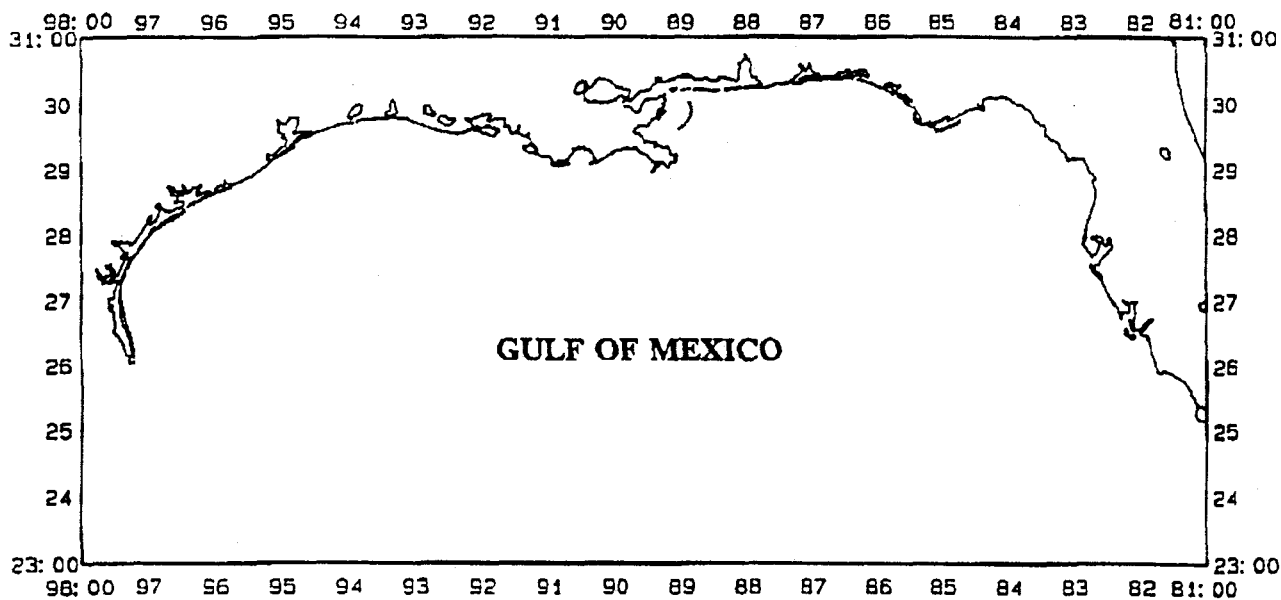


CRUISE RESULTS

Resource Assessment Survey

NOAA Ship OREGON II Cruise 92-06 (202)

10/14 - 11/19/92



U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
Mississippi Laboratories
Pascagoula Facility
P.O. Drawer 1207
Pascagoula, MS 39568-1207

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

OREGON II Cruise 92-06 (202)
10/14-11/19/92

INTRODUCTION

In 1972 the Mississippi Laboratories initiated a fall resource assessment program in response to the industrial bottomfish fishery's concern over declining catch per unit effort. Original objectives included the determination of the status of the multi-species bottomfish resource including abundance and distribution, and associated influential factors.

Sample sites were selected randomly in the northern Gulf of Mexico between 88° 00' and 91° 30' w longitude in depths of 5 to 50 fathoms (fms). Three ten-minute tows (at 2.5 knots) were completed at each site with tow direction at the discretion of the bridge officer on watch (usually parallel to depth contours).

In 1987 fall surveys were placed under the auspices of the Southeast Area Monitoring and Assessment Program (SEAMAP), a cooperative state/federal program for collection, management and dissemination of fishery research data in state and federal waters of the Gulf of Mexico. Sample design changed as the survey area was expanded westward along the Texas coast to the U. S./Mexican border, and seaward to 60 fms.

Fall resource assessment surveys have taken on added importance with the passing of the Fishery Conservation and Management Act of 1976. Results of these surveys provide a long term time series of estimates of relative abundance for many species now being managed as a result of the 1976 Act. Surveys are also important as they provide researchers an opportunity to collect specimens for scientific study.

