

ANNUAL REPORT

OF THE

SOUTHEAST AREA MONITORING

AND ASSESSMENT PROGRAM

(SEAMAP)

OCTOBER 1, 2007 - SEPTEMBER 30, 2006

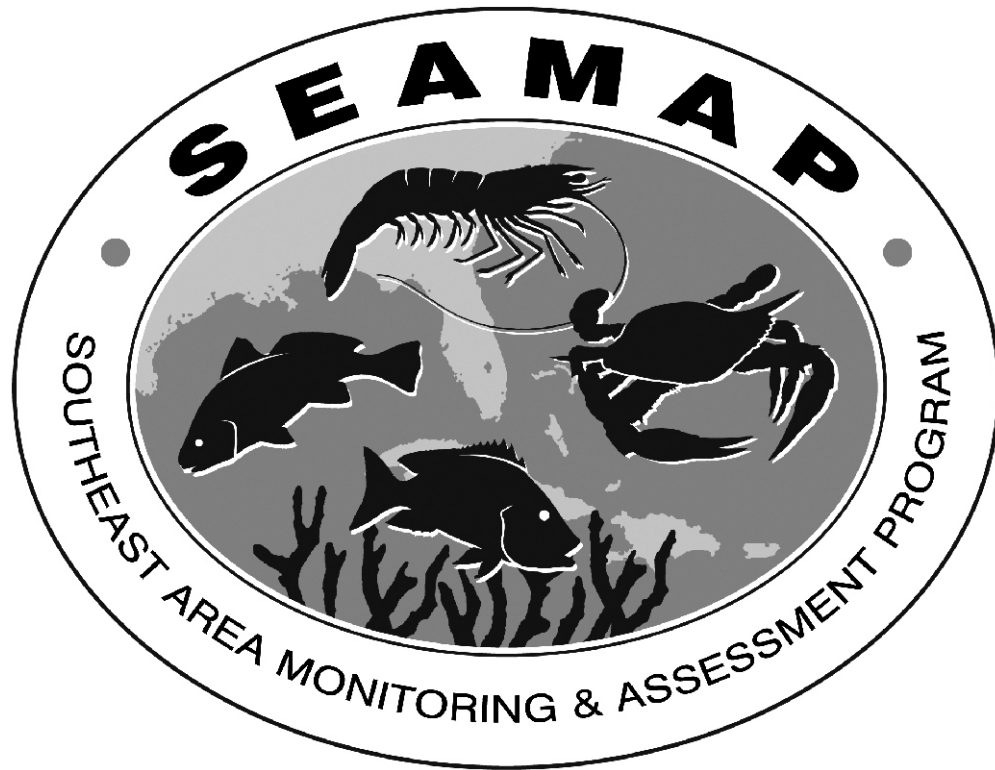
SEAMAP - Gulf of Mexico
Gulf States Marine Fisheries Commission

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 1985-2008. Funding allocations to participants for FY1985-FY2008 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 FY2008 and proposed activities for FY2009.

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 Archiving Center and SEAMAP Invertebrate Plankton Archiving Center (SIPAC).

SEAMAP-Gulf of Mexico

Major SEAMAP-Gulf Subcommittee meetings were held in October 2007 and March 2008 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 August 2008 to discuss respective program needs and priorities for FY2009. In addition to the Subcommittee meetings, several work groups met during the reporting period. The Data Management Work Group met October 9, 2007. The Longline Work Group met on April 21, 2008 while the Trawl Work Group met on April 22, 2008.

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 2008. 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.

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/COST/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 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

SEAMAP-South Atlantic

One committee meeting and one conference call were coordinated and documented in FY2008. 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 August 12-13, 2008 in Fort Myers, Florida. The meeting included participation by the work group leaders and coordinator. The Committee developed the SEAMAP-South Atlantic budget and research program priorities for FY2009. The Committee also reviewed progress by the Crustacean, Data Management, and Coastal Survey work groups and provided direction where necessary. Topics discussed included plans for the Bottom Mapping, Fish Habitat Characterization and Assessment Work

Group, which will be supporting efforts to collect information on Red Drum in the Southeast region, as well as snapper grouper fishes in conjunction with the Marine Resources Monitoring, Assessment, and Prediction (MARMAP) Program during FY09 and beyond.

SEAMAP-Caribbean

The SEAMAP-Caribbean Administrative and Working Group components held four meetings during FY 2008. They met November 16th in Río Piedras, Puerto Rico; February 1st in St. Thomas, Virgin Islands; May 16th in Río Piedras, Puerto Rico; and August 4th in St. Thomas, Virgin Islands. In addition, the Caribbean Chair, the respective component's program leaders, and the coordinator participated in the SEAMAP Joint Annual Meeting. Timely distribution of meeting memos, minutes and agendas to all SEAMAP-Caribbean Committee members were provided to coordinate alternating

meetings in Puerto Rico and the U.S. Virgin Islands (St. Thomas).

