

**marfin**

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**Executive Summary  
to the  
Annual Report**

**Marine Fisheries Initiative  
(MARFIN)  
Gulf of Mexico**

**1 October 1988 - 30 September 1989**

**November 1990**

**Gulf States Marine Fisheries Commission**



# **Executive Summary to the Annual Report of the Marine Fisheries Initiative Program (MARFIN)**

**1 October 1988 - 30 September 1989**

## **FY 1989 Program Highlights**

- **Several reef fish species are becoming over-fished. Many before the age of first spawning.**
- **A joint venture among NMFS, Mississippi Office of Technology Transfer and Mississippi State University has shown that near real time satellite imagery can provide tactical fishing information.**
- **Hydroacoustic data collected from the NOAA Ship CHAPMAN were used to determine populations of coastal herrings.**
- **The catch of king mackerel, which had declined steadily from 1984 to 1987, showed an increase in 1988. This management induced increase in population prompted an increase in the acceptable biological catch (ABC) for 1989.**
- **New experimental procedures have produced food grade fish oil, broth, puree and mince for chowders, fish cakes, sauces, stuffing, salad dressing, casseroles and sausages from menhaden.**
- **The Texas closure to shrimp fishing permitted the shrimp to grow to a larger size, which in turn produced an increase in brown shrimp landings of 3.87% and an increase in white shrimp landings of 7.6%. The overall shrimp revenue was increased 3.9%.**
- **The decline in offshore oil activity in Louisiana from 1977 to 1988 prompted oil workers to enter the shrimp fishery - mainly in inshore fishing.**
- **Although northern Gulf shrimp vessels using four trawls with Georgia Jumper TED's have a 10% shrimp loss, this loss is redistributed throughout the fishery grounds. Analysis of this redistribution shows that there will be no overall decrease in brown or white shrimp catch in that fishing area.**
- **A video-training program for fishing tournament directors is available from Florida Sea Grant.**
- **A catch and release program for recreational fishermen has been promoted using a video and brochures.**
- **Second annual MARFIN Conference held in New Orleans.**

## **INTRODUCTION**

The MARFIN Program was begun in 1986 to develop new fisheries, rejuvenate declining fisheries and to maintain other fisheries requiring research information. Development of new or underutilized resources centered mainly on coastal herrings and butterfish, with some attention paid to deepsea crabs and eels, mullet and tuna.

Declining fishery resources, brought about mainly by overfishing, have produced the greatest impact on MARFIN objectives. Red drum and mackerel research received much more funding than other fisheries. For the last two years research on shrimp (including TED technology transfer) and red drum - plus other estuarine fisheries research has declined. Ocean pelagics, menhaden, marine molluscs and endangered species research has increased.

Since the emphasis has been on research, the funding to universities has been higher than to other funding recipients (see Figure 1). In the past four years 124 projects have been funded through cooperative agreements. NMFS has completed 39 projects. A total of \$13.4M has been made available for these studies and associated contracts.

### PROGRAM ORGANIZATION

The Director, NMFS Southeast Regional Office (SERO) utilizes recommendations by individual members of the Program Management Board to direct the MARFIN Program. Program coordination and management is provided by permanently assigned SERO staff. Administrative support for meeting and travel arrangements and preparation of meeting minutes is provided by a contract to the Gulf States Marine Fisheries Commission.

Current Board members providing recommendations to the Regional Director are:

- Executive Director, Gulf and South Atlantic Fisheries Development Foundation, Inc.

- Executive Director, Gulf of Mexico Fishery Management Council.
- Executive Director, Gulf States Marine Fisheries Commission.
- NMFS representative.
- Administrator, Seafood Division, Louisiana Department of Wildlife and Fisheries, representing the five Gulf state fishery management agencies.
- Director, Florida Sea Grant, representing the four Gulf Sea Grant programs.
- Executive Director, Southeast Fisheries Association, representing commercial fisheries interests.
- Director, Coastal Research and Development Institute, University of South Alabama, representing recreational fisheries interests.

