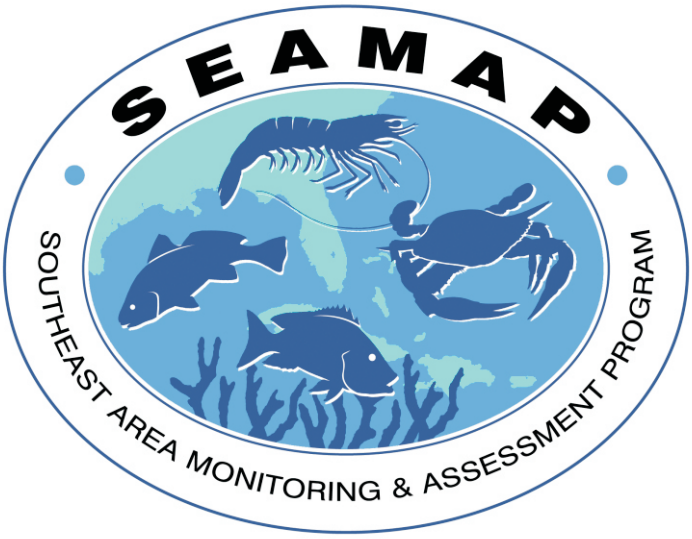
ANNUAL REPORT

OF THE SOUTHEAST AREA MONITORING AND ASSESSMENT PROGRAM (SEAMAP)

OCTOBER 1, 2011 - SEPTEMBER 30, 2012



SEAMAP - Gulf of Mexico
Gulf States Marine Fisheries Commission

SEAMAP - South Atlantic
Atlantic States Marine Fisheries Commission

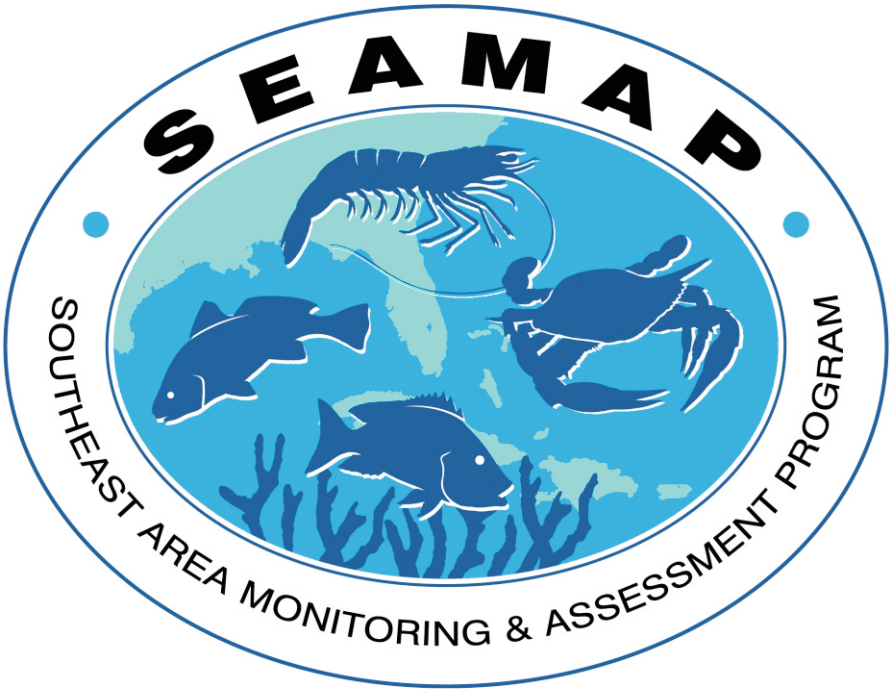
SEAMAP - Caribbean
Puerto Rico Sea Grant College Program

Number 214 **February 2013**

ANNUAL REPORT

OF THE
SOUTHEAST AREA MONITORING AND ASSESSMENT PROGRAM (SEAMAP)

OCTOBER 1, 2011 - SEPTEMBER 30, 2012



Gulf States Marine Fisheries Commission

Number 214 **February 2013**

SEAMAP is a State/Federal program administered by the Southeast Regional Office, National Marine Fisheries Service. This project was supported in part by the National Oceanic and Atmospheric Administration, National Marine Fisheries Service, under State/Federal Project Number NA11NMF4350028.

Annual Report Preparation By:

Jeffrey K. Rester
Coordinator, SEAMAP - Gulf of Mexico

Melissa Paine
Coordinator, SEAMAP - South Atlantic

Edgardo Ojeda Serrano
Coordinator, SEAMAP - Caribbean

Design and Layout:

Cheryl Noble
Gulf States Marine Fisheries Commission

ANNUAL REPORT
of the
Southeast Area Monitoring and Assessment Program
October 1, 2011 - September 30, 2012

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 and information in the southeastern United States. The program presently consists of three operational components: SEAMAP-Gulf of Mexico, which began in 1981; SEAMAP-South Atlantic, implemented in 1983; and SEAMAP-Caribbean, formed in 1988.

Each SEAMAP component operates independently, planning and conducting surveys and information dissemination in accordance with administrative policies and guidelines of the National Marine Fisheries Service's Southeast Regional Office (SERO). Agencies and organizations directly involved with SEAMAP are shown in Table 1.

Federal programmatic funding for SEAMAP activities and administration was appropriated in Federal Fiscal Years 1985-2012. Funding allocations to participants for FY1985-FY2012 were handled through State/Federal cooperative agreements, administered by SERO and the Southeast Fisheries Science Center (SEFSC), National Marine Fisheries Service (NMFS).

This report provides an overview of the SEAMAP Gulf, South Atlantic, and Caribbean programs. It outlines the program management, resource survey operations, information services activities, and publications for FY2012 and proposed activities for FY2013.

PROGRAM MANAGEMENT

Activities and operations of each SEAMAP component are wholly defined by the respective managing units: the SEAMAP-Gulf Subcommittee of the Gulf States Marine Fisheries Commission's (GSMFC) Technical Coordinating Committee, the SEAMAP-South Atlantic Committee of the Atlantic States Marine Fisheries Commission's South Atlantic State-Federal Fisheries Management Board, and the SEAMAP-Caribbean Committee of the University of Puerto Rico Sea Grant College Program. The Gulf and South Atlantic committees consist of designated representatives from each member state, NMFS, and the Gulf of Mexico and South Atlantic Fishery Management Councils. In addition, the SEAMAP-South Atlantic committee includes a representative from the Atlantic States Marine Fisheries Commission (ASMFC). The Caribbean component consists of members from the Puerto Rico Department of Natural and Environmental Resources, Virgin Islands Department of Planning and Natural Resources, Puerto Rico Sea Grant College Program, NMFS, U.S. Fish and Wildlife Service, and Caribbean Fishery Management Council. Each committee meets yearly to review operations, examine priorities, and plan future activities. Daily operations are carried out by the respective SEAMAP coordinators, assisted by staffs of the two

TABLE 1.

SEAMAP ORGANIZATION

Program	Administering Organization	Participating Agencies
SEAMAP-Gulf of Mexico	Gulf States Marine Fisheries Commission	Alabama Department of Conservation and Natural Resources Florida Fish and Wildlife Conservation Commission Louisiana Department of Wildlife and Fisheries Mississippi Department of Marine Resources/USM/Gulf Coast Research Laboratory Texas Parks and Wildlife Department National Marine Fisheries Service/Southeast Fisheries Science Center Gulf of Mexico Fishery Management Council
SEAMAP-South Atlantic	Atlantic States Marine Fisheries Commission	Florida Fish and Wildlife Conservation Commission Georgia Department of Natural Resources North Carolina Department of Environment and Natural Resources South Carolina Department of Natural Resources National Marine Fisheries Service/Southeast Fisheries Science Center South Atlantic Fishery Management Council U.S. Fish and Wildlife Service Atlantic States Marine Fisheries Commission
SEAMAP-Caribbean	Puerto Rico Sea Grant College Program	Puerto Rico Department of Natural and Environmental Resources Puerto Rico Sea Grant College Program Virgin Islands Division of Fish and Wildlife National Marine Fisheries Service/Southeast Fisheries Science Center U.S. Fish and Wildlife Service Caribbean Fishery Management Council

Commissions and Puerto Rico Sea Grant College Program and personnel associated with the SEAMAP Information System, SEAMAP-South Atlantic Data Management System (DMS), SEAMAP Archiving Center, SEAMAP Invertebrate Plankton Archiving Center (SIPAC), and the Southeast Regional Taxonomic Center (SERTC).

SEAMAP - Gulf of Mexico

Major SEAMAP-Gulf Subcommittee meetings were held in October 2011 and March 2012 in conjunction with the Annual Meeting of the GSMFC. All meetings included participation by various work group leaders, the Coordinator, the Program Monitor, and other GSMFC staff. Representatives from the Gulf program also met with the South Atlantic and Caribbean representatives in July 2012 to discuss respective program needs and priorities for FY2013.

