

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:
Lab Director

Date:

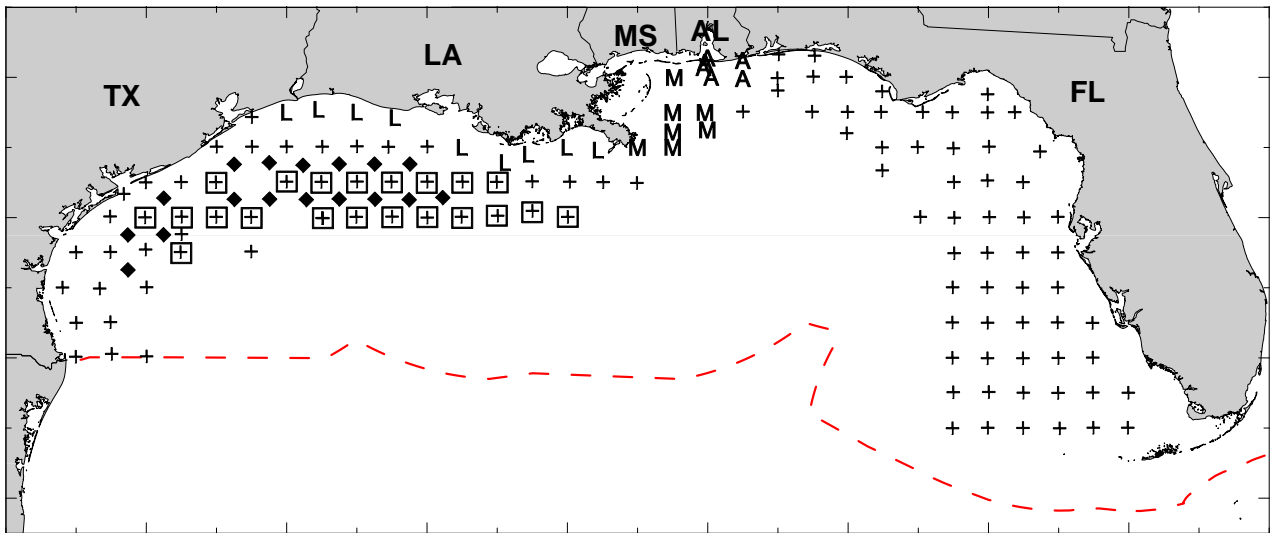
Approved by:
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Director, SEFSC

Date:

CRUISE RESULTS

Southeast Area Monitoring and Assessment Program
(SEAMAP) 2014 Fall Plankton Survey

NOAA Ship *Gordon Gunter* Cruise GU-14-05
August 22 – September 30, 2014



U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
Mississippi Laboratories
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INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA) Ship *Gordon Gunter* departed Pascagoula, MS on August 22, 2014 to initiate the Southeast Area Monitoring and Assessment Program (SEAMAP) Fall Ichthyoplankton Survey in the Gulf of Mexico (GOM). The SEAMAP Program is a cooperative State/Federal/University program designed to collect biological and environmental data from waters of the U.S. GOM. During the fall survey, plankton samples are collected from a systematic grid of stations to assess distribution, occurrence and abundance of the early life stages of a variety of species of fishes and invertebrates. A total of 31 successful sea days were worked over two legs during the cruise: Leg I, August 22 – September 8; Leg II, September 18 – 30.

The first leg of the survey was scheduled to begin on August 21st, however departure was delayed one day to repair a circuit board for the MSD system after an electrical surge earlier in the week damaged the part. Three full stations were skipped during Leg 1 due to inclement weather in the area of the station (LU007, B218, B216 -high winds/lightning). Two CTD casts at stations 032 and 068 were also skipped due to excessive winds or lightning at the end of the station. As the leg progressed, four offshore (B244, B245, B246, B247) stations were dropped to allow for the completion of all other planned stations. The transmissometer was found to be giving bad data early in Leg 1 and was subsequently removed from the CTD unit. There was not a spare transmissometer aboard the ship, therefore there was no reliable transmissometer data gathered for Leg 1 of the survey. Two transmissometers that were not in use were brought aboard for Leg 2, one from the Stennis facility and one from NOAA Ship *Oregon II*.

Departure for Leg 2 was delayed six days due to a damaged breaker in the port main engine. Due to the loss of so much time, all remaining secondary objective stations (LU stations & Dual Mesh tows) were cancelled at the beginning of the leg to focus on completing as many primary stations as possible. As the leg progressed, additional stations were skipped in consultation with the Chief Scientist, to ensure the best possible coverage of primary stations, this included seven dropped standard SEAMAP stations (B116, B113, B154, B097, B096, B088, B089) for Leg 2. In all, the dropped sampling included a total of seven standard SEAMAP stations, 16 LU stations, and 20 Dual-Mesh sampling tows from Leg 2 objectives.

OBJECTIVES

1. Assess the occurrence, abundance and geographical distribution of the early life stages of fall spawning fishes, especially king and Spanish mackerel, red drum, and snappers, on U.S. continental shelf waters in the GOM using a bongo frame fitted with 0.335 mm nets, and a neuston frame fitted with a 0.950 mm net at selected SEAMAP stations in support of annual stock assessments.
2. Describe the pelagic habitat of fish larvae through measurements of various physical and biological parameters:
 - a. Record profiles through the water column of temperature, salinity, fluorescence, dissolved oxygen, and turbidity using a CTD at SEAMAP stations.

- b. Measure chlorophyll *a* in replicate water samples taken at surface, mid or maximum chlorophyll layer and near bottom (to a maximum of 200 m) depths using bench top fluorometry.
 - c. Detect and measure frontal features along the survey cruise track using data from the ship's Fluoro-thermosalinograph flow-through system (TSG).
3. Map the distribution of fish eggs and invertebrate zooplankton along the cruise track using a Continuous Underway Fish Egg Sampler (CUFES).
4. Study extrusion of smaller fish larvae through the standard SEAMAP 0.335 mm mesh bongo nets by using a secondary standard bongo frame outfitted with both 0.335 mm and 0.202 mm mesh nets. These dual-mesh tows will be done at selected stations throughout the trackline.
5. Examine the spatial resolution of red and vermilion snapper distribution as compared with the standard 30 nm station grid by adding sampling stations at the 15 nm center points between standard stations in targeted areas. These stations will be sampled with a standard bongo, neuston, and CTD cast.
6. Collect detailed observations of net-caught jellyfish and ctenophores.

SURVEY RESULTS

Ichthyoplankton Data

Survey Design

A predefined cruise track of 143 stations, approximately 30 nm apart in a systematic grid, were targeted for this survey. An additional 37 non-SEAMAP stations (LU) were planned to examine spatial variability in areas within the SEAMAP grid. Each of these stations were positioned at a center-point equidistant (~15 nm) from the four surrounding standard SEAMAP stations. There were 44 planned Dual-Mesh stations throughout the trackline on both legs. The LU and Dual-Mesh stations were focused over areas where large numbers of snapper larvae have been collected on past surveys. The state of Louisiana planned to sample nine of the standard SEAMAP stations, Mississippi planned seven, and Alabama planned three stations.

Sampling Methodology

Sample and data collection were implemented in accordance with procedures outlined in the SEAMAP data collections manual. SEAMAP plankton samples were taken with the standard SEAMAP 61 cm bongo frame outfitted with two 0.335 mm mesh nets and towed in an oblique path from near bottom or 200 m maximum depth to the surface. A SBE19 SEACAT Profiler was attached on the towing wire above the frame to provide real time depth readings along with temperature and salinity. A flowmeter mounted inside each side of the bongo frame measured the volume filtered during the tow. SEAMAP plankton samples were also taken using a 0.950 mm mesh neuston net attached to a 1 x 2 m metal frame that was towed for 10 min at a vessel speed (~ 2 kt) sufficient to keep the net opening half submerged in the water maintaining a sampling depth of 0.5 m. In areas with a high density of sargassum or jellyfish, the total tow time

was reduced to 5 min. Preservation protocol called for the left bongo samples to be preserved in 10% formalin and then transferred to fresh 95% ETOH after 36 h in order to improve long term storage for genetic analysis. The right bongo and neuston samples were initially preserved in 95% ETOH and then transferred to fresh 95% ETOH after 24 h.

Additional plankton samples were taken using a SEAMAP dual-mesh bongo plankton sampler that is comprised of two 61 cm diameter collars mounted with a 0.335 and 0.202 mm net. Each dual-mesh tow was conducted exactly like standard SEAMAP bongo tows. This sampler was deployed to study extrusion of smaller fish larvae through the standard SEAMAP 0.335 mm mesh bongo nets. Samples from these dual-mesh tows were both initially preserved in 10% formalin and transferred to fresh 95% ETOH after 36 h.

LU stations were conducted like standard SEAMAP stations, which included a standard bongo tow, neuston tow, and CTD cast. All samples from the LU stations were initially preserved in 95% ETOH and then transferred to fresh 95% ETOH after 24 h.

Zooplankton and fish egg samples were collected between stations using a CUFES. Water sampled by the CUFES was pumped from the center sea chest which had an intake approximately 3 m below the surface of the water. Seawater was filtered through a 0.505 mm sieve within the CUFES and collected over 30 min intervals between stations.

CTD casts were conducted at each station and water was collected at the surface, chlorophyll maximum depth, and bottom depth, which was then used for chlorophyll extraction and measurement.

Collection Summary

Ichthyoplankton samples were collected at 128 stations by NOAA Ship *Gordon Gunter* during the survey (Figures 1 and 2). A total of 70 stations were sampled during Leg 1 resulting in 53 right bongo (RB), 53 left bongo (LB), 52 neuston (NN), 21 Dual-mesh right bongo (DM-RB), 21 Dual-mesh left bongo (DM-LB), and 17 full LU stations which each had a RB, LB, and NN (Table 1). A total of 58 stations were sampled during Leg 2 resulting in 57 right bongo, 58 left bongo, and 55 neuston (Table 1). High winds and lightning caused the cancelation of three full stations during Leg 1 and also cancelled the CTD at stations 032 and 068. In several situations the neuston sample was not retained due to very large amounts of sargassum (Station 016) or jellyfish present in the sample (Stations 92, 95, and 102). One neuston sample was lost when the neuston net failed during the tow (Station 034). An electronics issue was causing difficulty with some CTD casts making them unusable. Water samples were not collected for Chl *a* analysis at the end of Leg 1 (stations 069-070) due to the lack of proper time to process the samples.

A total of 648 near-surface fish egg and invertebrate zooplankton samples were collected between stations using a CUFES (Table 1, Figure 3). CUFES samples will remain at the NOAA /NMFS Mississippi Laboratories for sorting and analysis. These samples were collected along the trackline, including between station locations that were sampled by the state partners.

Jellyfish and ctenophores collected in bongo and neuston nets were thoroughly rinsed, removed from the plankton samples, and noted in the database. These organisms were identified, counted, and volume measured. Data were also recorded on data sheets for each station. *Sargassum* spp. collected in bongo and neuston nets were thoroughly rinsed, removed from the plankton sample, and volume measured. The amount of *Sargassum* spp. in each net was recorded in the database.

State Vessels

The Louisiana Department of Fisheries and Wildlife sampled nine SEAMAP stations off southern Louisiana with bongo, neuston, and CTD gear from the R/V *Acadiana* (Table 1, Figure 1). Plankton samples taken by the Louisiana vessel were preserved similar to the way it was completed aboard the NOAA vessel. The primary bongo for Louisiana was the LB, so the LB and Neuston samples were initially preserved in 95% ETOH and transferred to new 95% ETOH after 24 h. Their RB was initially preserved in 10% Formalin and transferred to new 95% ETOH after 36 h following SEAMAP procedure. Seven stations were sampled with bongo, neuston, and CTD by the University of Southern Mississippi (USM), Gulf Coast Research Laboratory (GCRL) R/V *Tommy Munro* off Mississippi (Table 1, Figure 1). These samples were initially all preserved in 10% Formalin and transferred to new 95% ETOH after the ship returned to the dock. The Alabama Marine Resource Division (AMRD) sampled three standard SEAMAP stations with bongo, neuston and CTD gear (Table 1, Figure 1) aboard the R/V *Discovery*. Alabama samples were initially preserved in 10% formalin and were transferred to 95% ETOH upon arrival at the NOAA/NMFS Laboratories. All samples from state vessels were transferred to the NOAA/NMFS Laboratory in Pascagoula, MS.