Alternate representatives have also been designated and serve as necessary. The Board Chairman and Vice Chairman are each elected for a two-year term, with

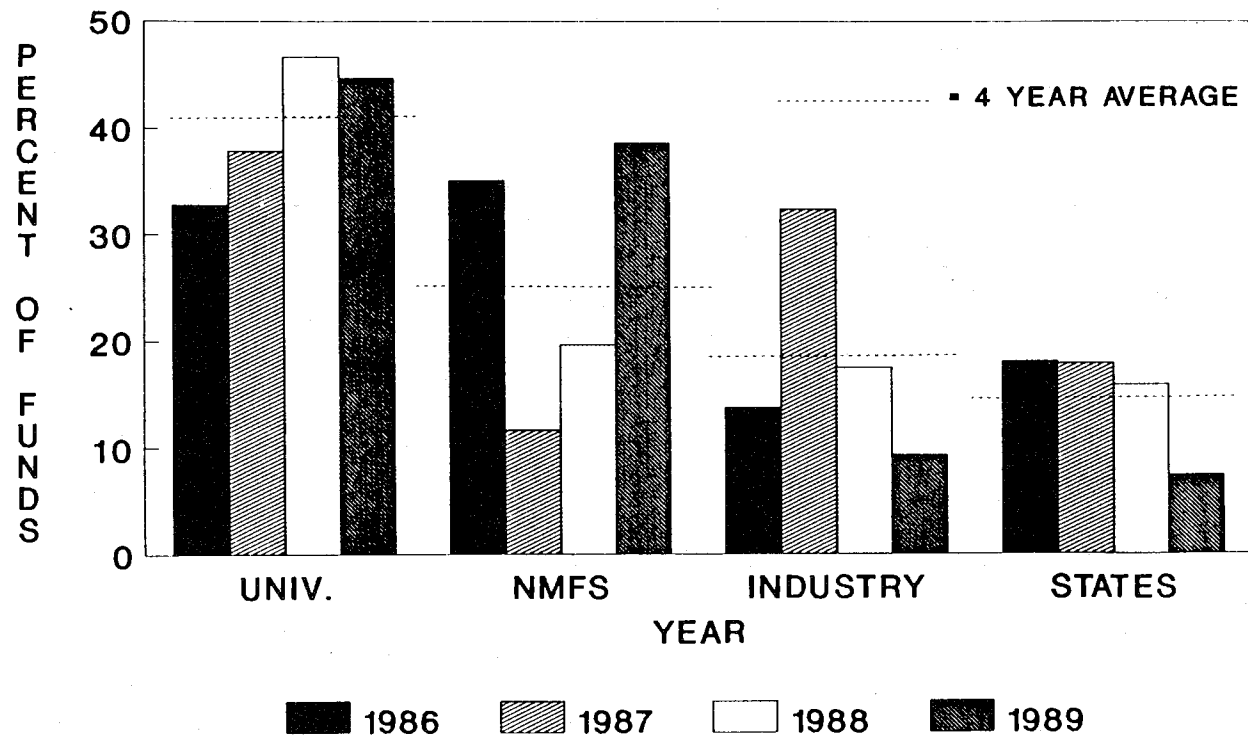


Figure 1. MARFIN Funding Trends

individual Board members appointed by member organizations for staggered three-year terms.

MARFIN operating procedures call for the Board to formulate annual program priorities as close as possible to the beginning of the fiscal year (October). These priorities are then incorporated by the Program Office into the Notice of Availability of Financial Assistance and published in accordance with established Department of Commerce procedures. Announcement of funds available through financial assistance is made through the *Federal Register*.

## Project Planning and Funding

In FY 1989, the *Federal Register* notice appeared on March 8. Fifty-nine applications were received by the closing date, April 24, and were reviewed for technical merit by academic, state agency and federal scientists. These reviews then were summarized by NMFS for presentation to the MARFIN Board. On June 13-14, the Board met to evaluate the reviews. Board members recommended funding 24 of the proposals judged technically superior. The Regional Director after reviewing the Board's recommendations forwarded the selected proposals to the NOAA Central Administrative Support Center (NCASC) for processing.

In addition to the cooperative agreements, ten NMFS research projects and a contract to the END-MARK Corporation for the MARFIN Board support were funded. Approved 1989 projects are shown in Tables 1 and 2.

