

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

NOAA Ship *Oregon II* Cruise 295 (R2-11-03)
6/7-7/17/2011

INTRODUCTION

NOAA Ship *Oregon II* departed Pascagoula, Mississippi on June 7, 2011 for the 31st annual Summer Southeast Area Monitoring and Assessment Program (SEAMAP) Shrimp/Bottom fish 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 the survey is to study the abundance and distribution of demersal organisms occurring in the northern Gulf of Mexico in 5 to 60 fm and to provide additional biological and catch rate information on demersal organisms occurring in the study area.

The cruise was originally scheduled to depart on June 6, but mandatory aloft training for the ship's crew delayed sailing for a day. Subsequently, we added this lost day onto the end of the cruise in order to make up the time. The total number of sea days remained the same at 39.

Three hundred and three hours were lost due to a stern tube oil leak which required emergency dry dock repairs. The ship turned around on June 9 and arrived at dry dock in Mobile, AL on June 11. The ship did not depart again until June 23. Ten additional hours were lost due to mechanical issues aboard NOAA Ship *Oregon II*. There was one scheduled port call to exchange scientific personnel (Galveston, Texas July 4 to July 6). The ship returned to Pascagoula, Mississippi on July 17, 2011.

Summary of Objectives:

1. Sample the northern Gulf of Mexico with SEAMAP standard sampling gear to determine the abundance and distribution of benthic fauna. Transmit information weekly, via email, for real time reports of catch rates of penaeid species.
2. Collect size measurements to determine population size structures.
3. Conduct CTD casts to profile temperature, salinity, conductivity, transmissivity, dissolved oxygen concentrations (DO), and fluorometry.
4. Collect daily water samples and perform bench top DO tests using the Winkler Titration method on triplicate samples and a handheld dissolved oxygen meter. Transmit data daily to NOAA National Coastal Data Development Center at Stennis Space Center, Mississippi and other researchers to map the hypoxic zone.
5. Collect ichthyoplankton samples with bongo and neuston samplers to map the distribution of fish eggs and larvae.

6. Conduct 3 additional CTD casts off of the Chandeleur Islands for additional data on the hypoxic zone.
7. Perform National Resource Damage Assessment (NRDA) Group bird observations from the bow of the *Oregon II*.
8. Collect batfish (*Halieutichthys aculeatus* and *Ogcocephalus* sp.); longspine porgy (*Stenotomus caprinus*); grouper (*Epinephelus* sp. and *Mycteroperca* sp.); sharks (Carcharhinidae), dogfish (*Mustelus* sp.), skates and rays (Elasmobranchii); red snapper (*Lutjanus campechanus*); searobins (*Prionotus* sp. and *Bellator* sp.); triggerfish (*Balistes capriscus*); mackerels (*Scomberomorus* sp.); gobies (*Bollmania* sp.); porgies (*Calamus* sp.); Spanish sardine (*Sardinella aurita*); pufferfish (*Lagocephalus* sp.); wenchman (*Pristipomoides aquilonaris*); lookdown (*Selene vomer*); jacks (*Caranx* sp.); and filefish (Monacanthidae); for age, growth, genetic, abundance, and distributional studies.

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 in shorter than the footrope was used to stimulate benthic organisms out of the substrate into the path of the oncoming net. Towing speed was targeted at 2.5 kt. Sample sites were downloaded from NOAA's Environmental Satellite, Data, and Information Service (NESDIS). Geographical strata consisted of Gulf coast shrimp zones 11-21 and bathymetric strata consisted of 5-60 fm. Once the data were downloaded, 400 sites were randomly selected (some were distributed to SEAMAP partners for completion). Towing durations were 30 min at a targeted speed of 2.5 kt with tow direction left to the discretion of the bridge watch.

The sampling design used in this survey was the same as last years, but altered from that used in previous years by making 3 major changes. Day/night stratification and depth stratification were eliminated and tow duration was limited to 30 min. These changes resulted in an increased efficiency of the survey and an increase in the number of stations that could be occupied. Additional stations resulted in improvement in precision of catch per unit effort (CPUE) estimates for a number of species.

