

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:
Field Party Chief

Date:

Approved by:
Acting Lab Director

Date:

Approved by:
Dr. Bonnie Ponwith
Director, SEFSC

Date:

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 313 (R2-15-03)
06/07/2015 – 07/18/2015

INTRODUCTION

NOAA Ship *Oregon II* departed Pascagoula, MS on June 7, 2015 for the 40th Summer Shrimp/Bottom Fish Survey, 35 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 goals 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 5 to 60 fm.

There were two scheduled port calls to exchange scientific personnel, Galveston, TX (June 22 to 24) and Pascagoula, MS (July 9 to 13). The ship returned to Pascagoula on July 17 after completing all stations plus seven additional trawl stations because of surplus survey time.

Summary of Objectives:

1. Determine size distribution of penaeid shrimp across the U.S. GOM.
2. Sample the U.S. GOM in depths of 5 to 60 fm with standard SEAMAP sampling gear to determine the abundance and distribution of benthic fauna.
3. Obtain size measurements to estimate size structure of sampled populations.
4. Conduct Conductivity, Temperature, Depth (CTD) casts to profile water temperature, salinity, dissolved oxygen (DO) concentration, fluorescence and light transmittance.
5. Transmit CTD profiles as realtime as possible to the NOAA National Centers for Environmental Information (NCEI) at Stennis Space Center, Bay St. Louis, MS.
6. Transmit realtime shrimp biological data to Gulf States Marine Fisheries Commission (GSMFC) in Ocean Springs, MS.
7. Collect ichthyoplankton samples with bongo and neuston samplers to determine the relative abundance and distribution of eggs and larvae of commercially and recreationally important fish species.
8. Collect: lionfish (*Pterois* sp.), grouper (*Epinephelus* sp. and *Mycteroperca* sp.), sharks, dogfish (*Mustelus* sp.), skates and rays (Elasmobranchii), red snapper (*Lutjanus campechanus*), vermilion snapper (*Rhomboplites aurorubens*), lane snapper (*Lutjanus synagris*), red porgy (*Pagrus pagrus*), king mackerel (*Scomberomorus cavalla*), tonguefish (*Symphurus* sp.), grey triggerfish (*Balistes caprisкус*), batfish

(*Halieutichthys* sp.), scorpionfish (*Neomerinthe hemingwayi* and *Pontinus longispinus*), and searobins (*Prionotus* sp.), for genetic, age, growth, abundance and/or distributional studies.

MATERIALS AND METHODS

The sampling gear consisted of 40-ft shrimp nets with 8-ft by 40-in chain bracketed wooden doors towed with 30-fm bridles and a single warp. A standard free tickler chain cut 42 in shorter than the footrope was used to stimulate organisms out of the substrate and into the path of the oncoming net. Sample sites (400) were randomly selected between 5 and 60 fm within Gulf coast shrimp statistical reporting zones 3-21. 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. During leg 1, a Precision Autonomous Hydroacoustic Altimeter (Echologger, model AA400) was installed in the trawl nets to monitor the trawl contact with the bottom during fishing.

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 metadata, including 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 lab 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 weigh total catch weights and small capacity scales (6 kg max, 1 gm resolution) for individual species weights. Lengths were recorded with Limnoterra Limited electronic measuring boards. A maximum of 20 individuals per species were selected for size measurements. Individual weight, sex and sexual stage were collected from one out of every fifth individual in the series of 20. All red snapper were measured, weighed and sexed. A maximum of 200 individuals of each commercial shrimp species was measured and sexed. The SCS was also used to collect metadata for ichthyoplankton stations and CTD casts.

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 two 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. Left bongo samples were initially preserved in 10% buffered formalin and then transferred to 95%

ethyl alcohol 36 h later. Right bongo and neuston samples were preserved in 95% ethyl alcohol, and transferred 24 h later using 95% ethyl alcohol.

Vertical profiles of temperature, conductivity, dissolved oxygen, percent light transmission and fluorometry values were recorded with a Seabird SBE 911 plus. 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 FSCS Access database. Second CTD casts were conducted when catches indicated tows may have transited hypoxic boundaries (little to no catch is expected where dissolved oxygen concentration falls below 2.0 mg/L).

CTD profiles were transmitted to a file transfer protocol 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.

