

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

OCTOBER 1, 1989 - SEPTEMBER 30, 1990

SEAMAP - Gulf of Mexico
Gulf States Marine Fisheries Commission

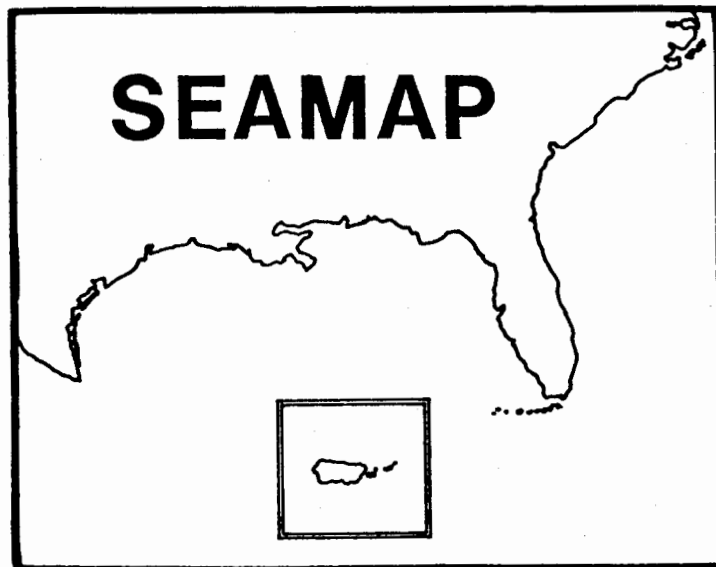
SEAMAP - South Atlantic
Atlantic States Marine Fisheries Commission

SEAMAP - Caribbean
Caribbean Fishery Management Council

MARCH 1991

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ANNUAL REPORT of the Southeast Area Monitoring and Assessment Program October 1, 1989 - September 30, 1990

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 mid-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 Program are shown on Table 1.

Federal programmatic funding for SEAMAP activities and administration was appropriated in Federal Fiscal Years 1985-1990. Funding allocations to participants for FY1986-FY1990 were handled through State-Federal cooperative agreements, administered by SERO and the Southeast Fisheries Center (SEFC), National Marine Fisheries Service (NMFS).

Joint annual reports of the Gulf and South Atlantic SEAMAP programs were published in October 1985, October 1986, and December 1987, covering activities of FY1985, FY1986, and FY1987 (Gulf States Marine Fisheries Commission-GSMFC, Atlantic States Marine Fisheries Commission-ASMFC). Beginning in 1988 the joint annual report included the newly-formed Caribbean component. Publication of reports in August 1989 and March 1990 covered activities for FY1988 and FY1989 (GSMFC, ASMFC, Caribbean Fishery Management Council-CFMC). Beginning in March 1989 the programs approved publication of a cooperative annual program report,

here presented as a summary of SEAMAP operations, administrative activities, and publications for FY1990 and proposed activities for FY1991.

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 Caribbean Fishery Management Council. The Gulf and South Atlantic committees consist of designated representatives from each member State and the NMFS (Mississippi Laboratories), and the Gulf of Mexico and South Atlantic Fishery Management Councils. The Caribbean component consists of members from Puerto Rico Department of Natural Resources (CODREMAR), Virgin Islands Division of Fish and Wildlife, Puerto Rico Sea Grant Program, NMFS-SEFC, U.S. Fish and Wildlife Service, and the National Park Service. Each committee meets several times 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 Caribbean Council, and personnel associated with the SEAMAP Information System, SEAMAP Archiving Center (SAC), and SEAMAP Invertebrate Plankton Archiving Center (SIPAC).

SEAMAP-CARIBBEAN

Action taken at the Joint SEAMAP-Gulf and South Atlantic meeting held in Mayaguez, Puerto Rico, August 1987, resulted in the approval of a SEAMAP-Caribbean component. An invitation was extended to the Caribbean Fishery Management Council to implement the program. The CFMC endorsed the

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TABLE 1.

