

ANNUAL REPORT
OF THE
SOUTHEAST AREA MONITORING
AND ASSESSMENT PROGRAM
(SEAMAP)

OCTOBER 1, 1994 - SEPTEMBER 30, 1995

SEAMAP - Gulf of Mexico
Gulf States Marine Fisheries Commission

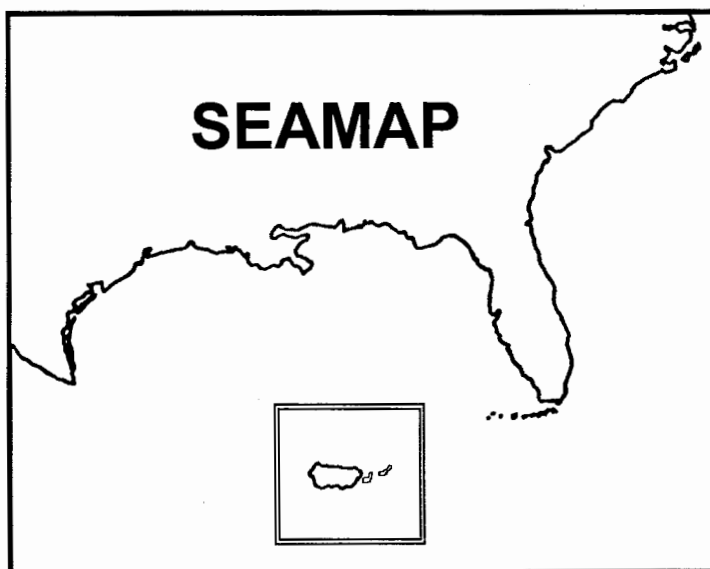
SEAMAP - South Atlantic
Atlantic States Marine Fisheries Commission

SEAMAP - Caribbean
Puerto Rico Department of Natural and Environmental Resources

DECEMBER 1995

ANNUAL REPORT
OF THE
SOUTHEAST AREA MONITORING
AND ASSESSMENT PROGRAM
(SEAMAP)

OCTOBER 1, 1994 - SEPTEMBER 30, 1995



Gulf States Marine Fisheries Commission

DECEMBER 1995

SEAMAP is a State/Federal program administered by the Southeast Regional Office, National Marine Fisheries Service. This project was supported, in part, by the National Oceanic and Atmospheric Administration, National Marine Fisheries Service, under State/Federal Project Number NA47FS0038.



Annual Report Preparation By:

David Donaldson
Coordinator, SEAMAP - Gulf of Mexico

Robin Peuser
Coordinator, SEAMAP - South Atlantic

Aida Rosario
Coordinator, SEAMAP - Caribbean

Design and Layout:

Cheryl R. Noble
Gulf States Marine Fisheries Commission

ANNUAL REPORT

of the

Southeast Area Monitoring and Assessment Program

October 1, 1994 - September 30, 1995

INTRODUCTION

The Southeast Area Monitoring and Assessment Program (SEAMAP) is a State/Federal/university program for 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 the SEAMAP are shown in Table 1.

Federal programmatic funding for SEAMAP activities and administration was appropriated in Federal Fiscal Years 1985-1995. Funding allocations to participants for FY1985-FY1995 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 FY1995 and proposed activities for FY1996.

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 Technical Coordinating Committee, the SEAMAP-South Atlantic Committee of the Atlantic States Marine Fisheries Commission's South Atlantic Board, and the SEAMAP-Caribbean Committee of the Puerto Rico Department of Natural and Environmental Resources. The Gulf and South Atlantic committees consist of designated representatives from each member state and 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 Puerto Rico Department of Natural and Environmental Resources, Virgin Islands Division of Fish and Wildlife, 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 Department of Natural and Environmental Resources and personnel associated with the SEAMAP Information System (SIS), SEAMAP Archiving Center (SAC) and SEAMAP Invertebrate Plankton Archiving Center (SIPAC).

SEAMAP - Gulf of Mexico

Major SEAMAP-Gulf Subcommittee meetings were held in October 1995 and March 1995, in conjunction with the Annual Fall and Spring Meetings of the Gulf States Marine Fisheries Commission (GSMFC). All meetings included participation by various work group leaders, Coordinator, Data Manager, and the GSMFC Executive Director. To prepare for the discussion of the new SEAMAP Strategic and Management Plan, a subgroup consisting of the three components' chairmen and coordinators and the SEAMAP technical monitor met in June and September 1995. The group discussed what types of report(s) should be developed by the SEAMAP, the timeframe which the plan will cover, the review and approval process of the report(s) and possible future activities of the program. In addition, representatives from the Gulf program also met with the South Atlantic and Caribbean representatives in August 1995 to discuss respective program needs and priorities for FY1996.

SEAMAP-Gulf work groups met this past year to provide recommendations to the Subcommittee for survey and data management needs. The Environmental Work Group met in March 1995 to discuss the method for collection of chlorophyll and standardization and calibration of environmental gear, and to review the environmental section of the SEAMAP Operations Manual. The Red Drum Work Group met in April 1995 (via conference call) to address the election of a new work group leader and discuss the method for sampling red drum in offshore waters. From this call, the group recommended that the \$233,000 earmarked for red drum work be used for aerial survey to determine the location of the stock biomass in the Gulf. The aerial survey is part of a three-year study where the first year consists of

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 Department of Environmental Protection Louisiana Department of Wildlife and Fisheries Mississippi Department of Marine Resources/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 Department of Environmental Protection Georgia Department of Natural Resources North Carolina Department of Environment, Health 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 Department of Natural and Environmental Resources	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

the aerial work, the second year consists of a tagging study and offshore age structure work and the third year is composed of a recapture study, offshore age structure work and aerial survey. In the event that full funding for the project is not appropriated, a study will be conducted next year to determine the age/analysis of the offshore red drum stocks. Funding for this activity will be authorized by the National Marine Fisheries Service. The Reef Fish Work Group sponsored a workshop concerning sampling artificial, vertically-distributed habitat (oil and gas structures) in the Gulf of Mexico at the Louisiana Department of Wildlife and Fisheries' Lyles St. Amant Marine Laboratory on Grand Terre Island. The workshop was conducted in April 1995 and consisted of presentations from invited speakers regarding their work as it pertained to sampling of oil and gas structures and group discussions to formulate some recommendations concerning this type of sampling. Where additional discussion was needed, the Subcommittee also deliberated plans and needs via conference calls.