RESULTS AND DISCUSSIONS

Three hundred and ninety seven trawls were completed by the SEAMAP partners: 194 by NOAA Ship *Oregon II*, 26 by Louisiana (R/V *Point Sur*), 18 by Mississippi (R/V *Tommy Munro*), 6 by Alabama (R/V *Alabama Discovery*), and 153 by Florida (R/V *Tommy Munro*) (Figure 1). There were 243 stations completed during the cruise on NOAA Ship *Oregon II*. There were 194 trawls, of which 184 were successful. There were also 49 bongo tows, 48 neuston tows (Figure 2), 243 CTD casts (Figure 3), 126 cloud cover observations, and 119 gross water color observations.

For summary purposes, data were grouped into 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), and six depth intervals; 5-9, 10-19, 20-29, 30-39, 40-49, and 50-60 fm. Eight species comprised 52.8% of the biomass and 54.8% of the total number of all organisms sampled (Table 1). The mean total catch rate for the survey was 91.7 kg per hour fished (kg/hr), a 3.6 % increase when compared to last year's survey (88.5 kg/hr) and a 13.1% decrease relative to the five year mean for 2010-2014 (105.6 kg/hr) (Table 2). Although catch rates declined this may not indicate a reduction in population size but may be due to reduced spatial coverage by NOAA Ship *Oregon II* because of increased participation by state SEAMAP partners. Sciaenidae was the most abundant family caught with Atlantic croaker, *Micropogonias undulatus*, 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, *F. duorarum*. There were 57,011 measurements; 29,385 individual weights; 29,393 sex determinations; and 20,378 sex stages recorded from 386 species (sex determinations and stages include instances where organisms were inspected but sex or stage could not be discerned).

Forty nine bongo and 48 neuston stations were accomplished. The neuston samples 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. The left

bongo samples were sent to the SEAMAP Plankton Archiving Center at the Gulf Coast Research Laboratory (GCRL) in Ocean Springs, MS.

Hypoxic conditions were defined as DO readings < 2.0 mg/L and are shown in Figure 4. 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 dissolved oxygen throughout the survey area (Figure 4).

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, and Texas A&M (Table 4).

ACKNOWLEDGMENTS

On behalf of the 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 throughout the survey.

CRUISE PARTICIPANTS

June 07 – 22, 2015

NAME	TITLE	ORGANIZATION
Kimberley Johnson	Field Party Chief	NMFS, Pascagoula, MS
Andre Debose	Watch Leader	NMFS, Pascagoula, MS
Chrissy Stepongzi	Watch Leader	Riverside, Pascagoula, MS
Taniya Wallace	Fisheries Biologist	Riverside, Pascagoula, MS
Kevin Rademacher	Fisheries Biologist	NMFS, Pascagoula, MS
Glenn Zapfe	Fisheries Biologist	NMFS, Pascagoula, MS
Adam Catusus	Graduate Student	Florida Gulf Coast Univ., FL
Charles Duffie	Graduate Student	Florida Gulf Coast Univ., FL
Erika Nuss	Ungrad. Student	Nicholl's State University, LA
Jeffrey Zingre	Graduate Student	Florida Gulf Coast Univ., FL
Lindsey Jakob	Graduate Student	Florida Gulf Coast Univ., FL

June 24 – July 09, 2015

NAME	TITLE	ORGANIZATION
Andre Debose	Field Party Chief	NMFS, Pascagoula, MS
Alonzo Hamilton, Jr.	Watch Leader	NMFS, Pascagoula, MS
Kevin Rademacher	Watch Leader	NMFS, Pascagoula, MS
Michael Hendon	Fisheries Biologist	NMFS, Pascagoula, MS
Warren Brown	FMES	Riverside, Pascagoula, MS
David Walker	Teacher At Sea	Austin ISD, TX
Charles Duffie	Graduate Student	Florida Gulf Coast Univ., FL
Jeffrey Zingre	Graduate Student	Florida Gulf Coast Univ., FL
Adam Catusus	Graduate Student	Florida Gulf Coast Univ., FL

