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

NOAA Ship OREGON II Cruise 06-04 (271)
06/14-07/17/06

INTRODUCTION

The *NOAA Ship OREGON II* departed Pascagoula, Mississippi on June 14, 2006 for the twenty-sixth annual Summer Southeast Area Monitoring and Assessment Program (SEAMAP) shrimp and bottomfish survey in the northern and western U.S. Gulf of Mexico. SEAMAP is a state-Federal-university program for the collection, management and dissemination of fishery independent data.

The primary goal of this survey is to monitor size composition and spatial distribution of penaeid shrimp stocks across the northern Gulf of Mexico in 5 to 60 fathoms (fms) and to provide additional biological and catch rate information on demersal organisms occurring in the study area.

Five and a half survey days were lost due to mechanical problems, and half a day due to crew sickness and family emergency. The cruise terminated in Pascagoula, Mississippi on July 17, 2006.

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) Sample the demersal fauna of the northcentral and northwestern Gulf of Mexico in depths of 5 to 60 fathoms.

4) Obtain length measurements to estimate size structure of sampled populations.

5) Conduct CTD casts to profile water temperature, salinity, dissolved oxygen, fluorometry and percent light transmission.

6) Collect ichthyoplankton samples to determine the relative abundance and

distribution of eggs and larvae of commercially and recreationally important fish species.

7) Collect hypoxia zone information and send real time environmental data to NOAA National Coastal Data Development Center at Stennis Space Center in Mississippi and NMFS in Galveston, Texas for analysis.

8) Collect *Caulolatilus, Epinephalus,* and various shark species for scientists at the National Marine Fisheries Service (NMFS) in Pascagoula, Mississippi.

9) Collect *Penaeus aztecus* for Dr. Brian Fry at Louisiana State University.

10) Collect *Raja texana, Sicyonia brevirostris, Squilla* and *Munida* species; and *Lepophidium brevibarbi* for the NMFS laboratory at Panama City, Florida.

11) Collect *Symphurus, Citharichthys, Etropus, Gymnachirus, Ancylopsetta, Paralichthys, Achirus,* and *Gastropsetta* species for Dr. Thomas Munroe of the National Systematics Laboratory in the Smithsonian Institution in Washington, D.C.

12) Collect *Lutjanus synagris* and *L. griseus* for Dr. Sean Powers of the University of South Alabama's Dauphin Island Sea Laboratory.

13) Collect *Lutjanus campechanus, Scomberomorus cavalla,* and *Synodus foetens* for Dr. Will Patterson of the University of West Florida.

14) Collect shark and ray samples for Dr. James Sulikowski of the University of New England.

15) Collect various shark, ray, and skate species for Dr. Eric Hoffmayer of the University of Southern Mississippi's Gulf Coast Research Laboratory.

16) Collect invertebrate species, including but not limited to shrimp, crab, and jellyfish species for the University of Southern Mississippi's Gulf Coast Research Laboratory.

MATERIALS AND METHODS

The sampling gear consisted of 40-ft shrimp nets with 8-ft by 40-in chain bracketed wooden doors. A standard free tickler chain cut 42 inches shorter than the footrope was used to stimulate benthic organisms out of the substrate and into the path of the oncoming net. Towing speed was targeted at 2.50 knots. Sample sites were randomly selected within area, depth and diel strata. Area strata consisted of Gulf coast shrimp statistical zones 11-12 (88°00'-89°00' W long), 13-15 (89°00'-92°00' W long), 16-17 (92°00'-94°00' W long), 18-19 (west of 94°00' W long and north of 28°00' N lat), and

20-21 (26°00'-28°00' N lat). 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. Diel strata consisted of day and night, and were delimited by astronomical sunrise and sunset. Minimum and maximum tow durations were 10 and 55 minutes respectively, depending on the time required to transect the respective depth strata. If a stratum was not completed in 55 minutes then additional tows were made until it was covered. Tow direction was determined as the shortest distance between strata boundaries (generally perpendicular to depth contours).

