



ANNUAL REPORT

OF THE SOUTHEAST AREA MONITORING AND ASSESSMENT PROGRAM (SEAMAP)

OCTOBER 1, 1997 - SEPTEMBER 30, 1998

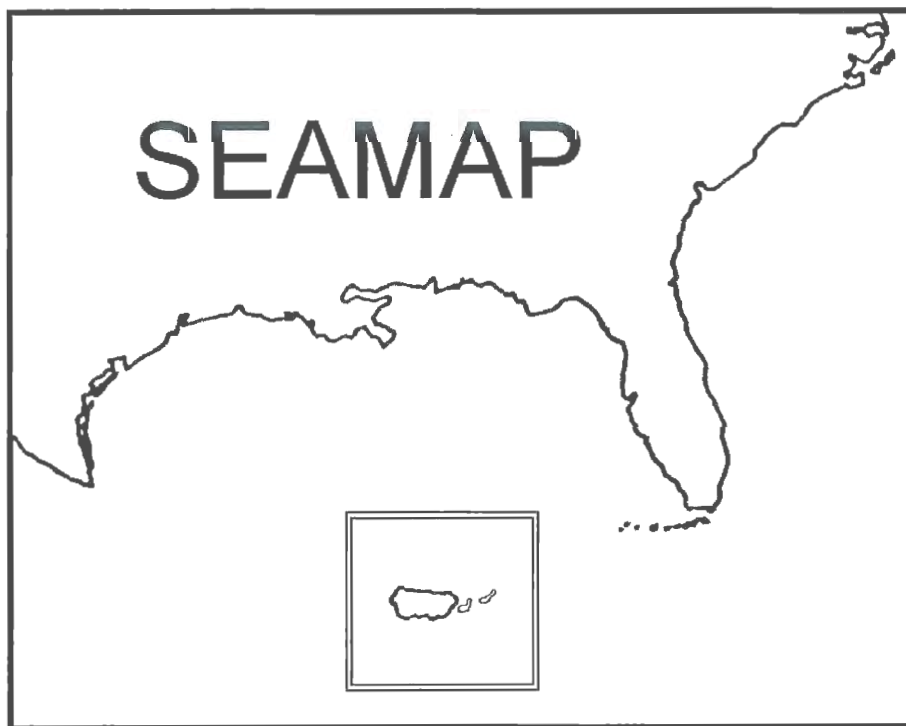
SEAMAP - Gulf of Mexico
Gulf States Marine Fisheries Commission

SEAMAP - South Atlantic
Atlantic States Marine Fisheries Commission

SEAMAP - Caribbean
Puerto Rico Sea Grant College Program

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Annual Report Preparation By:

Jeffrey K. Rester
Coordinator, SEAMAP - Gulf of Mexico

Geoff White
Coordinator, SEAMAP - South Atlantic

Lynne Hinkey
Coordinator, SEAMAP - Caribbean

Design and Layout:

Cheryl Noble
Gulf States Marine Fisheries Commission

ANNUAL REPORT of the Southeast Area Monitoring and Assessment Program October 1, 1997 - September 30, 1998

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 1985-1998. Funding allocations to participants for FY1985-FY1998 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 FY1998 and proposed activities for FY1999.

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 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 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 the 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 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 1997 and March 1998, in conjunction with the Annual Fall and Spring Meetings of the GSMFC. All meetings included participation by various work group leaders, Coordinator, Data Manager, Program Manager, and the GSMFC Executive Director. Representatives from the Gulf program also met with the South Atlantic and Caribbean representatives in August 1998 to discuss respective program needs and priorities for FY1999.

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 FY1998. 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 FY1998, in conjunction with the SEAMAP joint meeting in La Parguera, Puerto Rico. Topics for the meeting, held August 7, 1998 included: report of SEAMAP-SA activities in FY1998 (including work group meetings and reports, reports of survey activities and special studies, data management report, and utilization of SEAMAP-SA data), funding for FY1999, and future South Atlantic funding priorities.

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/USM/IMS/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 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

The Bottom Mapping Work Group met May 21-22, 1998 in St. Petersburg, Florida. Topics discussed included a review of the South Atlantic Bight Hardbottom Mapping CD-ROM, (Version 1.0), improvements to be made for Version 1.1, internet access to view the hardbottom data, and development of future initiatives and funding priorities of the Bottom Mapping Work Group. Work Group members developed a distribution list for the first printing of the CD, and discussed future production of the CD.

