

U. S. DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Southeast Fisheries Science Center

**Cruise Report**

**Date Submitted:**

**Platform:**

**Cruise Number:**

**Project Title:**

**Cruise Dates:** -

Submitted by:  
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Date:

Approved by:  
Lab Director

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Director, SEFSC

Date:

## INTRODUCTION

NOAA Ship *Oregon II* departed Pascagoula, MS on June 7, 2018 for the 43<sup>rd</sup> Summer Shrimp/Bottom Fish Survey, 38 of which have been conducted under the auspices of the Southeast Area Monitoring and Assessment Program (SEAMAP). SEAMAP is a state-federal-university program for the collection, management and dissemination of fishery independent data.

The primary objectives of this survey are to monitor the relative abundance, spatial distribution, and size composition of penaeid shrimp stocks and other demersal organisms across the northern Gulf of Mexico (GOM) in water depths from 5 to 60 fm.

NOAA Ship *Oregon II* was scheduled for 38 days at sea which was divided into three legs: Leg 1) June 7-July 20; Leg 2) July 22 – July 5; Leg 3) July 10-19. Due to a persistent problem with the trawl winch, there was a significant loss of survey time. The first leg left on June 7<sup>th</sup> and steamed down towards Brownsville, Texas as scheduled. Sampling began June 9<sup>th</sup> and was brought to a stop around 2100 on June 12<sup>th</sup> due to a hydraulic problem with the winch that could not be repaired at sea. It was decided that the best course of action would be to return Pascagoula, Mississippi for repairs. After five days in port, the ship departed again on June 19<sup>th</sup> as part of a rescheduled second leg; however, it had to return to Pascagoula on the 20<sup>th</sup> after problems with the winch were still evident after sampling one station. After additional repairs, the ship departed again on June 23<sup>rd</sup> but returned later that night after the repairs did not hold again. Finally, on June 27<sup>th</sup> the ship departed for a modified second leg and steamed for two days until they reached the targeted sampling area. NOAA Ship *Oregon II* successfully completed the second leg of the survey and returned to Pascagoula July 5<sup>th</sup>. The modified third leg was extended one day on either end of the survey (July 9-20). Due to the winch problems, the survey lost eight days at the dock and seven days due to the additional transit time. There were two scheduled port calls; however, the Galveston, Texas inport was canceled due to the ship needing to return to Pascagoula for repairs. The Pascagoula inport before the third leg happened as planned.

### **Summary of Objectives:**

1. Sample the northern GOM with SEAMAP standard trawl sampling gear to determine the abundance and distribution of demersal and benthic fauna.
2. Determine size distribution of penaeid shrimp and provide real-time shrimp reports to Gulf States Marine Fisheries Commission.
3. Collect size measurements to determine population size structure of demersal and benthic fauna.
4. Record profiles through the water column of temperature, salinity, fluorescence, dissolved oxygen and turbidity using a Conductivity/Temperature/Depth (CTD) unit at all stations.
5. Collect max depth water samples daily using Niskin bottles and measuring the dissolved oxygen (DO) levels using both Winkler titrations and a handheld Orion 3 Star Portable DO Meter. Transmit the processed CTD profiles to a previously setup file transfer

protocol (FTP) site as often as time permits to NOAA National Center for Environmental Information at Stennis Space Center, Mississippi and other researchers to map the hypoxic zone.

6. Conduct bottom mapping using EK-80 depth sounder, Side Scan Sonar, and a Real-Time bottom tracking program to determine trawlable habitat on all East Delta Stations in depths less than 50 fm.
7. Collect select specimens for genetic, age, growth, abundance and/or distributional studies.

## MATERIALS AND METHODS

The sampling gear consisted of 12-m (40 ft) shrimp nets with 2-m by 1-m chain bracketed wooden doors towed with 54-m bridles and a single warp. A standard free tickler chain cut 106 cm shorter than the footrope was used to stimulate organisms out of the substrate and into the path of the oncoming net. Sample sites (210) were randomly selected between 5 and 60 fm within Gulf Coast shrimp statistical reporting zones 1-21. Bathymetric data were obtained from NOAA's Environmental Satellite, Data, and Information Service (NESDIS) web site. Sampling sites were proportionally allocated according to surface area of statistical zones and two depth allocation units, 5-20 and 21-60 fm. Tow durations were 30 min at a targeted speed of 2.5 kt with tow direction left to the discretion of the bridge watch.