Ichthyoplankton samples (conducted with bongo and neuston samplers) were collected at half-degree intervals of latitude and longitude within the defined survey area. Plankton sampling 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. Nets were towed at 1.5-2.0 knots to maintain a 45° wire angle of towing warp, and were fished to a maximum depth of 200 meters or within two meters of bottom in depths less than 200 meters. 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. Bongo and neuston samples were initially preserved in 10% buffered formalin and then transferred to 95% ethyl alcohol 48 hours later.

Vertical profiles of temperature, salinity, dissolved oxygen, percent light transmission and fluorometer readings were recorded with a Seabird SBE 911+ CTD unit. Forel-ule water color, secchi disc, and percent cloud cover observations were also taken during daylight hours.

RESULTS AND DISCUSSIONS

One hundred and ninety-three strata (84%) were successfully sampled by *NOAA Ship OREGON II* (Table 1). An additional 28 strata were sampled by state vessels; 19 by *R/V Tommy Munro* of Mississippi and 9 by *R/V A. E. Verrill* of Alabama. Nine strata were not sampled because nets were torn on bottom obstructions.

Two hundred thirty two tows were required to sample the selected strata (Figure 1). For summary purposes, data were grouped into three geographic areas: East Delta (88°00'-89°15' W long), West Delta (89°15'-94°00' W long), and Texas (94°00'-98°00' W long), and six depth intervals: 5-9, 10-19, 20-29, 30-39, 40-49, and 50-60 fms (Table 2). The mean total catch rate for the entire survey was 94.4 kilograms per hour fished (kg/hr), a 4.0% increase in relative abundance as compared to 2005 and a 26.4% increase relative to the five year mean for 2001-2005 (74.7 kg/hr). Sciaenidae was again the most abundant family caught with Atlantic croaker (*Micropogonias undulatus)* making the greatest contribution (Table 3). Brown shrimp, *Farfantepenaeus aztecus*, was the most abundant commercial shrimp species, followed by white shrimp, *Litopenaeus setiferus*, and pink shrimp, *Farfantepenaeus duorarum*.

Forty-three bongo and forty-eight neuston stations were accomplished (Fig. 2). Neuston and right side bongo samples were returned to Pascagoula for subsequent shipment to the Polish Sorting Center for sorting and identification according to standard SEAMAP protocol. Left bongo samples were sent to the SEAMAP Plankton Archiving Center at the Institute of Marine Science's Gulf Coast Research Laboratory in Ocean Springs, Mississippi.

Two hundred and thirty-three CTD casts, one hundred and twenty-eight cloud cover, one hundred and fifteen water color, and ninety-two secchi disc measurements were collected (Table 4). Figure 3 shows stations where hypoxic conditions (dissolved oxygen readings ≤ 2 milligrams per liter) were encountered during the survey.

Specimen collections were shipped to the appropriate requesting scientists upon arrival in Pascagoula.

ACKNOWLEDGMENTS

On behalf of Mississippi Laboratory and the scientific party, I would like to thank the Commanding Officer and the crew of *NOAA Ship OREGON II* for a job well done.

CRUISE PARTICIPANTS

June 14 – June 31, 2006

NAME	TITLE	ORGANIZATION
Kimberley A Johnson	Field Party Chief	NMFS, Pascagoula, MS
Alonzo Hamilton	Watch Leader	NMFS, Pascagoula, MS
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Carolyn Burks	Res. Fish Biologist	NMFS, Pascagoula, MS
Ryan Jones	Fish. Biologist	IAP, Mississippi
Brittany Long	Intern	NMFS Science & Tech, MD
Aaron Lewis	Student	Central MO State Univ.
Danny Schindel	Student	St Mary's College of MD
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Susan Just	TeacherAtSea	Texas School Systems

July 1 – July 17, 2006

NAME	TITLE	ORGANIZATION
Kimberley A Johnson	Field Party Chief	NMFS, Pascagoula, MS
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Submitted By:

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Approved By:

Scott Nichols, Director
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Alex Chester, Acting Director
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Table 1. Distribution of sampling effort by strata for *NOAA Ship OREGON II* Cruise 271 (OT-06-04). Number in table body indicates number of times strata were sampled. "Ala." and "Miss." indicate strata sampled by the respective states, and "Tore net" indicates strata which were unsuccessfully sampled due to bottom obstructions.