Trawl catch data were electronically recorded at-sea with the Fishery Scientific Computing System (FSCS), version 1.6, developed by NOAA's System Development Branch of the Office of Marine & Aviation Operations. For FSCS to be operational, the Scientific Computing System (SCS) version 4.5.1.1063 was used to collect metadata, including position, depth, date, time and meteorological data. SCS was also used to collect metadata for ichthyoplankton stations and CTD stations. Catches were either processed in their entirety or subsampled, depending on the total catch weight. If catches exceeded 50 lb, then at least 10% was taken as a subsample. Catches (or subsamples) were sorted by species which were then enumerated and weighed. Additional data taken for specimens identified down to species level, included length measurements, sex, and gonad condition. Specimens that could not be identified to species level were frozen and brought back to the laboratory for identification.

Ichthyoplankton samples (conducted with bongo and neuston samplers) were collected at half-

degree intervals of latitude and longitude within the defined survey area. Plankton sample sites were occasionally relocated to the nearest trawl sample site to optimize survey time. Bongo tows were made with 2 conical 61-cm nets with 0.335 mm mesh netting. General Oceanic flowmeters were suspended in each side of the frame to measure the amount of water filtered. Single oblique tows were made. Nets were towed at 1.5 to 2.0 kt to maintain a 45° wire angle of towing warp, and were fished to a maximum depth of 200 m or within 2 m of bottom in depths less than 200 m. Neuston sampling gear consisted of a 0.950 mm mesh net mounted on a 1 by 2 m frame. The net was towed for 10 min 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 36 h later.

Vertical profiles of temperature, conductivity, DO, percent light transmission and fluorometer values were recorded with a Seabird SBE 9-11+. Forel-ule water color and percent cloud cover observations were also taken during daylight hours. Daily water samples (maximum depth) were taken at random stations each day to perform 3 replicate Winkler titrations to monitor the performance of the DO sensors on the environmental profiler. The values obtained from the Winkler titrations were recorded in the FSCS Access Database. An Orion LDO™ HQ10 portable DO meter was also used at these stations to calibrate DO readings.

RESULTS AND DISCUSSIONS

One hundred and forty-nine trawl stations were successfully sampled, along with 6 that were unsuccessful due to torn nets (Table 1). For summary purposes, data were grouped into 2 geographic areas; West Delta (89°15'-94°00' W Long), and Texas (94°00'-98°00' W Long), and 6 depth intervals; 5-9, 10-19, 20-29, 30-39, 40-49, and 50-60 fm (Table 2). Because of the lost sea time, we were not able to work in the East Delta (88°00'-89°15' W Long). However, several state agencies were able to pick up some extra stations in the East Delta. Table 3 lists the 6 most numerous species caught, plus pink and white shrimp and red snapper. The mean total catch rate for the survey was 120.7 kg/h, a 20% decrease in relative abundance as compared to 2010 (146.3 kg/h), but a 12% increase relative to the 5 year mean for 2005-2010 (106.2kg/h) (Table 2). Sciaenidae was the most abundant family caught with the Atlantic croaker making the greatest contribution (Table 2). Brown shrimp, *Farfantepenaeus aztecus*, was the most abundant commercial shrimp species, followed by white shrimp, *Litopenaeus setiferus* and pink shrimp, *Farfantepenaeus duorarum*.

Forty-six bongo and 47 neuston stations were accomplished (Table 1). 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 Gulf Coast Research Laboratory (GCRL) in Ocean Springs, Mississippi.

One hundred and ninety-four CTD casts, 96 cloud cover, and 96 water color measurements were collected (Table 1). There were 23 Winkler Titrations conducted (Table 1).

Fish and invertebrate samples were frozen and returned to staff members at GCRL, skate and ray samples were collected for Dr. James Sulikowski (University of New England), batfish species were collected for Dr. Bronson Nagareda (FWRI), wenchman and various searobins were collected for

Dr. Gold and Dr. Portnoy (Texas A&M University), various jacks, pufferfish, filefish, and were collected for Morgan Lindemayer (University of Massachusetts), long spine porgy were collected for Cher Newman (GCRL and Mississippi Laboratory) and red snapper samples were shipped to the Texas A&M University, Corpus Christi and Panama City NOAA Lab.

