

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

NOAA Ship *Oregon II* Cruise 08-06 (284)  
October 8 – November 18, 2008

## INTRODUCTION

The NOAA Ship *Oregon II* departed Pascagoula, Mississippi on October 8, 2008 for the 37th annual Fall 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 the survey is to study the abundance and distribution of demersal organisms occurring in the study area.

Two survey days were lost due to problems with the ship's aft crane. Two port calls were made to exchange scientific personnel (both in Pascagoula-October 20 to 24 and November 10 to 14). The ship returned to Pascagoula on November 18, 2008, two days earlier than scheduled, to terminate a very productive and successful survey. All primary objectives were accomplished as well as nine experimental tows with modified gear to study the escapement of age-0 red snapper.

## OBJECTIVES

- 1) Sample the demersal fauna of the north central and northwestern Gulf of Mexico in depths of 5 to 60 fm.
- 2) Obtain length measurements to estimate size structures of sampled populations.
- 3) Collect ichthyoplankton samples to determine the relative abundance and distribution of eggs and larvae of commercially and recreationally important fish species.
- 4) Conduct CTD casts to profile water temperature, salinity, dissolved oxygen, fluorometry and percent light transmission.
- 5) Collect fish and invertebrate samples as requested by staff members of the Center for Fisheries Research and Development, Gulf Coast Research Laboratory (GCRL), the University of Southern Mississippi.
- 6) Collect batfish (*Ogcocephalus* sp.); Atlantic croaker (*Micropogonias undulatus*), grouper (*Epinephelus* sp. and *Mycteroperca* sp.); sharks, skates and rays (Elasmobranchii); red snapper (*Lutjanus campechanus*); vermilion snapper

(*Rhomboplites aurorubens*); and tilefish (Malacanthidae) for age, growth, abundance and distributional studies.

- 7) Conduct double-rigged comparison tows with liner/no-liner sampling trawls to estimate the escapement rate of age-0 red snapper.

## MATERIALS AND METHODS

The sampling gear consisted of a 40-ft shrimp trawl 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 and into the path of the oncoming net. Sample sites were randomly selected within geographical and bathymetric strata. Geographical strata consisted of Gulf coast shrimp statistical zones 11-21 and bathymetric strata consisted of a 5-fm interval from 5 to 9.9 fms, 10-fm intervals from 10 to 39.9 fms and a 20-fm interval from 40 to 60 fms. Tow durations were 30 min at a targeted speed of 2.5 kn with tow direction left to the discretion of the bridge watch.

The sampling design used in this survey was altered from that used in previous years by making three major changes. Depth stratification was reduced from 23 to 5 strata, day/night stratification was 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 CPUE estimates for a number of species. For additional information on rationale for changes in the sampling design see Ingram (2008).

Nine double-rigged comparison tows with liner (0.75 in) versus no-liner sampling trawls were conducted south of Petit Bois Island, Mississippi in 7 to 9 fms. The sampling area was provided by the Mississippi Laboratory's Harvesting Systems Unit based on historical catches of red snapper. The experiment was requested by Walter Ingram, Ph.D. of the Mississippi Laboratory's Resource Surveys Branch.

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, Scientific Computing System (SCS) version 4.0 was used to collect station metadata, including position, depth, date and time. 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 lbs, at least 10% was taken as a subsample. Catches (or subsamples) were sorted by species with each group enumerated and weighed. Additional data taken for specimens identified to the species level included length measurements, sex, and gonad condition. Specimens that could not be identified to the species level were frozen and returned 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 sampling



sites were occasionally relocated to the nearest trawling sample site to optimize survey time. Bongo tows were made with two conical 61-cm nets with 0.333 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 kn to maintain a 45° wire angle of towing warp, and were fished to a maximum depth of 200 m or within two meters of bottom in depths less than 200 m. Neuston sampling gear consisted of a 0.947 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 transferred into 95% ethyl alcohol 36 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 and percent cloud cover observations were also taken during daylight hours. Also, a Hach LDO™ HQ10 portable dissolved oxygen meter was used on alternating days to compare with the CTD mounted dissolved oxygen sensor.