Sample Processing / Archival Storage

Plankton samples were assigned SEAMAP numbers at sea on NOAA Ship *Gordon Gunter* (Table 2). Primary bongo samples (RB for NOAA, Mississippi, and Alabama; LB for Louisiana) and neuston samples will be shipped to the Sea Fisheries Institute, Plankton Sorting and Identification Center (ZSIOP), Gdynia, Poland for sorting. The LBs (RB for Louisiana) will be deposited in the SEAMAP Invertebrate Archive at GCRL, USM, Ocean Springs, MS. At this time, all Dual-Mesh samples will remain with the NOAA/NMFS Mississippi Laboratory until processed in the future. Data on gelatinous organisms and sargassum collected during the cruise will be archived at NMFS Pascagoula Laboratory for future analysis.

Environmental Data

Environmental data were collected with a Seabird SBE 9/11 Plus CTD at a total of 126 stations from NOAA Ship *Gordon Gunter* during the survey. At all stations sampled with the SBE 9/11 Plus CTD, a cast to near bottom or a maximum depth of 200 m was conducted. The Seabird SBE 9/11 Plus CTD was used with a dual suite of the following sensors: SBE 03 Temperature sensor, SBE digiquartz pressure sensor, and SBE 43 dissolved oxygen sensor. Only a single Wetlabs Wetstar fluorometer and Wetlabs C-Star transmissometer were used because of space limitations on the CTD. Additional environmental and station information was accessed from shipboard sensors via the Scientific Computer System (SCS), which continuously displayed and recorded the ship's position, heading, speed, wind direction, wind speed, barometric pressure, sea surface temperature, air temperature and water depth. Each sampling event was

conducted through the SCS and data (environmental and biological) were ingested into a Microsoft Access database. Aboard *Gordon Gunter*, water samples were taken at all stations using Niskin bottles attached to a SBE carousel sampler. Target depths for the water samples were at the surface (d5 m), chlorophyll maximum, and near-bottom (up to 200 m maximum). At stations where the water column was shallow and well mixed, only surface and bottom water samples were taken. Triplicate, 200 ml subsamples from the three sampled depths were analyzed for chlorophyll *a* concentration ($\mu\text{g/L}$) using a Turner Designs 10-AU-005 benchtop fluorometer with a 10-04R optical kit and the modified Welshmeyer method. Chlorophyll readings from each sample depth were averaged (Table 3) and entered into the Microsoft Access database. The CTD and chlorophyll data were processed at sea and ingested into the database. A copy of the database and CTD casts will be kept at the NOAA Laboratory in Pascagoula, MS.

Salinity (PSU), sea temperature ($^{\circ}\text{C}$), and dissolved oxygen (mg/L), were recorded from the sensors on the CTD for the same depths as water samples for the chlorophyll *a* measurements. Near surface (d 5 m depth) values of salinity, sea temperature, dissolved oxygen, and chlorophyll *a* concentrations for stations are presented in Figures 4 through 7.

Throughout the cruise, a SBE21 TSG equipped with a Turner Designs 10-AU fluorometer continuously measured surface salinity, temperature, and fluorescence. A dedicated computer recorded all the information and was backed up daily to the ship's server. This complete dataset was copied off the ship's server and returned to the NMFS Pascagoula Laboratory for analysis and archiving.

CRUISE PARTICIPANTS

Leg I (22 August – 8 September 2014)

Name / Title / Organization

Pam Bond / Field Party Chief / NMFS, Pascagoula, MS
Adam Pollack / Fishery Biologist / Riverside¹, Pascagoula, MS
David Huddleston / Fishery Biologist / Riverside¹, Pascagoula, MS
Carley Knight / Fishery Biologist / Riverside¹, Pascagoula, MS
Cindy Gavins / Fishery Biologist / Riverside¹, Pascagoula, MS
Jonathan Jackson / Fishery Biologist / Riverside¹, Pascagoula, MS
Madalyn Meaker / Fishery Biologist / Riverside¹, Pascagoula, MS

Leg II (18-30 September 2014)

Name / Title / Organization

Pam Bond / Field Party Chief / NMFS, Pascagoula, MS
Andy Millett / Fishery Biologist / Riverside¹, Pascagoula, MS
Joanne Lyczkowski-Shultz / Fishery Biologist / NMFS, Pascagoula, MS
Denice Drass / Fishery Biologist / NMFS, Pascagoula, MS
David Huddleston / Fishery Biologist / Riverside¹, Pascagoula, MS
Chrissy Stepongzi / Fishery Biologist / Riverside¹, Pascagoula, MS
Rebeca Rosado Gonzalez / Fishery Biologist / Riverside¹, Pascagoula, MS

¹ – Riverside Technology, Inc.

Table 1. Summary of valid SEAMAP ichthyoplankton collections taken during Fall SEAMAP Plankton survey aboard the NOAA Ship *Gordon Gunter* GU-14-05 and state agency vessels. SEAMAP standard samples are denoted as Right Bongo, Left Bongo, and Neuston; Dual-mesh samples are denoted as DM-RB for Right bongo samples (0.333 mm mesh) and DM-LB for Left Bongo samples (0.202 mm mesh).

Leg	CTD Casts	Right Bongo (0.335 mm)	Left Bongo (0.335 mm)	Neuston (0.950 mm)	CUFES (0.505 mm)	Dual Mesh-Right Bongo (0.335 mm)	Dual Mesh-Left Bongo (0.202 mm)	LU Right Bongo (0.335 mm)	LU Left Bongo (0.335 mm)	LU Neuston (0.950 mm)
<i>Gunter</i> (NOAA) Leg 1	68	53	53	52	387	21	21*	17	17	17
<i>Gunter</i> (NOAA) Leg 2	58	57	58	55	261	0	0	0	0	0
<i>R/V Tommy Munro</i> (Mississippi)	7	7	7	7	0	0	0	0	0	0
<i>R/V Acadiana</i> (Louisiana)	9	9	9	9	0	0	0	0	0	0
<i>R/V Discovery</i> (Alabama)	6	6	6	6	0	0	0	0	0	0
Total	148	132	133	129	648	21	21*	17	17	17

* NOTE: One Dual-mesh left bongo was accidentally filtered through a 0.333 mesh sieve, so the sample was re-coded as a 0.333 mesh LB.

Table 2. Summary of plankton sampling effort during the Fall SEAMAP Plankton Survey conducted from the NOAA Ship *Gordon Gunter*, cruise GU-14-05, 22 August – 30 September 2014. P-Sta # = Pascagoula station number; S-Sta # = SEAMAP station number; Smp # = SEAMAP sample number; RB = Right Bongo; LB = Left Bongo; NN = Neuston; DM-RB = Dual Mesh Right Bongo; DM-LB = Dual Mesh Left Bongo; Preservative = Initial preservative; FORM = Formalin; ETOH = Ethanol; Date = GMT date; Lat = Latitude of sample in decimal degrees; Lon = Longitude of sample in decimal degrees.

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
001	B030	48102	RB	95% ETOH	25-Aug-14	26.0216	-95.9963
001	B030	48103	LB	10% Form	25-Aug-14	26.0216	-95.9963
001	B030	48104	NN	95% ETOH	25-Aug-14	26.0118	-96.0025
002	B316	48105	RB	95% ETOH	25-Aug-14	26.0571	-96.4932
002	B316	48106	LB	10% Form	25-Aug-14	26.0571	-96.4932
002	B316	48107	NN	95% ETOH	25-Aug-14	26.0484	-96.4953
003	B032	48108	RB	95% ETOH	25-Aug-14	26.0167	-97.0049
003	B032	48109	LB	10% Form	25-Aug-14	26.0167	-97.0049
003	B032	48110	NN	95% ETOH	25-Aug-14	26.0113	-97.0070
004	B238	48111	RB	95% ETOH	26-Aug-14	26.5002	-96.9984
004	B238	48112	LB	10% Form	26-Aug-14	26.5002	-96.9984
004	B238	48113	NN	95% ETOH	26-Aug-14	26.4954	-96.9954
005	B239	48114	RB	95% ETOH	26-Aug-14	26.5098	-96.5114
005	B239	48115	LB	10% Form	26-Aug-14	26.5098	-96.5114
005	B239	48116	NN	95% ETOH	26-Aug-14	26.5063	-96.5039
006	B031	48117	RB	95% ETOH	26-Aug-14	27.0068	-95.9964
006	B031	48118	LB	10% Form	26-Aug-14	27.0068	-95.9964
006	B031	48119	NN	95% ETOH	26-Aug-14	26.9975	-95.9976
007	B328	48120	RB	95% ETOH	26-Aug-14	26.9889	-96.6645
007	B328	48121	LB	10% Form	26-Aug-14	26.9889	-96.6645
007	B328	48122	NN	95% ETOH	26-Aug-14	27.0002	-96.6664

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
008	B051	48123	RB	95% ETOH	26-Aug-14	27.0034	-97.1943
008	B051	48124	LB	10% Form	26-Aug-14	27.0034	-97.1943
008	B051	48125	NN	95% ETOH	26-Aug-14	26.9960	-97.1961
009	B235	48126	RB	95% ETOH	26-Aug-14	27.5058	-97.0018
009	B235	48127	LB	10% Form	26-Aug-14	27.5058	-97.0018
009	B235	48128	NN	95% ETOH	26-Aug-14	27.5022	-96.9970
010	B234	48129	RB	95% ETOH	27-Aug-14	27.5097	-96.5130
010	B234	48130	LB	10% Form	27-Aug-14	27.5097	-96.5130
010	B234	48131	NN	95% ETOH	27-Aug-14	27.5072	-96.5069
011	LU001	48132	RB	95% ETOH	27-Aug-14	27.2529	-96.2623
011	LU001	48133	LB	95% ETOH	27-Aug-14	27.2529	-96.2623
011	LU001	48134	NN	95% ETOH	27-Aug-14	27.2492	-96.2521
012	B232	48135	RB	95% ETOH	27-Aug-14	27.5448	-96.0100
012	B232	48136	LB	10% Form	27-Aug-14	27.5448	-96.0100
012	B232	48137	NN	95% ETOH	27-Aug-14	27.5514	-96.0095
012	B232	48138	DM-RB	10% Form	27-Aug-14	27.5508	-95.9995
012	B232	48139	DM-LB	10% Form	27-Aug-14	27.5508	-95.9995
013	LU002	48140	RB	95% ETOH	27-Aug-14	27.7512	-96.2646
013	LU002	48141	LB	95% ETOH	27-Aug-14	27.7512	-96.2646
013	LU002	48142	NN	95% ETOH	27-Aug-14	27.7557	-96.2567
014	B233	48143	RB	95% ETOH	27-Aug-14	28.0162	-96.5163