ACKNOWLEDGMENTS

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

CRUISE PARTICIPANTS

Leg I (June 7 – June 11, 2011)

Name	Title	Sex	Organization	Citizenship
Michael Hendon	Field Party Chief	M	NMFS, Miss.	USA
Andre Debose	Watch Leader	M	NMFS, Miss.	USA
Adam Pollack	Watch Leader	M	IAP, Miss.	USA
Michael Felts	Fisheries Biologist	M	IAP, Miss.	USA
Cher Newman	Fisheries Biologist	F	IAP, Miss.	USA
Bronson Nagareda	Volunteer	M	FWRI	USA
Heather Otte	Volunteer	F	Cooperator	USA
Kendall Moyer	Volunteer	F	Cooperator	USA
Savannah Nease	Volunteer	F	Cooperator	USA
Scott Haider	Volunteer	M	Cooperator	USA
Kristin Foss	Volunteer	F	Cooperator	USA
David Lee	Bird Observer	M	NRDA	USA

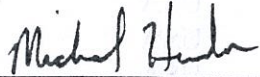
Leg II (June 23 – July 4, 2011)

Name	Title	Sex	Organization	Citizenship
Michael Hendon	Field Party Chief	M	NMFS, Miss.	USA
Alonzo Hamilton	Watch Leader	M	NMFS, Miss.	USA
Brittany Palm	Watch Leader	F	IAP, Miss.	USA
Allison Odom	Fisheries Biologist	F	IAP, Miss.	USA
Amy Schmitt	Fisheries Biologist	F	IAP, Miss.	USA
Jose Jarquin	Intern	M	NGI	USA
Brody Benoist	Intern	M	NGI	USA
Kristin Foss	Volunteer	F	Cooperator	USA
Sandra Coghlan	Volunteer	F	Cooperator	USA
Steven Wilkie	TAS	M	TAS Program	USA
David Lee	Bird Observer	M	NRDA	USA

Leg III (July 6 – July 17, 2011)

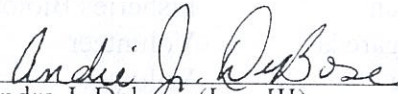
Name	Title	Sex	Organization	Citizenship
Andre Debose	Field Party Chief	M	NMFS, Miss	USA
Brittany Palm	Watch Leader	F	IAP, Miss.	USA
Alonzo Hamilton.	Watch Leader	M	NMFS, Miss.	USA
Christian Jones	Fisheries Biologist	M	NMFS, Miss.	USA
Amy Schmitt	Fisheries Biologist	F	IAP, Miss.	USA
Brondum Krebs	Intern	M	NMFS, Miss	USA
Richard Eginton	Volunteer	M	Cooperator	USA
Heather Haberman	TAS	F	TAS Program	USA
Sandra Coghlan	Volunteer	F	Cooperator	USA
Jenny Garten	Volunteer	F	Cooperator	USA
David Lee	Bird Observer	M	NRDA	USA

Submitted By:



Michael Hendon (Leg I + II)
Field Party Chief

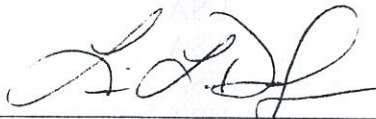
Date 9/6/2011



Andre J. DeBose (Leg III)
Field Party Chief

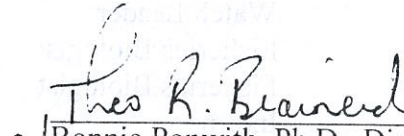
Date 9/6/2011

Approved By:



Lisa Desfosse, Ph.D., Director
Mississippi Laboratory

Date 9/7/11



Bonnie Ponwith, Ph.D., Director
Southeast Fisheries Science Center

Date 09/09/2011

Table 1. Summary of environmental samples and data collected during NOAA Ship *Oregon II* Cruise 295 (R2-11-03).

