

PROGRAM

(Commission Chairman Walter O. Sheppard, Presiding)

REGISTRATION 9:00 A.M.

CALL TO ORDER

INVOCATION
Reverend John B. Koelemay, Pastor
Gentilly Methodist Church

ROLL CALL

WELCOME ADDRESS
Chairman E. R. McDonald, Sr.
Louisiana Wild Life and Fisheries Commission
Introduced by:
Commission Vice-Chairman L. D. Young, Jr.,
Director
Louisiana Wild Life and Fisheries Commission

ADDRESS
Assistant Secretary Frank P. Briggs
Department of the Interior
Introduced by:
Commissioner Howard D. Dodgen, Executive
Director
Texas Game and Fish Commission

ADDRESS
Director David H. Wallace
Oyster Institute of North America
Introduced by:
James N. McConnell, Chief, Division of Oysters,
Water Bottoms and Seafood
Louisiana Wild Life and Fisheries Commission

RECESS Fifteen Minutes
10:45 A.M.

ANNUAL REPORT
Commission Chairman Walter O. Sheppard

MENHADEN RESEARCH IN THE GULF OF MEXICO
George A. Rounsefell, Director
Bureau of Commercial Fisheries Galveston
Laboratory

HOW MANY SPOTTED TROUT ARE THERE AROUND FORT MYERS?
Clarence P. Idyll, Chairman, Division of Fisheries
The Marine Laboratory, University of Miami

MOTION PICTURE: UNDERWATER ACTION OF SHRIMP TRAWLS
Francis J. Captiva, Assistant Base Director
Bureau of Commercial Fisheries, Pascagoula

LUNCHEON (Informal) 12 Noon

1:15 P.M.
THE FEDERAL SHRIMP BIOLOGICAL RESEARCH PROGRAM OF THE GULF OF MEXICO
Regional Director Seton H. Thompson
Bureau of Commercial Fisheries
Questions

1:45 P.M.
SERIES OF STATE BIOLOGICAL RESEARCH REPORTS ON THE SHRIMP FISHERY OF THE GULF OF MEXICO
(Reports—10 minutes each)
(Discussions—10 minutes each)
Discussion Leader:
James H. Summersgill, President
Louisiana Shrimp Association

Texas
Terrance R. Leary, Marine Fisheries Program
Coordinator
Texas Game and Fish Commission

Mississippi
William J. Demoran, Biologist
Mississippi Marine Conservation Commission

Alabama
Jack C. Mallory, Biologist
Alabama Department of Conservation

Florida
Robert M. Ingle, Director of Research
Florida State Board of Conservation

Louisiana
Lyle S. St. Amant, Chief Marine Biologist
Louisiana Wild Life and Fisheries Commission

ANY OTHER SUBJECTS FOR CONSIDERATION 3:45 P.M.

ADJOURNMENT 4:00 P.M.
FIELD TRIP TO MUSEUM OF LOUISIANA WILD LIFE AND FISHERIES COMMISSION
Conducted by:
Steve Harmon, Chief, Division of Education
Louisiana Wild Life and Fisheries Commission

Friday (October 20)
8:30 A.M.-11:00 A.M.
COMMISSION EXECUTIVE SESSION BREAKFAST—ROBERT E. LEE ROOM
9:30 A.M.-11:00 A.M.
SCIENTISTS' ROUND TABLE—QUEEN ANNE ROOM

Presiding:
Theodore B. Ford, Assistant Chief, Division of Game and Fish
Louisiana Wild Life and Fisheries Commission

11:10 A.M.
FINAL GENERAL SESSION—QUEEN ANNE ROOM

Summaries:
Commission Executive Session
Scientists' Session
Motion Picture:
Florida State Board of Conservation

ADJOURNMENT 12:00 Noon

October 19-20-1961 - Monteleone - N.O.

GULF STATES MARINE FISHERIES COMMISSION

*** Commissioners**

Alabama

William C. Younger
Will G. Caffey, Jr.
Max Lawrenz, Sr.

Florida

Ernest C. Mitts
Walter O. Sheppard
Open

Louisiana

L. D. Young, Jr.
Alvin Dyson
Sidney A. Bourg, Sr.

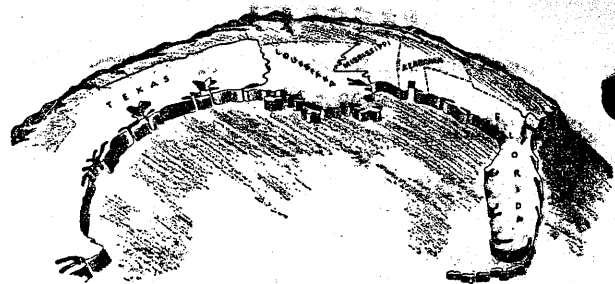
Mississippi

William G. Simpson
Stanford E. Morse, Jr.
Hermes Gautier

Texas

Howard D. Dodgen
R. H. Cory
Open

* Order of listing: Administrator, Legislator,
Governor's Appointee



GULF STATES MARINE FISHERIES COMMISSION

Twelfth Annual Meeting

New Orleans, Louisiana

Hotel Monteleone
Queen Anne Room

October 19-20, 1961

★

*A most cordial invitation is extended by the
Commissioners to join them for the fall
session in Ole' New Orleans*

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

Gulf States Marine Fisheries Commission

CHAIRMAN

L. D. YOUNG, JR., DIRECTOR
LOUISIANA WILD LIFE AND
FISHERIES COMMISSION
NEW ORLEANS, LOUISIANA

VICE-CHAIRMAN

WILL G. CAFFEY, JR., MEMBER
ALABAMA STATE SENATE
MOBILE, ALABAMA



DIRECTOR

W. DUDLEY GUNN

OFFICE SECRETARY
EMILY C. CARR

HEADQUARTERS OFFICE

312 AUDUBON BUILDING
NEW ORLEANS 16
LOUISIANA
TELEPHONE: 524-1765

M I N U T E S

REGULAR MEETING

MONTELEONE HOTEL

NEW ORLEANS, LOUISIANA

OCTOBER 19-20, 1961

GULF STATES MARINE FISHERIES COMMISSION
312 Audubon Building
New Orleans 16, Louisiana

M I N U T E S

REGULAR MEETING, OCTOBER 19-20, 1961
Monteleone Hotel
New Orleans, Louisiana

OFFICIAL ATTENDANCE OF COMMISSIONERS

	<u>PRESENT</u>	<u>ABSENT</u>
<u>ALABAMA</u>	William C. Younger Will G. Caffey, Jr. Max K. Lawrenz	
<u>FLORIDA</u>	W. Randolph Hodges Bruce J. Scott Walter O. Sheppard	
<u>LOUISIANA</u>	L. D. Young, Jr. Alvin Dyson Sidney A. Bourg, Sr.	
<u>MISSISSIPPI</u>	William G. Simpson Hermes Gautier	Stanford E. Morse, Jr.
<u>TEXAS</u>	Richard D. Cory	Howard D. Dodgen
<u>PROXIES</u>	Hermes Gautier Howard T. Lee William G. Simpson Walter O. Sheppard	(For Stanford E. Morse, Jr.) (For Howard D. Dodgen) (For Hermes Gautier, 10/20/61) (For W. Randolph Hodges, 10/20/61)
<u>STAFF</u>	W. Dudley Gunn Emily C. Carr	

FORMER COMMISSIONERS PRESENT

Charles W. Bevis, James H. Summersgill

OTHER STATE FISHERIES REPRESENTATIVES PRESENT

George W. Allen, Jack Britt, Hewitt B. Cabirac, T. B. Ford, Andy Friedrichs, Steve Harmon, Robert M. Ingle, Ellis C. Irwin, Terrance R. Leary, Howard T. Lee, Jack Mallory, James N. McConnell, E. R. McDonald, Barney Parrett, Lyle S. St. Amant, Joe F. Tomme, Richard F. Witcher, William J. Demoran.

FEDERAL GOVERNMENT REPRESENTATIVES PRESENT

U. S. BUREAU OF COMMERCIAL FISHERIES: Frank P. Briggs, Philip A. Butler, Francis Captiva, George B. Gross, Joseph H. Kutkuhn, Charles H. Lyles, George A. Rounsefell, Frank J. Silva, George W. Snow, Louis D. Stringer, Seton H. Thompson.

U. S. BUREAU OF SPORT FISHERIES AND WILDLIFE: Walter A. Gresh, John B. Degani, Spencer H. Smith, John L. Sypulski, Albert H. Swartz.

U. S. PUBLIC HEALTH SERVICE: J. Paul Bowers, W. B. Griffin.

REPRESENTATIVES OF ORGANIZATIONS AND FIRMS CONNECTED WITH
COMMERCIAL OR SPORTS FISHING (NOT PREVIOUSLY LISTED)

M. J. Benick, Sr., Abel J. Boudreaux, R. B. Davis, Ed Diaz, Paul Kalman, Albert Leftwich, Kenneth McLain, John Mehos, Roy J. Nicaud, J. S. Ramos, H. R. Robinson, L. W. Strasburger, Davis H. Wallace, Mal Xavier, James McPhillips.

UNIVERSITY REPRESENTATIVES PRESENT

J. Y. Christmas, Jr., E. A. Fieger, Milton L. Forbes, C. P. Idyll, Lewis T. Graham, W. L. Flannery, Arthur F. Novac, Sammy M. Ray, Jos. A. Riehl.

CLERGY AND TRADE JOURNAL REPRESENTATIVES PRESENT

Reverend John B. Koelemay S. W. Corbino, Marvin P. Fox, Bill Sarratt.

GENERAL SESSION, OCTOBER 19, 1961

Commission Chairman Sheppard called the twelfth annual meeting to order at 9:45 AM. The group stood in silence in memory of Williams C. Holmes and Percy Viosca, Jr., following a brief summary by the Chairman of the fine contribution each had made in furtherance of the purposes of the compact. Reverend John B. Koelemay, Pastor, Gentilly Methodist Church of New Orleans then rendered the invocation.

Chairman Sheppard introduced Commission Vice-Chairman L. D. Young, Jr., for the purpose of presenting Chairman E.R. McDonald, Sr., Louisiana Wild Life and Fisheries Commission, who delivered the welcoming address. Mr. McDonald's comments follow:

"It is indeed a pleasure for me to welcome you to New Orleans and Louisiana on this occasion because the organization you represent--the Gulf States Marine Fisheries Commission--has, since its beginning, appealed to me as being both unique and challenging. Unique in that it has gathered together some of the finest scientists in the country right here in the Gulf States region, and challenging because you people seem to be exploring all the time.

"I don't intend to go into the history of this successful compact which has contributed so much toward the development and proper utilization of the fisheries of the Gulf. This, I am sure, will be covered by the able and more informed speakers who will follow me at this rostum today and tomorrow. Although I cannot resist in reminding you that I continue to be amazed at the facts discovered by this group and the studies being conducted at this time. I have seen, with my own eyes, research recommended by you implemented by the Louisiana Wild Life and Fisheries Commission and the other cooperating agencies.

"Louisiana has on occasions requested member states to institute certain biological studies and considerable valuable information has been developed from resulting investigations.

"Laws or regulations have been changed because of the additional knowledge gained.

"The United States Fish and Wildlife Service, named in the compact as the primary research agency of the Gulf States Marine Fisheries Commission, has carried on a Gulf Biological program.

"Objectives of the program were to establish through oceanographic techniques the flow patterns of the Gulf of Mexico; to provide information leading to an understanding of the origin of the movements of young and the eggs of various fishes; to furnish information of fertility by areas and the movement of eggs and larvae into or away from these areas; and the collection of organisms other than fish for taxonomic and distributional studies, with whatever ecological interpretations were possible. While studies to achieve these general objectives are continuing, this program has been reoriented to focus primary attention on the major fishery resources--shrimp, menhaden and oysters. These studies are designed to provide sound research management.

"In Louisiana and our sister states considerable effort has been expended over the years in the interest of the oyster fishery. Work being done by Louisiana and the other states includes oyster and oyster predator investigations, cultch planting and the growing of seed oysters for distribution to growers.

"At present we are, here in Louisiana expanding our shrimp research program through which we have been investigating the movement of larval shrimp into bays and their movements out of the outside areas and their distribution. This program will include more detailed study in which we hope to increase the number of sample check points over a wide area. We are going to expand our shrimp staining program to check the movement of larval shrimp to inside waters and the movement of the shrimp to outside waters and their distributions in the outside area.

"We are also trying to locate the spawning grounds of the white and brown shrimp. By this we may make studies of the amount of spawning shrimp to correlate it with the shrimp production. The study will also include the movement and density of post-larval shrimp as they come into the bays. There are several other projects underway on the study of shrimp in the hopes that the overall data can be used in the overall picture.

"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 Game and Fish Commission, and the U. S. Fish

and Wildlife Service have contributed a good deal toward a better biological understanding of the shrimp fishery over the past several years, but much information is still desired for its management. Let us hope that we can continue to work together and enjoy the harmony that has been our lot in the past.

"I was asked to welcome you to this fine old city in deep South, to this progressive state we call Louisiana, to the headquarters of the Louisiana Wild Life and Fisheries Commission....and I find myself telling you experts how to run your business. Forgive me...I am a cotton farmer...and you know the old saying....a cotton farmer has to know a little bit about everything...and on the farm these days that's a mild statement.

"Anyway, welcome to New Orleans and Louisiana. Enjoy the sites of the old city---taste the delicious Louisiana oyster --and have a successful conference. We're with you all the way! Thank you."

After responding to the welcome the Chairman made mention of the next speaker's background in conservation endeavors over the years, his service in the Congress, his experiences in newspaper work, and other qualifications of the Assistant Secretary for Fish and Wildlife of the Department of the Interior, upon introducing Mr. Briggs. Copy of Assistant Secretary Frank P. Briggs' paper is first attached to these Minutes.

Mr. James N. McConnell, Louisiana Wild Life and Fisheries Commission, was introduced and he in turn presented a biographical sketch which cited the broad experience in shellfish problems of Director David H. Wallace, Oyster Institute of North America. Copy of Mr. Wallace's presentation is second attached to these Minutes.

Chairman Sheppard announced a fifteen minute recess during which time the group enjoyed coffee and fish flour cookies; the former being with the compliments of the Louisiana Wild Life and Fisheries Commission and the latter being from the ovens of the Bureau of Commercial Fisheries Technological Laboratory at Pascagoula.

Returning from recess, Chairman Sheppard presented a Commission report, which follows:

"In view of this being the Twelfth (12th) Annual Meeting of the Gulf States Marine Fisheries Commission, it has occurred to me that it might be of interest to summarize a bit on the subject of the compact and to mention a few of its cooperative activities.

The Gulf States Marine Fisheries Commission is an interstate compact of the States of Alabama, Florida, Louisiana, Mississippi and Texas. The compact was signed in July of 1949.

The purpose of the compact is to promote a proper utilization of the fisheries common to the seaboard of the Gulf coast states, by the development of a joint program for the promotion and protection of these fisheries, and the prevention of their physical waste from any cause.

In signing the compact the several member states did not relinquish any of their rights to regulate their own fisheries. In this connection, the Commission is given the power only to recommend the enactment of fishery laws

to the Governors and the legislatures of the party states. In furtherance of its liaison activities, the Commission is authorized to consult with and advise the pertinent administrative agencies of the member states regarding fishery management problems.

"The Commission is composed of three members from each of the five Gulf States; total 15. The head of the salt water fisheries administration of the state is one commissioner. The second is a member of the legislature. The third commissioner is a citizen who is appointed by the Governor. The offices of chairman and vice-chairman of the Commission are rotated annually between the states. Regular meetings are held semi-annually, in March and October, and special meetings are called when considered necessary. Regular meetings are rotated from state to state in order that the commissioners may better familiarize themselves with the fisheries of the entire seaboard, and additionally so that the executive and legislative branches of the states' government, industry, sportsmen and others can obtain a close look at, and participate in the comparative effort that is being pursued by the Commission in interest of the fishery resource.

"The Commission receives annual membership dues from the member states but not in a sufficient aggregate, at least to the present time, to support fishery research programs. From time to time the Commission suggests research work which might be accomplished at the state or federal levels.

"When the Commission was created in 1949, the U. S. Fish and Wildlife Service, which agency is named in the compact as the primary research agency of the Commission, was operating an oyster research laboratory at Pensacola and a temporary laboratory at Sarasota, the latter having been established to investigate the red tide outbreak of 1947. At present, the Service maintains biological research laboratories at Pensacola, Galveston and St. Petersburg Beach. Additionally, the Bureau of Commercial Fisheries maintains a Pascagoula facility for exploratory fishing and gear development and technological research. It was at the Commission's request that the Pensacola laboratory was not deactivated in early 1950, and the other mentioned installations have resulted from the Commission's efforts.

"Twelve years ago, only one of the member states maintained a marine laboratory, Texas. Now, Alabama, Florida, Louisiana and Mississippi have laboratories in operation. During the period, new university or college laboratories have been established and the facilities of those already in existence have been expanded. Each year we find a greater number of students being attracted to the marine sciences, and it is good to note that both state and federal support has increased to the extent that the graduate student may obtain employment in the area, due to the addition and expansion of programs.

"As Commission Chairman during the past year, it has been one of my several duties to study the progress of the research efforts of the member state agencies and the two Bureaus of the Fish and Wildlife Service. The amount of research which has been accomplished during the year is certainly deserving of the highest praise from everyone who is interested in the welfare of our great and renewable fishery resource. However, we must realize that there is much information which yet must be secured for fishery management purposes. Both state and federal reports for the past year were consolidated by our New Orleans office and were made available at the literature table this morning. It might be added that the consolidated report will be published, as in former years, in the forthcoming Annual Commission Report.