The NOAA Ship OREGON II departed Pascagoula, Miss. on October 14, 1992 for the twenty-first annual survey. Twenty-four hours were devoted to sampling a dredge spoil site off Mobile Bay, Ala. Two port calls were made to exchange scientific personnel, one in Galveston, Tex. on October 27 and another in Pascagoula on November 12. An additional port call was made in Pascagoula on November 14 to repair the ship's gyro-compass. Seventy-two hours of survey time were lost, eighteen due to weather and fifty-four due to ship's equipment breakdowns.

OBJECTIVES

- 1) Sample the demersal fauna of the northcentral and northwestern Gulf of Mexico in depths of 5 to 60 fms.
- 2) Obtain trawl samples at a U. S. Army Corps of Engineers dredge spoil site off Mobile Bay, Ala.
- 3) Collect ichthyoplankton samples to determine the relative abundance and distribution of eggs and larvae of commercially and recreationally important fish species.
- 4) Obtain surface, mid-depth and maximum depth samples of temperature, salinity, dissolved oxygen and percent light transmission.
- 5) Obtain length measurements to determine population size structure.
- 6) Collect triglid samples for the Institut Royal des Sciences Naturelle de Belgique.
- 7) Collect samples of Spanish mackerel, Atlantic croaker, gulf butterfish, and longspine porgy for Texas A & M University.
- 8) Collect samples of Atlantic croaker for the Gulf Coast Research Laboratory.
- 9) Collect samples of Atlantic cutlassfish for the Institute of Oceanology in the Peoples Republic of China.

MATERIALS AND METHODS

During the resource assessment portion of the survey, trawl samples were taken with a 40-ft shrimp net with 8-ft by 40-in chain bracketed doors towed at 3.0 knots. Sample sites were randomly selected within area, depth and diel strata. Area strata consisted of gulf coast shrimp statistical zones 11-12, 13-15, 16-17, 18-19 and 20-21. Depth strata consisted of 1-fm intervals from 5 to 20 fms, a 2-fm interval from 20 to 22 fms, a 3-fm interval from 22 to 25 fms, 5-fm intervals from 25 to 50 fms and a 10-fm interval from 50 to 60 fms. Minimum and maximum tow durations were 10 and 60 minutes respectively, depending on the time required to transect the respective depth strata. If a stratum was not completed in 60 minutes then additional tows were made until it was covered. Tow direction ran perpendicular to depth contours from one edge of a stratum to the other.

During the Corps of Engineers project, ten sample sites were randomly selected around a dredge spoil site near the mouth of Mobile Bay, Ala. Each site was visited twice; once during daylight

hours and again at night. Samples were taken with a 40-ft shrimp trawl and 65-ft fish trawl. Both nets were spread with 8-ft by 40-in chain bracketed doors. One ten-minute tow was made at each site.

Ichthyoplankton samples (bongo and neuston) were collected at half-degree intervals of latitude and longitude within the defined survey area using standard MARMAP sampling protocol. Sample sites were occasionally relocated to the nearest trawling sample site to optimize survey time. Bongo tows were made with two conical 61-centimeter nets with 0.333 mm mesh netting. Digital flowmeters were suspended in each side of the frame to measure the amount of water filtered and the nets were towed at 1.5-2.0 knots to maintain a 45° wire angle. Neuston sampling gear consisted of a 0.947 mm mesh net mounted on a 1 by 2 meter frame. The net was towed for 10 minutes with the frame half submerged at the surface. Samples were initially preserved in 10% buffered formalin and then transferred to 95% ethyl alcohol 48 hours later.

Temperature, salinity, dissolved oxygen, and transmissometer readings were taken at the surface, mid, and maximum depths. Three surface chlorophyll samples (3 liters each) were filtered at each station, except off Louisiana west of the Mississippi River delta inshore of 20 fms where a single bottom sample was also taken to investigate hypoxic conditions which occasionally occur in this area. Temperature, salinity and transmissometer data were collected with a CTD unit, and water samples for dissolved oxygen and chlorophyll measurements were collected with a rosette sampler attached to the CTD unit. Dissolved oxygen measurements were made with a dissolved oxygen meter and chlorophyll samples were filtered and frozen for subsequent analysis in Pascagoula. Forel-ule water color, secchi disc, and percent cloud cover observations were also taken during daylight hours.