Observation	Number
Shrimp trawl	155*
Bongo	46
Neuston	47
CTD	194
Water color	96
Cloud cover	96
Winkler Titrations	23

* Includes 6 unsuccessful stations during which nets were torn on bottom obstructions.

Table 2. Mean catch rates (kg/hr) of Atlantic croaker, lesser blue crab, brown shrimp, longspine porgy, Gulf butterfly, Atlantic bumper, white shrimp, red snapper, pink shrimp, crustacea, finfish and total live catch for NOAA Ship *Oregon II* Cruise 295 (R2-11-03) by area, depth, and diurnal strata.

Atlantic croaker

Area	Depth																		Diurnal Period						Total	
	5 - 9			10 - 19			20 - 29			30 - 39			40 - 49			50 - 60			Day			Night				
	N	Mean	N	N	Mean	N	N	Mean	N	N	Mean	N	N	Mean	N	N	Mean	N	N	Mean	N	N	Mean	N	Mean	N
West Delta	10	74.6	28		66.5	12	12.9	7		2.8	8	3.1	3		6.8	35	21.3	33		63.1	68		41.6			
Texas	15	99.0	29		13.1	18	10.9	10		0.9	6	0.7	3		0.0	43	27.4	38		23.6	81		25.6			
Areas Combined	25	89.2	57		39.3	30	11.7	17		1.7	14	2.1	6		3.4	78	24.6	71		41.9	149		32.9			

Lesser blue crab

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		
West Delta	10	0.0	28	3.5	12	3.0	7	0.4	8	0.0	3	0.0	35	2.0	33	2.0	68	2.0		
Texas	15	6.7	29	17.1	18	12.0	10	1.0	6	0.1	3	0.1	43	8.3	38	12.3	81	10.1		
Areas Combined	25	4.0	57	10.4	30	8.4	17	0.7	14	0.0	6	0.0	78	5.5	71	7.5	149	6.4		

Brown shrimp

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	
West Delta	10	1.0	28	7.9	12	8.8	7	8.2	8	3.3	3	0.9	35	4.7	33	7.8	68	13.7									
Texas	15	1.2	29	17.9	18	14.2	10	16.6	6	3.6	3	1.6	43	10.6	38	14.0	81	7.8									
Areas Combined	25	1.1	57	13.0	30	12.0	17	13.2	14	3.4	6	1.3	78	7.9	71	11.1	149	10.2									

Longspine porgy

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				
West Delta	10	0.0	28	5.5	12	20.3	7	4.8	8	12.7	3	17.6	35	7.6	33	9.7	68	8.6						
Texas	15	0.0	29	2.5	18	16.2	10	7.6	6	3.7	3	3.4	43	7.8	38	3.6	81	5.8						
Areas Combined	25	0.0	57	4.0	30	17.8	17	6.5	14	8.8	6	10.5	78	7.7	71	6.5	149	7.1						

Table 2. continued.

Gulf butterfish

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
West Delta	10	0.6	28	16.6	12	7.6	7	0.8	8	0.6	3	2.2	35	6.0	33	11.2	68	8.5
	15	0.3	29	22.4	18	4.0	10	4.2	6	0.5	3	7.6	43	9.1	38	10.6	81	9.8
Areas Combined	25	0.4	57	19.6	30	5.5	17	2.8	14	0.6	6	4.9	78	7.7	71	10.9	149	9.2

Atlantic bumper

Area	Depth												Diurnal Period						Total		
	5 - 9			10 - 19			20 - 29			30 - 39			40 - 49		50 - 60		Day				Night
	N	Mean	N	N	Mean	N	N	Mean	N	N	Mean	N	N	Mean	N	N	Mean	N	Mean	N	Mean
West Delta	10	2.1	28	28	9.4	12	12	0.0	7	0.0	8	8	0.0	3	0.0	35	7.1	33	1.1	68	4.2
Texas	15	19.5	29	29	4.5	18	18	0.0	10	0.0	6	6	0.0	3	0.0	43	6.4	38	3.9	81	5.2
Areas Combined	25	12.5	57	57	6.9	30	30	0.0	17	0.0	14	14	0.0	6	0.0	78	6.7	71	2.6	149	4.8