"Speaking of one avenue of distribution given the Annual Report, it has been the practice of the Commission to supply copies each year to the Governors and legislators of the member states, to the Congressional Delegates of the Gulf States, to Congressional Committees and other agencies of government concerned with the fisheries. Keeping our cooperators informed has been of obvious advantage; one example being the fine reception our Commissioners and committee members received last May when we visited at Washington in quest of additional funds for shrimp research. You possibly noticed the Commission's Shrimp Research Prospectus of April 1961 on the literature table. The publication was prepared especially for use in connection with the mentioned trip.

"In February of this year, the Council of State Governments sponsored a conference at Chicago of the thirty odd existing interstate agencies. The purpose of this meeting was to consider arrangements which would facilitate communication among the various interstate agencies, public officials responsible for administering interstate programs, and state agencies interested in or responsible for interstate programs. Your Chairman was appointed by the Conference to the Steering Committee and returned to Chicago in July to assist in the development of specific proposals designed to accomplish the mentioned objectives.

"Florida has been highly pleased with the accomplishments of the interstate agencies based on compacts in which the state holds membership. Attorney General Ervin only recently appointed me as an Assistant Attorney General to study the operation of all existing compacts and to survey the field to determine areas in which this particular character of governmental agency can be used to advantage by Florida in the years ahead.

"This meeting is a wonderful example of cooperative and coordinated effort on the part of the State and Federal Governments and various organizations and individuals. Such measure of success as the Commission has accomplished over the years is due to such team work as we will witness as today's agenda progresses.

"Although my term of office has yet a day to run, please let me at this time thank you most sincerely for the fine cooperation you have given me and other Commissioners and the Commission's staff, during the year."

Director George A. Rounsefell, Bureau of Commercial Fisheries Galveston Laboratory, presented a paper on menhaden and other industrial fishes research in the Gulf of Mexico. An extract of Dr. Rounsefell's paper is third attached to these Minutes. Mr. J. Y. Christman, who was menhaden research project leader at the Gulf Coast Research Laboratory during the period of a Bureau of Commercial Fisheries related contract with that laboratory, answered numerous questions concerning menhaden research.

"How Many Spotted Trout Are There Around Fort Myers?" was the subject of a paper presented by Dr. Clarence P. Idyll, Chairman, Division of Fisheries, The Marine Laboratory, University of Miami. Copy of the paper, less certain graphs which were shown from slides on a screen, is fourth attached to these Minutes.

Much interest was shown in a colored motion picture of the underwater action of shrimp trawls, which was presented with commentary by Mr. Francis J. Captiva, Assistant Base Director, Bureau of Commercial Fisheries, Pascagoula,

Mississippi. Methods and instrumentation used on the current shrimp trawl studies were briefly depicted. A general description of a shrimp trawl viewed from ahead and also from the side was shown. The significant features of the 3 basic Gulf of Mexico shrimp trawl designs were described including the flat trawl, the semi-balloon, and the two-seam balloon. The extremes of configuration assumed by any trawl and the factors contributing to configuration and performance were illustrated. These included door size, towing speed, scope ratio, flotation and the effect of mesh restriction (algae). The performance of plastic mud rollers was also described. The relative position of various lengths of tickler chains in relation to the foot rope was displayed. Configuration of a standard 16 foot try net was shown when used with 2 foot by 1 foot chain doors and with hydrofoil doors of comparable size.

Pictures of various types of bottoms presently considered untrawlable in both the Dry Tortugas and Florida's Middle Ground areas were shown. These included rock, live coral, dead coral, and loggerhead sponge.

Close up shots of pink shrimp burrowing in coarse sand were shown. This was an artificial situation, part of a shrimp staining experiment and the initial phase of the Gear Research Unit's behavior studies.

The morning session was adjourned at 12:30 PM and the Chairman announced that the program would be resumed at 1:45 PM.

Upon calling the afternoon session to order, Chairman Sheppard again announced the availability of materials on the literature table which had been prepared for distribution by GSMFC: Resume of State and Federal Gulf Research and Exploratory Activities for the Period October 1960-1961, Some Thoughts of Marine Biologists in Connection with the 1961 Supply of Shrimp, and additionally a comparative analysis of shrimp production prepared by the Bureau of Commercial Fisheries.

Mr. Seton H. Thompson, Regional Director, Bureau of Commercial Fisheries, presented a report on the subject, The Federal Shrimp Biological Research Program of the Gulf of Mexico. Copy of the report is fifth attached to these Minutes.

The Chairman next introduced Mr. James H. Summersgill, President, Louisiana Shrimp Association, as discussion leader for a panel presentation of a series of State biological research reports on the shrimp fishery of the Gulf of Mexico. Panelist were; Messrs. Terrance R. Leary, Texas Game and Fish Commission Marine Fisheries Program Coordinator; William J. Demoran, Biologist, Mississippi Marine Conservation Commission; Jack C. Mallory, Biologist, Alabama Department of Conservation; Robert M. Ingle, Director of Research, Florida State Board of Conservation; and Lyle S. St. Amant, Chief Marine Biologist, Louisiana Wild Life and Fisheries Commission.

Mr. Summersgill spoke briefly of the greatly diminished shrimp landings on the North Gulf for the current year; the resulting economic stress which had devolved upon the commercial industry; and concluded with mention of the possibility of nutria being utilized for animal food and fur as a supplemental source of revenue for the industry.

Mr. Leary stated that Texas had completed one full cycle of sampling.

Using charts, comparisons of abundance of shrimp by stages were presented. Speaking of the sliding 45 days closed season for offshore Texas waters, he said that checking was continuing so that correct closed season could be determined. Referring to the 38,800 live stained shrimp which were released June 6-8, 1961 in Aransas Bay, Mr. Leary said 166 returns had been recorded. The longest distance traveled by a recovery was 60 miles, this in 11 fathoms and southerly from release point. The Port Isabel area was said to have been selected for a staining project in the summer of 1962.

Mr. Demoran states that he would like to see a staining program for Alabama and Mississippi but that his state lacked both personnel and facilities. Answering Mr. Mehos, Mr. Demoran states that his Commission decides by field check as to count when season should be opened and that such authority extends to the three-mile limit.

Mr. Mallory agreed with Mr. Demoran in that Alabama likewise needs a staining program and hope was expressed for the implementation of such a program during the ensuing year. Lower than normal salinities and water temperatures were cited as adversely affecting shrimp availability. Rains during the winter and spring months caused muddy water 30-50 miles into the Gulf, it was said. It was suggested that this condition of fresh water infiltration might have presented a barrier to movement of post-larval shrimp. Mr. Mallory in conclusion stated that 70-80 percent of the Alabama oyster crop was also affected by abnormal conditions experienced during the year.

Mr. Ingle said that Florida after four years of study is getting down to the finer points of research and referred to a publication by Eldred, et al; due shortly. It was stated that the paper points out that brown shrimp like cool water for spawning, while the white and brown of the species prefer a warmer medium. He agreed with the Bureau of Commercial Fishery people in that temperatures and salinities at river mouths should be recorded at set intervals over a long period. 75 degrees F. was given as a critical temperature for the spawning of pink shrimp. 1957-58 was said to have been Florida's coldest winter in many years and a poor year class in 1959 resulted. Mr. Ingle concluded with a recommendation that the shrimp biologists meet to discuss the several research programs in progress on the Gulf at the State and Federal levels.

Dr. St. Amant said that the Louisiana hydrographic program was picking-up but that data were too scanty at present to be of any value in predictions of on-coming crops of shrimp. A further expanded program in shrimp research is anticipated now that the Louisiana Commission's laboratory at Grand Terre Island has been completed and equipped.

The Chairman announced at the conclusion of the panel that the previously mentioned two consolidations, and the statistical data sheet would be made a part of the meeting Minutes. These reports are sixth, seventh, and eighth (last) attached.

Chairman Sheppard called for any other business to be presented. Mr. Diez. Golden Meadow, Louisiana, inquired as to what small communities could do when something like this year's crop of shrimp happened. Mr. Mehos, in answer to the query, stated that a new bill had been presented during the closing days of the last Congress which proposes the granting of loans for areas when confronted with such misfortunes.

The Chairman announced that the field trip to the Museum of the Louisiana Wild Life and Fisheries Commission would proceed as scheduled; namely, leaving the hotel at 4:00 PM. The afternoon session was adjourned with thanks to the program participants and other guests, at 3:45 PM.

FIELD TRIP

Mr. Steve Harmon, Chief, Division of Education, Louisiana Wild Life and Fisheries Commission and staff acted as hosts for the visit to that Commission's Museum where the guests viewed taxidermically recaptured beauties of the colorful wildlife of Louisiana aimed settings of natural habitat. Following a conducted tour of the Museum, the 140 odd guests moved to appointed tables in an adjourning room where the internationally acclaimed Louisiana oyster on-the-halfshell was served in unlimited quantities to the group.

A number of the delegates returned to the Queen Anne Room at the Monteleone for a late afternoon meeting of the Louisiana Shrimp Association.

Friday (October 20)

The Commission Executive Session began at 8:30 AM with the serving of breakfast in the Robert E. Lee Room of the Monteleone Hotel. Twenty-three guests of the Commission attended the session until the scientists' round table was scheduled to start, 9:30 AM.

The Executive Session was adjourned at 11:30 AM and the Commissioners joined the group in the Queen Anne Room for the closing General Session.

The following notes from the Commission Executive Session were given by the Director upon the meeting having been called to order by the Chairman: One resolution expresses the appreciation of the Commission to the Congress and to the Fish and Wildlife Service for recent appropriations which have made possible a fuller implementation of the Gulf shrimp statistical reporting program. Another resolution requests the Commission Committee to Correlate Research and Exploratory Data, together with a representative of the Bureau of Commercial Fisheries, to form a special committee to examine existing shrimp programs of the Gulf States and the Federal Government in an effort to better coordinate these programs and suggest standardized procedures. Those to serve on the special committee were named as; Messrs. Demoran of Mississippi, Ingle of Florida, Kutkuhn of the Bureau of Commercial Fisheries, Leary of Texas, Mallory of Alabama and St. Amant of Louisiana. A third resolution changes the title of the Commission executive officer from Secretary-Treasurer to Director. Dauphin Isle was named as the site for the October 18-19, 1962 meeting. Chairman Sheppard returned to the speakers table to introduce the officers elected for 1961-62:

L. D. Young, Jr (Chairman)
New Orleans
Louisiana

Will G. Caffey, Jr. (Vice-Chairman)
Mobile
Alabama

Mr. Young stated that he was hopeful during the year for a stepped-up program in research education and promotion. Senator Caffey mentioned the fine cooperation which had been in evidence at the meeting and called upon all interests present for their continued support of the objectives of the Commission.

Mr. Sheppard was praised for the progress the body had made during his term as chairman and was presented by the Commission with a plaque in recognition of his outstanding service to the member states.

Dr. Ford was introduced for the purpose of apprising the delegates of proceedings at the Scientists' Session:

"Mr. Kenneth E. Biglaine, Chief, Water Pollution Control Division, Louisiana Wild Life and Fisheries Commission, and Executive Secretary, Louisiana Stream Control Commission, discussed industrial water pollution control in Louisiana and the potential influence of recent amendments to the federal law. It was emphasized that the states continue to have ample opportunity to take care of pollution matters without being subject to federal intervention. He pointed out some of the measures being taken in Louisiana to control pollution, as well as, improve water quality which is good.

"Dr. Claire Idyll discussed possibilities of predicting annual shrimp production by sampling post-larval shrimp movements. If the procedure develops successfully, the industry could be informed so that they would know to what extent fishing preparations should be made for local waters.

"Dr. ^{Philip}Butler discussed pesticide research work under way at the Gulf Breeze, Florida, laboratory. They have run comparative toxicity tests on minnows using ryannia and endrin. These two chemicals are effective in controlling the cane borer. However, many fish kills have resulted in Louisiana from the use of endrin. Concentrations of ryannia forty times greater than the recommended application rate of endrin exhibited no toxic effects. However, thirty-two pounds of ryannia must be used in place of each pound of endrin, and this presents a problem in application and handling."

The delegates were next treated to a recently released sound motion picture, in color, of the Florida State Board of Conservation. The picture centered around the activities of the Law Enforcement Division which carried the viewers through all phases of commercial and sports fishing in the salt waters of Florida.

With no further business to be presented, the session was adjourned at 12:30 PM.

Prepared by: W. Dudley Gunn
Director

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
New Orleans, Louisiana
Monteleone Hotel
October 19-20, 1961

ADDRESS

Frank P. Briggs, Assistant Secretary
for Fish and Wildlife
Department of the Interior
Washington, D. C.

I am pleased to have the opportunity to visit with you and talk about our mutual problems.

There is no better way to begin a discussion of what we must do to have strong, healthy Gulf States fishing industry than to remind you of our basic policy established by President Kennedy in his Natural Resources message last February.

"The sea around us represents one of our most important but least understood and almost wholly undeveloped areas for extending our resource base. Salt and fresh water fisheries are among our most important but far from fully developed reservoirs of protein foods. At present levels of use, this country alone will need an additional 3 billion pounds of fish and shellfish annually by 1980, and many other countries with large-scale protein deficiency can be greatly helped by more extensive use of marine foodstuffs. But all this will require increased efforts, under Federal leadership, for rehabilitation of depleted stocks through biological research, development of methods for passing fish over dams, and control of pollution."

In addition to this general mandate, President Kennedy has continued the personal interest in your problems that was exemplified when he placed his name on the Saltonstall-Kennedy Act which has been so important in supplying funds for research and other activities beneficial to the commercial fishing industry.

Our basic problem is easy to define. While the Space Age and its problems of tomorrow have penetrated American thought and action today, President Kennedy believed it was necessary to remind all of us that our renewable resources of fish and wildlife require special attention in the immediate future if we are to meet our obligations for tomorrow.

For years we have recklessly tampered with these resources. As we become more crowded we drain the land; and fill and burn and plow and build.

Waters are polluted or used in ways that render them unsuitable for fish or waterfowl.

Homes for fish and wildlife become fewer, year by year.

The commercial fisheries of our fresh waters have been seriously depleted.

(Briggs, #2)

Opportunities for healthful recreation are unable to keep pace with the rapid increase of population.

In addition to the recreational needs of our fast-growing Nation, there will be new food requirements. Now, just as since the days of the early settlers, the seas provide important food and industrial products.

As the land becomes more fully utilized we will turn to the sea for more and more of the things we must have to bolster the standard of living of a crowded America.

A half million people earn their livelihood from these resources.

This is the one remaining frontier in the search for new food resources.

The Department of Interior has grave responsibilities for all these renewable resources of the land and the sea. As surely as other Government agencies must plan and act for the future of defense, of education, of agriculture, of industry, and of the much-discussed Outer Space, so the Department of Interior must prepare now to meet its obligations for tomorrow.

But I want to stress to you that in planning, developing, and conducting tomorrow's fish and wildlife programs, the responsibilities of the Federal Government in wildlife conservation are only a part of the whole story. The Federal Government, the States, the private agencies, fishermen, hunters, and the many people who are just interested in fish and wildlife have one common responsibility. And that is to maintain our fish and wildlife resources in the healthiest, most productive condition possible. To do this, we must move together toward preservation of these resources with all the tools we can command. We must also jointly devise new management methods to produce more fish--both fresh and salt water--and more game from less area that we have today.

There is also the responsibility to operate in full partnership.

The States look to the Federal Government for coordination for their activities in areas of mutual interest. They want to know the latest developments in research and in management; how to avoid waste effort, how to contribute most effectively to Federal activities with which they are also concerned; and they want constructive criticism on new programs they themselves are developing so they may improve them.

The Federal Government must also know how it can effectively supplement the State programs. Both have exactly the same fish and wildlife objectives.

The teamwork approach applies particularly to the area of the commercial fisheries which are so important to the economy of our country. This cooperative approach is exemplified by the history of the Gulf States Marine Fisheries Commission.

What does this overall problem of providing future fish and wildlife mean to you people of the Gulf States?

Mr. Chairman, I am not coming to you posing as an expert in Gulf fisheries,

(Briggs, #3)

but I have been exposed to the United States' fisheries now for about eight months and there are certain problems which you have which are common to other parts of the United States. Some of these problems are common to all the major fisheries of the United States, and especially so to the more important commercial fisheries of the Gulf of Mexico--namely, shrimp, menhaden, and oysters.

If you will permit me to oversimplify the problems, I would say that your problem in industry here in the Gulf is a problem which is common to all of the fisheries of the world. First, you must have a consistent supply of raw material.

Second, you must have a fleet of boats and well-trained fishermen to harvest these resources from the sea and deliver them to your plants in an acceptable condition.

Third, you must produce a product which will sell. It has to look attractive; it has to be of high quality; and it has to create a demand.

Fourth, you must have markets, and broad markets that encompass a large segment of the population in order to avoid short-term changes in demand.

Given these four features, fisheries prosper. Handicapped in any one of the four, we run into serious problems, some of which have seriously handicapped you in recent years.

Let's review for a minute some of your major fisheries, take a look at their problems, and suggest features which perhaps can be the subject for further discussion at the current meeting of your Commission. The shrimp fishery is the most valuable fishery in the United States. Nothing more need be said about the importance of shrimp or its tremendous value in the Gulf States area. Some 4,000 boats of various sizes ply the inland and coastal waters of the Gulf of Mexico in search of this shellfish. Supply has been relatively constant until this year. Now catches are down about one-third from normal.

