

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

*NOAA Ship OREGON II* Cruise 03-03 (254)  
06/10-07/17/03

## INTRODUCTION

The *NOAA Ship OREGON II* departed Pascagoula, MS on June 10, 2003 for the twenty-third 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 has been 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.

Four survey days were lost due to mechanical problems, medical problems, and weather. The cruise terminated in Pascagoula, MS on July 17, 2003.

## 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) Collect ichthyoplankton samples to determine the relative abundance and distribution of eggs and larvae of commercially and recreationally important fish species.
- 5) Conduct CTD casts to profile water temperature, salinity, dissolved oxygen, fluorometry and percent light transmission.
- 6) Obtain length measurements to estimate size structures of sampled populations.
- 7) Collect various species for research by different cooperations.

## 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.

Temperature, salinity, dissolved oxygen, percent light transmission and fluorometer readings were recorded at the surface, mid, and maximum depths with a Seabird SBE 911+ CTD unit (complete profiles were archived for later analyses). Forel-ule water color, secchi disc, and percent cloud cover observations were also taken during daylight hours.

## RESULTS AND DISCUSSIONS

One hundred and fifty-eight trawl samples were collected (Fig. 1) in shrimp statistical zones 11 through 21. Distribution of effort within statistical zones by depth strata can be found in Table 1. In general each zone-depth strata combination was sampled once. In some cases, a second station was taken in a cell to avoid some obstruction or two stations were located so close together that after the second trawl haul was completed both stations fell into the same statistical zone. Unoccupied cells were due to lost gear or represent stations that were occupied by state SEAMAP participants.

Dominant faunal components are listed in (Table 2) with porgy Stenotomus caprinus being the most abundant species in terms of weight and number.

Brown shrimp, Farfantepenaeus aztecus, was the most abundant penaeus shrimp species, followed by white shrimp, Litopenaeus setiferus, and pink, Farfantepenaeus setiferus.

Thirty-five bongo and thirty-four 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, MS.

Figure 3 shows stations where hypoxic conditions (dissolved oxygen readings  $\leq 2$  milligrams per liter) were encountered during the survey.

#### ACKNOWLEDGMENTS

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

CRUISE PARTICIPANTS

6/10-6/11/03

NAME	TITLE	ORGANIZATION
Gilmore Pellegrin, Jr.	Field Party Chief	NMFS, Pascagoula, MS
Andre Debose	Watch Leader	NMFS, Pascagoula, MS
Kimberley Johnson	Watch Leader	Johnson Controls
Mark McDuff	Comp.Spec.	NMFS, Pascagoula, MS
Nick Hopkins	FMES	NMFS, Pascagoula, MS
Bronson Nagareda	Cooperator	Florida Institute Tech, FL
Claire Surrey	Cooperator	Florida Institute Tech, FL
Marcus Zokan	Cooperator	Florida Institute Tech, FL
Michael Doosey	Cooperator	Tulane University, LA
Dan O'Brien	Cooperator	Texas Tech University, TX
Tammy Shiflett	Cooperator	Georgia School System, GA
Priscilla Debose	Cooperator	Mississippi School System, MS

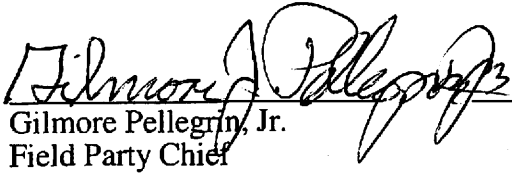
06/14-06/30/03

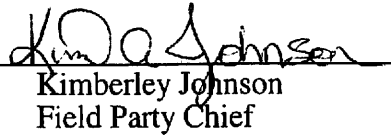
NAME	TITLE	ORGANIZATION
Gilmore Pellegrin, Jr.	Field Party Chief	NMFS, Pascagoula, MS
Andre Debose	Watch Leader	NMFS, Pascagoula, MS
Kimberley Johnson	Watch Leader	Johnson Controls
Paul Felts	Fish. Biologist	Johnson Controls
Dean Landi	Fish. Biologist	Johnson Controls
Jim Simons	Cooperator	Texas Parks and Wildlife
Alex Nunex	Cooperator	TAMU CC, TX
Michael Felts	Cooperator	Mississippi State University
Loukea Kovanis	Cooperator	Michigan School System
Melissa Sheba	Cooperator	Duke University