Coordination of program surveys and distribution of quick-report summaries of the Summer Shrimp/Groundfish survey to management agencies and industry were major functions of SEAMAP management in FY1995. 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

The SEAMAP - South Atlantic Committee met once during FY1995, in conjunction with the SEAMAP joint meeting in St. Croix, U.S. Virgin Islands. Topics for the meeting held August 6 and 8, 1995 included: report of SEAMAP - South Atlantic activities in FY1995 (including work group reports, reports of survey activities and special studies, data management report, and utilization of SEAMAP - South

Atlantic data), South Atlantic needs and funding priorities, funding for FY1996, strategic planning of SEAMAP - South Atlantic activities for 1996-2000, 1996 South Atlantic operations plan, and schedule for completion of final five-year strategic management plan. The Committee also discussed the need for disseminating the updated five-year management plan and strategic planning for implementing proposed activities for 1996-2000. Work group summary reports were presented for the Crustacean, Bottom-mapping, Shallow Water Trawl, and Shrimp Bycatch Work Groups. The Data Management Work Group did not meet during FY1995.

The Crustacean Work Group and Shallow Water Trawl Group met jointly on March 28-29 at the Waddell Mariculture Center, South Carolina to discuss shrimp and blue crab landings and effort data, management, bycatch, crustacean research at the Virginia Institute of Marine Science, status of blue crab fishery in Chesapeake Bay, Shallow Water Trawl update, North Carolina - Sound Survey update, weakfish problems related to the trawl fishery, electronic measuring boards and balances, and satellite projects. The work groups found the joint meeting to be very successful, and plan to meet jointly in FY1996 if funding is available.

The Bottom Mapping Work Group met on November 21, 1994 to discuss bottom mapping activities in North Carolina and Florida. The work group published their final report for mapping efforts in North Carolina, entitled *Distribution of Bottom Habitats on the Continental Shelf off North Carolina*. Data for Florida are currently being entered into the database.

The Shrimp Bycatch Work Group was established in FY1995 by the Committee, at the request of NMFS, to coordinate development of finfish bycatch estimates in the South Atlantic shrimp fishery. The working group met three times at the South Carolina Department of Natural Resources facilities. The working group discussed and identified available data sets that would be appropriate for use in the analysis, discussed possible estimation strategies, recommended specific stratifications for the analysis, and prepared a draft report. Technical support was provided by NMFS in conducting the specific analyses requested by the working group.

SEAMAP - Caribbean

During FY1995, the SEAMAP-Caribbean Committee met several times to consider various issues concerning the status of ongoing projects in Puerto Rico and the U.S. Virgin Islands, and budget matters. The Reef Resources Work Group (RRWG) also met to evaluate the status on ongoing projects. Among the issues considered were the validity of the data gathered by both the U.S. Virgin Islands and Puerto Rico. In order to evaluate the necessary number replicates needed for each sample station, the RRWG decided that Puerto Rico would sample 10 stations, 10 times. This data would be analyzed to determine if this was an appropriate number of replicates for the different stations. From this

analysis, the necessary adjustments were made to the sampling strategies in the U.S. Virgin Islands. The SEAMAP-Caribbean Committee approved this recommendation.

RESOURCE SURVEYS

In FY1995, collection of resource survey information continued for the thirteenth 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 data base. 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 14 to November 20, 1994, from off Mobile, Alabama to the U.S.-Mexican border. Vessels sampled waters out to 60 fm, covering a total of 373 trawl stations, in addition to plankton and environmental sampling.

Sampling design was similar to the Summer Shrimp/Groundfish Survey. The objectives of the survey were:

- (1) sample the northern Gulf of Mexico to determine abundance and distribution of demersal organisms from inshore waters to 60 fm;
- (2) obtain length-frequency measurements for major finfish and shrimp species to determine population size structures;
- (3) collect environmental data to investigate potential relationships between abundance and distribution of organisms and environmental parameters; and
- (4) collect ichthyoplankton samples to determine relative abundance and distribution of eggs and larvae of commercially and recreationally important fish species.

During the survey the NOAA Ship OREGON II sampled 242 stations in offshore waters and territorial Louisiana and Texas waters. The R/V VERRILL sampled 8 stations in Alabama territorial waters. The R/V TOMMY MUNRO sampled 23 stations in Mississippi territorial and offshore waters. The R/V PELICAN sampled 20 stations in

Louisiana territorial and offshore waters and Texas vessels sampled 80 stations within their territorial waters.

In addition, ichthyoplankton data were collected by NMFS and Louisiana vessels, at sample sites occurring nearest to half-degree intervals of latitude/longitude. A total of 52 stations was sampled with bongo and/or neuston nets, as encountered along cruise tracks. NMFS completed 48 ichthyoplankton stations and Louisiana completed 4 stations. The samples, except those taken by Louisiana, will be sorted by the Polish Sorting and Identification Center (PSIC). Once sorted, the specimens and data will be archived at the SEAMAP Archiving Center.

Louisiana Seasonal Day/Night Surveys

The Louisiana Department of Wildlife and Fisheries (LDWF) conducts seasonal day and night surveys as part of its continuing effort to provide comparative information on the abundance and distribution of critical life stages of major Gulf species, especially shrimp and associated environmental parameters. The sampling design for these surveys has changed little from similar day/night surveys in past years.

Sampling was conducted aboard the R/V PELICAN during four segments: September and November/December 1994 and March and June 1995. A stratified random station selection design was maintained, varying from the transects previously surveyed. During each segment, 24 stations were sampled during day and night at depths from 5 to 20 fm. The June sampling was completed as part of the SEAMAP Summer Shrimp/Groundfish Survey.

