U S DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Center
P 0 Drawer 1207
Pascagoula, Miss. 39568-1207

OREGON II Cruise 91-04 (195)
06/11-07/14/91

INTRODUCTION

The NOAA Ship OREGON II departed Pascagoula, MS on June 11, 1991 to conduct a 34-day shrimp and bottomfish survey in the northern and U.S. western Gulf of Mexico. This was a Southeast Area Monitoring and Assessment Program (SEAMAP) survey which also included additional nearshore sampling by the states of Florida, Alabama, Mississippi, Louisiana and Texas.

Major objectives were to monitor size composition and spatial distribution of penaeid shrimp stocks across the northern Gulf of Mexico in 5 to 60 fathoms (fm) and to provide additional biological and catch rate information on groundfish in the same area. Specific objectives are listed below.

The NOAA Ship OREGON II returned to Pascagoula, MS on July 14, 1991, terminating the cruise.

OBJECTIVES

1) Determine size distribution of penaeid shrimp by depth across the U.S. northern and western Gulf of Mexico.

2) Obtain samples of brown, pink and white shrimp to determine length-weight relationships.

3) Collect finfish catch and effort data.

4) Collect hydrographic and environmental data at each station.

5) Collect ichthyoplankton samples throughout the survey area.

6) Collect data allowing comparison of trawl catch rates between the NOAA Ship OREGON II, R/V PELICAN and the R/V TOMMY MUNRO.

7) Collect trawl samples in the vicinity of the U.S. Army Corps of Engineers berm site containing dredge spoil material from the Mobile ship channel.

SURVEY METHODOLOGY

Ten sample sites were randomly selected for day and night replicate sampling around the U.S. Army Corps of Engineers berm site off Mobile Bay, AL. Ten-minute tows were made at each site using a 40-ft shrimp trawl with mud rollers and 8-ft X 40-in wooden chain doors, and a 65-ft two seam fish trawl with six 10-in floats and 8-ft X 40-in wooden chain doors.

The shrimp assessment survey samples were taken with a 40-ft shrimp trawl. Sample sites between Mobile Bay, AL and the Texas-Mexico border in 5 to 60 fm (Fig. 1 through Fig. 3) were randomly selected. Sample sites encompassed 1 to 3 fm depth strata between 5 and 25 fm and 5 fm depth strata between 30 and 60 fm. Tows were perpendicular to depth contours for 10 to 60 minutes. Several stations required multiple tows to sample the entire depth strata.

Total weight of each catch was recorded, after which all Penaeus spp. shrimp, other invertebrates and finfish were separated. Weight and number of each species were then recorded. A random sample of 200 shrimp of each species (when available) was removed to extract data on sex, maturation, and length frequency.

Three stations were sampled simultaneously by the OREGON II, R/V PELICAN (Louisiana), and the R/V TOMMY MUNRO (Mississippi), to compare catch rates between the three vessels. The R/V PELICAN and OREGON II sampled an additional six stations for a total of nine comparative tows.

A SCANMAR acoustic unit was attached to the trawl to measure the height, width and speed of tow. The R/V TOMMY MUNRO used the unit on the first three stations, the R/V PELICAN on the next two stations and the OREGON II on the last four stations.

HYDROGRAPHIC AND ENVIRONMENTAL DATA

CTD casts were made at each station to collect salinity, temperature, depth, dissolved oxygen (DO) and turbidity data. Water samples were obtained daily to validate the CTD salinity readings. Surface DO samples was also determined at each station using a YSI meter. Surface chlorophyll samples (three replicates) were taken at each station, filtered with a GF/C filter, fixed with magnesium carbonate and frozen for later analysis at the Mississippi Laboratories, Pascagoula station. All chlorophyll samples were taken from the surface waters, except at stations less than 20 fm deep off Louisiana, where bottom samples were also collected.

ICHTHYOPLANKTON

Bongo (61 cm, 0.333 mm mesh) and neuston (1 X 2 X 6 m) samples were taken at preselected stations integrated into the cruise track. Samples were fixed in 10% buffered formalin for 48 hours, then drained and placed in 95% ethanol for final preservation.

REAL TIME DATA

A data telecommunication terminal aboard the NOAA Ship OREGON II was used to transmit environmental data and catch rates via cellular phone to the Mississippi Laboratories. These transmissions provided information for a weekly report on shrimp and finfish catch rates and location that was communicated on to shrimpers and other personnel in the fishing industry.

OBSERVATIONS AND RESULTS

A total of twenty trawl samples were collected around the berm site off Mobile Bay, AL; results were not available for incorporation in this cruise report.

Two hundred and twenty eight individual trawl samples (Fig. 1 through 3) were collected on the SEAMAP portion of the cruise. The dominant faunal components are listed in Table 1 for east of the Mississippi River. Table 2 for west of the Mississippi River and Table 3 for Texas and Table 4 for an overall view of the catch rates. In areas east, west delta and Texas, croakers, Micropogonias undulatus, were dominant by both number and weight.

Shrimp catches were best off Texas (Fig. 5), with brown shrimp, Penaeus aztecus, being second only to croakers in the numbers and weight (Table 3). Pink shrimp, Penaeus duorarum, and white shrimp, Penaeus setiferus, were less abundant throughout the survey.