SEAMAP ORGANIZATION

Program	Administering Organization	Participating Agencies
SEAMAP-Gulf of Mexico	Gulf States Marine Fisheries Commission (GSMFC)	Alabama Department of Conservation and Natural Resources (ADCNR) Florida Department of Natural Resources (FDNR) Louisiana Department of Wildlife and Fisheries (LDWF) Mississippi Department of Wildlife, Fisheries and Parks (MDWFP)/Gulf Coast Research Laboratory Texas Parks and Wildlife Department (TPWD) National Marine Fisheries Service - Southeast Fisheries Center (NMFS-SEFC) Gulf of Mexico Fishery Management Council (GMFMC)
SEAMAP-South Atlantic	Atlantic States Marine Fisheries Commission (ASMFC)	Florida Department of Natural Resources (FDNR) Georgia Department of Natural Resources (GDNR) South Carolina Wildlife and Marine Resources Department (SCWMRD) North Carolina Department of Environment, Health, and Natural Resources National Marine Fisheries Service - Southeast Fisheries Center (NMFS-SEFC) South Atlantic Fishery Management Council (SAFMC)
SEAMAP-Caribbean	Caribbean Fishery Management Council	Puerto Rico Department of Natural Resources (CODREMAR) Virgin Islands Division of Fish and Wildlife Puerto Rico Sea Grant Program National Marine Fisheries Service - Southeast Fisheries Center (NMFS-SEFC) U.S. Fish and Wildlife Service National Park Service

concept and created a task force to determine the appropriateness of SEAMAP activities in the Caribbean fisheries. The task force met on March 30, 1988, and agreed to establish a SEAMAP-Caribbean program under the guidance and supervision of the Caribbean Council. A series of goals and objectives was developed by the participating agencies and presented to the August 1988 Joint SEAMAP meeting held in St. Petersburg, Florida. The first SEAMAP-Caribbean survey of reef resources, including longlining and plankton sampling activities, was planned for November 1988.

The SEAMAP-Caribbean committee participated in the Joint SEAMAP meeting held during July 1990 in Charleston, South Carolina.

The SEAMAP-Caribbean reef resources work group met for a three day working session during September 1990. The purpose of the meeting was to develop a

statistically valid fishery independent survey to monitor the reef resources of the waters around Puerto Rico and the U.S. Virgin Islands. The work group submitted a working draft for a reef resources survey project which was approved by the SEAMAP-Caribbean Committee. The document will be used as a guide for reef resources research. Beginning in 1991, the survey will focus on a preliminary pilot study to assess the survey design and to standardize sampling methodologies between U.S. Virgin Islands and Puerto Rico. The research will be conducted in three-year cycles.

The SEAMAP-Caribbean have been working on the Fishery Independent Data Base Directory. The information for the directory concerning existing fishery-independent data bases and on-going local and federal government, university and other research activities of value in assessing and monitoring living marine resources was collected via 106

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questionnaires mailed to researchers, institutions and governments. The directory is near completion and should be published in early 1991.

The SEAMAP-Caribbean committee initiated conversations with Dr. Bertrand Gobert from ORSTOM (Institut Francais de Recherche Scientifique pour la Developpement en Cooperation) concerning the possibility of establishing a program similar to SEAMAP in the Lesser Antilles. Dr. Gobert is presently developing a program with ORSTOM, FMU (Fisheries Management Unit, St. Lucia), FDD (Fishery Development Division, Dominica) and UAG (Universite Antille-Guyane) to improve the analysis of fisheries by complementing classical approaches with similar data about different fisheries. Also, the SEAMAP-Caribbean was involved in exploring the possibilities concerning post-Hugo research proposals.

In conjunction with the Gulf and South Atlantic components, SEAMAP-Caribbean participated in planning and development of the overall Five-Year Joint Management Plan, which will serve to guide SEAMAP into the mid-1990's.

SEAMAP - GULF OF MEXICO

Major SEAMAP-Gulf Subcommittee meetings were held in October 1989 and March 1990, in conjunction with the Annual Fall and Spring Meetings of the GSMFC. Resource survey planning meetings of the Subcommittee were held in January and July 1990; all meetings included participation by the several work group leaders, Coordinator, Data Manager, curators, and the GSMFC Executive Director.

An annual meeting of the SEAMAP-Gulf program was held in January 1990, in New Orleans, Louisiana with representatives from all participating agencies attending. Representatives from the Gulf program also met with the South Atlantic and Caribbean representatives in July 1990 to discuss respective program needs and priorities for FY1991.