All seasonal trawls were completed with the standard SEAMAP net and doors. All organisms captured were identified, counted, measured and weighed. Environmental data and plankton/neuston sampling were conducted at trawl stations as well. Plankton samples were archived and sorted at the LDWF Plankton Laboratory. Specimens and data will be shipped to the SEAMAP Archiving Center in St. Petersburg, Florida. The area sampled covered Louisiana territorial and EEZ waters from 89°30' W. to 91°30' W. longitude.

Spring Plankton Survey

For the thirteenth year, plankton samples were collected during the spring in the northern Gulf of Mexico. The NOAA Ship CHAPMAN and Florida's R/V SUNCOASTER sampled offshore waters from the western edge of the West Florida Shelf to the Texas-Louisiana border from April 14 to June 10, 1995. A total of 142 stations was sampled. The CHAPMAN sampled 127 stations and the R/V SUNCOASTER sampled 15 stations along the west Florida shelf.

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. Wire angle was maintained at 45 degrees. Neuston

samples were taken with 947-micron mesh nets on 1 x 2-meter frames towed at the surface for ten minutes. Right bongo and neuston samples were initially preserved in 10% buffered formalin and after 48 hours were transferred to 95% ethyl alcohol for final preservation. Left bongo samples were preserved via an ethanol/ethanol transfer to aid in preservation of larval otoliths. In addition, hydrographic data (surface chlorophylls, salinity, temperature and dissolved oxygen from surface, midwater and near bottom and Forel-ule color) was collected at all stations.

Right bongo and neuston samples collected from SEAMAP stations will be transshipped to the PSIC. Left bongo samples will be archived at the SEAMAP Invertebrate Plankton Archiving Center (SIPAC). Salinity data from the Florida vessel were sent to the NMFS Mississippi Laboratories for interpretation.

Reef Fish Survey

The fourth Reef Fish Survey began on June 6 and will continue into late fall 1995. Vessels from NMFS, Texas, Mississippi, and Alabama sample inshore and offshore waters, in addition to plankton and environmental sampling. To date, approximately 190 stations have been sampled throughout the Gulf of Mexico. Randomly selected sites from Brownsville, Texas to Key West, Florida are chosen from known hard bottom locations. The objectives of the survey are:

- (1) assess relative abundance and compute population estimates of reef fish using a video/trap technique;
- (2) determine habitat using an echo sounder and video camera;
- (3) determine if bioacoustics assessment methodology can be applied to reef fish communities;
- (4) collect environmental data at each station; and
- (5) collect ichthyoplankton samples at selected reef sites.

The primary purpose of this survey is to assess the relative abundance and compute population estimates of reef fish. Stations are randomly-selected 100 m² sites which are designated as "reef areas". There are several aspects of the reef fish survey: 1) locating and compiling known hard bottom reef habitat locations; 2) survey site selection; 3) sampling protocol using a fish trap and video camera and 4) analyses of video records. Data is collected using the trap/video methodology where a fish trap containing a video camera is deployed onto the selected reef site. Trap soak time is one hour. After trap deployment, hydrographic data including a STD/light meter, transmissometer drop, secchi disk reading and surface chlorophyll samples are collected. For the NMFS vessel, after the last trap/camera set, one ichthyoplankton station is completed each day with a surface neuston net and Tucker trawl. Environmental and plankton samples collected use established SEAMAP protocols and

plankton samples will be transhipped to the Polish Sorting and Identification Center.

Final analyses of video tapes are accomplished at the Pascagoula Lab, where data is recorded onto standard SEAMAP forms. Tapes are analyzed either in their entirety or by randomly-selected one minute intervals. The determinant factors for sampling are based on whether the reader can identify and count fish entering the camera field of view and record the data.

Summer Shrimp/Groundfish Survey

During the spring 1995 there was communication between the Shrimp/Groundfish Work Group members to examine the design for the Summer Shrimp/Groundfish Survey and determine the random station locations for each participant. Objectives of the survey were to:

- (1) monitor size and distribution of penaeid shrimp during or prior to migration of brown shrimp from bays to the open Gulf;
- (2) aid in evaluating the "Texas Closure" management measure of the Gulf Council's Shrimp Fishery Management Plan; and
- (3) provide information on shrimp and groundfish stocks across the northern Gulf of Mexico from inshore waters to 50 fm.

The overall sampling strategy during the 1995 SEAMAP summary 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 entire survey occurred from June 1 to July 19, 1995. During the survey, the NOAA Ship OREGON II and TOMMY MUNRO sampled offshore and inshore Gulf waters with 40-ft trawls. Alabama's A.E. VERRILL sampled offshore Alabama waters with 40-ft trawls. The PELICAN sampled both Louisiana state waters and offshore waters with 40-ft trawls, and Texas vessels sampled Texas waters with 20-ft trawls.

A total of 323 trawl samples was taken from Gulf waters out to 50 fm from Mobile Bay, Alabama, to Brownsville, Texas. All vessels took environmental data, including temperature, salinity, oxygen, and chlorophyll at each station.

In June, catch rates of brown shrimp east of the River were very low, with a maximum catch of 12.1 lb/hr of 70-count shrimp. White shrimp catches east of the River were all less than 4.0 lb/hr. The largest pink shrimp catch rate east of the River was 27.0 lb/hr of 39-count shrimp taken in 15 fm of water off the Mobile Bay. Finfish catch rates east of the River were low, with the largest catch of 668 lb/hr with longspine porgy predominating.

In July's samples west of the river (Louisiana) brown shrimp catches were moderate with the largest catch rate of 36.1 lb/hr of 12-count shrimp occurring off Vermilion Bay in 14

fm. White shrimp catches were low, with a maximum catch rate of 19.0 lb/hr of 18-count shrimp taken in 15 fm east of Vermilion Bay. Catches of pink shrimp were very low off the Louisiana coast with a maximum catch rate of 6.6 lb/hr of 24-count shrimp. Finfish catch rates were also low with the largest catch rate of 1,116 lb/hr taken on July 18 with catfish predominating.

