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SEAMAP ENVIRONMENTAL AND BIOLOGICAL ATLAS OF THE GULF OF MEXICO, 2008

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INTRODUCTION

The Southeast Area Monitoring and Assessment Program (SEAMAP) is a State/Federal/university program for the collection, management, and dissemination of fishery-independent data (information collected without direct reliance on statistics reported by commercial or recreational fishermen) in United States waters of the Gulf of Mexico (Eldridge 1988). A major SEAMAP objective is to provide a large, standardized database needed by management agencies, industry, and scientists to wisely manage and develop fishery resources for the least possible cost. To accomplish this goal, survey data must be disseminated in a useful format to SEAMAP participants, cooperators, and other interested organizations.

The SEAMAP Program began in March 1981 when the National Marine Fisheries Service (NMFS), Southeast Fisheries Science Center (SEFSC), presented a SEAMAP Strategic Plan (1981) to the Gulf States Marine Fisheries Commission (GSMFC). This strategic plan outlined the proposed program organization (goals, objectives, procedures, resource requirements, etc.). A SEAMAP Subcommittee was then formed within the existing framework of the GSMFC. The Subcommittee consists of one representative from each state fishery management agency [Florida Fish and Wildlife Conservation Commission (FWC); Alabama Department of Conservation and Natural Resources (ADCNR); Mississippi Department of Marine Resources (MDMR) represented by the University of Southern Mississippi, Gulf Coast Research Laboratory (USM/GCRL); Louisiana Department of Wildlife and Fisheries (LDWF); and Texas Parks and Wildlife Department (TPWD)], one from NMFS SEFSC and a non-voting member representing the Gulf of Mexico Fishery Management Council (GMFMC). The Subcommittee has organized and successfully coordinated numerous resource surveys from 1982 through 2008 (Table 1). The resultant data are published in atlases for the surveys in 1982 (Stuntz et al. 1985); 1983 (Thompson and Bane 1986a); 1984 (Thompson and Bane 1986b); 1985 (Thompson et al. 1988); 1986 (Sanders et al. 1990a); 1987 (Sanders et al. 1990b); 1988 (Sanders et al. 1991a); 1989 (Sanders et al. 1991b); 1990 (Sanders et al. 1992); 1991 (Donaldson et al. 1993); 1992 (Donaldson et al. 1994); 1993 (Donaldson et al. 1996); 1994 (Donaldson et al. 1997a); 1995 (Donaldson et al. 1997b); 1996 (Donaldson et al. 1998); 1997 (Rester et al. 1999); 1998 (Rester et al. 2000); 1999 (Rester et al. 2001); 2000 (Rester et al. 2002); 2001 (Rester et al. 2004); 2002 (Rester et al. 2008); 2003 (Rester et al. 2009); 2004 (Rester 2009); 2005 (Rester 2010); 2006 (Rester 2010); and 2007 (Rester). Environmental assessment activities occurred with each of the surveys found in Table 1. All data are available to researchers or interested individuals. Details about how to obtain SEAMAP data can be found in the Data Request section of this document.

In March 2008, the SEAMAP Subcommittee identified and began to plan the year's SEAMAP survey activities for the Gulf of Mexico. In keeping with the program goal of establishing a coordinated long-term resource database, it was decided to continue the same types of survey activities conducted in 1982 through 2007. Overall survey objectives in 1982 to 2008 were to assess the distribution and abundance of recreational and commercial organisms collected by plankton, trap/video, bottom longlines, and trawl gears and document environmental factors that might affect their distribution and abundance. Data from plankton surveys are used for detection and assessment of fishery resources; in the determination of spawning seasons and areas; in investigations of early survival and recruitment mechanisms; and in estimation of the abundance of a stock based on its spawning production (Sherman et al. 1983). Assessment of the Texas Closure (Nichols 1982, 1984; Nichols and Poffenberger 1987) was the rationale for the establishment of the trawl surveys and to establish a seasonal database to assess the abundance and distribution of the shrimp and groundfish stocks across the northern Gulf of Mexico. The Reef Fish Survey is designed to determine the relative abundance

of reef fish populations and habitat using a fish trap/video recording system (Russell, unpublished report).

A major purpose of SEAMAP is to provide resource survey data to State and Federal management agencies and universities participating in SEAMAP activities. This twenty-sixth in a series of SEAMAP environmental and biological atlases presents such data, in a summarized form, collected during the 2008 SEAMAP surveys.

MATERIALS AND METHODS

Methodology for the 2008 SEAMAP surveys is similar to that of the 1982 through 2007 surveys. Sampling was conducted within the U.S. Exclusive Economic Zone (EEZ) and state territorial waters. The NOAA Ship OREGON II collected plankton and environmental data during the Winter Plankton Survey from February 7 to March 15. The NOAA Ship GORDON GUNTER collected plankton and environmental data during the Spring Plankton Survey from April 20 to May 30, while the USM/GCRL vessel TOMMY MUNRO collected data from June 20 to June 21. Vessels that participated in collecting plankton and environmental data during the Fall Plankton Survey included the NOAA Ship GORDON GUNTER (September 5 – September 30), USM/GCRL vessel TOMMY MUNRO (September 27-29) and the Alabama vessel A.E. VERRILL (September 17).

The Louisiana vessel PELICAN sampled waters off Louisiana from April 1-4 during the Spring Shrimp/Groundfish Survey.

Vessels that participated in the Summer Shrimp/Groundfish Survey and concurrently sampled plankton and environmental data included the USM/GCRL vessel TOMMY MUNRO (May 31 – June 3), the Louisiana vessel PELICAN (June 23-26), and the NOAA Ship OREGON II (June 11 – July 16). The A.E. VERRILL (June 2-16) and the TPWD vessels TRINITY BAY, SAN JACINTO, SABINE, MATAGORDA BAY, and NUECES (June 2-24) did not sample plankton in conjunction with the summer survey. For the first time, Florida participated in the Summer Shrimp/Groundfish Survey using the TOMMY MUNRO to sample on the west Florida shelf from August 1-10. Florida also did not sample plankton.

The NOAA Ship CARETTA participated in the Reef Fish Survey from February 2 – March 12. The NOAA Ship OREGON II participated in the Reef Fish Survey from April 13 – May 21, while the NOAA Ship GANDY participated in the Reef Fish Survey from June 12 – August 10.

Vessels that participated in the Fall Shrimp/Groundfish Survey and concurrently sampled plankton and environmental data included the NOAA Ships OREGON II (October 10 – November 18); the USM/GCRL vessel TOMMY MUNRO (November 19); and the Louisiana vessel PELICAN (September 23-26). The Alabama vessel A.E. VERRILL (November 7-17), Florida using the TOMMY MUNRO (October 15-22), and TPWD vessels TRINITY BAY, SAN JACINTO, SABINE, MATAGORDA BAY, and NUECES (November 3–20) did not sample plankton in conjunction with the fall survey.

Mississippi began an Inshore Bottom Longline Survey that compliments an existing NMFS offshore bottom longline survey. Mississippi conducted bottom longline sampling monthly from March 12 to October 16.

PLANKTON SURVEYS

Since 1982, SEAMAP resource surveys have been conducted by the National Marine Fisheries Service in cooperation with the states of Florida, Alabama, Mississippi, Louisiana, and Texas. Plankton sampling is carried out during these surveys at predetermined SEAMAP stations arranged in a fixed, systematic grid pattern across the entire Gulf of Mexico. Most but not all SEAMAP stations (designated by a unique SEAMAP number) are located at ~56 km or ½-degree intervals along this grid. Some SEAMAP stations are located at < 56 km intervals especially along the continental shelf edge, while others have been moved to avoid obstructions, navigational hazards, or shallow water. Most SEAMAP plankton samples are taken during either dedicated plankton or shrimp/bottomfish (trawl) surveys, but over the years additional samples were taken using SEAMAP gear and collection methods at locations other than designated SEAMAP stations and/or outside established SEAMAP surveys, e.g. during Louisiana seasonal trawl surveys, SEAMAP Squid/Butterfish survey; and other serendipitous or special projects.

The sampling gear and methodology used to collect SEAMAP plankton samples are similar to those recommended by Kramer et al. (1972), Smith and Richardson (1977) and Posgay and Marak (1980). A 61 cm bongo net fitted with 0.333 (0.335)[1] mm mesh netting is fished in an oblique tow path from a maximum depth of 200 m or to 2-5 m off the bottom at depths less than 200 m. A mechanical flowmeter is mounted off-center in the mouth of each bongo net to record the volume of water filtered. Volume filtered ranges from ~20 to 600 m^3, but is typically 30 to 40 m^3 at the shallowest stations and 300 to 400 m^3 at the deepest stations. A single or double 2x1 m pipe frame neuston net fitted with 0.947 (0.950)[1] mm mesh netting is towed at the surface with the frame half-submerged for 10 minutes. Samples are taken upon arrival on station regardless of time of day. At each station either a bongo and/or neuston tow are made depending on the specific survey. Samples are routinely preserved in 5 to 10 % formalin and later transferred after 48 hours to 95 % ethanol for long-term storage. During some surveys, selected samples are preserved initially in 95 % ethanol and later transferred to fresh ethanol.

Initial processing of one bongo sample and one neuston sample (except those collected by Louisiana vessels) from each SEAMAP station was accomplished at the Sea Fisheries Institute, Plankton Sorting and Identification Center (ZSIOP), in Szczecin, Poland, under a Joint Studies Agreement with NMFS. Plankton samples collected by Louisiana vessels were retained by LDWF for sorting and identification at their facilities using the same protocols used at ZSIOP. Wet plankton volumes of bongo net samples were measured by displacement to estimate net-caught zooplankton biomass (Smith and Richardson 1977). Fish eggs and larvae were removed from bongo net samples, and fish larvae only from neuston net samples. Fish eggs were not identified further, but larvae were identified to the lowest possible taxon (to family in most cases). Body length (either notochord or standard length) was measured.

Sorted ichthyoplankton specimens from ZSIOP and LDWF were sent to the SEAMAP Archiving Center, managed in conjunction with the FWC, for long-term storage under museum conditions. Sorted ichthyoplankton samples from 1982 through 2008 are available for loan to researchers throughout the country. The alternate bongo and neuston samples from each station are retained at USM/GCRL as a backup for those samples transshipped to ZSIOP in case of loss or damage during transit. These backup unsorted plankton samples are curated and housed at the SEAMAP

[1] Mesh size change in database does not represent an actual change in gear but only a change in the accuracy at which plankton mesh aperture size can be measured by the manufacturer.

Invertebrate Plankton Archiving Center, managed in conjunction with USM/GCRL, and are available for use by researchers.

See the SEAMAP Operations Manual for a more detailed description of sampling methods and protocols. Refer to the NOAA vessel cruise reports for more specific information on the individual SEAMAP Plankton Surveys conducted during 2008.

ENVIRONMENTAL DATA

Standardized methodology was used although the actual parameters measured varied among vessels participating in each survey. These parameters were measured based on equipment availability. The following parameters were recorded:

Vessel: Vessel code for each vessel.
Station: Station identifiers varied by state and vessel.
Cruise: Cruise numbers varied by state and vessels.
Date: Month/Day/Year.
Time: Local time and time zone, recorded at the start of sampling.
Latitude/longitude: Recorded to seconds.
Barometric pressure: Recorded in millibars.
Wave height: Estimated visually in meters.
Wind speed and direction: Recorded in knots with direction recorded in compass degrees from which the wind was blowing.
Air temperature: Recorded in Centigrade.
Cloud cover: Estimated visually in percent cloud cover.
Secchi depth: Secchi depth in meters, estimated at each daylight station. Standard oceanographic 30-cm white discs were lowered until no longer visible, and then raised until visible. If different depths were recorded, an average was used.
Water Color: Forel-Ule data was recorded.

The following parameters were measured at the surface, mid-depth, and bottom; for bottom depths greater than 200 m, samples were taken at surface, 100 m and 200 m:

Water temperature: Temperatures were measured by a hand-held thermometer or by in situ electronic sensors onboard ship. No attempt was made to intercalibrate the various instruments used on individual vessels although several vessels did sample together to calibrate other sampling gear. Some error can be expected.
Salinity: Salinity samples were collected by Niskin bottles and stored for laboratory analysis with a salinometer. Conductivity probes or refractometers were used on some vessels. Salinity samples were also measured with in situ electronic sensors.
Chlorophyll: Chlorophyll samples were collected and frozen for later laboratory analysis. The general procedure for shipboard collection of chlorophyll was to collect more than 9 liters of water from the surface. This was kept stirred by bubbling air through it while filtration was being done. Three samples, to each of which a 1 ml, 1% (W/V), suspension of $MgCO_3$ was added, of up to 3 liters of water from the 9 liter sample were filtered through GF/C filters. The three filters were placed individually in Petri dishes, wrapped in opaque material and frozen until analysis. Each of the three samples was analyzed separately in the laboratory. Values in the tables that follow are the mean of the three samples.

Laboratory analyses for chlorophyll a and phaeophytin a (chlorophyll degradation product) were conducted by fluorometry and spectrophotometry. The general extraction procedures prior to measurement were similar. Samples analyzed by spectrophotometer included other chlorophyllous products, but these have not been included as data in this report. The methodology used is described in Strickland and Parsons (1972) and Jeffrey and Humphrey (1975). Some of the values have been deleted from the database because of analytical errors. In addition, chlorophyll samples data were also collected using a CTD. This method only obtains measures of chlorophyll a and is a measure of fluorescence (FL) and appears in the Tables as such.

Dissolved oxygen: Dissolved oxygen values were measured by electronic probes or by the Winkler titration method. No attempts were made to intercalibrate the methods. When oxygen was measured in samples collected from a Niskin sampler, the oxygen bottles were allowed to overflow a minimum of 10 seconds to eliminate oxygen contamination. The tubing which delivered the water sample was inserted to the bottom of the bottle and withdrawn while the sample was still flowing. The oxygen bottles were sealed with a ground-glass stopper and analyzed onboard the vessels.

Turbidity: Turbidity values were measured by electronic probes when equipment was available.

TRAWL SURVEYS

Summer Shrimp/Groundfish Survey

The sampling strategy and a description of the statistical rationale for the sampling design as described by Nichols in the 1982 SEAMAP Atlas (Stuntz et al. 1985) have been modified. Since 1987, the strategy has been that day/night sampling sites were chosen randomly in areas stratified by depth and statistical area. These areas are shrimp statistical zones 4 through 22 (Figure 1). Trawl stations sampled by NMFS, Florida, Alabama, Mississippi, and Louisiana are made with a standard SEAMAP 40-ft net, and Texas sampled with a 20-ft net. Depth strata consisted of 1 fm intervals from 5 to 20 fm, a 2 fm interval from 20 to 22 fm, a 3 fm interval from 22 to 25 fm, 5 fm intervals from 25 to 50 fm and a 10 fm interval from 50 to 60 fm. Trawls were towed perpendicularly to the depth contours and covered the entire depth stratum on each station. Single tows were for a maximum of 55 minutes; for certain stations, a series of consecutive trawl tows was necessary to cover a given depth stratum, with a minimum individual tow across each stratum of 10 minutes and a maximum tow of 55 minutes. The Texas vessels towed 10 minutes parallel to the depth stratum. The Louisiana samples did not cover a complete depth stratum on several stations because of the distance between depth contours.

All *Litopenaeus setiferus, Farfantepenaeus aztecus,* and *Farfantepenaeus duorarum* were separated from the trawl catch at each station. Total count and weight by species were recorded for each station. A sample of up to 200 shrimp of each species from every trawl was sexed and measured to obtain length-frequency information. Estimated total numbers were derived from the total weights of those processed. Other species of fishes and invertebrates were identified, enumerated, and weighed. Weights and individual measurements on selected species, other than commercial shrimp, were also recorded.

Fall Shrimp/Groundfish Survey

The design of the Fall Survey was similar to the Summer Shrimp/Groundfish Survey. During the Fall Survey trawl stations were made with the standard 40-ft and 20-ft SEAMAP nets and covered NMFS

shrimp statistical zones 4 through 22 (Figure 1). Catch rates on all the vessels sampling were treated in the same manner as the Summer Shrimp/Groundfish Survey, with the exception to shrimp catches, where only 20 shrimp of each species from every trawl were measured, although Louisiana measures a minimum of 50 shrimp.

Spring Shrimp/Groundfish Survey

The design of the Spring Survey was similar to the other Shrimp/Groundfish Surveys. During the Spring Survey, Louisiana completed trawl stations off the coast of Louisiana in NMFS shrimp statistical zones 13 through 15 (Figure 1). Catch rates were treated in the same manner as the other Shrimp/Groundfish Survey, with the exception to shrimp catches, where Louisiana measures a minimum of 50 shrimp.

REEF FISH SURVEY

The primary purpose of this survey is to assess relative abundance and compute population estimates of reef fishes found on natural reef fish habitat in the Gulf of Mexico. Two types of gear are used to deploy video cameras: 1) a single-funnel fish trap (2.13 m long by 0.76 m square) with the camera mounted at a height of 25 cm above the bottom of the trap; or 2) a 4 camera array with 4 cameras mounted orthogonal to each other at a height of 25 cm above the bottom. Both gears are baited with squid before deployment. The resultant video recordings (typically of one-hour duration) are processed back at the laboratory where fishes are identified and counted independently by two tape readers. Final counts are entered into the SEAMAP reef fish database along with additional observations on habitat and fish activity.

The hardbottom database from which sampling sites for this survey are chosen was developed in the following manner. Areas of natural reef habitat from Brownsville, Texas to the southern tip of Florida (at 81°00' W longitude and 24°02' N latitude) and between 9 and 110 m water depth were first inscribed on navigation charts, then divided into 10 by 10 nautical mile blocks (primary sample units). Each block was subdivided into 100-m^2, secondary sample units that were numbered and initially classified as being “reef” or “nonreef” and then entered into a database. Prior to the survey, blocks are selected from this database in the eastern and western Gulf with probability proportional to the number of “reef” sample units within a block. Within each selected block, 100 sample sites are randomly selected. During the survey each selected block is occupied for one 24-h period, where night hours are devoted to ship’s echo sounder surveys of up to 100 sites and daytime hours to trap/video sampling. Each potential sample site surveyed at night is given a final determination as being either a reef site or not based on echo patterns, vertical relief and other characteristics. Up to 8 actual “reef” sites are then randomly selected for sampling during that day (Russell, unpublished report). Trap/video sampling begins one hour after sunrise and ends one hour before sunset. Trap soak time is one hour.

Associated environmental data collected at each site usually includes profiles of salinity, temperature, and surface chlorophyll; and may include profiles of dissolved oxygen, light transmittance, and fluorescence. Additional environmental and meteorological observations taken on stations follow standard SEAMAP methodology. During the NMFS component of the Reef Fish Survey, fish abundance is also measured with a fisheries acoustic device.

INSHORE BOTTOM LONGLINE SURVEY

This near shore survey complements an existing long-term fisheries independent survey currently being conducted by NMFS offshore, by targeting shark and finfish species within the shallow waters of the north central Gulf of Mexico. The objectives of the survey are to collect information on coastal shark and finfish abundances and distribution with a 1-mile longline and to collect environmental data. During the 2008 Inshore Bottom Longline Survey, the survey design included three Gulf of Mexico sampling regions: Mississippi Sound, South of the Mississippi Barrier Islands, and Northern Chandeleur Sound.

Stations were chosen randomly within each area and were stratified by depth (0-5m, 5-10m, and 10-20m). The stations were sampled over a four-day period between the hours of 7:30 a.m. and 7:30 p.m. each month. The sampling protocol follows the procedures established by the NMFS bottom longline survey. All equipment used in this inshore shark survey is identical to the equipment used by NMFS. The longline gear consisted of a 1.6 km (426 kg test monofilament) mainline with 100 gangions (3.66 m, 332 kg test monofilament) containing #15/0 circle hooks (0 offset) and baited with Atlantic mackerel, *Scomber scomber*. The mainline was weighted down with a midpoint and endpoint weights. Radar high-flyers with strobe bullet buoys were used to mark the longline locations. A hydraulic longline reel was used for setting and retrieving the mainline. The longline was fished for 1-hr and then retrieved. This research is conducted on the USM/GCRL vessel TOM MCILWAIN.

RESULTS

PLANKTON SURVEYS

The SEAMAP Archiving Center received 26,136 identified ichthyoplankton lots in 2008. Most of these samples have been accessioned into the SEAMAP Archiving Center computer systems and the remaining samples are being prepared for accession.

Plankton stations for the Winter Plankton Survey in conjunction with environmental are shown in Figure 2. Plankton stations for the Spring Plankton Survey in conjunction with environmental are shown in Figure 3. Plankton stations for the Spring Shrimp/Groundfish Survey are shown in Figure 4. The plankton stations for the Summer Shrimp/Groundfish Survey are shown in Figure 5. Plankton stations for the Fall Plankton Survey in conjunction with environmental are shown in Figure 6. Plankton stations for the Fall Shrimp/Groundfish Survey are shown in Figure 7.

