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GULF STATES MARINE FISHERIES COMMISSION

FOURTH ANNUAL REPORT
1952-53

To The

CONGRESS OF THE UNITED STATES

And to the

GOVERNORS AND LEGISLATORS

of

ALABAMA
FLORIDA
LOUISIANA
MISSISSIPPI
TEXAS

FOURTH ANNUAL REPORT (1952-53) OF THE
GULF STATES MARINE FISHERIES COMMISSION

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ALABAMA
FLORIDA
LOUISIANA
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TEXAS

Presented in compliance with the terms of the
Compact and the state enabling acts creating
such commission and Public Law 66-81st Con-
gress assenting thereto.

Gulf States Marine Fisheries Commission
312 Audubon Building
New Orleans 16, Louisiana

GULF STATES MARINE FISHERIES COMMISSION

ROSTER—OCTOBER 1953

Hermes Gautier
Chairman

William J. Hendry
Vice-Chairman

W. Dudley Gunn—Secretary-Treasurer
Ellen S. Hoover—Office Secretary

*** COMMISSIONERS**

ALABAMA

Earl M. McGowin, Director,
Alabama Department of Conservation,
Montgomery, Alabama
Thos. A. Johnston, III, Senator,
State of Alabama, Mobile, Alabama
W. C. Holmes, M.D.,
Foley, Alabama

FLORIDA

Charles W. Bevis, Supervisor,
Florida Board of Conservation, Tallahassee, Florida
D. C. Jones, Jr., Representative
State of Florida, Naples, Florida
William J. Hendry,
Okeechobee, Florida

LOUISIANA

L. D. Young, Jr., Executive Director,
Louisiana Wildlife and Fisheries Commission
New Orleans, Louisiana
C. C. Burleigh, Senator,
State of Louisiana, Franklin, Louisiana
Donald G. Bollinger,
Lockport, Louisiana

MISSISSIPPI

Walter J. Gex, President,
Mississippi Seafood Commission, Biloxi, Mississippi
Hermes Gautier, Senator,
State of Mississippi, Pascagoula, Mississippi
Louis Simmons, President,
Gulf Coast Shrimpers' and Oystermen's Assn.,
Biloxi, Mississippi

TEXAS

Howard D. Dodgen, Executive Secretary,
Texas Game and Fish Commission, Austin, Texas
Jimmy Phillips, Senator,
State of Texas, Angleton, Texas
Lawrence A. Kurtz, Colonel, U. S. Army (Retired),
San Antonio, Texas

★Order of listing—Administrator—Legislator—Governor's
Appointee

SUCCESSIONS ON THE COMMISSION DURING THE YEAR

Charles W. Bevis vice **George Vathis**
D. C. Jones, Jr. vice **Bryant Patton**
L. D. Young, Jr. vice **Ernest S. Clements**
C. C. Burleigh vice **E. J. Grizzaffi**
Donald G. Bollinger vice **Leander H. Perez**

COMMISSION OFFICERS ELECTED OCTOBER 16, 1953 FOR YEAR 1953-54

Chairman: Mr. Gautier succeeding **Mr. Dodgen**
Vice-Chairman: Mr. Hendry succeeding **Mr. Gautier**

STANDING COMMITTEES

COMMITTEE TO CORRELATE FISHERIES LAWS

- A. J. Harris, Jr.**, Asst. Attorney General
Alabama Department of Conservation,
Montgomery, Alabama
- Mary Schulman**, Assistant Attorney General,
State of Florida, Tallahassee, Florida
- Warren M. Simon**, Attorney,
La. Wildlife and Fisheries Commission
New Orleans, Louisiana
- Reece O. Bickerstaff**, Representative,
State of Mississippi, Gulfport, Mississippi
- Erma Baker**, Attorney,
Texas Game and Fish Commission, Austin, Texas