SEAMAP-Gulf work groups met this past year to provide recommendations to the Subcommittee for survey and data management needs. The Shrimp/Bottomfish Work Group met in April 1990 in Ocean Springs, Mississippi. The Plankton Work Group met in September 1990. The Adult Finfish Work Group met in October 1990. Where additional

discussion was needed, the Subcommittee and work groups also deliberated plans and needs via telephone conference calls.

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 FY1990. 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 FY1990 meetings of the SEAMAP-South Atlantic Committee were held in Charleston, South Carolina in April and July 1990. The July meeting was in conjunction with the annual SEAMAP meeting held jointly with SEAMAP-Gulf and SEAMAP-Caribbean.

Topics for the Committee meeting on April 18-19 included the shallow-water trawl survey, status of work groups, five-year SEAMAP management plan, 1991 South Atlantic operations plan, status of SEAMAP coordination and cooperative agreements, and election of new officers. The leader of the Shallow Trawl Work Group reviewed the results of the 1989 survey and plans for the 1990 cruise season. Upon review of the activities of the other work groups, it was agreed to disband three of the groups (stock identification, passive gear, and plankton) because they are not currently needed.

The Committee met on July 23 to review proposed 1991 activities and funding needs in preparation for the joint meeting. Discussion focused on the importance of protecting the funding for the trawl survey and for administrative support. The activities of the work groups were reviewed. The leader of the Crustacean Work Group was present to discuss FY1990 activities. Data from the April 1990 trawl survey were used in a major management decision on closure of the shrimp fishery in South Carolina. It was suggested that the Committee conduct a review of the crustacean data from the shallow-water trawl survey, either in conjunction with a scheduled Committee meeting or as a separate workshop. A report from the leader of the Bottom Mapping Work Group was submitted that summarized responses from potential sources of funding for mapping activities.

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The annual joint budget-planning meeting on July 24 was chaired by the South Atlantic Committee Chairman, who also presented an overview of the SEAMAP-South Atlantic activities. Each program's priorities and funding needs for FY1991 were discussed with representatives of the Gulf and Caribbean committees.

The South Atlantic Committee reconvened on July 25 to determine final plans for FY1991 and to revise the annual operations plan. The highest priority is maintaining the level of sampling in the trawl survey. It was decided to submit applications for the same total funding as in FY1990 but to allocate \$10,000 from administration to the survey. The Committee's priorities for any increased funding would be: 1) full funding for administration plus a small increase for benthic characterization; 2) increased funding for the trawl survey; 3) bottom mapping; and 4) data conversion.

The Crustacean Work Group met in Savannah, Georgia, on November 30 - December 1, 1989, to examine the status of the South Atlantic crustacean fisheries and several topics related to shrimp, blue crabs, stone crabs, and golden crabs. Discussions included the effects of Hurricane Hugo, results of the SEAMAP shallow-water trawl survey and several shrimp monitoring studies, gear efficiency studies, and blue crab management plans for the Gulf of Mexico and the Atlantic Coast. It was decided to produce one issue of the South Atlantic Crustacean Newsletter each year; the 1990 newsletter was published in early FY1991.

The Data Management Work Group attended a training session on the SEAMAP Data Management System at the Stennis Space Center, Mississippi, on December 11-12, 1989.

RESOURCE SURVEYS

In FY1990, collection of resource survey information continued for the ninth 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 1989 Fall Shrimp/Groundfish Survey was conducted from October 16 - November 19, 1989, from off Mobile, Alabama to the U.S.-Mexican border. Vessels from NMFS, Alabama, Mississippi, Louisiana and Texas sampled inshore and offshore waters to 60 fm, covering a total of 351 trawl stations, in addition to plankton and environmental sampling.

Sampling design was modified from previous fall surveys to conform to the summer shrimp/groundfish cruise; 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 commercial and recreationally important fish species.

During the survey the NOAA Ship OREGON II sampled offshore waters and territorial Louisiana and Texas waters. The R/V TOMMY MUNRO sampled Mississippi territorial and offshore waters. The R/V PELICAN sampled Louisiana territorial and offshore waters. Texas vessels sampled within territorial waters. The R/V VERRILL sampled Alabama territorial waters.