TRAWL SURVEYS

Spring Shrimp/Groundfish Survey

Louisiana completed the Spring Shrimp/Groundfish Survey in April. It has always been a goal of SEAMAP to conduct seasonal trawl surveys, but funding limitations have prevented all SEAMAP partners from participating. A plot of station locations is presented in Figure 8 with a plot of the trawl locations in Figure 9.

Summer Shrimp/Groundfish Survey

Shrimp and groundfish sampling was conducted during May through August from off Tampa, Florida to Brownsville, Texas. Figure 10 shows station locations and Figure 11 shows trawl locations. The Summer Shrimp/Groundfish Survey consisted primarily of biological trawl data and concomitant environmental and plankton data. A species composition listing from the 40-ft and 20-ft trawls is presented in Table 2, ranked in order of abundance, within the categories of finfish, crustaceans, and other invertebrates.

Fall Shrimp/Groundfish Survey

Shrimp and groundfish sampling was conducted from September through November from off Tampa, Florida to Brownsville, Texas. Figure 12 shows the station locations and Figure 13 shows trawl locations. The Fall Shrimp/Groundfish Survey consisted of biological trawl data, concomitant environmental, and plankton data. A species composition listing from the 40-ft and 20-ft trawls is presented in Table 3, ranked in order of abundance, within the categories of finfish, crustaceans, and other invertebrates.

REAL-TIME DATA MANAGEMENT

The SEAMAP Subcommittee agreed it was imperative to the success of the SEAMAP Program to distribute data on a near real-time basis to the fishing industry and others interested in SEAMAP. Summarized data were distributed weekly to approximately 200 individuals during the Summer Shrimp/Groundfish Survey. The summarized data in the form of computer plots and data listings were sent to management agencies and industry members. These plots showed station locations, catches of brown, pink, and white shrimp in lb/hr and count/lb, and total finfish catch in lb/hr.

REEF FISH SURVEY

Primary data collection and sampling for reef fish assessment were conducted during February through August by NMFS personnel. Station locations are plotted in Figure 14. A species composition listing from the traps is presented in Table 4. The species list for Table 3 is ranked in order of abundance. Video tapes from all sources were analyzed using NMFS standardized protocols.

INSHORE BOTTOM LONGLINE SURVEY

Station locations for the Inshore Bottom Longline Survey are plotted in Figure 15. A species composition list is presented in Table 5. The species list is ranked in order of abundance.

DISCUSSION

The quasisynoptic SEAMAP sampling program and the intended long-term nature of the sampling programs have been designed to provide the baseline data set needed for fishery management and conservation. In 1985, the SEAMAP long-term baseline data was disrupted by the loss of the Spring Gulf-wide plankton and Fall Mackerel Survey. In 1986, the SEAMAP Subcommittee renewed its commitment for the collection of baseline plankton data. These ichthyoplankton samples are and will continue to be used by researchers studying taxonomy, age and growth, bioenergetics, and other life

history aspects, as well as spawning biomass and recruitment. Information on species' relative distributions within the Gulf of Mexico can be analyzed with respect to environmental data to assess population abundance as a function of environmental change.

Similar analyses and investigations are being undertaken with Summer and Fall Shrimp/Groundfish Survey data. These data sets are being utilized in resource management decisions, and because of the program's ability to process data quickly, the capability exists to optimize some fisheries on a real-time basis. The long-term data set on all of the species collected, not just those of commercial and recreational importance, offers an opportunity to examine ecological relationships, with the eventual goal of developing management models that take into account the multi-species nature of most Gulf fisheries. The value of the SEAMAP program lies in its use for both immediate and long-range management goals.

Much use has already been made of SEAMAP data. For example, during the past SEAMAP surveys an area of very low dissolved bottom oxygen was found off Louisiana in the summers of 1982, 1985-2007. The presence of this phenomenon and some of the related conditions and biological effects were reported by Leming and Stuntz (1984) and Hanifen et al. (1995), and during such occurrences, SEAMAP has distributed special environmental bulletins and news releases to management agencies and the shrimp industry. In addition, SEAMAP data were used to assist in the identification of the minimum 1997 reduction in red snapper shrimp trawl bycatch mortality rate that would enable the red snapper fishery to still recover to the 20% spawning potential ratio (SPR) by the year 2019 (Goodyear 1997). This analysis was requested and supported by the Gulf of Mexico Fishery Management Council to address the issue of red snapper bycatch. SEAMAP data were also used by some coastal states to determine the status of shrimp stocks and their movements just as the shrimping seasons were to be opened and SEAMAP data were used to develop a guide to the grouper species of the western North Atlantic Ocean (Grace et al. 1994). The primary purpose of the guide is for species identification with projects that deploy underwater video camera systems.

Since SEAMAP's inception in 1982, the goal of plankton activities in the Gulf of Mexico has been to collect data on the early life stages of fishes and invertebrates that will complement and enhance the fishery-independent data gathered on the adult life-stage (Lyczkowski-Shultz and Brasher 1996). An annual larval index for the Atlantic bluefin tuna is generated each year from the Spring Plankton Survey and is used by the International Commission for the Conservation of Atlantic Bluefin Tunas to estimate stock size (Scott et al. 1993). Larval indices generated from the Summer Shrimp/Groundfish and Fall Plankton Surveys have now become an integral part of the king mackerel assessment in the Gulf (Gledhill and Lyczkowski-Shultz 2000). Larvae from SEAMAP collections have formed the basis for formal descriptions of larval development for fishes such as the snappers, cobia, tripletail, and dolphin (Drass et al. 2000; Ditty and Shaw 1992; Ditty and Shaw 1993; Ditty et al. 1994). Data on distribution and relative abundance of larvae of all Gulf fishes captured during SEAMAP surveys have been summarized by Richards et al. 1984, Kelley et al. 1985, Kelley et al. 1990, and Kelley et al. 1993.

The SEAMAP data collected during the Summer Shrimp/Groundfish Survey continues to be used extensively for fishery management purposes. In 1981, the Gulf of Mexico Fishery Management Council's plan for shrimp was implemented (Center for Wetland Resources 1980), with one management measure calling for the temporary closure to shrimping in the EEZ off Texas. This closure complements the traditional closure of the Texas territorial sea, normally May 15 through early July of each year. The GMFMC determined that this type of closure would allow small brown

shrimp to be protected from harvest, but would still allow the taking of larger brown shrimp by fishermen in deeper waters.

The National Marine Fisheries Service was charged with evaluating the effects of the Texas Closure and submitted a report to the GMFMC in January 2008. This report contained the results and an overview of the effect of the 2007 Texas Closure. After review of these data and other information, the GMFMC voted to continue the Texas Closure for 2008.

DATA REQUESTS

It is the policy of the SEAMAP Subcommittee that all verified non-confidential SEAMAP data, collected specimens, and samples shall be available to all SEAMAP participants, other fishery researchers, and management organizations approved by the Subcommittee. This atlas presents, to those individuals interested in the data or specimens, a chance to review the data in a summary form.

Data and specimen requests from SEAMAP participants, cooperators and others will normally be handled on a first-come, first-served, and time-available basis. Because of personnel and funding limitations, however, certain priorities must be assigned to the data and specimen requests. These priorities are reviewed by the SEAMAP Subcommittee. For further information on SEAMAP data management, see the Southeast Area Monitoring and Assessment Program (SEAMAP) Management Plan: 2006-2010 (ASMFC 2006).

Data requests and inquiries, as well as requests for plankton samples, can be made by contacting Jeff Rester, the SEAMAP Coordinator, Gulf States Marine Fisheries Commission, 2404 Government Street, Ocean Springs, MS 39564; (228) 875-5912 or via e-mail at jrester@gsmfc.org.

LITERATURE CITED

Atlantic States Marine Fisheries Commission. 2006. SEAMAP Management Plan: 2006-2010. Washington, DC: ASMFC.

Center for Wetland Resources. 1980. Management plan and final environmental impact statement for the shrimp fishery of the Gulf of Mexico, United States waters. Louisiana State Univ., Baton Rouge, Louisiana. 185 p.

Ditty, J.G. and R.F. Shaw. 1992. Larval development, distribution, and ecology of cobia *Rachycentron canadum* (Family: Rachycentridae), in the northern Gulf of Mexico. Fishery Bulletin. Vol. 90:668-677.

Ditty, J.G. and R.F. Shaw. 1993. Larval development of tripletail, *Lobotes surinamensis* (Pisces: Lobotidae), and their spatial and temporal distribution in the northern Gulf of Mexico. Fishery Bulletin. Vol. 92:33-45.

Ditty, J.G., R.F. Shaw, C.B. Grimes, and J.S. Cope. 1994. Larval development, distribution, and abundance of common dolphin, *Coryphaena hippurus*, and pompano dolphin, *C. equiselis* (Family: Coryphaenidae), in the northern Gulf of Mexico. Fishery Bulletin. Vol. 94:275-291.

Donaldson, D.M., N.J. Sanders, and P.A. Thompson. 1993. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1991. Gulf States Marine Fisheries Commission. No. 29. 321 p.

Donaldson, D.M., N.J. Sanders, and P.A. Thompson. 1994. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1992. Gulf States Marine Fisheries Commission. No. 30. 293 p.

Donaldson, D.M., N.J. Sanders, P.A. Thompson and R. Minkler. 1996. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1993. Gulf States Marine Fisheries Commission. No. 34. 284 p.

Donaldson, D.M., N.J. Sanders, P.A. Thompson and R. Minkler. 1997a. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1994. Gulf States Marine Fisheries Commission. No. 40. 277 p.

Donaldson, D.M., N.J. Sanders, P.A. Thompson and R. Minkler. 1997b. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1995. Gulf States Marine Fisheries Commission. No. 41. 280 p.

Donaldson, D.M., N.J. Sanders, P.A. Thompson and D. Hanisko. 1998. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1996. Gulf States Marine Fisheries Commission. No. 52. 263 p.

Drass, D.M., K.L. Bootes, J. Lyczkowski-Shultz, B.H. Comyns, G.J. Holt, C.M. Riley, and R.P. Phelps. 2000. Larval development of red snapper, *Lutjanus campechanus*, with comparisons to co-occurring snapper species. Fishery Bulletin. Vol. 98(3):507-527.

Eldridge, P.J. 1988. The Southeast Area Monitoring and Assessment Program (SEAMAP): A state-federal-university program for collection, management and dissemination of fishery-independent data and information in the southeast United States. Mar. Fish. Rev. 50(2): 29-39.

Gledhill, C.T. and J. Lyczkowski-Shultz. 2000. Indices of larval king mackerel, *Scomberomorus cavalla*, for use in population assessment in the Gulf of Mexico. Fishery Bulletin. Vol. 98(4):684-691.

Goodyear, C.P. 1997. An evaluation of the minimum reduction in the 1997 red snapper shrimp bycatch mortality rate consistent with the 2019 recovery target. GMFMC. 14 p. + appendix.

Grace, M., K.R. Rademacher and M. Russell. 1994. Pictorial guide to the groupers (Teleostei: Serrenidae) of the western North Atlantic. NOAA Tech. Report. NMFS 118. 46 p.

Hanifen, J.G., W.S. Perret, R.P. Allemand and T.L. Romaire. 1995. Potential impacts of hypoxia on fisheries: Louisiana=s fishery-independent data. *In* Proceedings of Gulf of Mexico Program=s Hypoxia Conference. November 1995, New Orleans, LA.

Jeffrey, S.W. and G.F. Humphrey. 1975. New spectrophotometric equations for determining chlorophylls $\underline{a}$, $\underline{b}$, $\underline{c_1}$ and $\underline{c_2}$ in higher plants, algae and natural phytoplankton. Biochem. Physiol. Pflanzer Bpp. 167: 191-194.

Kelley, S., T. Potthoff, W.J. Richards, L. Ejsymont and J.V. Gartner. 1985. SEAMAP 1983 - Ichthyoplankton. Larval distribution and abundance of Engraulididae, Carangidae, Clupeidae, Lutjanidae, Serranidae, Sciaenidae, Coryphaenidae, Istiophoridae, Xiphiidae and Scombridae in the Gulf of Mexico. NOAA Tech. Mem., NMFS-SEFC -167.

Kelley, S., J.V. Gartner, Jr., W.J. Richards and L. Ejsymont. 1990. SEAMAP 1984 & 1985 - Ichthyoplankton. Larval distribution and abundance of Carangidae, Clupeidae, Coryphaenidae, Engraulididae, Gobiidae, Istiophoridae, Lutjanidae, Scombridae, Serranidae, and Xiphiidae in the Gulf of Mexico. NOAA Tech. Mem., NMFS-SESC-317.

Kelley, S., J.V. Gartner, Jr., W.J. Richards and L. Ejsymont. 1993. SEAMAP 1986 - Ichthyoplankton. Larval distribution and abundance of Engraulididae, Carangidae, Clupeidae, Gobiidae, Lutjanidae, Serranidae, Coryphaenidae, Istiophoridae and Scombridae in the Gulf of Mexico. NOAA Tech. Mem., NMFS-SESC-245.

Kramer, D., M.J. Kalin, E.G. Stevens, J.R. Thrailkill and J.R. Zweifel. 1972. Collecting and processing data on fish eggs and larvae in the California Current region. NOAA Technical Report. NMFS Circular 370. 38 p.

Leming, T.D. and W.E. Stuntz. 1984. Zones of coastal hypoxia revealed by satellite scanning have implications for strategic fishing. Nature. 310 (5973): 131-138.

Lyczkowski-Shultz, J. and R. Brasher. 1996. Ichthyoplankton data summaries from SEAMAP Summer Shrimp/Groundfish Surveys. Pages 27-42 *in* Uses of Fishery-Independent Data. General Session Proceedings, Gulf States Marine Fisheries Commission. No. 35.

Nichols, S. 1982. Impacts of the 1981 and 1982 Texas closure on brown shrimp yields. NOAA, NMFS-SEFC. 44 p.

Nichols, S. 1984. Impacts of the 1982 and 1983 closure of the Texas FCZ on brown shrimp yields. Report to the Gulf of Mexico Fishery Management Council.

Nichols, S. and J.R. Poffenberger. 1987. Analysis of alternative closures for improving brown shrimp yield in the Gulf of Mexico. Report to the Gulf of Mexico Fishery Management Council.

Posgay, J.A. and R.R. Marak. 1980. The MARMAP bongo zooplankton samplers. J. Northw. Atl. Fish. Sci. 1: 9-99.

Rester, J.K. 2009. SEAMAP environmental and biological atlas of the Gulf of Mexico, 2004. Gulf States Marine Fisheries Commission. No. 173.

Rester, J.K. 2010. SEAMAP environmental and biological atlas of the Gulf of Mexico, 2005. Gulf States Marine Fisheries Commission. No. 175.

Rester, J.K. 2010. SEAMAP environmental and biological atlas of the Gulf of Mexico, 2006. Gulf States Marine Fisheries Commission. No. 179.

Rester, J.K. 2010. SEAMAP environmental and biological atlas of the Gulf of Mexico, 2006. Gulf States Marine Fisheries Commission. No. 180.

Rester, J.K., N.J. Sanders, P.A. Thompson and D. Hanisko. 1999. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1997. Gulf States Marine Fisheries Commission. No. 63. 254 p.

Rester, J.K., N.J. Sanders, G. Pellegrin, Jr. and D. Hanisko. 2000. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1998. Gulf States Marine Fisheries Commission. No. 75. 243 p.

Rester, J.K., N.J. Sanders, G. Pellegrin, Jr. and D. Hanisko. 2001. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1999. Gulf States Marine Fisheries Commission. No. 82. 247 p.

Rester, J.K., N.J. Sanders, G. Pellegrin, Jr. and D. Hanisko. 2002. SEAMAP environmental and biological atlas of the Gulf of Mexico, 2000. Gulf States Marine Fisheries Commission. No. 101. Available on CD-ROM only.

Rester, J.K., N.J. Sanders, G. Pellegrin, Jr., and D. Hanisko. 2004. SEAMAP environmental and biological atlas of the Gulf of Mexico, 2001. Gulf States Marine Fisheries Commission. No. 118. Available on CD-ROM only.

Rester, J.K., N.J. Sanders, and G. Pellegrin, Jr. 2008. SEAMAP environmental and biological atlas of the Gulf of Mexico, 2002. Gulf States Marine Fisheries Commission. No. 156.

Rester, J.K., N.J. Sanders, and G. Pellegrin, Jr. 2009. SEAMAP environmental and biological atlas of the Gulf of Mexico, 2003. Gulf States Marine Fisheries Commission. No. 172.

Richards, W.J., T. Potthoff, S. Kelley, M.F. McGowan, L. Ejsymont, J.H. Power and R.M. Olvera L. 1984. SEAMAP 1982 - Ichthyoplankton. Larval distribution and abundance of Engraulididae, Carangidae, Clupeidae, Lutjanidae, Serranidae, Sciaenidae, Coryphaenidae, Istiophoridae, Xiphiidae and Scombridae in the Gulf of Mexico. NOAA Tech. Mem., NMFS-SEFC-167.

Russell, G.M. Unpublished report. Reef fish assessment methodology for SEAMAP surveys of hardbottom areas. National Marine Fisheries Service. 25 p.

Sanders, N.J., P.A. Thompson and T. Van Devender. 1990a. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1986. Gulf States Marine Fisheries Commission. No. 20. 328 p.

Sanders, N.J., P.A. Thompson and D.M. Donaldson. 1990b. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1987. Gulf States Marine Fisheries Commission. No. 22. 337 p.

Sanders, N.J., D.M. Donaldson and P.A. Thompson. 1991a. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1988. Gulf States Marine Fisheries Commission. No. 23. 320 p.

Sanders, N.J., D.M. Donaldson and P.A. Thompson. 1991b. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1989. Gulf States Marine Fisheries Commission. No. 25. 318 p.

Sanders, N.J., D.M. Donaldson and P.A. Thompson. 1992. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1990. Gulf States Marine Fisheries Commission. No. 27. 311 p.

Scott, G.P., S.C. Turner, C.B. Grimes, W.J. Richards, and E.B. Brothers. 1993. Indices of larval bluefin tuna, *Thunnus thynnus*, abundance in the Gulf of Mexico: modeling variability in growth, mortality, and gear selectivity. Bulletin of Marine Science. Vol. 53(2):912-929.

Sherman, K., R. Lasker, W. Richards and A.W. Kendall, Jr. 1983. Ichthyoplankton and fish recruitment studies in large marine ecosystems. Mar. Fish. Rev. 45 (10, 11, 12): 1-25.

Smith, P.E. and S.L. Richardson, eds. 1977. Standard techniques for pelagic fish egg and larva surveys. FAO Fish. Tech. Paper 175. 100 p.

Southeast Area Monitoring and Assessment Program (SEAMAP) Strategic Plan. 1981. Report to the Gulf States Marine Fisheries Commission. 50 p.

Strickland, J.D.H. and T.R. Parsons. 1972. A practical handbook of seawater analysis. Ottawa: Fish. Res. Bd. Can. 310 p.

Stuntz, W.E., C.E. Bryan, K. Savastano, R.S. Waller and P.A. Thompson. 1985. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1982. Gulf States Marine Fisheries Commission. 145 p.

Thompson, P.A. and N. Bane. 1986a. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1983. Gulf States Marine Fisheries Commission. No. 13. 179 p.

Thompson, P.A. and N. Bane. 1986b. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1984. Gulf States Marine Fisheries Commission. No. 15. 171 p.

Thompson, P.A., T. Van Devender and N.J. Sanders, Jr. 1988. SEAMAP environmental and biological atlas of the Gulf of Mexico, 1985. Gulf States Marine Fisheries Commission. No. 17. 338 p.

Table 1. List of SEAMAP survey activities from 1982 to 2008.