July 13 – 18, 2015

NAME	TITLE	ORGANIZATION
Kimberley Johnson	Field Party Chief	NMFS, Pascagoula, MS
Alonzo Hamilton	Watch Leader	NMFS, Pascagoula, MS
Taniya Wallace	Watch Leader	Riverside, Pascagoula, MS
Chrissy Stepongzi	Fisheries Biologist	NMFS, Pascagoula, MS
Joey Salisbury	Fisheries Biologist	NMFS, Pascagoula, MS
Erika Nuss	Ungrad. Student	Nicholl's State University, LA
Adam Catusus	Graduate Student	Florida Gulf Coast Univ., FL
Sean Granata	NCCOS Intern	Washington College, MD
Kate Carroll	NOAA Hollings Scholar	Univ. of Hawaii, HI
Kenneth Ambrose	NOAA Hollings Scholar	Stockton University, PA
Sarah Stockton-Tekeste	NGI Intern	Duke University, PA

Table 1. Five most abundant species in terms of weight (kg) caught during NOAA Ship *Oregon II* Cruise 313 (R2-15-03), pink and white shrimp; and red snapper (n = 184).

	Taxon	Percent Of Total Number Caught	Percent Of Total Weight Caught	Percent Frequency Of Occurrence	Weight Per Individual (gm)
1	Atlantic croaker (<i>Micropogonias undulatus</i>)	27.8	26.7	52.2	28.2
2	Gulf butterflyfish (<i>Peprilus burti</i>)	6.3	8.2	63.0	38.2
3	Brown shrimp (<i>Farfantepenaeus aztecus</i>)	11.1	5.6	79.3	14.8
4	Longspine porgy (<i>Stenotomus caprinus</i>)	4.6	4.7	63.6	30.3
5	Atlantic bumper (<i>Chloroscombrus chrysurus</i>)	3.8	4.5	33.2	34.5
6	Red snapper (<i>Lutjanus campechanus</i>)	0.3	2.1	48.9	245.2
7	White shrimp (<i>Litopenaeus setiferus</i>)	0.6	0.8	25.0	41.3
8	Pink shrimp (<i>Farfantepenaeus duorarum</i>)	0.3	0.2	20.1	22.9
		54.8	52.8		

Table 2. Mean catch rates (kg/hr) of eight species and four catch categories listed in Table 1 by area, depth, and diurnal strata (N=number of tows) of observations during NOAA Ship *Oregon II* Cruise 313 (R2-15-03).

Atlantic croaker

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	.	16	0.0	14	0.0	3	0.0	.	.	.	.	18	0.0	15	0.0	33	0.0
West Delta	.	.	33	40.8	16	6.4	10	0.6	5	9.8	8	0.6	43	18.4	29	24.7	72	20.9
Texas	4	244.4	38	52.5	20	0.7	6	2.7	9	0.0	2	0.0	41	40.1	38	35.8	79	38.0
Areas Combined	4	244.4	87	38.4	50	2.3	19	1.2	14	3.5	16	0.5	102	23.9	82	25.3	184	24.5

Gulf butterfish

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	.	16	0.0	14	0.0	3	0.0	.	.	.	.	18	0.0	15	0.0	33	0.0
West Delta	.	.	33	12.2	16	2.0	10	2.0	5	14.6	8	9.3	43	9.4	29	6.7	72	8.3
Texas	4	1.1	38	12.6	20	11.2	6	0.2	9	7.7	2	0.0	41	7.0	38	12.9	79	9.9
Areas Combined	4	1.1	87	10.0	50	5.1	19	1.1	14	10.2	10	7.4	102	6.8	82	8.4	184	7.5

Brown shrimp

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	.	16	0.0	14	0.0	3	0.0	.	.	.	.	18	0.0	15	0.0	33	0.0
West Delta	.	.	33	7.8	16	10.4	10	3.8	5	5.4	8	4.2	43	8.1	29	6.0	72	7.2
Texas	4	4.8	38	6.8	20	5.6	6	3.3	9	1.4	2	0.0	41	4.6	38	6.2	79	5.3
Areas Combined	4	4.8	87	5.9	50	5.5	19	3.0	14	2.8	10	3.4	102	5.2	82	5.0	184	5.1

Table 2. Continued.

