Monitoring of Coastal Shellfish Resources, January - December 1983

by Paul C. Hammerschmidt, Richard L. Benefield,
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Texas Parks and Wildlife Department
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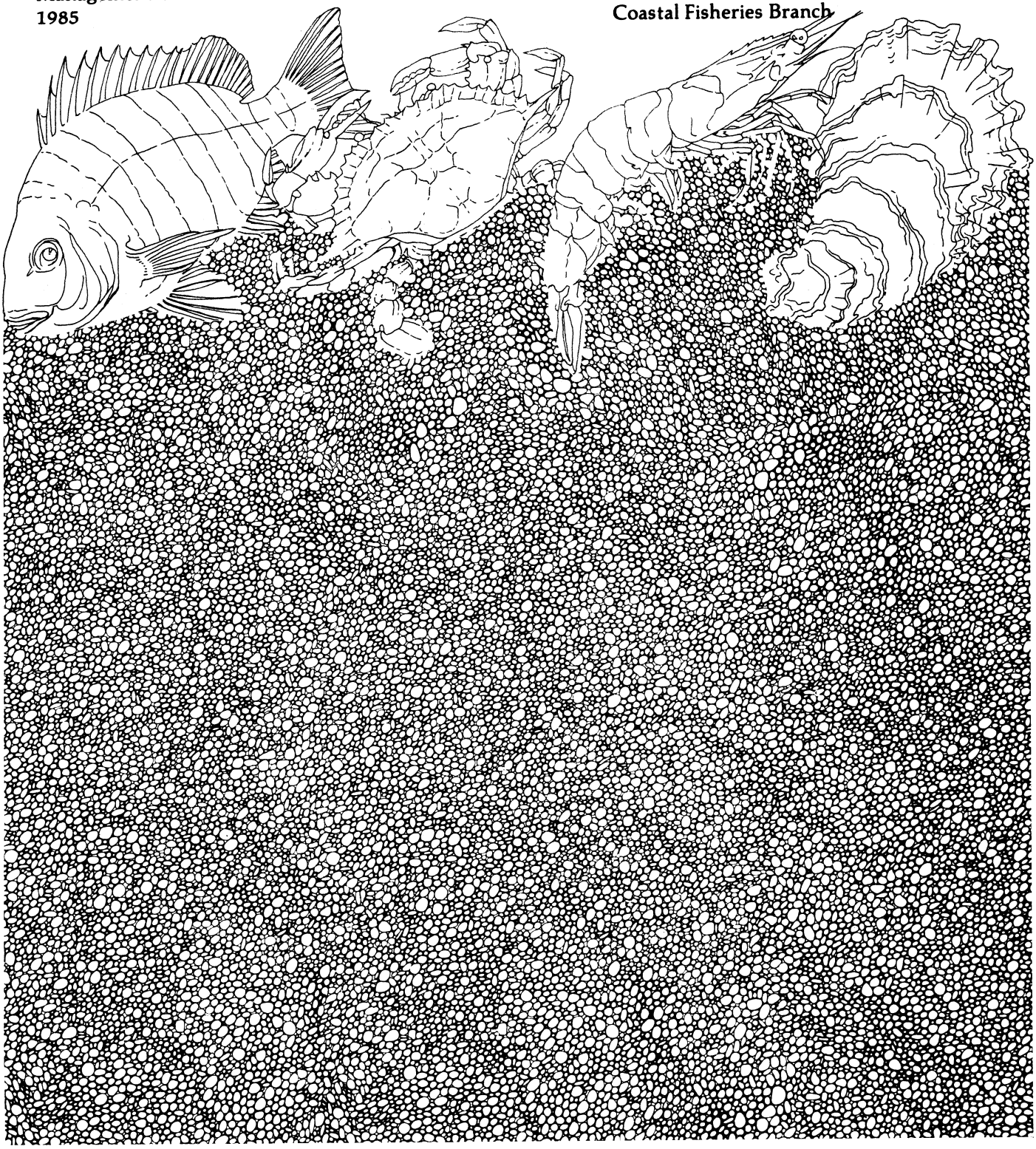

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ABSTRACT

Trends in relative abundance and size of brown shrimp (Penaeus aztecus), white shrimp (P. setiferus), pink shrimp (P. duorarum) and blue crabs (Callinectes sapidus) in Texas bay systems and the Gulf of Mexico were monitored during January-December 1983. Bag seines (18.3-m, 60-feet, long) were used to sample along shorelines of bays, 6.1-m wide otter trawls were used to sample water deeper than > 1.0 m 13.0 feet portion of bays and passes leading from the bays to the Gulf of Mexico, and 12.2-m (40-feet) wide trawls were used to sample Gulf waters.

Shorelines and deeper portions of bays were sampled in Galveston, Matagorda, San Antonio, Aransas and Corpus Christi Bays and the upper and lower Laguna Madre. Passes were sampled in Galveston, Matagorda, Aransas and Corpus Christi Bays and the lower Laguna Madre and Gulf samples were collected along the central coast and coastwide during the Southeastern Monitoring and Assessment Program (SEAMAP) in June-July.

Coastwide bag seine catch rates of brown shrimp decreased from 1982 to 1983, whereas trawl catch rates were similar during both years. Coastwide bag seine and trawl catch rates of white shrimp declined from 1982 to 1983. Coastwide bag seine catch rates of pink shrimp declined from 1982 to 1983, whereas trawl catch rates were similar during both years. Coastwide mean lengths of each shrimp species caught in trawls increased from 1982 to 1983. Coastwide bag seine catch rates of blue crabs declined slightly and trawl catch rates increased slightly from 1982 to 1983. Data collected during SEAMAP indicated a decrease in brown shrimp from 1982 to 1983. Abundance of white shrimp, pink shrimp and blue crabs was about the same both years.

Data were used to recommend a 27 May-15 July closure of Texas territorial waters to shrimping to protect small brown shrimp emigrating from coastal bays from fishing until they reached a larger more valuable size. Brown shrimp were most abundant in pass catches during 16 May-3 July with the week of 30 May-5 June 5 yielding peak catch rates at Lydia Ann Channel in Aransas Pass and with the week of 27 June-3 July yielding peak catch rates at Bolivar roads in Galveston Bay.

Data in this report represent the continuation of a program designed to yield long-term trends in abundance and stability of shellfish in Texas waters. This report summarizes data and is not intended as a detailed analysis. Statistical analyses of data will provide improved information on trends as the peaks of seasonal abundance are identified through time in the different areas sampled.

INTRODUCTION

The shrimp fishery is the most valuable commercial fishery in Texas. The 1982 harvest was 32.2 million kg having a dockside value of $175.9 million (Hamilton 1983). Reported landings of shrimp species by weight consisted of 72% brown shrimp (Penaeus aztecus) and pink shrimp (P. duorarum), 27% white shrimp (P. setiferus) and 1% other species.

The shrimp fishery is primarily regulated by the Texas Legislature through the Shrimp Conservation Act of 1959. This Act requires that Texas Parks and Wildlife Department (TPWD) continually monitor the supply, economic value and other aspects of the fishery to provide information on which to base sound management decisions. The TPWD Commission has the responsibility for adjusting the statutory 1 June-15 July Gulf shrimping closed season dates should biological sampling indicate an earlier, later or more prolonged emigration of brown shrimp from the bays to the Gulf.

The blue crab (Callinectes sapidus) fishery is the third most valuable fishery in Texas following shrimp and oysters. From 1977-1982, reported landings of hardshell blue crabs averaged 3.6 million kg and were valued at $2.0 million dockside (Hamilton 1983). From 1968-1977, reported blue crab landings increased from 1.9 to 3.7 million kg indicating possible increased fishing pressure. This led to the development of the blue crab monitoring program by TPWD.

Penaeid shrimp populations have been monitored in at least some bay systems since 1958 (Benefield and Baker 1980) while blue crab populations have been monitored since 1977 (Hammerschmidt 1982). The present bay and Gulf shellfish monitoring program was implemented in 1982 (Benefield et al., 1983) and was designed to establish long term trend information on relative abundance and size of penaeid shrimp and blue crabs in Texas coastal waters. This report summarizes data collected during calendar year 1983.

MATERIALS AND METHODS

Bay Sampling

Bag Seines

During January-December 1983, samples were collected with bag seines in Galveston, Matagorda, San Antonio, Aransas and Corpus Christi Bays and the upper and lower Laguna Madre (Figures 1-9). Ten different shoreline stations were sampled each month in each bay system. Stations were randomly selected from < 100 sample stations established in each bay system. Each station on the list was at least 1.6 km of continuous shoreline from any other bag seine station (Hegen 1982).

Five different stations were sampled with bag seines during each of the first two and last two fullest weeks of each month. Each sampling week extended from sunrise Monday through sunset of the following Sunday. Samples were collected during daylight hours. The randomly

selected stations for the bag seines could not always be sampled as scheduled. If a preselected station could not be sampled, an alternate randomly selected station was substituted.

A bag seine sample was collected by pulling an extended seine parallel to shore for a distance of no less than 15.2 m and no more than 30.5 m. The rectangular surface area sampled was estimated using the distance pulled and the length of extension of the bag seine.

Bag seines were 18.3-m long and 1.8-m deep with 19-mm stretched nylon multifilament mesh in the ends and 13-mm stretched nylon multifilament mesh in the 1.8-m square bag in the middle.

Brown shrimp, white shrimp, pink shrimp and blue crabs were identified to species and counted in each sample. No more than 19 randomly selected shrimp of each species and 19 randomly selected blue crabs were measured from each sample. Shrimp were measured to the nearest 1 mm from tip of rostrum to tip of telson. Blue crabs were measured to the nearest 1 mm from lateral spine tip to lateral spine tip.

Monthly abundance (No./ha) were calculated using the ratio estimator (Cochran 1977):

$$A = \frac{N}{H}$$

A = abundance
N = total number of individuals of each species caught
H = total number of hectares covered

Values were reported to the nearest 0.01 individuals/ha. Mean monthly length (nearest 1 mm as described above) was calculated using the ratio estimator:

$$\bar{L} = \frac{L \sum_{i=1}^{k} C_i \frac{\sum_{j=1}^{m} L_{ij}}{m_i}}{\sum_{i=i}^{k} C_i}$$

$\bar{L}$ = mean monthly length
k = total no. samples
C_i = total catch in sample i
m_i = total organisms measured in sample i
L_{ij} = length of j^{th} organism in sample i.

Coastwide mean monthly abundance and size values were calculated by weighting individual bay system values by the total amount of shoreline present in the respective bay system (Matlock and Ferguson 1982).

Hydrologic variables including salinity (o/oo) and water temperature (C) were measured at the time and location of each sample. Monthly means of these variables are summarized in Appendix A, Tables A.1-2.

Trawls

During January-December 1983, samples were collected with trawls in the Galveston, Matagorda, San Antonio, Aransas, Corpus Christi Bays and the upper and lower Laguna Madre. Trawl stations were established using

grids on National Oceanic and Atmospheric Administration (NOAA) Nautical Charts (Figures 10-19). Grids were based on 1-minute longitude-latitude lines. A sample station was established in a grid if at least 1/3 of the grid's surface area was covered by water > 1 m and had no known obstructions, snags or reefs which would hinder sampling, damage equipment or compromise safety.

Bay systems were divided into three sampling zones: Zone I (upper bay), Zone II (lower bay) and Zone III (passes) (Figures 10-19). Galveston, Matagorda, Aransas and Corpus Christi Bays were divided into Zones I, II and III; San Antonio into Zones I and II; upper Laguna Madre into Zone II; and, lower Laguna Madre into Zones II and III. Zone I contained upper bay stations nearest the mouths of rivers and bayous while Zone II contained lower bay stations farthest from river and bayou influence. Zone III contained pass stations including Bolivar Roads (Galveston Bay), Pass Cavallo and Matagorda Ship Channel (Matagorda Bay), Lydia Ann Channel (Aransas Bay), Corpus Christi Ship Channel (Corpus Christi Bay) and Brazos Santiago Pass (lower Laguna Madre).

Five stations in Zone I and five in Zone II were sampled during each of the first and latter half of the month. Data collected in Zones I and II were combined and reported as monthly catch totals. Two stations were sampled in Zone III each week and the sample week extended from Monday-Sunday. All stations to be sampled were selected randomly for each zone and each sample period. Samples were collected during day light hours only.

Trawls used in bays were 6.1-m wide at the mouth measured along the cork line between the rear margins of the trawl doors. The net was constructed of #9 nylon multifilament thread with a stretched mesh of 38 mm throughout. Trawl doors were 1.2-m long and 0.6-m high.

Trawls were towed using available TPWD boats. Trawls were towed in Zones I and II in a circular fashion near the center of each sample grid. They were towed linearly in Zone III (Gulfward or bayward); one sample with the current and one sample against the current. Direction of tow was randomly selected at each station on each sample date. Tow duration was 15 minutes in all bay systems except in the upper Laguna Madre where heavy vegetation necessitated reducing tow duration to 7.5 minutes. Catches in upper Laguna Madre were doubled to be comparable with all other catches. If a particular scheduled station could not be sampled, an alternate station was selected at random from stations immediately adjacent to that which could not be sampled.

Brown shrimp, white shrimp, pink shrimp and blue crabs were identified to species and counted in each sample. No more than 50 randomly selected shrimp of each species and 35 randomly selected blue crabs were measured from each sample. Shrimp were measured to the nearest 1 mm from tip of rostrum to tip of telson. Blue crabs were measured to the nearest 1 mm from lateral spine tip to lateral spine tip.

Catch rates were calculated in the same manner used for bag seines except total number of tows made was used instead of total area fished. Values were reported to the nearest 0.1 individuals/tow; the notation

< 0.1 individuals/tow indicated that at least one shrimp or crab was caught but due to the rounding, the value of the derived catch rate was less than the established degree of precision (Cochran 1977). Mean size of each species was calculated in the same manner as for bag seines. Coastwide data were weighted according to the percentage of each bay system's surface area in water > 1.2-m deep contributed to the coastwide area (Matlock and Ferguson 1982).

Hydrologic variables including salinity (o/oo) and water temperature (C) were measured at the time and location of each tow. Monthly means of these variables were summarized in Appendix A, Tables A.3-6.

Gulf Sampling

From January-July 1983, TPWD conducted a penaeid shrimp monitoring program in the Gulf of Mexico along the Texas coast from latitude 26°40'N to latitude 28°40'N.

During January-February 1983 and June-July 1983, samples were taken in randomly selected 1-minute sample grids within the territorial sea in NMFS statistical subareas 19 and 20 (Figure 20). Proposed stations were equally and randomly divided between day and night in depths ranging from 7 m to 22 m.

During June and July 1983, 40 randomly selected stations out to a depth of 82 m were sampled during the night as part of the Southeastern Area Monitoring and Assessment Program (SEAMAP). An additional 69 stations were sampled along the Texas coast by the National Marine Fisheries Service (NMFS) vessel OREGON II.

For long-term trend data two different trawls have been used; one was 12.2-m wide (used exclusively after September 1981) and the other was 13.7-m wide, measured along the headrope between the rear margins of the trawl doors. No adjustments were made in catches in the two nets because no differences were found in catch rates between the 12.2-m and 13.7-m trawls (Matthews 1982). Both trawls were constructed of #18 nylon multifilament thread in the body with a stretched mesh of 51 mm and of #36 nylon multifilament thread in the bag with a stretched mesh of 44 mm. Both trawls were equipped with tickler chains and spread with wooden doors, 2.1-m long and 0.9-m high. Sampling was conducted aboard the 21.9-m steel-hull shrimp trawler, R/V WESTERN GULF.

All penaeid shrimp were removed from the catch and sorted by species. No more than 50 randomly selected shrimp of each species were divided by sex, weighed en masse and measured individually. All remaining shrimp of each species were weighed en masse and estimates of the total number were calculated:

$$N = \frac{T}{S} \times n$$

T = total weight of species
S = subsample weight of species
n = number of shrimp in subsample
N = total number of shrimp in sample

Shrimp were measured to the nearest 1 mm from tip of rostrum to tip of telson.

Catch rates were calculated in the same manner used for bag seines except total hours fished (to nearest 0.1) was used instead of total area fished. Mean size of each species was calculated in the same manner as for bag seines.

Hydrologic variables including salinity (o/oo) and water temperature (C) were measured at the time and location of each trawl sample. Monthly means of these variables are summarized in Appendix A, Tables A.7-8.

This report summarizes data collected during calendar year 1983. Data collected in bag seines and bay trawls during January-March 1984 are summarized in Appendix B, Tables B.1-12. Data collected in Gulf trawls during January 1983 - March 1984 in Gulf Statistical Area 21 and the Fishery Conservation Zone (FCZ) are summarized in Appendix C, Tables C.1-4. These data are not included in the calculations presented in the text in order to maintain consistency between the years.

Any difference in this report compared to previous reports is due to updating of the data base and the most recent report should be considered the most accurate.

RESULTS

Bay Sampling

Bag Seines

Annual Trends. Coastwide annual mean catch rates of brown shrimp decreased from 509.65/ha during 1982 to 308.26/ha during 1983 (Table 1). Annual mean catch rates ranged from 40.60/ha in the upper Laguna Madre during 1983 to 1007.77/ha in the lower Laguna Madre during 1981. Brown shrimp annual mean catch rates increased during 1983 in Matagorda and Aransas Bays and decreased in the remaining bays when compared to 1982 catch rates. The 1983 Matagorda Bay catch rate of 248.20/ha was the highest since bag seine sampling was initiated in 1978. Coastwide annual mean length of brown shrimp increased from 53 mm during 1982 to 58 mm during 1983. Annual mean lengths ranged from a low of 49 mm in San Antonio Bay during 1982 and Corpus Christi Bay during 1981 to a high of 72 mm in upper Laguna Madre during 1981.

Coastwide annual mean catch rates of white shrimp ranged from 288.20/ha during 1980 to 1275.71/ha during 1982 (Table 1). Annual mean catch rates decreased in each bay system during 1983 when compared to 1982 catch rates. Catch rates ranged from 2.75/ha in upper Laguna Madre during 1979 to 3559.63/ha in Galveston Bay during 1982. Coastwide annual mean length of white shrimp decreased from 57 mm during 1982 to 53 mm during 1983. Annual mean lengths ranged from a low of 42 mm in Corpus Christi Bay during 1983 to a high of 74 mm in Matagorda Bay during 1980.

Coastwide annual mean catch rates of pink shrimp increased from 3.28/ha during 1978 to 25.54/ha during 1982 and declined to 12.62/ha in 1983 (Table 1). Annual mean catch rates ranged from 0.00/ha in all bays except the upper Laguna Madre to 124.40/ha in Aransas Bay during 1982. Coastwide annual mean length of pink shrimp increased from 48 mm during 1982 to 53 mm during 1983. Annual mean lengths ranged from a low of 46 mm in Aransas Bay during 1981 to a high of 106 mm in lower Laguna Madre during 1979.

Coastwide annual mean catch rates of blue crabs in bag seines increased from 48.94/ha in 1978 to 101.67/ha in 1982 and declined slightly to 85.55/ha in 1983 (Table 1). Mean catch rates in individual bay systems ranged from 10.68/ha during 1978 in Matagorda Bay to 192.61/ha during 1982 in Aransas Bay. Coastwide annual mean widths of blue crabs decreased from 52 mm in 1978 to 46 mm in 1983.

Monthly Trends. Coastwide monthly mean catch rates of brown shrimp were generally highest (639.65-1405.21/ha) during April-June (Table 2). Monthly mean catch rates ranged from a low of 0.00/ha in each bay to a high of 2696.67/ha in Galveston Bay during June. Coastwide monthly mean lengths of brown shrimp ranged from a low of 35 mm during January to a high of 68 mm during July. Monthly mean lengths ranged from a low of 30 mm in Corpus Christi Bay during April to a high of 85 mm in upper Laguna Madre during June.

Coastwide monthly mean catch rates of white shrimp were highest (934.39-1516.76/ha) during July-October (Table 3). Mean monthly catch rates ranged from a low of 0.00/ha in six of the seven bays to a high of 5286.67/ha, in Galveston Bay during August. Coastwide monthly mean lengths of white shrimp ranged from a low of 36 mm during June to a high of 104 mm during May. Monthly mean lengths ranged from a low of 28 mm in Corpus Christi Bay during February to a high of 160 mm in Matagorda Bay during June.

Coastwide monthly mean catch rates of pink shrimp were highest (50.63/ha) during November (Table 4). No pink shrimp were collected in Galveston Bay and the lower Laguna Madre. Monthly mean catch rates ranged from 0.00/ha in each bay to 181.40/ha in Aransas Bay during November. Coastwide monthly mean lengths of pink shrimp ranged from a low of 35 mm during July to a high of 80 mm during May. Monthly mean lengths ranged from a low of 27 mm in Aransas Bay during February to a high of 100 mm in San Antonio Bay during May.

Coastwide mean monthly catch rates of blue crabs were generally higher (202.95-246.60/ha) during March-April than the remainder of the year when catch rates ranged from 31.5/ha to 126.91/ha (Table 5). Catches in these months were among the highest in each bay system. Monthly mean catch rates within individual bay systems ranged from 0.00/ha in Corpus Christi Bay and the upper Laguna Madre to 660.00/ha in San Antonio Bay.

Coastwide monthly mean widths of blue crabs during 1983 ranged from 28 mm in February and March to 79 mm in September and varied without discernable pattern. Monthly mean widths within individual bay systems ranged from 20 mm in San Antonio and Corpus Christi Bays to 121 mm in Matagorda Bay.

Trawls

Annual Trends. Coastwide mean catch rate comparisons were calculated for the May-December period of 1982-83 due to coastwide sampling not being initiated until May 1982. Coastwide annual mean catch rates of brown shrimp increased from 6.8/tow during 1982 to 7.2/tow during 1983 (Table 6). Annual mean catch rates ranged from a low of 0.9/tow in the upper Laguna Madre to a high of 14.3/tow in Aransas Bay during 1983. Annual mean catch rates increased during 1983 in Matagorda, San Antonio and Aransas Bays and the lower Laguna Madre while catch rates decreased in the three other bay systems when compared to 1982 catch rates. Coastwide annual mean lengths of brown shrimp increased from 90 mm during 1982 to 95 mm during 1983. Brown shrimp caught in the lower Laguna Madre were considerably smaller (61 and 65 mm respectively during 1982-83) than were shrimp from other bay systems.

Coastwide annual mean catch rates of white shrimp decreased from 11.7/tow during 1982 to 10.2/tow during 1983 (Table 6). Annual mean catch rates decreased in each bay system during 1983 with the exception of Aransas Bay which yielded only a slight increase over 1982. Mean catch rates of white shrimp ranged from a low of 0.4/tow in the lower Laguna Madre during 1983 to a high of 20.1/tow in Galveston Bay during 1982. Coastwide annual mean lengths of white shrimp increased from 91 mm during

1982 to 100 mm during 1983. Annual mean lengths ranged from a low of 63 mm in the lower Laguna Madre during 1982 to a high of 112 mm in the upper Laguna Madre during 1983.

Coastwide annual mean catch rates of pink shrimp were similar during 1982-83 (0.4 and 0.3/tow) (Table 6). Catch rates ranged from a low of 0.0/tow in the lower Laguna Madre during 1982 to a high of 2.3/tow in Aransas Bay during 1983. Coastwide annual mean lengths increased from 93 mm during 1982 to 101 mm during 1983. Mean sizes ranged from a low of 88 mm in the lower Laguna Madre during 1983 to a high of 116 mm in Matagorda Bay during 1982.

Coastwide annual mean catch rates of blue crabs increased from 4.4/tow during 1982 to 5.1/tow during 1983 (Table 6). Annual mean catch rates during 1983 ranged from a low of 0.7/tow in the upper Laguna Madre to a high of 9.0/tow in Aransas Bay. Annual mean catch rates increased in Matagorda, San Antonio and Aransas Bays and declined in all other bay systems when compared to 1982 catch rates. Coastwide annual mean widths of blue crabs were slightly smaller (92 mm) in 1983 than in 1982 (94 mm).