SERO provided the Program Officer who used technical monitors throughout the Southeast Region to ensure that recipients complied with program technical objectives. NCASC provides the Grants Officer who monitors the administrative and financial progress of all projects.

## RESEARCH ACTIVITIES

The Second Annual MARFIN Conference was held in New Orleans, Louisiana on September 20-21, 1989. A summary of this symposium is given below:

**REEF FISH.** Recent information indicates that several species of reef fishes are becoming over-fished. Many of these species are taken before the age of first spawning. Since few data were available concerning age-at-length, length-frequencies of catch and age of first spawn, these data are now being collected. Other studies include the use of large fabricated artificial reefs to enhance fish

populations, and an analysis of the structure and economics of charter and party boat fishing. Grouper and snapper are the main targets of these recreational fishing activities.

**COASTAL HERRINGS.** Four surveys were conducted with the NOAA Ship CHAPMAN using midwater trawls for coastal herrings. A supermesh design trawl can be operated midwater, near bottom and on the bottom.

NOAA - Fisheries and the State of Mississippi (Mississippi Department of Economic and Community Development and Mississippi State University) developed a system to use satellite images of sea-surface temperature to predict favorable fishing locations for butterfish in the northern Gulf of Mexico (Figure 2). Satellite images and fish location charts are digitally transferred via cellular phone to fishing vessel at sea. Images can then be displayed on a computer onboard the ship. The software makes use of an expert system shell to decide on the best areas to fish. The expert system uses horizontal temperature gradients, bottom depth, sea-surface temperature, moon phase and the location of eddies and fronts relative to local bathymetric features to decide on the best fishing zones. Incomplete and inexact data are handled by the expert system using the concept-of-certainty factors.

Imagery and fishing charts were successfully transmitted to four fishing vessels on 19 separate occasions during April 1989. The excellent cellular phone communications in the northern Gulf of Mexico provided this opportunity. Fishing results are still being evaluated and used to refine the butterfish prediction model. All vessel captains were extremely pleased with the system in the fall fishing season. The average catch rates for the areas designated as good fishing by the model exceeded 3000 kilograms per hour.

A hydroacoustic system was acquired for use with the NOAA Ship CHAPMAN. The system consists of a sounder, 120 kHz and 38 kHz dual beam transducers mounted in a towed body, display and recording equipment and an echo signal processor (Figure 3). An initial cruise with the hydroacoustic equipment was successful. More experience in analyzing and interpreting acoustic data collected from the Gulf of Mexico is needed before reliable estimates of abundance can be made. The hydroacoustic system, along with high opening bottom trawls and a high speed semi-pelagic trawl will be used to survey coastal herrings.

**COASTAL PELAGICS.** King and Spanish mackerel have been major targets of study since the inception of the MARFIN Program. The king mackerel catch has been