Coordination of program surveys and distribution of quick-report summaries of a Gulf-wide survey to management agencies and industry were major functions of SEAMAP management in 2012. Other important management activities included

coordinating data provision and specimen loans, preparing publications and documents, and assisting in the preparation of State/Federal cooperative agreements, including amendments to permit extension of activities previously not detailed in the agreements.

SEAMAP - South Atlantic

One committee meeting and several conference calls were held in FY2012. Additional tasks included fulfilling data requests, preparation of annual program reports and State/Federal Cooperative Agreements, and distribution of publications.

The SEAMAP-South Atlantic Committee held their annual meeting in conjunction with the joint annual meeting held July 30-31, 2012 in Savannah, Georgia. The meeting included participation by the work group leaders and coordinator. The Committee developed the SEAMAP-South Atlantic budget and research program priorities for FY2013. The Committee also reviewed progress by the Crustacean, Data Management, Bottom Mapping, Coastal Survey, and Fish Habitat Characterization and Assessment Work Groups and provided direction where necessary. The major discussions centered on development of the SEAMAP-SA web-accessible database and preliminary presentations of the data output and mapped via ArcGIS.

SEAMAP - Caribbean

During FY2012, liaison activities included effective and efficient data collection during surveys, and management and dissemination of fishery independent data. Four SEAMAP-Caribbean committee meetings were held alternately in Puerto Rico and the U.S. Virgin Islands (USVI) to review programmatic surveys carried out in Puerto Rico and the USVI concerning conch, lobster, and reef fish populations. In addition, the SEAMAP-Caribbean chair and coordinator participated in the SEAMAP joint annual meeting held in July 2012.

The SEAMAP-Caribbean Reef Fish Work Group met in November 2011 to teach personnel how to use an acoustic hydrophone data logger during Fish Spawning Aggregations surveys. A second acoustic hydrophone data logger training workshop was conducted in June 2012 to train workers on data downloading, processing and analysis. Two additional training workshops were held in Puerto Rico in April 2012 with the first including training on remote operated vehicle (ROV) maintenance, and ROV sampling of fish spawning aggregations, while the second workshop discussed gonad processing for reproduction studies.

As part of the coordination section efforts, two SEAMAP-Caribbean posters and educational brochures on conch, whelk, lobster, and reef fish were distributed as outreach materials. The color posters entitled "SEAMAP-Caribbean in Puerto Rico" and "SEAMAP-Caribbean in the Virgin Islands," summarized the main studies performed by the Caribbean program in each region. The posters have been used during several fisheries workshops for fishermen and other targeted groups in Puerto Rico, and also have been given as handouts to the general public during visits to coastal communities.

During this reporting period, a doctoral student began working under contract with SEAMAP-Caribbean to update the sampling protocols and summarize all surveys conducted by the Caribbean program and disseminating the information at http://prsgfisheriesoutreach.wordpress.com. The main goals were to have a uniform

sampling protocol, have the information accessible for dissemination, and making them available for outreach. A graduate student was also contracted to conduct a quality control and preliminary evaluation of the lobster data collected by SEAMAP-Caribbean in Puerto Rico. A final report with specific recommendations was submitted to the SEAMAP-Caribbean committee in February 2012.

In addition to the two diving scooters that were purchased for the conch survey, two new bottom acoustic receiver data loggers and two surface hydrophones were purchased. The acoustic data loggers completed a set of four units that have been used on Puerto Rico and the USVI fish spawning aggregations for collecting acoustic data during the spawning season for dynamic population evaluation.

RESOURCE SURVEYS

In FY2012, collection of resource survey information continued for the thirty-first consecutive year. Surveys by each program component reflect distinct regional needs and priorities; however, survey operations in one geographic area often provide information useful to researchers in all three regions. For instance, the South Atlantic program's bottom mapping will be useful in SEAMAP-Gulf gear calibration efforts, while plankton and environmental surveys in the Gulf program have set the standards for the entire region's much-needed long-term database. Because of the diverse scope and target species involved in the SEAMAP survey operations, activities are discussed here by geographic region.

SEAMAP - Gulf of Mexico

Fall Shrimp/Groundfish Survey

The Fall Shrimp/Groundfish Survey was conducted from October 3 to November 29, 2011, from off Tampa, Florida to the U.S.-Mexican border. Three hundred four stations were sampled during the survey. Vessels sampled waters out to 60 fm with trawls and plankton nets in addition to environmental sampling. The objectives of the survey were to sample the northern Gulf of Mexico to determine abundance and distribution of demersal organisms from inshore waters to 60 fm; obtain length-frequency measurements for major finfish and shrimp species to determine population size structures; collect environmental data to investigate potential relationships between abundance and distribution of organisms and environmental parameters; and collect ichthyoplankton samples to determine relative abundance and distribution of eggs and larvae of commercially and recreationally important fish species.

NMFS and Louisiana vessels collected ichthyoplankton data at 62 stations with bongo and/or neuston nets at sample sites occurring nearest to half-degree intervals of latitude/longitude. The Polish Sorting and Identification Center will sort the samples. Once sorted, the specimens and data will be archived at the SEAMAP Archiving Center.

Winter Plankton Survey

The SEAMAP Winter Plankton Survey took place from January 28 to February 28, 2012. NOAA Fisheries collected ichthyoplankton samples at 107 SEAMAP stations. The

objectives of the survey were to assess the occurrence, abundance and geographical distribution of the early life stages of winter spawning fishes from mid continental shelf to deep Gulf waters; measure the vertical distribution of fish larvae by sampling at discrete depths in the water column using a 1-meter Multiple Opening and Closing Net Environmental Sensing System (MOCNESS); and sample the size fraction of fishes that are underrepresented in bongo and neuston samples using a juvenile (Methot) fish trawl.

Spring Plankton Survey

The SEAMAP Spring Plankton Survey took place from March 28 to May 29, 2012. NOAA Fisheries, Mississippi, and Louisiana collected ichthyoplankton samples at 111 SEAMAP stations. This was the thirty-first year for the survey. The objectives of the survey were to collect ichthyoplankton samples for estimates of the abundance and distribution of Atlantic bluefin tuna larvae and collect environmental data at all ichthyoplankton stations.

Plankton samples were taken with standard SEAMAP bongo and neuston samplers. The bongo sampler consisted of two conical 61-cm nets with 333-micron mesh. Tows were oblique, surface to near bottom (or 200 m) and back to surface. 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 approximately 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 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. Preservation protocol called for the right bongo samples to be preserved in 10% formalin and then transferred to fresh 95% ethanol after 36 hours. The original standard SEAMAP method of initial preservation in 10% formalin for 48 hours was changed to 36 hours in order to improve long-term storage for genetic analysis. The left bongo and neuston samples are initially preserved in 95% ethanol and then transferred to fresh 95% ethanol after 24 hours. In addition, hydrographic data (surface chlorophylls, salinity, temperature and dissolved oxygen from surface, midwater and near bottom, and Forel-ule color) were collected at all stations.

Right bongo and neuston samples collected from SEAMAP stations were transshipped to the Polish Sorting and Identification Center. Left bongo samples were archived at the SEAMAP Invertebrate Plankton Archiving Center (SIPAC).

Inshore Longline Survey

This nearshore survey complements an existing long-term fisheries independent survey currently being conducted by NOAA Fisheries, 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. Mississippi sampled 48 stations in FY2012. Texas sampled 20 stations from June through September 2012; Louisiana sampled 81 stations from March through September, while Alabama sampled 40 stations during the same period.

Vertical Longline Survey

In FY2012, Louisiana and Alabama conducted vertical longline sampling for reef

fish. In Alabama, a total of 12 grids are fished per survey. Vertical longline reels are randomly baited with either Atlantic mackerel or squid. Soak time is five minutes. Fish may be retained and processed for age and fecundity. All fish are sacrificed for otoliths at stations deeper than 60 m. In water depth less than 60 m, stations may be assigned as tag and release or collection sites. Eighty-one stations were completed in March, May, and August 2012 off Alabama.

In Louisiana, the sampling frame is subdivided into three sampling blocks based on depth between 89 degrees longitude and 91 degrees longitude, with the water depth ranging from 60 to 360 feet. Each block is sampled quarterly in a rotation. Within these sampling blocks there is a possibility of randomly selecting 40 different corridors within the block. The actual sites are randomly selected within the corridor boundary and sampled at the chief scientist's discretion. The sites roughly consist of artificial reefs, natural bottom, and petroleum production platforms. During FY2012, Louisiana sampled 75 stations in July and September.