Thus, even though we have an ample fleet of vessels--in fact, perchance too large a fleet--despite the fact that the product has never been better, with new shrimp products of good quality and despite the fact that the demand throughout the United States is at an all time high, the shrimp industry is in trouble.

This, then, suggests to us an area where immediate attention is needed--the matter of the abundance of our product to furnish our markets. Federal and State scientists, along with industry, are giving this matter serious study.

I urge you to concentrate your efforts toward expanding the areas of the fishery, studying factors affecting the abundance and availability of shrimp, and exploring the deeperwaters of the Gulf in order to find new stocks of shrimp which will be available during times when the normal inshore supply is limited.

With a better understanding of the factors in the ocean weather--a factor, by the way, which we believe brought about the present decline--and a knowledge of secondary resources which may be more expensive to produce but which may be highly desirable during periods of shortages such as has occurred this year, I believe our problems in this great fishery can be mitigated.

(Briggs, #4)

Let's look now, briefly, at the menhaden fishery. Here the resource has continued to produce at an increasingly high rate of about 450,000 tons in 1961, I don't think we are willing now to predict that great changes in the abundance of menhaden are not possible in the Gulf, for this is a short-lived fish and our fishery is dependent upon a relatively few year classes for its success. For the present, however, the supply seems adequate but the product itself could stand further study to improve processing and quality.

Vessels are available with which to harvest the resources but the limiting factor recently has been the market.

A world-wide crisis occurred in the market during 1959 and the early part of 1960 when great new supplies of fish meal became available from Peru, South Africa, Angola, and other parts of the world. This seems to have been overcome for the moment, and the menhaden industry is enjoying a relatively prosperous season. We must watch this market closely, however, and your discussions of the menhaden industry should well include further studies of the products and markets.

For these are now the weak links in this fishery.

In discussing areas of immediate concern, one must not overlook the long haul. In all of these resources, you must consider not only the problems of today but you must look further into all factors--from the resource itself to the consumer--in order to insure future stability in the menhaden fishery.

The ^{third}/~~great~~ commercial fishery in the Gulf of Mexico is the oyster fishery.

And here the yield has been going down or remaining fixed at about 12.5 millions of pounds for many years. Here is a case where the weak link is the resource itself and the inshore environment upon which the oyster depends.

The product is excellent and the market has perhaps never been better.

With the general decline in production from other east coast oyster-bearing areas, a careful study of the oyster environment and more intensive culture of this shellfish could undoubtedly improve the present condition of the oyster fishery in the Gulf.

This all leads to one inescapable conclusion. The Gulf fisheries are absolutely dependent upon an adequate inshore environment. Man-made and natural changes in recent years are leading to what appear on the surface to be serious adverse changes in the estuaries and brackish water coastal areas throughout the entire Gulf. Much has been said at these meetings concerning the need for estuarine studies, and good programs are under way, particularly for the Mississippi Gulf Outlet. A review of these programs and continued emphasis on them is essential.

I urge you to examine carefully the State and Federal programs relating to all of these fisheries, and to focus your attention on the factors which are affecting the fisheries now, while at the same time bringing about a balance to the programs which will not neglect the long-range objectives.

(Briggs, #5)

I am confident that our two organizations, with continued help of your Congressional delegations, particularly Representative Frank Boykin of Mobile, the Chairman of the House Fish and Wildlife Subcommittee, can successfully meet this challenge.

I know that the Gulf States Marine Fisheries Commission is willing to do its share.

Last spring, your Chairman, Walter Sheppard, and a number of your associates called on me in Washington to urge the appropriation of funds with which to carry on an adequate shrimp research program. Funds for this purpose were first sought by the Commission as long ago as 1954.

You were not satisfied that we were adding to our knowledge of shrimp as rapidly as we should. And quite properly so.

You appealed the case to your Congressional representatives who gave you an attentive ear and came away, not with the \$500,000 you sought, but with \$175,000--enough to definitely "put the show on the road."

You made it clear to Congress that this resource should be fully utilized and at the same time fully protected for future generations; and that to do this we must know much more about shrimp than we now know!

The thoughtful yet vigorous way in which you approached this problem, and the far better-than-average success you achieved, made me curious, so I looked back over the record to see what other accomplishments stemmed from the actions of the Gulf States Marine Fisheries Commission. I was impressed.

Frankly, I saw something more than an organization active in behalf of its own area. I saw the basis for a conservation program which is destined to reach worldwide proportions in a few years. I saw a start on the biological phases of an oceanographic program which must also reach worldwide proportions if we are to make the sea yield food to its full potential.

I saw the basis of a management program which will some day in the not too distant future begin to take on the shape and proportions necessary to make the seas yield twice the amount of protein yielded by the land.

In other words, I saw more clearly what President Kennedy meant in his stirring words about the use and perpetuation of our natural resources.

I saw more clearly the opportunity the Department of the Interior under Secretary Udall has in its ambitious efforts to effect true consideration on land and sea; and I saw more clearly what the world's great fishery scientists assembled at the recent Fish-in-Nutrition Conference meant when they said that the potential of the sea rested squarely in the hand of man to develop or destroy.

You are demonstrating how to develop.

You, who have at your doorstep, so many of the resources--biological and environmental--and so many of the problems--silt, spoilage, channelling,

(Briggs, #6)

dyking, all the frailties of man and nature--you, who have the good and the bad, the best and the worst within yoursphere, have an opportunity to serve not only yourselves but to help point the way to others. In my brief study of your problems, your efforts and your successes indicate to me that you are fully aware of your opportunity and your responsibility.

I am a newcomer in this business but I think I know a little about the conservation of natural resources on land.

In the Gulf of Mexico, it seems to me, man has a distinct water area which can serve as a laboratory and a testing ground for programs which will have world importance. And your organization has a running start in this field and, if I may judge the future from the past, you are going to stay out in front.

In meeting this challenge, Mr. Chairman, your fine organization will have all the help that we, in Government, can give!

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
New Orleans, Louisiana
Monteleone Hotel
October 19-20, 1961

"WHAT ABOUT GULF OYSTERS?"

David H. Wallace, Director
Oyster Institute of North America
Annapolis, Maryland

No animal, if I may use so coarse a word to describe such a delightful creature, has inspired poets and gourmets, as much as the oyster. It has been sought and praised in almost every place where civilization has spread, since the days when eating became an art and ceased to be a mere necessity. I can think of no more appropriate topic to discuss here in old New Orleans, which is noted the world over for the exquisite oyster dishes served in its outstanding restaurants.

Unfortunately, I am not here to recount or extoll the gastronomic virtues of these succulent bivalves. This would be an easy and pleasant task. I am here to discuss the sad state of affairs in which this glorious mollusk finds itself in this great country of ours.

Alas, our bivalve has fallen into evil times. Its innocent, tranquil nature apparently makes it an easy victim for all sorts of enemies. Man, disease, marine forms which dine on it, and pollution all have taken their toll. Today, production has fallen to the lowest point in modern times. In 1960 the catch dropped below 60,000,000 pounds.

This scarcity brought along with it the highest prices on record. We also received a record quantity of imports of canned, smoked and stew oysters, amounting to over 7,000,000 pounds compared to less than 700,000 pounds in 1953. However, even with the 7 million pounds of imports, there were 15,000,000 fewer pounds of oysters on the U. S. market in 1960 than there were in 1954.

Drastic steps will be needed to change this picture, and it appears to me that the Gulf states are in the best position to do something about it. Before we analyze ways in which the Gulf area might exploit the present low production, I would like to consider with you some of the conditions which have brought about this decline. These may have some bearing on a future course of action.

Let us review briefly the New England oyster production situation. When we consider New England oysters, we are dealing primarily with Long Island Sound and its tributary bays and rivers. Even Massachusetts oysters are grown from Long Island seed. Their major decline took place in 1953 following a disastrous storm in late 1952, which destroyed over 1,000,000 bushels of market oysters. Setting is erratic in these cold waters where temperature seldom exceeds 70 degrees F. There was not a single commercial set in the

(Wallace, #2)

period from 1952 until 1958. The industry, what is left of it, has kept alive on the remnants of oysters they nurtured over these years. As though nature was not satisfied with these disasters, in 1956-57 starfish set in record abundance. These enemies proceeded to devour vast quantities of set which took place in 1958. Fortunately, New England growers are stalwart, sturdy stock. Some of them have continued to fight and their efforts are beginning to bring some rewards. They were able to save some of the 1958 set, and then, additional set came in 1959 and 60. For the next several years their production can be expected to be increasing. It should have little or no effect on Gulf Coast sales since the bulk of these oysters will be marketed for the half shell trade in the big northeastern centers of population.

The Middle Atlantic states suffered their catastrophe in 1957 and 1958. At that time a malady hit the oysters which wiped out almost the entire Delaware Bay population. Oyster cultivation had been developed to rather a high degree in New Jersey and Delaware. This mortality put out of business almost every planter and packer. The only ones who survived were those who sought and found a source of supply of their raw material in the south. There is some ray of hope for oyster producers in Delaware Bay. In the spring of 1961 large oysters were transplanted from the Upper Bay seed grounds to the danger areas. Miraculously these oysters have survived and grown. Some planters feel that this indicates that the beds can be replanted successfully again. Even if this is true, however, it will be years before these beds can be brought back into full production, even if the MSX organism has ceased to be virulent.

In a manner, which cannot be explained satisfactorily, the MSX organism next was found in oysters in lower Chesapeake Bay. Its virulence was just as great as the Delaware Bay and it spread rapidly on beds in Virginia, particularly those located in high salinity areas. Production started dropping in 1959 as vast growing areas were decimated by the inroads of the organism. Production in 1960 dropped below 30,000,000 pounds for the first time, at least since the middle 1800's. Our shellfish scientists, particularly those studying Chesapeake oysters, are now talking about developing resistant strains. While such a program may ultimately develop a new industry, present planters probably will long since have been forced to abandon this business.

While MSX has not been found in substantial quantities in Maryland waters in the Upper Bay, their production has been declining steadily because of depletion of the public grounds, inadequate sources of seed, and discouragement of private oyster culture as a matter of state policy. Maryland's lowest production just happened to coincide with Virginia's, although the reasons for the scarcity of oysters appear to be different.

The South Atlantic area, with its relatively limited production, has not been a major factor in the overall U. S. oyster industry, except in the canning trade. With the limited markets in this field, a substantial part of their production has gone into the fresh business in recent years.

Adversity has been no respecter of region of the U. S. The Gulf states oyster industry also has been plagued with many problems. Hurricanes, Dermo inflations, conchs, pollution, and floods are some of the vicissitudes to which they have been subjected. Each one of these hazards still poses a

(Wallace, #3)

threat to the industry here. But, the Gulf has natural advantages not enjoyed by the East Coast. Setting occurs almost every year. Oysters grow to marketable size in about 18 months and acreages suitable for oyster production are vast indeed. In examining production records over the past ten years, except for Louisiana, production in every Gulf state has fluctuated very widely from year to year. Recovery from adverse conditions is rapid because of the favorable factors mentioned and soon the beds are back to a normal level. Louisiana, on the other hand, has maintained a fairly consistent level of production apparently because of their extensive seed grounds and widespread private oyster culture.

As you know, canning has been a mainstay of the Gulf industry. Even though Pacific canned oysters have been widely distributed, the so called "cove oyster" has had a preferred place in the market. The canning business, both here and on the Pacific Coast, has been hard hit by imports, particularly those from Japan. Prices of one third less than those of our producers has greatly reduced the volume of domestic canned oyster sales. Furthermore, this lower price has depressed the price domestic canners can pay for their raw material, which has created even more difficulties for these processors.

This change, coupled with the shortages in the east, has caused more and more Gulf oysters to be diverted to the fresh and frozen trade. East Coast packers in 1960 bought a sizeable volume of shucked Gulf oysters, which were transported to Maryland, Virginia, Delaware, and New Jersey for repacking and sale. This practice will undoubtedly reach a large volume during the current season. Chesapeake packers have built a nation-wide business. With the present scarcity, prices of fresh shucked oysters have risen to unprecedented levels. Even with the additional transportation costs these packers still find it profitable to buy shucked oysters here for repacking on the Middle Atlantic Coast. In a limited way even oysters in the shell are being shipped to East Coast plants for shucking and packaging.

Oysters here will probably bring the highest prices ever recorded. While shucking plants may prosper temporarily, your canners are squeezed between increased costs of shellstock and lower prices for the finished product. Gulf state fisheries administrators are faced with a real challenge and, at the same time, an opportunity. Every effort should be made to increase production as quickly as possible, without jeopardizing future yields. Some enterprising packers of fresh oysters are expanding their sales into areas previously supplied exclusively by eastern packers. If these packers can be assured a satisfactory source of supply they probably will be able to hold these markets even when eastern production rises again.

Each Gulf state should critically review its present oyster conservation program to determine whether or not all possible steps are being taken to attain or to assure a maximum sustained yield. Are steps being taken to see that adequate seeding is taking place on both public and private beds? Are the oysters being taken at the optimum size from both a biological and marketable standpoint? Are rigid precautions being taken to insure a pollution free product? Are your rehabilitation programs being carried out under the supervision of trained, skilled personnel? Finally, is every effort being made to encourage development of private oyster culture on lands not now in production?

(Wallace, #4)

If your answer is not "yes" to each of these questions you are missing a chance to corner a big segment of the oyster market.

The oyster business of the United States, unlike that of Europe, is based on the ability of this industry, with the assistance of the states, to produce oysters on a mass basis. The Gulf is an excellent area for this type of culture. As pressure grows for more and more production, stimulated by high prices, the need for intelligent state aid and control becomes increasingly important. The Gulf industry can expand its present markets to the great benefit of the citizens of the respective states. Positive aggressive, state programs will make this possible and enable your people to solidify any gains they might achieve. However, should the states fail to exploit their present temporary advantage, they may find in the not too distant future that the canned oyster business is dried up and the fresh business has returned to the East Coast from whence the big markets came.

While production is far down on the Middle Atlantic Coast, a tremendous amount of effort is going into research there. In Maryland and Virginia and even little Delaware, hundreds of thousands of dollars are being spent to understand the causes of their problems and develop the ways and means to overcome them. And, the ways will be found to do this, you can be sure.

You, as leaders on the Gulf, must see that adequate safeguards are developed to prevent drastic declines - yet, to increase your supply - if you are to take full advantage of current conditions. Your oyster industry is looking to you to provide leadership and guidance in this undertaking.

Meeting of Gulf States Marine Fisheries Commission
October 19-20, 1961, New Orleans, Louisiana

Research on Menhaden and Other Industrial Fishes
in the Gulf of Mexico

George A. Rounsefell
Director, Galveston Biological Laboratory
U. S. Bureau of Commercial Fisheries

Since 1948 the catch of menhaden in the Gulf of Mexico has increased from about 150 million pounds to 841 million pounds in 1960. During the same period a fishery for other industrial fishes--chiefly trawl-caught bottom fishes--used for canned petfood, mink feed, and fish meal has arisen, and the catch has grown to about 100 million pounds. The potential yield of all industrial fishes in the Gulf, including menhaden, anchovies, thread herring, and numerous species of bottom fishes, is tremendous. Our knowledge of the biology and abundance of the various species in this partially exploited resource is very fragmentary. The difficult economic situations often faced by any fishery dependent chiefly on one species point out the advantages of diversification. Therefore, the need for information on the size and dependability of this potential supply of raw material is obvious.

Observations made in the past few years from the Bureau's exploratory vessel OREGON and reported to you at previous meetings by Mr. Harvey Bullis indicate that the vast schools of thread herring (Opisthonema oglinum) in the eastern Gulf may even exceed the supply of menhaden which now approaches the one-billion-pound mark. Exploitation of thread herring requires development of improved fishing gear accompanied by biological studies to determine how the stocks react to intensive fishing. Anchovies, razorbellies, and other clupeid species are also known to occur in large quantities.

The 100-million-pound fishery for petfood, recently developed in the central Gulf, fishes on shoal water grounds on both sides of the Mississippi delta. Calculations show that the shoal areas of the remainder of the Gulf--even if we postulate half the density of fish found in areas now fished--could bring the yield of this fishery to about 700 million pounds.

With a potential industrial fishery easily three times the present, what is the state of our knowledge of the resource? Biological research in the Gulf has lagged behind that in the earlier developed fisheries on the Atlantic and Pacific coasts. Much of our scant knowledge of these fishes has been acquired incidentally from other investigations.

In the spring of 1957 the Bureau of Commercial Fisheries contracted with the Gulf Coast Research Laboratory for a 3-year study of menhaden populations. This has increased our knowledge of the distribution of the three species found in the Gulf. At present only the Gulf menhaden, Brevoortia

Apalachicola, Florida, Mississippi Sound, and Sabine Pass, Texas, were studied to determine whether they represent the same stocks. Although some slight differences were found, they are not sufficiently large to definitely prove the existence of separate races.

Very little is known of menhaden spawning, but a few with large ova have been occasionally taken offshore. The paucity of menhaden of large size in the Gulf fishery as compared to the Atlantic has caused some speculation that schools of larger and older menhaden may occur offshore. As the Gulf fishery is very largely conducted in shoal waters close to shore, we cannot dismiss this possibility without thorough exploration with midwater gear.

Although the adult menhaden apparently spawn in high salinity water somewhere offshore, the young larvae enter the estuaries. At Galveston they enter the estuaries from mid-November to June, indicating a long spawning period. Dr. Gunter found menhaden larvae entering Biloxi Bay from December through April.

