

ANNUAL REPORT

OF THE SOUTHEAST AREA MONITORING AND ASSESSMENT PROGRAM (SEAMAP)

OCTOBER 1, 2013 - SEPTEMBER 30, 2014

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

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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 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 1985-2014. Funding allocations to participants for FY1985-FY2014 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 FY2014 and proposed activities for FY2015.

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 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 2013 and March 2014 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 2014 to discuss respective program needs and priorities for FY2015.

TABLE 1.

SEAMAP ORGANIZATION		
Program	Administering Organization	Participating Agencies
SEAMAP-Gulf of Mexico Gulf States Marine Resources	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

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 2014. 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

Three committee meetings and several conference calls were held in FY2014. 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 July 29-30th, 2014, prior to the joint annual meeting. The meeting included participation by the work group leaders and coordinator. The Committee developed the SEAMAP-South Atlantic (SEAMAP-SA) budget and research program priorities for FY2015. 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 refinement of the SEAMAP-SA web-accessible database and the development of the 2016-2020 Management Plan.

SEAMAP-Caribbean

During FY2014, liaison activities included data collection and management and dissemination of fishery independent data. Five SEAMAP-Caribbean (SEAMAP-C) Committee meetings were held alternately in Puerto Rico and the U.S. Virgin Islands (USVI) between October 2013 and September 2014 to review programmatic surveys carried out in Puerto Rico and the USVI concerning conch, lobster, and reef fish populations. In addition, SEAMAP-C committee members participated in the SEAMAP joint annual meeting held in San Juan, Puerto Rico.

As part of the coordination section efforts, two SEAMAP-C 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 of SEAMAP in each region. These posters have been used during several fisheries workshops for fishermen and other targeted groups in Puerto Rico. They also have been given to the general public during visits to coastal communities.

During this reporting period, a contractor continued updating the Caribbean sampling protocols and to summarize the information from all projects conducted by the program. All SEAMAP-C study reports, including the Caribbean sampling protocols and related information has been made available for public dissemination at <http://prsgfisheriesoutreach.wordpress.com>. The main goal was to have a clear and uniform sampling protocol and to make the information accessible.

In addition, the hydroacoustic data obtained from seven bottom acoustic receiver data-loggers acquired to continue the USVI’s and Puerto Rico’s reef fish spawning aggregation identification and dynamic population evaluation surveys, has been processed and analyzed through a student assistantship. Three data-loggers have been recording fish spawning aggregation information on the Virgin Islands, and four in Puerto Rican waters. The Virgin Islands’ data-loggers have been deployed at Grammanik Bank and the historic Nassau-Hind Bank site. The four recording instruments deployed in Puerto Rico were located at two different depths at the Bajo de Cico and Abril la Sierra spawning grounds.

RESOURCE SURVEYS

In FY2014, collection of resource survey information continued for the thirty-third 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. 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 9 to December 6, 2013 from off southwest Florida to the U.S.-Mexican border. Two hundred eight-nine trawl stations were sampled during the survey. Survey effort was negatively impacted by the government shutdown in early October. 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.

NOAA Fisheries, Mississippi, and Louisiana vessels collected ichthyoplankton data 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.

Spring Plankton Survey

The SEAMAP Spring Plankton Survey was conducted from May 2 to May 30, 2014. One hundred twenty-nine stations were sampled during the survey. This was the thirty-third year for the survey and participants included NOAA Fisheries, Louisiana, and Mississippi. 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 m³ but is typically 30 to 40 m³ at the shallowest stations and 300 to 400 m³ 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. 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).

Bottom Longline Survey

The Bottom Longline 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. The Bottom Longline Survey samples the northern Gulf of Mexico from March through October each year. Mississippi, Alabama, Louisiana, and Texas participate in the Bottom Longline Survey.

Vertical Line Survey

In FY2014, Louisiana and Alabama conducted vertical line sampling for reeffish. In Alabama, a total of 12 grids are fished per survey. Vertical lines with ten hooks are baited with Atlantic mackerel and are fished for 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.

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. One hundred ninety-seven stations were sampled during FY2014 with sampling conducted from May to September.

Reef Fish Survey

The primary purpose of this survey was to assess relative abundance and compute population estimates of reeffish found on natural reeffish habitats 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. Florida sampled the west Florida shelf during June through September while NOAA Fisheries sampled around the Gulf of Mexico in May and June.

Summer Shrimp/Groundfish Survey

The overall sampling strategy during the 2014 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 SEAMAP Summer Shrimp/Groundfish Survey was conducted from June 2 to July 17, 2014. Five hundred fifty-two plankton and trawl stations were completed in this year's survey. This was the thirty-third year for

the survey. 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 60 fm.