Monthly Trends. Coastwide monthly mean catch rates of brown shrimp were highest (13.1-21.9/tow) during May-July (Table 7). Monthly mean catch rates ranged from 0.0/tow in four bays to a high of 81.5/tow in Aransas Bay during June. Coastwide mean lengths ranged from a low of 78 mm during January to a high of 102 mm during August. Monthly mean lengths ranged from a low of 34 mm in lower Laguna Madre during August to a high of 128 mm in upper Laguna Madre during August.

Coastwide monthly mean catch rate of white shrimp were highest during March-April (9.6-16.2/tow) and September-December (10.3-24.3/tow) (Table 8). Monthly mean catch rates ranged from 0.0/tow in three bays to a high of 49.2/tow in Galveston Bay during November. Coastwide mean lengths of white shrimp were smallest (78 mm) during January and largest (138 mm) during June. Monthly mean lengths ranged from 66 mm in San Antonio Bay during February to 154 mm in Corpus Christi Bay during June.

Coastwide monthly mean catch rates of pink shrimp were lowest (0.0/tow) during June and August and highest (3.0/tow) during April (Table 9). Monthly mean catch rates ranged from 0.0/tow in all bays to a high of 13.5/tow in Aransas Bay during April. Coastwide mean lengths ranged from 87 mm during September to 105 mm during July. Monthly mean lengths ranged from 63 mm in upper Laguna Madre during January to 128 mm in the upper Laguna Madre during May.

Coastwide monthly mean catch rates of blue crabs were generally higher (6.0-10.3/tow) during April-July than during the remainder of the year (0.5-4.3/tow) (Table 10). This general pattern was similar to each bay system. Mean monthly catch rates ranged from 0.0/tow in upper Laguna Madre to 18.1/tow in Galveston and Aransas Bays. Coastwide monthly mean lengths ranged from 64 mm in March to 113 mm in October.

Pass Sampling. Weekly catch rates of brown shrimp were generally highest during the period of 8 May-3 July ranging from 0.0/tow in Matagorda and Corpus Christi Ship Channel stations to 454.5/tow in Lydia

Ann Channel (Table 11). Weekly mean lengths ranged from 38 mm in lower Laguna Madre during 24-30 October to 173 mm in the Corpus Christi Ship Channel during 14-20 November.

Weekly catch rates of white shrimp were highest during the period 24 October-25 December ranging from 0.0/tow in each pass to 95.5/tow in Bolivar Roads (Table 12). Periods of smaller weekly catch rates of 25.0-28.0/tow during 24 January 27 February and 15.5-16.0/tow during 11-24 April were noted in Bolivar Roads. Weekly mean lengths ranged from 65 mm in Bolivar Roads during 3-9 January and Brazos Santiago during 13-19 June to 163 mm in Bolivar Roads during 2-8 May.

Weekly mean catch rates of pink shrimp were generally highest during March-April ranging from 0.0/tow at each pass station to 68.5/tow in Lydia Ann Channel during 21-27 March (Table 13). Mean lengths ranged from 36 mm in Bolivar Roads during 21-27 November to 160 mm in Pass Cavallo during 30 May-5 June.

Weekly catch rates of blue crabs caught at pass stations exhibited peaks during spring months (February-April) and during summer months (July-August) (Table 14). Catch rates ranged from 0.0/tow in all pass areas except Bolivar Roads to 66.5/tow in Lydia Ann Channel during the spring. They ranged from 0.0/tow in Pass Cavallo and the Matagorda and Corpus Christi Ship Channels to 75.5/tow in the Lydia Ann Channel during summer. Weekly mean lengths ranged from 11 mm in Pass Cavallo during 28 March-3 to April 181 mm in Brazos Santiago Pass during 14-20 March.

Gulf Sampling

Seasonal Trends

15 June-15 July. Seasonal catch rates (all depths combined) of brown shrimp in the Gulf fluctuated without pattern, and ranged from 134.0/h in 1979 to 2608.6/h during 1978 (Table 15). Mean lengths approximated 100-110 mm except in 1979 when the mean was 122 mm. Except in 1979 when only one sample per depth zone was collected, mean lengths of brown shrimp were generally smaller (90-117 mm) in 11-27 m than in 29-46 m (101-140 mm). Catches were also generally greater (358.0-3617.7/h) in the shallower depths than in the deeper depths (57.0-1649.0/h).

During 1983 more samples were taken in each depth zone than in any of the previous 5 years. Catch rates and mean lengths were similar to other years with the highest mean catch rate in 20-27 m (3538.6/h) and the lowest mean catch rate in 38-46 m (228.2/h). Mean lengths increased with depth and the overall mean of 114 mm was the largest since 1979.

Seasonal mean catch rates of white shrimp in the Gulf ranged from 0.0/h during 1979 to 19.9/h during 1978 with no discernible trend (Table 15). White shrimp were caught primarily in the 11-18 m depth zone. Mean lengths generally approximated 165-190 mm with no consistent pattern in mean length fluctuations. Catch rates and sizes in 1983 were consistent with other years except that white shrimp were captured for the first time in the 29-37 m zone.

Seasonal mean catch rates of pink shrimp in the Gulf generally increased from 3.0/h during 1978 to 88.4/h during 1983 (Table 15). Pink shrimp were caught primarily in the 11-18 m depth zone. Mean lengths of pink shrimp for combined depth zones ranged from 112 mm during 1978 to 137 mm during 1982. Mean annual lengths fluctuated without discernible pattern. The overall catch rate in 1983 was the highest in 6 years (88.4/h) with relatively high catch rates in the three shallowest zones.

November-February. Mean catch rates of brown shrimp in the Gulf ranged from 0.0/h during 1978-79 to 26.0/h during 1977-78 with no apparent trend among years (Table 16). Mean lengths of brown shrimp ranged from 88 mm to 109 mm. There was no consistent pattern in mean length fluctuations.

Seasonal mean catch rates for white shrimp in the Gulf ranged from 166.5/h during 1980-81 to 854.6/h during 1978-79 (Table 16). There were no apparent trends in catch rates. Mean lengths of white shrimp ranged from 103 mm to 120 mm and fluctuated without discernible pattern.

Seasonal mean catch rates of pink shrimp in the Gulf ranged from 4.1/h during 1982-83 to 19.4/h during 1980-81 with no discernible pattern in trends (Table 16). Seasonal mean lengths ranged from 89 mm to 106 mm with no consistent trend.

Monthly Trends

Monthly mean catch rates of brown shrimp within the Texas territorial sea (< 16.7 km) in 1983 were highest during June (up to 2838.5/h) in both statistical areas 19 and 20 (Table 17). During June, mean catch rates were greater during the night than during the day. Monthly mean lengths of brown shrimp in day samples ranged from 85 mm in January to 100 mm in June while those in night samples ranged from 86 mm in January to 126 mm in February. Mean lengths fluctuated without discernible pattern. Mean catch rates outside of the Texas territorial sea are presented in Appendix C, Tables C.1 and 4.

Monthly mean catch rates of white shrimp within the Texas territorial sea were lowest (0.0-25.0/h) and mean lengths largest (164-172 mm) during June-July (Table 18). Except for Area 20 during January 1983, day and night catch rates were approximately equal. Mean catch rates outside the Texas territorial sea are presented in Appendix C, Tables C.2 and 4.

Monthly mean catch rates of pink shrimp within the Texas territorial sea were highest during June-July 1983 (Table 19). Catch rates were generally higher in Area 20 than in Area 19. Monthly mean lengths of pink shrimp in day samples ranged from 84 mm in February to 107 mm in June while those in night samples ranged from 96 mm in February to 123 mm in July. Pink shrimp in night samples were generally larger than in day samples during 1983. Mean catch rates outside the Texas territorial sea are presented in Appendix C, Tables C.3 and 4.

Data on brown shrimp, white shrimp, pink shrimp and blue crabs collected off the Texas coast by TPWD and NMFS during the 1982 and 1983 SEAMAP sampling indicated that brown shrimp, with catches of up to 1445/h,

were the most abundant of the four species (Table 20). They were most numerous within the 19-37-m depth zone both years. Abundance was greater in 1982 since catch rates (1222/h) were higher in 0-18 m than in 1983 (254/h). Mean lengths increased with depth each year.

White shrimp, pink shrimp and blue crabs were most numerous within the shallowest (0-18 m) depth zone each year (Table 20). There was no large difference in numbers between years for the three species. White shrimp were larger (153 to 173 mm) than brown shrimp (99 to 119 mm) within 37 m, while mean lengths of pink shrimp were intermediate (118-138 mm) between the other two species. Lengths of pink shrimp did not increase with depth. No mean lengths were available for blue crabs.

DISCUSSION

The TPWD is mandated by the Texas Legislature to investigate the supply, economic value, environment, breeding habits, sex ratios, effects of fishing and any other factors or conditions causing increases or decreases in supply of shellfish in Texas waters. Long term trend data based on routine monitoring are necessary to assess changes in abundance and stability of shellfish populations in order to meet this mandate.

Data in this report represent the second year of a program that will yield long term trends in abundance and stability of shellfish along shorelines, the deeper waters of the bays and in the Gulf of Mexico. This report summarizes the data collected and is not intended to be a detailed analysis, but to outline general trends in abundance and size of organisms. Data gathered were used to recommend the 1983 seasonal closure date (27 May-15 July) for the flexible Gulf shrimping season (Bryan 1985). Statistical analyses of data will provide improved information on trends for all organisms as the peaks of seasonal abundance are identified through time in different areas.

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Table 1. Annual mean catch rate (No./ha) and mean sizes (mm) of shellfishes caught with bag seines in Texas bay systems during calendar years 1978-1983 (blank = no measurement taken).

Bay system	Year	Number samples	Brown shrimp		White shrimp		Pink shrimp		Blue crab	
			No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Width
Galveston	1978[a]	66	555.98	59	857.61	60	0.00		66.30	52
	1979	72	481.95	57	1719.92	61	0.00		105.56	52
	1980	72	494.86	57	571.03	64	0.00		121.96	54
	1981	84	718.73	54	1393.24	65	0.00		57.77	53
	1982	120	915.05	52	3559.63	56	0.00		100.56	48
	1983	120	374.16	61	1524.17	50	0.00		148.03	43
Matagorda	1978[a]	66	172.40	62	571.36	66	0.00		10.68	38
	1979	72	194.45	64	542.83	71	0.00		27.32	52
	1980	72	144.37	56	544.36	74	0.00		23.94	56
	1981	84	156.86	63	804.58	63	0.00		43.54	44
	1982	120	206.67	56	1749.60	66	0.00		31.25	51
	1983	120	248.20	66	394.17	65	0.00		35.14	34
San Antonio	1978[a]	66	103.13	62	134.38	60	0.52	100	52.65	51
	1979	72	69.44	62	211.58	57	0.00		75.93	49
	1980	72	552.78	64	290.74	53	6.02	51	118.98	45
	1981	84	310.32	59	66.27	59	27.78	61	51.19	54
	1982	120	599.45	49	649.73	54	0.00		106.95	42
	1983	120	235.15	55	147.27	64	9.70	51	53.33	40
Aransas	1978[a]	68	152.46	59	92.33	50	0.31	63	57.06	62
	1979	72	438.11	62	98.85	59	0.00		83.96	62
	1980	72	386.24	64	133.15	60	13.48	50	64.61	52
	1981	84	354.84	58	182.63	65	86.60	46	85.11	45
	1982	120	505.33	53	296.91	44	124.40	48	192.61	48
	1983	120	534.45	60	129.72	53	50.70	56	145.28	43
Corpus Christi	1978[a]	66	258.49	52	62.42	50	0.00		33.03	43
	1979	72	499.43	60	816.82	51	57.97	50	152.17	43
	1980	72	183.34	60	140.96	60	57.63	56	79.94	38
	1981	84	679.28	49	172.93	65	66.59	50	86.34	40
	1982	120	428.05	56	369.14	44	67.20	47	52.56	49
	1983	120	299.80	56	136.31	42	31.64	47	48.18	40

Table 1. (Cont'd.).

Bay system	Year	Number samples	Brown shrimp		White shrimp		Pink shrimp		Blue crab	
			No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Width
Upper Laguna Madre	1978[a]	66	188.26	64	20.83	55	26.14	79	97.73	61
	1979	72	53.47	61	4.86	53	12.50	78	90.28	48
	1980	72	63.99	64	62.50	62	9.72	60	64.93	40
	1981	84	101.79	72	19.05	65	8.33	69	41.96	58
	1982	120	61.88	65	13.96	50	7.29	58	35.42	54
	1983	120	40.60	65	2.75	71	13.08	54	28.67	59
Lower Laguna Madre	1978[a]	66	119.70	53	129.92	49	0.00		18.94	59
	1979	72	155.05	56	143.00	48	0.33	106	61.24	54
	1980	72	234.25	53	17.81	45	2.40	75	176.37	46
	1981	84	1007.77	55	263.86	60	5.54	64	167.19	35
	1982	120	556.25	55	325.91	48	3.32	64	175.04	42
	1983	120	392.63	50	247.81	52	0.00		100.20	33
Coastwide	1978[a]	464	249.90	59	337.65	60	3.28	79	48.94	52
	1979	504	284.73	60	607.83	59	6.99	55	83.03	51
	1980	504	314.43	60	288.20	64	9.59	56	94.72	47
	1981	588	489.86	55	527.46	64	23.89	51	74.51	47
	1982	840	509.65	53	1275.71	57	25.54	48	101.67	48
	1983	840	308.26	58	483.00	53	12.62	53	85.55	46

[a]No samples collected in June 1978.

Table 2. Monthly mean catch rate (No./ha) and mean length (mm) of brown shrimp caught with bag seines in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Samples[a]	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre		Coastwide	
		No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length
Jan	10	16.67	35	0.00		0.00		0.00		0.00		0.00		0.00		3.74	35
Feb	10	0.00		8.33	33	0.00		2.04	31	0.00		0.00		20.41	57	4.31	49
Mar	10	3.33		1.67	52	33.33	47	44.00	36	34.09	36	0.00		84.09	36	25.32	39
Apr	10	213.33	33	6.67	35	806.67	43	1130.61	41	176.19	30	237.50	54	2057.14	46	639.65	43
May	10	586.21	60	46.67	52	950.00	52	2410.64	64	1519.45	52	32.50	64	557.78	61	805.41	58
Jun	10	2696.67	65	2175.00	65	963.33	57	1312.25	59	584.62	59	67.50	85	912.82	50	1405.21	61
Jul	10	306.67	68	491.67	72	296.67	82	1020.46	67	1018.18	64	37.50	78	106.00	57	432.76	68
Aug	10	66.67	65	171.67	63	20.00	62	198.00	79	315.79	55	0.00	6	651.16	56	189.67	60
Sep	10	139.28	49	26.67	58	153.33	65	127.08	59	60.00	47	47.50	62	793.18	47	187.00	51
Oct	10	265.52	54	1.67	46	133.33	54	24.44	60	115.15	44	2.78	73	470.21	50	153.98	51
Nov	10	140.00	59	46.67	53	30.00	62	193.02	71	38.78	60	257.50	68	933.33	53	226.66	58
Dec	10	43.33	52	1.67	51	6.67	59	2.04	60	16.28	59	0.00		77.55	42	22.52	48

[a]10 Samples per month on each bay system: 70 samples per month coastwide.

Table 3. Monthly mean catch rate (No./ha) and mean length (mm) of white shrimp caught with bag seines in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Samples[a]	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre		Coastwide	
		No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length
Jan	10	6.67	46	0.00		0.00		0.00		0.00		0.00		0.00		1.50	46
Feb	10	6.67	43	5.00	70	0.00		0.00		4.76	28	0.00		0.00		2.63	47
Mar	10	6.67	67	0.00		0.00		0.00		6.82	58	0.00		0.00		2.12	62
Apr	10	71.43	75	0.00		0.00		2.04	68	0.00		0.00		0.00		25.02	75
May	10	10.34	104	0.00		0.00		0.00		0.00		0.00		0.00		2.47	104
Jun	10	6.67	39	1.67	160	0.00		4.08	30	0.00		0.00		141.03	35	21.03	36
Jul	10	4713.34	38	131.67	50	260.00	54	416.64	45	561.36	43	7.50	40	262.00	45	1229.11	40
Aug	10	5286.67	50	1486.67	52	206.67	46	194.00	50	263.16	38	0.00		372.09	41	1516.76	49
Sep	10	3435.72	54	666.67	71	130.00	59	291.67	60	47.50	65	0.00		88.64	59	934.39	57
Oct	10	2765.52	61	1441.67	80	586.67	70	222.22	69	775.76	38	11.11	72	1348.94	59	1249.39	63
Nov	10	1503.33	56	983.33	60	433.33	71	453.49	51	28.57	43	12.50	89	535.71	48	669.66	57
Dec	10	616.67	54	13.33	56	3.33	48	6.12	44	72.09	68	0.00		0.00		143.65	55

[a]10 Samples per month in each bay system; 70 samples per month coastwide.

Table 4. Monthly mean catch rate (No./ha) and mean length (mm) of pink shrimp caught with bag seines in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Samples[a]	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre		Coastwide	
		No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length
Jan	10	0.00		0.00		0.00		0.00		0.00		10.00	56	0.00		1.21	56
Feb	10	0.00		0.00		0.00		2.04	27	7.14	52	80.00	52	0.00		10.32	51
Mar	10	0.00		0.00		0.00		68.00	57	34.09	44	50.00	58	0.00		18.40	54
Apr	10	0.00		0.00		0.00		153.06	68	17.07	50	0.00		0.00		36.19	66
May	10	0.00		0.00		3.33	100	4.26	81	2.78	54	0.00		0.00		1.24	80
Jun	10	0.00		0.00		0.00		20.41	42	0.00		0.00		0.00		2.84	42
Jul	10	0.00		0.00		0.00		77.27	35	0.00		0.00		0.00		10.75	35
Aug	10	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Sep	10	0.00		0.00		0.00		0.00		42.50	50	0.00		0.00		7.46	50
Oct	10	0.00		0.00		23.33	43	15.56	56	42.42	50	0.00		0.00		8.77	49
Nov	10	0.00		0.00		80.00	51	181.40	50	169.39	47	5.00	56	0.00		50.63	49
Dec	10	0.00		0.00		0.00		100.00	62	0.00		0.00		0.00		13.91	62

[a]10 samples per month in each bay system; 70 samples per month coastwide.

Table 5. Monthly mean catch rate (No./ha) and mean width (mm) of blue crabs caught with bag seines in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Samples[a]	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre		Coastwide	
		No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length
Jan	10	40.00	41	13.33	23	26.67	31	93.88	44	29.55	20	2.50	31	4.00	28	31.48	37
Feb	10	340.00	30	151.67	22	46.67	22	53.06	26	33.33	21	35.00	37	75.51	31	126.91	28
Mar	10	450.00	28	55.00	25	80.00	28	228.00	25	86.36	22	65.00	55	300.00	26	202.95	28
Apr	10	103.33	29	58.33	41	660.00	38	544.90	41	30.95	31	125.00	58	265.31	40	246.60	40
May	10	262.07	37	48.33	23	126.67	41	44.68	58	211.11	43	27.50	57	17.78	56	110.71	41
Jun	10	36.67	101	16.67	121	53.33	45	148.98	49	25.64	56	5.00	55	33.33	34	46.05	57
Jul	10	196.67	61	43.33	33	100.00	54	145.45	81	31.82	94	90.00	56	192.00	34	120.40	57
Aug	10	93.33	59	15.00	87	33.33	41	48.00	54	44.74	45	7.50	41	225.58	31	68.65	43
Sep	10	110.71	79	8.33	126	33.33	103	83.33	94	30.00	68	25.00	85	93.18	45	58.99	79
Oct	10	55.17	64	5.00	51	26.67	49	8.89	72	54.55	34	16.67	91	65.96	28	33.70	47
Nov	10	73.33	56	5.00	89	46.67	20	86.05	25	42.86	28	40.00	69	97.62	23	56.07	35
Dec	10	13.33	80	1.67	23	13.33	31	234.69	28	0.00		0.00		10.20	60	38.72	32

[a]10 samples per month in each bay system; 70 samples per month coastwide.

Table 6. Annual mean catch rate (No./tow) and mean sizes (mm) of shellfishes caught with 6.1 m trawls in Texas bay systems during calendar years 1982-1983 (blank = no measurement taken).

Bay System	Year	Number Samples	Brown Shrimp		White Shrmip		Pink Shrimp		Blue Crabs	
			No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Width
Galveston	1982	240	5.7	89	20.1	91	0.3	93	7.0	91
	1983	240	3.2	99	19.4	93	<0.1	95	6.0	89
Matagorda	1982	160	6.3[a]	95	10.3[a]	88	<0.1[a]	116	1.3[a]	97
	1983	240	6.5	101	5.1	100	0.3	113	2.5	86
San Antonio	1982	240	4.1	101	3.5	100	<0.1	92	4.1	81
	1983	240	7.7	99	3.2	93	1.2	95	5.3	80
Aransas	1982	240	13.8	80	4.1	95	1.8	89	7.2	66
	1983	240	14.3	90	4.5	100	2.3	94	9.0	80
Corpus Christi	1982	160	10.2[a]	89	6.4[a]	102	0.5[a]	100	1.9[a]	98
	1983	240	2.2	98	3.6	111	0.4	102	1.3	101
Upper Laguna Madre	1982	80	9.5[a]	105	2.0[a]	109	0.5[a]	96	1.1[a]	148
	1983	120	0.9	102	0.8	112	0.2	113	0.7	115
Lower Laguna Madre	1982	77	1.6[a]	61	1.9[a]	63	0.0[a]		5.1[a]	106
	1983	120	2.3	65	0.4	83	0.2	88	3.1	95
Coastwide	1982	1197	6.8[b]	90	11.7[b]	91	0.4[b]	93	5.1[b]	94
	1983	1440	7.2[b]	95	10.2[b]	100	0.3[b]	101	5.1[b]	92

[a]No samples Jan-Apr

[b]Based on May-Dec samples

Table 7. Monthly mean catch rate (No./tow) and mean size (mm) of brown shrimp caught with 6.1-m trawls in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Number of samples[a]	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre		Coastwide	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	20	0.2	73	0.00		0.1	61	0.1	88	0.0		0.2	96	0.4	73	0.1	78
Feb	20	0.0		0.00		1.2	73	0.2	73	0.0		0.5	103	0.0		0.2	81
Mar	20	0.1	78	0.3	68	1.0	82	0.7	81	0.2	95	0.2	116	0.3	71	0.3	84
Apr	20	1.4	97	1.8	91	7.8	95	6.1	86	0.4	73	0.8	122	4.8	63	2.7	86
May	20	3.8	94	22.4	107	29.8	99	45.0	90	9.6	101	0.5	104	11.8	61	15.1	94
Jun	20	10.0	92	29.3	100	38.3	99	81.5	92	3.5	90	2.0	109	0.3	64	21.9	95
Jul	20	17.3	106	18.6	98	10.5	104	12.6	92	3.2	93	0.4	118	0.7	63	13.1	99
Aug	20	2.7	107	3.1	108	1.9	115	7.6	99	2.5	101	0.1	128	0.4	34	2.8	102
Sep	20	0.1	58	0.7	99	0.9	96	4.1	88	4.1	103	1.2	86	1.8	50	1.2	88
Oct	20	0.2	78	0.2	94	0.3	86	2.6	88	0.4	93	3.2	91	3.0	71	0.7	84
Nov	20	1.5	78	0.8	81	0.3	92	10.1	78	0.9	100	0.7	100	3.3	83	1.9	81
Dec	20	0.5	72	0.3	82	0.3	77	1.3	82	0.2	109	1.2	114	1.1	91	0.5	92

[a]20 samples were taken in each bay except upper and lower Laguna Madre where 10 samples were taken.