7/02-07/17/03

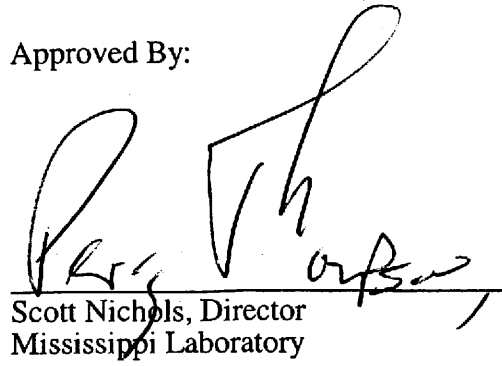
NAME	TITLE	ORGANIZATION
Kimberley Johnson	Field Party Chief	Johnson Controls
Andre Debose	Watch Leader	NMFS, Pascagoula, MS
Alonzo Hamilton	Watch Leader	NMFS, Pascagoula, MS
Carolyn Burks	Fish. Biologist	NMFS, Pascagoula, MS
Nelson May	Fish. Biologist	NMFS, Pascagoula, MS.
Brandi Trigg	Fish. Biologist	Johnson Controls
Loukea Kovanis	Cooperator	Michigan School System
Melissa Sheba	Cooperator	Duke University
Alex Payson	Cooperator	Duke University

Submitted By:

  
Gilmore Pellegrin, Jr.  
Field Party Chief

  
Kimberley Johnson  
Field Party Chief

Approved By:

  
Scott Nichols, Director  
Mississippi Laboratory

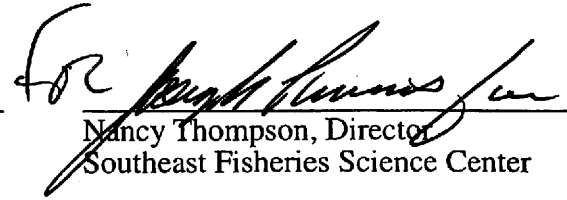
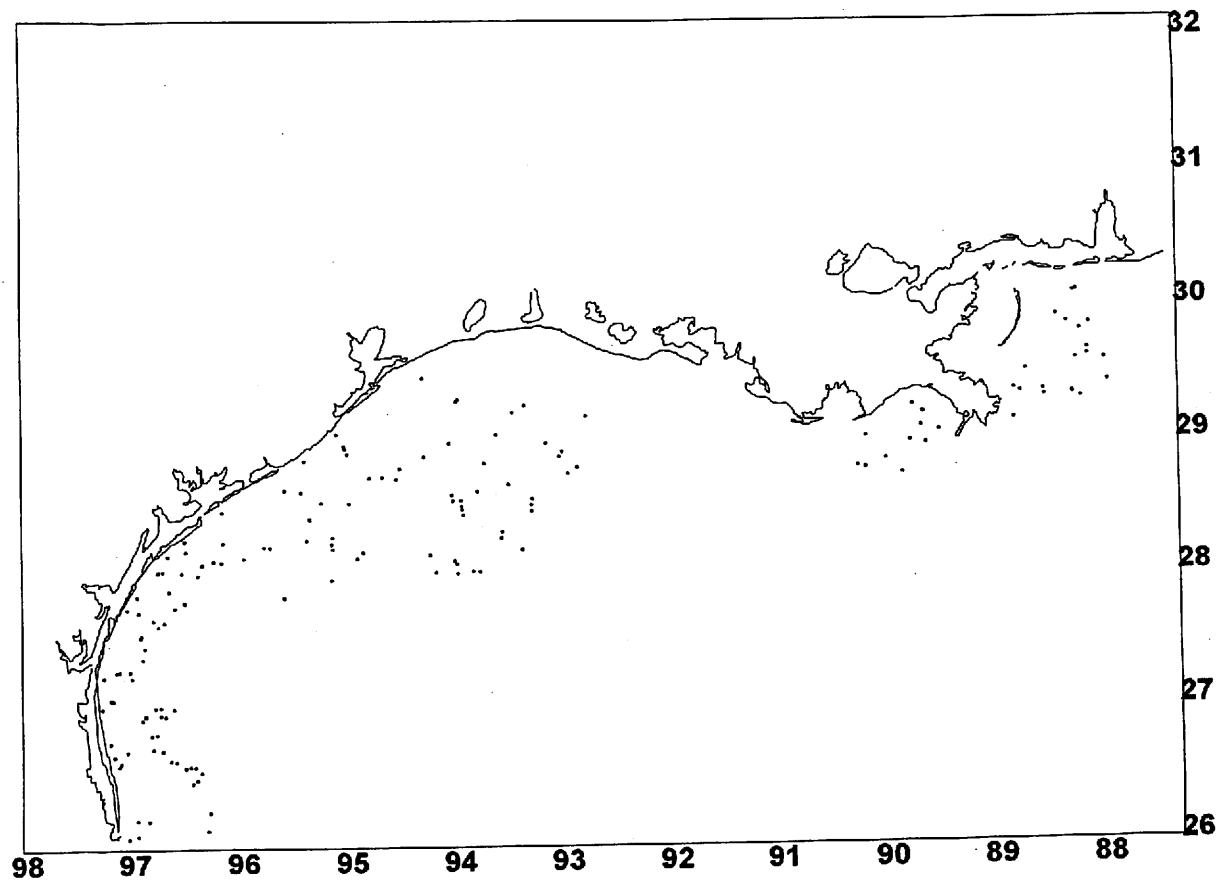
  