White shrimp

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	
West Delta	10	1.4		28	1.4		12	0.0		7	0.0		8	0.0		3	0.0		35	0.7		33	0.9		68	0.8	
Texas	15	7.0		29	3.6		18	0.0		10	0.0		6	0.0		3	0.0		43	4.0		38	1.1		81	2.6	
Areas Combined	25	4.8		57	2.5		30	0.0		17	0.0		14	0.0		6	0.0		78	2.5		71	1.0		149	1.8	

Red snapper

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	
West Delta	10	0.0		28	1.4		12	2.0		7	0.6		8	0.1		3	4.7		35	1.3		33	1.1		68	1.2	
Texas	15	0.4		29	0.8		18	1.2		10	0.7		6	3.6		3	6.9		43	1.4		38	1.1		81	1.2	
Areas Combined	25	0.2		57	1.1		30	1.5		17	0.7		14	1.6		6	5.8		78	1.4		71	1.1		149	1.2	

Table 2. continued
Pink shrimp

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	
West Delta	10	0.0	28	0.1	12	0.0	7	0.0	8	0.0	3	0.0	35	0.1	33	0.0	68	0.0									
Texas	15	0.2	29	0.5	18	0.0	10	0.0	6	0.0	3	0.0	43	0.4	38	0.0	81	0.2									
Areas Combined	25	0.1	57	0.3	30	0.0	17	0.0	14	0.0	6	0.0	78	0.2	71	0.0	149	0.1									

Crustacea

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
West Delta	10	3.1		28	17.4		12	16.0		7	17.1		8	6.4		3	2.6		35	11.1		33	15.1		68	13.1
Texas	15	17.9		29	43.8		18	32.1		10	23.0		6	5.6		3	3.4		43	27.0		38	32.4		81	29.5
Areas Combined	25	12.0		57	30.8		30	25.6		17	20.6		14	6.1		6	3.0		78	19.9		71	24.3		149	22.0

Finfish

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	
West Delta	10	92.7		28	149.3		12	64.0		7	36.1		8	47.8		3	78.1		35	70.5		33	129.6		68	99.2	
Texas	15	175.0		29	96.8		18	60.6		10	47.1		6	36.5		3	52.4		43	106.1		38	73.9		81	91.0	
Areas Combined	25	142.1		57	122.6		30	62.0		17	42.5		14	42.9		6	65.3		78	90.1		71	99.8		149	94.7	

Total catch

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
West Delta	10	98.5		28	167.3		12	84.7		7	57.9		8	66.0		3	87.7		35	85.3	33	148.4	68	115.9
Texas	15	195.0		29	143.4		18	99.3		10	75.3		6	47.0		3	62.9		43	137.2	38	110.4	81	124.6
Areas Combined	25	156.4		57	155.1		30	93.5		17	68.2		14	57.9		6	75.3		78	113.9	71	128.1	149	120.7

Table 3. Six most numerous organisms caught during NOAA Ship *Oregon II* Cruise 295 (R2-11-03), plus pink and white shrimp, and red snapper (n = 149).

	Name	Percent of Total Number Caught	Percent of Total Catch Weight	Percent Frequency Of Capture	Average Weight Per Individual (gms)
1	Atlantic croaker (<i>Micropogonias undulatus</i>)	20.4	27.3	66.4	33.2
2	Lesser blue crab (<i>Callinectes similis</i>)	15.7	5.3	77.2	8.4
3	Brown shrimp (<i>Farfantepenaeus aztecus</i>)	12.9	7.8	95.3	15.1
4	Longspine porgy (<i>Stenotomus caprinus</i>)	5.5	5.9	71.8	26.4
5	Gulf butterfish (<i>Peprilus burti</i>)	3.8	7.6	61.1	49.6
6	Atlantic bumper (<i>Chloroscombrus chrysurus</i>)	2.7	3.9	28.2	36.8
7	White shrimp (<i>Litopenaeus setiferus</i>)	0.7	1.5	30.2	49.1
8	Red snapper (<i>Lutjanus campechanus</i>)	0.2	1.0	54.4	104.9
9	Pink shrimp (<i>Farfantepenaeus duorarum</i>)	0.1	0.1	12.1	24.6