Catch data were electronically recorded at-sea with the Fishery Scientific Computing System (FSCS), version 1.6, developed by NOAA's Systems Development Branch of the Office of Marine & Aviation Operations. The FSCS was used in conjunction with the Scientific Computing System (SCS version 4.2.3) which recorded position, depth, date, time, and meteorological data. Catches were either processed in their entirety or subsampled, depending on the total catch weight. If catches exceeded 22.7 kg (50 lb), then at least 10% was taken as a subsample. Catches (or subsamples) were sorted to the lowest taxonomic level possible then enumerated and weighed. Taxa that were not identified to species level were returned to the laboratory for additional taxonomic resolution. Weights were collected using Marel motion compensating M1100 scales. Large capacity scales (30 kg max, 10 gm resolution) were used to obtain total catch weights and small capacity scales (6 kg max, 1 gm resolution) for individual species weights. Scales were calibrated before every station. Lengths were recorded using Limnoterra Limited electronic measuring boards. A maximum of 200 individuals of the three commercial shrimp species were selected for size measurement, weight, and sex. A maximum of 20 individuals per species of snapper, grouper, triggerfish, and lionfish were selected for individual size measurements, weight, and sex. For all other species, a maximum of 20 individuals were selected for size measurements and every fifth individual collected weight and sex in that series of 20.

Vertical profiles of temperature, conductivity, DO, percent light transmission and fluorometer values were recorded with a Seabird SBE 911. Water color and percent cloud cover observations were also taken during daylight hours. Bottom water samples were taken at the first station after sunrise in order to perform three replicate bench-top Winkler titrations to calibrate DO sensors mounted on the environmental profiler. The values obtained from the Winkler titrations were manually recorded in the Microsoft Access database. Second CTD casts were conducted when

catches indicated tows most likely transited hypoxic boundaries (little to no catch is expected where DO concentration falls below 2.0 mg/L).

CTD profiles were transmitted to a FTP website hosted by the NCEI. Realtime shrimp data were transmitted weekly to the Gulf States Marine Fisheries Commission (GSMFC) to consolidate data from all SEAMAP partners in order to monitor the abundance, distribution and size structure of commercial brown, white, and pink shrimp.

Due to the high occurrence of live bottom (sponges and corals) in the East Delta, mitigation measures were used prior to and during the survey to avoid these areas.

Prior to leaving the dock:

All previously known untrawlable areas including non-flat hard bottom areas, hydrophones, seagrass, reef sites, previous hang locations, wrecks, artificial reefs, Marine Protected Areas, and anything else deemed as untrawlable areas were taken out of the sampling universe. All stations selected for this survey fell in areas believed to be trawlable.

At Sea:

An Edgetech 4125 dual frequency side scan sonar, an EK-80 bottom depth sounder, and a Real Time SCS program were all used to help identify and avoid any habitat or obstructions along the sea floor. Every station in depths less than 50 m was surveyed at least once at a target speed of 5.0 – 6.0 kt. Watch Leaders (WL) and/or the Field Party Chief (FPC) used all methods in combination with one another to designate whether a station was trawlable. If a transect was deemed untrawlable, more transects would be run until either a trawlable transect was run or an hour of attempting to find one had passed. If no transects were deemed trawlable after an hour, the station was dropped. When a transect was deemed trawlable, a CTD and a trawl were completed.

Any movement of a station had to maintain the targeted starting depth of the original station and shrimp statistical zone before being moved.

## RESULTS AND DISCUSSIONS

Two hundred and ten stations were planned for NOAA Ship *Oregon II* to complete. Of the 210 stations, 31 stations were dropped for lack of time during the survey to make sure all stations satisfied the proportional allocations in each statistical zone and depth strata, 133 stations were completed successfully, four were given an operational code for gear problems (e.g. torn net, broken tickler chain, etc.), and two were dropped by the WL using the coral/sponge mitigation measures at sea.

The total catch weight was 4,409.6 kg. There were approximately 36,870 measurements; 18,562 individual weights, and 14,244 sex determinations recorded from 387 species.

For summary purposes, NOAA Ship *Oregon II* operated in three geographic areas; East Delta (81°00'-89°15' W Long), West Delta (89°15'-94°00' W Long) and Texas (94°00'-98°00' W Long). The West Delta and Texas regions were grouped together for this data summary due to similar species composition.

The three most abundant species that accounted for at least 1% of the total catch in number and weight from the West Delta included the Atlantic croaker, *Micropogonias undulatus* (n=35,930), the Longspine porgy, *Stenotomus caprinus* (n=13,514), and brown shrimp, *Farfantepenaeus aztecus* (n=15,459). These three species represent 41.1% of the 157,914 total specimens caught in that region (Table 1).