COMPARATIVE TRAWLING

Results of comparative tows between the NOAA Ship OREGON II, the R/V PELICAN, and the R/V TOMMY MUNRO were not available for incorporation in this cruise report.

A large hypoxic area was found off the Louisiana coast in 5 to 20 fm (Fig. 4). Smaller areas were found off the Texas coast in about the same depth of water. Bottom DO in these areas ranged from a low of 0.1 ppm to a high of 2.0 ppm, little or no catch occurred in these areas. Rock shrimp (Sicyonia brevirostris) were observed swimming on the surface, some were caught using a dip net. Although low bottom DO was the apparent cause for surface swimming rock shrimp, low DO was not observed in all areas, i.e., 5 ppm and above in some of the areas.

ICHTHYOPLANKTON

Thirty nine bongo and neuston samples were obtained during the cruise (Fig. 6). Right bongo and neuston samples are processed at the NMFS, Mississippi Laboratory and shipped to Polish Sorting Center for sorting and identification according to standard SEAMAP protocol. Left bongo samples were sent to the Gulf Coast Research Laboratory for storage.

CRUISE PARTICIPANTS

6/11-15/91

NAME	TITLE	ORGANIZATION
Nathaniel Sanders, Jr.	Field Party Chief	NMFS Pascagoula, Miss.
Gilmore Pellegrin, Jr.	Watch Leader	NMFS Pascagoula, Miss.
Perry Thompson, Jr.	Watch Leader	NMFS Pascagoula, Miss.
Robert Ford, Jr.	Watch Leader	NMFS Pascagoula, Miss.
Chris Williams	Student Trainee	NMFS Pascagoula, Miss.
Dale Burgin	Secretary	NMFS Pascagoula, Miss.
Kevin Rademacher	Biological Tech.	NMFS Pascagoula, Miss.
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6/16-30/91

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Mike Russell	Watch Leader	NMFS Pascagoula, Miss.
Carolyn Rogers	Watch Leader	NMFS Pascagoula, Miss.
Kevin Rademacher	Biological Tech.	NMFS Pascagoula, Miss.
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Tiffany Cavanaugh	Student Coop.	Forest Hill High School, Jackson, Miss.

CRUISE PARTICIPANTS (Cont'd)

7/1-14/91

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Kevin Rademacher	Biological Tech.	NMFS Pascagoula, Miss.
Travis Burke	Electrical Engineer	NMFS Bay St. Louis, Miss.
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Submitted By:

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Table 1. East of the Mississippi River 40-ft shrimp net catches adjusted to 60-min tows. The twenty most numerous species caught plus red snapper are listed in descending order of number caught (part A) and in descending order by weight (part B). Total number of stations 18.

Part A

Genus Species	Number	Weight (kg)	Frequency of occurrence
Micropogonias undulatus	24,558	1,361.0	10
Trachypeneus sp.	6,879	30.8	6
Stenotomus caprinus	6,862	223.0	13
Trachypeneus similis	2,244	7.5	1
Saurida brasiliensis	1,897	8.8	11
Leiostomus xanthurus	1,463	162.0	5
Squilla empusa	1,361	20.3	7
Synodus foetens	825	78.0	16
Anchoa hepsetus	764	8.4	5
Penaeus duorarum	741	10.5	5
Lagodon rhomboides	730	39.8	9
Penaeus aztecus	666	22.1	12
Halieutichthys aculeatus	645	4.5	7
Sicyonia brevirostris	645	6.5	8
Mullus auratus	598	44.5	3
Lepophidium brevibarbe	596	19.5	4
Callinectes similis	539	9.0	8
Loligo pealei	528	4.5	2
Diplectrum bivittatum	487	9.8	5
Serranus atrobranchus	485	5.8	5
Lutjanus campechanus	87	8.2	9

Part B.

Micropogonias undulatus	24,558	1,361.0	10
Stenotomus caprinus	6,862	223.0	13
Leiostomus xanthurus	1,463	162.0	5
Synodus foetens	825	78.0	16
Mullus auratus	598	44.5	3
Lagodon rhomboides	730	39.8	9
Trachypeneus sp.	6,879	30.8	6
Clypeaster sp.	159	27.2	9
Rhomboplites aurorubens	144	22.9	4
Penaeus aztecus	666	22.1	12
Squilla empusa	1,361	20.3	7
Lepophidium brevibarbe	596	19.5	4
Peprilus burti	325	17.6	3
Prionotus tribulus	56	15.7	2
Centropristis philadelphica	332	15.2	11
Syacium papillosum	441	14.1	8
Brotula barbatum	28	13.1	5
Cyclopsetta chittendeni	142	12.7	5
Mustelus norrisi	3	10.7	1
Penaeus duorarum	741	10.5	5
Lutjanus campechanus	87	8.2	9
Total	60,292	2,397.1	18

Table 2. West of the Mississippi River 40-ft shrimp net catches adjusted to 60-min tows. The twenty most numerous species caught plus red snapper are listed in descending order of number caught (part A) and by weight (part B). Total number stations 92.