Table 2 continued

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
014	B233	48144	LB	10% Form	27-Aug-14	28.0162	-96.5163
014	B233	48145	NN	95% ETOH	27-Aug-14	28.0130	-96.5140
015	B327	48146	RB	95% ETOH	27-Aug-14	28.3382	-96.3217
015	B327	48147	LB	10% Form	27-Aug-14	28.3382	-96.3217
015	B327	48148	NN	95% ETOH	27-Aug-14	28.3387	-96.3211
016	B231	48149	RB	95% ETOH	28-Aug-14	28.0031	-96.0188
016	B231	48150	LB	10% Form	28-Aug-14	28.0031	-96.0188
016	B231	48151	DM-RB	10% Form	28-Aug-14	27.9987	-96.0139
016	B231	48152	DM-LB	10% Form	28-Aug-14	27.9987	-96.0139
017	LU004	48153	RB	95% ETOH	28-Aug-14	27.7539	-95.7558
017	LU004	48154	LB	95% ETOH	28-Aug-14	27.7539	-95.7558
017	LU004	48155	NN	95% ETOH	28-Aug-14	27.7526	-95.7541
018	B225	48156	RB	95% ETOH	28-Aug-14	27.5085	-95.5126
018	B225	48157	LB	10% Form	28-Aug-14	27.5085	-95.5126
018	B225	48158	NN	95% ETOH	28-Aug-14	27.4965	-95.5096
018	B225	48159	DM-RB	10% Form	28-Aug-14	27.4928	-95.5020
018	B225	48160	DM-LB	10% Form	28-Aug-14	27.4928	-95.5020
019	B326	48161	RB	95% ETOH	28-Aug-14	27.7639	-95.4990
019	B326	48162	LB	10% Form	28-Aug-14	27.7639	-95.4990
019	B326	48163	NN	95% ETOH	28-Aug-14	27.7579	-95.5006
020	B226	48164	RB	95% ETOH	28-Aug-14	28.0127	-95.4979
020	B226	48165	LB	10% Form	28-Aug-14	28.0127	-95.4979
020	B226	48166	NN	95% ETOH	28-Aug-14	28.0068	-95.4963
020	B226	48167	DM-RB	10% Form	28-Aug-14	27.9985	-95.4927
020	B226	48168	DM-LB	10% Form	28-Aug-14	27.9985	-95.4927
021	LU003	48169	RB	95% ETOH	28-Aug-14	28.2749	-95.7523

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
021	LU003	48170	LB	95% ETOH	28-Aug-14	28.2749	-95.7523
021	LU003	48171	NN	95% ETOH	28-Aug-14	28.2680	-95.7541
022	B230	48172	RB	95% ETOH	28-Aug-14	28.5018	-96.0087
022	B230	48173	LB	10% Form	28-Aug-14	28.5018	-96.0087
022	B230	48174	NN	95% ETOH	28-Aug-14	28.4984	-96.0035
023	B228	48175	RB	95% ETOH	29-Aug-14	28.5069	-95.5052
023	B228	48176	LB	10% Form	29-Aug-14	28.5069	-95.5052
023	B228	48177	NN	95% ETOH	29-Aug-14	28.5010	-95.5029
024	B223	48178	RB	95% ETOH	29-Aug-14	28.0103	-95.0046
024	B223	48179	LB	10% Form	29-Aug-14	28.0103	-95.0046
024	B223	48180	NN	95% ETOH	29-Aug-14	28.0062	-95.0024
024	B223	48181	DM-RB	10% Form	29-Aug-14	28.0012	-94.9955
024	B223	48182	DM-LB	10% Form	29-Aug-14	28.0012	-94.9955
025	B243	48183	RB	95% ETOH	29-Aug-14	27.5164	-94.5061
025	B243	48184	LB	10% Form	29-Aug-14	27.5164	-94.5061
025	B243	48185	NN	95% ETOH	29-Aug-14	27.5114	-94.5034
026	B217	48186	RB	95% ETOH	29-Aug-14	28.0084	-94.5078
026	B217	48187	LB	10% Form	29-Aug-14	28.0084	-94.5078
026	B217	48188	NN	95% ETOH	29-Aug-14	28.0041	-94.5012
026	B217	48189	DM-RB	10% Form	29-Aug-14	27.9936	-94.4992
026	B217	48190	DM-LB	10% Form	29-Aug-14	27.9936	-94.4992
027	LU006	48191	RB	95% ETOH	29-Aug-14	28.2576	-94.7476
027	LU006	48192	LB	95% ETOH	29-Aug-14	28.2576	-94.7476
027	LU006	48193	NN	95% ETOH	29-Aug-14	28.2521	-94.7459
028	B222	48194	RB	95% ETOH	30-Aug-14	28.5052	-95.0092
028	B222	48195	LB	10% Form	30-Aug-14	28.5052	-95.0092

Table 2 continued

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
028	B222	48196	NN	95% ETOH	30-Aug-14	28.5011	-95.0061
028	B222	48197	DM-RB	10% Form	30-Aug-14	28.4957	-95.0015
028	B222	48198	DM-LB	10% Form	30-Aug-14	28.4957	-95.0015
029	B221	48199	RB	95% ETOH	30-Aug-14	29.0114	-94.9990
029	B221	48200	LB	10% Form	30-Aug-14	29.0114	-94.9990
029	B221	48201	NN	95% ETOH	30-Aug-14	29.0069	-95.0013
030	LU005	48202	RB	95% ETOH	30-Aug-14	28.7590	-94.7486
030	LU005	48203	LB	95% ETOH	30-Aug-14	28.7590	-94.7486
030	LU005	48204	NN	95% ETOH	30-Aug-14	28.7550	-94.7497
031	LU008	48205	RB	95% ETOH	30-Aug-14	28.2618	-94.2440
031	LU008	48206	LB	95% ETOH	30-Aug-14	28.2618	-94.2440
031	LU008	48207	NN	95% ETOH	30-Aug-14	28.2559	-94.2475
032	B209	48208	RB	95% ETOH	30-Aug-14	27.9942	-93.4954
032	B209	48209	LB	10% Form	30-Aug-14	27.9942	-93.4954
032	B209	48210	NN	95% ETOH	30-Aug-14	28.0030	-93.4930
032	B209	48211	DM-RB	10% Form	30-Aug-14	27.9915	-93.4835
032	B209	48212	*LB	10% Form	30-Aug-14	27.9915	-93.4835
033	LU023	48213	RB	95% ETOH	31-Aug-14	28.2545	-93.7217
033	LU023	48214	LB	95% ETOH	31-Aug-14	28.2545	-93.7217
033	LU023	48215	NN	95% ETOH	31-Aug-14	28.2529	-93.7290
034	B215	48216	RB	95% ETOH	31-Aug-14	28.5121	-94.0017
034	B215	48217	LB	10% Form	31-Aug-14	28.5121	-94.0017
034	B215	48218	DM-RB	10% Form	31-Aug-14	28.5127	-93.9980
034	B215	48219	DM-LB	10% Form	31-Aug-14	28.5127	-93.9980
035	LU009	48220	RB	95% ETOH	31-Aug-14	28.7808	-94.2491
035	LU009	48221	LB	95% ETOH	31-Aug-14	28.7808	-94.2491

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
035	LU009	48222	NN	95% ETOH	31-Aug-14	28.7773	-94.2498
036	B219	48223	RB	95% ETOH	31-Aug-14	29.0115	-94.4949
036	B219	48224	LB	10% Form	31-Aug-14	29.0115	-94.4949
036	B219	48225	NN	95% ETOH	31-Aug-14	29.0068	-94.4958
037	B220	48226	RB	95% ETOH	31-Aug-14	29.4336	-94.4974
037	B220	48227	LB	10% Form	31-Aug-14	29.4336	-94.4974
037	B220	48228	NN	95% ETOH	31-Aug-14	29.4280	-94.4991
038	B214	48229	RB	95% ETOH	31-Aug-14	29.0125	-94.0029
038	B214	48230	LB	10% Form	31-Aug-14	29.0125	-94.0029
038	B214	48231	NN	95% ETOH	31-Aug-14	29.0062	-94.0039
039	LU010	48232	RB	95% ETOH	01-Sep-14	28.7436	-93.7679
039	LU010	48233	LB	95% ETOH	01-Sep-14	28.7436	-93.7679
039	LU010	48234	NN	95% ETOH	01-Sep-14	28.7383	-93.7679
040	B210	48235	RB	95% ETOH	01-Sep-14	28.5097	-93.5067
040	B210	48236	LB	10% Form	01-Sep-14	28.5097	-93.5067
040	B210	48237	NN	95% ETOH	01-Sep-14	28.5041	-93.5068
040	B210	48238	DM-RB	10% Form	01-Sep-14	28.4954	-93.5061
040	B210	48239	DM-LB	10% Form	01-Sep-14	28.4954	-93.5061
041	LU024	48240	RB	95% ETOH	01-Sep-14	28.2631	-93.2529
041	LU024	48241	LB	95% ETOH	01-Sep-14	28.2631	-93.2529
041	LU024	48242	NN	95% ETOH	01-Sep-14	28.2556	-93.2539
042	B023	48243	RB	95% ETOH	01-Sep-14	28.0105	-93.0084
042	B023	48244	LB	10% Form	01-Sep-14	28.0105	-93.0084
042	B023	48245	NN	95% ETOH	01-Sep-14	28.0051	-93.0060
042	B023	48246	DM-RB	10% Form	01-Sep-14	27.9988	-92.9985
042	B023	48247	DM-LB	10% Form	01-Sep-14	27.9988	-92.9985

Table 2 continued

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
043	B202	48248	RB	95% ETOH	01-Sep-14	28.0139	-92.4983
043	B202	48249	LB	10% Form	01-Sep-14	28.0139	-92.4983
043	B202	48250	NN	95% ETOH	01-Sep-14	28.0092	-92.4969
043	B202	48251	DM-RB	10% Form	01-Sep-14	28.0036	-92.4949
043	B202	48252	DM-LB	10% Form	01-Sep-14	28.0036	-92.4949
044	LU027	48253	RB	95% ETOH	01-Sep-14	28.2599	-92.7438
044	LU027	48254	LB	95% ETOH	01-Sep-14	28.2599	-92.7438
044	LU027	48255	NN	95% ETOH	01-Sep-14	28.2576	-92.7377
045	B208	48256	RB	95% ETOH	01-Sep-14	28.5138	-92.9984
045	B208	48257	LB	10% Form	01-Sep-14	28.5138	-92.9984
045	B208	48258	NN	95% ETOH	01-Sep-14	28.5076	-92.9985
045	B208	48259	DM-RB	10% Form	01-Sep-14	28.4978	-92.9972
045	B208	48260	DM-LB	10% Form	01-Sep-14	28.4978	-92.9972
046	LU025	48261	RB	95% ETOH	02-Sep-14	28.7627	-93.2528
046	LU025	48262	LB	95% ETOH	02-Sep-14	28.7627	-93.2528
046	LU025	48263	NN	95% ETOH	02-Sep-14	28.7567	-93.2511
047	B211	48264	RB	95% ETOH	02-Sep-14	29.0117	-93.4933
047	B211	48265	LB	10% Form	02-Sep-14	29.0117	-93.4933
047	B211	48266	NN	95% ETOH	02-Sep-14	29.0092	-93.4939
048	B207	48267	RB	95% ETOH	02-Sep-14	29.0158	-92.9991
048	B207	48268	LB	10% Form	02-Sep-14	29.0158	-92.9991
048	B207	48269	NN	95% ETOH	02-Sep-14	29.0103	-92.9973
049	LU026	48270	RB	95% ETOH	02-Sep-14	28.7614	-92.7486
049	LU026	48271	LB	95% ETOH	02-Sep-14	28.7614	-92.7486
049	LU026	48272	NN	95% ETOH	02-Sep-14	28.7580	-92.7477
050	B203	48273	RB	95% ETOH	02-Sep-14	28.5119	-92.5089

