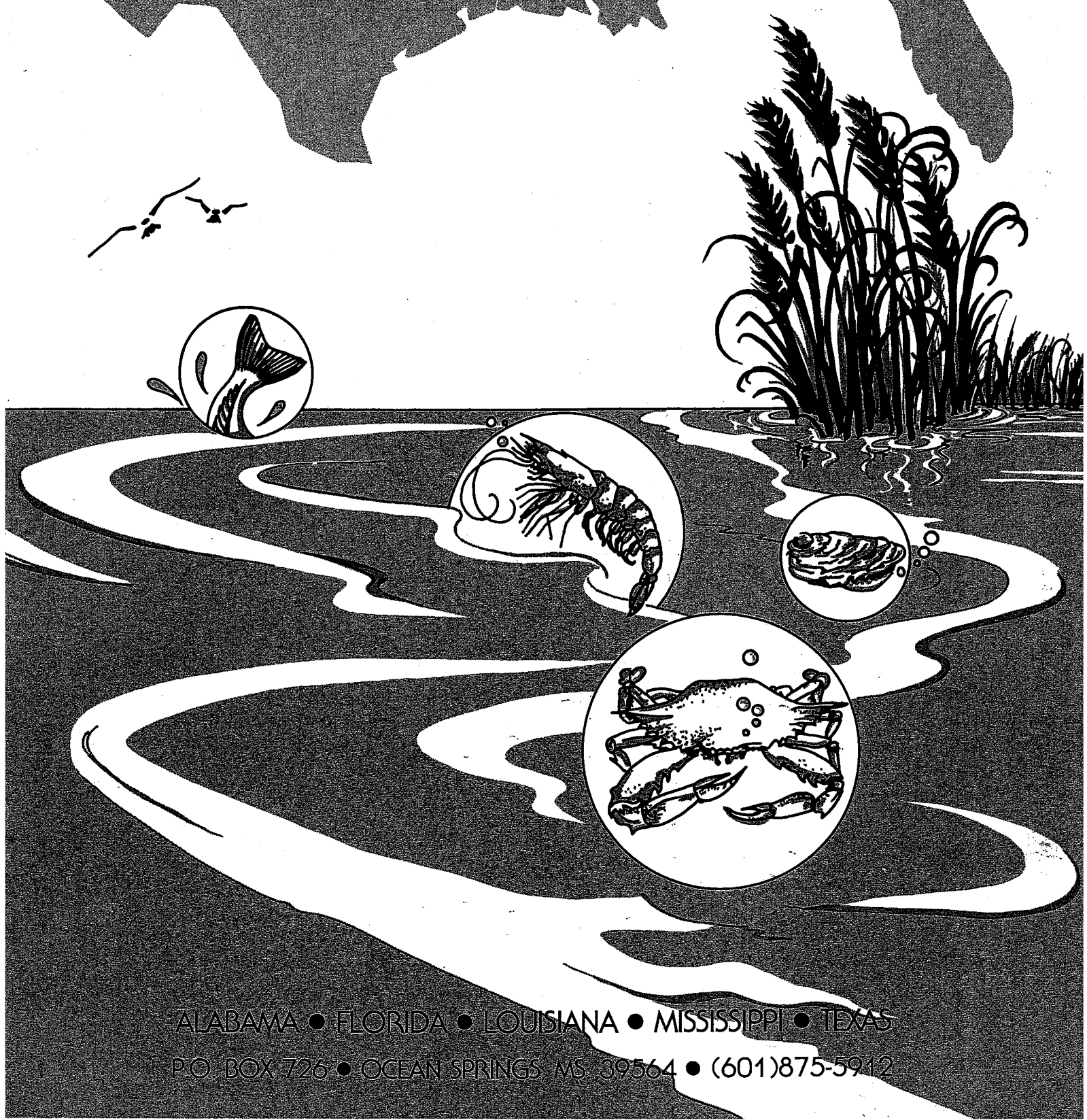


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THIRTY-FIFTH ANNUAL REPORT OF THE GULF STATES MARINE FISHERIES COMMISSION



ALABAMA • FLORIDA • LOUISIANA • MISSISSIPPI • TEXAS

P.O. BOX 726 • OCEAN SPRINGS, MS 39564 • (601)875-5912

The GULF STATES MARINE FISHERIES COMMISSION is an organization of the five States, whose coastal waters are the Gulf of Mexico. This compact, authorized under Public Law 81-66, was signed by the representatives of the Governors of the five Gulf States on July 16, 1949, at Mobile, Alabama. It has as its principal objective the conservation, development, and full utilization of the fishery resources of the Gulf of Mexico, to provide food, employment, income, and recreation to the people of these United States.

GULF STATES MARINE FISHERIES COMMISSION
THIRTY-FIFTH ANNUAL REPORT (1983-1984)

To the

CONGRESS OF THE UNITED STATES

And to the

GOVERNORS AND LEGISLATORS

of Alabama, Florida, Louisiana, Mississippi, and Texas

Presented in compliance with the terms of the Compact and
the State enabling Acts creating such Commission and
Public Law 66 - 81st Congress assenting thereto.

GULF STATES MARINE FISHERIES COMMISSION
P.O. Box 726
Ocean Springs, Mississippi 39564

(601) 875-5912

ACKNOWLEDGEMENT

In submitting this Thirty-Fifth Annual Report, the Commissioners wish to express their most sincere appreciation for the splendid cooperation of the Members of Congress and the Governors and Legislators of the compact states. The Commission fully appreciates that such measure of success as has been attained in the past thirty-five years could not have been possible without such valued assistance. This acknowledgment is also extended to the directorates and staffs of Federal, State and interstate agencies, and to representatives of all organizations and individuals who have contributed toward the realization of the objectives of the GULF STATES MARINE FISHERIES COMMISSION.

Respectfully submitted,

Robert J. Kemp, Chairman
Richard L. Leard, Vice Chairman
Larry B. Simpson, Executive Director

Published June 1985

GULF STATES MARINE FISHERIES COMMISSION

Thirty-fifth Annual Report (1983-1984)

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Roster of the
GULF STATES MARINE FISHERIES COMMISSION

October 1, 1983 - September 30, 1984

Chairman: Robert J. Kemp

Vice-Chairman: Richard L. Leard

COMMISSIONERS

(order of listing - Administrator, Legislator, Governor's appointee)

ALABAMA

John W. Hodnett, Commissioner
Alabama Department of Conservation
and Natural Resources
Montgomery, AL
Taylor F. Harper, Representative
State of Alabama
Grand Bay, AL
John Ray Nelson
Bon Secour Fisheries, Inc.
Bon Secour, AL

Frank J. Patti, Representative
State of Louisiana
Belle Chasse, LA
Leroy Kiffe
Tom Kiffe & Son Boats
Lockport, LA

FLORIDA

Elton J. Gissendanner
Executive Director
Florida Department of Natural
Resources
Tallahassee, FL
Sam Mitchell, Representative
State of Florida
Chipley, Florida
Clyde Richbourg
Gulf Breeze, FL

MISSISSIPPI

Lon Strong, Executive Director
Mississippi Department of
Wildlife Conservation
Jackson, MS
Ted Millette, Representative
State of Mississippi
Pascagoula, MS
Holton D. Turnbough
WGUF Radio Station
Gulfport, MS

LOUISIANA

J. Burton Angelle
Executive Secretary
Louisiana Department of
Wildlife and Fisheries
Baton Rouge, LA

TEXAS

Charles D. Travis
Executive Director
Texas Parks and Wildlife
Austin, TX
H. Tati Santiesteban, Senator
State of Texas
El Paso, TX
Leslie E. Casterline, Jr.
Fulton, TX

STAFF

Larry B. Simpson
Executive Director

Virginia K. Herring
Executive Assistant

Anneka W. Bane
SEAMAP Coordinator

Lucia B. O'Toole
Publication Specialist

COMMISSION OFFICERS ELECTED FOR
YEAR 1983-1984

Chairman: Robert J. Kemp succeeding Taylor F. Harper
Vice-Chairman: Richard L. Leard succeeding Robert J. Kemp

COMMITTEES

Executive Committee.....Robert J. Kemp, Chairman
Technical Coordinating Committee.....Ted Ford, Chairman
 SEAMAP Subcommittee.....Walter Tatum, Chairman
 Crab Subcommittee.....Paul Hammerschmidt, Chairman
 Statistical Subcommittee.....Claude Boudreaux, Chairman
 Anadromous Fish Subcommittee.....Larry Nicholson, Chairman
Industry Advisory Committee.....Ralph Rayburn, Chairman
Recreational Fisheries Committee.....Frederick Deegen, Chairman
Law Enforcement Committee.....Jerry Gollott, Chairman
Southeast Marine Advisory Service Network.....Mac Rawson, Chairman
Gulf State-Federal Fisheries Management Board.....I. B. Byrd, Chairman
 Menhaden Advisory Committee.....Dalton Berry, Chairman

COMMISSION ACTIVITIES

OCTOBER 1983 - SEPTEMBER 1984

The Gulf States Marine Fisheries Commission had a busy year in FY84. The full Commission held two regular semi-annual meetings in October and March. The Committees and Subcommittees met more frequently on an as needed basis. The October meeting was held in Key West, Florida and in keeping with past established policy this was a business meeting without a major symposium on a current issue or topic. At the Key West meeting several new initiatives were assigned to the staff. The Recreational Committee recommended that the Commission support National artificial reef legislation to establish standards and criteria for reef development. Federal legislation in the form of HR 6342 was introduced by Congressman Breaux, Chairman of the Merchant Marine and Fisheries Subcommittee for Fisheries, Wildlife Conservation and the Environment. The Executive Director actively worked on this legislation which was passed during the year. National standards are much needed to prevent loss of trawlable bottoms and conflicts due to ill-conceived and misplaced establishment of artificial fishing reefs.

The Statistical Subcommittee was active in fostering better working relationships between State and Federal partners in cooperative data collection and computer exchange of information. They also participated in the proposed Gulf Council Data Collection Fishery Management Plan.

A new subcommittee (Anadromous Fish Subcommittee) of the Technical Coordinating Committee was established with the charge to develop a Gulf-wide regional management plan for anadromous fishes. The Subcommittee's first action will be directed at striped bass in the Gulf.

As a result of a discussion paper developed by Dr. Thomas McIlwain entitled "Research Needs for Information Leading to Full and Wise Use of Fishery Resources in the Gulf of Mexico", the Executive Director was charged with seeking funding for and the development of a document that would state the needed research and the means by which it could be administered.

The Commission submitted a proposal and was awarded a contract for partial funding of this project by the Gulf and South Atlantic Fisheries Development Foundation, Inc. The project was a major endeavor to be accomplished by January 1, 1985. A broad-based task force of State, Federal, industry, and university personnel was assembled to work on the project. Approximately five major task force meetings were held and editorial consultants were utilized to develop the document. The Commission is hopeful that the project can be completed on schedule and be available for guidance to Federal funding sources for FY86.

The northern Gulf States experienced severe spring flooding in 1983. The Commission was instrumental in securing \$2.5 million to assist the States of Louisiana, Mississippi and Alabama for oyster shell planting to rehabilitate their destroyed reefs. The money was made available during this fiscal year.

The year also saw the passage of landmark legislation to expand the Dingell-Johnson (D-J) program. The new fund, named the Wallop-Breaux Fund after the two Federal legislators who spearheaded and sponsored its passage, provides for the marine fisheries programs to be given an equitable share of these new monies. Heretofore this user tax on fishing equipment and motorboat fuels was utilized almost entirely for freshwater fisheries projects. The States are encouraged by the passage of this legislation which will provide for the much needed expanded recreational work on freshwater and marine projects. Currently the D-J program funds are at \$35

million. It is expected that after incorporation and collection of the newly taxed items and the motorboat fuels taxes that the program could have available \$100 million per year.

The Commission met in Biloxi, Mississippi in March of 1984 for the Annual Spring Meeting. The theme of the meeting was centered around a full-day seminar on "Remote Sensing Technology and Its Application to Fisheries." The Seminar assembled experts from all over the country to discuss remote sensing applications to fisheries. Participants included the following: Florida and Mississippi-Alabama Sea Grant; National Marine Fisheries Service; Gulf and South Atlantic Fisheries Development Foundation, Inc.; Gulf Coast Research Laboratory; Southeast Marine Advisory Services; and the Gulf States Marine Fisheries Commission. The speakers addressed the major topics of finding fish, meteorological information for fisheries, marine and coastal resources, new technology and technology transfer, and extension programs. The information was well received by all who attended and the Commission is hopeful for further advances to bring the practical applications possible from satellites into use by fishermen.

A Southeast Area Monitoring and Assessment Program (SEAMAP) Operations Plan was developed and approved by the Commission during the year to aid that program and Subcommittee's actions.

A severe freeze around Christmas of 1983 caused the marine agencies of the northern Gulf some concern until monitoring reports were completed. Texas reported the loss of some 15 million organisms mainly in shallow water areas. Both Texas and Alabama enacted temporary emergency regulations to protect speckled trout and redfish populations. Alabama may have lost 20,000-50,000 pounds of white and striped mullet and from 7,000-25,000 pounds of speckled trout in two deep areas of Mobile Bay. Louisiana reported temperatures as low as 4.6°C and losses of 5,000-10,000 pounds of speckled trout in Lake Daire. Losses were localized and in shallow water areas. While the losses seem high, the States concurred that this was not unusual in marine areas and they expect no permanent overall effect on marine resources.

The Commission plans to meet in New Orleans, Louisiana in October of 1984 and in Mobile, Alabama for the March meeting in 1985.

MEETINGS/ACTIVITIES OF THE EXECUTIVE DIRECTOR

Gulf States Marine Fisheries Commission (GSMFC)

34th Annual Fall Meeting, Key West, Florida - October 1983
34th Annual Spring Meeting, Biloxi, Mississippi - March 1984
Meeting with Chairman Harper regarding October Commission Meeting, Mobile, Alabama - October 1983
Meeting with Commissions' Executive Directors regarding National priorities, Washington, DC - December 1983
Presented testimony regarding freshwater introduction into Louisiana and Mississippi marshes, Gulfport, Mississippi - December 1983
SEAMAP Conference Call regarding FY84 program - January 1984
SEAMAP Subcommittee meeting regarding FY85 budget, Kenner, Louisiana - January 1984
Radio Broadcast Interview regarding Commission Meeting, Ocean Springs, Mississippi - April 1984
Marine Fisheries Initiative (MARFIN - S/K Contract) Planning Meeting, Ocean Springs, Mississippi - April 1984
Marine Fisheries Initiative (MARFIN - S/K Contract) Task Force Meeting, Mobile, Alabama - May 1984
Texas Sunset Commission Review of GSMFC, Austin, Texas - June 1984
Ad Hoc Retirement Committee Conference Call, Ocean Springs, Mississippi - June 1984
Marine Fisheries Initiative (MARFIN - S/K Contract) Task Force Meeting, Houston, Texas - July 1984
U.S. Fish and Wildlife Service/GSMFC meeting regarding interaction of programs, Biloxi, Mississippi - July 1984
Anadromous Subcommittee Plan development meeting, Gulf Shores, Alabama - July 1984
Meeting with SEAMAP Chairman/Coordinator Gulf and Atlantic regarding FY85 Budget, Gulf Shores, Alabama - July 1984
Meeting with Japanese Delegation regarding Cooperative Squid Research in Gulf of Mexico, St. Petersburg, Florida - August 1984
SEAMAP Subcommittee Meeting regarding FY84 Program, Tampa, Florida - August 1984
Meeting with U.S. Fish and Wildlife Service Grant Program Administrators regarding GSMFC proposals concerning Wallop/Breaux, Tampa, Florida - August 1984
Presented Speech to Moss Point Rotary Club regarding GSMFC, Moss Point, Mississippi - August 1984
Marine Fisheries Initiative (MARFIN - S/K Contract) Task Force Meeting, Tampa, Florida - August 1984
SEAMAP Subcommittee Meeting regarding Budget FY85, New Orleans, Louisiana - September 1984
Presented Testimony before Florida's Governor Graham and Cabinet regarding their data collection program, Tallahassee, Florida - September 1984

Gulf State-Federal Fisheries Management Board (GS-FFMB)

GS-FFMB Meeting, Key West, Florida - October 1983
GS-FFMB Meeting, Biloxi, Mississippi - March 1984

Gulf of Mexico Fishery Management Council (GMFMC)

November 1983	Council Chairman's Meeting - Biloxi, Mississippi
November 1983	Tampa, Florida
January 1984	Houston, Texas
March 1984	Tampa, Florida
May 1984	Brownsville, Texas
July 1984	Key West, Florida (Proxy)
September 1984	New Orleans, Louisiana

Congressional Meetings

Testimony before House Subcommittee on Panama Canal - Outer Continental Shelf regarding fishing/oil and gas interactions, Houma, Louisiana - March 1984
Meeting with Senator Chafee's staff regarding HR5491 and S2667, Washington, DC - June 1984

Other Meetings and Activities

Pacific Marine Fisheries Commission (PMFC) Annual Meeting, Boise, Idaho - November 1983
International Association of Fish and Wildlife Agencies (IAFWA) National Priorities, Washington, DC - December 1983
National Marine Fisheries Service Budget Briefing, Washington, DC - February 1984
Southeast Regional Office Industry Advisory Meeting, St. Petersburg, Florida - February 1984
Marine Fisheries Advisory Committee (MAFAC), Orlando, Florida - February 1984
Presented Speech to National Fish Meal and Oil Association Annual Meeting, Williamsburg, Virginia - February 1984
Texas Shrimp Association Annual Convention, Las Vegas, Nevada - March 1984
Dr. Ted B. Ford Retirement Meeting, Baton Rouge, Louisiana - April 1984
Presented Speech at Sport Fishing Workshop (Sea Grant), Biloxi, Mississippi - April 1984
Shrimp Industry Roundtable Discussions, New Orleans, Louisiana - April 1984
NMFS Mississippi Laboratories/Pascagoula New Wing Dedication, Pascagoula, Mississippi - April 1984
Louisiana Department of Wildlife and Fisheries meeting regarding setting shrimp season, New Orleans, Louisiana - April 1984
NMFS/Southeast Fisheries Center Program Review on Recreational Fisheries, Miami, Florida - May 1984
NMFS/Southeast Fisheries Center Program Review on Endangered Species, Miami, Florida - May 1984
Marine Fisheries Advisory Committee (MAFAC), Washington, DC - June, 1984
National Fishing Week Luncheon, Washington, DC - June 1984
State Directors/Southeast Regional Office NMFS meeting, St. Peterburg, Florida - July 1984
Louisiana Seafood Promotion Board meeting, New Orleans, Louisiana - July 1984
U.S. Fish and Wildlife briefing regarding Wallop/Breaux Fund (expanded D-J), Atlanta, Georgia - August 1984
Meeting with Minerals Management Service regarding Artificial Reef National Plan development, New Orleans, Louisiana, August 1984
International Association of Fish and Wildlife Agencies Annual Meeting, Juneau, Alaska - September 1984

ALABAMA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

MARINE RESOURCES DIVISION

The Marine Resources Division is responsible for management, production and enhancement of the State's marine fishery resources. The Division conducts fisheries research aimed at increasing and protecting fishery resources, increasing the accessibility of fishery stocks to resource users and provides protection of these resources through enforcement of laws and regulations promulgated by the Commissioner.

The Division contains the Administrative, Research and Management, and Enforcement Sections and had 34 full-time employees during FY83-84.

ADMINISTRATIVE SECTION

The Administrative Section contains the Division Director, six full-time clerical, and one custodial-mechanical personnel during FY83-84 with offices maintained at Dauphin Island and Bayou La Batre (Mobile County) and Gulf Shores (Baldwin County).

FISHERIES SECTION

The Fisheries Section contains the Chief Marine Biologist, two Biologist III's, three Biologist II's, three Biologist Aide I's, three Biologist Aide III's, and two part-time biweekly laborers. The Section conducts applied marine fishery research, collects biological data from which management recommendations are made and provides supervision and recommendations on the maintenance and construction of public access areas and artificial reefs. The hatchery facility at Gulf Shores produces striped bass fingerlings for stocking into the estuarine area and additionally conducts mariculture research on a number of recreational and commercially important marine species including red drum, speckled trout, rainbow trout, bull minnows (bait fish) and shrimp.

Sampling of the oyster reefs following the 1983 spring flood which lasted from December through mid-June showed a combined loss of 32 percent (9.6 million) of the oysters and 18 percent (378 million) spat. A Federal grant through the National Marine Fisheries Service (NMFS) was approved for \$364,800 for shell planting during the summer of 1984. An additional \$100,000 grant was approved by the Economic Development Administration for additional work on the oyster reefs during FY85.

A total of 34,590.8 yd³ of clam shell was planted through competitive bid contract with Radcliff Materials at \$13.50/yd³ from July 7-24, 1984. The following areas were planted: western edge Cedar Point and State Bed 20,170.8; Portersville Bay east of Coffee Island 1,503.3; Sand Reef northwest end 3,583.9; Single Clear Reef 7,977.6; and Bush Stake Shoals 1,355.1.

COOPERATIVE STATE/FEDERAL STATISTICAL PROGRAM

The Marine Resources Division/NMFS Cooperative Statistical Program was initiated during FY81-82 to more efficiently collect and make available commercial fish and shellfish catch and

landings data. Since project initiation, the Marine Resources Division has established a data collection system utilizing a port sampler in Baldwin and Mobile counties, hired a data entry person for entering catch data on a microcomputer and hired a state statistician for overseeing the data collection system. The program, although functioning well from a State perspective, has been somewhat stymied from reaching its full potential by the failure of the NMFS to honor in a timely manner its commitment to the program.

COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT PL 88-309

Most of the research being conducted by the biological section of the Marine Resources Division is under this Federal program. Research includes shrimp, crab, finfish and oyster assessment and monitoring programs, environmental assessment program and mariculture program.

Forty-six biological samples were taken monthly to assess and monitor shrimp, crabs and fish and 20 samples were taken during the year to assess oyster reefs. A monthly catch per unit effort (CPUE) was determined for juvenile and postlarval shrimp, blue crab juveniles and megalopae, and targeted finfish species.

Juvenile brown shrimp appeared in 1984 samples in April with a CPUE of 0.4, extremely low compared to previous years but by May had increased to 101.9, the highest since 1977. Juvenile white shrimp appeared in samples in July with a CPUE of 15.1. This July CPUE was higher than any similar period since July 1979.

Insufficient data have been collected to provide any pattern between crab larval abundance and subsequent harvest. Blue crab megalopae CPUE was very low in all samples from October 1983-September 1984. Conversely, juvenile blue crab CPUE was extremely high during the period January 1984-September 1984. A peak CPUE of juvenile, which was three times greater than any monthly CPUE since 1980, occurred in May of 1984. Preliminary data for 1984 show the harvest to be about three times the average.

Eight finfish species were selected to receive special attention in the assessment and monitoring program because of commercial, recreational, or food chain importance. These species were Gulf menhaden, sand seatrout, spotted seatrout, Atlantic croaker, spot, Southern flounder, redfish and striped mullet. The CPUE for all species except spotted seatrout and red drum was higher than the average annual CPUE for the past three years (1981-1983). The CPUE for spotted seatrout and red drum was less than the past three years average CPUE.

A large 1983 oyster spat set was reflected in 1984 by a large increase in oyster densities on Buoy Reef (+57%), Cedar Point Reef (+1130%), and Sand Reef (+6100%). The 1984 spat set was down by 61 percent on Buoy Reef, 64 percent on Cedar Point Reef, and 81 percent on Sand Reef.