SEAMAP SURVEY ACTIVITIES

YEAR	SPRING PLANKTON	SUMMER SHRIMP/GROUNDFISH	BUTTERFISH	FALL PLANKTON	FALL SHRIMP/GROUNDFISH	WINTER PLANKTON	INSHORE BOTTOM LONGLINE	REEF FISH
1982	APRIL-MAY	JUNE-JULY	--	--	--	--	--	--
1983	APRIL-MAY	JUNE-JULY	--	--	--	DECEMBER	--	--
1984	APRIL-MAY	JUNE-JULY	--	AUGUST	--	DECEMBER	--	--
1985	--	JUNE-JULY	JULY-AUGUST	SEPTEMBER	SEPTEMBER-DECEMBER	--	--	--
1986	APRIL-MAY	JUNE-JULY	MAY-JUNE	SEPTEMBER	OCTOBER-DECEMBER	--	--	--
1987	APRIL-MAY	JUNE-JULY	--	SEPTEMBER	SEPTEMBER-DECEMBER	--	--	--
1988	MARCH-MAY	JUNE-JULY	--	SEPTEMBER-OCTOBER	OCTOBER-DECEMBER	--	--	--
1989	APRIL-MAY	JUNE-JULY	--	SEPTEMBER-OCTOBER	OCTOBER-DECEMBER	--	--	--
1990	APRIL-MAY	JUNE-JULY	--	SEPTEMBER-OCTOBER	OCTOBER-DECEMBER	--	--	--
1991	APRIL-MAY	JUNE-JULY	--	AUGUST-SEPTEMBER	SEPTEMBER-DECEMBER	--	--	--
1992	APRIL-MAY	JUNE-JULY	--	AUGUST-OCTOBER	OCTOBER-DECEMBER	--	--	MAY-JUNE
1993	APRIL-MAY	JUNE-JULY	--	SEPTEMBER-OCTOBER	OCTOBER-DECEMBER	JAN.-FEB.	--	MAY-JULY, SEPT., NOV.
1994	APRIL-MAY	JUNE-JULY	--	SEPTEMBER-OCTOBER	OCTOBER-NOVEMBER	--	--	MAY-JULY, AUG.-OCT., DEC.
1995	APRIL-JUNE	JUNE-JULY	--	SEPTEMBER	OCTOBER-DECEMBER	--	--	JAN., JUNE-AUG., DEC.
1996	APRIL-JUNE	JUNE-JULY	--	SEPTEMBER-OCTOBER	OCTOBER-DECEMBER	DECEMBER	--	JULY, AUGUST, NOVEMBER
1997	APRIL-JUNE	JUNE-JULY	--	SEPTEMBER-OCTOBER	OCTOBER-DECEMBER	--	--	JUNE, JULY, AUG., NOV.
1998	APRIL-JUNE	JUNE-JULY	--	SEPTEMBER-OCTOBER	OCTOBER-NOVEMBER	--	--	MAY, JULY, AUGUST
1999	APRIL-MAY	JUNE-JULY	--	SEPTEMBER-OCTOBER	OCTOBER-NOVEMBER	--	--	JAN., AUG., OCT., DEC.
2000	APRIL-MAY	JUNE-JULY	--	SEPTEMBER-OCTOBER	OCTOBER-DECEMBER	--	--	OCTOBER, NOVEMBER
2001	APRIL-MAY	JUNE-JULY	--	AUGUST-OCTOBER	OCTOBER-DECEMBER	--	--	MAY, JUNE, OCTOBER
2002	APRIL-MAY	JUNE-JULY	--	AUGUST-OCTOBER	OCTOBER-DECEMBER	--	--	FEBRUARY-MAY, OCTOBER
2003	MAY	JUNE-JULY	--	AUGUST-OCTOBER	OCTOBER-DECEMBER	--	--	OCTOBER-NOVEMBER
2004	APRIL-JUNE	JUNE-JULY	--	SEPTEMBER	OCTOBER-DECEMBER	JANUARY	--	FEBRUARY-MARCH
2005	APRIL-MAY	JUNE-AUGUST	--	--	OCTOBER-NOVEMBER	--	--	FEBRUARY-JULY, OCTOBER
2006	APRIL-MAY	JUNE-JULY	--	AUGUST-SEPTEMBER	OCTOBER-DECEMBER	--	--	FEBRUARY-AUGUST
2007	MARCH-JUNE	JUNE-AUGUST	--	AUGUST-SEPTEMBER	OCTOBER-DECEMBER	--	--	FEBRUARY-MAY
2008	APRIL-JUNE	JUNE-AUGUST	--	SEPTEMBER	SEPTEMBER-NOVEMBER	FEB.-MAR.	MARCH-OCTOBER	FEBRUARY-AUGUST

Table 2. 2008 Summer Shrimp/Groundfish Survey species composition list, 447 trawl stations, for those vessels that used either a 40-ft or 20-ft trawl. Species with a total weight of less than 0.0227 kg (0.05 lb) are indicated on the table as 0.0 kg.

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Finfishes					
Micropogonias undulatus	Atlantic croaker	167006	5874.2	247	55.3
Stenotomus caprinus	longspine porgy	39960	1406.9	241	53.9
Peprilus burti	Gulf butterfish	32181	1173.2	199	44.5
Prionotus longispinosus	bigeye searobin	14459	170.2	172	38.5
Trichiurus lepturus	Atlantic cutlassfish	7849	267.0	158	35.3
Leiostomus xanthurus	spot	7707	678.1	129	28.9
Trachurus lathami	rough scad	7584	185.1	132	29.5
Cynoscion nothus	silver seatrout	7255	380.4	131	29.3
Chloroscombrus chrysurus	Atlantic bumper	6876	267.2	85	19.0
Cynoscion arenarius	sand seatrout	5874	528.1	129	28.9
Decapterus punctatus	round scad	5111	64.8	26	5.8
Harengula jaguana	scaled herring	4809	150.1	47	10.5
Stellifer lanceolatus	star drum	3841	28.4	45	10.1
Lagodon rhomboides	pinfish	3728	229.4	192	43.0
Synodus foetens	inshore lizardfish	3570	441.5	240	53.7
Centropristis philadelphica	Rock Sea bass	3518	113.9	156	34.9
Larimus fasciatus	banded drum	3503	143.3	74	16.6
Saurida brasiliensis	largescale lizardfish	2987	16.0	128	28.6
Anchoa hepsetus	striped anchovy	2517	43.7	64	14.3
Upeneus parvus	dwarf goatfish	2207	65.0	127	28.4
Halieutichthys aculeatus	pancake batfish	2072	13.1	99	22.1
Pristipomoides aquilonaris	wenchman	2014	110.9	97	21.7
Syacium papillosum	dusky flounder	1938	123.2	61	13.6
Serranus atrobranchus	blackear bass	1924	17.8	100	22.4
Syacium gunteri	shoal flounder	1740	51.4	118	26.4
Selene setapinnis	Atlantic moonfish	1636	98.2	133	29.8
Prionotus stearnsi	shortwing searobin	1474	15.6	76	17.0

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Lutjanus campechanus	red snapper	1347	196.0	150	33.6
Steindachneria argentea	luminous hake	986	3.4	5	1.1
Eucinostomus gula	silver jenny	938	38.5	43	9.6
Peprilus paru	harvestfish	906	11.2	45	10.1
Prionotus paralatus	Mexican searobin	901	28.0	52	11.6
Trichopsetta ventralis	sash flounder	891	21.3	46	10.3
Lepophidium brevibarbe	blackedge cusk-eel	754	25.4	77	17.2
Haemulon aurolineatum	tomtate	753	41.4	35	7.8
Diplectrum bivittatum	dwarf sand perch	711	16.3	52	11.6
Prionotus rubio	blackfin searobin	708	62.4	54	12.1
Mullus auratus	red goatfish	701	50.7	29	6.5
Cynoscion spp.	seatrouts	681	3.5	20	4.5
Stephanolepis hispida	planehead filefish	675	12.6	70	15.7
Synodus intermedius	sand diver	673	40.4	36	8.1
Sphoeroides parvus	least puffer	586	2.7	35	7.8
Opisthonema oglinum	Atlantic thread herring	571	45.8	26	5.8
Lutjanus synagris	lane snapper	558	69.4	56	12.5
Bellator militaris	horned searobin	525	10.2	29	6.5
Saurida normani	shortjaw lizardfish	496	46.4	17	3.8
Trachinocephalus myops	snakefish	484	36.5	37	8.3
Polydactylus octonemus	Atlantic threadfin	436	12.1	28	6.3
Porichthys plectrodon	Atlantic midshipman	412	9.4	68	15.2
Sardinella aurita	Spanish sardine	383	7.3	24	5.4
Scorpaena brasiliensis	barbfish	382	16.6	34	7.6
Prionotus martis	barred searobin	371	7.8	15	3.4
Lagocephalus laevigatus	smooth puffer	362	10.9	86	19.2
Urophycis floridana	southern hake	350	27.9	61	13.6
Cyclopsetta chittendeni	Mexican flounder	344	49.5	53	11.9
Orthopristis chrysoptera	pigfish	340	29.0	26	5.8
Diplectrum formosum	sand perch	327	34.2	44	9.8

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Symphurus plagiusa	blackcheek tonguefish	306	5.7	43	9.6
Menticirrhus americanus	southern kingfish	302	43.5	28	6.3
Prionotus tribulus	bighead searobin	289	15.2	32	7.2
Anchoa nasus	longnose anchovy	285	5.5	6	1.3
Oligoplites saurus	leatherjack	255	5.6	2	0.4
Ophidion holbrookii	bank cusk-eel	235	18.4	16	3.6
Prionotus roseus	bluespotted searobin	217	11.3	24	5.4
Etropus crossotus	fringed flounder	215	3.7	38	8.5
Scorpaena calcarata	smoothhead scorpionfish	210	2.5	18	4.0
Calamus proridens	littlehead porgy	202	35.5	10	2.2
Sphyraena guachancho	guaguanche	202	40.2	43	9.6
Rhomboplites aurorubens	vermilion snapper	194	22.1	29	6.5
Ophidion josephi	crested cusk-eel	182	5.7	13	2.9
Ogcocephalus declivirostris	slantbrow batfish	177	11.9	34	7.6
Mustelus canis	smooth dogfish	172	70.2	7	1.6
Sphoeroides dorsalis	marbled puffer	157	9.1	23	5.1
Synodus poeyi	offshore lizardfish	155	1.3	38	8.5
Symphurus civitatium	offshore tonguefish	150	14.0	5	1.1
Citharichthys spilopterus	bay whiff	138	2.1	26	5.8
Lepophidium jeannae	mottled cusk-eel	136	7.8	15	3.4
Bregmaceros atlanticus	antenna codlet	134	0.1	18	4.0
Monacanthus ciliatus	fringed filefish	132	3.5	23	5.1
Urophycis cirrata	gulf hake	131	2.7	24	5.4
Serranus notospilus	saddle bass	130	7.7	7	1.6
Ariopsis felis	hardhead catfish	125	20.6	28	6.3
Prionotus alatus	spiny searobin	125	3.0	19	4.3
Haemulon plumierii	white grunt	122	27.6	8	1.8
Ogcocephalus parvus	roughback batfish	119	1.4	21	4.7
Aluterus schoepfii	orange filefish	116	39.1	23	5.1
Ancylopsetta dilecta	three-eye flounder	110	5.4	29	6.5

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Ancylopsetta ommata	ocellated flounder	105	18.0	23	5.1
Rhynchoconger flavus	yellow conger	101	7.4	17	3.8
Balistes capriscus	gray triggerfish	99	18.7	31	6.9
Antennarius radiosus	singlespot frogfish	95	1.0	27	6.0
Pomatomus saltatrix	bluefish	94	16.0	4	0.9
Brotula barbata	bearded brotula	94	15.5	19	4.3
Kathetostoma albigutta	lancer stargazer	92	3.9	30	6.7
Caranx crysos	blue runner	88	6.3	11	2.5
Etrumeus teres	round herring	87	0.9	14	3.1
Pagrus pagrus	red porgy	85	9.2	19	4.3
Pareques umbrosus	cubbyu	83	4.4	17	3.8
Raja texana	roundel skate	81	31.5	46	10.3
Scomberomorus cavalla	king mackerel	80	9.6	14	3.1
Acanthostracion quadricornis	scrawled cowfish	72	11.1	21	4.7
Equetus lanceolatus	jackknife fish	71	5.4	7	1.6
Hippocampus erectus	lined seahorse	70	0.6	20	4.5
Etropus cyclosquamus	shelf flounder	69	1.1	9	2.0
Rhizoprionodon terraenovae	Atlantic sharpnose shark	67	46.2	25	5.6
Paralichthys lethostigma	southern flounder	63	22.1	29	6.5
Scomberomorus maculatus	Atlantic Spanish mackerel	62	3.0	11	2.5
Trinectes maculatus	hogchoker	61	0.8	8	1.8
Prionotus scitulus	leopard searobin	59	2.9	12	2.7
Brevoortia patronus	Gulf menhaden	56	2.4	19	4.3
Pareques iwamotoi	blackbar drum	54	2.2	9	2.0
Symphurus diomedeanus	spottedfin tonguefish	53	1.4	17	3.8
Prionotus ophryas	bandtail searobin	53	1.7	18	4.0
Peristedion gracile	slender searobin	51	1.2	7	1.6
Menticirrhus littoralis	Gulf kingfish	48	2.5	6	1.3
Hoplunnis macrura	freckled pike-conger	46	0.6	14	3.1
Anchoa mitchilli	bay anchovy	44	0.1	16	3.6

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Bothus robinsi	twospot flounder	43	1.6	10	2.2
Prognathodes aya	bank butterflyfish	41	0.9	3	0.7
Caulolatilus intermedius	anchor tilefish	39	3.2	17	3.8
Conodon nobilis	barred grunt	38	0.6	4	0.9
Selene vomer	lookdown	37	0.4	18	4.0
Aluterus scriptus	scrawled filefish	37	0.5	4	0.9
Scorpaena agassizii	longfin scorpionfish	34	1.4	3	0.7
Scorpaena dispar	hunchback scorpionfish	33	1.2	3	0.7
Pontinus longispinis	longspine scorpionfish	31	0.3	8	1.8
Neomerinthe hemingwayi	spinycheek scorpionfish	30	3.6	12	2.7
Selar crumenophthalmus	bigeye scad	30	4.1	8	1.8
Chilomycterus schoepfii	striped burrfish	29	8.1	15	3.4
Coryphopterus punctipectophor	spotted goby	27	0.0	2	0.4
Prionotus	searobins	26	0.0	1	0.2
Citharichthys macrops	spotted whiff	25	0.7	6	1.3
Priacanthus arenatus	bigeye	25	4.2	8	1.8
Chaetodipterus faber	Atlantic spadefish	24	1.1	10	2.2
Ophidion grayi	blotched cusk-eel	23	1.3	4	0.9
Bollmannia communis	ragged goby	22	0.1	11	2.5
Squatina dumeril	Atlantic angel shark	22	33.4	12	2.7
Saurida caribbaea	smallscale lizardfish	22	0.1	5	1.1
Paraconger caudilimbatus	margintail conger	22	0.8	9	2.0
Ophidion	cusk-eels	20	1.4	11	2.5
Calamus penna	sheepshead porgy	20	5.3	3	0.7
Calamus nodosus	knobbed porgy	20	4.6	2	0.4
Echeneis neucratoides	whitefin sharksucker	19	5.8	2	0.4
Gymnachirus texae	fringed sole	19	0.5	6	1.3
Neobythites gilli	cusk-eel	18	0.1	4	0.9
Epinephelus morio	red grouper	18	6.3	8	1.8
Serraniculus pumilio	pygmy sea bass	16	0.1	3	0.7

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Lonchopisthus micrognathus	swordtail jawfish	16	0.1	5	1.1
Ogcocephalus corniger	longnose batfish	15	0.3	6	1.3
Sphoeroides spengleri	bandtail puffer	15	0.4	5	1.1
Prionotus carolinus	common searobin	15	0.3	1	0.2
Cyclopsetta fimbriata	spotfin flounder	14	1.4	8	1.8
Calamus arctifrons	grass porgy	14	2.8	3	0.7
Gastropsetta frontalis	shrimp flounder	14	1.1	7	1.6
Opsanus beta	Gulf toadfish	13	1.8	4	0.9
Holocentrus adscensionis	squirrelfish	13	0.5	3	0.7
Lachnolaimus maximus	hogfish	13	6.0	4	0.9
Bairdiella chrysoura	silver perch	13	0.1	6	1.3
Hemicaranx amblyrhynchus	bluntnose jack	13	1.5	5	1.1
Centropristis ocyurus	bank sea bass	12	0.5	6	1.3
Decodon puellaris	red hogfish	12	0.4	4	0.9
Gobionellus oceanicus	highfin goby	12	0.0	2	0.4
Rachycentron canadum	cobia	12	60.5	3	0.7
Raja eglanteria	clearnose skate	12	5.4	7	1.6
Paralichthys	southern flounders	12	1.8	6	1.3
Hemipteronotus novacula	pearly razorfish	11	0.6	6	1.3
Chaetodon sedentarius	reef butterflyfish	10	0.4	3	0.7
Centropristis striatus	black sea bass	10	1.6	3	0.7
Synagrops bellus	blackmouth bass	10	0.1	3	0.7
Eucinostomus	mojarras	9	0.6	6	1.3
Mustelus sinusmexicanus	Gulf smoothhound	9	8.3	7	1.6
Calamus bajonado	jolthead porgy	9	3.5	5	1.1
Seriola dumerili	greater amberjack	9	1.4	6	1.3
Ophichthus gomesii	shrimp eel	9	0.9	6	1.3
Engyophrys senta	spiny flounder	9	0.0	3	0.7
Paralichthys albigutta	Gulf flounder	9	3.2	3	0.7
Sphyrna tiburo	bonnethead	9	29.8	5	1.1

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Physiculus fulvus	metallic codling	9	0.1	3	0.7
Rypticus maculatus	whitespotted soapfish	8	0.4	8	1.8
Antennarius ocellatus	ocellated frogfish	8	0.2	4	0.9
Hoplunnis tenuis	spotted pike-conger	8	0.1	2	0.4
Pristigenys alta	short bigeye	8	0.5	6	1.3
Urophycis regia	spotted hake	8	0.5	3	0.7
Diplectrum	perch	7	0.0	1	0.2
Peprilus triacanthus	butterfish	7	0.1	1	0.2
Narcine brasiliensis	lesser electric ray	7	2.3	2	0.4
Epinephelus flavolimbatus	yellowedge grouper	7	0.8	6	1.3
Opsanus pardus	leopard toadfish	7	0.3	4	0.9
Aluterus heudelotii	dotterel filefish	6	1.6	5	1.1
Engraulis eurystole	silver anchovy	6	0.0	1	0.2
Bagre marinus	gafftopsail catfish	6	0.7	4	0.9
Caranx bartholomaei	yellow jack	6	1.3	2	0.4
Hippocampus reidi	longsnout seahorse	5	0.0	1	0.2
Peprilus paru	harvestfish	5	0.0	2	0.4
Hemanthias vivanus	red barbier	5	0.0	1	0.2
Nicholsina usta	emerald parrotfish	5	0.5	4	0.9
Gymnothorax nigromarginatus	blackedge moray	5	0.7	3	0.7
Dasyatis americana	southern stingray	5	4.4	4	0.9
Rypticus bistrispinus	freckled soapfish	5	0.1	4	0.9
Paralichthys squamilentus	broad flounder	5	2.0	4	0.9
Carcharhinus acronotus	blacknose shark	5	4.3	5	1.1
Rhinoptera brasiliensis	Brazilian cow-nosed ray	5	40.2	3	0.7
Hemanthias aureorubens	streamer bass	4	0.0	2	0.4
Sphoeroides nephelus	southern puffer	4	0.7	2	0.4
Gobionellus hastatus	darter gobies	4	0.0	2	0.4
Apogon pseudomaculatus	twospot cardinalfish	4	0.0	3	0.7
Ariomma bondi	silver-rag	4	0.1	3	0.7

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Echeneis naucrates	sharksucker	4	1.1	4	0.9
Calamus leucosteus	whitebone porgy	4	1.5	1	0.2
Antennarius striatus	striated frogfish	4	0.1	3	0.7
Apogon affinis	bigtooth cardinalfish	4	0.1	2	0.4
Parexocoetus brachypterus	sailfin flyingfish	4	0.1	3	0.7
Gymnothorax saxicola	honeycomb moray	4	0.5	4	0.9
Peristedion greyae	alligator searobin	4	0.0	1	0.2
Sphyraena borealis	northern sennet	4	0.5	2	0.4
Lutjanus griseus	gray snapper	4	1.4	2	0.4
Gymnachirus melas	naked sole	4	0.1	2	0.4
Otophidium omostigmum	polka-dot cusk-eel	4	0.1	2	0.4
Citharichthys cornutus	horned whiff	4	0.0	3	0.7
Gobiesox strumosus	skilletfish	4	0.0	1	0.2
Fistularia petimba	Pacific cornetfish	3	0.6	3	0.7
Echiophis intertinctus	spotted spoon-nose eel	3	1.1	3	0.7
Ogcocephalus pantostictus	spotted batfish	3	1.4	3	0.7
Seriola fasciata	lesser amberjack	3	0.7	2	0.4
Bathyanthias mexicanus	yellowtail bass	3	0.0	2	0.4
Epinephelus niveatus	snowy grouper	3	0.7	3	0.7
Dorosoma petenense	threadfin shad	3	0.0	1	0.2
Parablennius marmoreus	seaweed blenny	3	0.0	2	0.4
Chromis enchrysura	yellowtail reeffish	3	0.1	1	0.2
Holacanthus bermudensis	blue angelfish	3	1.3	3	0.7
Myliobatis freminvillii	bullnose ray	2	5.4	2	0.4
Hemanthias leptus	longtail bass	2	0.0	1	0.2
Hirundichthys rondeletii	blackwing flyingfish	2	0.0	2	0.4
Trichiuridae	cutlassfishes	2	0.1	1	0.2
Lophius americanus	goosefish	2	0.7	1	0.2
Heteropriacanthus cruentatus	glasseye snapper	2	0.7	1	0.2
Hoplunnis diomedianus	blacktail pike-conger	2	0.0	1	0.2