RESULTS

One hundred eighty nine of one hundred ninety nine strata (95%) were successfully sampled during the resource assessment portion of the survey (Table 1). Thirty one strata inside of 22 fms in statistical zones 11 and 12 were sampled by state vessels in fulfillment of their SEAMAP commitments. Five strata were not sampled because station locations occurred near strata boundaries and were inadvertently completed in adjacent strata. Nets were torn at four strata due to bottom obstructions and one stratum was not completed due to insufficient time.

Two hundred twenty-one tows were required to sample the selected strata (Figure 1). For summary purposes, data were grouped into three geographic areas and six depth intervals: East Delta (88°00'-89°15'), West Delta (89°15'-94°00') and Texas (94°00'-98°00'); and

5-9, 10-19, 20-29, 30-39, 40-49, and 50-60 fms., respectively (Table 2). The mean catch rate for the entire survey was 67.7 kilograms per hour fished (kg hr^{-1}), a 15% decrease in relative abundance as compared to 1991. This was due to low catch rates off Texas (66% lower than 1991). West and east delta areas showed 20 and 105% increases, respectively, when compared to 1991. Sciaenids again dominated catches with Atlantic croaker (Micropogonias undulatus) making the greatest contribution (Table 3).

Nineteen double-rigged tows were completed at the Corps of Engineers dredge spoil site. One day site was not processed due to a large amount of wood debris present in the catch. Night catch rates were greater than day catch rates, a phenomenon most evident for sciaenids (Table 4). Catch rates for the fish trawl were greater than the shrimp trawl due to its wider horizontal and higher vertical opening.

Thirty bongo and neuston tows were taken (Figure 2). Samples were returned to Pascagoula for processing and subsequent shipment to the appropriate sorting center.

Chlorophyll filtrations were returned to Pascagoula for analysis. A summary of accomplishments is presented in Table 5.

My thanks are extended to the scientific and vessel crew members whose cooperative efforts contributed to a successful survey.

CRUISE PARTICIPANTS

10/14-27/91

NAME

Gilmore Pellegrin, Jr.	Field Party Chief	NMFS Pascagoula, Miss.
Kevin Rademacher	Watch Leader	NMFS Pascagoula, Miss.
Eva Kargard	Watch Leader	NMFS Pascagoula, Miss.
Perry Thompson, Jr.	Watch Leader	NMFS Pascagoula, Miss.
Theresa Rotunno	Biological Tech.	NMFS Pascagoula, Miss.
Harriet Perry	Fishery Biologist	NMFS Pascagoula, Miss.
William Crosby	Biological Tech.	NMFS Pascagoula, Miss.
Anna Forrest	Biological Tech.	NMFS Galveston, Tex.
Michael Van	Biological Tech.	NMFS Galveston, Tex.
Chris Kiem	Biological Tech.	NMFS Panama City, Fla.

10/28-11/12/91

Gilmore Pellegrin, Jr.	Field Party Chief	NMFS Pascagoula, Miss.
Rob Ford, Jr.	Watch Leader	NMFS Pascagoula, Miss.
Nathaniel Sanders, Jr.	Watch Leader	NMFS Pascagoula, Miss.
Kevin Rademacher	Watch Leader	NMFS Pascagoula, Miss.
William Crosby	Biological Tech.	NMFS Pascagoula, Miss.

Kirsti Jirus	Biological Tech.	NMFS Galveston, Tex.
JoAnn Williams	Biological Tech.	NMFS Galveston, Tex.
Bennie Rohr	Fishery Biologist	NMFS Pascagoula, Miss.
Eva Kargard	Biological Tech.	NMFS Pascagoula, Miss.
Theresa Rotunno	Biological Tech.	NMFS Pascagoula, Miss.

11/13-19/91

Gilmore Pellegrin, Jr.	Field Party Chief	NMFS Pascagoula, Miss.
Alonzo Hamilton, Jr.	Watch Leader	NMFS Pascagoula, Miss.
Eva Kargard	Watch Leader	NMFS Pascagoula, Miss.
Nathaniel Sanders, Jr.	Watch Leader	NMFS Pascagoula, Miss.
Theresa Rotunno	Biological Tech.	NMFS Pascagoula, Miss.
Bennie Rohr	Fishery Biologist	NMFS Pascagoula, Miss.
Mike Russell	Fishery Biologist	NMFS Pascagouls, Miss.
William Crosby	Biological Tech.	NMFS Pascagoula, Miss.
Kirsti Jirus	Biological Tech.	NMFS Galveston, Tex.