The number of U.S. Army Corps of Engineers permit requests for construction in the coastal area during FY83-84 declined by 28 percent from FY82-83. Public awareness programs on the importance of fishery habitat in the coastal area was given special emphasis by all Marine Resources Division employees during FY83-84.

Juvenile shrimp, Penaeus vannamei, stocked in production ponds at the Claude Peteet Mariculture Center at 20,000, 25,000 and 30,000/acre in July and August 1983 and harvested after 79-110 production days produced 701, 774 and 948 pounds/acre, respectively. All shrimp harvested were 26-30 count (no./lb).

Production experiments with bull minnows (Fundulus grandis) continued during 1984. Egg production studies conducted during 1984 suggest that best egg production of bull minnows occurs

at a female to male ratio of 2:1, stocking rate of 5,000/acre, and spawning mat space of 166.4 cm²/female. A new disease, tentatively placed in the genus Alcaligenes, was isolated from cultured bull minnows during both 1983 and 1984. This disease poses a unique problem to the bull minnow culturist in that it appears to be most virulent at temperatures from 18°C to 25°C which exactly corresponds with spawning temperatures.

Four strains of rainbow trout were tested for the U.S. Fish and Wildlife Service (USF&WS) for pond culture potential during fall and winter of 1983-84. Fastest growth and greatest production was achieved by the Donaldson strain, best survived by the Wytheville strain, and best feed conversion by the Wytheville and London strains.

Efforts were intensified in the spring of 1984 to develop culture techniques for speckled trout. Techniques developed in spawning, larval rearing, and pond production of speckled trout at the Marine Resources Division's Claude Peteet Mariculture Center enabled the Division to stock 200 five and six-inch tagged speckled trout into the estuarine system in November. Even though this seems to be a small number of fish for the tremendous efforts put into the production project, it represents a major breakthrough because it is the first time speckled trout have been raised in captivity, tagged, and released into an estuary. Little is known about speckled trout during their first year of life and the annual release of tagged species coupled with the return of tagged fish to the Marine Resources Division by fishermen will help greatly in filling data gaps.

ANADROMOUS FISH ACT PL 89-304

Project number AFCS-23-1 is a cooperative project between the States of Alabama and Mississippi and is jointly funded by the Federal government (NMFS and USF&WS) and the States on a 66 2/3 to 33 1/3 match, respectively. The cooperative project utilized facilities at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi, to culture phase I striped bass after which the facilities at Claude Peteet Mariculture Center, Gulf Shores, Alabama, were utilized to culture advanced striped bass fingerlings. Personnel from the two States then worked together in the harvest, tagging and releasing of the cultured fish.

Fifteen ponds were stocked with phase I fingerlings reared at the Gulf Coast Research Laboratory on 27 and 28 May 1983 ponds stocked with 25,000 fish/acre had an average production of 255 pounds/acre and 30.9 percent survival. Ponds stocked with 10,000 fish/acre had an average production of 33 pounds/acre had 57.9 percent survival. Total production was 22,481 fingerlings.

A total of 20,160 fingerlings was tagged with Floy internal anchor tags and released in Alabama and Mississippi coastal waters. Overnight tagging mortality was 0.1 percent.

Thirteen fish were captured in Mississippi and 28 were captured in Alabama during evaluation surveys. Fish ranged in size from 33.9 cm to 60.0 cm in Mississippi and 18.4 cm to 61.0 cm in Alabama.

LAW ENFORCEMENT SECTION

The Enforcement Section contains 13 Conservation Enforcement Officers, eight in Mobile County and five in Baldwin County. Officers patrol the 780 square miles of brackish and salt waters of the State while enforcing state and federal laws and regulations pertaining primarily to seafood protection. They also enforce laws and regulations pertaining to public safety and unlawful activities such as smuggling. In addition to law enforcement, the officers conduct

numerous search and rescue operations for overdue or disabled vessels and assist various Federal, State, county and volunteer agencies with seafood festivals, fishing rodeos and sailboat races.

Marine Resources Division enforcement officers worked a total of 24,536 boat and shore patrol hours. During this period they checked 12,919 boats and 705 seafood shops. The officers worked 206 hours involving search and rescue missions. Presentations by enforcement officers about Alabama's marine resources laws and regulations were given at meetings sponsored by Alabama Sea Grant, Catholic Social Services, and Mobile and Baldwin county schools. Marine Resources Division officers assisted the Game and Fish Division during deer and dove seasons in Mobile, Baldwin, Butler, Conecuh and Escambia counties. Citations were given for 418 violations of marine resources, game and fish and boating safety laws. Violations of shrimping laws and regulations constituted 46 percent of issued citations. The conviction rate for all citations issued was 92 percent.

Officers Barry Bracknell and Paul Murphy were presented Officer-of-the-Year awards for their outstanding efforts by the Gulf Coast Conservation Association.

Commercial Fisheries Landings

Total seafood landings in Alabama during 1983 were 20,829,000 pounds valued at \$43 million which was a decrease of 17 percent in volume and an 8 percent decrease in value under 1982. The decrease in quantity resulted from poor catches of shrimp, white trout, Atlantic croaker and oysters.

Shrimp landings were 15,416,000 pounds valued at \$40 million accounting for 74 percent of the volume and 94 percent of the value of all landings during 1983.

Oyster landings were 335,666 pounds of meat valued at \$417,153. This was a 78 percent decrease from 1982 and was about one-third of the average annual harvest. Unless funds are made available for annual shell planting annual fluctuations in production will occur. The high landings during 1982 of 1.5 million pounds resulted from the Federally funded planting program in 1980. Oysters require two years to reach legal size and the inability to plant shell during 1981 is evident in the extremely low production during 1983.

Fish Kills

A total of 20 fish kill investigations was conducted by Marine Resource Division personnel during 1984 with an estimated 28,578,625 fish killed. The kills started in January with winter kills, went into spring with net and trawl discards and continued through the summer with menhaden kills from low dissolved oxygen. Fish kills occurred throughout the estuarine system and in the Gulf of Mexico. The frequency and intensity of the kills appear to be associated with very strong year classes of finfishes. Strong year class strengths identified by the Division's assessment and monitoring program were very evident for all species associated with kills during the year.

Location	County	Date	Total Killed	Species
Little Lagoon	Baldwin	1/5/84	20,000	Silver Mullet
Soldier Creek	Baldwin	1/6/84	1,000	Silver Mullet
Palmetto Creek	Baldwin	1/6/84	1,000	Silver Mullet
Eastern Shore, Mobile Bay	Baldwin	4/27/84	4,000	Hardhead Catfish
Ft. Morgan Pen., Mobile Bay	Baldwin	5/15/84	6,116	Hardhead Catfish
Dog River	Mobile	5/16/84	2,200,000	Menhaden
Gulf of Mexico	Baldwin	5/22/84	5,491	Hardhead Catfish
Salt Creek, Dauphin Island	Mobile	5/25/84	2,630,000	Menhaden
Point aux Pines	Mobile	5/25/84	1,000,000	Menhaden
Bayou La Batre	Mobile	5/23/84	60,000	Menhaden
Dog River	Mobile	6/5/84	1,586,340	Menhaden
Bon Secour River	Baldwin	6/25/84	6,600,000	Menhaden
Point Clear, Mobile Bay	Baldwin	6/19/84	1,211,000	Menhaden
Battles Wharf, Mobile Bay	Baldwin	6/22/84	15,417	Menhaden
Bayou La Batre	Mobile	6/19/84	38,000	Menhaden
Mississippi Sound	Mobile	6/28/84	100	Menhaden & Spot
Gulf of Mexico, Dauphin Is.	Mobile	6/27/84	61	Menhaden
Old River	Baldwin	5/25/84	13,200,000	Menhaden
Theodore Island Canal	Mobile	7/20/84	65	Pinfish
Dauphin Island Bay	Mobile	7/23/84	<u>35</u>	Striped Mullet
		Total	- 28,578,625	

Publications

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- Hawke, J. P. 1983. Spawning, Larval Rearing and Pond Production of Selected Marine Species. Completion Report. Project 2-391-R-1. pp 60-108.
- Minton, R. V. 1984. Alabama and Mississippi Cooperative Striped Bass Restoration Program. Completion Report. Project AFCS-23-1. 18 p.
- Swingle, H. A. 1984. Menhaden, A Misunderstood Fishery. Alabama Conservation September/October.
- Tatum, W. M. 1984. Some Folks are Connoisseurs of Gulf Coast Cuisine, Some are Not. Alabama Conservation January/February.
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FLORIDA DEPARTMENT OF NATURAL RESOURCES

DIVISION OF MARINE RESOURCES

BUREAU OF MARINE RESEARCH

The Florida Department of Natural Resources Bureau of Marine Research activities in Gulf and Atlantic fisheries management plans or bioprofiles included supplying research data and critiques of several species. Other advisory and research assistance was requested and given to various Federal, State and local agencies. New programs in 1984 included transferring West Indian Manatee recovery efforts to the Bureau; designing habitat research and rehabilitation efforts in the Tampa Bay area; investigating artificial conditioning and spawning of snook; establishing a study of the succession of toxic dinoflagellates in disturbed coral reef habitat; initiating several wetland habitat studies; and implementing a State "trip ticket" program for gathering fisheries statistics.

FINFISH

King mackerel size frequency monitoring continues. Electrophoretic research conducted this year, under contract, suggests that there are multiple stocks of king mackerel in the Gulf and South Atlantic. Tagging results also suggested multiple stocks, however, the ranges of these stocks suggested by the electrophoretic work differ from tagging results.

Snook tagging, in cooperation with recreational fishermen, was initiated on the lower east coast of Florida. Studies on snook spawning and physiology of growth and reproduction started this year.

Redfish research findings resulted in the following profile; adults spawn at the mouth of Tampa Bay and occasionally within the Bay, the young migrate toward fresher waters and as juveniles are found around freshwater outfalls frequently in areas of mud bottom, around age 3 redfish begin migrating out of the bay system and enter the offshore population. Tagging of redfish up to 3 years within Tampa Bay continued. The effects of fishing and the impacts of changing fishing patterns were determined for red drum and spotted seatrout in Florida. Separate models were used to assess for growth overfishing and recruitment overfishing. The parameters for each model were estimated from life history and tagging studies in Florida. The redfish is being growth overfished in Florida and it is also possible that they are being recruitment overfished. In both cases estimates of natural mortality is a critical factor in determining methods to alleviate this stress on Florida populations. Stocks assessment findings for spotted seatrout indicate that the fishery has the potential for being recruitment overfished with the present minimum size limit and fishing mortality. An increase in minimum size is supported by investigations of the possibility of seatrout being growth overfished. If natural mortality is moderate to high, then the greatest yields could be harvested if the minimum size limits were increased. A workshop on the biology and management of redfish and spotted seatrout in Florida, sponsored by the Department and the Marine Fisheries Commission, was held November 15-17.

INVERTEBRATES

Investigations of lobster fishery practices, which includes using juvenile lobsters as bait, continued. These studies included trap design studies (escape gap), effects of injury on lobster growth, and the effects of air exposure on lobster blood chemistry and desiccation rate. Escape gap research is aimed at finding a trap design that will allow juvenile lobsters to escape while successfully trapping legal-sized lobsters. The studies of growth and injury indicate that growth of injured lobsters is less than uninjured. Several symptoms resulting from exposure were noted in blood chemistry analysis of air-exposed lobsters. Chronic effects of exposure persisted in the form of reduced responsiveness to threatening stimuli.

Blue crab tagging began in Sarasota Bay, Charlotte Harbor, the eastern and western portions of the Everglades, and Apalachee Bay. Results continue to show seasonal northerly migration of female crabs, including migration of the tagged crabs from the eastern portion of the Everglades westward into the Ten Thousand Islands region.

HABITAT

Under contract with the Florida Department of Environmental Regulation, the Bureau has continued to assess coastal and estuarine fisheries habitat changes. Areal fisheries habitat component loss e.g., mangroves, seagrasses, saltmarshes, mud flats, and oyster reefs, has been documented through time series evaluations of aerial photographs, satellite imagery, and maps for Charlotte Harbor, Lake Worth, Tampa Bay, Nassau River and portions of the Indian and Loxahatchee Rivers.

In addition to documentation of habitat loss and vegetation inventories, there are several other habitat studies underway. These projects include evaluation of seagrass loss in bay systems due to shading seagrasses and studying effects of tidal inundation on mangroves. A major habitat study was started to perform isotopic analysis of several estuarine fishes and their prey to determine their trophic relationships to mangroves, seagrasses, macroalgae, and phytoplankton by bay system.

Evaluation of human impacts on coral reefs continues. The Bureau was active in assessing the damages caused by the grounding of the Wellwood tanker on Molasses Reef in Key Largo National Marine Sanctuary. Rehabilitation of the reef will be monitored by a variety of agencies.

PLANKTON

The Bureau archived the 1982 SEAMAP (Southeast Area Monitoring and Assessment Program) ichthyoplankton collection and participated in a research cruise to collect mackerel larvae. Curating the SEAMAP ichthyoplankton collection continues. The collection has served as a reference source of larval fishes for Southeast U.S. scientists.

Studies of toxic dinoflagellates continue. The Bureau initiated a study of the distribution and succession of toxic dinoflagellates at the disturbed coral reef site at Molasses Reef. Studies of ciguatera involve culturing suspect toxic species and determining the systematics, distribution, and seasonality of these species.

ENDANGERED SPECIES

The green sea turtle headstart program continued. Preliminary figures on nest sightings in 1984 were over 20,000 for loggerhead, green and leatherback sea turtle nests. Greater than 700 km of beach were surveyed.

West Indian manatee recovery efforts were transferred to the Bureau this year. The State legislature established a continuing appropriation for manatee recovery work. This work includes assessing inshore sites where manatees congregate for inclusion as manatee sanctuaries, review of development permits for potential harm to manatee populations, posting signs in manatee sanctuaries, establishing research priorities, and cooperating with Federal and private efforts.

FISHERIES STATISTICS

The fisheries statistics and data processing cooperative effort with National Marine Fisheries Service (NMFS) continued. Additionally, the State "trip ticket" program for commercial statistics started in December and had about 200 dealers reporting. When the program is in full operation, there will be about 600 reporting dealers. The purpose of these programs is to determine catch, effort, and exvessel value of all marine commercial fishery resources landed in Florida. The NMFS recreational catch statistics for 1979-84 were used for stock assessment of mackerels, redfish, and spotted seatrout. A State recreational fisheries program was designed and awaits sufficient funding for implementation.

BUREAU OF MARKETING AND EXTENSION SERVICES

The seafood industry today plays an important role in Florida's economy and the Florida Department of Natural Resources. The Bureau of Marketing and Extension Services is a vital factor in its continuous growth. The Bureau's prime function is to spearhead the State's seafood marketing activities, not only in Florida, but in existing and potential markets both foreign and domestic. With headquarters in Tallahassee, the Bureau consists of seven offices located throughout Florida; Atlanta, Georgia; and Little Rock, Arkansas.

Consumers are made aware of Florida seafood through personally conducted group demonstrations, television demonstrations, radio spots, and interviews, plus newspaper and magazine articles containing recipes and photographs. However, education goes much further than directly to the consumer. Marketing Specialists are in constant touch with food chain seafood merchandisers, brokers, wholesalers and retail seafood dealers making these people aware of species availability, promotional efforts and materials, "tie-ins," and market trends. Full knowledge of existing conditions in both Florida and the Nation's seafood industry, plus knowledge of and potential marketing possibilities is essential. This is accomplished by the continuous analysis of "catch" statistics, current market trends, and direct contacts with producers and processors. Also, Marketing staff members engage in specific seasonal promotions three times a year.

Educating consumers and professional food people on the nutritional value, selection, handling and storage techniques of Florida seafood products is another function of staff members. Reaching further to enhance the use of Florida seafood, school lunch program directors, institutional food directors and buyers, and other groups receive educational demonstrations and information to guide them in making cost-effective seafood selections. This past year, a major breakthrough was accomplished in a newly revitalized institutional program.

Many meetings and taste tests conducted in cooperation with the Florida Department of Corrections and the Florida Department of Health and Rehabilitative Services, and school lunch personnel have brought about new interests in Florida seafood and seafood products. The success of this program was due, in a large part, to the participation and interest of various industry representatives, who took the time to understand the problems associated with institutional foodservice and worked toward a common solution to increase the utilization of seafood.

The Bureau coordinated and participated in various trade shows and functions both nationally and internationally. These activities were conducted in concert with the Gulf and South Atlantic Fisheries Development Foundation, Inc. These shows included ANUGA International Food Fair in Cologne, West Germany; Alimentaria '84 in Barcelona, Spain; Hoteres and Foodex Japan '84 in Tokyo, Japan; Caribbean Food and Equipment Trade Exposition in San Juan, Puerto Rico; Rocky Mountain Hospitality Convention in Denver, Colorado; Pacific International Hospitality Convention in Seattle, Washington; Food Marketing Institute Convention, Dallas, Texas; 4th Gourmet Food and Wine Show, San Francisco, California; SIAL 84, Paris, France, National Grocer's Association Food Industry Exposition, Reno, Nevada; Midwest Grocer's Show, Indianapolis, Indiana; the American Diabetic Convention, Washington, D.C.; Florida Week, Toronto, Canada; and, Florida Trade Mission, Toronto/Calgary, Canada.

The Bureau continues to produce and distribute multi-million copies of point-of-sale and informational materials to retail markets, grocery chains, etc. These materials maintain top priority by retailers to educate the public on the awareness and utilization of seafood. While the materials are provided free-of-charge, major retail food chains are encouraged to utilize the Bureau's information, artwork, and transparencies to create their own point-of-sale materials.

The future for seafood marketing continues to focus on "change" and "new technology." The Bureau recently acquired video equipment which enables production of inhouse short-series video tapes to tell the story. Tapes will be introduced at seafood retail counters as point-of-sale information and will offer exciting graphics for seminars and consumer education programs. A tape library will be available for distribution of taped programs throughout the United States upon request and will contain a variety of subjects from "Catch to Kitchen" about the industry.

These marketing activities are a major reason why Florida's seafood industry is a great economic factor to the State, continuing to enrich those who participate in the production, distribution and consumption of seafood both nationally and internationally.

BUREAU OF MARINE RESOURCE REGULATION AND DEVELOPMENT

The primary responsibilities of the Bureau include the classification and monitoring of shellfish growing waters and the inspection of shellfish and blue crab processing plants to insure that shellfish and blue crabs are processed in a sanitary manner. Other programs include oyster reef construction and oyster transplanting, shellfish leasing, and artificial reef construction.

Approximately 10,000 shellfish growing water samples were tested for fecal coliform contamination to monitor Florida's shellfish harvesting areas. Florida has, as of 1980, 512,227 acres of Approved waters, 110,281 acres of Conditionally Approved waters, 292,484 acres of Prohibited waters and 1,352,635 acres of unclassified waters as calculated by the Food and Drug Administration's Northeast Technical Services Unit. Ten Environmental Specialists routinely

monitor open and prohibited areas. In addition to routine water monitoring, personnel are responsible for red tide sampling and comprehensive shellfish area surveys or reappraisals.

A plan to manage the shellfish harvesting areas of the Apalachicola Bay system was developed. Statistical analysis of environmental data from 1979 through early 1984 revealed that the Apalachicola River stage and the amount of local rainfall significantly affected the densities of fecal coliform organisms in the shellfish growing areas. Multiple regression analysis was performed using a two variable model. The equation describing the relationship between fecal coliform densities, river stage, and rainfall was used to determine the environmental conditions under which shellfish harvesting areas would exceed the recommended fecal coliform standard.

The Processing Plant Inspection Program is staffed by five Environmental Health Specialists responsible for ensuring that oyster, clam and blue crab processing plants throughout Florida maintain strict adherence to sanitary standards. As of January, 1985, a total of 263 oyster processing plants and 40 blue crab processing plants were certified.

One full-time staff member is utilized in the Shellfish Leasing Program and is responsible for the inspection of existing shellfish leases for compliance with State law in the cultivation of oysters and clams in State waters. Additionally, proposed leases are inspected to insure that the requested lease areas are compatible with those conditions favorable for oyster or clam cultivation. More than 2,300 acres are currently under lease.

The Artificial Reef Construction Program, implemented August 7, 1979, had 12 projects funded between the first year and 1981. By June, 1984, that figure had jumped to 54. Eleven reef construction projects will be funded in 1985.

Nine staff members are assigned to the Oyster Culture Program and are responsible for the construction of artificial oyster reefs to enhance the production of oysters in selected areas around the State. Shucked oyster shells are collected from selected oyster shucking establishments, stockpiled and "cured" before being used as cultch for the "planting" of these reefs. During 1984, more than 100 acres of oyster reefs were planted in Apalachicola Bay.

Legislative appropriations for relaying seed oysters and rehabilitating oyster reefs totaled \$300,000 during fiscal year 1984-85. Funds were committed to programs in the following Florida counties: Bay County received \$100,000; Wakulla County received \$35,000; Levy County received \$40,000; St. Johns County received \$25,000; and Franklin County received \$100,000 in addition to \$60,000 remaining from 1983-84 allocations. Funds were administered through contracts between the Department of Natural Resources and local fishermen's associations. Contracts accounted for planting 170,683 bushels of seed oysters, 38,108 bushels of shucked scallop shells, and 3,006 yards³ of dredged clam shells. These figures do not include Franklin County's 1984-85 allocations. Programs were supervised by representatives of the Division of Marine Resources.

Depuration is a process whereby bacteria-free water is circulated through shellfish harvested from polluted areas. After a minimum of 48 hours, the process will render shellfish safe for human consumption. Ultraviolet radiation is used to kill bacteria and viruses which are purged by the contaminated shellfish. Five depuration plants are currently permitted by the Department.

LOUISIANA DEPARTMENT OF WILDLIFE AND FISHERIES

SEAFOOD DIVISION

ADMINISTRATIVE SECTION

The Administrative Section controls the budgetary, personnel and policy function of the Division; technical and administrative personnel also perform research and management activities. Additionally, Division personnel serve as technical representatives on various committees, commissions and task forces. During 1984 technical assistance was given to various commissions and task forces, i.e. Gulf States Marine Fisheries Commission, Gulf of Mexico Fishery Management Council, Governor's Saltwater Finfish Task Force, Task Force on Shrimp Management, Lott/McIlwain Task Force, etc. In addition personnel reviewed and commented on several fisheries management plans for the FCZ (Fishery Conservation Zone) administered by the Gulf of Mexico Fishery Management Council.

This Section also administers and issues permits to persons engaged in various activities across the coast. During the year 57 scientific collecting permits were issued to scientists and researchers to collect specimens using a variety of gear and techniques for scientific research and educational purposes. Additionally 28 shrimp bait dealer permits were issued to bait dealers to harvest shrimp for live bait between the spring and fall inshore shrimp seasons. This Section also issued and monitored 21 pompano permits and 45 underutilized species permits.

LYLE S. ST. AMANT MARINE LABORATORY

The primary function of the Lyle S. St. Amant Marine Laboratory on Grand Terre Island is to conduct research aimed at providing better management information on commercially and recreationally important marine species. The major research projects undertaken in 1984 include:

1. Spotted Seatrout and Red Drum

A monitoring project was undertaken to determine relative stock size, population fluctuation and distribution, evaluate the effects of environmental parameters on stocks and increase the knowledge on habitat preference. Six sampling sites have been selected throughout the Barataria Bay system as a preliminary monitoring effort. The sites were paired on a north-south transect, so two different habitat types were sampled; one along the marshy shoreline and the other along an open water reef. The strike method of capture was employed using a 600 foot monofilament gill net with 1", 2", 3", and 4" stretch mesh. Environmental data (salinity and temperature) was collected at each of the sampling sites.