During the SEAMAP-Caribbean meetings, the committee overviewed and followed up on several topics. They reviewed the 2006 Conch Survey (first year of the multiyear proposal), discussed database management matters, discussed the collaboration with a MRAG/NMFS proposal in relation to the sampling expansion of the SEAMAP surveys, reviewed the 2007 spiny lobster survey (second year of the multiyear proposal), discussed cooperation with a spiny lobster recruitment study to be held in the Caribbean conducted by Old Dominion University, and to validate a hydrodynamic model. In addition, reef fish sampling protocol revisions were also discussed for new fish target species on new and expanding SEAMAP-C studies. A geographic information system (GIS) conch compilation study entitled "Continued GIS mapping and analysis of SEAMAP-C queen conch (*Strombus gigas*) surveys in Puerto Rico" was supervised by the coordinator. A student assistantship was given to a marine science graduate student to add very old conch data to this GIS compilation task.

RESOURCE SURVEYS

In FY2008, collection of resource survey information continued for the twenty-seventh 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's 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 7, 2007, from off Mobile, Alabama to the U.S.-Mexican border. A total of 311 trawl stations were completed 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 with bongo and/or neuston nets at sample sites occurring nearest to half-degree intervals of latitude/longitude. Thirty-three plankton stations were completed. 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 February 7 to March 17, 2008. Ichthyoplankton samples were collected at 171 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); sample the size fraction of fishes that are underrepresented in bongo and neuston samples using a juvenile (Methot) fish trawl; and measure extrusion of the smallest size fraction of fish larvae through the standard SEAMAP bongo net by collecting samples at selected locations with a bongo frame fitted with a 333 micron net on one side and a 202 micron mesh net on the other side.

Spring Plankton Survey

The SEAMAP Spring Plankton Survey took place from April 17 to May 29, 2008. Ichthyoplankton samples were collected at 157 stations. This was the twenty-seventh 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 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. Samples are routinely preserved in 5 to 10% formalin and later transferred after 48 hours to 95% ethanol for long term storage. During some surveys selected samples are preserved initially in 95% ethanol and later transferred to fresh ethanol. 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

A new SEAMAP longlining survey began in 2007 to monitor coastal shark populations in the near shore waters of the north central Gulf of Mexico. This nearshore survey will complement an existing long-term fisheries independent survey currently being conducted by NMFS, by targeting shark species within the shallow waters of the north central Gulf of Mexico. The objectives of the survey are to collect information on coastal shark abundances and distribution with a 1-mile longline and also to collect environmental data. During 2007, Mississippi sampled three stations in October. In 2008, the survey began monthly sampling in March that continued through October. Sixty stations were sampled by Mississippi from March through September.

Reeffish Survey

The primary purpose of this survey was to assess relative abundance and compute population estimates of reef fishes found on natural reef fish habitat in the Gulf of Mexico. Two types of gear were used to deploy video cameras: 1) a single-funnel fish trap (2.13 m long by 0.76 m square) with the camera mounted at a height of 25 cm above the bottom of the trap; or 2) a 4 camera array with 4 cameras mounted

orthogonal to each other at a height of 25 cm above the bottom. Both gears were baited with squid before deployment. The resultant video recordings (typically of one hour duration) were processed back at the laboratory where fishes were identified and counted independently by two tape readers. Final counts were entered into the SEAMAP reef fish database along with additional observations on habitat and fish activity. NMFS conducted reef fish sampling with fish traps and video cameras from April 17 to May 29, 2008 on the Oregon II and from June 4 to August 11, 2008 on the R/V Gandy. Approximately 220 stations were sampled on the Oregon II while 264 stations were sampled on the R/V Gandy.

Summer Shrimp/Groundfish Survey

The overall sampling strategy during the Summer Shrimp/Groundfish Survey was 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 May 31 to August 10, 2008. Florida, Alabama, Mississippi, Louisiana, Texas, and NMFS completed 401 trawl stations during the survey. In addition, NMFS, Mississippi, and Louisiana vessels collected ichthyoplankton data at 55 stations. This was the first year that Florida participated in the Summer Shrimp/Groundfish 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 50 fm.

Fall Plankton Survey

The Fall Plankton cruise took place from September 4-30, 2008. NMFS sampled 64 stations, Alabama sampled 9 stations, and Louisiana sampled 9 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 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 (0.950)1 mm mesh netting is towed at the surface with the frame half-submerged for 10 minutes. Samples are taken upon arrival on station regardless of time of day. At each station either a bongo and/or neuston tow are made depending on the specific survey. Samples are routinely preserved in 5 to 10% formalin and later transferred after 48 hours to 95% ethanol for long term storage. During some surveys selected samples are preserved initially in 95% ethanol and later transferred to fresh ethanol. 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).