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Apogon aurolineatus	bridle cardinalfish	2	0.0	1	0.2
Echiophis punctifer	snapper eel	2	0.4	2	0.4
Serranus phoebe	tattler	2	0.1	1	0.2
Haemulon striatum	striped grunt	2	0.1	2	0.4
Rhinoptera bonasus	cownose ray	2	22.6	2	0.4
Foetorepus goodenbeani	palefin dragonet	2	0.0	2	0.4
Mycteroperca microlepis	gag	2	3.6	1	0.2
Elops saurus	ladyfish	2	0.3	1	0.2
Pseudupeneus maculatus	spotted goatfish	2	0.0	1	0.2
Ophichthus puncticeps	palespotted eel	2	0.4	2	0.4
Menticirrhus saxatilis	northern kingfish	2	0.2	2	0.4
Ophidion selenops	mooneye cusk-eel	2	0.2	2	0.4
Lophiodes reticulatus	reticulate goosefish	2	0.2	1	0.2
Echiodon dawsoni	chain pearlfish	1	0.0	1	0.2
Pomacentrus variabilis	cocoa damselfish	1	0.0	1	0.2
Ophichthus rex	king snake eel	1	0.4	1	0.2
Hypoplectrus		1	0.0	1	0.2
Rypticus arenatus		1	0.1	1	0.2
Mycteroperca phenax	scamp	1	1.2	1	0.2
Blenniidae	blennies	1	0.0	1	0.2
Gymnothorax kolpos	blacktail moray	1	0.6	1	0.2
Histrio histrio	sargassum frogfish	1	0.0	1	0.2
Carcharhinus limbatus	blacktip shark	1	0.0	1	0.2
Achirus lineatus	lined sole	1	0.0	1	0.2
Symphurus urospilus	spottail tonguefish	1	0.0	1	0.2
Galeocerdo cuvieri	tiger shark	1	20.2	1	0.2
Eucinostomus harengulus	tidewater mojarra	1	0.0	1	0.2
Dasyatis centroura	clam cracker	1	86.7	1	0.2
Saurenchelys		1	0.0	1	0.2
Sphyraena barracuda	great barracuda	1	0.0	1	0.2

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Gymnothorax spp.	morays	1	0.3	1	0.2
Parahollardia lineata	jambeau	1	0.0	1	0.2
Halichoeres bivittatus	slippery dick	1	0.1	1	0.2
Sphyrna lewini	scalloped hammerhead	1	0.5	1	0.2
Scorpaena spp.	scorpionfishes	1	0.0	1	0.2
Chaetodon ocellatus	spotfin butterflyfish	1	0.1	1	0.2
Bothus ocellatus	eyed flounder	1	0.0	1	0.2
Ariomma regulus	spotted driftfish	1	0.0	1	0.2
Umbrina coroides	sand drum	1	0.2	1	0.2
Syngnathus louisianae	chain pipefish	1	0.0	1	0.2
Remora remora	remora	1	0.3	1	0.2
Crustaceans					
Farfantepenaeus aztecus	brown shrimp	59269	854.2	292	65.3
Callinectes similis	lesser blue crab	16357	194.2	245	54.8
Portunus spinicarpus	longspine swimming crab	9675	49.9	97	21.7
Rimapenaeus similis	roughback shrimp	9261	25.8	81	18.1
Squilla empusa	mantis shrimp	9135	81.7	136	30.4
Sicyonia brevirostris	brown rock shrimp	6384	78.9	100	22.4
Litopenaeus setiferus	white shrimp	4056	189.9	94	21.0
Farfantepenaeus duorarum	pink shrimp	3466	78.6	90	20.1
Rimapenaeus constrictus	roughneck shrimp	2322	11.2	51	11.4
Sicyonia dorsalis	lesser rock shrimp	1802	4.2	56	12.5
Solenocera vioscai	humpback shrimp	1560	6.9	47	10.5
Portunus gibbesii	iridescent swimming crab	1472	7.7	92	20.6
Squilla chydaea	mantis shrimp	749	4.3	85	19.0
Xiphopenaeus kroyeri	seabob	412	0.4	29	6.5
Callinectes sapidus	blue crab	381	62.9	53	11.9
Calappa sulcata	yellow box crab	369	59.7	75	16.8

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Parapenaeus politus	deepwater rose shrimp	369	0.6	15	3.4
Anasimus latus	stilt spider crab	331	2.2	52	11.6
Scyllarides nodifer	ridged slipper lobster	174	3.7	22	4.9
Stenorhynchus seticornis	yellowline arrow crab	137	0.4	35	7.8
Portunus spinimanus	blotched swimming crab	129	3.9	44	9.8
Solenocera atlantidis	dwarf humpback shrimp	124	0.2	12	2.7
Leiolambrus nitidus	white elbow crab	97	0.2	22	4.9
Raninoides louisianensis	Gulf frog crab	88	0.6	22	4.9
Sicyonia parri	rock shrimps	75	0.9	3	0.7
Pseudorhombila quadridentata	flecked squareback crab	69	1.1	9	2.0
Munida irrasa		60	0.0	1	0.2
Arenaeus cribrarius	speckled swimming crab	57	1.1	13	2.9
Hepatus epheliticus	calico crab	48	1.9	21	4.7
Ovalipes floridanus	Florida lady crab	46	0.8	22	4.9
Gibbesia neglecta	mantis shrimp	40	0.4	9	2.0
Mesopenaeus tropicalis	salmon shrimp	35	0.1	1	0.2
Portunus sayi	sargassum swimming crab	34	1.9	14	3.1
Sicyonia laevigata	rock shrimp	32	0.7	4	0.9
Libinia dubia	longnose spider crab	28	0.0	15	3.4
Myropsis quinquespinosa	fivespine purse crab	28	0.1	8	1.8
Paguristes sericeus	blue-eye hermit	27	0.1	8	1.8
Sicyonia burkenroadi	spiny rock shrimp	26	0.0	8	1.8
Libinia emarginata	portly spider crab	25	4.0	4	0.9
Persephona crinita	pink purse crab	25	0.0	15	3.4
Petrochirus diogenes	giant hermit crab	24	1.5	6	1.3
Calappa flammea	flame box crab	21	4.2	12	2.7
Plesionika longicauda	pandalid shrimp	21	0.1	3	0.7
Euphrosynoplax clausa	craggy bathyal crab	20	0.1	10	2.2
Pagurus bullisi	hermit crab	20	0.1	7	1.6
Persephona mediterranea	mottled purse crab	19	0.0	10	2.2

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Podochela sidneyi	shortfinger neck crab	18	0.0	9	2.0
Platylambrus granulata	bladetooth elbow crab	18	0.1	12	2.7
Acanthocarpus alexandri	gladiator box crab	15	0.1	2	0.4
Sicyonia spp.	rock shrimps	13	0.0	2	0.4
Collodes robustus	spider crab	12	0.0	6	1.3
Mithrax pleuracanthus	shaggy clinging crab	12	0.1	6	1.3
Solenocera spp.	humpback shrimps	11	0.0	1	0.2
Paguristes triangulatus	hermit crab	11	0.0	2	0.4
Macrocoeloma trispinosum	spongy decorator crab	10	0.1	3	0.7
Stenocionops furcatus furcatus	furcate crab	10	0.2	7	1.6
Cryptodromiopsis antillensis	hairy sponge crab	8	0.1	3	0.7
Pagurus pollicaris	flatclaw hermit crab	7	0.0	5	1.1
Dardanus insignis	red brocade hermit	7	0.0	2	0.4
Acanthilia intermedia	granulose purse crab	7	0.0	2	0.4
Gonodactylus bredini		6	0.0	3	0.7
Speocarcinus lobatus	Gulf squareback crab	6	0.0	2	0.4
Trachypenaeus spp.	roughneck shrimps	6	0.0	1	0.2
Parasquilla coccinea	mantis shrimp	6	0.1	3	0.7
Metapenaeopsis goodei	Caribbean velvet shrimp	6	0.0	2	0.4
Paguristes tortugae	bandeye hermit	6	0.0	1	0.2
Podochela riisei	longfinger neck crab	5	0.0	1	0.2
Parthenope agonus		5	0.0	3	0.7
Munida pusilla		4	0.0	1	0.2
Nephropsis aculeata	Florida lobsterette	4	0.0	1	0.2
Menippe adina	Gulf stone crab	4	0.0	1	0.2
Munida forceps	squat lobster	4	0.0	3	0.7
Stenocionops furcatus coelatus	spider crab	3	0.2	2	0.4
Squilla deceptrix		3	0.0	2	0.4
Stenopus scutellatus	golden coral shrimp	3	0.0	2	0.4
Penaeopsis serrata	megalops shrimp	3	0.0	1	0.2

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Libinia	spider crabs	3	0.3	1	0.2
Metoporhaphis calcarata	false arrow crab	3	0.0	3	0.7
Axiopsis hirsutimana	lobster shrimps	2	0.0	1	0.2
Porcellana sayana	spotted porcelain crab	2	0.0	1	0.2
Porcellana sigsbeiana	striped porcelain crab	2	0.0	1	0.2
Scyllarus depressus	scaled slipper lobster	2	0.0	2	0.4
Iliacantha liodactylus	purse crab	2	0.0	2	0.4
Pseudomedaeus agassizii	rough rubble crab	2	0.0	2	0.4
Portunus ordwayii		2	0.0	1	0.2
Plesionika edwardsii	soldier striped shrimp	2	0.0	1	0.2
Euryalidae		2	0.0	2	0.4
Iliacantha subglobosa	longfinger purse crab	2	0.0	1	0.2
Pilumnus sayi	spineback hairy crab	2	0.0	2	0.4
Galathea rostrata		2	0.0	1	0.2
Stenocionops spinimanus	prickly spider crab	2	0.0	2	0.4
Podochela lamelligera	neck crab	2	0.0	1	0.2
Munida		2	0.0	1	0.2
Metapenaeopsis	velvet shrimps	2	0.0	1	0.2
Mithrax forceps	red-ridged clinging crab	2	0.0	1	0.2
Paguristes lymani		2	0.0	1	0.2
Lysiosquilla scabricauda	mantis shrimp	1	0.1	1	0.2
Panopeus simpsoni	oystershell mud crab	1	0.0	1	0.2
Livoneca redmanii	isopod	1	0.0	1	0.2
Danielum ixbauchac	red sea crab	1	0.0	1	0.2
Parapenaeus spp.	penaeid shrimps	1	0.0	1	0.2
Parthenope	elbow crabs	1	0.0	1	0.2
Xanthidae	mud crabs	1	0.0	1	0.2
Ovalipes	lady crabs	1	0.0	1	0.2
Axiidae	lobster shrimps	1	0.0	1	0.2
Bathynectes longispina	bathyal swimming crab	1	0.0	1	0.2

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Panulirus argus	Caribbean spiny lobster	1	1.4	1	0.2
Macrocoeloma		1	0.0	1	0.2
Hypoconcha		1	0.0	1	0.2
Glyptoxanthus erosus	eroded mud crab	1	0.0	1	0.2
Pyromaia cuspidata	dartnose pear crab	1	0.0	1	0.2
Lobopilumnus agassizii	areolated hairy crab	1	0.0	1	0.2
Podochela gracilipes	unicorn neck crab	1	0.0	1	0.2
Pachycheles rugimanus	sculptured porcelain crab	1	0.0	1	0.2
Lysmata		1	0.0	1	0.2
Pinnixa		1	0.0	1	0.2
Others					
Argopecten gibbus	calico scallop	60021	74.6	10	2.2
Loligo pealeii	longfin squid	9965	163.5	139	31.1
Loligo plei	arrow squid	9599	149.0	109	24.4
Amusium papyraceum	paper scallop	5938	57.7	78	17.4
Lolliguncula brevis	Atlantic brief squid	2973	22.2	136	30.4
Loligo spp.	squids	540	4.6	14	3.1
Pitar cordatus	Schwengel's pitar	213	4.2	25	5.6
Lirophora clenchi	Clench venus	122	1.4	8	1.8
Polystira albida	white giant turris	85	0.6	15	3.4
Polystira tellea	delicate giant turret	37	0.2	4	0.9
Aplysiidae	opisthobranchs	34	0.7	1	0.2
Anadara baughmani	Baughman's ark	33	0.4	13	2.9
Octopus vulgaris	common Atlantic octopus	29	4.3	15	3.4
Evola	bivalves	28	0.1	6	1.3
Sconsia striata	royal bonnet	27	0.4	9	2.0
Distorsio clathrata	Atlantic distorsio	22	0.2	3	0.7
Macoma brevifrons	short macoma	21	0.1	4	0.9

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Pteria colymbus	Atlantic wing-oyster	19	0.3	6	1.3
Tonna galea	giant tun	14	0.8	5	1.1
Aequipecten muscosus	rough scallop	10	0.1	4	0.9
Mollusca	molluscs	9	0.1	3	0.7
Macoma pulleyi	delta macoma	8	0.1	3	0.7
Cantharus cancellarius	cancellate cantharus	8	0.0	5	1.1
Narcissia trigonaria		7	0.3	5	1.1
Aplysia morio	sooty seahare	7	0.7	2	0.4
Neverita duplicata	shark eye	6	0.0	3	0.7
Aplysia brasiliana	mottled seahare	5	0.2	4	0.9
Cypraeidae		5	0.0	2	0.4
Laevicardium laevigatum	egg cockle	5	0.2	1	0.2
Conus austini	cone shell	5	0.1	2	0.4
Anadara ovalis	blood ark	5	0.0	3	0.7
Euvola raveneli	Ravenel's scallop	3	0.0	2	0.4
Pleurobranchus	slugs	3	0.1	2	0.4
Muricidae		3	0.0	2	0.4
Busycon sinistrum	lightning whelk	2	0.0	2	0.4
Noetia ponderosa	ponderous ark	2	0.0	1	0.2
Fasciolaria lilium	banded tulip	2	0.2	1	0.2
Busycon perversum	whelk	2	0.1	1	0.2
Semirossia equalis	greater shining bobtail	2	0.0	2	0.4
Scaphella dubia	dubious volute	2	0.2	1	0.2
Atrina rigida	stiff penshell	2	0.1	2	0.4
Arca zebra	turkey wing	2	0.1	2	0.4
Latirus infundibulum	brown-line latirus	1	0.0	1	0.2
Laevicardium mortoni	yellow eggcockle	1	0.1	1	0.2
Murex		1	0.0	1	0.2
Mercenaria campechiensis	southern quahog	1	0.0	1	0.2
Strombus alatus	Florida fighting conch	1	0.0	1	0.2

Table 2. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Umbraculum plicatulum		1	0.0	1	0.2
Ficus communis	Atlantic figsnail	1	0.0	1	0.2
Anaspidea		1	0.0	1	0.2
Gastropoda	snails	1	0.0	1	0.2
Chicoreus florifer-dilectus		1	0.0	1	0.2
Pinctada		1	0.0	1	0.2
Diodora cayenensis	Cayenne keyhole limpet	1	0.0	1	0.2
Pleuroploca gigantea	horse conch	1	0.0	1	0.2
Eucrassatella speciosa	beautiful crassatella	1	0.0	1	0.2

Table 3. 2008 Fall Shrimp/Groundfish Survey species composition list, 449 trawl stations, for those vessels that used either a 40-ft or 20-ft trawl. Species with a total weight of less than 0.0227 kg (0.05 lb) are indicated on the table as 0.0 kg.

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Finfishes					
Micropogonias undulatus	Atlantic croaker	214094	10072.6	342	76.2
Stenotomus caprinus	longspine porgy	41867	1901.4	267	59.5
Chloroscombrus chrysurus	Atlantic bumper	25612	539.5	211	47.0
Leiostomus xanthurus	spot	17482	1647.6	223	49.7
Peprilus burti	Gulf butterfish	10975	696.1	218	48.6
Cynoscion nothus	silver seatrout	10691	590.3	238	53.0
Trachurus lathami	rough scad	6802	317.9	108	24.1
Prionotus longispinosus	bigeye searobin	6222	226.4	254	56.6
Trichiurus lepturus	Atlantic cutlassfish	6081	294.3	162	36.1
Cynoscion arenarius	sand seatrout	5061	605.0	225	50.1
Lagodon rhomboides	pinfish	3580	274.3	201	44.8
Larimus fasciatus	banded drum	3336	223.2	122	27.2
Synodus foetens	inshore lizardfish	3312	462.4	275	61.2
Serranus atrobranchus	blackear bass	2598	24.0	92	20.5
Syacium gunteri	shoal flounder	2585	57.1	186	41.4
Centropristis philadelphica	Rock Sea bass	2493	141.4	201	44.8
Harengula jaguana	scaled sardine	2320	125.8	84	18.7
Selene setapinnis	Atlantic moonfish	1730	52.4	153	34.1
Halieutichthys aculeatus	pancake batfish	1722	11.2	122	27.2
Stephanolepis hispida	planehead filefish	1518	33.5	51	11.4
Upeneus parvus	dwarf goatfish	1466	72.9	101	22.5
Anchoa hepsetus	striped anchovy	1451	20.2	91	20.3
Stellifer lanceolatus	star drum	1291	20.1	64	14.3
Ariopsis felis	hardhead catfish	1269	239.1	100	22.3
Lutjanus campechanus	red snapper	1265	145.5	210	46.8
Mullus auratus	red goatfish	1177	72.6	54	12.0

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Opisthonema oglinum	Atlantic thread herring	1101	55.8	70	15.6
Haemulon aurolineatum	tomtate	1025	84.2	35	7.8
Rhomboplites aurorubens	vermilion snapper	936	60.1	28	6.2
Pristipomoides aquilonaris	wenchman	930	65.5	56	12.5
Cyclopsetta chittendeni	Mexican flounder	910	91.2	162	36.1
Chaetodipterus faber	Atlantic spadefish	865	59.0	141	31.4
Eucinostomus gula	silver jenny	855	30.4	72	16.0
Bagre marinus	gafftopsail catfish	776	144.9	51	11.4
Orthopristis chrysoptera	pigfish	769	45.5	41	9.1
Lepophidium brevibarbe	blackedge cusk-eel	742	28.5	83	18.5
Trichopsetta ventralis	sash flounder	740	19.7	34	7.6
Cynoscion spp.	seatrouts	640	4.3	24	5.3
Prionotus paralatus	Mexican searobin	609	27.9	32	7.1
Lutjanus synagris	lane snapper	579	91.4	103	22.9
Caranx crysos	blue runner	578	41.0	84	18.7
Syacium papillosum	dusky flounder	571	26.0	46	10.2
Diplectrum bivittatum	dwarf sand perch	439	7.4	47	10.5
Sphoeroides parvus	least puffer	406	2.5	44	9.8
Decapterus punctatus	round scad	404	8.1	24	5.3
Peprilus paru	harvestfish	402	21.5	95	21.2
Etropus crossotus	fringed flounder	365	6.4	75	16.7
Balistes capriscus	gray triggerfish	342	27.4	138	30.7
Saurida brasiliensis	largescale lizardfish	334	1.1	58	12.9
Saurida normani	shortjaw lizardfish	314	21.7	4	0.9
Citharichthys spilopterus	bay whiff	298	4.0	60	13.4
Porichthys plectrodon	Atlantic midshipman	285	5.8	72	16.0
Diplectrum formosum	sand perch	266	28.8	38	8.5
Prionotus rubio	blackwing searobin	265	15.5	32	7.1
Centropristis ocyurus	bank sea bass	256	13.8	22	4.9
Menticirrhus americanus	southern kingfish	244	24.8	36	8.0