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
050	B203	48274	LB	10% Form	02-Sep-14	28.5119	-92.5089
050	B203	48275	NN	95% ETOH	02-Sep-14	28.5067	-92.5050
050	B203	48276	DM-RB	10% Form	02-Sep-14	28.4997	-92.5001
050	B203	48277	DM-LB	10% Form	02-Sep-14	28.4997	-92.5001
051	LU028	48278	RB	95% ETOH	03-Sep-14	28.2528	-92.2560
051	LU028	48279	LB	95% ETOH	03-Sep-14	28.2528	-92.2560
051	LU028	48280	NN	95% ETOH	03-Sep-14	28.2428	-92.2537
052	B022	48281	RB	95% ETOH	03-Sep-14	28.0001	-91.9970
052	B022	48282	LB	10% Form	03-Sep-14	28.0001	-91.9970
052	B022	48283	NN	95% ETOH	03-Sep-14	28.0159	-91.9998
052	B022	48284	DM-RB	10% Form	03-Sep-14	28.0058	-91.9954
052	B022	48285	DM-LB	10% Form	03-Sep-14	28.0058	-91.9954
053	B195	48286	RB	95% ETOH	03-Sep-14	28.0112	-91.5096
053	B195	48287	LB	10% Form	03-Sep-14	28.0112	-91.5096
053	B195	48288	NN	95% ETOH	03-Sep-14	28.0023	-91.5050
053	B195	48289	DM-RB	10% Form	03-Sep-14	27.9942	-91.4989
053	B195	48290	DM-LB	10% Form	03-Sep-14	27.9942	-91.4989
054	LU030	48291	RB	95% ETOH	03-Sep-14	28.2835	-91.7772
054	LU030	48292	LB	95% ETOH	03-Sep-14	28.2835	-91.7772
054	LU030	48293	NN	95% ETOH	03-Sep-14	28.2779	-91.7756
055	B201	48294	RB	95% ETOH	03-Sep-14	28.5120	-91.9975
055	B201	48295	LB	10% Form	03-Sep-14	28.5120	-91.9975
055	B201	48296	NN	95% ETOH	03-Sep-14	28.5042	-92.0005
055	B201	48297	DM-RB	10% Form	03-Sep-14	28.4940	-92.0042
055	B201	48298	DM-LB	10% Form	03-Sep-14	28.4940	-92.0042
056	LU029	48299	RB	95% ETOH	03-Sep-14	28.7617	-92.2453

Table 2 continued

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
056	LU029	48300	LB	95% ETOH	03-Sep-14	28.7617	-92.2453
056	LU029	48301	NN	95% ETOH	03-Sep-14	28.7561	-92.2451
057	B204	48302	RB	95% ETOH	03-Sep-14	29.0088	-92.5512
057	B204	48303	LB	10% Form	03-Sep-14	29.0088	-92.5512
057	B204	48304	NN	95% ETOH	03-Sep-14	29.0049	-92.5479
058	B200	48305	RB	95% ETOH	04-Sep-14	29.0126	-91.9974
058	B200	48306	LB	10% Form	04-Sep-14	29.0126	-91.9974
058	B200	48307	NN	95% ETOH	04-Sep-14	29.0075	-91.9973
059	B196	48308	RB	95% ETOH	04-Sep-14	28.5116	-91.4957
059	B196	48309	LB	10% Form	04-Sep-14	28.5116	-91.4957
059	B196	48310	NN	95% ETOH	04-Sep-14	28.5052	-91.4967
059	B196	48311	DM-RB	10% Form	04-Sep-14	28.4955	-91.4979
059	B196	48312	DM-LB	10% Form	04-Sep-14	28.4955	-91.4979
060	B017	48313	RB	95% ETOH	04-Sep-14	28.0267	-90.9935
060	B017	48314	LB	10% Form	04-Sep-14	28.0267	-90.9935
060	B017	48315	NN	95% ETOH	04-Sep-14	28.0193	-90.9901
060	B017	48316	DM-RB	10% Form	04-Sep-14	28.0262	-91.0055
060	B017	48317	DM-LB	10% Form	04-Sep-14	28.0262	-91.0055
061	B194	48318	RB	95% ETOH	04-Sep-14	28.5084	-91.0087
061	B194	48319	LB	10% Form	04-Sep-14	28.5084	-91.0087
061	B194	48320	NN	95% ETOH	05-Sep-14	28.5053	-91.0035
061	B194	48321	DM-RB	10% Form	05-Sep-14	28.4993	-90.9933
061	B194	48322	DM-LB	10% Form	05-Sep-14	28.4993	-90.9933
062	B191	48323	RB	95% ETOH	05-Sep-14	28.5161	-90.5017
062	B191	48324	LB	10% Form	05-Sep-14	28.5161	-90.5017
062	B191	48325	NN	95% ETOH	05-Sep-14	28.5109	-90.5036

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
063	B190	48326	RB	95% ETOH	05-Sep-14	28.0956	-90.4987
063	B190	48327	LB	10% Form	05-Sep-14	28.0956	-90.4987
063	B190	48328	NN	95% ETOH	05-Sep-14	28.0862	-90.4982
063	B190	48329	DM-RB	10% Form	05-Sep-14	28.0753	-90.5015
063	B190	48330	DM-LB	10% Form	05-Sep-14	28.0753	-90.5015
064	B016	48331	RB	95% ETOH	05-Sep-14	28.0098	-89.9945
064	B016	48332	LB	10% Form	05-Sep-14	28.0098	-89.9945
064	B016	48333	NN	95% ETOH	05-Sep-14	27.9967	-90.0050
064	B016	48334	DM-RB	10% Form	05-Sep-14	28.0096	-89.9943
064	B016	48335	DM-LB	10% Form	05-Sep-14	28.0096	-89.9943
065	B189	48336	RB	95% ETOH	05-Sep-14	28.5115	-89.9671
065	B189	48337	LB	10% Form	05-Sep-14	28.5115	-89.9671
065	B189	48338	NN	95% ETOH	05-Sep-14	28.4973	-89.9696
066	B186	48339	RB	95% ETOH	06-Sep-14	28.5052	-89.4911
066	B186	48340	LB	10% Form	06-Sep-14	28.5052	-89.4911
066	B186	48341	NN	95% ETOH	06-Sep-14	28.5031	-89.5077
067	B184	48342	RB	95% ETOH	06-Sep-14	28.4938	-89.0093
067	B184	48343	LB	10% Form	06-Sep-14	28.4938	-89.0093
067	B184	48344	NN	95% ETOH	06-Sep-14	28.5035	-89.0103
068	B319	48345	RB	95% ETOH	07-Sep-14	30.3260	-86.9904
068	B319	48346	LB	10% Form	07-Sep-14	30.3260	-86.9904
068	B319	48347	NN	95% ETOH	07-Sep-14	30.3293	-86.9946
069	B318	48348	RB	95% ETOH	07-Sep-14	30.3082	-86.4776
069	B318	48349	LB	10% Form	07-Sep-14	30.3082	-86.4776
069	B318	48350	NN	95% ETOH	07-Sep-14	30.3088	-86.4710
070	B172	48351	RB	95% ETOH	07-Sep-14	29.9888	-87.0081

Table 2 continued

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
070	B172	48352	LB	10% Form	07-Sep-14	29.9888	-87.0081
070	B172	48353	NN	95% ETOH	07-Sep-14	29.9911	-87.0009
071	B174	48354	RB	95% ETOH	19-Sep-14	29.5109	-87.4986
071	B174	48355	LB	10% Form	19-Sep-14	29.5109	-87.4986
071	B174	48356	NN	95% ETOH	19-Sep-14	29.5045	-87.5016
072	B320	48357	RB	95% ETOH	19-Sep-14	29.8117	-87.0025
072	B320	48358	LB	10% Form	19-Sep-14	29.8117	-87.0025
072	B320	48359	NN	95% ETOH	19-Sep-14	29.8022	-87.0048
073	B168	48360	RB	95% ETOH	19-Sep-14	30.0100	-86.4972
073	B168	48361	LB	10% Form	19-Sep-14	30.0100	-86.4972
073	B168	48362	NN	95% ETOH	19-Sep-14	30.0056	-86.4950
074	B167	48363	RB	95% ETOH	19-Sep-14	30.0058	-86.0275
074	B167	48364	LB	10% Form	19-Sep-14	30.0058	-86.0275
074	B167	48365	NN	95% ETOH	19-Sep-14	30.0014	-86.0238
075	B157	48366	RB	95% ETOH	20-Sep-14	29.7995	-85.5166
075	B157	48367	LB	10% Form	20-Sep-14	29.7995	-85.5166
075	B157	48368	NN	95% ETOH	20-Sep-14	29.7990	-85.5120
076	B158	48369	RB	95% ETOH	20-Sep-14	29.5067	-85.5320
076	B158	48370	LB	10% Form	20-Sep-14	29.5067	-85.5320
076	B158	48371	NN	95% ETOH	20-Sep-14	29.5072	-85.5295
077	B166	48372	RB	95% ETOH	20-Sep-14	29.5063	-86.0080
077	B166	48373	LB	10% Form	20-Sep-14	29.5063	-86.0080
077	B166	48374	NN	95% ETOH	20-Sep-14	29.5034	-86.0022
078	B169	48375	RB	95% ETOH	20-Sep-14	29.5093	-86.5138
078	B169	48376	LB	10% Form	20-Sep-14	29.5093	-86.5138
078	B169	48377	NN	95% ETOH	20-Sep-14	29.5081	-86.5006

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
079	B165	48378	RB	95% ETOH	20-Sep-14	29.2028	-86.0202
079	B165	48379	LB	10% Form	20-Sep-14	29.2028	-86.0202
079	B165	48380	NN	95% ETOH	20-Sep-14	29.2029	-86.0098
080	B159	48381	RB	95% ETOH	20-Sep-14	29.0003	-85.5168
080	B159	48382	LB	10% Form	20-Sep-14	29.0003	-85.5168
080	B159	48383	NN	95% ETOH	20-Sep-14	28.9999	-85.5081
081	B160	48384	RB	95% ETOH	20-Sep-14	28.6724	-85.5136
081	B160	48385	LB	10% Form	20-Sep-14	28.6724	-85.5136
081	B160	48386	NN	95% ETOH	20-Sep-14	28.6759	-85.5011
082	B155	48387	RB	95% ETOH	21-Sep-14	29.0058	-85.0110
082	B155	48388	LB	10% Form	21-Sep-14	29.0058	-85.0110
082	B155	48389	NN	95% ETOH	21-Sep-14	29.0038	-85.0061
083	B156	48390	RB	95% ETOH	21-Sep-14	29.5053	-84.9376
083	B156	48391	LB	10% Form	21-Sep-14	29.5053	-84.9376
083	B156	48392	NN	95% ETOH	21-Sep-14	29.5045	-84.9347
084	B140	48393	RB	95% ETOH	21-Sep-14	29.5016	-84.5156
084	B140	48394	LB	10% Form	21-Sep-14	29.5016	-84.5156
084	B140	48395	NN	95% ETOH	21-Sep-14	29.5022	-84.5080
085	B138	48396	RB	95% ETOH	21-Sep-14	29.4991	-84.0137
085	B138	48397	LB	10% Form	21-Sep-14	29.4991	-84.0137
085	B138	48398	NN	95% ETOH	21-Sep-14	29.4994	-84.0079
086	B139	48399	RB	95% ETOH	21-Sep-14	29.7573	-84.0124
086	B139	48400	LB	10% Form	21-Sep-14	29.7573	-84.0124
086	B139	48401	NN	95% ETOH	21-Sep-14	29.7546	-84.0074
087	B115	48402	RB	95% ETOH	21-Sep-14	29.5026	-83.6268
087	B115	48403	LB	10% Form	21-Sep-14	29.5026	-83.6268