A recreational catch survey of lower Barataria estuary was conducted to obtain estimates of harvest, recreational effort and to describe temporal and spatial patterns of fishing pressure and distribution of fishermen in the system. The basic sampling period was a calendar month, and day-type was stratified with each month as weekday and weekend/holiday. The total area encompassed was 122,424 acres.

The objectives of a project entitled "Growth and Distribution of Young-of-the-Year Spotted Seatrout and Red Drum in Barataria Estuary" were to determine habitat differences and local

distribution of juvenile spotted seatrout and red drum, monitor growth rates and develop a reasonable quantitative sampling methodology for assessing year class strength. Samples were taken bi-weekly at thirteen prescribed stations. Gear type used was a 20 x 6 foot minnow seine with 1/8 inch mesh. Sixty feet of shoreline were sampled at each station.

A study designed to age red drum to a year class using scales and otoliths as age determinants and to estimate growth with respect to year class was conducted. Red drum have been collected from Barataria Bay and adjacent waters using seines, pound net, trammel net, gill net, rotenone, and hook and line. Scales and otoliths were taken from each fish for age analysis. Annuli from scales were read from either the scale itself or an acetate impression of the scale's surface. Otoliths were sectioned, mounted on a slide, and examined microscopically. Morphometric and age data were analyzed to generate growth estimates as related to year class.

2. Menhaden

Ichthyoplankton samples were taken at six sites along the Barataria Waterway. These stations were chosen to sample diversified environmental regimes. The objective of this study was to monitor larval fish movements with a particular emphasis on Gulf menhaden, in response to these regimes. The ultimate goal of this study was to determine optimal salinity parameters for Gulf menhaden larvae and the larvae of other commercially important, estuarine dependent species for making recommendations concerning freshwater diversions from the Mississippi River. This was the first year of an ongoing study.

Proposed research at the Marine Lab includes an electrophoretic study of the menhaden found in the Gulf of Mexico. The objectives of this study are two fold, to determine the phylogenetic relationship of the three species of menhaden found in the Gulf, and to determine if the population of Gulf menhaden is composed of one or two subpopulations separated by the Mississippi River.

3. Stone Crab

Analysis of data collected during a study to compare stone crab catches of wire blue crab traps and plastic stone crab traps was completed in 1984. Results indicated that, while plastic traps caught significantly higher numbers of stone crabs over a broad size range, there were no significant differences between the two trap types in the catch of large stone crabs. Large stone crabs were defined as those crabs having a claw length of 2 3/4" or more (Florida's legal size). The results imply that in future studies on stock assessment of large, marketable stone crabs, the lighter, more manageable wire traps can be used.

A study comparing various tag types for stone crabs indicated the Floy sphyrion anchor tag was superior to the Floy dart tag in both survival and retention after molting. The techniques and methods developed in this study and the trap study will be used in future studies to assess the stone crab as a potential new fishery resource.

4. Shrimp

Brown shrimp emigrations from Barataria Bay to the Gulf of Mexico were intensively sampled with a stationary wing net. Results of the sampling, when correlated with environmental data, will increase the understanding of brown shrimp behavior. This will also aid in constructing a model for predicting mass emigrations of brown shrimp which will be useful in managing the species.

5. Clams

Research was conducted on the hard clam Mercenaria campechiensis to determine if the potential for a hard clam fishery exists in Louisiana. Hard clams were first successfully hatchery-spawned in Louisiana by biologists at the Marine Lab's oyster hatchery. Growth rate data for larval clams has been gathered in relations to salinity and temperature. Ongoing and future research will determine growth rate of seed clams and the time necessary for seed clams to reach harvest-size.

6. Oysters

A system for setting oyster larvae on clamshell was designed, constructed and implemented in the spring of 1984. With only a small amount of time, money and equipment nearly 400,000 oysters 12 mm in length were produced in a seven week period.

Operation of the State oyster hatchery and setting facility provided material for research into the dispersal of hatchery-reared larvae over State-owned oyster growing grounds, the staining of oyster larvae for spat identification and oyster genetics. Approximately 22.5 million oyster larvae were reared to the eyed ready-to-set stage and dispersed underwater over several State-owned reefs. After the first dispersal of 5 million larvae, indirect evidence indicated the set of larvae was excellent. A method of staining larval oysters was developed and applied to 12.5 million hatchery-reared larvae. After dispersal direct evidence through identification of stained spat showed that eyed larvae can be hatchery-reared, dispersed on Louisiana reef areas and set successfully. Genetic studies in conjunction with Louisiana State University (LSU) were begun in an effort to identify inheritable factors and determine growth rates in oysters. One factor already determined is that oysters with more protein-enzyme variation grow faster.

FISHERIES MANAGEMENT SECTION

Brown Shrimp

Early in 1984 hydrological and biological sampling indicated brown shrimp production would be above that observed in 1983. While Mississippi River discharge rates were high and similar to those observed in 1983 the Bonnet Carre Spillway was not opened, and coastal rainfall was well below 1983 levels. Average salinities in both the northern and southern portions of the nursery grounds were acceptable and it was estimated there were approximately 1.6 million acres of optimum (above 10 ppt salinity) nursery area available. This was substantially above the 900,000 acres available during 1983. Additionally, April water temperatures were significantly above those observed during 1983.

Biological sampling during the spring of 1984 indicated the brown shrimp recruitment responded favorably to the improved environmental conditions, as trawl samples detected larger numbers of brown shrimp on the nursery grounds with larger average sizes than during 1983.

When the inshore shrimp season for Zone 1 (the area east of the Mississippi River) opened at 6:00 am on May 25, it was estimated only 25 percent of the shrimp were larger than 100 count (shrimp per pound) heads-on. Biological recommendations were that Zone 1 should open on June 6; however, as a result of legal interpretations it was determined the seasons had to be opened no later than May 25. When the season opened, tides in Zone 1 were above normal, catches were less than expected, and the shrimp were much smaller than in recent years. It was estimated as much as 50 percent of the shrimp catch (by number) in Zone 1 was discarded due to its small size.

In Zone 2 the season opened at 6:00 am on May 21. Weather conditions, and a significant tidal fluctuation associated with the full moon phase of the lunar cycle during the four days preceding the opening of the season caused a significant movement of brown shrimp from the lower bays to the Gulf of Mexico. Catches of from 60 to 75 barrels (210 lbs/barrel) of 70/80 to 100+ count shrimp were reported for 36 hours of trawling in the offshore areas of Zone 2, and 20 to 25 barrel catches were not uncommon. Some difficulties at processing facilities were reported due to the large volume of shrimp being unloaded on the weekend (May 19 & 20) and the fact that many boats were driven inshore at the same time due to deteriorating weather conditions.

When the season opened in Zone 2, weather conditions were such that fishing activity by many of the boats were adversely affected. Winds south-southeast at 20 to 25 miles per hour caused lakes and bays to become extremely rough; also, the southerly winds and approximately three inches of rain caused tides to be greatly above normal and in many areas water was two to four inches deep in the marsh allowing the shrimp to disperse throughout the system.

In Zone 3, the spring season opened at 6:00 am on May 25. At this time it was estimated only 14 percent of the brown shrimp were larger than 100 count. On opening day hydrological conditions were deteriorating from the 7 to 8 inches of rain that fell in the area during May 21 and 22. This displaced part of the shrimp population in the northern portion of the system. Commercial fishermen on opening day averaged 700 pounds of 120+ count brown shrimp and 100 pounds of 16/20 count white shrimp. By May 31 trawling effort in the area was substantially reduced as fishermen apparently chose to wait and let the 100+ count shrimp grow before trying to harvest them.

The fishing effort during the opening days of the spring season, particularly in the recreational segment, appeared to be below that observed in past years. Also, the high winds and above normal tides adversely affected fishing effort and success.

White Shrimp

White shrimp recruitment in Zones 2 and 3 began during the last week of June and first week of July. On July 5 and 6, sampling indicated white shrimp exceeded 10 percent of the population, thereby meeting the criteria necessary to close the spring season in Zones 2 and 3. On July 14 at 6:00 am the spring season in Zones 2 and 3 was closed, with the exception that wing net fishing on outgoing tides was allowed until July 16 in the Calcasieu Ship Channel below Calcasieu Lake.

In Zone 1 white shrimp recruitment began during the week of July 8-14 and exceeded 10 percent of the population by the following week (July 15-21). The spring season in Zone 1 was closed at 6:00 pm on July 28, with the exception of wing net fishing on outgoing tides in three small areas (Rigolets, Chef Menteur Pass, and the Mississippi River-Gulf Outlet north of Bayou Bienvenue).

White shrimp recruitment continued in all three zones; trawl samples taken during the last week of July indicate the number of white shrimp in the marsh was greater than that observed in 1983 for the same time period.

The 1984 fall shrimp season opened statewide on Monday, August 20 at 12:01 am and closed at 12:00 midnight on December 21 as prescribed by law.

Both the 1984 spring and fall shrimp seasons started slow; however, production increased as the season progressed. Preliminary statistics reported by the National Marine Fisheries Service (NMFS) indicate Louisiana landed 68,585,000 pounds of heads-off shrimp during 1984; this is substantially above the 45,404,000 landed during 1983.

Oysters - Production

Consistent monitoring of environmental conditions, oyster abundance and fishing effort on the public seed grounds and reservations is essential to the effective management of Louisiana's oyster resources. Effective management in this case is best defined as allowing the maximum utilization of the resource in a given year, while simultaneously protecting and enhancing the resource for the future.

During 1984 over one-half million barrels of oysters were taken from the public oyster seed grounds and reservations. Of this total, approximately 200,000 barrels came from the Cabbage Reef area in Mississippi Sound; Bay Gardene and the Breton Sound area together contributed over 250,000 barrels; Sister Lake and Calcasieu Lake produced about 65,000 and 50,000 barrels, respectively. Oyster production from Hackberry Bay in 1984 was negligible.

Several management measures recommended by the Seafood Division and implemented by the Commission during 1984 substantially increased the value of the oysters taken from the public seed grounds and reservations. "Bedding only" restrictions were placed on the Sister Lake reservation during September, and during September and October, on a portion of the public grounds in St. Bernard Parish which includes the Cabbage Reef area. In Sister Lake this action allowed for the bedding of over 50,000 barrels of seed onto private leases. The "bedding only" restriction also resulted in a superior meat yield of the oysters when the Lake was opened for sacking in October. In the Cabbage Reef area the restriction allowed for the bedding of approximately 100,000 barrels of seed onto private leases. The oysters bedded during the restricted periods have had a stabilizing effect on the oyster industry and should insure the availability of oysters well into 1985.

Oysters - Shell Plants

A shellplant consisting of 25,000 yards³ of clam shell sprayed over 500 acres was conducted at Turkey Bayou in 1984. Subsequent biological sampling indicated that this plant was covered with spat and small seed oysters. This shellplant will be harvested in the fall of 1985. If environmental conditions remain favorable, production is expected to be substantial.

In 1984, three shellplants consisting of 15,000 yards³ sprayed over 300 acres in Bay Gardene, 15,000 yards³ over 300 acres in Black Bay east of Lonesome Island, and 20,000 yards³ over 400 acres in California Bay were conducted. Recent spat sets from early September to early November were recorded in the vicinities of these areas.

Shell plants were conducted in Coastal Study Area V in 1983 and 1984. Both shellplants consisted of approximately 25,000 yards³ each. The 1983 shellplant covered 477 acres. With spat sets in June of 1983 and the second week in September, 1984 together with recent biological sampling, indications are that both projects were successful. In addition to the natural spat sets, artificial spat sets have been conducted by the Lyle St. Amant Laboratory in order to insure success on the 1984 Sister Lake shellplants.

RESEARCH AND MONITORING

During 1984, shrimp, bottomfish and blue crab populations and associated hydrological parameters were monitored at 105 stations throughout Louisiana's territorial waters (both inshore and offshore) in conjunction with the 88-309 Federal aid projects 2-394-R and 2-412-R.

Additionally, under project 2-412-R, oyster populations on the public grounds and the oyster seed reservations as well as harvest estimates from these areas were monitored. Oyster

spatfall (density and timing) were monitored using spat collecting (Butler) plates while seed oyster and commercial sack oyster populations were monitored using a square meter frame and SCUBA. Harvest estimates were obtained from twice weekly boating surveys of boats fishing on the public grounds and oyster seed reservations.

Project 2-412-R also included a coastwide access point finfish creel survey. This survey interviewed finfishermen at every boat launch in coastal Louisiana and was the most comprehensive access point finfish creel survey ever conducted in coastal Louisiana.

In 1984 Louisiana continued collecting fishery dependent data as a result of a cooperative statistical agreement signed with NMFS under the State/Federal Statistics initiative. Data was gathered on king mackerel, black drum, striped mullet, brown shrimp and white shrimp. Sampling efforts for king mackerel and other coastal pelagic fisheries were centered in Grand Isle, while black drum and striped mullet sampling was centered east of the Mississippi River. The shrimp sampling was conducted in Terrebonne and Lafourche Parishes.

Section personnel have also been cooperating with Department of Health and Human Resources and LSU Department of Experimental Statistics in a project designed to model water quality data from Louisiana's oyster producing areas. This project involves (1) contacting all State and Federal agencies which gather water quality data or hydrological data in Louisiana's coastal waters, (2) locating all known sources of fecal coliform contamination which may impact the oyster growing areas, (3) collecting the available data and developing a data base which has the data in a uniform format, (4) developing a computer model which will predict the movement of waters which may be contaminated, and (5) developing the administrative and statutory ability to quickly open and close areas based on the results obtained from the model.

This Section also coordinates numerous Federal grants and contracts administered by the office, i.e. 88-309 program (fisheries research and development programs), Saltonstall/Kennedy program, Wallop/Breaux program, etc. as well as other grants and contracts, i.e. CZM (Louisiana Coastal Zone Management), DOE (U.S. Department of Energy), LOOP (Louisiana Offshore Oil Port) and the State/Federal fisheries statistics program.

Also through research efforts of this Section, forecast models for commercial catches of Gulf menhaden have been developed. These predictive models are based on abundance of juvenile menhaden taken in the shrimp monitoring trawl samples and on hydrological/climatological data such as salinity, temperature and river discharge. Annual meetings are held with representatives of the menhaden industry to present catch forecast and discuss other information relative to the menhaden industry which is the largest volume fishery in North America. Additionally personnel in this Section conducted a shrimp mark-recapture project in Lake Pontchartrain. This project was designed to provide migration information on brown shrimp in the Lake Pontchartrain system.

SALTWATER FINFISH MANAGEMENT SECTION

During 1984, as a result of the Governor's Saltwater Finfish Task Force and Act 295 which was passed by the Louisiana Legislature, a Saltwater Finfish Management Section was authorized and established within the Seafood Division. Staffing and equipping this Section was initiated in 1984.

Goals and objectives for this Section include (a) development of a management plan for finfish (particular emphasis on spotted seatrout and red drum) which will insure proper allocation of the resource while providing for the continuance of the species, (b) establishment

of a coastwide monitoring program yielding specific information concerning catch of commercial and recreational fishermen, (c) establishment of cooperative studies (with universities, other states, consultants, etc.) to define larval movement and transport, estuarine dependence and effect of environmental fluctuations, and development of predictive models for marine finfish, and (d) development of management recommendations for the Louisiana Legislature.

HYDROLOGICAL MANAGEMENT SECTION

The operation, maintenance and data processing of the 15 coastwide continuous recorder meter stations were accomplished during the year. Parameters measured by these meters included conductivity, salinity, water temperature, rainfall, tide and wind and current velocities. These data were recently used in the correlation of oyster contamination with environmental parameters, habitat mapping, and determination of estuarine water characteristics as they relate to shrimp harvest.

As in recent years, hypoxia was noted with the occurrence of summer water stratification. However, the extent of the hypoxia zone was not as large as in recent years.

Work was begun on the use of the Map Overlay and Statistical System (MOSS) developed by the National Coastal Ecosystems Team of the U.S. Fish and Wildlife Service. This system is used for mapping biological and environmental parameters and measurements of land and water areas.

SEAMAP

The Department's participation in the State/Federal cooperative Southeast Area Monitoring and Assessment Program (SEAMAP) continued for the third year. Representatives of each State along the Gulf of Mexico and the NMFS coordinated the 1984 SEAMAP monitoring program and funding requests for the 1985 program. With federal funds available in 1985, Louisiana will increase its participation to include sampling in offshore waters to 15 fathoms.

Monitoring activities in nearshore waters of each Coastal Study Area were completed in June and July 1984, in conjunction with sampling done further offshore by the NMFS research vessel. Communities sampled by the Department included demersal nekton, ichthyoplankton and zooplankton. The environmental parameters, i.e. salinity, water temperature, dissolved oxygen and chlorophyll concentrations were also determined.

Ichthyoplankton and zooplankton were sampled again in each Coastal Study Area in October and November 1984 in conjunction with offshore samples taken by NMFS. The environmental parameters, salinity and water temperature, were also measured.

Department personnel examined the sorted ichthyoplankton samples collected in the Gulf of Mexico off Louisiana in conjunction with 1982 SEAMAP activities. Specimens were identified to species, and length measurements were taken at that time.

MISSISSIPPI DEPARTMENT OF WILDLIFE CONSERVATION

BUREAU OF MARINE RESOURCES

The Bureau of Marine Resources (BMR) is a very technical and complex division of the Department of Wildlife Conservation (DWC). The BMR's responsibilities include saltwater fisheries management, enforcement of seafood laws, management of coastal wetlands and the all-encompassing effort to manage all coastal resources through the Mississippi Coastal Program.

Although the BMR's public image is often viewed to be regulatory, many of its functions are assistance and development oriented. The BMR offers technical assistance to the Department of Natural Resources and the Governor's Office on environmental matters regarding oil and gas exploration offshore. The BMR provides grant and contractual monies through the Coastal Program for a variety of recreational, public works and developmental programs needed by local units of government, universities and other public institutions. Furthermore, the BMR provides technical assistance to individuals, small businesses and industries in the coastal area concerning aquaculture, pollution abatement, product development, waste utilization and many other functions.

The following pages provide a more specific glance at BMR activities during FY84.

SALTWATER FISHERIES

In the past year, Saltwater Fisheries Division personnel have continued to provide technical support to the Commission in all areas of marine fisheries science. In order that the Division's recommendations, and hence the Commission's actions, can be based upon sound scientific information, fisheries staff members conduct a weekly survey of recently published scientific literature, extracting and cataloging any information that might be relevant to the activities of the Bureau. Additionally, Division scientists maintain close liaison with their counterparts at the Gulf Coast Research Laboratory, the Southeast Fisheries Center, and the National Marine Fisheries Service (NMFS) Pascagoula Laboratories.

Active participation in the Gulf of Mexico Fishery Management Council (GMFMC) and the Gulf States Marine Fisheries Commission (GSMFC) further complements the Division's fisheries management involvements.

In other related work, the staff has continued its program of shrimp sampling, monitoring, and assessment; oyster reef monitoring and enhancement through cultch planting and reef buildings; and other aspects of data collection to provide a basis for making sound management decisions.

Among this year's new initiatives, the Division continued with the second grant-year of the cooperative collection, processing and dissemination of commercial fisheries landings data. This year, the project also includes the collection of biological data (length, weight, age) for spotted seatrout, red and black drum, mullet, Spanish mackerel, lemonfish, red snapper, and others. Continuation of this project is expected to result in the collection of considerable data that will further enhance Mississippi's saltwater fisheries management practices.

Continued development of microcomputing software has enabled the Division to greatly improve the quality and timeliness of its work. Programs to project the effects of varying degrees of fishing pressure on stock size have been developed and will be combined with the age/size data being collected to produce useful management models. The microcomputer based

storage retrieval of seafood licensing data is a continuing program that enables fisheries biologists to readily obtain data on numbers of fishermen and hence fishing pressure.

Description of Fisheries

Landings of commercial saltwater fish and shellfish in Mississippi during 1983 amounted to 380,799,000 pounds valued at \$47,374,636. This represents a 15.3 percent increase in volume and a 24.8 percent increase in value over last year's figures. The following synopses represent status reports for each of the State's major fisheries for which data are available and which are published in accordance with applicable confidentiality laws.

SHRIMP

Commercial Fleet

Shrimp remained Mississippi's most valuable marine fishery resource in 1983 based upon reported commercial landings. Heads-off landings of 6.5 million pounds represented a 2.5 percent increase over landings in 1982 and were \$25.1 million dockside, a 13.5 percent increase in value over the previous year. The average value per pound for shrimp increased some 10 percent to \$3.84 per pound.

The 1983 shrimp season opened on June 12 after analysis of a series of weekly population samples taken by Division biologists indicates that the minimum legal size (68 whole shrimp/lb) would be reached by a majority of the shrimp population during early June. Environmental conditions on Mississippi's inshore nursery grounds were near optimal throughout the spring, and some 2.08 million pounds of shrimp were landed in Mississippi during the month of June. Gulf-wide shrimp landings during that month totaled 22.47 million pounds.

Mississippi Shrimp Landings for 1983 by Month

Month	Landings (lbs)	Value
July	558,000	\$ 1,662,840
August	410,000	1,221,800
September	199,000	593,020
October	265,000	789,700
November	202,000	601,960
December	84,000	250,320
January	36,000	107,280
February	26,000	77,480
March	15,000	44,700
April	41,000	122,180
May	695,000	2,071,100
June	3,282,000	9,780,360
Total	5,813,000	\$17,322,740

Average price \$3.80/lb heads-off

Bait Shrimping

Reported catches of live shrimp by coastal bait dealers totaled over 1.6 million shrimp during 1983. Peak months of bait shrimp catches coincided with peak production in the commercial fisheries and also with peak recreational fishing activity.

OYSTERS

The Mississippi oyster season in 1983-84 resulted in a total of 3.3 million pounds of oyster meats being landed. This represents a 29 percent increase over the previous season. Despite the fact that Mississippi oyster reefs only yielded some 4,138 sacks of oysters during the year, the increase in landings is attributed to increased imports from other states.

Mississippi oyster harvest for 1983-84 by month were as follows:

Mississippi Oyster Landings for 1983-84 by Month

Month	Landings (sacks)	Value
November, 1983	1,381	\$13,810
December, 1983	1,205	12,050
January, 1984	891	8,910
February, 1984	479	4,790
March, 1984	182	1,820
Total	4,138	\$41,380

Hand tongs and oyster dredges are the primary gears used in oyster harvesting during the public season which usually extends from October through March. Dredges may only be used in certain areas within a limited season as determined by the Commission. The quantity and value of Mississippi's oyster harvest is determined by a monthly trip ticket system. These reports contain information vital to monitoring the use of various gears and harvests by reef area.

The oyster harvest for the State was particularly poor in 1983 as a result of the floodwater-related mortalities caused by the May 1983 opening of the Bonnet Carre Spillway. The discharge of an average flow of 196,000 feet³ per second of Mississippi River waters between May 20 and June 23, 1983 resulted in a total mortality rate of some 95 percent on the majority of the State's reefs.

Historically, the Bonnet Carre flood control structure has been operated seven times, each time inflicting heavy damage on those oyster reefs located in the western section of Mississippi Sound. Subsequently, a Federal grant in the amount of \$500,000 was awarded to the State to fund an oyster reef rehabilitation program. The work involved the planting of some 50,000 cubic yards of clam shells to serve as cultch material and was undertaken by the Division of Saltwater Fisheries in the spring of 1984.