Plankton and Environmental Data Surveys

As in previous years, plankton samples and environmental data were collected routinely during most SEAMAP trawling surveys. During the Summer Shrimp/Groundfish Survey, plankton tows were piggybacked on the NMFS and state vessels, sampling randomly generated trawl stations within the standard 30-minute SEAMAP grids.

Objectives of these piggybacked surveys were: 1) to collect plankton samples throughout the survey area; and 2) to collect associated hydrographic and environmental data at each plankton station. Additionally, environmental data (salinity, temperature, and oxygen from surface, mid-depth and bottom waters) were collected during the shrimp/groundfish surveys. Wind direction, wind speed and wave height were taken at all trawl stations.

Samples from the right side of the bongo nets and neuston samples were shipped to the NMFS-Pascagoula Laboratory for shipment to the Polish Sorting and Identification Center, where they will be sorted to the family level (both ichthyoplankton and selected crustacean and molluscan species). The left bongo sample from each station is retained as a back up in the event of damage or loss of the specimens and maintained at the SIPAC. Preservation of

plankton samples was in buffered formalin prior to transfer to ethanol.

SEAMAP-South Atlantic

Coastal Survey

The largest component of SEAMAP-South Atlantic survey research in FY2008 was the continuing Shallow Water Trawl Survey conducted by the South Carolina Department of Natural Resources (SCDNR). The overall goal of this survey is to obtain 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 target species.

The objectives of the survey are to collect data on size, abundance, distribution, and seasonality of target finfish and decapod crustaceans; record species composition, biomass, and abundance to assess latitudinal and seasonal fluctuations; and collect data on size, sex, and gonadal condition of white, pink, and brown shrimp and attempt to locate spawning grounds.

Three multi-legged seasonal cruises were conducted between Cape Hatteras, North Carolina, and Cape Canaveral, Florida, during FY2008: Fall 2007; Spring 2008; and Summer 2008. Inshore strata (4.6 to 9.2m depths) were sampled during each cruise. All samples were collected during daylight hours to maximize the opportunities for collecting juvenile mackerels, which are found more frequently during the day.

The fall 2007 cruise completed the eighteenth full year of standardized sampling under a stratified random survey design. Sampling was conducted between October 9-November 11 and 102 inshore stations allocated to 24 shallow coastal strata in the South Atlantic Bight were sampled. A total of 130 species or genera were identified in fall trawls.

Chloroscombrus chrysurus, the Atlantic bumper, was the most abundant species, constituting 81% of total abundance, followed by the white shrimp, *Litopenaeus setiferus* (4%), and Atlantic croaker, *Micropogonias undulatus* (3%). Abundance of individuals collected (n=405,362 individuals, mean/tow=3,974 individuals) in fall 2007 increased from catches taken in the previous two years. This record abundance was primarily due to very large catches of Atlantic bumper in waters off Florida. The lowest regional abundance was observed in Long Bay. Miscellaneous invertebrate biomass (n=6,682 kg, mean/tow=65.5 kg) also increased slightly in fall 2007. The cannonball jelly, *Stomolophus meleagris*, constituted approximately 52% of miscellaneous invertebrate biomass.

The spring cruise for the SEAMAP-South Atlantic Shallow Water Trawl Survey began on April 17 and was completed on May 8, 2008. A total of 102 stations were sampled in the 24 shallow coastal strata in the South Atlantic Bight. A total of 129 species or genera were identified in spring trawls. Atlantic croaker was the most abundant species, constituting 25% of total abundance, followed by the spot (16%), northern searobin, *Prionotus carolinus* (6%); the white shrimp (5%), the butterflyfish, *Peprilus triacanthus*, 5%, and Southern kingfish, *Menticirrhus americanus* (5%). Abundance of individuals collected (n=107,586 individuals, mean/tow=1,055 individuals) in spring 2008 decreased slightly from the level of spring abundance observed in 2007. Miscellaneous invertebrate biomass (n=11,145 kg, mean/tow=109.3 kg) increased in 2008. This increase can be attributed to a larger catch of the cannonball jelly, *Stomolophus meleagris*, which constituted more than 94% of miscellaneous invertebrate biomass.

The summer cruise for the SEAMAP-South Atlantic Shallow Water Trawl Survey began on July 15 and was completed on August 5, 2008. A total of 102 stations were sampled in the 24 shallow coastal strata in the South Atlantic Bight. A total of 123 species or genera were identified in summer trawls. The Atlantic bumper was the most abundant species, constituting 35% of total abundance, followed by the Atlantic croaker (18%), spot (8%), the Atlantic moonfish, *Selene setapinnis* (8%), and the banded drum, *Larimus fasciatus* (4%). Abundance of individuals collected (n=185,112 individuals, mean/tow=1,815 individuals) in summer 2008 decreased from catches taken in the previous two years. Abundance was greatest in the Raleigh and Onslow Bays, whereas the lowest regional abundance was observed in South Carolina. Miscellaneous invertebrate biomass (n=5,802 kg, mean/tow= 56.9

kg) also decreased slightly in summer 2008. The cannonball jelly constituted approximately 29% of miscellaneous invertebrate biomass. Toward the end of the summer cruise, an increase in “hot” jellies, including *Drymonema*, was noted. Over 20% of all miscellaneous invertebrate biomass was taken in a single tow which comprised these jellies.