Longspine porgy

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	0	16	0.0	14	0.0	3	0.0	.	.	.	.	18	0.0	15	0.0	33	0.0
West Delta	.	.	33	0.6	16	6.5	10	11.0	5	13.0	8	13.6	43	7.6	29	2.8	72	5.7
Texas	4	0.0	38	0.8	20	14.0	6	2.1	9	6.9	2	0.4	41	4.0	38	5.9	79	4.9
Areas Combined	4	0.0	87	0.6	50	7.7	19	6.4	14	9.0	10	11.0	102	4.8	82	3.7	184	4.3

Atlantic bumper

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	.	16	0.0	14	0.0	3	0.0	.	.	.	.	18	0.0	15	0.0	33	0.0
West Delta	.	.	33	16.8	16	0.2	10	0.1	5	0.0	8	0.0	43	8.3	29	7.1	72	7.8
Texas	4	0.6	38	4.7	20	0.6	6	0.0	9	0.0	2	0.0	41	3.4	38	1.4	79	2.4
Areas Combined	4	0.6	87	8.4	50	0.3	19	0.0	14	0.0	10	0.0	102	4.9	82	3.1	184	4.1

Red snapper

	Depth												Diurnal Period				Total	
	05 - 09		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	.	.	16	0.5	14	0.6	3	0.0	.	.	.	.	18	0.5	15	0.5	33	0.5
West Delta	.	.	33	0.2	16	7.0	10	2.2	5	1.9	8	0.6	43	2.7	29	1.4	72	2.2
Texas	4	0.0	38	0.4	20	5.5	6	4.4	9	3.4	2	0.0	41	2.8	38	1.7	79	2.3
Areas Combined	4	0.0	87	0.3	50	4.6	19	2.6	14	2.9	10	0.5	102	2.4	82	1.4	184	1.9

Table 2. Continued.

White shrimp

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	.	16	0.0	14	0.0	3	0.0	.	.	.	.	18	0.0	15	0.0	33	0.0
West Delta	.	.	33	1.3	16	0.0	10	0.0	5	0.0	8	0.0	43	0.2	29	1.1	72	0.6
Texas	4	6.4	38	1.9	20	0.0	6	0.0	9	0.0	2	0.0	41	1.2	38	1.3	79	1.2
Areas Combined	4	6.4	87	1.3	50	0.0	19	0.0	14	0.0	10	0.0	102	0.6	82	1.0	184	0.8

Pink shrimp

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	.	16	0.6	14	0.8	3	0.0	.	.	.	.	18	0.6	15	0.8	33	0.6
West Delta	.	.	33	0.3	16	0.0	10	0.0	5	0.0	8	0.0	43	0.2	29	0.1	72	0.1
Texas	4	0.0	38	0.2	20	0.0	6	0.0	9	0.0	2	0.0	41	0.2	38	0.0	79	0.1
Areas Combined	4	0.0	87	0.3	50	0.2	19	0.0	14	0.0	10	0.0	102	0.2	82	0.2	184	0.2

Finfish

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	.	16	33.0	14	26.5	3	37.7	.	.	.	.	18	32.6	15	28.4	33	30.7
West Delta	.	.	33	94.5	16	38.1	10	31.6	5	69.9	8	60.6	43	68.7	29	66.3	72	67.8
Texas	4	267.5	38	112.8	20	76.9	6	27.5	9	45.0	2	17.5	41	102.7	38	86.5	79	94.9
Areas Combined	4	267.5	87	91.2	50	50.4	19	31.2	14	53.8	10	52.0	102	76.0	82	68.8	184	72.8

Table 2. Continued.

Crustaceans

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	.	16	2.7	14	3.0	3	0.8	.	.	.	.	18	2.4	15	3.0	33	2.6
West Delta	.	.	33	16.2	16	14.3	10	5.4	5	8.7	8	5.5	43	12.6	29	12.5	72	12.6
Texas	4	12.2	38	14.6	20	11.5	6	8.3	9	2.2	2	0.2	41	9.5	38	13.5	79	11.4
Areas Combined	4	12.2	87	13.0	50	10.0	19	5.6	14	4.5	10	4.4	102	9.6	82	11.2	184	10.3

Other invertebrates

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	.	16	30.1	14	20.1	3	40.6	.	.	.	.	18	16.8	15	38.8	33	26.8
West Delta	.	.	33	0.5	16	5.0	10	7.3	5	5.5	8	8.1	43	4.4	29	2.5	72	3.6
Texas	4	0.8	38	6.0	20	4.8	6	4.5	9	9.5	2	1.8	41	6.4	38	4.8	79	5.6
Areas Combined	4	0.8	87	8.3	50	9.1	19	11.7	14	8.1	10	6.8	102	7.4	82	10.2	184	8.6

Total Catch

	Depth												Diurnal Period				Total	
	05-09.9		10-19.9		20-29.9		30-39.9		40-49.9		50 +		Day		Night			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
East Delta	.	.	16	65.7	14	49.7	3	79.0	.	.	.	.	18	51.8	15	70.1	33	60.1
West Delta	.	.	33	111.3	16	57.4	10	44.2	5	83.9	8	74.4	43	85.8	29	81.3	72	84.0
Texas	4	280.5	38	133.4	20	93.2	6	40.3	9	56.7	2	19.6	41	118.6	38	104.8	79	112.0
Areas Combined	4	280.5	87	112.6	50	69.5	19	48.5	14	66.4	10	63.4	102	93.0	82	90.2	184	91.7

Table 3. Tally of scientific observations acquired during NOAA Ship *Oregon II* Cruise 313 (R2-15-03).