The outlook for the oyster industry in Mississippi depends upon several factors. Of major influence are the unpredictable effects of weather, principally rainfall and tropical storm activity, and also the ever increasing costs associated with replenishment activities -- the transfer of seed oysters and the planting of shells to enhance production on public reefs.

Private individuals have taken advantage of the State program allowing leasing of waterbottoms and the relaying of oysters from closed waters to their respective lease sites. The early returns on this type of activity appear promising though in 1983 only three leaseholders engaged in this practice. The current integrated and collective approach involving cultch planting, reef creation, oyster leasing, relaying and depuration may ultimately prove to be essential to the revitalization of the industry.

BLUE CRABS

Landings of hard, blue crabs decreased to 1,139,690 pounds in 1983. Processed crab meats were reported down at each of the principal ports of Pascagoula and Biloxi. The total value of blue crab landings fell to \$331,611, down 4 percent from the 1982 value. The price per pound for blue crabs, however, rose to \$0.29 representing an 8.5 percent increase.

With the 1983 opening of the Bonnet Carre Spillway, the prognosis for the 1984 blue crab season appears to be quite good.

MENHADEN

Menhaden landings of 365,084,340 pounds in 1983 represent a 0.158 percent increase over the landings in 1982. The total value of \$6,106,638 was up over the total value in 1982. The unit cost (price per pound) for menhaden, at \$.044 was up some 0.269 percent over the unit cost in 1982.

EDIBLE FINFISH

Fluctuating changes in the landings of finfish in the northern Gulf of Mexico are typical of the industry. Landings trends from each of the major indicator species are as follows:

Black drum landings showed a 19.6 percent increase in 1983 over the landings in 1982. The total dockside value of this species increased 28.4 percent between 1982 and 1983. Unit prices (price per pound) rose to .144, representing a 7.4 percent increase in that indicator.

Landings of striped mullet for 1983 totaled 800,010 pounds, representing a 74.1 percent increase over landings in the previous time period. Average total dockside value increased 59.1 percent in 1983, and the price per pound of fresh-whole mullet fell about 8 percent to \$.182.

Red snapper landings in 1983 underwent a rise of 7.1 percent from 1,041,450 pounds to 1,116,280 in the time interval. Total dockside value rose 6.7 percent from \$1,413,250 in 1982 to \$1,509,279 in 1983. Average unit prices during 1983 stood at \$1.35, down 3.6 percent from the previous year.

Changing patterns in the finfisheries are evident both in the short term and over longer periods of time. These trends are the result of any number of factors, chief among which is the switching of target species by fishermen. Unusual changes in landings (either increases or decreases) in other waters (deepwater fisheries in the New England States, for example), can also precipitate significant shifts. In Mississippi's finfish landings, demands for frozen fishery products are of particular importance in determining finfish prices.

In addition to black drum and mullet, Spanish mackerel contribute significantly to the composition of frozen fish products. In 1983 landings of Spanish mackerel totaled 46,150

pounds. The total dockside value of these landings was \$12,815, representing a 55 percent decrease in landings and a fall of 59 percent in value. The price per pound of Spanish mackerel in 1983 was \$.28 which is down 8 percent from the \$.31/pound referenced as an average price in 1982.

Landings of premium inshore market species (i.e. red drum, spotted seatrout, and flounder) were as follows:

Red drum landings in 1983 showed a fall of 40 percent, from 40,600 pounds in 1982 to 24,200 pounds. The total dockside value of red drum landings fell to 3.0 percent in 1983, the final tally standing at some \$9,241. The average price per pound of redfish in the round was \$.381, up 62 percent from the 1982 average.

Commercial landings of spotted seatrout during 1983 totaled 54,060 pounds, valued at \$49,913. If the results of Texas Parks and Wildlife Department studies, indicating that the sportfishing catch of this species may exceed the commercial catch 2- to 3-fold, then the estimated combined catch (sports and commercial) of spotted seatrout in Mississippi would total some 216,240 pounds. One of the higher-priced and consumer-preferred species, speckled trout prices averaged about \$.923/pound in 1983, representing 1 percent decrease over the \$.936/pound of 1982.

Flounder landings, as collected by Division and NMFS port agents under cooperative agreement, include a number of different species. In 1983 the landings volume totaled 49,750 pounds, representing a 1 percent decrease over those landed in 1982. The total dockside value of these landings was up 2.1 percent from \$21,884 in 1982 to \$22,352 in 1983.

Landings of kingfish (ground mullet, as they are locally known) amounted to 285,810 pounds in 1983, valued at some \$79,106. The average price of kingfish was up to \$.276/pound from the \$.259 of 1982.

Grouper landings, which included spotted, nasau, and black grouper, totaled 47,460 pounds in 1983, down 49 percent from the 94,400 pounds in 1982. Total dockside value of grouper fell 38 percent from 1982 to 1983. The price per pound of this species averaged \$.991 in 1983, up 22.4 percent from 1982.

In summary, of the 18 major finfish indicator species, nine showed landings gains in 1983. These were as follows: black drum, king whiting, menhaden, mullet, red snapper, sheepshead, spotted seatrout, sea catfish, and white seatrout.

On the other hand, landings declines were evidenced in the following species: bluefish, blue runner, crevalle jack, croaker (food), flounder, grouper (uncl.), pompano, red drum, Spanish mackerel.

INDUSTRIAL BOTTOMFISH

Landings data from the industrial bottomfish fishery are not available for publication because of confidential agreements between the BMR/NMFS and the industry which presently consists of only two processors. However, industry representatives and the NMFS port agents indicate that the declining trend in landings exhibited by the fishery in the past three years may have begun to change.

More bottomfish are currently being processed from independent shrimpers than has been the case in past years. The sale of the shrimp by-catch (bottomfish) is a favorable development

MISSISSIPPI BUREAU OF MARINE RESOURCES
DIVISION OF SALTWATER FISHERIES

LANDINGS COMPARISON REPORT

Species List	1982			1983			Percent Change		
	Pounds	Value	\$/lb	Pounds	Value	\$/lb	lb	\$	\$/lb
Black Drum	1,184,500	\$ 158,589	.133	1,416,730	\$ 203,766	.143	.196	.284	.074
Bluefish	7,600	2,195	.288	800	200	.25	-.89	-.90	-.13
Blue Runner	715,900	122,680	.171	405,200	60,840	.150	-.43	-.50	-.12
Crevalle Jack	43,700	7,555	.172	18,900	2,835	.15	-.56	-.62	-.13
Croaker (Food)	562,240	258,385	.459	165,120	68,585	.415	-.70	-.73	-.09
Flounder	50,655	21,884	.432	49,750	22,352	.449	-.01	.021	.039
Grouper (Uncl.)	94,400	76,395	.809	47,460	47,047	.991	-.49	-.38	.224
King Whiting	227,730	59,063	.259	285,810	79,106	.276	.255	.339	.067
Menhaden	315,092,800	10,953,919	.034	365,084,340	16,106,638	.044	.158	.470	.269
Mullet	459,500	91,843	.199	800,010	146,186	.182	.741	.591	-.08
Pompano	10,500	28,157	2.68	2,530	6,704	2.64	-.75	-.76	-.01
Red Drum	40,600	9,587	.236	24,200	9,241	.381	-.40	-.03	.617
Red Snapper	1,041,450	1,413,250	1.35	1,116,280	1,509,279	1.35	.071	.067	-3.6
Sheepshead	150,900	21,709	.143	206,460	29,991	.145	.368	.381	9.72
Spanish Mackerel	102,700	31,290	.304	46,150	12,815	.277	-.55	-.59	-.08
Spotted Seatrout	16,820	15,758	.936	54,060	49,913	.923	2.21	2.16	-.01
Sea Catfish	1,300	195	.15	2,760	432	.156	1.12	1.21	.043
White Seatrout	69,050	22,723	.329	73,240	22,448	.306	.060	-.01	-.06
Shrimp	6,362,000	22,076,140	3.47	6,527,000	25,063,680	3.84	.025	.135	.106
Oysters	2,575,970	2,237,683	.868	3,333,010	3,600,967	1.08	.293	.609	.243
Blue Crabs	1,297,100	347,628	.268	1,139,690	331,611	.290	-.12	-.04	.085
Total	330,107,415	\$37,956,628	.114	380,799,500	\$47,374,636	.124	.153	.248	.081

*Landings data collected and reported on a calendar year basis.

from a fisheries perspective since it promotes the use of a valuable resource that might otherwise have been discarded.

Saltwater Sportfishing

The recreational fishery in 1983 followed the usual seasonal trends, exhibiting an increase in the reported landings of certain popular species towards the close of the year. Charter catches consisted typically of Spanish mackerels, bonitos, and other migratory pelagic species (blue runners, jack crevasses, etc.). Reported catches of red drum were conspicuously up over those reported last year. The spring run of lemonfish (cobia) resulted in a number of good catches, with a reported 95-pound specimen being the largest. A number of cobia in the 80-pound-plus category were reportedly caught as well.

Inshore fishing varied from good to excellent. Spotted seatrout which comprise the most sought-after species in Mississippi's coastal waters were once again at lower than average densities, based upon reported catches of these fish. As was the case last year, catches consisted mostly of small fish averaging around a pound or so in size. The largest reported speckled trout were in the six-pound class, although several unconfirmed reports of larger trout were received.

In June 1982, the NMFS released the results of its most recent study on big game fishing in the northern Gulf of Mexico. The total recorded trolling effort for big game fishes (blue marlin, white marlin, sailfishes) in the Gulf for 1981 amounted to 34,881 hours. Of this, 85 percent of the effort originated from the ports of Panama City, Destin, Pensacola, Mobile, South Pass, Grand Isle, and Port Aransas, while 15 percent was recorded at the expansive ports which include Biloxi. Effort increased 9 percent over the previous year, and the total recorded billfish catch was 1,774. The catch per hour of billfishes for the year was 0.47, an 18 percent decline from last year. This decline was attributed chiefly to the decreased catch of white marlin. The catch per hour for both blue marlin and sailfish rose in 1981. The largest reported fish, a 679 pound blue marlin, was landed at Destin. The 88 pound white marlin landed at Galveston was the largest reported for that species. St. Petersburg accounted for the largest sailfish at 88 pounds. The average weights for both white marlin (51 lb) and sailfish (43 lb) were slightly below their respective 10-year averages. Data from the northcentral Gulf of Mexico showed that billfishing occurred in a 14 percent smaller area during the season than in the previous year.

Study results from Biloxi Small Craft Harbor and Broadwater Marina indicated that a total of 279 hours trolling for billfishes occurred, resulting in a total catch of 17 billfish. An area between the 50 and 100 fathom curve due east of South Pass in Louisiana showed the best promise for Mississippi-based anglers with .241 billfishes raised per hour of trolling.

The results of a recently published NMFS Sportsfishing Report indicated that some 500,000 spotted seatrout are annually caught by Mississippi sportsfishermen. The study further reported that total number of saltwater anglers to be about 155,000.

These figures indicate growth that marine sportsfishing has experienced in recent years. Nationwide estimates indicate that 15 to 20 million recreational fishermen harvest quantities of foodfish approximating one-third of total U.S. foodfish landings. Passage of the Fishery Conservation and Management Act of 1976, and the subsequent formation of the GMFMC has prompted considerable research on recreational fishing.

In Mississippi, as in most other states, funds are allocated primarily for the collection of data on commercial fisheries. Relatively speaking, the recreational fishing sector has been

neglected in terms of biological analysis, maintenance of a continuous and systematic statistical base and valuation of the economic impact of this industry, locally, regionally, and nationally.

Fishing rodeos constitute one of the best forums for interfacing with the recreational fishing sector. In recent years, the BMR has played an active part in the Mississippi Deep Sea Fishing Rodeo, and the Division has played an important role in that participation. The 1983-84 rodeo season resulted in a number of new fishing records for Mississippi.

Management decisions affect both commercial and recreational fisheries to varying degrees. Such decisions should be based upon several factors -- the life history of the species, appreciation of the sportfishermen's concerns and competing interests with the commercial fishermen and analyses of landings and effort data detailing the relative significance (biologically and economically) of the commercial and recreational sectors. In the coming fiscal year, it is the intent of the Division to pursue the continued collection of data in an attempt to further elucidate these matters and to ultimately improve the fishing prospects for all concerned.

ORDINANCES ADOPTED IN 1983

Ordinance No. 113 -- Adopted November 1983 -- An ordinance revising application procedures for live bait dealers licenses.

OTHER ACTIVITIES

GULF STATES MARINE FISHERIES COMMISSION (GSMFC)

The GSMFC is an organization of the five States bordering the Gulf of Mexico. This compact organization, authorized under PL 81-66 was signed by representatives of each of the five States on July 19, 1949, at Mobile, Alabama. The principal objective of the Commission is the conservation, development, and full utilization of the fishery resources of the Gulf of Mexico and to provide food, employment, income, and recreation to the people of the United States.

The GSMFC functions as a clearinghouse and coordination agency for the exchange of information and ideas concerning marine fisheries management among the Gulf States, particularly in regards to those species which commonly occur and migrate across interjurisdictional waters. The Commission also funds numerous projects and conducts symposia and workshops, all of which are of common interest to the affiliated State's resource management agencies.

Mississippi continued its membership in the GSMFC in 1983 through active participation in many of the Commission's committees and advisory boards. The BMR Director, Dr. Richard Leard served as vice chairman during FY83 and was an active participant of both the Gulf State-Federal Fisheries Management Board and the GSMFC Technical Coordinating Committee. Dr. Fred Deegen chaired the GSMFC Recreational Fisheries Committee and J. Ron Herring served on the Blue Crab Subcommittee which recently developed "A Profile of the Blue Crab Fishery of the Gulf of Mexico."

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL (GMFMC)

1983 marked the sixth year in which the Magnuson Act has been in full operation. Implementation of the Act by the GMFMC has resulted in the development of 12 draft fishery

management plans (FMPs) or management profiles. Of these, the shrimp and stone crab plans have been fully implemented and are currently in force. The mackerel (migratory pelagic) and other plans are expected to come on line soon. Only three plans, groundfish, sharks and coastal herring have been withdrawn because of an apparent lack of evidence for the need of management at the present time.

Under a continuing program, the GMFMC publishes a monthly newsletter summarizing Council activities. The circulation of this document includes some 2,000 fisheries organizations and members of the fishing constituency.

Among the other major fisheries management activities of the GMFMC, direct negotiations with the Japanese tuna fishing industry to reduce fishing pressure on the Gulf's billfish stocks mark a major accomplishment. The Council also actively participated in the MEXUS-Gulf Cooperative research and development program with Mexico and in the planning sessions of the Food and Agriculture Organization (FAO) Western Atlantic and Caribbean Fishery Development Programs.

In the coming year, it is expected that management plans for additional fisheries in the Fisheries Conservation Zone (FCZ) will be developed and implemented. It is the goal and projection of the GMFMC to have developed FMP's for all major fisheries occurring in the Gulf FCZ by the end of the 80's. The cooperative management of transboundary stocks by the states is also anticipated for those species which are largely confined to the territorial seas.

ENFORCEMENT

In FY84, the Enforcement Division of the BMR was involved in the following arrests and incidents. Incidents include such things as administrative details, assistance to motorists, assistance to other agencies, boating accidents, overdue vessels, capsized boats, drownings, marine mammal or sea turtle strandings or deaths, rescue missions, tow-ins, sinkings, and miscellaneous violation complaint investigations.

This year, some 740 persons were assisted by the Bureau's Enforcement officers.

Seafood-related arrests were up over 100 percent in comparison with last year's figure. Boat and Water Safety-related arrests were similarly up two-fold over the previous fiscal year while Game and Fish-related arrests showed only a 56 percent increase. Whether this dramatic increase in arrests reflects increased activities in Mississippi Sound or simply increased efficiency by Enforcement personnel as a result of a newly acquired aircraft is uncertain.

Division officers continue to become more involved with assisting both other State and Federal law enforcement officials. Routine duties include conducting public relations talks, providing information to the general public, issuing licenses, and assisting boat owners and waterfront property owners. Because our law enforcement officers are the only enforcement operation in coastal waters, routine assistance to sheriff offices, police departments, civil defense, narcotics officers, and others is an integral part of the marine enforcement scene.

The Enforcement Division also coordinates its activities with the Federal enforcement officers of the NMFS, the U.S. Fish and Wildlife Service, the United States Coast Guard, and the National Parks Service, Gulf Islands National Seashore. These agencies, the Enforcement Division of the Bureau and the Division of Saltwater Fisheries are all linked via EDIS CONFER, an environmental data and information service computer communications system. This mutual cooperation is intended to insure effective enforcement of all applicable State and Federal regulations.

WETLANDS

Mississippi coastal area is made up of approximately 66,000 acres of tidal marsh and approximately 370,000 acres of submerged waterbottoms. These public trust wetlands serve as a valuable and irreplaceable natural resource of great economic and aesthetic value to the State of Mississippi.

During FY84 the BMR, Wetlands Division processed 333 cases. This case load included the evaluation of several major development projects which may have had certain impacts on the integrity of the coastal resources. Working with the applicants, the Wetlands Division was able to incorporate modifications to their proposals to reduce serious environmental impacts.

The rapidly growing coastal region has suffered a loss in total acreage of coastal wetlands. Uncontrolled use and destruction of valuable wetlands areas in the past have resulted in losses of only 10,000 acres of tidally-influenced wetlands.

Through the efforts of the Wetlands Division, the BMR has been able to limit the unnecessary alterations of the coastal wetlands by encouraging projects and activities which are environmentally acceptable.

Wetlands Division personnel are the stewards of the State of Mississippi Public Trust lands. These tidal marshes and shallow water bottoms serve as a natural habitat and nursery area for approximately two-thirds of the state's commercial and recreational fish and shellfish. Additionally, these areas provide shelter and habitat for numerous species of waterfowl and mammals. Tidal wetlands produce large quantities of plant material annually which serve as a source of organic material which are in turn consumed by finfish and shellfish. These species make a significant commercial crop. Furthermore, these marshes serve as a buffer in protecting the shoreline against erosion and help reduce the damages as a result of floods. Perhaps more importantly, they protect the public health and welfare by absorbing silt and certain types of pollutants in our estuarine waters. The overall value of wetlands is well documented in the scientific literature and has an estimated capital value of \$82,000 per acre.

Under provisions of the Wetlands law, persons wishing to perform dredge and fill operations in the wetlands or to undertake major construction in wetlands must first obtain a permit from the Commission on Wildlife Conservation. The Wetlands Division of the BMR evaluates all proposed activities in the coastal area and makes reports and recommendations based on their findings to that Commission.

The Wetlands Division has continued throughout the year to maintain a high level of coordination between the BMR and other State and Federal regulatory agencies. Most notable is the Wetlands Division participation in Corps of Engineers (Mobile District) to develop a "Memorandum of Understanding" whereby all applications are submitted to the BMR. Once the application has been determined by the Division to be a completed application, the application is then forwarded to Mobile District and they proceed to issue a public notice. This then gives all agencies the opportunity to review the same information and thereby shorten the review time. This procedure while developed in FY84 will go into effect July 1, 1984 or FY85.

MISSISSIPPI COASTAL PROGRAM

The Mississippi Coastal Program (MCP) is a consolidated statement of State policy. The text, maps and guidelines, included therein, applies to the coastal area of Mississippi and represents a balance of protection with development of the State's coastal and marine resources. The MCP was approved by the Governor, the Commission on Wildlife Conservation and the Office of

Ocean and Coastal Resource Management (OCRM) NOAA, Department of Commerce during September 1980 and became operational as State policy on September 29, 1980. The maintenance and implementation of the MCP is handled by the Coastal Program Division of BMR; however, the Coastal Program supports all areas of the Bureau's operation.

The provisions of the Coastal Program apply to activities in the coastal wetlands below the watermark of ordinary high tide and certain uplands in Hancock, Harrison and Jackson counties.

In early FY82 BMR received a grant from OCRM in the amount of \$706,000 for implementation of the MCP for an 18-month period which was later extended to terminate December 31, 1984.

The MCP applies to activities that have a direct and significant impact on the State coastal resources. It provides financial support to the Bureau in the form of equipment purchases, certain office expenses and contractual support for research, planning and technical studies.

The Coastal Program also contains the consistency provisions of the Coastal Zone Management Act, PL 92-583. These consistency provisions require that all Federal activities that may affect land and water resources in the coastal area, including Federal License and Permits, Direct Federal Activities and Development Projects, Outer Continental Shelf (OCS) Exploration, Development and Production Activities and any Federal assistance to State and local governments, be compatible with the guidelines and the Wetlands Use Plan of the Coastal Program.

The Coastal Program encompasses five areas of the BMR's overall program:

The Wetlands Management function which includes wetlands permitting as well as regulatory authority over designated waterfront industrial sites.

For eligibility of Federal funding and coordinating purposes, Fisheries Management is incorporated into the Coastal Program; however, the program makes no change to the State's existing fisheries management efforts.

The ten broad goals on which the Coastal Program was established necessitated a procedure for Policy Coordination in wetlands management, industrial development, waterfront conservation, fisheries management, pollution control, water conservation, archaeological and historical preservation, preservation of natural scenic qualities, protection of national interests, assistance to local governments and the coordinated implementation of public policy. The legislation on which this function was based requires that all State agencies comply with the program and these 10 goals. In addition to compliance by State agencies, activities proposed by Federal agencies are also required to comply under "Federal consistency" provisions of the Coastal Program.

Because of their localized development problems and opportunities, many areas on the coast require site-specific planning and management. Such areas are designated as Special Management Areas. The Coastal Program recognizes three such areas: industrial and port areas, urban waterfronts, and shorefront access areas. Just as the general provisions of the program govern activities in the coastal area in general, special management plans govern the specific areas for which they are adopted.

To complement the regulatory provisions of the Coastal Program, Affirmative Management Activities were developed and included efforts in areas such as energy facility planning, shoreline erosion work, designation of preservation/restoration areas, the Coastal Energy Impact Program (CEIP), marine research and public education on marine and coastal resources.

Policy Coordination Procedures

From July 1, 1983, through June 30, 1984, 102 actions were subject to policy coordination procedures and submitted to the State A-95 Clearinghouse Office, the instrument used in State agency reviews for policy coordination activities.

Of these 102 actions, 49 were for activities requiring a wetlands permit or were subject to formal wetlands review. Four activities were determined to be inconsistent with the Coastal Program and one action was issued a conditional consistency, meaning that additional conditions had to be met before a full consistency finding could be issued. Forty-four wetlands actions were determined to be consistent with the program and received wither a wetlands permit or were issued a waiver of permit requirements.

The remaining 53 actions (of the 102 actions) consisted of projects submitted by State agencies such as CEIP projects from the BMR; Federal assistance to local and city government through such programs as community development block grants; and direct Federal actions, such as Outer Continental Shelf (OCS) oil and gas drilling applications submitted by the Minerals Management Service (MMS) and Corps of Engineers federally authorized channel maintenance dredging. Each of these actions were determined to be consistent with the MCP.

Special Management Area Planning

At the request of a local governmental entity, the BMR will begin Special Management Area (SMA) planning to requested areas. The advance planning in SMAs insures that development will occur in an orderly manner, avoiding the problems of piece-meal decisions and preserving environmental quality to the greatest extent possible.

In FY 84, BMR concentrated SMA planning efforts on the Port Bienville Industrial Park, the Port of Pascagoula and the Pass Christian Industrial Park.

Early in 1982, BMR retained a consultant to assist and facilitate SMA planning. During this same time period, the Bureau formed an SMA Task Force to actually develop SMA plans. This Task Force is composed of representatives from the Corps of Engineers, Environmental Protection Agency, NMFS, U.S. Fish and Wildlife Service, Mississippi BMR, Mississippi Bureau of Pollution Control, Mississippi Department of Archives and History as well as representatives from the local entities.