Fall Plankton Survey

The Fall Plankton cruise took place in August and September 2014 with NOAA Fisheries, Alabama, Louisiana, and Mississippi all participating. One hundred eighty-one stations were sampled. 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 fishes, 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 m³ but is typically 30 to 40 m³ at the shallowest stations and 300 to 400 m³ 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. 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 provide data for stock assessments and to aid in management of stocks off the coast of the southeastern United States. 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. For 2009 through 2012 seasonal effort was increased by 10%. However, as of spring 2013, seasonal effort was dropped back to pre-2009 levels as a result of funding reductions.

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 FY2014 (fall 2013, spring 2014, and summer 2014). A total of 102 stations in nearshore latitudinal strata (4.6 to 9.2m depths) were sampled during each of the three seasonal cruises. All samples were collected during daylight hours. The decision to focus on daylight sampling was made in 1989 to maximize the opportunities for collecting juvenile mackerels.

The fall 2013 cruise constituted the completion of the twenty-fourth full year of standardized sampling under a stratified random survey design. Sampling was conducted from September 30 to November 8, 2013. A total of 132 species or genera were identified in fall trawls. The total abundance of all individuals ($n=218,076$ or 2,138 fish/tow) decreased relative to the catches in the 2012 fall season. Catches in Raleigh Bay yielded the highest regional CPUE, yielding an average of 3,859 fish/tow ($n=34,732$ individuals). Florida had the second largest summer CPUE (3,507 fish/tow, $n=73,645$).

The 2014 spring cruise for the SEAMAP-Coastal Survey began on April 10 and was completed on May 7, 2014. Seasonal sample allocation continued at 102 stations. A total of 137 taxa were identified in spring trawls. Estimated abundance of individuals taken in trawls ($n=358,134$ individuals, 3,511 fish/tow) increased from the previous spring. It should be noted, however, that Raleigh Bay was not sampled during the spring of 2013, possibly lowering the overall catch per unit effort for that season. In spring 2014, catches in Raleigh Bay yielded the highest regional abundance with 98,603 individuals and a CPUE of 10,956 individuals per tow. Onslow Bay had the second largest abundance (97,658 individuals, 5,425 ind./tow). Miscellaneous invertebrate biomass was estimated at 1,798.248 kg (17.6 kg/tow), decreasing from the previous spring's estimated biomass.

The summer cruise season for the SEAMAP-South Atlantic Coastal Survey began on July 8 and was completed on August 6, 2014. A total of 129 taxa were identified in summer catches. Abundance of individuals taken in summer trawls increased from the previous year to a total estimated abundance of 374,417 individuals and a mean catch per unit effort (CPUE) of 3,671 individuals per tow. This is the highest estimated seasonal abundance recorded by the Coastal Survey during a summer season. Catches in Onslow Bay yielded the highest regional CPUE for this summer with 4,925 individuals per tow and an estimated total abundance of 88,658 individuals. The second largest summer CPUE occurred in the Florida region (97,361 individuals, 4,636 fish/tow). Miscellaneous invertebrate biomass (wt=6804 kg, 66.7 kg/tow) increased from the previous summer.

Data from all 2013 cruises have been added to the SEAMAP-SA data management system. Additional cruise information can be found in the cruise reports that are available via links at <http://www.seamap.org/CoastalSurvey.html>.

During the reporting period, SEAMAP-SA Coastal Survey staff provided data and participated in conference calls, webinars and workshops for the SouthEast Data, Assessment and Review (SEDAR) stock assessments for South Atlantic and Gulf of Mexico King Mackerel (SEDAR 38), HMS Smoothhound Sharks (SEDAR 39), and the Shrimp Procedural Workshop.

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, 108 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 FY2014, the North Carolina Division of Marine Fisheries (NCDMF) continued the ongoing Pamlico Sound Survey. The survey sampled 54 stations each in June (9th – 13th, 16th – 18st) and September (8th – 12th and 15rd – 17th) of 2013. The 2014 data are processed by NCDMF and will be made available to the SEAMAP-South Atlantic DMS by April 2015.