Depth Strata (fathoms)	Diel 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	Miss.	1	1	1	1	1	1	1	1	1
6-7	Miss.	1	1	1	1	1	1	1	1	1
7-8	Ala.	1	1	1	1	1	1	1	1	1
8-9	Miss.	1	1	1	1	Miss.	1	1	1	1
9-10	Ala.	1	1	1	1	Ala.	1	1	1	1
10-11	Miss.	1	1	1	1	Ala.	1	1	1	1
11-12	Ala.	1	1	1	1	Miss.	1	1	1	1
12-13	Miss.	1	1	1	1	Miss.	1	1	1	1
13-14	Miss.	1	1	1	1	Ala	1	1	1	1
14-15	Miss.	1	1	1	1	Ala	1	1	1	1
15-16	1	1	1	1	1	Miss.	1	1	1	1
16-17	Ala.	1	1	1	1	1	1	1	1	1
17-18	Miss.	1	1	1	1	Miss.	1	1	1	1
18-19	Ala	1	1	1	1	1	1	1	1	1
19-20	Miss.	1	1	1	1	1	1	1	1	1
20-22	Miss.	1	1	1	1	Miss.	1	1	1	1
22-25	Miss.	1	1	1	Tore net	Miss.	1	1	1	1
25-30	1	1	1	Tore net	1	Miss.	1	1	1	1
30-35	1	1	1	1	1	1	1	1	1	1
35-40	1	1	1	1	1	Tore net	1	Tore net	1	1
40-45	1	1	1	1	1	1	1	1	1	1
45-50	1	1	1	1	1	1	Tore net	Tore net	Tore net	1
50-60	1	Tore net	Tore net	1	1	1	1	1	1	1

Table 2. Mean total catch rates (kg/hr) of finfish species and three shrimp species caught during *NOAA Ship OREGON II* Cruise 271 (OT-06-04) by area, depth, and diel strata.

Area	Depth												Diurnal Period				Total	
	5 – 9		10 – 19		20 – 29		30 – 39		40 – 49		50 – 60		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	3	99.5	4	259.8	2	40.2	4	109.1	4	130.5	2	111.3	9	116.2	10	155.3	19	136.8
West Delta	19	50.1	42	128.1	21	108.8	12	81.7	7	64.1	2	58.4	54	88.5	49	109.9	103	98.7
Texas	17	109.5	41	104.9	21	61.3	15	54.3	10	48.8	6	62.9	57	96.9	53	68.0	110	83.0
Areas Combined	39	79.8	87	123.2	44	83.0	31	72.0	21	69.5	10	71.7	120	94.6	112	94.1	232	94.4

Table 3. Organisms caught during *NOAA Ship OREGON II* Cruise 271 (OT-06-04) which comprised at least 1.0% of the total catch in terms of numbers and kilograms caught per hour fished (n = 232).

	Name	Percent of Total Number Caught	Percent of Total Catch Weight	Percent Frequency Of Capture	Weight Per Individual (gms)
1	Atlantic croaker (*Micropogonias undulatus*)	20.3	27.1	58.1	64.0
2	Brown shrimp (*Farfantepenaeus aztecus*)	14.8	9.8	90.9	32.0
3	Longspine porgy (*Stenotomus caprinus*)	14.0	11.3	85.3	39.0
4	Atlantic bumper (*Chloroscombrus chrysurus*)	7.6	9.3	48.7	59.0
5	Lesser blue crab (*Callinectes similis*)	4.2	1.7	67.7	19.0
6	Blackwing searobin (*Prionotus rubio)*	2.8	1.6	53.3	280
7	Silver seatrout (*Cynoscion nothus*)	1.5	2.3	34.4	76.0
8	Gulf butterfish (*Peprilus burti*)	1.2	3.1	57.3	125.0
9	Banded drum (*Larimus fasciatus)*	1.0	1.3	18.9	64.0
	Totals	67.8	68.0		

Table 4. Summary of environmental samples and data collected during *NOAA Ship OREGON II* Cruise 271 (OT-06-04)

	Surface	Mid-depth	Maximum Depth	Total
Temperature	230	230	230	690
Salinity	230	230	230	690
Dissolved Oxygen	230	230	230	690
Light Transmission	230	230	230	690
Secchi disk	--	--	--	92
Water color	--	--	--	115
Cloud cover	--	--	--	128
**CTD	--	--	--	233
*Shrimp trawl	--	--	--	243
Bongo	--	--	--	43
Neuston	--	--	--	47

*Shrimp trawl total consists of 11 stations with problems (9 nets were torn on bottom obstructions and 2 stations were repeated successfully).
**3 CTD casts had erroneous data in them and were therefore deleted from the database.