A joint meeting was held between the Shallow Water Trawl Work Group and the Crustacean Work Group on June 24, 1998 in Bluffton, South Carolina. The Trawl Work Group reported the results of the spring cruise, and discussed future initiatives, including: the improvement of SEAMAP METADATA, development of an internet site, and a ten-year trawl survey summary report. The Crustacean Work Group reviewed state reports of recent landings and legislative actions, discussed future initiatives, and coordinated the development of the 1998 Crustacean Newsletter.

SEAMAP - Caribbean

The SEAMAP-Caribbean Administrative component met four times during the past year to discuss results of the previous year's projects, plan strategies and scheduling for use of equipment for the Bottom Mapping Projects, and begin planning for the Reef Resources Survey in 1999.

A Side Scan Sonar equipment demonstration was held in San Juan Bay in April 1998, where Committee and Work Group members were able to work with equipment and become familiar with its set-up prior to beginning the project.

The Coordinator assisted with the planning and logistical arrangements for the SEAMAP Joint Annual Meeting, held in La Parguera, Puerto Rico in August 1998.

RESOURCE SURVEYS

In FY1998, collection of resource survey information continued for the sixteenth 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 8, 1997 to December 4, 1997, from off Mobile, Alabama to the U.S.-Mexican border. Vessels sampled waters out to 60 fm, covering a total of 254 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 to:

- (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 191 stations from Mobile Bay, Alabama to Brownsville, Texas at depths out to 60 fm. The R/V VERRILL sampled 8 stations at the mouth and outside Mobile Bay. The R/V TOMMY MUNRO sampled 31 stations south of Mississippi Sound along a 30-minute grid. The R/V PELICAN sampled 24 stations in Louisiana territorial waters. 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 50 stations was sampled with bongo and/or neuston nets, as encountered along cruise tracks. NMFS completed 43

ichthyoplankton stations and Louisiana completed 7 stations. The samples, except those taken by Louisiana, will be sorted by the Polish Sorting and Identification Center. Once sorted, the specimens and data will be archived at the SEAMAP Archiving Center.

Spring Plankton Survey

For the seventeenth 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 19 to June 26, 1998. A total of 175 stations was sampled. The CHAPMAN sampled 157 stations and the R/V SUNCOASTER sampled 18 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) 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 SIPAC. Salinity data from the Florida vessel were sent to the NMFS Mississippi Laboratories for interpretation.

Summer Shrimp/Groundfish Survey

During the spring of 1998, 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 1998 SEAMAP summer 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 2 to July 16, 1998.

During the survey, the NOAA Ship OREGON II and R/V TOMMY MUNRO sampled offshore and inshore Gulf waters with 40-ft trawls. Alabama's R/V VERRILL sampled offshore Alabama waters with 40-ft trawls, the R/V PELICAN sampled both Louisiana state waters and offshore waters with 40-ft trawls, and Texas vessels sampled Texas state waters and offshore waters with 20-ft trawls.

A total of 266 trawl samples was taken from coastal and offshore 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.

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 1986-1997 and in the current year covered Gulf waters from Florida Bay to Brownsville, Texas. Vessels from Florida, Alabama, Mississippi, Louisiana and NMFS surveyed Gulf waters from September 4, 1997 and continued until October 7, 1997. Stations are located along a 30-minute latitude/longitude grid from inshore waters to the shelf edge.

In the fall of 1997, the NOAA Ship CHAPMAN sampled 123 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 50 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 20 stations off Tampa Bay south to the Florida Straits area.

Stations are 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 including 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 Polish Sorting and Identification Center. 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.

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 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.

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 FY1998, as detailed earlier.

SEAMAP - South Atlantic

Shallow Water Trawl Survey

The major SEAMAP - South Atlantic survey in FY1998 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 FY1998: Fall 1997 (September 29 – October 25), Spring 1998 (April 13 – May 12), and Summer 1998 (July 14 – July 31). 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 1997 cruise completed the ninth full year of standardized sampling under a stratified random survey design. Sampling was conducted during September 29 – October 25 at 94 stations and emphasized 24 target species for additional biological measurements. The mean number of individuals taken per tow (mean = 548/tow) in fall collections was the lowest observed in SEAMAP-SA history. Miscellaneous invertebrate biomass was also at the lowest level ever observed in SEAMAP-SA samples from fall trawls. Spanish mackerel were absent in Raleigh Bay, and most abundant in Long Bay and waters off of South Carolina. King mackerel were also absent from Raleigh Bay, yet were most abundant in Onslow Bay, with decreasing numbers as sampling progressed south to Florida. White shrimp were the most abundant penaeid species collected, especially in waters off of South Carolina, where more than 78% of the white shrimp were collected during the fall cruise.