Table 2 continued

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
087	B115	48404	NN	95% ETOH	21-Sep-14	29.4998	-83.6229
088	B137	48405	RB	95% ETOH	22-Sep-14	29.0115	-83.9929
088	B137	48406	LB	10% Form	22-Sep-14	29.0115	-83.9929
088	B137	48407	NN	95% ETOH	22-Sep-14	29.0067	-83.9957
089	B141	48408	RB	95% ETOH	22-Sep-14	28.9873	-84.5005
089	B141	48409	LB	10% Form	22-Sep-14	28.9873	-84.5005
089	B141	48410	NN	95% ETOH	22-Sep-14	28.9926	-84.5001
090	B142	48411	RB	95% ETOH	22-Sep-14	28.5066	-84.4933
090	B142	48412	LB	10% Form	22-Sep-14	28.5066	-84.4933
090	B142	48413	NN	95% ETOH	22-Sep-14	28.5024	-84.4868
091	B136	48414	RB	95% ETOH	22-Sep-14	28.5291	-84.0152
091	B136	48415	LB	10% Form	22-Sep-14	28.5291	-84.0152
091	B136	48416	NN	95% ETOH	22-Sep-14	28.5327	-84.0086
092	B114	48417	RB	10% Form	22-Sep-14	28.9419	-83.2662
092	B114	48418	LB	10% Form	22-Sep-14	28.9419	-83.2662
093	B117	48419	RB	95% ETOH	22-Sep-14	28.5049	-83.5088
093	B117	48420	LB	10% Form	22-Sep-14	28.5049	-83.5088
093	B117	48421	NN	95% ETOH	22-Sep-14	28.5027	-83.5048
094	B112	48422	RB	95% ETOH	23-Sep-14	28.0107	-83.0118
094	B112	48423	LB	10% Form	23-Sep-14	28.0107	-83.0118
094	B112	48424	NN	95% ETOH	23-Sep-14	28.0097	-83.0143
095	B118	48425	RB	95% ETOH	23-Sep-14	28.0023	-83.4956
095	B118	48426	LB	10% Form	23-Sep-14	28.0023	-83.4956
096	B135	48427	RB	95% ETOH	23-Sep-14	28.0063	-83.9880
096	B135	48428	LB	10% Form	23-Sep-14	28.0063	-83.9880
096	B135	48429	NN	95% ETOH	23-Sep-14	28.0073	-83.9985

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
097	B143	48430	RB	95% ETOH	23-Sep-14	27.9981	-84.4872
097	B143	48431	LB	10% Form	23-Sep-14	27.9981	-84.4872
097	B143	48432	NN	95% ETOH	23-Sep-14	27.9995	-84.4958
098	B153	48433	RB	95% ETOH	23-Sep-14	28.0102	-84.9719
098	B153	48434	LB	10% Form	23-Sep-14	28.0102	-84.9719
098	B153	48435	NN	95% ETOH	23-Sep-14	28.0007	-84.9784
099	B144	48436	RB	95% ETOH	23-Sep-14	27.4918	-84.4891
099	B144	48437	LB	10% Form	23-Sep-14	27.4918	-84.4891
099	B144	48438	NN	95% ETOH	23-Sep-14	27.4966	-84.4947
100	B134	48439	RB	95% ETOH	23-Sep-14	27.4987	-84.0168
100	B134	48440	LB	10% Form	23-Sep-14	27.4987	-84.0168
100	B134	48441	NN	95% ETOH	23-Sep-14	27.5015	-84.0072
101	B119	48442	RB	95% ETOH	24-Sep-14	27.5031	-83.5127
101	B119	48443	LB	10% Form	24-Sep-14	27.5031	-83.5127
101	B119	48444	NN	95% ETOH	24-Sep-14	27.5027	-83.5047
102	B111	48445	RB	95% ETOH	24-Sep-14	27.5026	-83.0118
102	B111	48446	LB	10% Form	24-Sep-14	27.5026	-83.0118
103	B110	48447	RB	95% ETOH	24-Sep-14	27.0042	-83.0134
103	B110	48448	LB	10% Form	24-Sep-14	27.0042	-83.0134
103	B110	48449	NN	95% ETOH	24-Sep-14	27.0079	-83.0101
104	B120	48450	RB	95% ETOH	24-Sep-14	27.0019	-83.5153
104	B120	48451	LB	10% Form	24-Sep-14	27.0019	-83.5153
104	B120	48452	NN	95% ETOH	24-Sep-14	27.0034	-83.5095
105	B133	48453	RB	95% ETOH	24-Sep-14	27.0050	-84.0185
105	B133	48454	LB	10% Form	24-Sep-14	27.0050	-84.0185
105	B133	48455	NN	95% ETOH	24-Sep-14	27.0021	-84.0114

Table 2 continued

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
106	B145	48456	RB	95% ETOH	24-Sep-14	27.0055	-84.5108
106	B145	48457	LB	10% Form	24-Sep-14	27.0055	-84.5108
106	B145	48458	NN	95% ETOH	24-Sep-14	27.0040	-84.5008
107	B146	48459	RB	95% ETOH	25-Sep-14	26.5048	-84.5148
107	B146	48460	LB	10% Form	25-Sep-14	26.5048	-84.5148
107	B146	48461	NN	95% ETOH	25-Sep-14	26.5098	-84.5082
108	B132	48462	RB	95% ETOH	25-Sep-14	26.5007	-84.0131
108	B132	48463	LB	10% Form	25-Sep-14	26.5007	-84.0131
108	B132	48464	NN	95% ETOH	25-Sep-14	26.5005	-84.0020
109	B121	48465	RB	95% ETOH	25-Sep-14	26.5046	-83.5133
109	B121	48466	LB	10% Form	25-Sep-14	26.5046	-83.5133
109	B121	48467	NN	95% ETOH	25-Sep-14	26.5024	-83.5089
110	B109	48468	RB	95% ETOH	25-Sep-14	26.5047	-83.0162
110	B109	48469	LB	10% Form	25-Sep-14	26.5047	-83.0162
110	B109	48470	NN	95% ETOH	25-Sep-14	26.5018	-83.0088
111	B098	48471	RB	95% ETOH	25-Sep-14	26.4986	-82.5186
111	B098	48472	LB	10% Form	25-Sep-14	26.4986	-82.5186
111	B098	48473	NN	95% ETOH	25-Sep-14	26.4997	-82.5125
112	B099	48474	RB	95% ETOH	25-Sep-14	26.0039	-82.5144
112	B099	48475	LB	10% Form	25-Sep-14	26.0039	-82.5144
112	B099	48476	NN	95% ETOH	25-Sep-14	26.0033	-82.5083
113	B108	48477	RB	95% ETOH	25-Sep-14	25.9985	-83.0054
113	B108	48478	LB	10% Form	25-Sep-14	25.9985	-83.0054
113	B108	48479	NN	95% ETOH	25-Sep-14	26.0009	-82.9980
114	B122	48480	RB	95% ETOH	26-Sep-14	25.9944	-83.5091
114	B122	48481	LB	10% Form	26-Sep-14	25.9944	-83.5091

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
114	B122	48482	NN	95% ETOH	26-Sep-14	25.9983	-83.5025
115	B131	48483	RB	95% ETOH	26-Sep-14	25.9944	-84.0143
115	B131	48484	LB	10% Form	26-Sep-14	25.9944	-84.0143
115	B131	48485	NN	95% ETOH	26-Sep-14	25.9924	-84.0039
116	B147	48486	RB	95% ETOH	26-Sep-14	26.0011	-84.5141
116	B147	48487	LB	10% Form	26-Sep-14	26.0011	-84.5141
116	B147	48488	NN	95% ETOH	26-Sep-14	25.9981	-84.5012
117	B148	48489	RB	95% ETOH	26-Sep-14	25.5099	-84.5020
117	B148	48490	LB	10% Form	26-Sep-14	25.5099	-84.5020
117	B148	48491	NN	95% ETOH	26-Sep-14	25.5005	-84.5003
118	B130	48492	RB	95% ETOH	26-Sep-14	25.5130	-83.9962
118	B130	48493	LB	10% Form	26-Sep-14	25.5130	-83.9962
118	B130	48494	NN	95% ETOH	26-Sep-14	25.5072	-83.9882
119	B123	48495	RB	95% ETOH	26-Sep-14	25.5034	-83.5039
119	B123	48496	LB	10% Form	26-Sep-14	25.5034	-83.5039
119	123	48497	NN	95% ETOH	26-Sep-14	25.4992	-83.4975
120	B107	48498	RB	95% ETOH	27-Sep-14	25.5004	-83.0086
120	B107	48499	LB	10% Form	27-Sep-14	25.5004	-83.0086
120	B107	48500	NN	95% ETOH	27-Sep-14	25.5004	-83.0008
121	B100	48501	RB	95% ETOH	27-Sep-14	25.5057	-82.5140
121	B100	48502	LB	10% Form	27-Sep-14	25.5057	-82.5140
121	B100	48503	NN	95% ETOH	27-Sep-14	25.5035	-82.5088
122	B095	48504	RB	95% ETOH	27-Sep-14	25.5027	-82.0076
122	B095	48505	LB	10% Form	27-Sep-14	25.5027	-82.0076
122	B095	48506	NN	95% ETOH	27-Sep-14	25.5015	-82.0036
123	B094	48507	RB	95% ETOH	27-Sep-14	25.0038	-82.0152

Table 2 continued

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
123	B094	48508	LB	10% Form	27-Sep-14	25.0038	-82.0152
123	B094	48509	NN	95% ETOH	27-Sep-14	25.0029	-82.0109
124	B101	48510	RB	95% ETOH	27-Sep-14	25.0040	-82.5067
124	B101	48511	LB	10% Form	27-Sep-14	25.0040	-82.5067
124	B101	48512	NN	95% ETOH	27-Sep-14	25.0021	-82.5014
125	B106	48513	RB	95% ETOH	27-Sep-14	24.9953	-82.9863
125	B106	48514	LB	10% Form	27-Sep-14	24.9953	-82.9863
125	B106	48515	NN	95% ETOH	27-Sep-14	24.9978	-82.9940
126	B124	48516	RB	95% ETOH	27-Sep-14	25.0001	-83.5084

P-Sta #	S-Sta #	Smp #	Gear	Preservative	Date	Lat	Lon
126	B124	48517	LB	10% Form	27-Sep-14	25.0001	-83.5084
126	B124	48518	NN	10% Form	28-Sep-14	25.0022	-83.4977
127	B129	48519	RB	95% ETOH	28-Sep-14	25.0030	-84.0109
127	B129	48520	LB	10% Form	28-Sep-14	25.0030	-84.0109
127	B129	48521	NN	95% ETOH	28-Sep-14	24.9961	-84.0010
128	B262	48522	RB	95% ETOH	28-Sep-14	24.9965	-84.5127
128	B262	48523	LB	10% Form	28-Sep-14	24.9965	-84.5127
128	B262	48524	NN	95% ETOH	28-Sep-14	25.0006	-84.5010

* NOTE: Dual-mesh bongo at this station was accidentally filtered through a 0.333 mesh sieve, so the sample was re-coded as a 0.333 mesh LB.

Table 3. Summary of average chlorophyll *a* measurements at three depths (surface, chlorophyll maximum, bottom) for each station where the CTD was deployed during the 2014 Fall SEAMAP Plankton Survey conducted from the NOAA Ship *Gordon Gunter* cruise GU-14-05, 22 August – 30 September 2014. P-Sta # = Pascagoula station number; S-Sta # = SEAMAP station number or other station identifier; Depth = Depth (meters); D-Code = Sample location (meters) in water column (S = Surface, MAX = Chlorophyll maximum, B = Bottom); Chl-*a* = Chlorophyll *a* measurement ($\mu\text{g/L}$).