COMMITTEE TO CORRELATE RESEARCH AND EXPLORATORY DATA

- Harold C. Loesch**, Marine Biologist
Alabama Dept. of Conservation, Bayou LaBatre, Ala.
- F. G. Walton Smith**, Director
Marine Laboratory, University of Miami,
Coral Gables, Florida
- Percy Viosca, Jr.**, Marine Biologist
La. Wildlife and Fisheries Commission
New Orleans, Louisiana
- A. E. Hopkins**, Director
Gulf Coast Research Laboratory,
Ocean Springs, Mississippi
- Cecil W. Reid**, Director,
Division of Coastal Fisheries
Texas Game and Fish Commission, Rockport, Texas

ACKNOWLEDGEMENT

In submitting this fourth 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 four 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,

Hermes Gautier, Chairman

William J. Hendry, Vice-Chairman

W. Dudley Gunn, Secretary-Treasurer

COMMISSION ACTIVITIES
OCTOBER 1952 - OCTOBER 1953

The proper utilization of the fisheries common to the territorial waters of the compacted States of Alabama, Florida, Louisiana, Mississippi and Texas is the objective of the Gulf States Marine Fisheries Commission. The Commission has authority to recommend to the proper State officials the enactment of laws or the institution of regulations designed to establish improved fishery management practices. However, prior to the drafting of a regulatory recommendation on any fishery the Commission must be in possession of pertinent scientific data which have been properly interpreted. It is to this end that the States are so wholeheartedly cooperating.

The following summarizes the principal activities of the marine fisheries administration of each of the several States in interest of bringing about the proper utilization of the fishery resources:

Alabama—During the year Alabama started a research program on shrimp in Mobile Bay, setting up twelve bay and twelve shore stations from which to conduct observations. The purpose of the program is to reevaluate present closed season regulations and to determine if certain areas should be set aside as nursery grounds. Condition of oyster reefs is also a subject of study. Hydrographic conditions in Mobile Bay have been studied during the year. Investigation was conducted to determine oyster mortality resulting from the heavy run-off of fresh water in May over the productive reefs. The investigation disclosed that while considerable damage was done to oysters in shallow waters the influx of fresh water had inflicted appreciable inroads into the predator population. The annual survey of the reefs to determine prospect for next year's oyster crop disclosed a heavy set during the summer. Research activity in Alabama has as a focal point, The Marine Laboratory, Alabama Department of Conservation, Bayou LaBatre.

Florida (West Coast)—Study of the life history and habits of the West Coast mullet has continued through the year. Observations have appeared in the quarterly reports of the Florida Board of Conservation rendered by its contract research agency,

The Marine Laboratory, University of Miami. A survey of the Florida red snapper fishery has been completed and a report is in preparation. Information on spawning and growth of scallops in Lee County is being collected. Technological work on shrimp is a continuing study as well as is gear development. Experimental plantings of oysters in several areas of the West Coast are projected. A survey of all oyster leases and leased reefs has been undertaken. Another project undertaken at the direction of the Board of Conservation is an intensive spot sampling of an area of West Florida to determine the drain on the fisheries through sports fishing effort.

Mississippi—A recent survey by the Gulf Coast Research Laboratory, Ocean Springs, for the Mississippi Seafood Commission disclosed that the young oysters resulting from an experimental planting of shell were growing exceedingly well. As the chemical, physical and biological survey of Mississippi's water bottoms progresses, a good picture of the surface 12 inches of the bottom is being developed. Information acquired through this survey assisted in the selection of water bottoms for the mentioned experimental planting of shell. In addition to being of assistance in selecting oyster growing areas, data developed by the survey is expected to provide a better understanding of shrimp and fin fishes. Another continuing project of the Laboratory is the study of shrimp in inside tanks to determine what food is consumed. During the year two manuscripts were prepared dealing with the marine fishes of Mississippi.