High catches of brown shrimp were made off Texas from June 1 to July 9. The largest catch rate occurred June 24 in waters off Brownsville, Texas in 18 fm (142.2 lb/hr of 68-count shrimp). White shrimp catches off Texas were low with the largest catch, 27.4 lb/hr of 18-count shrimp, taken off Sabine in 5 fm. Catch rates for pink shrimp were also low off Texas, though the largest catch was 42.6 lb/hr of 47-count shrimp off the lower Laguna Madre in 8 fm. Finfish catch rates were moderate in Texas inshore and offshore waters. The largest catch of finfish was 802 lb/hr in 5 fm off Sabine with croaker predominating.

Fall Plankton Survey

The first fall ichthyoplankton survey to assess abundance and distribution of king mackerel eggs and larvae occurred in August 1984. No sampling survey was conducted in 1985, however expanded surveys in 1986-1994 and in the current year covered Gulf waters from Florida Bay to Brownsville, Texas. Vessels from Florida, Alabama, Mississippi, Louisiana and NMFS surveyed from September 6 to September 29, 1995. Stations were located along a 30-minute latitude/longitude grid from inshore waters to the shelf edge.

The NOAA Ship CHAPMAN sampled 110 stations from Tampa Bay, Florida to Brownsville, Texas at depths from 5 to 100 fm. The R/V VERRILL sampled 9 stations at the mouth and outside Mobile Bay. The R/V TOMMY MUNRO sampled 49 stations south of Mississippi Sound along a 30-minute grid. The R/V PELICAN sampled 7 stations in Louisiana territorial waters. And Florida's R/V SUNCOASTER sampled 25 stations off Tampa Bay south to the Florida Straits area.

Stations were sampled with standard SEAMAP bongo nets with 333-micron mesh and/or 1 x 2-meter neuston nets fitted with 947-micron mesh. In addition, hydrographic sampling included chlorophylls, salinity, temperature and dissolved oxygen from surface, mid-water, and bottom, water transparency and water color was conducted at each station. Right bongo samples collected by NMFS and the Gulf States will be transhipped to the PSIC. Left bongo and neuston samples will be stored at the SIPAC at the Gulf Coast Research Laboratory for possible future sorting. Louisiana plankton samples will be sorted by LDWF according to SEAMAP protocols and specimens and data provided to the SEAMAP Archiving Center.

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. Plankton and environmental data were also taken by Louisiana at all of its seasonal day/night survey stations. Samples were taken by participants with a 60-cm bongo net and a standard SEAMAP neuston net.

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, and chlorophyll from surface 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 Poland, 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.

Chlorophyll samples were filtered at each station using GF/C filters. All filters were put in petri disks and wrapped in foil for onboard storage in the freezer. Chlorophyll analysis will be completed ashore. Preservation of plankton samples was in buffered formalin prior to transfer to ethanol.

In addition to these piggybacked surveys, two major SEAMAP plankton surveys were conducted in FY1995, as detailed earlier.

SEAMAP - South Atlantic

Shallow Water Trawl Survey

The major SEAMAP - South Atlantic survey in FY1995 was the continuing Shallow Water Trawl Survey conducted by the South Carolina Department of Natural Resources (SCDNR). 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. The overall goal is to obtain a long-term database to facilitate management of stocks in the South Atlantic Bight.

The objectives of the survey are to:

- (1) collect data on size, abundance, distribution, and seasonality of target finfish and decapod crustaceans;

- (2) record species composition, biomass, and abundance in order to assess latitudinal and seasonal fluctuations; and
- (3) 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 FY1995: Fall 1994 (October 5 - November 4), Spring 1995 (April 17 - May 12), and Summer 1995 (July 17 - August 16). Inshore strata (4.6 to 9.2m depths) were sampled during each cruise. Offshore strata (9.2 to 19m depths) were sampled only during fall and spring when penaeid shrimp spawning is thought to occur. All samples were collected during daylight hours to maximize the opportunities for collecting juvenile mackerels.

The Fall 1994 cruise completed the sixth full year of standardized sampling under a stratified random survey design. Sampling was conducted during October 5 - November 4 at 94 stations and emphasized 24 target species for additional biological measurements. Spanish mackerel were most abundant in waters off Florida while king mackerel were most abundant in Georgia waters. White shrimp, the most abundant penaeid, made up 63% by number and were most abundant off South Carolina.

The Spring 1995 cruise sampled 105 stations from April 17 through May 12. Spanish mackerel were most abundant in South Carolina waters. White shrimp was the most abundant penaeid collected, and the majority were captured off South Carolina.

The Summer 1995 cruise sampled 78 stations and targeted 24 species. Sampling was conducted from July 17 through August 16, 1995. The greatest average number of Spanish mackerel were taken in Long Bay. The greatest average number of king mackerel were taken in waters off Florida where over 92% of all the king mackerel were collected. White shrimp was the most abundant penaeid taken during the cruise. The greatest mean number of individuals per tow occurred in waters off Florida. Although more individuals were collected off South Carolina, the mean number per tow was lower than in Florida.

Data from the Fall 1994 and Spring 1995 cruises have been added to the SEAMAP Data Management System (DMS). Data from the Summer 1995 cruises are currently being added to the SEAMAP DMS. The results of the entire 1994 cruise season (Fall 1993, Spring 1994, and Summer 1994 cruises) are documented in the final 1994 project report, *Results of Trawling Efforts in the Coastal Habitat of the South Atlantic Bight, FY1994* by South Carolina Marine Resources Division.

Pamlico Sound Survey

During FY1995, the North Carolina Division of Marine Fisheries (NCDMF) continued the ongoing Pamlico Sound

Survey. Cruises sample approximately 52 stations each in June and September. 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.

Benthic Characterization

During FY1995, the Florida Department of Environmental Protection (FDEP) completed work characterizing the structure and general ecology of South Atlantic benthic communities. Invertebrates were collected on four SEAMAP survey cruises in the region during 1983-1987. Selected invertebrate groups from northeast Florida were identified to the lowest appropriate taxonomic level.