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Sardinella aurita	Spanish sardine	207	8.0	12	2.7
Calamus proridens	littlehead porgy	207	40.9	20	4.5
Lagocephalus laevigatus	smooth puffer	206	27.9	69	15.4
Scorpaena calcarata	smoothhead scorpionfish	187	4.2	33	7.3
Synodus intermedius	sand diver	144	8.4	25	5.6
Prionotus stearnsi	shortwing searobin	141	1.3	16	3.6
Ogcocephalus declivirostris	slantbrow batfish	130	2.7	29	6.5
Sphyraena guachancho	guaguanche	129	24.3	41	9.1
Selene vomer	lookdown	129	3.6	49	10.9
Anchoa mitchilli	bay anchovy	126	0.1	23	5.1
Pareques umbrosus	cubbyu	124	4.4	20	4.5
Ophidion holbrookii	bank cusk-eel	121	8.8	16	3.6
Symphurus plagiusa	blackcheek tonguefish	117	2.4	37	8.2
Ophidion josephi	crested cusk-eel	117	4.5	23	5.1
Aluterus schoepfii	orange filefish	117	48.7	13	2.9
Ancylopsetta ommata	ocellated flounder	116	16.2	35	7.8
Trachinocephalus myops	snakefish	113	7.4	25	5.6
Prionotus roseus	bluespotted searobin	107	4.3	26	5.8
Bellator militaris	horned searobin	92	1.5	8	1.8
Prionotus scitulus	leopard searobin	91	2.1	6	1.3
Prionotus martis	barred searobin	91	3.7	7	1.6
Ariomma regulus	spotted driftfish	84	2.9	19	4.2
Scomberomorus maculatus	Spanish mackerel	80	15.4	14	3.1
Brotula barbata	bearded brotula	80	7.5	30	6.7
Lepophidium jeannae	mottled cusk-eel	76	3.8	14	3.1
Prionotus tribulus	bighead searobin	74	7.4	22	4.9
Pagrus pagrus	red porgy	73	18.5	17	3.8
Eucinostomus argenteus	spotfin mojarra	72	1.0	3	0.7
Kathetostoma albigutta	lancer stargazer	72	2.5	20	4.5
Pareques iwamotoi	blackbar drum	71	6.1	14	3.1

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Symphurus diomedeanus	spottedfin tonguefish	70	1.8	24	5.3
Rhynchoconger flavus	yellow conger	70	5.0	18	4.0
Brevoortia patronus	Gulf menhaden	63	6.5	23	5.1
Acanthostracion quadricornis	scrawled cowfish	60	10.3	17	3.8
Calamus arctifrons	grass porgy	56	8.7	5	1.1
Paralichthys lethostigma	southern flounder	52	16.9	19	4.2
Hoplunnis macrura	freckled pike-conger	51	0.3	12	2.7
Rhizoprionodon terraenovae	Atlantic sharpnose shark	51	60.7	25	5.6
Hemicaranx amblyrhynchus	bluntnose jack	51	2.0	22	4.9
Prionotus ophryas	bandtail searobin	48	1.0	12	2.7
Raja texana	roundel skate	47	18.3	37	8.2
Peprilus paru	harvestfish	46	2.8	5	1.1
Selar crumenophthalmus	bigeye scad	46	5.3	16	3.6
Citharichthys macrops	spotted whiff	41	1.0	12	2.7
Anchoa nasus	longnose anchovy	41	0.0	3	0.7
Conodon nobilis	barred grunt	39	1.1	4	0.9
Anchoa lyolepis	dusky anchovy	39	0.0	6	1.3
Urophycis regia	spotted hake	39	3.1	2	0.4
Sphoeroides dorsalis	marbled puffer	35	1.7	9	2.0
Synodus poeyi	offshore lizardfish	33	0.2	12	2.7
Sphyrna tiburo	bonnethead	33	38.2	24	5.3
Estropus microstomus	smallmouth flounder	32	0.4	4	0.9
Mustelus canis	smooth dogfish	30	22.4	18	4.0
Haemulon plumierii	white grunt	30	8.4	9	2.0
Symphurus urospilus	spottail tonguefish	28	0.6	3	0.7
Gymnachirus texae	fringed sole	27	0.5	15	3.3
Engyophrys senta	spiny flounder	27	0.1	13	2.9
Echeneis neucratoides	whitefin sharksucker	24	6.1	10	2.2
Steindachneria argentea	luminous hake	24	0.1	3	0.7
Calamus		22	3.4	2	0.4

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Urophycis floridana	southern hake	21	3.2	3	0.7
Dasyatis americana	southern stingray	19	115.1	15	3.3
Caulolatilus intermedius	anchor tilefish	19	2.6	5	1.1
Caranx hippos	crevalle jack	18	1.4	7	1.6
Neomerinthe hemingwayi	spinycheek scorpionfish	18	4.0	6	1.3
Calamus leucosteus	whitebone porgy	18	6.0	7	1.6
Bollmannia communis	ragged goby	17	0.0	8	1.8
Prionotus alatus	spiny searobin	17	0.6	6	1.3
Calamus nodosus	knobbed porgy	17	5.0	4	0.9
Ophidion grayi	blotched cusk-eel	16	0.9	3	0.7
Epinephelus morio	red grouper	16	10.3	7	1.6
Bothus robinsi	twospot flounder	16	0.4	6	1.3
Pomatomus saltatrix	bluefish	16	5.7	9	2.0
Paralichthys squamilentus	broad flounder	15	6.0	11	2.4
Ogcocephalus pantostictus	spotted batfish	14	6.3	11	2.4
Carcharhinus acronotus	blacknose shark	14	22.2	6	1.3
Serranus phoebe	tattler	14	0.6	5	1.1
Lachnolaimus maximus	hogfish	13	5.1	5	1.1
Polydactylus octonemus	Atlantic threadfin	12	0.8	3	0.7
Scomberomorus cavalla	king mackerel	12	2.3	4	0.9
Dorosoma petenense	threadfin shad	12	0.1	9	2.0
Rachycentron canadum	cobia	11	13.9	8	1.8
Equetus lanceolatus	jackknife fish	11	0.9	5	1.1
Decodon puellaris	red hogfish	11	0.8	4	0.9
Alectis ciliaris	African pompano	11	0.3	5	1.1
Rypticus maculatus	whitespotted soapfish	10	0.3	8	1.8
Trachinotus carolinus	Florida pompano	10	2.5	7	1.6
Priacanthus arenatus	bigeye	10	0.8	3	0.7
Apogon affinis	bigtooth cardinalfish	9	0.0	3	0.7
Chaetodon ocellatus	spotfin butterflyfish	9	0.7	7	1.6

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Apogon pseudomaculatus	twospot cardinalfish	9	0.1	3	0.7
Scorpaena agassizii	longfin scorpionfish	9	0.1	2	0.4
Monacanthus ciliatus	fringed filefish	9	0.2	7	1.6
Ophidion beani	longnose cusk-eel	8	0.4	4	0.9
Opsanus beta	Gulf toadfish	8	0.7	4	0.9
Etrumeus teres	round herring	8	0.3	4	0.9
Ancylopsetta dilecta	three-eye flounder	8	1.2	2	0.4
Echeneis naucrates	sharksucker	8	4.3	8	1.8
Seriola dumerili	greater amberjack	7	2.0	5	1.1
Epinephelus flavolimbatus	yellowedge grouper	7	0.6	5	1.1
Sphoeroides spengleri	bandtail puffer	7	0.3	6	1.3
Sphoeroides nephelus	southern puffer	7	0.1	4	0.9
Phaeoptyx pigmentaria	dusky cardinalfish	7	0.0	3	0.7
Mugil cephalus	black mullet	6	0.2	1	0.2
Rhinoptera brasiliensis	Brazilian cow-nosed ray	6	57.2	1	0.2
Gymnothorax saxicola	honeycomb moray	6	0.6	5	1.1
Antennarius radiosus	singlespot frogfish	6	0.1	3	0.7
Hippocampus erectus	lined seahorse	6	0.2	6	1.3
Equetus punctatus	spotted drum	6	0.3	2	0.4
Apogon quadrisquamatus	sawcheek cardinalfish	5	0.0	3	0.7
Ogcocephalus parvus	roughback batfish	5	0.0	4	0.9
Narcine brasiliensis	lesser electric ray	5	2.6	5	1.1
Rhinoptera bonasus	cownose ray	4	6.2	2	0.4
Eucinostomus	mojarras	4	0.2	4	0.9
Mycteroperca phenax	scamp	4	1.3	4	0.9
Cyclopsetta fimbriata	spotfin flounder	4	0.9	3	0.7
Ophidion selenops	mooneye cusk-eel	4	0.0	2	0.4
Scorpaena brasiliensis	barbfish	4	0.1	2	0.4
Syngnathus	seahorses and pipefishes	4	0.0	1	0.2
Chaetodon sedentarius	reef butterflyfish	4	0.2	2	0.4

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Lutjanus griseus	grey snapper	4	2.7	2	0.4
Gymnura micrura	smooth butterfly ray	3	2.0	2	0.4
Aluterus scriptus	scrawled filefish	3	0.4	3	0.7
Chilomycterus schoepfii	striped burrfish	3	0.6	2	0.4
Sphyraena borealis	northern sennet	3	0.5	2	0.4
Paralichthys albigutta	Gulf flounder	3	1.5	3	0.7
Caulolatilus cyanops	blackline tilefish	3	0.4	1	0.2
Nicholsina usta	emerald parrotfish	3	0.3	2	0.4
Serranus notospilus	saddle bass	3	0.1	3	0.7
Peprilus triacanthus	butterfish	3	0.0	1	0.2
Serraniculus pumilio	pygmy sea bass	3	0.0	1	0.2
Astrapogon alutus	bronze cardinalfish	3	0.0	2	0.4
Ophichthus gomesii	shrimp eel	3	0.3	3	0.7
Saurida caribbaea	smallscale lizardfish	3	0.0	1	0.2
Gymnachirus melas	naked sole	2	0.1	2	0.4
Holacanthus bermudensis	blue angelfish	2	0.5	1	0.2
Aluterus monoceros	unicorn filefish	2	0.8	1	0.2
Ogcocephalus cubifrons	polka-dot batfish	2	0.3	2	0.4
Otophidium omostigmum	polka-dot cusk-eel	2	0.0	1	0.2
Carcharhinus falciformis	silky shark	2	56.4	1	0.2
Apogon spp.	cardinalfishes	2	0.0	1	0.2
Bathyanthias mexicanus	yellowtail bass	2	0.0	1	0.2
Hippocampus reidi	longsnout seahorse	2	0.0	2	0.4
Peristedion gracile	slender searobin	2	0.1	1	0.2
Remora remora	remora	2	1.8	2	0.4
Raja eglanteria	clearnose skate	2	1.5	2	0.4
Mycteroperca microlepis	gag	2	1.4	2	0.4
Anguilliformes	eels	2	0.0	1	0.2
Gymnothorax nigromarginatus	blackedge moray	2	0.2	1	0.2
Unid.fish	fishes	2	0.0	1	0.2

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Urophycis cirrata	gulf hake	2	0.0	1	0.2
Elops saurus	ladyfish	2	0.1	1	0.2
Scorpaena plumieri	spotted scorpionfish	2	0.3	2	0.4
Carangidae	jacks	2	0.0	1	0.2
Bregmaceros atlanticus	antenna codlet	2	0.0	1	0.2
Anchoa	common anchovies	2	0.0	1	0.2
`lactophrys triqueter	smooth trunkfish	2	0.2	1	0.2
Pogonias cromis	black drum	2	6.5	2	0.4
Gymnura altavela	spiny butterfly ray	1	1.6	1	0.2
Pomacanthus arcuatus	gray angelfish	1	0.7	1	0.2
Gnathophis bracheatopos	longeye conger	1	0.0	1	0.2
Epinephelus niveatus	snowy grouper	1	0.1	1	0.2
Hoplunnis diomedianus	blacktail pike-conger	1	0.0	1	0.2
Bairdiella chrysoura	silver perch	1	0.0	1	0.2
Centropristis striatus	black sea bass	1	0.2	1	0.2
Achirus lineatus	lined sole	1	0.0	1	0.2
Engraulidae	anchovies	1	0.0	1	0.2
Sphyraena barracuda	great barracuda	1	0.0	1	0.2
Dasyatis sabina	Atlantic stingray	1	0.0	1	0.2
Lobotes surinamensis	Atlantic tripletail	1	0.1	1	0.2
Microdesmidae	dartfishes	1	0.0	1	0.2
Pristigenys alta	short bigeye	1	0.2	1	0.2
Trinectes maculatus	hogchoker	1	0.0	1	0.2
Lactophrys trigonus	trunkfish	1	0.0	1	0.2
Hemipteronotus novacula	pearly razorfish	1	0.0	1	0.2
Menticirrhus saxatilis	northern kingfish	1	0.1	1	0.2
Astroscopus y-graecum	southern stargazer	1	0.1	1	0.2
Gastropsetta frontalis	shrimp flounder	1	0.1	1	0.2
Albula vulpes	bonefish	1	0.1	1	0.2
Symphurus civitatium	offshore tonguefish	1	0.0	1	0.2

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Sciaenops ocellatus	red drum	1	5.2	1	0.2
Myliobatis freminvillii	bullnose ray	1	1.0	1	0.2
Gymnothorax kolpos	blacktail moray	1	0.5	1	0.2
Echiophis punctifer	snapper eel	1	0.2	1	0.2
Uraspis secunda	cottonmouth jack	1	0.3	1	0.2
Seriola rivoliana	almaco jack	1	0.2	1	0.2
Prognathodes aya	bank butterflyfish	1	0.0	1	0.2
Holocentrus adscensionis	squirrelfish	1	0.2	1	0.2
Mustelus	smooth hound sharks	1	0.8	1	0.2
Pomadasys crocro	burro grunt	1	0.3	1	0.2
Ogcocephalus corniger	longnose batfish	1	0.0	1	0.2
Apogon aurolineatus	bridle cardinalfish	1	0.0	1	0.2
Crustaceans					
Farfantepenaeus aztecus	brown shrimp	29927	652.2	301	67.0
Callinectes similis	lesser blue crab	6057	125.6	234	52.1
Litopenaeus setiferus	white shrimp	3324	110.5	151	33.6
Rimapenaeus similis	Roughback shrimp	1943	6.1	112	24.9
Squilla empusa	Mantis shrimp	1859	27.6	128	28.5
Portunus spinicarpus	longspine swimming crab	1603	13.8	46	10.2
Sicyonia brevirostris	brown rock shrimp	1041	17.2	85	18.9
Farfantepenaeus duorarum	pink shrimp	1005	27.9	73	16.3
Sicyonia dorsalis	lesser rock shrimp	562	1.9	39	8.7
Portunus gibbesii	iridescent swimming crab	530	6.5	77	17.1
Solenocera vioscai	humpback shrimp	480	1.9	31	6.9
Squilla chydaea	mantis shrimp	325	1.9	48	10.7
Xiphopenaeus kroyeri	seabob	268	0.0	18	4.0
Calappa sulcata	yellow box crab	265	56.0	81	18.0
Callinectes sapidus	blue crab	245	40.6	61	13.6

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Portunus spinimanus	blotched swimming crab	213	8.6	48	10.7
Anasimus latus	stilt spider crab	187	1.4	23	5.1
Rimapenaeus constrictus	roughneck shrimp	91	0.3	26	5.8
Raninoides louisianensis	Gulf frog crab	55	0.6	19	4.2
Solenocera atlantidis	dwarf humpback shrimp	33	0.0	9	2.0
Metapenaeopsis goodei	Caribbean velvet shrimp	23	0.0	7	1.6
Pseudorhombila quadridentata	flecked squareback crab	18	0.2	5	1.1
Podochela sidneyi	shortfinger neck crab	18	0.1	7	1.6
Plesionika longicauda	pandalid shrimp	18	0.0	3	0.7
Scyllarides nodifer	ridged slipper lobster	17	4.5	8	1.8
Paguristes triangulatus	hermit crab	14	0.0	3	0.7
Stenorhynchus seticornis	yellowline arrow crab	13	0.1	7	1.6
Dardanus insignis	red brocade hermit	13	0.0	3	0.7
Pagurus impressus	dimpled hermit	12	0.0	2	0.4
Porcellana sayana	spotted porcelain crab	11	0.0	1	0.2
Parapenaeus politus	deepwater rose shrimp	9	0.0	3	0.7
Mithrax forceps	red-ridged clinging crab	8	0.0	3	0.7
Petrochirus diogenes	giant hermit crab	8	0.8	5	1.1
Arenaeus cribrarius	speckled swimming crab	8	0.4	6	1.3
Ovalipes floridanus	Florida lady crab	8	0.3	4	0.9
Libinia dubia	longnose spider crab	8	0.0	8	1.8
Portunus sayi	sargassum swimming crab	7	0.0	3	0.7
Dardanus fucosus	bareye hermit	7	0.0	4	0.9
Hepatus epheliticus	calico crab	7	0.3	5	1.1
Cryptodromiopsis antillensis	hairy sponge crab	7	0.1	5	1.1
Persephona crinita	pink purse crab	7	0.0	6	1.3
Euphrosynoplax clausa	craggy bathyal crab	6	0.0	4	0.9
Scyllarus chacei	Chace slipper lobster	6	0.0	4	0.9
Portunus ordwayii		6	0.0	3	0.7
Leiolambrus nitidus	white elbow crab	5	0.0	3	0.7
Myropsis quinquespinosa	fivespine purse crab	5	0.0	2	0.4
Acanthocarpus alexandri	gladiator box crab	4	0.0	2	0.4

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Sicyonia parri	rock shrimps	4	0.1	1	0.2
Mithrax pleuracanthus	shaggy clinging crab	4	0.0	3	0.7
Stenocionops furcatus coelatus	spider crab	4	0.0	2	0.4
Calappa flammea	flame box crab	3	0.6	2	0.4
Stenocionops furcatus furcatus	furcate crab	3	0.2	2	0.4
Scyllarus depressus	scaled slipper lobster	3	0.1	1	0.2
Platylambrus granulata	bladetooth elbow crab	3	0.0	2	0.4
Libinia emarginata	portly spider crab	3	0.6	3	0.7
Petrolisthes		2	0.0	1	0.2
Paguristes spp.	hermit crabs	2	0.0	2	0.4
Pilumnus dasypodus	shortspine hairy crab	2	0.0	2	0.4
Pagurus bullisi	hermit crab	2	0.0	1	0.2
Mesopenaeus tropicalis	salmon shrimp	2	0.0	2	0.4
Pilumnus floridanus	plumed hairy crab	2	0.0	1	0.2
Diogenidae	left-handed hermit crabs	1	0.0	1	0.2
Eriphia		1	0.0	1	0.2
Pilumnus sayi	spineback hairy crab	1	0.0	1	0.2
Paguridae	right-handed hermit crabs	1	0.0	1	0.2
Nerocila		1	0.0	1	0.2
Tyche emarginata	fourhorn crab	1	0.0	1	0.2
Synalpheus		1	0.0	1	0.2
Pagurus pollicaris	flatclaw hermit crab	1	0.0	1	0.2
Paguristes sericeus	blue-eyed hermit	1	0.0	1	0.2
Stenocionops spinimanus	prickly spider crab	1	0.3	1	0.2
Danielum ixbauchac	red sea crab	1	0.0	1	0.2
Xanthidae	mud crabs	1	0.0	1	0.2
Livoneca redmanii	isopod	1	0.0	1	0.2
Parthenope agonus		1	0.0	1	0.2
Sicyonia spp.	rock shrimps	1	0.0	1	0.2
Unid crusta		1	0.5	1	0.2

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Crustaceans	Unidentified crustacean	1	0.2	1	0.2
Iliacantha liodactylus	purse crab	1	0.0	1	0.2
Macrocoeloma trispinosum	spongy decorator crab	1	0.0	1	0.2
Others					
Amusium papyraceum	paper scallop	2173	19.2	53	11.8
Loligo plei	arrow squid	1094	22.7	108	24.1
Lolliguncula brevis	Atlantic brief squid	933	3.3	118	26.3
Loligo pealeii	longfin squid	637	20.5	70	15.6
Loligo spp.	squids	348	5.1	11	2.4
Anadara baughmani	Baughman's ark	114	1.7	11	2.4
Pitar cordatus	Schwengel's pitar	65	1.3	20	4.5
Polystira albida	white giant turris	60	0.4	11	2.4
Mollusca	molluscs	40	8.9	13	2.9
Lirophora clenchi	Clench venus	19	0.2	4	0.9
Unid other		12	56.6	6	1.3
Conus austini	cone shell	10	0.1	3	0.7
Euvola raveneli	Ravenel's scallop	9	0.0	5	1.1
Unid other		8	89.9	6	1.3
Eucrassatella speciosa	beautiful crassatella	7	0.1	1	0.2
Cantharus cancellarius	cancellate cantharus	6	0.0	3	0.7
Pteria colymbus	Atlantic wing-oyster	6	0.1	3	0.7
Anadara transversa	transverse ark	5	0.1	1	0.2
Distorsio clathrata	Atlantic distorsio	4	0.0	2	0.4
Neverita duplicata	shark eye	4	0.0	4	0.9
Tonna galea	giant tun	4	0.4	3	0.7
Dendostrea		2	0.0	2	0.4
Murex cabritti		2	0.0	1	0.2
Pinctada		2	0.0	1	0.2

Table 3. Species composition list (continued)

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Stramonita haemastoma	rocksnail	2	0.0	2	0.4
Chicoreus florifer-dilectus		2	0.0	2	0.4
Latirus infundibulum	brown-line latirus	2	0.0	1	0.2
Argopecten gibbus	calico scallop	2	0.0	2	0.4
Pleuroploca gigantea	horse conch	1	0.0	1	0.2
Sinum perspectivum	white baby-ear	1	0.0	1	0.2
Nodipecten		1	0.0	1	0.2
Scyllaea pelagica	sargassum nudibranch	1	0.0	1	0.2
Calliostoma jujubinum	mottled topsnail	1	0.0	1	0.2
Laevicardium laevigatum	eggcockle	1	0.1	1	0.2
Macoma pulleyi	delta macoma	1	0.0	1	0.2
Octopus burryi	brownstripe octopus	1	0.1	1	0.2
Octopus vulgaris	common Atlantic octopus	1	0.3	1	0.2
Sconsia striata	royal bonnet	1	0.0	1	0.2
Busycon sinistrum	lightning whelk	1	0.0	1	0.2

Table 4. 2008 Reeffish Survey species composition list, 26 trap stations where a fish trap was used.