Nancy Thompson, Director  
Southeast Fisheries Science Center

Table 1. Distribution of sampling effort by strata for NOAA Ship Oregon II Cruise 254 (OT-03-03). Numbers in table body indicate number of times strata were sampled. "Ala." and "Miss." indicate strata sampled by the respective states, and "Caretta" indicates strata sampled by the NOAA Research Vessel Caretta. "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.	.	Caretta	1	1	Miss.	Caretta	.	.	1
6-7	Miss.	.	.	1	1	Ala.	Caretta	.	1	1
7-8	Ala.	.	.	1	1	Miss.	Caretta	.	1	1
8-9	Ala.	.	.	1	1	Ala.	1	.	1	1
9-10	Ala.	1	1	1	1	Miss.	Caretta	.	1	1
10-11	Miss.	.	1	1	1	Ala.	1	1	1	1
11-12	Miss.	1	1	1	1	1	Caretta	.	1	1
12-13	Ala.	.	1	1	1	1	Caretta	.	1	1
13-14	Miss.	1	.	1	1	1	Caretta	1	1	1
14-15	Ala.	Caretta	1	1	1	Ala.	.	1	1	1
15-16	1	1	.	1	1	Miss.	.	.	1	1
16-17	Miss.	Caretta	.	1	1	Ala.	Caretta	.	1	1
17-18	Ala.	.	1	1	1	Miss.	Caretta	.	1	1
18-19	Miss.	.	.	1	1	1	Caretta	1	1	1
19-20	1	.	1	1	1	1	1	1	1	1
20-22	Miss.	1	1	1	1	1	.	.	1	1
22-25	1	1	1	1	1	1	Caretta	.	1	1
25-30	Miss.	.	1	1	1	1	Caretta	.	1	1
30-35	Miss.	.	.	1	1	1	1	1	1	1
35-40	tore net	.	1	1	1	1	1	.	1	1
40-45	tore net	.	.	1	1	1	.	.	1	1
45-50	1	.	1	1	1	tore net	.	.	tore net	1
50-60	1	.	.	1	1	1	.	1	1	1

