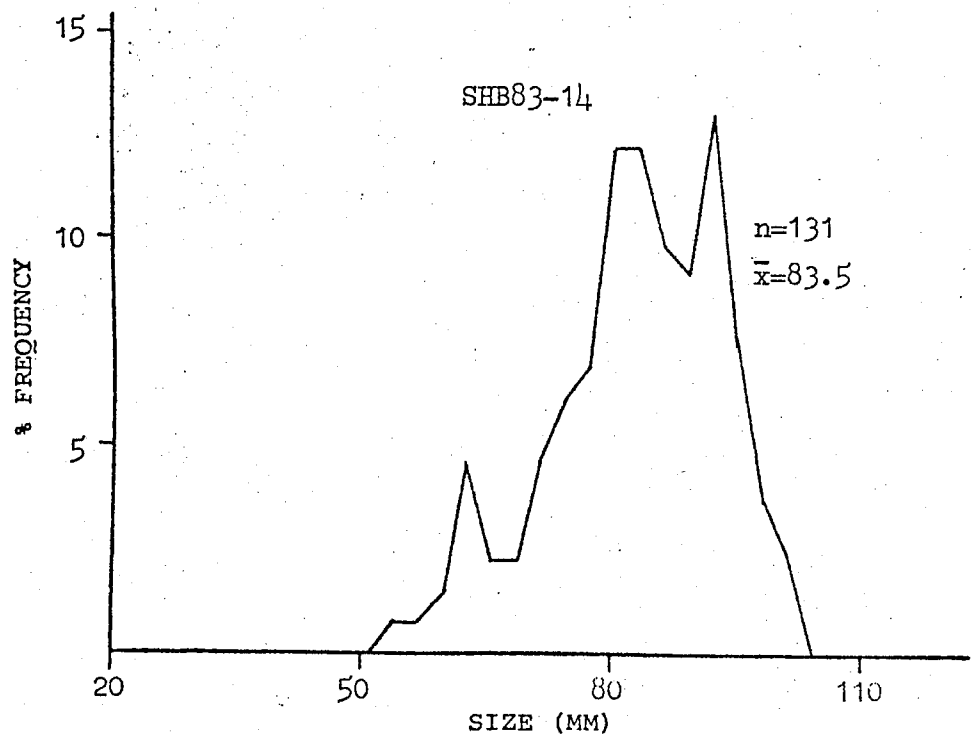


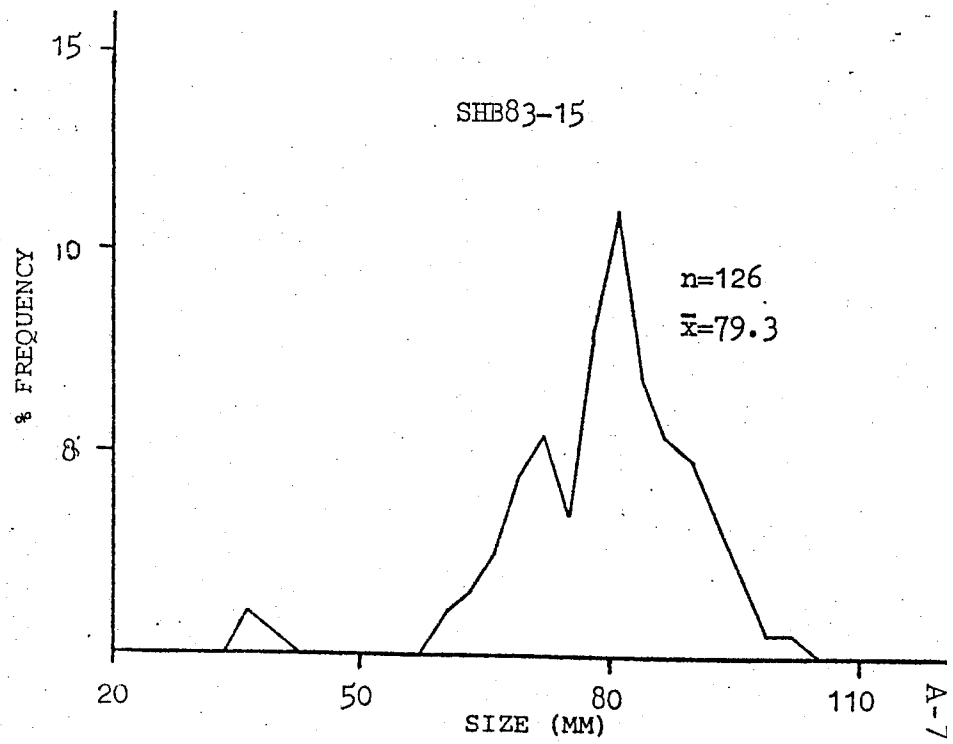


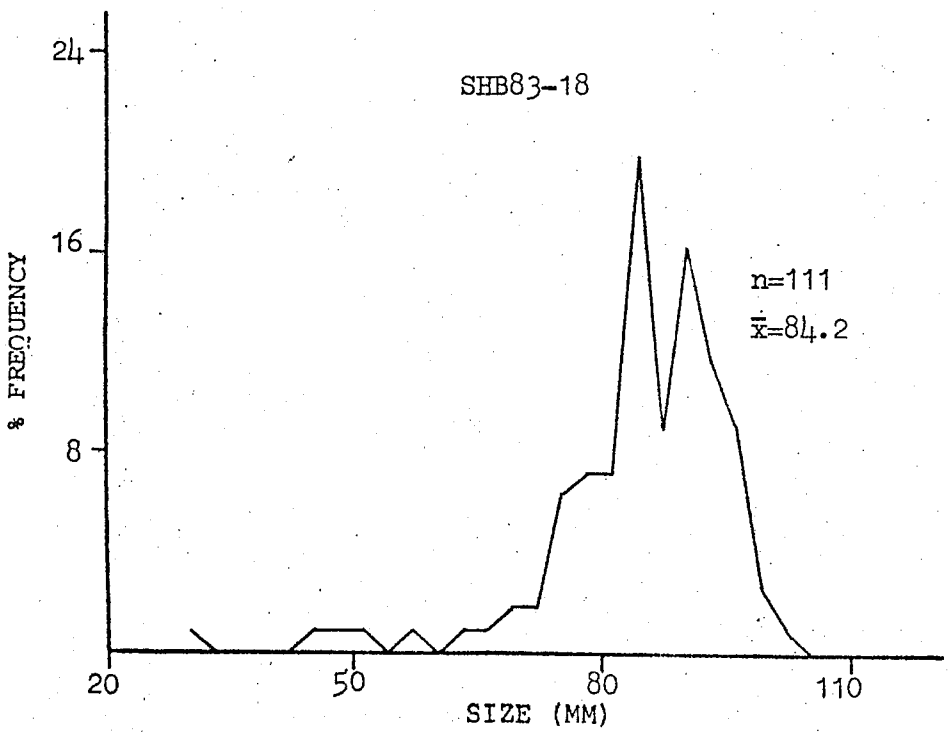


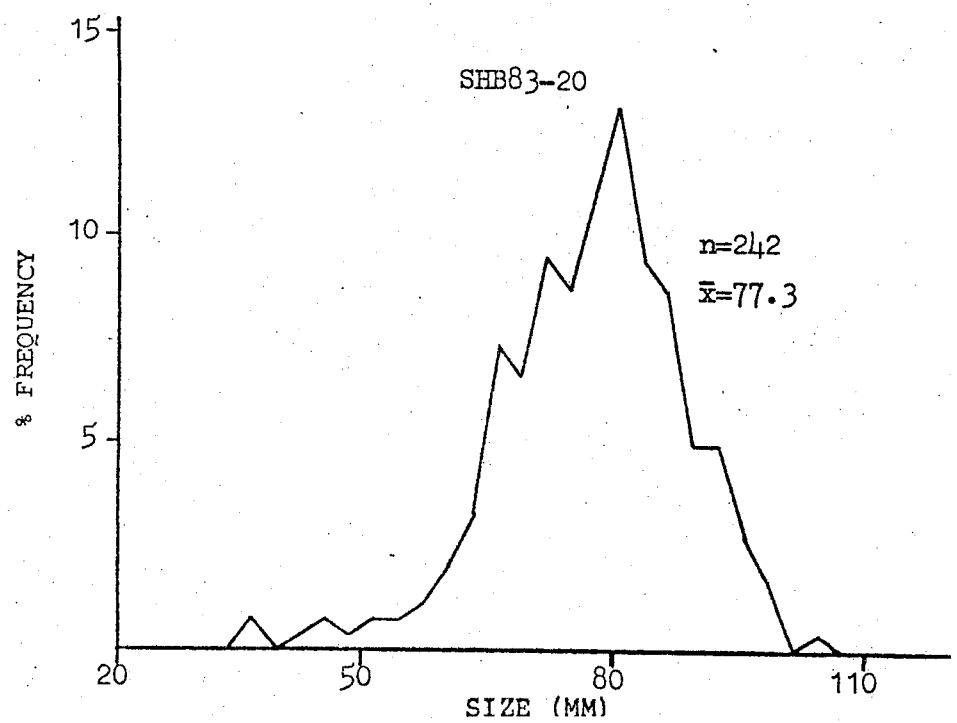


Mercenaria mercenaria
Mya arenaria









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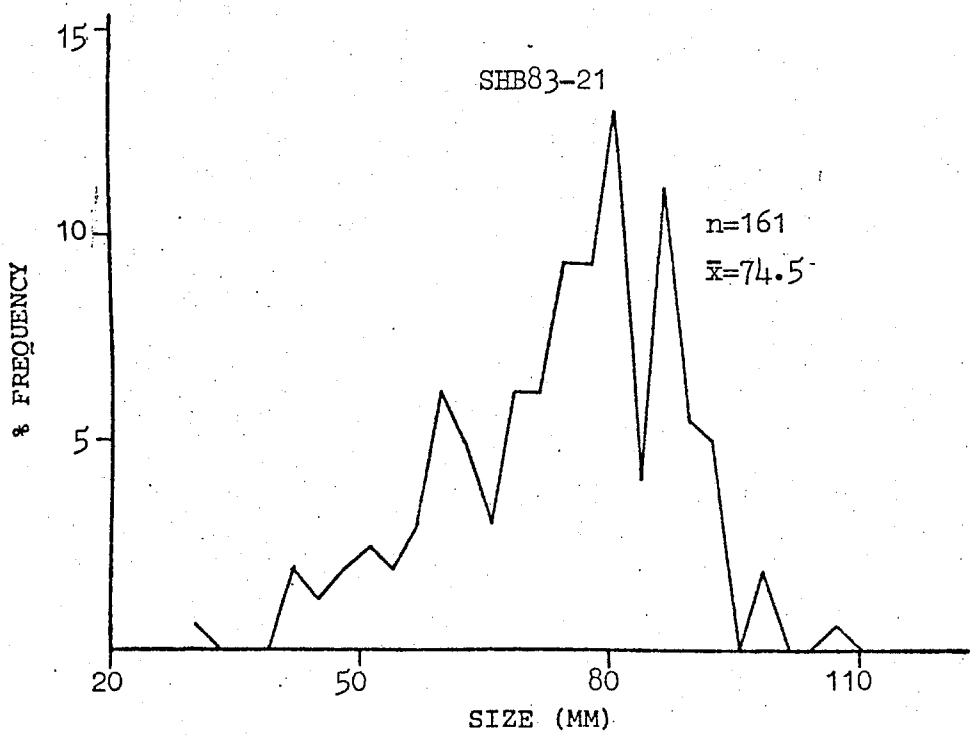
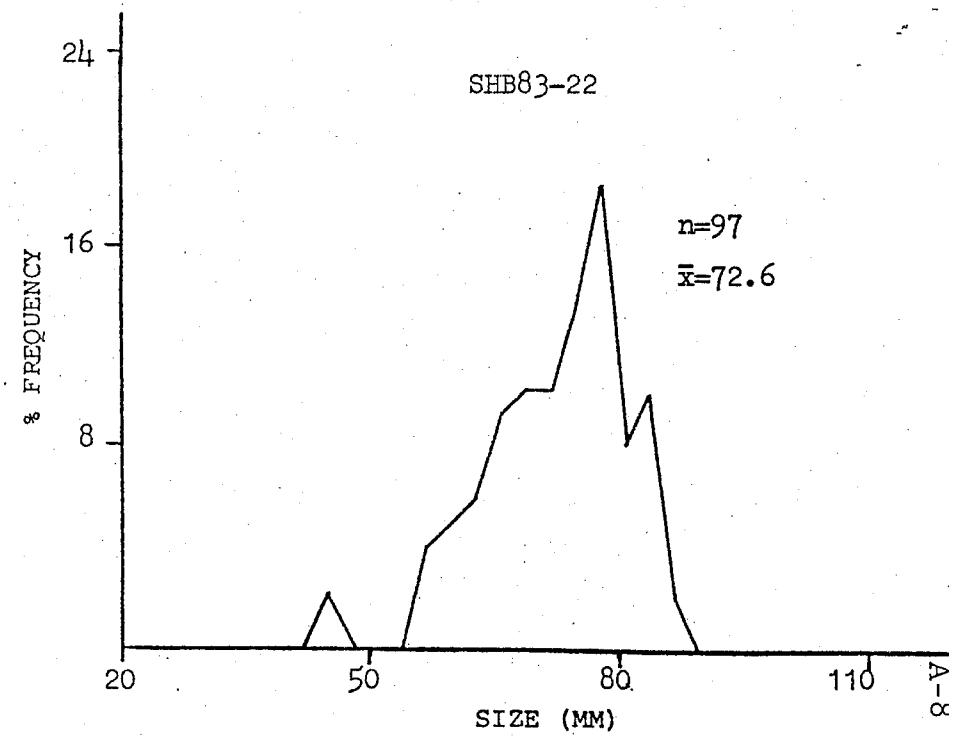
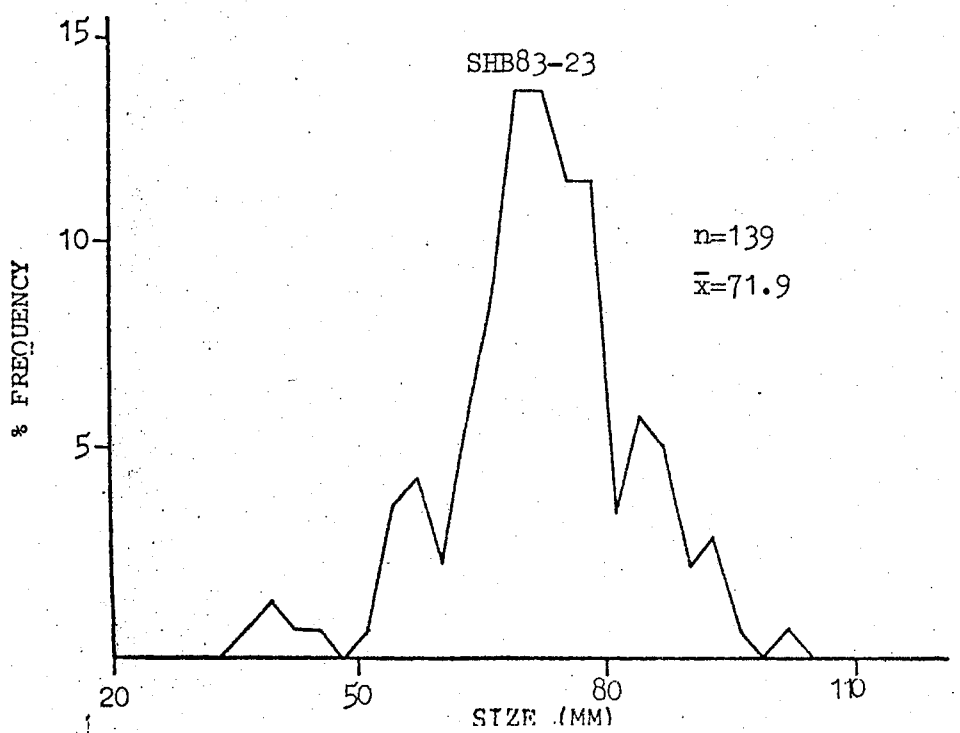
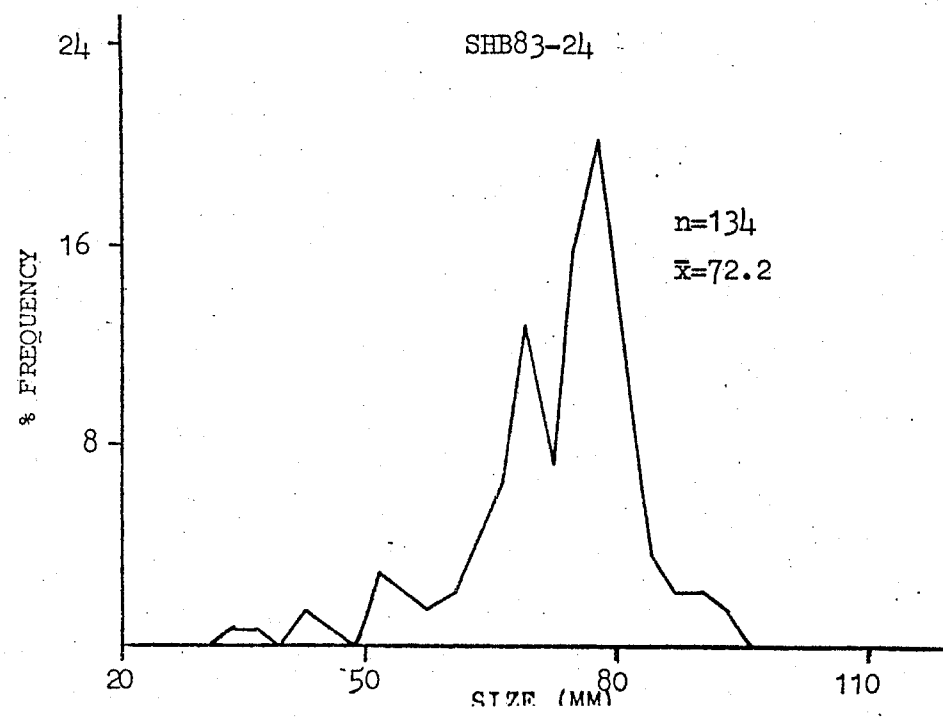
— — — *Mya arenaria*

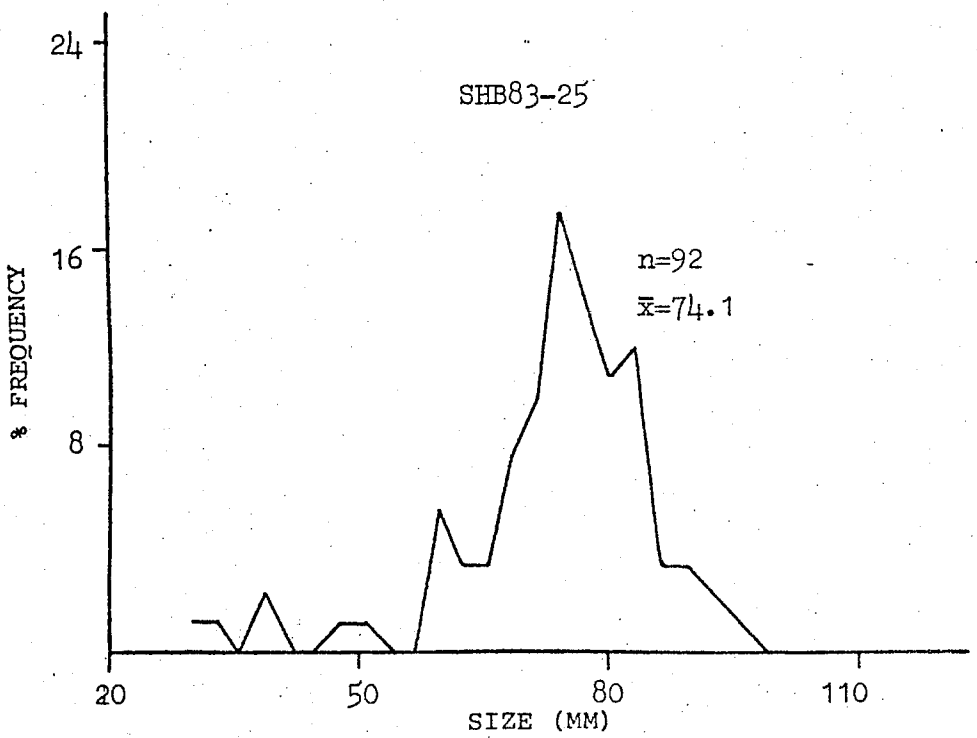


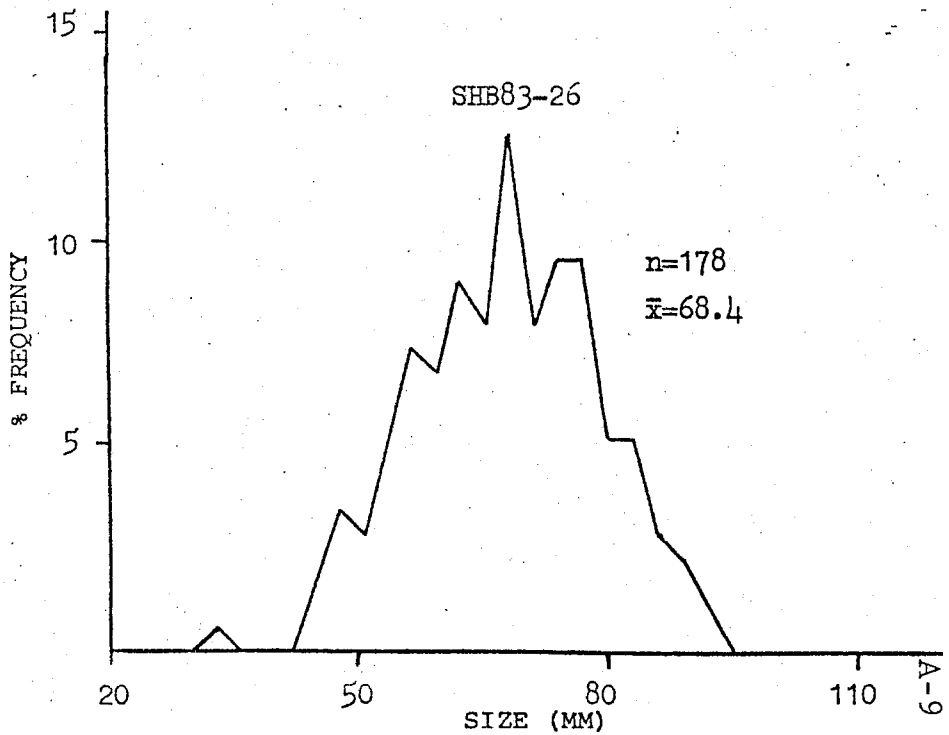


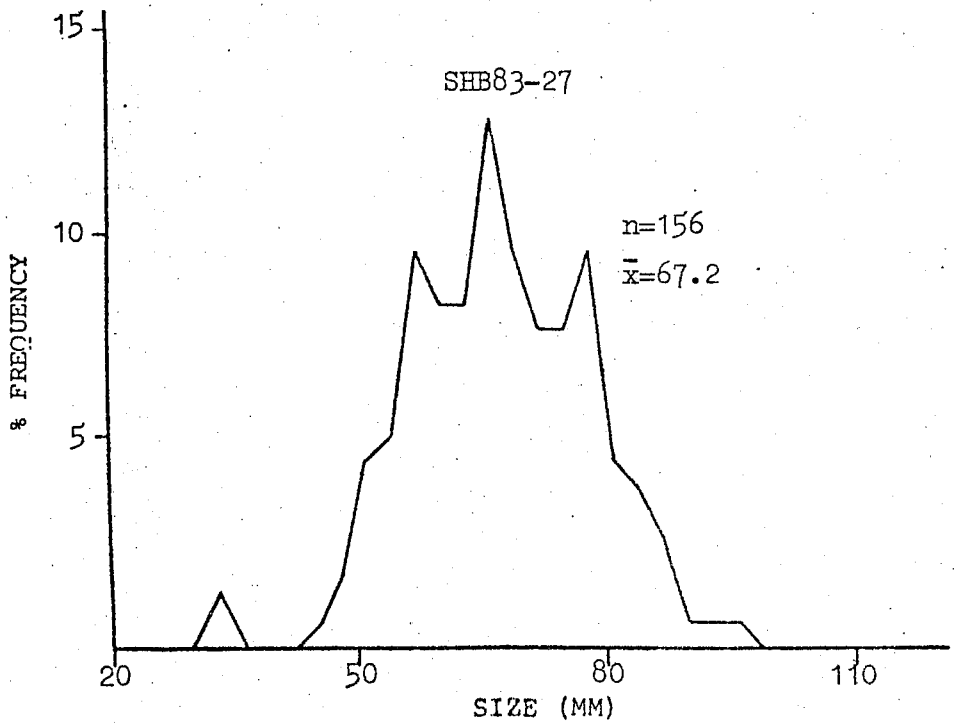


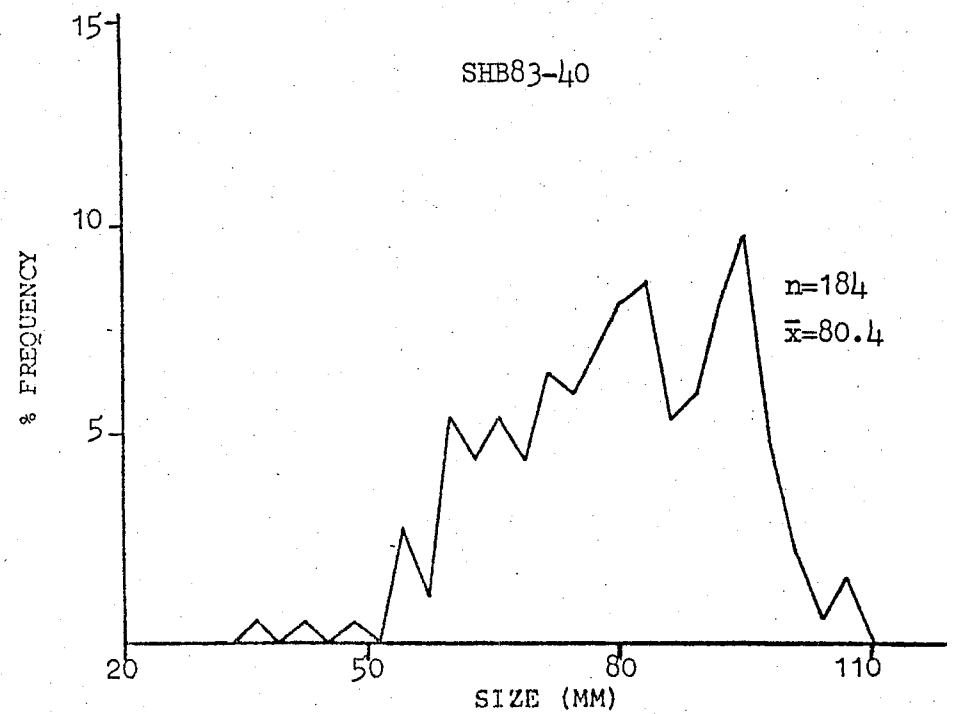


Mercenaria mercenaria
Mya arenaria









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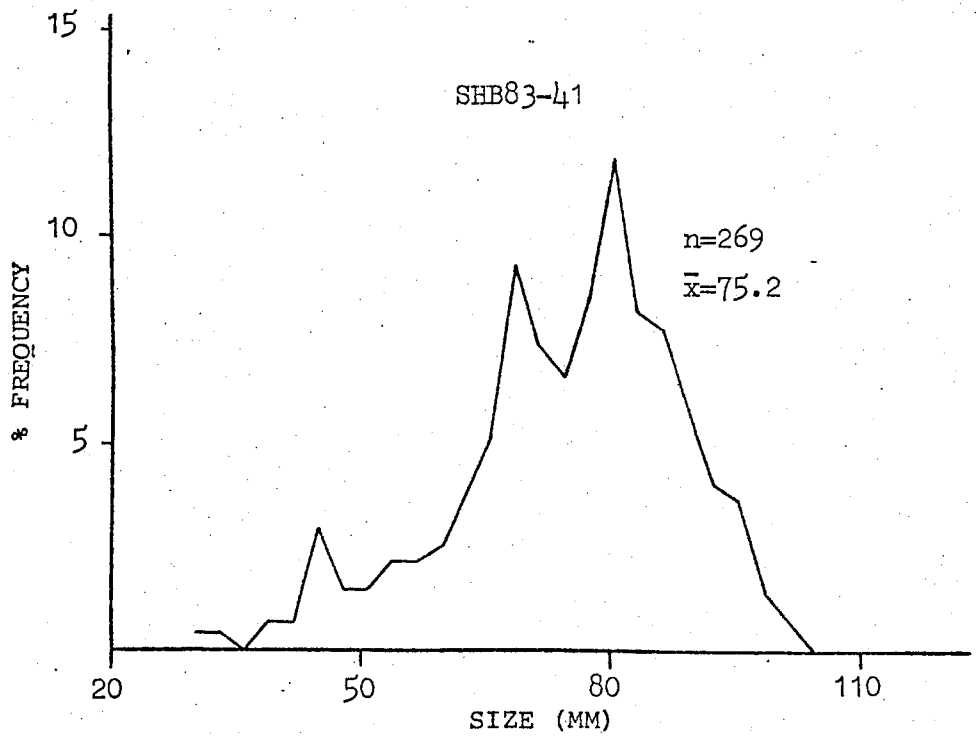