Table 8. Monthly mean catch rate (No./tow) and mean size (mm) of white shrimp caught with 6.1-m trawls in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Number of samples[a]	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre		Coastwide	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	20[a]	1.5	74	1.3	80	0.5	69	0.8	74	0.2	108	0.1	88	0.1	118	1.0	78
Feb	20	13.8	80	0.4	83	0.8	66	0.3	76	0.0		0.0		0.0		5.3	79
Mar	20	23.4	86	2.6	87	0.8	82	2.0	84	0.2	121	0.8	103	0.1	78	9.6	86
Apr	20	38.0	98	8.2	96	1.2	92	0.5	106	0.3	108	0.6	121	0.0		16.2	98
May	20	14.2	112	4.6	132	3.2	105	0.7	130	0.3	117	0.2	123	0.1	128	6.7	116
Jun	20	3.1	124	2.8	150	0.2	140	0.3	146	0.4	154	0.3	138	0.1	136	1.9	138
Jul	20	0.8	100	0.9	83	0.3	92	0.1	91	0.0		0.0		0.0		0.5	91
Aug	20	10.3	98	3.2	92	9.9	94	2.3	100	7.8	110	0.5	90	0.0		6.8	99
Sep	20	20.9	97	9.7	96	10.4	96	6.4	118	12.8	119	4.9	113	0.0		13.3	104
Oct	20	36.0	92	12.8	104	5.4	87	10.3	105	3.9	110	0.5	112	0.0		18.1	97
Nov	20	49.2	92	10.2	90	3.0	93	22.2	97	13.6	104	0.7	109	3.2	81	24.3	94
Dec	20	21.5	80	4.1	88	2.9	89	7.8	89	3.2	111	0.5	117	0.7	72	10.3	86

[a]20 samples were taken in each bay except upper and lower Laguna Madre where 10 samples were taken.

Table 9. Monthly mean catch rate (No./tow) and mean size (mm) of pink shrimp caught with 6.1-m trawls in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Number of samples[a]	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre		Coastwide	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	20[a]	0.0		0.0		0.0		0.1	81	0.1	103	0.1	63	0.6	98	<0.1	92
Feb	20	0.0		0.1	140	0.1	85	0.2	89	0.1	98	0.1	113	0.0		<0.1	102
Mar	20	0.2	79	0.0		1.0	94	3.6	87	0.3	92	0.1	98	0.0		0.5	89
Apr	20	0.5	95	0.6	99	11.0	95	13.5	96	1.1	100	0.5	118	1.2	83	3.0	96
May	20	0.2	110	3.1	115	1.6	96	7.7	98	1.9	108	0.1	128	0.0		1.8	103
Jun	20	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Jul	20	0.0		0.0		0.1	112	0.1	103	0.0		0.0		0.0		<0.1	105
Aug	20	0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Sep	20	0.0		0.0		0.0		0.0		0.4	87	0.0		0.0		<0.1	87
Oct	20	0.0		0.0		0.0		0.2	103	0.1	101	0.0		0.0		<0.1	102
Nov	20	0.0		0.0		0.0		0.5	67	0.7	97	0.2	121	0.0		0.1	90
Dec	20	0.0		0.0		0.1	104	1.1	83	0.2	119	0.1	120	0.0		0.1	92

[a]20 samples were taken in each bay except upper and lower Laguna Madre where 10 samples were taken.

Table 10. Monthly mean catch rate (No./tow) and mean size (mm) of blue crabs caught with 6.1-m trawls in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Number of samples[a]	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre		Coastwide	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	20[a]	0.6	112	0.2	53	1.5	60	0.4	86	0.1	166	0.0		0.1	130	0.5	79
Feb	20	1.0	130	0.2	158	6.9	59	2.4	45	0.1	148	0.8	140	0.1	38	1.5	71
Mar	20	2.3	92	1.0	63	2.3	63	16.8	54	0.1	31	0.4	124	1.3	138	2.8	64
Apr	20	6.3	71	4.1	64	17.6	71	10.9	54	2.6	68	0.4	75	1.9	70	6.4	66
May	20	10.6	77	7.8	83	14.4	89	16.1	66	1.3	91	0.6	116	15.2	85	8.1	80
Jun	20	18.1	94	5.9	86	4.3	90	8.3	90	8.9	105	0.5	60	3.6	98	10.3	94
Jul	20	10.9	92	5.3	104	2.9	88	2.7	86	0.3	123	0.5	81	5.2	108	6.0	96
Aug	20	5.0	94	2.2	91	4.1	102	9.9	98	0.8	127	0.5	118	4.2	111	3.9	101
Sep	20	6.3	97	1.3	99	3.6	82	6.8	94	0.4	105	1.7	101	3.2	98	4.3	94
Oct	20	2.6	104	0.6	105	2.3	80	10.8	122	0.4	134	1.1	111	0.9	112	2.4	113
Nov	20	5.2	74	0.9	94	2.2	103	18.1	81	0.2	113	0.9	149	0.4	67	4.2	84
Dec	20	2.7	84	0.7	71	1.2	79	5.0	107	0.4	139	0.7	167	0.7	67	1.5	99

[a]20 samples were taken in each bay except upper and lower Laguna Madre where 10 samples were taken.

Table 11. Weekly mean catch rate (No./tow) and mean length (mm) of brown shrimp caught in Zone III at 6.1 m trawl stations in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C.[a]		MATAGORDA M.C.[b]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan 3-9	2	0.0		0.0		0.0		0.0		0.0		0.5	63
10-16	2	0.5	73	0.0		0.0		0.0		0.0		0.0	
17-23	2	0.0		0.0		0.0		0.0		0.0		0.0	
24-30	2	0.0		0.0		0.0		0.0		0.0		0.0	
31-Feb 6	2	0.0		0.5	88	0.0		0.0		0.0		0.0	
Feb 7-13	2	0.0		0.0		0.0		0.0		0.0		0.0	
14-20	2	0.0		0.0		0.0		0.0		0.0		0.0	
21-27	2	0.0		0.0		0.0		0.0		0.0		0.0	
28-Mar 6	2	0.0		0.0		0.0		0.5	78	0.0		0.5	75
Mar 7-13	2	0.0		0.0		0.0		0.0		0.0		0.0	
14-20	2	0.0		0.0		0.0		0.0		0.0		0.5	88
21-27	2	0.0		0.0		0.0		0.5	93	0.0		7.0	78
28-Apr 3	2	1.0	76	0.0		0.0		0.0		0.0		0.5	94
Apr 4-10	2	0.0		0.0		0.0		0.0		0.0		6.0	77
11-17	2	2.5	99	0.0		0.0		0.0		0.0		0.5	97
18-24	2	5.0	90	0.5	93	1.0	93	0.0		0.0		0.0	
25-May 1	2	0.0		0.0		0.0		0.0		0.0		0.5	73
May 2-8	2	0.0		0.0		0.0		2.0	90	0.0		27.5	72
9-15	2	0.0		0.5	103	0.0	113	0.0		0.0		1.5	69
16-22	2	13.0	106	0.5	98	0.0		7.5	90	0.0		4.5	70
23-29	2	2.0	104	0.0		0.0		12.5	103	0.0		2.0	64
30-Jun 5	2	25.5	97	3.5	87	0.5	113	454.5	98	0.0		3.0	74
Jun 6-12	2	0.5	83	0.0		0.0		0.0		0.0		0.0	
13-19	2	3.0	101	0.0		0.0		0.0		0.0		0.0	
20-26	2	0.0		0.0		0.0		0.0		0.0		0.0	
27-Jul 3	2	45.5	97	0.0		0.0		0.0		0.0		0.5	92
Jul 4-10	2	0.0		0.5	110	0.0		0.5	103	0.0		0.0	
11-17	2	0.0		4.5	92	0.0		0.0		0.0		0.0	
18-24	2	0.0		0.0		0.0		2.0	102	0.0		0.0	
25-31	2	0.5	98	12.5	109	0.0		5.5	106	0.0		13.5	84

Table 11. (Cont'd.).

Month	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C.[a]		MATAGORDA M.C.[b]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Aug 1-7	2	0.0		0.5	118	0.0		0.0		0.0		0.0	
8-14	2	0.0		0.0		0.0		0.0		0.0		0.0	
15-21	2	0.0		0.0		0.0		0.0		0.0		2.5	54
22-28	2	0.0		0.0		0.0		0.0		0.0		0.0	
29-Sep 4	2	0.0		0.0		0.0		0.0		0.0		0.5	97
Sep 5-11	2	0.0		0.5	88	0.0		ND	ND	ND	ND	0.5	45
12-18	2	0.0		0.0		0.0		0.0		0.0		0.0	
19-25	2	0.0		0.0		0.0		0.0		0.0		3.0	69
26-Oct 2	2	0.5	93	0.0		0.5	29.0		120	0.0		0.0	
Oct 3-9	2	0.0		0.0		0.0		0.0		0.0		0.0	
10-16	2	0.0		0.0		0.0		8.0	91	1.0	110	0.0	
17-23	2	0.0		0.0		0.0		0.5	102	0.5	88	0.0	
24-30	2	0.0		3.0	83	2.0	88	0.5	102	1.5	102	0.5	38
31-Nov 6	2	0.5	103	0.0		3.0	104	0.5	100	0.0		0.0	
Nov 7-13	2	0.0		0.0		0.0		0.0		6.0	96	0.0	
14-20	2	0.0		0.0		0.0		0.5	100	0.5	173	0.0	
21-27	2	0.0		0.0		0.0		0.5	60	0.0		1.5	89
28-Dec 4	2	0.0		0.0		0.0		0.5	90	0.0		0.0	
Dec 5-11	2	0.0		0.0		0.0		0.5	89	0.0		1.0	75
12-18	2	2.5	80	0.0		0.0		0.5	95	0.0		0.0	
19-25	2	0.0		0.0		0.		3.5	91	1.0	92	0.0	
26-31	2	0.0		0.0		0.0		0.0		0.0		0.0	

[a]P.C. = Pass Cavallo

[b]M.C. = Matagorda Channel

Table 12. Weekly mean catch rate (No./tow) and mean length (mm) of white shrimp caught in Zone III at 6.1 m trawl stations in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C.[a]		MATAGORDA M.C.[b]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan 3-9	2	1.5	65	1.0	81	2.5	79	0.0		0.0		0.0	
10-16	2	4.0	82	1.0	83	0.0		0.0		0.0		0.0	
17-23	2	4.5	101	1.5	88	8.5	108	0.0		0.0		0.0	
24-30	2	26.0	72	0.5	98	0.5	82	0.0		0.0		0.5	93
31-Feb 6	2	6.0	83	0.0		1.5	81	0.0		0.0		0.0	
Feb 7-13	2	28.0	82	0.0		1.5	87	0.0		0.0		0.0	
14-20	2	2.5	96	0.0		0.0		0.0		0.0		0.0	
21-27	2	25.0	77	0.0		0.0		0.0		0.0		0.5	130
28-Mar 6	2	7.5	91	0.5	95	0.0		2.0	113	0.0		1.5	108
Mar 7-13	2	1.0	103	0.0		0.0		0.0		0.0		0.0	
14-20	2	0.5	118	0.0		0.0		0.0		0.0		0.0	
21-27	2	2.0	103	0.0		0.0		3.5	89	0.0		0.0	
28-Apr 3	2	3.5	105	0.0		0.0		0.0		0.0		0.0	
Apr 4-10	2	2.5	104	0.0		0.0		0.0		0.0		0.0	
11-17	2	15.5	146	0.0		0.0		0.0		0.0		1.0	88
18-24	2	16.0	129	2.0	148	1.0	157	0.0		0.0		0.0	
25-May 1	2	1.0	158	0.0		0.0		0.0		0.0		0.0	
May 2-8	2	0.5	163	0.0		0.0		0.0		0.0		1.0	148
9-15	2	0.0		0.0		0.0		0.0		0.0		0.0	
16-22	2	10.0	125	0.0		0.0		0.0		0.0		0.0	
23-29	2	3.0	119	0.5	162	0.0		0.0		0.0		0.0	
30-Jun 5	2	10.5	106	0.0		0.0		0.0		0.0		0.0	
Jun 6-12	2	8.0	128	0.0		0.0		0.0		0.0		1.0	151
13-19	2	3.0	131	0.0		0.0		0.0		0.0		1.5	65
20-26	2	0.0		0.0		0.0		0.0		0.0		0.0	
27-Jul 3	2	2.5	152	0.0		0.0		0.0		0.0		0.0	
Jul 4-10	2	0.0		0.0		0.0		0.0		0.0		0.0	
11-17	2	0.0		0.0		0.0		0.0		0.0		0.0	
18-24	2	0.0		0.0		0.0		0.0		0.0		0.0	
25-31	2	0.0		0.0		0.0		0.0		0.0		14.0	97

Table 12. (Cont'd.).

Month	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C.[a]		MATAGORDA M.C.[b]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Aug 1-7	2	0.0		0.0		0.0		0.0		0.0		0.0	
8-14	2	0.0		0.0		0.0		0.0		0.0		0.0	
15-21	2	1.5	126	0.0		0.0		0.0		0.0		0.0	
22-28	2	0.0		0.0		0.0		0.0		0.0		0.0	
29-Sep 4	2	1.5	116	0.0		0.0		0.0		0.0		0.0	
Sep 5-11	2	2.5	127	0.0		0.0		ND	ND	ND	ND	0.0	
12-18	2	0.5	98	0.0		0.0		0.5	135	0.0		0.5	96
19-25	2	0.5	118	0.0		0.0		1.0	136	0.0		0.0	
26-Oct 2	2	7.0	105	0.0		0.0		2.5	141	0.0		0.0	
Oct 3-9	2	3.0	113	0.0		0.5	144	0.0		0.0		0.0	
10-16	2	15.0	121	0.0		0.0		0.0		0.0		0.0	
17-23	2	9.0	115	0.0		0.0		0.0		0.0		0.0	
24-30	2	82.5	111	0.5	99	0.5	134	1.5	122	0.0		0.0	
31-Nov 6	2	23.0	108	0.0		0.0		0.0		1.5	128	0.0	
Nov 7-13	2	2.0	116	0.5	122	0.0		0.5	90	0.5	125	0.0	
14-20	2	95.5	98	0.0		0.0		1.5	117	0.0		0.0	
21-27	2	0.0		1.5	131	0.0		0.0		0.0		0.0	
28-Dec 4	2	0.5	104	0.0		0.0		1.0	105	0.0		0.0	
Dec 5-11	2	14.5	95	0.0		0.0		1.0	96	0.0		0.5	92
12-18	2	67.0	93	2.5	108	1.0	113	1.5	103	0.0		0.0	
19-25	2	61.0	86	2.5	96	0.0		18.5	89	0.0		1.0	73
26-31	2	1.0	68	0.0		0.0		0.0		0.0		0.0	

[a]P.C. = Pass Cavallo

[b]M.C. = Matagorda Channel

ND = No data

Table 13. Weekly mean catch rate (No./tow) and mean length (mm) of pink shrimp caught in Zone III at 6.1 m trawl stations in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C.[a]		MATAGORDA M.C.[b]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan 3-9	2	0.0		0.0		0.0		0.0		0.0		0.0	
10-16	2	0.0		0.0		0.0		0.0		0.5	77	0.0	
17-23	2	0.0		0.0		0.0		0.0		0.0		0.0	
24-30	2	0.0		0.0		0.0		0.0		0.0		0.0	
31-Feb 6	2	0.0		0.0		0.0		0.0		0.0		0.0	
Feb 7-13	2	0.0		0.0		0.0		0.0		0.0		0.0	
14-20	2	0.0		0.0		0.0		0.0		0.0		0.0	
21-27	2	0.0		0.0		0.0		0.0		0.0		1.5	87
28-Mar 6	2	0.0		0.0		0.0		0.0		0.5	99	0.0	
Mar 7-13	2	0.0		0.0		0.0		1.0	98	0.0		0.0	
14-20	2	0.0		0.0		0.0		0.0		0.0		0.0	
21-27	2	0.0		0.0		0.0		68.5	94	0.0		0.0	
28-Apr 3	2	0.5	103	0.0		0.0		0.0		0.5	85	0.0	
Apr 4-10	2	0.0		0.0		0.0		5.4	92	0.0		0.0	
11-17	2	1.5	106	0.0		0.0		1.0	107	0.0		0.5	84
18-24	2	6.5	98	7.0	97	3.5	97	0.5	130	0.0		0.0	
25-May 1	2	0.0		0.0		0.0		0.5	114	0.0		0.0	
May 2-8	2	1.0	106	0.0		0.0		11.5	100	0.0		6.0	85
9-15	2	0.0		0.0		2.5	124	0.5	115	0.0		0.0	
16-22	2	5.0	106	0.0		0.0		0.5	108	0.0		0.0	
23-29	2	0.0		0.0		0.5	103	2.0	108	0.0		0.0	
30-Jun 5	2	0.0		0.5	160	0.0		0.0		0.0		0.0	
Jun 6-12	2	0.0		0.0		0.0		0.0		0.0		0.0	
13-19	2	0.0		0.0		0.0		0.0		0.0		0.0	
20-26	2	0.0		0.0		0.0		0.0		0.0		0.0	
27-Jul 3	2	0.0		0.0		0.0		0.0		0.0		0.0	
Jul 4-10	2	0.0		0.0		0.0		0.0		0.0		0.0	
11-17	2	0.0		0.0		0.0		0.0		0.0		0.0	
18-24	2	0.0		0.0		0.0		0.0		0.0		0.0	
25-31	2	0.0		0.0		0.0		0.0		0.0		0.0	

Table 13. (Cont'd.).

Month	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C.[a]		MATAGORDA M.C.[b]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Aug 1-7	2	0.0		0.0		0.0		0.0		0.0		0.0	
8-14	2	0.0		0.0		0.0		0.0		0.0		0.0	
15-21	2	0.0		0.0		0.0		0.0		0.0		0.0	
22-28	2	0.0		0.0		0.0		0.0		0.0		0.0	
28-Sep 4	2	0.0		0.0		0.0		0.0		0.0		0.0	
Sep 5-11	2	0.0		0.0		0.0		ND	ND	ND	ND	0.0	
12-18	2	0.0		0.0		0.0		0.0		0.0		0.0	
19-25	2	0.0		0.0		0.0		0.0		0.0		1.0	83
26-Oct 2	2	0.0		0.0		0.0		0.0		0.0		0.0	
Oct 3-9	2	0.0		0.0		0.0		0.0		0.0		0.0	
10-16	2	0.0		0.0		0.0		4.0	87	2.5	76	0.0	
17-23	2	0.0		0.0		0.0		0.0		0.0		1.0	72
24-30	2	0.0		0.0		0.0		1.0	96	0.0		0.0	
31-Nov 6	2	0.0		0.0		0.0		0.0		0.5	105	0.0	
Nov 7-13	2	0.0		0.0		0.0		0.0		2.0	97	1.0	87
14-20	2	0.0		0.0		0.0		0.0		0.0			
21-27	2	0.5	36	0.0		0.0		3.5	101	0.5	118	0.0	
28-Dec 4	2	0.5	75	0.0		0.0		0.0		0.5	71	0.0	
Dec 5-11	2	2.0	106	0.0		0.0		0.0		0.5	121	0.0	
12-18	2	0.5	98	0.0		0.0		0.0		0.0		0.0	
19-25	2	0.0		0.0		0.0		1.0	103	0.0		0.0	
25-31	2	0.0		0.0		0.0		0.0		0.0		0.0	

[a]P.C. = Pass Cavallo

[b]M.C. = Matagorda Channel

ND = No data

Table 14. Weekly mean catch rate (No./tow) and mean length (mm) of blue crabs caught in Zone III at 6.1 m trawl stations in Texas bay systems during calendar year 1983 (blank = no measurement taken).

Month		Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C.[a]		MATAGORDA M.C.[b]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
			No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	3-9	2	0.0	140	0.0		0.0		0.0		0.0		0.5	140
	10-16	2	1.5	110	0.0		0.0		0.0		0.0		0.0	
	17-23	2	1.5	164	0.0		0.0		0.5	154	0.5	179	0.0	
	24-30	2	1.0	114	0.0		0.0		0.0		0.0		0.0	
	31-Feb 6	2	6.0	83	0.0		0.0		0.0		0.0		0.0	
Feb	7-13	2	9.5	71	0.0		0.0		0.0		0.0		0.0	
	14-20	2	8.5	70	0.0		0.0		0.5	141	0.5	42	0.0	
	21-27	2	12.0	83	0.0		0.0		0.0		0.0		1.0	100
	28-Mar 6	2	1.0	163	0.0		0.0		1.5	63	2.0	24	0.0	
Mar	7-13	2	3.0	110	0.0		0.0		1.0	38	2.0	83	0.5	106
	14-20	2	2.5	164	0.0		0.0		0.0		0.0		1.0	181
	21-27	2	12.0	52	1.5	44	0.5	43	66.5	118	1.0	36	1.5	131
	28-Apr 3	2	3.0	58	5.0	11	0.0		43.5	157	1.5	111	1.0	153
Apr	4-10	2	8.5	153	0.5	23	0.5	160	3.5	98	1.5	59	2.5	82
	11-17	2	15.0	137	0.0		0.0		0.0		1.5	118	0.0	
	18-24	2	6.5	95	3.5	86	1.5	143	1.5	114	2.5	96	1.0	151
	25-May 1	2	0.5	143	0.0		0.0		0.0		45.0	105	3.0	142
May	2-8	2	0.0		0.0		1.5	156	14.5	65	7.0	75	3.5	96
	9-15	2	1.0	54	0.0		1.5	153	0.0		0.0		2.0	121
	16-22	2	8.5	76	0.0		0.0		1.0	56	1.5	117	1.0	121
	23-29	2	0.0		0.0		0.5	175	2.0	98	0.0		0.0	
	30-Jun 5	2	1.5	141	1.5	169	0.5	-	3.5	100	2.5	162	1.0	175
Jun	6-12	2	3.5	59	0.0		1.0	146	3.0	118	9.5	133	1.0	142
	13-19	2	7.5	109	0.0		0.0		0.0		0.0		1.5	140
	20-26	2	3.0	167	1.0	113	0.5	112	1.5	102	1.5	112	0.0	
	27-Jul 3	2	5.5	143	0.0		0.5	140	1.5	130	0.0		2.0	87
Jul	4-10	2	10.5	125	0.5	120	6.0	134	3.5	139	4.0	131	2.0	132
	11-17	2	2.0	153	1.0	67	2.0	140	3.0	117	3.5	100	3.0	134
	18-24	2	2.0	146	0.5	156	1.5	151	11.5	110	11.5	123	7.0	125
	25-31	2	29.0	148	1.0	147	0.0		5.5	134	9.5	114	7.0	134

Table 14. (Cont'd.).

Month	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C.[a]		MATAGORDA M.C.[b]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Aug 1-7	2	4.0	148	0.5	121	1.0	138	75.5	116	5.0	119	3.0	135
8-14	2	0.5	168	0.0		0.0		4.5	123	14.5	120	2.0	127
15-21	2	1.5	157	1.5	103	42.5	118	22.0	114	33.0	124	2.5	141
22-28	2	0.5	144	0.0		2.5	126	19.0	116	24.5	124	1.0	122
29-Sep 4	2	3.0	111	0.0		2.5	136	16.5	127	59.0	121	2.5	138
Sep 5-11	2	0.5	144	0.0		0.5	130	ND		ND		1.5	158
12-18	2	0.0		0.0		0.0		4.0	117	1.0	140	0.5	170
19-25	2	1.0	60	0.0		0.0		3.0	116	3.0	113	2.5	120
26-Oct 2	2	2.0	98	1.0	108	0.0		7.5	117	11.0	131	0.0	
Oct 3-9	2	0.0		0.0		0.0		7.0	113	2.0	123	0.0	
10-16	2	0.0		0.0		0.0		8.0	126	1.0	26	0.0	
17-23	2	0.0		0.0		0.0		1.0	128	0.0		0.0	
24-30	2	0.5	65	0.0		0.0		3.5	123	2.5	123	0.0	
31-Nov 6	2	2.0	81	0.0		0.0		13.5	97	0.5	142	0.0	
Nov 7-13	2	1.0	169	0.0		0.0		1.0	152	1.5	140	0.0	
14-20	2	1.0	162	0.0		0.0		13.0	123	3.0	137	0.0	
21-27	2	0.0		0.0		0.0		7.0	112	3.0	154	2.0	29
28-Dec 4	2	8.0	73	0.0		0.0		1.5	102	0.0		0.5	35
Dec 5-11	2	3.0	62	0.0		0.0		8.5	118	2.0	151	0.0	
12-18	2	6.0	61	0.0		0.0		3.5	104	0.5	175	0.0	
19-25	2	0.0		0.0		0.0		6.5	130	0.0		0.0	
26-31	2	0.0		0.0		0.0		0.0		0.0		0.0	

[a]P.C. = Pass Cavallo

[b]M.C. = Matagorda Channle

ND = No data

Table 15. Seasonal (June 15-July 15) mean catch rate (No./h) and mean length (mm) of shrimp caught with Gulf trawls during night along the central Texas coast, 1978-1983 (blank = no measurement taken).