Submitted By:

Approved By:

Gilmore J. Pellegrin, Jr.
 Gilmore Pellegrin, Jr.
 Field Party Chief

Scott Nichols
 Scott Nichols, Director,
 Mississippi Laboratories

Bradford E. Brown
 Bradford E. Brown, Acting
 Director, Southeast Science
 & Research Center

Table 1. Distribution of sampling effort by strata for NOAA Ship OREGON II Cruise 92-06 (202). Numbers in table body indicate number of times strata were sampled.

Depth Strata (fathoms)	Diurnal Strata									
	Day					Night				
	Statistical Zones					Statistical Zones				
	11-12	13-15	16-17	18-19	20-21	11-12	13-15	16-17	18-19	20-21
5-6	.	1	1	1	1	.	1	1	1	1
6-7	.	.	1	1	1	.	1	1	1	1
7-8	.	2	1	1	1	.	.	1	1	1
8-9	.	1	1	1	1	.	1	1	1	1
9-10	.	1	1	1	1	.	1	1	1	1
10-11	.	1	1	1	1	.	1	1	1	1
11-12	.	1	1	1	1	.	1	1	1	1
12-13	.	1	1	1	1	.	1	1	1	1
13-14	.	1	1	.	2	.	1	1	1	1
14-15	.	1	1	1	1	.	1	1	1	1
15-16	.	1	1	1	1	.	1	1	1	1
16-17	.	1	.	.	1	.	1	1	1	1
17-18	.	1	2	2	1	1	1	1	1	1
18-19	.	1	1	1	1	.	1	1	1	1
19-20	.	1	1	1	1	.	1	1	1	1
20-22	.	1	1	1	1	.	1	1	1	1
22-25	1	1	1	1	1	1	1	1	1	1
25-30	1	1	1	.	2	1	1	.	1	1
30-35	1	1	1	1	1	1	1	1	1	1
35-40	1	1	1	1	1	1	1	.	1	1
40-45	1	1	1	1	1	1	1	1	1	1
45-50	1	1	1	1	1	1	.	1	1	1
50-60	1	1	.	1	1	1	1	1	1	1

Table 2. Catch rates (kg hr⁻¹) of five abundant finfish species and three shrimp species caught during the resource assessment segment of NOAA Ship OREGON II Cruise 92-06 (202).

East Delta									
	Depth (fms)						Diurnal Period		Total
	5-9	10-19	20-29	30-39	40-49	50-60	Day	Night	
Atlantic croaker	--	0.0	35.2	7.4	4.0	0.0	5.2	18.8	12.4
Longspine porgy	--	107.4	5.1	1.4	10.0	0.4	1.8	20.2	11.6
Sand seatrout	--	0.0	7.4	108.8	62.9	59.8	71.1	42.3	55.7
Hardhead catfish	--	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spot	--	0.0	0.9	35.1	28.8	12.2	21.7	20.9	21.3
Brown shrimp	--	0.2	0.8	2.4	6.6	1.8	4.1	1.8	2.9
White shrimp	--	0.0	1.3	4.0	0.4	0.0	2.0	1.1	1.5
Pink shrimp	--	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Crustacea catch	--	0.6	5.3	14.8	14.8	24.2	12.6	12.6	12.6
Finfish catch	--	120.0	87.2	194.3	154.6	115.6	140.5	139.1	139.7
Total catch	--	121.8	92.9	209.2	169.6	139.9	153.3	151.9	152.5
Number of tows	0	1	4	4	4	2	7	8	15

