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# GULF STATES MARINE FISHERIES COMMISSION

## FOURTEENTH ANNUAL REPORT 1962-1963

To The

CONGRESS OF THE UNITED STATES

And To The

GOVERNORS AND LEGISLATORS

Of

ALABAMA  
FLORIDA  
LOUISIANA  
MISSISSIPPI  
TEXAS

#### ACKNOWLEDGEMENT

In submitting this fourteenth annual report the Commissioners wish to express their most sincere gratitude for the splendid cooperation of the members of the Congress and the Governors and Legislators of the compacted States. The Commission fully appreciates that such measure of success as has been attained in the past fourteen years could not have been possible without such valued assistance. This acknowledgement 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,

Richard H. Cory, Chairman

George A. Brumfield, Vice-Chairman

W. Dudley Gunn, Director

**FOURTEENTH ANNUAL REPORT (1962-1963)**  
**OF THE**  
**GULF STATES MARINE FISHERIES COMMISSION**

**To The**  
**CONGRESS OF THE UNITED STATES**

**And To The**  
**GOVERNORS AND LEGISLATORS**

**Of**

**ALABAMA**  
**FLORIDA**  
**LOUISIANA**  
**MISSISSIPPI**  
**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**  
**312 Audubon Building**  
**New Orleans, Louisiana 70112**

**IN MEMORIAM**  
**EMILY C. CARR**  
**COMMISSION OFFICE SECRETARY**  
**1955 - 1963**

# GULF STATES MARINE FISHERIES COMMISSION

## ROSTER — OCTOBER 1963

Richard H. Cory  
Chairman

George A. Brumfield  
Vice-Chairman

W. Dudley Gunn, Director  
Ellen S. Hoover, Office Secretary

### \* COMMISSIONERS

#### Alabama

Claude D. Kelley, Director  
Alabama Department of Conservation  
Montgomery, Alabama

L. W. Brannan, Jr., Senator  
State of Alabama  
Foley, Alabama

Will G. Caffey, Jr.  
Mobile, Alabama

#### Florida

W. Randolph Hodges, Director  
Florida State Board of Conservation  
Tallahassee, Florida

Bruce J. Scott, Representative  
State of Florida  
North Fort Myers, Florida

Walter O. Sheppard  
Fort Myers, Florida

#### Louisiana

L. D. Young, Jr., Director  
Louisiana Wild Life and Fisheries Commission  
New Orleans, Louisiana

Alvin Dyson, Representative  
State of Louisiana  
Cameron, Louisiana

Feltus Daigle  
Golden Meadow, Louisiana

## Mississippi

George A. Brumfield, Chairman  
Mississippi Marine Conservation Commission  
Biloxi, Mississippi

Stanford E. Morse, Jr., Senator  
State of Mississippi  
Gulfport, Mississippi

Hermes Gautier  
Pascagoula, Mississippi

## Texas

J. Weldon Watson, Director  
Texas Parks & Wildlife Department  
Austin, Texas

Richard H. Cory, Representative  
State of Texas  
Victoria, Texas

Virgil Versaggi  
Brownsville, Texas

\* Order of listing - Administrator - Legislator - Governor's Appointee

### **SUCCESSIONS ON THE COMMISSION DURING THE YEAR**

Claude D. Kelley	vice	William C. Younger
George A. Brumfield	vice	Joseph V. Colson
L. W. Brannan, Jr.	vice	Will G. Caffey, Jr.
Will G. Caffey, Jr.	vice	Max K. Lawrenz, Sr.
J. Weldon Watson	vice	Howard D. Dodgen
Virgil Versaggi	vice	Weldon Cabaniss

### **COMMISSION OFFICERS ELECTED OCTOBER 18, 1963**

#### **FOR YEAR 1963-64**

Chairman: Richard H. Cory, succeeding Will G. Caffey, Jr.  
Vice-Chairman: George A. Brumfield, succeeding  
Richard H. Cory

**STANDING COMMITTEES**  
**ROSTER – OCTOBER 1963**

- Committee to Correlate Fishery Laws** (Committee 1)  
**Committee To Correlate Research And Exploratory Data** (Committee 2)  
**Shellfish Committee** (Committee 3)  
**Estuarine Technical Coordinating Committee** (Committee 4)

**Committee Membership**

- George W. Allen (3-4)  
Alabama Department of Conservation  
Dauphin Island, Alabama
- William J. Demoran (2)  
Mississippi Marine Conservation Commission  
Biloxi, Mississippi
- Charles R. Chapman (4)  
Bureau of Commercial Fisheries  
Galveston, Texas
- Theodore B. Ford (4)  
Louisiana Wild Life and Fisheries Commission  
New Orleans, Louisiana
- Gordon Gunter (3-4)  
Gulf Coast Research Laboratory  
Ocean Springs, Mississippi
- Walter A. Gresh (4)  
Bureau of Sport Fisheries and Wildlife  
Atlanta, Georgia
- Robert M. Ingle (2-3-4)  
Florida State Board of Conservation  
Tallahassee, Florida
- Ellis C. Irwin (1)  
Louisiana Wild Life and Fisheries Commission  
New Orleans, Louisiana
- Joseph C. Jacobs (1)  
Assistant Attorney General  
Tallahassee, Florida

- Terrance R. Leary (2-3-4)  
Texas Parks and Wildlife Department  
Austin, Texas
- Jack C. Mallory (2-4)  
Alabama Department of Conservation  
Dauphin Island, Alabama
- Cleburne A. Schultz (4)  
Mississippi Game and Fish Commission  
Jackson, Mississippi
- Lyle S. St. Amant (2-3-4)  
Louisiana Wild Life and Fisheries Commission  
New Orleans, Louisiana
- Paul E. Thompson (4)  
Bureau of Sport Fisheries and Wildlife  
Washington, D. C.
- James E. Sykes (4)  
Bureau of Commercial Fisheries  
St. Petersburg Beach, Florida
- H. Eugene Wallace (4)  
Florida Game and Fresh Water Fish Commission  
Tallahassee, Florida



## COMMISSION ACTIVITIES

OCTOBER 1962 - OCTOBER 1963

The Gulf States Marine Fisheries Commission met twice in regular session during the year. The usual spring meeting was held at Clearwater, Florida, March 21-22. The annual meeting was scheduled for Biloxi, Mississippi, October 17-18. New Orleans, Louisiana has been selected for the next regular meeting, April 9-10, 1964, while Brownsville, Texas, has been chosen for the Fifteenth Annual Meeting, October 15-16 of next year.

At the spring 1963 meeting the Commission adopted a resolution which approved S. 627 and H.R. 3738 (88th Congress—1st Session); such bills having been designed to promote state commercial fishery research and development projects, and for other purposes. Also adopted at the spring meeting was a resolution which requested that a representative of the marine fishery conservation agency of each member state together with a representative of each member state board of health meet together for the purpose of discussing and studying oyster shipping containers. Representatives of the Commission participated in the Washington hearings of S. 627 April 24-25. The suggested meeting mentioned in the second resolution was held in New Orleans on May 31.

Another resolution of general interest adopted at the fall meeting approved in principle S. 1988 (88th Congress—1st Session), which legislation is designed to prohibit fishing in the territorial waters of the United States and in certain other areas by persons other than nationals or inhabitants of the United States. This resolution also provides that endorsement of the purposes of such proposed legislation is in no way intended to define territorial limits that are presently or may be claimed by any state of the United States.

In connection with the two regular meetings held during the year, field trips were made to the Florida State Board of Conservation Laboratory, St. Petersburg, and the Gulf Coast Research Laboratory at Ocean Springs, Mississippi.

One day prior to the March 1964 meeting representatives of each of the member Gulf States will meet to study a Commission-prepared consolidation of rules, regulations, laws, licenses and taxes affecting the commercial fisheries of the area.

At the invitation of the Council of State Governments, representatives of the Commission attended a meeting in Chicago during the year at which the Conference of Interstate Agencies established itself as a permanent body.