In the East Delta, the three most abundant species that accounted for at least 1 % of the total catch in number and weight included the Atlantic calico scallop, *Argopecten gibbus* (n=8,733), inshore squid, *Loligo sp.* (n=1,957) and brown shrimp, *Farfantepenaeus aztecus* (n=1,042). These three species comprised 57.4% of the 20,442 total specimens caught in that region (Table 2).

Hypoxic conditions were defined as DO readings < 2.0 mg/L. Each CTD cast was uploaded and sent to NCEI for distribution amongst interested organizations. The final chart of hypoxia conditions shows the occurrence of various levels of DO throughout the survey area (Figure 2).

Fish and invertebrate samples were frozen and returned to staff members at NOAA Fisheries Pascagoula, MS and Panama City, FL; University of Southern Mississippi-GCRL, Texas A&M University, Tulane University, and Florida Fish and Wildlife Conservation Commission.

## QUALITY CONTROL

Five of each species that were taken down to the lowest taxonomic level at one station once per calendar day were frozen and brought back to the National Marine Science Center in Pascagoula, MS to verify their accuracy.

## ACKNOWLEDGMENTS

On behalf of the Mississippi Laboratory and the scientific party, we would like to thank the Commanding Officer and crew of NOAA Ship *Oregon II* for a job well done. This was an especially difficult survey that was saved from disaster by the ship's willingness to go the extra mile to give days back when possible and to run on two engines as long as possible to salvage as many stations as possible.

## CRUISE PARTICIPANTS

Leg I: June 7 – June 15, 2018

<b>Name</b>	<b>Title</b>	<b>Organization</b>
Chrissy Stepongzi	Field Party Chief	Riverside Technology, Inc.
Taniya Wallace	Watch Leader	Riverside Technology, Inc.

Andre Debose	Watch Leader	NMFS
Mark Grace	Watch Stander	NMFS
Kevin Rademacher	Watch Stander	NMFS
Mike Cyrana	Watch Stander	Tulane University
Joe Manetta	Watch Stander	Volunteer
Geoff Carlisle	Watch Stander	Teacher at Sea Program
Sofia Rodas	Watch Stander	Intern
Jennifer Gut	Watch Stander	SEAMAP-SA NC DMR
Zehra Mohsin	Watch Stander	Volunteer

Leg II: June 19 – July 5, 2018

<b>Name</b>	<b>Title</b>	<b>Organization</b>
Taniya Wallace	Field Party Chief	Riverside Technology, Inc.
Alonzo Hamilton	Watch Leader	NMFS
Kristin Hannan	Watch Leader	Riverside Technology, Inc.
Andy Millett	Watch Stander	Riverside Technology, Inc.
John Moser	Watch Stander	NMFS
Mike Cyrana	Watch Stander	Tulane University
Joe Manetta	Watch Stander	Volunteer
Angela Hung	Watch Stander	Teacher at Sea Program
Kelsey Hofheinz	Watch Stander	Intern
Emily Dobson	Watch Stander	Intern

Leg III: July 9 – July 20, 2018

<b>Name</b>	<b>Title</b>	<b>Organization</b>
Chrissy Stepongzi	Field Party Chief	Riverside Technology, Inc.
Alonzo Hamilton	Watch Leader	NMFS
Andre Debose	Watch Leader	NMFS
Brandi Noble	Watch Stander	NMFS
Nick Hopkins	Watch Stander	NMFS
Adam Pollack	Watch Stander	Riverside Technology, Inc.
Will Tilley	Watch Stander	Volunteer
Emily McMullen	Watch Stander	Volunteer
Jeff Peterson	Watch Stander	Teacher at Sea Program

Table 1: The most abundant species caught at 116 stations in the West Delta which accounted for 1% of the total catch in number and weight on NOAA Ship *Oregon II* R2-18-03 (328).