West Delta									
	Depth (fms)						Diurnal Period		Total
	5-9	10-19	20-29	30-39	40-49	50-60	Day	Night	
Atlantic croaker	31.0	55.9	31.1	9.7	0.7	29.4	16.5	59.8	36.9
Longspine porgy	2.8	11.9	10.0	9.6	9.5	6.6	9.9	7.9	9.0
Sand seatrout	2.1	3.6	2.4	2.8	2.2	11.9	2.4	4.0	3.1
Hardhead catfish	1832	9.7	0.2	0.0	0.0	0.0	6.2	10.7	8.4
Spot	0.1	4.7	4.2	8.2	11.8	0.1	3.1	5.8	4.4
Brown shrimp	0.4	1.5	1.4	4.4	2.0	0.9	0.8	2.4	1.6
White shrimp	1.5	0.3	0.0	0.0	0.0	0.0	0.5	0.5	0.5
Pink shrimp	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.1
Crustacea catch	3.7	4.2	4.3	7.2	3.3	1.3	2.0	6.8	4.2
Finfish catch	68.6	109.6	74.1	58.0	63.6	136.0	67.8	108.8	87.1
Total catch	76.0	115.8	78.6	68.7	69.8	138.5	71.5	118.7	93.7
Number of tows	24	44	14	11	8	3	55	49	104

Table 2. (continued)

Texas									
	Depth (fms)						Diurnal Period		Total
	5-9	10-19	20-29	30-39	40-49	50-60	Day	Night	
Atlantic croaker	0.2	4.5	2.4	0.9	0.0	0.0	2.4	2.4	2.4
Longspine porgy	0.0	1.5	4.7	10.6	10.7	5.7	2.6	4.7	3.6
Sand seatrout	0.3	0.4	0.3	0.1	0.1	0.1	0.3	0.3	0.3
Hardhead catfish	7.2	0.5	0.0	0.0	0.0	0.0	0.4	2.8	1.6
Spot	0.0	0.4	1.2	1.1	0.0	0.0	0.5	0.4	0.5
Brown shrimp	0.2	1.9	1.6	1.9	1.3	0.4	1.0	1.8	1.4
White shrimp	0.7	0.3	0.0	0.0	0.0	0.0	0.2	0.3	0.3
Pink shrimp	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Crustacea catch	1.9	3.4	4.3	2.7	2.3	0.6	1.8	4.1	3.0
Finfish catch	15.9	22.2	23.0	30.4	42.9	23.9	27.6	20.2	23.8
Total catch	23.1	26.8	27.7	34.9	46.5	27.3	30.8	26.8	28.8
Number of tows	20	41	18	10	9	4	50	52	102

All Areas Combined									
	Depth (fms)						Diurnal Period		Total
	5-9	10-19	20-29	30-39	40-49	50-60	Day	Night	
Atlantic croaker	17.0	30.7	17.2	5.8	1.0	9.8	9.5	29.4	19.3
Longspine porgy	1.5	8.1	6.8	8.7	10.1	4.8	6.1	7.3	6.7
Sand seatrout	1.3	2.0	1.9	18.6	12.9	17.3	5.7	5.0	5.4
Hardhead catfish	13.2	5.2	0.1	0.0	0.0	0.0	3.2	6.2	4.7
Spot	0.1	2.6	3.3	9.6	10.0	2.7	3.1	4.4	3.7
Brown shrimp	0.3	1.7	1.5	3.1	2.6	0.9	1.1	2.1	1.6
White shrimp	1.2	0.3	0.1	0.6	0.1	0.0	0.5	0.4	0.5
Pink shrimp	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1
Crustacea catch	2.9	3.8	4.4	6.6	5.1	6.1	2.6	5.9	4.2
Finfish catch	44.7	68.0	50.0	68.8	72.1	81.7	54.4	68.8	61.5
Total catch	51.9	73.4	54.7	77.7	78.8	89.4	58.4	77.3	67.7
Number of tows	44	86	36	25	21	9	112	109	221

Table 3. Organisms caught during NOAA Ship OREGON II Cruise 92-06 (202) which comprised at least 1.0% of the total catch in terms of numbers and weights for the resource assessment portion of the survey (n=221). Catches adjusted to kilograms per hour fished.