While 1962 commercial landings of marine fishery products at Gulf ports established a record of 1.4 billion pounds with a value of 94.5 million dollars it is appreciated that still greater production gains are possible with the continuing development of the oyster resource; improved management practices being applied to the shrimp fishery due to increasing biological knowledge; expansion of the menhaden fishery; and with the prosecution of certain deeper water stocks such as the tunas, anchovies or sardine-like fishes and others.

At its inception the Commission realized that the fisheries of the Gulf would be subjected to increasing year-to-year fishing pressures, both commercially and sportwise, and in such recognition also realized that biological and allied research programs were fundamental to the bringing about of a proper utilization of these renewable resources. Therefore, this agency has strongly supported the providing of adequate laboratory facilities. During 1962-63 the Commission welcomed three new laboratories to the area: The U. S. Bureau of Commercial Fisheries Gear Research Laboratory at Panama City, Florida; the U. S. Public Health Service Gulf Coast Shellfish Sanitation Research Center at Dauphin Island, Alabama; and the Alabama Marine Resources Laboratory, also at Dauphin Island.

At the formation of the Gulf Commission in 1949, the U. S. Fish and Wildlife Service was operating a shellfish laboratory at Pensacola, and a temporary laboratory at Sarasota to study the Red Tide outbreak of 1947. In effect there was one permanent federal biological laboratory for the entire continental seaboard of the Gulf. At present, the Service, through the Bureau of Commercial Fisheries, maintains biological laboratories at Pensacola, Galveston and St. Petersburg Beach. Additionally, the Bureau maintains a Pascagoula facility for exploratory fishing and gear development and, as previously mentioned, the comparatively new Panama City installation now concentrating on shrimp trawl development, and shrimp behavior as televised underwater. The Bureau's Pascagoula technological laboratory completed in 1957 resulted from an early request of this Commission. Turning to the states, fourteen years ago only one of

the Gulf States' marine fishery administrations maintained a coastal marine biological laboratory; Texas. For some years Alabama, Florida, Louisiana and Mississippi have had laboratories in operation. Alabama's was replaced during the year, as has been stated, while others have been enlarged or have expansion authorizations in hand. During the referred to fourteen-year period, new university or college laboratories have been established and the facilities of a number of these have been expanded from time to time.

Increases in annual allocations continue at both state and federal levels as the legislative arms of government reassess the importance of the fisheries to the expanding population. The additional research facilities, and an accompanying expansion of programs, are providing a greater impetus for students of the area's institutions to pursue studies in the marine sciences.

Information resulting from the various state and federal research programs is continuously exchanged among the agencies either directly or through the Commission. The pages which follow present in summary certain 1962-63 activities thought to be of general interest, of the Alabama Department of Conservation, the Florida State Board of Conservation, the Louisiana Wild Life and Fisheries Commission, the Mississippi Marine Conservation Commission, the Texas Parks and Wildlife Department, the U. S. Bureau of Commercial Fisheries, and the U. S. Bureau of Sport Fisheries and Wildlife.

**STATE ACTIVITIES**  
**OCTOBER 1962 - OCTOBER 1963**

**ALABAMA**



The Capitol  
at  
Montgomery

Alabama's seafood program made a major advancement with the completion of a modern \$400,000 marine research laboratory. For the first time space and equipment are available to handle field collections and data and to conduct laboratory research. The Seafoods Division of the Department of Conservation and the University of Alabama are both using the new building under a cooperative agreement.

The new facilities have enabled the Division to begin an extensive biological survey of the large estuarine areas of Mobile Bay and eastern Mississippi Sound. A project was initiated to obtain some basic data on the biomass and species composition of the inside waters and will obtain seasonal variations as the project is continued.

Under a new contract with the Alabama Division of Game and Fish the Seafoods Division is beginning a more extensive program of artificial fish haven investigations. Reefs are being built under controlled conditions to determine the effects of

depth and reef size. This project is primarily concerned with the attraction of red snapper but other sport fish are also being studied.

#### SHRIMP

1963 has been one of the best shrimping years in Alabama history. Landings have been up more than 50% over last year and the market has been good and fairly steady.

Investigations of the growth and movement of postlarval and adult populations has continued and should produce a clearer understanding of our estuarine patterns.

#### OYSTERS

The oyster reefs have completely recovered from the devastation of the 1961 flood and oyster production has been higher than it has been for a decade.

This year the public oyster reefs were kept open to tonging all year without the usual closed season during the summer months. This experiment in management is proving to be a great success as oysters were harvested all through the summer and a high steady market was maintained. During the month of August the demand exceeded the supply. Examinations of the public reefs in September showed no harmful effects from the summer harvest.

Alabama has continued its shell planting program and has supplemented it with seed oysters moved from permanently closed areas. A survey of Alabama's oyster growing areas has been completed which shows a considerable increase in productive acreage.

The Seafoods Division has added a self propelled barge to its oyster planting and dredging equipment.

## FLORIDA



The Capitol  
at  
Tallahassee

Once again the research program of the Board of Conservation was expanded and directed into previously unstudied areas. This was the final year of contract research for the Board by the University of Miami Marine Laboratory. Work was continued at the St. Augustine Laboratory where investigations were carried on the shrimp of the northeastern estuaries and coastal regions. The Laboratory at Pigeon Key in the Florida Keys continued work on spiny lobsters.

Marine Laboratory  
Bayboro Harbor, Maritime Base  
St. Petersburg, Florida

### SALT WATER CHEMISTRY

Vitamin B-12 measurement continued. Plans were completed for estimation of biotin and thiamin as a continuing en-

largement of the organic seawater studies. Preliminary work was done on estimating the amount of vitamin B-12 and its potentiality as a precursor of Red Tide.

#### OYSTER NUTRITION

Work on oyster nutrition was begun during the year. As a preliminary experiment oysters were tested as to their potential use of glucose. At the end of the first year the results were difficult to evaluate but it appeared that the oysters getting glucose had greater vigor. This work will continue as a long range project.

#### REEF FISHES

Massive tagging of offshore species of fishes has resulted in a hitherto unmatched amount of data on migration of the species concerned. The surprising fact was developed that the fishes are largely inclined to inhabit one particular area with very little movement.

King Mackerel were tagged for the first time during the past fiscal year. Special provisions had to be made for them, however, due to their weakened condition when finally brought into the boat. Returns indicate that some of them endured the ordeal and continued to live after being tagged. A complete evaluation and write-up of the previous year's massive fish tagging program was in press as the fiscal year ended.

#### SHRIMP BIOLOGY

Biological studies of the shrimp of the northeastern part of the state and areas of the Tampa Bay region were continued. A write-up of the west coast investigation is presently underway.

#### MUSEUM

The fish collection was maintained during the fiscal year. A start was made on the preparations of an annotated checklist which should prove to be valuable to persons interested in distribution and faunal studies of fishes.

#### RED TIDE

Plans were completed during the fiscal year for an enlargement of Red Tide Studies. Vitamin B-12 investigations mentioned previously will figure prominently in these efforts. The Florida Legislature during the latter part of the fiscal year appropriated \$250,000 for Red Tide scientific work.

## SPINY LOBSTERS

During the year seven trips were made from coastal ports along the west coast of Florida into the lower Gulf of Mexico and Yucatan Straits. Samples were made for phyllosomes. In addition, samples were taken off the east coast of Florida in the Gulf stream at the latitude of St. Augustine. These samples plus those taken on incidental oceanographic cruises, some of which were sponsored by an outside agency, were used in attempting to delineate the drift pattern of spiny lobster larvae during their long pelagic period. It was definitely established that Florida shores are more or less continually seeded by sources of larvae much further to the south, perhaps in middle America. Hatchery studies continued in the Florida Keys. Great difficulty was encountered in rearing the larvae and new techniques were being put into effect as the fiscal year ended.

## OYSTER DIVISION

At the end of the fiscal year there were 221 oyster leases all over the state. A total of 7,302.6 acres was privately held in these bottoms. The lease program continued to accelerate and during the next few years will probably develop into a greater force in Florida shellfish production than heretofore.

Approximately 300,000 bushels of shell were planted in Apalachicola Bay and about 24,000 bushels were planted in Choctawhatchee Bay. All of this work was done on public reefs.