Data from the spring, summer, and fall FY2008 cruises have been added to the SEAMAP Data Management System (DMS). For additional cruise information, please see the individual cruise reports available at www.asmfc.org under the Research & Statistics section of the website.

Pamlico Sound Survey

During FY2008, the North Carolina Division of Marine Fisheries (NCDMF) continued the ongoing Pamlico Sound Survey. Cruises sampled 54 stations each in June and September of 2008. This seasonal trawl survey is designed to provide a long-term fishery-independent database on the distribution, relative abundance, and size composition of target species of estuarine fish and decapod crustaceans for the waters of Pamlico Sound. The data are processed by NCDMF and are made available to the SEAMAP DMS.

Sixty-eight species of finfish and invertebrates were captured during the June 9-20, 2008 cruise. The top five species that are considered economically important include spot, Atlantic croaker, Atlantic menhaden, pink shrimp, and blue crab, *Callinectes sapidus*. Sixty-nine species of finfish and invertebrates were captured during the September 8-19 cruise. The top five species were spot, Atlantic croaker, pinfish, Atlantic thread herring, and Atlantic menhaden. Of particular note was the take of only 140 blue crabs during the cruise (317 taken in 2007).

Bottom Mapping Project

In 2001, the Southeast Area Monitoring and Assessment Program (SEAMAP) and its Bottom Mapping Workgroup (BMWG) identified deepwater resources as a priority for mapping. The main objective of the Deepwater Bottom Mapping Project was to synthesize data on habitat distributions for water depths between 200 and 2000 m within the U.S. Exclusive Economic Zone (EEZ) extending from just south of the Virginia/North Carolina border to the Florida Keys.

From FY2005 through FY2007, the Florida Fish and Wildlife Research Institute (FWRI), South Carolina

Department of Natural Resources, University of North Carolina – Wilmington, and Harbor Branch Oceanographic Institute collaborated to create a deepwater bottom habitat GIS. The methodology to develop the GIS data for this project followed the SEAMAP BMWG deepwater habitat protocol and is compatible with the GIS data originally built for the shelf project (Distribution of Bottom Habitats on the Continental Shelf from North Carolina through the Florida Keys).

In FY2008, FWRI refined the Deepwater Bottom Habitat Distribution: South Atlantic Bight CD product. The CD provides an HTML interface for users to browse project specifics and GIS data. HTML pages were created for the project overview, relevant documents, cooperating partners, data sources, and map products. The CD also includes Federal Geographic Data Committee (FGDC) metadata records for each GIS data layer created for this project.

The deepwater GIS will prove to be critical for regional management decisions related to: identification, description, and conservation of unique habitats, including deep-water coral communities and Essential Fish Habitat; designation of Marine Protected Areas; recovery of over-exploited fisheries; locating appropriate cable routes; and exploration for mineral and hydrocarbon resources. As such, a broad user group is anticipated including, but not limited to, state natural resource and commerce agencies, federal agencies, university scientists, and private industry.

Fish Habitat Characterization and Assessment

In the summer of 2008, SEAMAP-SA received funds to be able to support their proposal to complement and expand MARMAP sampling to address high priority needs for over-fished species in the snapper-grouper complex. The primary objective is to enhance the fishery-independent reef fish data collected by MARMAP by increasing sampling in underrepresented regions of the sampled area. The effort includes a plan to develop a phased in SEAMAP sampling protocol for a nearshore ocean/larval/sub-adult/adult finfish survey associated with live/hard bottom habitat from Cape Hatteras, North Carolina to Sebastian Inlet, Florida to complement offshore sampling conducted through the MARMAP survey. In addition, additional expansion of offshore site sampling through SEAMAP will result in more complete coverage and address identified shortfalls of the MARMAP sampling regime.