Reeffish Survey

The primary purpose of this survey was to assess relative abundance and compute population estimates of reeffish found on natural reeffish habitat in the Gulf of Mexico. Video stereo cameras were used during the survey since they enabled the measurement of length frequencies. Each stereo camera contained paired black-and-white Video stereo still cameras along with a color mpeg camera in a cylindrical pressure housing. Four of these were mounted in a camera array and were positioned orthogonally with the center of the camera mounted 51 cm above the bottom of the array. A chevron fish trap, that measured 1.83 x 1.83 x 0.75 meters with 3.81-cm mesh, was used to capture fish for ageing and other life history studies. Both the fish trap and camera array were baited with squid. The camera array was allowed to soak on the bottom for 30 minutes, and the fish trap soaked for one hour. In July and August 2012, Florida sampled 147 stations on the west Florida shelf. NOAA Fisheries conducted reeffish sampling in April through May 2012 and completed 206 stations.

Summer Shrimp/Groundfish Survey

The overall sampling strategy during the 2012 SEAMAP Summer Shrimp/Groundfish Survey was to work from the eastern Gulf to the Texas/Mexico border, in order to sample during or prior to migration of brown shrimp from bays to the open Gulf area. The Summer Shrimp/Groundfish Survey was conducted from May 29 to July 15, 2012. Florida, Alabama, Mississippi, Louisiana, Texas, and NOAA Fisheries sampled 409 trawl stations during the survey. In addition, NOAA Fisheries and Louisiana vessels collected ichthyoplankton data. Objectives of the survey were to monitor size and distribution of penaeid shrimp during or prior to migration of brown shrimp from bays to the open Gulf; aid in evaluating the "Texas Closure" management measure of the Gulf Council's Shrimp Fishery Management Plan; and provide information on shrimp and groundfish stocks across the northern Gulf of Mexico from inshore waters to 50 fm.

Fall Plankton Survey

The Fall Plankton cruise took place from August 22 through September 28, 2012. NMFS sampled 173 stations, Alabama sampled 6 stations, Louisiana sampled 7 stations, and Mississippi sampled 8 stations. The objective of this survey was to collect ichthyoplankton samples with bongo and neuston gear for the purpose of estimating

abundance and defining the distribution of eggs, larvae, and small juveniles of Gulf of Mexico fish, particularly king and Spanish mackerel, lutjanids and sciaenids.

Plankton samples were taken with standard SEAMAP bongo and neuston samplers. The bongo sampler consisted of two conical 61 cm nets with 333-micron mesh. Tows were oblique, surface to near bottom (or 200 m) and back to surface. 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 approximately 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 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 36 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. In addition, hydrographic data (surface chlorophylls, salinity, temperature, and dissolved oxygen from surface, midwater and near bottom, and Forel-ule color) were collected at all stations.

Right bongo and neuston samples collected from SEAMAP stations will be transshipped to the Polish Sorting and Identification Center. Left bongo samples will be archived at the SEAMAP Invertebrate Plankton Archiving Center (SIPAC).

SEAMAP - South Atlantic

Coastal Survey

The Coastal Survey, conducted by the South Carolina Department of Natural Resources (SCDNR), continued as the long-standing core component of SEAMAP-South Atlantic survey research through the period. The overall goal of this survey is to continue to build a long-term database to facilitate management of stocks in the South Atlantic Bight. Initiated as a pilot project in 1986, this is a fishery independent study designed to monitor the distribution and abundance of coastal species in the South Atlantic Bight and to measure associated environmental parameters in nearshore coastal waters. Sampling was standardized in 1990, and a 10-year trawl report was completed in December 2000 summarizing species composition, regional species assemblages, and trends in distribution and abundance of 27 priority species. In January 2001, the sampling design was changed based on the results of an external program review. Offshore strata were discontinued, and additional stations were added to inshore strata for all three (spring, summer and fall) cruises to reduce variability in the abundance estimates for priority species. For 2009 through 2012 seasonal effort was increased again by 10%.

The objectives of the survey are to collect data on annual, seasonal, and latitudinal distribution, abundance, and biomass of most species encountered; collect additional size data on priority finfish, sharks, decapod crustaceans, xiphosurans, and sea turtles; collect additional data on sex and gonad development of white, pink, and brown

shrimp and blue crabs; and collect otolith, gonad, and stomach samples from selected finfish species for additional life history and diet data.

Three multi-legged seasonal cruises were conducted between Cape Hatteras, North Carolina, and Cape Canaveral, Florida, during FY2012: fall 2011; spring 2012; and summer 2012. A nearshore band (4.6 to 9.2m depths) of latitudinal strata was sampled during each cruise. All samples were collected during daylight hours for comparability with previous data. The decision to focus on daylight sampling was made in 1989 to maximize the opportunities for collecting juvenile mackerels, which had been shown to be captured more frequently during the day, based on 1987 and 1988 datasets. A total of 336 stations were sampled each year, with 112 stations sampled during each seasonal cruise.

The fall 2011 cruise completed the twenty-second full year of standardized sampling under a stratified random survey design. Sampling was conducted from October 4 to November 14, 2011. A total of 157 species or genera were identified in fall trawls. While aggregate abundance of all species combined reached a record level for a fall cruise (n= 464,959 individuals, mean of 4,151 individuals), the typically numerically dominant species of spot, *Leiostomus xanthurus* and Atlantic croaker, *Micropogonias undulatus* were displaced substantially in their ranking to eleventh and thirteenth, respectively. Atlantic bumper, *Chloroscombrus chrysurus*, was the most abundant species, constituting 23.3% of total abundance (mean of 967.0 individuals per tow); followed by the broad-striped anchovy, *Anchoa hepsetus* (10.9%); Atlantic moonfish, *Selene setapinnis* (8.8%); American star drum, *Stellifer lanceolatus* (8.8%); and white shrimp, *Litopenaeus setiferus* (5.8%) rounded out the top five species. The southern kingfish, *Menticirrhus americanus*, had a record fall season; placing them tenth in overall abundance, and first among sciaenids of interest. Considering all enumerated species, catches in Onslow Bay yielded the most individuals with a mean of 6,038 individuals per tow; followed by Florida (mean of 5,068 individuals), and Raleigh Bay (mean of 4,004 individuals per tow). Miscellaneous invertebrate biomass (n=12,928 kg, mean = 115.4 kg) decreased in fall 2011 from the previous fall (n= 15,586 kg, mean = 139.0 kg). The cannonball jelly, *Stomolophus meleagris*, constituted 69.7% of miscellaneous invertebrate biomass (n= 58,552 individuals, 9,013 kg), and occurred in 80.4% of tows. King mackerel, *Scomberomorus cavalla*, were encountered in all regions. While numbers were still moderate (n= 586, mean = 5.2), they were substantially higher than the previous two falls. While the Spanish mackerel, *S. maculatus*, was also encountered in every region, its numbers declined for the second fall in a row to the third lowest fall CPUE in the time series (n= 203, mean = 1.8) . It was a relatively good fall for the three commercial penaeid shrimp as a whole, with both the brown shrimp, *Farfantepenaeus aztecus*, and pink shrimp, *F. duorarum*, achieving their third highest fall CPUEs, and white shrimp, *Litopenaeus setiferus*, abundance slightly topping fall 2010 to achieve fourth highest fall CPUE for the species. However, regional distribution was far from even, with GA and southern SC producing most of the white shrimp, Onslow Bay yielding a substantial proportion of brown shrimp, and Raleigh and Onslow Bays contributing most of the pinks. Collection and processing of otoliths and gonads from select sciaenids, mackerels, and bluefish continued in fall 2011. Samples were taken from weakfish (otoliths: n= 228; gonads: n= 158), Atlantic croaker (otoliths: n= 142; gonads: n= 84), southern kingfish

(otoliths: n= 607; gonads: n= 359), king mackerel (otoliths: n= 88; gonads: n= 79), Spanish mackerel (otoliths: n= 106; gonads: n= 96), and bluefish (otoliths n= 94; gonads n= 82). Stomach samples continued to be collected for king mackerel (n= 54), Spanish mackerel (n= 85), and bluefish (n= 75). Assessment of previously archived sciaenid stomachs continued.