Of the total 351 trawl samples taken, NMFS completed 211 stations; Alabama 12; Mississippi 17; Louisiana 31; and Texas 80 trawl stations. All vessels took environmental data, including temperature, salinity and oxygen.

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The greatest catch rates were encountered east of the Mississippi River Delta. Shrimp catch rates were highest in the 50-59 fm strata while the highest finfish catches were recorded in the 20-29 fm strata. Slightly higher catch rates were observed at night.

Ichthyoplankton data were collected by all vessels except Texas, at sample sites occurring nearest to half-degree intervals of latitude/longitude. A total of 63 stations was sampled with bongo and/or neuston nets, as encountered along cruise tracks: NMFS completed 39 ichthyoplankton stations; Louisiana 21; and Mississippi 3. All samples, except those taken by Louisiana, will be sorted at the Polish Sorting Center with specimens and data archived at the SEAMAP Archiving Centers.

°Summer Shrimp/Groundfish Trawl Survey

A planning meeting of the Shrimp/Bottomfish Work Group was held in April 1990 to examine the design for the 1990 Summer Shrimp/Groundfish Trawl 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 FMP; and
- (3) provide information on shrimp and bottomfish stocks across the northern Gulf of Mexico from inshore waters to 50 fm.

The overall sampling strategy during the 1990 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 7 to July 13, 1990. SEAMAP sampling conducted east of the Mississippi River, from July 1 to July 13 re-surveyed eastern areas after emigration of brown shrimp from inshore waters. Sampling locations east and west of the Mississippi River Delta, by vessel, are shown in Figures 5-7 for the following dates: combined June and July sampling east of the River (June 7 to July 13), Gulf waters off Texas (June 11 to July 2), and waters off Louisiana west of the River (July 1 to July 13).

During the survey, the NOAA Ship OREGON II and Mississippi's R/V TOMMY MUNRO sampled offshore and inshore Gulf waters with 40-ft trawls. Alabama's R/V VERRILL sampled offshore Alabama waters with 16-ft trawls in waters less than 5 fm and 40-ft trawls in deeper waters. The R/V PELICAN sampled both Louisiana state waters and offshore waters with 40-ft nets, and Texas vessels sampled Texas state waters and offshore waters with 20-ft nets.

A total of 341 trawl samples was taken from coastal and offshore waters out to 50 fm from Perdido 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 low, with a maximum catch of 15.1 lb/hr of 34-count shrimp. White shrimp catches east of the River were all less than 2 lb/hr. The largest pink shrimp catch rate east of the River was 8.8 lb/hr of 34-count shrimp taken in 11 fm of water off Mobile Bay, Alabama. The next largest pink shrimp catch rate east of the River in June was 7.9 lb/hr of 21-count shrimp south of Petit Bois Island in 12 fm. Finfish catch rates east of the River were generally low, with the largest catch on June 7 of 172 lb/hr with Gulf butterfish predominating.

Moderate catches of brown shrimp were also made off Texas from June 10 to July 2. The largest catch rate occurred June 20 off Brownsville in 16 fm (284.4 lb/hr of 66-count shrimp). White shrimp catches off Texas were low with the largest catch, 39.7 lb/hr of 13-count shrimp, taken off Matagorda Bay in 5 fm. Catch rates for pink shrimp were generally low off Texas, though the largest catch was 11.8 lb/hr of 25-count shrimp south of Galveston Bay in 12 fm. Finfish catch rates were moderate to low in Texas inshore and offshore waters. The largest catch of finfish was 2,436 lb/hr off the entrance to Matagorda Bay with spot predominating.

In July's samples west of the river (Louisiana), brown shrimp catches were low with the largest catch rate of 41.8 lb/hr of 35-count shrimp occurring southeast of Vermilion Bay in 16 fm. White shrimp catches were low, with a maximum catch rate of 2.9 lb/hr of 16-count shrimp taken in 6 fm south of Calcasieu Lake. Catches of pink shrimp were very low off the Louisiana coast with a maximum catch rate of 2.4 lb/hr of 23-count shrimp. Finfish catch rates

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were moderate with the largest catch rate of 1,181 lb/hr taken on July 1 with trout predominating.