Louisiana—The organization of the Seafood Division of the Louisiana Wildlife and Fisheries Commission was completed in March 1953. The Division has three sections, Research, Industrial Services, and Exploratory Fishing and Gear Development. A 57 foot, 29 net ton, vessel has been fully equipped for research and explorations. First assignment of the vessel has been to a sectional study of Lake Pontchartrain. Field work in connection with the study will be done by the Seafood Division. Laboratory work essential to the study will be accomplished by Tulane University under contract consummated in June. Library research designed to gather all available information on the marine fishes of Louisiana is another project of the Division. The Division of Oysters and Water Bottoms expanded its program during the year of growing seed oysters, in reserved areas, for supply to

lease holders. The added emphasis placed upon this program is expected to offset to some degree damage inflicted by the drills and other prevalent oyster enemies.

Texas—Some two years ago a long range program designed to develop information relative to the habits of the speckled trout, redfish and drum was undertaken. Data collected on the subject species are expected to be made available in the near future. The ecology of the oyster has been studied in a number of areas by the Coastal Fisheries Division of the Texas Game and Fish Commission. Industrial pollution is another project which has recently been undertaken. Equipment is now available for the inauguration of a program involving migrations of shrimp along the Texas Coast. Survey of the State's dead shell resources will begin in the near future with use of a modified fathometer expected to deliver a picture of 15 feet or more below the bottom surface.

Aside from the interest of the Commission in the effort being made by the States to gather basic information concerning the fisheries, a number of other subjects relating to the compact's objectives have received attention during the year.

Work Plan—It is the thinking of the Commission that the following Work Plan adopted at the April 1953 meeting covers questions which must be answered if the States are to be in possession of the necessary information essential to the promulgation of regulatory procedures incident to the proper utilization of the fisheries:

1. Drain on the present resources by annual harvest.

Is there an over-harvest of any species in any locality?

Are the present harvest methods of any species detrimental to that, or any other species, to the extent that methods should be changed or modified?

Should areas be set aside as nursery grounds to aid in annual crop?

2. Development of unused resources.

Is there a practical means of using scrap fish, and fish waste?

What valuable uses can be made of presently unharvested species?

3. Physical improvements to increase annual maximum yield.

Is physical improvement to inland waters possible, so as to improve fish production?

Is physical improvement to adjacent land needed to improve fish production?

Is artificial propagation of marine fishes feasible to improve annual production?

What effect does siltation have upon production? Should the Gulf States Marine Fisheries Commission work toward the encouragement of flood control and stoppage of marsh drainage?

It would seem desirable that all publications on the subject of marine fisheries conservation be distributed through the Gulf States Marine Fisheries Commission in order that each State may be familiar with the work of the others. Such a plan would disseminate information and encourage greater unity in thinking and lead toward a more uniform effort in physical improvement.

Shrimp Study—The Commission invited scientists representative of the compacted States, the United States Fish and Wildlife Service and Universities of the Gulf States offering courses in the marine sciences to meet at Tampa, Florida, October 14, 1953. The purpose of the meeting was to consider all of the biological information available on the several species of Gulf shrimp and also to consider the question of what additional research is needed to provide the basic knowledge essential to considerations involving management of the shrimp fishery. The objectives of the meeting were accomplished. The Commission has asked the Fish and Wildlife Service to prepare a detailed report of the general subjects presented at the Tampa meeting, October 15-16, for further consideration of the matter at a special Commission meeting called for January 21-22, 1954, at Edgewater Beach, Mississippi.

The following general subjects of shrimp research were presented at Tampa by the scientists for consideration by the Commission:

Study the life history of the species of shrimps other than white shrimp that enter importantly into the catch.

Sample the commercial catch representatively for size.

Determine what mechanisms carry or lead the young into the inside waters, and learn how variations in environment relate to size of brood.

Tag throughout the range of the species to clarify our knowledge about migrations, to identify stocks, to estimate size of populations and to estimate mortality rates.

Cultivate shrimp under controlled laboratory conditions and carry on experiments to determine how various factors affect them.

Study the ecology of a sample inside area with particular attention to shrimps.

Maintain a history of the conditions of the inside areas.

Establish useful and adequate statistics on the catch and location of catches and fishing effort.

Differentiate the stocks.

Establish facilities and staff for proper coordination and publications.