The 2012 spring cruise for the SEAMAP-Coastal Survey began on April 16 and was completed on May 12, 2012. A total of 131 species or genera were identified in spring trawls. Following high abundance the previous fall, the Atlantic bumper was again the most abundant species, comprising 27% of the total abundance. The northern searobin, *Prionotus carolinus*, was the second most abundant species (12%), followed by the Atlantic croaker (11%); spot, (5%); and banded drum, *Larimus fasciatus* (5%). Abundance of individuals taken in trawls was the third highest on record (n=342,547 individuals, mean = 3,058 individuals). Catches off Florida yielded the highest regional abundance with 109,958 individuals and a CPUE of 4,781 individuals per tow. Onslow Bay had the second largest abundance (82,958 individuals, mean =4,366 individuals). Miscellaneous invertebrate biomass (n=2,921 kg, mean = 26.1 kg) decreased from the previous year. The cannonball jelly composed 72% of the invertebrate biomass with the majority being taken in Onslow Bay. Atlantic croaker were the most abundant sciaenid of interest (n=38,790 individuals, mean = 346 individuals), though their numbers dropped substantially from the previous record, spring. Spot was the second most abundant sciaenid of interest (n=18,316 individuals, mean = 164 individuals), followed by the southern kingfish (n=12,122 individuals, mean = 108 individuals), and the weakfish, *Cynoscion regalis*, (n=3,082 individuals, mean = 28 individuals). Abundance of king mackerel improved, but remained low for the sixth straight spring (n=5 individuals, mean = 0.04 individuals) and they were only encountered off Florida. Spanish mackerel reached a new low (n=159, mean = 1.4 individuals) in the sixth year of a generally downward trend, but were encountered in all regions. White shrimp abundance rebounded substantially over the previous two springs (n=4,779 individuals, mean = 42.7 individuals), as did browns (n=60 individuals, mean = .54 individuals). Pink shrimp abundance (n=4,928 individuals, mean = 44 individuals) was the highest recorded for this species by the Coastal Survey during a spring sampling season. Onslow Bay produced the majority (93%) of the seasonal catch with a total abundance of 4,605 individuals, and a CPUE of 242 individuals per tow. Collection and processing of otoliths and gonads from select sciaenids, mackerels, and bluefish continued in spring 2012. Samples were taken from weakfish (otoliths: n= 107; gonads: n= 79), Atlantic croaker (otoliths: n= 114; gonads: n= 75), southern kingfish (otoliths: n= 546; gonads: n= 334), king mackerel (otoliths: n= 5; gonads: n= 3), Spanish mackerel (otoliths: n= 116; gonads: n= 87), and bluefish (otoliths n= 76; gonads n= 68). Stomach samples continued to be collected for king mackerel (n= 3), Spanish mackerel (n= 88), and bluefish (n= 54). Assessment of previously archived sciaenid stomachs continued.

The summer cruise for the SEAMAP-Coastal Survey began on July 10 and was completed on August 2, 2012. A total of 131 species or genera were identified in summer trawls. The Atlantic bumper was the most abundant species, comprising 16% of the total abundance. The Atlantic croaker was the second most abundant species (15%) followed by spot (13%), banded drum (9%),

and brown shrimp (6%). Abundance of individuals taken in trawls yielded the third highest summer CPUE on record (n=299,677 individuals, mean = 2,675 individuals). Catches off Onslow Bay yielded the highest regional abundance with 78,883 individuals and a CPUE of 4,152 individuals per tow. Florida had the second highest abundance (62,486 individuals, mean = 2,717 individuals). Miscellaneous invertebrate biomass (n=2,204 kg, mean = 19.7 kg) decreased from the previous summer. The cannonball jelly was virtually absent from collections; with the 9 individuals collected comprising less than 1% of the total miscellaneous invertebrate biomass. The Atlantic croaker was the most abundant sciaenid of interest observed (n=46,600 individuals, mean = 416 individuals). Although a substantial decrease from the previous summer, it was still the second highest CPUE since 2006 for this species. Onslow and Long Bays yielded 60% of croaker. Spot was the second most numerous sciaenid of interest and reached its highest summer abundance (n=38,711 individuals, mean = 346 individuals) since 2003. Fifty-four percent of spot were collected north of Cape Fear, North Carolina. Similarly, southern kingfish reached a record summer level (n=7,843 individuals; mean = 70 individuals). King mackerel rebounded from a record summer low in 2011 to a record summer high (n=272 individuals, mean = 2.4 individuals) in 2012. However, 98% of these were collected off Florida, so abundance in other regions remained extremely low. Abundance of Spanish mackerel remained low (n=202, $\bar{x}$/tow=1.8 individuals), but was a very slight increase from summer 2011. Collections off Georgia accounted for 60% of the catch of Spanish mackerel. Brown and white shrimp experienced summer catches second only to their record catches the summer before. Pink shrimp reached record summer levels (n=275 individuals, mean = 2.5 individuals). However, Raleigh Bay accounted for 96% of the catch, with the remaining 4% coming from Onslow Bay. Collection and processing of otoliths and gonads from select sciaenids, mackerels, and bluefish continued in summer 2012. Samples were taken from weakfish (otoliths: n= 196; gonads: n= 136), Atlantic croaker (otoliths: n= 371; gonads: n= 213), southern kingfish (otoliths: n= 544; gonads: n= 319), king mackerel (otoliths: n= 45; gonads: n= 30), Spanish mackerel (otoliths: n= 80; gonads: n= 64), and bluefish (otoliths n= 27; gonads n= 27). Stomach samples continued to be collected for king mackerel (n= 30), Spanish mackerel (n= 61), and bluefish (n= 20). Lab assessment of previously archived sciaenid stomachs was wrapping up at the close of September.

Data from the fall FY2011 cruises have been added to the SEAMAP-South Atlantic data management system (DMS). For additional cruise information, please see reports available via links at http://www.seamap.org/trawlSurveys.html.

Pamlico Sound Survey

The Pamlico Sound survey provides a long-term fishery independent database for the waters of the Pamlico Sound, and the lower Neuse, Pamlico, and Pungo rivers. Data collected from the survey provides juvenile abundance indices and long-term population parameters for interstate and statewide stock assessments of recreationally and commercially important fish stocks. Annually, 52-54 randomly selected stations are trawled for 20 minutes using double rigged demersal mongoose trawls. Sampling occurs over a two-week period in June and September each year. During FY2012, the North Carolina Division of Marine Fisheries (NCDMF) continued the ongoing Pamlico Sound Survey. The survey sampled 54

stations each in June (11^{th}-12^{th}, 18^{th}-21^{st}, and 25^{th}-28^{th}) and September (10^{th}-14^{th}, 17^{th}-19^{th}, 24^{st} -27^{st}) of 2012. The data are processed by NCDMF and made available to the SEAMAP-South Atlantic DMS by April of the following year.

Bottom Mapping Project

In FY2012, the Florida Fish and Wildlife Research Institute (FWRI) provided technical support and infrastructure for maintaining and distributing GIS data products of bottom habitats in the South Atlantic region. Online access of SEAMAP bottom mapping products is available via the South Atlantic Habitat and Ecosystem Internet Map Server http://ocean.floridamarine.org/efh_coral/ims/viewer.htm.

Fish Habitat Characterization and Assessment

Reef fish sampling - In the summer of 2008, SEAMAP-SA received funding to complement and expand MARMAP reef fish sampling to address high priority needs for over-fished species in the snapper-grouper complex. The primary objective was to enhance the fishery independent reef fish data collected by the Marine Resources Monitoring, Assessment, and Prediction program (MARMAP) by increasing sampling in underrepresented geographical regions of the sampled area. In addition, expanding the number of shallow (<20m) and deep (>90m) sampling sites through SEAMAP-SA would result in more complete coverage, and address identified shortfalls of the MARMAP sampling regime. Beginning in the 2011 sampling season, the Reef Fish Survey activities through SEAMAP-SA included regular monitoring of natural reef (live bottom) habitat identified in prior years, in addition to surveying for new areas with this habitat that have not been included in the survey to date. In addition, the SEAMAP-SA Reef Fish Survey continued diet studies of selected snapper and grouper species. SEAMAP-SA Reef Fish Survey staff has been coordinating all efforts with MARMAP and the South East Fishery Independent Survey (SEFIS) to accomplish a comprehensive fishery independent sampling of reef fishes in the southeast region. Prior to the 2011 sampling season, it was decided in consultation with staff from all three reef fish surveys, that each program would sample a specific geographical area. As a result, SEFIS was scheduled to sample all chevron trap stations south of roughly 32°N latitude using the *R/V Savannah*, while MARMAP and SEAMAP-SA were scheduled to sample all chevron trap stations north of roughly 32°N latitude and all short bottom long-line (SBLL) stations. All sampling has been well coordinated between programs to ensure data quality standards and continuity. In addition, exploration of new areas of reef habitat to be included in the sampling stations database was continued by both SEAMAP-SA and SEFIS.