## PLANKTON

During plankton studies of recent years other forms than shrimp and spiny lobster larvae were segregated from the samples. Larval fishes and crab larvae were among the special forms that were removed and filed for later studies. Plans were completed in the fiscal year for the inauguration of a larval fish study of a long range type and a crab reproduction investigation largely based on the larvae caught.



## LOUISIANA



The Capitol  
at  
Baton Rouge

Marine research activities in Louisiana in 1963 were continued and intensified in major fields of work. These are shrimp research, which was patterned after the 1962 efforts but considerably expanded, hydrographic studies, and an oyster program designed to furnish information and aid to the industry. In addition, contracts have been let for the construction of suitable housing and dormitories at the Marine Laboratory. This work is now in progress and should be completed early in 1964.

### SHRIMP STUDIES

An expanded shrimp research program was carried out and coordinated with research programs of the other states of the

northern Gulf area, the U. S. Fish and Wildlife Service, and contractual work being done at the University of Southwestern Louisiana. The program continues to use standardized methods agreed upon by the Gulf States Marine Fisheries Commission Shrimp Biological Research Committee, and for all intents and purposes was a repetition of work carried out in 1962 excepting that better coverage and more intensification of work was obtained, and our efforts to study the white shrimp have shown somewhat more success in 1963.

In general, the work covered may be summarized as follows:

1. Postlarval studies began in January and have continued until the present. Standard sampling stations were used plus additional sampling during periods of postlarval depth intensities in order to determine the distribution as well as the density. In some instances float-type aircraft have been used to make these samples with considerable success and a great saving in time and personnel. The general results of the postlarval studies indicate that in 1963 a greater density of the larvae entered the bays in two waves with brown shrimp and thus far one wave for white shrimp. Postlarvae were observed in great numbers in the first two weeks in March and the first two weeks in May. White shrimp postlarvae made an appearance in considerable densities in mid-July. Certain investigations of tidal cycles indicate that there may be a relationship between long high tidal periods and postlarval movement.

2. An intensive study of subadult brown shrimp was carried out over the entire coast during late March and April. A similar sampling of subadult whites was carried out in July.

3. An analysis of data on postlarvae and subadult densities, distribution and growth rates made it possible to determine the proper time to open the season and afforded an opportunity for a cautious prediction of high production in 1963. The accuracy of these predictions was brought out by the subsequent brown shrimp production during May, June and July which was greater than any time in recent years.

4. Studies on white shrimp postlarvae have continued throughout July and August. Preliminary data indicate a much better white shrimp crop during the early season of 1963 than occurred in 1962. White shrimp appeared to be well distributed over the entire coast.

5. The pond culture program was continued in 1963. Ponds were stocked with postlarvae, rotenone was used to eliminate some predators, and the first experiments indicate that a greater production in ponds per acre did occur when the initial stocking was done with postlarvae. No staining program was carried out in 1963.

6. All shrimp research data was correlated with hydrographic conditions in order to evaluate the factors which might control shrimp cycles.

#### HYDROGRAPHIC STUDIES

The hydrographic studies at the Grand Terre Laboratory have continued in an intensive manner and in some instances have been expanded. As pointed out in some detail in the Thirteenth Annual Report of the Gulf States Marine Fisheries Commission, the following information is gathered at the Laboratory on a continuous basis, is analyzed and summarized in order that the information may be correlated for various phases of biological research:

1. Water temperature
2. Air temperature
3. Barometric pressure
4. Surface wind speed and direction
5. Tides
6. Rainfall
7. Mississippi River stages
8. Salinity
9. Currents and bay bottom profile

Details of the areas sampled and the date of sampling are given in the Thirteenth Annual Report.

In addition to routine monitoring of hydrographic conditions, the hydrographic section has also undertaken a contract with the Fish and Wildlife Service to do a specific study on the Mississippi River-Gulf Outlet Project area New Orleans to Gulf ship channel. Work on this project should commence around September 1, 1963.

Other studies have been carried out with respect to the effect of the Barataria Bay Waterway which is now in the process of being dredged.

Hydrographic information is also used in examinations of damages to oyster leases by silting, dredging and similar accidents.

#### OYSTER STUDIES

Work on oysters continues in Louisiana in a fixed pattern and degree of activity commensurate with the demands of the industry.

In 1962 and 1963 the oyster set was so excellent that it was deemed unnecessary to plant shells as cultch. Sister Lake, an oyster reservation, under an alternate year of harvesting was opened in 1963 with an excellent production. Calcasieu Lake was harvested under careful supervision and more than 130,000 sacks of choice oysters were harvested from a limited area of natural reef.

Continued service to the oyster growers especially in relation to industrial damage to leases has been offered. In most instances in 1963, damages were confined to dredging, silting and the effects of operating deep draft craft on oyster leases.

The film on the life cycle and biology of the snail *Thais* has been completed and narrated and it was selected as one of a group of films to be shown at the International Congress of Zoology in Washington, D. C.

## MISSISSIPPI



The Capitol  
at  
Jackson

### GULF COAST RESEARCH LABORATORY

The final manuscript on racial studies of the Gulf menhaden was submitted to the Bureau of Commercial Fisheries. The chief conclusion was that there are no separate races of the Gulf menhaden, *Brevoortia patronus*.

Oceanographers at the Laboratory published papers on the Florida current and recent circulation studies east of the Mississippi delta.

The biologists published investigations of the Caloosahatchee Estuary, a study of the distribution of the planktonic diatom genus *Rhizosolenia* in Mississippi Sound, albinism in the star-gazer, a comparison of the shrimp production of the State of Texas with other Gulf states and notes on the distribution of certain crustaceans and fishes, on the behavior of small gobies in aquaria, and length-weight relationships of young red snap-

pers in the Gulf. Some additional information was given on the name of the white shrimp, *Penaeus fluvialis*.

In November 1962 the Bureau of Commercial Fisheries awarded the Laboratory \$30,000 for quantitative studies of larval shrimp. The aim is to predict the oncoming crop, and to estimate the minimum number of stations that have to be made for such purposes. The remaining unused space of the lower floor of the Faculty Residence was turned into a laboratory for the use of the shrimp investigations. In November and December small numbers of pink shrimp were found. During the exceedingly cold weather of December and January all postlarval shrimp disappeared from the catches. Large amounts of brown shrimp came in after a slow start in February and the brown shrimp season which followed was equal to the best on record. Incoming white shrimp were late but they were in considerable numbers and it looks as if there will be a good white shrimp season in the fall of 1963.

A strong attack on the menhaden industry was mounted by sports fishing interests in Gulfport. The opposition to the industry was based almost completely upon spurious evidence which marine biologists were able to answer on the basis of research work done here before.

Volume I, Numbers 4 and 5 of the GULF RESEARCH REPORTS were published. Number 4 concerned ecological study of the Foraminifera of Timbalier Bay, and Number 5 concerned a biological investigation of St. Lucie Estuary.

Sixty-two college students registered for courses in marine biology and geology and there were 34 high school students in the Summer Institute in Marine Science operated by Louisiana State University. This is the largest enrollment the Laboratory has ever had and the living facilities were utilized to the fullest.

One master's thesis was completed by a University of Southern Mississippi student. It concerned the study of the ageing markings of the various hard parts of redfish in Mississippi Sound.

The Southeastern Division of the American Society of Ichthyologists and Herpetologists met at the Laboratory on October 26 and 27.

During the fiscal year 38 field trip groups in biology and geology visited the Laboratory and made boat trips to the outer islands.

Through the Surplus Property Agency of the State of Mississippi the Laboratory acquired a T-boat which was named the Gulf Researcher. The Building Commission granted \$24,000 for incidental repairs of this boat and the National Science Foundation gave \$99,350 for equipping it with various scientific instruments and gear. Installation work continued during most of 1963 and it is expected that the boat will be in full operation in November.

A member of the Gulf Coast Research Laboratory staff continued to serve as a member of the Mississippi Marine Conservation Commission and as biologist for the Commission. His chief job has been to supervise the oyster and shrimp resources of the state.

On March 31 a scientist from Tirupati, India arrived at the Laboratory for postdoctoral research. His special concern has been fertility and productivity of Mississippi Sound.