In July sampling east of the Mississippi River, brown shrimp catches were low with the highest rate of 6.3 lb/hr of 85-count shrimp taken south of Horn Island, Mississippi in 8 fm on July 13. Highest catch rate of white shrimp east of the River was 0.2 lb/hr of 14-count shrimp taken west of Chandeleur Islands in 22 fm. The highest pink shrimp catch rate east of the River was 13.2 lb/hr of 30-count shrimp taken east of Chandeleur Islands in 11 fm. Finfish catch rates east of the River in July were low with a maximum catch rate of 709 lb/hr reported in 45 fm east of the mouth of the Mississippi River with croaker predominant in the sample.

West of the Mississippi River Delta, hypoxic bottom waters (less than 2.0 parts per million) were noted in several areas between 89°37.8' and 91°21.1' W. Long. in 7-17 fm.

°Spring Plankton Survey

For the eighth season since 1982, plankton samples were collected during the spring in the northern Gulf of Mexico. The NOAA Ship OREGON II and Florida's R/V HERNAN CORTEZ II sampled offshore waters from 24°30' N. Lat. and 85°00' W. Long. from April 19 to May 30, 1990 (Figure 4). At irregular intervals during the survey, the NOAA vessel departed from the scheduled cruise track to run a series of stations across ocean fronts and other physical features. Time and location of these special stations were determined from satellite imagery processed by NMFS Mississippi Laboratories, Stennis Space Center. Samples taken at special frontal boundary stations consisted of bongo and neuston tows, chlorophyll and environmental data.

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°. 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.

A total of 168 stations was sampled. The OREGON II occupied 147 stations and the R/V HERNAN CORTEZ II sampled 21 stations along the west Florida shelf. Time restraints and inclement weather prevented the OREGON II from occupying nine station sites.

Hydrographic data at all stations included surface chlorophylls, salinity, temperature and dissolved oxygen from surface, midwater and near bottom and forel-ule color.

Right bongo and neuston samples from SEAMAP stations will be transshipped by the NMFS Miami Laboratory to the Polish Sorting Center (PSC) in Szczecin, Poland. Left bongo samples are currently archived at the Gulf Coast Research Laboratory in Ocean Springs, Mississippi. Samples from the special frontal boundary stations will be sorted at the Miami Laboratory. Salinity data from the Florida vessels were sent to the NMFS Mississippi Laboratories for interpretation.

°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, 1987, 1988, 1989 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 1 through October 19, 1990 for a total of 128 stations.

The NOAA Ship OREGON II sampled 55 stations from Tampa Bay, Florida to Terrebonne Bay, Louisiana at depths from 5 to 100 fm. Chlorophyll samples were filtered at each station. Florida's R/V HERNAN CORTEZ sampled 30 stations from off Tampa Bay south to the Florida Straits. Stations were located along a 30-minute latitude/longitude grid from inshore waters to the shelf edge. An Alabama vessel sampled 10 stations at the mouth and outside Mobile Bay. The R/V TOMMY MUNRO sampled 2 stations south of Mississippi Sound along a 30-minute grid, and the R/V PELICAN sampled 7 stations in Louisiana waters.

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. Hydrographic sampling included chlorophylls, salinity, temperature and dissolved oxygen from surface, mid-water, and bottom, water transparency and water color. Right

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bongo samples will be transshipped by the NMFS Miami Laboratory to the PSC; left bongo and neuston samples will be stored at the SEAMAP Invertebrate Archiving Center 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 NMFS neuston net. Louisiana sampled with a 0.5-m ring net and a 20.0-cm bongo 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 and 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-Miami Laboratory for transshipment 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 sent to Poland, and maintained at the Gulf Coast Research Laboratory.

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 1990, detailed earlier.

SEAMAP - SOUTH ATLANTIC

°Bottom Mapping Survey

Lack of funding again prevented implementation of the data entry and analysis for the first element in this study, mapping the extent and location of hard-bottom areas off Georgia and north Florida. This project remains a high priority for SEAMAP-South Atlantic, but it must be postponed until funds are available. Sources of funds are being investigated by the Bottom Mapping Work Group. The agencies contacted expressed interest in the project, but are willing to contribute only limited funds. If funding can be obtained, the work group will develop a proposal.

°Nearshore Regional Trawl Survey

The major SEAMAP-South Atlantic survey in FY1990 was the continuing Nearshore Regional Trawl Survey conducted by the South Carolina Division of Marine Resources. 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.