In early 2012, MARMAP was informed of a major funding reduction for the period May 1, 2012 through April 30, 2013. There was a 41% reduction relative to FY11 (2011-2012), and 60% under the requested funding for FY12. The implications were discussed within the program and amongst program partners (South East Fishery Science Center [SEFSC], SEFIS, and SEAMAP), as well as during a review of the regional fishery independent monitoring programs for reef fishes conducted in late February 2012. The resulting priorities agreed upon by the various parties, optimizes the number of sea days for the chevron trap survey on the *R/V Palmetto* in lieu of other activities. Currently, the recommended changes in the sampling strategy will only have implications for SEAMAP-SA in that it halted the SBLL gear

deployments. Sea days (time) scheduled for the longline gear was used for sampling reef fish with chevron traps instead. The halting of the SBLL survey for 2012 mostly affected data collection for snowy grouper and several other deep water species. In addition, it significantly restricted data collection in areas of high vertical relief and Marine Protected Areas.

In this reporting period, sampling was conducted from April 30 - October 11, 2012 using the *R/V Palmetto*. A total of 22.5 sea days were realized for the SEAMAP-SA Reef Fish Survey, with the vast majority of these sea days used for reef fish monitoring and capturing specimens for diet studies, but some effort was geared towards investigating new reef habitat. The number of realized sea days was under the scheduled number of sea days as a result of cruises cancelled due to a number of named storms and mechanical issues (broken vessel generator and hydraulics pump). These sea days (mostly reconnaissance efforts for new reef bottom habitat) will be made up early in the 2013 sampling season as it is expected that the *R/V Palmetto* is not in need of yard maintenance this winter.

During the 2012 sampling season, SEAMAP-SA researchers collected data for the annual reef fish monitoring identified some additional natural reef habitat (including areas with expected red snapper presence), and collected samples for diet analysis (see section below). Surveys for new reef habitat were conducted using bathymetry (5), reconnaissance trap deployments with cameras on the traps (72), short bottom longline deployments (28), and hook and line fishing efforts (140). Hook and line and bathymetry efforts were conducted during both day and nighttime hours, while other sampling activities occurred during daytime hours only. Sampling efforts for monitoring purposes with chevron traps by the MARMAP and SEAMAP-SA programs totaled 376 deployments, and were conducted following standard procedures. During each trap deployment, a 60-90 minute video was recorded detailing habitat and fish populations near each trap. As per agreement with SEFIS, examination and analysis of these videos are performed by SEFIS staff in Beaufort, North Carolina. In addition, traps deployed by the MARMAP/SEAMAP-SA Reef Fish Survey continued to have a still camera attached that takes a picture every five minutes. Images captured by these cameras have been examined and analyzed by MARMAP/SEAMAP-SA Reef Fish Survey staff.

Following any collections, hydrographic and meteorological data (air and water temperature, salinity, wind speed and direction, wave height, and barometric pressure) were recorded during 82 CTD deployments. Abundance, biomass, and length-frequency data of the collected fish were recorded on a computer utilizing electronic measuring boards, and specimens identified for life-history work up were kept on ice and processed later. Otoliths, gonad samples, stomach contents, and DNA samples were taken and stored for later processing. MARMAP and SEAMAP-SA Reef Fish Survey staff will process all life-history samples collected by the three projects (MARMAP, SEAMAP-SA, and SEFIS). The cruise information and samples are currently being processed, analyzed, and entered into the Reef Fish Database system and will subsequently be available for entry in the SEAMAP-SA database.

Preliminary analysis of the 2012 sampling season data indicated that a total of 17,503 individual fish, representing 53 species, were captured by the MARMAP and SEAMAP-SA Reef Fish Survey. Just over 26% of the

captured specimens (4,558) were retained for life-history work-up. The most abundant species in the catches were black sea bass (7,687), *Stenotomus* spp. (3,000), tomtate (2,879), red porgy (1,320), bank sea bass (593), vermilion snapper (554), white grunt (323), sand perch (265), gray triggerfish (264), spottail pinfish (150), and knobbed porgy (66). All other species were collected in numbers <60. The samples collected for the diet studies are provided below. A detailed cruise report is being prepared and will be available in early 2013. Staff also began the process of including the Reef Fish Survey data in the SEAMAP-SA database.

Juvenile gag ingress - In this reporting period (2012 sampling season), collaborations with partners at GA-DNR and NC-DMF continued. Sub recipient contracts were completed to maintain sampling sites for the 2012-2016 sampling seasons. Between March 12 and June 20, 2012, 15 estuarine sites were sampled to monitor ingress of juveniles of winter spawning commercially and recreationally important fish species, in particular gag (*Mycteroperca microlepis*), in the vicinity of Swansboro, NC; Wilmington, NC; Georgetown, SC; Charleston, SC; Beaufort, SC; Savannah, GA; and Brunswick, GA. The study sites were selected from high salinity areas with oyster shell habitat and an associated benthic community consisting of sponge and soft coral (*Leptogorgia* spp.) All of these sites were sampled from 1995-1997 with the exception of the Wilmington and Savannah sites, which were added during 2009, Brunswick which was added during 2010, and Swansboro, which was added in 2011. Monitoring at the original sites resumed in 2005 and continues to the present. Due to some physical factors, the two sites in Beaufort, NC (that were sampled in 1997 and 2010) were relocated in 2011 to Swansboro, NC. At each site, four Witham collectors were deployed approximately 30 meters apart and sampled two to three times a week from mid-March to mid-June (when winter spawned reef fish no longer recruit to this gear type). Air and water temperature, salinity, wind velocity and direction, and tide stage were measured and recorded in each creek. Salinity and water temperature were measured using a handheld YSI meter. Bycatch species were identified to the lowest practical taxonomic level and recorded. Gag were brought back to the lab to confirm identification due to the possibility of confusion with black grouper (*Mycteroperca bonaci*). At all stations, surface salinity ranged from 25 to 38 with a mean of 32. Surface water temperatures expectedly ranged from 10°C to 31°C with a mean of 23°C. Catches in the Witham collectors were dominated by grass shrimp, *Palaemonetes* sp., and xanthid crabs. Several species of juvenile fish were caught including pinfish, pigfish, toadfish, mummichogs and gobies. Gag was the 34th most abundant taxa, less abundant than in previous years (10th and 15th most abundant taxa in 2010 and 2009, respectively).

During 2012, a total of 1,505 collections (examination and identification of collected organisms in one Witham collector on a given date) were made. Eighty-two gag were collected: 30 from the Swansboro, NC sites, 38 from the Wilmington sites, 1 from the Georgetown, SC sites, 10 from the Charleston, SC sites, 1 from Beaufort, SC sites, and 2 from the Brunswick, GA sites. Note that in 2011 a total of 1,708 collections were made with 7 gag being collected. During 2010, a total of 2,366 collections were made while 144 gag were collected: 1 from the Beaufort, NC sites; 13 from the Wilmington sites; 117 from the Charleston sites; 10 from the Georgetown, SC sites and 3 from the Beaufort, SC sites. Since gag become fully recruited to commercial fishing

gear at age four or five, data collected in the 1990's will be re-examined to determine if there is a link between juvenile abundance and the number of fishes landed commercially. From that it can be established if the recruitment index has any predictive value. Survival of gag during early life stages, and thus the variability in annual recruitment for gag and other fishes is determined by many biotic and abiotic factors. The more important factors are considered to be food for first feeding larvae, predation, suitable environmental conditions for development (i.e., water temperature), and transport towards favorable nursery areas. Currently, logistical preparations are being made for the 2013 sampling period. Under the current funding levels, no additional sites will be added to 2013 sampling season.

Diet studies - During the reporting period, samples were taken for diet studies targeting gray triggerfish, *Balistes capriscus*; red porgy, *Pagrus pagrus*; vermilion snapper, *Rhomboplites aurorubens*; grouper species (scamp, red, gag, rock hind, Warsaw, snowy, and graysby); red snapper, *Lutjanus campechanus*; and squirrelfish, *Holocentrus adscensionis*. Fishes were collected using hook and line fishing (cigar minnows and squid used as bait) aboard the *RV Palmetto*, *RV Savannah*, and *RV Pisces*. It was decided that fishes from the baited chevron traps would not be included in analyses because fish caught in traps often gorge themselves on bait (menhaden), compromising processing and analysis of the stomach samples. Some red snapper guts have been collected from traps to increase sample size. The gorging and bait identification issue is less of a problem in this species as they eat their prey whole and the bait is easily distinguished from other prey. For species caught in large numbers (red porgy, gray triggerfish, and vermilion snapper), ten specimens of each species were targeted in each of 24 zones. Each zone consisted of one of three depth zones (0-20m, 21-50m, and >50m) and one of eight 1-degree latitudinal zones (from 27° N through 34° N). This resulted in 240 specimens needed per species to reach the collection goal. For porgy, triggerfish, and grouper specimens the entire digestive tract was collected from the mouth to the anus. For all other species, only the stomach was collected from the mouth to the pyloric sphincter. Contents of individual guts were sorted by taxa, counted, and weighed. Prey items were identified to the lowest possible taxon. In the 2012 sampling season (May through mid October), 253 specimens (7 red porgy, 10 gray triggerfish, 37 vermilion snapper, 74 groupers, 113 red snapper, and 12 squirrelfish) were collected. Although sampling occurred in the shallowest depth zone (0-20m) no samples of the targeted species were collected. It is likely that these species do not occur frequently in this depth zone. Catches from the shallowest depth zone were dominated by black sea bass and tomtate. During the reporting period, prey items from 156 guts were fully identified. Preliminary results reveal that gray triggerfish prey consists primarily of molluscs and crustaceans, but gray triggerfish consumed at least 125 different prey taxa including barnacles, polychaetes, amphipods, crabs, echinoderms, and seahorses. Red porgy most frequently consume crabs and mollusks, but 164 different prey taxa were consumed including polychaetes, bryozoans, amphipods, and echinoderms.