Obs	Observation	COUNT
1	CTD	243
2	Neuston	48
3	Bongo	49
4	Shrimp Trawl	194*
5	Cloud Cover	126
6	Water Color	119

* Includes 10 tows during which gear codes were applied to the station.

Table 4. List of specimen requests acquired during NOAA Ship *Oregon II* Cruise 313 (R2-15-03).

Requestor	Taxon	Location/ Depth	Size Range	Number Requested	Sample Type
Robert Allman	<i>Rhomboplites aurorubens</i> <i>Balistes capriscus</i>	All All	All All	All 5/station, 100/survey	Frozen whole
Beverly Barnett	<i>Lutjanus campechanus</i> <i>Lutjanus synagris</i> <i>Lutjanus griseus</i> <i>Epinephelus nigritus</i> <i>Epinephelus</i> <i>drummondhayi</i> <i>Epinephelus flavolimbatus</i> <i>Scomberomorus cavalla</i> <i>Scomberomorus maculatus</i> <i>Rachycentron canadum</i>	All	All	All	Frozen whole
Jill Hendon	Various sharks and rays	All	All	1/species	Frozen whole
Christian Jones	All skates and rays	All	All	All	Frozen whole
Lisa Jones	<i>Mustelus</i> spp.	All	All	All	Biopsies
Linda Lombardi	<i>Epinephelus morio</i>	All	All	All	Frozen whole
Kevin Rademacher	<i>Calamus</i> spp.	All	All	All	Frozen whole
National Seafood Inspection Laboratory	Numerous species for DNA profiles	All	All	5/species	Frozen whole
Alex Fogg	<i>Pterois volitans/miles</i>	All	All	All	Frozen whole