P-Sta #	S-Sta #	Depth	D-Code	Chl- <i>a</i>
001	B030	2.90	S	0.142
001	B030	75.90	MAX	0.491
001	B030	203.20	B	0.008
002	B316	2.20	S	0.146
002	B316	62.20	B	1.82
003	B032	3.10	S	0.26
003	B032	25.10	B	1.077
004	B238	2.40	S	0.244
004	B238	33.10	B	0.993
005	B239	2.60	S	0.092
005	B239	86.30	B	0.647
006	B031	2.60	S	0.116
006	B031	95.30	MAX	0.497
006	B031	200.50	B	0.014
007	B328	2.60	S	0.141
007	B328	72.60	MAX	1.018
007	B328	87.40	B	0.832
008	B051	2.90	S	0.207
008	B051	25.50	B	0.908
009	B235	2.50	S	0.13
009	B235	27.00	B	1.028
010	B234	2.90	S	0.239
010	B234	73.40	B	0.92
011	LU001	2.30	S	0.11
011	LU001	95.20	MAX	0.452
011	LU001	198.80	B	0.01
012	B232	2.90	S	0.142

P-Sta #	S-Sta #	Depth	D-Code	Chl- <i>a</i>
012	B232	97.10	MAX	0.387
012	B232	167.70	B	0.011
013	LU002	2.50	S	0.198
013	LU002	64.80	B	1.202
014	B233	3.50	S	0.267
014	B233	23.10	B	2.053
015	B327	2.10	S	4.72
015	B327	4.80	B	4.802
016	B231	3.40	S	0.231
016	B231	41.90	B	1.302
017	LU004	3.40	S	0.184
017	LU004	41.90	B	1.302
018	B225	3.40	S	0.133
018	B225	77.00	MAX	0.543
018	B225	201.10	B	0.024
019	B326	3.10	S	0.146
019	B326	104.90	B	0.393
020	B226	2.40	S	0.228
020	B226	52.90	B	0.908
021	LU003	3.40	S	0.368
021	LU003	28.00	B	0.598
022	B230	1.90	S	4.632
022	B230	13.10	B	5.637
023	B228	3.40	S	1.067
023	B228	23.80	B	0.867
024	B223	2.70	S	0.187
024	B223	80.70	B	0.78

Table 3 continued

P-Sta #	S-Sta #	Depth	D-Code	Chl-a
025	B243	2.70	S	0.197
025	B243	82.90	MAX	0.472
025	B243	200.20	B	0.021
026	B217	2.60	S	0.343
026	B217	73.40	B	0.923
027	LU006	3.00	S	0.359
027	LU006	45.70	B	1.115
028	B222	2.70	S	0.645
028	B222	32.50	B	0.94
029	B221	2.20	S	2.373
029	B221	14.90	B	2.535
030	LU005	4.96	S	1.11
030	LU005	22.10	B	1.115
031	LU008	2.90	S	0.767
031	LU008	49.60	B	0.952
033	LU023	3.60	S	0.311
033	LU023	61.40	B	0.645
034	B215	3.50	S	0.695
034	B215	40.30	B	0.685
035	LU009	3.20	S	0.61
035	LU009	25.10	B	0.61
036	B219	2.90	S	1.268
036	B219	17.50	B	1.253
037	B220	2.50	S	2.928
037	B220	10.30	B	2.759
038	B214	3.10	S	0.737
038	B214	18.90	B	1.522
039	LU010	2.10	S	1.545
039	LU010	23.60	B	2.098
040	B210	3.50	S	0.273
040	B210	41.60	B	1.488
041	LU024	3.30	S	0.254

P-Sta #	S-Sta #	Depth	D-Code	Chl-a
041	LU024	55.80	B	0.897
042	B023	NONE		NONE
043	B202	3.60	S	0.161
043	B202	102.30	B	0.389
044	LU027	3.80	S	0.199
044	LU027	58.60	B	1.132
045	B208	3.80	S	1.05
045	B208	43.60	B	0.85
046	LU025	2.30	S	0.403
046	LU025	27.20	B	1.525
047	B211	3.30	S	0.394
047	B211	24.10	B	1.55
048	B207	3.10	S	0.742
048	B207	24.30	B	3.41
049	LU026	2.60	S	0.52
049	LU026	28.00	B	1.143
050	B203	2.80	S	0.117
050	B203	38.40	MAX	2.802
050	B203	49.90	B	1.237
051	LU028	3.00	S	0.156
051	LU028	56.40	MAX	1.728
051	LU028	65.70	B	0.818
052	B022	4.00	S	0.119
052	B022	77.00	MAX	0.566
052	B022	120.00	B	0.213
053	B195	3.10	S	0.13
053	B195	80.40	MAX	0.444
053	B195	168.60	B	0.051
054	LU030	2.30	S	0.365
054	LU030	69.90	B	1.078
055	B201	2.80	S	0.205
055	B201	41.90	MAX	2.518

Table 3 continued

P-Sta #	S-Sta #	Depth	D-Code	Chl-a
055	B201	49.80	B	1.828
056	LU029	2.30	S	0.263
056	LU029	26.50	MAX	3.345
056	LU029	33.80	B	1.775
057	B204	2.30	S	0.395
057	B204	23.40	B	2.472
058	B200	2.10	S	1.203
058	B200	19.40	B	2.62
059	B196	3.00	S	0.195
059	B196	40.90	MAX	2.805
059	B196	45.30	B	2.675
060	B017	2.80	S	0.171
060	B017	69.60	MAX	0.607
060	B017	135.90	B	0.03
061	B194	3.20	S	0.412
061	B194	20.50	MAX	1.567
061	B194	32.20	B	1.097
062	B191	2.80	S	0.317
062	B191	37.50	B	1.365
063	B190	2.80	S	0.199
063	B190	60.40	MAX	0.541
063	B190	163.60	B	0.01
064	B016	2.80	S	0.079
064	B016	56.30	MAX	0.752
064	B016	200.70	B	0.006
065	B189	2.30	S	0.155
065	B189	51.20	MAX	1.063
065	B189	201.60	B	0.018
066	B186	2.60	S	0.32
066	B186	26.70	MAX	1.165
066	B186	197.90	B	0.011
067	B184	2.40	S	0.288

P-Sta #	S-Sta #	Depth	D-Code	Chl-a
067	B184	33.20	MAX	0.82
067	B184	198.70	B	0.019
071	B174	2.20	S	0.329
071	B174	48.20	MAX	0.502
071	B174	69.20	B	0.271
072	B320	2.80	S	0.211
072	B320	46.70	MAX	0.752
072	B320	191.80	B	0.009
073	B168	3.20	S	0.333
073	B168	33.50	MAX	1.133
073	B168	51.80	B	0.446
074	B167	3.20	S	0.9
074	B167	28.00	B	0.462
075	B157	2.30	S	1.005
075	B157	17.40	B	2.868
076	B158	2.80	S	0.782
076	B158	18.20	B	1.17
077	B166	2.70	S	0.24
077	B166	55.10	B	0.632
078	B169	2.90	S	0.4
078	B169	45.90	MAX	0.602
078	B169	204.20	B	0.009
079	B165	2.80	S	0.309
079	B165	59.10	MAX	0.622
079	B165	191.50	B	0.016
080	B159	3.80	S	0.432
080	B159	32.90	MAX	1.202
080	B159	68.90	B	0.186
081	B160	3.40	S	0.238
081	B160	34.40	MAX	1.033
081	B160	176.20	B	0.011
082	B155	3.20	S	0.256

Table 3 continued

P-Sta #	S-Sta #	Depth	D-Code	Chl-a
082	B155	41.10	B	1.425
083	B156	2.60	S	0.637
083	B156	11.40	B	0.673
084	B140	2.80	S	0.653
084	B140	20.50	B	0.652
085	B138	3.20	S	1.775
085	B138	14.60	MAX	1.662
085	B138	17.00	B	1.288
086	B139	2.50	S	3.215
086	B139	9.20	B	2.152
087	B115	1.80	S	8.196
087	B115	8.60	B	8.033
088	B137	2.70	S	0.482
088	B137	25.10	B	4.858
089	B141	2.40	S	0.425
089	B141	26.50	MAX	9.647
089	B141	29.90	B	1.905
090	B142	2.40	S	0.475
090	B142	43.40	B	1.25
091	B136	2.20	S	0.588
091	B136	28.20	MAX	2.158
091	B136	32.80	B	0.785
092	B114	3.00	S	3.59
092	B114	10.40	B	3.482
093	B117	2.1	S	1.110
093	B117	21.4	B	0.882
094	B112	1.90	S	2.627
094	B112	12.00	B	2.55
095	B118	2.60	S	0.763
095	B118	29.70	B	0.802
096	B135	2.40	S	0.237
096	B135	37.80	MAX	0.955

P-Sta #	S-Sta #	Depth	D-Code	Chl-a
096	B135	44.80	B	0.765
097	B143	2.00	S	0.242
097	B143	56.80	MAX	0.435
097	B143	76.70	B	0.206
098	B153	2.70	S	0.24
098	B153	49.40	MAX	0.529
098	B153	201.80	B	0.008
099	B144	2.20	S	0.331
099	B144	41.30	MAX	0.832
099	B144	134.50	B	0.016
100	B134	2.70	S	0.192
100	B134	57.90	B	0.561
101	B119	2.80	S	0.224
101	B119	38.00	B	1.022
102	B111	2.70	S	1.063
102	B111	14.30	B	0.912
103	B110	2.90	S	0.717
103	B110	32.40	B	1.067
104	B120	2.40	S	0.221
104	B120	33.60	MAX	0.399
104	B120	51.20	B	0.381
105	B133	3.00	S	0.205
105	B133	41.70	MAX	0.988
105	B133	82.70	B	0.111
106	B145	3.70	S	0.235
106	B145	52.30	MAX	0.419
106	B145	175.20	B	0.004
107	B146	3.00	S	0.158
107	B146	53.70	MAX	0.723
107	B146	200.50	B	0.005
108	B132	3.10	S	0.158
108	B132	46.30	MAX	0.613

Table 3 continued

P-Sta #	S-Sta #	Depth	D-Code	Chl-a
108	B132	122.10	B	0.016
109	B121	2.70	S	0.202
109	B121	27.00	MAX	1.157
109	B121	57.90	B	0.282
110	B109	2.80	S	0.755
110	B109	38.90	B	1.053
111	B098	2.70	S	0.642
111	B098	19.50	B	0.835
112	B099	2.60	S	0.319
112	B099	27.40	B	1.707
113	B108	2.90	S	0.244
113	B108	27.40	MAX	1.442
113	B108	42.20	B	0.647
114	B122	3.80	S	0.192
114	B122	62.70	B	0.595
115	B131	3.00	S	0.156
115	B131	65.20	MAX	0.518
115	B131	136.60	B	0.009
116	B147	2.20	S	0.181
116	B147	51.40	MAX	0.593
116	B147	201.40	B	0.004
117	B148	2.20	S	0.236
117	B148	52.80	MAX	0.725
117	B148	201.50	B	0.002
118	B130	3.30	S	0.238
118	B130	54.20	MAX	0.501

P-Sta #	S-Sta #	Depth	D-Code	Chl-a
118	B130	136.30	B	0.011
119	123	2.90	S	0.196
119	123	56.40	MAX	0.625
119	123	69.00	B	0.507
120	B107	3.20	S	0.258
120	B107	50.20	B	0.592
121	B100	2.80	S	0.356
121	B100	31.80	B	2.227
122	B095	2.70	S	0.965
122	B095	16.30	B	0.917
123	B094	2.80	S	0.461
123	B094	17.50	B	0.667
124	B101	3.10	S	0.464
124	B101	30.70	B	2.672
125	B106	2.60	S	0.952
125	B106	50.90	B	0.234
126	B124	2.70	S	0.157
126	B124	56.60	MAX	0.742
126	B124	69.50	B	0.398
127	B129	2.60	S	0.153
127	B129	74.80	MAX	0.422
127	B129	126.50	B	0.036
128	B262	3.50	S	0.089
128	B262	85.00	MAX	0.336
128	B262	196.50	B	0.035

Figure 1. Plankton stations completed for the SEAMAP Fall Plankton Survey, 22 August - 30 September 2014. Bongo tows sampled by NOAA as part of the standard fall SEAMAP survey are represented by a plus. Closed diamonds represent LU stations that were sampled for spatial variability analysis (NOAA). Stations sampled by the state of Louisiana are represented with an 'L', state of Mississippi with an 'M', and Alabama with an 'A'. Open squares represent stations where an additional dual-mesh bongo tow was conducted for extrusion analysis.