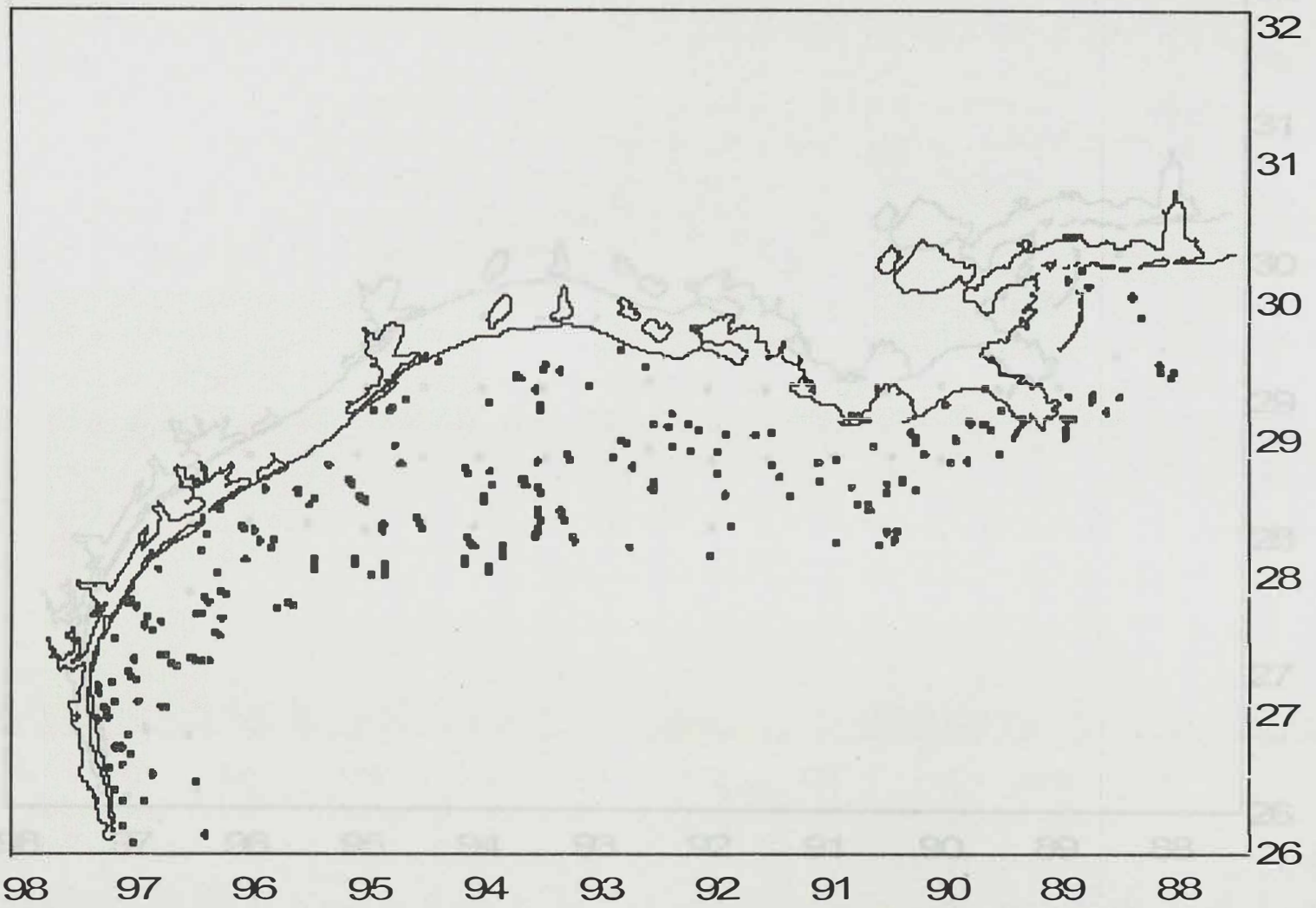

Figure 1. Shrimp trawl stations accomplished during *NOAA Ship OREGON II* Cruise 271 (OT-06-04).