Bottom Mapping and Species Characterization

In FY2014, the Florida Fish and Wildlife Research Institute (FWRI) provided technical support and infrastructure for maintaining and distributing GIS data products of bottom habitats and fishery independent surveys in the South Atlantic region. Online access of SEAMAP mapping products is available via the South Atlantic Habitat and Ecosystem Atlas (http://ocean.floridamarine.org/safmc_atlas/). The Atlas integrates multiple services including spatial presentation of SEAMAP and other fishery independent data through http://ocean.floridamarine.org/SA_Fisheries/ and SEAMAP bottom mapping information through the SAFMC EFH service at http://ocean.floridamarine.org/sa_efh/. The SEAMAP-South Atlantic Bottom Mapping, Fish Habitat Characterization and Assessment Work Group met on January 23, 2014 in conjunction with the Southern Division AFS Meeting. The Work Group was presented an overview of the South East Reef Fish Survey (SERFS), a review of the modifications and updates to the Habitat Ecosystem Atlas/South Atlantic Fisheries including those accomplished in response to Work Group recommendations. The Work Group discussed the process underway to update/refine species, Essential Fish Habitat (EFH) and fishery operations information for the developing Fishery Ecosystem Plan (FEP) II and EFH 5 year review and update. The Work Group was provided a presentation on the SALCC/TNC Resource Mapping project and provided input and recommendations on its further development. The Work Group was engaged in initiating the development of a South Atlantic Mapping Strategy for FEP II. The Work Group was introduced to the South Atlantic Ecospecies online species information system. The Work Group discussed 2014 activities which in general support continued work on activities reviewed at the meeting.

Fish Habitat Characterization and Assessment

Reef fish sampling - In the summer of 2008, SEAMAP-SA received funding to complement and expand the Marine Resources Monitoring, Assessment, and Prediction Program (MARMAP) reef fish sampling to address high priority needs for overfished species in the snapper-grouper complex. The primary objective was to enhance the fishery independent reef fish data collected by 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 2011, 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 at SEFSC) to accomplish a comprehensive fishery independent sampling of reef fish in the southeast region. Prior to 2011, 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 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 2013 the combined monitoring efforts were conducted under a new name: The South East Reef Fish Survey (or SERFS).

In 2014, priorities agreed upon by the various parties involved in the Reef Fish Survey continued to be aimed at optimizing the number of sea days for the chevron trap survey on the R/V Palmetto in lieu of other activities. However, additional funding in FY2014 (starting in the July 2014 through June 2015 project funding year), allowed short bottom longline gear sampling to be resumed in the 2014 sampling season. The halting of the short bottom longline survey for 2012, 2013, and the first half of the 2014 sampling season 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.

The Reef Fish Survey was conducted from April 23 – October 22, 2014 using the R/V Palmetto. A total of 24.5 sea days were realized for the SEAMAP-SA Reef Fish Survey, with the vast majority of these sea days used for reef fish monitoring, capturing specimens for diet studies, and short bottom longline efforts, with very limited effort towards investigating new reef habitat. In addition, MARMAP funded 22.5 sea days.

During the 2014 sampling season, SEAMAP-SA researchers collected data for the annual reef fish monitoring, identified a few additional areas with natural reef habitat, collected samples for diet analysis, and collected information on bycatch mortality of several snapper grouper species. Surveys for new reef habitat were conducted using fathometry (6 areas), reconnaissance trap deployments with cameras on the traps (55 deployments), and short bottom longline deployments (7 deployments). Hook and line fishing efforts (170 deployments) were mostly conducted for diet and bycatch mortality studies. 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 464 deployments. During each trap deployment, a 60-90 minute video was recorded by two underwater cameras 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, NC, but MARMAP aided with the examination of about 1,000 videos.

As a result of additional SEAMAP-SA funding (starting in July 2014), the Reef Fish Survey resumed short bottom longline (SBLL) sampling for species in deeper hard bottom habitat (>90m) with significant relief. A total of 60 SBLL stations were sampled (including 7 reconnaissance deployments), a significant increase over 2012 (n=28) and 2013 (n=42) efforts. The SBLL efforts were funded solely by SEAMAP-SA and we expect to continue the SBLL sampling in 2015.

Following any collections, hydrographic data (water temperature, salinity, etc.) were recorded during 97 CTD deployments (MARMAP and SEAMAP-SA combined). 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 all SERFS 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 2014 sampling season data indicated that a total of 15,715 individual fish, representing 64 species, were captured by the MARMAP and SEAMAP-SA Reef Fish Survey. Just over 32% of the captured specimens (5,089) were retained for life history work-up.

SEAMAP-SA Reef Fish Survey staff provided data and analyses, and participated in conference calls, webinars, and workshops for the SEDAR41 benchmark stock assessment for Red Snapper and Gray Triggerfish. Staff has also been preparing for assessments of Red Grouper and Blueline Tilefish (2016), and Red Porgy, Scamp, and Vermilion Snapper (2017). The program also provided samples and data to researchers from various academic Institutions, state and federal agencies, NGO's, SAFMC, ASMFC, and others.