**Table 1. Approved Financial Assistance Awards for FY 89**

<b>Recipient</b>	<b>Project</b>	<b>Award (\$)</b>
Alabama Department of Conservation and Natural Resources	Age Class Structure of Exploited Red Drum in Northern Coast Gulf of Mexico	\$61,675.00
Florida Department of Natural Resources	Estimation of Spawning Stock Biomass & Exploitation/ Escapement Rates for Population Assessment of Black Mullet	\$42,670.00
Florida Department of Natural Resources	Investigations of Inshore and Offshore Population Dynamics of Spanish Sardines Along the Central West Coast of Florida	\$42,790.00
Florida Department of Natural Resources	Systematic Survey of Stranded Marine Turtles for NMFS Statistical Zones 4 and 5	\$55,570.00
Florida Department of Natural Resources	Age Validation of Adult Black Drum in Florida	\$4,000.00
Florida Keys Artificial Reef Association, Inc.	An Evaluation of the Use of Large Fabricated Artificial Reefs to Enhance Reef Fish Populations at Different Depths in the Florida Keys	\$16,190.00
Gulf Coast Research Laboratory	Early Life History of Snappers in Coastal and Shelf Waters of the Northcentral Gulf of Mexico, Late Summer/Fall Months, 1983-1989	\$8,920.00
Gulf Specimen Marine Laboratory	Characterization of Inshore Population of the Kemp's Ridley Sea Turtle in the Northeastern Gulf of Mexico	\$55,493.00
Louisiana Department of Wildlife & Fisheries	Enhancing the Benefits Derived from Shrimp in the Gulf of Mexico Through Optimizing Shrimp Management in Louisiana	\$126,000.00
Louisiana Department of Wildlife & Fisheries	Biological and Catch/Effort Sampling from the Domestic Tuna and Shark Fisheries in the Northern Gulf of Mexico	\$87,700.00
Louisiana Tech University	Allozyme Variation in Black Drum, Red Drum and Spotted Seatrout: Stock Boundaries, Recruitment and Stock Composition	\$24,960.00
Louisiana State University	Age, Growth, Diet and Spawning Dates of Yellowfin Tuna, About the Mississippi River Plume	\$23,940.00
Louisiana State University	The Variation of Year-class Strength and Annual Reproduction Output of Red Drum and Black Drum from the Northern Gulf of Mexico	\$84,200.00
Louisiana State University	Habitat Selection and Recruitment of Juvenile Blue Crabs Along Environmental Gradients in Louisiana	\$26,707.00
Louisiana State University	Utilization of Fisheries-Independent Data: Future Management Implications	\$79,600.00
Louisiana State University	An Economic Analysis of Leasing Activities in the Louisiana Oyster Industry: Part II	\$38,299.00
Louisiana State University	Age, Growth and Reproductive Biology of Greater Amberjack and Cobia from Coastal Louisiana Waters	\$66,800.00
Louisiana State University	Mackerel and Reef Fish Bioprofile and Catch/Effort Data Collection from the Northern Gulf of Mexico	\$38,730.00
Louisiana State University	Fishery Independent Characterization of Population Dynamics and Life History of Striped Mullet in Louisiana — Year Three	\$51,224.00
Louisiana State University	Larval Food, Growth and Microhabitat Selection: Factors Affecting Recruitment of Estuarine-dependent Fishes in the Northern Gulf of Mexico	\$73,400.00

**Table 1. Approved Financial Assistance Awards for FY 89 (Continued)**

<b>Recipient</b>	<b>Project</b>	<b>Award (\$)</b>
Marine Chemurgics	Shelf Life of Food Grade Gulf Menhaden Oils, Fish Oil/Vegetable Oil (FO/VO) and FO/VO used in Food Systems	\$30,880.00
Marine Environmental Sciences Consortium	Evaluation of Quahog Abundance and Growth in Inshore Alabama and Northwestern Florida Waters: An Assessment of Favorability for Clam Culture	\$57,832.00
Marine Environmental Sciences Consortium	The Relative Value of Vegetated and Unvegetated Habitats to Juvenile Spotted Seatrout and Red Drum: Comparisons of Nursery Habitats and Field Growth Rate Measurement Techniques	\$51,900.00
Mote Marine Laboratory	King and Spanish Mackerel Migration and Stock Assessment Study in the Southern Gulf of Mexico	\$75,950.00
Mississippi Department of Wildlife, Fisheries & Parks	MS/NMFS King and Spanish Mackerel Sampling Program	\$26,856.00
Texas A&M Research Foundation	Assessment of Non-shrimping Mortality of Sea Turtles	\$50,000.00
Texas A&M Research Foundation	Population Genetic Studies of Red Drum in the Gulf of Mexico	\$71,462.00
University of Miami	Implementation of a Log Book System for Spotter Pilots and Fleet Captains to Record Observations on Mackerel Schools in South Florida	\$25,000.00
University of Miami	Supplement Length and Sex Frequency Data and Catch Per Unit of Effort Information from the Commercial Fishery for Spanish Mackerel off West Florida	\$44,895.00
University of South Alabama	Investigation of Life History Parameters of Species of Secondarily Targeted Reef Fish and Dolphin (Fish) in the Northern Gulf of Mexico	\$42,190.00
Total FY 89 Financial Assistance Awards		\$2,275,133.00