Sampling will be conducted seasonally. Estuarine ingress sampling will occur during late winter through early summer (March-June). The MARMAP reef fish survey, during which new inshore and deepwater stations will be investigated, occurs during summer (May-September). If sea days remain to be used after the summer, additional nearshore and deepwater reconnaissance will take place during fall (October-November), however any catch data obtained during this period will not be used for indices of abundance. The area to be sampled is between Cape Hatteras, North Carolina (35° 13'N) and Fort Pierce, Florida (27° 30'N). Sampling will be conducted during daylight hours. Reef fish ingress sampling will utilize Witham collectors anchored in tidal creeks close to inlets. Each site will be monitored two to three times per week, and all reef fish post larvae will be counted and identified to species. A subsample of larvae will be kept in 95% ethanol for future aging and genetic studies. Nearshore site identification and sampling will focus on hard bottom areas, which will be the only areas providing adult reef fish habitat, and may be the predominant juvenile habitat as well. Sites to be investigated will be identified from a variety of sources. Sampling effort in deeper waters off North Carolina and central and south Florida will similarly identify and sample habitats supporting reef species and reef associated species. Site identification will focus on live bottom areas, shelf break habitat and deepwater reefs, and will be identified from a variety of sources. Sampling will be conducted using chevron traps and vertical long-lines following standard MARMAP protocol.

Following any collections, hydrographic and meteorological data (air and water temperature, salinity, wind speed and direction, wave height, and barometric pressure) will be recorded. Water temperature and salinity will be measured and recorded with a SEABIRD electronic CTD. Abundance, biomass, and length-frequency data will be recorded on a computer utilizing electronic measuring boards, and specimens identified for life history work up will be kept on ice for later processing.

South Carolina MARMAP personnel will prepare cruise, interim and annual reports for the SEAMAP Committee to provide progress information. The annual report will contain data reflecting the identification of new sampling sites, and the estuarine ingress of reef fishes, and initial results on gut content analyses. The R/V Palmetto will be used as the primary sampling platform. The R/V Palmetto has been a platform of opportunity since the 1988 MARMAP sampling season and all scientific

personnel are familiar with all sampling procedures pertaining to this vessel. In addition, vessel personnel are intimately familiar with the MARMAP mission and procedures.

In this reporting period logistical preparations were made for the 2009 estuarine ingress sampling period. Construction of 70 Witham traps was completed and construction is ongoing. A number of the 2009 sampling stations were identified. It is anticipated that the 2009 sampling will primarily occur in South Carolina, but may include southern North Carolina and northern Georgia. In the following years the sampling effort will gradually extend further north and south to accomplish regional sampling. Researchers are currently working on establishing collaborations with agencies and organizations in the region, which are essential in the successful completion of this aspect of the study.

During the 2008 sampling season (which includes October) eight sea days were completed to identify additional natural reef habitat. The low number of sea days was due to the late availability of funds (July 28, 2008) and adverse weather conditions, including several named storms, in the later part of the sampling season. Several shallow water natural reef areas off of North Carolina, Florida, and Georgia, that were not part of the MARMAP database, were identified.

Researchers collected stomach contents of snowy grouper, gray triggerfish, white grunt, and several other species for the diet studies. This time consuming processing and analysis is ongoing. Also, they are experimenting with attaching cameras to their traps to be able to develop additional indices based on the pictures for those species that do not enter the traps, possibly gag and red snapper.

Assessment of Adult Red Drum Populations on the Southeast Atlantic Coast

The increase in funds to SEAMAP-SA activities in 2008 have also allowed for initiation of 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. These surveys also provide information that can be used for coastal shark assessments in the South Atlantic.

The primary objectives of the survey will be 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 will be 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 Popping and Nursery Survey) database and to respond to external requests for samples and/or data.

SEAMAP-Caribbean

In FY2008, SEAMAP-Caribbean supported a variety of activities in the U.S. Virgin Islands (USVI) and Puerto Rico. The Virgin Islands had a number of key administrative and fisheries staff changes during the reporting period. A new administration for the Virgin Islands was inaugurated in January 2007. Dr. David Olsen, a former researcher and Division of Fish and Wildlife Director in the early 1980's, was appointed as the new Director by Governor John deJongh. Filling fisheries personnel vacancies was established as a top priority. The adoption of a new fiscal system, in combination with a new administration, created delays in activating grants.

Queen Conch Survey – Virgin Islands

The SEAMAP conch surveys, scheduled to end by December 31, 2007, was extended through October 2008 to allow priority for the completion of the 2004-2005 trap study. The conch survey is expected to be completed during the 2008 closed season from June 1 to October 31. Spare batteries for the underwater scooters were requested and received from the SEAMAP-Caribbean Program Coordinator.

Trap Survey – Virgin Islands

On St. Thomas/St. John, twenty subquadrats were sampled from June 23 to October 23, 2007 totaling 112.5 hours for traps and 38.3 hours of line fishing. Of the 559 fish caught, 72.6% were caught by handline and 27.3% by trap. Handline catch represented 83.5% by weight (205 kg) and trap catch represented 16.4% by weight (16 kg). Twenty-five species of fish from 12 families were caught by handline and 24 species of fish from 12 families were

caught by trap. The trap average CPUE was 0.6fish/trip/trap and 0.2kg/trip/trap. The hook average/trip was 2.3 fish/trip/hook and 0.9 kg/trip/hook.