Juvenile gag ingress - In 2014, collaborations with partners at GA-DNR and NC-DMF continued. Fifteen 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, North Carolina; Wilmington, North Carolina; Georgetown, South Carolina; Charleston, South Carolina; Beaufort, South Carolina; Savannah, Georgia; and Brunswick, Georgia. The study sites were selected for the high salinity with oyster shell habitat with an associated benthic community consisting of sponge and soft coral. All of these sites were sampled from 1995-1997 with the exception of the Wilmington and Savannah sites, which were added during 2009, and Brunswick and Beaufort, which were added during 2010. Due to some physical factors, the two sites in Beaufort (that were sampled in 1997 and 2010) were relocated in 2011 to Swansboro. Ingress monitoring using Witham collectors was established in 1995 and continued until 1998. Monitoring resumed in 2005 until the present.

At each site, four Witham collectors were deployed approximately 30 meters apart and sampled two 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 (model 85). 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*).

As in previous years, 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 were the 17th most abundant taxa. During 2014, a total of 1,282 collections (examination and identification of collected organisms of one Witham collector on a given date) were made. Forty Gag were collected: 18 from the Wilmington sites, only 4 from the Swansboro sites, 0 from the Georgetown sites, 6 from the

Charleston sites, 1 from Beaufort sites, and 10 from the Brunswick sites and 1 from the Savannah sites.

Diet studies – During the reporting period, targeted species for diet studies were grouper/hind species (family Serranidae), Black Sea Bass (*Centropristes striata*), Squirrelfish (*Holocentrus adscensionis*), White Grunt (*Haemulon plumieri*), Tomtate (*Haemulon aurolineatum*), Blueline Tilefish (*Caulolatilus microps*), and Scup (*Stenotomus* sp.) Fish were collected using hook and line fishing gear (Round Scad and squid used as bait) and chevron traps (baited with Atlantic Menhaden) aboard the RV Palmetto and RV Savannah. For species caught in large numbers (Black Sea Bass and White Grunt) a stratified sampling design was employed, pursuing a sample size of 20 specimens 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). In total, 266 stomachs (47 groupers/hinds, 44 Black Sea Bass, 11 Squirrelfish, 27 White Grunt, 97 Tomtate, 3 Blueline Tilefish, and 37 Scup) were collected, 255 of which contained prey items.

Stomachs were excised from the posterior end of the esophagus (near the mouth) to the pyloric sphincter, and preserved in 10% Formalin. After 2 weeks, stomachs were rinsed with fresh water and contents of individual guts were removed and placed into separate containers and submerged in 70% ETOH. All contents from each stomach were then sorted, counted, measured (if whole), and weighed. Prey items were identified to the lowest possible taxon. For each species, to quantify feeding habits, the relative contribution of food items to the total diet will be determined 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 prey composition by predator size class, depth zone, latitude and between species).

During this reporting period, prey from 284 stomachs (including backlogged samples from previous reporting periods), were fully identified. Black Sea Bass diets consisted primarily of crabs and juvenile fishes. White Grunt consumed a variety of hard-bottom associated crustaceans including stomatopods, snapping shrimp (Alpheidae), and brachyuran crabs. Tomtate, on the other hand, consumed more soft-bottom associated prey such as polychaetes and bivalves.

In January 2014, a report on Red Snapper diet data was presented at the annual meeting for the American Fisheries Society Southern Division. Diet manuscripts are currently in preparation for Red Snapper, Gray Triggerfish and Red Porgy, and Squirrelfish. The diet studies laboratory provided research support for 1 master's degree thesis, and 1 undergraduate research project during the reporting period.

Assessment of Adult Red Drum Populations on the Southeast Atlantic Coast

In 2008, SEAMAP-SA initiated support for a project to sample the adult Red Drum population from North Carolina to Florida to develop a better understanding of abundance, distribution and age composition of the stock. These surveys contribute to the understanding of adult Red Drum populations along the southeastern Atlantic coast by expanding the currently available data, thereby allowing for more effective and responsible management of the stock. Information derived from these surveys can also be used for coastal shark assessments in the South Atlantic.

The primary objectives of the survey are to conduct fishery independent longline sampling on adult Red Drum to: develop information on catch per unit effort (CPUE); collect biological information

(size, sex etc.) and samples (otoliths, gonads, muscle, fin clips, etc.) from sub-samples of the Red Drum catch in order to determine size at age, recruitment to the spawning population, mercury contamination, and genetic composition of the stock; tag adult Red Drum for the collection of migratory and stock identification data; disseminate accomplishments and results to the ASMFC and NMFS for inclusion in stock assessments; and produce an annual summary report. Secondary objectives are to tag and measure small coastal and large coastal sharks caught incidentally to Red Drum sampling, for inclusion in the COASTSPAN (Cooperative Atlantic States Shark Pupping and Nursery Survey) database and to respond to external requests for samples and/or data.