**Table 2. Approved NMFS Projects For FY 89**

<b>Recipient</b>	<b>Project</b>	<b>Award (\$)</b>
Pascagoula Laboratory	Red Drum Stock Assessment Analysis	\$25,000.00
Pascagoula Laboratory	Centralized Tagging for Red Drum	\$30,000.00
Panama City Laboratory	King and Spanish Mackerel Research	\$205,000.00
Pascagoula Laboratory	Latent Resources Research	\$540,000.00
Galveston Laboratory	Evaluation of the Impacts of TED on Shrimp, Catch Rates, & Bycatch in Gulf of Mexico	\$112,000.00
Galveston Laboratory	Sea Turtle Stranding in Texas and Southwest Louisiana	\$40,000.00
Pascagoula Laboratory	TED Technology Transfer	\$55,000.00
Pascagoula Laboratory	Small Turtle TED Evaluation	\$35,000.00
Southeast Regional Office	MARFIN Program Management	\$75,000.00
Southeast Regional Office	Educational Tools for Marine Recreational Fishermen to Promote Wise Use & Conservation of Gulf Fishery Resources	\$13,450.00
Total		\$1,130,450.00

# DIGITAL COMMUNICATION OF SATELLITE IMAGERY AND TACTICAL FISHING CHARTS FOR 1989 DEMONSTRATION

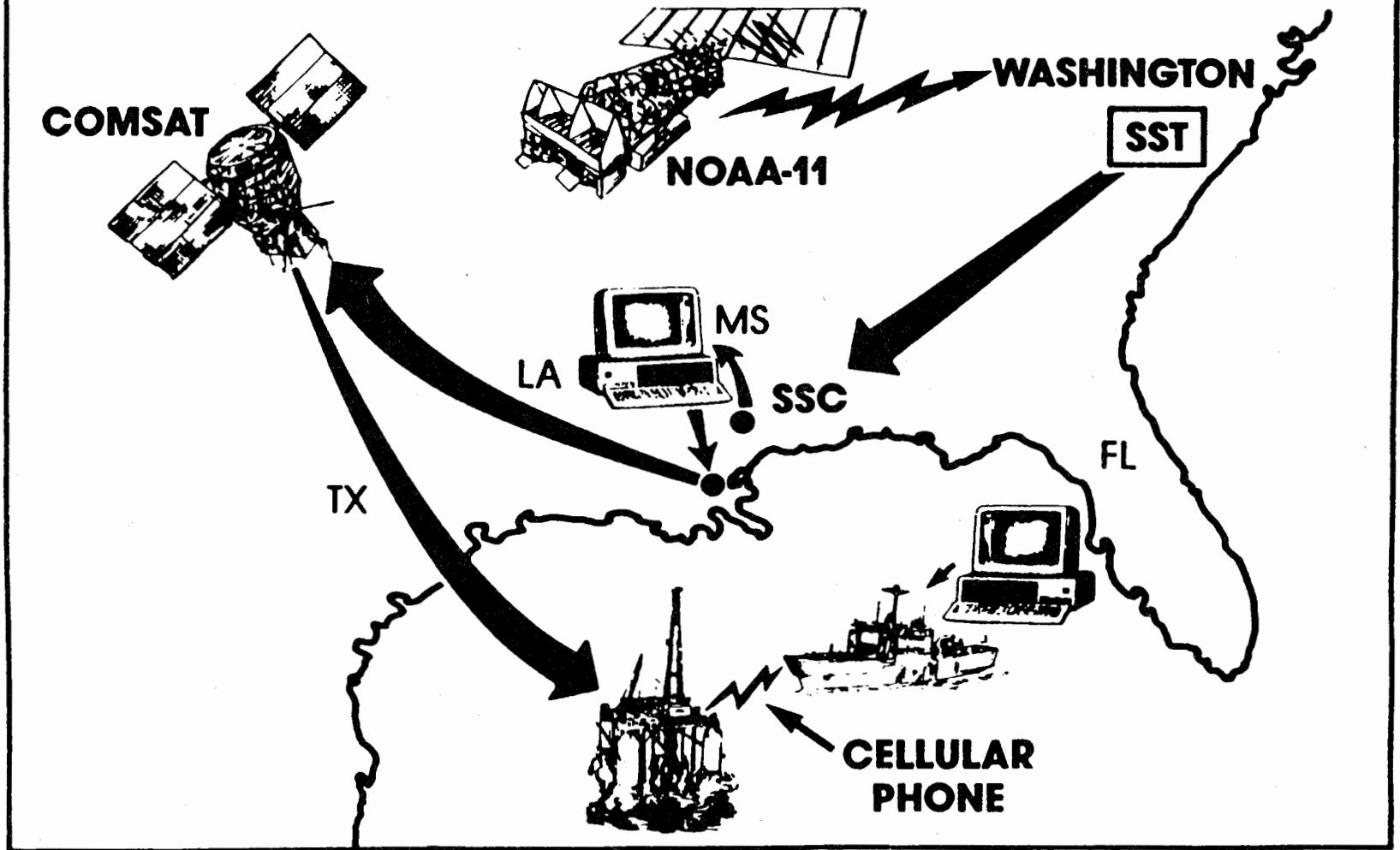