The young menhaden grow and develop in these protected bays and estuaries. The action of the Gulf States Commission in sponsoring studies to perpetuate suitable habitat in the estuaries thus assumes great importance to the industrial fishes.

Dr. Suttkus of Tulane University, through a Bureau contract, has described and illustrated the young stages of the three menhaden species found in the Gulf. The report will be published soon. At the present time the Bureau is not conducting research on Gulf menhaden stocks.

In 1958 your Commission urged the Bureau to initiate a study of the presently underexploited industrial fishes of the Gulf. A small-scale study was commenced at Pascagoula on the several species taken by the trawlers for the petfood plants. We are also studying what clupeoid fishes we can obtain when the OREGON fishes with experimental midwater trawls. At Galveston we are studying the bottom fishes taken between the Mississippi River and Brownsville in our offshore sampling of shrimp populations. We hope thus to acquire a fair knowledge of the biology of many of the more abundant pelagic and bottom fishes of the Gulf so that future expansion can be intelligently planned.

GULF STATES MARINE FISHERIES COMMISSION
New Orleans, Louisiana
Monteleone Hotel
October 19-20, 1961

"HOW MANY SPOTTED TROUT ARE THERE AROUND FORT MYERS?"

Clarence P. Idyll, Chairman
Division of Fisheries
The Marine Laboratory, University of Miami
Miami, Florida

DIRECTOR'S NOTE

Upon receipt of Dr. Idyll's paper it was found that equations and maps were therein contained which we are not equipped to reproduce.

The paper will be made a part of the office copy of the meeting Minutes.

For the information of interested biologists the paper has been sent to the American Fisheries Society for publication in the near future. It will appear bearing the title; "Estimation of Abundance and Mortality of a Spotted Seatrout Population" (by E. S. Iversen and A. M. Moffett).

GULF STATES MARINE FISHERIES COMMISSION
12th Annual Meeting
New Orleans, Louisiana - October 19-20, 1961

SHRIMP RESEARCH IN THE GULF OF MEXICO
By
Seton H. Thompson

When we talk about shrimp in the Gulf of Mexico, we are talking about the most important fishery resource in the United States. Its yield of more than 120 million pounds, worth almost \$60 million to the fishermen, far exceeds the value of tuna or salmon catches and, in fact, in some years it has exceeded their combined value.

The Gulf shrimp harvest is made by about 7,000 trawlers and some 16,000 fishermen. Add to these the employees of the shore plants and related industries, and there can be no doubt that we are talking about a resource that plays a very important role in the economy of the Gulf States. It is a resource well worth protecting -- so what are we doing about it?

This Commission in 1954 asked the Bureau of Commercial Fisheries to undertake biological research that would provide the States with the basis for sound management of the shrimp fishery. Translated, this meant we had to know the complete life history of each species of shrimp -- time and place of spawning, larval development, nursery grounds, rates of growth, movements and migrations, mortality, and interrelationships of the various species.

It meant we had to know for each species something about their distribution by size, season, and area.

It meant we had to understand the mechanisms that transport or guide the young from the offshore spawning grounds to the inside nursery grounds.

It meant that we should know how salinity, temperature, pollution, species composition, and available food effect the survival and growth of the several species.

These are the things we were asked to find the answers to, if we were to be responsive to your resolution. There are others, but these seemed to be most important.

This is an involved and costly undertaking. I am convinced it could be done most economically by tackling it on a large scale -- blanketing the Gulf with teams of biologists working on all of the problems simultaneously and completing the job in 5 years. Funds have never been sufficient for shrimp research on such a grand scale, and if they had been there is some doubt whether we could have mustered the staff for it. Instead, our efforts have been concentrated on the pink shrimp in the Tortugas area, and on the browns and whites in the vicinity of Galveston Bay. The research program itself was divided into small segments that could be attacked separately in order of priority. Studies on some of these segments have been completed, good progress is being made on others, and eventually we will have the whole picture.

In the Tortugas area, for example, the offshore spawning areas now are known, and by sampling the waters of Florida Bay between the spawning grounds and the nursery grounds, the distribution has been plotted of larval and post larval pink shrimp throughout the year. We still do not know how they make this inshore journey, but we do know the early larval stages do not occur in the inshore waters, nor do the post-larval stages occur near the spawning grounds. To set the stage for this work, the various larval forms of pink shrimp first had to be identified. This was done by rearing eggs of known parentage. All of this work was done by the Marine Laboratory of the University of Miami under contract with the Bureau

The relationship has been worked out between the size of the adult pink shrimp and the depth of water in which they are found. This study carried out for us by the University of Miami Marine Laboratory under contract yielded positive evidence that pink shrimp moved farther off shore and into deeper water as they grow larger.

While these studies were going on, the Bureau's staff, using vital stains, marked and released almost 50,000 juvenile shrimp as they were leaving the estuaries of Florida Bay. By subsequent recovery of 114 marked individuals on the Tortugas fishing grounds, it is possible to say positively that the estuaries of Florida Bay provide the nursery environment for post-larval and juvenile shrimp that ultimately sustain the valuable Tortugas fishery. Since some of the stained shrimp were

recovered after being at liberty as long as six months, we have learned something about their migratory paths from inshore to offshore waters, rate of movement, and rate of growth.

In the Galveston Bay area, our efforts have been directed toward an understanding of the species composition of shrimp, their distribution in inside waters, their interrelationships with associated fauna, and the changes that take place through the year. We know, for example, that small brown shrimp appear on the nursery grounds in May, and remain until about the first of July. The whites, in contrast, are in nursery areas from late June until early October, so the browns normally have vacated before the whites become numerous. It has been found also that shrimp are used far less for food by fish, with which they are associated in the nursery areas, than one would believe. During the time both the whites and browns are abundant in the inshore waters, the resident fish seem to have a preference for menhaden and croakers over shrimp.

An explanation has been sought for the change in species composition of the Texas catches from a preponderance of whites to a dominance of browns by studying in the laboratory the nutritional requirements of the two species, their tolerance to changes and chemical factors, and their behavior in response to these changes. Among other things, these studies have demonstrated that shrimp are very sensitive to minute quantities of practically all the commonly

used insecticides and pesticides.

The distribution and density of larval shrimp off the entrances of Galveston Bay have been under study for two years. This parallels the study being carried on by the Marine Laboratory in Florida Bay on pink shrimp. Systematic sampling with standard gear may give us a clue to the harvestable crop later in the year. For example, during March and April 1960 the number of post-larval shrimp entering Galveston Bay was 582 per sample, whereas in the same period in 1961 it was 22 per sample. Perhaps this should have been the warning flag for a poor shrimp season in that area this year. But certainly no one could be positive with the limited information we now have.

An analysis has been completed of the first four years of detailed statistics of the Gulf shrimp fishery. As has been said many times these are the best statistics in existence for an ocean fishery of this size. This and other analyses will tell us whether the stocks are successfully maintaining themselves in the face of intense fishing effort. In these first four years of data, there is no indication that the contrary is true.

These are some of the things that have been done during the past four or five years. Good results have been achieved and apparently the Commission was confident that more could be accomplished, if a broader program could be undertaken. The Commission succeeded in persuading Congress to increase funds for this purpose

by \$175,000 in the current year. After discussing the subject with a number of you, it was concluded that this amount should be used in the area off Louisiana and Texas, which normally accounts for 60 percent of the Gulf catch. The work which is already underway will include (1) systematic sampling of species and size composition on the grounds; (2) determination of migrations, growth and mortality by means of large-scale marking with vital stains; (3) collection of data such as temperature, salinity, currents, and larval shrimp movements and abundance so an estimate can be made of the effect on shrimp of natural variations in the environment; and (4) sampling of shrimp landings from the area at the major ports to determine species and size composition, compare sizes landed with sizes actually caught, and determine the accurate species composition of mixed landings.

This is as much as can be done with the additional funds made available this year. They could, of course, have been used in other ways to advantage, but we all felt that concentrating their use in this area would be most productive.

In asking for an increase in funds for shrimp research, the Commission sought a total of \$500,000, instead of \$175,000 which was appropriated. Assuming that this additional amount may become available next July, we would propose expansion of the work in the eastern Gulf to include extensive port sampling similar to that underway in the western Gulf, and a large-scale tagging program on

the grounds to determine growth and mortality rates. We would propose also a study of post-larval and juvenile shrimp under controlled conditions to determine what factors guide their movements from the offshore spawning grounds to various types of estuaries. Information obtainable from this study would be especially useful to a study of shrimp culture for commercial purposes. Contemplated, also, in this expanded program is a year-round systematic survey of the shrimp grounds of the western Gulf lying between 50 and 150 fathoms. Information concerning the abundance, distribution and size of shrimp in these waters is essential to a full understanding of the biometrics of the shrimp population, since it is probable that these offshore populations form a spawning reserve not now being exploited.

These are segments of the shrimp research program that should be undertaken when additional funds are available. We invite your comments on this proposed approach. We are more than willing to consider alternative projects if, in your opinion, they would lead to an earlier or better understanding of the shrimp stocks and how they should be harvested. The Bureau of Commercial Fisheries, after all, is your agent in the field of research, and the best results will be attained through our combined efforts.

T E X A S

Little change has taken place in the basic program established some years ago but the quality and quantity of the work performed has increased. For the first time in quite a few years the technical staff of the Coastal Fisheries Division, Texas Game and Fish Commission, has been unchanged and some degree of continuity has been attained. No resignations of biologists or chemists interrupted a program and the addition of one biologist allowed work to continue on schedule.

A special report called for by the Texas Shrimp Conservation Act, which analyzes shrimp data, was prepared and submitted during the year to the Governor and Members of the Legislature.

The report for fiscal 1958-59 contained a brief summation of some of the results of a salt water sports harvest survey. A similar survey was conducted early in this fiscal year. For purposes of comparison the following is taken from page B-5 of the report on the results of that survey:

	1959-60	1957-58
Projected pounds caught (redfish, speckled trout, flounder, drum, shrimp)	26,322,000	39,586,000
Projected number of fishermen	665,200	748,000
Average number fishing days per fisherman	7.7	9.4
Average number hours fished per day	4.7	5.2
Average catch per unit of effort (pounds per man-hour of fishing)	1.09	1.08

It is readily apparent that the total poundage declined considerably and if this fact is considered alone it might be cause for some alarm. However, when the number of fishermen and days as well as the hours per day are considered it is not surprising that the total catch was off. Weather conditions were not suitable for long or frequent trips into the bays. A slight economic recession caused people to be somewhat more cautious in their recreational spending. These facts are borne out by the report. Yet, the fisherman who did go and try was, on the average, just as successful as in the second year previous. Continued samplings such as this will be of great value in measuring population trends of the fish species considered.

Field studies were continued in all major bay areas and resulted in much valuable information which is being reported separately. These reports on specific projects and jobs in each area are reproduced and distributed to interested agencies throughout the world.

Basic studies involving bottom type, vegetation and inventory of species have been completed for all major bay systems although much detail remains to be added. In this year seasonal abundance of various forms has been measured and an attempt made to relate this to hydrographic conditions and other environmental factors. Some pertinent information is presented here.

OYSTER FISHERY INVESTIGATIONS IN AREA MO-1 (GALVESTON BAY)

The spat set in 1961 was moderate to heavy with a peak setting period in late spring. Increased salinities permitted oyster populations to expand slightly in the upper bay areas. Mussel fouling continued to be heavy in the upper bay. Conch predation was a serious problem in the lower bay areas during the spring but decreased considerably in summer after a period of heavy, local rainfall.

Market oysters were fairly abundant during the 1960-61 season but were below average in quality. Because of low winter salinities, oysters did not have a salty flavor nor did they reach full fatness. Fishing effort was heavy on Hanna's Reef in East Bay and on Todd's Dump in middle Galveston Bay. Other reefs were fished infrequently, chiefly because the oysters were thickly clustered or heavily fouled by mussels.

Shell dredging problems continued to demand attention. The shell planting program initiated in 1959-60 failed to gain public approval and was never able to function at maximum effort. However, 53,000 cubic yards of shell were planted and 61,000 barrels of oysters were transplanted. Construction was started on five new reefs bringing the total to twelve. Eight natural reefs were removed or partially removed and replaced in the process. All artificial reefs maintained populations of oysters.

OYSTER FISHERY INVESTIGATIONS IN AREA MO-2 (COAST BELOW BRAZOS RIVER)

The fungus parasite Dermocystidium marinum incidence rating in all bays have been relatively low, probably due to reduced salinities, but, its continued presence is a potential threat.

Interest in leases for private oyster culture continued high although production from these areas were negligible. Cost of operation and yield from the leases is being studied in various bay areas for comparative purposes.

COORDINATED SHRIMP STUDY PROGRAM

The sampling information from this year's juvenile shrimp population as compared with the previous year's data indicated a decline in the crop of both brown and white shrimp.

In June over 39,000 brown shrimp were marked by injection with a biological stain and released in Aransas Bay. Although less than one per cent have been returned through commercial shrimping channels, the locations of recapture indicate a southerly movement from the Pass during the summer months.

Correlation of data gathered in the bays with Gulf conditions was facilitated by the lease of a large shrimp boat capable of fishing deeper waters.

REGION M-1 (SABINE LAKE)

Regular samplings in Sabine Lake showed that area to be comparatively less productive than other bay areas. The large amount of river discharge leaves the area almost devoid of marine life at times.

REGION M-2 (UPPER GALVESTON & TRINITY BAYS)

Emphasis in biological studies was on commercial shrimp, blue crabs and game fish. Sampling stations were established in various bay habitat to observe brown and white shrimp from post-larval stages until they migrate out of the bays.

Blue crabs have become increasingly important to fishermen in recent years and more attention is being given to them. Data are collected in conjunction with other projects.

Low salinities observed in January and February are considered the prime cause of a relatively poor shrimp season.

REGION M-3 (LOWER GALVESTON BAY)

Commercial shrimp were sampled at various stations as a part of the unified coast-wide program. Game fish populations received particular attention and preliminary returns of tagged fish indicate very little movement.

Salinities were consistently higher in West Bay than in East Bay which appears to be affected more by Trinity River discharge. West Bay also supports more submerged vegetation than does East Bay.

REGION M-4 (MATAGORDA AND LAVACA BAYS)

Vegetation surveys have thus far shown a major changeover, as far as species and abundance are concerned, at about 20° C. Shoal grass has remained abundant throughout the year. Widgeon grass, which began fruiting in June is increasing and spreading its distribution.

Shrimp samples indicate a late and relatively light harvest of white shrimp and a somewhat late season for browns. Both pink shrimp and sea bobs were more abundant than in 1960 samples.

Oysters in East Matagorda Bay are suffering from excessive fresh water and an abundance of fouling mussels.

REGION M-5 (SAN ANTONIO AND ESPIRITU SANTO BAYS)

Studies have shown a rapid decline in the oyster population which has supported a heavy fishery for the past two seasons. The high mortality is attributed to fresh water flooding and an increase in the incidence of Dermocystidium marinum in San Antonio Bay. Early spat sets were killed by flooding and many mature oysters suffered the same fate.

Bait shrimping is concentrated largely on the white species and was apparently responsible for a very limited supply of commercial size shrimp being available at the time the commercial season opened. Brown shrimp constitute a small part of the bait catch and an even smaller part of the commercial catch.

A relatively small experimental oyster reef was built using shell from a local shucking house. The shell was placed on a semi-solid mud bottom and in early summer was found to have had a heavy spat set. This was killed by flooding but a later set will offer some index for future comparisons.

REGION M-6 (ARANSAS, COPANO AND MESQUITE BAYS)

Data gathered in Mesquite Bay indicate the intrusion of higher salinity Gulf water through Cedar Bayou has caused some changes in distribution of both plant and animal forms. The pass has continued to operate effectively although some south-migration of the gulf mouth has occurred.

Oyster populations have improved somewhat and it is anticipated that Aransas Bay will be allowed a short harvest season this year.

REGION M-7 (CORFUS CHRISTI AND NUECES BAYS)

Routine sampling revealed that the first juvenile brown shrimp appeared in mid-April and began moving out of nursery areas by mid-July. First catches of young white shrimp were made in July and were present as the year ended. Samples of the fish populations showed that croaker, spot and pinfish were most common generally and that anchovies were extremely abundant but in few localities.

REGION M-8 (UPPER LAGUNA MADRE)

Heavy rainfall during winter months reduced salinity to a record low of 7.6 ppt. and, as a result, no salinity over 45.0 ppt. was reported for the year. The small mollusk population was virtually exterminated and there followed a sharp reduction in the standing crop of black drum. All major species increased in abundance in autumn but became less plentiful during the summer months. For the year, the cumulative redfish population was up 20-30 percent while the trout population increased about 20 percent.

During most of the year forage and juvenile fish appeared to be scarce in comparison to previous years.

Mortality studies indicate that few trout survive over five years, that females live longer and grow larger than males, and that nearly 60 percent of the population is lost to natural mortality. This natural mortality was about five times as great as fishing mortality.

About 20 percent of the redfish crop is harvested each year but there is 70-80 percent loss due to natural mortality or emigration.

Shrimp are of minor importance in this region except to the live bait fishery. Few edible shrimp are produced. Grooved shrimp were about as abundant as in previous years but the peaks of abundance were of much shorter duration.

Trial oyster mats, placed in the area as fishing reefs, have remained in excellent condition and have attracted small fish. The oysters planted thereon did not survive.