Species with a total weight of less than 0.0227 kg (0.05 lb) are indicated on the table as 0.0 kg.

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)	NUMBER OF TOWS WHERE CAUGHT	% FREQUENCY OCCURRENCE
Finfishes					
Lutjanus campechanus	red snapper	90	87.8	10	38.5
Pagrus pagrus	red porgy	72	44.8	13	50.0
Rhomboplites aurorubens	vermilion snapper	54	34.6	9	34.6
Balistes capriscus	gray triggerfish	42	33.8	5	19.2
Calamus nodosus	knobbed porgy	21	6.6	4	15.4
Epinephelus morio	red grouper	13	33.1	6	23.1
Haemulon aurolineatum	tomtate	12	1.9	1	3.8
Mycteroperca phenax	scamp	11	11.2	5	19.2
Pareques umbrosus	cubbyu	4	0.6	1	3.8
Centropristis ocyurus		3	0.4	2	7.7
Chaetodon sedentarius	reef butterflyfish	1	0.3	1	3.8
Gymnothorax moringa	spotted moray	1	0.9	1	3.8
Holacanthus bermudensis	blue angelfish	1	1.2	1	3.8
Calamus calamus	saucereye porgy	1	0.4	1	3.8
Calamus leucosteus	whitebone porgy	1	0.5	1	3.8
Epinephelus flavolimbatus	yellowedge grouper	1	1.9	1	3.8
Epinephelus niveatus	snowy grouper	1	0.7	1	3.8
Epinephelus drummondhayi	speckled hind	1	1.7	1	3.8

Table 5. 2008 Bottom Longline Survey species composition list. Species with no weight recorded were too large to measure.

GENUS/SPECIES	COMMON NAME	TOTAL NUMBER CAUGHT	TOTAL WEIGHT CAUGHT (KG)
Finfishes			
Rhizoprionodon terraenovae	Atlantic sharpnose shark	407	793.39
Carcharhinus limbatus	blacktip shark	145	545.90
Bagre marinus	gafftopsail catfish	88	120.65
Sciaenops ocellatus	red drum	73	563.00
Carcharhinus leucas	bull shark	36	1.00
Carcharhinus isodon	finetooth shark	17	69.25
Dasyatis americana	southern stingray	16	73.50
Galeocerdo cuvier	tiger shark	13	9.00
Arius felis	hardhead catfish	11	6.25
Carcharhinus acronotus	blacknose shark	8	52.25
Rhinoptera bonasus	cownose ray	6	9.00
Pomatomus saltatrix	bluefish	6	2.85
Carcharhinus brevipinna	spinner shark	4	13.25
Sphyrna mokarran	great hammerhead	3	
Pogonias cromis	black drum	1	13.70
Rachycentron canadum	cobia	1	8.00
Carcharhinus plumbeus	sandbar shark	1	
Lepidochelys kempii	Kemp's ridley	1	
Carcharhinidae	requiem sharks	1	
Dasyatis say	bluntnose stingray	1	
Caretta caretta	Loggerhead	1	

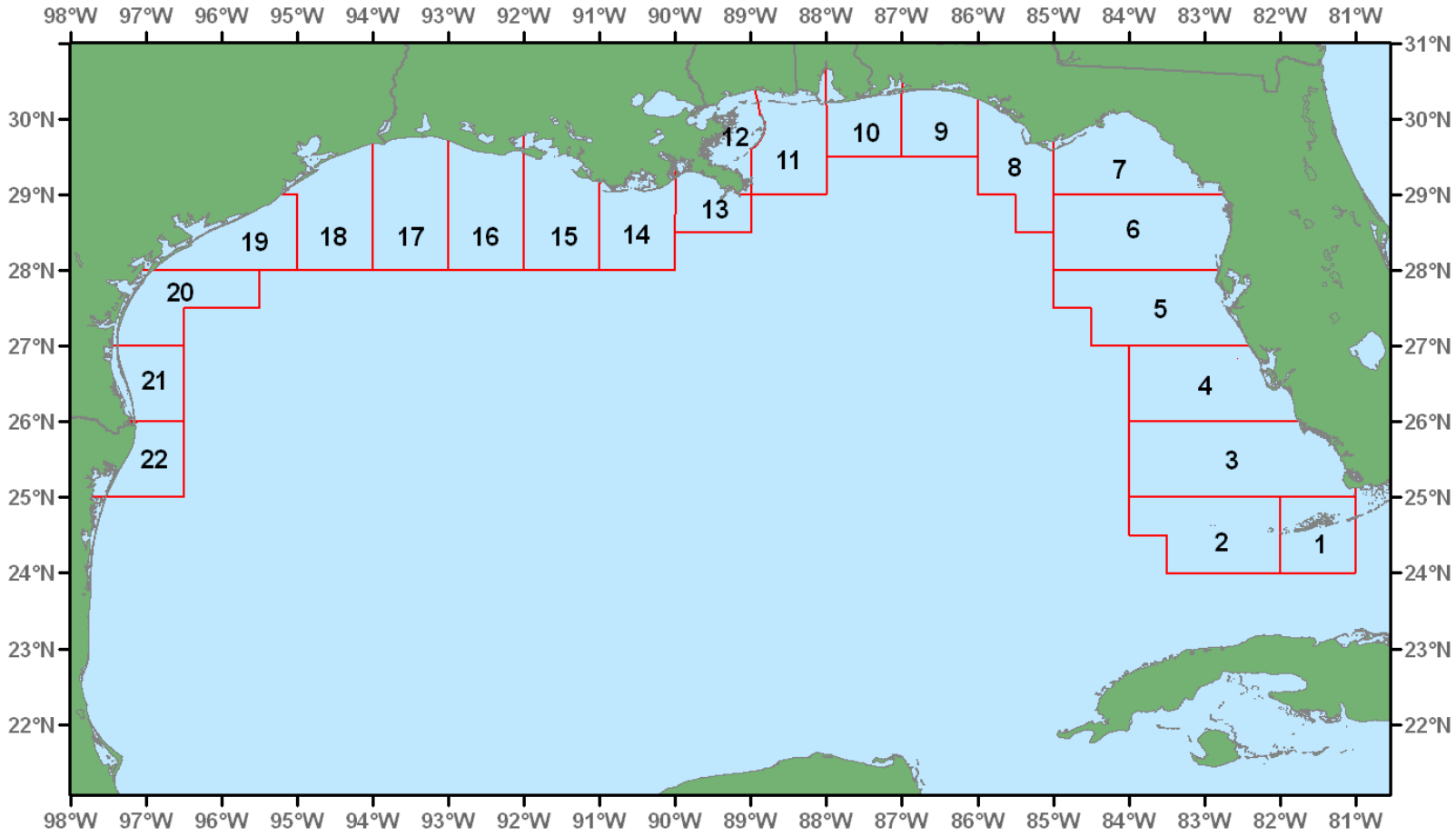

Figure 1. Statistical zones for shrimp in the Gulf of Mexico.

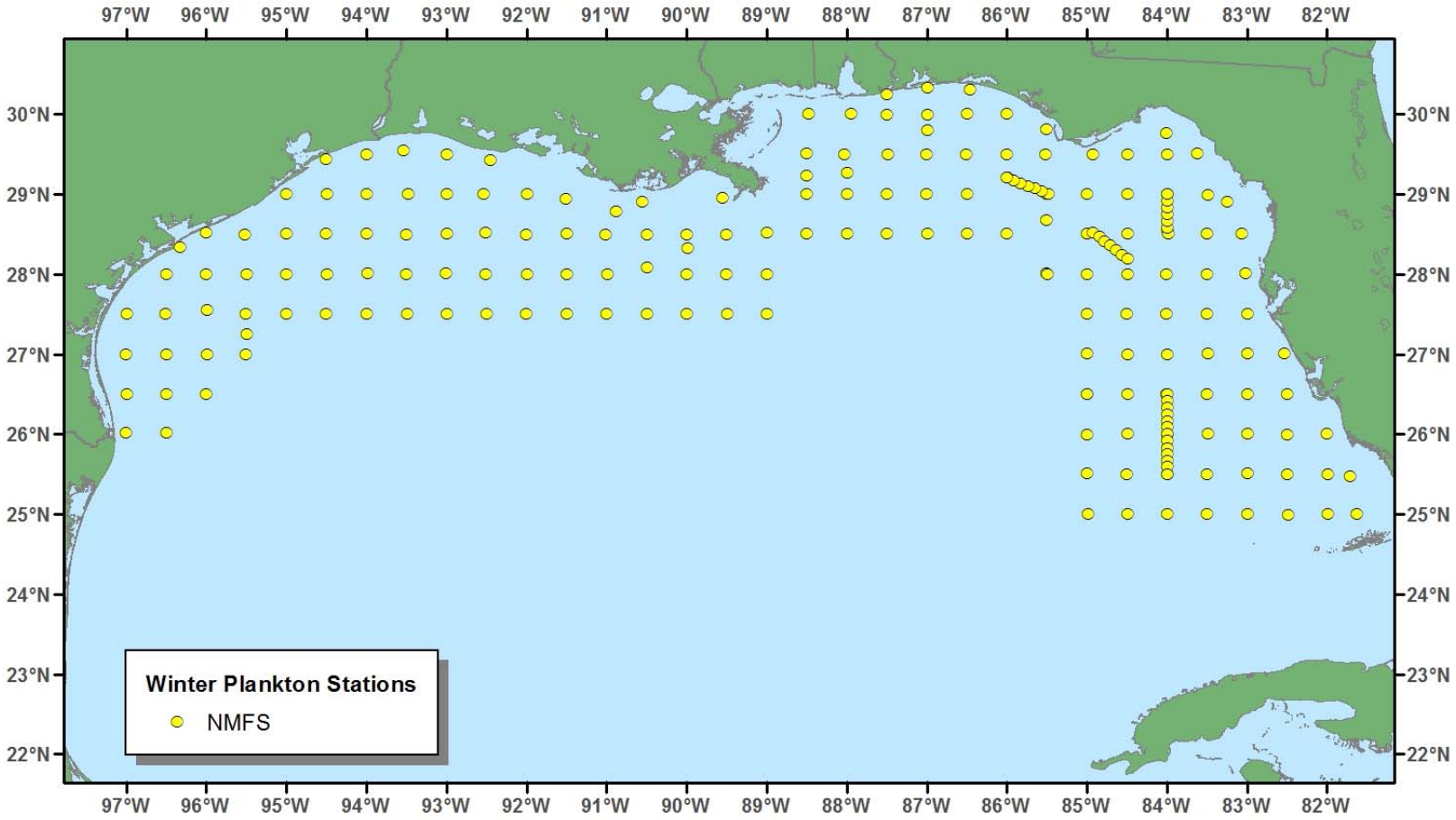

Figure 2. Locations of plankton stations during the 2008 Winter Plankton Survey.

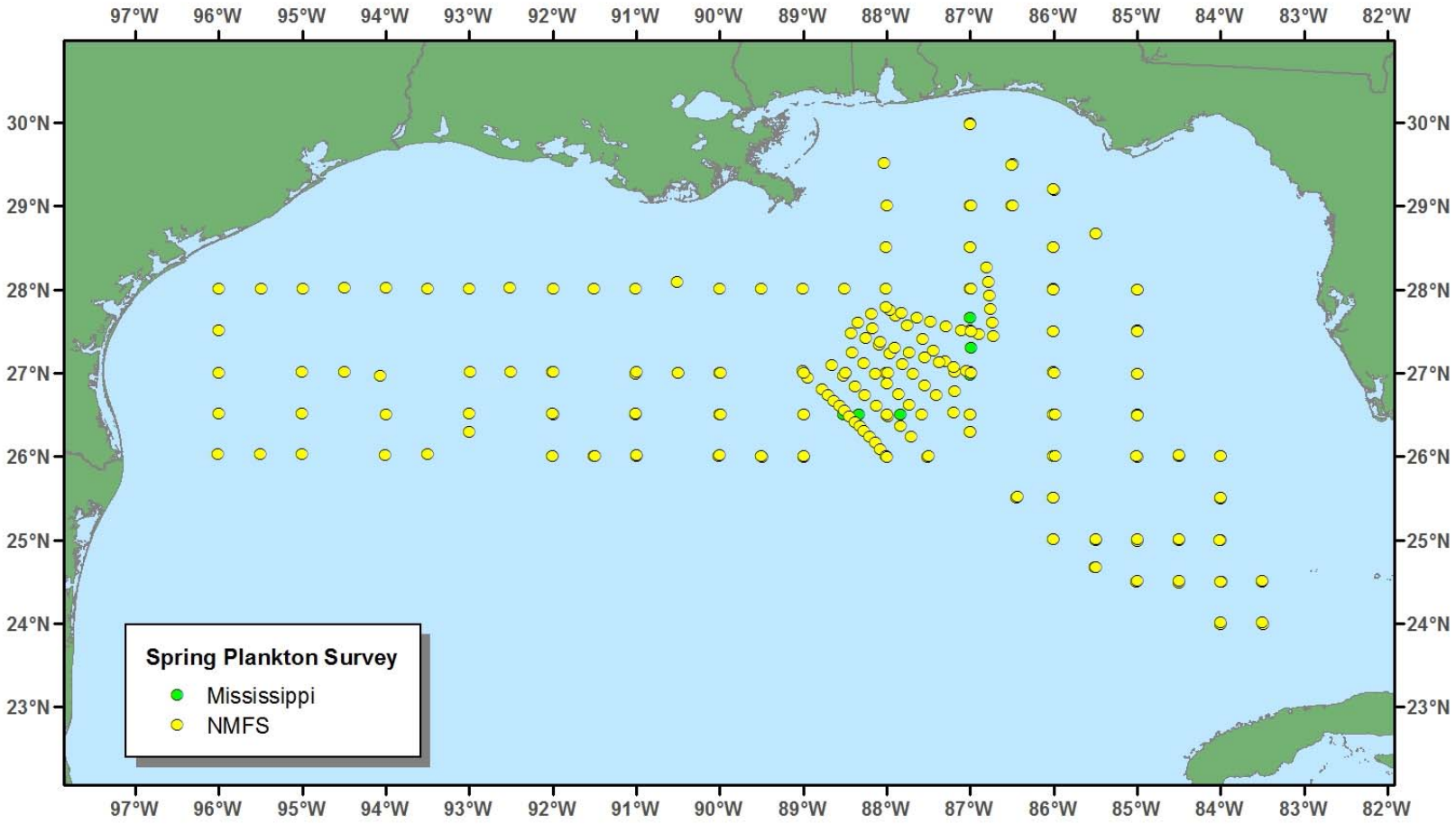

Figure 3. Locations of plankton and environmental stations during the 2008 Spring Plankton Survey.

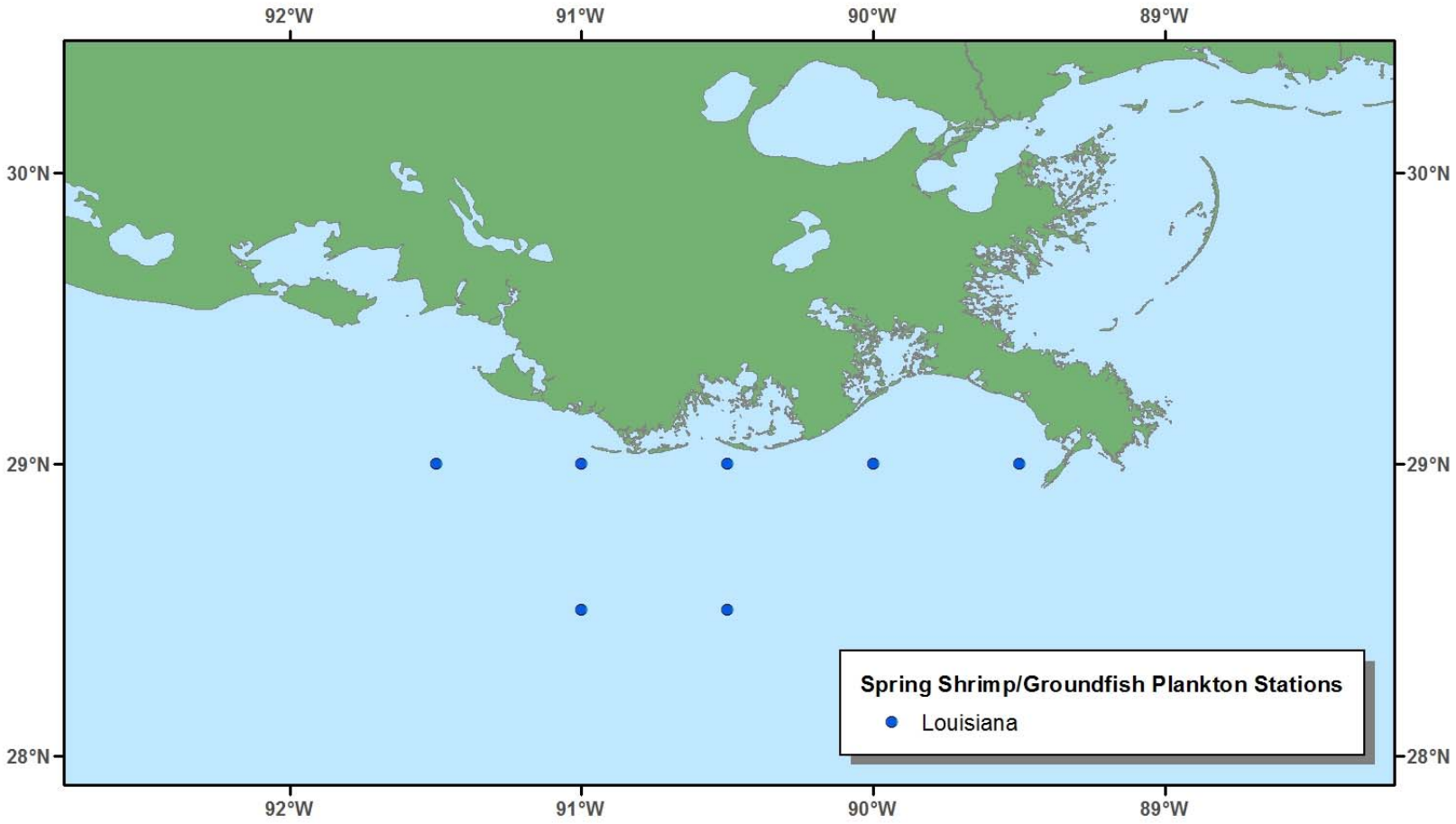

Figure 4. Locations of plankton stations during the 2008 Spring Shrimp/Groundfish Survey.