Significant achievements for Port Bienville SMA planning during FY84 included the completion of the draft Port Bienville SMA plan, the convening of a public hearing on the Port Bienville plan, completion of a water quality study and the initial steps necessary to incorporate the SMA plan into the MCP.

Efforts for the Pass Christian SMA included the execution of a contract between BMR and the Harrison County Development Commission. This contract provides for the procurement of technical information necessary for the planning effort. One such piece of information, the Pass Christian Water Quality Study, was completed in FY84.

Progress on the Pascagoula SMA plan was also made. The SMA Task Force identified and produced statements for as many as 16 development and environmental issues. Consensus Agreements for 80 percent of the issue statements were reached. The remaining issues are expected to be resolved with a final plan being drafted in FY85.

During FY 84 the Bureau and Task Force consultant convened eight SMA Task Force meetings and two site evaluation visits to complete these SMA planning efforts.

During FY84, one revision to the MCP was made. Revisions were made to the Guidelines for Regulated Activities and the Coastal Wetlands Use Plan Text. The revisions were necessary for the Bureau staff to better address projects where wetlands filling would be at issue.

Also during FY 84 the third edition of the MCP was printed and distributed to local, State and Federal agencies as well as to the general public. This edition incorporated all revisions and corrections made to the MCP from its initial implementation in October 1980 to the third edition printing in October 1983.

Affirmative Management Activities

In Affirmative Management activities the BMR, Coastal Program Division instituted four special studies, two of which included a legal review of the status on which the Coastal Program was based upon and its regulation on implementation. The second project was a management study completed on the Coastal Program Division as well as the other operational divisions of the Bureau's administrative support group. Both the legal analysis and management study were geared to review current operations of the Bureau's staff with objectives of eliminating duplicate efforts of the staff and finding means and methods where regulations and permits could be streamlined to be less encumbent upon the coastal wetlands applicant.

Thirdly, a marina study was completed addressing the growing need for marina space along the coast and the possible location of new marinas in the coastal wetlands. The study inventoried all marina and fish camps to gain an accurate count on the total of slips available on the coast. Other parts of the study include a projection of boat slip needs based on regional, State and national boat trends on boat ownership. The trend in ownership and slip inventory resulted in a projection of approximately 3,000 wet and dry slip needs by the year 2000. Other aspects of the marina study included an environmental analysis as to locations of new marinas and recommendations on how the Commission on Wildlife Conservation may better address and permit marinas.

The fourth affirmative management study funded pertained to the Biloxi Urban Waterfront. The purposes of such a study are to seek ways, methods and means in which urban waterfront areas can be developed to increase public access and be aesthetically pleasing as well as economically viable.

Other affirmative management efforts of the Bureau include public information/education activities. The publication of a periodic newsletter continued with circulating increasing from 486 to 534. News releases, public speaking engagements, stories and photographs published in MS Outdoors, participating in the Mississippi Deep Sea Fishing Rodeo, and the distribution of DWC educational material were also part of BMR's public information/education efforts.

The Mississippi Coastal Program Guide was printed in FY82 and distribution of this 32-page booklet continued in FY84. Five thousand copies of the "Marine Discovery Series" were printed during this period. This five booklet series was first published in FY83 and has been distributed State-wide to schools, libraries and interested citizens to help educate young people about Mississippi's marine resources and their importance to the economy, ecology and heritage of the State.

Work on two grants for education projects funded in FY83 continued in FY84. The writing of two illustrated elementary-level marine education booklets on vertebrates and invertebrates

occurred during this period. At the end of this reporting period the text of the booklets was being edited for final approval. These two booklets should be printed and distribution started by mid FY85.

The second grant was used for the production of a 20-30 minute documentary video taped program on Mississippi's coastal resources. At the end of FY84, editing, final scripting and production related work were underway and a final product should be completed by November 1984. The tape will be distributed to high schools, civic groups and persons interested in coastal resources and the need to conserve them.

Work was initiated in June, 1984 on a children's activity workbook. The Commission on Wildlife Conservation approved a grant for the production of a workbook which will be designed for elementary school level children and will provide students with a basic knowledge of coastal fisheries, wetlands, barrier islands and other resources. This workbook should be completed by mid FY85 and will be distributed free to schools and citizens throughout the State.

COASTAL ENERGY IMPACT PROGRAM (CEIP)

Although no new funding was allotted to the Mississippi CEIP in FY84, a number of projects financed in previous years were successfully completed. The Jackson County Inner Harbor Park located in Ocean Springs was dedicated for use by Senator Thad Cochran in April 1984.

The Pass Christian Harbor bulkhead was finished in early 1984 as was the renovation of the fishing vessel Scranton. The Scranton is located off the Pascagoula River Pier and Park facilities in West Pascagoula. It was donated to the city and renovated using CEIP funds and in-kind and volunteer labor. It serves as a museum and exhibit facility for marine oriented topics especially those related to the fishing industry. Several CEIP projects currently in progress are scheduled to be concluded during the upcoming fiscal year.

CEIP Planning Projects

Mississippi State Boat Slip Study -- \$31,000 to compare the effects of indented vs. keyhole boat slips; Hancock County Beach Road Study -- \$9,250 to investigate reasons for the Beach Road's deterioration; Bay St. Louis Drainage Plan -- \$433,000 to study drainage problems in Hancock County/Bay St. Louis; and Jackson County Drainage Study -- \$76,000 to investigate commercial and residential drainage problems in western Jackson County.

OIL AND GAS ACTIVITIES

From an environmental perspective, the BMR addresses oil and gas activities proposed for and occurring in the State's coastal waters and in Federal waters (the Outer Continental Shelf). The staff of the Scientific-Statistical Division provides the technical advice for and support to many State and Federal agencies, as well as the DWC on environmental aspects of oil and gas development.

OUTER CONTINENTAL SHELF (OCS) PROGRAM

The OCS begins at the seaward boundary of the coastal territorial waters of each state and extends seaward to the limits of the Federal waters. The development of oil and gas resources in the Gulf of Mexico OCS Region has an influence upon the coastal States in this region. The

influences, many of them indirect, affect the socio-economic and environmental conditions of the States whose coastal areas adjoin the Gulf of Mexico.

The MMS has the responsibility for managing oil and gas exploration, development and production activities as well as other mineral resource development on the OCS. For management purposes, OCS activities are divided into five categories: (1) oil and gas leasing, (2) oil and gas transportation, (3) environmental studies, (4) post leasing activities, and (5) hard minerals mining. Also, for management purposes, the Gulf Region has been divided into the western, central and eastern planning areas. The central planning area includes OCS waters south of the State of Mississippi. In late 1983, there were 3,158 active Gulf of Mexico OCS oil/gas leases with a large percentage of these leases being located within the central planning area.

Forty-eight oil and gas lease sales have been held in the Gulf of Mexico since 1953. In that time more than 15 million acres have been leased. Presently, the Gulf leasing activity (number of tracts leased) accounts for 78 percent of all U.S. OCS leasing. Almost 21,000 wells have been drilled in Gulf OCS waters and approximately 6,500 are actively producing oil or gas today. There are almost 3,000 platforms currently emplaced in the Gulf OCS waters and over 13,000 miles of pipeline in support of this production effort. Of the oil and gas produced from U.S. OCS areas, the Gulf of Mexico accounts for more than 94 percent and over 80 percent of the leased U.S. OCS acreage.

The BMR provides advice to the MMS regarding environmental aspects of oil and gas activities on the OCS, thus, providing the State of Mississippi the opportunity for input into OCS management matters. The Bureau also provides recommendations to the Office of Governor, State of Mississippi regarding OCS-related matters. The participation of the State in the formulation of decisions pertaining to development of oil and gas resources on the OCS is valuable to the State. The participation provides the opportunity for the State to receive maximum benefits from oil and gas activities that affect it socio-economically and that have the potential to impact its living coastal resources.

In response to the Governor's request, during FY84 a report was prepared for the MMS and entitled "Comments and Information Pertaining to the Multilease Offering (Year 1985) Environmental Impact Statement for the Gulf of Mexico Outer Continental Shelf Planning Area." The staff of the Scientific/Statistical Division provided the lead role in the work required to prepare the report. This document provided information to assist the MMS in the preparation of a detailed statement describing the environmental impact of, and alternatives to, proposed sales of leases during 1985 for oil and gas exploration, development and production, particularly in the central planning area.

During FY84 there were three OCS Lease Sales in the Gulf of Mexico. These sales generated over \$3 billion in revenues for the Federal government. For the central planning area of the Gulf, \$1.3 billion in bonus bids were accepted covering a total of 2.28 million acres.

The BMR, through the Scientific/Statistical Division, is requested every year to participate in the update and development of the MMS Environmental Studies Program for the Gulf Region. Each year this process involves reviewing new study proposals, providing advice and information regarding previously approved study projects, maintaining an awareness of the progress of overall annual Studies Program components and attending a series of related meetings. During FY84 the BMR participated in the development of Studies Programs for 1984, 1985 and 1986. During FY84 there were 22 on-going environmental study projects within the Gulf OCS region.

During FY84, Federal preparations and State reviews and comments were made for two future OCS sales for the Gulf Region (Sales 84 and 98).

The staff of the Scientific/Statistical Division participated in a total of nine OCS-related meetings. The staff also developed a total of 21 OCS-related written responses. In addition, the staff reviewed a number of documents to maintain an awareness of OCS oil and gas activities in the Gulf of Mexico in order to be aware of those activities which may have an influence on Mississippi.

OIL AND GAS-RELATED ACTIVITIES IN MISSISSIPPI'S COASTAL WATERS

Interest continues in the potential development of oil/gas resources in the Mississippi Sound. The Mississippi Department of Natural Resources has initiated pre-leasing activities. As action progresses the BMR will address aspects of oil/gas leasing in the area.

Through FY84 the staff of the Scientific/Statistical Division participated in 12 technical meetings. These meetings pertained to oil/gas activities that may influence the coastal environments of Mississippi.

The staff served on executive and technical committees charged with the development of a U.S. Army Corps of Engineers general permit for oil and gas operations within the coastal waters of Mississippi and Alabama. The staff also developed several comments for the Corps and the U.S. Environmental Protection Agency. These comments pertained to environmental aspects of oil/gas activities within Mississippi's coastal waters.

GRANTS AND CONTRACTS

RESEARCH GRANTS AND CONTRACTS UTILIZING STATE FUNDS

The goal of these grants and contracts is to develop, through BMR-sponsored efforts and research projects, valuable information which is applicable to protecting, enhancing and utilizing Mississippi's coastal and marine resources and to aquaculture enhancement to benefit the citizens of Mississippi. The developed information is utilized by the BMR staff to enhance existing business opportunities and to create new ones, to manage the coastal and marine resources and address problems related to them, and to aid in preparing recommendations to the Commission on Wildlife Conservation who renders the management decisions.

Under the Grants and Contracts Program utilizing State funds, the staff of the Scientific/Statistical Division prepares detailed budget and technical specifications for each project. Through the duration of each project, the staff monitors project progress through progress reports required from the principal investigators. During FY84, no projects were supported with State funds.

RESEARCH GRANTS AND CONTRACTS UTILIZING FEDERAL FUNDS AND MATCHING STATE FUNDS

Mississippi OCS Participation Grant Award from the Office of Ocean and Coastal Resource Management. Mississippi Department of Wildlife Conservation, Bureau of Marine Resources -- \$95,906.08.

Subcontracts included the following: Determination of Hydraulic Forces in Selected Passages in Mississippi Coastal Waters - Gulf Coast Research Laboratory -- \$9,367; Support

service for Development of an Oil Spill Plan for the State of Mississippi - Southern Mississippi Planning and Development District -- \$18,684.

INDUSTRY AND PRIVATE ENTERPRISE ASSISTANCE

The purpose of this activity is to provide technical advice and assistance to industries and individuals involved and interested in the appropriate development and utilization of Mississippi's coastal and marine resources. The technical advice and assistance is aimed at enhancing the quality and marketability of seafood (including underutilized species), encouraging intensive cultured production of aquatic organisms in the coastal area to supplement the harvest of food from the natural marine environment, reducing pollution to the coastal marine environment by transforming wastewaters into saleable products, and for Mississippi citizens, enhancing their income and maintaining consistent, profitable income from the sale of products derived directly or indirectly from coastal and marine resources.

The staff of the Scientific/Statistical Division continues to provide technical assistance to persons involved or interested in becoming involved in aquaculture in the coastal area of Mississippi. Aquaculture is the controlled cultivation of aquatic animals and plants.

The BMR's aquaculture program efforts continue to be mainly aimed at providing an awareness of aquacultural opportunities and developing aquaculture operations which diversify and supplement an existing income base. Highly technical information developed by research organizations has been reviewed and evaluated and is being transformed by the Division's staff into information which can be readily understood and applied by aquaculturists located in the coastal region of Mississippi.

Requests for aquaculture assistance from the Bureau continue to escalate from year to year. During FY84 the staff worked with a number of private individuals in providing aquacultural information, in evaluating available resources for aquaculture, in producing new aquacultural species in the coastal area and in test marketing some of the produced products. All aquacultural assistance was rendered by the Bureau with the aim of enhancing jobs and income opportunities in the coastal area of Mississippi.

During FY84, as examples, specific aquacultural assistance included providing information on saltwater shrimp culture to several interested Mississippi investors and to a foreign investor; aiding in the development of a private freshwater shrimp larval and juvenile production facility on the Mississippi Gulf Coast; providing tilapia brood stock for a Mississippi commercial fish farmer and for a wastewater research project at Jackson State University; providing information on green crab shedding, on some ideas for an automatic softshell crab producing system, and information on crawfish culture. Assistance rendered also includes providing technical information for a prison farm aquaculture operation in the coastal area of Mississippi, for an aquacultural activity for a local Boy Scout group and for an aquacultural activity for enhancing the well-being of the mentally handicapped.

The Division's staff continued working with a large Mississippi coastal corporation in utilizing selected fish to remove suspended solids from their wastewater effluent stream. New species were introduced during FY84. Highly satisfactory results have been achieved in solids removal.

The staff of the Division participated in the aquaculture workshop in conjunction with the Soil Conservation Service. Three aquaculture publications produced by the Bureau were provided to the workshop participants.

Through efforts of the division, an Israeli group finalized a cooperative aquacultural-related agreement with Mississippi State University. During FY84, the group supplied freshwater shrimp juveniles produced in Israel for a cooperative shrimp research project conducted in ponds located at Mississippi State University. Also, freshwater shrimp researchers from Israel were involved in the freshwater shrimp research project on the University's campus.

In the area of food processing and product marketing and as examples, the Division provided assistance and information pertaining to the following aspects: the possible use of extracted shrimp head flavors in products produced by a surimi plant; shark harvesting, processing and marketing; production of smoked catfish by a Mississippi Delta business; peeling Mississippi farm-raised crawfish by a new process based upon research conducted by the staff of the Scientific/Statistical Division; a procedure for enhancing the peeling of shrimp on conventional shrimp peeling machines. Based upon recommendations, the procedure was used by a local seafood processor and several positive benefits were readily observed; a market linkage between a Mississippi food exporter and a local seafood supplier; brine-freezing of crawfish to aid a Mississippi crawfish grower in expanding his market potential.

During FY84, the staff of the Scientific/Statistical Division continued to provide assistance aimed at developing outlets and markets for shrimp waste solids produced by coastal seafood processors.

An investor met with the staff and was provided detailed information on shrimp waste production in Mississippi and some unique potential markets for the stabilized waste. Based upon recommendations by the staff, a commercial sod-producer in Mississippi applied shrimp waste to his sod crop. Results should be available in FY85. Based upon information developed by research efforts sponsored by the Bureau and based upon recommendations by the staff of the Scientific/Statistical Division, a local seafood processor was able to sell several thousand pounds of dried shrimp shells to be applied to control citrus tree disease in Florida. Also, as a result of technical information developed by the Bureau, a commercial potted-plant grower in Florida has requested and has been supplied dried shrimp shells for testing their several complementary and unique benefits for growing potted plants.

In support of industry and private enterprise assistance the following publications were produced by the staff of the Scientific/Statistical Division:

Information Pertaining to the Production and Utilization of Shrimp Waste Solids Generated in Mississippi Coastal Area. By Cornell M. Ladner and James S. Franks. Mississippi Department of Wildlife Conservation, Bureau of Marine Resources. Original February 1981, Revised February 1984.

Biotechnology, Aquacultural Opportunities in the Coastal Area of the State of Mississippi and Associated Potential Benefits. By Cornell M. Ladner. Mississippi Department of Wildlife Conservation, Bureau of Marine Resources. April 1984.

Highlights Pertaining to Production of a High Value Gourmet Food -- Softshell Crawfish. By John M. Loftus and Cornell M. Ladner. Mississippi Department of Wildlife Conservation, Bureau of Marine Resources. June 1984.

Aquacultural Information Pertaining to the Coastal Area of Mississippi. By Cornell M. Ladner and John B. Loftus. Mississippi Department of Wildlife Conservation, Bureau of Marine Resources. June 1984.

INTERAGENCY COORDINATION AND ASSISTANCE

Throughout the course of a given fiscal year, the BMR staff becomes involved in a number of special projects and services. Some of these projects and services occur routinely each year while others are one-time events.

During FY84, Dr. Richard Leard, Bureau Director, and Dr. Cornell Ladner and Mr. James Franks of the Scientific/Statistical Division, applied a considerable amount of time developing recommendations, reviewing technical information, providing comments and attending meetings pertaining to oil and gas development in State and Federal waters. The time and associated activities involved interactions and coordination with oil and gas industry representatives, the U.S. Minerals Management Service, the U.S. Environmental Protection Agency and U.S. Army Corps of Engineers at the Federal level, and the Office of the Governor, State of Mississippi and the Mississippi Department of Natural Resources.

Specifically, the time applied by the Bureau personnel involved aspects of oil and gas development and environmental management of the Federal Outer Continental Shelf waters, development of a generic environmental impact statement of oil and gas development in territorial waters of the States of Alabama and Mississippi, and formulation of the specifications for a general permit for oil and gas exploration in the territorial waters of the respective states.

A draft oil spill plan for the State of Mississippi developed by the staff of the Scientific/Statistical Division was provided for review and comment to the Mississippi Department of Natural Resources, the Gulf Coast Research Laboratory and four Federal agencies which have resource management responsibilities in Mississippi's coastal marine waters.

The Mississippi Gulf Coast Mosquito Control Commission was provided use of some recent BMR high resolution aerial photographs. The expensive photographs helped that Commission in developing mosquito control operations in the Mississippi coastal area.

The MMS was provided information on black Mississippi colleges which could be potential recipients of Federal funds applicable to research on Outer Continental Shelf resources.

The staff of the Scientific/Statistical Division worked in a complementary way with the Soil Conservation Service in developing inland coastal aquatic resources.

During FY84 the staff of the Division participated in the Mississippi-Alabama Sea Grant Consortium Program serving on the Consortium's Advisory Committee. Assigned by the Bureau Director to serve on the Committee, the staff reviewed and commented on research proposals which were submitted to the Consortium for funding. The staff also reviewed and provided comments and ratings for proposals submitted to the Water Resources Research Institute.

In addition to the previously mentioned coordination and assistance activities, the Bureau staff conducted numerous other reviews and provided comments on a variety of special topics, proposals and papers as responses were needed.

TEXAS PARKS AND WILDLIFE DEPARTMENT

Texas Parks and Wildlife Coastal Fisheries Research Management Programs

There were three major projects during fiscal year 1984 dealing with finfish resources. These included: (1) monitoring the availability of adult and juvenile finfishes; (2) monitoring the commercial and recreational harvest of finfish; and, (3) the enhancement of red drum in Texas bays.

Monitoring of the relative abundance of adult finfishes in eight Texas bay systems continued using 600-foot-long gill nets with individual 150-foot sections of 3-, 4-, 5- and 6-inch stretched mesh. Bag seines (60 feet long) and 20- or 40-foot trawls were used to determine the abundance of juvenile finfishes. Assessment of the success of House Bill 1000 (67th Texas Legislature) in reducing overfishing on red drum and spotted seatrout is continuing through routine monitoring and special studies. A spotted seatrout tagging program using rod and reel initiated in 1981 to supplement mortality, growth and movement data of this recreationally important species was completed. Approximately 14,000 spotted seatrout were tagged since 1981. Approximately 8 percent of the tags have been returned to date. Tagging and handling mortality studies on this species caught by rod and reel initiated in 1982 were completed. No differences were found between tagging and handling mortalities or handling mortality alone. Total mortality (handling and tagging) of rod and reel caught spotted seatrout was approximately 25 percent.

Minimum finfish harvest by commercial fishermen was determined through a self-reporting system using Monthly Marine Products Reports. A cooperative agreement between the National Marine Fisheries Service (NMFS) and this Department provided for the gathering of complementary catch rate and harvest information of the recreational fisheries. Texas Parks and Wildlife Department (TPWD) obtained sport boat and charter fleet catch rate and harvest data, and NMFS obtained wade bank, pier, surf and jetty catch rate and harvest data. When these data are combined, it will be possible to estimate the total harvest of the sport fishery.

Restrictive regulations were imposed on both recreational and commercial fishermen as a result of the December 1983 freeze in which more than 15 million animals were killed. The ongoing monitoring programs have substantiated early assessments that fish populations are down and fishermen success is down.

In August 1984, the Department requested and received a first-ever freshwater release from an impoundment to ameliorate drought conditions in upper Matagorda Bay.

The shellfish program consisted of four major projects including: (1) penaeid shrimp population monitoring in bay for abundance, size and movements; (2) penaeid shrimp population monitoring in the Gulf of Mexico; (3) oyster population monitoring; and, (4) blue crab population monitoring. Population monitoring of valuable commercial and sport species was carried out to determine trends in relative abundance, and to determine the factors that affect abundance in order to recommend closed seasons and other management options. Shrimp, crabs and associated organisms were monitored with 60-foot-wide bag seines along shorelines; with 20-foot-wide otter trawls in deeper (+3 feet) portions of bays; passes leading from the bays to the Gulf of Mexico; in the Gulf of Mexico (territorial sea). Four new 44-foot vessels were constructed and all should be in service in 1985 to increase sampling efforts in the Gulf of Mexico.

A tagging study to determine the feasibility of estimating shrimp mortality in bays was completed. There were 36,000 brown shrimp and white shrimp tagged in Aransas and Galveston bays. Included in the study were routine boat counts to determine relative fishing pressure, tagging and handling mortality studies, non-reporting rate studies and comparisons of return rates by different capture methods. Payment of awards and computerization of tag returns were conducted by the NMFS Galveston Laboratory.

For over 20 years Texas has closed its territorial waters (9 nautical miles) in the Gulf of Mexico to shrimping during June 1-July 15 to allow small shrimp leaving the bays to grow to a larger size before harvest and minimize waste from discarding. These season dates may be changed if biologists find that there may be an earlier, later or prolonged emigration of brown shrimp. In 1984 the season was set for 30 minutes after sunset on May 16 to 30 minutes after sunset on July 6. The earlier than normal closing and opening dates were due to an earlier emigration from bays in May and larger than normal sizes of shrimp in the bays and Gulf of Mexico in June.