Part A

Genus Species	Number	Weight (kg)	Frequency of occurrence
Micropogonias undulatus	50,255	1,443.0	49
Trachypeneus sp.	48,943	167.4	46
Stenotomus caprinus	19,015	546.0	63
Penaeus aztecus	13,792	239.9	77
Squilla empusa	13,549	120.5	48
Anchoa hepsetus	12,492	236.9	20
Trichiurus lepturus	11,198	232.0	39
Peprilus burti	10,542	648.0	46
Prionotus longispinosus	7,144	112.0	48
Serranus atrobranchus	5,846	43.8	43
Callinectes similis	4,591	83.7	50
Prionotus roseus	4,113	43.2	14
Cynoscion arenarius	3,939	208.2	44
Solenocera sp.	3,798	11.8	21
Amusium papyraceum	3,521	26.2	30
Loligo pealei	3,389	20.3	37
Centropristis philadelphica	3,364	127.9	56
Leiostomus xanthurus	2,840	285.7	17
Sicyonia brevirostris	2,817	30.8	25
Portunus gibbesii	2,784	15.1	33
Lutjanus campechanus	335	41.3	27

Part B

Micropogonias undulatus	50,255	1,443.0	49
Peprilus burti	10,542	648.0	46
Stenotomus caprinus	19,015	546.0	63
Leiostomus xanthurus	2,840	285.7	17
Synodus foetens	2,237	240.2	61
Penaeus aztecus	13,792	239.9	77
Anchoa hepsetus	12,492	236.9	20
Trichiurus lepturus	11,198	232.0	39
Cynoscion arenarius	3,939	208.2	44
Trachypeneus sp.	48,943	167.4	46
Arius felis	743	163.2	7
Centropristis philadelphica	3,364	127.9	56
Squilla empusa	13,549	120.5	48
Prionotus longispinosus	7,144	112.0	48
Cynoscion nothus	2,101	107.1	13
Callinectes sapidus	637	98.7	14
Callinectes similis	4,591	83.7	50
Chloroscombrus chrysurus	1,323	57.5	25
Ophidion welshi	1,918	51.2	9
Lagodon rhomboides	770	49.9	26
Lutjanus campechanus	335	41.3	27
Total	78,935	6,539.2	103

Table 3. Texas 40-ft shrimp net catches adjusted to 60-min tows. The twenty most numerous species caught plus red snapper are listed in descending order by number (part A) and in descending order by weight (part B). Total number of stations 99.

Part A

Genus Species	Number	Weight (kg)	Frequency of occurrence
Micropogonias undulatus	147,641	3,169.4	59
Penaeus aztecus	87,603	974.9	86
Trachypeneus sp.	66,419	268.9	26
Trichiurus lepturus	59,719	932.2	43
Loligo pealei	24,350	378.2	49
Callinectes similis	20,623	295.7	67
Stenotomus caprinus	19,383	288.7	72
Trachypeneus constrictus	18,319	61.7	11
Leiostomus xanthurus	18,276	970.4	34
Cynoscion arenarius	14,196	208.2	29
Upeneus parvus	11,765	139.2	75
Lagodon rhomboides	11,007	321.8	71
Chloroscombrus chrysurus	9,732	264.8	40
Prionotus longispinosus	9,344	70.9	45
Trachypeneus similis	8,873	38.0	11
Trachurus lathami	8,069	194.0	46
Squilla empusa	7,492	72.9	34
Peprilus burti	7,478	249.9	62
Lolliguncula brevis	7,355	80.1	37
Cynoscion nothus	6,955	152.9	33
Lutjanus campechanus	554	61.6	40

Part B

Micropogonias undulatus	147,641	3,169.4	59
Penaeus aztecus	87,603	974.9	86
Leiostomus xanthurus	18,276	970.4	34
Trichiurus lepturus	59,719	932.2	43
Loligo pealei	24,350	378.2	49
Lagodon rhomboides	11,007	321.8	71
Callinectes similis	20,623	295.7	67
Synodus foetens	3,762	290.2	77
Stenotomus caprinus	19,383	288.7	72
Trachypeneus sp.	66,419	268.9	26
Chloroscombrus chrysurus	9,732	264.8	40
Peprilus burti	7,478	249.9	62
Cynoscion arenarius	14,196	208.2	29
Trachurus lathami	8,069	194.0	46
Cynoscion nothus	6,955	152.9	33
Upeneus parvus	11,765	139.2	75
Penaeus duorarum	5,707	117.1	32
Pristipomoides aquilonaris	2,044	94.5	44
Loligo plei	4,538	87.8	14
Polydactylus octonemus	4,918	84.5	19
Lutjanus campechanus	554	61.6	40
Total	666,734	11,483.4	99

Table 4. All areas combined for 40-ft shrimp net catches adjusted to 60-min tows. The twenty most numerous species caught plus red snapper are listed in descending order by number (part A) and in descending order by weight (part B). Total number of stations 220.