Name	Number Caught	Weight (kgs)	Frequency of Occurrence	Percent of Total Number Caught	Percent of Total Catch Weight	Weight Per Individual (gms)
Atlantic croaker (<i>Micropogonias undulatus</i>)	85,321	4,267.0	163	22.0	28.5	50.0
Longspine porgy (<i>Stenotomus caprinus</i>)	56,018	1,477.9	159	14.5	9.9	26.4
Sand seatrout (<i>Cynoscion arenarius</i>)	11,819	1,190.6	132	3.1	8.0	100.7
Hardhead catfish (<i>Arius felis</i>)	10,744	1,033.7	76	2.8	6.9	96.2
Spot (<i>Leiostomus xanthurus</i>)	8,158	824.5	117	2.1	5.5	101.1
Gulf butterfish (<i>Peprilus burti</i>)	10,898	631.7	120	2.8	4.2	58.0
Brown shrimp (<i>Penaeus aztecus</i>)	15,578	349.7	192	4.0	2.3	22.4
Atlantic bumper (<i>Chloroscombrus chrysurus</i>)	19,235	341.0	87	5.0	2.3	17.7
Bigeye searobin (<i>Prionotus longispinosus</i>)	7,909	266.8	118	2.0	1.8	33.7
Atlantic cutlassfish (<i>Trichiurus lepturus</i>)	6,575	230.3	77	1.7	1.5	35.0
Bank sea bass (<i>Centropristis philadelphica</i>)	5,988	226.3	132	1.5	1.5	37.8

Table 4. Five most abundant species caught in terms of number caught per 10-minute tow for U. S. Army Corps of Engineers dredge spoil samples taken during NOAA Ship OREGON II cruise 92-06 (202).

Shrimp Trawl	Number Caught	Kilograms	Frequency of Occurrence	Weight per Individual (gms)
Day (n=9)				
Atlantic croaker (<i>Micropogonias undulatus</i>)	4,600	236.6	9	51.4
Striped anchovy (<i>Anchoa hepsetus</i>)	1,901	16.8	9	8.8
Scaled sardine (<i>Harengula jaguana</i>)	999	27.0	9	27.0
Atlantic cutlassfish (<i>Trichiurus lepturus</i>)	703	40.1	8	57.0
Spot (<i>Leiostomus xanthurus</i>)	464	32.5	8	70.0
Night (n=10)				
Atlantic croaker (<i>Micropogonias undulatus</i>)	7,479	350.0	10	46.8
Moon jelly (<i>Aurelia aurita</i>)	2,104	581.3	8	276.3
Spot (<i>Leiostomus xanthurus</i>)	1,135	121.8	8	107.3
Lesser blue crab (<i>Callinectes similis</i>)	108	3.9	8	36.4
Sand seatrout (<i>Cynoscion arenarius</i>)	107	9.0	7	84.1
Day/night combined (n=19)				
Atlantic croaker (<i>Micropogonias undulatus</i>)	12,079	587.7	19	48.6
Moon jelly (<i>Aurelia aurita</i>)	2,114	582.2	11	275.4
Striped anchovy (<i>Anchoa hepsetus</i>)	1,971	17.6	15	8.9
Spot (<i>Leiostomus xanthurus</i>)	1,599	154.3	16	96.5
Scaled sardine (<i>Harengula jaguana</i>)	1,020	27.7	14	27.2

Table 4. (continued)

Fish Trawl	Number Caught	Kilograms	Frequency of Occurrence	Weight per Individual (gms)
Day (n=9)				
Atlantic croaker (<u>Micropogonias undulatus</u>)	3,892	197.3	9	50.7
Scaled sardine (<u>Harengula jaguana</u>)	925	27.9	9	30.2
Atlantic cutlassfish (<u>Trichiurus lepturus</u>)	630	35.0	8	55.6
Spot (<u>Leiostomus xanthurus</u>)	602	62.1	8	103.2
Striped anchovy (<u>Anchoa hepsetus</u>)	534	6.4	8	12.0
Night (n=10)				
Atlantic croaker (<u>Micropogonias undulatus</u>)	8,603	433.0	10	50.3
Moon jelly (<u>Aurelia aurita</u>)	1,937	936.9	10	483.7
Spot (<u>Leiostomus xanthurus</u>)	1,173	257.4	10	219.4
Sand seatrout (<u>Cynoscion arenarius</u>)	225	19.3	9	85.7
Lesser blue crab (<u>Callinectes similis</u>)	193	5.8	8	30.1
Day/night combined (n=19)				
Atlantic croaker (<u>Micropogonias undulatus</u>)	12,495	630.3	19	50.4
Moon jelly (<u>Aurelia aurita</u>)	1,958	942.6	15	481.4
Spot (<u>Leiostomus xanthurus</u>)	1,775	319.5	18	180.0
Scaled sardine (<u>Harengula jaguana</u>)	1,096	33.1	17	30.2
Atlantic cutlassfish (<u>Trichiurus lepturus</u>)	797	47.2	16	59.2

Table 5. Summary of sample and data collections for NOAA Ship OREGON II Cruise 92-06 (202).