The spring 1998 cruise sampled 105 stations from April 13 through May 12. Overall abundance from spring collections in 1998 was lower than the mean catch per tow observed in spring 1997 and the average of 1990-1998 period, whereas invertebrate biomass (comprising mostly of jellyfish) increased in 1998. Catches of spot, *Leiostomus xanthurus*, decreased from 1997 levels, with only two years (1993, 1996) recording lower catch levels. However, catches of Atlantic croaker, *Micropogonias undulatus*, in 1998 increased to levels surpassed only by catches in 1991 and 1992. The spring 1998 Spanish mackerel catch was a record high for the period 1990-1998, and Spanish mackerel were most abundant in tows made in waters off South Carolina. King mackerel exhibited low abundance in spring 1998, equal to that found in 1994 and lower only in 1992 when no king mackerel were taken in spring collections. The abundance of penaeid shrimp were dominated by the white shrimp, of which over 80% were caught in Georgia's waters.

The summer 1998 cruise sampled 78 stations and targeted 24 species. Sampling was conducted from July 14 through July 31, 1998. Overall number of individuals taken in summer collections in 1998 increased from 1997 levels, generally reflecting the abundance of spot, *Leiostomus xanthurus*, and

Atlantic croaker, *Micropogonias undulatus*. Spanish mackerel were absent in collections from Onslow Bay, North Carolina and were most abundant in Long Bay and waters off South Carolina. King mackerel were most abundant in tows made off Florida, and were not taken in South Carolina or Georgia waters. Brown shrimp were the most abundant penaeid taken during the cruise. Brown shrimp were taken from strata in all regions, but the highest mean catch per tow of brown shrimp was taken in Onslow Bay, North Carolina.

Data from the fall 1997 and spring 1998 cruises have been added to the SEAMAP Data Management System (DMS). Data from the summer 1998 cruise are currently being added to the SEAMAP DMS. The results of the entire 1997 cruise season (Spring 1997, Summer 1997, and Fall 1997 cruises) are documented in the final 1997 project report, *Results of Trawling Efforts in the Coastal Habitat of the South Atlantic Bight, FY1997* by South Carolina Marine Resources Division.

Pamlico Sound Survey

During FY1998, 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.

Bottom Mapping Project

In 1992, the SEAMAP-South Atlantic Bottom Mapping Work Group began an intensive effort to establish a regional database that includes the location and characteristics of hard bottom resources throughout 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.

The primary objectives of the Work Group 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 200 m 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 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 Geographic Information System (GIS) or other PC mapping software programs.

By the end of FY1997, more than 65,700 records were compiled from databases obtained off North Carolina, South Carolina, Georgia, and Florida in three study phases. Reports summarizing the databases available for these areas were provided in three final reports submitted to the SEAMAP-SA Committee. Continuing into FY1998, staff with the Florida Marine Research Institute (FMRI) reproduced the Bottom Mapping Final Reports on a CD-ROM readable on any desk top PC (SEAMAP-SA South Atlantic Bight Hardbottom mapping CD-ROM, version 1.0). Included on the CD-ROM are data and maps covering the area from Florida to the North Carolina-Virginia border. The CD-ROM also includes GIS files, a map viewing program (ArcExplorer) and a database file of the entire region that can be imported into most database software systems. The Bottom Mapping Work Group met in May 1998 and discussed future improvements to the CD, product distribution, and internet availability of the data. Copies of the Bottom Mapping CD are available through the ASMFC.

SEAMAP - Caribbean

The Virgin Islands component of the SEAMAP-Caribbean completed their Lobster Survey (1½ years of sampling) in spring 1998. They began the 1998 SEAMAP study sites' Bottom Mapping Project in June 1998 with the side scan sonar mapping of Christmas Cove in St. Thomas. Additional mapping, scheduled for late September/early October was postponed due to Hurricane Georges, which passed through the area on September 21-22. The Virgin Islands will complete mapping of the SEAMAP study areas by spring 1999, and will then return to the reef fish survey.