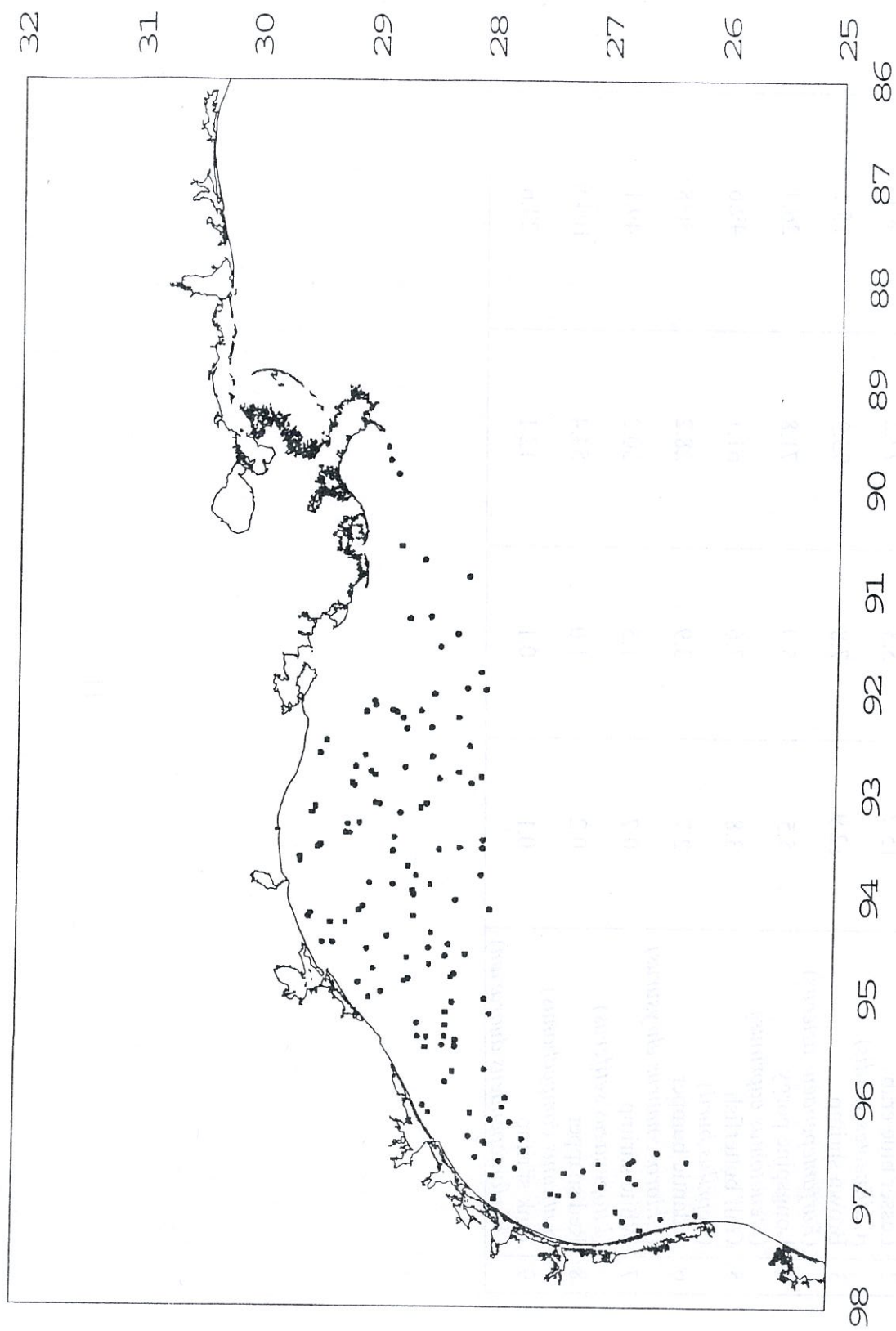


Figure 1. Shrimp trawl stations accomplished during NOAA Ship *Oregon II* Cruise 295 (R2-11-03).

