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 05-06 (267)
11/04-11/16/05

## INTRODUCTION

The *NOAA Ship Oregon II* departed Pascagoula, Mississippi on November 4, 2005 to assist in completing the thirty-fourth annual Fall Southeast Area Monitoring and Assessment Program (SEAMAP) Shrimp/Bottomfish Survey in the northern and western U.S. Gulf of Mexico. A majority of the survey was conducted aboard *NOAA Ship Gordon Gunter* because of damage to *NOAA Ship Oregon II* caused by Hurricane Katrina. 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 weather. The cruise terminated in Pascagoula, Mississippi on November 16, 2005.

## OBJECTIVES

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

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.); frogfish (Antennaridae); wenchmen (*Pristipomoides aquilonaris*); jacks (Carangidae); tilefish (Malacanthidae); grouper (*Epinephelus* sp. and *Mycteroperca* sp.); red and lane snapper (*Lutjanus campechanus* and *L. synagris*); vermilion snapper (*Rhomboplites aurorubens*); sharks, skates and rays (Elasmobranchii); and squid (Loliginidae); for various age, growth 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 inches shorter than the footrope was used to stimulate benthic organisms out of the substrate and into the path of the oncoming net. Targeted towing speed was 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 fathom (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).

Size measurements were taken from a maximum number of 20 individuals per species at each station. Individual weight, sex and sexual development stage was collected from every fifth individual measured.

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

A total of seventy strata were sampled (Table 1) which required 84 tows (Figure 1). Nine tows were unsuccessful; four because the cod-end untied, four due to damaged gear (one was successfully repeated), and one because the doors didn't spread properly. For summary purposes, data were grouped into two geographic areas, East Delta (88°00'-89°15' W Long) and West Delta (89°15'-94°00' W Long). Each geographic area was partitioned into six depth intervals; 5-9, 10-19, 20-29, 30-39, 40-49, and 50-60 fms (Table 2). The mean total catch rate was 79.5 kilograms per hour fished (kg/hr). Sciaenidae was again the most abundant family with Atlantic croaker (*Micropogonias undulatus)* making the greatest contribution (Table 3).

Ten bongo and eleven 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 GCRL in Ocean Springs, Mississippi.

Seventy-two CTD casts, thirty-two cloud cover, thirty-three water color, and thirty Secchi disc measurements were collected (Table 4).

Fish and invertebrate samples were delivered to the GCRL and red snapper samples were shipped to Dr. Will Patterson of the University of West Florida.

## ACKNOWLEDGMENTS

On behalf of Mississippi Laboratory 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

November 04 – November 16, 2005

| NAME | TITLE | ORGANIZATION |
|---|---|---|
| Alonzo N. Hamilton, Jr. | Field Party Chief | NMFS, Pascagoula, MS |
| Kimberley Johnson | Watch Leader | NMFS, Pascagoula, MS |
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| Christian Jones | Fishery Biologist II | IAP, MS |
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Table 1. Distribution of sampling effort by strata for *NOAA Ship Oregon II* Cruise 267 (OT-05-06). Checks in table body indicate strata that were successfully sampled. "GU" and "Ala." indicate strata that were successfully sampled by *NOAA Ship Gordon Gunter* and the state of Alabama, respectively. "Tore net" indicates strata that were not sampled because of gear damage, and "." indicates strata that were not sampled because sampling inadvertently occurred in the wrong depth or geographical stratum.