Specific objectives of the survey are: 1) to collect data on size, abundance, distribution, and seasonality of several target species of finfish and decapod crustaceans; 2) to record species composition, biomass, and abundance in order to assess latitudinal and seasonal fluctuations; and 3) to 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 FY1990: fall 1989

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(October 9 - November 14; postponed one week due to Hurricane Hugo), spring 1990 (April 23 - May 23), and summer 1990 (July 18 - August 23). Inshore strata (4.6- to 9.2-m depths) were sampled during each cruise. Offshore strata (9.2- to 19-m depths) were sampled only during fall and spring when penaeid shrimp spawning is thought to occur. Sampling was conducted with paired 22.9-m mongoose-type trawls towed for 20 minutes. All samples were collected during daylight hours to maximize the opportunities for collecting juvenile mackerel. Collections were sorted to species, counted, and weighed. Target species were measured to the nearest centimeter. Hydrographic and meteorological data were also collected at each sampling station.

The fall 1989 cruise completed the first full year of standardized sampling under a stratified random survey design. Sampling was conducted at 106 stations and emphasized 27 target species. The spring 1990 cruise sampled 105 stations and targeted 24 species. Based on data from this cruise, South Carolina made a major management decision on closure of its shrimp fishery. The summer 1990 cruise sampled 78 stations, all in the inshore strata.

A brief summary of the preliminary results of each FY1990 cruise is available as a cruise report. Data from the spring and summer 1990 cruises are being processed by the South Carolina Division of Marine Resources. The results of the entire 1989 cruise season (spring and summer 1989 cruises in addition to the fall 1989 cruise) are documented in the final 1989 project report, Results of Trawling Efforts in the Coastal Habitat of the South Atlantic Bight (Webster, Beatty, and Wenner 1990).

°Pamlico-Albermarle Sounds Survey

During FY1990, the North Carolina Division of Marine Fisheries continued the ongoing Pamlico-Albermarle Sounds Survey with quarterly cruises in December 1989 and in March, June, and September 1990. 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, eastern Albermarle Sound, and the lower Neuse and Pamlico Rivers.

Samples were collected with a 9.1-m falcon trawl towed for 20 minutes during daylight hours. Sampling was conducted according to a stratified random design using depth strata (less than 3.7 m, greater than 3.7 m) and 1-minute grids. Environmental data were recorded at each station. The data are being processed and are made available to the SEAMAP Data Management System.

°Benthic Characterization

During FY1990, the Florida Department of Natural Resources continued work to characterize the structure and general ecology of South Atlantic benthic communities. Invertebrates were collected on four SEAMAP survey cruises in the region during 1983-1986. Selected invertebrate groups from northeast Florida are being identified to the lowest appropriate taxonomic level, and the data are provided to the SEAMAP database.

The identification of all mollusks (38,653 individuals) in the samples has been completed, and they represent 311 species and subspecies in 86 families. Entry of all the mollusk data into the SEAMAP database has been completed and verified. Hermit crabs have been extracted from the gastropod samples. The SEAMAP invertebrate technician was assigned to assist in sorting and identification of echinoderms. It is anticipated that analyses of the data can begin as soon as the echinoderm data are computerized.

SPECIAL STUDIES

°Benthic Surveillance Project

For the seventh year, the SEAMAP Program actively participated in the nationwide sampling for contaminants in coastal fishes and sediments, as part of the NOAA National Status and Trends Benthic Surveillance Project. Both SEAMAP-Gulf of Mexico and SEAMAP-South Atlantic supplied personnel from state fishery management agencies to provide guidance in locating concentrations of the target species, Atlantic croaker and spot.

Sampling methodologies in the 1990 Benthic Surveillance Project were identical to those of the five previous surveys. Gulf sites included:

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Apalachicola Bay (FL), Mobile Bay (AL), Mississippi River Delta (LA), Calcasieu Lake (LA), Galveston Bay (TX), Lavaca Bay (TX), Corpus Christi Bay (TX) and Lower Laguna Madre (TX).

South Atlantic sites sampled in the summer and fall 1990 included: Pamlico Sound (NC), Savannah River (GA), and Biscayne Bay (FL).