Depth zone (m)	Year	Number samples	Brown shrimp		White shrimp		Pink shrimp	
			No./h	Length	No./h	Length	No./h	Length
11-18	1978	6	2618.7	90	63.0	174	8.3	110
	1979	1	4.0	135	0.0		0.0	
	1980	3	3059.7	100	6.0	168	29.3	131
	1981	3	1965.3	96	47.3	167	19.3	127
	1982	5	2496.2	105	6.4	178	232.8	137
	1983	13	1445.9	106	5.2	172	188.6	116
20-27	1978	7	3617.7	98	0.0		1.1	122
	1979	1	358.0	120	0.0		0.0	
	1980	3	725.3	100	0.0		27.3	130
	1981	3	2469.3	112	3.3	188	0.0	
	1982	5	1978.8	117	0.0		8.8	141
	1983	8	3538.6	117	3.1	167	38.2	117
29-37	1978	3	1352.0	109	0.0		0.0	
	1979	1	94.0	122	0.0		0.0	
	1980	3	803.3	112	0.0		0.7	172
	1981	2	1649.0	115	0.0		0.0	
	1982	5	689.2	101	0.0		0.0	
	1983	7	620.6	126	2.4	166	22.7	111
38-46	1978	3	1490.7	112	0.0		0.0	
	1979	1	80.0	132	0.0		0.0	
	1980	3	114.0	135	0.0		0.0	
	1981	1	380.0	111	0.0		0.0	
	1982	2	57.0	140	0.0		0.0	
	1983	5	228.2	127	0.0		0.0	
11-46 combined	1978	19	2608.6	98	19.9	174	3.0	112
	1979	4	134.0	122	0.0		0.0	
	1980	12	1175.3	103	1.5	168	14.3	131
	1981	9	1886.9	107	16.9	168	6.4	127
	1982	17	1525.6	109	1.9	178	71.0	137
	1983	33	1593.7	114	3.3	170	88.4	116

Table 16. Seasonal (November-February) mean catch rate (No./h) and mean length (mm) of shrimp caught in the Gulf during day along the central Texas coast in 6-18 m deep water, 1977-78 through 1982-83 (blank = no measurement taken).

Year	Number samples	Brown shrimp		White shrimp		Pink shrimp	
		No./h	Length	No./h	Length	No./h	Length
77-78	17	26.0	90	353.0	120	18.9	98
78-79[a]	7	0.0		854.6	107	4.6	106
79-80[b]	10	1.4	88	446.7	103	7.9	98
80-81	21	9.1	109	166.5	117	19.4	98
81-82	38	8.7	90	470.5	104	7.9	89
82-83	34	4.0	93	264.5	110	4.1	101

[a] No samples in February

[b] No samples in November

Table 17. Monthly mean catch rate (No./h) and mean length (mm) of brown shrimp caught with Gulf trawls in the Texas territorial sea (within 16.7 km) during January 1983-March 1984 (blank = no measurement taken).

	Area 19						Area 20					
	DAY			NIGHT			DAY			NIGHT		
Month	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length
Jan 83	5	0.0		5	4.0	90	5	0.0	85	5	7.2	86
Feb 83	5	0.0		5	6.4	113	5	0.8	98	5	1.6	126
Mar 83	0			0			0			0		
Apr 83	0			0			0			0		
May 83	0			0			0			0		
Jun 83	4	82.2	96	3	565.7	102	5	58.8	100	6	2838.5	107
Jul 83	0			3	0.0		2	0.0		4	2546.0	114
Aug 83-Mar 84	0			0			0			0		

Table 18. Monthly mean catch rate (No./h) and mean length (mm) of white shrimp caught with Gulf trawls in the Texas territorial sea (within 16.7 km) during January 1983-March 1984 (blank = no measurement taken).

	Area 19						Area 20					
	DAY			NIGHT			DAY			NIGHT		
Month	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length
Jan 83	5	241.6	104	5	196.0	121	5	96.8	124	5	526.0	111
Feb 83	5	37.6	133	5	21.6	148	5	365.6	102	5	299.2	108
Mar 83	0			0			0			0		
Apr 83	0			0			0			0		
May 83	0			0			0			0		
Jun 83	4	25.0	164	3	21.0	172	5	0.0		6	0.0	
Jul 83	0			3	1.3	172	2	0.0		4	0.0	
Aug 83-Mar 84	0			0			0			0		

Table 19. Monthly mean catch rate (No./h) and mean length (mm) of pink shrimp caught with Gulf trawls in the Texas territorial sea (within 16.7 km) during January 1983-March 1984 (blank = no measurement taken).

	Area 19						Area 20					
	DAY			NIGHT			DAY			NIGHT		
Month	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length
Jan 83	5	0.0		5	6.4	99	5	3.2	104	5	23.8	116
Feb 83	5	0.0		5	0.0		5	13.6	84	5	8.0	96
Mar 83	0			0			0			0		
Apr 83	0			0			0			0		
May 83	0			0			0			0		
Jun 83	4	0.0		3	69.3	117	5	8.0	107	6	295.2	115
Jul 83	0			3	0.0		2	0.0		4	154.2	123
Aug 83-Mar 84	0			0			0			0		

Table 20. Mean catch rates and mean lengths (mm) for penaeid shrimp (Penaeus sp.) and blue crabs (Callinectes sapidus) collected during SEAMAP[a] sampling off the Texas coast in June-July 1982 and 1983 (Blank = No data).

			P. aztecus		P. setiferus		P. duorarum		C. sapidus	
Year	Depth	No./ samples	No./h	Mean length.	No./h	Mean length	No./h	Mean length	No./h	Mean length
1982										
	0-18 m	22	1222	108	15	173	161	136	8	
	19-37 m	50	1427	115	0		20	138	1	
	38-55 m	29	138	145	0		<1	126	0	
	56-73 m	5	117	179	0		0		0	
	74-91 m	3	79	182	0		0		0	
1983										
	0-18 m	28	254	99	20	153	195	127	8	
	19-37 m	47	1445	119	1	167	87	121	4	
	38-55 m	24	304	132	0		1	118	1	
	56-73 m	8	66	156	0		0		0	
	74-91 m	2	71	168	0		0		0	

[a] Data presented here was collected by R/V OREGON II (NMFS) and R/V WESTERN GULF (TPWD). The data was made available by the Southeast Area Monitoring and Assessment Program (SEAMAP). Samples collected with 12.2-m trawl.

Figure 1. Map of Texas coast.

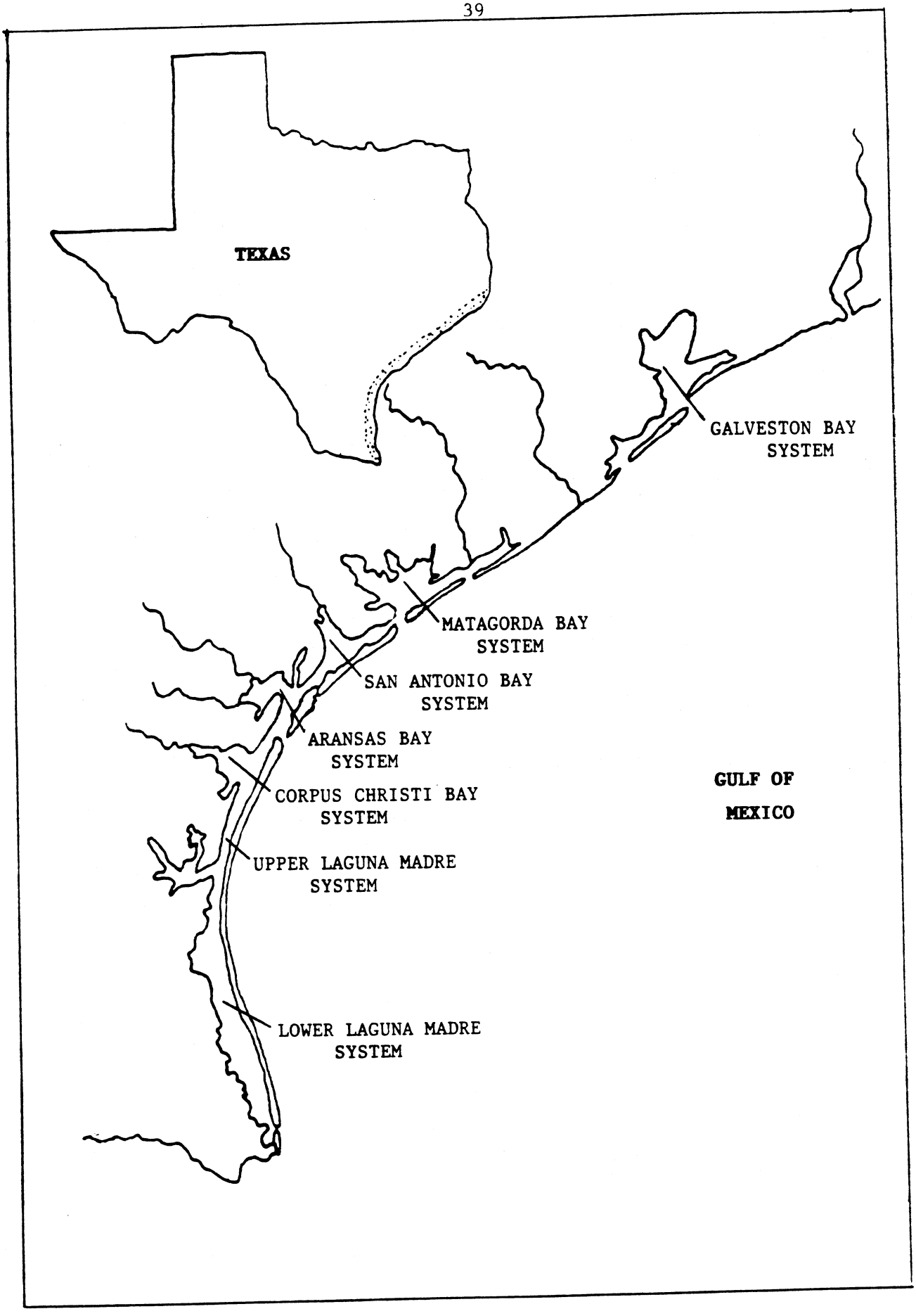

TEXAS
GALVESTON BAY SYSTEM
MATAGORDA BAY SYSTEM
SAN ANTONIO BAY SYSTEM
ARANSAS BAY SYSTEM
CORPUS CHRISTI BAY SYSTEM
UPPER LAGUNA MADRE SYSTEM
LOWER LAGUNA MADRE SYSTEM
GULF OF MEXICO

Figure 2. 18.3-m bag seine sample sites in the Galveston Bay system during 1983 (each station number should be preceded by the digit 2).

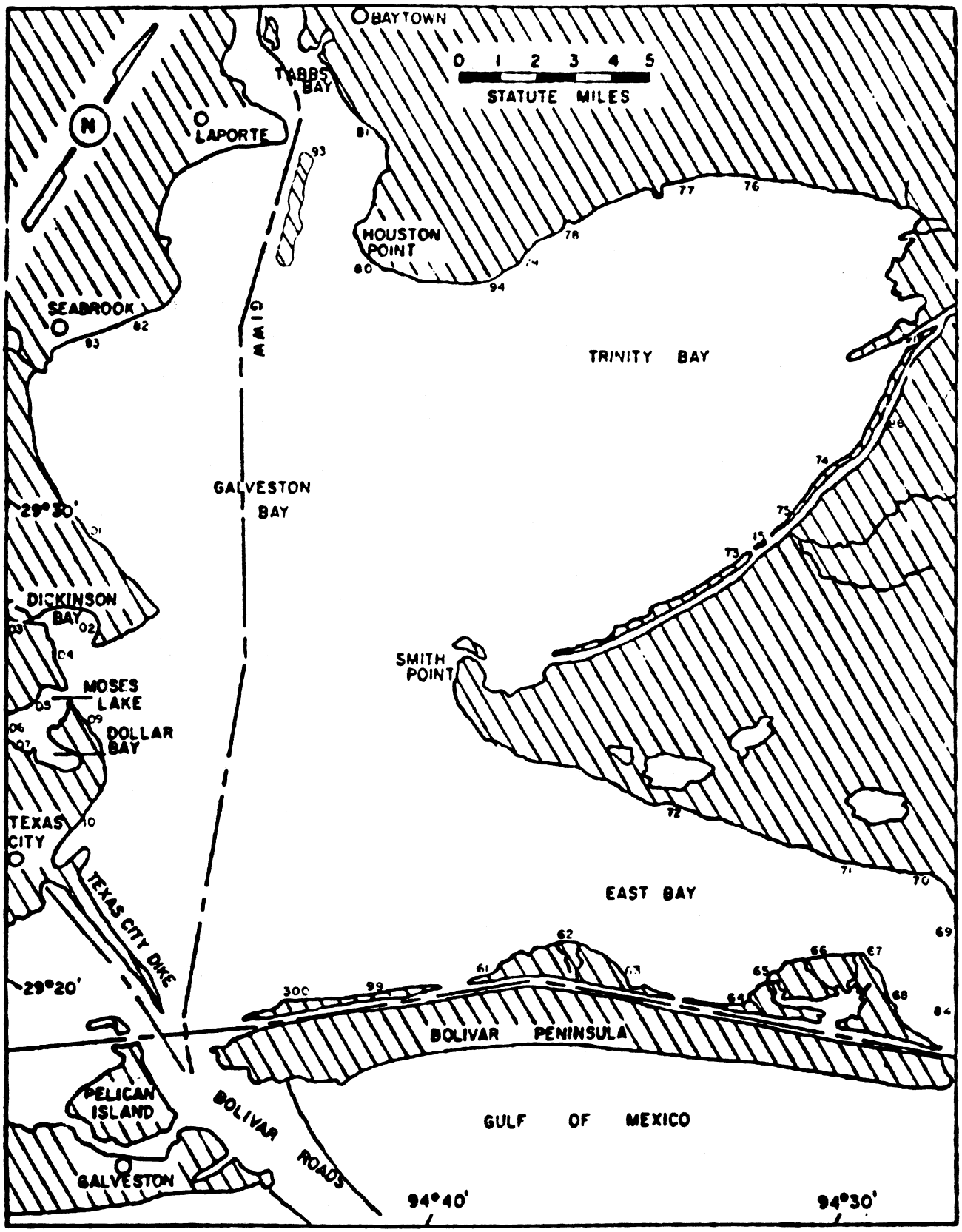

BAYTOWN
0 1 2 3 4 5
STATUTE MILES
TABBS BAY
N
LAPORTE
HOUSTON POINT
SEABROOK
GIWW
TRINITY BAY
GALVESTON BAY
29°30'
DICKINSON BAY
MOSES LAKE
DOLLAR BAY
SMITH POINT
TEXAS CITY
TEXAS CITY DIKE
EAST BAY
29°20'
BOLIVAR PENINSULA
PELICAN ISLAND
BOLIVAR ROADS
GULF OF MEXICO
GALVESTON
94°40'
94°30'

Figure 3. 18.3-m bag seine sample sites in the Galveston Bay system during 1983 (each station number should be preceded by the digit 2).

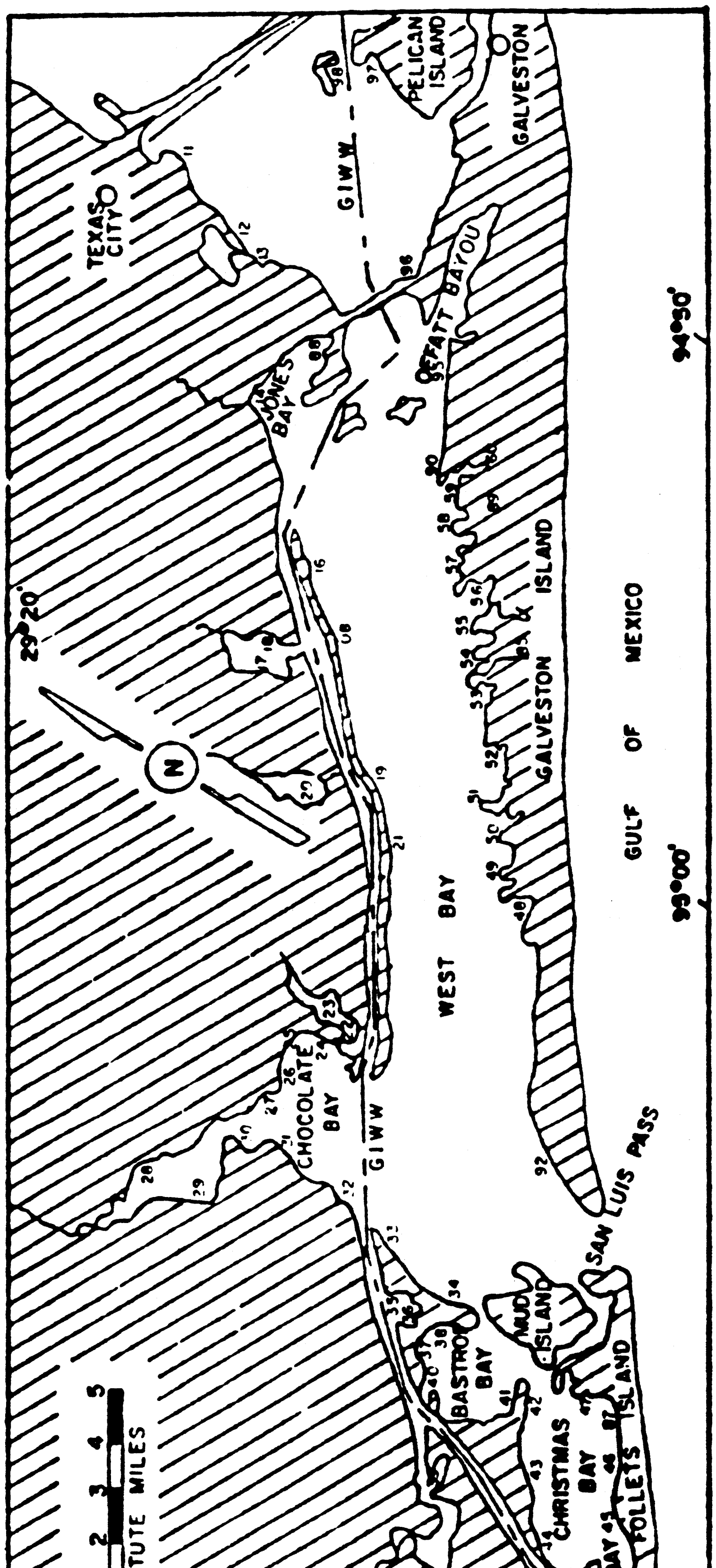

TEXAS CITY
GIWW
PELICAN ISLAND
GALVESTON
OFFATT BAYOU
JONES BAY
WEST BAY
GALVESTON ISLAND
GULF OF MEXICO
CHOCOLATE BAY
SAN LUIS PASS
MUD ISLAND
BASTROP BAY
CHRISTMAS BAY
FOLLETS ISLAND
DRUM BAY
STATUTE MILES
0 1 2 3 4 5
N
29°20'
29°10'
95°00'
94°50'

Figure 4. 18.3-m bag seine sample sites in the Matagorda Bay system during 1983 (each station number should be preceded by the digit 2).

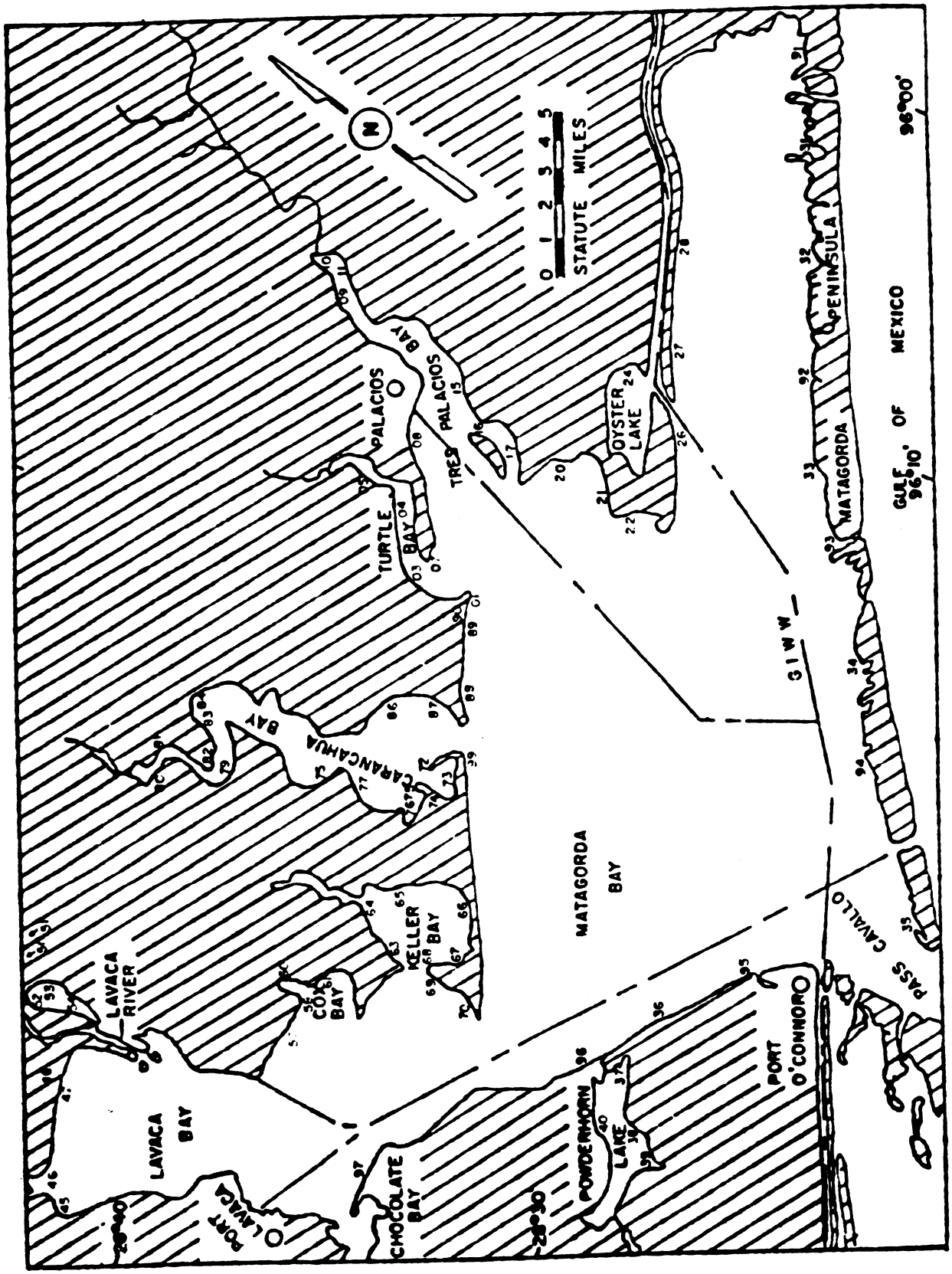

N
0 1 2 3 4 5
STATUTE MILES
LAVACA BAY
LAVACA RIVER
CHOCOLATE BAY
POWDERHORN LAKE
PORT LAVACA
COX BAY
KELLER BAY
CARANCAHUA BAY
TURTLE BAY
PALACIOS
TRES PALACIOS BAY
OYSTER LAKE
MATAGORDA BAY
MATAGORDA PENINSULA
GULF OF MEXICO
96°00'
96°10'
GIWW
CAVALLO PASS
PORT O'CONNOR

Figure 5. 18.3-m bag seine sample sites in the San Antonio Bay system during 1983 (each station number should be preceded by the digit 2).