#### MISSISSIPPI MARINE CONSERVATION COMMISSION

During the year the Mississippi Marine Conservation Commission put forth great effort to protect and conserve the natural resources of the state. An effective patrol system instituted by the Chief Inspector reduced the number of seafood violations.

The Commission received copies of AN ECONOMIC SURVEY OF THE MISSISSIPPI SEAFOOD INDUSTRY which was conducted by the Department of Business Administration of the University of Southern Mississippi at the request of the Commission. The survey showed an annual payroll of 7.5 million dollars; a total of 4,792 persons employed in the industry and a total investment of 21.1 million dollars.

During the period the Commission adopted ordinances regulating the catching of egg bearing female crabs, closing certain areas which were unfit for oyster cultivation and an ordinance regulating the sale of live bait licenses.

In other action during the year the Commission entered into a contract for the sale of dead reef shell from the submerged deposits in Mississippi Sound. The firm agrees to pay the Commission a minimum of \$60,000 per annum for the shells.

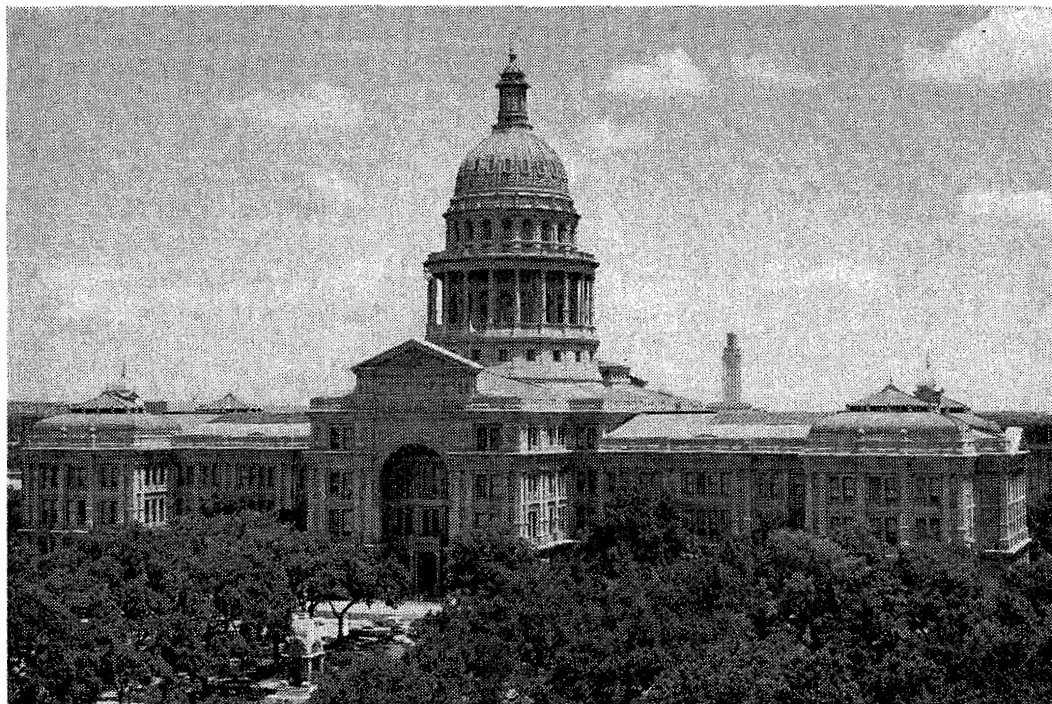
During the year Mississippi enjoyed one of the greatest oyster seasons ever. Between December 1962 and March 1963,



266,427 barrels of oysters were harvested from the dredgin reefs of the state.

In an effort to maintain the oyster reefs of the state, the Commission planted 10,595 barrels of seed oysters and 10,15 barrels of shells during the 1962-63 year.

## TEXAS



The Capitol  
at  
Austin

This year was one of severe drouth, broken temporarily in some areas in June. The winter was long and severe, and the spring and summer were windy. Some additional bay habitat has been displaced by the works of man, and still more dams are under construction on the shrinking rivers. For the most part this has not been a vintage year for the fisheries; the brown shrimp fishery may be the exception.

All positions in Coastal Fisheries function of this department were filled for the first time in several years. The State legislature passed a bill which combined the Texas Game and Fish Commission with the State Parks Board, and the new



agency, the Texas Parks and Wildlife Department, began operations in August.

#### SHRIMP PROJECT

The study of penaeid shrimp populations in the coastal bays of Texas is now in its fourth year. This program consists of semi-monthly systematic sampling of commercially important shrimps during the postlarval and juvenile phases of their life cycle. The data are used to determine growth rates, relative and seasonal abundance (occurrence) and to pinpoint the time each brood or wave enters and leaves the nurseries. Sampling results are compared to past data to forecast production and take sound fishery management measures. This year additional data are being collected on commercial bay shrimp catches to determine sizes caught by commercial gear.

Samples collected in the spring of 1963 offered evidence that the first brood or wave of brown shrimp was more numerous than corresponding broods of the past two years, and a successful brown shrimp season was predicted. At that time data were not available on white shrimp (which spawn at a later time) however; lack of spring rain resulting in high salinities cast some doubt on the success of the upcoming white shrimp season. Fortunately, rainfall increased in early June, and in some areas salinities in nursery areas were altered to approach the apparent low salinity requirements of small white shrimp.

As in past years, essential Gulf shrimp research continued to advance at a fast pace. This is due to excellent cooperation and exchange of ideas between members of the Gulf States Marine Fisheries Commission represented by agencies of the five Gulf states and the U. S. Fish and Wildlife Service.

#### FISH PROJECT

The standard sampling methods employed during the previous year were continued in all bay areas to seek further population data on the important forage, food, and game fish of the Texas coast. While the current data have not been evaluated, the use of standard and coordinated sampling methods since September 1961 will allow accurate comparison of results, not only of one area with another but also of the current year with the year previous. Preliminary comparisons of results have already indicated the need for several modifications of the sam-

pling methods which include the enlargement of the adult food and game fish sampling areas, more extensive sampling of juvenile food and game fish, and complete modification of the foraging species sampling methods.

The most disturbing result noted this year was the decline in the juvenile redfish crop over the entire bay area of the lower coast and which ranged from a drop of from 67 per cent to 100 per cent from the 1961 redfish crop. This decline is suspected to be due to a failure in the redfish spawn or survival in the fall of 1962 or a heavy mortality of juvenile redfish in January 1963 due to severe cold weather or a combination of both.

Tag returns from tagged redfish over the Texas coast indicate a 20 per cent return on redfish one year of age or less (except in the Lower Laguna Madre where a 14-inch minimum size limit is in effect) and 25 per cent returns on each successive year class thereafter. This high incidence of tag returns combined with the failure of the 1962 redfish spawn to survive suggests a need for additional regulation of the redfish fishery.

Three separate periods of severe weather occurred during January 1963. While the temperatures dropped to below freezing in all three periods, they were of comparatively short duration which appears to account for the light fish kill compared to that of January 1962. There was, however, a local kill of considerable proportion of speckled trout in the Laguna Madre.

Tides were far below normal throughout the summer months, and a general lack of rainfall prevailed for the second consecutive year resulting in higher than normal salinities in the Texas coastal areas.

#### CONTRACT DRUM REMOVAL PROGRAM

During the 1962-63 contract drum removal season, 17 commercial fishermen were awarded contracts to remove black drum from the waters of Cameron and Willacy Counties in the Lower Laguna Madre under the laws of the State of Texas and the rules and regulations of the Game and Fish Commission. During the six-month period, 619,556 pounds (live weight) of black drum were removed from the two-county area reflecting a drop of 14.5 per cent compared to the previous season, although the catch rose from 361.9 pounds of drum per contractor per day during the 1961-62 season to 638 pounds of drum per contractor per day during this season.

The drop in black drum landings is contributed to the comparatively short period of time during the six-month season when ideal black drum netting conditions prevailed, the early migration of the drum out of the contract area, and the general scarcity of the choice drum (under 5 pounds) within the contract area. The increase in number of pounds of drum taken per day per contractor is attributed to the harvest of the large drum which were very abundant during the contract season. Even these large drum were not harvested to the fullest extent due to the limited market for them.