Sampling was conducted from August 14 to October 25, 1990, with the NOAA Ship FERRREL serving as the primary platform. Analyses of trace metals, aromatic and chlorinated hydrocarbons, and other contaminants in fish tissues and sediments are coordinated by the NMFS Beaufort (NC) Laboratory.

Special sediment collections were made at additional sites different from the annual sites at four locations. Mobile Bay (1 site), Mississippi River Delta (2 sites), Calcasieu River (1 site) and Corpus Christi Bay (1 site). An intensive survey was conducted in Galveston Bay where a large number of Atlantic croaker, the primary species, were collected at 3 sites. Special collections of hardhead catfish were made at 4 locations: Savannah River (1 site), Mississippi River Delta (1 site), Calcasieu River (3 sites) and Lavaca Bay (1 site). Special collections of red drum and black drum were made at 2 locations: Galveston Bay (1 site) and Lavaca Bay (1 site).

A list of publications produced under NOAA's National Status and Trends Program is available from NOAA, National Status and Trends Program, N/OMA32, 11400 Rockville Pike, Rockville, MD 20852.

°Striped Bass Tagging

During January 16-25, 1990, personnel from the States of North Carolina and Maryland, U.S. Fish and Wildlife Service (FWS), and NMFS/SEFC participated in a striped bass tagging cruise. This was the third 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 to assess the population structure and exploitation rates of the migratory Atlantic Coast stock.

A color video sounder was used to locate targets and reduce bycatch. A total of 3,010 striped bass was captured in 77 tows made at depths of 9-27 m. Of

these, 2,010 healthy fish were measured, tagged with FWS internal anchor tags, and released. Scales were collected from most of these fish for age and growth determinations. Blood samples were collected from 229 fish for stock identification at the FWS National Fish Health Research Laboratory in West Virginia. Severely distressed fish were sacrificed for PCB tissue analyses by the North Carolina Department of Environmental Regulation. A database for the tag returns is managed by FWS.

FIVE YEAR PLAN

Preparation of a joint SEAMAP five-year plan was authorized as a result of the external Joint SEAMAP Program Review conducted in 1987 under contract from the SEFC. North Carolina was funded to prepare this document through the NMFS/North Carolina 1989 SEAMAP cooperative agreement. In FY1990, the Southeast Area Monitoring and Assessment Program (SEAMAP) Management Plan: 1990 - 1995, by C. D. Stephan, was completed and approved by the committees and management bodies of the Gulf, South Atlantic and Caribbean SEAMAP components.

DATA MANAGEMENT

Biological and environmental data from all SEAMAP-Gulf surveys are included in the SEAMAP Information System, managed in conjunction with NMFS-SEFC. 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 1982-1989 have been entered into the system and data from 1989 and 1990 surveys are in the process of being verified, edited, and entered for storage and retrieval. Data from SEAMAP-South Atlantic surveys have not yet been entered into the system, but will be transferred from North Carolina and South Carolina data management systems when the modules for survey data in the SEAMAP system are available.

Verified, non-confidential SEAMAP data are available conditionally to all requestors, although the highest priority is assigned to SEAMAP participants. A total of 95 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.

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To date, 91 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.

As mentioned previously, data from the South Atlantic surveys have not yet been entered into the SEAMAP Data Management System. Pending completion of the system, the States of South Carolina and North Carolina utilize their own computer facilities to store and analyze their SEAMAP data. Data from the Nearshore Regional Trawl Survey are managed under a separate system of the South Carolina Marine Resources Division. Data from the Pamlico-Albermarle Sounds Survey are managed under a system of the North Carolina Division of Marine Fisheries. Funds are still being sought for conversion of these data to the new SEAMAP format. SEAMAP personnel will work with the States to reformat the survey data and transfer it to the SEAMAP system.

During FY1990, a microcomputer was provided by SEAMAP to the State of North Carolina, and updated versions of the system software and user manuals were distributed to each SEAMAP field site. The SEAMAP-South Atlantic Data Management Work Group attended a training session on the new system at Stennis Space Center.

Work was completed during FY90 on the new distributed SEAMAP Data Management System. New modules completed include those for data entry, edit, upload, data query and download has been completed. Operational versions are now located at six SEAMAP field sites. Approximately 61% of the total system

estimated cost of \$536,500 has been committed to contracts (\$328,744). Approximately 98% of the committed contract money (\$321,390) has been utilized as of June 24, 1990. Delivery of the remaining PS/2's has been completed. All Gulf States are now equipped with the necessary computer hardware and software.