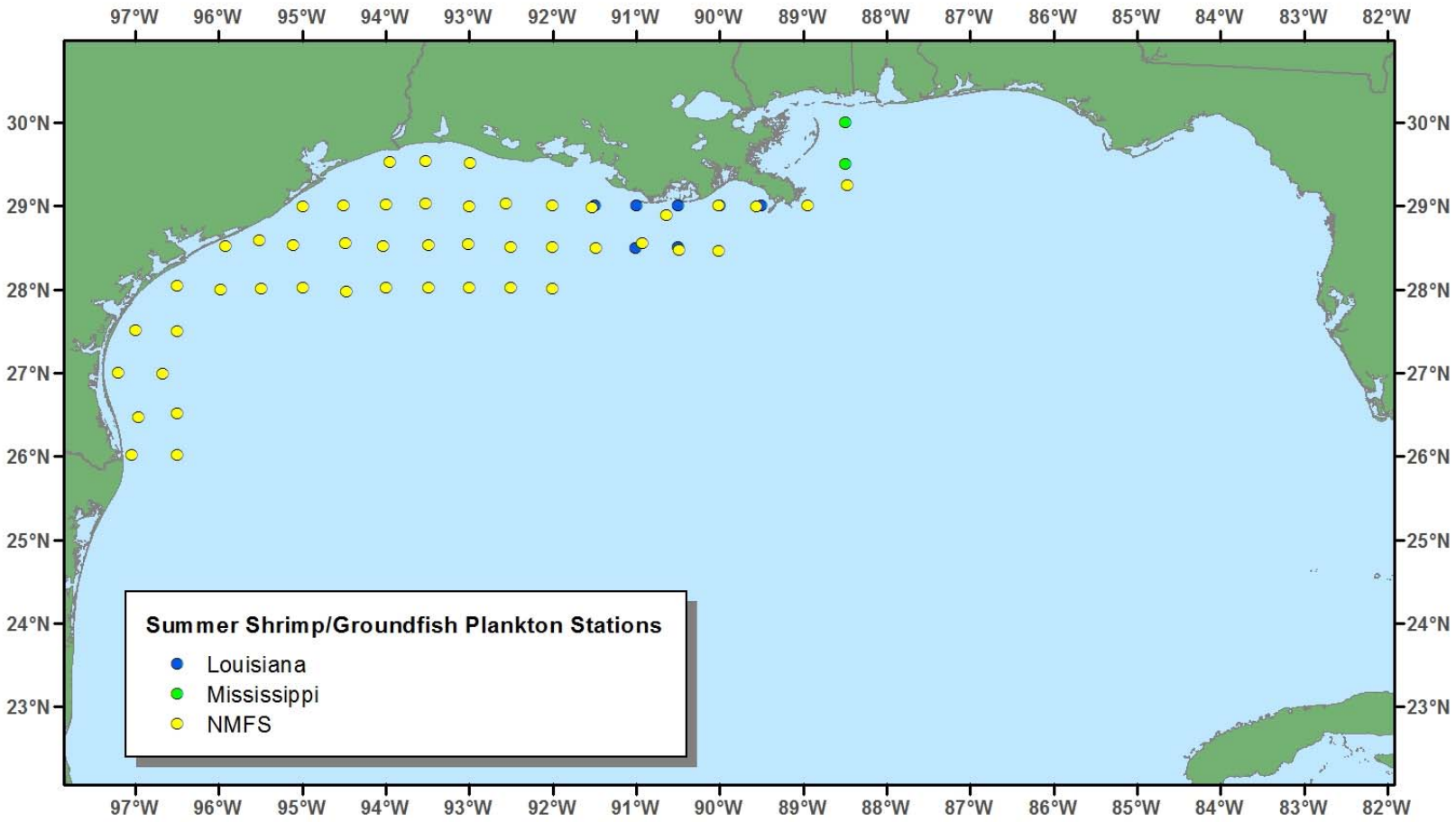

Figure 5. Locations of plankton stations during the 2008 Summer Shrimp/Groundfish Survey.

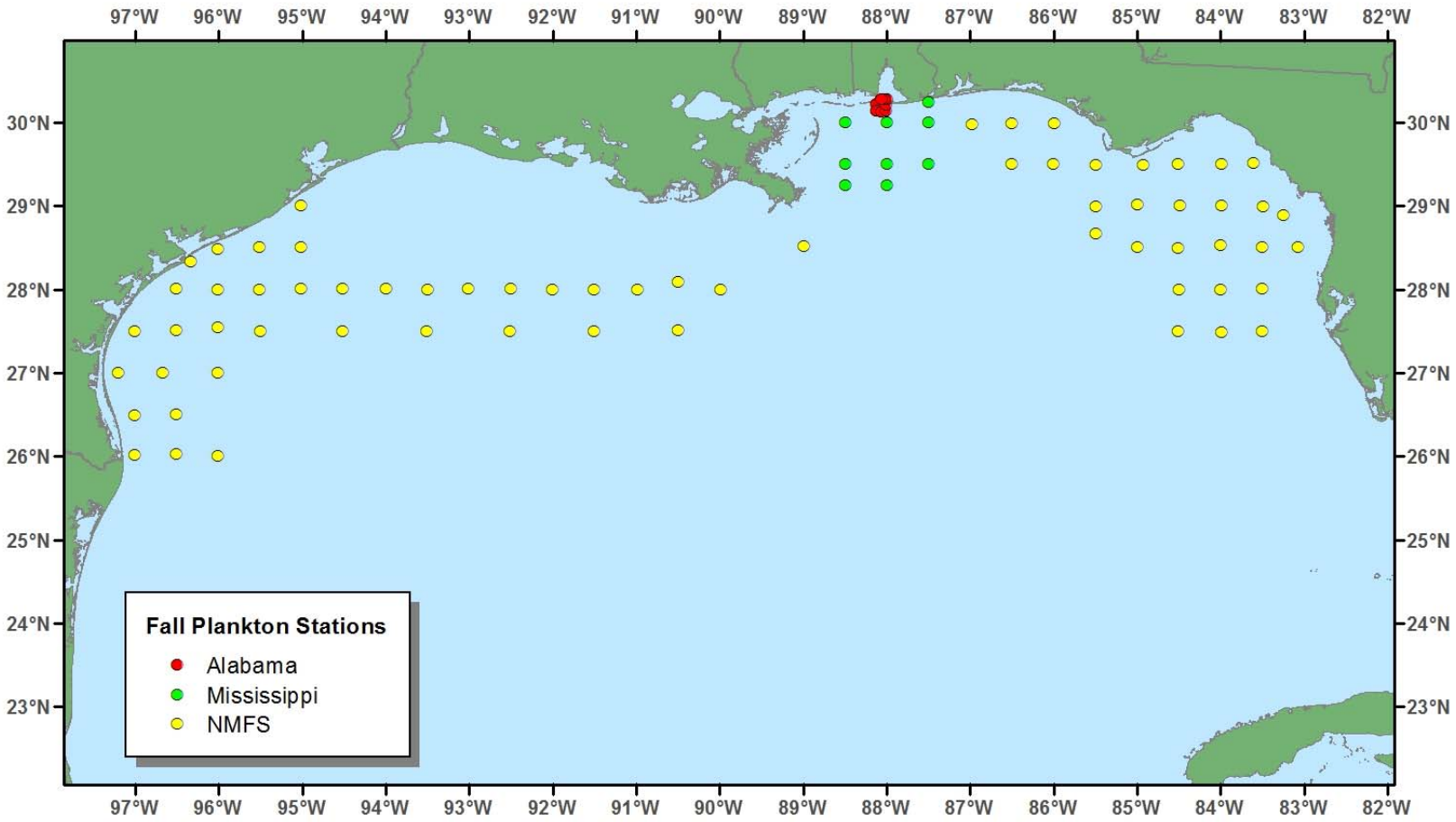

Figure 6. Locations of plankton and environmental stations during the 2008 Fall Plankton Survey.

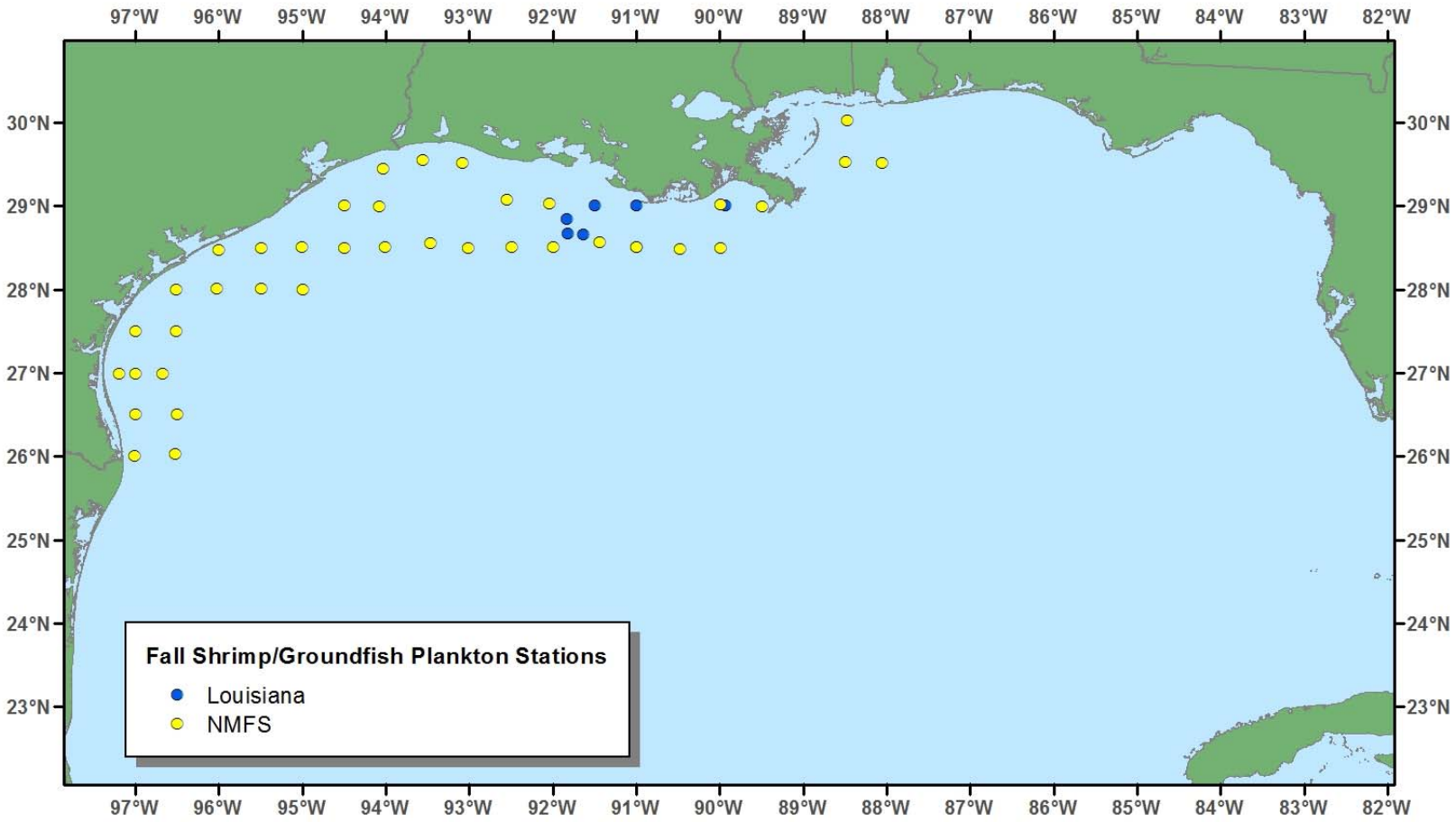

Figure 7. Locations of plankton stations during the 2008 Fall Shrimp/Groundfish Survey.

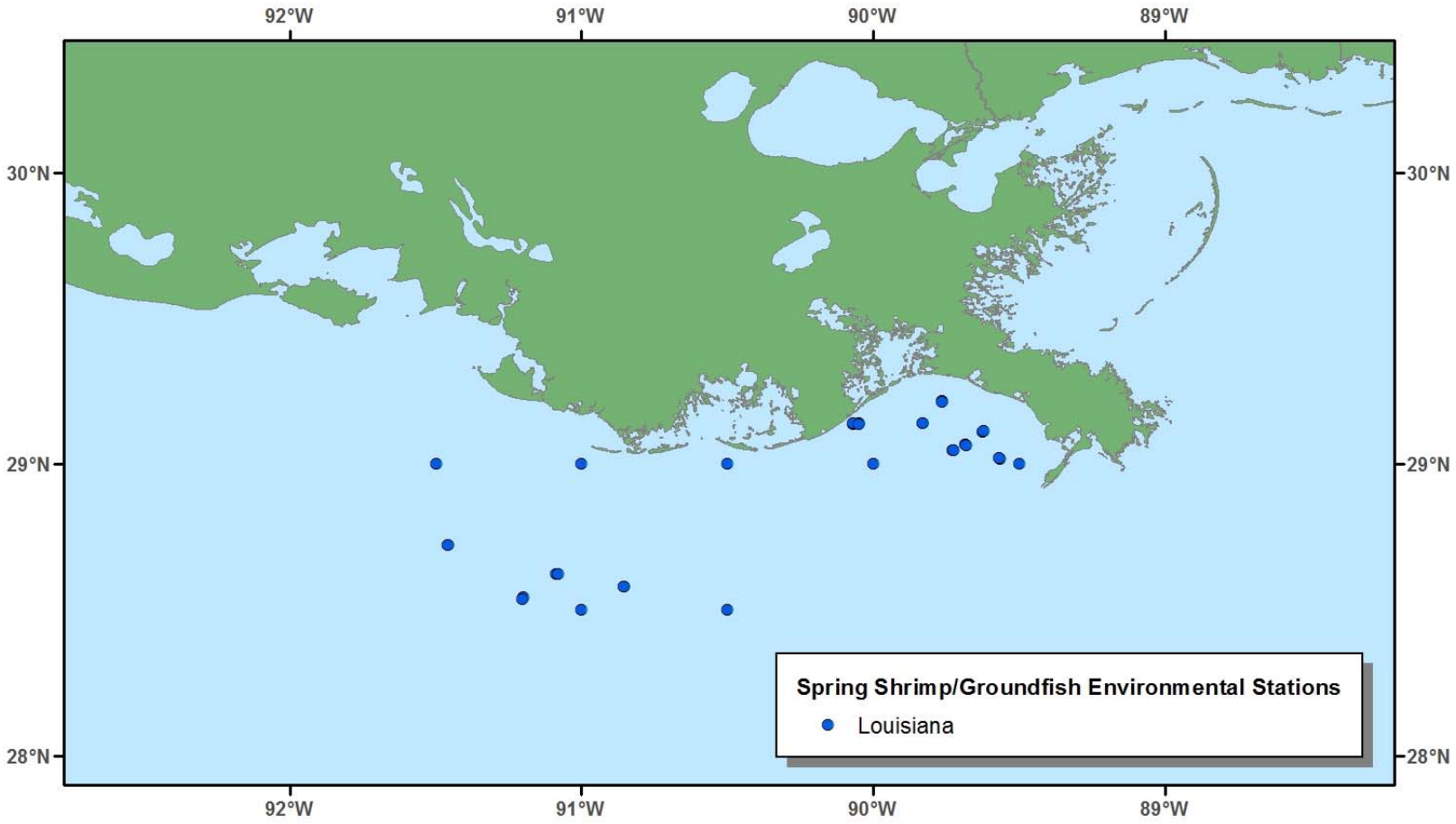

Figure 8. Locations of environmental stations during the 2008 Spring Shrimp/Groundfish Survey.

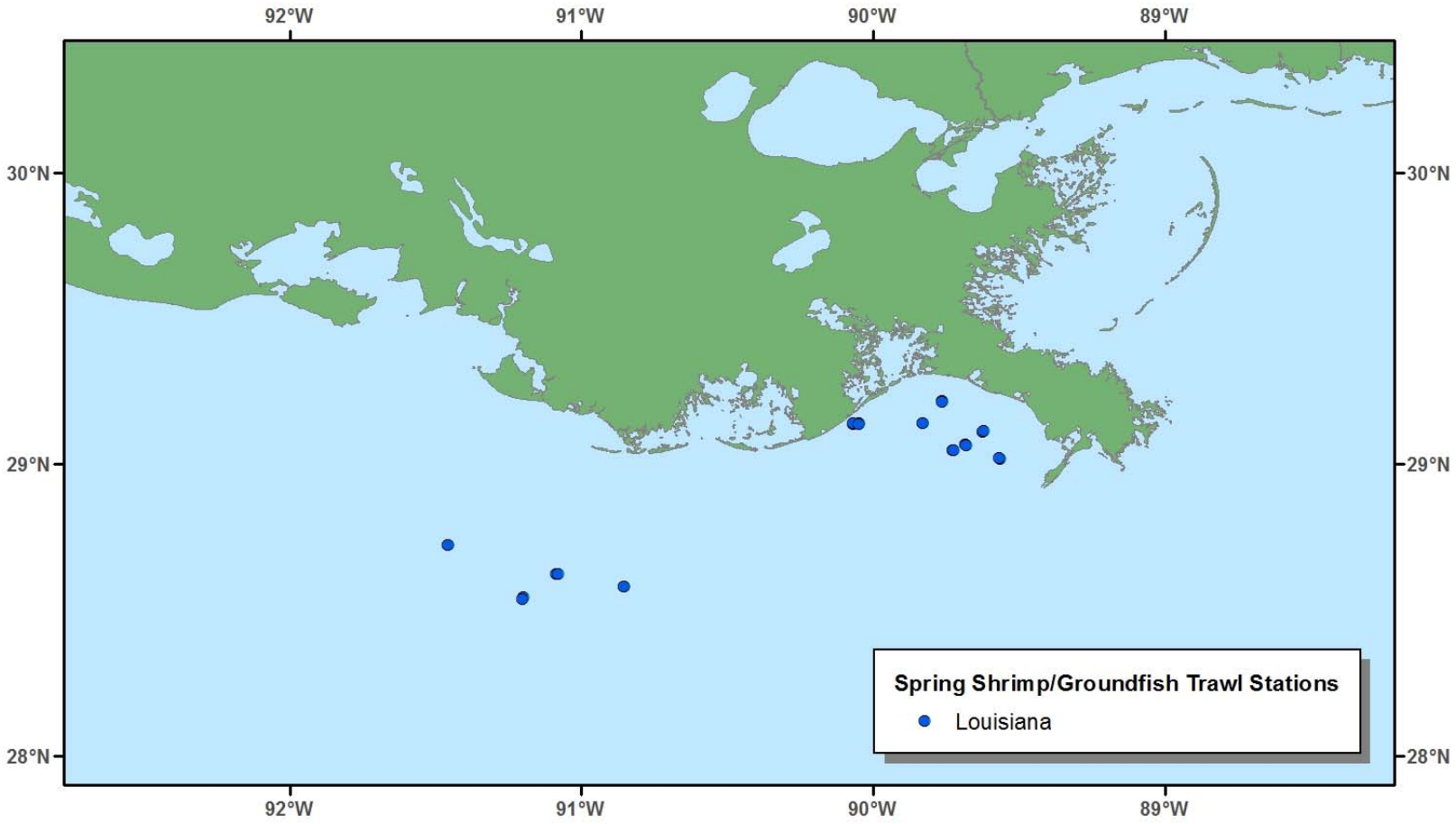

Figure 9. Locations of trawl stations during the 2008 Spring Shrimp/Groundfish Survey.

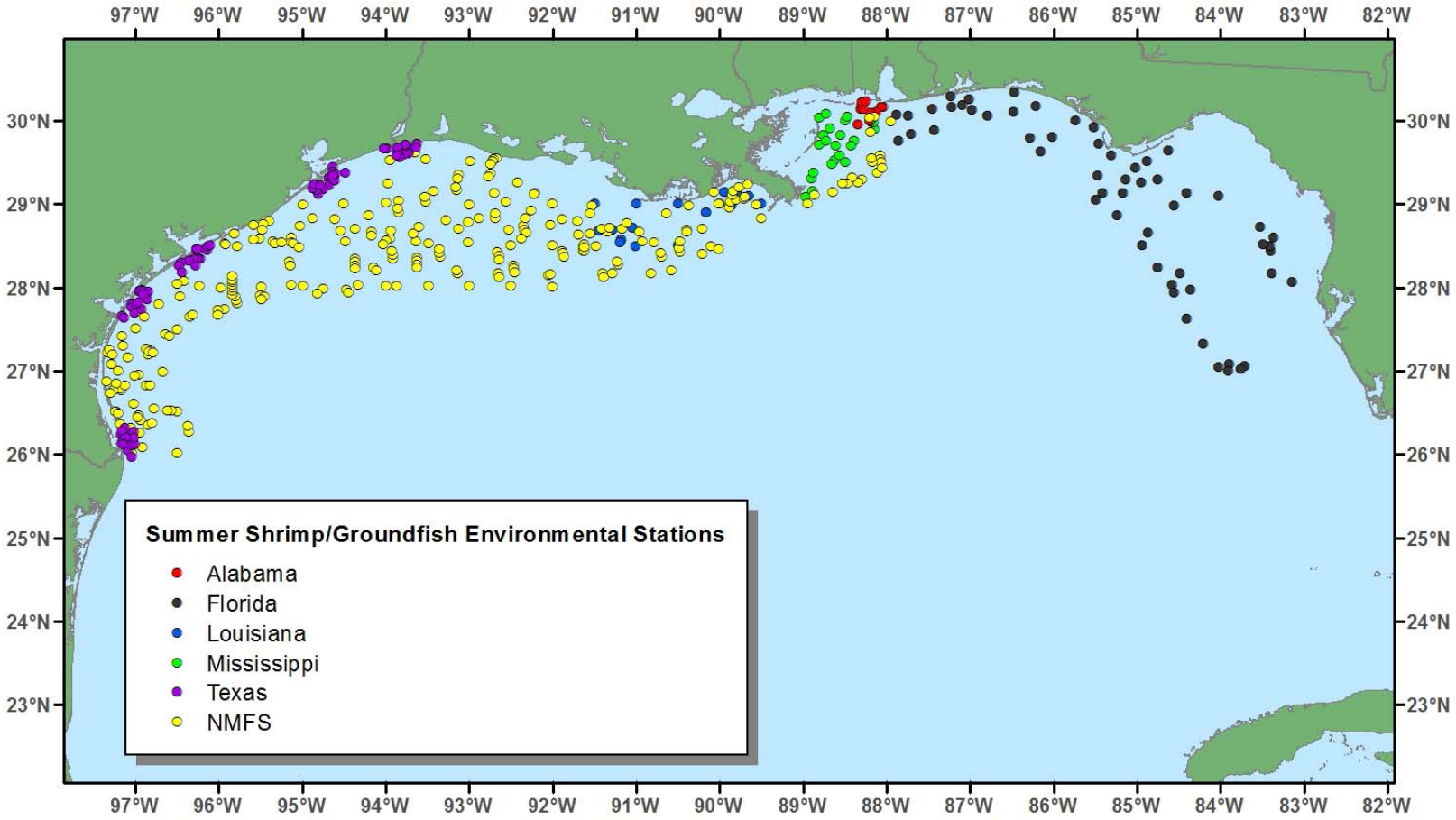

Figure 10. Locations of environmental stations during the 2008 Summer Shrimp/Groundfish Survey.