Part A

Genus Species	Number	Weight (kg)	Frequency of occurrence
Micropogonias undulatus	222,454	5,973.5	118
Trachypeneus sp.	122,241	467.1	78
Penaeus aztecus	102,061	1,237.0	175
Trachurus lathami	71,024	1,170.0	86
Stenotomus caprinus	45,260	1,057.8	148
Loligo pealei	28,267	403.0	88
Callinectes similis	25,753	388.5	125
Leiostomus xanthurus	22,579	1,418.2	56
Squilla empusa	22,402	213.8	89
Peprilus burti	18,345	915.6	111
Trachypeneus constrictus	18,332	61.7	12
Cynoscion arenarius	18,152	417.9	75
Prionotus longispinosus	16,735	192.9	104
Anchoa hepsetus	14,756	269.6	45
Upeneus parvus	13,502	187.4	116
Lagodon rhomboides	12,507	411.6	106
Chloroscombrus chrysurus	11,300	332.0	67
Trachypeneus similis	11,117	45.3	12
Serranus atrobranchus	10,763	92.2	87
Trachurus lathami	10,171	239.9	72
Lutjanus campechanus	976	111.2	76

Part B

Micropogonias undulatus	222,454	5,973.5	118
Leiostomus xanthurus	22,579	1,418.2	56
Penaeus aztecus	102,061	1,237.0	175
Trichiurus lepturus	71,024	1,170.0	86
Stenotomus caprinus	45,260	1,057.8	148
Peprilus burti	18,345	915.6	111
Synodus foetens	6,824	608.5	154
Trachypeneus sp.	122,241	467.1	78
Cynoscion arenarius	18,152	417.9	75
Lagodon rhomboides	12,507	411.6	106
Loligo pealei	28,267	403.0	88
Callinectes similis	25,753	388.5	125
Chloroscombrus chrysurus	11,300	332.0	67
Anchoa hepsetus	14,756	269.6	45
Cynoscion nothus	9,056	260.1	46
Trachurus lathami	10,171	239.9	72
Arius felis	1,177	235.5	17
Squilla empusa	22,402	213.8	89
Prionotus longispinosus	16,735	192.9	104
Upeneus parvus	13,502	187.4	116
Lutjanus campechanus	976	111.2	76
Total	1,005,961	20,419.7	220

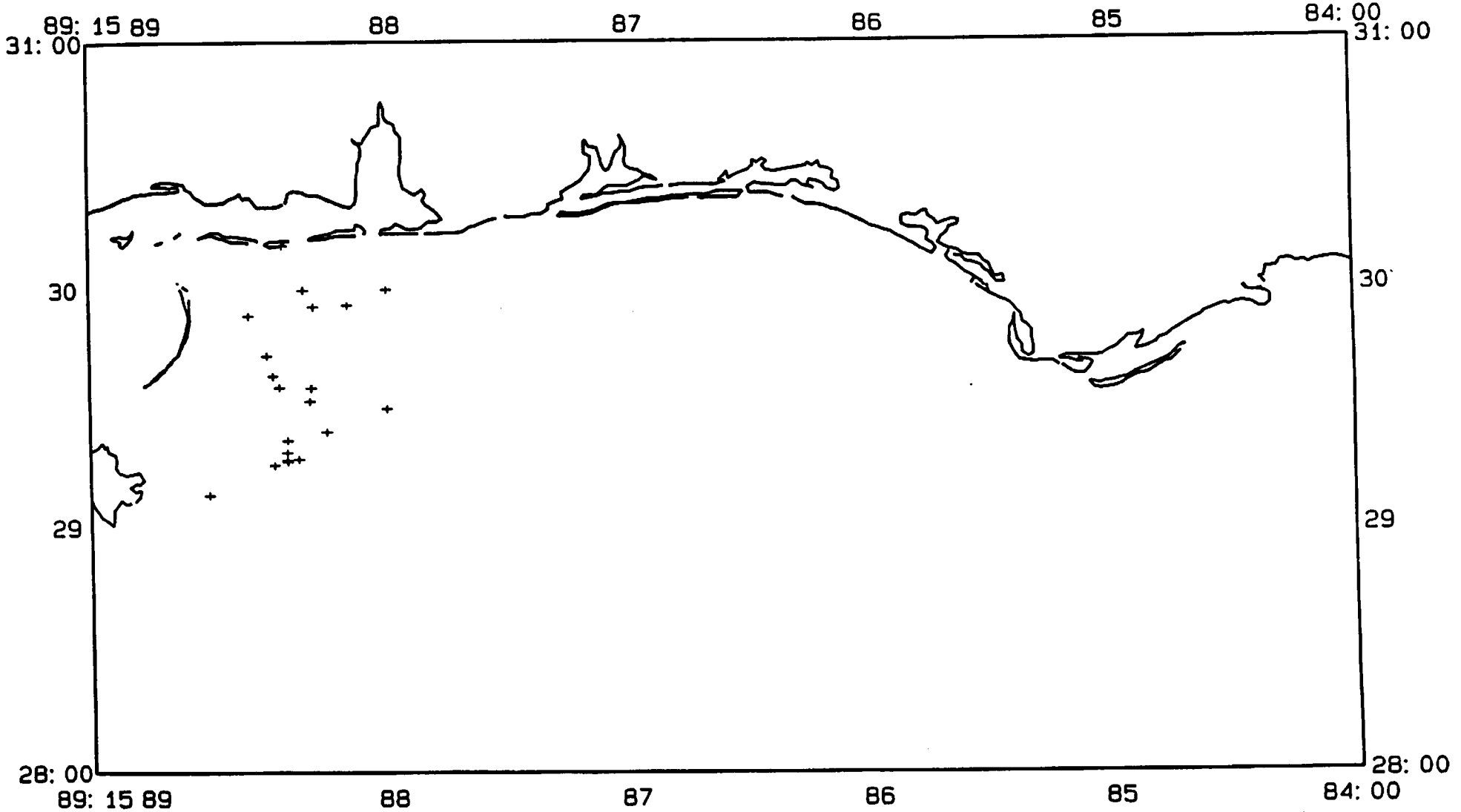

Figure 1. Map of the area sampled east of the Mississippi River showing location of trawl samples.