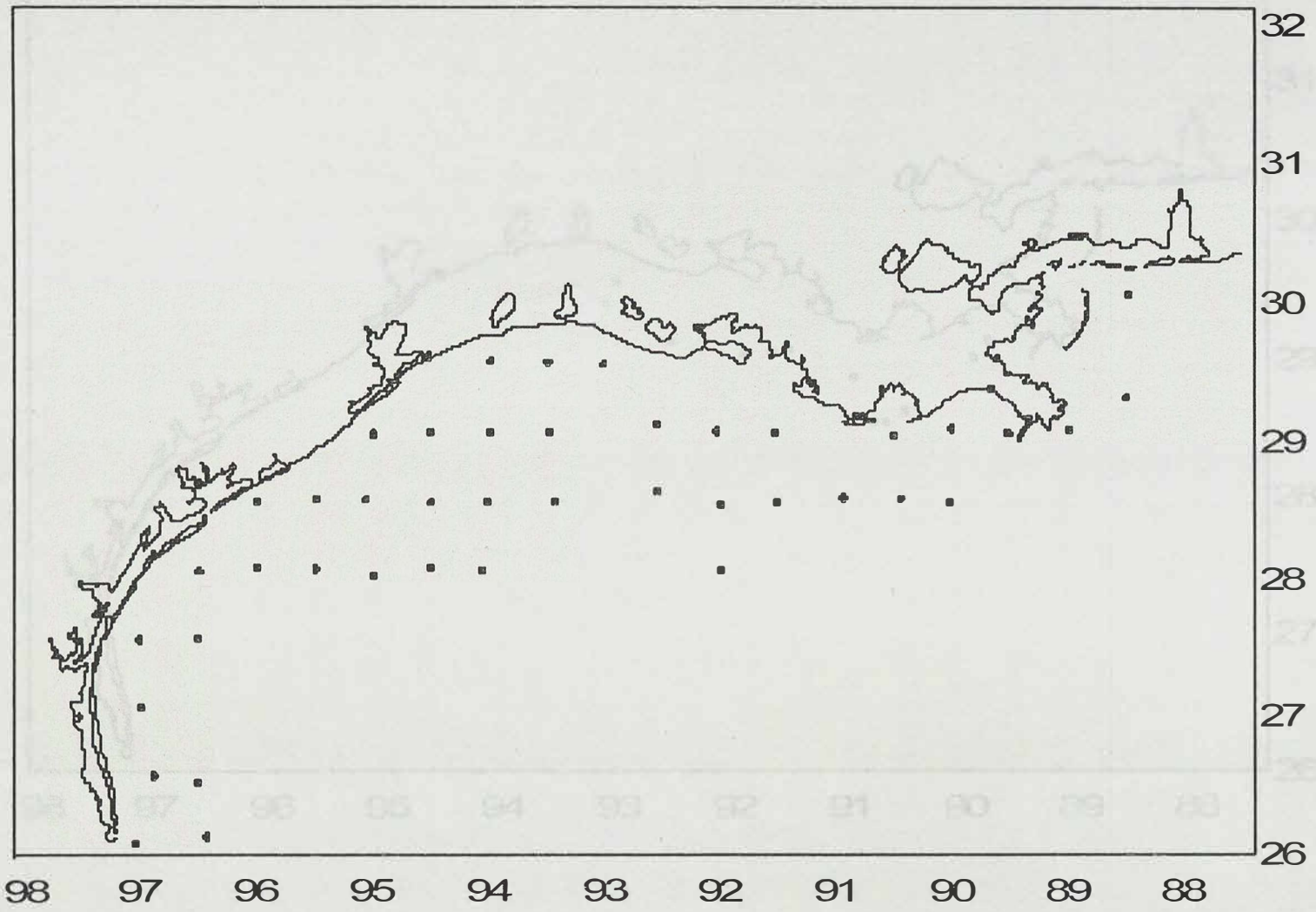

Figure 2. Ichthyoplankton sampling stations completed during *NOAA Ship OREGON II* Cruise 271 (OT-06-04).