Sampling for gray triggerfish, red porgy, and vermilion snapper guts is complete. Numbers of collected fish were slightly under target of the maximum number of specimens specified in the scope of work. Not all depth/latitude zones were filled, particularly at the extremes of the sampling range (i.e., 34˚, 27˚) as a result of the species' depth distribution, rather than lack of sampling.

During the 2013 sampling season, staff will continue to collect red snapper, groupers, and squirrelfish. In addition, the relative contribution of food items to the total diet will be determined for all species using % frequency of occurrence (F), % composition by number (N) and % composition by weight (W). These measures will be used to calculate an index of relative importance (IRI). Once all prey items are identified for a particular species, more analyses will be completed (i.e., examining differences in prey items by predator size class, depth zone, latitude and between species).

South Carolina - During the 2011/2012 sampling season, 390 longline sets were made in four strata along the coast of South Carolina. The season was broken down into three periods, defined to maximize catches of red drum (August 1 - September 15, September 16 - October 31, November 1 - December 15). In this report, for the 2011 sample season only the latter part of time period II and the whole of time period III are considered (October through December); in 2012 only the first time period (August through mid-September) and the first part of the second time period (mid-September through end of September) are included in this summary. Each time period and stratum were sampled equally. During sampling, 440 red drum were caught. Winyah Bay yielded the highest numbers of red drum (174) followed by Charleston Harbor (115), Port Royal Sound (80) and Saint Helena Sound (71). Three hundred forty red drum were tagged and released, fourteen were recaptured, fifteen were given to the mariculture project at SCDNR for brood stock, and fifty-nine were sacrificed for age/growth and reproductive investigations. Fin clips were taken from all individuals for genetic investigations (determination of stocked fish, recaptured fish that have lost external and PIT tags, telomere research). Stomach samples were also collected for diet determination. Some red drum were also surveyed for parasite fauna. Most shark species are tagged and released, with the exception of Atlantic sharpnose and large nurse sharks. During this reporting period, 291 sharks were tagged and released.

North Carolina - For sampling year 2012, North Carolina conducted sampling in Pamlico Sound from July through October. Sampling occurred as part of a standardized, stratified-random sample design that has occurred in North Carolina since 2007. This design divides a large portion of the Pamlico Sound estuary into 12 similarly sized regions. From July through October, samples were taken from randomly selected grids (1 square nautical mile) within each region during each of three four-week intervals. All samples were conducted with a 1,500 meter mainline, with gangions placed at 15 meter intervals (100 hooks/set) during nighttime hours starting at sunset. On average, four sets were made per night. Two samples were collected from each randomly chosen sample site.

Random sampling occurred in July (n=12 sets), August (n=24 sets), September (n=28 sets), and October (n=8 sets) and yielded 374 red drum (50, 141, 183 and 0 respectively). Red drum captured ranged in size from 29 to 49 inches fork length. Sixty-six red drum were sacrificed to determine age composition and for other biological investigations. Two-hundred forty-eight fish were tagged and released to track migration, stock ID and growth rates. Forty-eight fish were measured and released but not tagged due to fish condition or adverse weather. Sampling during this period resulted in six recaptures of red drum.

Georgia - For the current reporting period, sampling occurred off southeast Georgia and northeast Florida during the fall months

(October - December) of 2011 and the spring and summer months (May - September) of 2012. A total of 235 longline sets were deployed over the two seasons with 104 sets made during fall 2011 and 131 sets during the spring and summer of 2012. A total of 47 adult red drum were captured; 39 during fall 2011, 1 during June 2012 and the remaining 7 were caught after August 26, 2012. Red drum ranged in size from 836 to 1,017 mm center length. All but two red drum were tagged with PIT tags prior to release. Three Kemp's Ridley and 2 loggerhead sea turtles were caught during the study period. All turtles were released in excellent condition with all hooks removed.

SEAMAP - Caribbean

Queen Conch Survey - Virgin Islands

The USVI Division of Fish and Wildlife, Department of Planning and Natural Resources completed all underwater conch surveys for the USVI. Approximately twenty trips for the territory were completed in August and September 2012. The queen conch population was visually surveyed using scooter transects around the USVI. Transects were 4 meters in width and varied in length depending on the water depth. A total of 108 scooter transects were sampled at 54 sites/stations around the territory. At the start of each site, two divers were deployed to collect data along parallel line transects maintained while following a predetermined compass bearing. One diver towed a surface float that was followed by the support vessel. GPS coordinates of diver entry and surface return were recorded by onboard personnel. Records were kept on start/stop times, depths, habitat type, time of each habitat change, and length and lip thickness of each conch encountered. Conch shell measurements were used to classify individuals into maturity categories and to assess stage composition.

A total of 883 queen conch were observed of which greater than 75% were adults. Over 90% of the survey sites in the USVI contained conch. Overall average conch density for the territory was 169.46 (conch/ha). Mean conch density was higher around St. Croix (248.09 conch/ha) compared to St. Thomas (216.6 conch/ha) and St. John (43.7 conch/ha). The highest conch abundances and densities occurred in seagrass habitat throughout the territory.

Yellowtail Snapper and Reef fish Surveys - Virgin Islands

The Division of Fish and Wildlife collected fisheries independent data on yellowtail snapper, *Ocyurus chrysurus*, populations from June 2010 to March 31, 2012. Relative stock abundance of yellowtail snapper within the districts of St. Thomas/St. John and St. Croix were determined by standardized SEAMAP line fishing methodologies using baited hand lines. This study was conducted while at anchor. Sampling areas were adjusted to compensate for previously determined areas that are now lost due to the expansion of federal waters of the USVI Coral Reef National Monument on St. John and the Buck Island Reef National Monument on St. Croix in 2000.

For the St. Thomas/St. John district, nine subquadrats from the SEAMAP-C sampling grid south of St. John were sampled from June 2010 to November 2011, totaling 37 hours and 55 minutes. All sites were randomly selected. A total of 328 fish were caught, 303 were yellowtail snapper making up 92% of the total catch. The catch per unit effort for all species sampled was 8.7 fish per boat hour, and for total yellowtail snapper sampled was 7.9 fish per boat hour.

For the St. Croix district, eleven subquadrats from the SEAMPA-C sampling grid northeast of St. Croix were sampled from April 2011 to March 2012, totaling 39 hours and 5 minutes. All sites were randomly selected. A total of 118 fish were caught during sampling, 64 were yellowtail snapper making up 54% of the total catch. The catch per unit effort for species sampled was 3.0 fish per boat hour, and for total yellowtail snapper sampled was 1.6.

Three hundred and three (303) yellowtail snapper were caught in the St. Thomas/St. John district and sixty-four (64) in the St. Croix district. The majority of yellowtail snapper samples collected in the St. Thomas/St. John district was of maturing or running ripe gonadal stages. For the St. Croix district, the majority of yellowtail snapper samples collected was of running ripe gonadal stages. The dominant length frequency for both districts was 360 mm and female. Likewise, the lunar illumination factor that yielded greater sample sizes for both districts was between .5 - .75, or larger moon phases.

Puerto Rico

Although researchers were not able to conduct the ROV assessment of tiger grouper spawning aggregations due to several logistic problems, SEAMAP-C was able to do an assessment of several grouper species on the west coast of Puerto Rico using hydrophones. SEAMAP-C leveraged funds and efforts with the Caribbean Coral Reef Institute (CCRI) and installed several hydrophones in areas identified as spawning sites for various species of groupers. The instruments were deployed in December 2011and were recovered in May 2012. Data are currently being analysed to determine species' spawning periods. Using this methodology CCRI has been able to identify the spawning activity of red hinds, Nassau grouper, and yellowfin grouper in several areas off the west coast of Puerto Rico that includes el Bajo de Cico, Abrir la Sierra and Mona Island. SEAMAP-C is planning to deploy the hydrophones year round in areas that have been identified as spawning areas to determine if any other species use those grounds for spawning.