REGION M-9 (LOWER LAGUNA MADRE)

The vegetative survey shows a marked increase in both the stand and range of shoal grass Diplanthera wrightii. Widgeon grass Ruppia maritima continues to extend its range northward past Port Mansfield particularly around spoil banks.

Brown shrimp ^{are} present throughout the year with peak abundance from April to July. White shrimp were notably more scarce this year than last. Both species are present in the lower Laguna Madre as sub-adult forms only since the adults do not utilize this bay area.

Oyster production from the area has been about one-third to one-half of the previous annual average and has shown no sign of recovery. Oyster populations in South Bay were seriously damaged in 1959 by spoil deposition resulting from maintenance dredging of the Brownsville ship channel. Results of studies of six experimental oyster reefs in Port Isabel Bay were not encouraging. While hydrographic conditions appear to be equal to or better than those in South Bay for the production of oysters, the extremely heavy summer growth of marine grasses and algae over the experimental reefs appears to prevent the establishment of

these reefs as producers of commercial oysters. These reefs have become increasingly important in the sport fish catch.

Anchovies continued to be the most abundant winter forage fish with pig fish and pin perch serving this need in spring. Pig fish, pin perch, spot and croakers were present in fewer numbers but white perch or yellowtail showed an increase in both range and numbers as compared to the previous year.

The removal of black drum fish from the Laguna Madre of Cameron and Willacy Counties was continued as in the year before. The apparent success of the previous season was responsible for thirty-two applications being received. A total of twenty-two contracts were issued with only sixteen effective in either county. Total production of dressed drum was reported as 805,927 pounds with almost one-third of that amount reported in January. Repeated spot inspections of the total catch of these nets showed some 10% to be trout, redbfish, or flounder and further that 1.6% of these "good" fish were dead when returned to the water. There is still considerable opposition to the program in spite of the fact that most reports indicate an increase in the populations of other species.

In addition to the job reports referred to earlier and the special shrimp report, several technical articles were prepared for publication. A bulletin on the Crabs of Texas has been completed and is in the hands of the printer. This should be available for distribution early in fiscal 1961-62.

U. S. FISH AND WILDLIFE SERVICE ACTIVITIES

October 1960 - October 1961

BUREAU OF SPORT FISHERIES AND WILDLIFE

Activities of the Bureau of Sport Fisheries and Wildlife as they relate to Gulf fisheries were confined primarily to investigations of Civil Works projects conducted under the authority of the Fish and Wildlife Coordination Act. Project reports were prepared on all significant coastal projects, and these reports were coordinated with the Bureau of Commercial Fisheries and the affected State agencies.

Planning and construction of public and private projects for use of the coastal waters and lands continues at a rapid pace. An increasing competing use of coastal waters and increased problems associated with fresh water drainage projects demand coordinated efforts toward multiple-use planning for Federal, State, and local interests.

Investigations which warrant attention in this report include:

NAVIGATION PROJECTS

Mississippi River-Gulf Outlet Project, Louisiana: The Bureau, in coordination with the Bureau of Commercial Fisheries and Louisiana Wild Life and Fisheries Commission, continued its program of reporting on construction segments. These reports deal primarily with the development of effective methods to reduce the spread of spoil material. These studies will be continued through most of the construction phase of the project. Additional funds were provided, and the schedule for project construction was materially advanced.

Calcasieu River and Pass, Louisiana: Enlargement of the authorized ship channel to Lake Charles is under construction. Coordinated studies with the Bureau of Commercial Fisheries and the Louisiana Wild Life and Fisheries Commission were initiated to advise the construction agency of requirements for spoil control in the interest of fish and wildlife resources.

FLOOD CONTROL PROJECTS

Lake Okeechobee Regulation: The tentatively proposed South Florida Floodway which would discharge through Everglades National Park would affect major commercial and sport marine fisheries. With the cooperation of the Bureau of Commercial Fisheries and other conservation agencies, steps have been taken to develop a comprehensive study on which to provide recommendations for the regulation of fresh water discharges necessary to protect the Tortugas shrimp fishery and other major fish industries.

Mississippi River and Tributaries Project: This project is nearing completion and the Chief of Engineers is preparing his report. Included in this report will be a consideration of recommendations by conservation agencies for fresh water introduction into the Louisiana Delta marshes for the benefit of fish and wildlife resources. The proposal for freshwater introduction would significantly enhance the oyster producing potential of these Delta marshes. The report of the Chief of Engineers will, therefore, be of considerable interest to the Gulf States Marine Fisheries Commission.

HURRICANE PROTECTION PROJECTS

Lake Pontchartrain Hurricane Protection Project, Louisiana: Model studies to determine the effects of this project and the Mississippi River-Gulf Outlet project on salinities in Lake Pontchartrain and related areas have been completed. From the results of this model study, recommendations as to gate sizes needed to maintain required salinity exchanges between the lake and the Gulf will be prepared.

NAVIGATION PERMITS

Private Construction: A great number of permits to private developers for a variety of projects ranging from pipe lines to dredge and fill projects were issued. The Bureau has attempted to comment only on the larger of these developments which would have the most significant effect on fishery resources. While the individual effects of these developments are usually small, their cumulative effects are large. The bait shrimp fishery in a few of Florida's bays has been noticeably affected. Other fisheries using inshore dependent marine species will undoubtedly be affected by the cumulative effects of all such developments.

Gulf States Marine Fisheries Commission

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SOME THOUGHTS OF MARINE BIOLOGISTS IN CONNECTION WITH THE 1961 SUPPLY OF SHRIMP

Gordon Gunter, Director
Gulf Coast Research Laboratory
Ocean Springs, Mississippi

"The year 1961 is very similar to 1957, when January and February were warm, but then in March or April it was very cool and became warm again later. Similarly, we have had a great deal of rainfall. It has been a most unusual year climatically, and cotton production here and in Louisiana is running a low parallel with the shrimp. I think that is the explanation of the current decline of shrimp, but I am very hopeful that the white shrimp will begin to show up in large numbers before September 15, and possibly will extend on and have a longer season than usual. If the white shrimp are not available by September 15, then I think we shall have to give up hope for this year.

"I might add that the tides seem to have been unusually high this summer and I think possibly that the small white shrimp are farther back in the marshes and inlets than most people realize.

"I do not think the current decline in shrimp is man-made, because it is altogether too sudden and because it does correspond with unusual weather which has similarly affected certain phases of agriculture."

William J. Demoran, Biologist
Mississippi Marine Conservation Commission
Biloxi, Mississippi

"Here in Mississippi I noticed that the small brownies appeared quite late this year. They usually appear in appreciable numbers around the last of April and or the first of May, however, this year I had difficulty finding young brown shrimp by using various methods; otter trawl, beach seine, Brill net, etc. Around the first of June a fair crop of small shrimp showed up and proceeded to grow very slowly as compared with last years growth rates.

(Demoran continued)

"Up until the present time small shrimp have been scarce in the shallows of the bays. I can't help but believe that the cool weather that we had earlier in the year had a devastating effect on the young shrimp population in this respect. The cool weather retarded the growth of the young shrimp and possibly at the same time predation on the young shrimp was greater than usual.

"As for the fall white shrimp crop here in Mississippi, there is no evidence of a large crop of whites as yet, so my own prediction is that we will have a fair white shrimp season this year."

Terrance R. Leary, Coordinator Coastal Fisheries
Texas Game and Fish Commission
Austin, Texas

(Also expressed views
of Howard T. Lee)

"Our study of juvenile brown shrimp in the bay nursery areas indicated a decline to about 1/5 as many shrimp in May of 1961 as in May of 1960. This May group of juveniles is from a March spawn.

"Our hydrographic records show that the inshore waters warmed more rapidly this year along the Texas coast. In March of this year water temperatures were about 21°C as compared with about 11°C during the same period in 1960. Bay salinities in March and April of this year were generally lower than last year. The warmer temperatures and lower salinities during the critical months for the brown shrimp probably contributed to the decline in production.

"It appears that the first 1961 spawn came two weeks earlier this year, probably triggered by the earlier warm water temperatures. The earlier arrival may have been prior to the most favorable bay conditions.

"Since air temperatures do not indicate so great a change in February and March of the two years, the warmer water may have been caused by a change in Gulf current patterns. Such a change may have prevented the migration of the post-larval shrimp into the bays.

"Our survey of juvenile white shrimp shows about 1/10 the number in some areas this year over last. We expect a poor white shrimp fishery year."

G. Robert Lunz, Director
Bears Bluff Laboratories
Wadmalaw Island, S. C.

"I have been following with a great deal of interest the decline in shrimp landings all through the southeast and Gulf. We had predicted this decline in March, based on our plankton studies of postlarval brown shrimp (see Bears Bluff Lab. progress report #47 Jan. through Mch. 1961. Rep. Comm. Fish. Review, Vol. 23, No.6, June '61, pp. 39-42). We felt that the decline in postlarval shrimp was definitely due to bad weather - cold, rain, and wind - which we had and were having when the postlarval shrimp should have been abundant.

(Lunz continued)

"As for the white shrimp, our plankton tows and continuous sampling of the juvenile shrimp indicate that we should have a fairly normal abundance of white shrimp."

Robert M. Ingle, Director of Research
Florida State Board of Conservation
Tallahassee, Florida

(Mr. Ingle's reference below is to shrimp landings figures for the period January 1 through July 1, which accompanied the GSMFC letter of inquiry, and which figures were not broken down as to species the same not being available).

"I think a species breakdown would be revealing. These animals have different spawning periods and, as we shall point out in a forthcoming publication (Eldred, et al., 1961, in press), annual variations in temperature can "very likely influence absolute as well as relative abundance of the three principal species." The lack of production may be more pronounced in the brown than in the white, etc.

"A monthly breakdown (again by species) would be useful for the same reason.

"In this connection I note that Florida's spring production, based principally on pink shrimp is down only 8%, while July production based on brown and a few whites is down 23%."

Joseph H. Kutkuhn, Assistant Laboratory Director (Also expresses views of
Bureau of Commercial Fisheries George A. Rounsefell)
Galveston, Texas

"Unfortunately, I haven't had an opportunity to survey last year's shrimp fishery statistics which were just recently assembled. There is a good chance that their analysis, by providing a picture of events leading up to this year's situation, would have enabled me to form a more substantial opinion at this time. But I will comment briefly on what information is readily available and base an opinion thereon, sketchy though it may be.

"With reference to the brown shrimp, all observations made in connection with our routine sampling activities point to a reduced population in the western Gulf this year. Low catch rates of commercial sizes parallel those experienced by the fishing fleet. Reduced numbers of postlarvae entering the Galveston Bay system in March and April portended a reduced commercial supply offshore during this summer and fall. Fairly good production but catch rates of bait-size shrimp much lower than last year's confirmed Bay conditions in May and June forecast by the index of postlarval abundance. The expected summer run of brown shrimp off Louisiana and Texas just never materialized although we thought at first it had merely been delayed. Lack of similar

(Kutkuhn continued)

information precluded any forewarning that spring white shrimp production would suffer a fate comparable to that of the brown's summer production.

"From the data secured by research crews and supplied by the Branch of Statistics, I think it significant that this year's decline in our domestic shrimp supply is about equally evident at all points along the northern Gulf coast, and affects both the brown and white species. In my mind this tends to eliminate excessive fishing (on last year's spawning populations) as the major cause--though I'd be hard pressed to explain the probable mechanics involved. Rather, I would attribute the over-all decline to interacting climatological factors which operated over a wide area to reduce survival during early (oceanic) stages of shrimp hatched late last year and early this year. In short, we are experiencing a natural ebb in the amount of shrimp annually produced by the environment. It is quite likely that the combined effect of these natural factors would have been the same regardless of how many shrimp were produced initially.

"Insofar as the remainder of the season is concerned, I do not want to be overly pessimistic. We are receiving sporadic reports of very good white shrimp catches off Galveston and just yesterday (9/16) I was informed that brown shrimp production off south Texas has picked up measurably. I agree that our shrimp resource has suffered a real setback but it's too early to assess the extent. We still have two big months to go."

C. P. Idyll, Chairman
Division of Fisheries
The Marine Laboratory, University of Miami
Miami, Florida

"It is to be expected that shrimp stocks will fluctuate from year to year, and that catches will be variable as a consequence. This is more likely to happen to stocks in which the fishable population includes few year classes than in those having many year classes, since in the former case low numbers of fish due to failures of one or more years will be smoothed out by larger numbers of other, more successful year classes. The shrimp represents the extreme case where, apparently, only one year class is represented in the fishable stock, and I am surprised that we have not had more violent fluctuations in abundance than have actually been exhibited.

"Of course, there have been failures of various segments of the shrimp fishery in various years in the past. Usually, however, these have been offset by good catches in other areas, and the boats and processing plants have been able to adjust by exploiting these. This year is unusual in exhibiting a universal failure. This implies that whatever are the factors causing a shortage, they are universal.

"Clearly we are a long way from understanding what these factors consist of. It is extremely unfortunate that despite progress in the matter of launching and supporting shrimp research, we are still far behind the pace of studies which are necessary. The work already done suggests that the number of spawners may not

(Idyll continued)

control the size of populations of shrimp. This is not surprising since it seems to be the case with most marine animals. Instead, the rate of survival during the early stages of the life history in all likelihood controls the size of the adult population. Survival is affected by an exceedingly complex combination of factors, including temperature, salinity, currents, number of predators and competitors, and others.

"We have a three-year series of observations on numbers of shrimp larvae in Florida Bay and of the currents there as a result of a study supported by the Bureau of Commercial Fisheries, and directed by Dr. Albert Jones. It is apparent that 1961 is an unusual year compared with 1959 and 1960 in respect to spawning time, numbers of larvae, temperatures and currents. Of course the reduced numbers of larvae this year could not be the cause of the low catches of adults this year (but may be reflected in poor catches next year) but it may be possible that the hydrographic changes which caused low larval abundance also affected adult stocks.

"The work done at our laboratory sheds some light on the relationship between hydrographic conditions and larval shrimp abundance. We have evidence that temperature changes have effects on spawning, and there is some data which suggest effects of currents.

"Systematic collections of shrimp larvae have been made since 1959, and these data now cover three spring through fall periods. Sampling in the first year was incomplete and we lay less reliance on them than on the 1960 and 1961 collections. In 1961 both the time of peak spawning and the numbers of larvae caught were very different from the other two years. In 1959 and 1960 the largest numbers of larvae appeared in June, July and August. In 1961 the "peak" of larval abundance was in March and April. This peak was somewhat higher than that of 1959, and many times lower than the high values in the summer of 1960, in the order of 10 times or more. Further, the distribution of the larvae in the summer of 1961 was different from that previously observed, with the largest quantities being encountered in the southern section of the spawning grounds in shallow water, in the controlled area. In 1960 the much larger numbers of larvae were found in greatest abundance in an area to the north, centered north of Buoys B and C.

"It may be that the different patterns of abundance and distribution are related to temperature differences. In the summer of 1961 bottom temperatures were 3 degrees to 5 degrees C lower than surface temperatures in waters from 10 to 20 fathoms. In previous years this difference was only 1 degree to 2 degrees C. Further, bottom temperatures of this water averaged about 25 degrees C compared to 28 degrees C in 1960. It may be of special significance that bottom temperatures prevailed during the period of June through August, when peak spawning had taken place in the previous two years.

"There appears to have been a successful spawning, with good survival, at least to postlarval stages in 1960. The stocks may then have suffered a blow which reduced the populations markedly, when Hurricane Donna passed over the estuary on September 9. This possibility is supported by much reduced catches of young adult shrimp in the estuaries, as sampled at dip netting stations

(Idyll continued)

near Flamingo. Catches per unit of effort were much lower than normal (e.g. zero in September compared with an average of 193 per man hour in August) for six months after the storm, and somewhat lower thereafter. Catches now (in September 1961) are about 30% lower than the same time last year.

"In addition to larval numbers and distribution and sampling of young adults in the estuary, we have studied currents in the spawning grounds and in waters adjacent. Contrary to expectation, we have not found prevailing on-shore currents which would carry shrimp larvae to the mainland nursery grounds. Some other mechanism, perhaps the shrimp's own swimming power, must carry them there. We have, however, seen a difference in current patterns from year to year and there is a possibility that these affect larval abundance. A strong current was traced flowing south from Florida Bay into the Florida Straits in 1961, apparently of greater magnitude than in the other two years. It could, presumably, carry many larval shrimp out of Florida Bay, perhaps to their destruction.

"A "good year" of high larvae abundance in 1960 was followed by a poor year of commercial catches. It remains to be seen whether the low numbers of young adults in the estuary and the different spawning pattern observed in 1961 will produce an even worse catch next year.

"Clearly we must have far more information before we can relate shrimp abundance to natural conditions, and then to proceed to the next step of translating physiological observations into predictions of catch."

Lyle S. St. Amant, Chief Biologist
Division of Oysters, Water Bottoms and Seafood
Louisiana Wild Life and Fisheries Commission
New Orleans, Louisiana

"As per your request I'm submitting the following comments on the 1961 shrimp situation.

1. Without doubt 1961 is the worst year since 1957 and the total production may be well below 1957.
2. Financially the shrimp people are in serious trouble.
3. The cause of this shortage of shrimp could be any of a number of factors some of which we may not even suspect. On the other hand 1961 has been a most unusual year hydrographically speaking and no doubt these factors had a lot to do with the change in shrimp movements and populations.