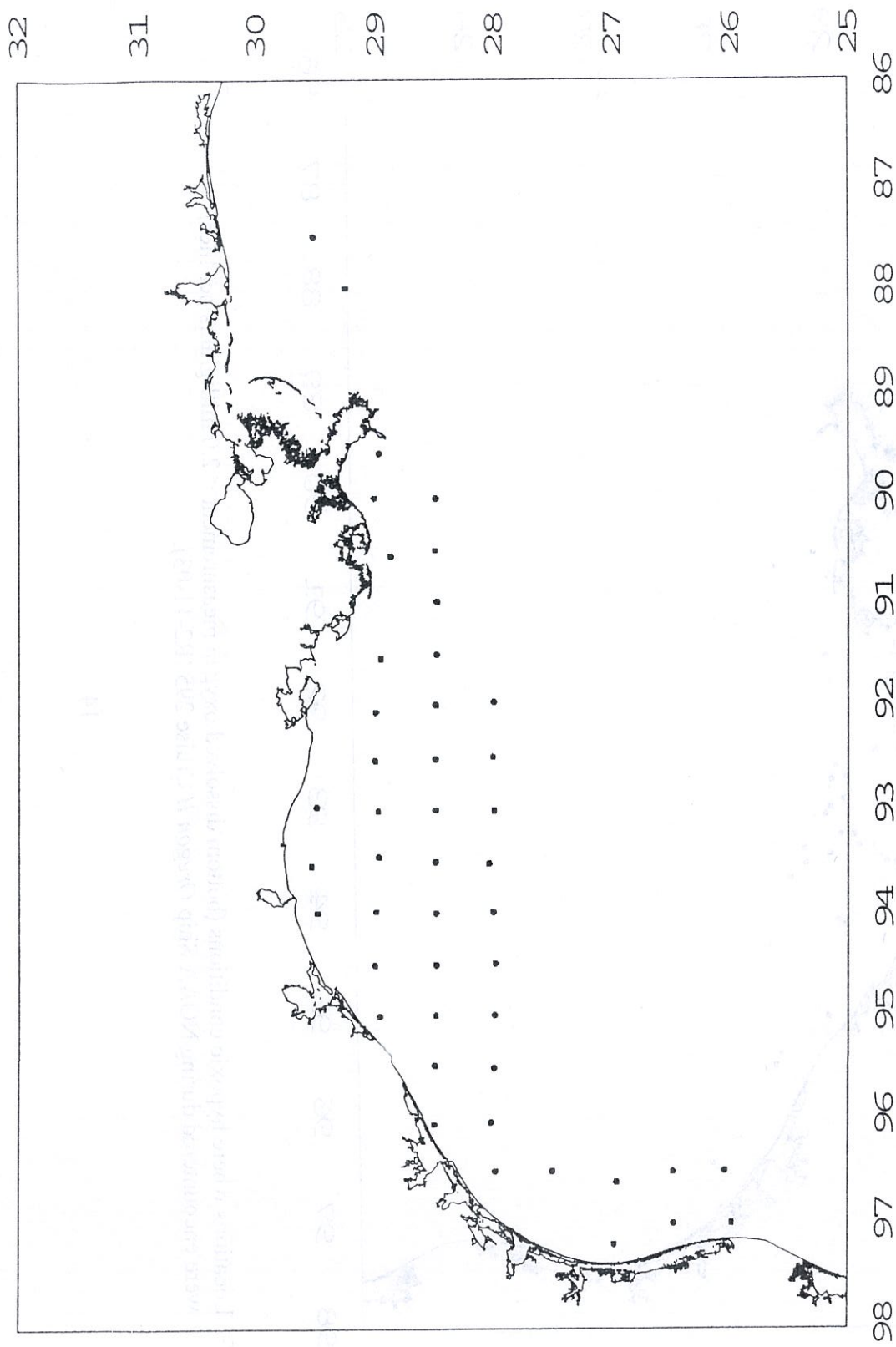


Figure 2. Ichthyoplankton sampling stations completed during NOAA Ship *Oregon II* Cruise 295 (R2-11-03).