## RESULTS AND DISCUSSION

Three hundred fourteen tows were accomplished including four that were unsuccessful because the sampling gear was damaged on bottom obstructions (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); six depth intervals: 5-9, 10-19, 20-29, 30-39, 40-49, and 50-60 fms; and day/night. The mean total catch rate for the entire survey was 137.0 kg per hour fished (kg/hr), a 43% increase in relative abundance as compared to 2007 (96.3 kg/hr) and a 59% increase relative to the five year mean for 2003-2007 (86.4 kg/hr). Sciaenidae was again the most abundant family caught with Atlantic croaker making the greatest contribution. Brown shrimp, *Farfantepenaeus aztecus*, was the most abundant commercial shrimp species, followed by white shrimp, *Litopenaeus setiferus* and pink shrimp, *Farfantepenaeus duorarum* (Tables 1 and 2).

The comparison tows to investigate the escapement of age-0 red snapper were hampered by low fish densities. The experiment resulted in the catch of 16 red snapper, five in the standard net and 11 in the liner equipped net. These numbers were too low to draw definite conclusions on escapement rates.

Thirty-eight bongo and neuston stations were accomplished (Figure 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 GCRL in Ocean Springs, Mississippi.

Two hundred and eighty-one CTD casts, one hundred thirty-one cloud cover and one hundred twenty-five water color observations were collected (Table 3). Specimen collections were shipped to the appropriate requesting scientists upon arrival in Pascagoula.

## REFERENCES

Ingram, G. Walter. 2008. Evaluation of Summer and Fall SEAMAP groundfish surveys in the western U.S. Gulf of Mexico (1988-2007) to assess the efficacy of future changes in survey design. NMFS internal report. Mississippi Laboratories, Pascagoula, MS

## ACKNOWLEDGMENTS

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

## CRUISE PARTICIPANTS

October 8 – 20, 2008

NAME	TITLE	ORGANIZATION
Andre Debose	Field Party Chief	NMFS, Pascagoula, MS
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NAME	TITLE	ORGANIZATION
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November 14 – November 18, 2008

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Table 1. Five most numerous organisms caught during NOAA Ship *Oregon II* Cruise 284 (OT-08-06), plus pink and white shrimp, and red snapper (n = 310).

	Name	Percent of Total Number Caught	Percent of Total Catch Weight	Percent Frequency Of Capture	Weight Per Individual (gms)
1	Atlantic croaker ( <i>Micropogonias undulatus</i> )	46.5	44.1	91.0	47
2	Longspine porgy ( <i>Stenotomus caprinus</i> )	9.4	8.6	81.9	46
3	Atlantic bumper ( <i>Chloroscombrus chrysurus</i> )	7.1	2.8	47.1	20
4	Brown shrimp ( <i>Farfantepenaeus aztecus</i> )	6.8	3.0	90.3	22
5	Spot ( <i>Leiostomus xanthurus</i> )	3.8	7.3	64.5	95
6	White shrimp ( <i>Litopenaeus setiferus</i> )	0.6	0.5	32.6	39
7	Red snapper ( <i>Lutjanus campechanus</i> )	0.3	0.5	63.2	91
8	Pink shrimp ( <i>Farfantepenaeus duorarum</i> )	0.2	0.1	18.7	29

Table 2. Mean catch rates (kg/hr) of five abundant species, pink and white shrimp, red snapper, and total live catch for NOAA Ship *Oregon II* Cruise 284 (OT-08-06) 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	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	12	41.2	6	99.9	9	71.3	4	19.2	6	61.2	.	.	15	23.4	22	83.1	37	58.9
West Delta	8	23.0	51	125.7	32	98.3	38	51.3	20	7.8	5	24.9	72	75.4	82	79.7	154	77.7
Texas	16	25.4	56	65.0	30	15.5	8	9.4	8	7.4	1	4.9	43	37.7	76	39.8	119	39.0
Areas Combined	36	30.1	113	94.2	71	59.9	50	42.0	34	17.1	6	21.6	130	56.9	180	63.3	310	60.6

Longspine porgy

Table 1. Data for Figure 1.