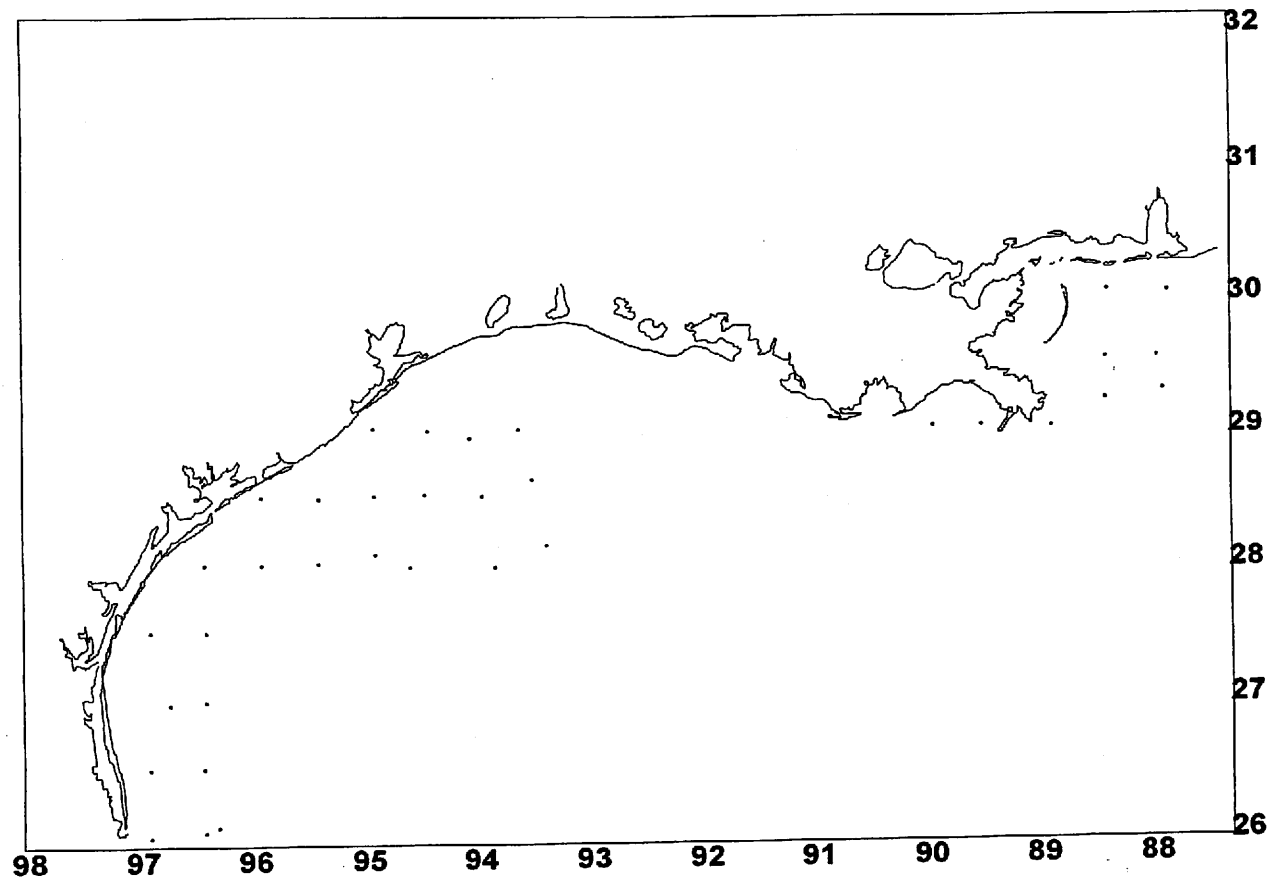
Table 2. Twenty most abundant organisms (plus red snapper) caught in 40-ft trawls during NOAA Ship OREGON II Cruise 254. Catches were adjusted to number and weights per hour fished and species are listed in descending order of number caught. Catch frequency is the number of tows in which respective species were caught (N = 158).

Genus Species	Number	Weight (Kg)	Frequency Of Catch
<i>Farfantepenaeus aztecus</i>	62,125	629.2	141
<i>Stenotomus caprinus</i>	76,407	1,171.7	132
<i>Synodus foetens</i>	2,575	249.6	113
<i>Peprilus burti</i>	22,677	663.5	110
<i>Callinectes similus</i>	19,802	144.6	105
<i>Saurida brasilienses</i>	4,398	28	101
<i>Centropristis philadelphica</i>	2,239	68.2	91
<i>Upeneus parvus</i>	3,770	66.8	90
<i>Lagodon rhomboides</i>	2,899	119.2	88
<i>Syacium gunteri</i>	2,411	43.0	87
<i>Squilla empusa</i>	12,351	107.0	79
<i>Loligo pealei</i>	15,253	194.6	74
<i>Squilla chydea</i>	5,589	37.1	73
<i>Loligo pleii</i>	22,542	297.8	72
<i>Prionotus stearnsi</i>	3,494	31.9	69
<i>Pristipomoides aquilonaris</i>	3,172	166.6	68
<i>Serranus atrobranchus</i>	5,150	64.1	67
<i>Portunus spinicarpus</i>	12,392	83.4	64
<i>Halieutichthys aculeatus</i>	1,681	11.0	63
<i>Chloroscombrus chrysurus</i>	20,119	592.8	61
<i>Lutjanus campechanus</i>	427	51.2	57
Total	301,473	4,821.3	