	Surface	Mid-depth	Maximum depth	Total
Temperature	217	216	217	650
Salinity	217	217	217	651
Dissolved oxygen	220	218	214	652
Turbidity	217	217	214	648
Secchi disk	--	--	--	59
Water color	--	--	--	65
Cloud cover	--	--	--	95
Bottle cast	--	--	--	209
STD	--	--	--	218
Fish trawl	--	--	--	19
Shrimp trawl	--	--	--	240
Bongo	--	--	--	30
Neuston	--	--	--	30

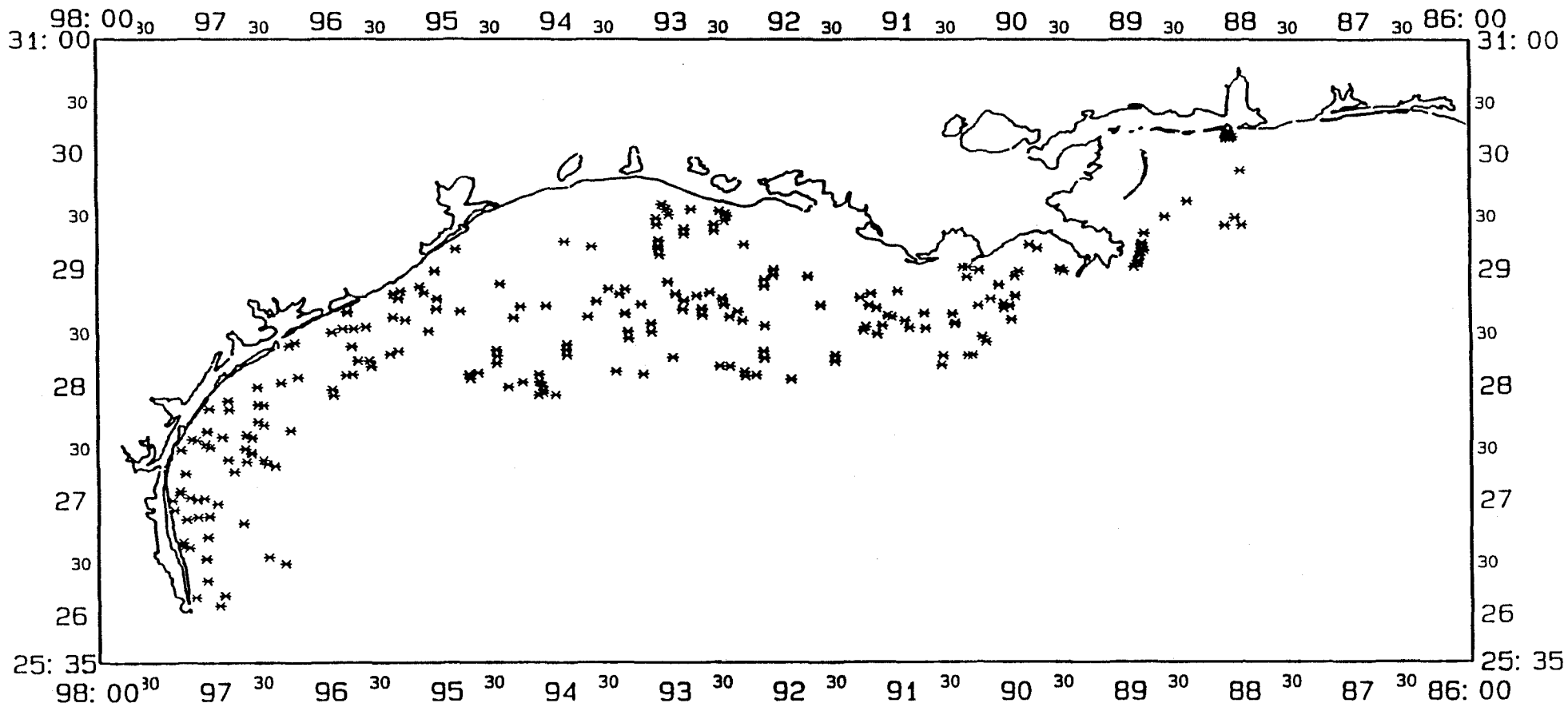


Figure 1. Shrimp trawl stations completed during NOAA Ship OREGON II Cruise 92-06 (202).