Some of the things which occurred in 1961 may be listed as follows:

- a. Water and air temperatures were abnormal and almost the reverse of normal. In February and early March instead of the expected cold water, water temperatures averaged 7° C above normal and was well above 20° C much of

(St. Amant continued)

the time. Evidence of breeding activity was noted in many crustacea and other bay types. In March, April and May the water was colder than normal and was below 20° C much of the time. The net result of this was that the brown shrimp were much later than normal in entering the bay. The population and post larval counts were extremely low and it might be that the temperature drops in April may have killed most of the larval shrimp.

- b. Salinities in Louisiana were also far below normal. A high river coupled with excessive rain dropped salinities far below anything recorded in the past 10 years. Barataria Bay for example was practically fresh over its northern half and many fresh water or river shrimp invaded the area.
- c. The net result was that the larval shrimp crop may have been reduced by low temperatures only to enter bays that had an abnormal environment salinity-wise.
- d. Some other observations made include -
 1. Very late entrance of brown shrimp into the bays.
 2. No evidence of post larval or small white shrimp in June and July.
 3. Very slow growth and no distinct modes in the brown shrimp population.
 4. Staining indicated little if any movement of brown shrimp out of the bays as late as September 15 long after they should have moved to the outside.
 5. A very late or second hatch of white shrimp occurred in August or September and was noted in late September.
 6. Though lower than normal, better populations of brown shrimp occurred to the west of Bayou Lafourche where salinities were slightly higher."

BUREAU OF COMMERCIAL FISHERIES
(Gulf and South Atlantic Region)

The Bureau of Commercial Fisheries, under the direction of its Regional Office in St. Petersburg Beach, Florida, again carried out an integrated and coordinated program, giving special attention to action requested by the Gulf States Marine Fisheries Commission. A resume of the Bureau's activities follows:

EXPLORATORY FISHING AND GEAR RESEARCH BASE
PASCAGOULA, MISSISSIPPI

During the interval July 1960 to June 1961, exploratory and gear research work was initiated or continued on the following projects: industrial fish explorations, gear research on experimental and conventional shrimp and midwater trawl designs and evaluation of controllable pitch propellers for use with standard shrimp hull forms, scallop and clam explorations, exploratory snapper trawling, and shrimp explorations. A total of 1,889 stations were occupied during the period by the Base research vessels Oregon, George M. Bowers and Silver Bay.

INDUSTRIAL FISH EXPLORATIONS

The Oregon completed two exploratory cruises in the 3 to 50 fathom depth range between the Mississippi Delta and Brownsville, Texas, and one cruise off the Mississippi and Alabama coasts. Primary objective of these cruises was to determine the availability of industrial fish species to bottom trawling gear in the areas not presently fished by the commercial fleet. Commercial size catches (2,000 to 6,000 pounds/hour) were confined to the 3-20 fathom depth range off the western Louisiana and the eastern Texas coasts and in the 16-42 fathom depth range off the Mississippi and Alabama coasts. A secondary objective of these cruises was to delineate and chart foul bottom areas that are not indicated on current navigation charts.

The Silver Bay conducted a bottom trawl survey of industrial fishes off the east coast of Florida. Commercial concentrations were found along the 10 fathom curve south of Cape Canaveral.

GEAR RESEARCH

The Oregon conducted performance tests of experimental midwater trawl designs and different types of doors, depressors and elevators. Electronic instrumentation devices were designed and developed which recorded gear performance and fish behavior patterns. Of particular interest was the development of remote controlled underwater movie camera gear to record performance data under conditions not suitable for SCUBA divers.

The George M. Bowers continued underwater shrimp trawl studies. Instrumentation and methods for measuring significant mechanical parameters of shrimp trawl gear were designed and tested. These included a trawl door angle-of-attack indicator, a door-to-net leg angle indicator, a trawl and door spread indicator, and a towing warp angle indicator. These instruments, and others now being developed, should prove invaluable in future investigations of shrimp trawl mechanics. Preliminary findings indicate that the configuration of a given shrimp trawl assembly varies widely, and is dependent upon towing speed, warp scope ratio, and flotation. Underwater movies of 40' balloon and flat trawls fished with several sizes of chain doors were obtained at various speeds and scope ratios. Model midwater trawls of three different designs were constructed and comparative towing tests conducted to evaluate the comparative efficiency of each versus the standard British Columbia midwater trawl.

The George M. Bowers was outfitted with a 3-blade controllable pitch propeller. Steaming and towing tests made with the C-P propeller over the past 12 months indicate greater vessel maneuverability, significant elimination of torsional vibrations, a reduction in fuel consumption due to greater effective thrust from available horsepower, and increased propeller efficiency at both towing and steaming speeds.

SCALLOP AND CLAM EXPLORATIONS

The Silver Bay completed follow-up cruises in September, January and April to further delineate the calico scallop bed discovered earlier off Cape Canaveral and to check on the seasonal occurrence of this species. Approximately 100 interested industry members accompanied the vessel during these cruises. Shell stocks of calico scallops, in sufficient quantities for processing tests, were delivered to the industry at Port Canaveral, Miami and Fort Pierce, Florida. Exploratory clam dredging was conducted by the Silver Bay off the Florida east coast. Catches of marketable hard clams (*Venus* sp.) were insignificant; however, moderate quantities of dead shell were taken in the dredge indicating that this species has inhabited the area.

The Oregon made two trips to the calico scallop bed discovered off Pensacola during previous years to obtain shell stock for technological study.

EXPLORATORY SNAPPER TRAWLING

Snapper trawling experiments were conducted by the Silver Bay off the Florida east coast in May 1961 to determine the commercial availability of snapper, grouper and related species. Catches of marketable species ranged to 1,000 pounds per one-hour tow. Gear damage was negligible.

SHRIMP EXPLORATIONS

The Silver Bay conducted exploratory shrimp trawling operations along the Florida east coast, Straits of Florida and the western edge of the Great Bahama Bank.

No significant quantities of commercially important shrimp were taken in the areas surveyed. Surprising depth records were obtained for the pink (*P. duorarum*), Caribbean brown (*P. brasiliensis*), and the Caribbean white shrimp (*P. schmitti*) when catches of 1 to 8 pounds were made in depths of 150 to 200 fathoms.

The royal red shrimp grounds previously discovered off the east coast of Florida were sampled by the Silver Bay during a cruise in May 1961 to compare the potential with that observed in previous years. Five tows completed in 164 to 191 fathoms produced 1,195 pounds of 31-35 count royal red shrimp.

The Oregon periodically sampled the royal red shrimp grounds discovered earlier between the Mississippi Delta and Pensacola, Florida, to compare catch rates with those of previous years and to gather information relative to the seasonal distribution of the species.

BIOLOGICAL LABORATORY GULF BREEZE, FLORIDA

During the year, the coordination of the Bureau of Commercial Fisheries' research program on agricultural chemicals has been centered at this laboratory. Chemical manufacturers are cooperating fully in providing samples for testing of the most important pesticides as well as new compounds which are of potential value. Currently, tests are conducted only in the laboratory. The immediate toxic effects on estuarine species such as crabs, shrimp and mullet are being determined as well as the effects of sub-lethal doses on growth and reproduction in the oyster. Pesticide chemicals labelled with radioactive carbon are being used to determine how long they are stored in live oysters, and also to determine their effect on plankton productivity. Eventually, such labelled compounds will be used to trace the movement of pesticides in drainage areas following a commercial application. Laboratory facilities for this testing are being greatly expanded.

In conjunction with other Bureau laboratories, we have undertaken a study of the calico scallop. At present, little is known of its biology, how fast it grows, its population dynamics and other factors of importance to the establishment of a stable commercial fishery. Efforts to find previously fished populations in the Gulf near Pensacola have been unsatisfactory and samples are now being collected on a periodic basis in the Cape Canaveral area on Florida's east coast.

Studies to determine the resistance to disease of South Carolina seed oysters grown in Florida waters show that such oysters are not as susceptible to fungus infections as Pensacola oysters. On the other hand, they grow so much more slowly than local stock it would not be practical to import them.

The project to determine the effects of man-made changes on the ecology of a small bay near the laboratory is being expanded. Extensive surveys of the area fauna have been completed prior to significant artificial changes and it is going to be possible to document the effects due to man over a period of years. For comparative data, we have found it necessary to undertake a thorough inventory of the biota in the entire Pensacola Bay area. It is our intention to build a complete reference collection for the area and to record the seasonal changes in the animal communities. Such data will be invaluable in later years to serve as base lines for interpreting changes in these estuarine habitats.

Efforts to find ways of controlling the southern oyster drill are continuing. Approximately a thousand snails have been exposed to gamma radiation to determine dosage levels that will prevent the snails from reproducing without killing them. Levels used this year were too high and the snails eventually died. Surviving snails X-rayed the previous year with smaller dosages again failed to produce eggs and this partial success indicates that the idea is worth pursuing although the details of its commercial application are not yet clear.

During the past year, the laboratory staff has had five manuscripts accepted for publication and three other terminal project reports are being prepared for publication. The annual marine exhibit and lecture series for science classes was attended by more than 4,000 students in a ten-day period and sound movies of the lectures were made for national distribution as educational television shorts.

BIOLOGICAL LABORATORY GALVESTON, TEXAS

The Galveston Biological Laboratory conducts research on shrimp, industrial fishes, pesticides, red tide, and estuarine problems especially those concerned with engineering problems. Field personnel are also stationed at Pascagoula, Miami and St. Petersburg Beach.

SHRIMP PROGRAM

Completed analyses of four years (1956-1959) of detailed observations on catches of shrimp and fishing effort throughout the Gulf show that populations of all three major species, brown, pink, and white, undergo two periods of heightened spawning activity and thus produce two definable broods of young shrimp each year. There is good evidence that hurricanes, sweeping high turbulent waters over the estuaries,

can cause decreased survival of a brood of young shrimp. Because fishermen in the high seas fishery (especially on the Campeche Banks) cull the smaller sizes of shrimp from their catches, it will be difficult to obtain reliable estimates of relative abundance of stocks on these far banks until we can secure uncultured samples of the catches.

Relatively high recoveries on the Sanibel fishing grounds of juvenile pink shrimp stained and released in Pine Island Sound, coupled with no recoveries on the Tortugas grounds indicates that shrimp taken in the Sanibel and Tortugas fisheries probably depend on different nursery areas. More exact definition of the boundary must await future releases in the area between Pine Island Sound and Shark River.

Larval stages of the seabob, Xiphopeneus kryeri, have been identified and described for a forthcoming publication.

The numbers of postlarval shrimp entering Galveston Bay during March and April fell from 582 per sample (17 samples) in 1960 to 22 per sample (15 samples) in the same period of 1961. Associated hydrographic data are being analyzed for an answer to this sharp fall in numbers.

INDUSTRIAL FISH PROGRAM

Preliminary studies of industrial-type fishes off the east coast of Texas over a 9-month period show that the most abundant species by both number and weight was the longspine porgy, Stentomus caprinus. The second most abundant by weight was the lizardfish, Synodus foetens, followed by the Atlantic croaker, Micropogon undulatus. This contrasts with the findings of the study in the Mississippi Sound area in which the leading species was shown to be the Atlantic croaker.

In the central Gulf area the total number of fishing trips in 1960 dropped 11 per cent from that made by the commercial fleet in the preceding year. On the other hand, the average catch per trip rose by 11-1/2 per cent. Average-length-of-trip data for both years are not available, but this jump in fishing success is believed mostly due to a significant increase in trawler size (and power) and the correspondingly greater number of vessels with refrigeration facilities.

Also worthy of note is the tendency toward westward extension of the fishing grounds. With the advent of larger vessels and refrigeration equipment, increasing poundage of industrial species are being taken west of the Delta. Contrasted to only 16 per cent in 1959, an estimated 60 per cent of the total industrial fish harvest originated here in 1960. As in the past, all fishing was concentrated inside the 20 fathom contour.

PESTICIDE PROGRAM

The studies reported last year on postlarval shrimp were extended to include adult shrimp, both brown and white, and several estuarine fishes. The results show that most of the many types of chlorinated hydrocarbons are very toxic to all species. The toxicity is somewhat dependent on the formulation used, the liquid formulations being generally much more toxic than the solid.

ESTUARINE PROGRAM

Because of the growing need to understand the effects of man-made changes on the estuarine environment, a small estuarine program was initiated in 1961. The purpose was to develop a nucleus of personnel and preliminary knowledge, and to explore the type and scope of research necessary to predict the effects of engineering projects on the fisheries.

For the present, the estuarine work is divided into three projects:

1. Evaluation of estuarine data. The study of existing published and unpublished data to obtain a clear picture of the present state of our knowledge in order to determine how most effectively to attack the basic problems without duplication of effort.
2. Effects of engineering problems. Aimed at more or less empirical determination of the causes of effects on the fauna through study of conditions before and after construction of specific projects. Also advises on particular projects.
3. Ecology of nursery grounds. To determine the types of estuarine habitat suitable for different sizes and species of fish and invertebrates, how they are affected by fluctuations in the environment, and their interrelationships.

Much of the knowledge must be obtained from studying conditions before and after construction of specific projects; thus, in some cases, the project and adjacent waters constitute our "laboratory." The Corps of Engineers constructs large-scale models of some of its projects at the Waterways Experiment Station in Vicksburg, Mississippi. Tests with these models can be very useful in the prediction of project effects on the hydrography of an area.

Study of the Mississippi River-Gulf Outlet Project, carried on by the Texas A & M Research Foundation, is nearing completion after some 2-1/2 years of intensive work. The field station at Hopedale, Louisiana, was closed in April, and the final report will be completed by midsummer. The wealth of data on biota in the low, medium and high salinity areas, and the extensive hydrographic observations will

permit, perhaps for the first time, a full evaluation in later years of the long-term effects of a very large-scale channelization project.

RED TIDE PROGRAM

Nearly 5,000 organic compounds have been tested to determine their toxicity to the red tide organism, and 88 of them proved to be as toxic or more toxic to Gymnodinium breve than copper sulphate. Tests are now in progress to determine whether any of these extremely toxic substances are sufficiently harmless to other marine fauna to warrant field testing.

All experimental and field work on red tide is being drastically reduced to permit analysis and preparation of reports on accumulated data. When these reports are completed, a reappraisal of red tide research will be made to determine the scope and direction of any future research.

TECHNOLOGICAL LABORATORY PASCAGOULA, MISSISSIPPI

The staff of the laboratory consists of a laboratory director, a chemist, a food technologist, a bacteriologist, two technicians, and two clerk-typists. Three programs of studies are now under way at Pascagoula: chemical studies, bacteriological studies and products and standards development. In addition, the director supervises the Seafood Inspection and Certification Services Region 2.

Chemical studies on marine products included proximate composition analyses on industrial fish used for petfood and meal production. Samples are collected weekly from local plants for protein, oil, moisture and ash analyses. Chemical studies on reactions in canned seafoods is a more basic approach to problems of can corrosion, food discoloration, and struvite formation.

Bacteriological studies have been initiated to determine the separate effect of marine and terrestrial micro-organisms on seafoods stored in ice and later canned. Sanitation improvements should follow in-plant bacteriological studies to determine the numbers and source of micro-organisms found in frozen seafoods. Special methods and media were utilized to cultivate these marine bacteria.

Product development work continued on canned sardine-like fishes and mullet. Several methods of canning were utilized in processing sardines in oil and brine. Studies were continued on the development of a canned fish for mullet. Data were obtained on approximate costs and yield of processing these fish. A pilot plant for smoking mullet was set up and a leaflet published describing the construction and operation of the smokehouse.

The Seafood Inspection and Certification Services continues to grow with 20-22 plants now under Continuous Inspection. Approximately 22 inspectors and two supervisors provide inspection on as high as 1.5 million pounds of seafoods per week during the busy fall season. Although frozen raw breaded shrimp provides the bulk of the production, other frozen specialties such as shrimp-a-la-creole, casserole of crab meat, frozen peeled raw deveined shrimp, breaded oysters, and TV dinners continue to grow in importance. The inspectors also provide lot inspection on occasions.

STATISTICS

An annual general canvass of the commercial salt water fisheries of each of the Gulf States was conducted. This canvass encompassed the gathering and publication of data covering employment within both the fisheries and shore plant installations, production and value of landings and processed or manufactured seafood products, number of craft and types of gear engaged in the fisheries, and catch by gear by general waterbodies.

A report on the commercial and sport fishing and hunting harvests in the Lake Pontchartrain area was completed. Data for the report were collected for the Office of River Basins, and, together with reports covering biological and ecological studies, will form the basis for the Fish and Wildlife Service recommendations regarding the best type of hurricane protection structures from the standpoint of conserving fish and wildlife resources within the area.

Through the excellent cooperation of the conservation agencies of the respective States, the publication of monthly landings bulletins was continued. The inclusion of a value figure for each species in the Florida and Alabama bulletins, commencing January 1, 1961, has increased the usefulness of these publications. The inclusion of this feature in the monthly bulletins of the other States will be accomplished as soon as possible.

Through the efforts of the Commission, additional funds were provided for fiscal year 1962. These funds will be used to obtain detailed shrimp statistical data at ports not previously covered on a full time basis, and which have grown in volume of landings since the start of the detailed shrimp statistical program in 1955. A review of the shrimp statistical program as it applies to biological research was conducted at the Regional Office on June 20. Recommendations were made at that time regarding modifications in the monthly and annual Gulf Coast Shrimp Catch by Depth and Area which will, in turn, allow port agents more time to interview vessel captains regarding areas fished and productive and non-productive fishing effort.

MARKET NEWS

Publication of accurate and current marketing information was continued by the issuance of daily Fishery Products Reports, together with monthly and annual summaries.