This year the legislature amended the laws pertaining to black drum netting in Cameron and Willacy Counties. The months of November and March were added to the contract period in Cameron County to the months of December, January, February, which had comprised the contract season previously. In Willacy County the months of April and May were deleted from the contract season, the month of December added, and the waters west of the Intracoastal Waterway excluded from the contract area.

While the net effect of the legislative change is expected to be an improvement, a greatly extended season and fishing area is needed in order to affect the desired reduction in the black drum population of the area.

#### CRAB PROJECT

The study of the blue crab populations of the Texas coast began in September 1961, and the aims of this study are to determine seasonal abundance, movement and migrations, growth rates, and the effects of hydrographic and environmental conditions. During the first portion of the study, trends in seasonal abundance, movement, and migration were evaluated. Continued studies should substantiate the present data. The growth rate was determined to be 10 to 16 millimeters per month with the average for the year being 13 millimeters. Environmental effects are continuing to be studied.

The experimental crab tagging study was completed and methods of crab tagging adopted for use in all areas from Galveston to Corpus Christi Bay. Dart tags are anchored internally in immature crabs, and Peterson disc tags are attached with monel wire to the carapace of adult crabs.

Field biologists in the seven Texas bay areas are continuing semimonthly sampling.

Drouth conditions persist, and salinities are high in most areas of the Texas coast.

Commercial production is near 3 million pounds per year, but at present there are indications of a decline in the populations of the blue crab. This decline is a result of increased fishing pressure and the unfavorable climatic conditions.

#### OYSTER PROJECT

Biological research concerned with the commercial oyster, *Crassostrea virginica*, is directed toward the development of information for use in management of the species.

Coast wide studies were made of growth, spat fall, spat survival, diseases, and effects of changes in hydrographic conditions as well as the effects of commercial pressure, dredging, pollution, and bay development, all of which influence the Texas oyster harvest.

In July the coast wide size limit of commercial oysters was reduced from 3½ inches to 3 inches when studies of the oyster disease, *Dermocystidium marinum*, and reef population studies showed that approximately 70 per cent of the oysters of 3 inches in size and larger were lost because of this parasitic fungus. Reduction of the size limit will permit oystermen to harvest oysters prior to the summer loss to this disease.

Drouth conditions in the central and lower coast areas created unfavorable oyster conditions which resulted in a poor harvest from Matagorda, San Antonio, Espiritu Santo, Mesquite, and Aransas Bays. Habitat conditions for the production of oysters in Galveston Bay were good, and an excellent harvest of 1,298,610 pounds of meats was produced. This production was primarily from Todd's Dump Reef and Hanna's Reef, the two major reefs in the Galveston Bay area.

Environmental conditions in other bays approached those of the 1951-1957 drouth. Precipitation in some areas was 61 per cent below normal and salinities increased beyond that of the Gulf of Mexico (35.0 ppt) and well beyond the optimum for good oyster conditions (15-25 ppt) in Texas.

Special disease studies made under an interagency contract with Texas A&M College, indicate the presence of other oyster

diseases in Texas bays. These include "mycelial disease," *Bucephalus*, *Hexamita*, *Nematopsis*, and an amoeboid disease unofficially called "mulberry." Studies are being made to determine the specific nature of these diseases and their effect upon the commercial oyster.

#### GENERAL ACTIVITIES

Construction was begun on the Seabrook Laboratory in July. This building, when completed, will house the coastal fisheries and law enforcement personnel that work in the Galveston Bay area. The original lab was destroyed by Hurricane Carla in September 1961. Completion is scheduled for early 1964.

Contracts have been awarded and construction will soon begin on an addition to the artificial fishing reef in the Gulf of Mexico off Galveston. The addition will consist of three hundred 30-inch concrete pipes strapped together into units of three pipes each.

The existing reef, constructed in August 1962, was sampled several times with hook and line and inspected once by skin divers. The reef was found to be intact and in good condition.

The first step in the rehabilitation of the Port Aransas Fishing Reef was taken on June 14, 1963, when fifty sections of concrete culvert, donated by the Port Aransas Boatmen's Association, were placed near the buoy. Each section was 4 or 6 feet in diameter and weighed approximately 5,000 pounds.

During the week of August 19, 1963, a contractor loaded, hauled, and placed 400 sections of clay pipe, each pipe measuring 18-24 inches in diameter and 5-6 feet in length. The material was donated by the Port Aransas Boatmen's Association.

Two natural reefs in the Gulf were marked in the vicinity of Port Mansfield, the buoys being donated by the Willacy County Navigation District. The northernmost reef, located 17½ miles north of the Mansfield jetty and 11½ miles offshore, was marked with a bell buoy; the southernmost reef, located 12½ miles northeast of the Mansfield jetty and 3 miles offshore, was marked with a lighted buoy. This work was completed July 5, 1963

Five artificial reefs under construction at the end of the previous year were completed. Roughly 75,000 cubic yards of shell were required to build the reefs which had a combined area

of 50 acres. Two of the reefs were extensions to existing artificial reefs; the other three were new locations. Work is presently under way to mark the three new locations with lighted pilings. Two other artificial reefs will also be marked. One of these has never been marked; the other was previously marked but the marker was destroyed.

In addition to the regular shell dredging permits ten special permits were issued to shell producers in Galveston Bay for the dredging of small, exposed oyster reefs. These special permits required that any live oysters present on the small reefs be moved to other reefs and that a replacement reef of equal size be built. The total area of the reefs thus cleaned of live oysters and dredged was 9.7 acres.

The old Port Lavaca causeway, which was destroyed by Hurricane Carla, was partially rebuilt at either end. The two segments extending 162 feet at the Port Lavaca end and 252 feet at the Point Comfort end are used as public fishing piers.

A census of sport fishermen in the Galveston-Trinity Bay System was begun in June. This study, which utilizes an aerial survey and interviews of fishermen at boat docks, is expected to yield data on numbers of boat fishermen and the quantity of their catch.

# U. S. FISH AND WILDLIFE SERVICE ACTIVITIES

OCTOBER 1962 - OCTOBER 1963



The Capitol  
at  
Washington, D. C.

## **Bureau of Commercial Fisheries**

For the second consecutive year, funding of Bureau of Commercial Fisheries activities in the Gulf States has been substantially increased. The additional financing has made possible the acceleration of several programs and the extension of others into new fields of activity. The Bureau programs in the Gulf States are directed by the Regional Office at St. Petersburg Beach, Florida. This office also coordinates program activities with recommendations from the Gulf States Marine Fisheries Commission to orient the research and services toward timely solution of important problems in the area. A summary of Bureau activities for the year ending September 30, 1963 follows:

### **EXPLORATORY FISHING AND GEAR RESEARCH BASE PASCAGOULA, MISSISSIPPI**

Five extended cruises of the exploratory fishing vessel Oregon were conducted in the Gulf of Mexico during this reporting period in a continuing assessment of the Continental

Shelf and Slope resources. An additional cruise was devoted to deepwater gear developmental research.

A contract was let in August for marine architect-engineer services as a first step in designing a replacement for the 17-year old vessel Oregon which has been in continuous service in the Gulf since 1950. The new vessel will be a versatile craft, somewhat larger than the Oregon, faster and capable of extended range. Construction of the new vessel is expected to commence late in 1964 provided that current funding plans materialize.

#### SHELLFISH

Clams and scallops: One cruise was conducted in the northwestern Gulf of Mexico during September and October 1962. Objectives were to secure seasonal information on off-shore clam and scallop distribution along the Louisiana and Texas coastal areas.

Two hundred and thirty-one hauls in the 4 to 80-fathom depth range showed wide-spread occurrence of paper shell scallops (*Amusium papyraceus*) and deepwater Gulf clams (*Pitaria cordata*). Although concentrations were generally small during this cruise, additional coverage is planned to determine seasonal concentrations and yield.