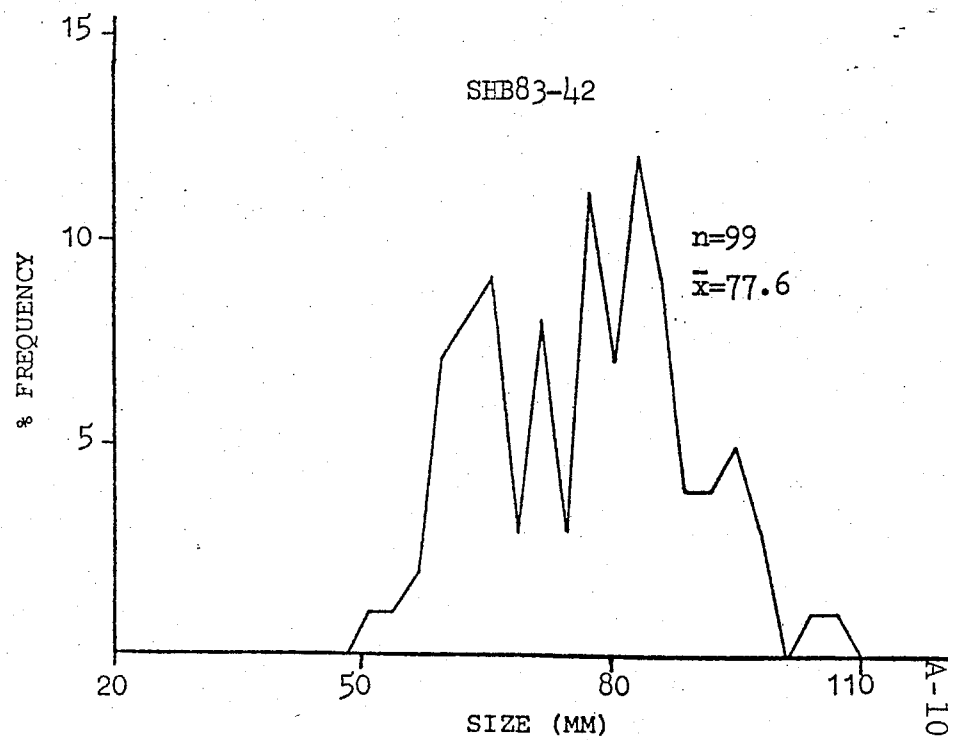

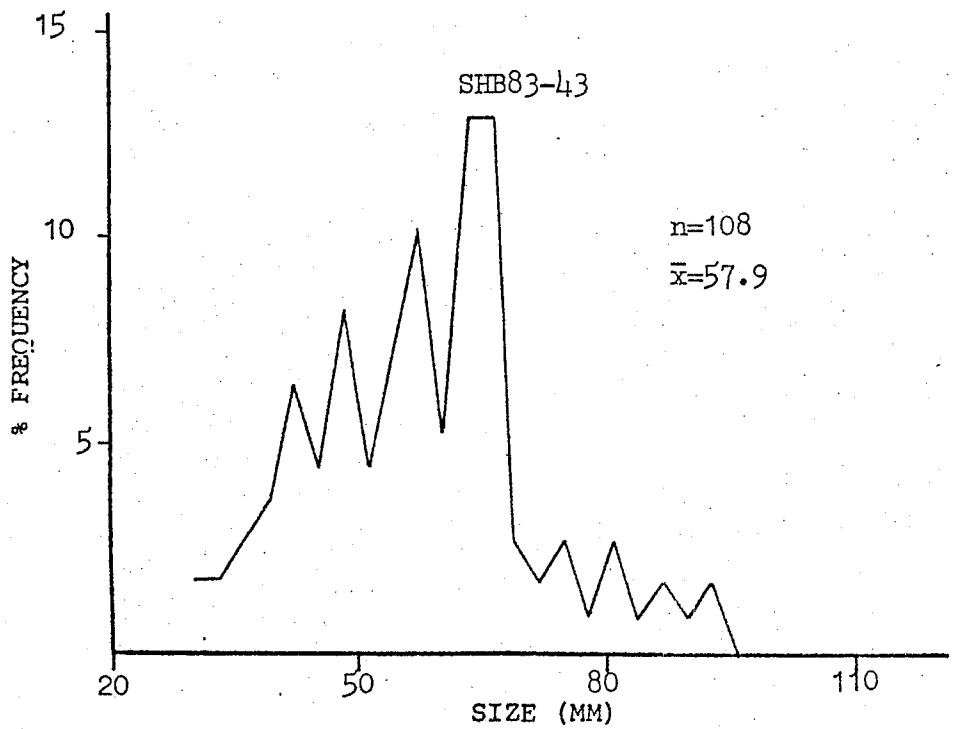

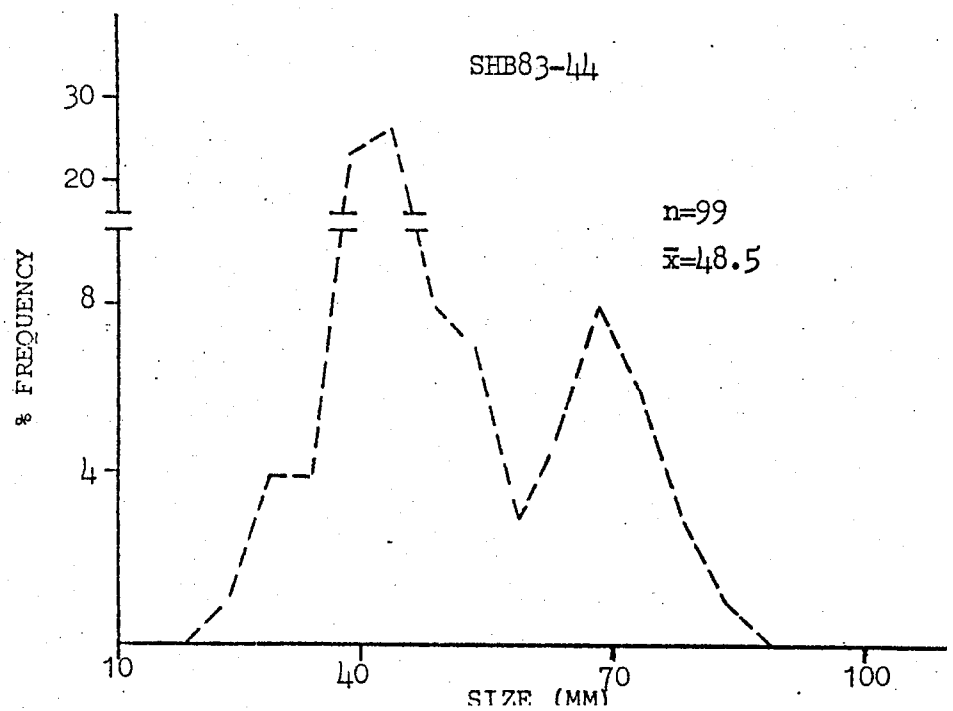

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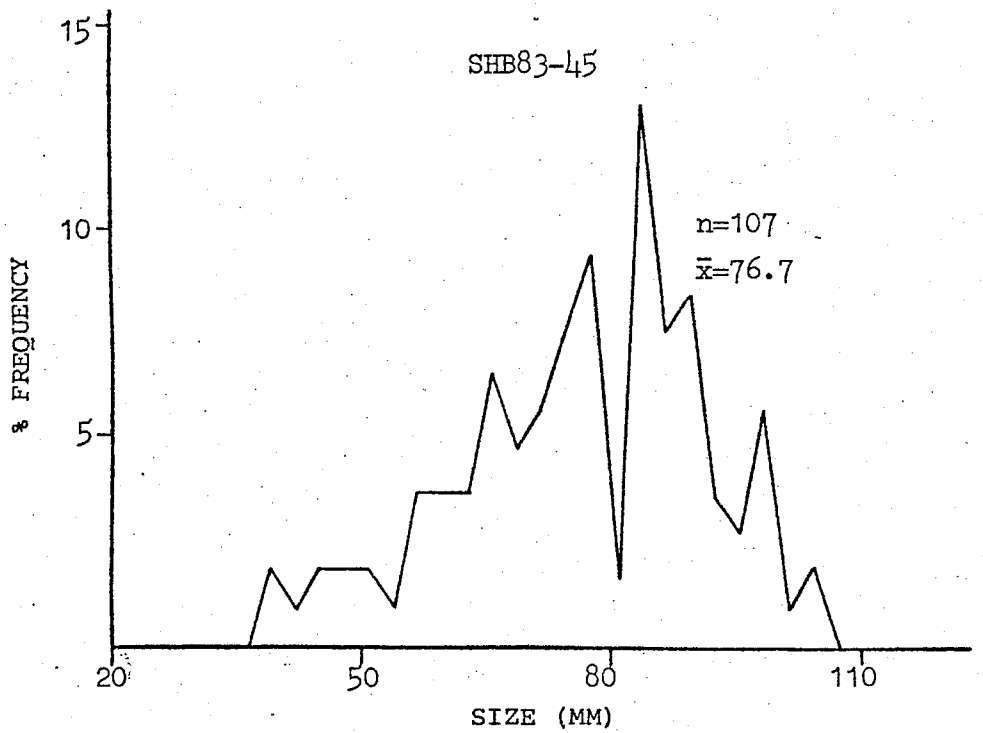

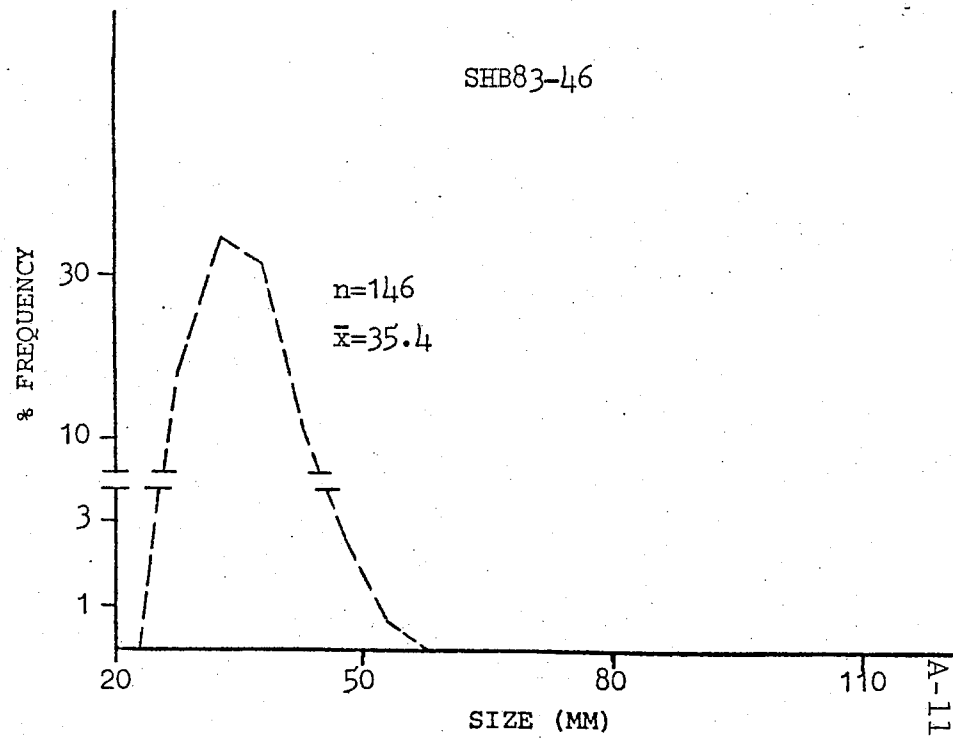

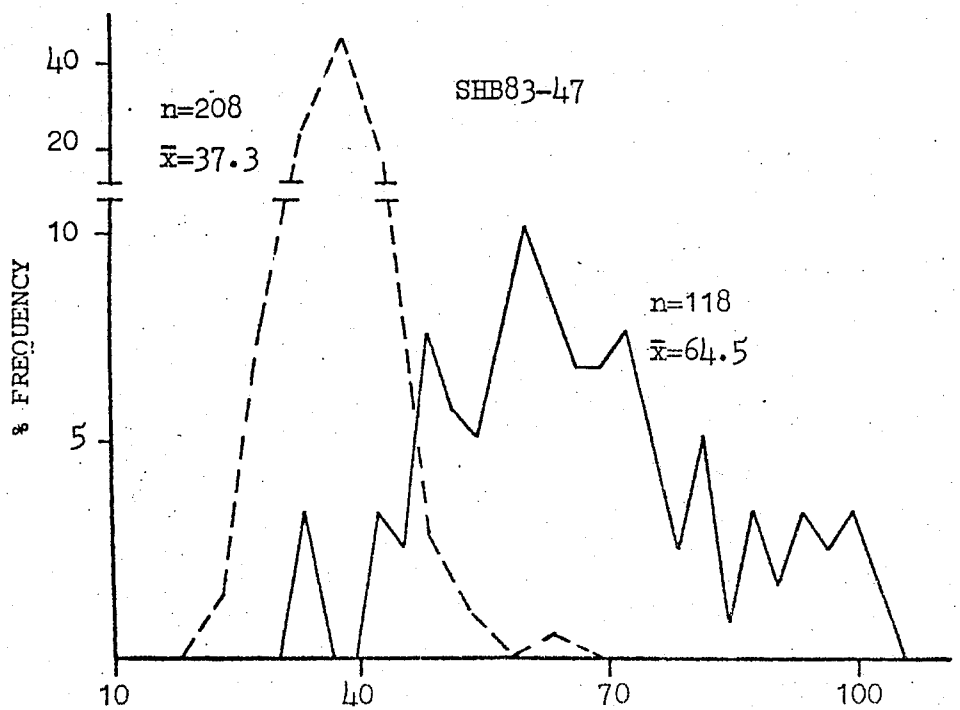

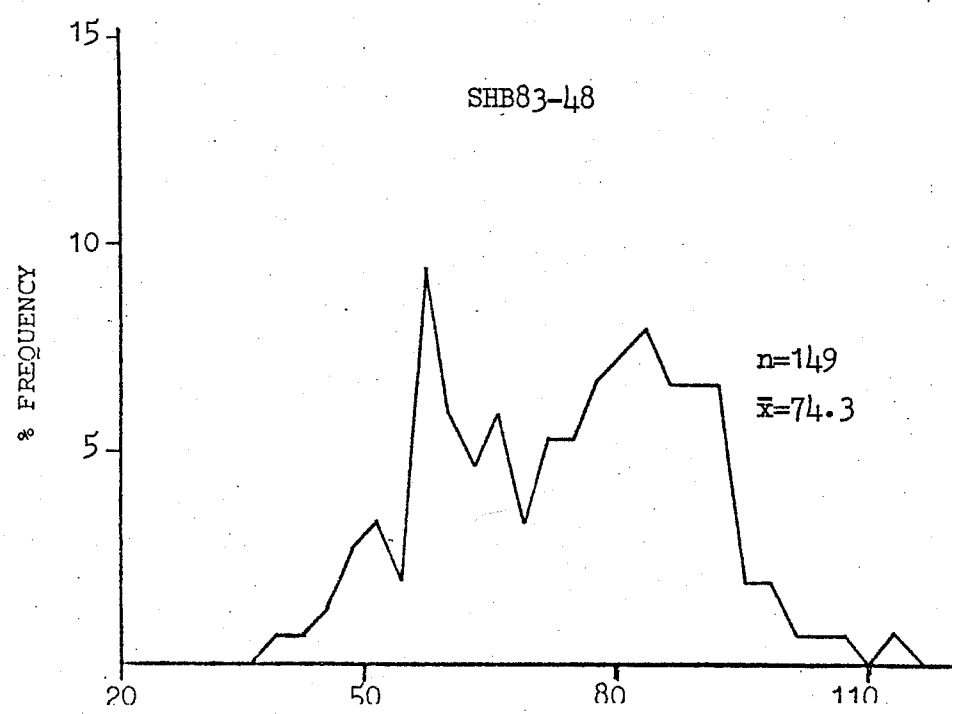

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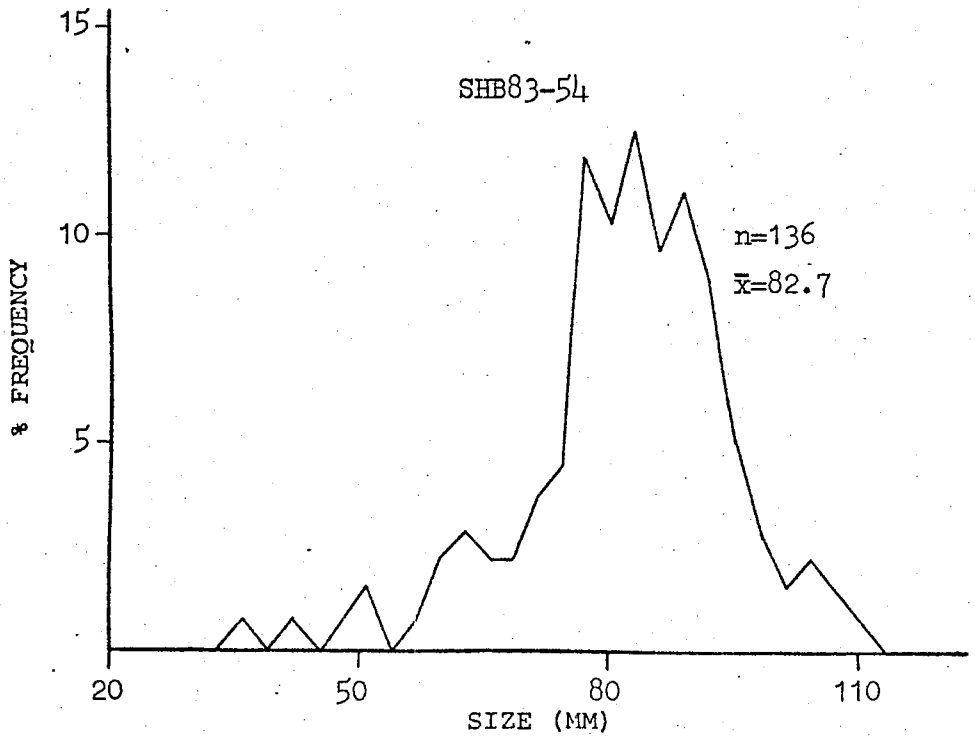

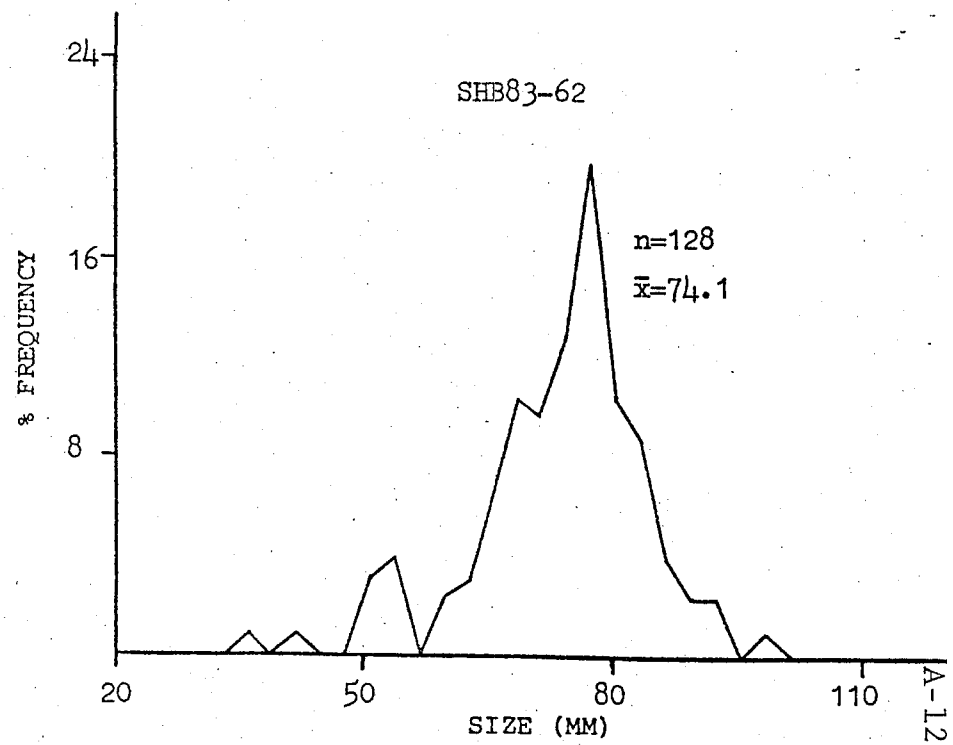

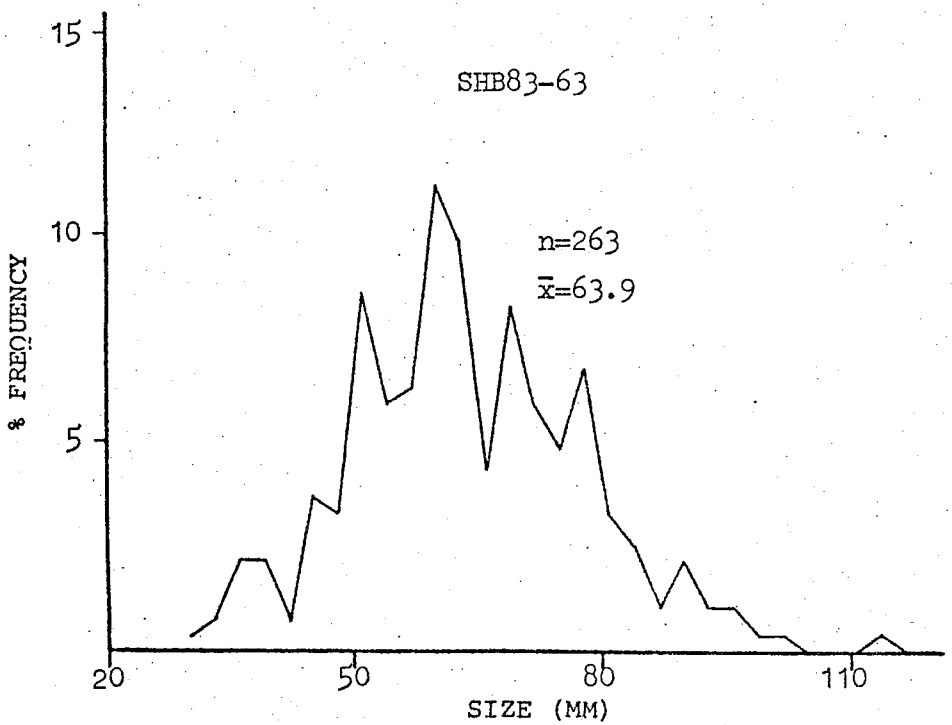

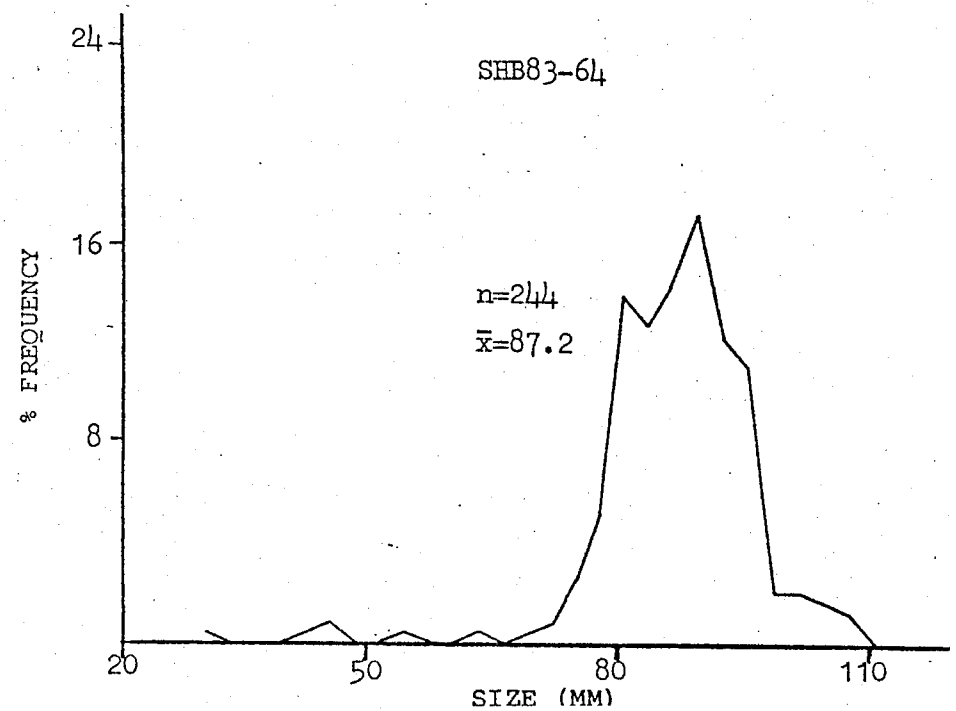

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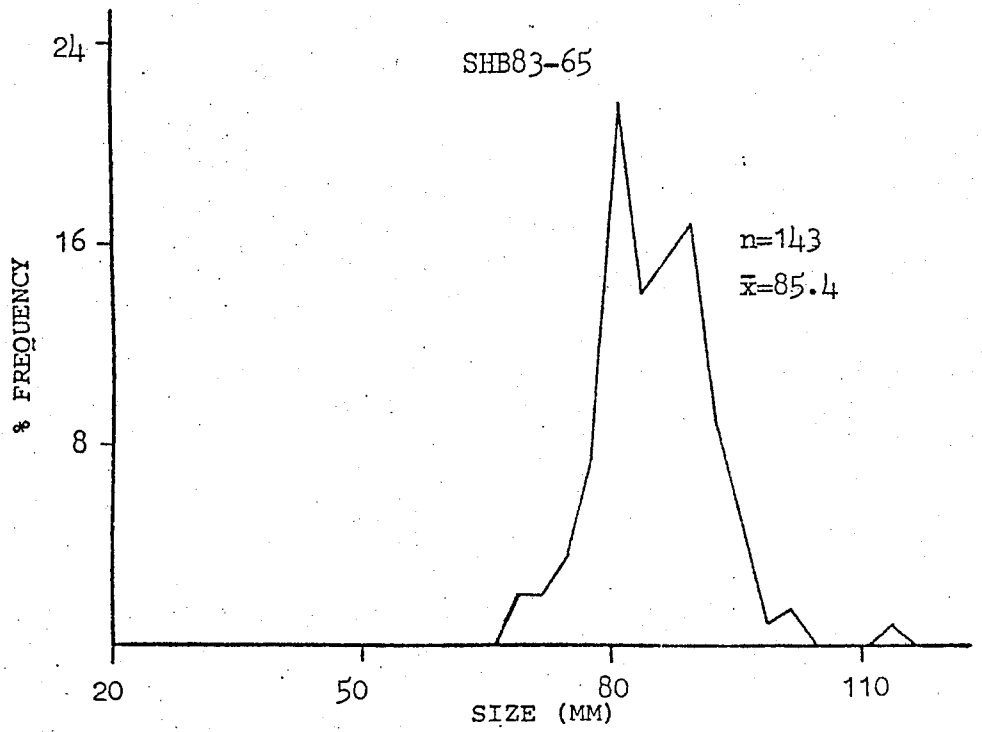