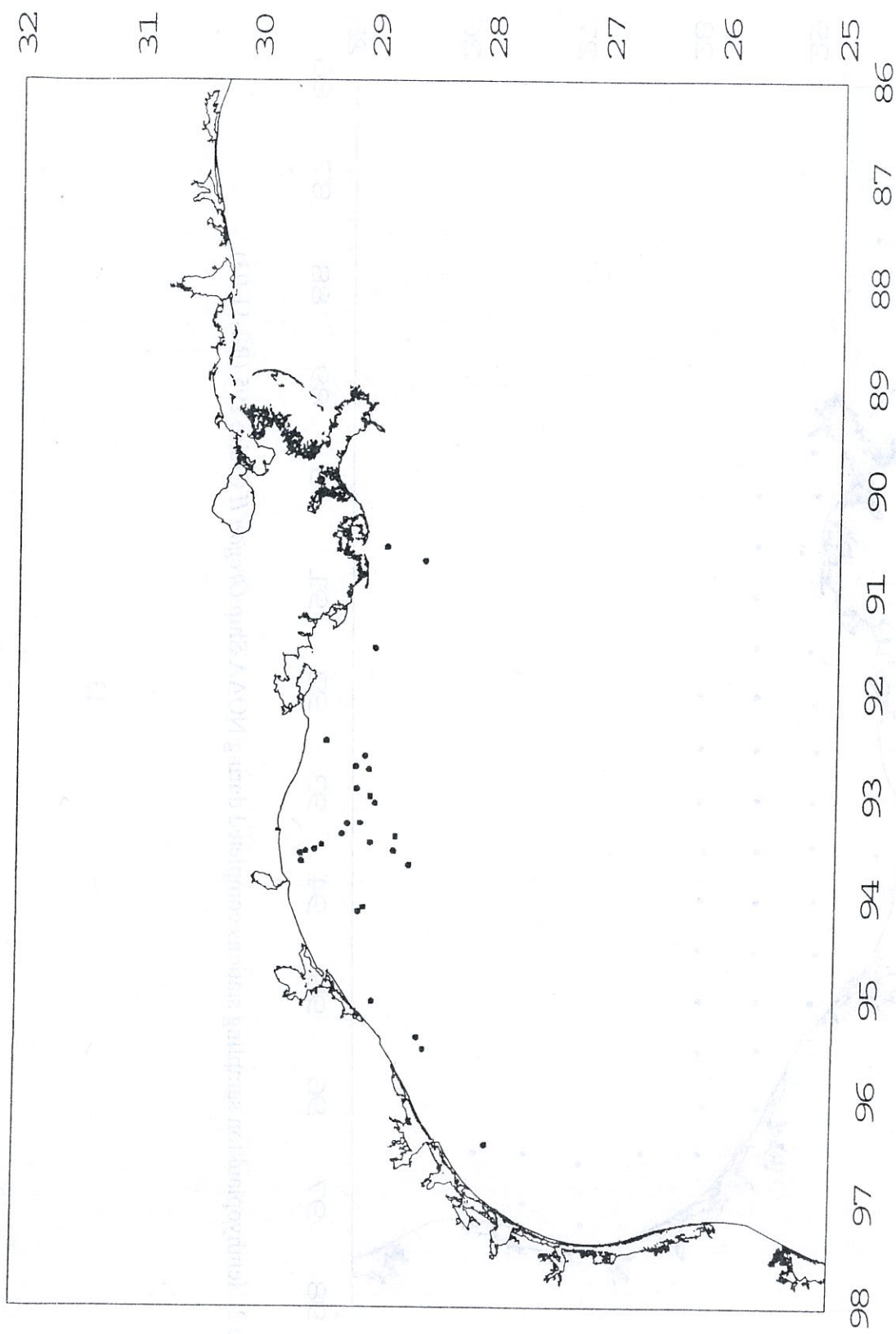


Figure 3. Locations where hypoxic conditions (bottom dissolved oxygen measurement ≤ 2.0 milligrams per liter) were encountered during NOAA Ship *Oregon II* Cruise 295 (R2-11-03).