Oyster Fishery Survey—At the request of the Commission the States made a survey during the year to determine if any areas were experiencing a decline in oyster production. The survey disclosed that where production had dropped the principal reason was lack of rainfall which invited predation by the drill.

Blue Crab Fishery Survey—A survey conducted by the States disclosed that there had been a general decline in blue crab production but that the cause was economic rather than biological, that the fishery as a whole was under-prosecuted.

Water Bottom Debris Survey—The Bottom Debris Committee, appointed during the year to look into the extent of damage to trawls and resulting loss of time on the shrimping grounds

caused by contact with other than natural obstructions, reported at the annual meeting that it appeared States other than Louisiana were not experiencing subject difficulties. The Louisiana Wildlife and Fisheries Commission invited the fishing and oil industries to participate in two meetings during the late summer. The following regulations, effective November 5, 1953, which were worked out by interested parties attending the mentioned meetings, are expected to do much toward improving operations in the Louisiana trawl fishery:

Memorandum To All Concerned With The Conduct Of The Use Of Explosives For Seismograph Exploration In The Waters Of The State Of Louisiana

All parties using pipe must have clearly stamped at each end of each joint the name or abbreviation of the name of the company using the pipe.

All parties using pipe must pull such pipe before leaving the shot-point.

All 2x2s used for survey lines must be clearly stamped with the name of the company using the stakes at approximately three-foot intervals.

All 2x2s used for survey lines must be pulled upon the completion of the prospect.

No pipes should be left in the waters during the crew-off time.

Conservation Agents will assist the U. S. Engineers in seeing that all pipes are pulled, but the responsibility will still rest with the geophysical operators to remove the pipe.

Permits will be issued for a period of six months from date of issue but may be renewed for not more than two additional ninety-day periods at the discretion of the Director of Wildlife and Fisheries. Applications for renewal may be made in letter form.

Education—Better conservation of the marine fisheries through resource use education of the several age groups has been a subject of continuing interest to the Commission. Considerable advance has been made by the States as a whole during the year in the issuance of educational folders, pamphlets and news releases. More radio time has been consumed during the

year and it is expected the range of disseminating media will be broadened in the immediate future to include television.

Other Subjects—The Commission has acknowledged its sincere appreciation for the assistance rendered by the Marine Sciences Committee of the Southern Regional Education Board at the fourth annual meeting and the shrimp symposium which preceded the meeting. The Commission looks forward to receiving further assistance from the scientists whom it has requested along with the State and Federal scientists to serve on the Shrimp Research Committee.

Regular meetings of the Commission have been rescheduled to start on the third Thursday in the months of March and October of each year. The next regular meeting of the Commission will be held in New Orleans, Louisiana, March 18-19, 1954.

U. S. FISH AND WILDLIFE SERVICE ACTIVITIES OCTOBER 1952 - OCTOBER 1953

The Fish and Wildlife Service, primary research agency of the compact, has continued its programs relating to exploratory fishing, fishery biology, oceanography (in cooperation with the Texas A. & M. College Department of Oceanography) and oyster research. The Commission is pleased to present summaries of the year's work furnished by the several activities:

EXPLORATORY FISHING

During the period from October 1952 to October 1953 the major part of the program of the Fish and Wildlife Service Exploratory Fishing and Gear Development unit at Pascagoula concerned exploration for tunas in the Gulf of Mexico. In addition, some of the operation time of the **Oregon** was spent on shrimp fishing and on gear development problems.

Tuna—Earlier observations made from the **Oregon** had shown that valuable species of tuna occur in offshore Gulf waters, sometimes in considerable quantity. Attempts to catch them on a commercial scale by purse seining or by trolling were unsuccessful in 1952 and a trial of live bait fishing was undertaken in 1953. The live bait fishery of Cuba was studied as a preliminary to work in the Gulf and the results (A Report on the Cuban Tuna

Fishery) were published in Commercial Fisheries Review for January 1953.