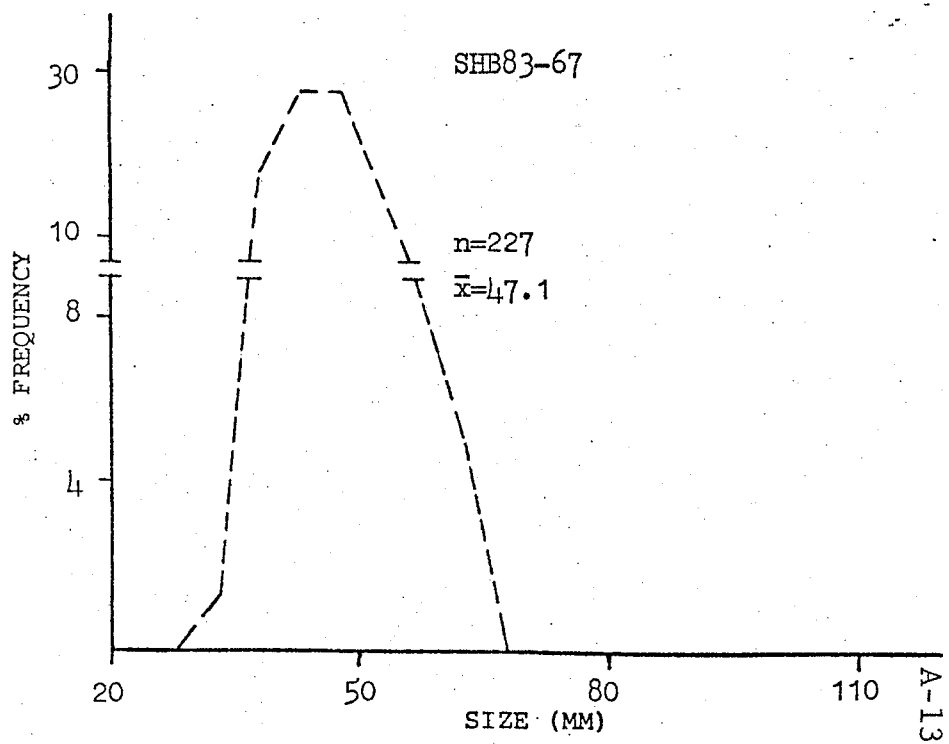

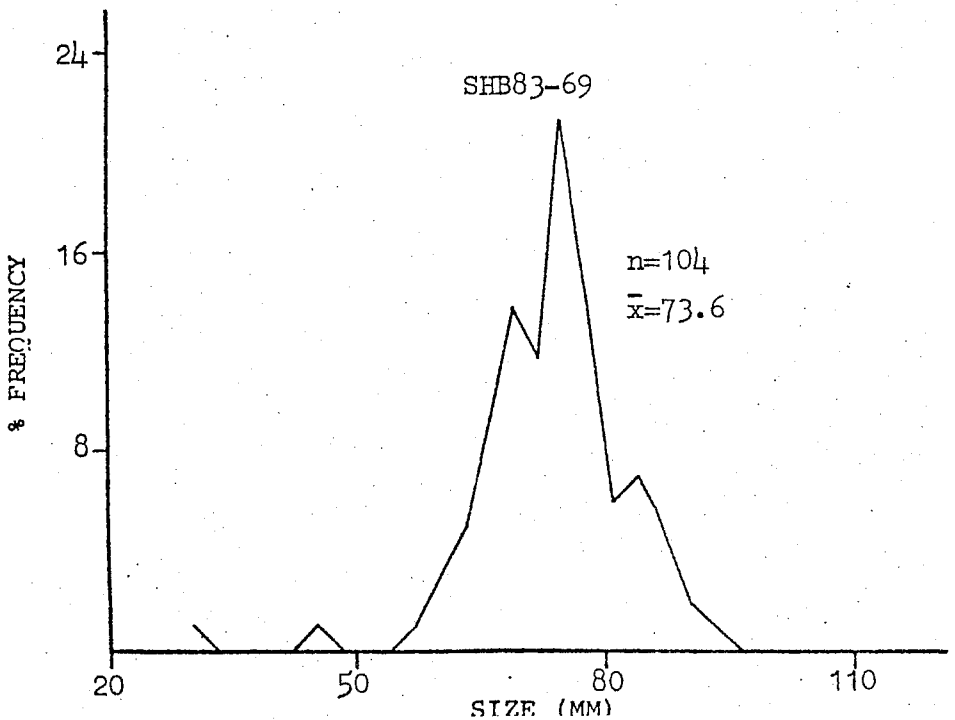

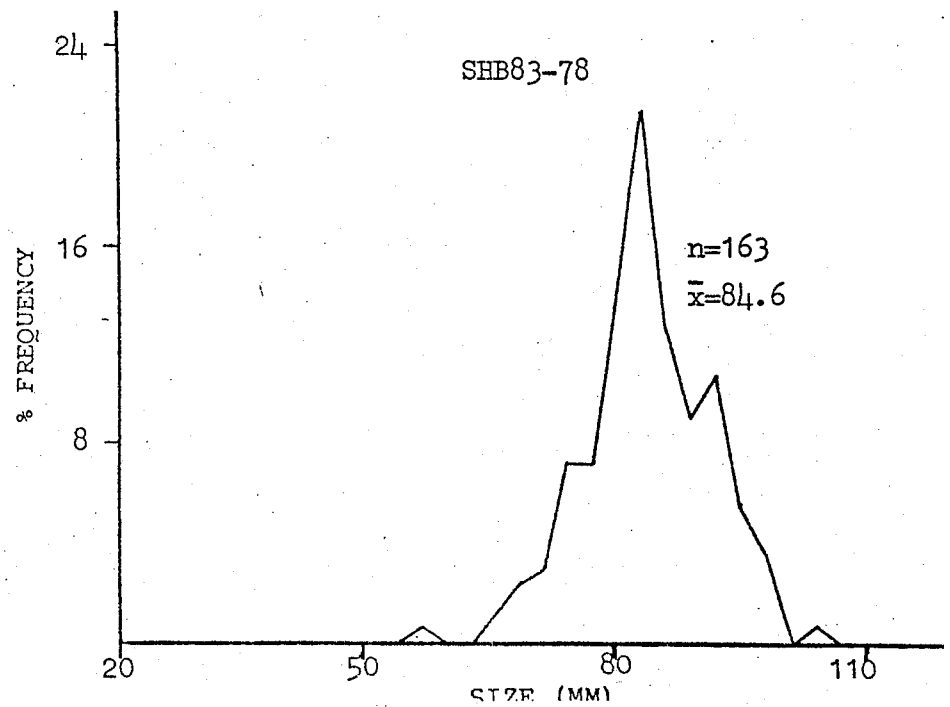

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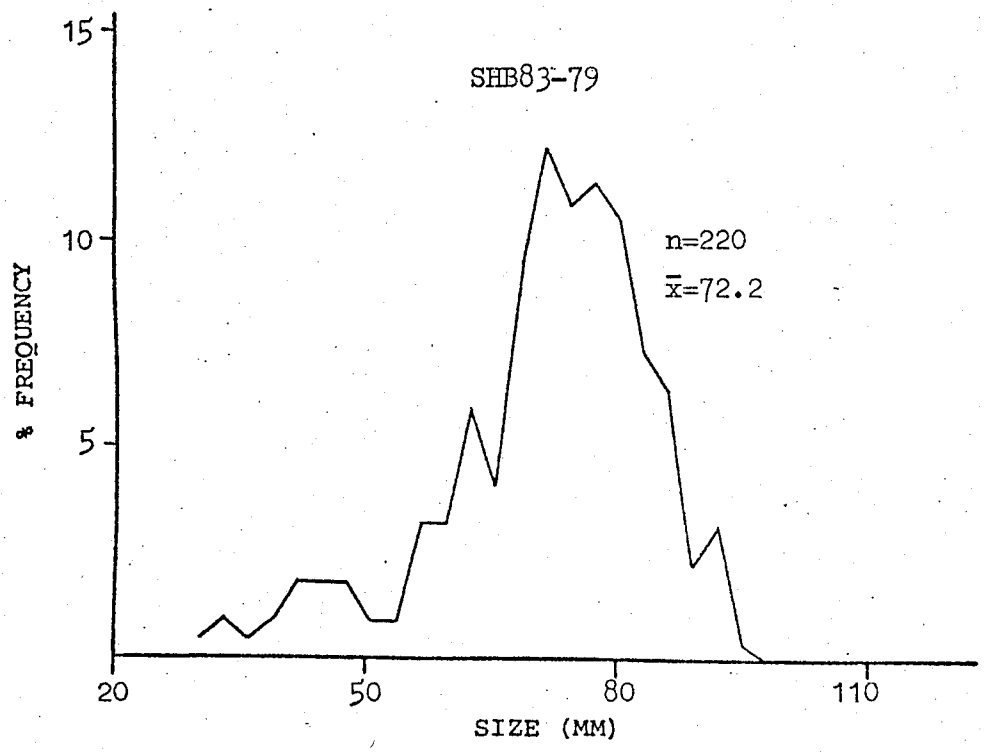

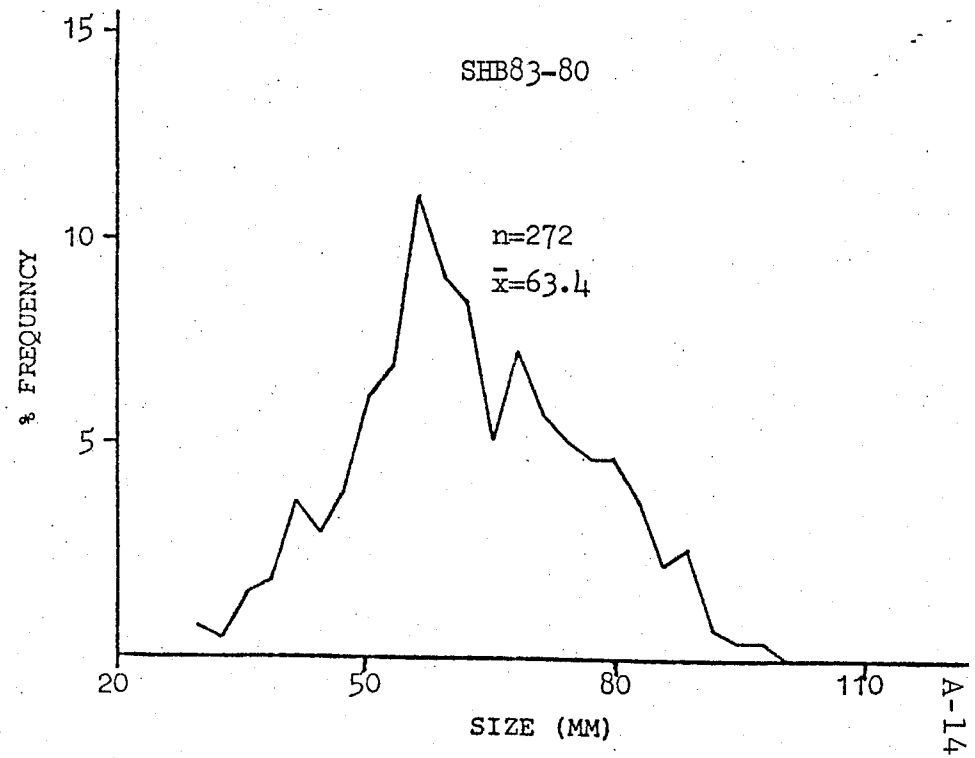

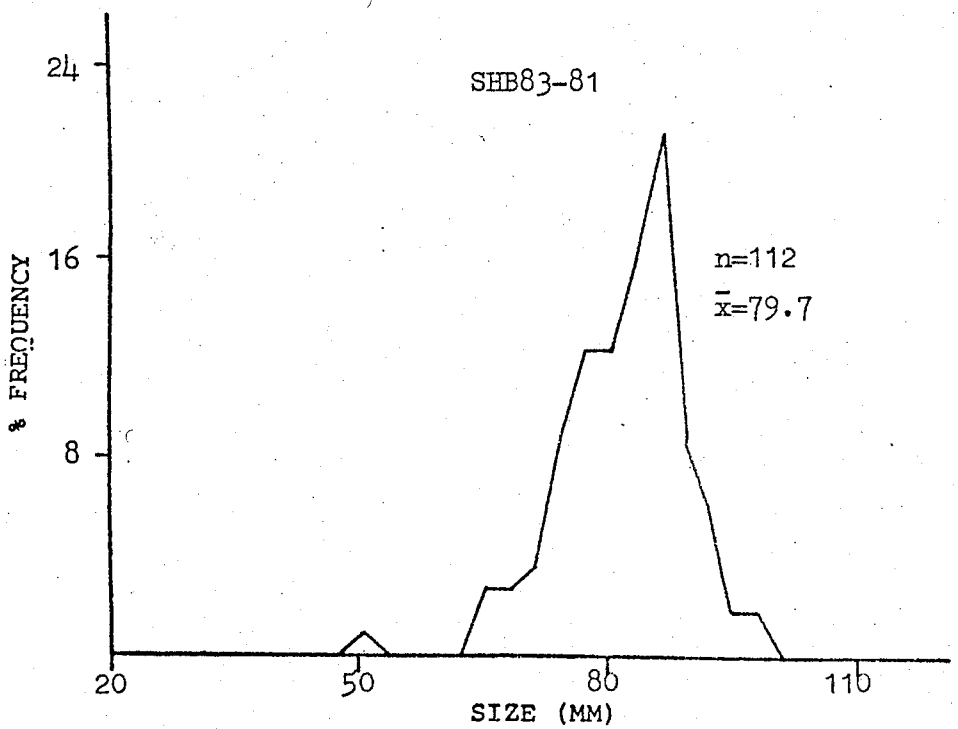

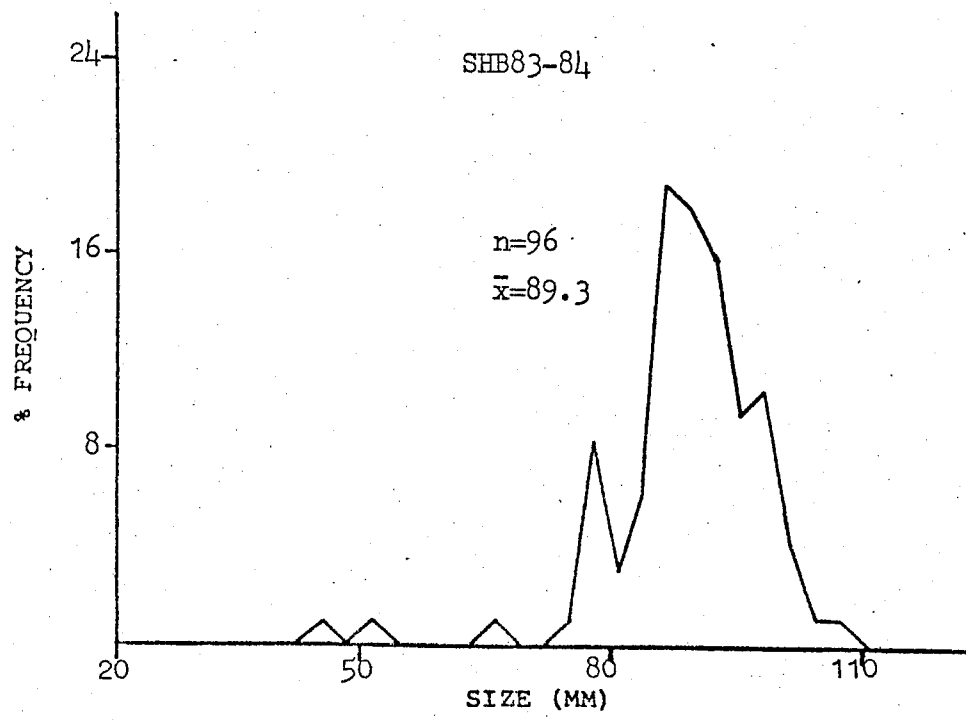

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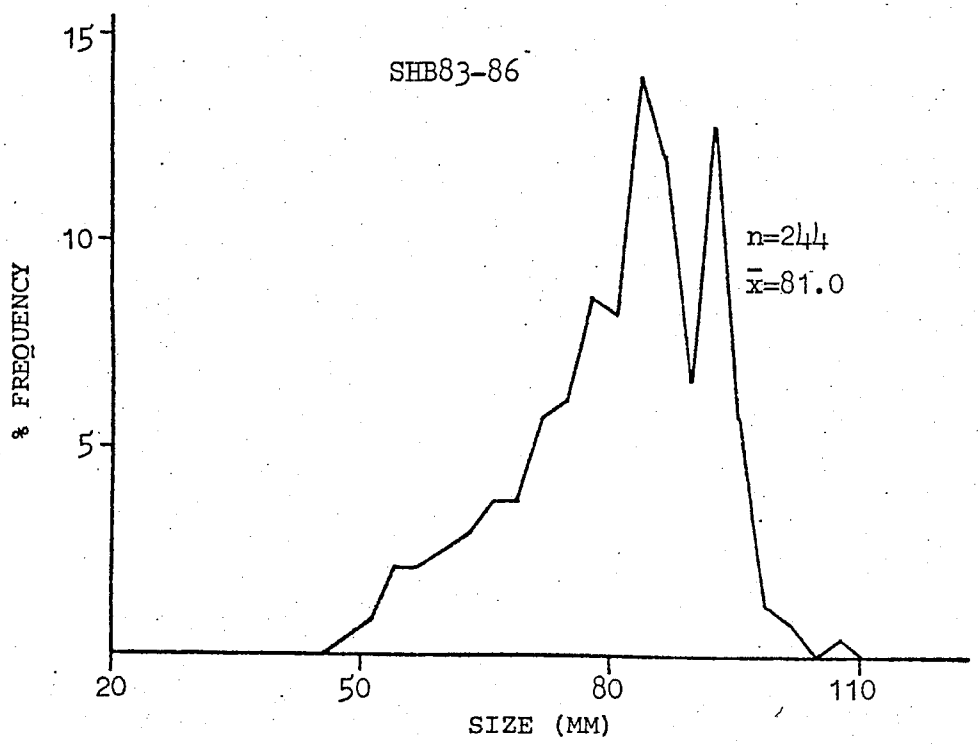

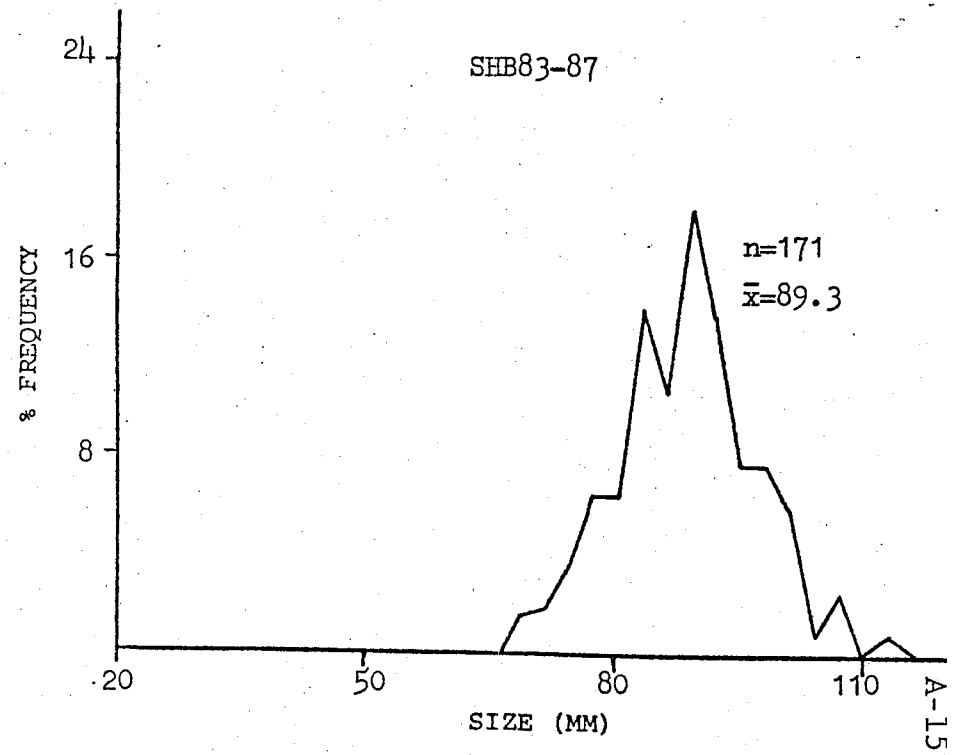

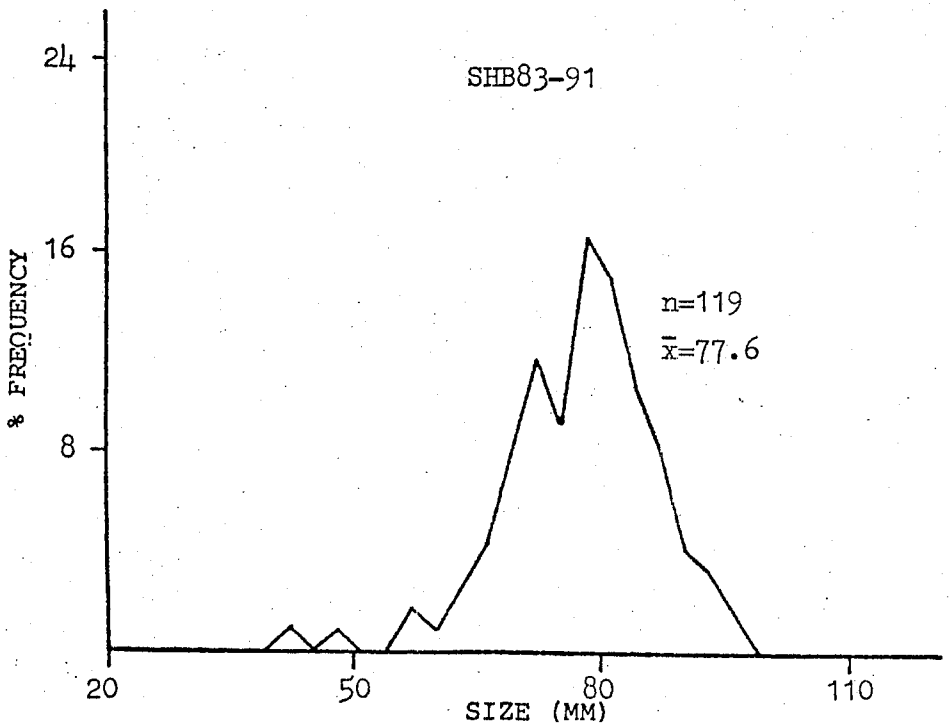

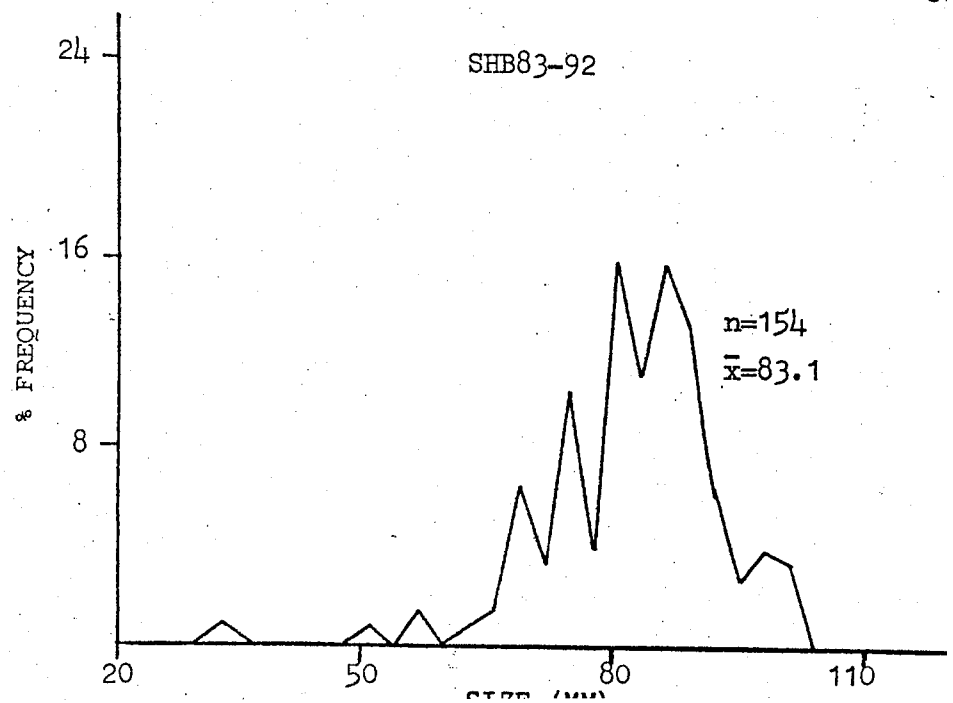

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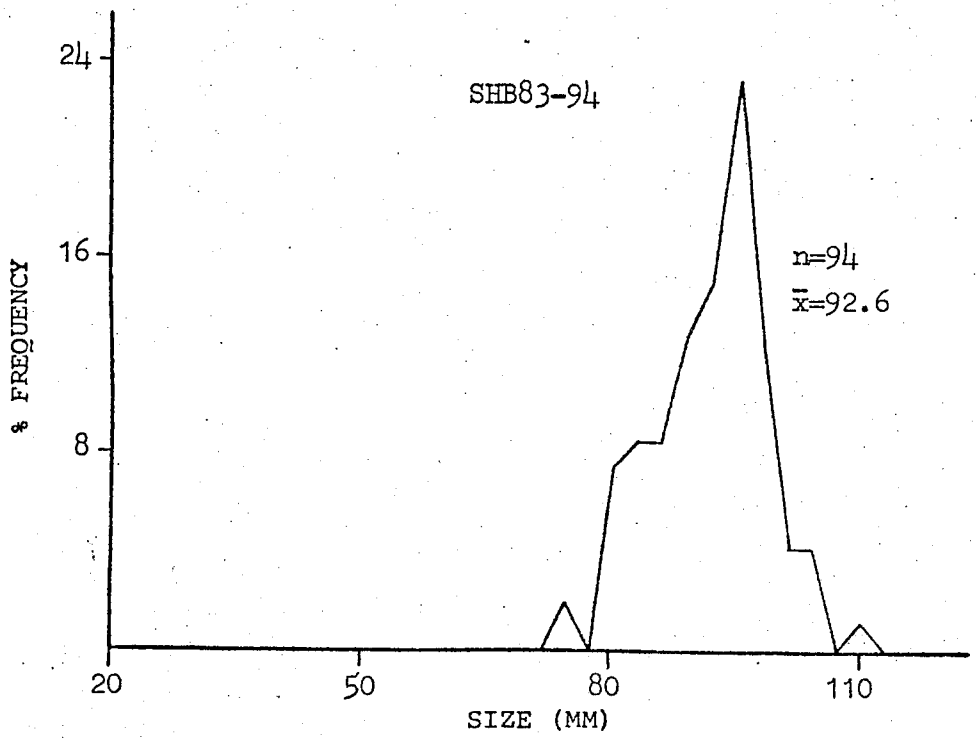