On St. Croix, eight subquadrats were sampled from November 18, 2007 to February 26, 2008, totaling 50.6 hours for traps and 27.5 hours of line fishing. Of the 850 fish caught, 70.8% were caught by handline and 29.1% by trap. Handline catch represented 77.7% by weight (286 lbs) and trap catch represented 22.2% by weight (82 lbs). Eighteen species of fish from 12 families were caught by handline and 22 species of fish from 12 families were caught by trap. The trap average CPUE was 2.6 fish/trip/trap and 0.41kg/trip/trap. The hook average/trip was 8.4 fish/trip/hook and 1.82kg/trip/hook.

In both island groups, more than twice the fish were caught by handline than by trap. More fish were caught in patch reef and hard bottom habitats than in sand, seagrass or rubble habitats. More fish were caught in St. Croix by both trap and handline methods than in St. Thomas/St. John; however, the fish caught in St. Croix were smaller. The trap and handline catch from both districts were dominated by similar species. Coney dominated the trap catch in St. Croix and St. Thomas/St. John. Differences in species and abundance of the trap catch were apparent, related to differences in habitat type and water depth on the respective platforms. Similar differences were evident in the handline catch, dominated in St. Croix by coney, sand tilefish and red hind and in St. Thomas/St. John by red hind, coney and yellowtail snapper. A completion report on the trap survey was submitted in April 2008.

Supplemental Drift vs. Anchored Line Fishing – Virgin Islands

Historically, St. Croix and Puerto Rico have conducted drift hook and line fishing during the reef fish trapping project while St. Thomas/St. John conducted anchored fishing. SEAMAP supplemental funds were obtained to determine an index between drift and anchored hook and line fishing so that line fishing results between island groups could be compared.

Five trips were made drift fishing (25.5 hours) and five trips were made anchor fishing (24.0 hours) in the Supplemental Line Study, resulting in a total catch of 243 fish. Anchor fishing accounted for 51.4% of the fish (53.6% by weight) and drift fishing accounted for 48.5% of the fish (46.4% by weight).

CPUE for anchor fishing was 1.35 kg/hook/trip. The CPUE for drift fishing was 0.93kg/hook/trip. No significant difference in either the number or weight of fish caught while drift or anchor fishing was apparent. A completion report on the trap survey was submitted in April 2008.

Lobster Survey – Virgin Islands

Permit applications were prepared and submitted to establish lobster habitats, casitas, in St. Thomas and St. Croix territorial waters. Purchase requisitions were submitted and processed for the purchase of concrete blocks to construct lobster habitats. Preliminary site investigations were conducted to previously existing lobster habitat sites in St. Thomas and prospective habitat sites on St. Croix. GPS coordinates were obtained to identify research sites. Construction and monitoring of lobster habitats is scheduled to occur during the first quarter of the 2009 reporting period.

Reef Fish Survey – Virgin Islands

Due to administrative delays in entering the grant amendment funds on the new fiscal system, funds were not available to initiate the reef fish surveys during this funding period. The reef fish survey will be initiated during the 2009 reporting period.

Lobster Survey – Puerto Rico

The materials to build the “casitas” for the lobster artificial habitats were received in November 2007. Sixty “casitas” were deployed in December 2007. The “casitas” were grouped in six stations, each with ten casitas located 30 meters apart from each other. The “casitas” have been monitored monthly between the new and full moon. The monitoring will continue for a year and is expected to be finished by January 2009. Many octopus have been found inside the casitas. Since they are the major lobster predator, octopuses have been relocated from the structures when found. The lobsters are not removed from the structures. The largest lobster found was of 2.5” of carapace length. The total overall number of lobsters in the “casitas” has been increasing gradually during the monitoring timeframe, with a maximum in October of 84 lobsters.

On February 2008, the materials to build the lobster collectors were received. A total of 28 collectors were deployed in March 2008. These collectors were divided into seven stations. Each station contains two separate lines, with two collectors each. One collector is 5 feet from the bottom, and the other is at

30-40 feet of depth, in the water column. The collectors are sampled monthly to observe for lobster presence. During the sampling the collectors are taken out of the water, and replaced with a dry collector from the previous month. The lobsters found are counted according to the classification (development stage). All larvae are put in an aquarium to be released later. The development stages used to classify the lobsters are: transparent, pigmented, post-plerulii and juvenile. September and October have been the month with the highest lobster abundances of 151 and 147 respectively.

Reef Fish Survey- Puerto Rico

The Reef Fish Survey was delayed due to a delay in funding. Materials and contracts were obtained as soon as funds were available. Reef Fish Surveys will be conducted on the East and West coast simultaneously.