<b>ZONE</b>	<b>TAXON</b>	<b>Frequency</b>	<b>Percent Number Caught (%)</b>	<b>Percent Weight Caught (%)</b>	<b>Percent Occurrence (%)</b>
<b>WEST</b>	<i>Micropogonias undulatus</i>	75	22.8	26.9	64.7

<b>WEST</b>	<i>Stenotomus caprinus</i>	94	8.6	10.5	81.0
<b>WEST</b>	<i>Farfantepenaeus aztecus</i>	110	9.8	7.4	94.8
<b>WEST</b>	<i>Chloroscombrus chrysurus</i>	49	5.0	6.5	42.2
<b>WEST</b>	<i>Peprilus burti</i>	70	3.0	5.4	60.3
<b>WEST</b>	<i>Callinectes similis</i>	76	10.3	3.9	65.5
<b>WEST</b>	<i>Amusium papyraceum</i>	65	10.9	3.8	56.0
<b>WEST</b>	<i>Leiostomus xanthurus</i>	34	1.9	3.1	29.3
<b>WEST</b>	<i>Loligo sp.</i>	90	3.0	1.5	77.6

Table 2: The most abundant species caught at 21 stations in the East Delta which accounted for 1% of the total catch in number and weight on NOAA Ship *Oregon II* R2-18-03 (328).

ZONE	TAXON	Frequency	Percent Number Caught (%)	Percent Weight Caught (%)	Percent Occurrence (%)
EAST	<i>Argopecten gibbus</i>	3	42.7	6.6	14.3
EAST	<i>Loligo sp.</i>	14	9.6	5.9	66.7
EAST	<i>Farfantepenaeus aztecus</i>	7	5.1	3.3	33.3
EAST	<i>Stenotomus caprinus</i>	8	2.1	3.0	38.1
EAST	<i>Syacium papillosum</i>	16	1.6	2.8	76.2
EAST	<i>Pristipomoides aquilonaris</i>	5	1.6	1.7	23.8
EAST	<i>Prionotus stearnsi</i>	5	1.9	1.2	23.8
EAST	<i>Sicyonia brevirostris</i>	13	3.0	1.2	61.9
EAST	<i>Farfantepenaeus duorarum</i>	4	1.4	1.2	19.0

Figure 1: Trawl stations assigned to NOAA Ship *Oregon II* R2-18-03 (328).

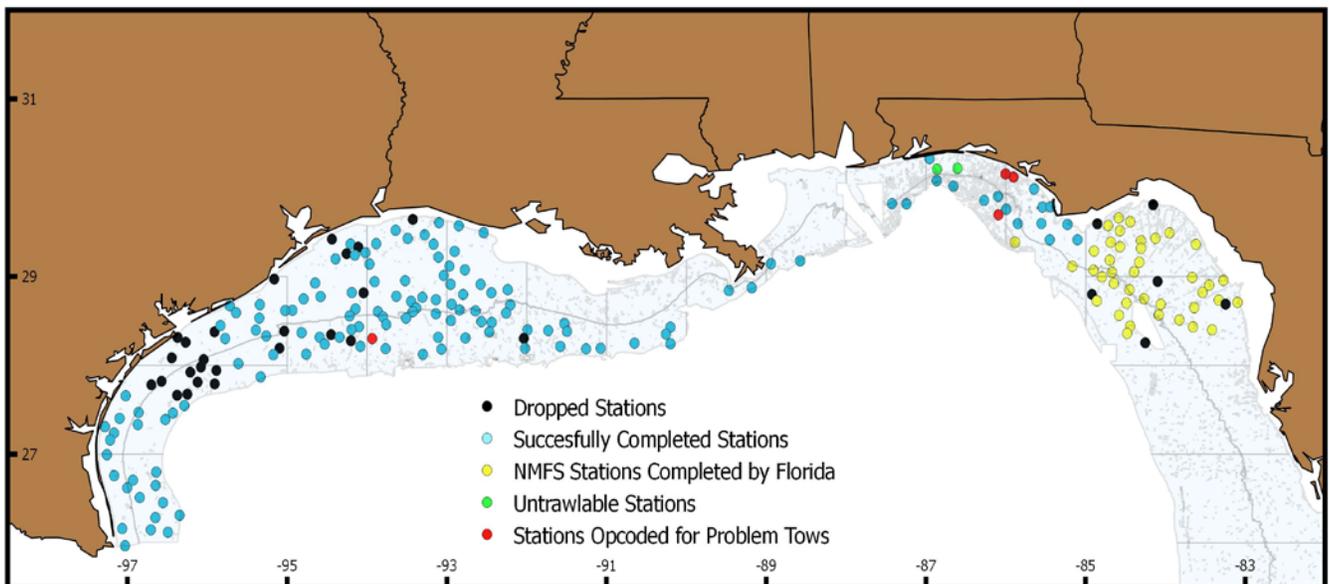


Figure 2. Dissolved oxygen levels as recorded by NOAA Ship *Oregon II* during cruise R2-18-03 (328). (<https://www.ncddc.noaa.gov/hypoxia/products/>)