Species of mollusk, crustaceans, echinoderms and brittle stars have been catalogued and recorded in a database of benthic shelf fauna from Georgia to Palm Beach, Florida. Identified organisms are housed in a number of reference collections, including Harbor Branch Foundation, Smithsonian Institution, and FDEP.

Bottom Mapping Project

In 1985, the SEAMAP-South Atlantic Bottom Mapping Work Group developed a plan for establishing a regional database which would include the location and characteristics of hard bottom resources in the South Atlantic Bight. The importance of defining these areas has increased in the face of declining reef fish resources and increased fishing pressure. In order to assess reef fish populations and the effects of changes in fishing pressure, the amount of habitat available for priority species of fishes must be quantified. Funds for this project resumed in FY1992 after a seven year hiatus. The primary objectives of the project are to:

- (1) Conduct an extensive search of existing databases to identify all known critical hard bottom reef habitats on the continental shelf of the South Atlantic Bight from Florida through North Carolina from the beach out to 200m in depth; and
- (2) Summarize the bottom type information into a flexible, easy to use database which will provide researchers and managers with pertinent information concerning the location and extent of these areas, types of data used in determining bottom type, and source of the data for the development of future habitat mapping systems on available PC hardware.

All reasonable accessible databases available from state and federal agencies and other sources that have sampled or surveyed bottom habitats in the region are being investigated to obtain files for processing. The data available from these sources varies in information content and accuracy in pinpointing reef habitat location. Treatment of each data type and gear is standardized, and the most accurate data for

each gear type for each location are being compiled according to procedures developed by the Bottom mapping Work Group. The database is designed for easy incorporation into GIS or other PC mapping software programs.

The following accomplishments were made during FY1995: (1) All data available for North Carolina were entered into the database representing 11,890 records, and (2) A final report was prepared for this region. More than 23,900 total records have been compiled for this project to date. Database development for the continental shelf off Florida was also initiated in FY1995.

It is anticipated that mapping for the Florida region will be completed by the end of FY1996. Additional future activities are planned subject to available funding.

SEAMAP - Caribbean

Reef Resources Survey

During the sampling period from April 1994 to March 1995, a total of 36 stations were sampled west of Parallel 67 of Puerto Rico. Hook and line yielded 39 species representing 19 families weighing over 800 kg. The two most important commercial groups, snappers and groupers, constituted 86.7% of total catch, by weight. Red hinds and coney represented 58.3% and 23.4%, respectively of the total hook and line catch, by weight. Other species that constituted more than one percent of hook and line catches by weight were: sand tilefish (5.9%); great barracuda (3.2%); blackjack (2.3%); and graysby (2.0%).

Fish traps yielded 38 species representing 16 families weighing over 140 kg. Catches by number were dominated by the same species as for hook and line catches. Red hinds constituted 32.7% of total trap catches by weight, while coney made up 21.5%. Other species that represented significant trap catches by weight were: princess parrotfish (5.6%); queen triggerfish (4.8%); longjaw squirrelfish (4.2%); longspine squirrelfish (3.9%); vermilion snapper (3.0%); spotted goatfish (2.5%); ocean surgeonfish (2.0%); and white grunt (2.0%). The banded butterflyfish constituted the third most abundant species caught by fish traps in terms of number representing 10.1% of total fish landed, although, it only represented 2.6% by weight. In terms of weight, the percent contribution of the sampled butterflyfishes is not representative of their importance in trap catches. This may be due to their small size, and weight. Their relevance in trap catches should be measured in terms of number of individuals caught.

Catch per unit effort (CPUE) by stations ranged from 0 to 18 g/trap hours and from 0 to 164 g/hook hours. Stations where bottom substrate consisted of coral and/or sponges yielded higher CPUE, followed by stations with substrate consisting of algae. The least productive stations were those in which there was a mud bottom.

The sampling period from April 1994 to March 1995 was the last year of the three-year cycle of the reef fish survey. For the entire three-year period, 443 trips were made, yielding over 3,991 kg of fish sampled with hook and line. Species composition was dominated by groupers of which red hinds constituted 51.3% of the total catch, followed by coney with 14.5% of the catch by weight. The completion report for the reef fish survey in Puerto Rico is in preparation and will be available next year.

During April 1995, a new survey for sampling queen conch in the U.S. Caribbean was initiated and funded by the SEAMAP-Caribbean (U.S. Virgin Islands and Puerto Rico). The methodology used during this survey is the one described by Friedlander, et al. 1994 and has been used in previous surveys conducted by the U.S. Virgin Islands Division of Fish and Wildlife. Unfortunately, work has not started in the U.S. Virgin Islands due to the effects of Hurricane Marilyn. Both the U.S. Virgin Islands Division of Fish and Wildlife and the University of Virgin Islands lost their vessels during the storm. The U.S. Virgin Islands Division of Fish and Wildlife is currently working with the University of Puerto Rico to contract them to conduct the survey in the U.S. Virgin Islands.

Puerto Rico has contracted the Sea Grant College Program of the University of Puerto Rico to conduct the survey. Divers participating in the survey have been trained to distinguish between live and dead conch and determine their relative age. To date, 30 stations have been sampled on the west coast of Puerto Rico. It is expected that all stations on the west coast will be completed by mid-December 1995. After completion of these stations, there will be an evaluation to determine how many stations will be necessary on the east and south coasts and if additional stations will be needed on the west coast of Puerto Rico.

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

During January 23-29, 1995, personnel from the states of New York, North Carolina, and Maryland, the U.S. Fish and Wildlife Service (FWS), and the NMFS, participated in a striped bass tagging cruise. This was the seventh year of the cooperative project, initiated in 1988 at the request of SEAMAP-South Atlantic. Adult striped bass overwintering in the area between False Cape, Virginia and Wimble Shoals, North Carolina, were tagged for assessment of the population structure and estimation of exploitation rates of the migratory Atlantic Coast stock.

A color video sounder was used to locate targets and reduce bycatch. A total of 911 striped bass were captured. All

healthy fish were measured, tagged with FWS internal anchor tags and released. A total of 644 striped bass were tagged. Fourteen summer flounder were also tagged. Scales were collected from tagged fish for age and growth determinations. Captured tagged striped bass were tested for coded wire tags (CWTs) which indicate hatchery origin; 17 CWT positive fish were identified. A database for striped bass tag returns is managed by FWS in Annapolis, MD.