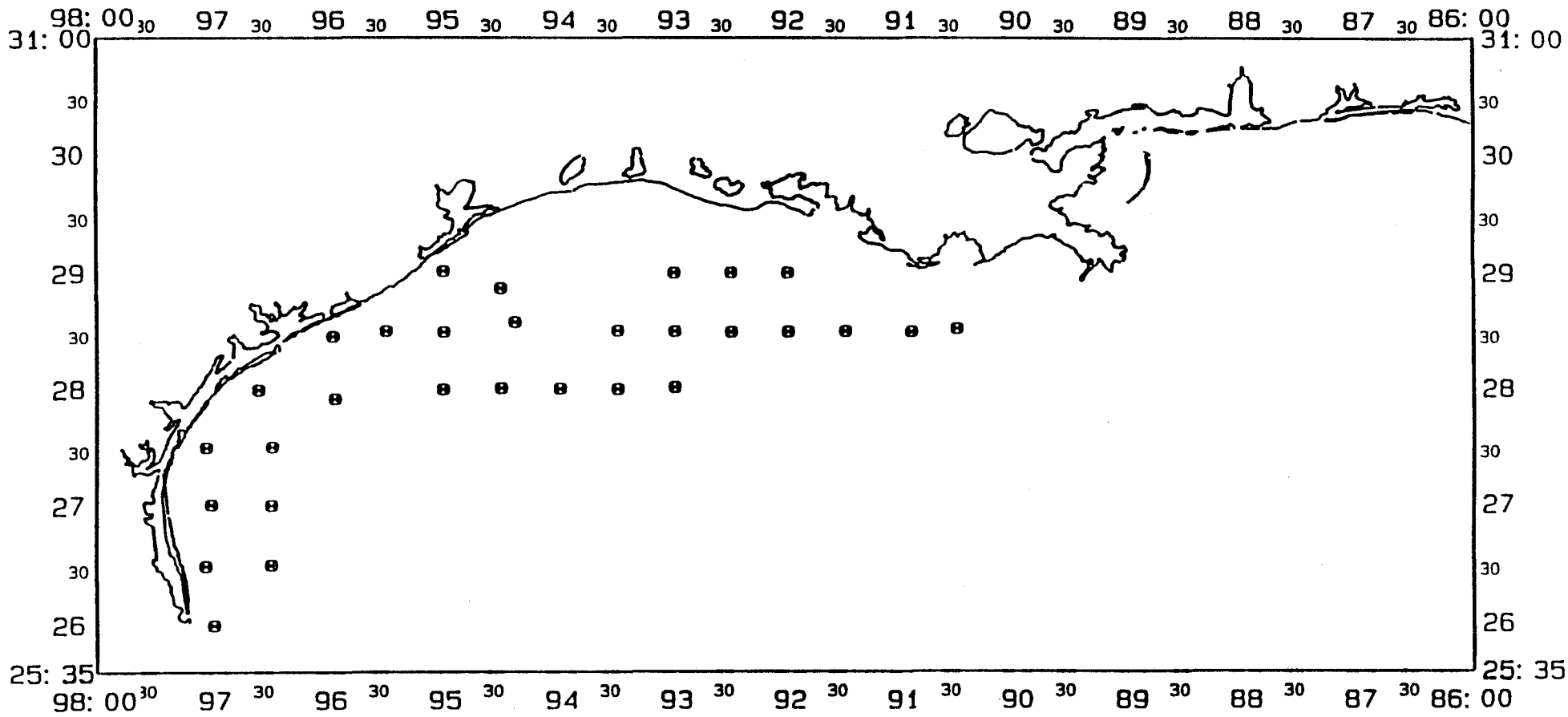


Figure 2. Bongo/neuston stations completed during NOAA Ship OREGON II Cruise 92-06 (202).