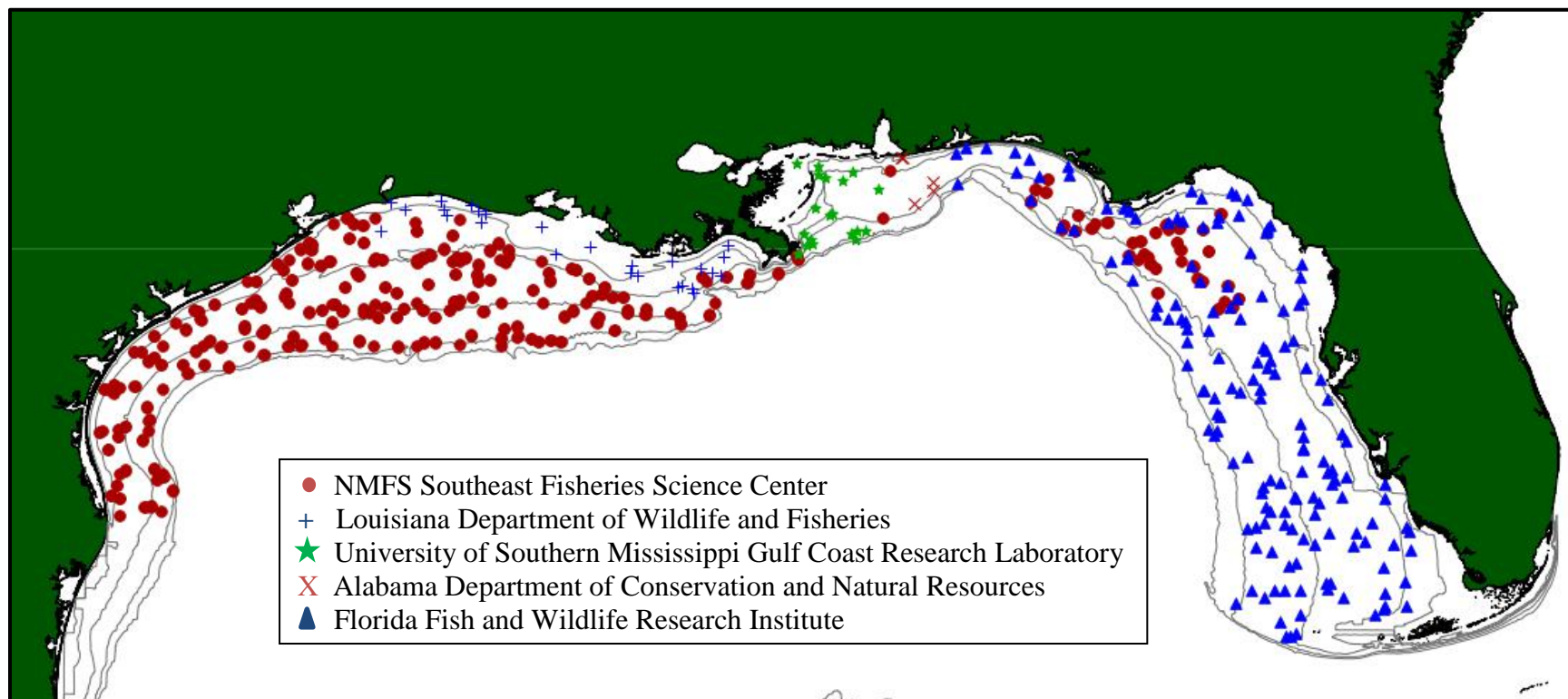


Figure 1. Trawl stations completed by SEAMAP partners during the 2015 Summer Shrimp/Bottomfish Survey.