In the 1998-99 project year, the Puerto Rico component of SEAMAP-Caribbean completed the Reef Fish Survey from 1997-98 as well as the Lobster Survey that had experienced delays in the previous year. Initial set-up of the side scan sonar equipment and some preliminary bottom mapping were conducted in the San Juan Bay estuary in spring 1998, but further mapping in Puerto Rico was disrupted by Hurricane Georges. The Puerto Rico component has applied for a no-cost extension to complete the project and anticipates completion no later than May 1999. The Reef Fish Survey will begin as scheduled in April.

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 16-23, 1998, personnel from the U.S. Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS), Maryland Department of Natural Resources, North Carolina Division of Marine Fisheries, and Acadia University, Nova Scotia, Canada participated in a striped bass tagging cruise. This was the eleventh 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.

In an effort to focus on fish using the southern part of the wintering grounds, and to attempt to tag coastal migratory fish and avoid tagging Chesapeake Bay out-migrants, sampling locations were primarily in North Carolina waters. Efforts were also made to sample the Wimble Shoals area based on observed bycatch of large striped bass during the last three years of the spiny dogfish gill net fishery. All healthy fish were measured, tagged with FWS internal anchor tags, and released. A total of 463 striped bass was tagged and released from 64 trawls. Captured striped bass were tested for coded wire tags (CWT) which indicate hatchery origin. Recaptures included one internal anchor tagged fish and one coded wire tagged fish. Any additional striped bass mortalities were processed for scale and otolith aging, food habits determination, and PCB analysis of the muscle tissue. A database for striped bass tag returns is managed by the FWS in Annapolis, MD.

Additional work on the cruise included enumeration and tagging of spiny dogfish, tagging of Atlantic sturgeon, and measurement of summer flounder. A total of 581 spiny dogfish was tagged with dart tags and released. The number of spiny dogfish captured in 1998 was far below last years' total. As observed in previous years, the majority of captures were females, however, the percentage of males (10.6%) was up this year. Conversely, no neonates were captured in 1998. One Atlantic sturgeon was captured, tagged, and released after taking tissue samples for genetic analysis and a pectoral fin spine section for age analysis. Summer flounder were not tagged this year, since the North Carolina Division of Marine Fisheries has discontinued their tagging program. However, 182 summer flounder were measured, with some larger fish captured than in previous years.

INFORMATION SERVICES

Information from the SEAMAP activities is provided to user groups through 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 documents.

SEAMAP Information System

Biological and environmental data from all SEAMAP-Gulf surveys are included in the SEAMAP Information System, 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 1982-1997 have been entered into the system and data from 1998 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. A total of 216 SEAMAP data requests has 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, all requests have been completed.

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) a modular implementation plan which includes costs and schedule.

Work was completed during FY1990 on the new distributed SEAMAP DMS. New modules completed include those for data entry, edit, upload, data query and download. All of the Gulf States 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 SEAMAP-Gulf 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.

Requested SEAMAP data were used for a multitude of purposes in FY1998:

- 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 1998 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. tyrannus* and age and growth of cobia by NMFS;

- Shrimp viral analysis, life history work on *Centropristis striata* (black sea bass) and *Ballistes capriciscus* (gray triggerfish), and DNA research on *Paralichthys dentatus* (summer flounder) and *Cynoscion regalis* (weakfish) by SCDNR;
- Species verification study on *Brevoortia smithi* (yellowfin menhaden) by NMFS;
- Otolith and gonad analyses on seven species *Leiostomus xanthurus* (spot), *Micropogonias undulatus* (Atlantic croaker), *Pomatomus saltatrix* (bluefish), *Cynoscion regalis* (weakfish), *Menticirrhus americanus* (southern kingfish), *Paralichthys dentatus* (summer flounder), *Paralichthys lethostigma* (southern flounder) for a MARFIN project;
- Juvenile *Scomberomorus maculatus* (Spanish mackerel) for graduate research at Virginia Institute of Marine Science;
- *Rhizoprionodon terraenova* (Atlantic sharpnose shark) for graduate research at the University of Charleston;
- *Etropus crossotus* (fringed flounder) for life history/fecundity study at the University of South Carolina;
- Differentiation of skate and ray DNA by NMFS;
- Validation of juvenile abundance indices on *Cynoscion regalis*, *Leiostomus xanthurus*, *Menticirrhus americanus*, *M. saxatilis*, *Micropogonias undulatus*, *Paralichthys dentatus*, *P. lethostigma*, *Archosargus probatocephalus*, *Brevoortia tyrannus*, *Peprilus alepidotus*, *P. triacanthus*, *Pomatomus saltatrix*, and *Scomberomorus maculatus* by the North Carolina Department of Environment, Health, and Natural Resources;
- Differentiation of shark DNA by NMFS.