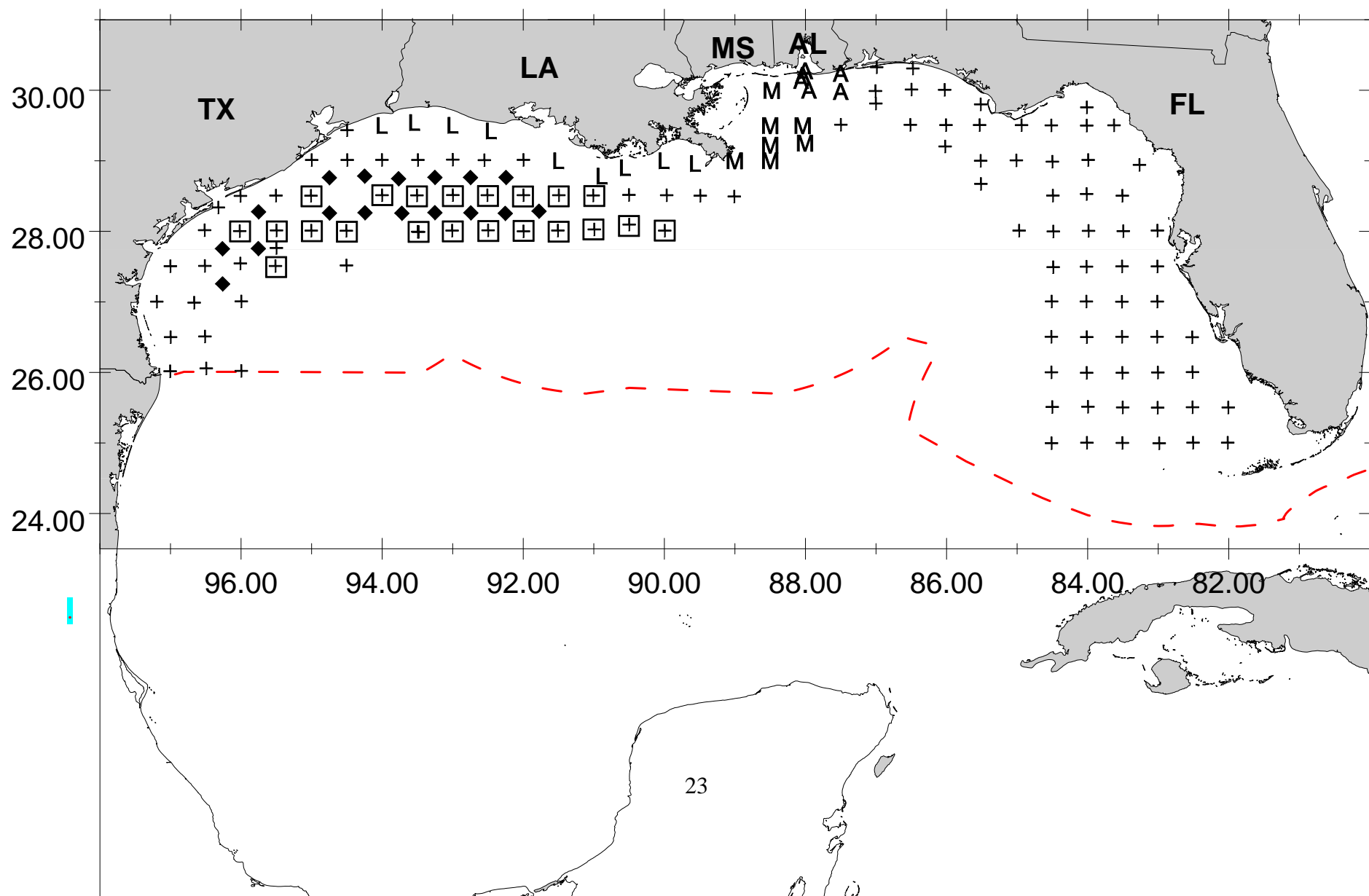


Figure 2. Plankton stations completed during the SEAMAP Fall Plankton Survey aboard the NOAA Ship *Gordon Gunter*, cruise GU-14-05, 22 August - 30 September 2014. Bongo tows are represented by a plus, neuston tows are represented by an “X”, and CTD casts are represented by open circles.

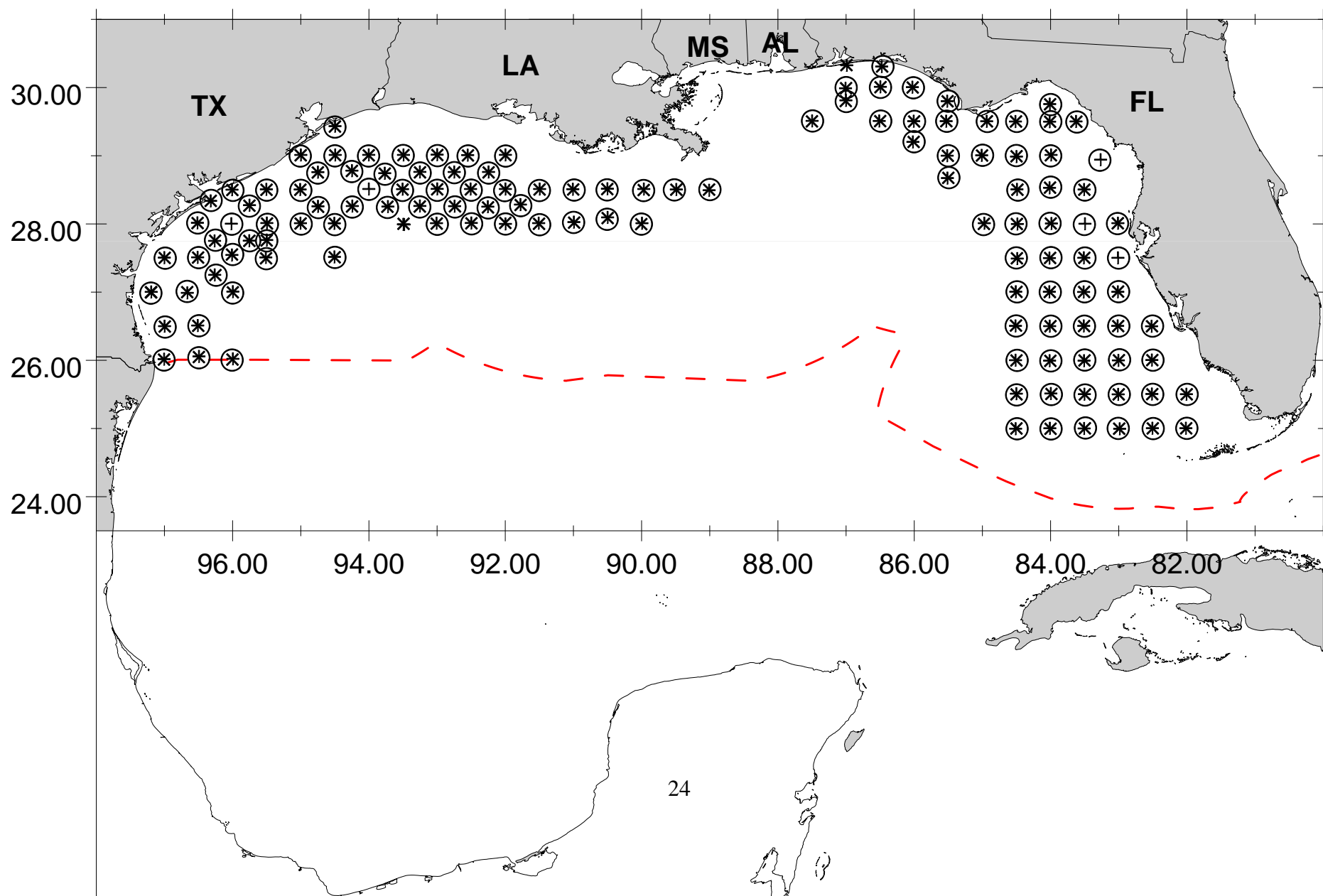


Figure 3. Locations of CUFES samples taken during the SEAMAP Fall Plankton Survey aboard the NOAA Ship *Gordon Gunter*, cruise GU-14-05, 22 August – 30 September 2014.

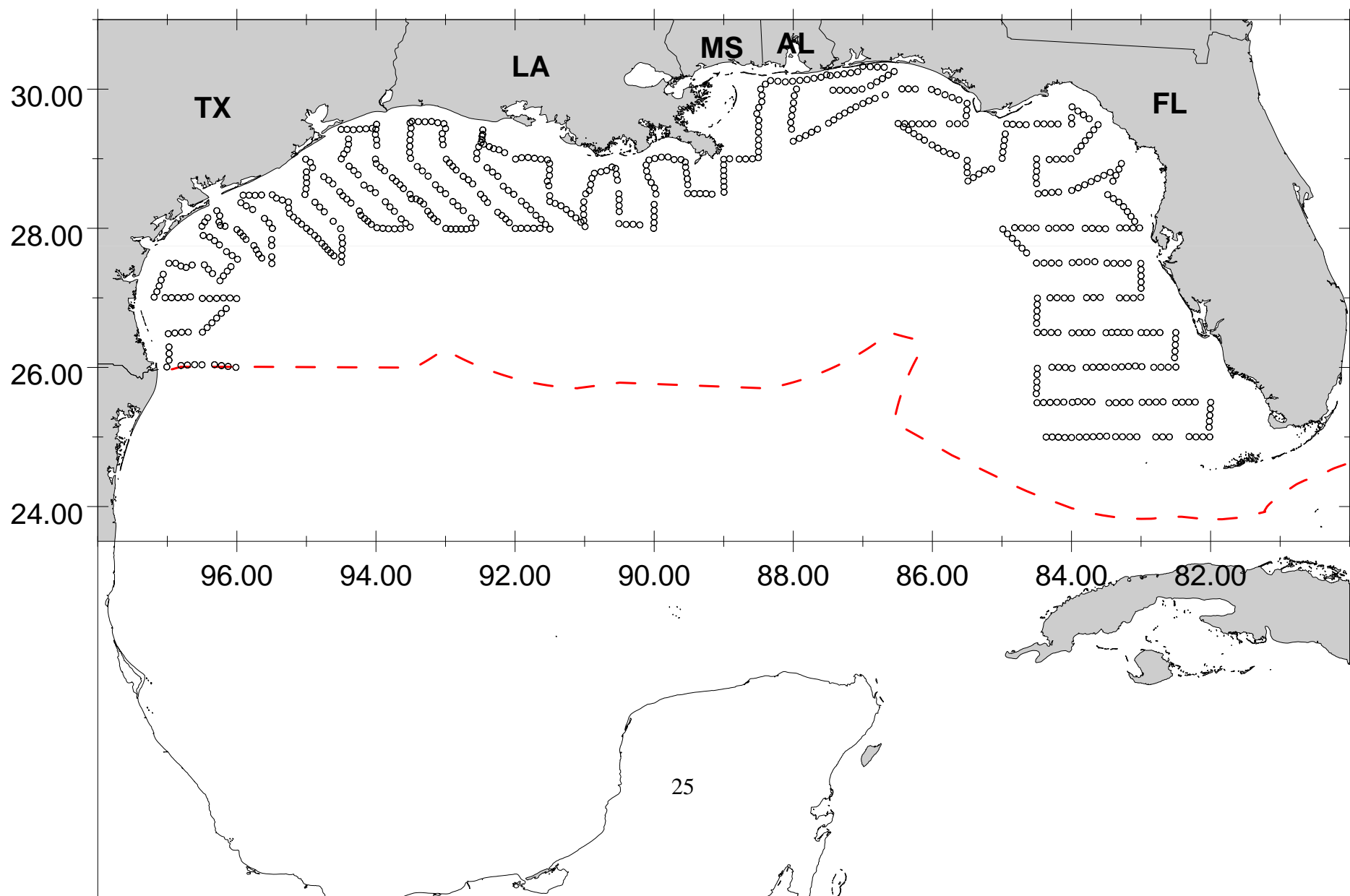


Figure 4. Sea temperature ($^{\circ}$ C) near the surface (d 5 m depth) at plankton stations during the SEAMAP Fall Plankton Survey aboard the NOAA Ship *Gordon Gunter* cruise GU-14-05, 22 August – 30 September 2014.