A seasonal check on hard clam (*Mercenaria campecheinsis*) beds off southwest Florida was completed in December 1962. Catches up to 185 clams (3 to 5 inches in diameter) per 30-minute tow were taken off St. Petersburg, and a small area off Gasparilla Island yielded as high as 154 clams per 15-minute tow. Fishing effectiveness of the 22-tooth Fall River clam dredge was hampered by heavy concentrations of pen shells (*Atrina rigida*) throughout the area and several tows were marginal.

Royal red shrimp: Major portions of three cruises were directed toward commercial production type assessment of royal red shrimp (*Hymenopenaeus robustus*) stocks on the Mississippi Delta and Dry Tortugas grounds. A total of 5,250 pounds, heads-off, shrimp were caught on the Delta grounds in 51 tows during the October-December period. Catch ratios were slightly higher on the Tortugas grounds with some 6,000 pounds, heads-on, produced in 41 tows. Most trawling tows were of 3-hour duration, and conventionally rigged 100-foot trawls were used in the simulated production fishing. Additional effort is scheduled to fill



in seasonal gaps in data and to provide systematic coverage, both geographically and seasonally.

#### BOTTOMFISH

Bottomfish explorations were not scheduled during this period although bottomfish species occurring coincidentally with shrimp catches were recorded for future reference.

#### PELAGIC FISH

Work was started on a new project with the construction of a 1,200-foot monofilament gill net. Objectives are to conduct experimental gear trials with transparent monofilament gill nets on tuna and other surface schooling fish. One gill net has been completed and a hydraulic power block installed on the Oregon to facilitate handling this gear.

#### OFFSHORE SHRIMP GEAR RESEARCH

A self-contained underwater motion picture camera system was devised and fabricated at the Pascagoula Base for use in studying the behavior of shrimp in relation to trawling gear. The camera was mounted on the headrope of a shrimp trawl and field tested on the royal red shrimp grounds. Approximately 1,800 feet of usable film have been obtained, and the success of the camera has been established as a deep-water tool for evaluating trawl effectiveness as related to shrimp reactions to this gear. The camera system will also be valuable in providing the basis for quantitative estimates of shrimp abundance on offshore grounds. Another useful piece of equipment, an underwater television unit capable of operating to depths beyond those currently being routinely explored, has been acquired recently and is being readied for operation.

#### FAUNAL ASSESSMENT

The production of a series of atlas type presentations portraying the distribution and concentration of commercially valuable fish and shellfish resources on the Continental Shelf and Slope of the Gulf of Mexico has commenced. An important phase of this work has been the transferring of more than a decade of Oregon and Silver Bay data to automatic data processing (ADP) cards. In addition to aiding in the production of the atlas type presentations, the ADP system is expected to increase the speed and effectiveness of reporting research results.

GEAR RESEARCH AND DEVELOPMENT STATION  
PANAMA CITY, FLORIDA

The Gear Research Unit moved from the Pascagoula base to its present location in Panama City, Florida, in November 1962. Here advantage can be taken of the clear water conditions for shrimp behavior studies. Office facilities, vessel dockage for the George M. Bowers, and underwater observation areas are available. The work is divided into three segments: shrimp burrowing studies, electrical stimulation studies, and gear development.

SHRIMP BURROWING BEHAVIOR

Pink shrimp burrowing studies center around attempts to relate shrimp activities to environmental factors. The shrimp are being studied both in the laboratory and in cages in the sea. An underwater observation tank allows lengthy observations without the necessity of using diving gear. A manuscript report of initial phases of the work has been prepared.

ELECTRICAL STIMULATION OF PINK SHRIMP

Controlled experiments are being conducted to determine behavior characteristics of shrimp to electrical stimuli as a preliminary step toward development of an electrical impulse shrimp trawl. These experiments are being conducted in the laboratory and in the field. The object of the studies is to stimulate shrimp burrowed during daylight hours to the extent that they will emerge from the burrows so as to be taken by shrimp trawls.

GEAR DEVELOPMENT

An electrode equipped trawl is being constructed and tested for use in the stimulation studies. A pulse generator for use with the trawl is also being built.

Instruments developed during the reporting period for use in studying trawl action include: a sonic distance measuring system, a load cell system for subsurface load measurements, a bottom speed indicator, a door angle-of-attack indicator, and a net leg-door angle indicator.

BIOLOGICAL LABORATORY  
GALVESTON, TEXAS

Additional funds permitted further expansion of the Bureau's program of shrimp research. The level of funding and scope of activity now satisfy the recommendations for a revital-

ized research program outlined in the Commission's resolution of 1954.

The systematic survey of shrimp spawning activity and larval abundance in relation to oceanic conditions along the northern Gulf coast has been extended to the east of the Mississippi Delta. Preliminary analysis of accumulated data indicates that brown shrimp do not ordinarily spawn inside the 15-fathom contour and that most reproduction takes place at 25 to 40 fathoms. It also reveals that some spawning occurs throughout the year but is most intense from late winter to early spring, and again from midsummer to early fall. Among other uses, such information will be of considerable value in determining the influence of the marine environment on spawning success and survival of larvae.

Early spring results of the continuing survey of brown and white shrimp postlarvae as they move into Galveston Bay and other estuaries on the northwestern Gulf coast indicated that shrimp production there in 1963 would be at least as great as that in 1962.

Employing stains (and in a few instances, tags) as the marking agents, seven mark-recapture experiments involving brown, white, and pink shrimp were either begun or completed at various locations around the Gulf. Results of most experiments are still being processed but incomplete analysis of recapture data for pink shrimp in the Sanibel-Tortugas area suggests that measures of growth approximate those determined in earlier work and that the pink shrimp resource off southwest Florida is not composed, as formerly speculated, of two distinctly separate, non-interbreeding groups—one off Sanibel Island and the other off Dry Tortugas.

Catch-sampling personnel are now located at Brownsville, Aransas Pass, Galveston, Morgan City, Houma, Pascagoula, Tampa and Key West. Besides furnishing Bureau statistical agents with data that will create improvement in shrimp fishery statistics, the samplers are also aiding in the conduct of mark-recapture experiments and checking on the extent of shrimp discarding in areas where it is frequently practiced.

#### PHYSIOLOGY AND BEHAVIOR PROGRAM

With the aid of four new specially constructed rooms in which temperature and light can be precisely controlled, biologists have been able to step up their program of study to gain a

better understanding of how young shrimp adapt to the dynamic estuarine environment in which they spend a good portion of their lives. Most recent findings indicate that growth of post-larvae is markedly influenced by temperature whereas differences in salinity within the range of the shrimp's tolerance produce no significant effect. Such information promises to be of great value in predicting the results of environmental changes, especially those arising from extensive engineering and water-resource projects proposed for Gulf coast estuaries and marshes.

#### ESTUARINE PROGRAM

Research in estuarine ecology was expanded during the year, with emphasis gradually being shifted from routine investigation of the general biology of estuarine species to detailed studies of the dynamics of their populations. Cooperative arrangements were made with the Corps of Engineers and Texas Water Pollution Control Board for the exchange of hydrological data collected in the Galveston Bay area. This consolidated data-gathering effort is resulting in better definition of the estuary's physical characteristics.

Processing and analysis of biological and hydrological data collected in the Galveston Bay area since 1959 were also initiated. Preliminary examination of biological data gathered in 1961 indicates that some sections of estuarine complexes are significantly more valuable than others from the standpoint of their capacity to produce and maintain fishery resources.

#### INDUSTRIAL FISHERY PROGRAM

Landings of miscellaneous bottomfishes for production of petfood and meal increased 28 percent to nearly 50,000 tons in 1962. Analysis of fishery statistics revealed, however, that the overall abundance of these fishes remained about the same as in 1961. The Atlantic croaker continued as the dominant species supporting the industrial bottomfish fishery, with 1- and 2-year old fish again contributing the bulk of this species' contribution to the total landings.

Continuing studies of unutilized bottomfish resources in the western Gulf reveal that the longspine porgy is the most abundant species beyond 10 fathoms, and that average bottomfish size generally increases with increasing depth of capture.