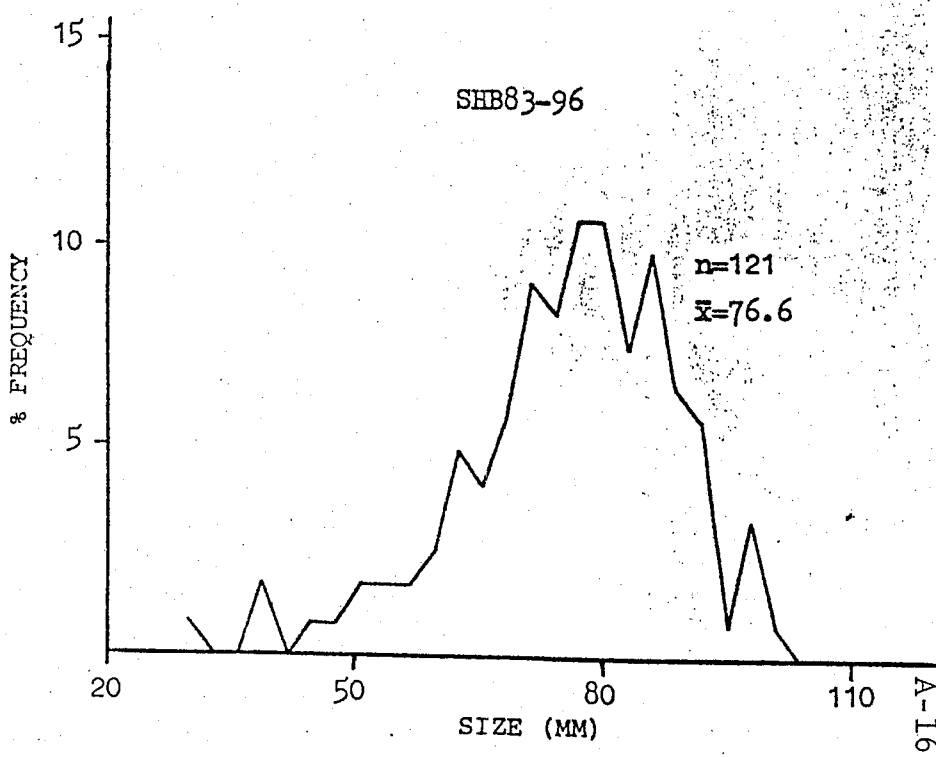

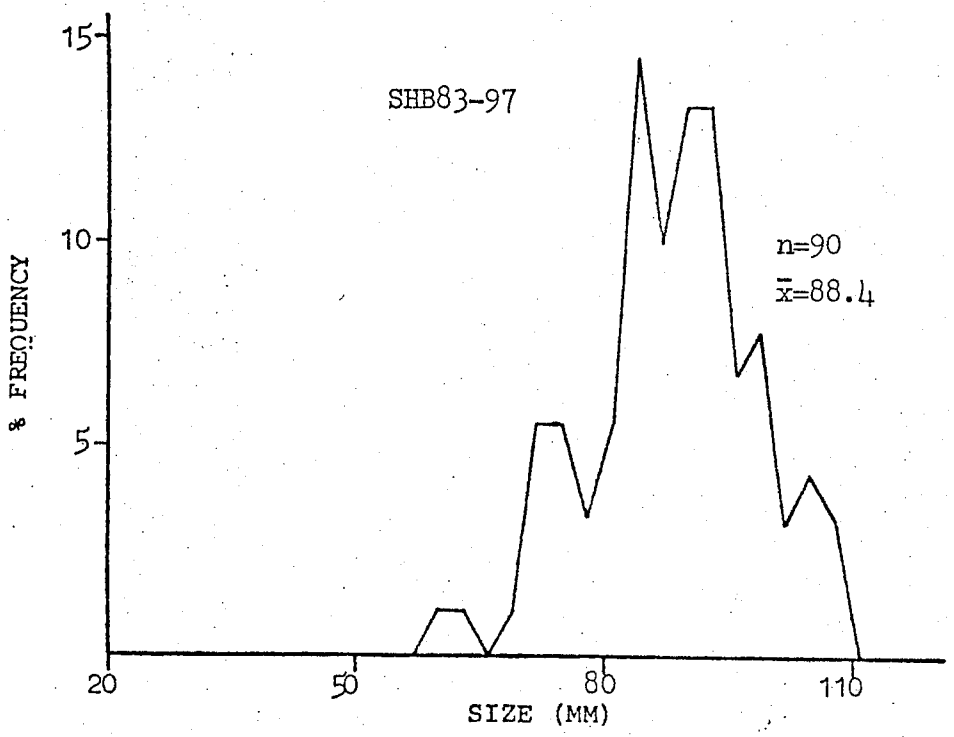

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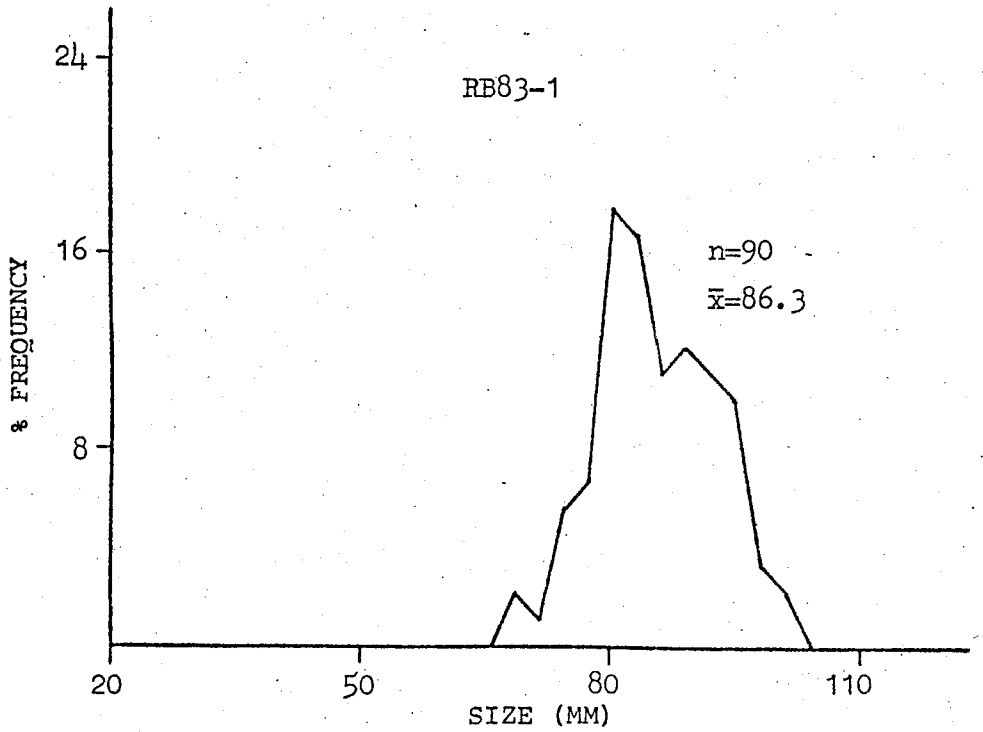

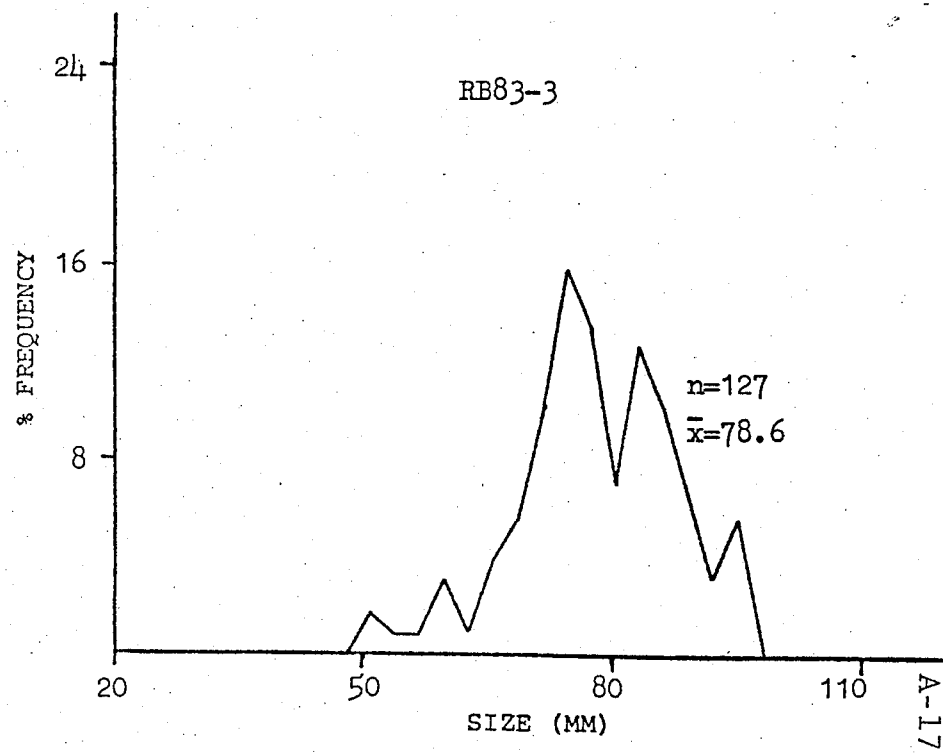

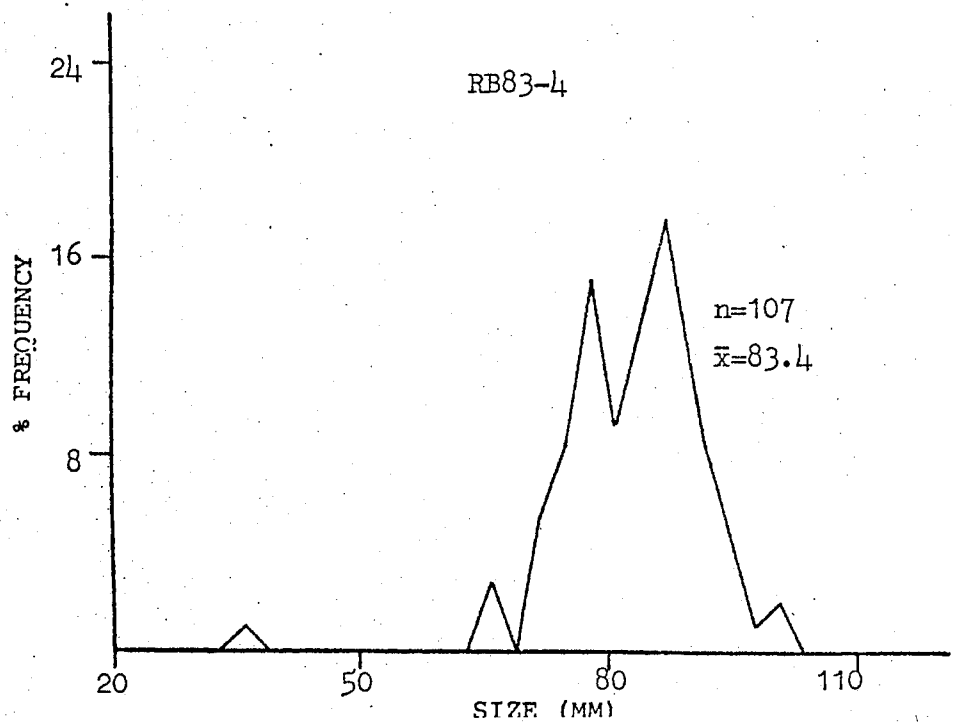

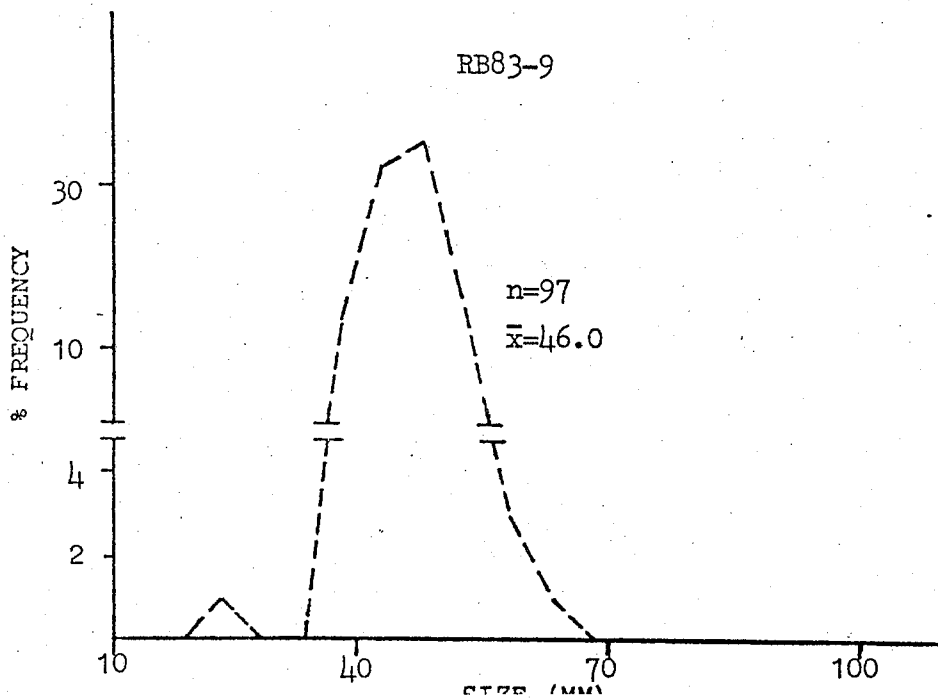

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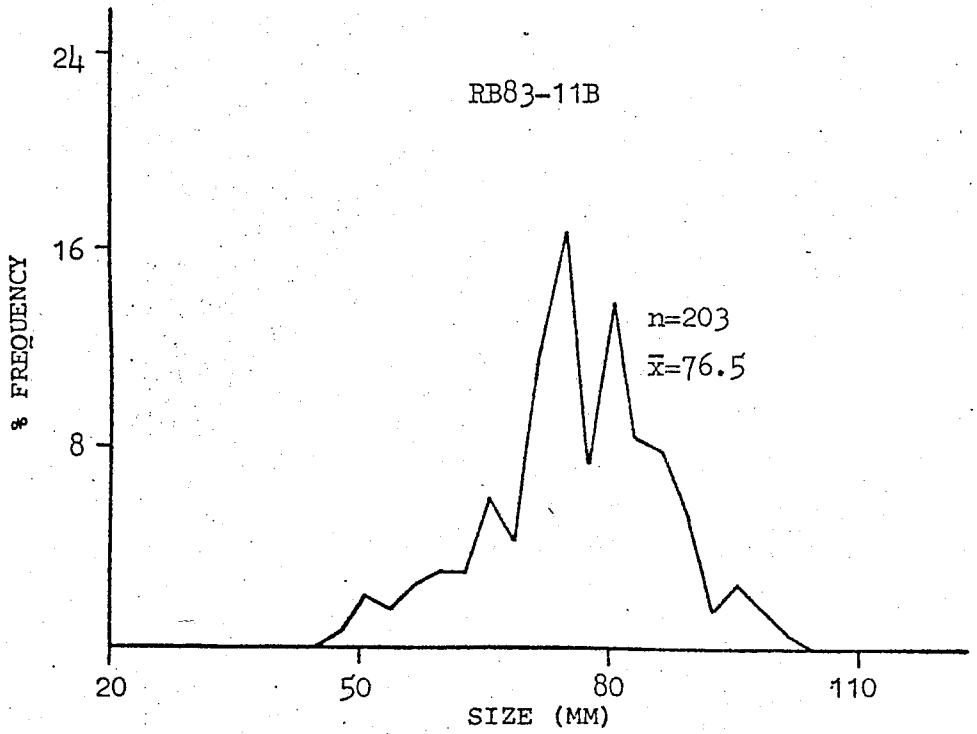

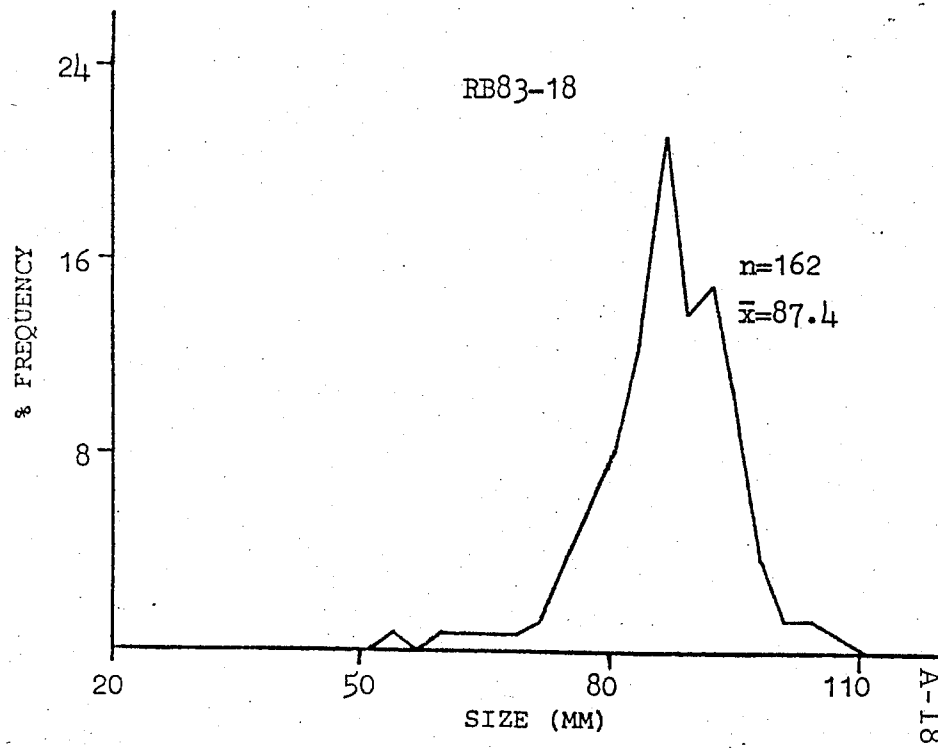

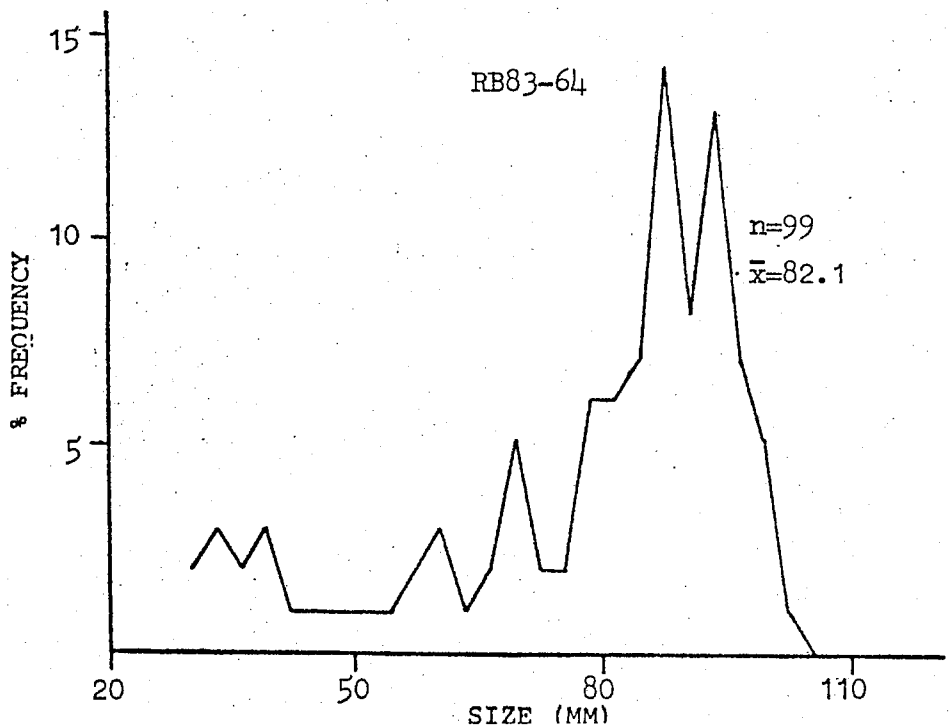

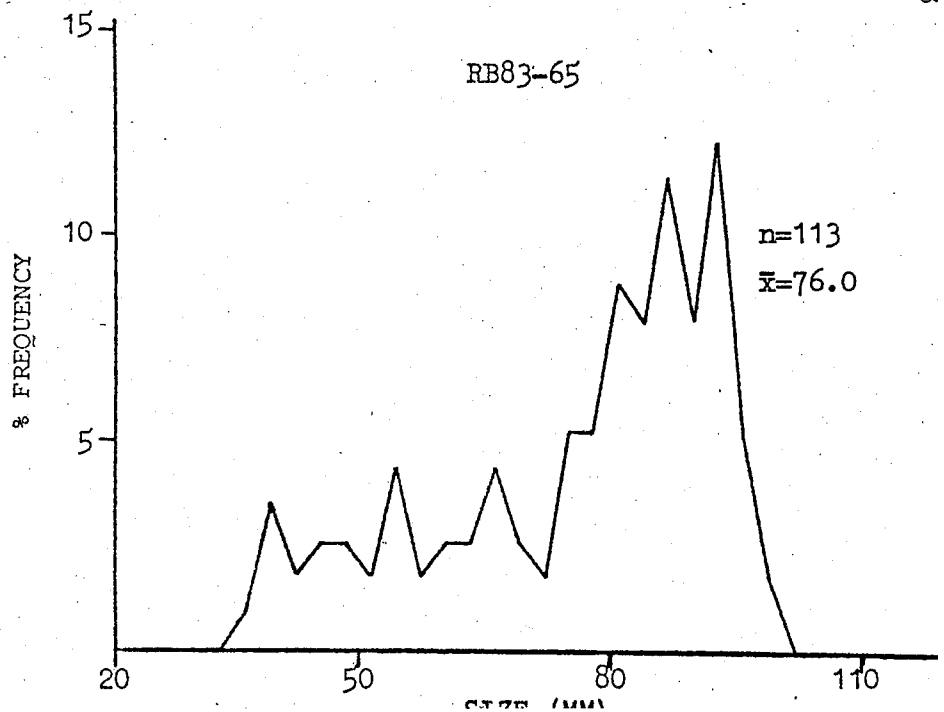

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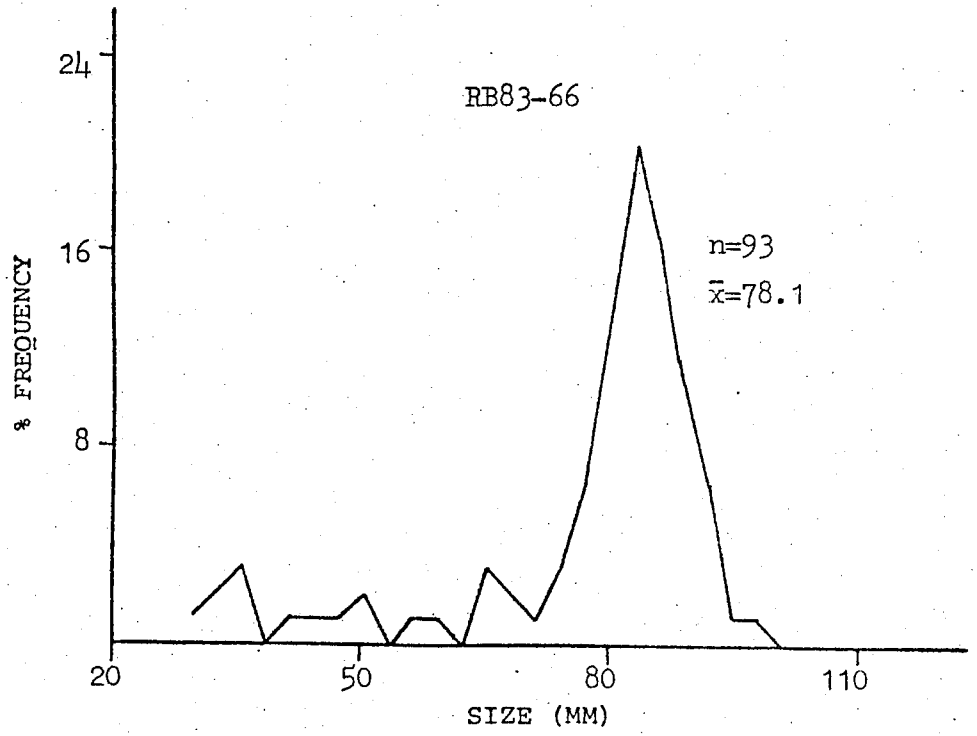