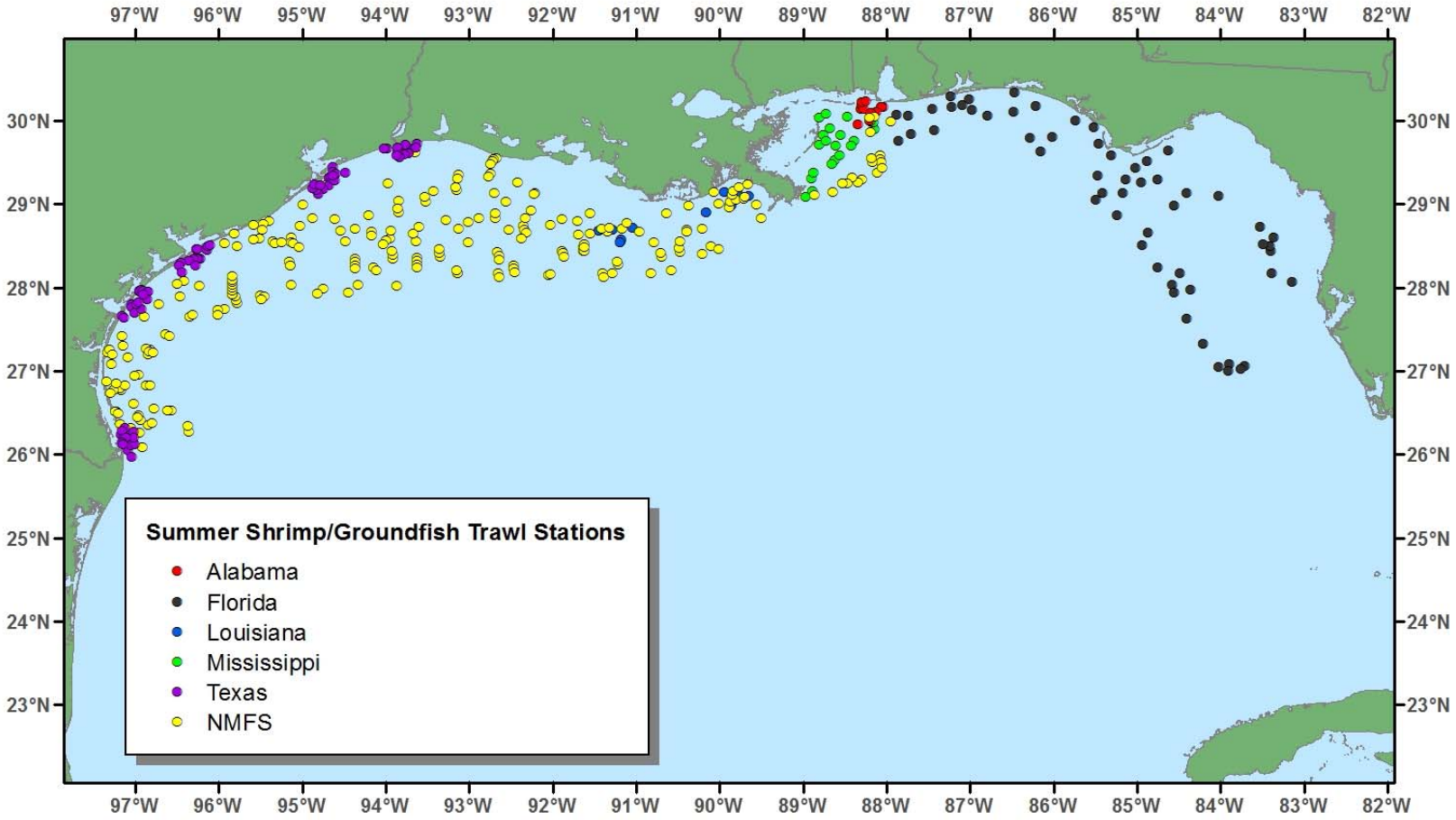

Figure 11. Locations of trawl stations during the 2008 Summer Shrimp/Groundfish Survey.

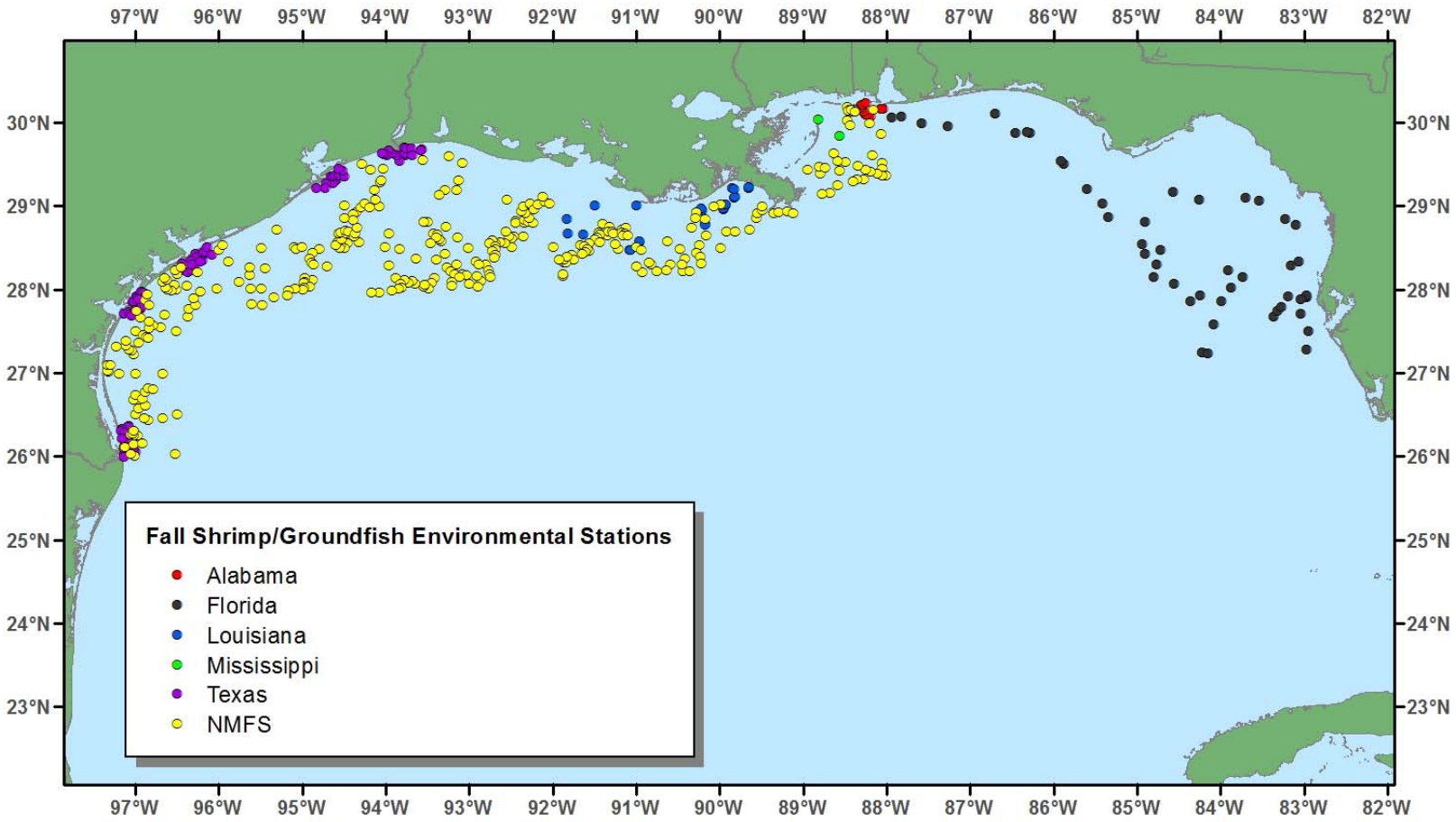

Figure 12. Locations of environmental stations during the 2008 Fall Shrimp/Groundfish Survey.

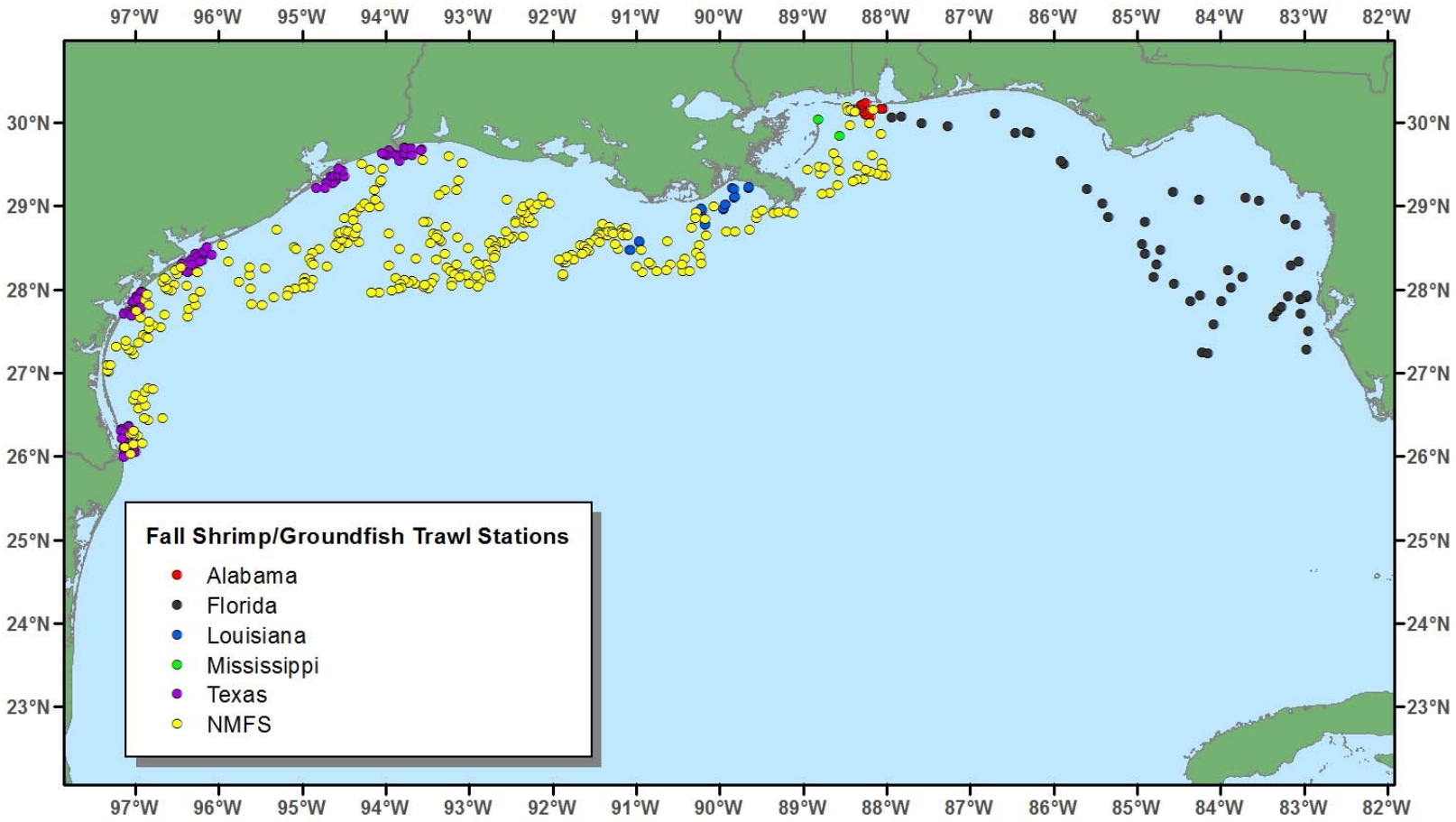

Figure 13. Locations of trawl stations during the 2008 Fall Shrimp/Groundfish Survey.

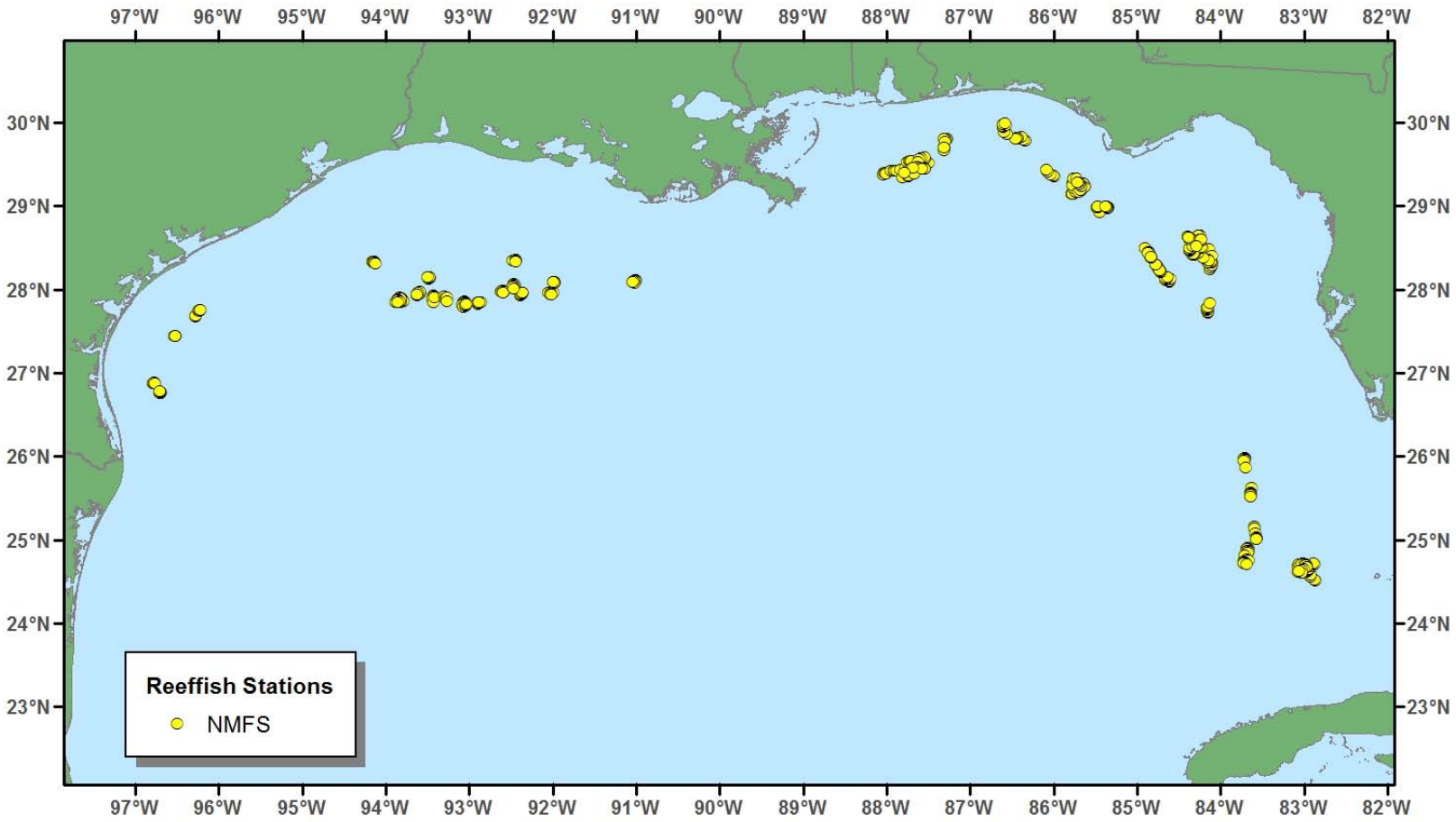

Figure 14. Locations of stations during the 2008 Reeffish Survey.

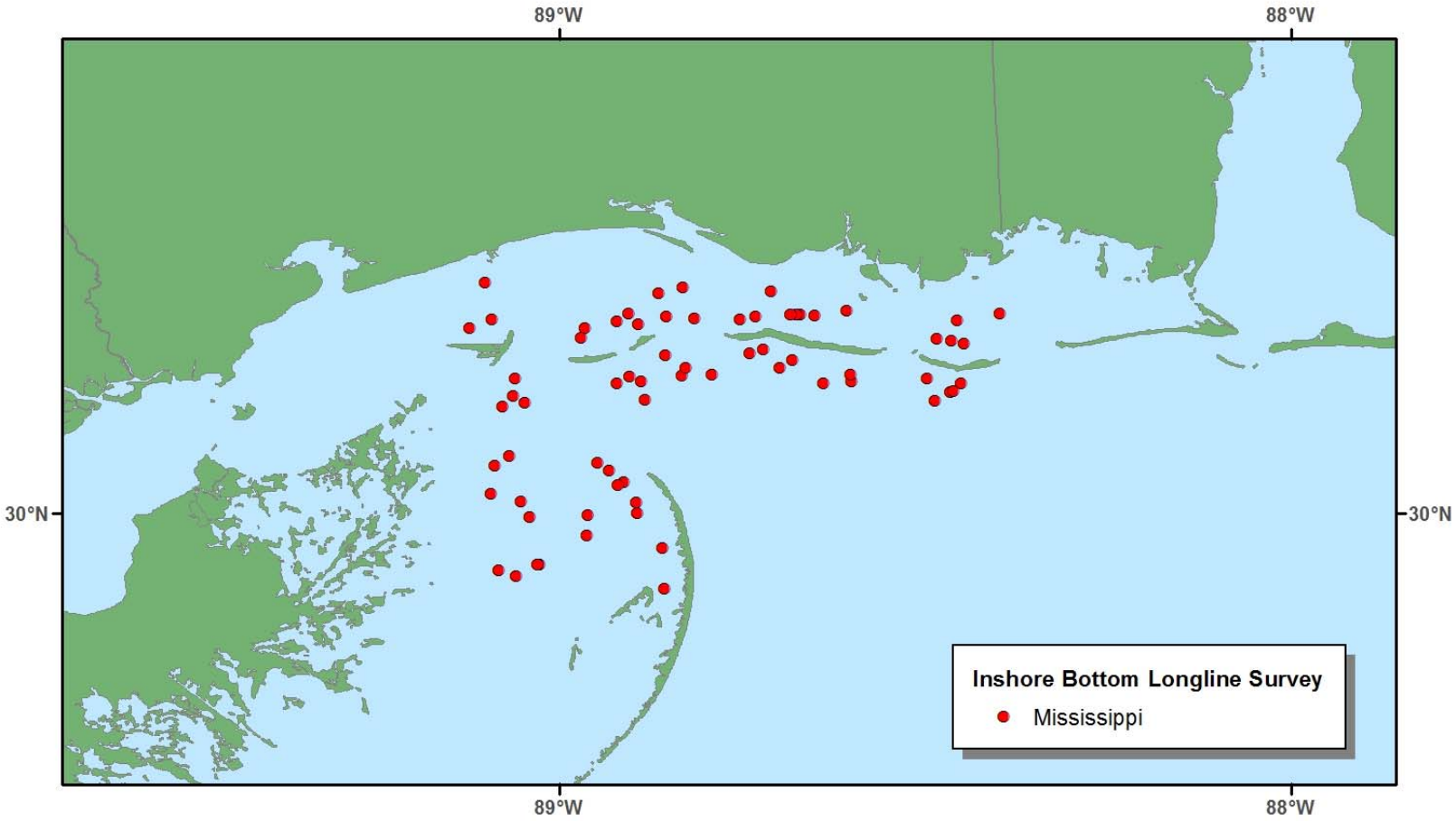

Figure 15. Locations of stations during the 2008 Inshore Bottom Longline Survey.