Biological monitoring of oyster reefs in Galveston Bay prior to the 1984 season (November 1 - April 30) indicated that market oysters were about one-half as abundant and small oysters were about twice as numerous as in the 1983 season. The TPWD Commission delayed the season opening until January 15, 1985 to prevent damage to small oysters by allowing more to reach legal cullable size (3/4 inch) and market size (3 inch). The previous season had been closed one month earlier to prevent depletion of the reefs by a record high number of boats observed working the reefs. The high number of boats followed a 1982 statewide record harvest of 7.1 million pounds. The previous high of 4.9 million pounds was landed in 1965-66. Galveston Bay generally accounts for about 80 percent of the State's harvest.

Reported blue crab landings have fluctuated between 7 and 9 million pounds since 1977. Preliminary landings indicate that landings will be within the same range in 1984. No statistical differences have been detected in population abundance in recent years.

A total of 10 technical reports, 12 scientific journal articles and 3 newspaper/magazine articles about various aspects of the Texas coastal fishery resources were completed.

GULF STATE-FEDERAL FISHERIES MANAGEMENT BOARD

During the period October 1, 1983 to September 30, 1984, two meetings were held by the Gulf State-Federal Fisheries Management Board (GS-FFMB): Key West, Florida - October 1983 and Biloxi, Mississippi - March 1984.

The GS-FFMB is comprised of Gulf States Marine Fisheries Commission (GSMFC) Commissioners, two from each of the five Gulf States. The Board members vote as a State with a single vote per State. The Regional Director of the National Marine Fisheries Service (NMFS) or his designee, and the Executive Director of the GSMFC are non-voting members of the Board. The Board is advised on technical, scientific matters, and industry views by the same advisory groups as the Commission. Among these groups are the Technical Coordinating Committee (scientific), the Menhaden Advisory and Management Committee, the Shrimp Management Committee, as well as the NMFS.

The GSMFC is the prime contractor for all management plan development and support in the Gulf of Mexico for the Board. This has resulted in coordinated involvement by the Commission in State-Federal management and information in the territorial seas. The activities of the Board and the Commission complement those of the Gulf of Mexico Regional Fishery Management Council, thereby providing an effective system for advising the management of the fisheries throughout the extent of their range.

The major activities and accomplishments of the Board are described in the following summary:

The GSMFC in accordance with provisions included in Cooperative Agreement #SF-25 provided for administration, travel, communication, planning and other activities for the administration and committee support of the Board. This agreement in the amount of \$94,000 provided financial support for the following.

The staff of the GSMFC carried out many secretarial duties for the Board and its Committees (Crab Subcommittee, Menhaden Advisory Committee, SEAMAP Subcommittee, and Statistical Subcommittee), which included: preparing and distributing minutes of all Board meetings as well as minutes of all Committees of the Board, preparing and distributing meeting material, arranging and financially supporting meetings of the Board and its committees, and all other duties as required by the Board. Travel reimbursements were made for members and other approved participants of State-Federal Board meetings in accordance with Commission policy. Travel reimbursements were also made for attendance of other meetings related to State-Federal activities by authorized representatives of the GSMFC.

The Statistical Subcommittee held two workshops which allowed the members and other authorized participants to discuss problems and accomplishments encountered by North Carolina, Texas and NMFS in the enhanced State-Federal statistics initiative. These workshops were very beneficial since most of the Gulf States have signed cooperative statistics agreements with NMFS and are actively working to input and extract data from the NMFS Burroughs Computer System.

The Crab Subcommittee completed final editing, typesetting and publication of "Profile of the Blue Crab Fishery of the Gulf of Mexico." Copies were distributed Gulf-wide.

The SEAMAP Subcommittee has successfully completed its third year of SEAMAP activities in the Gulf of Mexico. With the assistance of the SEAMAP Coordinator, two publications were produced during this period. They are "SEAMAP, Executive Summary," and "1984 SEAMAP Marine Directory."

The Board elected Mr. I. B. Byrd (NMFS) Chairman, and Mr. Hugh A. Swingle (Alabama) Vice-Chairman to serve in 1983-84.

SOUTHEAST REGIONAL OFFICE AND SOUTHEAST FISHERIES CENTER

NATIONAL MARINE FISHERIES SERVICE (NMFS)

National Oceanic & Atmospheric Administration (NOAA)
U.S. Department of Commerce

Fisheries

COASTAL PELAGICS

This is the second year that NMFS observers were placed aboard all vessels purse seining for mackerels (The Coastal Migratory Pelagic Fishery Management Plan allows experimental purse seining of mackerels for three years). The vessel, gear, trip, purse seine sets, and the catch were recorded, and length and sex data were obtained from the catches. Purse seine catches of king and Spanish mackerel were found to be substantially below the quotas.

Fishery and tagging data indicated that the United States and Mexico may be fishing the same king mackerel resources. Plans were developed to work cooperatively with Mexico on this resource.

The charterboat survey to obtain catch and effort data was conducted for the third year. A monthly bulletin reporting catch-per-boat-hour data from survey areas was initiated and distributed to charterboat captains.

The biology of several species of coastal pelagics was completed and information on these studies is being published.

HERRINGS

Bioprofile studies on herrings centered around the reproductive biology and the age and growth of the blue runner, the reproduction and food habits of several herrings, and stock identification of Spanish sardine and Atlantic thread herring.

Exploratory cruises were conducted in the Gulf to locate herring schools with sonar and to sample the schools with a high-opening-bottom trawl and a mid-water trawl. Plans are in progress for future cruises in order to develop more efficient sampling technology.

The inshore purse seine fishery for herrings (primarily for bait) was monitored from information contained in boat captains' logbooks.

MENHADEN

Menhaden landings during the 1984 fishing season trailed the previous year's by 20 percent through September in the Atlantic, while Gulf menhaden landings exceeded expectations and will set a new landing record in 1984.

An evaluation of the statistical properties and forecast performance of the multiple linear regression forecast model was completed as a preliminary step in developing alternative modeling strategies for forecasting menhaden landings.

A stock assessment analysis of the Atlantic menhaden fishery was conducted with purse-seine landings data from 1940 to 1981 and port data from 1955 to 1981. Results indicate that the Atlantic menhaden fishery suffers from overfishing. Data from a stock assessment analysis of the Gulf menhaden, conducted with purse-seine landings data from 1946 to 1983 and port sampling data from 1964 to 1983, were analyzed to determine rate of growth, yield-per-recruit and spawner-recruit relationships, and maximum sustainable yield. These analyses were reviewed during the second stock assessment workshop on menhaden and coastal herrings held in Miami, Florida, during June.

The Captain's Daily Fishing Report project, a cooperative industry, State and Federal activity was continued. Data in these reports provide information and otherwise unavailable data about the process of purse-seine fishing as well as the Atlantic and Gulf of Mexico menhaden resources.

Tagging of juvenile menhaden in estuaries along the Atlantic and Gulf of Mexico coasts continued, with a record number of Atlantic menhaden being tagged in the South Atlantic. The tagging data were analyzed for developing a survey methodology for forecasting year-class strength and subsequent harvests by the commercial fleet.

OCEAN PELAGICS

Billfish tournaments were sampled for catch and effort statistics along the U.S. East Coast, Caribbean Sea, Bahamas, Florida Straits, and Gulf of Mexico. Two new tournaments were added to the 1984 survey. Data collected will contribute to the estimates of total catch and long-term trends in abundance of billfishes.

Two important tag recaptured fishes were acquired in 1984. A sailfish was recaptured after almost 11 years and a bluefin tuna was recaptured after four years. Samples of otoliths, spines and vertebrae from these fishes are being used to validate aging techniques. Processing marlin otoliths and analysis of dorsal spines is continuing. A new visual analysis system for analyzing zonations for skeletal structures is almost complete.

As of October, recreational and commercial anglers tagged and released 2,423 fishes of more than 12 species. Tag recaptures reported for the same period include 2 blue marlin, 10 white marlin, 9 bluefin tuna, and 17 sailfish.

The Oceanic Pelagics Program Summary Newsletter for 1983 reported on the cooperative gamefish tagging, recreational billfish surveys, and research on age and growth of big game fishes.

Information on the Atlantic swordfish fishery, provided by dealers and vessel operators on trip weighout sheets covering 1978-84, was computerized and will be used in stock assessment analyses scheduled for 1985.

PROTECTED SPECIES

Kemp's ridley sea turtle headstarting continued with 191 of the 1983 year-class released off Texas during June and 1,441 hatchlings of 1984 year-class received for rearing. For stock

assessment, a comprehensive Kemp's ridley survey and reporting network was established in the northern Gulf of Mexico.

The turtle excluder device (TED) design was significantly improved. The new design is collapsible, made of steel or fiberglass, and has better handling characteristics and durability. The new model should encourage voluntary use by shrimp fishermen because the TED performs well with no shrimp loss, and with consistent finfish reduction rates of 50 percent or better during day and night.

The three-volume Proceedings of the Western Atlantic Turtle Survey (WATS), held during July 1983, was published and distributed in the English edition. The Spanish edition of the Sea Turtle Manual was also published and distributed. The WATS II Executive Committee has planned survey and administrative activities with IOCARIBE through 1987.

Aerial surveys and data acquisition off the Atlantic coast from Cape Hatteras to Key Biscayne provided necessary information for population assessments of loggerhead and leatherback sea turtles.

The Sea Turtle Stranding and Salvage Network, the Sea Turtle/Dredging Task Force, and the International Cooperative Sea Turtle Tagging Program were maintained and reports were issued to constituents.

Population analyses of bottlenose dolphin populations from the Florida east coast to Texas were produced.

Pelagic aerial sampling surveys were made in the northwestern Gulf of Mexico to improve population estimates of dolphins.

Boat resighting surveys for bottlenose dolphins continued in the Mississippi Sound to assess heard biodynamics.

The Marine Mammal Stranding and Salvage Network was maintained, and reports were issued to constituents.

REEF FISH

Visual surveys were conducted of reef fish fauna associated with reef habitats in Key Largo and Looe Key National Marine Sanctuaries in Florida. Reef fishes were quantitatively classified according to abundance, distribution, frequency of occurrence, activity patterns, and food web level. Data are being used to better describe reef fish resources and to optimize sampling strategies for reef fish assessment.

SEFC and the Harbor Branch Foundation (Florida) evaluated the distribution of tilefishes and yellowedge grouper in the western Gulf of Mexico during September 1984. Studies with a submersible and surface support vessels compared densities of fish from visual assessments and fishing techniques. The principal objective was to calibrate assessment methods that can be used for fishery independent surveys over wide areas. Yellowedge groupers were observed to occupy species-specific type burrows.

The second Southeast Stock Assessment Workshop was held in Miami. The workshop included sessions on reef fish resources as well as groundfish and coastal pelagics, marine mammals and turtles, menhaden and coastal herrings, and shrimp.

A comprehensive review of over 400 references on artificial reefs was completed. The references were annotated and compiled by a computer program for rapid retrieval. The authors concluded their report with 29 recommendations for future studies and for improving the usefulness and effectiveness of artificial reefs.

SEFC and Sea Grant evaluated the survival of hook-and-line-caught red snapper to determine if a minimum size limit would be practical for this species.

In response to a request by the Gulf of Mexico Fishery Management Council (GMFMC), a yield-per-recruit model was developed to assist in analysis of alternative minimum size limits for red snapper and other reef fish. Minimum size limits appear to be a viable management option for red snapper and some groupers, provided that the management objective is to increase equilibrium yield-per-recruit.

Reef fish scientists from the SEFC, Florida Sea Grant, and the Marine Sanctuary Office evaluated techniques for estimating fish abundance and diversity using SCUBA at a visual assessment workshop held at Looe Key National Marine Sanctuary.

SHRIMP AND BOTTOMFISH

The findings from a two year study of shrimp size and abundance distributions in the Tortugas Sanctuary and a one-year tagging study were reported to the GMFMC in January and February 1984. After considering the results of these studies and other recommendations and testimony, the GMFMC requested that all the sanctuary foot outside the Florida territorial waters and north of the reef line be opened to trawling. The NMFS, after considering the Council's request and reviewing public testimony and scientific analyses of the studies, concluded the change in the geographic boundaries of the Tortugas sanctuary was not consistent with the objective of the fishery management plan to protect small pink shrimp from overfishing. As a result, a management decision was made to permanently close all of the Tortugas Sanctuary in August 1984.

NMFS and the State of Texas cooperated in closing shrimp fishing from 4 fathoms to 200 nautical miles offshore of Texas between late May and mid July as part of the Gulf of Mexico Shrimp Fishery Management Plan.

Data from a cooperative mark-recapture study of brown and pink shrimp, conducted by the Texas Parks and Wildlife Department, Mexico's Instituto Nacional de Pesca, and NMFS, were analyzed in response to the GMFMC's concern over shrimp migrations during the Texas closed shrimp season. The data, although sparse along the south Texas coast, indicate an exchange of shrimp across the border, but a directed tagging effort is needed there for a definitive statement.

A forecast concerning the prospects for the 1984 brown shrimp season based on indices of postlarval and juvenile shrimp abundance was issued. Shrimp abundance was also estimated by tagging experiments in a Galveston, Texas coastal pond. The most reliable estimate of the relative magnitude of the brown shrimp crop came from data collected from the Galveston Bay bait shrimp fishery during May and early June. The 1984 index is slightly below average.

A sampling study of shrimp distribution and population size in the marsh system of Galveston Bay is being conducted at two sites. Predator-prey experiments examined the effect of turbid water on predation. Shrimp aggregation studies with the beam trawl in nonvegetated areas of the marsh found that brown shrimp tend to aggregate in clusters during March-May. Laboratory studies of fish predation on postlarval brown shrimp continued.

Spring and fall shrimp and bottomfish surveys (SEAMAP) were conducted in the north-central Gulf of Mexico in depths of 5 to 50 fathoms.

Financial Assistance Programs

Federal financial assistance programs are administered in cooperation with 17 states, Puerto Rico, the U.S. Virgin Islands, the Gulf and South Atlantic State-Federal Fisheries Boards, and the Gulf and Atlantic States Marine Fisheries Commissions to develop fisheries resource information and management practices for use by the states, fishery management councils, marine fisheries commissions, the NMFS, and others.

The following programs are administered by the Southeast:

- Commercial Fisheries Research and Development Grant-in-Aid Program (PL 88-309)
- Anadromous Fish Conservation Grant-in-Aid Program (PL 89-304)
- State Liaison to Fishery Management Councils (PL 94-265)
- State/Federal Cooperative Fisheries Statistics Program (PL 94-265)

FY83 FEDERAL FUNDS

<u>Participant</u>	<u>PL 88-309</u>	<u>PL 89-304</u>	<u>Cooperative Statistics</u>	<u>Council Liaison</u>	<u>State/Federal Boards</u>	<u>Total</u>
Alabama	\$ 585.2	\$ 71.7	\$ 89.2	\$ 25.0	\$ --	\$ 771.1
Florida	240.0	--	139.7	50.0	--	429.7
Georgia	64.5	--	85.4	25.0	--	174.9
Louisiana	1,740.0	--	118.3	25.0	--	1,883.3
Mississippi	702.4	30.5	90.3	25.0	--	848.4
North Carolina	80.5	25.3	113.3	25.0	--	244.1
South Carolina	23.5	64.7	92.8	25.0	--	206.0
Texas	240.0	--	--	25.0	--	265.0
Puerto Rico	240.0	--	87.7	25.0	--	352.7
Virgin Islands	20.0	--	82.1	25.0	--	127.1
Inland States	181.7	--	--	--	--	181.7
Gulf States Marine Fisheries Comm.	--	--	--	25.0	44.0	69.0
Total	\$4,117.8(A)	\$192.2	\$899.0(B)	\$300.0(C)	\$44.0(D)	\$5,553.0

(A) Includes PL 88-309(4b) funds for disaster relief in Alabama (\$464.8K), Louisiana (\$1,500.0K) and Mississippi (\$535.20K).

(B) Southeast Fisheries Center funds.

(C) Washington funds.

(D) Various funding sources.

Enforcement and Observer Program

The Enforcement Division serves as the Regional Director's investigative and enforcement arm with responsibilities for planning, organizing, and implementing law enforcement activities related to the conservation and protection of ocean fisheries, marine mammals, and endangered species. It investigates criminal and civil violations of all statutes and regulations within the Service's enforcement jurisdiction and refers cases to Assistant U.S. Attorneys and NOAA

General Counsel for prosecution. The Division plans and participates with the U.S. Coast Guard, U.S. Customs Service, and State agencies in patrol, inspection, and investigative activities for maximum effective application of the participating agencies, resources, and expertise. The Division also provides staff advice, review, and assistance in formulating enforcement policies.

Program activities are as follows:

- o Documented 813 violations with assessed penalties and seizures totalling \$1,107,292.
- o Thirteen multi-agency enforcement operations conducted in FY84 under the Magnuson Act. Three multi-agency enforcement operations were conducted on bluefin tuna. Six multi-agency operations in the Caribbean area and three Lacey Act operations for shellfish violations were completed.
- o Seven cases were referred to and accepted by the U.S. Attorney.
- o Four hundred eighty-one civil cases were opened with total fines assessed at \$1,288,786.
- o Undercover operations for spiny lobster are expected to result in six to eight criminal indictments. It is likely that these efforts will significantly reduce the illicit trade in undersized lobsters that has been going on for several decades.
- o Forty-nine training sessions were conducted for U.S. Coast Guard and State enforcement officers.
- o Three hundred forty Lacey Act cases were documented in south Texas against U.S. shrimpers for fishing in Mexican waters. During these operations, 452 illegal aliens were turned over to the U.S. Immigration Service. Nine Magnuson Act cases were documented involving the Texas Closure.
- o Participated in the first Caribbean law enforcement organization meeting that included representatives from 15 Federal, territorial, and British Virgin Islands enforcement agencies. Primary aim was to improve coordination of marine interdiction and enforcement efforts.
- o Implemented a cooperative agreement for enforcement of MFCMA between the State of South Carolina, U.S. Coast Guard, and NMFS.
- o Special enforcement operations were conducted in Tortugas Shrimp Sanctuary, Crystal River area, Louisiana/Mississippi border, and Miami.

Environmental

NMFS is an active participant with the U.S. Army Corps of Engineers under the Fish and Wildlife Coordination Act, and through regulations, in programs directed toward the protection of the coastal and marine habitats which support fisheries resources. In this regard, NMFS, SERO investigates and analyzes proposed environmental alterations and reviews of environmental impact analyses, provides technical consultation services to development interests, delineates environmental research requirements, develops criteria and guidelines, disseminates public information as it relates to habitat protection, and conducts surveillance activities related to environmental alterations.

The Habitat Conservation Division also represents the Regional Director in all matters involving technology transfer and technical services. Technology transfer involves matching

fisheries needs with technology available throughout the world. To do so, information is provided on applicable technologies for transfer through various dissemination organizations to the commercial fishing industry. Identifies existing and new technology that may apply to commercial fishing, fish handling, and processing. The Technical Services Branch provides ADP and word processing support to the Regional Office.

Program activities are as follows:

As a result of private and commercial development, hydroelectric power projects along the coastline, and offshore energy development, major losses of estuarine habitat and coastal wetlands have occurred. These areas are vital to the health and growth of living marine resources as spawning, nursery, and forage grounds. Contributing to a continuing loss or degradation of vital habitat are construction and maintenance of navigation channels, dredge and fill activities, draining, ditching, and impoundment of wetlands, offshore drilling, mining and lumbering, and ocean dumping and waste disposal. Non-point source marine pollution is potentially the most serious problem for coastal water quality management having both resource and public health implications since it is largely uncontrollable. These losses continued to accelerate in the 1970's as development efforts in the coastal zone and offshore intensified. The NMFS has an obligation to prevent or mitigate the loss of these habitats.

- o Received 1,006 significant project proposals. All were commented on within established timeframes. Army Corps of Engineers accepted NMFS recommendations in 87 percent of cases resulting in conserving an estimated 15,000 acres of habitat. Applicant compliance to permit conditions was measured at 86 percent.
- o During the year, both the South Atlantic and Caribbean Councils established Habitat Management Committees. The Gulf Council, which already had such a committee, established three advisory subpanels. All Southeast Councils are supporting NMFS habitat efforts on proposed permits.
- o The number of pre-application meetings increased an estimated 14 percent over FY83, i.e. from 60 to 68 such meetings.
- o Completed review of nearly 6,000 State-owned submerged tracts in Texas relative to providing environmental recommendations for oil and gas exploration.
- o Initiated assembly of data base on habitat pollution. Coordination meetings held with EPA and Fish and Wildlife regional offices.
- o Participated on a blue ribbon panel for Bottomland Hardwoods; a joint Army, Agriculture, Commerce, Interior, and EPA report on clearing of lower Mississippi River Valley bottomland hardwoods for agriculture.
- o Initiated environmental requirements study for menhaden and shrimp.
- o Participated in evaluation of Louisiana Coastal Resources Program.

Development - Marketing

The Fisheries Development Division is responsible for the largest regional fisheries marketing program in the NMFS in terms of area coverage, manpower and dollar resources devoted to marketing, states having marketing programs, species coverage, export market development activity, and results with underutilized species. It plans, organizes, implements, and monitors

commercial fisheries development activities. The Division administers the Fisheries Obligation Guarantee program, Fisheries Loan Fund, Capital Construction Fund, Fishermen's Protective Act, Fishing Vessel and Gear Damage Compensation Fund, and the Fishermen's Contingency Fund financial assistance programs. It conducts marketing and consumer service programs including field market development and market news services. The Division also administers a wide range of service programs including export development and domestic programs.

Under the American Fisheries Promotion Act of 1980 (AFPA), NMFS is to aid the industry in reducing technical, economic, legal, and policy constraints that limit the growth of the U.S. fishing industry in the Southeast Region by:

- (a) The Fisheries Obligation Guarantee Program which facilitates financing, reconstruction, or reconditioning of eligible commercial/charter fishing vessels as well as shoreside facilities engaged in wholesale trade; Fisheries Loan Fund program which is designed as an emergency assistance activity directed on a need basis by this Agency; the Capital Construction Fund Program for the purchase of new/replacement/reconstruction of eligible vessels; the Fishermen's Protective Act Program compensating fishermen for unlawful seizure of U.S. fishing vessels by foreign countries; the Fishing Vessel and Gear Damage Compensation Fund; the Fishermen's Contingency Fund; and the Commercial Fishing Vessel Safety and Insurance Services Program.
- (b) The Division conducts investigations of market potential for Southeast Region fishery products in other regions of the U.S. and overseas and reports findings to industry. It participates in foreign and domestic food trade shows to introduce the Region's fishery products to potential buyers. It publishes a monthly marketing newsletter, supply data, industry directories, and educational materials to facilitate the marketing of seafood products.
- (c) Market information to the fishing industry and others through the New Orleans Market News Office, providing economics information and fisheries situation/outlook for use by NMFS, the industry and others, collecting and disseminating information on shrimp aquaculture and administering the Saltonstall-Kennedy Grants Program and the Region's responsibilities under the Fishermen's Contingency Fund.

Program activities are as follows:

- o Made nine trips in connection with arrests, foreclosures, bankruptcy hearings, foreclosure sales, inspection of foreclosed vessels, and release of vessels.
- o Represented the Agency at eight foreclosure sales. Repurchased two of the vessels at the sale, one of which has been resold.
- o Handled three assumptions and one refinancing totalling approximately \$1,000,000.
- o Serviced 123 problem cases and consented to payment deferments on 58 of those.
- o Received and processed three new Fisheries Obligation Guarantee applications totalling \$673,000.
- o Received and processed 44 new Fisheries Loan Fund applications totalling \$2,006,858.
- o Furnished information on Southeast Region products and a directory of Southeast Region exporters to U.S. embassies around the world.