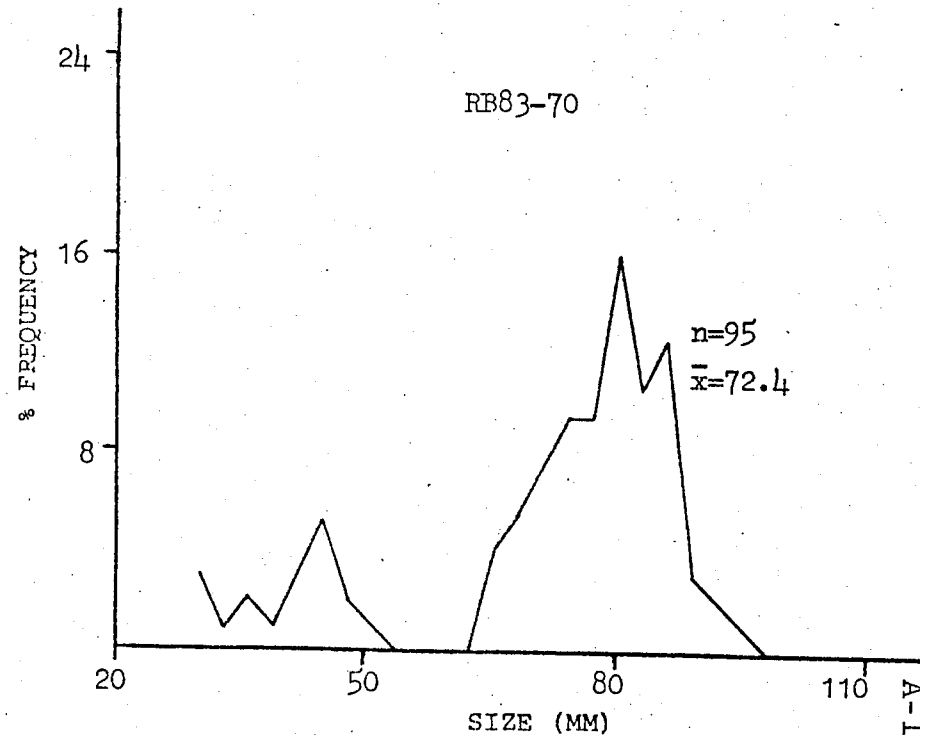

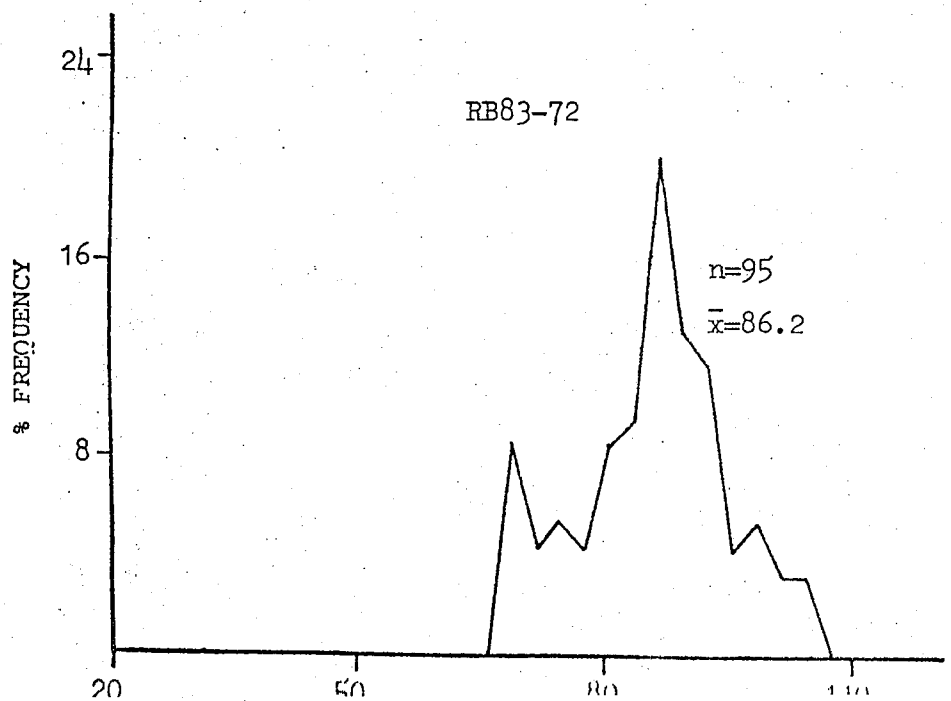

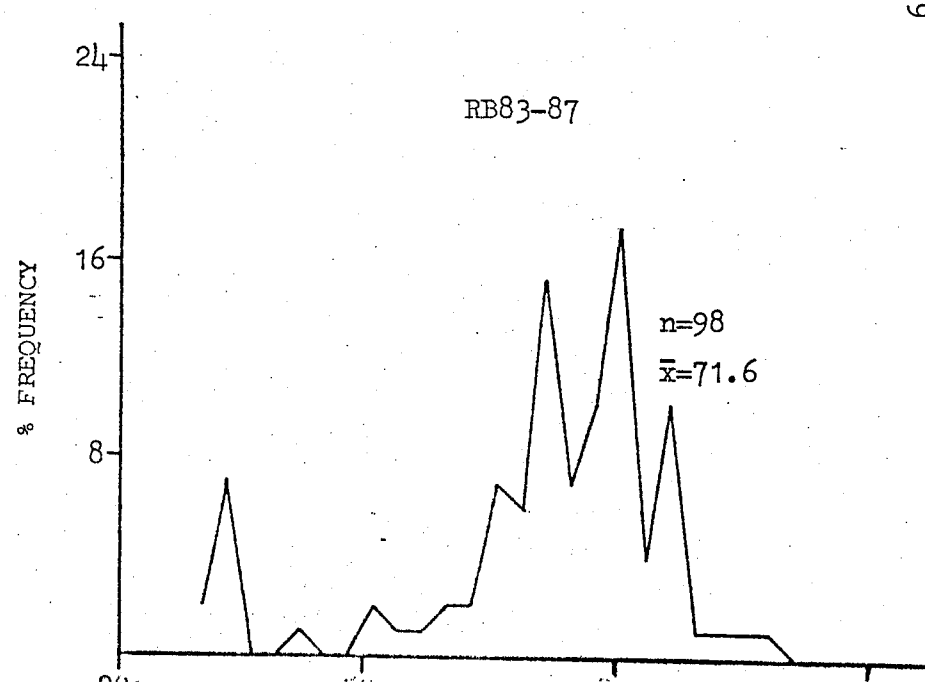

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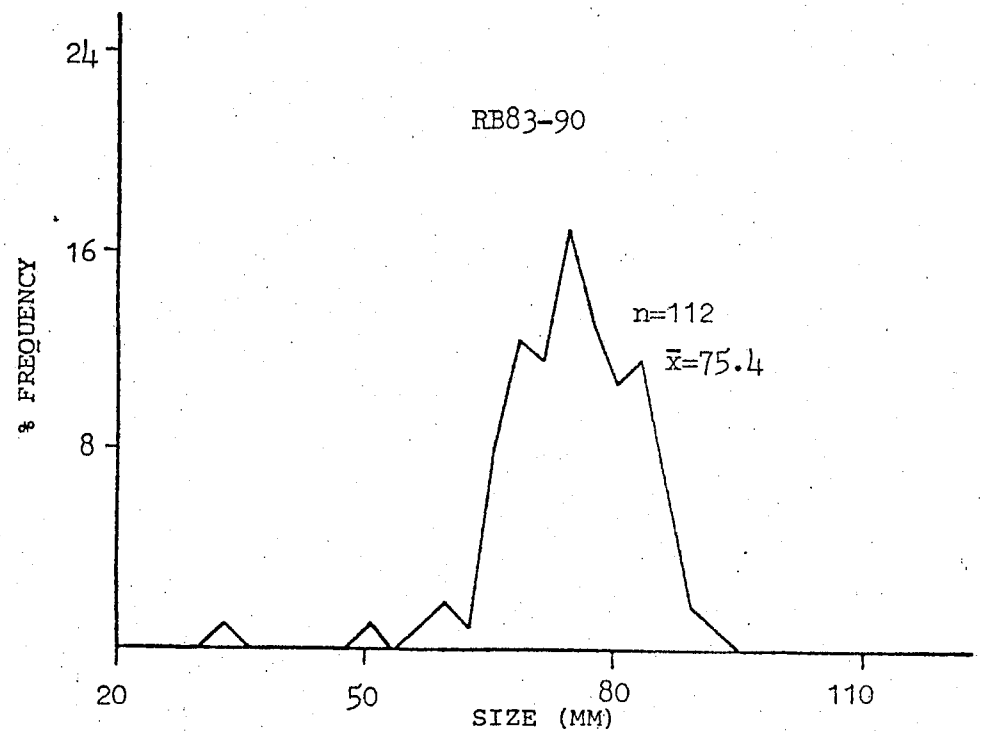
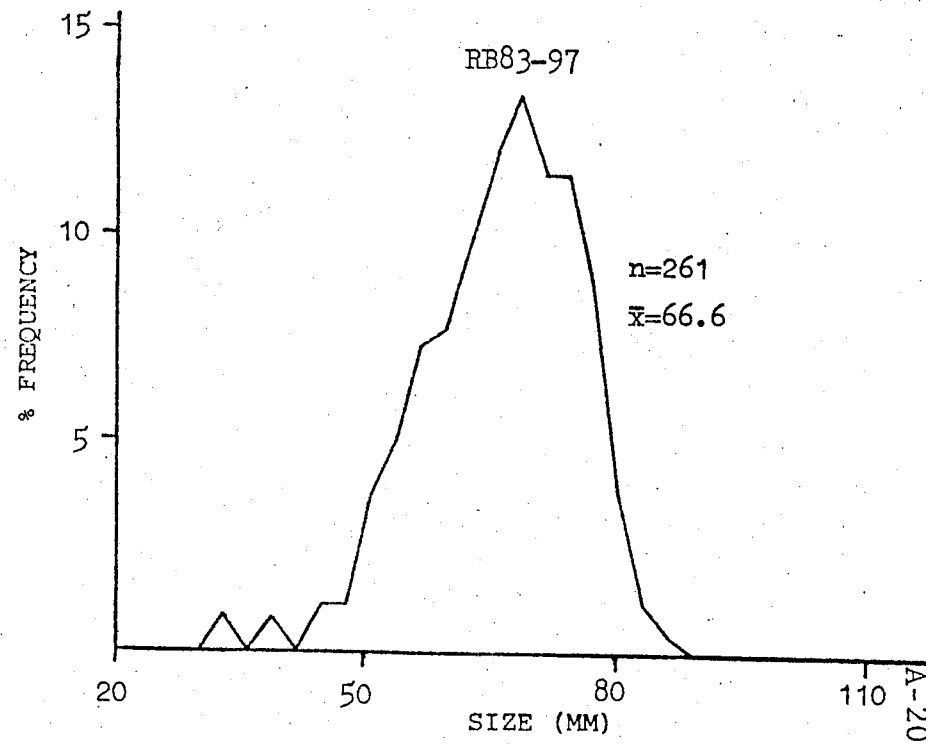
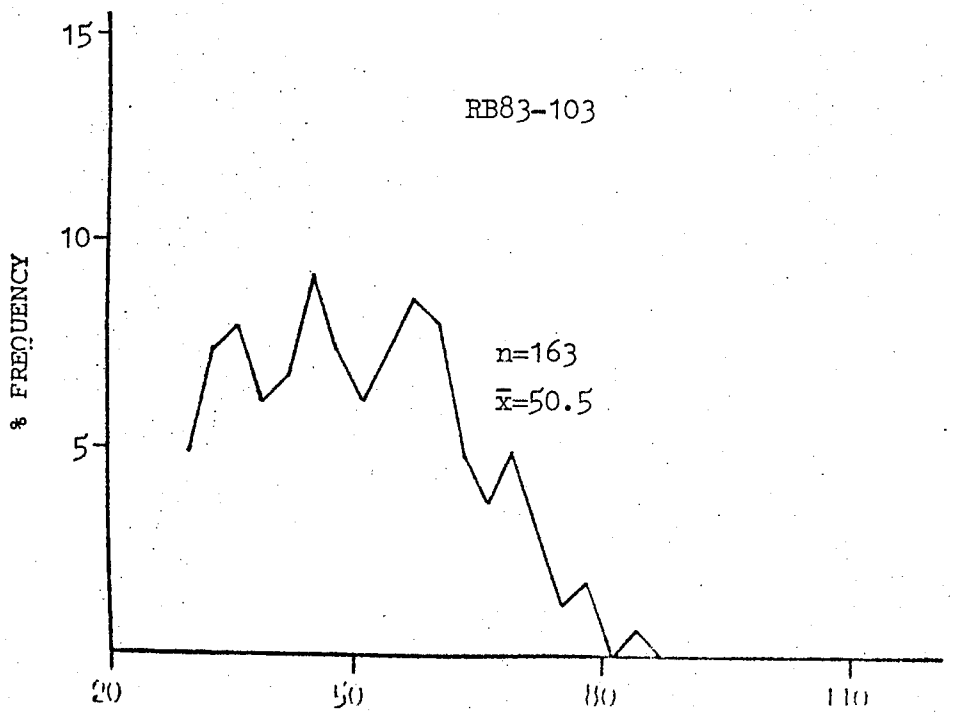






SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-1	SHB83-2	SHB83-3	SHB83-4	SHB83-5
LATITUDE N			40°26.75'	40°26.63'	40°26.38'	40°26.16'	40°26.05
LONGITUDE W			73°59.80'	73°59.65'	73°59.68'	73°59.72'	73°59.72
COLLECTION DATE			5/18/83	5/18/83	5/18/83	5/18/83	5/18/83
TIDE AND HOURS			Low + 2	Low + 2.5	Low + 3	Low + 4	Low + 5
TEMPERATURE °C	AIR		13.5	15.0	16.0	15.0	14.0
	WATER	S	13.7	12.2	13.3	13.6	12.5
		B	13.7	12.0	12.8	12.9	11.4
D.O. (ppm)	S		11.1	11.1	11.1	11.2	11.5
	B		10.9	10.8	11.0	11.3	11.2
SALINITY (ppt)	S		22.0	22.0	20.5	20.5	21.5
	B		22.0	22.0	22.0	22.0	21.5
pH	S		8.5	8.5	8.5	8.5	8.5
	B		8.5	8.5	8.5	8.5	8.5
DEPTH (ft)			6	8	9	10	8
SUBSTRATE	% GRAVEL		0	0.6	10.5	2.2	3.8
	% SAND		71.8	82.6	82.8	87.2	88.5
	% MUD		28.2	16.8	6.7	10.6	7.7
ESTIMATED HARD CLAM DENSITY (#/ft²)			1.54	2.50	0.54	0.21	0.15
% COMMERCIAL SIZES	SL		4.0	2.0	0.9	0	0
	LN		12.9	6.6	0.9	2.4	0
	CS		37.1	41.4	26.8	4.9	31.0
	CH		46.0	50.0	71.4	92.7	69.0
NUMBER CLAMS COLLECTED			307	498	107	41	30
SIZE RANGE (mm)			30-108	31-110	36-103	38-103	61-108
$\bar{X}$ SIZE (mm)			72.2	75.6	82.0	87.2	83.2
% MORTALITY			1.0	0.6	2.7	16.3	18.9

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

ATION NUMBER			SHB83-6	SHB83-7	SHB83-8	SHB83-9	SHB83-10
TITUDE N			40°25.75'	40°25.53'	40°25.30'	40°25.25'	40°26.75'
NGITUDE W			73°59.80'	73°59.84'	73°59.92'	74°00.12'	74°00.05'
LLECTION DATE			5/19/83	5/19/83	5/19/83	5/19/83	5/19/83
DE AND HOURS			Low + 0.5	Low + 1	Low + 1.5	Low + 2	Low + 3
MPERATURE °C	AIR		14.5	15.5	14.5	15.0	13.0
	WATER	S	12.0	12.2	12.6	12.9	13.2
		B	11.9	12.0	12.1	11.5	13.0
D.O. (ppm)	S		9.9	9.8	9.4	9.6	10.4
	B		10.0	9.3	9.3	8.8	10.4
LINITY (ppt)	S		21.0	20.5	20.0	21.0	21.0
	B		21.0	21.0	20.0	23.5	21.0
pH	S		8.4	8.3	8.3	8.3	8.4
	B		8.4	8.3	8.3	8.2	8.4
PTH (ft)			5	5	8	8	13
BSTRATE	% GRAVEL		0.2	0.4	0.4	0.4	0
	% SAND		91.0	90.8	94.0	95.1	9.5
	% MUD		8.8	8.8	5.6	5.0	90.5
TIMATED HARD CLAM NSITY (#/ft²)			0.01	0.07	0.03	0	0.02
% MMERCIAL SIZES	SL		0	0	11.1	0	0
	LN		0	5.9	11.1	0	33.3
	CS		50.0	17.6	66.7	0	33.3
	CH		50.0	76.5	11.1	0	33.3
MBER CLAMS COLLECTED			2	13	6	0	3
ZE RANGE (mm)			68-98	52-107	37-87	ND	47-81
SIZE (mm)			83.0	84.0	61.0	ND	63.0
MORTALITY			0	23.5	33.3	100	40.0

) = No Data

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

TATION NUMBER			SHB83-11	SHB83-12	SHB83-13	SHB83-14	SHB83-15
ATITUDE N			40°26.50'	40°26.35'	40°26.00'	40°25.75'	40°25.50'
ONGITUDE W			74°00.08'	74°00.08'	74°00.16'	74°00.12'	74°00.12'
OLLECTION DATE			5/24/83	5/24/83	5/24/83	5/24/83	5/24/83
IDE AND HOURS			High + 2	High + 2.5	High + 3.3	High + 3.4	High + 4.5
EMPERATURE °C	AIR		12.5	20.0	20.0	23.0	23.0
	WATER	S	14.0	14.2	14.9	15.6	14.4
		B	13.3	13.8	14.5	14.9	13.6
D.O. (ppm)	S		12.1	13.2	13.8	11.7	10.9
	B		10.4	12.3	11.7	10.4	9.1
LINITY (ppt)	S		22.0	22.0	21.0	21.5	22.0
	B		22.0	22.0	22.0	22.0	22.0
pH	S		8.5	8.5	8.5	8.4	8.4
	B		8.5	8.5	8.4	8.4	8.3
PTH (ft)			17	13	15	17	21
BSTRATE	% GRAVEL		14.1	6.0	0.4	1.4	2.2
	% SAND		77.4	90.4	94.2	57.8	60.4
	% MUD		8.5	3.6	5.4	40.8	37.4
TIMATED HARD CLAM NSITY (#/ft²)			2.27	0.30	0.20	0.67	0.65
% MMERCIAL SIZES	SL		1.4	0	0	0	1.6
	LN		4.2	0	5.0	0.8	0.8
	CS		25.7	13.6	12.5	22.1	29.4
	CH		68.7	86.4	82.5	77.1	68.2
MBER CLAMS COLLECTED			454	60	39	134	129
ZE RANGE (mm)			30-103	56-106	38-112	54-103	35-103
SIZE (mm)			78.8	85.8	85.0	83.5	79.3
MORTALITY			0.9	0	2.5	0.7	1.5

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

TATION NUMBER			SHB83-16	SHB83-17	SHB83-18	SHB83-19	SHB83-20
ATITUDE N			40°25.70'	40°26.05'	40°26.25'	40°26.38'	40°26.50'
ONGITUDE W			74°00.00'	74°00.00'	73°59.90'	73°59.95'	73°59.80'
OLLECTION DATE			5/25/83	5/25/83	5/25/83	5/25/83	5/25/83
IDE AND HOURS			High + 1	High + 2	High + 2.5	High + 3	High + 3.
EMPERATURE °C	AIR		17.0	19.0	19.5	21.0	22.5
	WATER	S	13.5	15.9	16.9	17.0	15.4
		B	12.8	14.8	16.4	16.2	14.4
D.O. (ppm)	S		13.6	13.9	14.0	13.7	14.1
	B		11.2	11.3	13.8	17.3	13.8
ALINITY (ppt)	S		20.5	21.0	22.0	22.0	22.0
	B		22.0	21.5	22.0	22.5	22.5
pH	S		8.5	8.6	8.6	8.6	8.6
	B		8.4	8.5	8.5	8.5	8.6
EPTH (ft)			10	11	10	10	8
UBSTRATE	% GRAVEL		0.4	11.4	3.2	10.8	19.8
	% SAND		93.7	86.2	96.2	86.2	78.4
	% MUD		5.9	2.4	0.6	3.0	1.8
STIMATED HARD CLAM ENSITY (#/ft²)			0.21	0.18	0.55	0.16	2.67
% OMMERCIAL SIZES	SL		4.9	0	0.9	0	0.8
	LN		7.3	2.9	2.7	0	3.3
	CS		17.1	14.7	12.6	19.4	38.9
	CH		70.7	82.4	83.8	80.6	57.0
UMBER CLAMS COLLECTED			41	35	110	31	534
IZE RANGE (mm)			33-109	50-105	31-101	59-103	35-106
SIZE (mm)			79.1	88.0	84.2	85.7	77.3
MORTALITY			0	10.3	7.6	0	0.7

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-21	SHB83-22	SHB83-23	SHB83-24	SHB83-25
LATITUDE N			40°25.20'	40°25.43'	40°25.68'	40°25.95'	40°25.75
LONGITUDE W			74°00.52'	74°00.56'	74°00.68'	74°00.76'	74°00.44
COLLECTION DATE			6/6/83	6/6/83	6/6/83	6/6/83	6/7/83
TIDE AND HOURS			High + 3	High + 5	High + 5.5	Low + 0.5	High + 3
TEMPERATURE °C	AIR		19.5	22.0	23.0	20.5	21.5
	WATER	S	20.0	21.0	20.3	19.6	20.4
		B	17.2	17.5	17.4	16.5	18.2
D.O. (ppm)	S		12.8	12.9	13.3	14.0	11.1
	B		7.9	7.1	9.6	5.5	6.9
SALINITY (ppt)	S		18.0	20.0	19.5	20.0	19.0
	B		20.0	22.5	21.5	24.5	22.0
pH	S		8.6	8.7	8.7	8.7	8.5
	B		8.3	8.0	8.3	8.0	8.1
DEPTH (ft)			18	18	18	19	22
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.66	0.45	0.71	0.47	0.46
% COMMERCIAL SIZES	SL		0.6	0	0.7	1.5	2.2
	LN		9.3	2.1	7.2	7.5	4.4
	CS		39.1	58.7	59.7	50.7	46.7
	CH		51.0	39.2	32.4	40.3	46.7
NUMBER CLAMS COLLECTED			132	89	141	94	91
SIZE RANGE (mm)			31-107	44-87	35-101	32-93	30-95
$\bar{X}$ SIZE (mm)			74.5	72.6	71.9	72.2	74.1
% MORTALITY			4.3	8.2	5.4	9.6	6.2

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-26	SHB83-27	SHB83-28	SHB83-29	SHB83-30
LATITUDE N			40°26.00'	40°26.25'	40°26.50'	40°26.75'	40°27.00'
LONGITUDE W			74°00.44'	74°00.44'	74°00.44'	74°00.44'	74°00.44'
COLLECTION DATE			6/7/83	6/7/83	6/7/83	6/7/83	6/8/83
TIDE AND HOURS			High + 4	High + 4.5	High + 5	High + 5.5	High + 3.
TEMPERATURE °C	AIR		22.0	21.0	23.0	21.5	20.0
	WATER	S	21.7	21.2	21.3	21.5	21.0
		B	17.3	17.3	16.8	17.7	20.8
D.O. (ppm)	S		11.0	11.5	12.1	12.3	13.4
	B		7.0	7.0	7.2	7.1	12.7
SALINITY (ppt)	S		20.0	20.0	20.5	20.0	17.5
	B		22.5	22.5	23.0	22.5	18.0
pH	S		8.5	8.5	8.6	8.6	8.6
	B		8.1	8.2	8.2	8.2	8.6
DEPTH (ft)			21	21	21	20	8
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.94	1.03	0.17	0.29	0.11
% COMMERCIAL SIZES	SL		0.6	1.3	0	0	0
	LN		12.9	12.2	7.4	0	8.7
	CS		60.7	64.1	59.3	36.7	4.3
	CH		25.8	22.4	33.3	63.3	87.0
NUMBER CLAMS COLLECTED			187	155	26	29	22
SIZE RANGE (mm)			34-94	32-95	53-106	62-101	54-106
SIZE (mm)			684	67.2	73.4	78.6	87.0
MORTALITY			4.1	1.3	10.3	9.4	15.4

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-31	SHB83-32	SHB83-33	SHB83-34	SHB83-3
LATITUDE N			40°27.23'	40°27.47'	40°27.73'	40°25.50'	40°26.0
LONGITUDE W			74°00.48'	74°00.52'	74°00.52'	74°01.08'	74°01.0
COLLECTION DATE			6/8/83	6/8/83	6/8/83	6/9/83	6/9/83
TIDE AND HOURS			High + 4	High + 4.5	High + 5	High + 1.5	High +
TEMPERATURE °C	AIR		22.0	21.5	23.5	12.5	12.0
	WATER	S	21.0	21.5	21.7	20.3	19.8
		B	20.3	21.6	21.2	17.3	17.3
D.O. (ppm)	S		13.7	13.8	13.8	10.6	10.7
	B		13.2	13.3	13.8	7.8	8.5
SALINITY (ppt)	S		20.0	20.5	20.0	18.0	20.0
	B		20.5	19.5	21.0	20.5	22.0
pH	S		8.7	8.7	8.7	8.5	8.5
	B		8.7	8.7	8.7	8.2	8.3
DEPTH (ft)			9	9	9	21	21
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft^2)			0.03	0.05	0.09	0.19	0.35
% COMMERCIAL SIZES	SL		0	22.2	0	5.3	1.4
	LN		16.7	22.2	5.6	0	0
	CS		16.7	33.4	61.1	18.4	37.7
	CH		66.6	22.2	33.3	76.3	60.9
NUMBER CLAMS COLLECTED			6	9	18	38	69
SIZE RANGE (mm)			53-98	35-86	48-100	34-95	32-96
$\bar{X}$ SIZE (mm)			78.3	55.0	73.1	80.7	78.1
% MORTALITY			0	18.2	14.3	7.3	9.2

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-36	SHB83-37	SHB83-38	SHB83-39	SHB83-40
LATITUDE N			40°26.50'	40°25.95'	40°25.07'	40°25.03'	40°24.75'
LONGITUDE W			74°01.08'	73°59.40'	73°59.34'	73°59.18'	73°59.16'
COLLECTION DATE			6/9/83	6/13/83	6/13/83	6/13/83	6/13/83
TIDE AND HOURS			High + 3	Low + 3.5	Low + 4	Low + 5	Low + 5.5
TEMPERATURE °C	AIR		12.5	24.0	27.0	25.5	26.5
	WATER	S	20.3	21.6	22.1	20.3	23.0
		B	17.3	21.5	22.0	20.0	22.6
D.O. (ppm)	S		10.9	9.3	9.2	8.5	9.2
	B		10.2	9.2	8.9	9.0	8.8
SALINITY (ppt)	S		18.0	19.5	20.0	20.5	20.5
	B		21.5	19.5	20.5	21.0	20.0
pH	S		8.5	8.3	8.3	8.3	8.3
	B		8.4	8.3	8.3	8.3	8.3
DEPTH (ft)			20	7	8	9	7
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.22	0.37	0.27	0.27	0.93
% COMMERCIAL SIZES	SL		0	0	0	0	0.5
	LN		0	1.4	3.7	3.7	3.8
	CS		15.6	31.9	29.6	25.9	33.2
	CH		84.4	66.7	66.7	70.4	62.5
NUMBER CLAMS COLLECTED			44	69	54	53	186
SIZE RANGE (mm)			69-98	42-111	53-110	49-105	37-108
$\bar{X}$ SIZE (mm)			83.0	81.5	80.8	84.0	80.4
% MORTALITY			10.2	1.4	1.8	7.0	4.1

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-41	SHB83-42	SHB83-43	SHB83-44	SHB83-45
LATITUDE N			40°24.75'	40°24.75'	40°25.20'	40°25.35'	40°25.50
LONGITUDE W			73°58.88'	73°59.41'	73°59.52'	73°59.28'	73°59.26
COLLECTION DATE			6/13/83	6/13/83	6/14/83	6/14/83	6/14/83
TIDE AND HOURS			High + 0.5	High + 1	Low + 3.5	Low + 4	Low + 4.5
TEMPERATURE °C	AIR		28.5	29.5	26.0	27.0	26.0
	WATER	S	23.0	23.5	23.5	23.4	22.6
		B	22.8	22.5	23.2	23.2	22.6
D.O. (ppm)	S		9.0	9.6	8.3	10.0	10.3
	B		8.8	9.4	8.3	9.9	10.1
SALINITY (ppt)	S		20.5	20.0	20.0	20.0	20.0
	B		20.5	20.0	22.0	20.0	20.0
pH	S		8.3	8.4	8.2	8.2	8.2
	B		8.3	8.4	8.2	8.2	8.2
DEPTH (ft)			9	7	7	5	7
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			1.38	0.49	0.55	0.12	0.54
% COMMERCIAL SIZES	SL		0.7	0	6.5	22.7	0
	LN		9.7	2.0	35.2	50.0	9.4
	CS		37.2	40.4	49.1	13.6	35.5
	CH		52.4	57.6	9.2	13.6	55.1
NUMBER CLAMS COLLECTED			275	98	110	24	108
SIZE RANGE (mm)			31-103	50-109	30-94	31-93	38-106
AVG SIZE (mm)			75.2	77.6	57.9	51.0	76.7
% MORTALITY			0.4	0	9.8	42.9	7.7

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

TATION NUMBER			SHB83-46	SHB83-47	SHB83-48	SHB83-49	SHB83-50
ATITUDE N			40°25.50'	40°25.40'	40°24.25'	40°24.00'	40°24.50'
ONGITUDE W			73°59.51'	73°59.44'	73°58.84'	73°58.80'	73°59.16'
OLLECTION DATE			6/14/83	6/14/83	6/16/83	6/16/83	6/16/83
IDE AND HOURS			Low + 5	High + 0	Low + 0.5	Low + 1	Low + 2
EMPERATURE °C	AIR		26.0	26.3	25.5	25.5	28.5
	WATER	S	23.7	23.0	24.0	24.3	23.0
		B	23.2	23.0	23.8	23.8	23.0
D.O. (ppm)	S		10.5	10.7	6.9	7.1	7.8
	B		10.3	10.6	6.6	6.6	7.8
ALINITY (ppt)	S		20.5	20.0	20.5	20.0	21.5
	B		20.0	20.0	21.0	20.5	21.5
pH	S		8.1	8.1	8.2	8.2	8.2
	B		8.1	8.1	8.2	8.2	8.2
EPTH (ft)			6	5	13	14	6
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.24	0.60	0.75	0.19	0.03
% OMMERCIAL SIZES	SL		2.1	3.4	0	2.6	20.0
	LN		29.8	24.6	10.7	2.6	20.0
	CS		46.8	52.5	40.3	46.1	20.0
	CH		21.3	19.5	49.0	48.7	40.0
UMBER CLAMS COLLECTED			48	120	150	38	5
IZE RANGE (mm)			37-98	33-102	38-115	34-105	36-80
SIZE (mm)			64.0	64.5	74.3	75.9	62.2
MORTALITY			9.4	1.6	2.0	13.6	54.6

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-51	SHB83-52	SHB83-53	SHB83-54	SHB83-55
LATITUDE N			40°24.50'	40°25.00'	40°24.85'	40°24.80'	40°24.80
LONGITUDE W			73°59.48'	74°00.12'	74°01.32'	74°01.08'	74°00.68
COLLECTION DATE			6/16/83	6/16/83	6/27/83	6/27/83	6/27/83
TIDE AND HOURS			Low + 2.5	Low + 3	Low + 4.5	High + 0	High + 1
TEMPERATURE °C	AIR		27.5	26.0	27.5	28.0	29.5
	WATER	S	23.6	23.7	21.7	21.6	22.2
		B	22.5	20.0	21.5	20.8	21.2
D.O. (ppm)	S		7.1	10.5	7.6	7.6	8.8
	B		6.6	5.8	7.3	6.5	7.5
SALINITY (ppt)	S		20.5	21.5	24.0	23.5	23.5
	B		21.0	22.5	24.5	25.0	24.0
pH	S		8.2	8.5	8.2	8.2	8.3
	B		8.1	8.1	8.2	8.2	8.2
DEPTH (ft)			20	10	6	10	8
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.38	0.08	0.24	0.40	0.21
% COMMERCIAL SIZES	SL		3.9	0	10.4	0.7	0
	LN		7.8	0	12.5	2.9	4.0
	CS		39.0	20.0	37.5	18.4	28.0
	CH		49.3	80.0	39.6	78.0	68.0
NUMBER CLAMS COLLECTED			76	15	48	79	42
SIZE RANGE (mm)			30-108	75-97	31-95	37-111	51-104
SIZE (mm)			76.1	84.0	68.1	82.7	80.8
MORTALITY			2.6	6.3	0	9.2	4.5

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

TATION NUMBER			SHB83-56	SHB83-57	SHB83-58	SHB83-59	SHB83-60
ATITUDE N			40°24.75'	40°24.75'	40°25.00'	40°25.00'	40°24.25'
ONGITUDE W			74°00.44'	74°00.12'	74°00.44'	74°00.76'	73°59.10'
OLLECTION DATE			6/27/83	7/5/83	7/5/83	7/5/83	7/6/83
IDE AND HOURS			High + 1.5	High + 6	Low + 0	Low + 0.5	High + 5
EMPERATURE °C	AIR		31.0	26.5	27.0	28.5	26.0
	WATER	S	22.5	25.8	26.4	26.2	25.8
		B	21.8	25.5	26.4	22.3	25.5
D.O. (ppm)	S		7.8	6.4	4.8	5.4	4.2
	B		7.7	4.8	4.8	3.6	4.0
ALINITY (ppt)	S		23.5	22.0	22.5	23.0	20.0
	B		24.0	22.0	22.5	25.5	20.5
pH	S		8.2	7.7	7.7	7.8	7.7
	B		8.2	7.7	7.7	7.7	7.7
EPTH (ft)			6	8	6	17	10
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.25	0.10	0.01	0.31	0.02
% OMMERCIAL SIZES	SL		0	0	0	1.6	25.0
	LN		2.5	10.5	0	1.6	0
	CS		27.5	52.6	0	36.1	75.0
	CH		70.0	36.9	100.0	60.7	0
UMBER CLAMS COLLECTED			38	19	1	61	4
IZE RANGE (mm)			50-108	41-92	-82-	34-96	35-70
SIZE (mm)			82.6	71.1	82.0	77.4	57.3
MORTALITY			11.6	5.0	50.0	3.2	0

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

TATION NUMBER			SHB83-61	SHB83-62	SHB83-63	SHB83-64	SHB83-65
ATITUDE N			40°25.20'	40°25.23'	40°24.65'	40°28.18'	40°27.66'
ONGITUDE W			74°01.02'	74°01.24'	73°58.90'	74°00.72'	74°00.67'
OLLECTION DATE			7/6/83	7/6/83	7/12/83	7/14/83	7/14/83
IDE AND HOURS			High + 5.5	Low + 0	Low + 4	Low + 2	Low + 4
EMPERATURE °C	AIR		26.5	27.0	26.0	24.5	25.0
	WATER	S	24.5	25.3	24.4	23.5	22.3
		B	23.6	23.6	24.2	21.3	21.3
D.O. (ppm)	S		7.4	8.7	6.9	8.6	7.7
	B		5.3	3.8	6.9	7.6	7.5
ALINITY (ppt)	S		23.0	22.5	22.0	22.5	24.0
	B		24.0	24.0	23.0	27.0	25.0
pH	S		8.1	8.2	8.1	8.1	8.1
	B		7.9	7.9	8.1	8.1	8.1
EPTH (ft)			16	15	10	28	24
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.58	0.65	1.34	1.24	0.70
% COMMERCIAL SIZES	SL		1.1	0.8	3.4	0.4	0
	LN		5.8	7.8	25.1	1.6	0
	CS		50.6	43.7	51.7	4.1	7.7
	CH		42.5	47.7	19.8	93.9	92.3
UMBER CLAMS COLLECTED			88	129	267	248	139
IZE RANGE (mm)			33-94	36-98	31-115	31-109	69-114
SIZE (mm)			73.4	74.1	63.9	87.2	85.4
MORTALITY			6.3	0.8	4.3	2.7	3.5