Real-time Data

A major function of the SEAMAP Information System in the past 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 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 and edited at the NMFS Mississippi Laboratories, and processed by GSMFC for weekly distribution to management agencies, fishermen, processors and researchers. These plots were also available through the SEAMAP home page. Management agencies also received comprehensive data listings showing penaeid shrimp length frequencies, sampling parameters and environmental conditions.

In the summer of 1998, discussions with representatives from the shrimp industry led the NMFS to request that near-real-

time data not be produced during the 1998 survey. At their request, only one near-real-time mailing was produced in the summer of 1998.

SEAMAP Archiving Center

Larval fish and fish egg samples sorted to the lowest taxa level possible by the Polish Sorting and Identification Center are returned to the SEAMAP Archiving Center for archiving and loan to researchers. For 1998, 13,770 samples were returned from the Polish Sorting and Identification Center. Data entry for the returned sorted samples has been 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. Fourteen requests have been accommodated in the present fiscal year to seven different researchers. The SEAMAP Archiving Center personnel, in cooperation with other staff from FDEP, have completed the fall ichthyoplankton survey (October 2 - 7, 1997) and spring ichthyoplankton survey (June 20 - 26, 1998). The SEAMAP Archiving Center personnel will also be participating in the fall ichthyoplankton cruise. The fall cruise was scheduled to depart in September 1998.

SEAMAP Invertebrate Plankton Archiving Center

The SIPAC is in its fourteenth year of operation. Ken Stuck at the USM/IMS/GCRL serves as 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 at a reduced level of activity. The SIPAC continues to provide unsorted plankton samples and data or specimens of larval invertebrates to qualified researchers upon request.

Due to a lack of funding during this reporting period, there were no students or technicians employed by SIPAC. Therefore, activities were limited to maintenance and curation of the existing collection. The number of samples currently cataloged in the SIPAC collections is 6,268, with 146 samples currently on loan.

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 Polish Sorting and Identification Center, are aliquoted to ¼ their original volume and placed into 100 ml vials. When possible, the remaining ¾ 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 1,450 samples collected from 1982 - 1985 have been aliquoted and prepared for long-term storage. Due to the recent addition of samples to the collection during the year, there is currently no space available for additional samples to be deposited into the SIPAC archives.

During the next fiscal year, the SIPAC will continue to manage SEAMAP plankton collections, accession samples, and provide unsorted samples, sorted specimens and data from the collection to qualified researchers as requested. Efforts with sorted materials will concentrate on curation and analysis of current holdings and publication of distribution patterns of selected taxa by cruise.

Program Documents

The following documents were published and distributed by the SEAMAP program in FY1998:

Donaldson, D.M., D. Hanisko, P.A. Thompson, N. Sanders, Jr. 1998. SEAMAP Environmental and Biological Atlas of the Gulf of Mexico, 1996. No. 52. Gulf States Marine Fisheries Commission, Ocean Springs, 263 pp.

Donaldson, D.M., R. Peuser and L. Hinkey 1997. Annual Report of the Southeast Area Monitoring and Assessment Program (SEAMAP), October 1, 1996 to September 30, 1997. Gulf States Marine Fisheries Commission, Atlantic States Marine Fisheries Commission, Puerto Rico Sea Grant College Program. 11 pp.

Gulf States Marine Fisheries Commission. 1998. SEAMAP Marine Directory. Gulf States Marine Fisheries Commission, Ocean Springs, 1 p. + appendices.

North Carolina Division of Marine Fisheries. 1998. Survey Population Parameters of Marine Recreational Fishes in North Carolina. Annual Progress Report, grant F-42 segment 7 (January 1 – December 31, 1997). North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries. 36 pp.

Peuser, R.L. 1998. SEAMAP - South Atlantic Annual Report, 1 October 1996 - 30 September 1997. Submitted to the South Atlantic Board of the Atlantic States Marine Fisheries Commission, Washington, DC. 105 pp.

Pulley, M.G. 1998. Pamlico Sound Survey, September 1997 Cruise Report, North Carolina Department of Environment, Health, Natural Resources, Division of Marine Fisheries. 25 pp.