## NEW FISHERY-OCEANOGRAPHIC RESEARCH VESSEL

In accordance with plans developed several years ago, a new seagoing vessel for use in research programs on shrimp and industrial fishes in the Gulf of Mexico is being designed, and bids for its construction are to be solicited soon. This steel-hulled vessel is to be about 95 feet long, and to be rigged for trawling, seining, as well as handling conventional oceanographic sampling gear. It will also be equipped with "wet" and "dry" laboratories, have accommodations for nine crewmen and five scientists, and be based at Galveston.

## BIOLOGICAL LABORATORY, GULF BREEZE, FLORIDA PESTICIDES PROGRAM

Greater emphasis has been placed on the investigation of effects of pesticides on marine commercial species of fish and shellfish. Funds for this research have been approximately doubled making possible corresponding increases in research activities. The majority of the most frequently used chemical pesticides have now been screened to determine their acute toxicity to fish and shellfish. Projects are now underway to determine the persistence of these chemicals both in the shellfish and their environment. Oysters, for example, when exposed to only one part per billion of DDT for a week store up to 20,000 times this amount in their tissues. Observations are being made to determine the period required for oysters to cleanse themselves of such residues. Pesticide residues are found in clam meats, too, but not to the extent found in oysters.

## OYSTER PROGRAM

Studies have been renewed to find methods for controlling the oyster drill and other oyster reef predators. Recently developed chemical controls are being tested to find whether they may possibly be more harmful to shrimp and useful crustaceans than they are to oyster pests.

Completed experiments show that the unusually high silt content in sea water, such as results from channel and dredging operations, will decrease oyster growth by a third and cause a 25 percent decrease in meat quality after exposure for several weeks. Oysters do not become adjusted to the silt and are affected by it regardless of whether they came from clear or turbid waters originally. Heavy concentrations of silt do not kill

oysters as long as it remains in suspension, but may cause mortality by smothering oysters when it settles on the bottom.

#### CLAM STUDIES

Studies are being made on the growth rate of the hard clam and a brackish water clam for the same purpose. It is expected that changes in growth rates from year to year in protected population of clams will reflect changes in the quality of the estuarine environment.

#### ESTUARINE PRODUCTIVITY

Projects have been initiated to test the use of marine animals as indicators of estuarine productivity and pollution over long periods of time. Detailed studies of the population dynamics of one of the more common estuarine fish will make it possible to evaluate an estuary on the basis of the abundance of these fish from year to year.

An inventory has been completed of the vertebrate and invertebrate animals occurring in the Pensacola estuary during the past two years. This check list will be useful in future years in identifying permanent changes that may be taking place in the estuarine fauna due to either man's activities or to basic changes in the environment.

#### BIOLOGICAL STATION, ST. PETERSBURG BEACH, FLORIDA ESTUARINE PROGRAM

Studies of estuarine dependent fish species found in Gulf commercial catches were completed. Twenty-four economically important species were found to inhabit Tampa Bay during larval and juvenile stages. Primary productivity, plankton, water chemistry, and fauna have been investigated systematically in Tampa Bay to form a base line for detection of gradual or radical effects from estuarine alteration.

Benthic sediments and biota have been obtained at series of stations on 20 transects throughout the bay. The purpose was to correlate fauna and flora with bottom type, salinity, and depth in determining the benthic species-habitat relation for the entire bay. Since the bottom is among the foremost indicators of estuarine balance and condition, these data are useful in assessing the effects of hurricane barriers, dams, and spoil banks.

Standardized methods are being developed for Bureau laboratories in this region for coordinated primary production studies in estuaries throughout the Gulf. This project will serve as a Bureau contribution to the international Biological Year which starts with the beginning of 1964.

#### RED TIDE PROGRAM

Funds were provided for red tide studies and their application to the program is in the planning stage. Initially, a manual of results from past research will be assembled. There is also need for relating hydrology to the occurrence of the red tide organism, *Gymnodinium breve*, by automatic data analysis.

#### TECHNOLOGICAL LABORATORY, PASCAGOULA, MISSISSIPPI CHEMISTRY PROGRAM

Since little is known of the nutritive factors of fish and shellfish, a project to determine the composition and nutritive value of seafoods was initiated with the bimonthly sampling of six species throughout the United States. Blue crab, dungeness crab, brown shrimp, Alaskan pink shrimp, alewives, and ocean perch comprise the first series to be analyzed for proximate composition, amino acid, trace mineral, vitamin, fatty acid, phospholipid, and steroid content. The resultant data will show the effect of season and geographical area of catch upon composition, as well as variations to be expected due to differences in species and in type of tissue. A special part of this study has indicated the important role several species of shellfish can play in a low cholesterol diet.

The probable mechanism of "blackening" of shrimp after heat processing has been determined, as has an interim method of control. Further work in this area will soon show the basic cause and effect relationship and thus allow the development of a preventative measure.

#### VOLUNTARY STANDARDS OF GRADE FOR FISHERY PRODUCTS

A proposed standard was prepared for frozen raw peeled shrimp. A completed draft is now available for presentation to industry. A revision of the present standard for frozen raw breaded shrimp was completed and a finished draft presented to industry at five meetings in the major producing areas of the country. Promulgation of the revision has been held in

abeyance, however, pending decision by the U. S. Food and Drug Administration on promulgation of a standard of identity.

Studies are underway to develop chemical tests for more accurate determination of "borderline" decomposition in fishery products. Chemical indices of progressive deterioration are being correlated with taste and odor evaluations by trained technologists.

#### BACTERIOLOGY PROGRAM

Bacteriological studies were initiated to gather data on the numbers and species of microorganisms found in frozen seafoods. A large number of in-plant samples have been analyzed and data from this project will be helpful in identifying plant practices that need improvement.

#### INSPECTION SERVICE

The USDI Inspection and Certification Service furnished continuous inspection to a substantial portion of frozen seafood industry in the region. A training seminar was held in each area to keep all inspectors aware of latest methods and policies. There has been an increase in requests for lot inspection on seafoods offered under bids for state purchasing agencies.

#### STATISTICS

Gulf fisheries statistical programs are directed by a supervising office in New Orleans. Continuity was maintained in the collection and publication of detailed statistics on the commercial fisheries. The annual general canvass of the commercial fisheries of the coastal areas was made. This survey provides data on the number of fishermen, types and number of fishing gear, and volume and value of catch by individual species by specific gear within the major waterbodies of each state. The annual general canvass of shore plant installations was also completed. Information obtained relates to the volume and value of processed fishery products and employment within shore plant installations.

Monthly landings bulletins, compiled and published in cooperation with the respective state conservation agencies, were issued on as current a basis as possible.

Content of the monthly shrimp preliminary report (land-



ings, imports, cold storage holdings) was revised to provide comparative data for a 5- rather than a 2-year period.

#### MARKET NEWS

Daily Fishery Products Reports were published and mailed to approximately 1,200 subscribers. Monthly and annual summaries were also issued. Value of the daily report was enhanced by addition of coverage on quantity and types of fishery products imported through the ports of Miami, Florida, and Houston, Texas. Sizable amounts of imports arriving both by air and sea transportation are entered at these two ports. Publication of shrimp ex-vessel prices at Key West and Marathon, Florida, was initiated, thereby rounding out shrimp price reporting along the Gulf coast.

#### MARKETING

The market development program continued at a vigorous pace in the Gulf States during the year. With the addition of a home economist at the Dallas office, an expanded consumer education program was undertaken, with gratifying results. It has resulted in a multitude of requests for fish cookery demonstrations and educational material on the use of seafoods. The annual industry-government promotional campaigns—Lent Promotion and Fish 'n Seafood Parade—were again successful in stimulating sales increases at all levels of distribution. Notable progress was made during the year in the attack on the problem of better utilization of mullet. As a result of a successful canning technique developed by the technological laboratory at Pascagoula, two firms in Florida entered the mullet (or LISA, as it is known in Florida) canning business, and are now producing a very acceptable pack. The regional marketing staff worked closely with the mullet industry and the Florida State Board of Conservation in developing plans for the introduction of this product into the institutional and retail fields. More progress in this field is expected during the coming year.