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-66	SHB83-67	SHB83-68	SHB83-69	SHB83-70
LATITUDE N			40°27.00'	40°24.75'	40°25.00'	40°25.25'	40°25.50'
LONGITUDE W			74°00.99'	73°59.80'	73°59.80'	74°01.72'	74°01.72'
COLLECTION DATE			7/14/83	7/26/83	7/26/83	7/26/83	7/27/83
TIDE AND HOURS			Low + 5	Low + 4	Low + 5	High + 0.5	Low + 3
TEMPERATURE °C	AIR		27.0	25.0	26.0	29.0	24.0
	WATER	S	23.3	22.6	23.0	23.6	23.6
		B	22.3	22.6	22.7	22.9	21.6
D.O. (ppm)	S		8.7	6.6	7.6	10.2	8.3
	B		6.8	6.6	7.2	8.8	4.2
SALINITY (ppt)	S		23.5	25.0	26.0	25.0	26.0
	B		25.0	25.5	26.5	26.0	26.5
pH	S		8.1	8.0	8.1	8.3	8.1
	B		8.1	8.0	8.1	8.2	7.7
DEPTH (ft)			24	7	7	17	20
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.23	0.02	0.21	0.54	0.25
% COMMERCIAL SIZES	SL		0	0	0	1.0	2.0
	LN		2.1	0	0	1.0	2.0
	CS		12.8	66.7	17.1	63.4	36.8
	CH		85.1	33.3	82.9	34.6	59.2
NUMBER CLAMS COLLECTED			46	3	41	107	50
SIZE RANGE (mm)			42-102	62-87	64-100	30-94	30-96
SIZE (mm)			84.7	74.7	83.4	73.6	78.2
MORTALITY			11.5	40.0	4.7	2.7	19.4

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-71	SHB83-72	SHB83-73	SHB83-74	SHB83-75
LATITUDE N			40°25.90'	40°26.50'	40°27.00'	40°27.50'	40°28.00
LONGITUDE W			74°01.80'	74°01.72'	74°01.72'	74°01.72'	74°01.72
COLLECTION DATE			7/27/83	7/27/83	7/27/83	7/27/83	7/27/83
TIDE AND HOURS			Low + 3.5	Low + 4	Low + 4.5	High + 0	High + 1
TEMPERATURE °C	AIR		25.0	26.0	26.5	27.0	26.5
	WATER	S	23.6	24.0	24.0	24.0	24.2
		B	21.3	21.2	21.3	21.2	20.5
D.O. (ppm)	S		12.0	12.6	12.7	12.9	13.5
	B		4.6	4.8	7.9	7.8	6.5
SALINITY (ppt)	S		27.5	26.0	26.0	26.5	26.0
	B		28.0	27.5	27.5	28.0	28.0
pH	S		8.3	8.5	8.5	8.5	8.5
	B		7.7	7.7	8.1	8.1	8.1
DEPTH (ft)			21	22	23	24	29
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.18	0.21	0.18	0.44	0.33
% COMMERCIAL SIZES	SL		8.3	0	0	0	0
	LN		27.8	0	0	0	0
	CS		13.9	9.8	11.1	2.2	4.0
	CH		50.0	90.2	88.9	97.8	96.0
NUMBER CLAMS COLLECTED			36	41	36	87	25
SIZE RANGE (mm)			32-99	68-102	74-105	76-112	76-106
$\bar{X}$ SIZE (mm)			69.6	85.0	87.6	91.1	91.7
% MORTALITY			2.7	4.7	2.7	5.4	16.7

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

TATION NUMBER			SHB83-76	SHB83-77	SHB83-78	SHB83-79	SHB83-80
ATITUDE N			40°25.55'	40°25.78'	40°25.46'	40°25.75'	40°25.74'
ONGITUDE W			74°01.54	74°01.63'	74°01.99	74°02.08'	74°02.36'
OLLECTION DATE			7/28/83	7/28/83	7/28/83	7/28/83	7/28/83
IDE AND HOURS			Low + 2	Low + 2.5	Low + 3	Low + 4	Low + 5
EMPERATURE °C	AIR		24.5	28.0	29.5	30.0	29.5
	WATER	S	23.2	24.0	24.2	24.2	24.8
		B	21.4	21.6	21.6	21.6	22.5
D.O. (ppm)	S		10.3	10.7	10.7	10.2	10.8
	B		7.2	6.1	5.6	6.4	8.2
ALINITY (ppt)	S		25.5	26.0	26.0	25.5	26.0
	B		25.5	27.0	27.5	26.0	26.0
pH	S		8.2	8.3	8.3	8.1	8.3
	B		7.9	7.9	7.7	8.0	8.1
EPTH (ft)			17	19	8	18	16
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.45	0.26	0.83	1.12	2.73
% COMMERCIAL SIZES	SL		1.1	1.9	0	1.8	2.6
	LN		2.3	5.8	0	8.2	25.7
	CS		61.8	26.9	14.7	48.6	52.2
	CH		34.8	65.4	85.3	41.4	19.5
UMBER CLAMS COLLECTED			89	52	166	224	273
IZE RANGE (mm)			35-95	36-98	58-104	30-95	30-98
SIZE (mm)			73.4	77.3	84.6	72.2	63.4
MORTALITY			2.2	14.8	32.8	1.3	3.5

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-81	SHB83-82	SHB83-83	SHB83-84	SHB83-85
LATITUDE N			40°25.75'	40°26.00'	40°26.50'	40°27.00'	40°26.00'
LONGITUDE W			74°02.78'	74°02.36'	74°02.36	74°02.36'	74°03.06'
COLLECTION DATE			8/1/83	8/1/83	8/1/83	8/1/83	8/1/83
TIDE AND HOURS			High + 5.5	Low + 0.5	Low + 1	Low + 2	Low + 2.5
TEMPERATURE °C	AIR		28.0	30.0	29.5	30.5	29.0
	WATER	S	24.1	24.5	25.2	25.4	26.0
		B	22.4	22.1	22.2	23.2	23.2
D.O. (ppm)	S		8.4	8.6	8.3	8.3	8.2
	B		5.3	5.2	4.8	6.2	5.7
SALINITY (ppt)	S		24.5	26.0	26.5	26.5	26.0
	B		26.0	27.5	27.5	26.5	26.5
pH	S		8.0	8.1	8.0	8.0	7.9
	B		7.9	7.9	7.9	7.9	7.7
DEPTH (ft)			16	18	19	21	17
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.59	0.13	0.40	0.49	0.34
% COMMERCIAL SIZES	SL		0	3.8	8.9	0	2.8
	LN		0.9	3.8	25.3	2.1	11.1
	CS		17.9	15.4	3.8	2.1	20.8
	CH		81.2	76.9	62.0	95.8	65.3
NUMBER CLAMS COLLECTED			117	26	79	98	67
SIZE RANGE (mm)			51-98	32-96	34-98	44-107	30-104
AVG SIZE (mm)			79.7	80.1	71.3	89.3	76.0
% MORTALITY			3.3	7.1	2.5	2.0	1.5

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-86	SHB83-87	SHB83-88	SHB83-89	SHB83-90
LATITUDE N			40°25.75'	40°27.30'	40°27.00'	40°26.50'	40°26.25'
LONGITUDE W			74°03.06'	74°02.30'	74°02.78'	74°03.06'	74°03.38'
COLLECTION DATE			8/1/83	8/2/83	8/2/83	8/2/83	8/2/83
TIDE AND HOURS			Low + 3	High + 5	High + 5.75	Low + 0	Low + 0.5
TEMPERATURE °C	AIR		31.0	24.0	26.0	27.0	28.0
	WATER	S	25.0	24.9	22.2	24.5	24.5
		B	24.1	21.6	24.6	22.3	22.3
D.O. (ppm)	S		8.0	7.3	7.2	7.8	7.8
	B		5.1	5.8	3.6	4.2	4.0
SALINITY (ppt)	S		26.0	25.0	26.5	27.0	26.5
	B		27.0	26.0	28.0	28.5	28.0
pH	S		7.9	8.0	7.9	7.9	7.9
	B		7.7	7.9	7.8	7.9	7.7
DEPTH (ft)			16	21	18	16	14
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			1.51	0.90	0.13	0.18	0.21
% COMMERCIAL SIZES	SL		0	0	0	2.9	0
	LN		10.7	0	0	11.4	7.5
	CS		50.0	6.4	4.0	11.4	17.5
	CH		39.3	93.6	96.0	74.3	75.0
NUMBER CLAMS COLLECTED			256	179	25	35	41
SIZE RANGE (mm)			40-99	69-114	76-102	30-93	48-99
$\bar{X}$ SIZE (mm)			81.0	89.3	87.6	77.4	81.1
% MORTALITY			1.2	1.7	3.9	0	2.4

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-91	SHB83-92	SHB83-93	SHB83-94	SHB83-95
LATITUDE N			40°26.00'	40°25.95'	40°25.75'	40°27.85'	40°28.30'
LONGITUDE W			74°03.38'	74°03.70'	74°03.38'	74°02.38'	74°01.74'
COLLECTION DATE			8/2/83	8/2/83	8/3/83	8/3/83	8/3/83
TIDE AND HOURS			Low + 1	Low + 1.5	High + 4	High + 5	High + 5.
TEMPERATURE °C	AIR		26.0	28.5	26.0	27.0	27.0
	WATER	S	24.8	24.2	25.3	24.2	24.4
		B	22.6	25.5	25.1	23.3	23.9
D.O. (ppm)	S		7.9	7.3	7.6	8.5	8.3
	B		3.7	5.2	5.5	5.9	7.8
SALINITY (ppt)	S		27.0	26.5	25.0	26.0	26.5
	B		28.0	27.0	26.0	27.0	27.0
pH	S		7.9	7.9	7.8	8.0	8.0
	B		7.7	7.7	7.6	7.9	8.0
DEPTH (ft)			14	8	10	26	28
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.60	0.77	0.15	0.48	0
% COMMERCIAL SIZES	SL		0	0.6	0	0	0
	LN		1.7	0.6	0	0	0
	CS		37.8	23.4	28.6	2.1	0
	CH		60.5	75.4	71.4	97.9	0
NUMBER CLAMS COLLECTED			120	153	29	95	0
SIZE RANGE (mm)			42-95	33-103	61-110	74-111	ND
SIZE (mm)			77.6	83.1	85.1	92.6	ND
MORTALITY			3.2	5.0	14.7	5.9	0

ND = NO DATA
*Analysis Pending

SHELLFISH INVENTORY SUMMARY
SANDY HOOK BAY
1983

STATION NUMBER			SHB83-96	SHB83-97	SHB83-98	SHB83-99	SHB83-100
LATITUDE N			40°25.75'	40°25.30'	40°25.50'	40°25.30'	40°25.50'
LONGITUDE W			74°03.70'	74°02.92'	74°03.06'	74°03.00'	74°03.38'
COLLECTION DATE			8/3/83	8/3/83	8/4/83	8/4/83	8/8/83
TIDE AND HOURS			Low + 0.5	Low + 1.5	Low + 0	Low + 1	Low + 5.5
TEMPERATURE °C	AIR		27.0	27.5	28.0	29.5	30.0
	WATER	S	26.1	26.5	24.8	25.4	25.1
		B	26.0	26.2	24.0	24.2	25.0
D.O. (ppm)	S		11.0	12.5	7.1	7.4	7.2
	B		11.5	12.3	5.5	5.9	6.2
SALINITY (ppt)	S		26.0	26.0	27.5	28.0	24.5
	B		26.0	26.5	27.5	27.5	25.0
pH	S		8.2	8.4	8.1	8.1	7.9
	B		8.3	8.4	8.0	7.7	7.8
DEPTH (ft)			5	6	5	5	7
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.61	0.45	0.36	0.21	0.06
% COMMERCIAL SIZES	SL		0.8	0	0	0	0
	LN		6.6	0	0	0	0
	CS		36.4	14.4	6.9	4.8	9.1
	CH		56.2	85.6	93.1	95.2	90.9
NUMBER CLAMS COLLECTED			121	90	72	42	11
SIZE RANGE (mm)			32-102	61-108	60-110	74-106	73-96
SIZE (mm)			76.6	88.4	88.4	87.8	86.3
MORTALITY			0	6.3	10.0	16.0	15.4

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-1	RB83-2	RB83-3	RB83-4	RB83-5
LATITUDE N			40°27.50'	40°27.00'	40°26.53'	40°27.50'	40°27.55'
LONGITUDE W			74°03.34'	74°03.67'	74°03.71'	74°03.71'	74°03.33'
COLLECTION DATE			8/4/83	8/4/83	8/4/83	8/8/83	8/8/83
TIDE AND HOURS			High + 5	Low + 0	Low + 1	High + 2	High + 2
TEMPERATURE °C	AIR		26.0	27.5	28.0	28.5	32.0
	WATER	S	24.5	24.8	24.9	24.0	25.5
		B	22.4	23.8	23.6	23.3	23.4
D.O. (ppm)	S		7.7	7.3	5.9	6.8	5.6
	B		4.7	5.1	5.4	5.5	4.6
SALINITY (ppt)	S		25.0	26.0	26.0	25.5	25.5
	B		26.5	25.5	26.5	26.0	26.5
pH	S		8.1	7.9	7.9	7.9	7.7
	B		7.9	7.9	7.9	7.8	7.7
DEPTH (ft)			19	16	14	23	21
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.44	0.19	0.65	1.58	0.20
% COMMERCIAL SIZES	SL		0	5.6	0	1.0	25.0
	LN		0	33.3	2.4	0	12.5
	CS		8.9	2.8	39.4	16.8	25.0
	CH		91.1	58.3	58.2	82.2	37.5
NUMBER CLAMS COLLECTED			88	37	129	79	40
SIZE RANGE (mm)			69-103	30-108	51-97	37-102	30-93
AVG SIZE (mm)			86.3	71.0	78.6	83.4	63.1
% MORTALITY			5.4	9.8	7.9	1.3	0

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

TATION NUMBER			RB83-6	RB83-7	RB83-8	RB83-9	RB83-10
ATITUDE N			40°27.65'	40°27.50'	40°26.00'	40°26.50'	40°27.00'
ONGITUDE W			74°04.84'	74°05.66'	74°04.14'	74°05.00'	74°05.00'
OLLECTION DATE			8/8/83	8/8/83	8/9/83	8/9/83	8/9/83
IDE AND HOURS			High + 3	High + 4	High + 0	High + 1	High + 2
EMPERATURE °C	AIR		32.5	34.0	28.5	29.5	29.5
	WATER	S	26.0	26.5	24.9	26.1	25.3
		B	23.9	24.5	23.8	25.1	25.0
D.O. (ppm)	S		6.0	4.1	5.3	4.8	4.1
	B		4.1	4.1	5.1	4.3	4.5
ALINITY (ppt)	S		26.0	25.5	26.5	26.0	26.5
	B		26.5	26.5	26.5	26.5	27.0
pH	S		7.9	7.5	7.7	7.6	7.6
	B		7.7	7.5	7.6	7.6	7.6
EPTH (ft)			20	12	9	9	10
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.16	0.03	0.21	0.11	0.06
% OMMERCIAL SIZES	SL		0	0	0	0	0
	LN		6.2	0	2.5	0	0
	CS		12.5	60.0	30.0	27.3	9.1
	CH		81.3	40.0	67.5	72.7	90.9
UMBER CLAMS COLLECTED			32	5	41	21	12
IZE RANGE (mm)			43-99	58-84	50-104	58-96	66-104
SIZE (mm)			81.2	74.4	81.3	80.1	92.3
MORTALITY			13.5	37.5	8.9	4.5	29.4

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

TATION NUMBER			RB83-11A	RB83-11B	RB83-12	RB83-13	RB83-14
ATITUDE N			40°27.00'	40°27.00'	40°26.50'	40°27.00'	40°26.50'
ONGITUDE W			74°04.33'	74°04.33'	74°04.33'	74°05.66'	74°05.66'
OLLECTION DATE			8/9/83	8/9/83	8/10/83	8/11/83	8/11/83
IDE AND HOURS			High + 3	High + 3.5	Low + 5	Low + 4	Low + 5
EMPERATURE °C	AIR		28.0	28.0	22.0	25.0	25.5
	WATER	S	25.3	25.3	23.9	23.9	24.2
		B	24.3	24.3	23.6	23.9	23.9
D.O. (ppm)	S		5.0	5.0	5.3	4.3	3.6
	B		5.0	5.0	5.0	4.0	3.4
ALINITY (ppt)	S		27.0	27.0	26.5	26.5	26.5
	B		26.5	26.5	26.5	26.5	27.0
pH	S		7.6	7.6	7.7	7.5	7.5
	B		7.6	7.6	7.7	7.5	7.5
EPTH (ft)			14	14	15	11	8
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.02	1.01	0.17	0.05	0.16
% OMMERCIAL SIZES	SL		0	0	3.1	0	0
	LN		0	3.9	0	0	0
	CS		75.0	47.3	40.6	28.6	36.7
	CH		25.0	48.8	56.3	71.4	63.3
UMBER CLAMS COLLECTED			4	202	33	8	32
IZE RANGE (mm)			63-94	49-102	35-109	71-100	65-98
SIZE (mm)			75.3	76.5	78.3	84.7	82.8
MORTALITY			0	1.0	23.3	11.1	37.3

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-15	RB83-16	RB83-17	RB83-18	RB83-19
LATITUDE N			40°27.03'	40°27.05'	40°27.60'	40°28.00'	40°27.95
LONGITUDE W			74°06.31'	74°06.97'	74°08.17'	74°03.09'	74°03.76
COLLECTION DATE			8/11/83	8/11/83	8/11/83	8/15/83	8/15/83
TIDE AND HOURS			Low + 5.5	High + 0	High + 1	Low + 1	Low + 2
TEMPERATURE °C	AIR		25.0	25.5	26.5	21.5	23.0
	WATER	S	24.1	24.3	25.5	21.6	21.9
		B	23.6	24.1	25.0	21.6	21.6
D.O. (ppm)	S		3.6	4.2	3.4	5.9	6.1
	B		3.6	3.9	3.0	5.0	5.6
SALINITY (ppt)	S		27.0	27.5	27.0	26.0	26.0
	B		27.5	28.0	26.5	26.5	26.5
pH	S		7.5	7.5	7.5	7.7	7.7
	B		7.5	7.5	7.5	7.7	7.7
DEPTH (ft)			12	8	10	23	22
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.02	0.04	0.04	0.81	0.33
% COMMERCIAL SIZES	SL		0	0	0	0	7.6
	LN		0	12.5	0	0.6	18.2
	CS		66.7	37.5	12.5	7.4	19.7
	CH		33.3	50.0	87.5	92.0	54.5
NUMBER CLAMS COLLECTED			3	7	7	162	66
SIZE RANGE (mm)			70-93	54-96	72-93	54-108	31-95
X SIZE (mm)			78.3	76.3	82.8	87.4	70.8
% MORTALITY			66.7	12.5	36.4	1.2	4.3

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-20	RB83-21	RB83-22	RB83-23	RB83-24
LATITUDE N			40°28.00'	40°28.00'	40°28.00'	40°28.00'	40°28.33'
LONGITUDE W			74°04.33'	74°05.00'	74°05.66'	74°06.31'	74°03.09'
COLLECTION DATE			8/15/83	8/15/83	8/15/83	8/15/83	8/16/83
TIDE AND HOURS			Low + 2.5	Low + 3	Low + 3.5	Low + 4	Low + 0
TEMPERATURE °C	AIR		23.0	23.5	24.0	26.0	23.0
	WATER	S	22.5	22.6	23.0	23.8	22.3
		B	22.5	22.0	22.1	22.1	22.8
D.O. (ppm)	S		5.6	5.9	5.7	6.2	6.3
	B		5.5	5.3	5.3	5.5	4.9
SALINITY (ppt)	S		27.5	27.5	27.0	27.0	24.5
	B		27.5	28.0	28.0	28.0	26.0
pH	S		7.7	7.7	7.6	7.7	7.7
	B		7.7	7.7	7.6	7.7	7.7
DEPTH (ft)			22	22	21	22	25
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.25	0.22	0.21	0.14	0.03
% COMMERCIAL SIZES	SL		13.2	0	0	3.7	0
	LN		2.6	2.3	2.7	11.1	0
	CS		23.7	34.9	16.2	25.9	0
	CH		60.5	62.8	81.1	59.3	100
NUMBER CLAMS COLLECTED			38	44	41	28	5
SIZE RANGE (mm)			30-96	55-102	48-99	31-96	80-97
SIZE (mm)			73.8	79.7	82.2	73.7	88.5
MORTALITY			2.6	4.3	10.9	6.7	0

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-25	RB83-26	RB83-27	RB83-28	RB83-29
LATITUDE N			40°28.60'	40°28.50'	40°28.45'	40°28.50'	40°28.50
LONGITUDE W			74°03.67'	74°04.33'	74°05.00'	74°05.66'	74°06.31
COLLECTION DATE			8/16/83	8/16/83	8/16/83	8/16/83	8/16/83
TIDE AND HOURS			Low + 1	Low + 1.5	Low + 2.5	Low + 3	Low + 4
TEMPERATURE °C	AIR		23.5	26.0	24.0	29.5	28.5
	WATER	S	22.8	23.0	23.5	24.0	25.5
		B	22.1	22.4	22.4	22.1	22.4
D.O. (ppm)	S		6.2	6.2	6.0	6.5	6.4
	B		4.8	4.9	4.9	5.0	4.9
SALINITY (ppt)	S		26.0	26.0	26.0	26.5	26.0
	B		27.0	27.0	27.5	27.5	27.5
pH	S		7.7	7.7	7.7	7.7	7.7
	B		7.7	7.7	7.7	7.7	7.7
DEPTH (ft)			24	25	24	24	23
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.10	0.09	0.27	0.26	0.29
% COMMERCIAL SIZES	SL		0	14.3	3.8	0	19.0
	LN		0	35.7	23.1	9.8	20.7
	CS		15.0	14.3	38.5	13.7	19.0
	CH		85.0	35.7	34.6	76.5	41.3
NUMBER CLAMS COLLECTED			20	13	53	52	58
SIZE RANGE (mm)			73-106	30-95	34-93	38-95	30-100
SIZE (mm)			86.5	63.2	67.8	80.1	66.3
MORTALITY			13.0	7.1	1.9	11.9	6.5

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-30	RB83-31	RB83-32	RB83-33	RB83-34
LATITUDE N			40°29.00'	40°29.00'	40°29.00'	40°29.00'	40°29.00'
LONGITUDE W			74°03.01'	74°03.67'	74°04.33'	74°05.00'	74°06.25'
COLLECTION DATE			8/17/83	8/17/83	8/17/83	8/17/83	8/17/83
TIDE AND HOURS			High + 5	Low + 0	Low + 0.5	Low + 1	Low + 2
TEMPERATURE °C	AIR		25.5	25.5	26.5	27.0	29.0
	WATER	S	22.7	23.0	23.5	23.6	24.6
		B	22.3	22.4	22.4	22.6	22.5
D.O. (ppm)	S		6.8	6.8	6.9	6.9	6.8
	B		5.6	5.3	4.6	4.3	4.1
SALINITY (ppt)	S		24.5	25.0	26.0	26.5	26.5
	B		26.0	26.5	27.0	27.5	28.0
pH	S		7.8	7.8	7.8	7.8	7.8
	B		7.8	7.7	7.7	7.7	7.7
DEPTH (ft)			23	25	26	26	26
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.31	0.28	0.09	0.09	0.33
% COMMERCIAL SIZES	SL		3.3	9.7	0	14.3	4.6
	LN		21.3	4.9	0	0	18.5
	CS		11.5	12.2	27.8	14.3	21.5
	CH		63.9	73.2	72.2	71.4	55.4
NUMBER CLAMS COLLECTED			62	42	18	14	65
SIZE RANGE (mm)			33-110	34-102	60-91	30-104	30-96
SIZE (mm)			74.7	78.6	80.3	77.4	72.9
MORTALITY			4.6	19.2	33.3	12.5	5.8

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

TATION NUMBER			RB83-35	RB83-36	RB83-37	RB83-38	RB83-39
ATITUDE N			40°29.00'	40°27.50'	40°27.50'	40°28.00'	40°28.00'
ONGITUDE W			74°05.66'	74°06.31'	74°06.97'	74°06.97'	74°07.62'
OLLECTION DATE			8/17/83	8/22/83	8/22/83	8/22/83	8/22/83
IDE AND HOURS			Low + 2.5	High + 1	High + 2	High + 2.5	High + 3
EMPERATURE °C	AIR		29.5	28.5	27.0	27.0	30.0
	WATER	S	25.5	24.5	25.1	25.1	25.4
		B	22.6	24.0	24.4	24.0	24.2
D.O. (ppm)	S		7.7	7.9	6.4	6.1	6.0
	B		4.2	9.3	7.1	6.5	5.9
ALINITY (ppt)	S		27.0	24.0	24.0	24.5	25.0
	B		28.0	24.5	24.5	25.5	25.0
pH	S		7.9	7.9	7.7	7.7	7.7
	B		7.7	8.1	8.1	8.1	7.7
EPTH (ft)			27	16	15	19	9
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.24	0.04	0.28	0.09	0.02
% OMMERCIAL SIZES	SL		29.7	0	0	0	0
	LN		27.0	0	0	0	0
	CS		16.3	42.9	20.4	27.8	0
	CH		27.0	57.1	79.6	72.2	100
UMBER CLAMS COLLECTED			37	8	56	18	3
IZE RANGE (mm)			30-97	58-95	69-105	61-95	87-93
SIZE (mm)			56.0	76.9	84.3	80.7	91.0
MORTALITY			0	46.7	32.5	10.0	50.0

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

TATION NUMBER			RB83-40	RB83-41	RB83-42	RB83-43	RB83-44
ATITUDE N			40°28.00	40°28.00'	40°27.50'	40°27.50'	40°27.50'
ONGITUDE W			74°08.27'	74°08.92'	74°07.62	74°08.92'	74°09.57'
OLLECTION DATE			8/22/83	8/22/83	8/23/83	8/23/83	8/23/83
IDE AND HOURS			High + 4	High + 5	High + 0.5	High + 2	High + 2.5
EMPERATURE °C	AIR		30.0	29.5	29.5	26.0	26.5
	WATER	S	25.5	25.5	24.6	25.0	25.0
		B	24.6	24.1	24.3	24.1	24.5
D.O. (ppm)	S		6.8	5.8	5.5	6.5	6.5
	B		6.6	5.3	5.3	5.8	6.4
ALINITY (ppt)	S		25.0	25.0	24.5	24.5	25.0
	B		24.5	25.5	25.0	25.0	25.5
pH	S		7.7	7.7	7.6	7.7	7.7
	B		7.7	7.7	7.6	7.7	7.7
EPTH (ft)			8	14	8	14	12
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.02	0.39	0.01	0.04	0.11
% COMMERCIAL SIZES	SL		0	0	0	0	4.7
	LN		0	2.6	0	0	9.5
	CS		50.0	42.1	50.0	87.5	42.9
	CH		50.0	55.3	50.0	12.5	42.9
UMBER CLAMS COLLECTED			4	39	2	8	22
IZE RANGE (mm)			71-95	54-95	68-85	59-77	33-92
SIZE (mm)			82.5	77.6	76.5	68.9	71.7
MORTALITY			0	13.3	75.0	50.0	15.4

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-45	RB83-46	RB83-47	RB83-48	RB83-49
LATITUDE N			40°27.50'	40°28.00'	40°28.50'	40°28.50'	40°28.50'
LONGITUDE W			74°10.22'	74°10.22'	74°06.97'	74°07.62'	74°08.27'
COLLECTION DATE			8/23/83	8/23/83	8/24/83	8/24/83	8/24/83
TIDE AND HOURS			High + 3	High + 4	High +2	High + 2.5	High + 3.
TEMPERATURE °C	AIR		27.5	27.0	27.5	26.5	26.0
	WATER	S	25.0	25.0	24.7	24.9	25.2
		B	24.7	24.8	23.9	24.5	24.1
D.O. (ppm)	S		4.6	5.6	7.9	6.4	7.4
	B		4.3	5.5	6.8	6.2	6.5
SALINITY (ppt)	S		25.0	26.0	26.0	25.0	26.0
	B		25.0	26.0	26.0	25.5	26.5
pH	S		7.5	7.7	8.0	7.8	7.9
	B		7.5	7.7	7.9	7.8	7.9
DEPTH (ft)			10	11	21	14	12
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.05	0.04	0.24	0.02	0.40
% COMMERCIAL SIZES	SL		0	0	5.6	0	0
	LN		0	0	5.6	0	0
	CS		60.0	57.1	22.2	0	26.0
	CH		40.0	42.9	66.6	100	74.0
NUMBER CLAMS COLLECTED			10	8	36	3	79
SIZE RANGE (mm)			62-86	62-89	30-96	78-81	57-103
$\bar{X}$ SIZE (mm)			73.9	74.0	75.4	79.5	80.1
% MORTALITY			64.3	50.0	7.7	50.0	0