In addition to supply and market conditions in the major domestic fisheries, news articles in the daily reports have been expanded to include information on the status of foreign fisheries based upon reports of U. S. Embassy personnel. Considerable space has also been devoted to articles dealing with Congressional proceedings on fishery matters.

The daily Fishery Products Report also continued to serve as one of the foremost media for informing industry of the activities of other Branches of the Bureau and conservation agencies of the States. A specific example of this type of information is that published regarding the shrimp staining program during the past year.

MARKETING

The Bureau's three Marketing offices continued a vigorous marketing program aimed at stimulating consumption of regional species. Activities included the two annual industry-government campaigns--National Fish 'n' Seafood Week and the Lenten promotion--development of a special marketing program for the newly discovered calico scallop resource, a special regional promotion to assist the blue crab industry, and Phase II of "OPERATION SHRIMP." A total of 89 fish cookery demonstrations were presented, and recipe testing and development work was carried on at the Bureau's test kitchen in Pascagoula.

FINANCIAL ASSISTANCE

In the Gulf States, 201 fishery loan applications have been received. Of these, 68 have been approved in the total amount of \$1,615,154. Also, 2 applications for Federal insurance of fishing vessel mortgages have been approved. The past year's economic stress experienced by the fishing industry in this area curtailed construction of new boats, and applications for mortgage insurance fell short of those expected. The Bureau also administers a subsidy program for the construction of fishing vessels. Under this program, subsidies may be granted to qualified applicants. The amount which can be paid is limited to the difference between the cost of construction in domestic and foreign shipyards, or 33-1/3 per cent of the domestic cost, whichever is smaller. Eligibility for such a subsidy has not yet been established for fisheries in the Gulf.

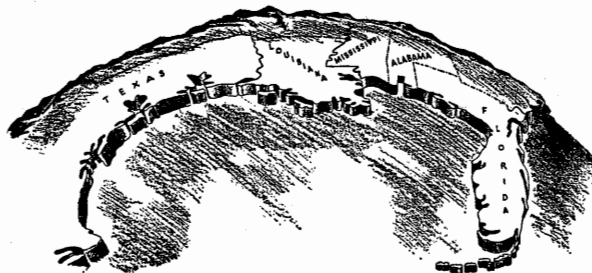
Gulf States Marine Fisheries Commission

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RESUME OF STATE AND FEDERAL GULF RESEARCH AND EXPLORATORY ACTIVITIES FOR THE PERIOD OCTOBER 1960 - 1961

A L A B A M A

The research program of the Department of Conservation has continued at the Marine Laboratory at Cedar Point in cooperation with the University of Alabama. New equipment has been added by both the Department and the University and the laboratory staff has been increased.

Plans have been drawn for a modern laboratory and Seafoods Division office to be built on Dauphin Island. This plan has not reached its final stage but hopes are high that these much needed facilities will soon become a reality.

The major efforts of the laboratory's research program have been directed toward increasing oyster production on existing oyster reefs and establishing new reefs by an increased shell planting program. This operation was set back greatly in the spring of 1961 when ten weeks of flood waters and rain killed nearly 80% of Alabama's oysters. Efforts have since been increased to rehabilitate the old reefs and enlarge the new ones.

As of September 1, 1961 when oyster season opened it looked as though there would be almost no commercial size oysters available this year but that recovery of the reefs was progressing very satisfactorily.

FLORIDA

As in past years, the Florida State Board of Conservation, Salt Water Fisheries Division, conducts research through its own facilities in St. Petersburg and Apalachicola and by contract with the University of Miami. All three are under the supervision of the headquarters and director of research of the department in Tallahassee.

Oyster Division Apalachicola

The decline of northern production centers has been responsible for a new surge of interest in Florida oysters. In order to better handle the increased activity, arrangements were completed for the hiring of an oyster biologist.

During the spring of 1961 approximately 65,000 bushels of shell were planted in Apalachicola Bay.

Marine Laboratory Bayboro Harbor, Maritime Base St. Petersburg

REEF FISHES

During the past year fish studies have turned from estuarine to offshore reef problems. Increasing fishing pressures in the inshore areas plus the implacable deleterious effects of a mushrooming urbanization, increase the potential importance of reefs, particularly those of the near-offshore.

Emphasis during the first year has been on the baracuda, a fish of increasing importance to anglers in the extreme southern part of the state. Tagging has indicated that baracuda migrate very little, generally speaking. Most of the fish returned were caught within a very few miles of the place where they were tagged, even though in a few instances they were at large several months.

Other studies, including the tagging of a variety of reef fishes indicated that reef species generally are "stay at homes," being recaptured in traps on the same reef over a period of several months.

BASIC SHRIMP BIOLOGY

Final write-up has been made on several years' observations on the pink spotted shrimp, Peneaus duorarum Burkenroad. The manuscript has been consigned to the Board's Professional Series.

Summaries are presented therein on the size of shrimp at offshore migration, growth rate, spawning season and food.

It seems likely from the studies reported upon that temperature may play an important role in determining the abundance of year classes because of its role in spawning stimulation.

TAXONOMY AND BIOLOGY OF MINOR FISH SPECIES

Although not used directly by commercial men and anglers, many of the smaller species of fishes serve as food for the larger species and thus become important items for study. Investigations were continued during the year on the systematics and biology of several of these inconspicuous forms.

SHRIMP PARASITES

Research continued on the parasites of shrimp. A survey was completed on the intensity of infection in various parts of southeastern United States, the Gulf of Mexico, Caribbean and other tropical and sub-tropical waters. In addition, life history work was done on one of the nematodes found commonly.

ALGAE AND SPERMATOPHYTES

Studies continued on the occurrence and abundance of various species of algae.

The basic biology of the spermatophytes having been largely dealt with in work of previous years, attention was focused during the past year of the possibility of establishing beds of Thalassia in areas where they do not now exist.

Spots were selected which appeared to be satisfactory and clumps and individuals were planted in submerged bottoms. Some of these prospered and increased.

The principal problem was erosion and future studies should be directed to a solution of that problem.

RED TIDE

Samples are taken periodically throughout each year for presence and abundance of Gymnodinium breve. Any minor outbreak is inspected by airplane and sampling. Later, the permanent records made will be useful in correlating these dinoflagellate blooms with weather and hydrographic conditions. These studies have now been carried out over a period of several years.

BASIC ESTUARINE AND COASTAL ECOLOGY

Frequent surveys made in connection with proposed construction projects, dredge and fill developments and other man-made changes provide raw data of great value for ecological interpretation. A synthesis has been started whereby ecological data and geographical distribution information is to be compiled by species for all animals and plants encountered. This long term project is expected to result in several volumes of reference material for Florida's coastal waters.

During the past two years these inspections have been extended to include information relative to the establishment of artificial fishing reefs.

Marine Laboratory
University of Miami
(Contract work)

STATISTICS

Fishery landings of all commercial species are recorded by county. In addition, fish tickets are used widely in the industry on a voluntary basis. These tickets form the basis of yield per unit of effort evaluations.

SPECKLED TROUT

Tagging studies, carried out in the area around Fort Myers have been concluded. Results are presently being analyzed mathematically for conclusion on population dynamics including natural mortality.

FLORIDA BAY ECOLOGY

Much of the data obtained in previous years has been compiled into reports. These include an annotated check list of animals and plants encountered,

hydrographic data and shrimp dynamics.

Sampling is continuing with emphasis on indicator organisms.

TRASH FISH CONVERSION

A report has been prepared on an investigation on the break-down of trash fish at sea utilizing natural enzymes catalyzed by the addition of acid.

HURRICANE DONNA

A detailed report has been compiled of the damage wrought by Hurricane Donna of 1960 to the areas of Florida Bay encompassed by its path. This will be of value in interpreting future disasters of a similar nature.

L O U I S I A N A

The Louisiana Wild Life and Fisheries Commission through its seafood section is gradually expanding its marine research and development program as rapidly as trained personnel becomes available. The Marine Laboratory at Grand Terre Island is now operating to the full capacity of its personnel and a long range program is rapidly becoming a reality. The principal programs at the present deal with hydrographic studies, shrimp and oysters.

HYDROGRAPHIC STUDIES

Continuous hydrographic studies are being made in the Grand Isle area and over as much of the adjacent coast as possible. The aim of this work is to establish what may be considered normal or expected environmental conditions as compared to abnormal conditions. This information is then correlated with all phases of work on shrimp and oysters. Results from these studies indicate that 1961 was a most unusual year, both from a standpoint of salinity and the temperature. Salinities were far below normal throughout most of the summer. Water temperatures were above normal in late winter and early spring, and below normal in late spring. These data appear to coincide with the poor shrimp crop of 1961.

SHRIMP STUDIES

Shrimp research in recent years in Louisiana was principally confined to studies of distribution, growth, and population modes. Much of this work dealt with the white shrimp Penaeus setiferus. In 1959-60 the program was expanded to do more work on the brown shrimp Penaeus aztecus, and the staff at the marine laboratory cooperated in much of this work. All shrimp studies are now assigned to the marine laboratory. The work now being carried out is in its initial phase but includes the following:

1. Attempts to determine the off-shore spawning areas, time of spawning, and factors affecting spawning of both P. setiferus and P. aztecus.
2. Growth rates distribution, and movements of both species in inside waters.
3. Studies of post larval arrival into the bays including density counts.

4. A staining program of tagging has been carried out in 1960-61 to determine movements from the bays to the open seas. In this work some 50,000 shrimp have been released: 33,000 in 1960, and 20,000 in 1961.
5. Hydrographic and weather data are being correlated with past and present production of shrimp.
6. Histological studies of the reproductive cycle at different ages and at different times of the year are in progress.
7. Controlled effects of temperature and salinity on very small shrimp is contemplated.

OYSTER STUDIES

The research and management of oysters in Louisiana has followed much the same pattern as in past years. In 1960 oyster production was excellent and a bumper seed year occurred. In 1961 seed oysters are not as plentiful because of excessive fresh water, and a late spawning season resulting from low water temperatures. Adequate seed for planting is expected and if growth is normal, 1961 production should be successful. Fresh water did greatly reduce the snail Thais and eliminate much of its reproduction. Dermocystidium marinum is apparently greatly reduced because of fresh water or other causes. The net result should be excellent oyster conditions in 1962.

Studies and development of oysters in Louisiana in 1961 included the following:

1. Forty thousand cubic yards of shell were planted for cultch. This included 25,000 yards of clam shell planted in Black Bay, and 15,000 cubic yards of mud shell planted in the Lake Borgne-Raccoon Island area. Initial sets on the Black Bay shell exceeded 70%.
2. Sister Lake has been maintained on an alternate year harvest plan to maintain a high yield. Under this plan production increased from 15,000 barrels in 1957-58 to nearly 100,000 barrels in 1961.
3. Routine studies of oysters for D. marinum indicated a sharp reduction in the occurrence of the fungus after mid-summer of 1960. Extensive studies of summer oysters in 1961 have failed to show much evidence of infection in over 1000 samples. This study is being intensified and all phases of the procedure is being checked to rule out any possibility of error in examination..
4. Observations and studies of the snail Thais haemastoma have continued and are principally aimed at making a movie record of its life history, breeding, feeding, and general biology.
5. Studies of oil pollution of oysters and related industrial damage to oyster beds is routine. In 1961 complaints and problems have shown a general reduction except in cases of boat and barge traffic, and dredging and silting.
6. The use of radio-active tracers in studying oil intake by oysters is contemplated in cooperation with the Louisiana State University Biochemistry Department.

M I S S I S S I P P I

Work continued on the data collected on the fauna of the Louisiana coast off the Grand Isle region during the two previous years by the Gulf Coast Research Laboratory.

Work also continued on the data relating to racial studies, life history and to development of the eggs and gonads of the menhaden. A review of menhaden biology, with special reference to the Gulf menhaden, was published by the Fish and Wildlife Service. A paper on the distribution of the three species of menhaden in the Gulf of Mexico was published in Transactions of the American Fisheries Society. A paper on the cephalic lateral line system of these fishes was published in Copeia.

The Gulf Coast Research Laboratory established its own journal, called Gulf Research Reports, and Vol. I, No. 1 was published. This was a paper describing the distribution with natural history notes on all marine and brackish water mollusks of the State of Mississippi.

The study of the outflow of the Mississippi River was continued for the Office of Naval Research.

Forty-six senior and graduate students took advanced courses in marine geology and marine biology at the Gulf Coast Research Laboratory during the summer session. Twenty-two engineering students took a course in surveying which was especially related to the marine geological program and fifty high school students were given an introduction to the marine sciences with the cooperation of Louisiana State University and the National Sciences Foundation.

Laboratory scientists published papers on the following subjects during the year: pollution problems along the Gulf coast, studies on the proteins and salts in the blood of marine fishes, a new starfish from South America, and several others.

A member of the Laboratory staff has acted as biologist for the Mississippi Marine Conservation Commission and is a member of that body. During the year 1960-61 he spent approximately half of his time on the Commission's business and assisted the Marine Conservation Commission in the following activities:

OYSTER BOTTOM SURVEYS AND SHELL AND SEED OYSTER PLANTING

During the first part of 1960 a survey of the productive and potentially productive oyster bottoms of the entire Mississippi Sound and bays was undertaken to ascertain the condition of the existing reefs and bottoms so that future plans for rehabilitating and enlarging of the oyster growing areas could be undertaken and so that a definite plan for the future could be adopted and put into effect.

During the summer of 1961 the Laboratory geologist joined with the Commission biologist and an employee of the U. S. Soil Conservation Service in studying the sedimentation of the bottom of Mississippi Sound by a new method which consists of a probe which gives off gamma rays and a receiving apparatus. It is hoped that the best bottom for oysters can be selected with this new tool.

From June 16-July 22, 1960, 30,000 barrels of fresh oyster shells were planted in the waters of the three coastal counties. The shells were planted on productive and once productive bottoms close to shore. The shells planted on productive bottoms were so placed as to enlarge those areas. Fresh oyster shells were collected at the canneries and were transferred to a 90 x 26 foot barge. The barge was maneuvered by the Commission work boat URANUS over the desired bottom. As the barge was being towed in the planting area, a 4-inch discharge pump was used to jet the shells overboard so as to distribute the shells evenly over the bottom. Thus far preliminary findings concerning the 1960 shell plantings look promising considering the late start that the Commission had in getting a program underway.

Seed oyster planting was carried out for the first time in recent years. Approximately 2,500 barrels of seed oysters were removed from areas where small oysters were thick; they were redistributed to areas that were sparsely populated. The work was done by Commission personnel using the Commission vessel URANUS. This project was conducted with two objectives in mind--one, to improve existing productive oyster bottoms and, second, to thin and cultivate over-crowded areas.

Another phase of the oyster bottom improvement program was instituted in 1961. This involved the dragging of the once productive outside reefs off Pass Christian by oyster dredges following heavy spring rains; this was done with the idea that the shells would be turned over and clean, unfouled surfaces would be exposed prior to the spawning and setting period which takes place in late spring and summer.

SHRIMP INVESTIGATIONS

Shrimp investigations during 1960 were not intensive; however, enough information was gathered to indicate that the migrations and other life habits of our commercial species of shrimp conformed with those found in the adjoining states. In the early part of 1960 the Commission undertook to revise some of its shrimping regulations based on the current knowledge of habits and migrations of the three commercially important species. Brown shrimp usually make their appearance in the bays and shallows around the last of March or the first weeks in April and grow approximately 2 inches per month from March to June. During the spring of 1961 small brown shrimp were not found in Mississippi Sound until April 27 and the numbers were relatively small. The numbers found decreased through the month of May and growth of the small brown shrimp progressed very slowly. During the last week in May the numbers of small brown shrimp increased slightly up until the second week in June, during which time another population of small shrimp averaging 70 mm. in length appeared in the deeper waters of the Sound and mingled in with the larger shrimp. During the month of June there was a noticeable decrease in the entire brown shrimp population. Possibly natural mortality exceeded growth due to the lowered temperatures of the water during the growing season. White shrimp appeared in Mississippi waters from two to three weeks late and they are in goodly numbers as this report goes to press.

M I N U T E S

Executive Session, New Orleans, Louisiana, October 20, 1961

Joining the Commissioners and proxies in the Robert E. Lee Room of the Monteleone Hoteo for breakfast at 8:30 AM were: George W. Allen, Jack Britt, Robert M. Ingle, William J. Demoran, Terrance R. Leary, James N. McConnell, Lyle S. St. Amant, Philip A. Butler, Francis Captiva, George B. Gross, Joseph H. Kutkuhn, Charles H. Lyles, George A. Rounsefell, Frank J. Silva, George W. Snow, Spencer H. Smith, James H. Summersgill, Seton H. Thompson, John Mehos, C. P. Idyll and David H. Wallace.

Chairman Sheppard called upon Mr. Seton Thompson following breakfast, who briefly discussed the Gruening Bill (S. 1230), which will again be presented to the Congress for consideration of increasing Saltonstall-Kennedy funds by some \$4,000,000. Mr. Thompson suggested a special committee be appointed which would meet regularly to study shrimp research progress. He said that the \$175,000 additional shrimp research allocation for fiscal 1962 would probably be carried in 1963. It was also stated that funds in addition to the \$175,000 would be requested for fiscal 1963 by the Fish and Wildlife Service and that it would be known by January 1962 if the requested amount has been permitted to remain in the budget by the Bureau of the Budget.

Dr. Idyll said that the Magnuson Oceanographic Bill passed the Senate in the last session. He believes the Miller bill has more of a chance in the House of Representatives. The two bills will likely be considered in Conference, it was added.