Pulley, M.G. 1998. Pamlico Sound Survey, June 1997 Cruise Report, North Carolina Department of Environment, Health, Natural Resources, Division of Marine Fisheries. 22 pp.

Rester, J.K. 1998. SEAMAP Annual Report to the Technical Coordinating Committee (October 1, 1997 to September 30, 1998). Gulf States Marine Fisheries Commission, Ocean Springs, 16 pp. + appendices.

SEAMAP-SA. 1998. South Atlantic Bight Hardbottom Mapping CD-ROM, Version 1.0. Southeast Area Monitoring and Assessment Program – South Atlantic (SEAMAP-SA) Bottom Mapping Work Group. Available: ASMFC (202) 289-6400, September 1998.

South Carolina Marine Resources Division. 1997. 1997 Fall SEAMAP Cruise Report. South Carolina Department of Natural Resources. Charleston, SC., 7 pp.

South Carolina Marine Resources Division. 1998. 1998 Spring SEAMAP Cruise Report. South Carolina Department of Natural Resources. Charleston, SC., 8 pp.

South Carolina Marine Resources Division. 1998. 1998 Summer SEAMAP Cruise Report. South Carolina Department of Natural Resources. Charleston, SC., 7 pp.

South Carolina Marine Resources Division. 1998. Results of Trawling Efforts in the Coastal Habitat of the South Atlantic Bight, FY1997. South Carolina Department of Natural Resources, Charleston, SC. 67 pp.

PROPOSED SEAMAP ACTIVITIES, FY1999

Annual program allocations for the SEAMAP programs, Gulf, South Atlantic and Caribbean total approximately \$1.2 million. Proposed FY1999 activities for all participants are shown in Table 2.

TABLE 2.

PROPOSED SEAMAP ACTIVITIES, FY1999

	Fall	Winter	Spring	Summer
Gulf of Mexico Activities				
Resource Surveys:				
Spring Plankton Survey			X	
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:				
1997 Biological and Environmental Atlas		X		
1999 Marine Directory			X	
FY1998 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
1997 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	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

Richard Waller, Chairperson
Mississippi Department of Marine Resources
USM/IMS/Gulf Coast Research Laboratory

Joanne Lyczkowski-Shultz
National Marine Fisheries Service
Pascagoula Laboratory

Jim Hanifen, Vice Chairperson
Louisiana Department of Wildlife and Fisheries

Richard Leard
Gulf of Mexico Fishery Management Council

Terry Cody
Texas Parks and Wildlife Department

Steve Heath
Alabama Department of Conservation and Natural Resources

Mark Leiby
Florida Department of Environmental Protection

SEAMAP-South Atlantic Representatives

Roger Pugliese, Chairperson
South Atlantic Fishery Management Council

John Dunnigan
Atlantic States Marine Fisheries Commission

David Whitaker, Vice Chairperson
South Carolina Department of Natural Resources

John Merriner
National Marine Fisheries Service
Beaufort Laboratory

Alan Huff
Florida Department of Environmental Protection

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

Henry Ansley
Georgia Department of Natural Resources

SEAMAP-Caribbean Representatives

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

James Oland
U.S. Fish and Wildlife Service

Barbara Kojis
Virgin Island Division of Fish and Wildlife

Miguel Rolón
Caribbean Fishery Management Council

Manuel Hernández-Avila
Puerto Rico Sea Grant College Program

Nancy Thompson
National Marine Fisheries Service

SEAMAP Personnel

Jeffrey K. Rester
SEAMAP-Gulf Coordinator
Gulf States Marine Fisheries Commission

Paul Sandifer, Chairman
Atlantic States Marine Fisheries Commission

Geoff White
SEAMAP-South Atlantic Coordinator
Atlantic States Marine Fisheries Commission

Kenneth Savastano
National Marine Fisheries Service
SEAMAP Data Manager

Lynne Hinkey
SEAMAP-Caribbean Coordinator
Puerto Rico Sea Grant College Program

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

Cynthia Pierce
National Marine Fisheries Service
SEAMAP Program Officer

Senator J.E. "Buster" Brown, Chairman
Gulf States Marine Fisheries Commission



ANNUAL REPORT

OF THE SOUTHEAST AREA MONITORING AND ASSESSMENT PROGRAM (SEAMAP)

OCTOBER 1, 1997 - SEPTEMBER 30, 1998

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