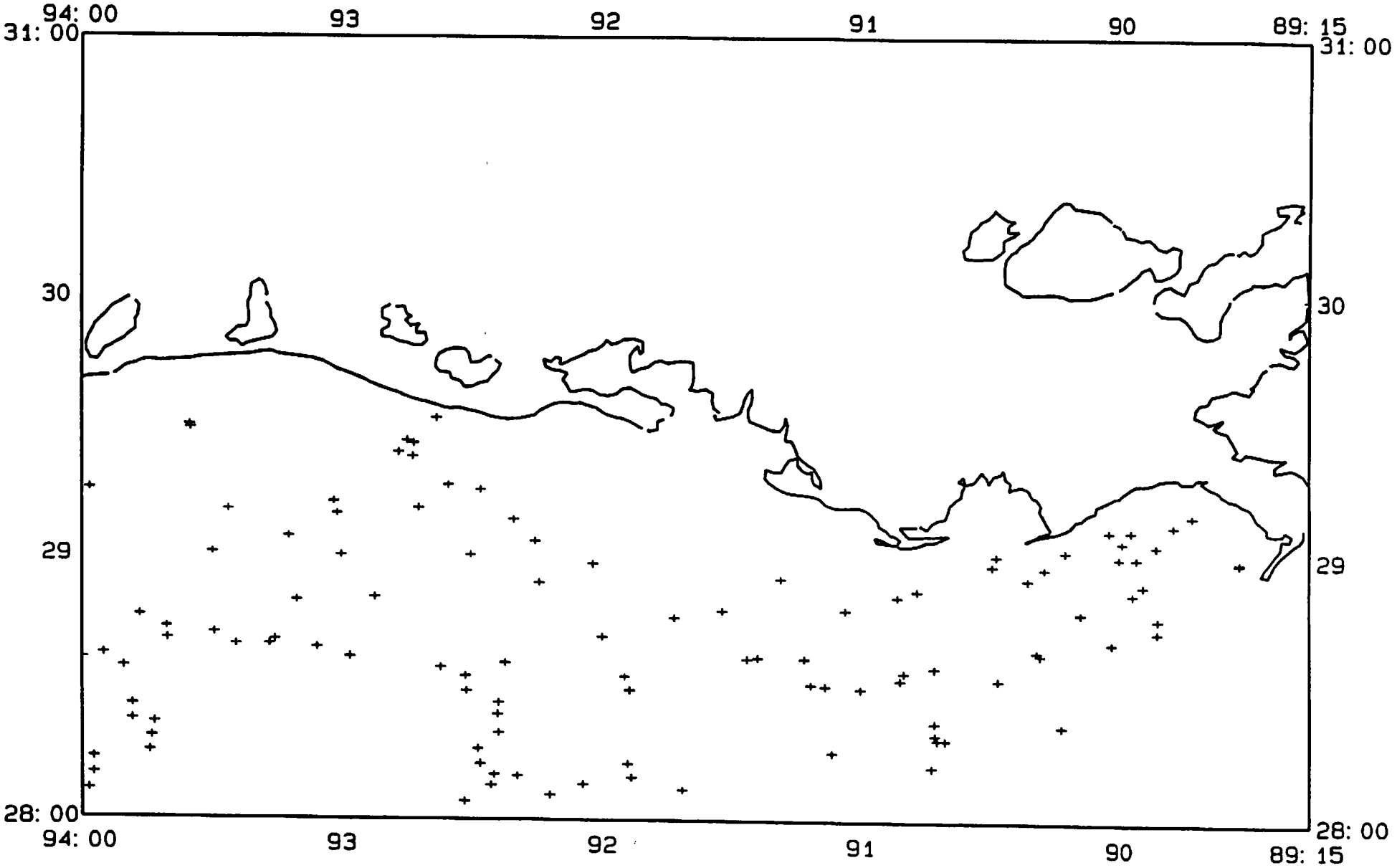

Figure 2. Map of the area sampled west of the Mississippi River showing location of trawl samples.