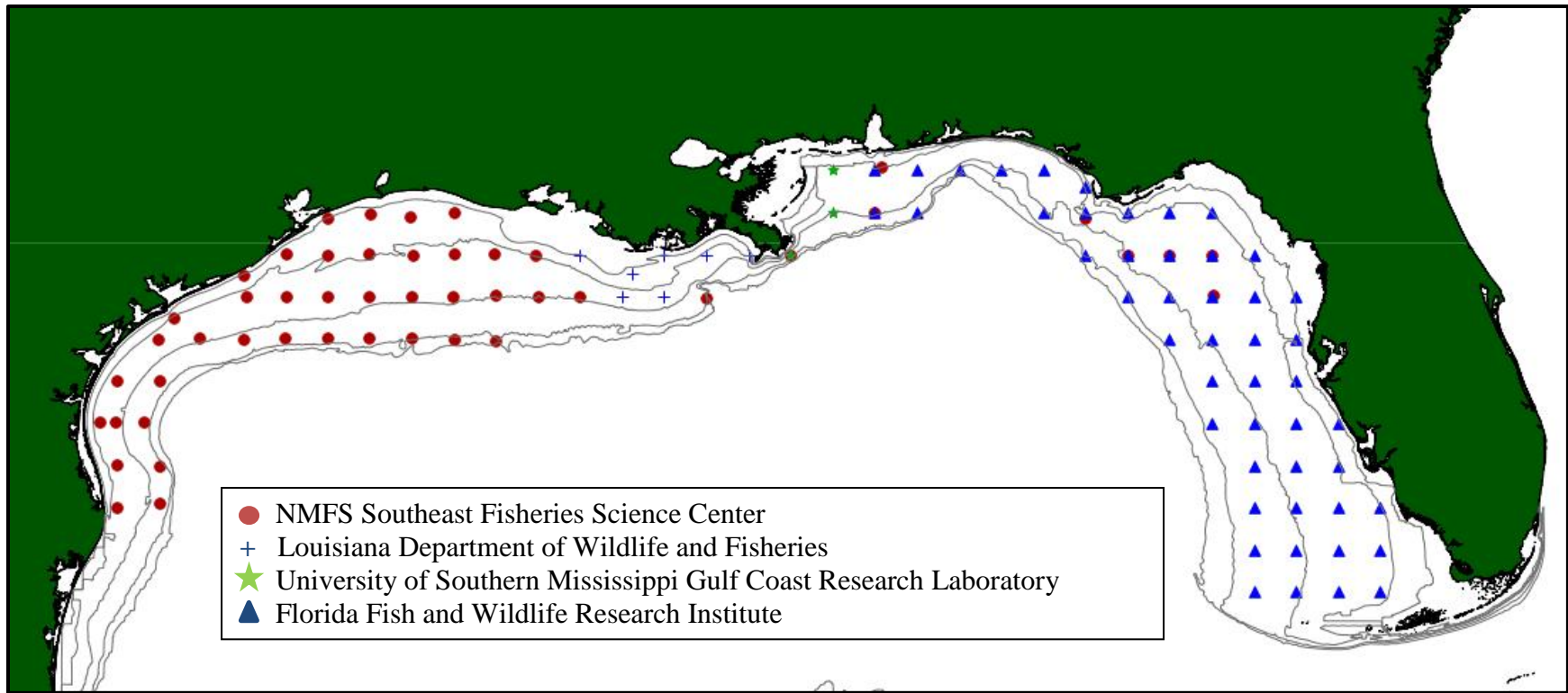


Figure 2. Ichthyoplankton stations completed by SEAMAP partners during the 2015 Summer Shrimp/Bottomfish Survey.

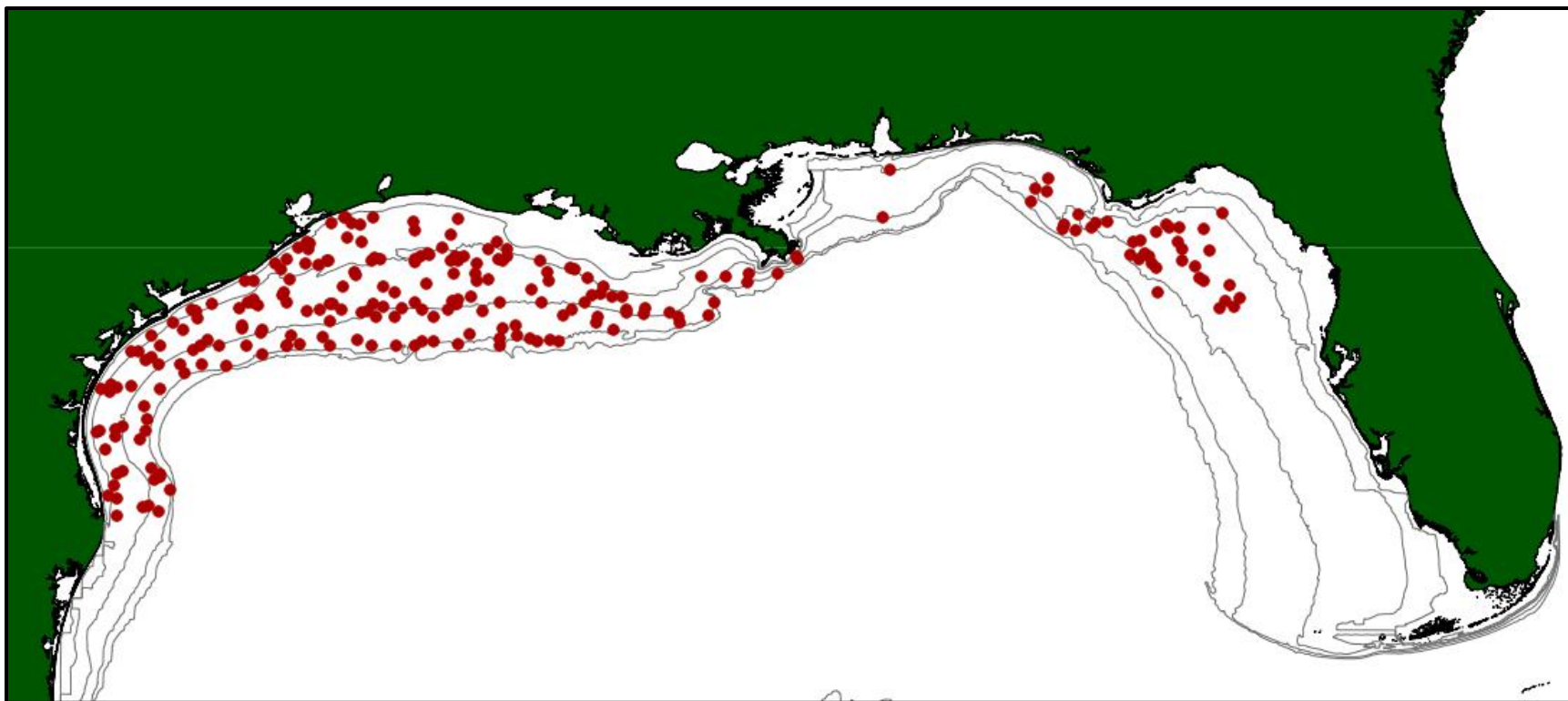


Figure 3. CTD stations recorded by NOAA Ship *Oregon II* during the R2-15-03 (313) Survey.