Yellowtail Snapper Survey - Puerto Rico

Sampling started in May 2010 on the west coast of Puerto Rico while sampling started in January 2012 on the east coast. Data from 50 out of 60 trips showed a total of 368 individuals weighing 95 kg and belonging to 11 species were processed. Of those the most dominant species was the longspine squirrelfish, *Holocentrus rufus* (27.2%), followed by the yellowtail snapper, *Ocyurus chrysurus* (22.3%). Other species represented in the catch are the coney, *Cephalopholis fulva* (17.1%), the white grunt, *Haemulon plumier* (11.7%), the vermillion snapper, *Rhomboplites aurorubens* (5.2%) and the red hind, *Epinephelus guttatus* (4.4%). All individuals were visually sexed and gonads were collected for histological processing.

Lane Snapper Survey - Puerto Rico

The objective of this survey is to collect data on the lane snapper fishery around Puerto Rico. A fisher survey was conducted among identified fishers that target this species to collect information on traditional fishing grounds. With this information, the stations to be sampled were selected. Sampling started in November 2011 on the west coast. A total of 60 trips were made by March 2012. Sampling included fishing at traditional commercial yellowtail fishing grounds, and at other places identified by fishers as not good yellowtail fishing sites. A total of 1,045 fish

weighing over 253 kg were collected during the west coast lane snapper survey. The catch comprised 45 species in 20 families. These included 7 species of snappers (red, dog, schoolmaster, gray, lane, vermillion and yellowtail). Other species included four groupers, two species of squirrelfish, haemulids, jacks, and several species of sharks. A total of 576 lane snappers were captured weighing over 86 kg, representing the most abundant species (55.2% of total number and 34.2% by weight).

Sampling on the east coast of Puerto Rico started in January 2012. As of July 2012, a total of 262 individuals weighing over 112 kg were caught. The most abundant species was lane snapper comprising 41.6% of the catch, followed by yellowtail snapper (15.7%), and the blue runner (10.3%). Other species represented in the catch were mutton snapper (6.1%), white grunt (4.6%), bonefish (4.6%), and Caribbean sharpnose shark (5.3%). All individuals were visually sexed and gonads collected for histological processing.

SPECIAL STUDIES

In addition to the regularly scheduled surveys, SEAMAP participates in a variety of other projects. The SEAMAP provides guidance, personnel, and other contributions to these studies for enhancement and protection of the marine resources.

Winter Trawling and Fish Tagging Cruise

While the long running Cooperative Winter Tagging Cruise was not able to conduct a full research vessel, trawl-based cruise in 2012 due to lack of funding, it was able to conduct striped bass tagging operations with the help of its state and federal partners. Historically funded by NOAA Fisheries (through use of one of its survey vessels, or provision of charter funds) and supported with in-kind contributions from the U.S. Fish and Wildlife (USFWS), the Atlantic States Marine Fisheries Commission (ASMFC), Maryland DNR-Fisheries Service, North Carolina Division of Marine Fisheries and numerous additional state fishery agencies and universities, the Tagging Cruise provides important data for the striped bass stock assessment, as well as other ASMFC species. In order to keep the striped bass time series intact, all the partners worked together, with the assistance of additional partners to implement a cruise in 2012. This marked the 25th year of the Cruise, however, the methodology has changed and data have only been gathered on one species (striped bass) for last year and this year. Since 2010, the Cruise has employed charter sport fishing vessels and tagged striped bass caught on hook-and-line gear, using the protocol supplied by the Massachusetts Division of Marine Fisheries. The research vessel for the first couple trips conducted this year is the privately-owned, *FV Smokin' Gun II*.

Tagging Cruise partners are working together to secure long-term funding to continue conducting the Cruise using a federal research vessel with traditional trawl gear. Use of this gear has proven not only efficient, but also enables the collection of data on multiple ASMFC-managed species, including Atlantic sturgeon, spiny dogfish, weakfish, summer flounder and alosine species, such as shad and river herring. Collection of the fish via hook and line provides data only for striped bass.

INFORMATION SERVICES

Information from the SEAMAP activities is provided to user groups through the program administration and complementary systems: the SEAMAP Information System,

SEAMAP-South Atlantic Data Management System, SEAMAP Archiving Center, and SERTC. Products resulting from SEAMAP activities can be grouped into two major categories: data sets (including broadly, digital data and collected specimens) managed by the SEAMAP Information System, SEAMAP-South Atlantic Data Management System, SEAMAP Archiving Center, and SERTC; and program information. Program information is discussed in the PROGRAM MANAGEMENT Section of this report.

SEAMAP Information System

Biological and environmental data from all SEAMAP-Gulf surveys are included in the SEAMAP Information System, managed by GSMFC and NMFS-SEFSC. Raw data are edited by the collecting agency and verified by the SEAMAP Data Manager prior to entry into the system. Data from all SEAMAP-Gulf surveys during 1982-2011 have been entered into the system and data from 2012 surveys are in the process of being verified, edited, and entered for storage and retrieval. Verified, non-confidential SEAMAP data are available conditionally to all requesters.

Requested SEAMAP data were used for a multitude of purposes in 2012:

- Evaluating the abundance and size distribution of penaeid shrimp in federal and state waters to assist in determining opening and closing dates for commercial fisheries;
- Assessing the impact of the BP Deepwater Horizon oil spill on the Gulf of Mexico ecosystem;
- Evaluating and plotting the size of the hypoxic (Dead Zone) area off of Louisiana;
- Assessing shrimp and groundfish abundance and distribution and their relationship to such environmental parameters as temperature, salinity, and dissolved oxygen;
- Identifying environmental parameters associated with concentrations of larval finfish;
- Assessing the potential impact of liquefied natural gas facilities on marine fish stocks;
- Assessing the potential impact of the Deepwater Horizon oil spill on marine fish stocks;
- Compiling the 2012 SEAMAP Environmental and Biological Atlas; and
- Comparing catches of shrimp and groundfish captured by 40-ft versus 20-ft trawl nets.

Real-time Data

A major function of the SEAMAP Information System is the processing of catch data from the Summer Shrimp/Groundfish Survey as near-real-time data. Data were transmitted to the NMFS Mississippi Laboratories from the NOAA vessel, while the states' data were entered into the system weekly. Plots of station locations and catch rates of shrimp, squid and dominant finfish species were prepared, edited, and processed by GSMFC for weekly distribution to management agencies, fishermen, processors and researchers. SEAMAP real-time data plots were produced during the 2012 Summer Shrimp/Groundfish Survey. Seven weekly mailings were produced and distributed to approximately 150 interested individuals.

These plots were also available through the SEAMAP web page.

SEAMAP - South Atlantic Data Management System

The SEAMAP-SA data management system goal is a web based information system that facilitates data capture, error checking, data extraction, dissemination, and summary of fishery independent data and information for all ongoing SEAMAP-SA surveys and special studies. The SEAMAP-SA Data Management work group in 2011/2012 made significant progress toward providing public access on the web to the ASMFC maintained www.seamap.org/ site and the SCDNR maintained based Oracle relational database www.dnr.sc.gov/seamap/. The SEAMAP.org website is where general links, information, and documents (surveys, reports, metadata, special studies) for SEAMAP-SA are presented. The Oracle database is constructed to provide access to "normalized data" for a number of fishery independent programs including, but not limited to, SEAMAP Coastal Survey, the NCDMF Pamlico Sound trawl survey, the adult red drum longline survey, the augmented MARMAP survey, and eventually the SEAMAP Cooperative Winter tagging cruises. Spatial presentations of SEAMAP and other South Atlantic fishery independent data http://ocean.floridamarine.org/sa_fisheries/ are available through a developing regional GIS service managed by Florida Fish and Wildlife Research Institute for the South Atlantic Fishery Management Council (SAFMC Fisheries Viewer). This application was developed for the SAFMC with ArcGIS Viewer for Flex. The custom GIS web mapping application supports data display, interactive querying, geocoding and printing. Users may download GIS shapefiles and associated metadata.

Since last year's annual meeting, the Data Management Workgroup held nine conference calls for coordination of project activities. The Workgroup worked primarily on data management tasks that relate to the web design, database maintenance, and data extraction queries. To assist in this effort the group worked with South Carolina Information Technology specialists in Columbia, SC to convert the current SCDNR Microsoft Access database and develop an Oracle database with a web access application. After some delay SCDNR contracted with an Oracle programmer in early 2012 to oversee the development of the Oracle database and web interface system. Contractual work concluded in the fall of 2012.