#### FINANCIAL ASSISTANCE

A great deal of progress has been made in the Fishing Vessel Mortgage Insurance Program. Under this program, the Government insures 100 percent of the mortgages securing loans made by lenders for the construction of new and renovation of

old vessels. Over the past 12 months, 10 applications have been received, requesting insurance for a total of \$363,681.

Only 8 fishery loan applications amounting to \$159,039 were received during the year. These loans are granted to qualified commercial fishermen for financing and refinancing fishing operations, repair of gear, purchase of fishing equipment, and for replacement of gear and vessels which have been lost or have become obsolete or inefficient. Over \$6 million is still available for lending in the Fisheries Loan Fund.

### **Bureau of Sport Fisheries and Wildlife**

Primary activities of the Bureau of Sport Fisheries and Wildlife as they relate to the Gulf States Marine Fisheries Commission have continued to be work conducted under the authority of the Fish and Wildlife Coordination Act. One new activity does merit attention. A Fishery Management Cooperative Unit was recently established at Louisiana State University, Baton Rouge. Contributions to the Commission's interest of scientific discipline should be forthcoming from work conducted by this unit.

The Fish and Wildlife Coordination Act activities have resulted in investigation of project-occasioned effects on fisheries in all significant coastal projects. The investigations have been conducted cooperatively with the Bureau of Commercial Fisheries and the appropriate State agency.

The competition for use of coastal water areas and freshwater discharge changes associated with inland drainage alterations continue to represent the primary need for maintenance of estuarine conditions.

Investigations undertaken by this Bureau warranting attention in this report include:

#### **SMALL WATERSHED PROJECTS**

There has been an initiation of interest in planning to convert coastal marsh areas to agriculture use under the auspices of the Soil Conservation Service-administered Small Watershed Act (Public Law 566). Project-occasioned effects which may result in these marine fishery environs merit close attention by the fishery interest. One project in Cameron Parish, Louisiana, adjacent to Lake Calcasieu, is currently under planning consideration.

## NAVIGATION PROJECTS

Mississippi River-Gulf Outlet Project, Louisiana: Channel construction is completed to half-width dimensions. A saline water regulatory control and navigation lock structure has been recommended by the construction agency. The structure will be located in the Industrial Canal. Further definitive investigation of the salt water wedge within the ship channel is being conducted.

## FLOOD CONTROL PROJECTS

Lake Okeechobee Regulation, Florida: Investigation of the water requirement for the Everglades National Park has been initiated by the construction agency. Requirements for the Tortugas shrimp fishery and other marine interest must, of necessity, be determined and considered concurrently with the Park's needs. Hydrological studies by the U. S. Geological Survey for this Bureau are being continued. The current Bureau studies and plans for other contract investigations will assist in this development.

Atchafalaya Floodway, Louisiana: Certain recommendations submitted by this Bureau were not accepted by the construction agency. Request for reconsideration of the project fish and wildlife needs has been made.

## NAVIGATION PROJECTS

Private construction: The detrimental accumulative effect of canals, bulkhead, dredging, and filling projects continues the urgent need for cataloging and initiating protective action for the important coastal fishery areas.

PEAT, MARWICK, MITCHELL & CO.  
(Combining Barton, Pilié, Hughes & Jones)

Certified Public Accountants

535 Gravier Street  
New Orleans 12, La.

### **ACCOUNTANTS' REPORT**

Commissioners

Gulf States Marine Fisheries Commission:

We have examined the statement of income and expenses of Gulf States Marine Fisheries Commission for the year ended June 30, 1963 and related statement of resources as of that date. 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 statements of income and expenses and resources present fairly the results of the financial transactions of Gulf States Marine Fisheries Commission for the year ended June 30, 1963 and its resources at that date, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year. Also, in our opinion, the accompanying supplementary information to accounts is stated fairly in all material respects when considered in conjunction with the financial statements taken as a whole.

Peat, Marwick, Mitchell & Co.

New Orleans, Louisiana  
July 18, 1963

# GULF STATES MARINE FISHERIES COMMISSION

## Statement of Income and Expenses

Year ended June 30, 1963

Income—member states' contributions:		
Alabama .....		\$ 3,500.00
Florida .....		4,500.00
Louisiana .....		5,000.00
Mississippi .....		1,000.00
Texas .....		6,000.00
Total income .....		<u>20,000.00</u>
Expenses:		
Salaries .....	\$13,700.00	
Traveling .....	1,430.46	
Office rent .....	1,080.00	
Stationery, printing and supplies .....	440.65	
Telephone and telegraph .....	539.49	
Postage .....	184.21	
Electricity .....	57.89	
Equipment maintenance .....	69.28	
Accounting .....	250.00	
Insurance .....	247.92	
Meeting expense .....	287.70	
Publication expense .....	654.48	
Payroll taxes .....	323.31	
Depreciation .....	61.30	
Sundry .....	39.70	
Total expenses .....		<u>19,366.39</u>
Excess of income over expenses .....		633.61
Resources of the Commission at beginning of year .....		1,982.54
Resources of the Commission at end of year .....		<u>\$ 2,616.15</u>

## Statement of Resources — June 30, 1963

Cash (note 1) .....		\$ 6,727.50
Traveling advance .....		250.00
Meter deposit .....		10.00
Prepaid insurance premiums .....		120.85
Equipment—at cost less allowance for depreciation, \$2,436.95 (note 2) .....		507.80
		<u>7,616.15</u>
Less member's (Louisiana) contribution collected in advance .....		5,000.00
Resources (net) .....		<u>\$2,616.15</u>

For notes see accompanying supplementary information to accounts.

**BUDGET**  
**GULF STATES MARINE FISHERIES COMMISSION**  
**Fiscal Year 1963-64**

Salaries .....	\$14,200.00
Traveling .....	1,700.00
Office rent .....	1,080.00
Stationery, printing and supplies .....	475.00
Telephone and telegraph .....	525.00
Postage .....	250.00
Electricity .....	60.00
Equipment maintenance .....	75.00
Accounting .....	250.00
Insurance .....	250.00
Meeting expense .....	300.00
Publication expense .....	675.00
Payroll taxes .....	326.25
Depreciation .....	60.00
Sundry .....	40.00
	<u>\$20,266.25</u>

(Approved October 18, 1963)

**GULF STATES MARINE FISHERIES COMMISSION**

**Supplementary Information to Accounts**

**June 30, 1963**

(1) Cash:

Cash receipts:

Income (see accompanying statement) .....	\$20,000.00
Member's (Louisiana) contribution collected in advance .....	5,000.00
<b>Total cash receipts .....</b>	<b>25,000.00</b>

Cash disbursements:

Expenses (see accompanying statement) .....	\$19,366.39
Equipment purchases .....	80.47
<b>.....</b>	<b>19,446.86</b>

Less adjustment for expenses not representing cash outlay:

Decrease in prepaid insurance .....	1.32
Depreciation .....	61.30

**Total cash disbursements .....** 19,384.24

Excess of receipts over disbursements .....

Cash balance at beginning of year .....

Cash balance at end of year .....

Comprised as follows:

National American Bank of New Orleans, checking account .....	6,703.66
Petty cash .....	23.84
<b>.....</b>	<b>6,727.50</b>

\$6,727.50

(2) Equipment:

	<u>Cost</u>	<u>Allowance for depreciation</u>	<u>Net</u>
Amount at beginning of year:			
Automobile .....	\$1,436.38	1,436.38	—
Furniture and fixtures .....	1,427.90	939.27	488.63
	<u>2,864.28</u>	<u>2,375.65</u>	<u>488.63</u>
Additions to furniture and fixtures....	80.47	—	80.47
Depreciation allowance for year .....	—	61.30	(61.30)
	<u>\$2,944.75</u>	<u>2,436.95</u>	<u>507.80</u>
Amount at end of year:			
Automobile .....	\$1,436.38	1,436.38	—
Furniture and fixtures .....	1,508.37	1,000.57	507.80
	<u>\$2,944.75</u>	<u>2,436.95</u>	<u>507.80</u>

(3) Fidelity Bond Insurance:

Fidelity bond insurance of \$10,000.00 each is carried on chairman, vice-chairman and director of the Commission.