- o Developed a "1984 Directory of Southeast Region Seafood Exporters" and distributed 1,000 copies at foreign food shows.
- o Published "National Directory of Seafood Purveyors." The Directory is now a government sales document.
- o Developed a Southeast Region seasonality poster that was published by the Gulf & South Atlantic Fisheries Development Foundation, Inc. A total of 5,000 copies were printed and about 3,000 copies have been distributed.
- o Developed a "Directory of Southeast Region Seafood Companies." Several hundred copies were distributed at domestic food shows.
- o Published 12 issues of "Best Southeast Region Seafood Buys Report." Over 1,400 food companies subscribe to this publication.
- o Published 12 issues of "Fishery Marketing Opportunities Newsletter." About 500 companies and government organizations subscribe to this publication.
- o Region participated in over a dozen domestic and foreign food shows. NMFS disseminated reports on all the shows.
- o Developed waterproof, pocket-size shark identification pamphlet.
- o Conducted three squid workshops.
- o Distributed on a regular basis 150 "Market News Reports" to 775 paid subscribers.
- o Published a "Shrimp Situation and Outlook" report describing trends and current developments affecting the U.S. shrimp industry.
- o Produced and distributed reports on shrimp mariculture.
- o Assisted in transfer of intensive shrimp culture technology from Taiwan to U.S. firms.
- o Processed two Fisheries Obligation Guarantee shoreside applications for loans in excess of \$1 million.
- o Processed 73 Fisheries Loan Fund applications totalling \$2.9 million.
- o Completed 18 Fisheries Obligation Guarantee refinancing, 10 loan assumptions, the sale of 13 foreclosed Fisheries Obligation Guarantee financed vessels, and worked on 25 bankruptcy cases.
- o Minimized foreclosures in our Fisheries Vessel Obligation Guarantee program for shrimp vessels despite the fact that the shrimp industry has experienced two and a half years of depression.

Research and Information Development

RESEARCH

Assessments

The Southeast Fisheries Center sponsored its second Stock Assessment Workshop in Miami, June 4-8, 1984. The Fishery Analysis Division of the Center's Miami Laboratory organized and hosted the workshop to present the most current information on the status of fishery/marine resource stocks within the purview of the Center, including the Gulf of Mexico, southwestern Atlantic and Caribbean. This second Stock Assessment Workshop was a continuation of the Fishery Analysis Division's efforts to provide a forum for discussion of stock assessment research and marks the progress since the first Stock Assessment Workshop in August of 1982 (Report of the Southeast Fisheries Center Stock Assessment Workshop, August 2-6, 1982. J. E. Powers, ed. NOAA Technical Memorandum NMFS-SEFC-127). The report which follows documents this progress and represents current scientific advice for use by the management agencies and institutions which have interest in these resources.

As in the previous workshop, the Fishery Analysis Division had four primary objectives in hosting this workshop. The first objective was to provide the current management advice needed by the regional Fishery Management Councils and national and international commissions and agencies.

The second purpose of the workshop was to provide a timely forum for critical review of the stock assessment research being done by the Fishery Analysis Division and other research groups in the Center and in the Southeast. The documents presented at the workshop are the most current updates of analyses, given available data and available models.

The third objective of this workshop was to improve future stock assessment research and scientific advice by providing direction for data collection and research programs.

The final objective was to promote scientific interchange between stock assessment researchers working on the fishery resources of the Southeast. The workshop provided an excellent opportunity in the Southeast for formal and informal discussions of ongoing research. This was particularly effective in transferring knowledge about analytical techniques, population models and statistical procedures from researcher to research and institution to institution.

The workshop was attended by more than 50 people representing individual laboratories within the Southeast Fisheries Center, the Northwest and Southwest Fisheries Centers, State agencies of the southeast United States, Puerto Rico and the U.S. Virgin Islands, the three Fishery Management Councils within the Region (South Atlantic, Gulf of Mexico and Caribbean) and various academic institutions. More than 60 stock assessment reports and documents were submitted at the workshop by participants. These were reviewed during the workshop by working groups covering: (1) groundfish and coastal pelagics, (2) marine mammals and sea turtles, (3) menhaden and coastal herrings, (4) reef fish and reef resources, and (5) shrimp. Note that oceanic pelagics (billfish, swordfish, bluefin tuna and sharks) were not discussed during the June, 1984 workshop. Development of current assessment advice on these resources is being done by several independent Center and Council sponsored review panels. However, a report of those results will be included with these proceedings.

As can be seen, these marine resources are geographically distributed through a wide area and are extremely diverse in their biological, ecological and fishery characteristics. The charge of the assessment scientists in this workshop was to address that complexity and provide

succinct updates and reviews on the status of the resources. This report represents those efforts.

Operational hardware and software systems aboard the OREGON II were developed for satellite communication and provided near real-time data reports for 7 SEAMAP cruises.

Data of 1983 SEAMAP cruises were edited and added to 1982 data. Graphics were produced for FY82 atlas and FY83 station data plots. User requests for SEAMAP data output were completed.

The basic data file of selected 1979 menhaden vessel log sheet data was completed and sent to Texas A&M in support of a NMFS/Sea Grant coastal zone color scanner study.

An evaluation of the color sounder hydroacoustic system aboard the OREGON II was conducted in support of the latent resource (herring) program.

Captive animal field tests were conducted of a satellite-linked turtle transmitter at the Florida Power and Light facility in Juno Beach, Florida.

Input was provided for Chapter 13, "Living Marine Resources Applications" for a special issue of "Advances in Geophysics" devoted to NOAA's SEASTAT-A and NUMBUS-7 satellite experiences.

Synoptic charts of surface chlorophyll and temperature were provided for the 1982 SEAMAP Environmental Data Atlas.

Areas of potential hypoxic bottom water conditions were identified from satellite chlorophyll and temperature data. Research vessel sampling during June confirmed the prediction, finding no hypoxia along the entire coast until approaching the predicted area.

The Mini-Mach project designed to determine the feasibility of using digital data and computer-assisted processing techniques to detect and quantify land cover and land use changes in the Barataria Basin, Louisiana, was continued.

Environmental

The influence of excessive freshwater inflow into a south Florida estuarine system was studied. Sampling during the rainy season showed that, while the species composition of the fishery community in the estuary receiving excessive freshwater was similar to that in adjacent unimpacted areas, the total number of individuals was severely depressed.

The utilization of seagrass and mangrove habitats by sport fishery species in Florida Bay was evaluated to determine the major avenues of entrance of larval fishes into the Florida Bay system and to evaluate juvenile fish nursery areas.

Research was conducted to determine the usefulness of transplanted seagrasses in stabilizing dredge material. Three tropical species of grass were transplanted both in the Florida Keys and along the Florida panhandle, attaining growth rates similar to natural seagrass systems.

Studies evaluating the nature and significance of natural or man-induced environmental changes on fish production in the northern Gulf of Mexico determined that the Gulf menhaden, spot, and Atlantic croaker larvae are particularly abundant along the edge of the Mississippi River plume. It was found that these larval fish are not indiscriminant feeders, but select a limited array of food organisms, particularly several species of copepods.

Field and laboratory research determined the effects of proposed OTEC operations in the Caribbean Sea on larval fish.

Contaminant research was concerned with the mechanisms of trace metal effects on food webs that support larval fish survival and growth and the processes involved in the accumulation and detoxification of metal by fishery organisms.

Beaufort Laboratory scientists presented testimony at public hearings on the possible impact of impounding coastal marshes on the production of fishery organisms.

Product and Quality Safety Research

Technical information to be used by industry during 1985 to petition FDA for the human food use of partially hydrogenated menhaden oil was compiled. Information was gained on the composition and stability of lipids and preparation of minced fish surimi intermediates for use in making structured seafood products.

Salted, smoked, and canned products were prepared from several underutilized species to support export market research being carried out by other groups.

Quality impediments in the handling and processing of calico scallops, preparatory to the development of quality specification for use by industry, were identified.

Work was initiated to identify a suitable replacement for the use of bisulfite in controlling quality problems (black spot) in shrimp, due to plans of FDA to eliminate the use of bisulfite in foods because of a public health hazard.

Composition and edibility profile data on numerous latent southeast species were compiled to more effectively program utilization of latent species.

Progress was made in delineating intrinsic factors that influence the toxicity to humans of oyster-bound cadmium, an issue of high priority to public health agencies. Collaborative studies on this heavy metal were carried out with FDA.

Work was completed on acquiring an information base on petrochemical contamination of reef-associated species obtained from the Caribbean area.

Preparations were made for participation in the 1985 Benthic Surveillance Project of the NOAA status and trends environmental monitoring program, as well as in the east coast survey of PCBs contained in bluefish.

Progress continued in establishing computerized seafood contaminants and consumer consumption data bases to permit analyses of correlations between seafood contamination and consumer risk.

Progress was made in improving methods for detecting and measuring the presence of potentially harmful contaminants of biological origin, especially pathogenic viruses, known to cause gastrointestinal illnesses among consumers of molluscan shellfish. Effective dialogue was maintained with all nine U.S. institutions engaged in ciguatera-related research, orchestrating a more effective and unified attack on this disease problem.

A third technology transfer forum was held to advise State public health agencies how to develop and apply a viral monitoring capability to provide more assurance of the safety of harvested shellfish products.

Special Projects

- o Urban Fishing: Serving as the Chairman of the Urban Fishing Subcommittee, Marine and Estuarine Committee, International Association of Fish and Wildlife Agencies (IAFWA), coordinated the preparation of a "Report on Urban Fishing" and "Urban Fishing Resolution." These documents were presented to IAFWA on August 17, 1984. The resolution calls for an urban fishing clearinghouse, the adoption of Federal and State urban fishing policies, local government urban fishing plans, and greater involvement by national organizations and private industry.

- o Caribbean Basin Initiative: The fisheries-oriented Caribbean Basin Initiative (CBI) proposal entitled "Pearls of the Sea" was prepared in March 1984. The proposal is directed at promoting sustained economic viability, including fishing in the Caribbean region. A proposal to establish a fishing academy in Puerto Rico under a Trade Adjustment Assistance grant has been developed in coordination with the Institute of Public Administration and Puerto Rico's CODREMAR.

- o Florida Marine Information: A non-profit, tax-exempt educational foundation called MARINE was established in June 1984 to inform the public on marine environmental matters. Through radio and T.V. public service announcements, T.V. documentaries, press releases, an information clearinghouse, and a speakers bureau, timely information will be communicated to governmental officials, media, industry leaders, and others on the need to conserve Florida's marine environment. Regional staff assisted in the conceptualization and formation of MARINE. This is visualized as a prototype for the Nation.

- o Presidential Initiative on Habitat Conservation: The Region submitted a legislative proposal entitled "The Marine Habitat Conservation Rehabilitation and Enhancement Act of 1985" on June 7, 1984. The bill, which was coordinated with the Army Corps of Engineers (COE), provides for the preparation of integrated habitat management programs by fishery management councils and implementation by interagency working groups. The COE would divert some of its civil works capability to coastal rehabilitation projects. In addition, \$100 million of OCS revenues would be made available for wetland acquisition, planning, research, and studies.

- o Bluefin Tuna: The Region is continuing to assist the Northeast Regional Office with management of the bluefin tuna fishery. Such assistance includes conducting public hearings, issuing news releases on amended regulations, and closures, and enforcing regulations.

GULF OF MEXICO FISHERY MANAGEMENT COUNCIL

Activities of the Gulf Council During 1984

During 1984, the fishery management plans (FMPs) for coral and reef fish resources were implemented. The Coral FMP allows coral harvest only for scientific purposes, establishes special habitat areas of particular concern (HAPCS) where fishing methods for other species are restricted to hook and line, and prohibits harvesting or damaging hard coral and seafans without scientific permits. The FMP regulates the resource from Texas through North Carolina.

The Reef Fish FMP establishes specific stressed areas where the stocks are subject to excessive fishing pressure, and prohibits utilization of specific gear in these areas, such as traps, roller trawls, and powerheads. A size limit of 13 inches total length is established for red snapper to increase the biomass of that species. An allowance for possession of five undersized snapper is provided. The FMP specifies areas where fish traps may be fished, and construction requirements for traps, as well as vessel limits on the number of traps.

Because of the extended delay in implementation of the Reef Fish FMP after it was submitted for implementation (November 1980), much of the information the FMP was based on was out of date. The Council, therefore, instructed staff to proceed with development of an amendment to the plan utilizing current information on the fishery. It is anticipated that the FMP amendment will be completed in 1985.

Amendments to the Shrimp and Stone Crab FMPs were implemented during 1984. These amendments addressed a gear conflict off central west Florida between shrimp and stone crab fishermen which was resulting in extensive gear losses and loss of harvest productivity. The amendments established procedures whereby Federal waters off the three county area could be zoned for fishing cooperatively with the State of Florida, and based on recommendations of State and Federal advisory panels consisting of area fishermen. A rule under this procedure was approved for the 1984-1985 season and restored order to the fishery. The advisory panels may recommend changes to the rule at any time. The procedure allows such changes to be implemented within 30 days after approval by the Council.

The area of the Tortugas Sanctuary, opened under a provision of the Shrimp FMP for the purposes of studying shrimp migration in the area, was closed during 1984 by NMFS. After reviewing scientific information on the size composition and migratory characteristics of the shrimp, and after obtaining public comment at hearings on the pros and cons of leaving the area open, the Council voted to recommend to the Regional Director of the National Marine Fisheries Service (NMFS) that the area remain open. Because this recommendation did not support the objectives of the FMP to increase the poundage of shrimp landed, the Regional Director allowed the area to close as scheduled in August.

The Council during 1984 developed a major amendment to its Mackerel FMP. Recent information indicated that king mackerel stock consisted of two migratory groups instead of one, and that the Gulf group was being overfished. The Council and its scientific committee and Mackerel Advisory Panel, developed an amendment which will reduce the excessive harvest through bag limits for recreational fishermen and reduced landing levels for commercial fishermen. Fifteen public hearings were held on the amendment, and most of the provisions were agreed upon by the Gulf and South Atlantic Councils during 1984. Implementation of the amendment provisions

is expected by the fall of 1985. The amendment will restore the stock to maximum sustainable yield within three and one-half years.

After holding six public hearings, the Council took final action to approve a FMP for swordfish. This FMP regulates the fishery on the east coast of the United States in five Council areas. This fishery was being subjected to overharvest of juvenile female swordfish reducing the biomass. The FMP provisions call for a one and one-half month moratorium on harvest in the Gulf to alleviate this problem. The FMP's provisions allow the length of such a moratorium to be adjusted annually or eliminated, based on new stock assessment information.

During 1984, the first critical evaluation of the effectiveness of the provisions of the Spiny Lobster FMP was completed. New scientific information developed by biologists of the State of Florida suggested that significant mortality was occurring as a result of the provision which allowed juvenile lobster to be used as attractants in traps. Following reviews of the FMP and of new information by the advisory panel and scientific committee, the Council took action to recommend completion of research on live wells and escape gaps that have potential to reduce this mortality. Upon completion of this research, the Council will consider amendment of this FMP in 1985, and has instructed staff to prepare background information on amendment alternatives.

During 1984, the Council completed a discussion paper for a data collection plan which examines the alternatives for more effective collection of fishery statistics. A work plan was developed by staff for consideration by the Council in 1985. Such a work plan, if approved by the Council, will be submitted to NMFS for approval and funding.

The Council participated with representatives of other fishery agencies in the Gulf States Marine Fisheries Commission's task force in developing the Marine Fisheries Initiative (MARFIN) which delineates research requirements to obtain additional production from Gulf fisheries. This document will be submitted to Congress for funding in 1985.

The Council's Chairman acted as keynote speaker for the Minerals Management Service Information Transfer meeting. He also served on the Department of Interior's Rigs to Reefs working group who were exploring methods and policies which would retain offshore oil and gas structures for artificial reefs.

The Council's Habitat and Environmental Protection Committee reviewed and commented on several major developmental projects that had potential to adversely impact fisheries managed by the Council.

1985 SEAMAP MARINE DIRECTORY

In March 1982 the SEAMAP Subcommittee recommended to the Technical Coordinating Committee of the Gulf States Marine Fisheries Commission that an annual SEAMAP Marine Directory of fishery-independent research programs in the Gulf of Mexico be developed. The Directory describes the survey activities, target species, sampling areas, gear used and vessel schedules of State, Federal and university programs; this information is also published in the Commission's Annual Report. The objective of the Directory is to inform regional marine management, development and research organizations of current fishery-independent research, in order to prevent redundant and wasteful data collection in the Gulf.

Agencies responding to the 1985 Directory were contacted in January 1985 and requested to provide current information or projected changes in their survey programs. Tables 1, 2 and 3 are condensed summaries of information submitted by responding agencies and organizations, indicated as either Federal, State or university activities.

TABLE 1. SUMMARY OF INFORMATION PROVIDED BY FEDERAL AGENCIES

AGENCY	TARGET SPECIES	LIFE STAGES SAMPLED	TYPES OF FISHERY-INDEPENDENT SAMPLING		ANNUAL EFFORT DEVOTED TO FISHERY-INDEPENDENT SAMPLING BY ACTIVITY IN:			TYPES OF GEAR		SAMPLE STRATEGY FOR DATA COLLECTION	ANTICIPATED CHANGES IN DIRECTION OF FISHERY-INDEPEND. ACTIVITIES OVER NEXT 5 YEARS	HIGH PRIORITY SPECIES PRESENTLY UNABLE TO SAMPLE
			AREA SAMPLED	GEOGRAPHIC AREAS OF IMPORTANCE	TYPES OF PLATFORMS	NUMBER OF DAYS	NUMBER OF SAMPLES	FISHING, TRAWLING	PLANKTON			
NOAA NMFS/SEFC Mississippi Labs, Pascagoula	Groundfish (shrimp, spot, croaker, catfish, trout)	Subadult-adult	U.S. Gulf of Mexico	Territorial, open ocean (FCZ)	172' R/V NOAA Ship OREGON II	70/yr toward target species 70/yr total sea days	1644/yr trawl stations, 180 ichthy./yr, 180 neuston/yr	Standard 40' semiballoon trawl	Bongo array with .333m mesh nets and 1 x 2 m neuston net with .947m	Random (stratified) 5 - 50 fm	None	None
	Reeffish (snapper, grouper, tilefish)	Subadult-adult	U.S. Gulf of Mexico, South Atlantic, Caribbean	Territorial, open ocean (FCZ)	OREGON II; 127' R/V NOAA Ship CHAPMAN; Submersible	70/yr toward target species	250 longline sets/yr	Longline, Traps	None	Stratified random	None	None
	Latent resources (coastal pelagics, squid, butterfish)	Subadult-adult	U.S. Gulf of Mexico	Territorial, open ocean (FCZ)	CHAPMAN	140/yr toward target species 180/yr total sea days	400/yr trawl stations	Mid-water & high-opening bottom trawls	None	Transsects	Expansion	None
	Marine mammals and sea turtles	Subadult-adult	Mississippi Sound	Internal, territorial	Outboard 100 hp and airplane	72/yr	None	None	None	Transsects	Expansion	None
NOAA NMFS/SEFC Miami Lab	All recreation-ally & commercially important species	Larval stages	U.S. Gulf of Mexico, Southwest Florida	Territorial, open ocean (FCZ), internal	172' R/V NOAA Ship OREGON II, various small boats	35/yr	1500/yr	No fishing or trawling gear	Bongo nets 60 & 20 cm with .333m mesh; neuston 1 x 2 m w/ 0.5.47m mesh	Systematic, grid basis long-term station selection; estuary entrances	Continuation of SEAMP, continuation of SE Florida monitoring	None
					60/yr	1500/yr						
NOAA NMFS/SEFC Beaufort Lab (NC)	Atlantic croaker and spot	Subadult-adult	Charlotte Harbor; Tampa, Apalachicola, Escambia, Mobile, Barataria, Corpus Christi, Galveston Bays; Miss. Sound; Miss. Delta; Laguna Madre	Territorial	133' NOAA Ship FERREL	70/yr	90 fish per sampling site	30' otter trawl	None	Samples representative of general contaminant levels at each sampling site (NOAA Status & Trends project: organic contaminants, trace metals, histopath.)	Project funded on yearly basis	None
NOAA NMFS/SEFC Galveston Lab	Penaeid shrimp, lane snapper, red snapper, rock sea bass, so. kingfish, dwarf sand perch, blackfin sea robin, inshore lizardfish, bighead sea robin, ocellated flounder	Postlarval-adult	U.S. Gulf of Mexico	Internal, FCZ	172' R/V NOAA Ship OREGON II (Texas Closure); Charter vessels for Tortugas Sanctuary	117 days total, Texas Closure & Tortugas Sanctuary		Same as OREGON II	Same as OREGON II	Random stratified for Texas Closure & Tortugas Sanctuary Short-term special studies for estuarine ecology	None	None

TABLE 1. (CONTINUED)

AGENCY	TARGET SPECIES	LIFE STAGES SAMPLED	TYPES OF FISHERY-INDEPENDENT SAMPLING		ANNUAL EFFORT DEVOTED TO FISHERY-INDEPENDENT SAMPLING BY ACTIVITY IN:			TYPES OF GEAR		SAMPLE STRATEGY FOR DATA COLLECTION	ANTICIPATED CHANGES IN DIRECTION OF FISHERY-INDEPENDENT ACTIVITIES OVER NEXT 5 YEARS	HIGH PRIORITY SPECIES PRESENTLY UNABLE TO SAMPLE
			AREA SAMPLED	GEOGRAPHIC AREAS OF IMPORTANCE	TYPES OF PLATFORMS	NUMBER OF DAYS	NUMBER OF SAMPLES	FISHING, TRAWLING	PLANKTON			
U.S. Department of Interior, Fish & Wildlife, LSU, Baton Rouge, LA	All economically important estuarine-dependent fishes & crustaceans	Larval-juvenile	SW Louisiana	Estuarine	275-hp mudboat; 250-hp airboat 35-hp outboard	365/yr	Varies with project	16' flat otter trawl	0.5-m 0000 plankton net; 6' beam trawl w/ 0000 mesh	Systematic, long-term station selection Short-term special studies	Depending on funding, will remain the same	None
U.S. Army Corps of Engineers, Mobile, AL	All commercially & recreationally important species	All stages	Mobile Bay, Miss. Sound, U.S. Gulf of Mexico to the 20-fm contour	Internal, territorial	Charter research vessel; small boats	Varies with project	Varies with project	Varies	None	Systematic, random, short-term special studies	None	None
USDI MMS/GOM Regional OCS Office, Metairie, LA	Epifaunal, macrofaunal & meiofaunal	All stages	Gulf-wide	Deep-sea (300-3000m)	HOS CITATION; R/V GYRE	35/yr	168 box cores, 26 hydrocasts, & CSTD profiles; 5600 photographs	None	None	Transects sampled in western, central & eastern Gulf; additional stations in areas of interest	Anticipated end of this program 1985 (Contractor: LGL Ecol. Res. Assoc., Texas A & M Univ.)	None
Northern Gulf Cont. Slope Study Year 2	None	None	None	None	None	None	None	None	None	None	None	None
Physical oceanography; Circulation Modelling Program	None	None	None	None	None	None	None	None	None	None	None	None
SW Florida Shelf Ecosystems Study	Macroepifaunal & macrofaunal communities	All	SW Florida Shelf	Inner, middle & outer shelf	105' R/V SUNCOASTER and in situ environmental arrays	37/yr on ship 365 days for 8 environmental arrays	28 trawls; 8 dredges; 36 CSTD profiles/hydrocasts; 36 grabs; 56 km underwater TV/still photos; 8 array yrs. in situ data	None	None	Non-random selection of habitat types	Anticipated end of program: 1985 (Contractor: Environmental Sci. & Engin., Inc./LGL Ecol. Res. Assoc.)	None
Physical oceanography; Field Measurements Program	None	None	Gulf-wide	Shelf and slope	R/V's GYRE and SUNCOASTER; Drifting (satellite-tracked) buoys; ships of opportunity (SOOPS)	Ships: ± 40 sea days/yr to 1987; Buoys: 200-500 buoy days/yr; SOOPS: 70 transects of Gulf basin/yr	Hydrographic records	None	None	Fixed location current meter moorings; Selected hydrographic station transects; Random locators for buoys only; Repeating transects for SOOPS	Anticipated end of program: May-June, 1987. Contractors: Science Applic. Int., Nat. Data Buoy Center; NMFS	None