Figure 2



## Components of Hydroacoustic System

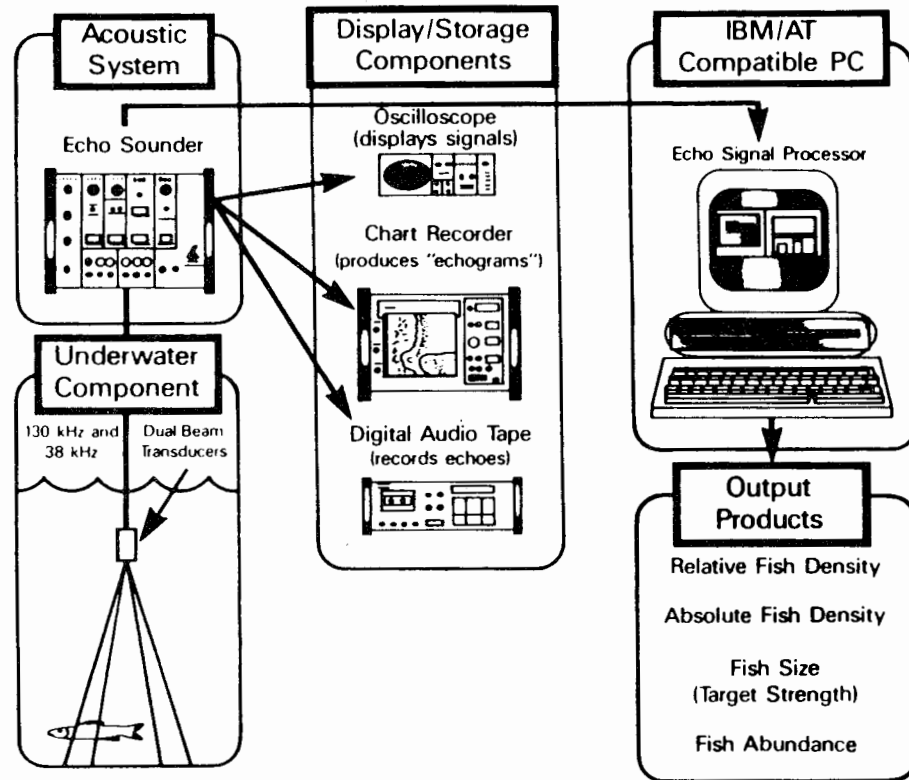


Figure 3. Components of Hydroacoustic System

greater than the acceptable biological catch (ABC) for years 1985-1988, but improved management measures increased the ABC for 1989 (see Figure 4). Spanish mackerel were caught in greater number than the ABC for 1987, but within the range for 1988.

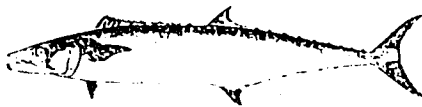
**MENHADEN.** Menhaden have provided the largest catch of fish in the U.S. Landings averaging 2.67 billion pounds per year (1983-1988). Yet the industry received only \$34.6 million for 281 million pounds of fish oil. If food-grade Gulf menhaden (FGGM) can be made, which is not only acceptable to the public, but passes food safety standard, the industry could realize a much larger return on these plentiful fish. Processing experiments have produced food-grade fish oil, broth, puree and mince for chowders, fish cakes, sauces, stuffing, salad dressing, casseroles and sausages.