South Carolina – During the 2013/2014 sampling season, 419 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 2013 sample season only the later part of time period II and the whole of time period III are considered (October through December); in 2013 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, 647 Red Drum were caught. Winyah Bay yielded the highest numbers of Red Drum (240) followed by Charleston Harbor (161), Saint Helena Sound (123), and Port Royal Sound (123). Four hundred and eighty-five Red Drum were tagged and released, twenty were recaptured, nine were given to the mariculture project at SCDNR for broodstock, and one hundred and twenty-two were sacrificed for age/growth and reproductive investigations, and eleven Red Drum were released without tags (fish that are too stressed are released without tags to reduce mortality). Fin clips were taken from all individuals for genetic investigations (determination of stocked fish, recaptured fish that have lost external and PIT tags). 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, 337 sharks were tagged and released.

North Carolina – For 2014, North Carolina conducted sampling in Pamlico Sound from July through September. 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 September, 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=16 sets), August (n=31 sets), and September (n=24 sets) and yielded 321 Red Drum (43, 173, and 105 respectively). Red Drum captured ranged in size from 31 to 48 inches fork length. Fifty-six Red Drum were sacrificed to determine age composition and for other biological investigations. Two-hundred fifty-five fish were tagged and released to track migration, stock ID and growth rates. Sampling during this period resulted in three 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 2013 and the spring and summer months (May - September) of 2014. A total of 221 longline sets were deployed over the two seasons with 91 sets made during fall 2013 and 130 sets during the spring and summer of 2014. A total of 51

adult Red Drum were captured; 51 during fall 2013, and 25 during the spring/summer of 2014. Red Drum ranged in size from 522 to 1,091 mm center length. All Red Drum were tagged with PIT tags prior to release. Three Kemp's ridley turtles and 1 loggerhead sea turtle were caught during the study period. All turtles were released in excellent condition with all hooks removed.

SEAMAP-Caribbean

Administrative – Virgin Islands

Several staff changes occurred in both districts. One Fisheries Biologist III was hired in St. Croix. One Fisheries Biologist II resigned in February, and the Grants Manager and an Administrative Assistant resigned midway through the year. Those positions have not yet been filled, and the loss of critical staff greatly reduced research capacity and institutional knowledge.

Acoustic Hydrophones

Data from three bottom acoustic receiver data-loggers from the historic Nassau grouper site and Grammanik Bank in St. Thomas have been downloaded. The original SIM cards were sent to Puerto Rico for data processing and analysis. The hydrophones are expected to be redeployed at the Grammanik and Hind Banks.

Lobster – Virgin Islands

Artificial habitat sites were re-established in both districts. The St. Thomas district contains two artificial habitat sites, one deep (20 m) and one shallow (10 m) each containing ten artificial shelters. The St. Croix district contains one shallow artificial habitat site (less than 10 m) with nine artificial shelters. All three sites were surveyed monthly by divers from January through October 2014. Surveys will continue until January 2015. To date, the surveys have found no lobster in the shelters; although a variety of juvenile reef fish have been present each month. It is possible that a combination of inappropriate block size and poor quality habitat contributed to the recruitment failure. An attempt was made to deploy smaller shelter structures, but construction materials could not be obtained in a timely manner. Use of subsurface collectors for pueruli is being planned to allow monitoring of post-larval supply to the sites.

Reef Fish Hook and Line Surveys – Virgin Islands Staff in the St. Thomas District were trained in the handlining technique specified in the proposal. Staff in the St. Croix office still require training. Loss of staff and the inability to acquire fuel for the research vessels until late in the year further delayed the study. Equipment and supplies have been obtained in support of this study, and it is now anticipated that it will commence in January 2015.

Reef Fish Survey – Puerto Rico

During the sampling period of April 7 to August 18, 2014, a total of 21 stations from off the west coast of Puerto Rico were sampled at least once. Hook and line sampling yielded 65 species representing 18 families weighing over 249 kg. The categories of fish that dominated the catch in terms of number were the snappers, followed by porgies and groupers. The snappers were represented by eight species making up 24.2% of total catch, of which two species represented 22% in terms of number.

For the sampling period of February 2, 2014 to September 10, 2014, a total of 17 stations were sampled, off the east coast. A total of 12 species representing 5 families weighing 36 kg were collected. Snappers constituted 55.2% of total catch by number.

Snappers and groupers which are considered the most valuable commercial species group represented 95.8% of the total catch.

Species composition by sampled stations varied according to two factors: area and depth. Species composition collected off the west coast comprised snappers (36.4%), followed by the porgies (9.0%), groupers (23.9%), jacks (17.7%), grunts (3.9%), squirrel fishes (5.4%), and representation of seven families in terms of number of individuals caught. In terms of weight the species composition was led by snappers (29.7%), followed by the jacks (24.5%), the groupers (21.8%), porgies (6.4%), the squirrel fishes (2.3%), the grunts (2.3%), the triggerfishes (1.9%) and the other category of fish (10.4%).