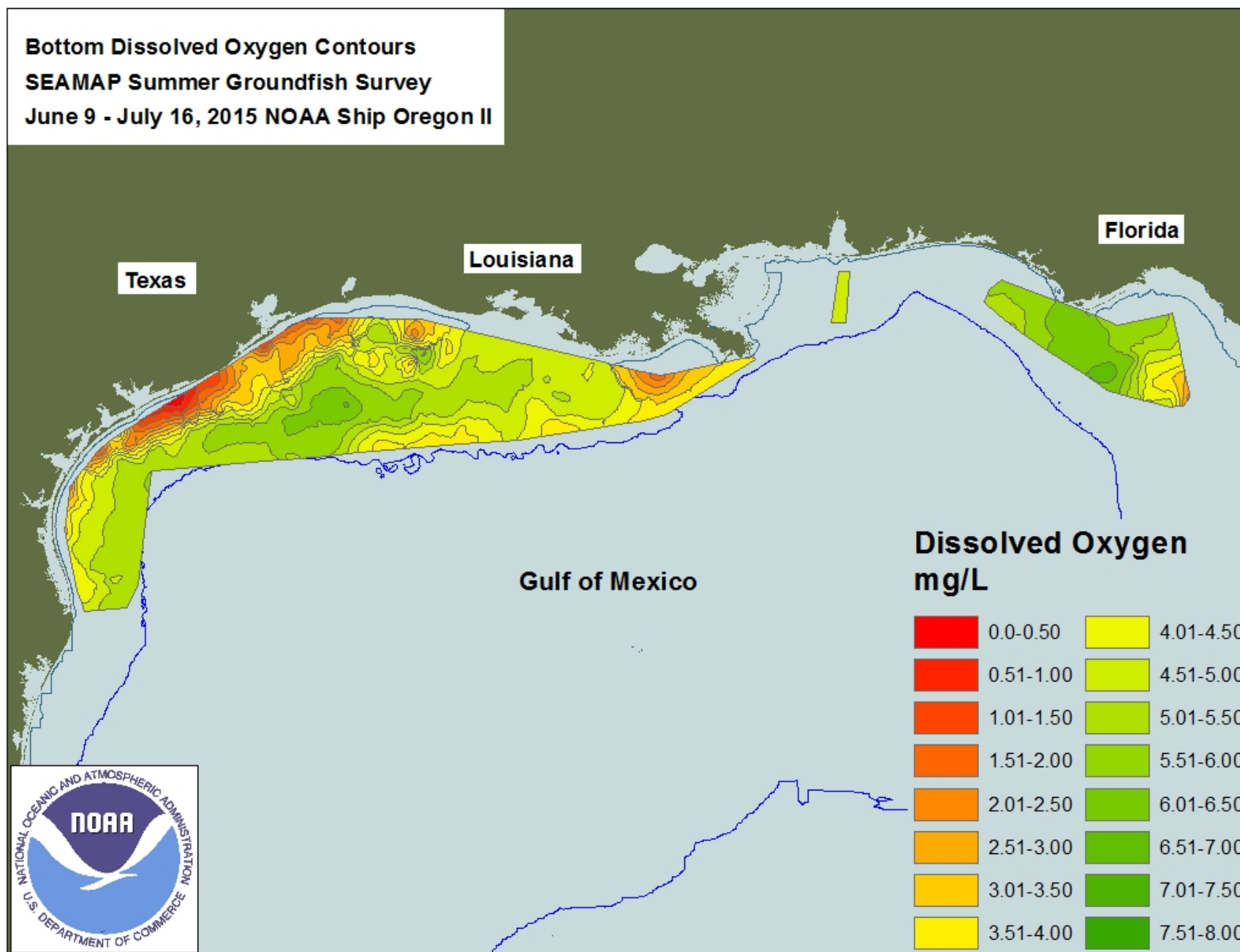


Figure 4. Dissolved oxygen levels as recorded by NOAA Ship *Oregon II* during¹⁶ cruise R2-15-03 (313).
(<http://www.ncddc.noaa.gov/hypoxia/products/>)