**SHRIMP.** Since shrimp trawls are non-selective with regard to target species, turtles and bottom fish are harvested. Turtle excluder devices (TEDs) exclude by-catch as well as turtles. Thus, efforts are underway to transfer TED technology to the shrimping industry. TED technology transfer assistance was provided to individual fishermen, industry associations, Sea Grant and state and federal agencies. Group workshops and demonstrations

were provided in Georgia, Florida, South Carolina, North Carolina, Louisiana and Alabama.

The Texas closure (about 45 days) produced an increase in brown shrimp landings of 3.8% and an increase in white shrimp landings of 7.6%. The overall revenue was increased 3.9%. Because of different fishing patterns in the four regions, some regions will be more impacted by the TED loss than others. The Florida pink shrimp fishery, for example, is predominantly an off-shore fishery from 11 to 20 fathoms in which the benefit of smaller shrimp escape 0 to 10 fathoms cannot be realized fully. The Texas fishery for brown and white shrimp, on the other hand, would appear to suffer the least impact from the use of TEDs. This is because the fishing effort is more evenly distributed throughout all depth zones enabling the fishery to realize the benefits of nearshore shrimp escape. Again, the nearshore vessels will suffer at the expense of the vessels which fish further offshore. Because of the greater number of vessels that fish further offshore, however, the offshore vessel class will suffer a greater overall loss in rent to the fleet.

**GENERAL.** A video training program was developed for fishing tournament directors and managers to facilitate safety and resource awareness. The five tape series



□ ABC Range

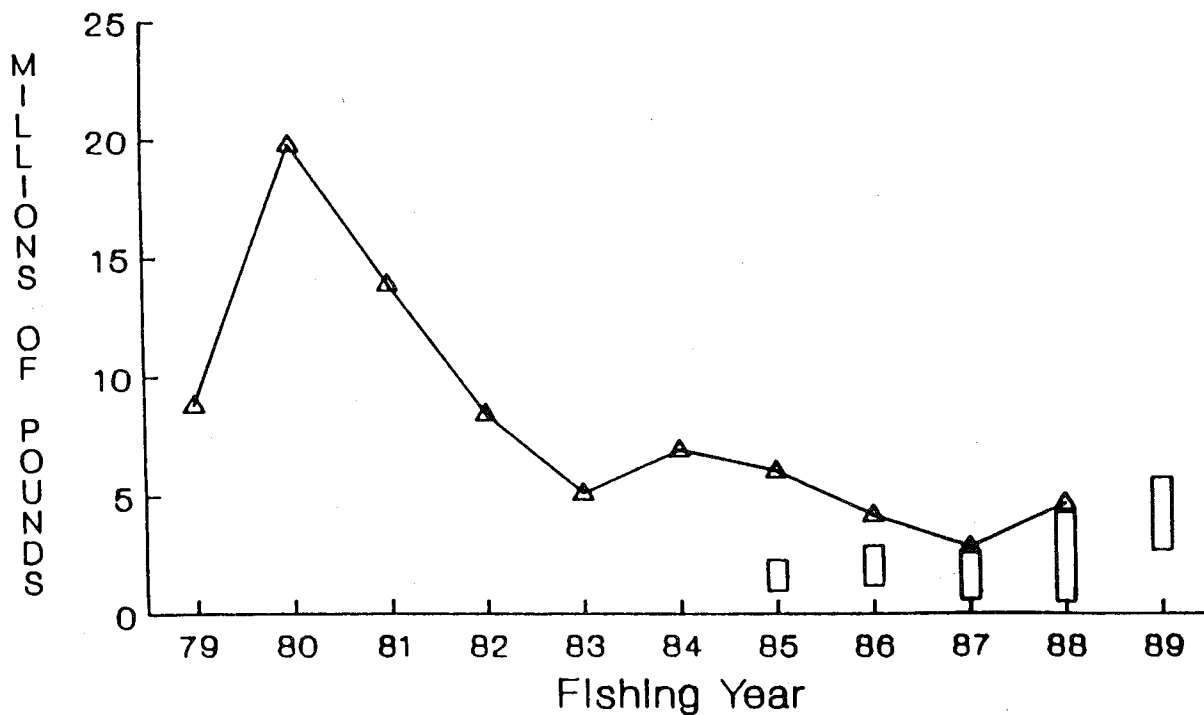


Figure 4. King Mackerel, US Gulf Catch in Pounds

is available from Florida Sea Grant.