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	12	1.1	6	31.8	9	11.7	4	5.3	6	142.9	.	.	15	3.4	22	51.7	37	32.1
West Delta	8	0.0	51	3.3	32	17.3	38	8.4	20	5.7	5	9.4	72	8.8	82	7.0	154	7.8
Texas	16	1.1	56	13.7	30	13.6	8	6.7	8	5.5	1	4.4	43	13.8	76	9.2	119	10.9
Areas Combined	36	0.9	113	9.9	71	15.1	50	7.9	34	29.9	6	8.6	130	9.8	180	13.4	310	11.9

Atlantic bumper

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	12	14.0	6	0.7	9	7.8	4	0.0	6	0.0	.	.	15	9.0	22	4.9	37	6.6
West Delta	8	0.0	51	0.8	32	0.8	38	0.1	20	0.0	5	0.0	72	0.6	82	0.4	154	0.5
Texas	16	6.0	56	10.5	30	6.3	8	3.0	8	0.1	1	0.0	43	2.6	76	10.3	119	7.5
Areas Combined	36	7.3	113	5.6	71	4.0	50	0.6	34	0.0	6	0.0	130	2.2	180	5.1	310	3.9

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
East Delta	12	0.5	6	0.3	9	0.5	4	3.4	6	4.2	.	.	15	2.3	22	0.7	37	1.4
West Delta	8	0.0	51	1.1	32	3.2	38	10.9	20	8.3	5	15.6	72	5.5	82	5.2	154	5.3
Texas	16	0.1	56	2.6	30	4.5	8	7.9	8	8.2	1	8.2	43	3.9	76	3.3	119	3.5
Areas Combined	36	0.2	113	1.8	71	3.4	50	9.8	34	7.5	6	14.4	130	4.6	180	3.9	310	4.2



Table 2 continued.

## Spot

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	12	11.1	6	47.4	9	88.0	4	7.1	6	17.0	.	.	15	6.7	22	56.3	37	36.2
West Delta	8	0.2	51	8.4	32	20.9	38	6.8	20	0.9	5	8.6	72	10.9	82	7.7	154	9.2
Texas	16	0.0	56	5.4	30	0.4	8	1.8	8	1.7	1	0.0	43	2.1	76	3.3	119	2.9
Areas Combined	36	3.7	113	9.0	71	20.7	50	6.0	34	3.9	6	7.2	130	7.5	180	11.8	310	10.0

## 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
East Delta	12	1.0	6	0.7	9	0.0	4	0.0	6	0.0	.	.	15	0.1	22	0.7	37	0.5
West Delta	8	3.5	51	1.1	32	0.1	38	0.0	20	0.0	5	0.0	72	0.8	82	0.4	154	0.6
Texas	16	3.7	56	0.6	30	0.0	8	0.0	8	0.0	1	0.0	43	0.3	76	1.1	119	0.8
Areas Combined	36	2.8	113	0.8	71	0.0	50	0.0	34	0.0	6	0.0	130	0.5	180	0.7	310	0.6

## 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
East Delta	12	0.0	6	0.2	9	0.8	4	1.8	6	0.2	.	.	15	0.1	22	0.7	37	0.5
West Delta	8	0.1	51	0.1	32	1.2	38	1.0	20	1.6	5	0.3	72	1.1	82	0.5	154	0.8
Texas	16	0.2	56	0.5	30	0.6	8	1.0	8	1.4	1	0.0	43	0.6	76	0.6	119	0.6
Areas Combined	36	0.1	113	0.3	71	0.9	50	1.1	34	1.3	6	0.3	130	0.8	180	0.5	310	0.7