TABLE 2. SUMMARY OF INFORMATION PROVIDED BY STATE AGENCIES

Agencies	Target Species	Life Stages Samples	TYPES OF FISHERY-INDEPENDENT SAMPLING		ANNUAL EFFORT DEVOTED TO FISHERY-IND. SAMPLING BY ACTIVITY IN:			TYPES OF GEAR		Sample Strategy for Data Collection	Anticipated Changes in Direction of Fishery-Ind. Activities Over Next 5 Years	High Priority Species That are Presently Unable To Sample
			Area Sampled	Geographic Areas of Importance	Types of Platforms	No. of Days	No. of Samples	Fishing, Trawling	Plankton			
Texas Parks & Wildlife	All penaeid shrimp, all other species	Juvenile-adult	TX internal coastal waters and territorial sea	Internal, territorial	30' inboard & 18' out-board skiffs, 44' inboard inboard	365/yr	960/yr 1440/yr 520/yr 768/yr 666/yr 40/yr 1200/yr	60' bag seines (shoreline) 20' trawl (bay, open water) 20' trawl (bay to Gulf Pass) 20' trawl (Gulf waters) Gill nets for adult finfish (along shore) 40' trawl (Gulf waters)	None	Random, grid basis	None	Include Sabine Lake and Gulf beaches in sampling
Louisiana Dept. Wildlife & Fisheries	All penaeid shrimp and groundfish	Larval to adult	LA inshore waters, territorial seas, FCZ	Internal, territorial	13-17' out-boards for 6' trawl; 30' in-boards for 16' trawls; 85' vessel (LOOP) for 50' trawl Leased vessel for 40' trawl	167/yr state 92/yr LOOP	Plankton, 1285/yr; Benthos, 56/yr; Trawls: 1225/yr 1288/yr 494/yr 72/yr 12/yr 120/yr	Otter trawls: 6' (inshore) 16' (inshore) 16' (offshore) 50' (offshore) 50' (inshore) 40' (offshore)	1/2-m surface ring nets (153 and 363 µm) 1-m surface ring (363 µm) 60-cm bongo nets (363 µm)	Long-term station selection LOOP monitoring, and stratified random sampling for SEAMAP (40' trawls and bongos)	Increase territorial sea sampling; increase emphasis on commercial and recreational finfish	Most of the important commercial and recreational catch
Mississippi Bureau of Marine Resources	All penaeid shrimp, speckled trout, redfish, mullet, black drum, flounder, snapper, grouper, white trout, ground mullet, menhaden, blue crab	Juvenile-adult	MS territorial sea	Internal, territorial (FCZ)	32' Laffitte 19' Cobia 65' Oyster Dredge Boat	50/yr 10/yr 50-60/yr	Varies Oyster 6/mo Shrimp 10-15/mo	12' and 16' trawl Oyster tongs and dredge	None	Long-term station selection, varies with opening and closing of areas	Increase and expand mackerel, snapper, grouper research with age and growth length frequency	Highest priority are shrimp and oysters; finfish inadequate personnel
Alabama Dept. of Conservation & Nat. Resources	All penaeid shrimp, southern flounder, Gulf menhaden, spot, croaker, red drum, seatrout, blue crab	Larval-adult	AL marshes to territorial sea	Internal, territorial	18' Seacraft, 115 hp; 23' Seacraft, (2) 115 hp	110/yr	626/yr	50' bag seine 16' otter trawl	6' beam plankton trawl	Long-term station selection	More intensive work with target species, i.e., tagging	Increase level of sampling in AL territorial sea, presently prevented due to lack of appropriate vessel
Florida Dept. of Natural Resources	Red drum spotted trout, snook, king mackerel, mullets, gag grouper, tarpon, stone crab, blue crab, spiny lobster, oysters, hard clam	All stages, larval-adult	FL waters & offshore	Internal, territorial	37' R/V BUNNIE "E", 27' Sea Star twin I/O, 24' T-craft inboard, 2 small out-boards used for inshore sampling, 1 mullet skiff	Varies Weekly intervals (annually)	Varies with project	100' bag seine Benthic sled w/net Trammel net, 600' x 8' Lobster & crab traps	Bongo array	Systematic, random (stratified), grid basis Long-term station selection, short-term special studies	As per Florida Marine Fisheries Commission	Mainly applies to implementation of research phases on current species or topics w/additional personnel and increased funding

TABLE 3. SUMMARY OF INFORMATION PROVIDED BY UNIVERSITIES

Universities	Target Species	Life Stages Samples	TYPES OF FISHERY-INDEPENDENT SAMPLING		ANNUAL EFFORT DEVOTED TO FISHERY-IND. SAMPLING BY ACTIVITY IN:			TYPES OF GEAR		Sample Strategy for Data Collection	Anticipated Changes in Direction of Fishery-Ind. Activities Over Next 5 Years	High Priority Species That are Presently Unable To Sample
			Area Sampled	Geographic Areas of Importance	Types of Platforms	No. of Days	No. of Samples	Fishing, Trawling	Plankton			
FLORIDA												
Florida State Tallahassee	Benthic infauna Epibenthic fishes & invertebrates	Larval-adult	NE Gulf of Mexico	Internal, territorial	(3) 55 hp 25' skiffs, outboard	48/yr	Monthly samples; both trawl & environ.	Standard 5-m otter trawl	80-µm plankton net	Systematic, random long-term station sel., short-term special studies	More environmental experimentation	Areas: Apalachicola Bay system & Apalachee Bay; species: all species in those areas
Univ. West Florida Pensacola	Snappers groupers triggerfish	Subadult-adult	NE Gulf of Mexico	Internal	(1) 23' R/V ARGONAUT	7/yr trawling, 14/yr plankton neuston	50/yr 140/yr	16' otter trawl	2 (1-m) nets 3 (1-m) neustons	Systematic, random (stratified)	None	None
Florida Sea Grant Gainesville	Oysters, spiny lobster, swordfish, tilefish, snowy grouper, shark and clams	All stages	FL waters	Estuarine, coastal	Industry, NMFS and F.I.O. contract vessels	Varies w/ project	Varies w/ project			Varies w/project	None	None
Florida Institute of Oceanography St. Petersburg	All species	All stages	Gulf, Caribbean and South Atlantic	Internal, territorial	R/V. SUNCOASTER	20-30/project	Varies	40' otter trawl, Tucker Trawl, Shellfish dredge	Various plankton nets	Random, long-term station sel., short-term special studies	To continue w/SEAMAP; Expanded environmental	None
ALABAMA												
Univ. So. Alabama Mobile	All finfish	Egg & larvae	Mobile Bay and nearshore waters	Internal, territorial	40' R/V DEBORAH "B"	Biweekly, April - October	200/yr		Meter net 505-mm mesh demersal, 6 neuston	Systematic, grid basis, long-term station selection	Strongly oriented toward sciaenid eggs and larvae	None
Marine Environmental Sciences Consortium (Dauphin Is. Sea Lab & U. Alabama)	Spotted sea-trout, white sand trout, croaker, red drum	All stages	Miss. Sound, Mobile Bay, Perdido Bay	Estuarine	40' DEBORAH "B", 14' skiff, 23' outboard	At least monthly, April 85 through March 86	Undetermined	Fyke net; drop net; bag seine	.505 beam trawl	Target areas: grass beds	None	None
MISSISSIPPI												
Univ. So. Mississippi Hattiesburg	American eel, freshwater prawn, all estuarine finfish	All stages	MS estuarine Northern Gulf barrier islands	Estuarine, territorial	Various small skiffs (outboard)	Varies	Varies	Standard basic equip.	Standard basic equip.	Short-term special studies	Increase development of a marine science program	None
Gulf Coast Research Laboratory	All penaeid shrimp, blue crab, croaker, spot, seatrout, catfish, Gulf menhaden, sea mullet, Atlan. bumper, butterfly, cutlassfish	Larval-adult	MS territorial sea	Internal, territorial (FCZ)	96' R/V TOMMY MUNRO (5) 20' skiffs 35' R/V HERMES 40' R/V NERLUS	Semimonthly at 2-week intervals	216 trawl stations/yr	50' bng seine 36' otter trawl 16' otter trawl 6' Renfro beam trawl Variable mesh gill net sampler	Tucker trawl	Long-term station selection	Fishery Division anticipates its program of monitoring & assessment over the long term, with appropriate increases in intensity & scope if funds become available	Adult phases of most finfish & shrimp species occur offshore where coherent long-term sampling is difficult due to current funds restrictions; precludes adequate inshore sampling of some adults, such as striped mullet.
Mississippi-Alabama Sea Grant Consortium	Red drum, blue crab, stone crabs, oysters	Vertebrate larvae; invertebrates, all stages	No. Gulf of Mexico, Miss. Sound, Mobile Bay	Territorial, FCZ, estuarine, coastal	96' R/V TOMMY MUNRO; skiffs; industry	Varies with project	Varies with project	Various types of crab pots; tonging for oysters	Tucker trawl (0.202 mm and .333 mm mesh nets)	Varies with project	None	None

TABLE 3. (CONTINUED)

			TYPES OF FISHERY-INDEPENDENT SAMPLING		ANNUAL EFFORT DEVOTED TO FISHERY-IND. SAMPLING BY ACTIVITY IN:			TYPES OF GEAR					
Universities	Target Species	Life Stages Samples	Area Sampled	Geographic Areas of Importance	Types of Platforms	No. of Days	No. of Samples	Fishing, Trawling	Plankton	Sample Strategy for Data Collection	Anticipated Changes in Direction of Fishery-Ind. Activities Over Next 5 Years	High Priority Species That are Presently Unable To Sample	
LOUISIANA													
Univ. New Orleans New Orleans	Blue crab, oysters, marine commercial finfish	All stages	Lake Pontchartrain; Sister Lake	Estuarine		Varies				Short-term special studies	Analyze commercial fish populations by use of electrophoresis; studies of oyster nutrition	None	
McReese St. University Lake Charles	All penaeid sp., Gulf menhaden, red drum	All stages	Nearshore Gulf off Cameron/Holly Beach, Calcasieu Lake, Calcasieu Pass	Estuarine, coastal	65' R/V CAPT. BRADY JOSEPH	12-24/yr for 4 disciplines 75/yr total		Benthic nekton, phytoplankton, Zooplankton	15-m balloon otter trawl, 5-m flat otter trawl	3-liter Van Dorn bottle, 67-cc bongo array, 0.333-mm & 0.505-mm mesh nitex nets, Ring net 1.0 m w/ .353 mesh	Grid basis Long-term station selection Short-term special studies	Scale down sampling activities from monthly to quarterly. Direction will remain essentially unchanged.	None
Nicholls St. University Thibodaux	Oysters	All stages	Terrebonne Bay, Barataria Bay	Estuarine	21' skiff 30' oyster dredge boat	48/yr	144/yr	Oyster dredge			Random, long-term station selection	Two more yrs. w/oyster project before it ends	None
Louisiana St. University Baton Rouge													
169-20-1014	Red drum, spotted sea trout	Juveniles	Caminada Bay,	Estuarine		Varies	Varies				Special study to compare sampling efficiency	Short-term special study	None
169-20-4108	All nekton	All stages	Upper Calcasieu	Estuarine	19' Boston Whaler	12-20	50	16' crawl w/ modified net			Stratified, short-term station select.	1-yr special study	None
169-20-0117	Benthic macrofauna	All stages	Caillou Is.	Internal, coastal	Oil rig	Varies	6	Box corer			Site-specific special study	Short-term special study	None
169-20-4112	King mackerel, other coastal pelagics	Juvenile, adults	Grand Isle	Internal, coastal	24' Aquasport	Varies	Varies	Trolling (4 lines)			Sample in areas of commercial activity	Increase tagging activity to include Mexican stocks	None
169-20-0124	Shrimp	Larvae	Sabine and Rockefeller Refuges	Estuarine	Airboat w/ towed skiff	30	80	Drop net			Short-term station selection	Two additional years	None
169-20-1210	Snapper, grouper, tilefish	Adults	Cont. shelf of FCZ	Internal, territorial	Chartered shrimp	15	15	1000-hook longline			Exploratory	Short-term special study	None
169-20-5164	Squid	Adults	LA Cont. shelf	Internal, territorial	Chartered shrimp	10	Varies	4-line squid jig			Exploratory	Short-term special study	None
169-20-4123	Nekton, benthos	All stages	Pt. Au Chien Mgmt. Area	Estuarine	Small Boston Whaler	30		Box corer, unspecified nets			Long-term station selection	None	None
169-20-0107	Nekton	Juveniles, adults	Calcasieu Ship Canal	Coastal, estuarine	Commercial wing-net shrimp	20-25	200	Wing-net			Areas of commercial	Short-term special study	None
169-20-4133	Scomberids, Carangids, Clupeids	Larvae	Gulf of Mexico	Gulf-wide	Ocean-going SEAMAP vessels	Varies	Varies	None	Bongo array with .333 mm and .505 mm mesh nets		Partially randomized stations, Gulf-wide	Examine recruitment of stocks from 1982-83 summer period	None

TABLE 3. (CONTINUED)

			TYPES OF FISHERY- INDEPENDENT SAMPLING		ANNUAL EFFORT DEVOTED TO FISHERY-IND. SAMPLING BY ACTIVITY IN:			TYPES OF GEAR				
Universities	Target Species	Life Stages Samples	Area Sampled	Geographic Areas of Importance	Types of Platforms	No. of Days	No. of Samples	Fishing, Trawling	Plankton	Sample Strategy for Data Collection	Anticipated Changes in Direction of Fishery-Ind. Activities Over Next 5 Years	High Priority Species That are Presently Unable To Sample
LOUISIANA												
Louisiana Universities Marine Consortium	Zooplankton, benthos	All stages	Terrebonne and Timbalier Bays, Inner Cont. Shelf	Internal, territorial	110' R/V PELICAN; 44' R/V R.J. RUSSELL small out- boards	Varies	Varies	5-m otter trawl	.333- m and .505- m mesh bongo nets	Fixed station transects	Expand effort using new 17-m and 32-m vessels	None
TEXAS												
Univ. Texas, Austin Marine Science Laboratory, Port Aransas	All larval fishes Ecosystem/ benthic	All stages	Internal, territorial waters	Internal, territorial (FCZ)	80' R/V LONGHORN 57' R/V KATY	100/yr	Varies with pro- ject	42' semi- balloon shrimp trawl; 40' otter trawl	12' x 24" plankton net	Short-term special studies	Institute ex- pansion on all present programs	None
Texas A & T Kingsville	All inshore bay species	All stages	Corpus Christi to Brownsville	Internal, coastal		24/yr	150/yr			Short-term special studies	None	None
Texas A & M College Sta- tion and Galveston	All macro- crustaceans and finfish	All stages	Bryan Mound, Freeport, TX; West Hack- berry, Cam- eron, LA	Internal, territorial (FCZ)	71' R/V EXCELLENCE II	40/yr	Monthly samples	34' and 50' semi- balloon trawls	Bongo net with .333 m and .505 m mesh	Long-term station selection, short- term special studies; systematic, grid basis	None	None
Pan American University, Coastal Stud- ies Lab, So. Faire Island	All finfishes of Laguna Madre, benthic macrofauna of of Laguna Madre	All stages	Corpus Christi to Brownsville	Laguna Madre and Gulf near- shore	Shallow- draft bay boats	48/yr	Biweekly and monthly depending on project	Otter trawls and bag seines	Plankton tows	Long-term baseline studies	Intensive studies of individual species	None

GULF STATES MARINE FISHERIES COMMISSION

Financial Statements
September 30, 1984

BOUTWELL AND COMPANY, LIMITED
Certified Public Accountants
Pascagoula, Mississippi

Boutwell and Company, Limited

Certified Public Accountants

1126 JACKSON AVENUE — POST OFFICE BOX 295
PASCAGOULA, MISSISSIPPI 39567

MEMBER
AMERICAN INSTITUTE OF
CERTIFIED PUBLIC ACCOUNTANTS
MISSISSIPPI SOCIETY OF
CERTIFIED PUBLIC ACCOUNTANTS

MILLETTE BUILDING
SUITE 402
TELEPHONE 762-5181

February 14, 1985

To The Commissioners
Gulf States Marine Fisheries Commission
c/o Mr. Larry B. Simpson, Executive Director
P. O. Box 726
Ocean Springs, Mississippi 39564

Gentlemen:

We have examined the balance sheet of Gulf States Marine Fisheries Commission as of September 30, 1984, and the related statement of revenues, expenses and changes in fund balances for the fiscal year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion the accompanying financial statements present fairly the financial position of Gulf States Marine Fisheries Commission at September 30, 1984, and the results of its operations and changes in fund balances for the twelve months then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

A separate management letter containing our observations pertaining to the internal administration of the Commission's financial affairs will be furnished in a separate letter.

Respectfully submitted,

Boutwell and Company, Limited

BOUTWELL AND COMPANY, LIMITED
Certified Public Accountants

GULF STATES MARINE FISHERIES COMMISSION
 Balance Sheet
 September 30, 1984

ASSETS

Cash		\$ 66,862
Furniture, Fixtures and Equipment	\$ 40,486	
Automotive Equipment	5,570	
Total	<u>\$ 46,056</u>	
Less: Accumulated Depreciation	(20,078)	<u>25,978</u>
 Total		 <u><u>\$ 92,840</u></u>

LIABILITIES

Payroll Taxes Withheld and Accrued		\$ 1,752
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FUND BALANCES

Operating Fund	\$ 126,865	
State-Federal Management Funds	17,864	
State-Federal Administrative Programmatic Funds	(30,975)	
State-Federal SEAMAP Funds	12,680	
State-Federal Council Funds	161	
Marine Fisheries Initiative Funds	<u>(35,507)</u>	<u>91,088</u>
 Total		 <u><u>\$ 92,840</u></u>

The accompanying notes are an integral part of these financial statements.

GULF STATES MARINE FISHERIES COMMISSION
Statement of Revenues, Expenses and Changes in Fund Balances
Fiscal Year Ended September 30, 1984

	Operating Fund	State-Federal Management Funds
<u>REVENUES:</u>		
Member States Appropriations		
Alabama	\$ 11,250	
Florida	22,500	
Louisiana	45,000	
Mississippi	11,250	
Texas	60,000	
Grants - Current Year		
Grants - Previous Year		\$ 1,082
Interest Earned	5,520	
Gain on Sale - Office Equipment	53	
Total Revenues	\$ 155,573	\$ 1,082
<u>EXPENSES:</u>		
Salaries	\$ 15,517	
Insurance - Hospital	4,753	
Taxes - Payable	5,353	
Office Rental	1,100	
Office Supplies	2,137	
Postage	1,750	
Professional Fees	1,758	
Travel and Entertainment	11,863	
Telephone	5,497	
Equipment Rental	4,931	
Printing	3,823	
Meetings	609	
Dues and Subscriptions	1,217	
Auto Expense	1,549	
Insurance - Auto and Bonds	757	
Maintenance and Repairs	2,971	
Courtesies	500	
Depreciation	2,775	
Miscellaneous	-0-	
Total Expenses	\$ 68,860	\$ -0-
Excess of Revenues Over (Under) Expenses	\$ 86,713	\$ 1,082
Fund Balances, October 1, 1983	40,152	16,782
Fund Balances, September 30, 1984	\$ 126,865	\$ 17,864

1. To receive \$36,609 in next fiscal year on \$94,000 contract.
2. To receive \$ 6,940 in next fiscal year on \$25,000 contract.
3. To receive \$70,000 in next fiscal year on \$70,000 contract.

The accompanying notes are an integral part of these financial statements.

<u>State-Federal Administrative Programmatic Funds</u>	<u>State-Federal SEAMAP Funds</u>	<u>State-Federal Council Funds</u>	<u>Marine Fisheries Initiative Funds</u>	<u>Combined Funds</u>
				\$ 11,250
				22,500
				45,000
				11,250
				60,000
\$ 57,391	\$ 24,251	\$ 18,060	\$ -0-	99,702
7,275	5,251	8,959	-0-	22,567
				5,520
				53
<u>\$ 64,666</u>	<u>\$ 29,502</u>	<u>\$ 27,019</u>	<u>\$ -0-</u>	<u>\$ 277,842</u>
\$ 32,211		\$ 24,195	\$ 6,411	\$ 78,334
				4,753
				5,353
				1,100
1,929		166	1,290	5,522
3,331			756	5,837
7,043	\$ 34,751		15,000	58,552
31,410		279	10,592	54,144
2,785		360	300	8,942
2,461			186	7,578
6,775				10,598
3,738			651	4,998
				1,217
				1,549
				757
				2,971
				500
			221	2,996
			100	100
<u>\$ 91,683</u>	<u>\$ 34,751</u>	<u>\$ 25,000</u>	<u>\$ 35,507</u>	<u>\$ 255,801</u>
\$ (27,017)	\$ (5,249)	\$ 2,019	\$ (35,507)	\$ 22,041
<u>(3,958)</u>	<u>17,929</u>	<u>(1,858)</u>	<u>-0-</u>	<u>69,047</u>
<u>\$ (30,975)</u>	<u>\$ 12,680</u>	<u>\$ 161</u>	<u>\$ (35,507)</u>	<u>\$ 91,088</u>
1		2	3	

GULF STATES MARINE FISHERIES COMMISSION
Notes to Financial Statements
September 30, 1984

NOTE 1: SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES:

(A) The accounting and reporting practices of the Commission conform to generally accepted accounting principles applicable to governmental units applied on a consistent basis between periods. The accrued basis of accounting is followed with these modifications:

(1) Revenues from members states' appropriations are recorded when received in cash.

(B) Depreciation of furniture, fixtures, equipment and the commission vehicle is calculated using the straight-line method.

NOTE 2: ORGANIZATION:

Gulf States Marine Fisheries Commission was created with the consent of the 81st Congress of the United States, granted by Public Law 66, approved May 19, 1949, authorizing an interstate compact relating to the better utilization of the fisheries of the Gulf of Mexico. Parties to the agreement are the states of Alabama, Florida, Louisiana, Mississippi and Texas.

NOTE 3: STATE-FEDERAL FISHERIES MANAGEMENT PROGRAM:

Effective August 15, 1975, the Commission entered into a contract with the U. S. Department of Commerce to provide administrative support of the State-Federal Fisheries Management Program in the Gulf of Mexico coastal states.

NOTE 4: STATE-FEDERAL FISHERIES ADMINISTRATIVE SUPPORT PROGRAM:

Effective in April, 1978, the Commission entered into contracts with the U. S. Department of Commerce to provide programmatic funds to support the State-Federal Fisheries Planning and Administrative Program in the Gulf of Mexico coastal states.

NOTE 5: STATE-FEDERAL FISHERIES COUNCIL SUPPORT PROGRAM:

Effective in October, 1977, the Commission entered into contracts with the U. S. Department of Commerce to provide administrative support of the State-Federal Fisheries Council in the Gulf of Mexico coastal states.