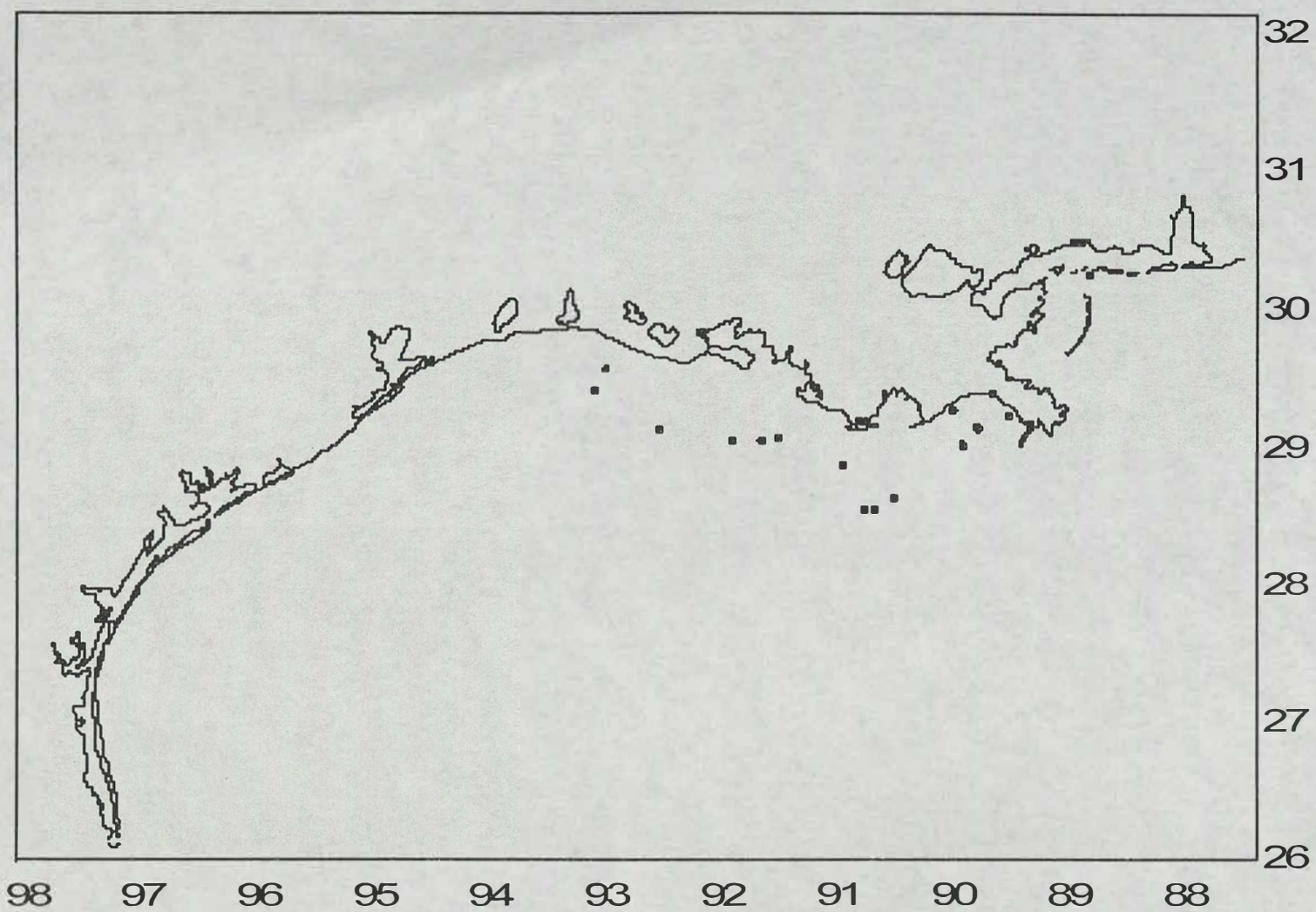

Figure 3. Locations where hypoxic conditions (bottom dissolved oxygen measurement ≤2.0 milligrams per liter) were encountered during *NOAA Ship OREGON II* Cruise 271 (OT-06-04).