The east coast species composition comprised snappers (55.2%), followed by groupers (39.9%), jacks (1.6%), squirrel fishes (1.8%), porgies (2.2%), in terms of number. The three dominant groups were the same in terms of weight.

Queen Conch – Puerto Rico

Puerto Rico's conch fishery is currently overfished, but recovering from severe overfishing and loss of habitat in the 1980s. In the mid-1980s one boat trip could average 160 pounds of meat, while the same trip in the early 2000s averaged 72 pounds. Catch was based on juveniles and fishing mortality was greater than natural mortality. A general trend of decreasing catch has been observed since the early 1980s. To try and combat this decreasing trend, the Puerto Rico Department of Natural and Environmental Resources (DNER) through the Southeast Area Monitoring and Assessment Program - Caribbean (SEAMAP-C) has been funding periodic visual surveys to collect data that will help with management. Prior to the standardized SEAMAP surveys, a survey was conducted in 1987 and was restricted to 81 sites on the southwest corner of the island. Average density was 8.11/ha. In 1997, the survey was expanded to cover both the east (29 sites) and west (60 sites) coasts, and average densities were 7.49/ha and 8.49/ha, respectively. Sixty sites were again surveyed on the west coast in 2001, and density had increased to 14.42/ha. The 2006 survey added the south coast (14 sites) to the sampling regime and resampled the west (46 sites) and east (40 sites). No significant temporal changes were detected using the statistics available at the time.

The low densities of conch observed repeatedly throughout the course of these surveys, combined with studies that suggest that a minimum density of 50/ha is needed for reproduction, may suggest that other sources of larvae are sustaining the queen conch population. In 2012, a survey of commercially important species at three mesophotic reefs off the west coast of Puerto Rico (125-145 feet depth) was completed. At one of these sites in particular, Abrir La Sierra, large numbers of adult conch (672 individuals) were observed. This high density of reproductively active conch may be contributing larvae for settlement further inshore.

The purpose of this study was to resurvey the shallow-water conch population off the west coast of Puerto Rico, which supports both the primary fishing grounds and the longest time series of past surveys. Goals were to generate density estimates that could be used (1) to assess trends and current status and (2) to address specific management question. The latter include comparing the shallow and deep water spawning stocks and comparing the status of the stocks within the EEZ (offshore), where fishing is prohibited, to those in local waters, which are open to fishing. Additionally, unlike past surveys, data analyses will employ Generalized Linear Models to generate more robust statistical comparisons.

Data Analysis – total area surveyed was calculated by multiplying the length of transect by 4m width and then doubling the area (two transects per site) and finally summing over all 46 sites (92 transects). Densities were calculated by dividing number of conch observed at each site by the area surveyed. Comparisons of densities of both adults and juveniles between years (1997, 2001, 2006 and 2013) were made by modelling densities as a function of management regime (territorial or federal), depth, habitat and year using a log transformed negative binomial distribution. Analyses were conducted using the generalized linear model function (GLIMMIX) of SAS. This distribution was chosen over a Poisson because it is better equipped to handle high variability. No spatial correlation term was included in the model because the inclusion of the depth and habitat terms explained most of the variability. Including the management regime in the model helped to elucidate the effectiveness of a more than 10 year closure of the fishing grounds in the federal area. Trends regarding age structure and size frequency were also described. The spawning stock for the west coast was calculated using only the older age classes (adult, old adult and very old adult) densities multiplied by estimates of suitable habitat area on the western platform based on the previously digitized strata. This spawning stock was then compared to the mesophotic population estimate at Abrir La Sierra to get an idea of the potential contribution of the mesophotic population relative to the shallow water stock.

Results and Discussion – Forty-six sites were sampled during the course of the 2013 survey. Total area surveyed was 37.45 ha, with transect areas ranging from 0.3 ha at site 5 to 3.97 ha at site 11. Differences in the amount of area covered are based on a variety of factors including but not limited to depth and current. Average area per transect was 0.814 ha. Number of conch observed was 194 juveniles and 186 adults, for a total of 380 conchs. This does not include site 6, where 1,399 juveniles less than 10 cm shell length were observed. This site was not included in subsequent analyses due to statistical distortion effects. Counts were separated by age class, for each station, as well as the calculated juvenile, adult and total densities. A general representation of size frequency for all age classes was obtained

The first question addressed temporal differences in the total, adult only or juvenile only densities as factors of depth and habitat. Results of these analyses were summarized by modelling density as a function of the following effects: year, depth and habitat. All significant results are represented at the p=0.05 level. There was a lower density of total (adult+juvenile) conch in 1997 (-0.783) compared to 2006 or 2013. There was a lower density of total conch in the mud habitat (-1.4726). There was also a lower density of adult conch in 1997 (-1.0379) compared to 2006 and 2013 and again a lower density of adult conch in the mud habitat (-2.3756). With the juveniles, there were no significant changes in density temporally, but habitat was a much greater factor in determining density distribution. Hard bottom (-1.7592), reef (-1.3177) and mud (-1.405) all had significantly lower densities of juvenile conch, while gorgonians had significantly higher densities of juveniles (1.0776).