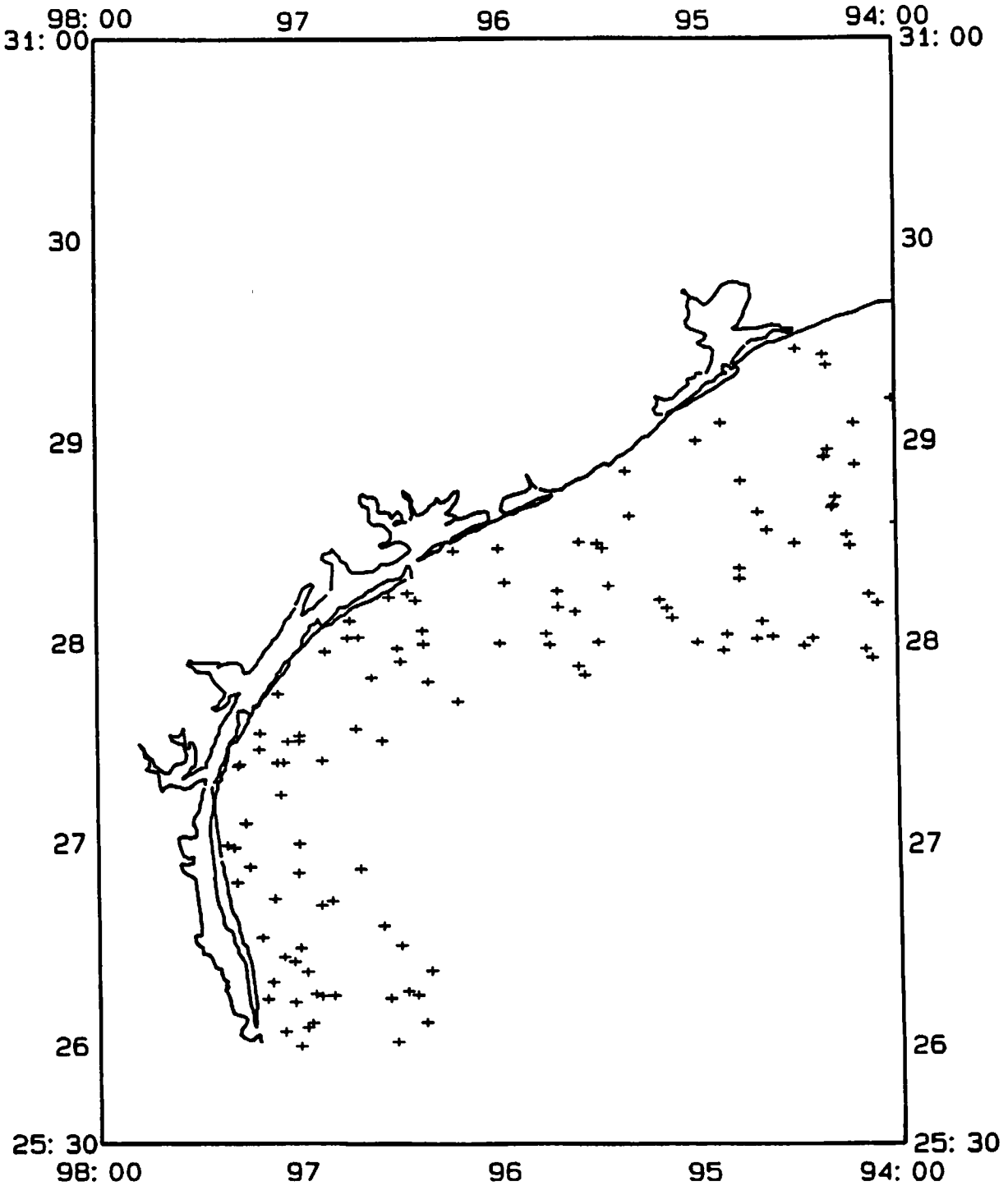

Figure 3. Map of the area sampled along the Texas coast showing location of trawl samples.