## Total catch

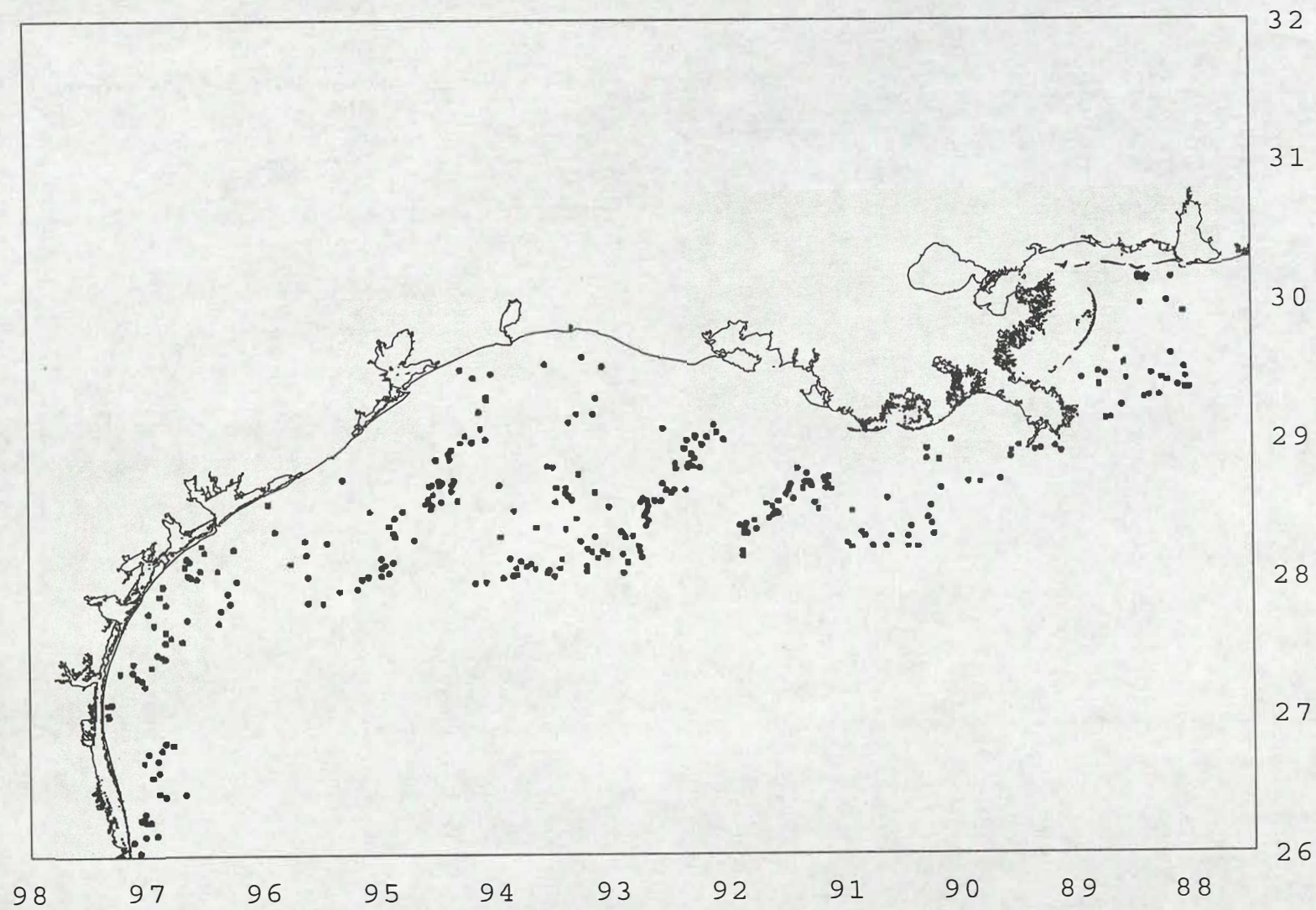
Area	Depth												Diurnal Period				Total	
	5 – 9		10 – 19		20 – 29		30 – 39		40 – 49		50 – 60		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	12	86.7	6	251.2	9	209.5	4	90.9	6	313.7	.	.	15	74.0	22	253.1	37	180.5
West Delta	8	41.6	51	199.1	32	188.7	38	110.1	20	52.9	5	121.5	72	153.0	82	138.6	154	145.3
Texas	16	97.6	56	156.6	30	63.8	8	68.0	8	69.5	1	59.3	43	99.7	76	120.0	119	112.6
Areas Combined	36	81.5	113	180.8	71	138.6	50	101.8	34	102.8	6	111.2	130	126.2	180	144.7	310	137.0

Table 3. Tally of scientific observations acquired during NOAA Ship *Oregon II* Cruise 284 (OT-08-06).

Observation	Number
Shrimp trawl *	314
Experimental trawl	9
Bongo	38
Neuston	38
CTD profile	281
Water color	125
Cloud cover	131

\* Includes four tows that were torn due to bottom obstructions.





**Figure 1.** Shrimp trawl stations accomplished during NOAA Ship *Oregon II* Cruise 284 (OT-08-06).