Preliminary conclusions regarding length frequency and age structure between the 1997 survey and the latest show the following: (1) the increase in density seen between 1997 and the later years represents a more than a twofold increase (8.49/ha overall in 1997 versus 14.42-22.4/ha overall in 2013 and 2006, respectively). This suggests that management efforts (closed areas, closed seasons, daily quota, size limits) have had some positive effect. (2) The appearance of the 16-20 cm size class adults in the later surveys suggests that the minimum shell length regulation is also having some effect. Those individuals that are below the threshold are not fished, and are able to make it to adult stages.

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

The long running Cooperative Winter Tagging Cruise (Cruise) conducted only hook-and-line based striped bass tagging during 2014 due to a delay in funding notification caused in part by the government shutdown. Funding from a North Carolina Coastal Recreational Fishing License (CRFL) grant was available for matching a Saltonstall-Kennedy (S-K) grant which had been submitted; however notification that the S-K grant was awarded did not arrive until March 28, too late to conduct trawling. Partners did conduct hook-and-line striped bass tagging operations using the CRFL funds and with help of state and federal partners and volunteer anglers. 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 Service (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 Cruise provides important monitoring data for the striped bass stock assessment, as well as data on other ASMFC species. Since 2011, 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 fishing vessel used for the ten day-long trips conducted this year was the privately-owned FV Midnight Sun. Tagging operations in 2014 resulted in a total of 921 striped bass tagged and released, including one that weighed in at 74 pounds. All fish this year were located in the EEZ off Virginia. None were captured and tagged in waters off North Carolina. This number was below last year's total but considerably above the two prior years.

Cruise partners continue working together to secure long-term funding to maintain tagging using a research vessel with traditional trawl gear, and hook-and-line. Use of the trawl 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. The successful S-K proposal will provide funding for the project during 2015 and 2016. A new CRFL proposal has been submitted to request matching funding to the S-K grant for 2016. Discussions have been initiated with ASMFC and other partners regarding future sources of funding for 2017 and beyond.

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 1982-2013 have been entered into the system and data from 2014 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 2014:

- 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 2014 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. Weekly plots of station locations and catch rates of shrimp and dominant finfish species were prepared, edited, and processed by GSMFC for distribution to management agencies, fishermen, processors and researchers. SEAMAP real-time data plots were produced during the 2014 Summer Shrimp/Groundfish Survey. Seven weekly mailings were produced and distributed to approximately 125 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, and dissemination of fishery independent data and information for all ongoing SEAMAP-SA surveys and special studies. A major accomplishment this year was the fact that the SEAMAP-SA database is now publically available for data exploration and extraction via the ASMFC maintained www.seamap.org site and the SCDNR maintained based Oracle relational database (www.dnr.sc.gov/seamap). The SEAMAP website also includes general links, information, and documentation (surveys, reports, metadata, and special studies) for SEAMAP-SA programs. 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 the 2013 annual meeting, the Data Management Work Group worked primarily to refine the web design and data extraction queries. To assist in this effort the group worked with the SCDNR Information Technology Department to develop an Oracle database with a web accessible application. With the expertise of a contracted Oracle programmer, SCDNR continued the development of the Oracle database and web interface system.

Southeast Regional Taxonomic Center (SERTC)

During 2014, a 167-page, comprehensive prey identification guide pertaining to the SEAMAP-SA Coastal Survey portion of the diet study was completed. The purpose of the guide was to assist Coastal Survey diet study personnel with the taxonomic identification of stomach contents from six fish predator species: Weakfish (*Cynoscion regalis*), Atlantic Croaker (*Micropogonias undulatus*), Southern Kingfish (*Menticirrhus americanus*), Bluefish (*Pomatomus saltatrix*), King Mackerel (*Scomberomorus cavalla*), and Spanish Mackerel (*Scomberomorus maculatus*). The guide is organized into two sections: 1) prey frequency of occurrence tables for each predator fish species and 2) a prey identification section organized by taxa, with species lists for each prey category, detailed species descriptions, photos of partially digested voucher specimens and close-ups of diagnostic characters. As part of this effort, SERTC taxonomists verified and photographed all voucher specimens collected by the SEAMAP-SA Coastal Survey diet study. The guide is currently available as an internal document only and will eventually be made available to a wider audience on the SERTC website (pending permissions for the use of copyrighted material).