| 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 | Ala. | ✓ | ✓ | GU | GU | Ala. | ✓ | ✓ | GU | GU |
| 6-7 | GU | ✓ | GU | GU | GU | GU | ✓ | GU | GU | Tore net (GU) |
| 7-8 | GU | GU | GU | GU | GU | GU | ✓ | GU | GU | GU |
| 8-9 | . | GU | GU | GU | GU | GU | ✓ | GU | GU | GU |
| 9-10 | ✓ | ✓ | ✓ | GU | GU | GU | ✓ | GU | Tore net (GU) | GU |
| 10-11 | ✓ | ✓ | GU | GU | GU | ✓ | ✓ | GU | GU | GU |
| 11-12 | Tore net | ✓ | GU | GU | GU | ✓ | ✓ | ✓ | GU | GU |
| 12-13 | ✓ | ✓ | ✓ | GU | GU | ✓ | ✓ | GU | GU | GU |
| 13-14 | ✓ | ✓ | GU | GU | GU | Ala. | GU | GU | GU | GU |
| 14-15 | ✓ | ✓ | GU | GU | GU | Ala. | ✓ | ✓ | GU | GU |
| 15-16 | GU | ✓ | GU | GU | GU | GU | ✓ | GU | GU | GU |
| 16-17 | ✓ | ✓ | GU | GU | GU | ✓ | ✓ | GU | GU | GU |
| 17-18 | GU | ✓ | ✓ | GU | GU | GU | ✓ | GU | GU | GU |
| 18-19 | GU | ✓ | GU | GU | GU | GU | ✓ | GU | GU | GU |
| 19-20 | GU | ✓ | GU | GU | GU | ✓ | ✓ | GU | GU | GU |
| 20-22 | ✓ | GU | GU | GU | GU | GU | ✓ | GU | GU | GU |
| 22-25 | GU | GU | GU | GU | GU | ✓ | ✓ | GU | GU | GU |
| 25-30 | GU | ✓ | GU[2] | GU | GU | ✓ | ✓ | GU | GU | GU |
| 30-35 | ✓ | ✓ | GU | GU | GU | ✓[3] | ✓ | GU | GU | GU |
| 35-40 | ✓[1] | ✓ | GU | GU | GU | ✓ | ✓ | ✓ | GU | GU |
| 40-45 | . | ✓ | GU | GU | GU | ✓ | ✓ | GU | GU | GU |
| 45-50 | ✓ | GU | GU | GU | GU | ✓ | GU | GU | GU | GU |
| 50-60 | ✓ | ✓ | GU[2] | GU | Tore net (GU) | ✓ | ✓ | GU | GU | Tore net (GU) |

[1] Tore net but successfully repeated.
[2] *NOAA Ship Oregon* II tore net.
[3] One tow of multiple tow stratum was successful.

Table 2. Mean total catch rates (kg/hr) calculated from *NOAA Ship Oregon II* Cruise 267 (OT-05-06) 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 | 1 | 46.9 | 10 | 49.7 | 4 | 54.6 | 4 | 140.8 | 3 | 141.9 | 2 | 78.3 | 11 | 68.3 | 13 | 88.9 | 24 | 79.5 |
| West Delta | 11 | 77.7 | 23 | 127.3 | 6 | 154.7 | 7 | 145.3 | 2 | 216.0 | 2 | 111.7 | 25 | 101.3 | 26 | 148.1 | 51 | 125.2 |
| Areas Combined | 12 | 75.1 | 33 | 103.8 | 10 | 114.7 | 11 | 143.6 | 5 | 171.5 | 4 | 95.0 | 36 | 91.2 | 39 | 128.4 | 75 | 110.5 |

Table 3. Organisms caught during *NOAA Ship Oregon II* Cruise 267 (OT-05-06) which comprised at least 1.0% of the total catch in terms of numbers and kilograms caught per hour fished (n = 75).

| | Name | Percent of Total Number Caught | Percent of Total Catch Weight | Percent Frequency Of Capture | Weight Per Individual (gms) |
|---|---|---|---|---|---|
| 1 | Atlantic croaker (*Micropogonias undulatus*) | 51.4 | 50.0 | 96.0 | 40 |
| 2 | Brown shrimp (*Farfantepenaeus aztecus*) | 6.3 | 2.2 | 85.3 | 14 |
| 3 | Longspine porgy (*Stenotomus caprinus*) | 4.8 | 3.7 | 76.0 | 31 |
| 4 | Spot (*Leiostomus xanthurus*) | 3.7 | 7.6 | 88.0 | 86 |
| 5 | Atlantic bumper (*Chloroscombrus chrysurus*) | 3.3 | 1.9 | 37.3 | 24 |
| 6 | Sand seatrout (*Cynoscion arenarius*) | 3.1 | 8.0 | 82.7 | 109 |
| 7 | Lesser blue crab (*Callinectes similis*) | 2.9 | 1.3 | 84.0 | 18 |
| 8 | Silver seatrout (*Cynoscion nothus*) | 2.2 | 2.6 | 68.0 | 48 |
| 9 | Atlantic cutlassfish (*Trichiurus lepturus*) | 2.2 | 1.8 | 50.7 | 34 |
| 10 | White shrimp (*Litopenaeus setiferus*) | 2.0 | 1.4 | 41.3 | 29 |
| 11 | Blue spotted searobin (*Prionotus roseus*) | 1.9 | 2.1 | 61.3 | 47 |
| | Totals | 83.8 | 82.6 | | |