Bycatch Estimates

In November 1994, the NMFS asked the South Atlantic SEAMAP Committee to undertake a coordination role for developing finfish bycatch estimates in the South Atlantic shrimp fishery. In response, the SEAMAP-SA Committee formed the Shrimp Bycatch Working Group, consisting of sixteen members with expertise in shrimp bycatch research and management from appropriate state and federal agencies. The working group's charge was to guide data identification and summarization, evaluate estimation methods, and review final estimates of bycatch removals by the South Atlantic shrimp fisheries. Data used in the analyses were obtained from the NMFS, the Florida Department of Environmental Protection, the Gulf & South Atlantic Fisheries Development Foundation, the North Carolina Sea Grant, and the North Carolina State University.

The working group presented their results in the draft report, *Estimates of Finfish Bycatch in the South Atlantic Shrimp Fishery*. The report provides estimates of finfish bycatch associated with the South Atlantic shrimp fisheries for specific geographic regions during specific periods of time based on available data--catch and effort data for seasons during 1992 and 1993, and characterization and bycatch reduction devices (BRD) data from 1992-1994. The final report is expected to be available in early 1996.

Bycatch of finfish associated with the shrimp trawl fishery in the South Atlantic region is a critical issue for fisheries managers. Bycatch of weakfish is especially of interest because of new regulations adopted by the Atlantic States Marine Fisheries Commission to reduce weakfish bycatch by 50 percent and new regulations being developed by the South Atlantic Fishery Management Council to reduce the bycatch component of weakfish and Spanish mackerel fishing mortality by 50 percent.

Five Year Plan

At the SEAMAP joint annual meeting held in August 1994, the three committees agreed to develop a new five-year management plan to supersede the existing plan that was developed for 1990 - 1995. Through the NMFS/ASMFC 1995 SEAMAP cooperative agreement, the ASMFC was funded to prepare a new five-year strategic management plan. A Strategic Planning Subgroup was formed, consisting of the NMFS Program Manager; Gulf, South Atlantic, and Caribbean chairpersons and coordinators; and the ASMFC's Director of Research and Statistics. The subgroup met in June 1995 to plan and discuss the development of a new

five-year plan for 1996-2000. A draft report was prepared and distributed to members of all three SEAMAP committees at the joint annual meeting held August 6-8, 1995 in St Croix, U.S. Virgin Islands. Discussions during the joint meeting focused on review of the draft report and on suggestions for expansion of SEAMAP activities in each region. The subgroup met again in September 1995 to review a revised plan, prepared in response to comments received from SEAMAP committee members, and to discuss completion and final approval of the report. The final report and separate Executive Summary are expected to be available in early 1996.

INFORMATION SERVICES

Information from the SEAMAP activities is provided to user groups through three complementary systems: the SIS, SAC and SIPAC. Products resulting from SEAMAP activities can be grouped into two major categories: data sets managed by SIS, SAC and SIPAC and program documents.

SEAMAP Information System

Biological and environmental data from all SEAMAP-Gulf surveys are included in the SIS, managed in conjunction with 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 1982-1994 have been entered into the system and data from 1995 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 requestors, although the highest priority is assigned to SEAMAP participants. A total of 162 SEAMAP data requests have been received and processed. In some instances, requests were filled promptly; in many cases, however, a substantial lag occurred because of the extremely large amount of data being collected on an increased number of surveys over those of past years. To date, 158 requests have been completed and work is being performed on those remaining.

The requirements report for an integrated data system, *Data Management System Design Study for Gulf and South Atlantic, 1987*, was completed in March 1987. The document identifies the high-level design specifications and recommended implementation plan for a module-based SEAMAP Data Management System (DMS). The design is based on information contained in the SEAMAP Gulf and South Atlantic DMS Requirements Document developed through a cooperative effort between NMFS and other SEAMAP participants. The document has five sections: (1) background and brief descriptions of current centralized and proposed distributed systems; (2) summary of the Requirements Survey; (3) overview of the system's architecture; (4) description of developmental modules constituting the DMS design; and (5) modular implementation plan which includes costs and schedule.

Work was completed during FY1990 on the new distributed SEAMAP DMS. The modules for the system include those for data entry, edit, upload, data query and download. All of the Gulf, South Atlantic, and Caribbean participants are now equipped with the necessary computer hardware and software.

The system is decentralized, i.e., distributed. Thus, the SEAMAP users are able to locally, and directly, enter and retrieve data. Software for the system has been distributed to participants for trial runs of data input.

This system decreases the time necessary to enter and retrieve data and provides powerful and flexible local data analysis and display capabilities. Under the system, each SEAMAP site enters, verifies and edits their data, eliminating the mail-oriented loop necessary to enter/edit/verify data. Secondly, each site has the capability of locally accessing SEAMAP data, utilizing a user-friendly system. Local data retrieval allows the data to be accessed in a timely manner with a minimum amount of effort and programming skills.

Under the system, outside users (e.g., Minerals Management Service, U.S. Army Corps of Engineers, etc.) may request special data sets for research or study. The outside users submit the request to the SEAMAP Subcommittee through the appropriate coordinator for approval to proceed. Once the request is approved, the information is provided by the Data Manager and staff members through a priority-based, mail-oriented system. Also, SEAMAP participants may use the Special Request mechanism for data sets too large for economical downloading by telephone. These requests will be handled by a Central Operations staff in the same priority-based, mail-oriented manner as noted above.