The bait tank, originally a part of the **Oregon's** equipment, was reinstalled and the first objective in operation of the **Oregon** was to locate suitable Gulf species for tuna bait and to find a practical means of catching them. In December 1952, a good bait was found along the outer Campeche Bank and in April, May, and June 1953 good supplies of bait were taken along the Florida coast, especially near the Florida Keys. Small bait fishes like those used in the Cuban tuna fishery were taken near the Florida Keys and other larger bait species were taken all along the Florida, Alabama, and Mississippi coasts and near Chandeleur Island, Louisiana.

Although capture of the species of bait available in the Gulf was found to be practical with lampara nets and fine mesh beach seines, the **Oregon** crew got the best results by use of a specially designed trap lift net used from the vessel at anchor at night with lights to attract the fish. A description of the net and its use, "Trap Lift Net for Tuna Bait Fishes" has been published in Commercial Fisheries Review for August 1953.

In the course of tuna bait fishing large quantities of **Sardinella anchoa** and various species of anchovies were observed as well as schools of **Opisthonema oglinum** and **Harengula**. Sample catches were made to get information on this apparently abundant resource.

The **Oregon** cruised with live bait aboard in May and June in the Straits of Florida, the Yucatan Channel and in the Caribbean south of western Cuba. Schools of tuna, mostly blackfin, were sighted but only a few fish, about 75, were taken. The weather generally was not favorable but the chief difficulty appeared to be that the schools were small and would not approach the vessel. The few schools that did produce some action remained at the vessel for a very short time.

In August and September the **Oregon** cruised in the area off the continental shelf between the Mississippi River mouth and Cape San Blas, Florida with similarly poor results. Fewer tuna were sighted than in 1951 and 1952 and those schools encountered did not stop for bait except occasionally for very short periods.

Similar results were reported for blackfin tuna by two large commercial tuna bait boats fishing in the Caribbean for brief periods during 1953. Although the trial of purse seines and live bait by the **Oregon** for tuna in the Gulf of Mexico should not be regarded as conclusive, the results were not promising for these methods of fishing. In 1953, tuna were seen regularly during August and September just off the continental shelf between the mouth of the Mississippi River and Cape San Blas. In addition to the tunas already reported from the area, (blackfins, yellowfins, and white skipjack) a series of five bluefins weighing about two pounds each were taken in 1953 along with blackfins of about the same size.

Shrimp—Whenever time has been available, shrimp trawling has been carried on to supply information about specific questions. An experimental model of an electronic instrument for the location of shrimp has been used. Attempts to locate Gulf shrimp by means of bottom water temperature patterns have been continued. A report on shrimp exploration is being prepared for publication within a few months.

Miscellaneous Observations—Trial use of short set lines show the area to be unusually well supplied with sharks, chiefly silk sharks and white-tips at the surface. On each of the trips of the **Oregon** from July through September whales were sighted daily in the area. Most of these were sperm whales which feed on squids, but plankton feeding finbacks were also seen regularly. An unusually large assortment of juvenile oceanic fishes were collected here on some favorable nights with dip nets under lights. An electronic fish finder installed on the **Oregon** in 1953 indicated that, in contrast to most offshore Gulf areas, there were substantial numbers of large fish in depths from 40 to 140 fathoms. They were unevenly distributed and not in dense schools. Of course, since the fish were not caught, identification was impossible but it is reasonable to assume that a part may have been tuna because tuna were the fish most often seen at the surface. As in earlier years the tuna were seen only in the early morning or the late afternoon, usually in the two hour period before dark.

This and other available evidence points to a rich deep water fauna for this particular area with fish only showing at the surface under special conditions which occur too infrequently to

exploit by purse seining or live bait fishing. The use of long line sets is the obvious step in attempting to assess the potential productive possibilities. Equipment for this work is available and plans have been made for long line fishing beginning in January 1954.

FISHERY INVESTIGATIONS

General objective: To detect and devise means of measuring those natural factors which influence the yield of the marine fisheries of the Gulf of Mexico, and to distinguish between natural and man-made fluctuations in fisheries production.