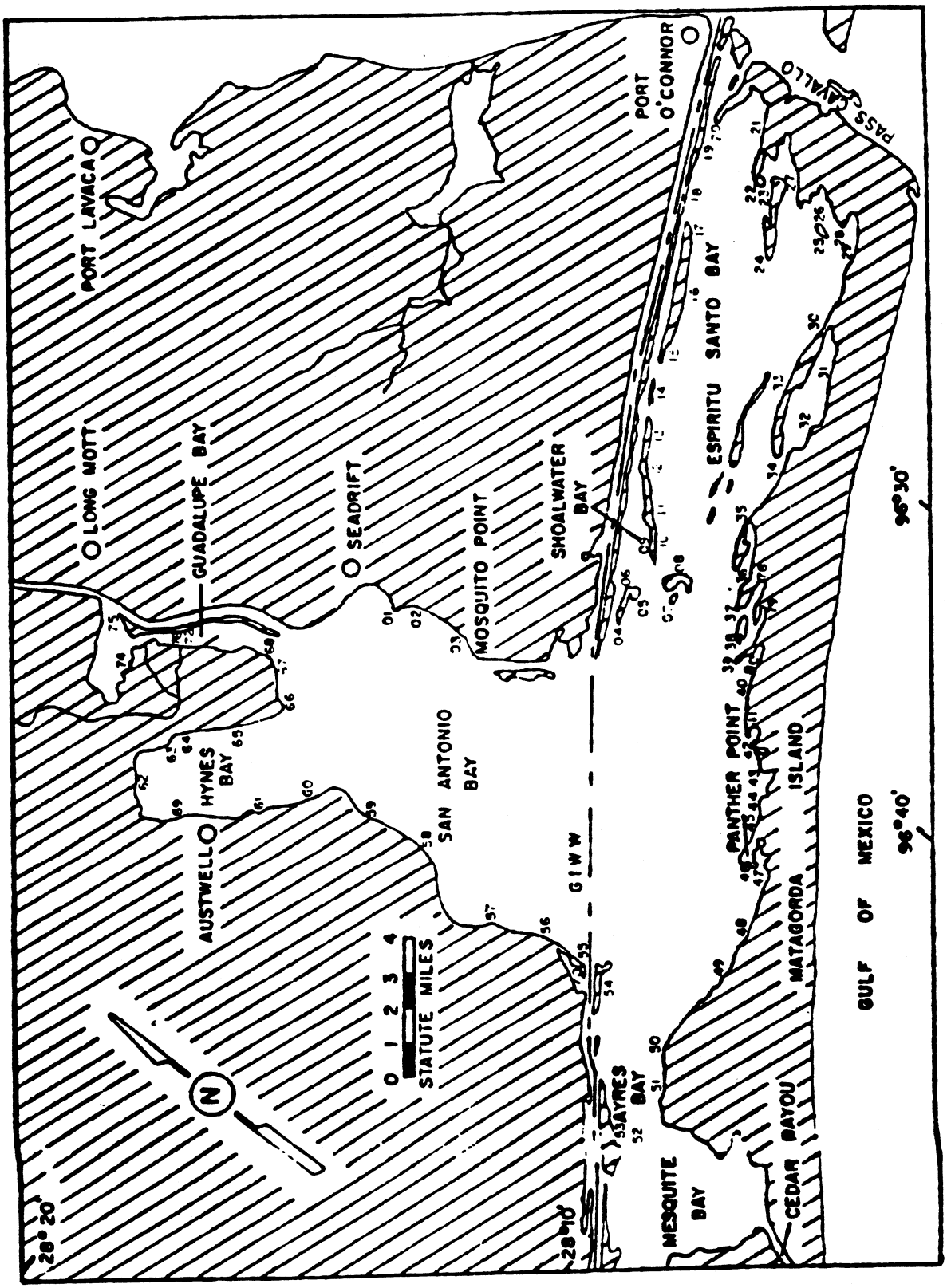

PORT LAVACA
LONG MOTT
GUADALUPE BAY
SEADRIFT
PORT O'CONNOR
PASS CAVALLO
ESPIRITU SANTO BAY
MOSQUITO POINT
SHOALWATER BAY
HYNES BAY
AUSTWELL
SAN ANTONIO BAY
GIWW
PANTHER POINT
MATAGORDA ISLAND
GULF OF MEXICO
SAYRES BAY
MESQUITE BAY
CEDAR BAYOU
STATUTE MILES
0 1 2 3 4
N
28°20'
28°10'
96°30'
96°40'

Figure 6. 18.3-m bag seine sample sites in the Aransas Bay system during 1983 (each station number should be preceded by the digit 2).

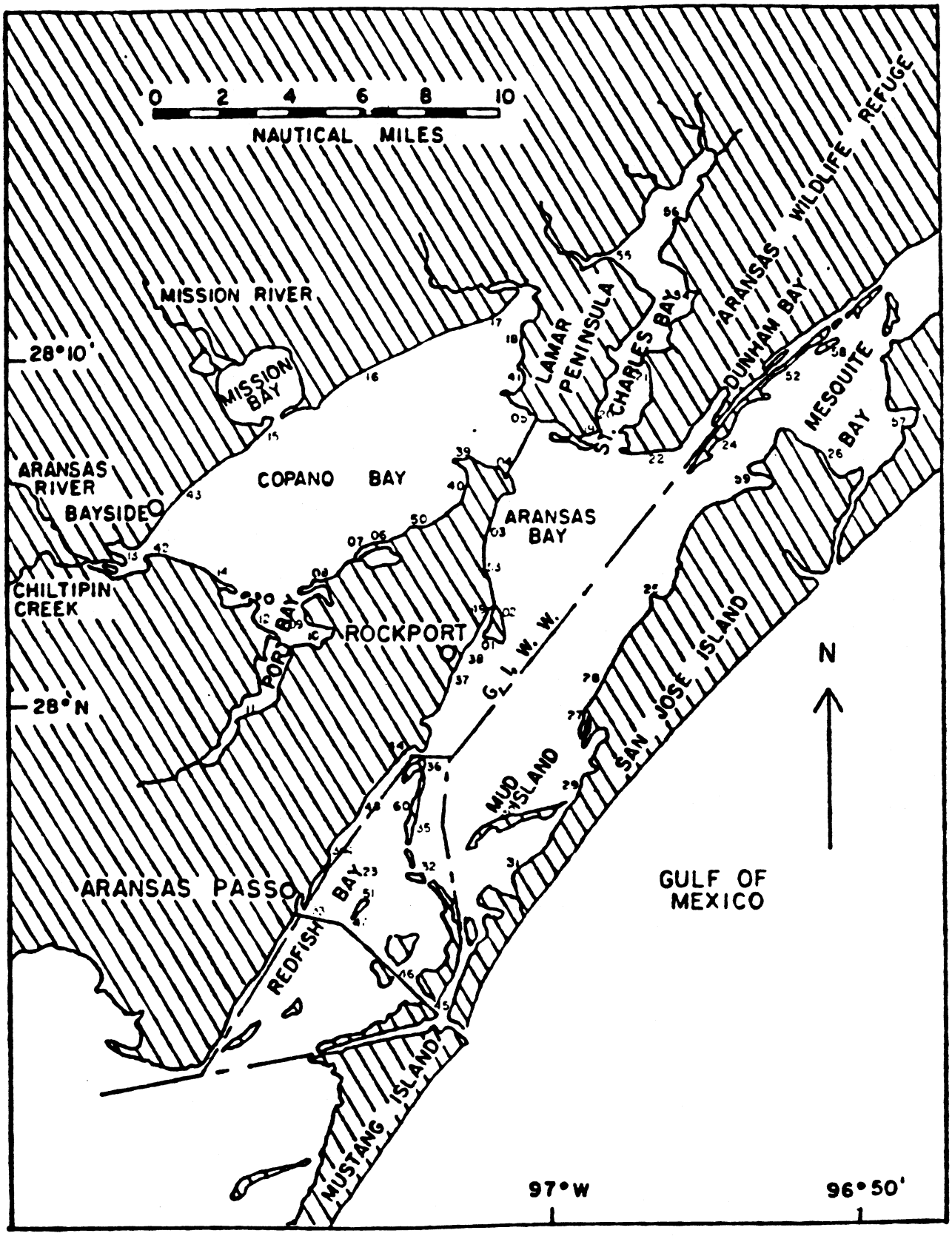

0 2 4 6 8 10
NAUTICAL MILES
MISSION RIVER
MISSION BAY
28°10'
ARANSAS RIVER
BAYSIDE
COPANO BAY
ARANSAS BAY
LAMAR PENINSULA
ST. CHARLES BAY
DUNHAM BAY
ARANSAS WILDLIFE REFUGE
MESQUITE BAY
CHILTIPIN CREEK
PORT BAY
ROCKPORT
G. I. W. W.
28°N
MUD ISLAND
SAN JOSE ISLAND
N
ARANSAS PASS
REDFISH BAY
GULF OF MEXICO
MUSTANG ISLAND
97°W
96°50'

Figure 7. 18.3-m bag seine sample sites in the Corpus Christi Bay system during 1983 (each station number should be preceded by the digit 2).

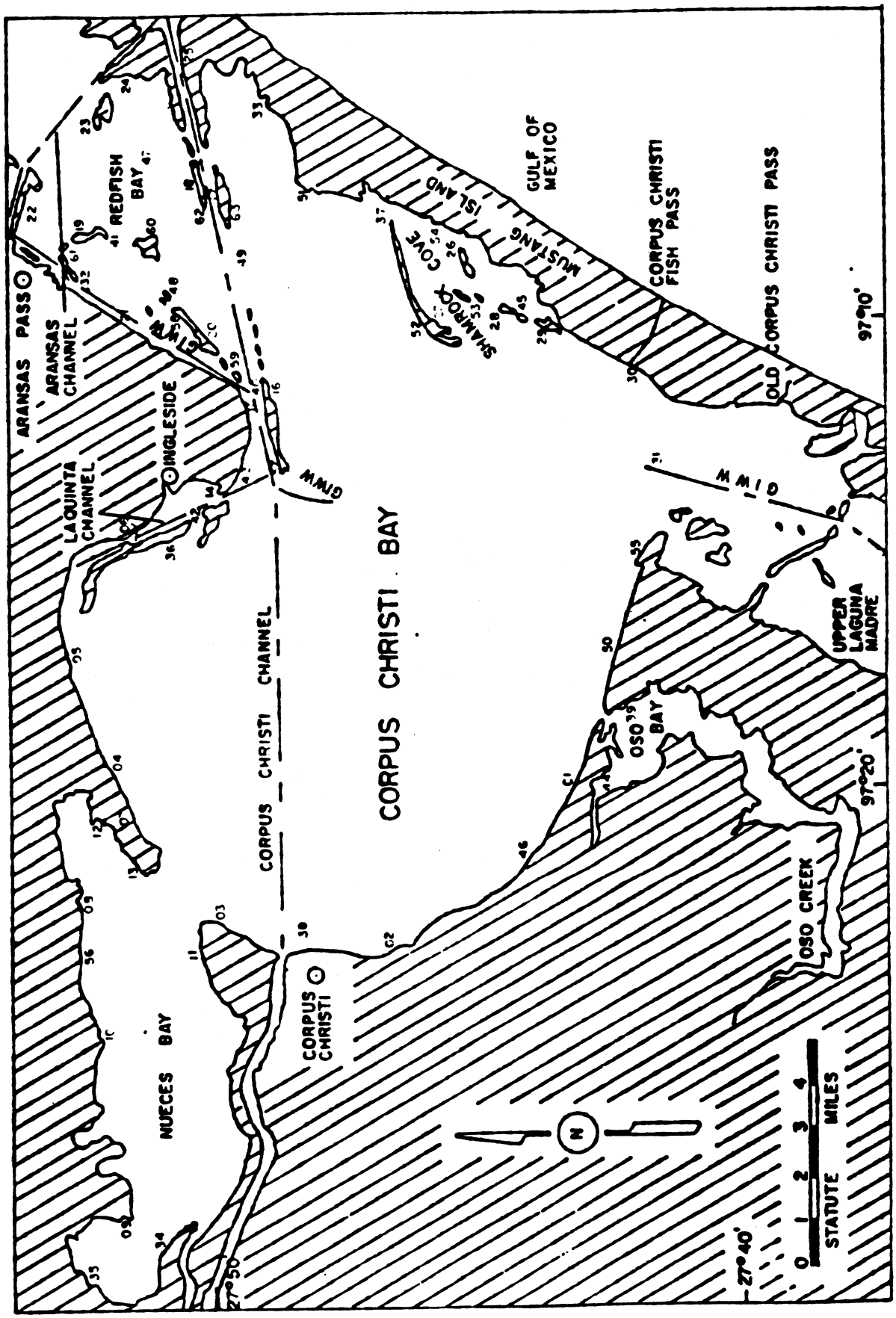

ARANSAS PASS
ARANSAS CHANNEL
REDFISH BAY
INGLESIDE
LAQUINTA CHANNEL
MM 10
MM 9
CORPUS CHRISTI CHANNEL
CORPUS CHRISTI BAY
MUSTANG ISLAND
GULF OF MEXICO
CORPUS CHRISTI FISH PASS
CORPUS CHRISTI PASS
OLD
SHAMROCK COVE
UPPER LAGUNA MADRE
OSO BAY
OSO CREEK
NUECES BAY
CORPUS CHRISTI
97°10'
97°20'
27°40'
N
0 1 2 3 4
STATUTE MILES

Figure 8. 18.3-m bag seine sample sites in the upper Laguna Madre during 1983 (each station number should be preceded by the digit 2).

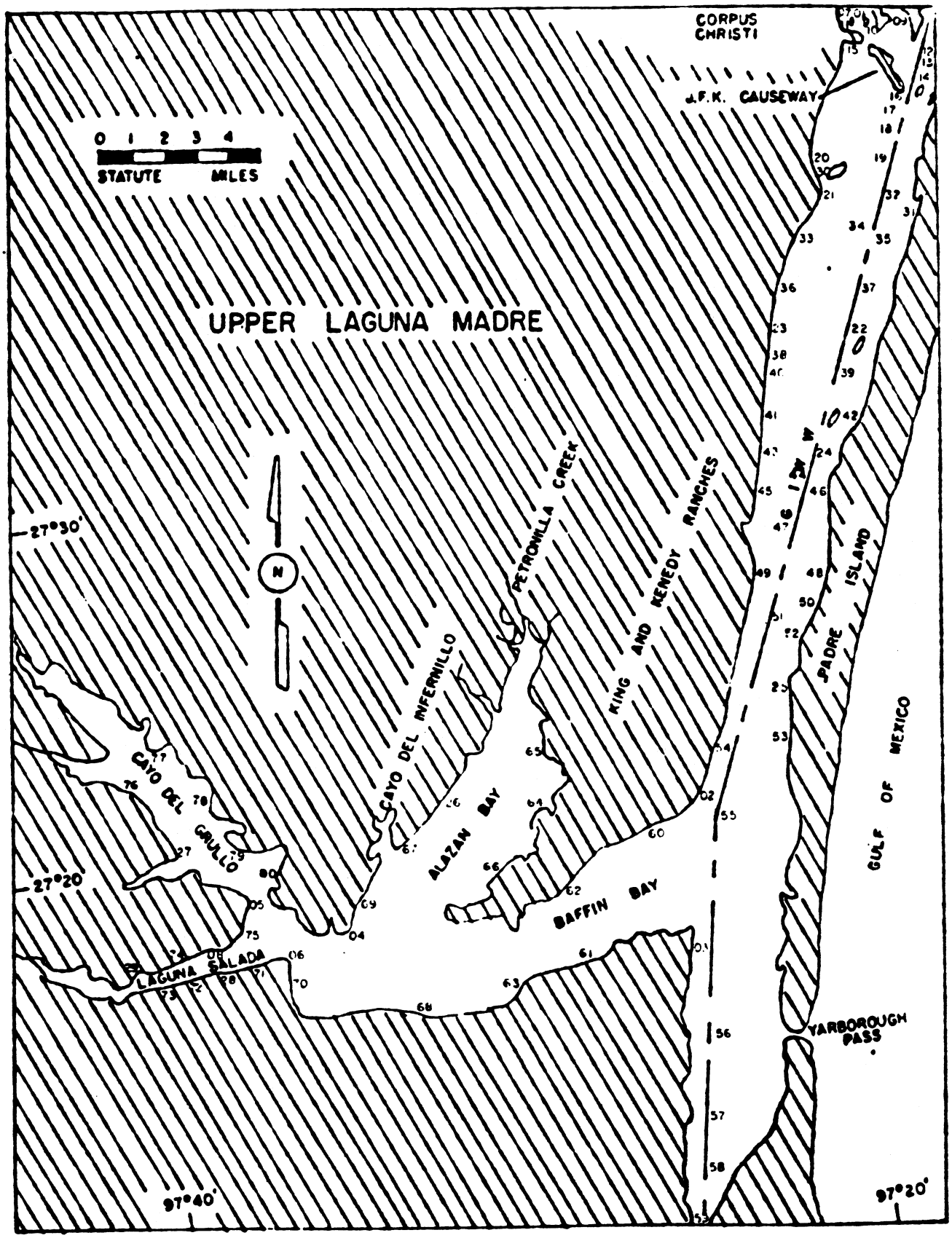

CORPUS CHRISTI
J.F.K. CAUSEWAY
0 1 2 3 4
STATUTE MILES
UPPER LAGUNA MADRE
N
PETRONILLA CREEK
KING AND KENEDY RANCHES
PADRE ISLAND
GULF OF MEXICO
CAYO DEL INFERNILLO
ALAZAN BAY
BAFFIN BAY
CAYO DEL GRULLO
LAGUNA SALADA
YARBOROUGH PASS
27°30'
27°20'
97°40'
97°20'

Figure 9. 18.3-m bag seine sample sites in the lower Laguna Madre during 1983 (each station number should be preceded by the digit 2).

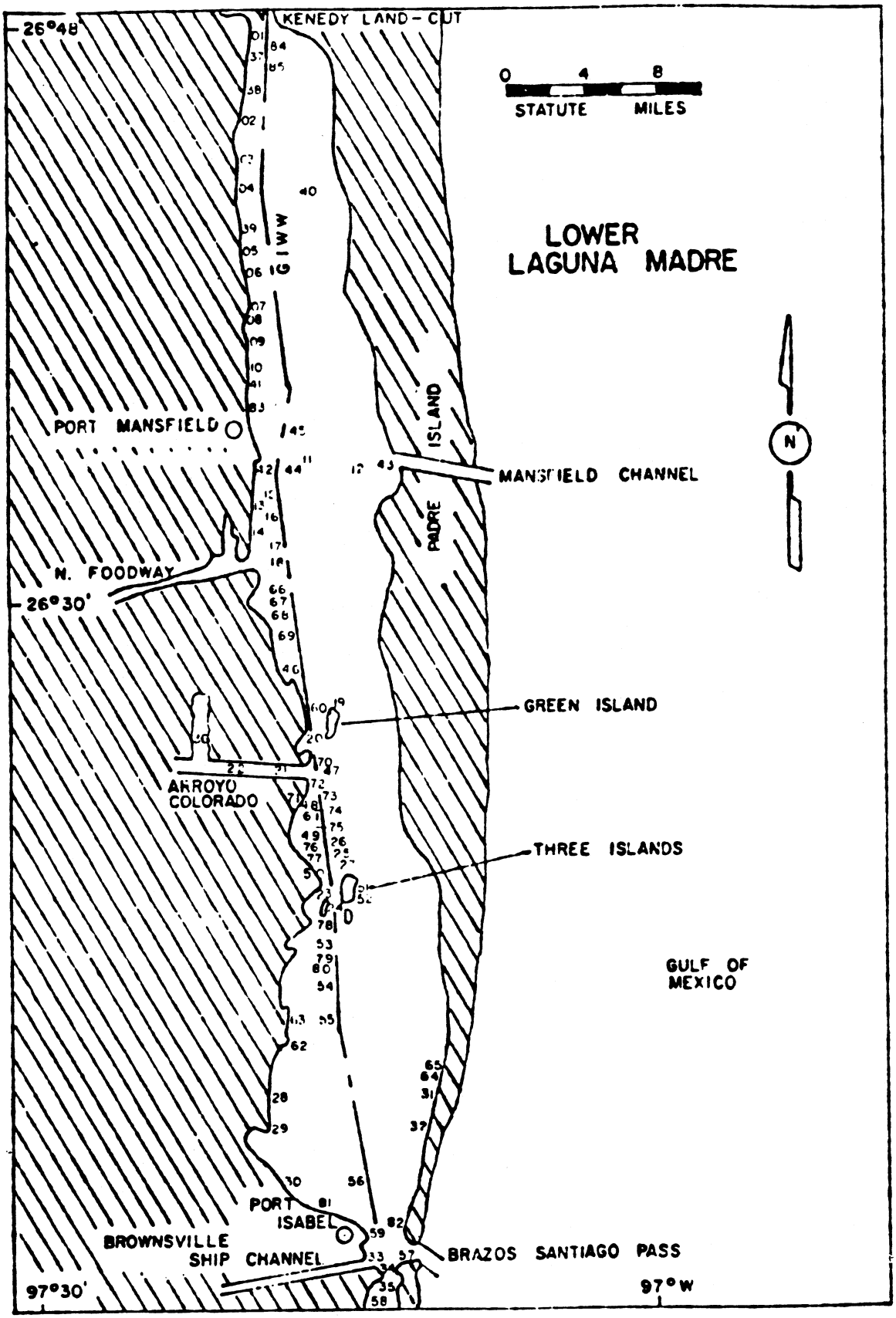

26°48'
KENEDY LAND-CUT
0 4 8
STATUTE MILES
LOWER
LAGUNA MADRE
GIWW
PORT MANSFIELD
ISLAND
MANSFIELD CHANNEL
PADRE
N
N. FOODWAY
26°30'
GREEN ISLAND
ARROYO
COLORADO
THREE ISLANDS
GULF OF
MEXICO
PORT
ISABEL
BROWNSVILLE
SHIP CHANNEL
BRAZOS SANTIAGO PASS
97°30'
97°W

Figure 10. 6.1-m bay trawl sample sites in the Galveston Bay system during 1983.

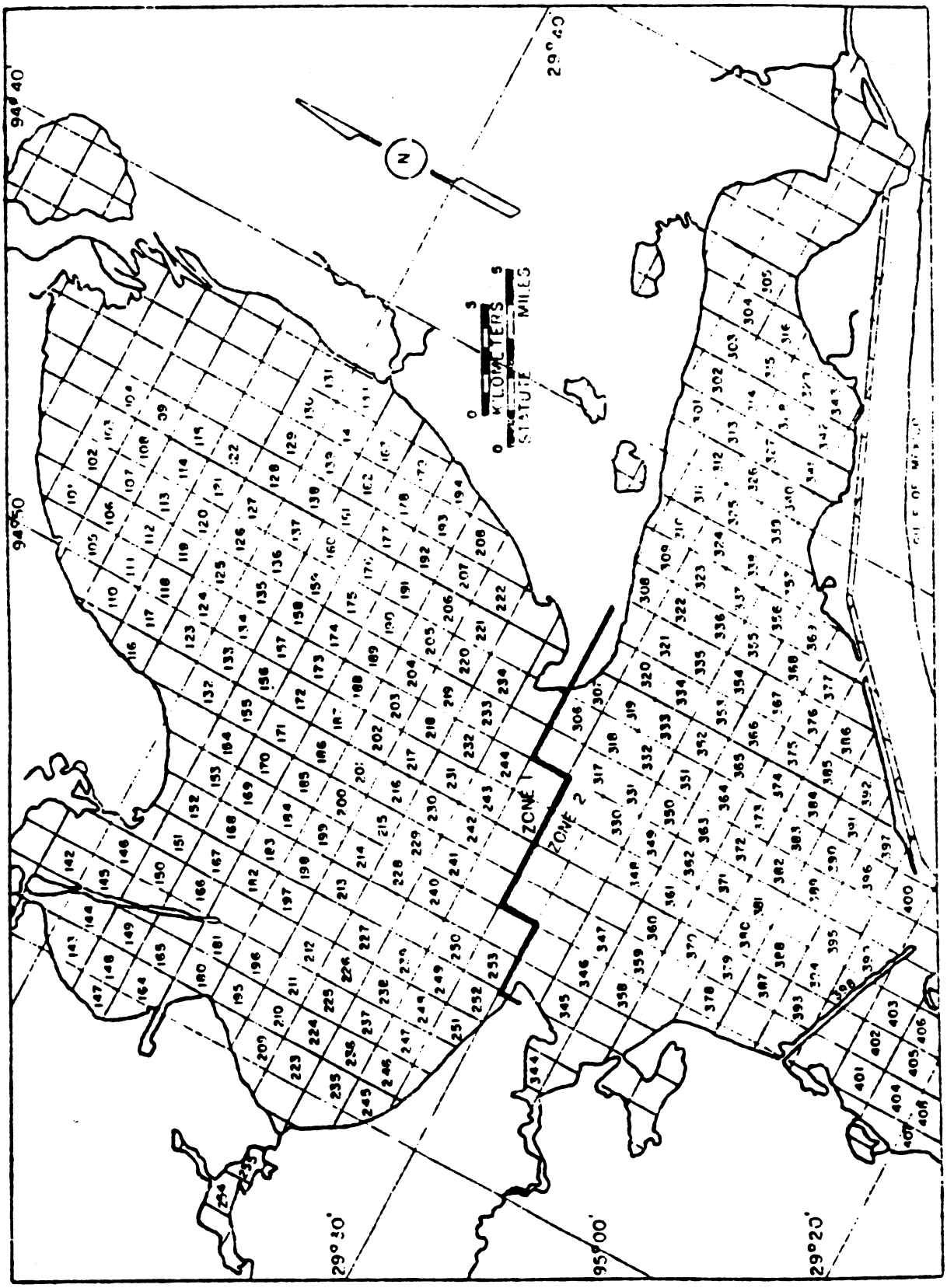

94°40'
29°40'
94°50'
29°30'
95°00'
29°20'
N
0 3 5
KILOMETERS
0
STATUTE MILES
ZONE 1
ZONE 2

Figure 11. 6.1-m bay trawl sample sites in the Galveston Bay system during 1983.