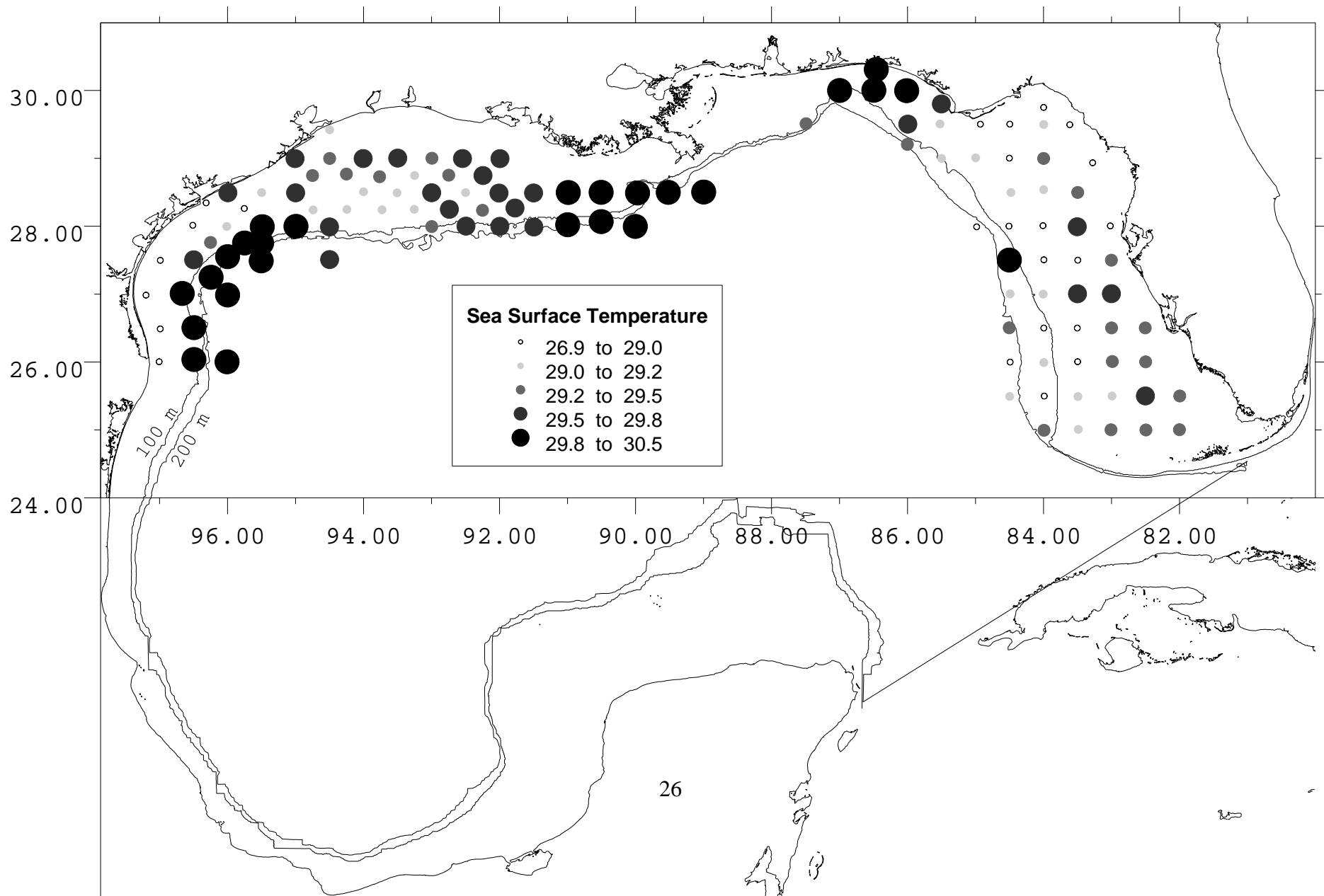


Figure 5. Salinity (PSU) near the surface (d 5 m depth) at plankton stations during the SEAMAP Fall Plankton Survey aboard the NOAA Ship *Gordon Gunter* cruise GU-14-05, 22 August – 30 September 2014.

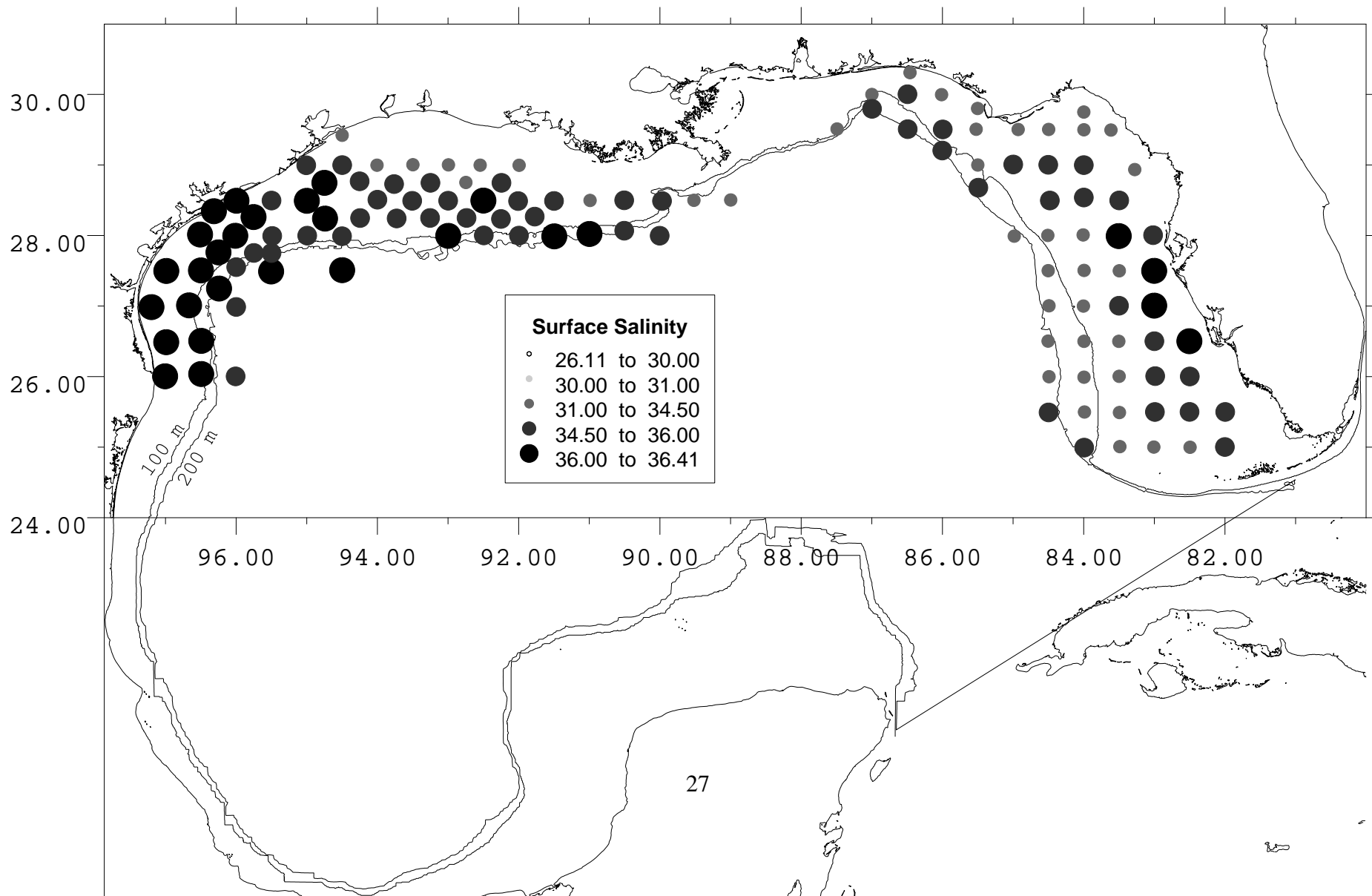


Figure 6. Dissolved oxygen (mg/L) near the surface (d 5 m depth) at plankton stations during the SEAMAP Fall Plankton Survey aboard the NOAA Ship *Gordon Gunter* cruise GU-14-05, 22 August – 30 September 2014.

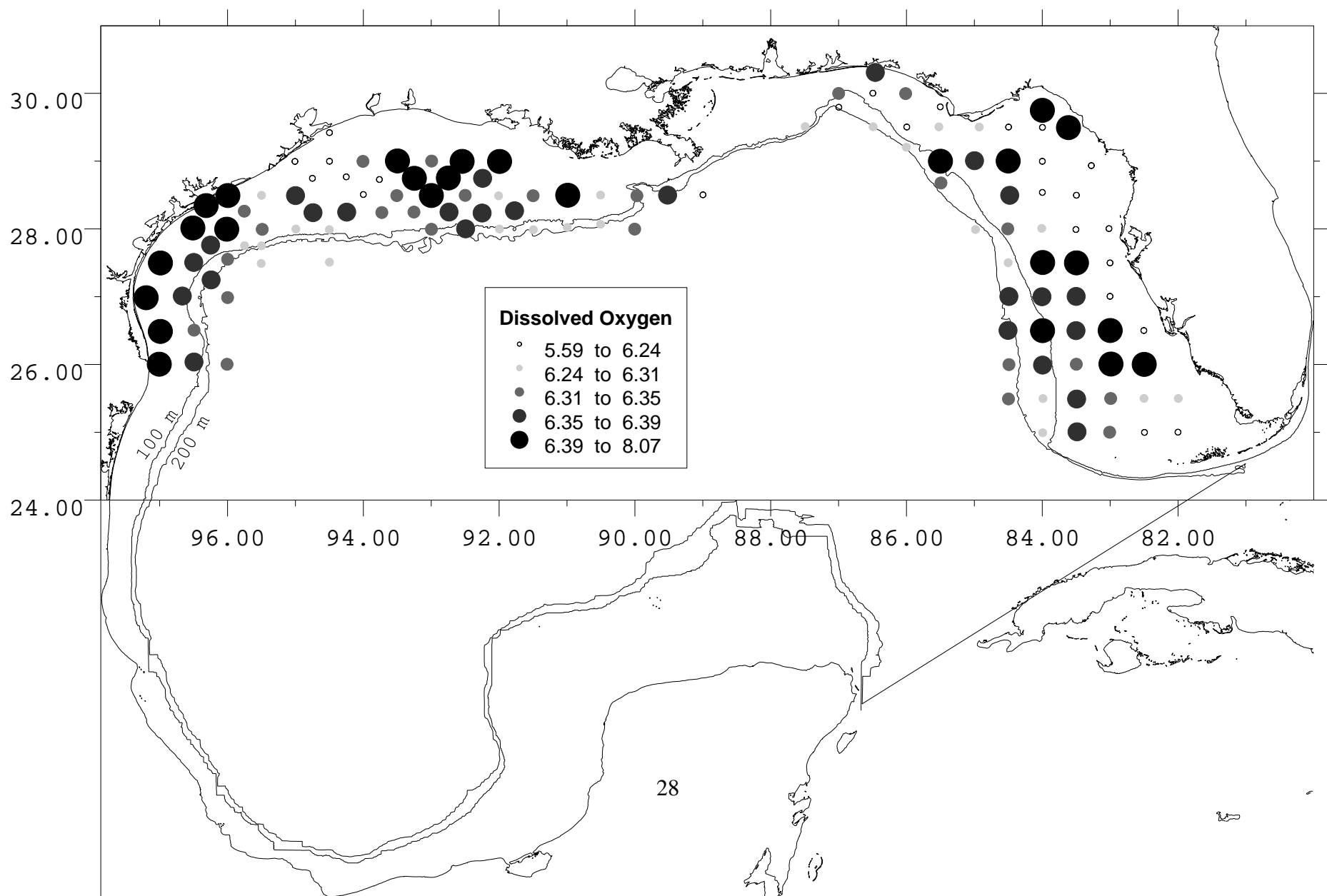


Figure 7. Surface chlorophyll a ($\mu\text{g/L}$) near the surface (d 5 m depth) at plankton stations during the SEAMAP Fall Plankton Survey aboard the NOAA Ship *Gordon Gunter* cruise GU-14-05, 22 August – 30 September 2014.