Projects set up to achieve objective:

1. General survey of Gulf of Mexico.

Eggs and larvae—study continues, no change in tentative conclusions given in 1952 report.

Chemical factors. All laboratory analyses complete. Assimilation and final treatment of data in progress.

Climatological history of Gulf area. Data being accumulated and analyzed.

2. Red tide studies. Field and experimental studies in laboratory not only valuable in offering possibilities for control of red tide itself, but also in providing means of understanding basic problems in applied fisheries biology.

Hydrographic study of red tide of November, 1952. Work completed and report submitted. Land drainage significant in initiation of large blooms of **Gymnodinium brevis**.

Non-blooming specimens of **Gymnodinium brevis** found in company with **Gymnodinium splendens** in Barfield Bay, Florida (near Caxambas Pass.) Not present in quantity.

Laboratory experiments in culture of **Gymnodinium splendens** highly successful and present attempts to grow **Gymnodinium brevis** as substitute for **Gymnodinium splendens** encouraging at this writing.

Field studies of **Gymnodinium splendens** in tidal lagoon offer excellent basis for determining significance of laboratory findings, as well as providing material for study of larval shrimp and fish.

Large scale tank cultures in process of being set up. Will provide "stepping stone" between test tube and open sea.

3. Shrimp investigations.

Provision in 1953-54 program for detailed studies of life history, growth and survival in experimental set-ups made. Work to get underway in near future. Principal immediate objective to learn what factors critical in survival of newly hatched **Penaeus setiferus** and **P. duorarum**.

4. Biochemistry of sea water.

Crude carbohydrates concentrated and used in experiments with micro-organisms. Preliminary tests positive for growth-promoting activity.

Natural carbohydrate and proteinaceous components to be isolated and used experimentally.

Carbohydrate substances produced experimentally in tanks. Production by various organisms to be studied.

Procedures for other important chemical analyses being developed for application to experimental tank work on red tide, shrimp, and fish.

OCEANOGRAPHIC SURVEY

A major activity of the Department of Oceanography during the period October 1952-October 1953 has been the publication of several reports of the work of the Texas A. & M. Research Foundation project, Oceanographic Survey of the Gulf of Mexico. **Physical and Meteorological Data**, Data Report No. 1, was distributed in November, 1952. All the physical, chemical, and meteorological data and dynamic calculations for each station of the first three cruises of the **Alaska** are contained in this report. Data Report No. 2 which contains the same information about cruise 4 of the **Alaska** was published in June, 1953.

The current status of information concerning the weather over the Gulf of Mexico is surveyed in Technical Report No. 5, **Marine Meteorology of the Gulf of Mexico, a Brief Review**, which was sent out in February, 1953.

The theoretical aspects of the phenomenon of upwelling, which is a subject having great application in fisheries work, are presented in two papers prepared during the year. The first paper, **A Contribution to the Theory of Upwelling**, Technical Report No. 6, February, 1953, presents a theory of upwelling taking into account the effects of the earth's rotation and vertical and horizontal mixing. **Part II**, of this work, Technical Report No. 8, August, 1953, describes the most favorable wind conditions for upwelling and the coastal currents induced by winds.

Another report issued in June, 1953, Technical Report No. 7, **Determination of Inorganic Phosphate in Sea Water by a Butanol Extraction Procedure**, describes a method for determination of inorganic phosphate in sea water. The method is an order of magnitude more sensitive than methods currently in use and has the same relative accuracy.

Technical Report No. 10, **Submarine Topography of the Continental Slope of the Bay of Campeche**, issued October, 1953, has as its objectives the assemblage of available depth soundings for the Bay of Campeche, the charting of the bathymetry of the area and the presentation of a geomorphological interpretation of the results.

The cooperative arrangement with the U. S. Fish and Wildlife Service in Galveston was continued during this year. Additional data for the Oceanographic Survey of the Gulf of Mexico were collected by members of the department who participated in three cruises of the **Alaska**. The most interesting of these were Cruise 8, one leg of which was along the northeastern Gulf coast, and Cruise 10, which was in the far western Gulf.