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 Cruise¹

The SEAMAP Cooperative Winter Offshore Tagging Cruise was conducted from January 13-25, 2008 aboard the NOAA R/V Oregon II. Personnel from U.S. Fish and Wildlife Service, North Carolina Division of Marine Fisheries, Atlantic States Marine Fisheries Commission, Atlantic Coastal Cooperative Statistics Program, East Carolina State University, U.S. Geological Survey, Florida Integrated Science Center, and Maryland Department of Natural Resources participated in the cruise. This was the twenty-first year of the cooperative project, initiated in 1988 at the request of SEAMAP-South Atlantic. Adult striped bass, *Morone saxatilis*, over-wintering in the area between False Cape, Virginia and Cape Lookout, North Carolina, were tagged for assessment of the population structure and exploitation rates. Other species tagged included Atlantic sturgeon, *Acipenser oxyrinchus*, and horseshoe crab, *Limulus polyphemus*. This year marked the first tagging of a thresher shark, a juvenile female. Summer flounder and three species of skates were measured and released.

¹ Data from the cruise is preliminary and therefore subject to revision.

During the course of the trip, 1,033 striped bass were tagged, as were 8 horseshoe crabs, and 73 Atlantic sturgeon. This year's cruise capture and tagging of migratory Atlantic striped bass was below the long-term average value for striped bass tagged (20-year average of 2,124). The 2008 cruise ranks fourteenth overall in numbers of striped bass tagged and released. During its 21-year history, the Cooperative Winter Tagging Cruises have collectively tagged 42,413 striped bass. A majority of the fish tagged this year were in the 28-inch and up (711 mm +) size classes. Summary reports for each annual cruise are available through the South Atlantic Fisheries Resources Office.

INFORMATION SERVICES

Information from the SEAMAP activities is provided to user groups through the program administration and three complementary systems: the SEAMAP Information System, SEAMAP Archiving Center and SIPAC. 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 Archiving Center and SIPAC; 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 1982-2007 have been entered into the system and data from 2008 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, although the highest priority is assigned to SEAMAP participants.

Requested SEAMAP data were used for a multitude of purposes in 2008:

- 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;
- 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;
- Compiling the 2008 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 2008 Summer Shrimp/Groundfish Survey. Seven weekly mailings were produced and distributed to approximately 200 interested individuals. These plots were also available through the SEAMAP web page.

SEAMAP Archiving Center

Larval fish and fish eggs are sorted to the lowest taxa level possible at the Polish Sorting and Identification Center of the Sea Fisheries Institute in Szczecin and Gdynia. The specimens are then returned to the SEAMAP Archiving Center (SAC) for archiving and loan to researchers. Over the last year, 26,136 lots of specimens were returned from the Polish Sorting and Identification Center and thirty-one thousand seven hundred and thirty (31,730) new lots have been added to the SEAMAP Access database. The specimens cataloged this year represent 18 orders, 126 families, 235 genera and 245 species.

The SEAMAP Archiving Center is managed in conjunction with Florida Fish and Wildlife Conservation Commission's (FWC) Fish and Wildlife Research Institute (FWRI) in St. Petersburg, Florida.

The SAC processes specimen loans, requests for associated plankton data, and requests for data clarification. Sixty-three requests have been accommodated this year to twenty different researchers at both the state and federal level.

SEAMAP Invertebrate Plankton Archiving Center

The SEAMAP Invertebrate Plankton Archiving Center (SIPAC) is in its twenty-fourth year of operation. Sara LeCroy at the USM/GCRL Museum currently serves as the SIPAC curator. The overall mission of the SIPAC, to archive and manage the large collection of plankton samples acquired during SEAMAP cruises and to obtain specimens and/or data on selected invertebrate larval stages from those samples, continued during the year, but the focus remained on the recovery of material damaged by Hurricane Katrina.

On August 29, 2005, Hurricane Katrina struck the Mississippi Gulf coast, severely damaging the building at the Gulf Coast Research Laboratory in which the SIPAC samples were housed. The room containing these samples was breached by the storm surge and many samples were washed out into the surrounding area. Although some samples were destroyed, many were not, and as a result of post-Katrina recovery efforts, approximately 5,000 of the 9,010 archived samples (55%) have been reclaimed and are in the process of being re-archived. An additional 4,000 (estimated) small vials containing partially or completely identified invertebrate plankton material have also been recovered. The recovered samples are currently housed within the GCRL Museum's Research Building Collection Room. At this time, the room that previously housed the samples has been completely cleared of debris and there are no remaining samples to be recovered in that area. The actual number of recovered samples mentioned above may change slightly in the future as some of the salvaged material may ultimately prove to be damaged beyond recovery when it is examined more closely.

In July 2007, additional NOAA SEAMAP funds were awarded to aid in the recovery of the SIPAC plankton collection over the next two years. As a result, a half-time technician has been hired specifically to work on rehabilitating and reorganizing the recovered plankton samples and integrating new samples from ongoing cruises into the collection. She is being assisted by a graduate student in the Department of Coastal Sciences for part of that time. Thus we are once again in a position to begin receiving

backlogged material from past SEAMAP plankton cruises, as well as new material from current cruises, and are making good progress on rehabilitating the recovered SIPAC material.