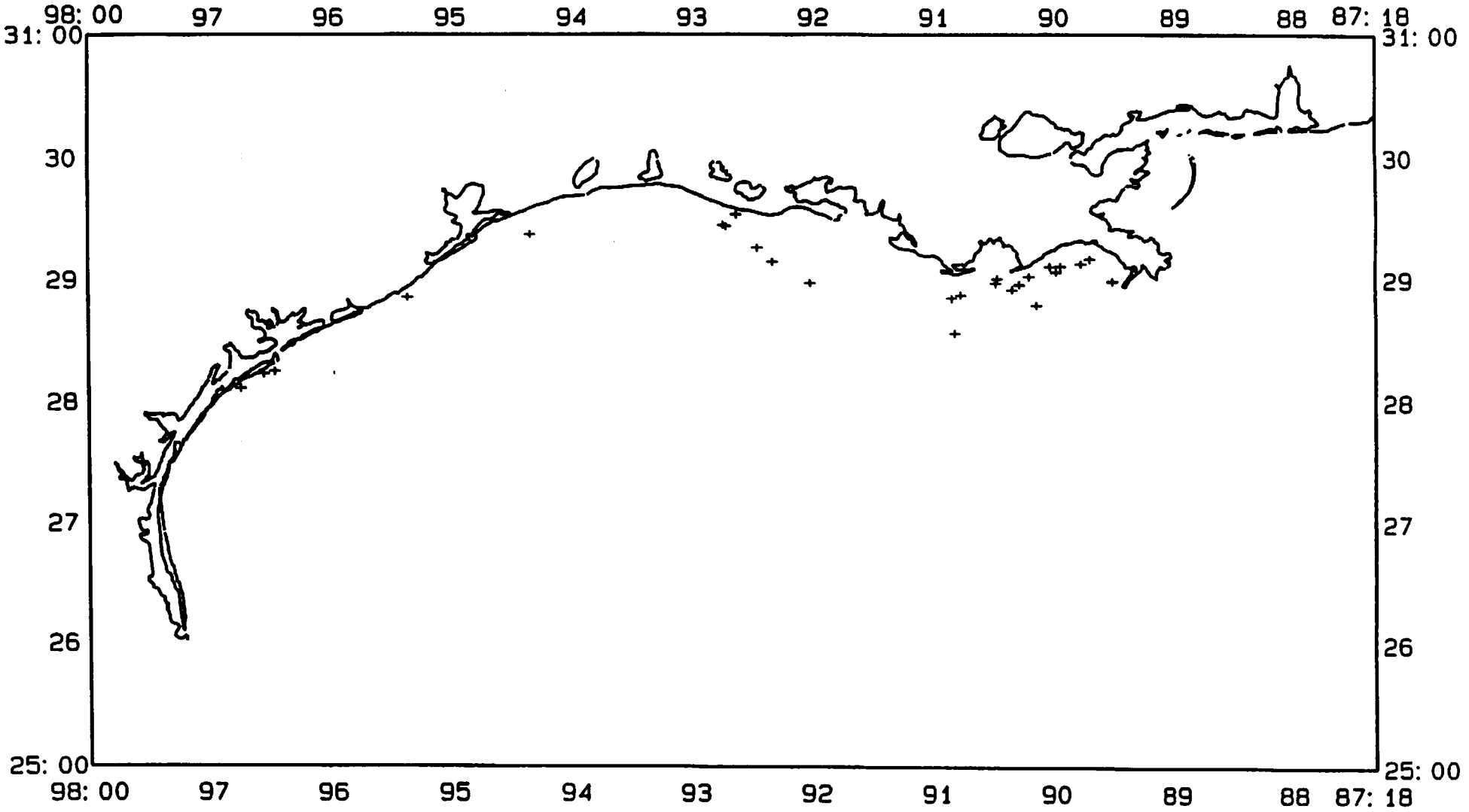

Figure 4. Map of the area sampled showing trawl sample sites where bottom dissolved oxygen was less than 2.0 ppm.