A second prey identification guide is currently being developed for the SEAMAP-SA Reef Fish diet study – the expected timeframe for completion is early 2015. This guide will be similar in format and content to the Coastal Survey guide, but will focus on a different set of prey items consumed by the following 16 reef fish predator species: Gray Triggerfish (*Balistes capriscus*), Black Sea Bass (*Centropristes striata*), Graysby (*Cephalopholis cruentata*), Coney (*Cephalopholis fulva*), Rock Hind (*Epinephelus adscensionis*), Speckled Hind (*Epinephelus drummondhayi*), Red Hind (*Epinephelus guttatus*), Red Grouper (*Epinephelus morio*), Snowy Grouper (*Epinephelus niveatus*), White Grunt (*Haemulon plumieri*), Squirrelfish (*Holocentrus adscensionis*), Red Snapper (*Lutjanus campechanus*), Gag Grouper (*Mycteroperca microlepis*), Scamp Grouper (*Mycteroperca phenax*), Red Porgy (*Pagrus pagrus*) and Vermillion Snapper (*Rhomboplites aurorubens*). Identifications of SEAMAP-SA's Reef Fish diet study voucher collection will be verified as part of this project. In addition to providing assistance to SEAMAP diet study personnel, SERTC provided taxonomic expertise, image loans, photographic assistance, and general information to members of the public and researchers both in and outside of the SCDNR.

SERTC's voucher collections (including the SEAMAP collection and general specimen collection) were expanded during the reporting period. In total, 18 species (comprising 10 fish and 8

invertebrate species) were catalogued into the database this year, with another 16 fish species and 3 invertebrate species accessioned and awaiting addition to the collection. Representative specimens from the ten catalogued fish species were also fin-clipped. These tissue samples were cataloged for future genetic analysis, with fin clips from another 16 species awaiting addition to the collection.

SERTC's taxonomic library and photo gallery were also expanded this year, with approximately 90 taxonomic references either added to Endnote or updated with electronic versions. Forty-eight new fish and invertebrate images, including 23 new images of SEAMAP fish and invertebrate specimens, were added to the photo gallery.

Staff continued to work with the SCDNR Education and Outreach Department and other formal and informal educators in order to promote increased distribution of SERTC-produced educational materials to local and regional schools. During FY2013-2014, approximately 750 posters and 65 copies of the Beachcomber's Guide to SC were distributed to regional schools, museums, and nature centers.

Program Documents

The following documents were published and distributed by the SEAMAP program in FY2014:

Ojeda, E., O. Hernández, E. García and F. Chaparro. 2014. SEAMAP-C sampling protocols (Revision), 2014. PRSGCP, University of Puerto Rico. 98pp.

Rester, J.K., S. Madsen, and E. Ojeda Serrano. 2014. Annual Report of the Southeast Area Monitoring and Assessment Program (SEAMAP), October 1, 2012 to September 30, 2013. Gulf States Marine Fisheries Commission, Atlantic States Marine Fisheries Commission, Puerto Rico Sea Grant College Program. No. 223, GSMFC, Ocean Springs, MS. 17pp.

Rester, J.K. 2014. SEAMAP Annual Report to the Technical Coordinating Committee. Gulf States Marine Fisheries Commission, No. 234, GSMFC, Ocean Springs, MS.

Richardson, J. and J. Boylan. 2014. SEAMAP-SA: Results of trawling efforts in the coastal habitat of the South Atlantic Bight, 2013. ASMFC, Washington, DC.

SEAMAP-SA Coastal Survey, Cruise Report, Fall 2013.

SEAMAP-SA Coastal Survey, Cruise Report, Spring 2014.

SEAMAP-SA Coastal Survey, Cruise Report, Summer 2014

PROPOSED SEAMAP ACTIVITIES, FY2015

Last year, total program allocations for all three SEAMAP components, Gulf, South Atlantic and Caribbean, was approximately \$4.48 million. At the July 2014 meeting, the SEAMAP components based their allocations for 2015 on level funding of \$4.48 million. Proposed FY2015 activities for all participants are shown in Table 2.

Table 2.**PROPOSED SEAMAP ACTIVITIES, FY2015**

	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
Bottom Longline Survey	X		X	X
Vertical Line Survey			X	X
Information Operations:				
Biological and Environmental Atlas		X		
FY2014 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:				
Lobster Juvenile Artificial Shelter Survey (VI)	X			
Lobster Juvenile Artificial Shelter Survey (PR)	X	X	X	X
Lobster Postlarvae Collector Survey (PR & VI)	X	X	X	X
Parrotfish Reproductive Cycle Survey (VI)	X	X	X	X
Yellowtail Snapper H&L Survey (PR & VI)	X	X	X	X
Deep Water Snapper H&L Survey (VI)	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

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