In an effort to keep the space required to house the SIPAC collection of unsorted plankton samples to a minimum, samples that have been in the collection for over 10 years and duplicate samples sorted and received from the Polish Sorting and Identification Center, are aliquoted to 1/4 their original volume and placed into 100 ml vials, as necessary. When possible, the remaining 3/4 aliquots are donated to educational institutions for use as teaching materials. If the remaining sample must be discarded, sample jars are cleaned and returned to NMFS-Pascagoula for reuse. To date, approximately 2,264 samples collected from 1982-1988 have been aliquoted and prepared for long-term storage; of these, at least 900 (40%) were recovered post-Katrina. Because there is very little free space in the area currently being used to store the samples, part of the post-Katrina recovery process will include further aliquoting of older samples to reduce the space required for storage.

The status of the recovered SIPAC collection as of September 30, 2008 is as follows: (1) All 5,000 unsorted bongo samples have been externally cleaned, re-alcoholized if immediately necessary and moved into temporary storage crates or shelves within the GCRL Museum collections rooms. Lids and labels were replaced on a number of these samples if they were determined to be damaged. (2) All 4,000 partially identified invertebrate vials have been externally cleaned, re-alcoholized and boxed for temporary storage. (3) A spreadsheet of recovered samples has been created and samples are currently being logged in. Approximately 1,875 samples have been entered thus far, approximately half (900) of which are aliquoted samples from the years 1982-1986. Samples are organized and grouped by year on the shelves as they are entered into the spreadsheet to permit a certain degree of accessibility. (4) A second spreadsheet of samples known to be destroyed has also been created, based on information obtained from recovered labels in broken sample jars or free in the debris field. Currently, 412 samples have been recorded as "known destroyed". Approximately 75 of these are aliquoted samples from the years 1982-1986. (5) A Motodo sample splitter and vials have been acquired to permit aliquoting of additional samples when shelf space for the recovered material becomes problematic. (6) New (post-Katrina) SEAMAP plankton samples are again being accepted and archived, with 960 additional samples added as of September 2008. This brings the current total

number of archived invertebrate plankton samples to 5,960, with 326 samples currently on loan.

Program Documents

The following documents were published and distributed by the SEAMAP program in FY2008:

Gulf States Marine Fisheries Commission. 2007. SEAMAP Marine Directory. Gulf States Marine Fisheries Commission, Ocean Springs. 1 p. + appendices.

Rester, J.K., M. Paine, and E. Ojeda Serrano. 2007. Annual Report of the Southeast Area Monitoring and Assessment Program (SEAMAP), October 1, 2006 to September 30, 2007. Gulf States Marine Fisheries Commission, Atlantic States Marine Fisheries Commission, Puerto Rico Sea Grant College Program. 10 pp.

Rester, J. K. 2008. SEAMAP Annual Report of the Technical Coordinating Committee, Gulf States Marine Fisheries Commission, October 1, 2007 - September 30, 2008. GSMFC, Ocean Springs, MS.

Rester, J.K., N. Sanders, Jr., and B. Pellegrin. 2008. SEAMAP Environmental and Biological Atlas of the Gulf of Mexico, 2002. Gulf States Marine Fisheries Commission, No. 156, GSMFC, Ocean Springs, MS.

PROPOSED SEAMAP ACTIVITIES, FY2009

Last year, total program allocations for all three SEAMAP components, Gulf, South Atlantic and Caribbean, was approximately \$4.387 million. At the August meeting, the SEAMAP components based their allocations for 2009 on level funding of \$4.387 million. Proposed FY2009 activities for all participants are shown in Table 2.

Table 2.

PROPOSED SEAMAP ACTIVITIES, FY2009				
	Fall	Winter	Spring	Summer
Gulf of Mexico Activities				
Resource Surveys:				
Spring Plankton Survey			X	
Reeffish Survey			X	X
Summer Shrimp/Groundfish Surveys				X
Fall Shrimp/Groundfish Surveys	X			
Fall Plankton Survey	X			
Plankton and Environmental Data Surveys			X	X
Inshore Shark Surveys	X		X	X
Florida Trawl Survey	X			X
Louisiana Inshore Survey	X	X	X	X
Information Operations:				
Biological and Environmental Atlas		X		
2009 Marine Directory			X	
FY2009 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
Joint Planning Activities	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
2008 South Atlantic Annual Report		X		
Data Analysis and Utilization	X	X	X	X
Program Administration	X	X	X	X
Joint Planning Activities	X	X	X	X
Caribbean Activities				
Lobster Recruitment Surveys	X	X	X	X
Reeffish Surveys			X	X
Information Operations:				
Coordination with Caribbean Countries				
Research Programs	X	X	X	X
Program Administration	X	X	X	X
Joint Planning Activities	X	X	X	X

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