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-50	RB83-51	RB83-52	RB83-53	RB83-54
LATITUDE N			40°28.00'	40°28.00'	40°28.00'	40°28.00'	40°28.00'
LONGITUDE W			74°09.57'	74°10.88'	74°11.54'	74°12.20'	74°12.85'
COLLECTION DATE			8/25/83	8/25/83	8/25/83	8/25/83	8/25/83
TIDE AND HOURS			High + 0	High + 1	High + 1.5	High + 2	High + 2.
TEMPERATURE °C	AIR		25.0	24.5	24.0	24.5	24.0
	WATER	S	24.6	24.9	24.9	25.1	25.3
		B	24.1	24.6	24.5	24.5	24.6
D.O. (ppm)	S		6.9	4.8	5.6	6.4	6.5
	B		6.1	5.7	5.2	5.8	5.5
SALINITY (ppt)	S		25.5	25.5	25.5	25.5	26.0
	B		26.0	26.0	26.0	26.0	26.0
pH	S		7.9	7.6	7.7	7.7	7.8
	B		7.8	7.7	7.7	7.7	7.7
DEPTH (ft)			16	11	16	15	14
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.56	0.03	0.01	0	0
% COMMERCIAL SIZES	SL		0	0	0	0	0
	LN		0	50.0	0	0	0
	CS		68.4	33.3	0	0	0
	CH		31.6	16.7	100	0	0
NUMBER CLAMS COLLECTED			56	6	1	0	0
SIZE RANGE (mm)			61-91	45-78	-86-	ND	ND
SIZE (mm)			73.8	58.3	86.0	ND	ND
MORTALITY			15.2	0	88.9	100	0

ND - No Data
*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

ATION NUMBER			RB83-55	RB83-56	RB83-57	RB83-58	RB83-59
TITUDE N			40°27.25'	40°27.25'	40°27.00'	40°26.50'	40°27.00'
NGITUDE W			74°08.60'	74°09.90'	74°11.54'	74°12.20'	74°12.20'
LLECTION DATE			8/29/83	8/29/83	8/29/83	8/29/83	8/29/83
DE AND HOURS			Low + 3	Low + 4	Low + 5	High + 0	High + 0.5
MPERATURE °C	AIR		23.5	24.5	25.5	25.5	27.0
	WATER	S	23.5	24.0	24.5	24.5	24.6
		B	24.4	24.4	24.5	24.9	24.5
D.O. (ppm)	S		6.1	5.8	4.7	5.2	5.7
	B		5.2	4.8	4.5	5.2	4.9
LINITY (ppt)	S		23.5	22.5	25.0	25.5	24.0
	B		24.5	26.0	25.5	26.0	25.0
pH	S		7.5	7.5	7.5	7.5	7.5
	B		7.5	7.5	7.5	7.5	7.5
PTH (ft)			7	7	8	10	13
BSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
TIMATED HARD CLAM NSITY (#/ft²)			0.04	0.02	0.01	0	0
% MMERCIAL SIZES	SL		0	0	25.0	0	0
	LN		0	0	25.0	0	0
	CS		28.6	50.0	0	0	0
	CH		71.4	50.0	50.0	0	0
MBER CLAMS COLLECTED			7	4	4	0	0
ZE RANGE (mm)			67-87	56-77	34-87	ND	ND
SIZE (mm)			76.6	71.0	63.8	ND	ND
MORTALITY			0	33.3	75.0	0	100

ND - No Data
*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

TATION NUMBER			RB83-60	RB83-61	RB83-62	RB83-63	RB83-64
ATITUDE N			40°27.13'	40°27.65'	40°28.00'	40°28.50'	40°29.50'
ONGITUDE W			74°12.69'	74°14.25'	74°15.47'	74°15.47'	74°03.01'
OLLECTION DATE			8/30/83	8/30/83	8/30/83	8/30/83	9/1/83
IDE AND HOURS			Low + 3	Low + 4.5	Low + 5	Low + 5.8	Low + 0.5
EMPERATURE °C	AIR		23.5	27.5	31.0	29.0	22.0
	WATER	S	24.6	25.0	25.7	26.2	22.5
		B	24.3	24.3	24.8	24.9	22.2
D.O. (ppm)	S		5.0	5.4	5.9	4.5	6.1
	B		4.9	6.1	7.2	4.5	5.3
ALINITY (ppt)	S		23.5	24.0	23.0	23.5	25.5
	B		24.0	24.5	24.0	24.0	27.0
pH	S		7.6	7.6	7.7	7.6	7.9
	B		7.6	7.7	7.7	7.5	7.9
EPTH (ft)			7	6	8	8	25
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.05	0.01	0	0	0.65
% OMMERCIAL SIZES	SL		11.1	0	0	0	7.1
	LN		55.6	50.0	0	0	8.1
	CS		33.3	50.0	0	0	17.2
	CH		0	0	0	0	67.7
UMBER CLAMS COLLECTED			9	2	0	0	98
IZE RANGE (mm)			36-67	55-61	ND	ND	30-101
SIZE (mm)			49.3	58.0	ND	ND	82.1
MORTALITY			18.2	33.3	0	100	2.0

ND-No Data
*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-65	RB83-66	RB83-67	RB83-68	RB83-69
LATITUDE N			40°29.50'	40°29.50'	40°29.50'	40°29.10'	40°29.50'
LONGITUDE W			74°03.67'	74°04.33'	74°05.00'	74°05.56'	74°06.31'
COLLECTION DATE			9/1/83	9/1/83	9/1/83	9/19/83	9/19/83
TIDE AND HOURS			Low + 1	Low + 2.5	Low + 3.5	High + 3.5	High + 4.5
TEMPERATURE °C	AIR		22.0	23.5	24.0	27	26
	WATER	S	22.7	23.0	23.4	20.5	20.7
		B	22.4	22.6	22.3	20.5	20.5
D.O. (ppm)	S		6.0	7.2	8.3	8.1	10.2
	B		4.9	4.6	6.3	6.2	7.6
SALINITY (ppt)	S		26.0	26.5	26.5	26.0	26.5
	B		28.0	28.0	26.5	26.5	27.0
pH	S		7.9	8.0	8.1	8.1	8.2
	B		7.9	7.9	7.9	8.0	8.1
DEPTH (ft)			26	27	27	27	26
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			1.15	0.95	0.43	0.44	0.40
% COMMERCIAL SIZES	SL		0.9	6.5	0	2.2	0
	LN		16.8	5.4	0	0	5.2
	CS		21.2	11.8	16.3	15.6	31.0
	CH		61.1	76.3	83.7	82.2	63.8
NUMBER CLAMS COLLECTED			115	95	43	44	60
SIZE RANGE (mm)			35-99	30-99	65-102	33-98	40-97
SIZE (mm)			76.0	78.1	84.2	82.1	78.5
MORTALITY			12.2	10.4	12.3	13.7	1.6

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

TATION NUMBER			RB83-70	RB83-71	RB83-72	RB83-73	RB83-74
ATITUDE N			40°29.10'	40°30.00'	40°30.00'	40°30.00'	40°30.00'
ONGITUDE W			74°06.97'	74°03.01'	74°03.67'	74°04.33'	74°05.00'
OLLECTION DATE			9/19/83	9/20/83	9/20/83	9/20/83	9/20/83
IDE AND HOURS			High + 5	High + 1.8	High + 3	High + 3.5	High + 4.5
EMPERATURE °C	AIR		28.5	24.5	26.5	27.0	30.0
	WATER	S	20.8	20.9	21.0	21.5	22.1
		B	20.3	20.7	20.8	20.8	20.9
D.O. (ppm)	S		9.2	8.0	7.8	10.7	13.1
	B		6.2	7.4	6.8	7.3	6.8
ALINITY (ppt)	S		27.0	26.0	26.0	26.5	27.0
	B		27.0	26.5	27.0	27.0	27.0
pH	S		7.9	8.1	8.1	8.3	8.5
	B		8.1	8.1	8.0	8.1	8.1
EPTH (ft)			29	26	26	25	23
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.50	0.16	0.49	0.11	0.30
% OMMERCIAL SIZES	SL		6.3	0	0	0	0
	LN		12.6	0	0	3.8	0
	CS		26.3	0	17.9	3.8	12.3
	CH		54.8	100	82.1	92.3	87.7
UMBER CLAMS COLLECTED			99	31	97	21	59
IZE RANGE (mm)			30-97	79-109	68-106	44-100	65-101
SIZE (mm)			72.4	92.1	86.2	86.4	85.7
MORTALITY			3.9	8.8	3.0	16.0	4.8

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

TATION NUMBER			RB83-75	RB83-76	RB83-77	RB83-78	RB83-79
ATITUDE N			40°29.00'	40°29.00'	40°29.50'	40°27.50'	40°27.50'
ONGITUDE W			74°07.62'	74°08.27'	74°07.62'	74°11.54'	74°12.20'
OLLECTION DATE			9/21/83	9/21/83	9/21/83	10/4/83	10/4/83
IDE AND HOURS			High + 1	High + 2	High + 3.5	High + 3.5	High + 4
EMPERATURE °C	AIR		24.5	25.5	26.0	21.5	23.5
	WATER	S	21.0	21.2	21.3	18.5	18.7
		B	20.8	21.0	21.0	18.5	18.6
D.O. (ppm)	S		7.0	6.7	7.4	5.7	5.8
	B		7.0	5.8	7.2	5.7	5.2
ALINITY (ppt)	S		26.0	26.0	27.0	23.5	24.5
	B		26.0	26.5	27.0	23.0	24.0
pH	S		8.1	8.0	8.1	7.7	7.7
	B		8.0	8.0	8.1	7.7	7.7
EPTH (ft)			15	24	30	11	12
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.01	0.26	0.47	0	0
% OMMERCIAL SIZES	SL		0	1.9	4.3	0	0
	LN		0	11.1	10.9	0	0
	CS		0	22.2	28.3	0	0
	CH		100	64.8	56.5	0	0
UMBER CLAMS COLLECTED			2	52	47	0	0
IZE RANGE (mm)			81-87	37-96	30-102	ND	ND
SIZE (mm)			85.0	76.4	73.1	ND	ND
MORTALITY			71.4	10.3	6.0	0	100

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-80	RB83-81	RB83-82	RB83-83	RB83-84
LATITUDE N			40°27.50'	40°27.50'	40°29.00'	40°29.00'	40°28.30
LONGITUDE W			74°12.85'	74°13.51'	74°15.47'	74°14.82'	74°14.90
COLLECTION DATE			10/4/83	10/4/83	10/5/83	10/5/83	10/5/83
TIDE AND HOURS			High + 5	High + 5.5	High + 2.5	High + 3.3	High + 4
TEMPERATURE °C	AIR		25.5	26.0	25.0	23.0	22.0
	WATER	S	19.0	19.5	19.4	20.0	19.9
		B	18.8	19.0	19.1	19.5	19.6
D.O. (ppm)	S		5.0	5.1	4.6	4.4	4.4
	B		4.9	4.7	4.6	4.4	4.3
SALINITY (ppt)	S		24.0	25.0	24.0	24.5	24.5
	B		24.5	25.5	25.0	25.0	25.0
pH	S		7.7	7.7	7.5	7.5	7.5
	B		7.7	7.7	7.5	7.5	7.5
DEPTH (ft)			7	10	12	14	11
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0	0.01	0	0	0
% COMMERCIAL SIZES	SL		0	0	0	0	0
	LN		0	0	0	0	0
	CS		0	100	0	0	0
	CH		0	0	0	0	0
NUMBER CLAMS COLLECTED			0	1	0	0	0
SIZE RANGE (mm)			ND	68.0	ND	ND	ND
SIZE (mm)			ND	-68-	ND	ND	ND
% MORTALITY			100	66.7	0	100	100

ND-No Data
*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

TATION NUMBER			RB83-85	RB83-86	RB83-87	RB83-88	RB83-89
ATITUDE N			40°28.00'	40°29.00'	40°29.10'	40°28.90'	40°29.10'
ONGITUDE W			74°14.82'	74°06.97'	74°08.92'	74°09.57'	74°10.22'
OLLECTION DATE			10/5/83	10/17/83	10/17/83	10/17/83	10/17/83
IDE AND HOURS			High + 4.5	High + 3.8	High + 5	Low + 0.5	Low + 1
EMPERATURE °C	AIR		23.0	18.5	23.0	20.0	19.0
	WATER	S	20.0	15.6	16.5	16.6	16.1
		B	19.5	17.2	16.7	15.6	15.7
D.O. (ppm)	S		4.3	7.4	7.2	7.0	6.6
	B		4.2	6.7	6.8	6.7	6.3
ALINITY (ppt)	S		24.5	24.0	24.5	24.0	24.0
	B		25.0	26.0	26.5	25.5	25.5
pH	S		7.5	7.7	7.7	7.7	7.7
	B		7.5	7.7	7.7	7.7	7.7
EPTH (ft)			8	24	20	17	18
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0	0.16	0.41	0.12	0.22
% OMMERCIAL SIZES	SL		0	0	9.2	5.6	0
	LN		0	10.5	4.1	5.6	0
	CS		0	34.2	40.8	44.4	38.1
	CH		0	55.3	45.9	44.4	61.9
UMBER CLAMS COLLECTED			0	32	81	18	44
IZE RANGE (mm)			ND	40-102	30-98	36-87	62-93
SIZE (mm)			ND	77.5	71.6	72.6	78.0
MORTALITY			0	0	3.6	10.0	24.1

ND-No Data
*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

TATION NUMBER			RB83-90	RB83-91	RB83-92	RB83-93	RB83-94
ATITUDE N			40°29.00'	40°28.00'	40°28.00'	40°28.50'	40°28.50'
ONGITUDE W			74°10.88'	74°13.51'	74°14.17'	74°14.17'	74°08.92'
OLLECTION DATE			10/17/83	10/18/83	10/18/83	10/18/83	10/31/83
IDE AND HOURS			Low + 2	High + 4.5	High + 6.5	Low + 0	Low + 0
EMPERATURE °C	AIR		19.5	19.5	19.0	21.0	09.0
	WATER	S	17.0	16.2	17.2	18.0	11.5
		B	16.6	16.4	17.5	17.5	11.9
D.O. (ppm)	S		6.5	5.7	5.8	5.7	7.5
	B		6.2	4.8	4.9	5.2	7.5
ALINITY (ppt)	S		24.0	25.0	25.0	24.5	22.5
	B		25.5	26.0	26.0	26.0	24.0
pH	S		7.7	7.5	7.5	7.5	7.7
	B		7.7	7.5	7.5	7.5	7.7
EPTH (ft)			17	12	11	11	15
UBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
STIMATED HARD CLAM ENSITY (#/ft²)			0.60	0.01	0	0	0.23
% OMMERCIAL SIZES	SL		0.9	0	0	0	0
	LN		0.9	0	0	0	0
	CS		52.7	100	0	0	37.8
	CH		45.5	0	0	0	62.2
UMBER CLAMS COLLECTED			120	1	0	0	45
IZE RANGE (mm)			34-93	75	ND	ND	61-90
SIZE (mm)			75.4	75.0	ND	ND	78.2
MORTALITY			20.5	50.0	100	0	11.8

ND-No Data
*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-95	RB83-96	RB83-97	RB83-98	RB83-99
LATITUDE N			40°28.50'	40°28.50'	40°28.50'	40°28.50'	40°28.50
LONGITUDE W			74°09.57'	74°10.22'	74°10.88'	74°11.54'	74°13.51
COLLECTION DATE			10/31/83	10/31/83	10/31/83	10/31/83	11/1/83
TIDE AND HOURS			Low + 1	Low + 1.5	Low + 2	Low + 3.5	Low + 0
TEMPERATURE °C	AIR		11.0	13.0	14.0	14.5	11.0
	WATER	S	11.3	11.5	11.6	12.0	12.3
		B	12.0	11.5	11.6	11.6	12.0
D.O. (ppm)	S		7.3	7.4	7.2	7.2	6.7
	B		7.3	7.2	7.2	7.1	6.7
SALINITY (ppt)	S		22.5	22.0	22.0	22.0	23.0
	B		23.5	22.5	22.0	22.5	23.0
pH	S		7.7	7.7	7.7	7.7	7.5
	B		7.7	7.7	7.7	7.7	7.5
DEPTH (ft)			13	11	11	16	11
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0.19	0.17	1.33	0.03	0.01
% COMMERCIAL SIZES	SL		0	0	0.7	0	0
	LN		0	2.9	11.9	0	0
	CS		51.7	41.2	73.2	75.0	100
	CH		48.3	55.9	14.2	25.0	0
NUMBER CLAMS COLLECTED			29	34	265	4	1
SIZE RANGE (mm)			64-93	53-94	32-88	70-80	-62-
$\bar{X}$ SIZE (mm)			76.3	76.9	66.6	75.0	62.0
% MORTALITY			17.1	60.9	4.0	55.6	66.7

*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-100	RB83-101	RB83-102	RB83-103	RB83-1
LATITUDE N			40°28.40'	40°28.50'	40°29.00'	40°29.50'	40°30.
LONGITUDE W			74°12.85'	74°12.20'	74°02.36'	74°02.36'	74°02.
COLLECTION DATE			11/1/83	11/1/83	11/2/83	11/2/83	11/2/8
TIDE AND HOURS			Low + 1	Low + 2	High + 3.3	High + 4	High +
TEMPERATURE °C	AIR		15.0	16.0	15.0	16.0	18.0
	WATER	S	12.4	12.5	12.8	13.0	13.1
		B	12.0	11.9	12.9	13.0	13.0
D.O. (ppm)	S		6.7	6.8	7.1	6.8	6.6
	B		6.6	6.7	7.0	6.7	6.6
SALINITY (ppt)	S		22.5	22.0	25.0	26.0	26.0
	B		22.5	22.0	26.5	26.5	26.0
pH	S		7.5	7.6	7.8	7.8	7.8
	B		7.5	7.6	7.9	7.8	7.8
DEPTH (ft)			11	13	24	23	23
SUBSTRATE	% GRAVEL		*	*	*	*	*
	% SAND		*	*	*	*	*
	% MUD		*	*	*	*	*
ESTIMATED HARD CLAM DENSITY (#/ft²)			0	0.03	0.65	0.84	0
% COMMERCIAL SIZES	SL		0	0	17.4	20.2	0
	LN		0	0	41.3	42.9	0
	CS		0	66.7	28.6	34.4	0
	CH		0	33.3	12.7	2.5	0
NUMBER CLAMS COLLECTED			0	3	65	167	0
SIZE RANGE (mm)			ND	59-80	30-102	30-84	ND
SIZE (mm)			ND	69.7	54.3	50.5	ND
% MORTALITY			100	0	16.7	1.2	0

ND-No Data
*Analysis Pending

SHELLFISH INVENTORY SUMMARY
RARITAN BAY
1983

STATION NUMBER			RB83-105	RB83-106	RB83-107		
LATITUDE N			40°30.00'	40°29.50'	40°29.00'		
LONGITUDE W			74°01.42'	74°01.72'	74°01.72'		
COLLECTION DATE			11/2/83	11/2/83	11/2/83		
TIDE AND HOURS			High + 5.5	Low + 0	Low + 1		
TEMPERATURE °C	AIR		12.5	16.5	17.0		
	WATER	S	13.4	13.6	12.9		
		B	13.4	13.5	13.0		
D.O. (ppm)	S		6.7	6.7	7.3		
	B		6.6	6.6	6.9		
SALINITY (ppt)	S		25.5	26.0	24.0		
	B		26.0	26.0	24.0		
pH	S		7.8	7.8	7.8		
	B		7.8	7.8	7.8		
DEPTH (ft)			18	17	15		
SUBSTRATE	% GRAVEL		*	*	*		
	% SAND		*	*	*		
	% MUD		*	*	*		
ESTIMATED HARD CLAM DENSITY (#/ft²)			0	0	0.01		
% COMMERCIAL SIZES	SL		0	0	0		
	LN		0	0	0		
	CS		0	0	0		
	CH		0	0	100		
NUMBER CLAMS COLLECTED			0	0	1		
SIZE RANGE (mm)			ND	ND	-93-		
$\bar{X}$ SIZE (mm)			ND	ND	93.0		
% MORTALITY			0	0	75.0		

ND-No Data
*Analysis Pending

SANDY HOOK BAY 1983
DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/SQ. FT.)

ORGANISMS	STATIONS																							
	SHB 83-1	SHB 83-2	SHB 83-3	SHB 83-4	SHB 83-5	SHB 83-6	SHB 83-7	SHB 83-8	SHB 83-9	SHB 83-10	SHB 83-11	SHB 83-12	SHB 83-13	SHB 83-14	SHB 83-15	SHB 83-16	SHB 83-17	SHB 83-18	SHB 83-19	SHB 83-20	SHB 83-21	SHB 83-22	SHB 83-23	SHB 83-24
PHYLUM CNIDARIA																								
CLASS ANTHOZOA																								
Metridium senile																								
PHYLUM MOLLUSCA																								
CLASS GASTROPODA																								
Busycon canaliculatum	0.01	0.01																						
Crepidula fornicata		+	+	+			+				+		+			+	+							
Crepidula plana																								
Ilyanassa obsoleta																								
Lunatia heros												0.01							0.01					
Nassarius trivittatus																								
Polinices duplicatus																0.01								
Urosalpinx cinerea																	+							
CLASS BIVALVIA																								
Crassostrea virginica																								
Ensis directus	0.03	0.05	0.02	0.03	0.02	0.01	0.04				0.01	0.01	0.21	0.27	0.05	0.10	0.02	0.03	0.02	0.02	0.01	0.09	0.01	0.01
Geukensia demissa							0.01																	
Mercenaria mercenaria	1.54	2.50	0.54	0.21	0.15	0.01	0.07	0.03	0	0.02	2.27	0.30	0.20	0.67	0.65	0.21	0.18	0.55	0.16	2.67	0.66	0.45	0.71	0.47
M. mercenaria notata																								
Mulinia lateralis																								
Mya arenaria																								
Mytilus edulis																								
Petricola pholadiformis																								
Pitar morrhuanus																								
Spisula solidissima								0.01																
PHYLUM ARTHROPODA																								
CLASS MEROSTOMATA																								
Limulus polyphemus	0.02	0.02	0.01	0.01	0.02		0.01			0.02	0.02	0.02		0.01	0.02	0.01	0.01	0.02	0.01	0.01				
CLASS CRUSTACEA																								
Callinectes sapidus																								
Cancer irroratus	0.02	0.01	0.03	0.04	0.02	0.02		0.01	0.03		0.03	0.02	0.02	0.03	0.01	0.02	0.03	0.04	0.02	0.01		0.01		
Homarus americanus																								
Libinia emarginata																								
Ovalipes ocellatus	0.02	0.01	+	0.17	+	0.08	0.03	0.01	0.07		0.05	0.09	0.04	0.02		0.03	0.10	0.05	0.09	0.04				
Pagurus longicarpus																								
Pagurus pollicaris																								
PHYLUM ECHINODERMATA																								
CLASS STELLEROIDEA																								
Asterias forbesii																								

+ Presence (Size of organism not large enough to reliably estimate density)

+ + Too numerous to count (Density not calculated)

SANDY HOOK BAY 1983
DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/SQ. FT.)

ORGANISMS	STATIONS																							
	SHB 83-25	SHB 83-26	SHB 83-27	SHB 83-28	SHB 83-29	SHB 83-30	SHB 83-31	SHB 83-32	SHB 83-33	SHB 83-34	SHB 83-35	SHB 83-36	SHB 83-37	SHB 83-38	SHB 83-39	SHB 83-40	SHB 83-41	SHB 83-42	SHB 83-43	SHB 83-44	SHB 83-45	SHB 83-46	SHB 83-47	SHB 83-48
PHYLUM CNIDARIA																								
CLASS ANTHOZOA																								
Metridium senile																								
PHYLUM MOLLUSCA																								
CLASS GASTROPODA																								
Busycon canaliculatum																								
Crepidula fornicata						+																		
Crepidula plana																								
Ilyanassa obsoleta																								
Lunatia heros							0.01																	
Nassarius trivittatus								+																
Polinices duplicatus											0.02													
Urosalpinx cinerea									+															
CLASS BIVALVIA																								
Crassostrea virginica																								
Ensis directus	0.07	0.05	0.02	0.01	0.02				0.01	0.02	0.01	0.01	0.01	0.02	0.04	0.17	0.05	0.05	0.04			0.06	0.08	0.01
Geukensia demissa																								
Mercenaria mercenaria	0.46	0.94	1.03	0.17	0.29	0.11	0.03	0.05	0.09	0.19	0.35	0.22	0.37	0.27	0.27	0.93	1.38	0.49	0.55	0.12	0.54	0.24	0.60	0.75
M. mercenaria notata																								
Mulinia lateralis																				0.58		3.10	18.90	
Mya arenaria																								
Mytilus edulis					0.01				0.01		+													
Petricola pholadiformis																								
Pitar morrhuanus																								
Spisula solidissima																								
PHYLUM ARTHROPODA																								
CLASS MEROSTOMATA																								
Limulus polyphemus	0.01						0.03	0.02	0.03				0.01	0.04	0.01	0.02	0.02	0.06	0.01			0.01	0.01	0.04
CLASS CRUSTACEA																								
Callinectes sapidus									0.01															
Cancer irroratus		0.01	0.01	0.01	0.01	0.05		0.01	0.02	0.01	0.02	0.01			0.01	0.01								
Homarus americanus																								
Libinia emarginata									0.01															
Ovalipes ocellatus						0.14	+	+	+						0.01	0.01			0.01			0.01		
Pagurus longicarpus																								
Pagurus pollicaris																								
PHYLUM ECHINODERMATA																								
CLASS STELLEROIDEA																								
Asterias forbesii												0.01												

+ Presence (Size of organism not large enough to reliably estimate density)

SANDY HOOK BAY 1983
DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/SQ. FT.)

ORGANISMS	STATIONS																							
	SHB 83-49	SHB 83-50	SHB 83-51	SHB 83-52	SHB 83-53	SHB 83-54	SHB 83-55	SHB 83-56	SHB 83-57	SHB 83-58	SHB 83-59	SHB 83-60	SHB 83-61	SHB 83-62	SHB 83-63	SHB 83-64	SHB 83-65	SHB 83-66	SHB 83-67	SHB 83-68	SHB 83-69	SHB 83-70	SHB 83-71	SHB 83-72
PHYLUM CNIDARIA																								
CLASS ANTHOZOA																								
Metridium senile																								
PHYLUM MOLLUSCA																								
CLASS GASTROPODA																								
Busycon canaliculatum																								
Crepidula fornicata				+			+													+	+			
Crepidula plana				+																+				
Ilyanassa obsoleta																								
Lunatia heros																								
Nassarius trivittatus																							0.02	0.01
Polinices duplicatus																								
Urosalpinx cinerea																				+				
CLASS BIVALVIA																								
Crassostrea virginica																								
Ensis directus			0.01	0.04	0.06	0.06	0.02	0.03			0.03		0.05	0.03		0.01					0.03	0.03	0.01	
Geukensia demissa																								
Mercenaria mercenaria	0.19	0.03	0.38	0.08	0.24	0.40	0.21	0.25	0.10	0.01	0.31	0.02	0.58	0.65	1.34	1.24	0.70	0.23	0.02	0.21	0.54	0.25	0.18	0.21
M. mercenaria notata																								
Mulinia lateralis																								
Mya arenaria																			10.60	0.05	0.01	0.01		
Mytilus edulis																++					0.03	+	+	++
Petricola pholadiformis																					+			
Pitar morrhuanus																								
Spisula solidissima																				0.01				
PHYLUM ARTHROPODA																								
CLASS MEROSTOMATA																								
Limulus polyphemus		0.01	0.02	0.01	0.04	0.01	0.01		0.01			0.01							0.01	0.04				0.01
CLASS CRUSTACEA																								
Callinectes sapidus								0.01															0.01	
Cancer irroratus																0.04	0.01			0.01				
Homarus americanus																0.01								
Libinia emarginata																								
Ovalipes ocellatus			0.02	0.01	0.01	0.01	0.04		0.01	0.12	0.01	0.01						0.01		0.03				
Pagurus longicarpus																								
Pagurus pollicaris																								
PHYLUM ECHINODERMATA																								
CLASS STELLEROIDEA																								
Asterias forbesii																0.02								

+ Presence (Size of organism not large enough to reliably estimate density)

+ + Too numerous to count (Density not calculated)

SANDY HOOK BAY 1983
DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/SQ. FT.)