A graphic presentation of some of the data obtained during the survey of the Gulf has been made in the **Annual Report for Period June 1952-June 1953** of the Oceanographic Survey of the Gulf of Mexico. Included in the figures are surface currents in the Gulf (as determined from Dynamic Computations of Cruise 4-2A), and sea surface isotherms for Cruises 1 through 5 of the **Alaska**.

In October, 1952, a hydrographic survey of Mobile Bay, Alabama was conducted in cooperation with members of the Alabama State Department of Conservation. Salinity, temperature, and current data were analyzed to determine the flushing rate of the bay. A technical report entitled **On the Circulation and Tidal Flushing of Mobile Bay, Alabama** is being prepared. This survey will be repeated in November, 1953.

The Department of Oceanography now operates the 120 foot, 3 masted auxiliary schooner, the **A. A. Jakkula** (formerly the **Atlantic**) which is being converted to carry out all phases of oceanographic investigation. During the conversion period the vessel has made six short cruises. The purpose of Cruise 2 was to observe the effect of the dumping of industrial waste by-products. Cruise 3 was the initial cruise of a new project which is being conducted for the U. S. Navy Hydrographic Office. The title of this project is **Hydrographic Survey of the Galveston-Port Arthur Harbor Approach Area** and it deals primarily with the waters over the continental shelf.

Data from cruises 1, 3, 4, 5, and 8 of the **Alaska** will provide a basis for a fairly good determination of existing general current patterns for the eastern Gulf. On the other hand, comparatively little is known about the current patterns in the western Gulf. Two cruises have been made in that area but several stations were missed on each cruise. For this reason it is planned to make at least one comprehensive coverage of the western Gulf during the next year.

Emphasis will be placed on studies in relatively shallow water (less than 100 fathoms) and the work will not be confined to any specific portion of the Gulf.

OYSTER INVESTIGATIONS

In the past year the following projects were completed and manuscripts discussing the data are in preparation.

Oyster—Study of rate of setting at different water levels from surface to bottom showed well-defined gradient. In absence of sediment, oyster larvae set more on upper than on under surfaces and more on cultch in a horizontal rather than vertical or oblique position.

Set of oysters at Pensacola is now a mixture of the commercial and of two non-commercial species. In July was found the highest observed incidence of setting. During one 7-day period more than 185 oysters set per square inch of cultch. This is higher than set for the entire season in either 1951 or 52.

The invasion of this area by two non-commercial oysters in the short period of three years emphasizes the drastic changes which may occur in an oyster producing area without any obvious changes in the environment. This summer, the set in some locations was composed of as much as 90% non-commercial oysters.

Oyster sex change—A one-year study demonstrated that less than half of a population of adult oysters changed sex and the net change in male:female ratio was an increase of approximately 13% in number of females. Simultaneous study of growth showed no clear differential in rates for the two sexes.

Hard clams, Venus—Data on a small sample of hard clams grown at Pensacola for two years showed that growth was approximately the same as in New England. Predation by snails and crabs makes it impractical to grow this clam commercially in the Pensacola area.

Experimental work on activity and sensory perception of the oyster drill, preliminary to devising more efficient methods for control:

Tests have been completed showing at what distances snails can be attracted to bait.

Experiments are now underway testing effectiveness of snail trap of a new design. Initial experiments in the field did not permit satisfactory observations, and a large snail population has been established in outdoor tanks at the laboratory. This will permit detailed observations of snail behavior toward different types of bait and traps.

Laboratory tests of tolerance of snail larvae to lowered salinity showed reactions similar to but more marked than in the adult. Salinity decreases of more than 10 parts soon cause death, and it is probable that summer floods are an important factor in the natural control of drill populations through their quick action on the larval stages.

Limitations on technical assistance have curtailed the number of research projects, and the laboratory program for the coming year will be restricted primarily to studies on snail predation. Three manuscripts were prepared during the year and data on oyster growth and snail ecology were discussed at scientific meetings in Miami and New Orleans.

PEAT, MARWICK, MITCHELL & CO.