SEAMAP data collected during surveys were used for a multitude of purposes in FY1995:

- Evaluation of the abundance and size distribution of penaeid shrimp in Federal and state waters to assist in determining opening and closing dates for commercial fisheries by NMFS;
- Evaluation of shrimp fishery bycatch and weakfish stock assessment by NMFS;
- Assessment of shrimp and groundfish abundance and distribution and their relationship to such environmental parameters as temperature, salinity, and dissolved oxygen by NMFS;
- Identification of environmental parameters associated with concentrations of larval finfish by NMFS;
- Compilation of the 1993 SEAMAP Biological and Environmental Atlas by NMFS and GSMFC;
- Comparison of catches of shrimp and groundfish captured by 40-ft versus 20-ft trawl nets by NMFS;

- Stock assessment of weakfish, striped bass, bluefish, spot and croaker by the ASMFC;
- Stock assessment of Spanish mackerel by South Atlantic Fishery Management Council and NMFS;
- Species differentiation of Brevoortia smithi and B. tyranus and age and growth of cobia by NMFS;
- Development of an amendment to the Coral and Coral Reef Fishery Management Plan by South Atlantic Fishery Management Council;
- Development of the striped bass fishery management plan by NCDMF;
- Comparison of South Atlantic portunid crabs with Brazilian assemblages;
- Shrimp viral analysis, life history work on Centropristis striata, and DNA research in Paralichthys dentatus and Cynoscion regalis by SCDNR;
- Age/growth and fecundity of Cynoscion regalis by University of Charleston;
- Analysis of data collected during the Caribbean Reef Resources Survey to determine if other parameters are needed by the SEAMAP-Caribbean Committee;
- Differentiation of shark DNA by NMFS;
- Turtle research by Georgia Department of Natural Resources.

Real-time Data

A major function of the SEAMAP Information System in FY1995 was the processing of catch data from the Summer Shrimp/Groundfish Survey as near-real-time data. Data were transmitted three times weekly via cellular phone to the NMFS Pascagoula Laboratory from the NOAA vessel OREGON II, while the states' data were entered into the system weekly. Plots of station locations and catch rates of shrimp and dominant finfish species were prepared and edited at the NMFS Pascagoula Laboratory, and processed by GSMFC for weekly distribution to management agencies, fishermen, processors and researchers. Management agencies also received comprehensive data listings showing penaeid shrimp length frequencies, sampling parameters and environmental conditions.

SEAMAP Archiving Center

Larval fish and fish egg samples sorted to the lowest tax level possible by the PSIC are returned to the SEAMAP Archiving Center for archiving and loan to researchers. For FY1995, approximately 12,600 vials have been returned from the PSIC. Data entry for most of the returned sorted samples is completed in an improved and simplified

SEAMAP DMS. Samples cataloged to date represent 18 orders, 126 families, 235 genera and 245 species.

The SEAMAP Archiving Center, which is managed in conjunction with Florida Department of Environmental Protection (FDEP) in St. Petersburg, Florida, processes both specimen loans and requests for associated plankton survey environmental data. Seven such requests have been accommodated in the present fiscal year. Currently, the FDEP is in the process of renovating the existing building which houses the SEAMAP Archiving Center, allowing for expansion of the climate-controlled storage area. The SEAMAP Archiving Center personnel, in conjunction with other staff from FDEP, will be participating in the fall ichthyoplankton cruise. The cruise is scheduled to depart on September 23, 1995.

SEAMAP Invertebrate Plankton Archiving Center

The SIPAC is in its eleventh year of operation. Ken Stuck of GCRL serves as SIPAC curator, and is assisted by one technician. The mission of the SIPAC is 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. The SIPAC provides unsorted plankton samples and data or specimens of larval invertebrates to qualified researchers upon request. SIPAC personnel also participate in SEAMAP cruises.

During FY1995, a total of 225 SEAMAP plankton samples were received and logged into the SIPAC database. The samples were obtained from various OREGON II, CHAPMAN, HERNAN CORTEZ II, SUNCOASTER, R/V BELLOWS, and TOMMY MUNRO cruises. A total of 428 neuston samples in the SIPAC collection that were collected during 1986 and 1987 have been transferred to the NMFS-Pascagoula for shipment to the PSIC. The number of samples currently catalogued in the SIPAC collections is 5,627. Samples currently on loan include 146 samples, from OREGON II cruises 187, 194, 199, CHAPMAN cruises 904, HERNAN CORTEZ II cruises 901 and 911, and SUNCOASTER cruise 921 to S. Turner, NMFS-Miami; and 7 samples from TOMMY MUNRO cruise 923 to B. Comyns, GCRL.

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 7 years and duplicate samples sorted and received from the PSIC are aliquoted to 1/4 their original volume and placed into 100ml vials. 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 1,200 samples collected from 1982 - 1985 have been aliquoted and prepared for long-term storage. However, because of the recent transfer of a large

number of neuston samples from the SIPAC collections to NMFS-Pascagoula, and the relatively low number of new samples deposited in the collection over the last year, sufficient storage space is currently available and sample aliquoting has been temporally suspended.

During FY1995, 33 SEAMAP plankton samples collected during OREGON II cruises 185 and 190, 38 samples collected from Louisiana inshore waters, and 30 samples collected during cruise 902 by the HERNAN CORTEZ, were sorted for selected invertebrates following previously established protocols. A total of 436 lots of specimens were obtained from those samples. To date, the total number of SEAMAP samples sorted for invertebrates is 1,458 and the total number of lots obtained is 6,233.

During the next fiscal year, the SIPAC will continue to manage SEAMAP plankton collections and generate specimens and data on selected invertebrate species. A general inventory of sample holdings and verification of computer records will be conducted. Mary Tussey, the technician working for the SIPAC for the last 5 years resigned in July. Although maintenance and cataloging of unsorted samples continues, invertebrate sample sorting has been suspended until a suitable replacement is found. In addition, attempts are being made to find a graduate student to work with the collection of invertebrate specimens as part of a master's or doctoral thesis. The current level of SEAMAP funding and support of the SIPAC should be sufficient to support these activities during the next fiscal year.