ORGANISMS	STATIONS																							
	SHB 83-73	SHB 83-74	SHB 83-75	SHB 83-76	SHB 83-77	SHB 83-78	SHB 83-79	SHB 83-80	SHB 83-81	SHB 83-82	SHB 83-83	SHB 83-84	SHB 83-85	SHB 83-86	SHB 83-87	SHB 83-88	SHB 83-89	SHB 83-90	SHB 83-91	SHB 83-92	SHB 83-93	SHB 83-94	SHB 83-95	SHB 83-96
PHYLUM CNIDARIA																								
CLASS ANTHOZOA																								
Metridium senile																								
PHYLUM MOLLUSCA																								
CLASS GASTROPODA																								
Busycon canaliculatum														+	+	+			+	+	+			
Crepidula fornicata														+	+						+	+		
Crepidula plana																								
Ilyanassa obsoleta																								
Lunatia heros																								
Nassarius trivittatus						+						+									+			
Polinices duplicatus		0.01																		0.01				
Urosalpinx cinerea																								
CLASS BIVALVIA																								
Crassostrea virginica																								
Ensis directus				0.05	0.02	0.02	0.03	0.04	0.07	0.02	0.03		0.01	0.09	0.01				0.02	0.04	0.01	0.03		
Geukensia demissa																								
Mercenaria mercenaria	0.18	0.44	0.33	0.45	0.26	0.83	1.12	2.73	0.59	0.13	0.40	0.49	0.34	1.51	0.90	0.13	0.18	0.21	0.60	0.77	0.15	0.48	0	0.61
M. mercenaria notata																								
Mulinia lateralis																								
Mya arenaria					0.01				0.01	0.01														0.01
Mytilus edulis	++	++			+					+	++	+	0.01		+	+			+	+			+	+
Petricola pholadiformis																								
Pitar morrhuanus		0.01										0.02			0.04	0.01						0.01		
Spisula solidissima																								
PHYLUM ARTHROPODA																								
CLASS MEROSTOMATA																								
Limulus polyphemus										0.01	0.01					0.01				0.04			0.01	0.02
CLASS CRUSTACEA																								
Callinectes sapidus																								
Cancer irroratus	0.01	0.06	0.05	0.02		0.01	0.01				0.05	0.02			0.01				0.01				+	
Homarus americanus																								
Libinia emarginata																								
Ovalipes ocellatus						0.01														0.01			0.01	
Pagurus longicarpus																						+		
Pagurus pollicaris																						+		
PHYLUM ECHINODERMATA																								
CLASS STELLEROIDEA																								
Asterias forbesii	0.01	0.01																					0.01	

+ Presence (Size of organism not large enough to reliably estimate density)

SANDY HOOK BAY 1983
DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/SQ. FT.)

ORGANISMS	STATIONS																		
	SHB 83-97	SHB 83-98	SHB 83-99	SHB 83-100															
PHYLUM CNIDARIA																			
CLASS ANTHOZOA																			
Metridium senile																			
PHYLUM MOLLUSCA																			
CLASS GASTROPODA																			
Busycon canaliculatum																			
Crepidula fornicata		+	+																
Crepidula plana																			
Ilyanassa obsoleta			+	+															
Lunatia heros																			
Nassarius trivittatus																			
Polinices duplicatus																			
Urosalpinx cinerea																			
CLASS BIVALVIA																			
Crassostrea virginica																			
Ensis directus	0.03	0.02	0.07	0.01															
Geukensia demissa																			
Mercenaria mercenaria	0.45	0.36	0.21	0.06															
M. mercenaria notata																			
Mulinia lateralis																			
Mya arenaria																			
Mytilus edulis																			
Petricola pholadiformis																			
Pitar morrhuanus																			
Spisula solidissima																			
PHYLUM ARTHROPODA																			
CLASS MEROSTOMATA																			
Limulus polyphemus	0.01	0.01	0.01	0.01															
CLASS CRUSTACEA																			
Callinectes sapidus																			
Cancer irroratus				0.01															
Homarus americanus																			
Libinia emarginata																			
Ovalipes ocellatus		0.04	0.03																
Pagurus longicarpus																			
Pagurus pollicaris																			
PHYLUM ECHINODERMATA																			
CLASS STELLEROIDEA																			
Asterias forbesii																			

+ Presence (Size of organism not large enough to reliably estimate density)

RARITAN BAY 1983
DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/SQ. FT.)

ORGANISMS	STATIONS																							
	RB83 1	RB83 2	RB83 3	RB83 4	RB83 5	RB83 6	RB83 7	RB83 8	RB83 9	RB83 10	RB83 11A	RB83 11B	RB83 12	RB83 13	RB83 14	RB83 15	RB83 16	RB83 17	RB83 18	RB83 19	RB83 20	RB83 21	RB83 22	RB83 23
PHYLUM CNIDARIA																								
CLASS ANTHOZOA																								
Metridium senile																								
PHYLUM MOLLUSCA																								
CLASS GASTROPODA																								
Busycon canaliculatum																								
Crepidula fornicata			+								+	+	+									+		
Crepidula plana					+							+	+					+	+	+		+	+	
Ilyanassa obsoleta								+																
Lunatia heros																								
Nassarius trivittatus																+		+	+					
Polinices duplicatus																								
Urosalpinx cinerea																								
CLASS BIVALVIA																								
Crassostrea virginica													0.01											
Ensis directus	0.02			0.01							0.02	0.04	0.03				0.01		0.04			0.02	0.02	0.01
Geukensia demissa																								
Mercenaria mercenaria	0.44	0.19	0.65	1.58	0.20	0.16	0.03	0.21	0.11	0.06	0.02	1.01	0.17	0.05	0.16	0.02	0.04	0.04	0.81	0.33	0.25	0.22	0.21	0.14
M. mercenaria notata																								
Mulinia lateralis																								
Mya arenaria									0.47															
Mytilus edulis	++	+		+	+							+							+	+	++	++	+	
Petricola pholadiformis																						+		
Pitar morrhuanus	0.01																		0.04	0.01				
Spisula solidissima																			0.01		0.01			
PHYLUM ARTHROPODA																								
CLASS MEROSTOMATA																								
Limulus polyphemus							0.01	0.03	0.04	0.01					0.01	0.01			0.01					
CLASS CRUSTACEA																								
Callinectes sapidus																								
Cancer irroratus	0.03	0.01		0.01			0.02	0.02	0.02		+	+	0.01						0.06	0.02	0.05	0.01	0.02	
Homarus americanus																								
Libinia emarginata																								
Ovalipes ocellatus		0.01					+	+	0.01	+	+	+	0.01	0.08	+	+	0.01	0.01						
Pagurus longicarpus																								
Pagurus pollicaris																								
PHYLUM ECHINODERMATA																								
CLASS STELLEROIDEA																								
Asterias forbesii																								

+ Presence (Size of organism not large enough to reliably estimate density)

++ Too numerous to count (Density not calculated)

RARITAN BAY 1983
DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/SQ. FT.)

ORGANISMS	STATIONS																							
	RB83 24	RB83 25	RB83 26	RB83 27	RB83 28	RB83 29	RB83 30	RB83 31	RB83 32	RB83 33	RB83 34	RB83 35	RB83 36	RB83 37	RB83 38	RB83 39	RB83 40	RB83 41	RB83 42	RB83 43	RB83 44	RB83 45	RB83 46	RB83 47
PHYLUM CNIDARIA																								
CLASS ANTHOZOA																								
Metridium senile																								
PHYLUM MOLLUSCA																								
CLASS GASTROPODA																								
Busycon canaliculatum																								
Crepidula fornicata				+	+	+				+		+												+
Crepidula plana				+	+	+			+	+	+	+		+			+				+			+
Ilyanassa obsoleta																							+	
Lunatia heros																								
Nassarius trivittatus																							+	
Polinices duplicatus																								
Urosalpinx cinerea																								
CLASS BIVALVIA																								
Crassostrea virginica																								
Ensis directus	0.01	0.04	0.03	0.02	0.03	0.01	0.01	0.05	0.01	0.05	0.10	0.06		0.04							0.01	0.01	0.01	0.01
Geukensia demissa																								
Mercenaria mercenaria	0.03	0.10	0.09	0.27	0.26	0.29	0.31	0.28	0.09	0.09	0.33	0.24	0.04	0.28	0.09	0.02	0.02	0.39	0.01	0.04	0.11	0.05	0.04	0.24
M. mercenaria notata																								
Mulinia lateralis																								
Mya arenaria			0.01	0.01	0.12	0.03					0.09							6.82					0.34	
Mytilus edulis	++	+	+	+	+	+	+		0.03	+		+											+	+
Petricola pholadiformis					+						+	0.01												
Pitar morrhuanus								0.01																
Spisula solidissima				0.06																				
PHYLUM ARTHROPODA																								
CLASS MEROSTOMATA																								
Limulus polyphemus																0.01				0.01				0.01
CLASS CRUSTACEA																								
Callinectes sapidus																								
Cancer irroratus	0.18	0.04	0.13	0.03				+-	0.01	0.04		0.12	0.02			0.02	0.01		0.02		0.04		0.13	
Homarus americanus	0.01		0.01																					
Libinia emarginata				0.01																				
Ovalipes ocellatus													0.05	+		+	0.09		+		+	+		
Pagurus longicarpus																								
Pagurus pollicaris																								
PHYLUM ECHINODERMATA																								
CLASS STELLEROIDEA																								
Asterias forbesii																								

+ Presence (Size of organism not large enough to reliably estimate density)

+ + Too numerous to count (Density not calculated)

RARITAN BAY 1983
DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/SQ. FT.)

ORGANISMS	STATIONS																							
	RB83 48	RB83 49	RB83 50	RB83 51	RB83 52	RB83 53	RB83 54	RB83 55	RB83 56	RB83 57	RB83 58	RB83 59	RB83 60	RB83 61	RB83 62	RB83 63	RB83 64	RB83 65	RB83 66	RB83 67	RB83 68	RB83 69	RB83 70	RB83 71
PHYLUM CNIDARIA																								
CLASS ANTHOZOA																								
Metridium senile																							+	
PHYLUM MOLLUSCA																								
CLASS GASTROPODA																								
Busycon canaliculatum																								
Crepidula fornicata									+										+		+		+	
Crepidula plana		+																			+	+	+	+
Ilyanassa obsoleta																								
Lunatia heros																								
Nassarius trivittatus																	+							
Polinices duplicatus																								
Urosalpinx cinerea										+														
CLASS BIVALVIA																								
Crassostrea virginica			0.01							0.01		0.01	0.03											
Ensis directus		0.08						0.03		0.01		0.03	0.01				0.35	0.19	0.24		0.10	0.36	0.14	0.27
Geukensia demissa											0.01													
Mercenaria mercenaria	0.02	0.40	0.56	0.03	0.01	0	0	0.04	0.02	0.01	0	0	0.05	0.01	0	0	0.65	1.15	0.95	0.43	0.44	0.40	0.50	0.16
M. mercenaria notata																								
Mulinia lateralis							+					+												
Mya arenaria						0.02	0.03			+	0.01	0.01	0.02								0.01		0.01	
Mytilus edulis																				+	+		+	
Petricola pholadiformis																							0.03	
Pitar morrhuanus																	0.01							
Spisula solidissima																								
PHYLUM ARTHROPODA																								
CLASS MEROSTOMATA																								
Limulus polyphemus				0.01	0.01				0.02				0.01	0.01		0.01								0.01
CLASS CRUSTACEA																								
Callinectes sapidus																								
Cancer irroratus	0.05	0.01		0.06	0.01			0.01												0.24	0.23	0.01	0.02	
Homarus americanus																				0.03				
Libinia emarginata																				0.02				
Ovalipes ocellatus	+	+		0.05				0.06	0.17	0.01			0.06	0.01	0.03	0.02						0.01		0.01
Pagurus longicarpus																								
Pagurus pollicaris																								
PHYLUM ECHINODERMATA																								
CLASS STELLEROIDEA																								
Asterias forbesii																			0.09	0.35	0.01			

+ Presence (Size of organism not large enough to reliably estimate density)

++ Too numerous to count (Density not calculated)

RARITAN BAY 1983
DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/SQ. FT.)

ORGANISMS	STATIONS																							
	RB83 72	RB83 73	RB83 74	RB83 75	RB83 76	RB83 77	RB83 78	RB83 79	RB83 80	RB83 81	RB83 82	RB83 83	RB83 84	RB83 85	RB83 86	RB83 87	RB83 88	RB83 89	RB83 90	RB83 91	RB83 92	RB83 93	RB83 94	RB83 95
PHYLUM CNIDARIA																								
CLASS ANTHOZOA																								
Metridium senile																								
PHYLUM MOLLUSCA																								
CLASS GASTROPODA																								
Busycon canaliculatum																								
Crepidula fornicata		+	+		+	+			+							+								
Crepidula plana	+	+	+			+				+						+	+		+		+	+	+	
Ilyanassa obsoleta																								
Lunatia heros																								
Nassarius trivittatus	+			+												+								
Polinices duplicatus																								
Urosalpinx cinerea																								
CLASS BIVALVIA																								
Crassostrea virginica																0.03	0.01		0.01					
Ensis directus	0.10	0.08	0.07			0.09							0.05		0.05	0.36		0.04	0.18		0.01		0.01	0.01
Geukensia demissa																								
Mercenaria mercenaria	0.49	0.11	0.30	0.01	0.26	0.47	0	0	0	0.01	0	0	0	0	0.16	0.41	0.12	0.22	0.60	0.01	0	0	0.23	0.19
M. mercenaria notata																0.01	0.01							
Mulinia lateralis																								
Mya arenaria					0.05		4.46					0.06		0.05	0.29	+	0.28	0.03		0.02		2.09		
Mytilus edulis			+			+										0.07	0.01		0.01					
Petricola pholadiformis						0.02									0.01		+							
Pitar morrhuanus																							0.01	
Spisula solidissima																								
PHYLUM ARTHROPODA																								
CLASS MEROSTOMATA																								
Limulus polyphemus	0.01				0.01							0.02		0.01									0.01	
CLASS CRUSTACEA																								
Callinectes sapidus																		0.01						
Cancer irroratus			0.01	0.03												0.01							0.01	
Homarus americanus																								
Libinia emarginata									0.01															
Ovalipes ocellatus	0.02		0.01	+					+	0.03						0.01			+					
Pagurus longicarpus																								
Pagurus pollicaris																								
PHYLUM ECHINODERMATA																								
CLASS STELLEROIDEA																								
Asterias forbesii																								

+ Presence (Size of organism not large enough to reliably estimate density)

+ + Too numerous to count (Density not calculated)

RARITAN BAY 1983
DENSITIES OF ORGANISMS COLLECTED BY HYDRAULIC CLAM DREDGE (#/SQ. FT.)

ORGANISMS	STATIONS																		
	RB83 96	RB83 97	RB83 98	RBS3 99	RB83 100	RB83 101	RB83 102	RB83 103	RB83 104	RB83 105	RB83 106	RB83 107							
PHYLUM CNIDARIA																			
CLASS ANTHOZOA																			
Metridium senile																			
PHYLUM MOLLUSCA																			
CLASS GASTROPODA																			
Busycon canaliculatum																			
Crepidula fornicata		+					+	+	+			+							
Crepidula plana		+					+	+	+			+							
Ilyanassa obsoleta																			
Lunatia heros										0.02									
Nassarius trivittatus	+	+																	
Polinices duplicatus																			
Urosalpinx cinerea	+																		
CLASS BIVALVIA																			
Crassostrea virginica		0.01		0.03															
Ensis directus		0.02		0.02			+	0.08				0.04							
Geukensia demissa				0.01															
Mercenaria mercenaria	0.17	1.33	0.03	0.01	0	0.03	0.65	0.84	0	0	0	0.01							
M. mercenaria notata																			
Mulinia lateralis																			
Mya arenaria					0.02	0.13													
Mytilus edulis																			
Petricola pholadiformis																			
Pitar morrhuanus																			
Spisula solidissima									0.02	1.84	42.3	0.15							
PHYLUM ARTHROPODA																			
CLASS MEROSTOMATA																			
Limulus polyphemus	0.01	0.01						0.01											
CLASS CRUSTACEA																			
Callinectes sapidus																			
Cancer irroratus		0.01					0.13	0.11		0.02									
Homarus americanus																			
Libinia emarginata								0.02											
Ovalipes ocellatus	+	+							0.06	0.06	0.02	0.01							
Pagurus longicarpus																			
Pagurus pollicaris																			
PHYLUM ECHINODERMATA																			
CLASS STELLEROIDEA																			
Asterias forbesii							0.14	0.01	0.01	0.01		+							

+ Presence (Size of organism not large enough to reliably estimate density)

+ + Too numerous to count (Density not calculated)

ATTACHMENT B

1983 REPORTED HARD CLAM RELAY AND DEPURATION HARVEST

	TOTAL REPORTED HARVEST (# CLAMS)	EFFORT (MAN-DAYS)	MEAN CATCH PER EFFORT (CLAMS/MAN/DAY)
ATLANTIC COUNTY RELAY (2/28/83-9/22/83)	460,860	339	1359
SHARK RIVER RELAY (2/28/83-9/8/83)	320,050	397	806
NO. MONMOUTH COUNTY RELAY AND DEPURATION*			
AREAS 1 & 2	2,377,191	1373	1731
AREA 3	1,069,261	647	1653
AREA 4	964,987	598	1614
AREA 5	765,930	444	1725
AREA 6	91,750	70	1311
AREAS 7 & 8	1,223,602	643	1903
AREA 9	135,216	125	1082
NO. MONMOUTH CO. TOTAL	6,627,937	3900	1699
STATE TOTAL (RELAY & DEPURATION)	7,408,847	4636	1598

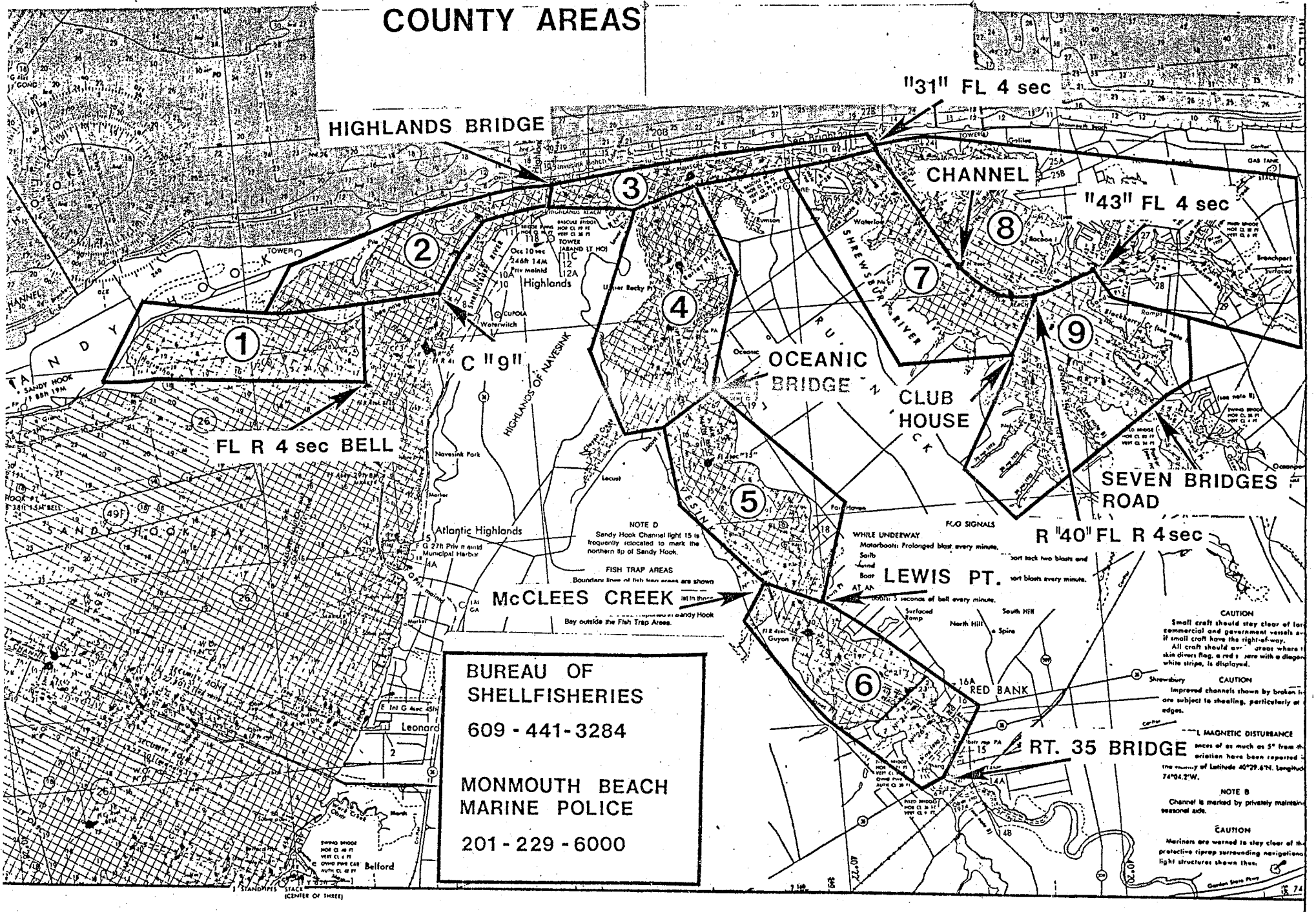
*Northern Monmouth County Relay: 6/1/83-11/18/83

Depuration: 7/11/83-12/29/83

1983 HARD CLAM RELAY

EFFECTIVE JUNE 1, 1983

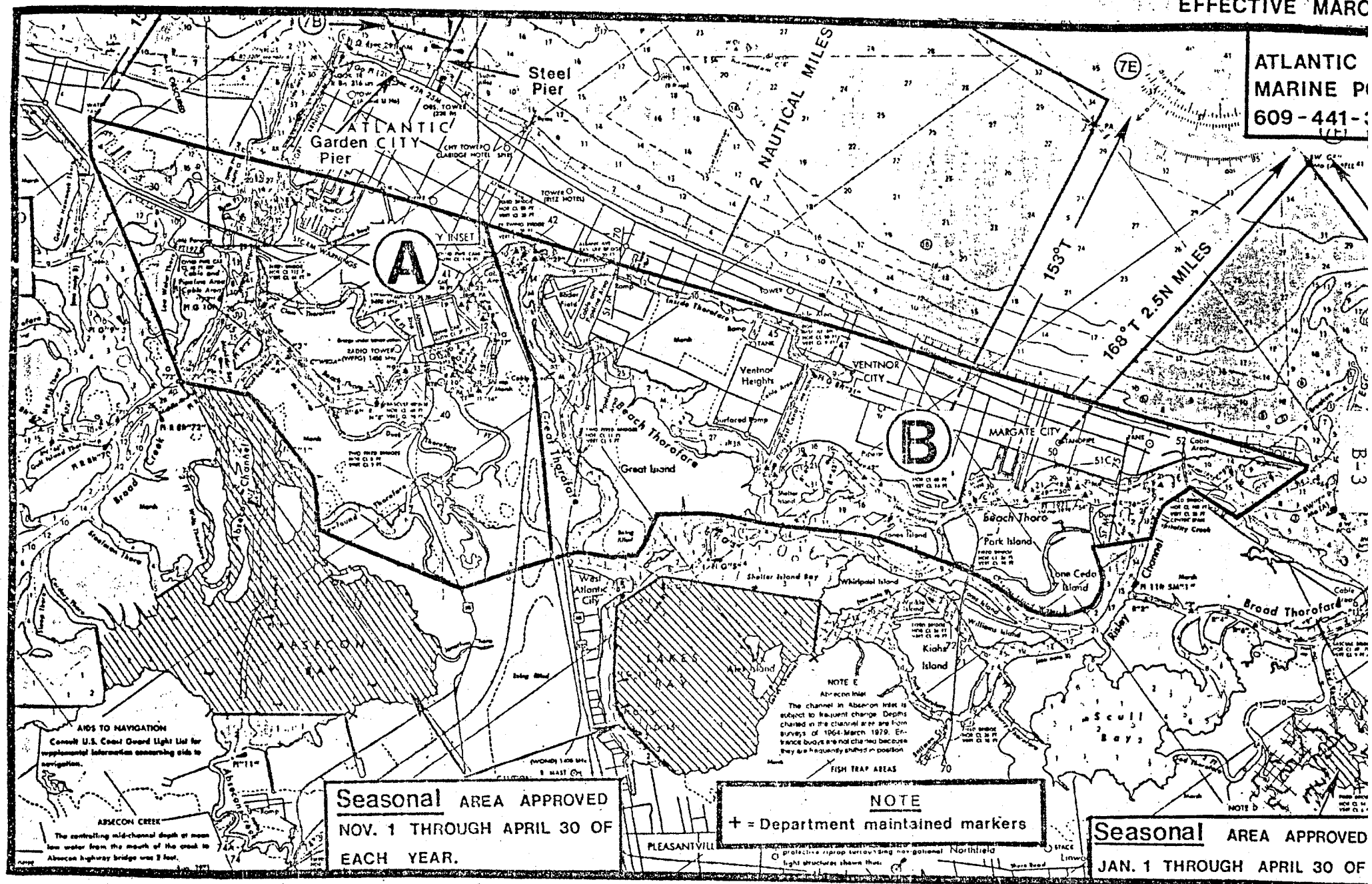
DESIGNATED NORTHERN MONMOUTH COUNTY AREAS



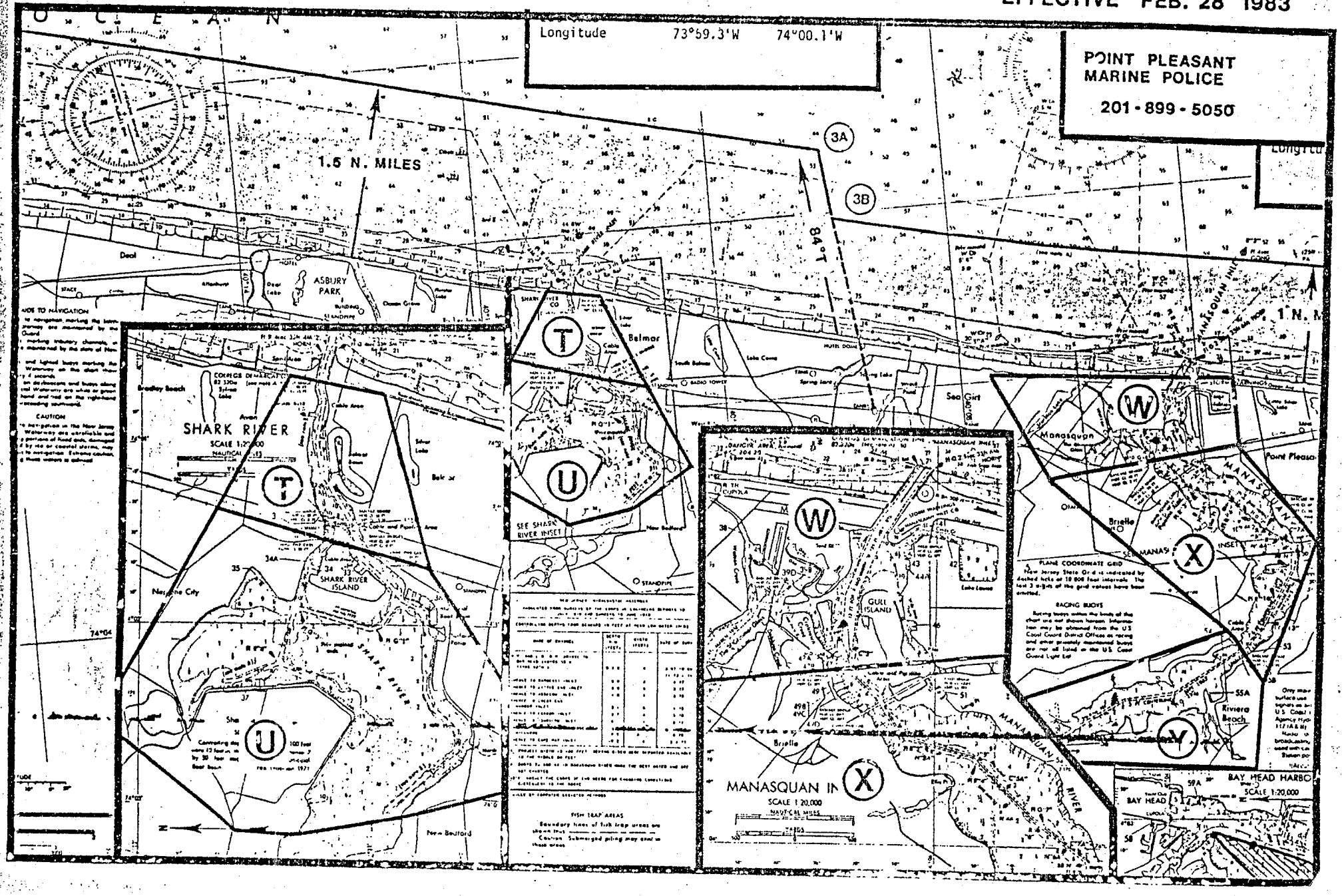
1983 HARD CLAM RELAY

DESIGNATED ATLANTIC CO. AREA A & B

REVISED CHART
EFFECTIVE MARC



1983 HARD CLAM RELAY

DESIGNATED MONMOUTH CO. AREAS [T-Y]

EFFECTIVE FEB. 28 1983