Southeast Regional Taxonomic Center (SERTC)

During FY2012, SERTC staff continued to add to the SEAMAP voucher collection. In addition to specimens collected on Coastal Survey cruises, SERTC staff accompanied personnel from other SCDNR projects, including the Crustacean Management project, on research cruises to provide taxonomic expertise and to collect specimens. In total, 38 new specimens (comprising 20 fish and invertebrate species) and 25 new images were added to the collection and photo gallery, respectively, during the reporting period. All SEAMAP specimens collected during 2011 and 2012 were accessioned and formally cataloged into the new Specify 6 database. Specimens are now labeled, shelved, and available for use by researchers. Fin clips from representative fish specimens for genetic analysis were also accessioned and cataloged for future genetic analysis. SERTC's taxonomic library was expanded by approximately 200 references, and approximately half of the existing 4,000

references were updated to include electronic versions.

The SERTC facilities continue to serve as a sample processing facility for collections generated by SEAMAP components, and SERTC staff continued to provide support, training, and expertise to assist the Coastal Survey and the Reef Fish Survey with the examination and analysis of stomach contents. In order to further assist diet study personnel with taxonomic identifications, the general framework was laid for a comprehensive stomach content guide that will include photographs of digested and undigested major prey taxa. As part of this effort, SERTC staff have begun verifying and photographing voucher specimens for the Coastal Survey portion of the diet study. SERTC staff also provided taxonomic expertise, image loans, and general information to members of the public and researchers both in and outside of the DNR. SERTC assisted DNR invasive species personnel with ongoing research efforts by processing and packaging *Penaeus monodon* tissue samples for shipment to NOAA geneticists in North Carolina.

The five SERTC educational posters were reprinted during this period. In addition, staff researched and designed a new poster for the SERTC educational poster series, *Sargassum: Golden Rainforest of the Sea*. The poster highlights the unique aspects of this floating habitat from the nursery functions to feeding grounds and potential threats to *Sargassum* communities. The SERTC web page was updated to include this new poster and additional images, as well as lesson plan resources for teachers. Staff is working with the SCDNR Education and Outreach Department, the SC Aquarium, and other formal and informal educators in order to promote increased distribution of SERTC-produced educational materials to local and regional schools.

Program Documents

The following documents were published and distributed by the SEAMAP program in FY2011:

Gulf States Marine Fisheries Commission. 2012. SEAMAP Marine Directory. Gulf States Marine Fisheries Commission, Ocean Springs. 1 p. + appendices.

Hendrix, C. and J. Boylan. 2012. SEAMAP-SA: Results of trawling efforts in the coastal habitat of the South Atlantic Bight, 2011. ASMFC, Washington, DC.

Rester, J.K., M. Paine, and E. Ojeda Serrano. 2011. Annual Report of the Southeast Area Monitoring and Assessment Program (SEAMAP), October 1, 2010 to September 30, 2011. Gulf States Marine Fisheries Commission, Atlantic States Marine Fisheries Commission, Puerto Rico Sea Grant College Program. No. 199, GSMFC, Ocean Springs, MS. 17pp.

Rester, J.K. 2011. SEAMAP Environmental and Biological Atlas of the Gulf of Mexico, 2009. Gulf States Marine Fisheries Commission, No. 198, GSMFC, Ocean Springs, MS.

Rester, J.K. 2012. SEAMAP Environmental and Biological Atlas of the Gulf of Mexico, 2010. Gulf States Marine Fisheries Commission, No. 206, GSMFC, Ocean Springs, MS.

SEAMAP-SA Coastal Survey, Cruise Report, Fall 2011.

SEAMAP-SA Coastal Survey, Cruise Report, Spring 2012.

SEAMAP-SA Coastal Survey, Cruise Report, Summer 2012.

PROPOSED SEAMAP ACTIVITIES, FY2013

Last year, total program allocations for all three SEAMAP components, Gulf, South Atlantic and Caribbean, was approximately $5.03 million. At the July 2012 meeting, the SEAMAP components based their allocations for 2013 on level funding of $5.03 million. Proposed FY2013 activities for all participants are shown in Table 2.

Table 2.

PROPOSED SEAMAP ACTIVITIES, FY2013

	Fall	Winter	Spring	Summer
Gulf of Mexico Activities				
Resource Surveys:				
Spring Plankton Survey			X	
Reef Fish Survey			X	X
Summer Shrimp/Groundfish Surveys				X
Fall Shrimp/Groundfish Surveys	X			
Fall Plankton Survey	X			
Winter Plankton Survey		X		
Plankton and Environmental Data Surveys			X	X
Inshore Longline Surveys	X		X	X
Vertical Longline Survey			X	X
Information Operations:				
Biological and Environmental Atlas		X		
2013 Marine Directory			X	
FY2012 Joint Annual Report		X		
Real-time Data Summaries		X		X
Data Input and Request Processing	X	X	X	X
Specimen Archiving and Loan	X	X	X	X
Program Administration	X	X	X	X
South Atlantic Activities				
Resource Surveys:				
Coastal Survey	X		X	X
Pamlico Sound Survey	X			X
Winter Trawling and Fish Tagging Cruise		X		
Bottom Mapping Project	X	X	X	X
Fish Habitat Characterization and Assessment	X	X	X	X
Adult Red Drum Longline Survey	X		X	X
Information Operations:				
Data Input and Request Processing	X	X	X	X
Data Analysis and Utilization	X	X	X	X
Program Administration	X	X	X	X
Joint Planning Activities	X	X	X	X
Caribbean Activities				
Resource Surveys:				
Conch Survey (Puerto Rico &Virgin Islands)	X	X	X	X
Spiny Lobster Survey (Puerto Rico)	X	X	X	X
Spiny Lobster Survey (Virgin Islands)	X	X	X	X
Reef Fish Survey (Puerto Rico)	X	X	X	X
Parrotfish Survey (Virgin Islands)	X	X	X	X
Information Operations:				
Preliminary Data Analysis and Quality Control	X	X	X	X
Research Programs	X	X	X	X
Information Dissemination	X	X	X	X
Program Administration				
Joint Planning Activities	X	X	X	X

SEAMAP-Gulf of Mexico Representatives

Read Hendon, Chairperson
Mississippi Department of Marin Resources
USM/Gulf Coast Research Laboratory

Myron Fisher
Louisiana Department of Wildlife and Fisheries

John Mareska
Alabama Department of Conservation and Natural Resources

Fernando Martinez-Andrade
Texas Parks and Wildlife Department

Bob McMichael
Florida Fish and Wildlife Conservation Commission

Butch Pellegrin
National Marine Fisheries Service
Pascagoula Laboratory

John Froeschke
Gulf of Mexico Fishery Management Council

SEAMAP-South Atlantic Representatives

Roger Pugliese, Chairperson
South Atlantic Fishery Management Council

Marcel Reichert
South Carolina Department of Natural Resources

Patrick Campfield
Atlantic States Marine Fisheries Commission

Wilson Laney
U.S. Fish and Wildlife Service

Patrick Geer
Georgia Department of Natural Resources

Tina Udouj
Florida Fish and Wildlife Research Institute

Todd Kellison
National Marine Fisheries Service
Beaufort Laboratory

Katy West
North Carolina Department of Environment and Natural Resources

SEAMAP-Caribbean Representatives

Aida Rosario, Chairperson
Puerto Rico Department of Natural
and Environmental Resources

Roy Pemberton
U.S. Virgin Island Division of Fish
and Wildlife

Verónica Seda
Puerto Rico Department of Natural
and Environmental Resources

Ruperto Chaparro
Puerto Rico Sea Grant College Program

Richard Appeldoorn
University of Puerto Rico

Stephen Hale/Jonathan Brown
U.S. Virgin Islands Division of Fish
and Wildlife

Graciela Garcia-Moliner
Caribbean Fishery Management Council

Miguel Rolón
Caribbean Fishery Management Council

Peter Thompson/Theo Brainerd
National Marine Fisheries Service

Edwin Muñíz/Ana Román
Puerto Rico & Virgin Islands
US Fish and Wildlife Service

SEAMAP Personnel

Jeffrey Rester
SEAMAP-Gulf Coordinator
Gulf States Marine Fisheries Commission

Melissa Paine
SEAMAP-South Atlantic Coordinator
Atlantic States Marine Fisheries Commission

Edgardo Ojeda Serrano
SEAMAP-Caribbean Coordinator
Puerto Rico Sea Grant College Program

Larry Simpson, Executive Director
Gulf States Marine Fisheries Commission

Robert Beal, Executive Director
Atlantic States Marine Fisheries Commission

Joe Gill, Chairman
Gulf States Marine Fisheries Commission

Paul Diodati, Chairman
Atlantic States Marine Fisheries Commission

Lloyd Kirk
Gulf States Marine Fisheries Commission
SEAMAP Data Manager

Sara LeCroy, Curator
SEAMAP Invertebrate Plankton Archiving Center

Terry Henwood
National Marine Fisheries Service
SEAMAP Program Manager

Kelly Donnelly
National Marine Fisheries Service
SEAMAP Program Office

Gulf States Marine Fisheries Commission
2404 Government Street
Ocean Springs, Mississippi, 39564