Table 4. Summary of environmental samples and data collected during *NOAA Ship Oregon II* Cruise 267 (OT-05-06).

| | Surface | Mid-depth | Maximum Depth | Total |
|---|---|---|---|---|
| Temperature | 71 | 71 | 71 | 213 |
| Salinity | 71 | 71 | 71 | 213 |
| Dissolved Oxygen | 71 | 71 | 71 | 213 |
| Light Transmission | 71 | 71 | 71 | 213 |
| Secchi disk | 30 | -- | -- | 30 |
| Water color | 33 | -- | -- | 33 |
| Cloud cover | 32 | -- | -- | 32 |
| *CTD | 72 | -- | -- | 72 |
| **Shrimp trawl | 84 | -- | -- | 84 |
| Bongo | 10 | -- | -- | 10 |
| Neuston | 11 | -- | -- | 11 |

* CTD total accounts for one profile subsequently found to be corrupt.
** Shrimp trawl total consists of nets torn on bottom obstructions, untied/improperly tied bags and repeated tows.

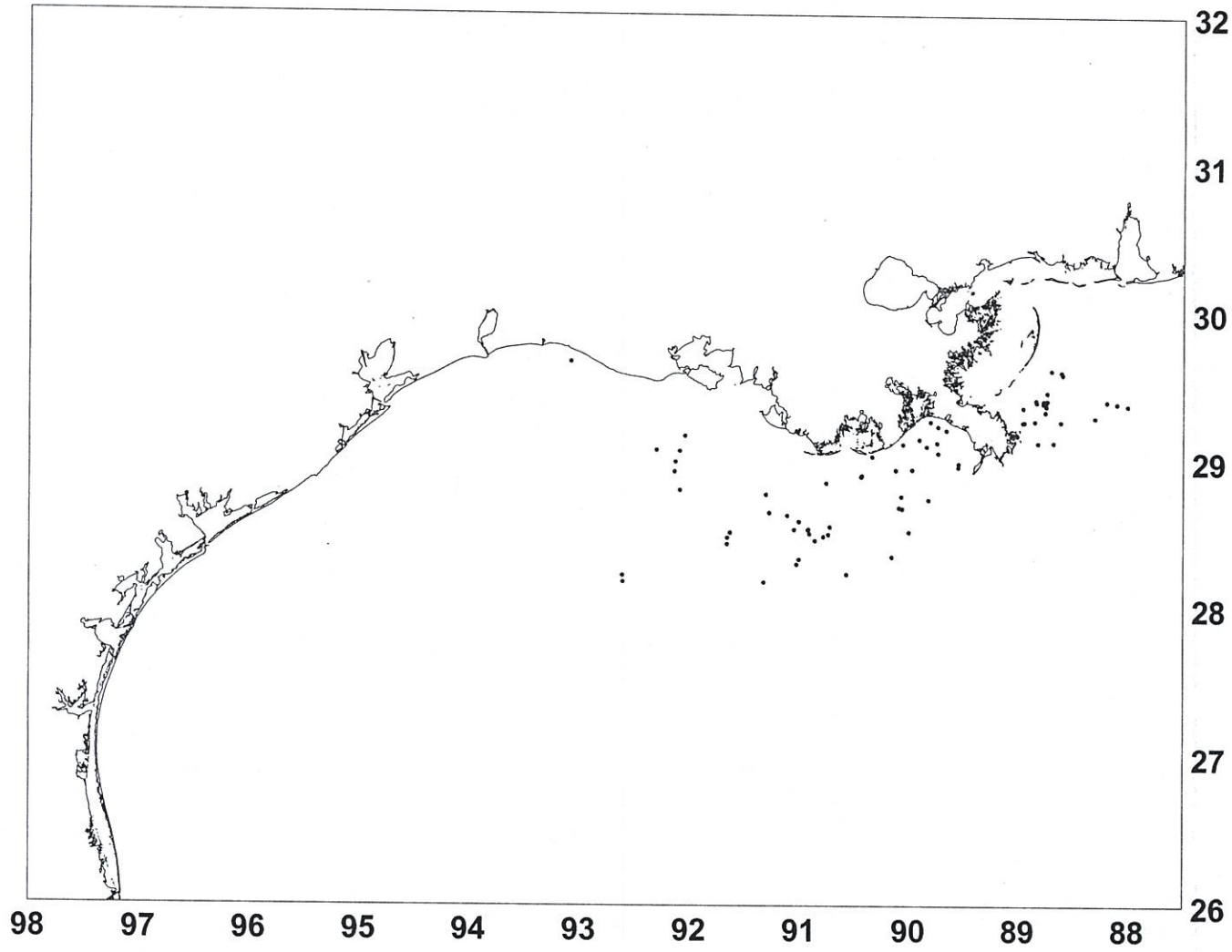


**Figure 1**. Shrimp trawl stations accomplished during *NOAA Ship Oregon II* Cruise 267 (OT-05-06).

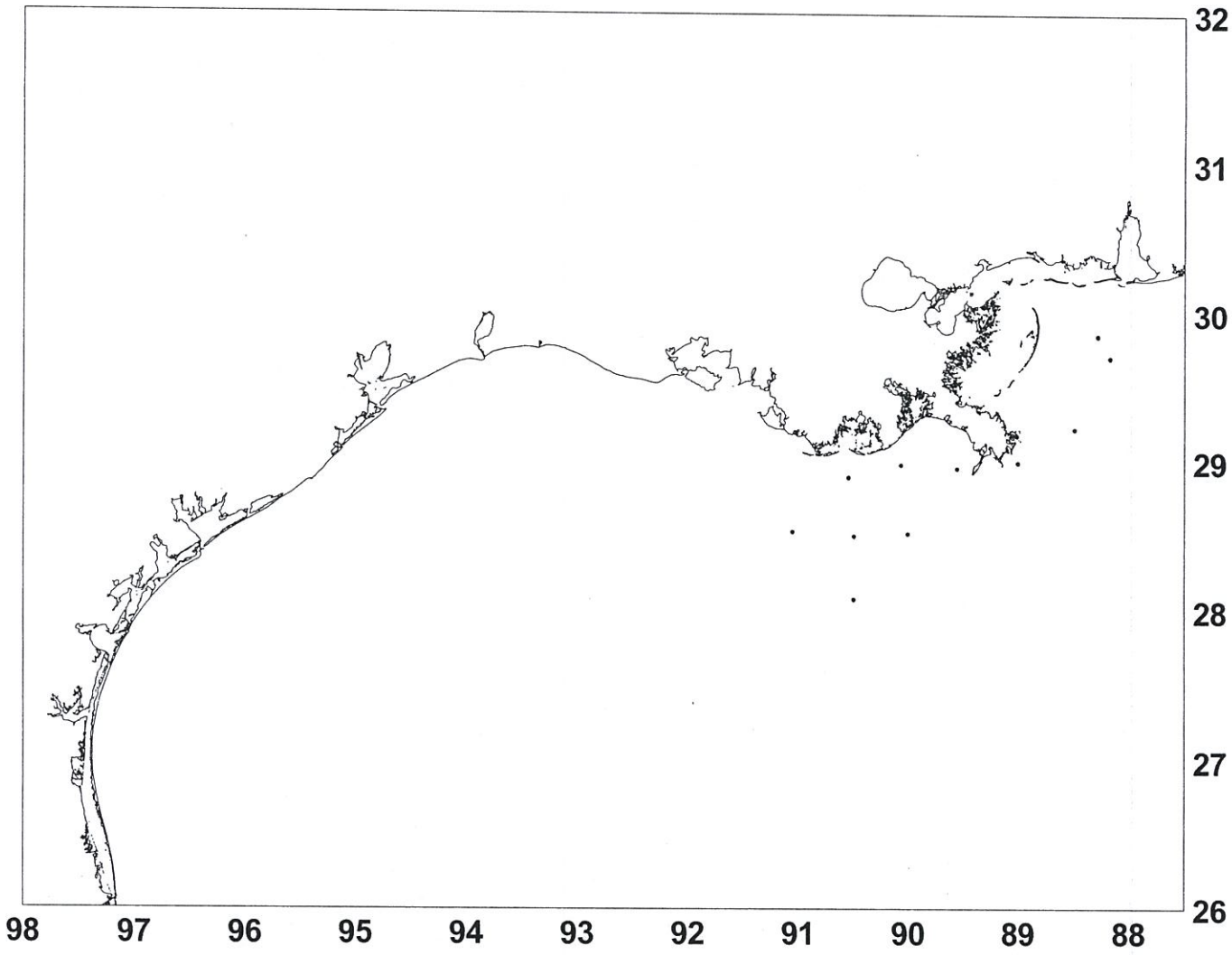


**Figure 2.** Ichthyoplankton sampling stations completed during *NOAA Ship Oregon II* Cruise 267 (OT-05-06).