Program Documents

The following documents were published and distributed by the SEAMAP program in FY1995:

- Beatty, H.R. 1994. 1994 Fall SEAMAP Cruise Report. South Carolina Wildlife and Marine Resources Department. 6 pp.
- Beatty, H.R. 1995. 1995 Spring SEAMAP Cruise Report. South Carolina Wildlife and Marine Resources Department. 6 pp.
- Beatty, H.R. 1995. 1995 Summer SEAMAP Cruise Report. South Carolina Wildlife and Marine Resources Department. 6 pp.
- Donaldson, D.M. 1995. SEAMAP Annual Report to the Technical Coordinating Committee (October 1, 1994 to September 30, 1995). Gulf States Marine Fisheries Commission, Ocean Springs, 28 pp. + appendices
- Donaldson, D.M., N. Sanders, R. Minkler, P.A. Thompson. SEAMAP Environmental and Biological Atlas of the Gulf of Mexico, 1992. No. 30. Gulf States Marine Fisheries Commission, Ocean Springs, 293 pp.
- Donaldson, D.M., C.D. Stephan and A. Rosario 1994. Annual Report of the Southeast Area Monitoring and Assessment Program (SEAMAP), October 1, 1993 to September 30, 1994. Gulf States Marine Fisheries Commission, Atlantic States Marine Fisheries Commission, Puerto Rico Department of Natural Resources. 12 pp.
- Gulf States Marine Fisheries Commission. 1995. SEAMAP Marine Directory. Gulf States Marine Fisheries Commission, Ocean Springs, 1 p. + appendices.
- Pulley, M.G. 1995. Pamlico Sound Survey, June 1993 Cruise Report, North Carolina Department of Environment, Health, Natural Resources, Division of Marine Fisheries, 27 pp.
- Pulley, M.G. 1995. Pamlico Sound Survey, September 1993 Cruise Report, North Carolina Department of Environment, Health, Natural Resources, Division of Marine Fisheries, 33 pp.
- South Carolina Marine Resources Division. 1995. Results of Trawling Efforts in the Coastal Habitat of the South Atlantic Bight, FY1994. South Carolina Department of Natural Resources, Charleston, SC.
- Stephan, C.D. 1995. SEAMAP - South Atlantic Annual Report, 1 October 1993 - 30 September 1994. Submitted to the South Atlantic Board of the Atlantic States Marine Fisheries Commission, Washington, D.C. 74 pp.

PROPOSED SEAMAP ACTIVITIES, FY1996

Annual program allocations for the SEAMAP programs, Gulf, South Atlantic and Caribbean total approximately \$1.1 million. Proposed FY1996 activities for all participants are shown in Table 2.

TABLE 2.

PROPOSED SEAMAP ACTIVITIES, FY1996

	Fall	Winter	Spring	Summer
Gulf of Mexico Activities				
Resource Surveys:				
Spring Plankton Survey			X	
Spring Reef Fish Survey			X	X
Summer Shrimp/Groundfish Surveys				X
Louisiana Seasonal Surveys	X	X	X	X
Fall Shrimp/Groundfish Surveys	X			
Fall Plankton Survey	X			
Plankton and Environmental Data Surveys	X	X	X	X
Information Operations:				
1993 Biological and Environmental Atlas		X		
1994 Biological and Environmental Atlas				X
1996 Marine Directory			X	
FY1995 Joint Annual Report		X		
Real-time Data Summaries				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:				
Shallow Water Trawl Survey	X		X	X
Pamlico Sound Survey	X			X
Winter Trawling and Fish Tagging Cruise		X		
Bottom Mapping Project	X	X	X	X
Information Operations:				
Data Input and Request Processing	X	X	X	X
1995 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				
Resource Surveys:				
Reef Resources Survey	X	X	X	X
Information Operations:				
Coordination with Caribbean Countries				
Research Programs		X	X	
Program Administration	X	X	X	X
Joint Planning Activities	X	X	X	X

SEAMAP-Gulf of Mexico Representatives

Walter Tatum, Chairperson
Alabama Department of Conservation and Natural Resources

Mark Leiby
Florida Department of Environmental Protection

Richard Waller, Vice Chairperson
Mississippi Department of Marine Resources
Gulf Coast Research Laboratory

Joanne Lyczkowski-Shultz
National Marine Fisheries Service
Pascagoula Laboratory

Terry Cody
Texas Parks and Wildlife Department

Wayne Swingle
Gulf of Mexico Fishery Management Council

Jim Hanifen
Louisiana Department of Wildlife and Fisheries

SEAMAP-South Atlantic Representatives

Alan Huff, Chairperson
Florida Department of Environmental Protection

John Merriner
National Marine Fisheries Service
Beaufort Laboratory

Roger Pugliese, Vice Chairperson
South Atlantic Fishery Management Council

Michael Street
North Carolina Department of Environment, Health and Natural Resources

Henry Ansley
Georgia Department of Natural Resources

David Whitaker
South Carolina Department of Natural Resources

John Dunnigan
Atlantic States Marine Fisheries Commission

SEAMAP-Caribbean Representatives

Steven Meyers, Chairperson
Virgin Island Division of Fish and Wildlife

Walter Padilla Peña
Puerto Rico Department of Natural and Environmental Resources

Manuel Hernández-Avila
Puerto Rico Sea Grant College Program

Miguel Rolón
Caribbean Fishery Management Council

James Oland
U.S. Fish and Wildlife Service

Nancy Thompson
National Marine Fisheries Service

SEAMAP Personnel

David Donaldson
SEAMAP-Gulf Coordinator
Gulf States Marine Fisheries Commission

Gordon Colvin, Chairman
Atlantic States Marine Fisheries Commission

Robin Peuser
SEAMAP-South Atlantic Coordinator
Atlantic States Marine Fisheries Commission

Kenneth Savastano
National Marine Fisheries Service
SEAMAP Data Manager

Aida Rosario
SEAMAP-Caribbean Coordinator
Puerto Rico Department of Natural and Environmental Resources

Kenneth Stuck, Curator
SEAMAP Invertebrate Plankton Archiving Center

Larry Simpson, Executive Director
Gulf States Marine Fisheries Commission

Scott Nichols
National Marine Fisheries Service
SEAMAP Program Manager

John Dunnigan, Executive Director
Atlantic States Marine Fisheries Commission

David Pritchard
National Marine Fisheries Service
SEAMAP Program Officer

Edwin Conklin, Chairman
Gulf States Marine Fisheries Commission