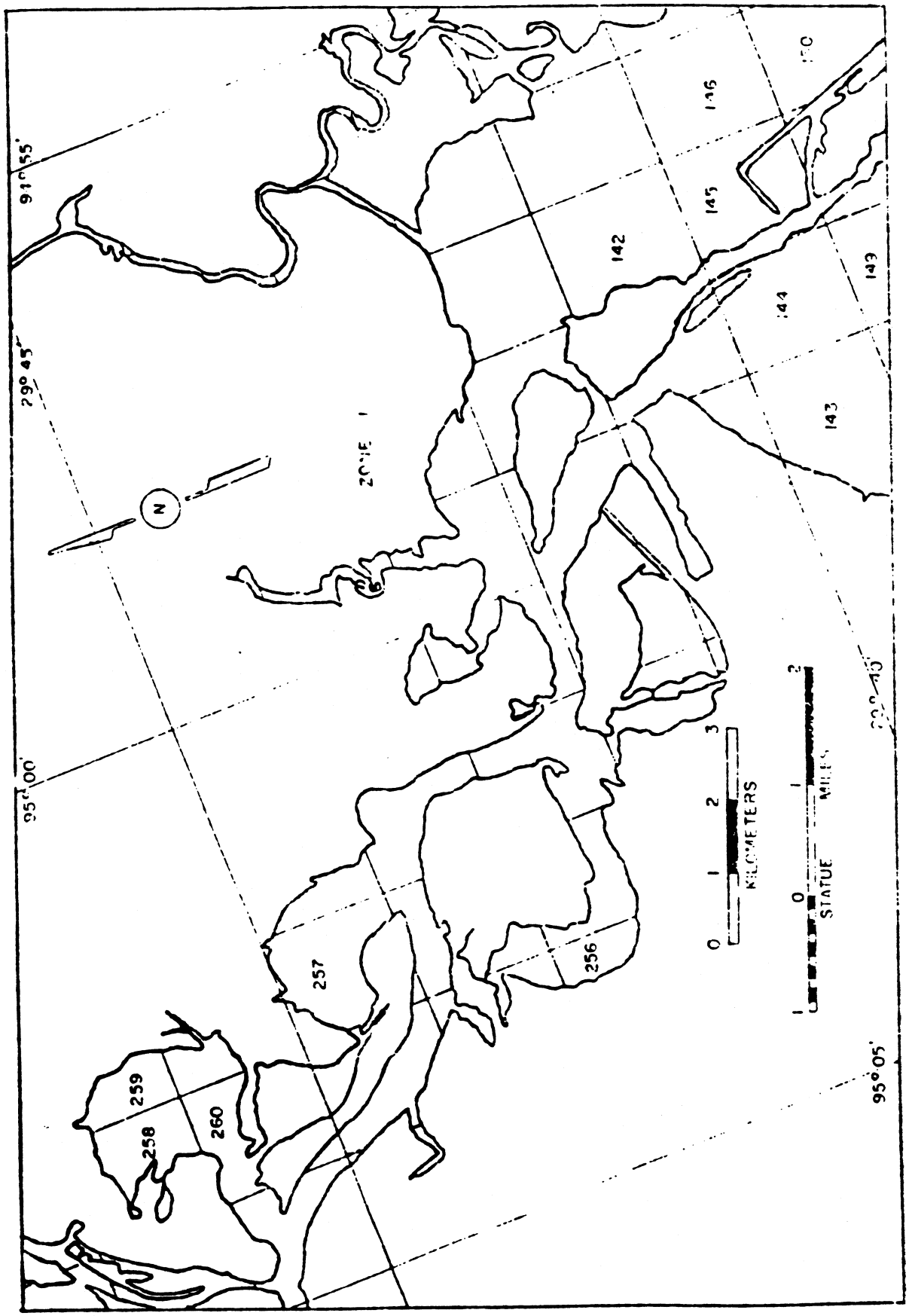

91°55'
29°45'
95°00'
95°05'
ZONE 1
N
142
145
146
144
143
149
257
256
259
258
260
0
1
2
3
KILOMETERS
0
1
STATUTE

Figure 12. 6.1-m bay trawl sample sites in the Galveston Bay system during 1983.

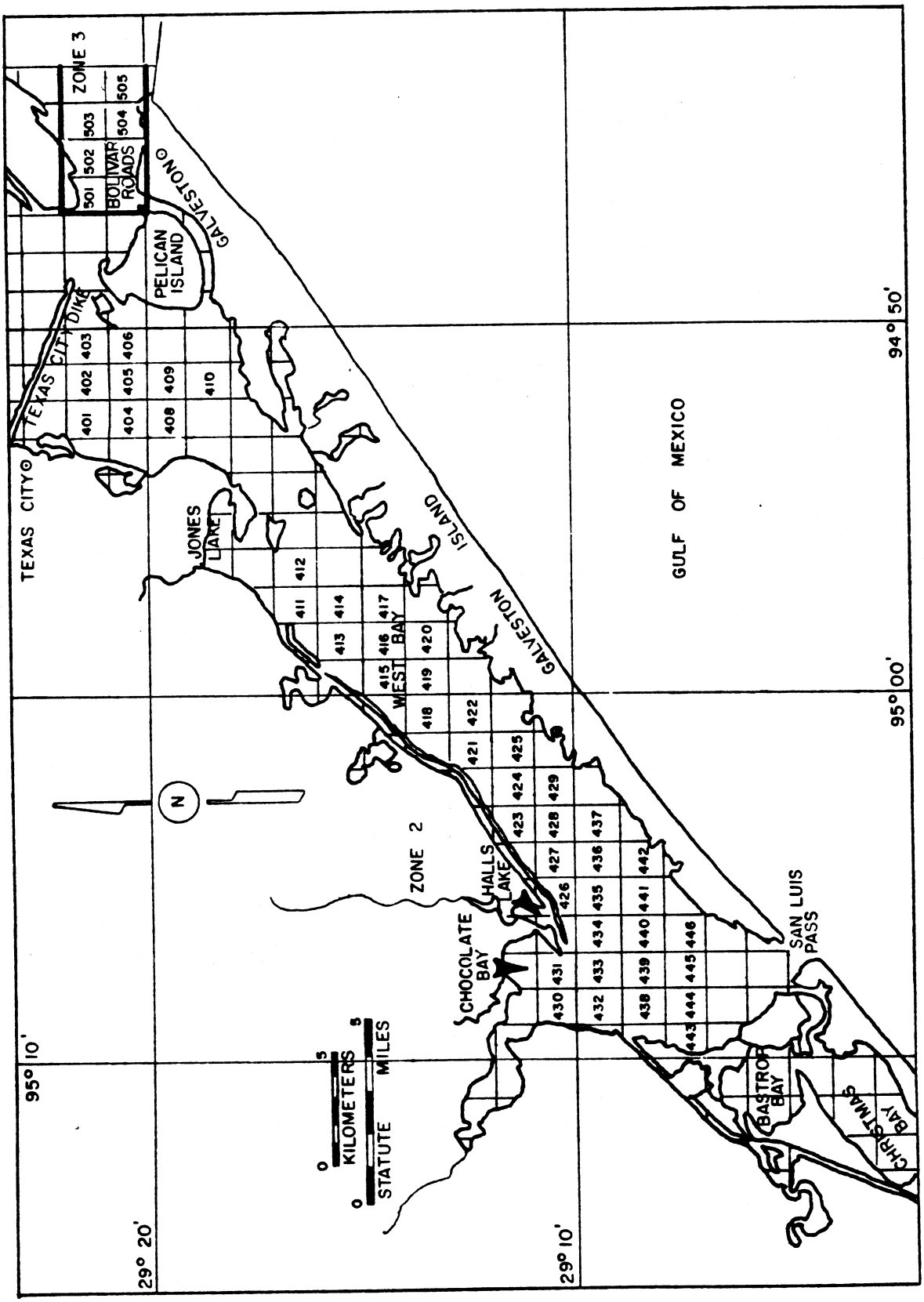

ZONE 3
501 502 503
BOLIVAR ROADS
504 505
401 402 403 406
404 405 409
408 410
TEXAS CITY DIKE
PELICAN ISLAND
GALVESTON
TEXAS CITY
JONES LAKE
411 412
413 414
415 416 417
WEST BAY
418 419 420
421 422
423 424 425
427 428 429
426 435 436 437
430 431 432 433 434 438 439 440 441 442 443 444 445 446
ISLAND
GALVESTON
GULF OF MEXICO
ZONE 2
HALLS LAKE
CHOCOLATE BAY
SAN LUIS PASS
BASTROP BAY
CHRISTMAS BAY
N
0 5 KILOMETERS
0 5 STATUTE MILES
95° 10'
95° 00'
94° 50'
29° 20'
29° 10'

Figure 13. 6.1-m bay trawl sample sites in the Matagorda Bay system during 1983.

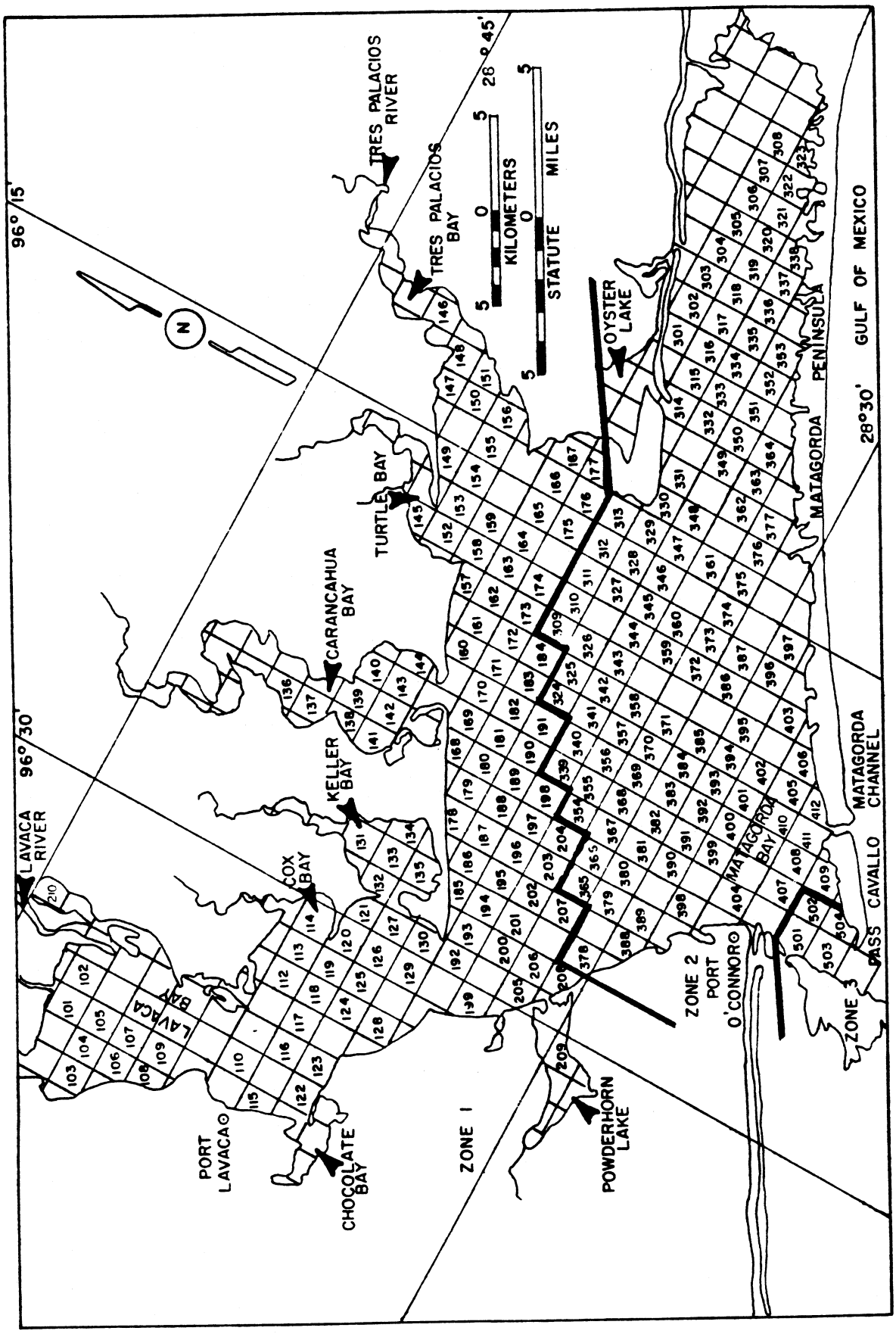

96° 15'
96° 30'
28° 45'
28°30'
LAVACA RIVER
COX BAY
KELLER BAY
CARANCAHUA BAY
TURTLE BAY
TRES PALACIOS BAY
TRES PALACIOS RIVER
OYSTER LAKE
MATAGORDA PENINSULA
GULF OF MEXICO
MATAGORDA CHANNEL
PASS CAVALLO
MATAGORDA BAY
LAVACA BAY
CHOCOLATE BAY
POWDERHORN LAKE
PORT LAVACA
PORT O'CONNOR
ZONE 1
ZONE 2
ZONE 3
KILOMETERS
STATUTE MILES
N

Figure 14. 6.1-m bay trawl sample sites in the San Antonio Bay system during 1983.

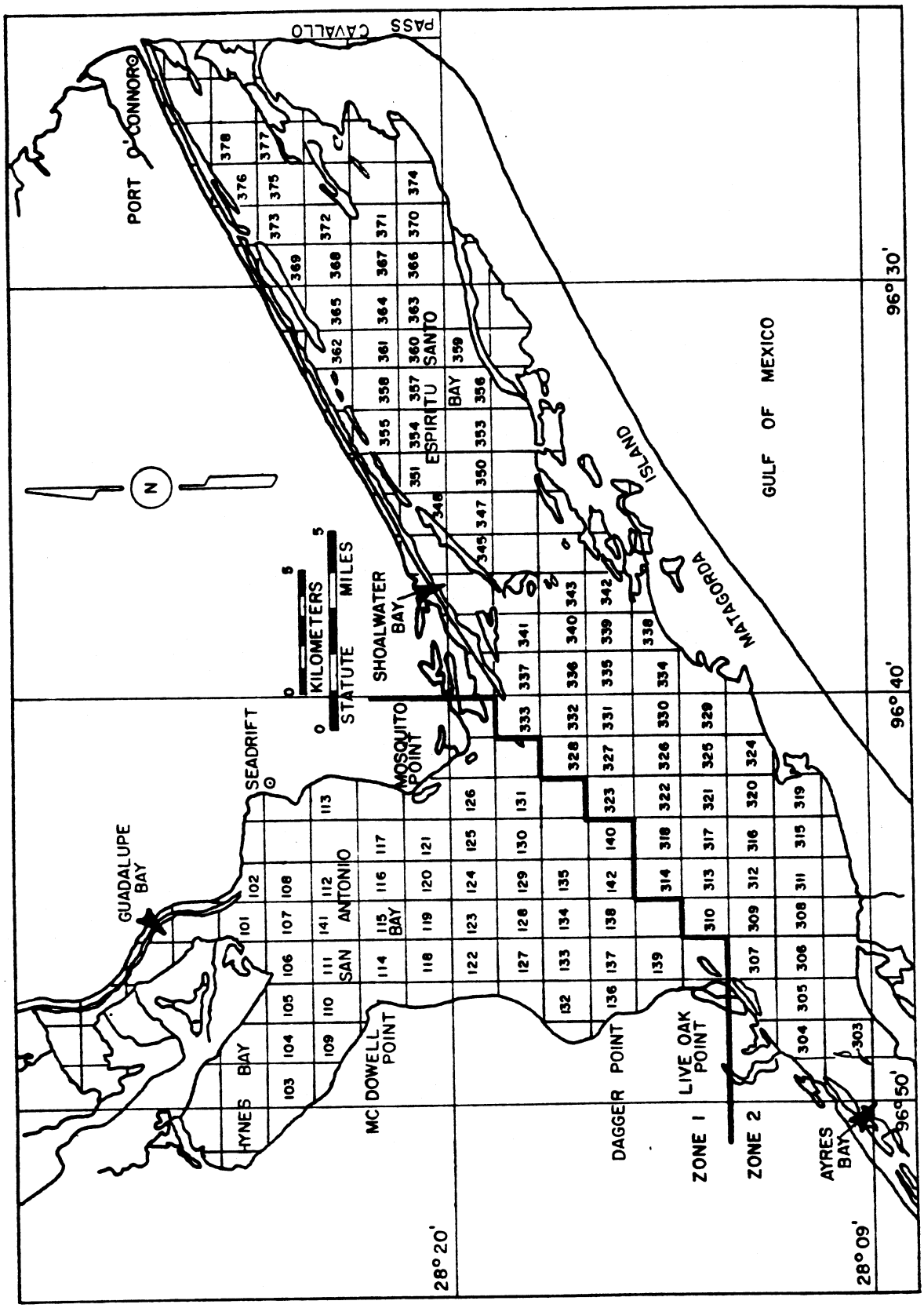

PORT O'CONNOR
CAVALLO PASS
GUADALUPE BAY
SEADRIFT
SHOALWATER BAY
MOSQUITO POINT
MATAGORDA ISLAND
GULF OF MEXICO
HYNES BAY
SAN ANTONIO BAY
MC DOWELL POINT
DAGGER POINT
LIVE OAK POINT
ZONE 1
ZONE 2
AYRES BAY
ESPIRITU SANTO BAY
KILOMETERS
STATUTE MILES
N
28° 20'
28° 09'
96° 50'
96° 40'
96° 30'

Figure 15. 6.1-m bay trawl sample sites in the Aransas Bay system during 1983.

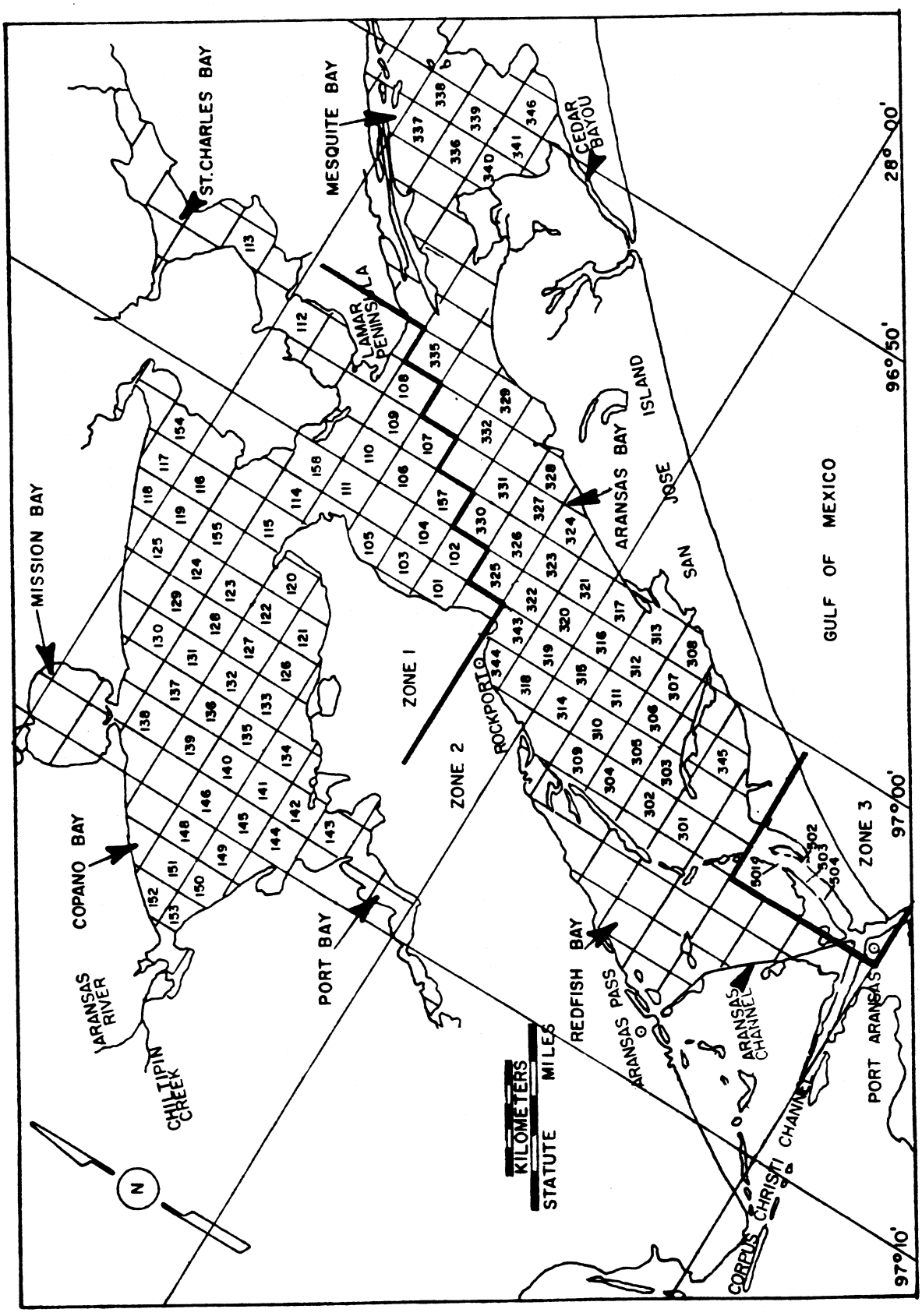

MISSION BAY
COPANO BAY
ARANSAS RIVER
CHILTIPIN CREEK
PORT BAY
ST.CHARLES BAY
MESQUITE BAY
LAMAR PENINSULA
CEDAR BAYOU
ARANSAS BAY
ISLAND
JOSE
SAN
ROCKPORT
ZONE 1
ZONE 2
ZONE 3
REDFISH BAY
ARANSAS PASS
ARANSAS CHANNEL
PORT ARANSAS
CORPUS CHRISTI CHANNEL
GULF OF MEXICO
KILOMETERS
STATUTE MILES
N
97°10'
97°00'
96°50'
28°00'

Figure 16. 6.1-m bay trawl sample sites in the Corpus Christi Bay system during 1983.