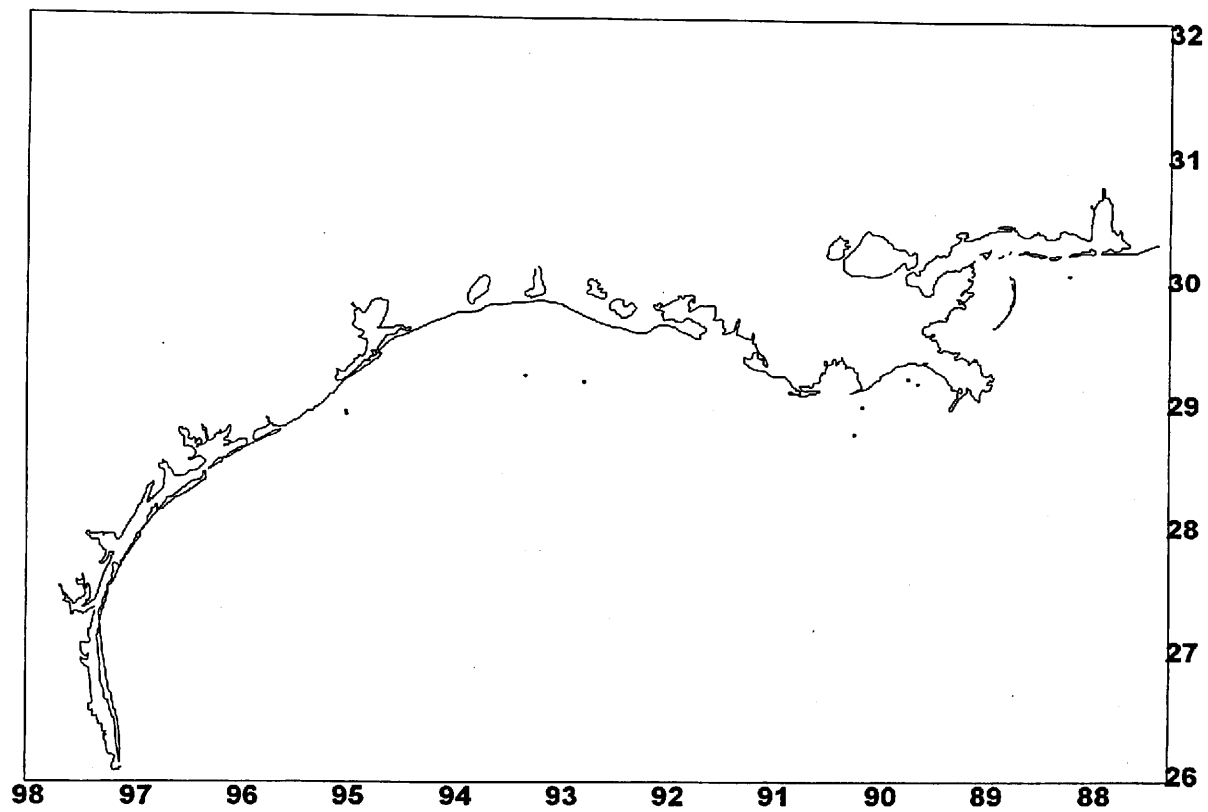


**Figure 1.** Shrimp trawl stations accomplished during *NOAA Ship Oregon II* Cruise 254 (OT-03-03).





**Figure 2.** Ichthyoplankton sampling stations completed during *NOAA Ship Oregon II* Cruise 254 (ot-03-03).



**Figure 3.** Locations where hypoxic conditions (bottom dissolved oxygen measurement  $\leq 2.0$  milligrams per liter) were encountered during *NOAA Ship Oregon II* Cruise 254 (OT-03-03).