The giant snake eel (Keoghfish) is caught at depths of 140-500 ft on soft bottoms. This high protein, low fat resource has good acceptability in foreign markets, but the abundant number of bones makes this fish

less acceptable domestically.

Saltwater recreational anglers were given information (brochures, video) stressing the need to comply with fishing regulations and to release fish rather than keeping them.

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## MARFIN PROGRAM MANAGEMENT BOARD

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James C. Cato  
Director  
Sea Grant Program  
University of Florida  
Building 803  
Gainesville, FL 32611

Robert P. Jones  
Executive Director  
Southeast Fisheries  
Association  
312 East Georgia Street  
Tallahassee, FL 32301

Andrew J. Kemmerer  
Director  
Mississippi Laboratories  
National Marine Fisheries  
Service  
P.O. Drawer 1207  
Pascagoula, MS 39567

Thomas Murray  
Executive Director  
Gulf and South Atlantic Fisheries  
Development Foundation, Inc.  
5401 West Kennedy Boulevard  
Suite 669  
Tampa, FL 33609

William S. Perret  
Administrator, Seafood Division  
Louisiana Department of Wildlife  
and Fisheries  
P.O. Box 15570  
Baton Rouge, LA 70895

Robert L. Shipp  
Director, Coastal Research and  
Development Institute  
University of South Alabama  
Mobile, AL 36604

Larry B. Simpson  
Executive Director  
Gulf States Marine  
Fisheries Commission  
P.O. Box 726  
Ocean Springs, MS 39564

Wayne Swingle  
Executive Director  
Gulf of Mexico Fishery  
Management Council  
5401 West Kennedy Boulevard  
Suite 881  
Tampa, FL 33609

Jean Martin-West, *ex officio*  
Grants Officer, NOAA Central  
Administrative Support Center  
Federal Building  
601 East 12th Street  
Kansas City, MO 64106

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## ALTERNATES, MARFIN PROGRAM MANAGEMENT BOARD

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Robert B. Ditton  
Department of Recreation  
and Parks  
Texas A&M University  
College Station, TX 77843

Terry Leary  
Gulf of Mexico Fishery  
Management Council  
5401 West Kennedy Boulevard  
Suite 881  
Tampa, FL 33609

John Ray Nelson  
President  
Bon Secour Fisheries, Inc.  
P.O. Box 60  
Bon Secour, AL 36511

Ralph Rayburn  
Executive Director  
Texas Shrimp Association  
403 Vaughn Building  
Austin, TX 78701

Walter Tatum  
Alabama Department of Conserva-  
tion and Natural Resources  
P.O. Drawer 458  
Gulf Shores, AL 36542

Jack Van Lopik  
Director  
Sea Grant Program  
Center for Wetland Resources  
Louisiana State University  
Baton Rouge, LA 70803

Mike Voisin  
Louisiana Oyster Dealers &  
Growers Association  
P.O. Box 134  
Houma, LA 70361

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## MARFIN PROGRAM MANAGEMENT STAFF

---

Donald R. Ekberg  
Program Manager  
Southeast Regional Office  
National Marine Fisheries  
Service  
9450 Koger Boulevard  
St. Petersburg, FL 33702  
(813) 893-3720

Ellie Roche  
Grants Specialist  
Southeast Regional Office  
National Marine Fisheries  
Service  
9450 Koger Boulevard  
St. Petersburg, FL 33702  
(813) 893-3720

Linda Stevens  
Secretary  
Southeast Regional Office  
National Marine Fisheries  
Service  
9450 Koger Boulevard  
St. Petersburg, FL 33702  
(813) 893-3720

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## CONTRACT SUPPORT

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Gulf States Marine Fisheries  
Commission  
P.O. Box 726  
Ocean Springs, MS 39564  
(601) 875-5912

The ENDMARK Corporation  
1215 Jefferson Davis Highway,  
#1106  
Arlington, VA 22202  
(703) 486-5570