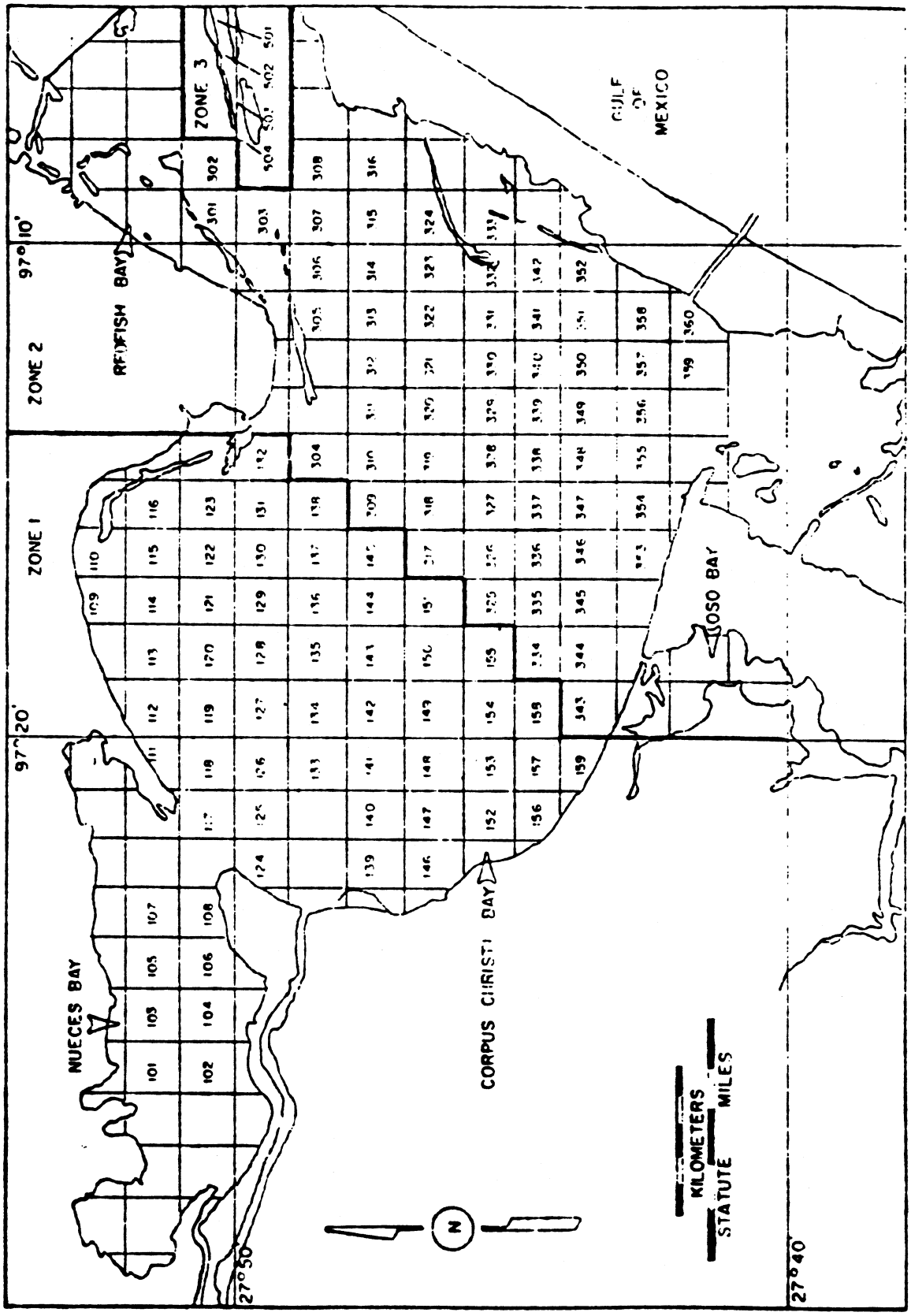

ZONE 1
ZONE 2
ZONE 3
97° 20'
97° 10'
27° 50'
27° 40'
NUECES BAY
CORPUS CHRISTI BAY
REDFISH BAY
LOSO BAY
GULF OF MEXICO
KILOMETERS
STATUTE MILES
N

Figure 17. 6.1-m bay trawl sample sites in the upper Laguna Madre during 1983.

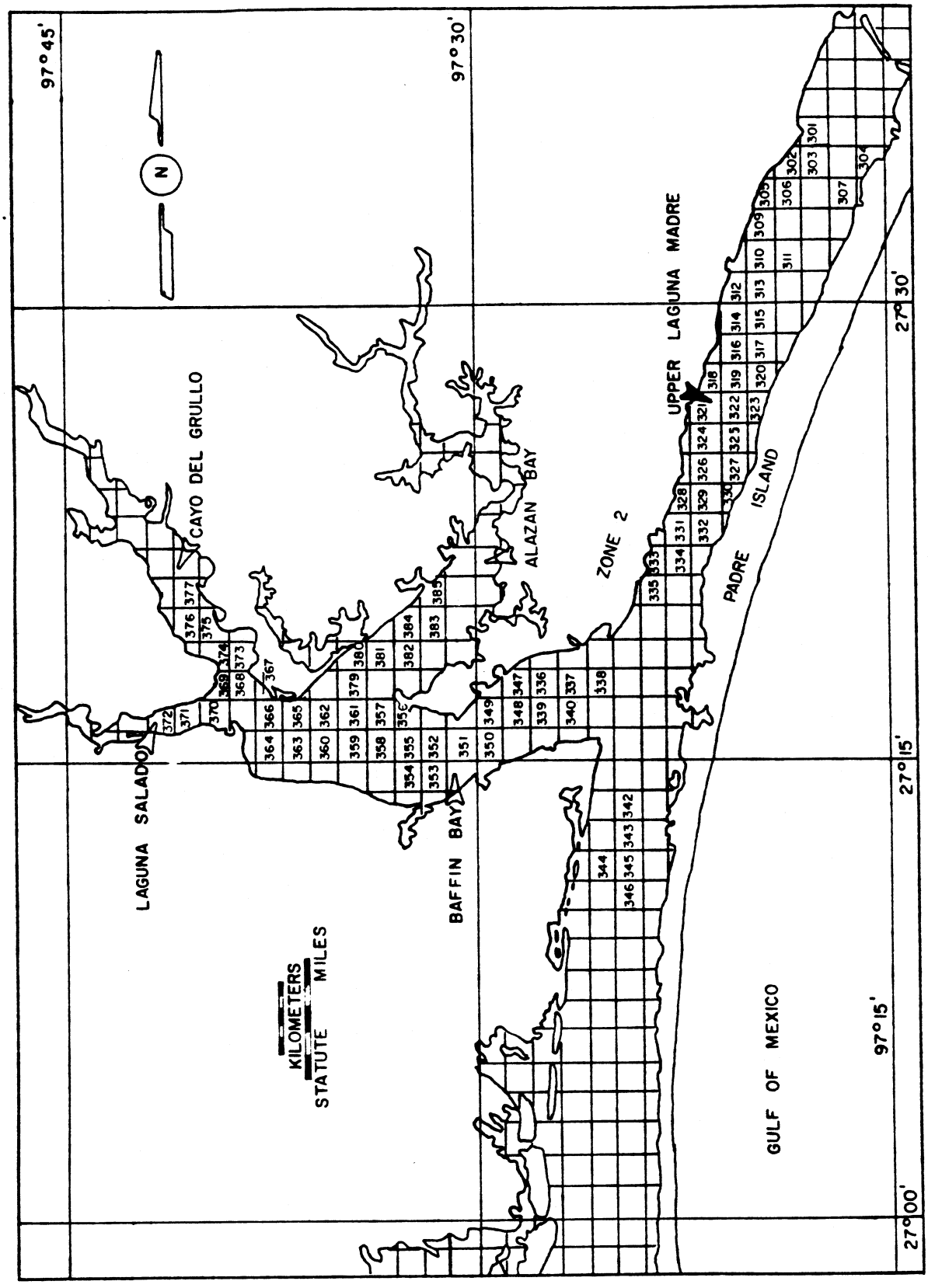

97°45'
97°30'
27°30'
27°15'
27°00'
97°15'
N
LAGUNA SALADO
CAYO DEL GRULLO
BAFFIN BAY
ALAZAN BAY
ZONE 2
UPPER LAGUNA MADRE
PADRE ISLAND
GULF OF MEXICO
KILOMETERS
STATUTE MILES

Figure 18. 6.1-m bay trawl sample sites in the lower Laguna Madre during 1983.

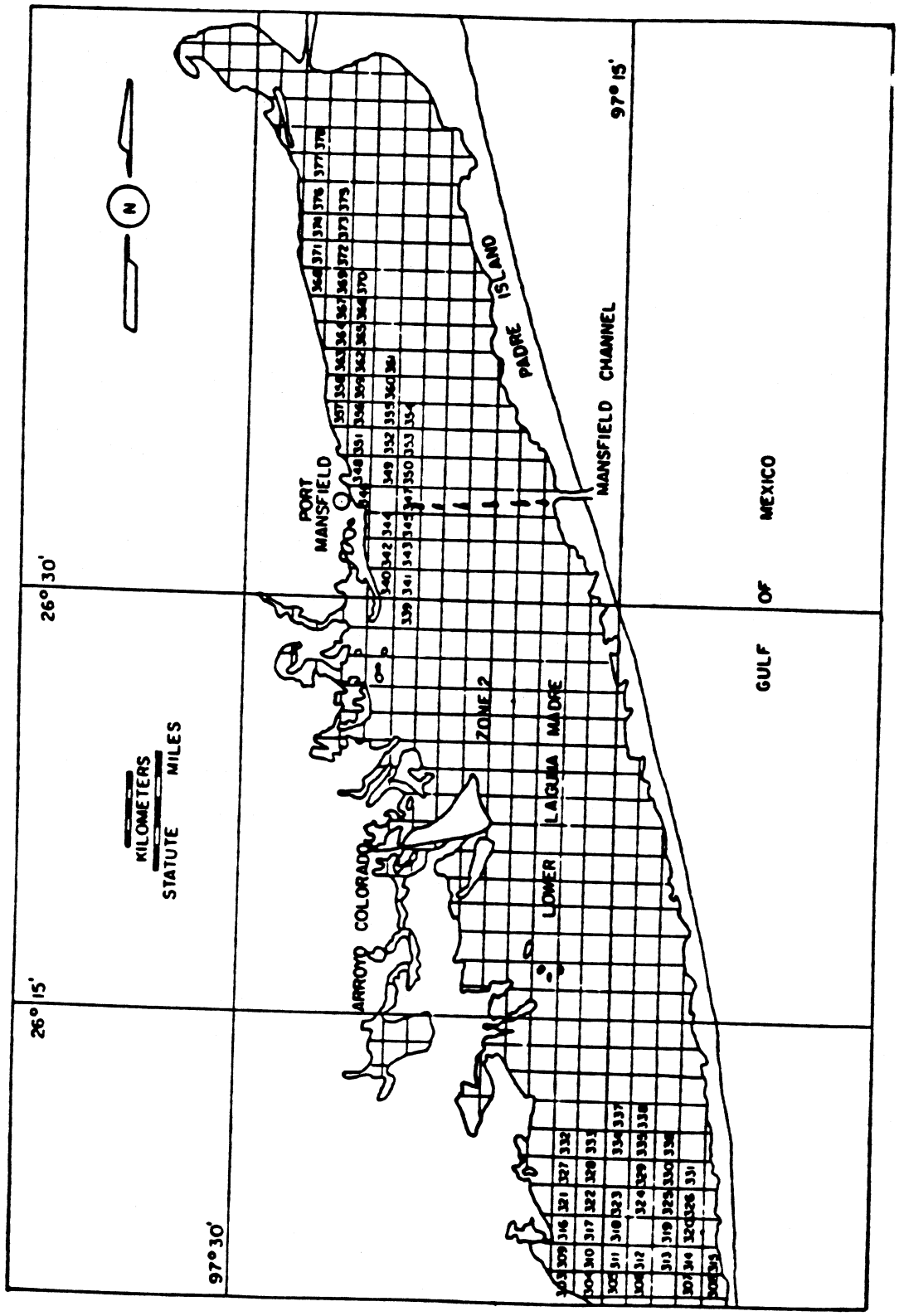

N
KILOMETERS
STATUTE MILES
26° 30'
26° 15'
97° 30'
97° 15'
PORT MANSFIELD
ARROYO COLORADO
LOWER LAGUNA MADRE
ZONE 2
PADRE ISLAND
MANSFIELD CHANNEL
GULF OF MEXICO

Figure 19. 6.1-m bay trawl sample sites in the lower Laguna Madre during 1983.

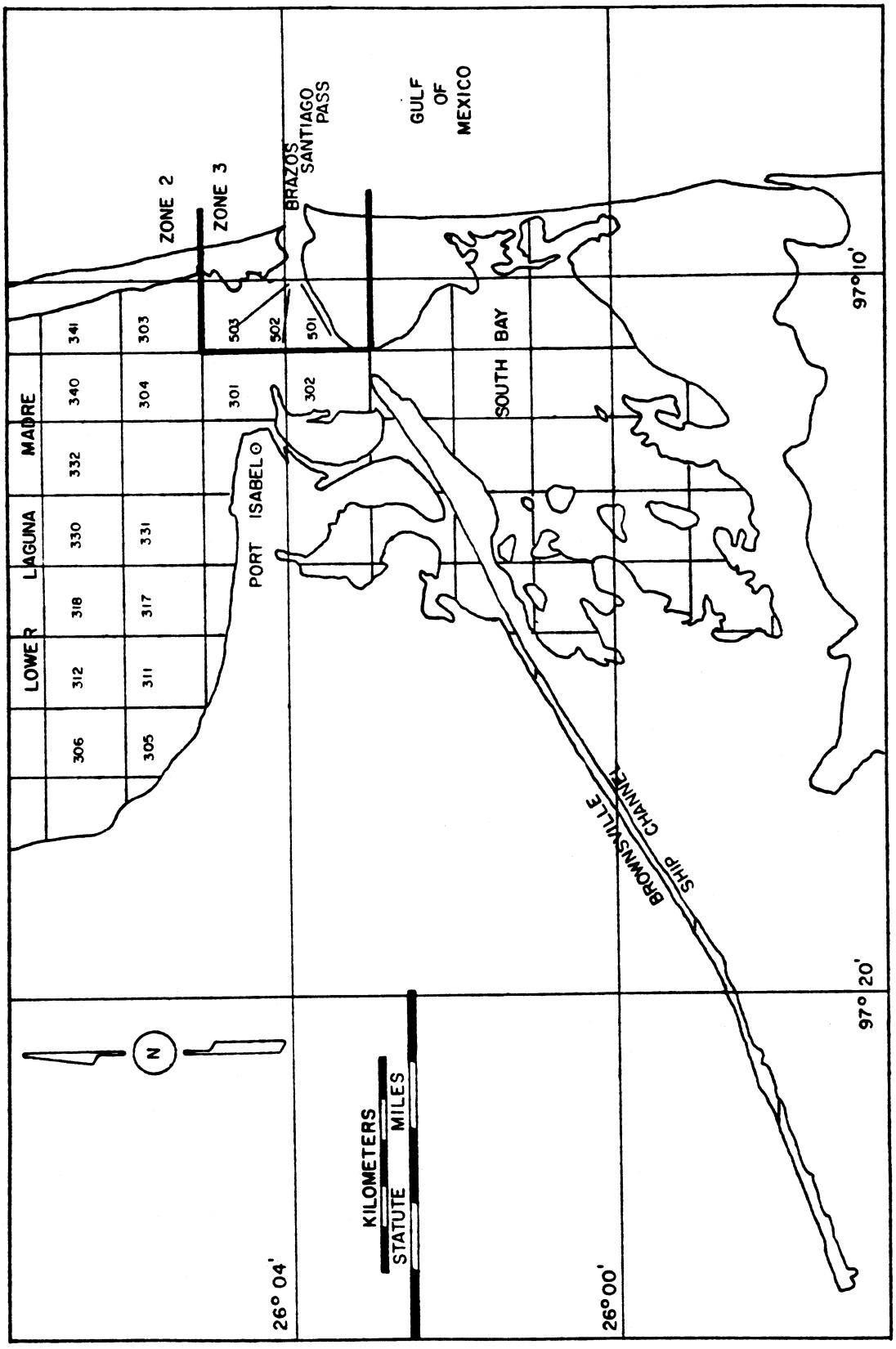
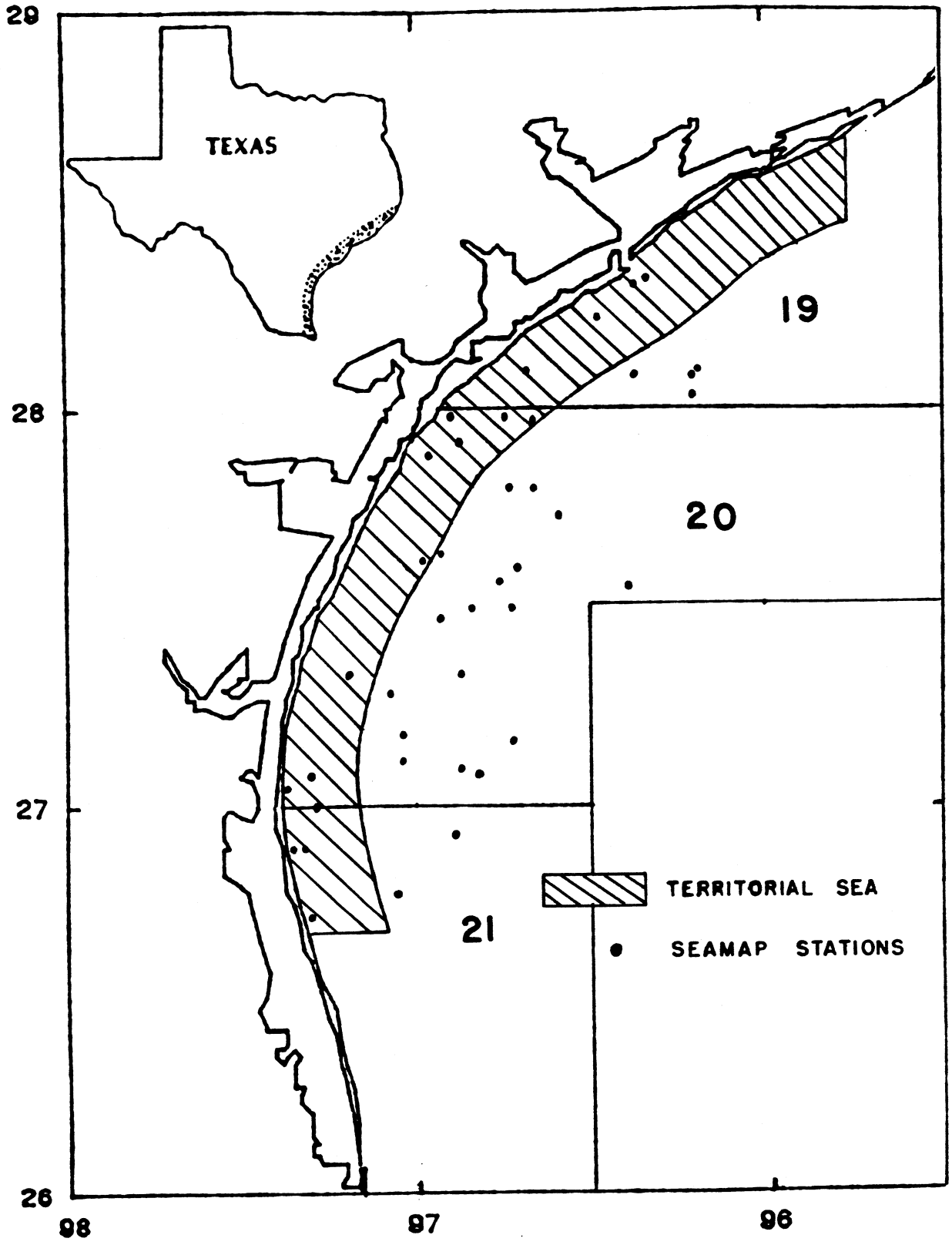

LOWER LAGUNA MADRE
306
312
318
330
332
340
341
305
311
317
331
304
303
ZONE 2
ZONE 3
301
503
502
501
302
PORT ISABEL
BRAZOS SANTIAGO PASS
GULF OF MEXICO
SOUTH BAY
BROWNSVILLE SHIP CHANNEL
N
KILOMETERS
STATUTE MILES
26° 04'
26° 00'
97° 20'
97° 10'

Figure 20. Major Gulf of Mexico sampling areas along the Texas coast during 1983. (Numbers indicate NMFS Gulf statistical areas).


29
28
27
26
98
97
96
TEXAS
19
20
21
TERRITORIAL SEA
SEAMAP STATIONS

Appendix A: Hydrological Data Summary.

Table A.1. Monthly mean surface water temperature (C) at sampled bag seine stations in each Texas bay system during calendar year 1983 (blank = no measurement taken).

Month	Galveston	Matagorda	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre
Jan	13.8	15.3	11.5	17.3	15.6	17.8	15.2
Feb	17.9	15.2	14.9	16.8	16.1	19.6	17.2
Mar	20.9	15.8	17.2	21.8	21.5	20.6	19.3
Apr	21.3	21.2	22.0	23.3	23.2	24.6	22.2
May	26.2	24.6	23.7	27.2	26.5	28.0	27.1
Jun	30.0	29.6	27.7	30.1	29.9	31.2	29.7
Jul	29.2	28.1	29.0	29.0	31.2	29.9	28.8
Aug	30.8	30.2	30.5	30.5	31.1	33.3	30.3
Sep	27.4	27.8	26.1	26.5	28.2	29.7	28.7
Oct	24.9	25.9	24.9	24.8	25.9	27.5	28.5
Nov	23.3	21.1	23.2	22.9	22.1	24.1	27.0
Dec	16.9	13.8	12.1	16.6	11.4	13.7	16.5

Table A.2. Monthly mean surface salinity (o/oo) at sampled bag seine stations in each Texas bay system during calendar year 1983 (blank = no measurement taken).

Month	Galveston	Matagorda	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre
Jan	6.5	23.5	18.3	23.2	29.1	36.4	33.8
Feb	6.3	17.6	16.3	22.5	29.9	33.2	28.9
Mar	11.5	16.7	18.9	23.9	29.7	34.0	24.6
Apr	14.1	17.3	18.8	23.3	31.2	39.5	32.8
May	17.0	23.2	18.8	21.2	29.3	42.5	34.7
Jun	17.8	18.6	18.6	20.7	26.7	41.0	32.6
Jul	13.7	12.4	16.0	14.7	25.8	33.5	24.1
Aug	12.5	9.5	12.0	9.9	27.8	33.7	32.4
Sep	6.9	9.6	17.6	11.2	25.5	34.8	32.8
Oct	10.8	11.7	18.6	9.6	25.3	33.8	33.1
Nov	17.0	11.9	15.9	9.8	22.8	35.1	32.3
Dec	18.9	19.3	15.1	17.7	27.7	33.1	32.4

Table A.3. Monthly mean bottom water temperatures (C) recorded at 6.1-m trawl stations in Texas bays during calendar year 1983 (blank = no measurement taken).

Month	Galveston	Matagorda	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre
Jan	11.9	11.8	12.2	12.5	12.4	12.0	11.7
Feb	13.3	14.4	13.8	11.9	15.7	14.7	17.1
Mar	15.6	17.7	17.1	17.2	18.1	16.8	20.7
Apr	19.6	19.2	21.9	20.7	21.4	22.3	21.4
May	24.5	22.4	24.3	23.6	24.9	23.3	23.4
Jun	27.0	28.0	27.8	27.4	28.1	27.0	28.6
Jul	29.4	27.7	29.6	29.6	29.5	28.8	28.3
Aug	29.4	29.7	29.1	30.2	29.7	29.7	29.0
Sep	26.1	27.7	27.4	27.7	26.3	26.1	26.8
Oct	24.3	26.7	26.5	26.4	26.3	26.7	26.0
Nov	19.9	22.7	22.4	22.3	22.3	22.7	18.8
Dec	11.1	13.8	14.4	10.4	13.4	12.1	10.3

Table A.4. Monthly mean bottom water salinity (o/oo) recorded at 6.1-m trawl stations in Texas bays during calendar year 1983 (blank = no measurement taken).