Certified Public Accountants

Hibernia Bank Building

New Orleans 12, La.

July 29, 1953

ACCOUNTANTS' REPORT

Commissioners

The Gulf States Marine Fisheries Commission,
New Orleans, Louisiana.

We have examined the statement of income and expenses of The Gulf States Marine Fisheries Commission for the year ended June 30, 1953 and the 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 The Gulf States Marine Fisheries Commission for the year ended June 30, 1953 and its resources at that date, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Peat, Marwick, Mitchell & Co.

THE GULF STATES MARINE FISHERIES COMMISSION

Statement of Income and Expenses

Year ended June 30, 1953

Income:

Member state contributions received:

Alabama	\$ 1,000.00
Florida	3,500.00
Louisiana	5,000.00
Texas	2,500.00

12,000.00

Member state contribution receivable—Mississippi 1,000.00

13,000.00

Other—sale of used tires 8.00

Total income 13,008.00

Expenses:

Disbursements:

Salaries	\$ 9,778.25
Traveling	1,332.93
Rent of office	1,080.00
Stationery, printing and supplies	431.18
Telephone and telegraph	479.42
Postage	89.79
Electricity	60.87
Accounting	175.00
Insurance	233.57
Sundry	29.36

Expense disbursements 13,690.37

Decrease in prepaid insurance 1.85

Depreciation 496.96

Total expenses 14,189.18

Excess of expenses over income 1,181.18

Resources of the Commission, June 30, 1952 11,415.93

Resources of the Commission, June 30, 1953 \$10,234.75

Statement of Resources

June 30, 1953

Cash		\$ 7,619.13
Receivables:		
State of Mississippi	\$ 1,000.00	
Traveling advance	250.00	1,250.00
	<u> </u>	
Meter deposit		10.00
Prepaid insurance premiums		87.31
Equipment—at cost:		
Automobile	1,645.80	
Furniture and fixtures	855.09	
	<u> </u>	
	2,500.89	
Less allowance for depreciation	1,232.58	1,268.31
	<u> </u>	
		<u>\$10,234.75</u>

Note: All liabilities had been paid except sundry bills totalling \$33.46

THE GULF STATES MARINE FISHERIES COMMISSION

Supplementary Information to Accounts

June 30, 1953

(1)	Cash receipts (see accompanying statement)	\$12,008.00
	Cash disbursements (see accompanying statement)	13,690.37
		1,682.37
	Excess of disbursements over receipts	1,682.37
	Cash balance, June 30, 1952	9,301.50
		7,619.13
	Cash balance, June 30, 1953	7,619.13
Comprised as follows:		
	National American Bank of New Orleans— checking account	7,606.27
	Petty cash fund	12.86
		\$ 7,619.13

(2) Equipment:

	Cost	Depreciation	Net
Balance at beginning of year:			
Automobile	\$1,645.80	582.90	1,062.90
Furniture and fixtures	855.09	152.72	702.37
	2,500.89	735.62	1,765.27
Depreciation allowance for yr.	-	496.96	(496.96)
	2,500.89	1,232.58	1,268.31
Balance at end of year:			
Automobile	1,645.80	994.35	651.45
Furniture and fixtures	855.09	238.23	616.86
	\$2,500.89	1,232.58	1,268.31

(3) Fidelity bond insurance carried—\$10,000.00 each on chairman, vice-chairman, and secretary-treasurer of the Commission.

BUDGET

GULF STATES MARINE FISHERIES COMMISSION

Fiscal Year 1953-54

Salaries	\$10,000.00
Rent, Office	1,080.00
Bond & Insurance Premiums	236.00
Accounting Fees	175.00
Telephone & Telegraph	450.00
Electricity	60.00
Travel-Personal & Auto	1,350.00
Postage	90.00
Stationery, Printing & Office Supplies	430.00
Furniture, Fixtures & Maintenance	50.00
Reserved for Depreciation	497.00
Miscellaneous	25.00
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	\$14,443.00
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Approved by the Commission October 16, 1953.