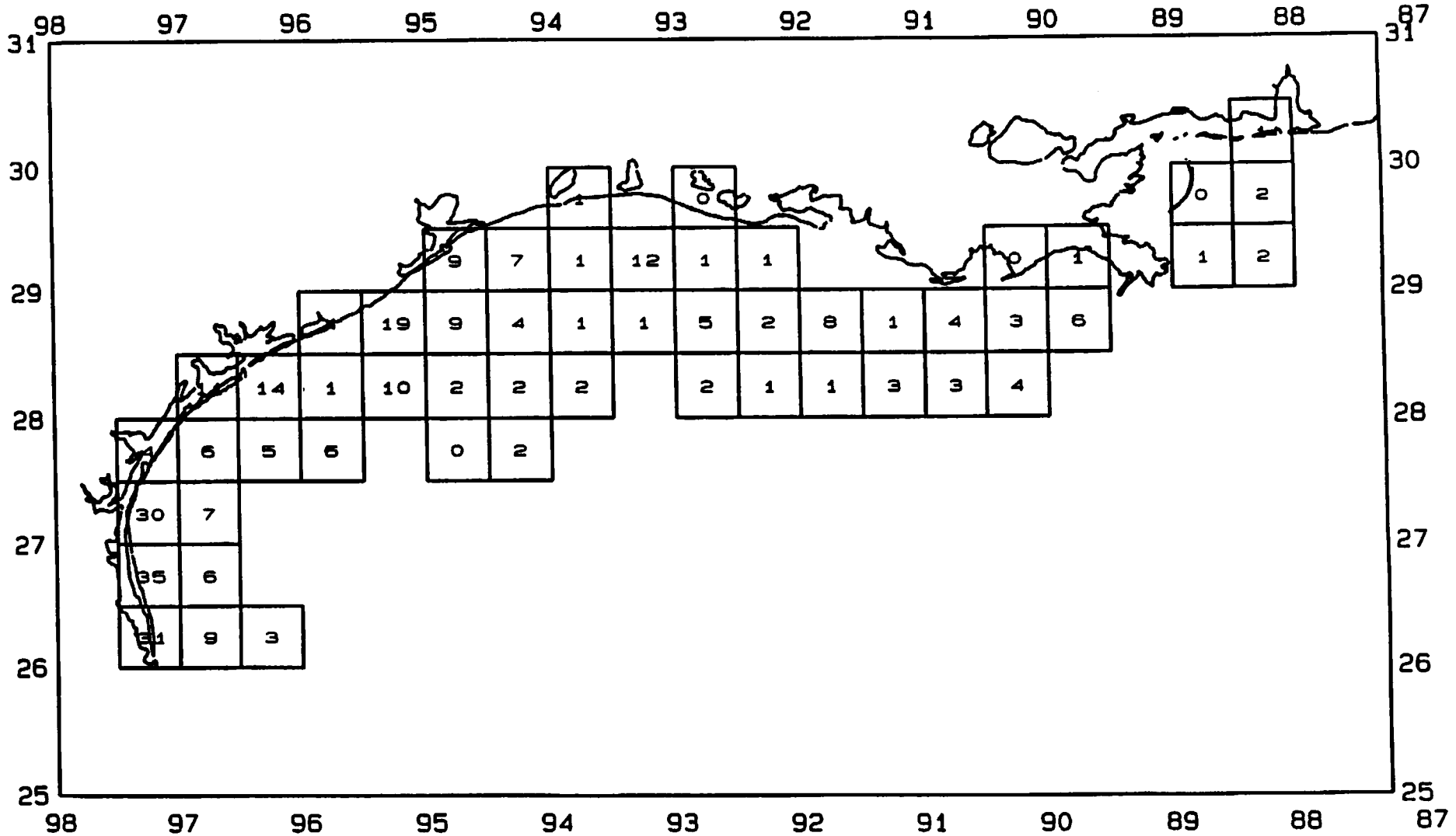

Figure 5. Map of the entire sampling area showing shrimp catch rates kg h^{-1} (40-ft trawl) within a 30 x 30 minute block.

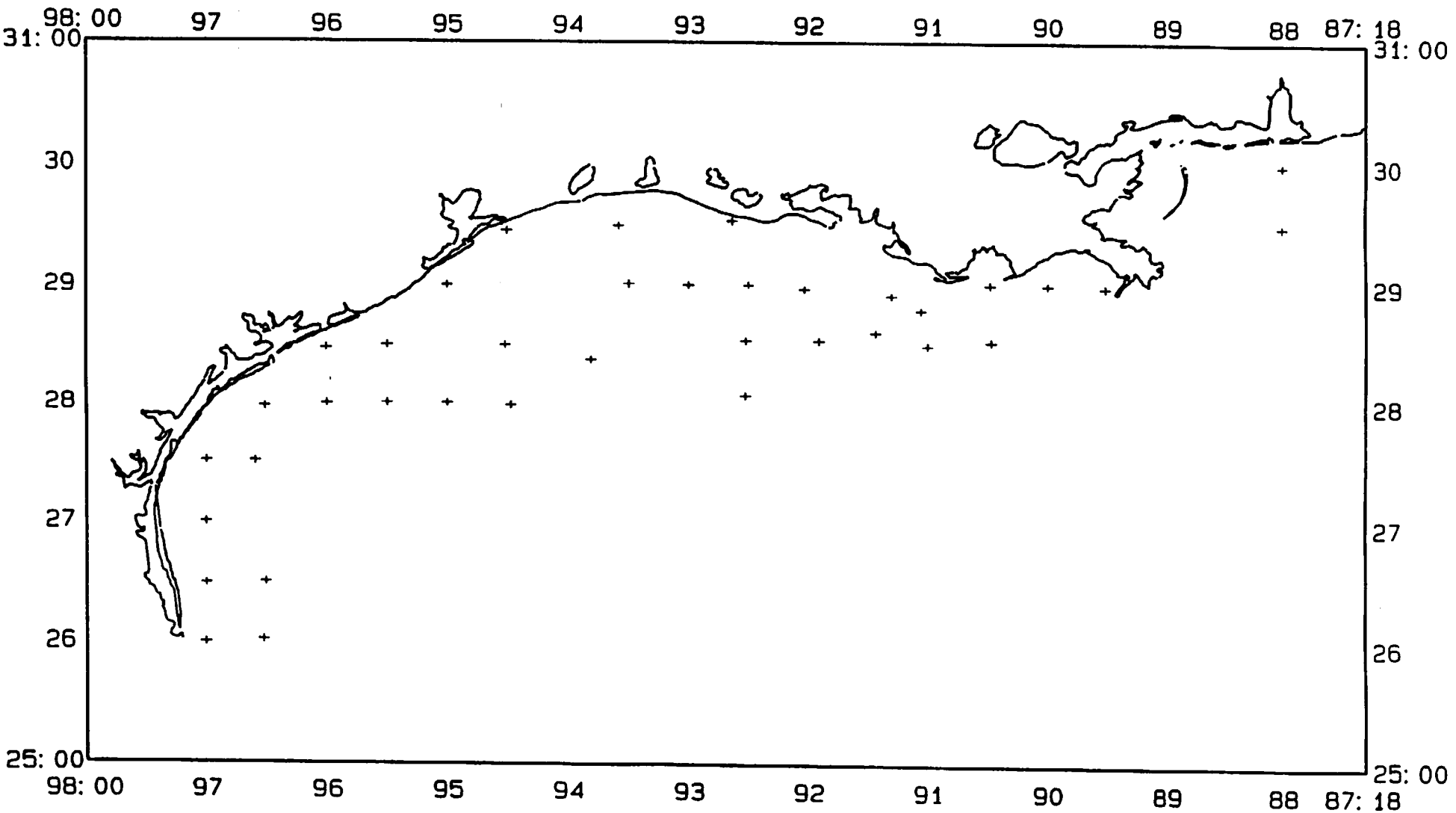

Figure 6. Map of the entire sampling area showing locations of ichthyoplankton samples.