Month	Galveston	Matagorda	San Antonio	Aransas	Corpus Christi	Upper Laguna Madre	Lower Laguna Madre
Jan	8.5	23.5	21.7	22.8	31.0	35.7	38.3
Feb	9.2	21.1	17.7	21.3	29.2	36.0	34.3
Mar	10.7	21.4	15.8	22.8	29.3	37.5	32.8
Apr	13.2	21.5	13.7	23.1	32.5	39.1	32.1
May	11.5	24.7	18.8	22.8	29.7	41.8	34.9
Jun	8.4	21.5	18.6	22.6	30.5	42.2	31.4
Jul	6.5	15.9	13.6	19.8	30.8	42.0	33.2
Aug	10.0	19.4	10.4	19.1	29.8	39.2	29.1
Sep	5.0	22.7	14.3	17.7	29.9	35.8	32.4
Oct	8.3	19.7	18.0	12.8	27.6	35.4	31.5
Nov	14.2	17.9	13.8	8.7	27.0	35.1	34.2
Dec	12.4	20.7	13.9	11.6	29.3	35.9	33.2

Table A.5. Weekly mean bottom water temperatures (C) recorded in Zone III at 6.1 m trawl stations in Texas bay systems during calendar year 1983.

Month	Day	Galveston	Matagorda P.C.	Matagorda M.C.[a]	Aransas	Corpus Christi	Lower Laguna Madre
Jan	3-9	12.8	9.5	10.5	13.3	13.0	13.0
	10-16	14.0	14.0	15.0	14.3	14.8	18.0
	17-23	14.5	15.0	11.3	14.5	14.5	16.0
	24-30	11.0	13.5	14.0	12.3	13.0	15.0
	31-Feb 6	14.0	14.0	14.5	13.5	14.3	17.5
Feb	7-13	11.8	12.0	10.5	15.5	15.3	15.0
	14-20	13.3	17.0	16.5	15.0	15.3	16.3
	21-27	16.0	15.0	15.5	16.8	17.5	17.5
	28-Mar 6	14.5	17.5	18.0	15.5	15.8	15.8
Mar	7-13	18.0	19.0	19.0	18.3	19.0	19.0
	14-20	16.5	16.5	17.0	17.8	18.0	19.0
	21-27	14.0	16.0	15.0	15.5	16.0	19.0
	28-Apr 3	14.5	19.0	17.5	18.0	18.5	19.0
Apr	3-10	14.5	16.0	16.0	18.5	17.8	21.0
	11-17	14.0	18.5	20.5	19.0	19.0	21.0
	18-24	17.3	20.0	19.0	20.3	20.8	20.5
	25-May 1	18.3	22.5	21.5	22.0	22.5	22.0
May	2-8	18.8	20.3	21.0	23.5	23.8	21.5
	9-15	23.0	22.0	22.0	23.3	23.5	23.0
	15-22	23.0	21.5	21.0	23.0	23.5	23.0
	23-29	24.0	25.5	26.0	25.8	25.5	25.0
	30-June 5	24.0	25.8	26.0	27.0	26.8	24.5
June	6-12	25.5	28.8	28.0	28.0	28.5	25.3
	13-19	26.0	29.0	29.0	27.5	27.0	26.8
	20-26	27.5	29.0	29.3	28.5	29.0	28.0
	27-July 3	28.0	20.0	30.5	30.0	30.5	26.5
July	4-10	28.5	31.0	30.5	30.3	29.5	27.5
	11-17	29.5	29.8	27.0	29.0	29.5	28.0
	18-24	29.5	29.5	28.8	28.0	28.8	27.0
	25-31	29.0	29.0	30.0	29.0	29.0	27.0
Aug	1-7	29.5	29.0	29.0	29.3	28.8	28.0
	8-14	29.5	30.0	30.0	30.3	30.3	28.5
	15-21	29.5	31.0	29.5	29.8	31.0	27.5
	22-28	29.5	29.0	29.5	30.5	33.5	28.0
	29-Sept 4	31.0	28.0	29.0	30.5	31.0	28.8

Table A.5. (Cont'd.).

Month	Day	Galveston	Matagorda P.C.	Matagorda M.C.[a]	Aransas	Corpus Christi	Lower Laguna Madre
Sept	5-11	30.0	29.8	30.0	ND	ND	29.0
	12-18	27.5	27.8	27.0	28.0	28.2	27.0
	19-25	24.0	26.5	27.8	29.2	29.4	27.5
	26-Oct 2	24.0	27.0	25.5	25.8	26.0	27.0
Oct	3-9	26.0	26.0	26.0	26.5	26.3	27.0
	10-16	25.5	23.5	25.0	26.8	26.3	25.0
	17-23	24.8	26.0	26.0	25.8	25.5	26.0
	24-30	23.3	22.0	22.0	24.8	25.3	24.0
	31-Nov 5	23.3	26.0	26.0	24.0	24.0	25.0
Nov	7-13	21.8	23.3	25.0	24.0	24.0	24.0
	14-20	20.0	24.0	23.5	23.8	23.8	22.0
	21-27	18.5	20.5	21.3	22.0	21.0	20.5
	28-Dec 4	17.0	17.0	17.0	18.8	17.8	20.0
Dec	5-11	16.0	21.3	21.5	20.8	20.8	17.0
	12-18	16.3	16.0	16.0	18.5	19.3	20.0
	19-25	12.5	9.5	9.5	9.0	11.0	10.0
	26-31	5.0	4.0	6.5	7.3	6.8	5.0

[a] P.C. Pass Cavallo
M.C. Matagorda Channel

ND = No Data

Table A.6. Weekly mean bottom water salinity (o/oo) recorded in Zone III at 6.1 m trawl stations in Texas bay systems during calendar year 1983.

Month	Day	Galveston	Matagorda P.C.	Matagorda M.C.[a]	Aransas	Corpus Christi	Lower Laguna Madre
Jan	3-9	20.0	27.0	26.0	26.5	27.0	31.0
	10-16	17.5	27.0	26.0	24.5	28.5	34.0
	17-23	23.0	28.0	26.5	27.0	28.0	30.0
	24-30	15.0	26.5	26.0	21.0	27.5	31.0
	31-Feb 6	25.0	26.0	26.5	23.5	27.0	34.0
Feb	7-13	17.0	28.0	29.0	29.0	30.0	32.0
	14-20	16.5	23.0	23.5	29.5	30.5	32.0
	21-27	8.5	24.0	24.0	23.0	29.0	33.5
	28-Mar 6	18.0	27.0	23.5	26.0	27.5	31.0
Mar	7-13	17.0	28.5	29.0	29.0	30.0	36.0
	14-20	26.5	29.0	28.0	28.0	30.0	32.0
	21-27	20.0	24.0	24.5	26.5	28.5	32.5
	28-Apr 3	21.5	23.0	25.0	26.0	30.0	32.0
Apr	4-10	21.5	29.5	29.5	29.5	31.0	35.0
	11-17	18.0	25.0	25.0	31.5	30.5	35.0
	18-24	24.5	31.0	31.0	32.0	32.5	32.0
	25-May 1	27.5	29.0	29.0	29.5	31.5	36.0
May	2-8	26.5	28.0	26.5	31.5	32.0	36.0
	9-15	20.0	27.0	27.0	30.0	30.0	36.0
	16-22	16.5	24.0	23.5	24.5	23.0	32.0
	23-29	17.0	21.0	21.5	25.0	24.0	26.5
	30-June 5	15.0	22.0	23.0	25.0	26.0	25.0
June	6-12	23.0	23.0	23.5	27.0	27.5	33.0
	13-19	22.0	24.5	24.0	27.5	28.0	31.0
	20-26	18.0	22.1	21.8	24.0	24.0	32.0
	27-July 3	15.0	19.0	19.0	24.0	24.0	35.0
July	4-10	16.5	24.5	23.0	31.5	32.0	35.0
	11-17	19.0	24.5	23.5	28.0	28.5	30.5
	18-24	14.5	20.5	20.5	22.5	23.5	32.0
	25-31	15.0	27.0	28.5	31.0	31.0	35.0
Aug	1-7	25.0	25.0	24.0	34.0	34.0	36.0
	8-14	21.0	30.0	28.0	32.5	32.5	35.0
	15-21	28.0	26.5	28.5	33.0	32.5	38.0
	22-28	14.5	28.5	29.5	33.5	30.3	35.5
	29-Sept 4	21.5	30.0	28.5	30.0	31.0	35.0

Table A.6. (Cont'd.).

Month	Day	Galveston	Matagorda P.C.	Matagorda M.C.[a]	Aransas	Corpus Christi	Lower Laguna Madre
Sept	5-11	24.0	40.0	30.0	ND	ND	35.0
	12-18	17.5	27.0	27.0	29.0	30.0	34.0
	19-25	20.0	27.0	27.0	31.0	30.0	36.0
	26-Oct 2	19.0	23.5	22.5	25.0	28.0	34.0
Oct	3-9	21.0	22.0	22.0	25.0	25.0	30.0
	10-16	21.0	22.0	22.0	21.5	22.5	30.0
	17-23	22.5	27.0	27.0	28.0	27.0	30.0
	24-30	25.0	22.0	22.0	15.5	26.0	30.0
	31-Nov 6	23.0	26.6	22.7	27.0	27.0	32.0
Nov	7-13	16.5	23.0	23.5	24.5	27.5	32.0
	14-20	27.5	32.0	32.0	32.5	28.5	32.0
	21-27	26.5	29.0	28.0	31.5	31.0	36.0
	28-Dec 4	26.0	28.6	27.2	28.5	29.0	35.0
Dec	5-11	26.0	25.8	28.1	28.0	31.5	35.0
	12-18	24.5	26.2	24.7	20.0	30.0	35.0
	19-25	24.5	26.6	24.9	30.0	28.0	32.0
	26-31	25.0	26.6	26.6	19.5	24.5	32.0

P.C. Pass Cavallo
M.C. Matagorda Channel

ND = No Data

Table A.7. Monthly mean bottom water temperature (C), salinity (o/oo) and depth (m) at sampled Gulf trawl stations within the territorial sea during January 1983-March 1984 (blank = no measurement taken).

	Area 19[a] Territorial Sea						Area 20 Territorial Sea						Area 21 Territorial Sea		
	Day			Night			Day			Night			Night		
Month	Depth (m)	Salin. (o/oo)	Temp. (C)	Depth (m)	Salin. (o/oo)	Temp. (C)	Depth (m)	Salin. (o/oo)	Temp. (C)	Depth (m)	Salin. (o/oo)	Temp. (C)	Depth (m)	Salin. (o/oo)	Temp. (C)
Jan 83	11	28.4	14.1	15	30.2	14.4	15	30.8	15.5	13	28.2	14.8			
Feb 83	16	33.2	15.8	17	31.8	15.7	18	33.0	15.3	13	28.4	14.5			
Mar 83															
Apr 83															
May 83															
June 83	17	31.2	26.2	14	29.7	27.3	18	32.2	26.4	13	31.3	27.1			
July 83				12	30.3	27.3	12	28.5	29.0	17	29.7	28.2	13	29.4	28.7
Aug 83 - Mar 84															

[a]Territorial sea = < 16.7 km

Table A.8. Monthly mean bottom water temperature (C), salinity (o/oo) and depth (m) at sampled Gulf trawl stations within the FCZ during January 1983-March 1984 (blank = no measurement taken).

	Area 19			Area 20						Area 21					
	FCZ[a] < 46 m			FCZ < 46 m			FCZ 46-91 m			FCZ < 46 m			FCZ 46-91 M		
	Night			Night			Night			Night			Night		
Month	Depth (m)	Salin. (o/oo)	Temp. (C)	Depth (m)	Salin. (o/oo)	Temp. (C)	Depth (m)	Salin. (o/oo)	Temp. (C)	Depth (m)	Salin. (o/oo)	Temp. (C)	Depth (m)	Salin. (o/oo)	Temp. (C)
Jan 83															
Feb 83															
Mar 83															
Apr 83															
May 83															
June 83	30	35.2	24.6	20	34.0	25.0									
July 83				33	34.0	24.6	62	34.7	22.3	35	34.4	25.5	55	36.1	21.5
Aug 83 - Mar 84															

[a]FCZ = Fishery Conservation Zone (< 16.7 km to 370.6 km)

Appendix B. Summary of data collected during January-March 1984

Table B.1. Monthly mean catch rate (No./ha) and mean length (mm) of brown shrimp caught with bag seines in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Number samples	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre	
		No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length
Jan	10	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Feb	10	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Mar	10	0.00		0.00		0.00		22.92	31	158.33	34	0.00		90.00	37

Table B.2. Monthly mean catch rate (No./ha) and mean length (mm) of white shrimp caught with bag seines in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Number samples	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre	
		No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length
Jan	10	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Feb	10	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Mar	10	0.00		1.67	85	0.00		0.00		0.00		0.00		0.00	

Table B.3. Monthly mean catch rate (No./ha) and mean length (mm) of pink shrimp caught with bag seines in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Number samples	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre	
		No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length
Jan	10	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Feb	10	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Mar	10	0.00		5.00	25	0.00		0.00		0.00		0.00		0.00	

Table B.4. Monthly mean catch rate (No./ha) and mean width (mm) of blue crabs caught with 18.3-m seines in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Number samples	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre	
		No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length	No./ha	Length
Jan	10	10.00	30	10.00	32	10.00		2.08	13	6.12	19	0.00		2.00	30
Feb	10	3.33	25	0.00		13.00	16	6.12	14	4.17	15	0.00		96.00	34
Mar	10	136.67	34	110.00	36	10.00	17	81.25	27	31.25	27	62.50	70	290.00	46

Table B.5. Monthly mean catch rate (No./tow) and mean length (mm) of brown shrimp caught with 6.1-m trawls in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Number samples	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	20[a]	<0.1	78	0.0		0.0		0.2		0.0		0.0		0.2	60
Feb	20	0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Mar	20	0.0		0.0		0.0		0.0		< 0.1	119	0.0		0.3	25

Table B.6. Monthly mean catch rate (No./tow) and mean length (mm) of white shrimp caught with 6.1-m trawls in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Number samples	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	20[a]	0.3		<0.1	72	0.1	97	0.5	70	0.0		0.0		0.4	34
Feb	20	0.2	98	0.0		0.0		0.0		0.0		0.0		0.0	
Mar	20	1.8	103	1.5	94	0.0		1.0	109	0.5	106	0.0		0.1	109

Table B.7. Monthly mean catch rate (No./tow) and mean length (mm) of pink shrimp caught with 6.1-m trawls in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Number samples	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	20[a]	0.0		0.0		0.0		0.8	85	0.0		0.0		0.0	
Feb	20	0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Mar	20	0.0		< 0.1	94	0.0		0.1	105	0.2	92	0.0		0.0	

[a]20 samples were taken in each bay system except the upper and lower Laguna Madre where 10 samples were taken.

Table B.8. Monthly mean catch rate (No./tow) and mean length (mm) of blue crabs caught with 6.1-m trawls in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Number samples	Galveston		Matagorda		San Antonio		Aransas		Corpus Christi		Upper Laguna Madre		Lower Laguna Madre	
		No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	20[a]	0.3	75	< 0.1	24	0.2	46	2.8	37	0.1	103	0.1	152	0.2	165
Feb	20	0.8	134	0.2	89	1.0	52	3.7	117	0.4	27	1.1	130	1.2	120
Mar	20	2.1	104	2.4	82	4.6	65	15.1	66	1.5	81	3.2	109	10.7	73

[a]20 samples were taken in each bay system except in the upper and lower Laguna Madre where 10 samples were taken.

Table B.9. Weekly mean catch rate (No./tow) and mean length (mm) of brown shrimp caught in Zone III at 6.1-m trawl stations in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Day	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C. and M.C.[a]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
			No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	1-8	2	0.0		0.0		0.0		0.0		0.0	
	9-15	2	0.0		0.0		0.0		0.0		0.0	
	16-22	2	0.0		0.0		0.0		0.0		0.0	
	23-29	2	0.0		0.0		0.0		0.0		0.0	
	30-Feb 5	2	0.0		0.0		0.0		0.0		0.0	
Feb	6-12	2	0.0		0.0		0.0		0.0		0.5	72
	13-19	2	0.0		0.0		0.0		0.0		0.0	
	20-26	2	0.0		0.0		0.0		0.0		0.5	112
	27-Mar 4	2	0.0		0.0		0.0		0.0		0.5	86
Mar	5-11	2	0.0		0.0		0.0		0.0		0.0	
	12-18	2	0.0		0.0		0.0		0.0		0.0	
	19-25	2	0.0		0.0		0.0		0.0		0.0	
	26-Apr 1	2	0.0		0.0		0.0		0.0		0.0	

[a]Pass Cavallo and Matagorda Channel

Table B.10. Weekly mean catch rate (No./tow) and mean length (mm) of white shrimp caught in Zone III at 6.1-m trawl stations in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Day	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C. and M.C.[a]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
			No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	1-8	2	0.5		0.0		0.5		0.0		0.0	
	9-15	2	0.0		0.0		7.5	89	0.0		0.0	
	16-22	2	0.0		0.5	71	0.0		0.0		0.0	
	23-29	2	0.0		0.0		0.0		0.0		0.0	
	30-Feb 5	2	0.0		0.0		0.0		0.0		0.0	
Feb	6-12	2	1.0	90	0.0		0.0		1.5	93	0.0	
	13-19	2	3.0	94	0.0		0.0		0.0		0.5	101
	20-26	2	2.5	110	0.5	66	19.5	85	8.0	89	0.0	
	27-Mar 4	2	9.5	99	1.0	86	0.5	83	0.0		1.0	96
	5-11	2	0.5	98	0.0		7.0	89	0.0		0.0	
	12-18	2	1.5	117	0.5	70	0.0		0.0		3.0	109
	19-25	2	2.0	136	0.5	105	0.0		0.0		5.5	101
	26-Apr 1	2	1.0	124	0.0		1.0	90	0.0		0.0	

[a]Pass Cavallo and Matagorda Channel

Table B.11. Weekly mean catch rate (No./tow) and mean length (mm) of pink shrimp caught in Zone III at 6.1-m trawl stations in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Day	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C. and M.C.[a]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
			No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	1-8	2	0.0		0.0		0.5		0.0		0.0	
	9-15	2	0.0		0.0		0.0		0.0		0.0	
	16-22	2	0.0		0.0		0.5	105	0.0		0.0	
	23-29	2	0.0		0.0		0.0		0.0		0.0	
	30-Feb 5	2	0.0		0.0		0.0		0.0		0.0	
Feb	6-12	2	0.0		0.0		0.0		0.0		0.0	
	13-19	2	0.0		0.0		0.0		0.0		0.0	
	20-26	2	0.0		0.0		0.5	73	0.0		0.0	
	27-Mar 4	2	0.0		0.0		0.0		0.5	68	0.0	
Mar	5-11	2	0.0		0.0		0.0		0.0		0.0	
	12-18	2	0.5	96	0.0		0.5	98	0.0		0.0	
	19-25	2	0.0		0.0		0.0		0.0		0.0	
	26-Apr 1	2	0.0		0.0		0.0		0.0		0.0	

[a]Pass Cavallo and Matagorda Channel

Table B.12. Weekly mean catch rate (No./tow) and mean length (mm) of blue crab caught in Zone III at 6.1-m trawl stations in Texas bay systems during January-March 1984 (blank = no measurement taken).

Month	Day	Number samples	GALVESTON Bolivar Roads		MATAGORDA P.C. and M.C.[a]		ARANSAS Lydia Ann Channel		CORPUS CHRISTI Corpus Christi Channel		LOWER LAGUNA MADRE Brazos Santiago Pass	
			No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length	No./tow	Length
Jan	1-8	2	1.0	46	0.5	44	0.0		0.0		0.0	
	9-15	2	0.5	63	1.0	112	19.5	83	0.0		0.0	
	16-22	2	2.5	72	0.0		1.0	55	0.0		0.0	
	23-29	2	0.5	47	0.0		2.0	138	0.5	25	0.0	
	30-Feb 5	2	3.5	107	0.0		9.0	150	1.0	133	0.0	
Feb	6-12	2	2.0	108	0.5	162	9.0	130	0.5	136	1.0	151
	13-19	2	1.5	103	0.0		7.0	119	0.0		0.5	163
	20-26	2	8.0	78	0.0		11.0	101	1.0	62	0.5	155
	27-Mar 4	2	1.0	65	0.5	115	4.0	127	18.5	34	2.0	55
Mar	5-11	2	1.5	51	0.0		83.0	109	10.0	45	1.5	114
	12-18	2	5.0	93	0.5	159	25.0	120	4.0	43	0.5	34
	19-25	2	31.5	141	0.0		102.5	113	1.0	87	0.0	
	26-Apr 1	2	2.5	162	0.0		6.5	116	4.0	86	0.5	46

[a]Pass Cavallo and Matagorda Channel

Appendix C. Summary of data collected in Gulf Statistical Area 21 and the Fishery Conservation Zone, January 1983-March 1984

Table C.1. Monthly mean catch rate (No./h) and mean length (mm) of brown shrimp caught with Gulf trawls in the FCZ during January 1983-March 1984 (blank = no measurement taken).

	Area 19						Area 20					
	FCZ[a] < 46 m			FCZ 46-91 m			FCZ < 46 m			FCZ 46-91 M		
Month	No. of samples	No./h	Mean length	No. of samples	No./h	Mean Length	No. of samples	No./h	Mean Length	No. of samples	No./h	Mean Length
Jan 83	0			0			0			0		
Feb 83	0			0			0			0		
Mar 83	0			0			0			0		
Apr 83	0			0			0			0		
May 83	0			0			0			0		
Jun 83	4	713.8	121	0			1	1547.0	119	0		
Jul 83	0			0			12	1591.4	120	6	196.3	139
Aug 83 - Mar 84	0			0			0			0		

[a]FCZ = Fishery Conservation Zone (> 16.7 km to 370.6 km)

Table C.2. Monthly mean catch rate (No./h) and mean length (mm) of white shrimp caught with Gulf trawls in the FCZ during January 1983-March 1984 (blank = no measurement taken).

	Area 19						Area 20					
	FCZ[a] < 46 m			FCZ 46-91 m			FCZ < 46 m			FCZ 46-91 m		
Month	No. of samples	No./h	Mean length	No. of samples	No./h	Mean Length	No. of samples	No./h	Mean Length	No. of samples	No./h	Mean Length
Jan 83	0			0			0			0		
Feb 83	0			0			0			0		
Mar 83	0			0			0			0		
Apr 83	0			0			0			0		
May 83	0			0			0			0		
Jun 83	4	0.0		0			1	0.0		0		
Jul 83	0			0			12	3.5	167	6	0.0	
Aug 83 - Mar 84	0			0			0			0		

[a]FCZ = Fishery Conservation Zone (> 16.7 km to 370.6 km)

Table C.3. Monthly mean catch rate (No./h) and mean length (mm) of pink shrimp caught with Gulf trawls in the FCZ during January 1983-March 1984 (blank = no measurement taken).

	Area 19						Area 20					
	FCZ[a] < 46 m			FCZ 46-91 m			FCZ < 46 m			FCZ 46-91 m		
Month	No. of samples	No./h	Mean length	No. of samples	No./h	Mean Length	No. of samples	No./h	Mean Length	No. of samples	No./h	Mean Length
Jan 83	0			0			0			0		
Feb 83	0			0			0			0		
Mar 83	0			0			0			0		
Apr 83	0			0			0			0		
May 83	0			0			0			0		
Jun 83	4	52.0	112	0			1	120.0	109	0		
Jul 83	0			0			12	0.0		6	0.0	
Aug 83 - Mar 84	0			0			0			0		

[a]FCZ = Fishery Conservation Zone (> 16.7 km to 370.6 km)

Table C.4. Mean catch rate (No./h) and mean length (mm) of shrimp caught with Gulf trawls in statistical Area 21 during July 1983 (blank = no measurement taken).

	Area 21								
	Territorial Sea[a]			FCZ[b] < 46 m			FCZ 46-91 m		
Species	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length	No. of samples	No./h	Mean length
Brown shrimp	3	303.0	91	1	1051.0	133	1	203.0	133
White shrimp	3	0.0		1	0.0		1	0.0	
Pink shrimp	3	1144.3	128	1	0.0		1	0.0	

[a]Territorial Sea = < 16.7 km

[b]FCZ = Fishery Conservation Zone (> 16.7 km to 370.6 km)

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