The centralized data management system presently being used by NMFS for the SEAMAP Program operates on a Burroughs 7811 computer located in Seattle, Washington, and depends on skilled programmers and computer operators for data entry, retrieval and display. SEAMAP participants submit their data to the SEAMAP Data Manager for system entry, who then assures the entry of data to the Burroughs. To verify the data, printed listings of newly entered data are produced and returned to the SEAMAP participant. Entry errors are corrected on the listing and the data are resubmitted. This mail-oriented loop iterates until all data are verified.

To retrieve data, SEAMAP participants must submit a Data Request and Use Agreement Form to the Data Manager. The Data Manager approves the request, and ensures the data are retrieved from the system by skilled programmers.

Outside users (e.g., Minerals Management Service, U.S. Army Corps of Engineers, etc.) may request listings of particular data sets. The information provided is used for efforts such as environmental impact statements, life history studies, oceanographic process research, and long-term ecological trends strategy evaluation. Outside users, like the SEAMAP participants, submit the request to the SEAMAP Subcommittee through the SEAMAP-Gulf Coordinator for approval to proceed. Once the request is approved, information is provided by the Data Manager and staff members through a priority-based, mail-oriented system.

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

This new system will overcome the deficiencies of the current system (i.e., the time necessary to enter and retrieve data) and will provide powerful

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and flexible local data analysis and display capabilities. Under the proposed system, each SEAMAP site will enter, verify and edit their data, eliminating the mail-oriented loop necessary to enter/edit/verify data under the current system. Secondly, each site will have the capability of locally accessing SEAMAP data, utilizing a user-friendly system. Local data retrieval will allow the data to be accessed in a timely manner with a minimum amount of effort and programming skills.

Under the new system, outside users may continue to request special data sets for research or study. 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 FY1990:

- Evaluating the abundance and size distribution of penaeid shrimp in Federal and state waters to assist in determining opening and closing dates for commercial fisheries.
- Assessing shrimp and groundfish abundance and distribution and their relationship to such environmental parameters as temperature, salinity, and dissolved oxygen.
- Identifying environmental parameters associated with concentrations of larval finfish.
- Compiling the 1983, 1984, 1985, 1986, 1987, and 1988 SEAMAP Biological and Environmental atlases.
- Comparing catches of shrimp and groundfish captured by 40-ft versus 20-ft trawl nets.
- Compiling the 1984, 1985, and 1986 SEAMAP Ichthyoplankton Atlas.

REAL-TIME DATA

A major function of the SEAMAP Information System in 1990 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. Management agencies also received comprehensive data listings showing penaeid shrimp length frequencies, sampling parameters and environmental conditions.

SPECIMEN ARCHIVING

Larval fish and fish egg samples sorted to the family level by the PSC are returned to the SAC for archiving and loan to researchers. Data entry for most of the returned sorted samples is completed in an improved and simplified information management system. All data are now managed by a dual microcomputer/mainframe program which eliminates coding errors and facilitates faster data entry. Samples cataloged to date represent 18 orders, 125 families, 234 genera and 244 species.

The SAC is managed in conjunction with FDNR in St. Petersburg, and processes both specimen loans and requests for associated plankton survey environmental data. Merging of these files within the SEAMAP Information System will greatly facilitate managing the environmental data, presently a cumbersome manual procedure. Plans call for SEAMAP samples to be sorted for ichthyoplankton during the PSC contract period of September 1989 through August 1990. Priorities for sorting these samples from the backlog at PSC have been determined. Beginning in the fall of 1987 plankton samples taken by Louisiana vessels were sorted by LDWF and sorting has continued for 1989-1990 samples. All specimens and data will be provided to the SAC.

Loan of SEAMAP specimens and development of the system and its protocols are supervised by SAC's curator, following policies outlined in the SEAMAP-Gulf Operations Plan. With the complete accessioning of 1986 samples, the catalogue is expected to contain approximately 43,200 lots, a collection of significant size. Due to space constraints and logistical problems with the PSC, the SAC has been hampered which has slowed the increase of the number of samples sorted and cataloged.