Dr. Philip Butler told briefly of the progress being made in the study of pesticides.

Mr. John Mehos thanked the Commission for its efforts in securing additional shrimp research funds, on behalf of the Texas Shrimp Association. He said that Gulf shrimp associations were agreed that a committee should be appointed to coordinate the several shrimp research programs and to study such programs in all areas. He mentioned that Messrs. Albert Collier, Gordon Gunter, Howard T. Odum and Robert M. Ingle would be a good group to serve on such a committee. Drs. Rounsefell and Idyll stated that they believed men who are in the actual research could best serve on the suggested committee. Chairman Sheppard assured Messrs. Thompson and Mehos that their suggestions about a special shrimp committee would receive attention following the Pre-Executive Session; whereupon the guests were excused in order that they may attend the Scientists' Session in the Queen Anne Room.

With the opening of the Executive Session, Mr. Lee moved that the Biloxi Meeting Minutes, March 16-17, 1961, be approved as mailed to the Commissioners, April 25. Commissioner Dyson seconded. On vote the motion was passed.

A Financial Analysis approved by the officers was distributed. Appreciation for the increased Alabama membership dues was expressed and hope was expressed that the 1962 Mississippi Legislature would increase that State's

dues to the requested sum of \$3,500 per annum. The Financial Analysis, which contains a budget of suggested operating costs for fiscal 1961-62, is herewith first attached. The secretary explained that the \$800 item of Furniture and Fixtures was proposed to replace the second-hand office furniture purchased in early 1950 and to replace the 1954 purchased manual typewriter with an electric machine. The secretary asked for retention of the \$1,500 travel estimate so that he could better perform the liaison duties of the office, which function has been handicapped in recent years due to the lack of funds. Commissioner Caffey moved that the Budget be approved as presented. Commissioner Younger seconded. On vote the motion was passed.

Following a discussion among the Alabama Delegates as to a site for the October 18-19, 1962 meeting, their decision favoring Dauphin Island, Commissioner Simpson moved for designation of that location. Commissioner Dyson seconded. On vote the motion passed.

It was brought-up by Chairman Sheppard that consideration should be given to changing the title Secretary-Treasurer of the Commission to that of Director, due to the latter title more clearly defining the position of the executive officer. It was pointed out that there would be no change in either remuneration or duties as the matter was discussed. Commissioner ^{er Young} proposed such a resolution. Commissioner Scott seconded. On vote the resolution was adopted. Copy of ~~same~~ is herewith second attached.

The matter of appointing a special shrimp committee was discussed at length. Commissioner Cory presented a resolution in this connection, copy of which is herewith third attached. Commissioner Simpson seconded. Upon vote the resolution was adopted.

Messrs. Demoran of Mississippi and Leary of Texas were recommended by their respective State Delegations to serve on the Committee to Correlate Research and Exploratory Data. The Chairman instructed that their names be added to the roster.

Mr. Lee presented a resolution expressing appreciation for the support of the Congress and the Fish and Wildlife Service of GSMFC resolutions involving the gathering of shrimp statistical data. Commissioner Dyson seconded. Upon vote the resolution was adopted. Copy of resolution is herewith fourth attached.

Considerable time was devoted to a consideration of the purposes of and limitations imposed upon the GSMFC Compact. The Chairman read appropriate sections of the Compact.

Commissioner Dyson nominated Commissioner Young of Louisiana for the office of Commission Chairman for the year 1961-62. Mr. Lee seconded. No further nominations were presented and Commissioner Young was acclaimed Commission Chairman.

Commissioner Younger nominated Commissioner Caffey for the office of Commission Vice-Chairman for the year 1961-62. Commissioner Simpson seconded. No further nominations were presented and Commissioner Caffey was acclaimed Commission Vice-Chairman.

Chairman elect Young referred to the excellent manner in which Commissioner Sheppard had administered the duties of Commission Chairman during the year and proposed a resolution in acknowledgement of the Commission's gratitude. Mr. Lee seconded. Upon vote the resolution was adopted; copy of which is herewith fifth attached.

Vice-Chairman elect Caffey proposed a resolution of thanks for the wonderful manner in which the Louisiana Wild Life and Fisheries Commission had hosted the meeting. Commissioner Lawrenz seconded. Upon vote the resolution was adopted; copy of which is herewith sixth attached.

No further business remained to be transacted and the session was adjourned at 11:30 AM.

Prepared by: W. Dudley Gunn
Director

Gulf States Marine Fisheries Commission

CHAIRMAN
 WALTER O. SHEPPARD, MEMBER
 HOUSE OF REPRESENTATIVES
 STATE OF FLORIDA
 FORT MYERS, FLORIDA

VICE-CHAIRMAN
 L. D. YOUNG, JR., DIRECTOR
 LOUISIANA WILD LIFE AND
 FISHERIES COMMISSION
 NEW ORLEANS, LOUISIANA



SECRETARY-TREASURER
 W. DUDLEY GUNN
OFFICE SECRETARY
 EMILY C. CARR
HEADQUARTERS OFFICE
 312 AUDUBON BUILDING
 NEW ORLEANS 16
 LOUISIANA
 TELEPHONE: 524-1765

Financial Analysis

Working Capital

Cash on hand, June 30, 1961	\$	69.59
Membership dues for 1961-62		
Alabama	\$ 3,500.00	
Florida	4,500.00	
Louisiana	5,000.00	
Mississippi	1,000.00	
Texas	6,000.00	
Available for operating expenses, 1961-62	\$	<u>20,000.00</u>
	\$	<u>20,069.59</u>

Operating Expenses:

<u>Item</u>	<u>Budget 1960-61</u>	<u>Actual 1960-61</u>	<u>Suggested 1961-62</u>
Salaries	\$ 13,000.00	\$ 13,000.00	\$ 13,000.00
Publication expense	500.00	672.08	600.00
Travel expense	1,000.00	1,192.36	1,500.00
Rent	1,080.00	1,080.00	1,080.00
Stationery, printing, supplies	375.00	281.85	375.00
Telephone and telegraph	350.00	426.77	425.00
Postage	150.00	169.78	185.00
Electricity	95.00	92.54	94.00
Accounting	225.00	225.00	225.00
Insurance	260.00	258.69	260.00
Meeting expense	85.00	87.57	150.00
Payroll taxes	250.00	274.50	275.00
Furniture and fixtures	-	-	800.00
Equipment maintenance	-	-	75.00
Sundry	30.00	45.94	60.00
Depreciation	70.00	40.91	45.00
	\$ <u>17,470.00</u>	\$ <u>17,847.99</u>	\$ <u>19,149.00</u>

RESOLUTION

BE IT RESOLVED by the Gulf States Marine Fisheries Commission
that the title of its executive officer be changed from that of
Secretary-Treasurer to that of Director.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission, October 20, 1961, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.



W. D. Gunn, Director
Gulf States Marine Fisheries Commission

RESOLUTION

RESOLVED by the Gulf States Marine Fisheries Commission that the Commission Committee To Correlate Research and Exploratory Data, together with a representative of the United States Bureau of Commercial Fisheries, form a special committee to examine existing shrimp programs of the Gulf States and the Federal Government in an effort to better coordinate these programs and suggest standardized procedures; and

BE IT FURTHER RESOLVED that said special committee be requested to report its findings not later than the March 15-16, 1962 regular meeting of the Commission at Galveston, Texas.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission, October 20, 1961, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.



W. D. Gunn, Director
Gulf States Marine Fisheries Commission

RESOLUTION

WHEREAS, the Gulf States Marine Fisheries Commission has made repeated requests for improvement in the shrimp statistical reporting program in the member states; and

WHEREAS, the importance of this fully implemented program has been recognized by the Congress of the United States and the Department of the Interior Fish and Wildlife Service in recent appropriations;

NOW, THEREFORE, BE IT RESOLVED, that the Gulf States Marine Fisheries Commission expresses its appreciation to the above agencies for this support in continued implementation of this essential part of the overall shrimp study program.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission, October 20, 1961, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.



W. D. Gunn, Director
Gulf States Marine Fisheries Commission

RESOLUTION

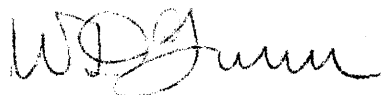
WHEREAS, Walter O. Sheppard, appointee of the Governor of Florida on the Gulf States Marine Fisheries Commission, has served as Chairman of the Commission for the year 1960-61; and

WHEREAS, he has served in a most distinguished manner, having not only discharged in a highly commendable fashion the duties of such office as set out in the Commission directives, but having additionally served the member Gulf States through his attendance and participation at numerous meetings and conferences of other agencies concerning the marine fisheries resource.

NOW, THEREFORE, BE IT RESOLVED that the Gulf States Marine Fisheries Commission expresses to Walter O. Sheppard its most sincere appreciation for the fine leadership he most generously provided the Commission during his term of office and during which period the objectives of the Compact so admirably advanced.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission, October 20, 1961, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.



W. D. Gunn, Director
Gulf States Marine Fisheries Commission

RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission expresses its most sincere appreciation to the Louisiana Wild Life and Fisheries Commission for the very cordial hospitality extended upon the occasion of the twelfth annual meeting of the body at New Orleans on October 19-20, 1961.

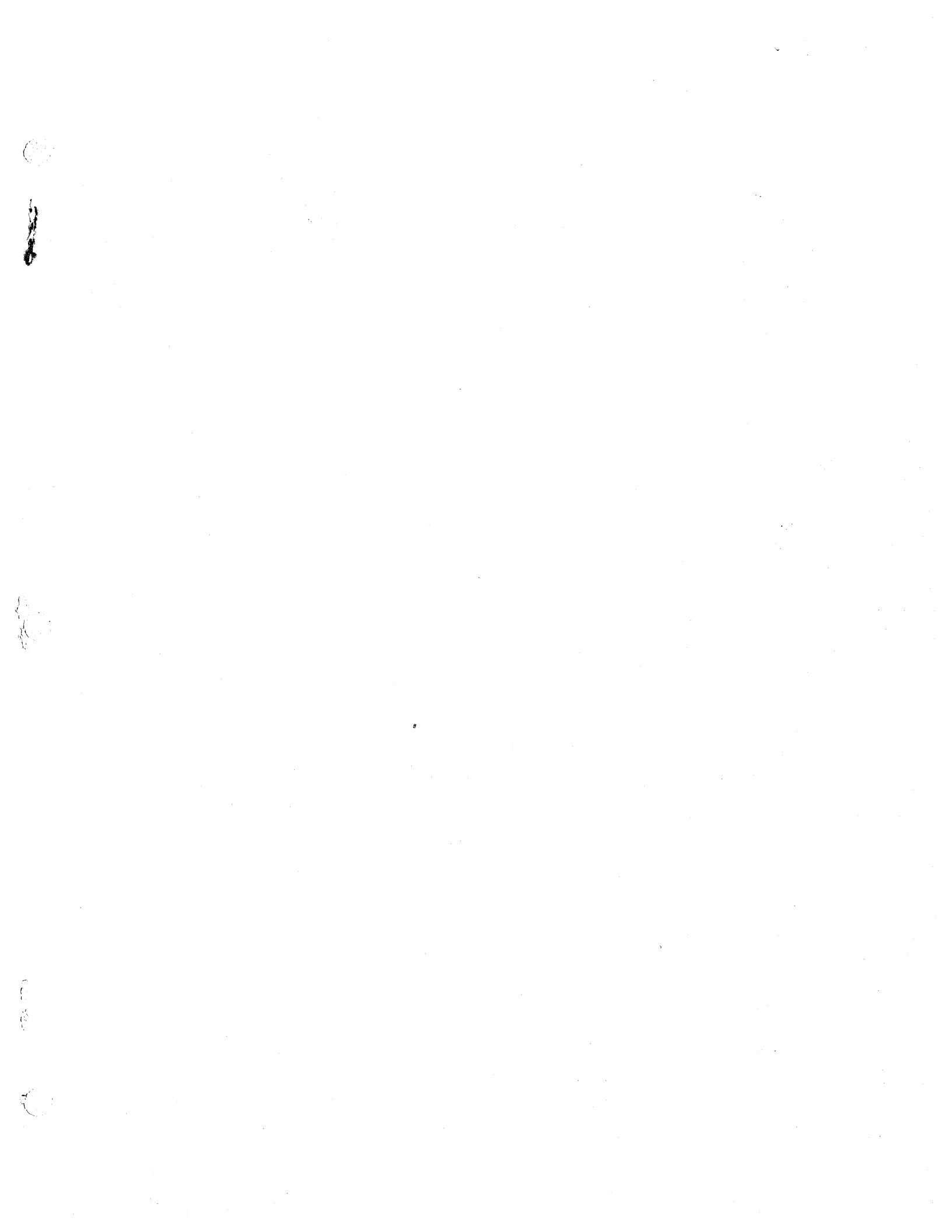
BE IT FURTHER RESOLVED that this Commission particularly expresses its gratitude to the Division of Education and Publicity for an excellent coverage of the meeting and for a most interesting conducted tour of the Museum of the Louisiana Wild Life and Fisheries Commission. This acknowledgement is also extended to the Division of Law Enforcement, the Division of Oysters, Water Bottoms and Seafood, and others who contributed to the delighted surprise and enjoyment of the delegates in the generous serving of delectable Louisiana oysters on-the-halfshell, upon completion of the tour; and to those who otherwise assisted in the accomplishment of a successful meeting of this interstate fisheries compact agency.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission, October 20, 1961, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.



W. D. Gunn, Director
Gulf States Marine Fisheries Commission



PROGRAM

(Commission Chairman Walter O. Sheppard, Presiding)

REGISTRATION 9:00 A.M.

CALL TO ORDER 9:30 A.M.

INVOCATION
Reverend L. C. Hoff, Pastor
East Howard Baptist Church, Biloxi

ROLL CALL

WELCOME ADDRESS
The Honorable Ross R. Barnett
Governor of Mississippi
Introduced by:
Commissioner William G. Simpson, President
Mississippi Marine Conservation Commission

BUREAU OF COMMERCIAL FISHERIES ACTIVITIES
Seton H. Thompson, Regional Director
Bureau of Commercial Fisheries

STOCK, ORGANIZED SPORTSMEN—SHRIMP
Charles W. Bosch, Jr., Executive Secretary
Louisiana Wildlife Federation

RECESS *Fifteen Minutes*
10:45 A.M.

RECENT ECONOMIC SURVEY OF THE ALABAMA SEAFOODS INDUSTRY
George W. Allen, Director
Seafoods Division
Alabama Department of Conservation

PROGRESS REPORT: FEDERAL PESTICIDES PROGRAM
Philip A. Butler, Director
Gulf Breeze Biological Laboratory
Bureau of Commercial Fisheries

REPORT: MARCH 15 MEETING OF ESTUARINE COORDINATING COMMITTEE
Theodore B. Ford, Committee Chairman
Louisiana Wild Life and Fisheries Commission

FISHERY LEGISLATION ANTICIPATED AT THE 1961 LEGISLATIVE SESSIONS

Alabama
Commissioner William C. Younger, Director
Alabama Department of Conservation

Florida
Commissioner Ernest C. Mitts, Director
Florida State Board of Conservation

Texas
Commissioner Howard D. Dodgen, Executive Secretary
Texas Game and Fish Commission

ANY OTHER SUBJECTS

ADJOURNMENT 12 Noon

12:30 P.M.

FIELD TRIP TO PASCAGOULA—LEAVING FROM HURRICANE ROOM

1:00 P.M.

SAMPLING OF COOKED FISHERY PRODUCTS—BUREAU OF COMMERCIAL FISHERIES TECHNOLOGICAL LABORATORY
Conducting:
Travis D. Love, Laboratory Director

2:00 P.M.

TOUR OF BUREAU OF COMMERCIAL FISHERIES EXPLORATORY AND GEAR DEVELOPMENT FACILITIES
Conducting:
Harvey R. Bullis, Jr., Base Director

3:00 P.M.

TOUR OF PET FOOD PLANT
Conducting:
Commissioner Hermes Gautier

4:00 P.M.

RETURN TO BILOXI

Friday (March 17)

9:00 A.M.

COMMISSION EXECUTIVE SESSION BREAKFAST—FIESTA ROOM

9:00 A.M.

FIELD TRIP TO THE GULF COAST RESEARCH LABORATORY—LEAVING FROM HURRICANE ROOM
Conducting:
Gordon Gunter, Laboratory Director

9:30 A.M. to 11:00 A.M.

SCIENTISTS' ROUND TABLE
Presiding:

Fin Fish
Howard T. Lee, Director
Coastal Fisheries Division
Texas Game and Fish Commission

Shellfish
Robert M. Ingle, Research Director
Florida State Board of Conservation

11:30 A.M.

FINAL GENERAL SESSION—HURRICANE ROOM

ADJOURNMENT 12 Noon

March 16-17-1961 - Buena Vista - Biloxi

GULF STATES MARINE FISHERIES COMMISSION

Commissioners

Alabama

William C. Younger
Will G. Gaffey, Jr.
W. C. Holmes

Florida

Ernest G. Mills
Walter O. Sheppard
Vern Merritt

Louisiana

D. D. Young, Jr.
Alvin Wilson
Harold H. Saunders, III

Mississippi

William C. Younger
St. George W. McLean, Jr.
B. H. Jones

Texas

Harold C. Bonds, Jr.
B. H. Jones
William S. Brown

Organization of the Gulf States Marine Fisheries Commission
1954-1961



GULF STATES MARINE FISHERIES COMMISSION

Biloxi, Mississippi

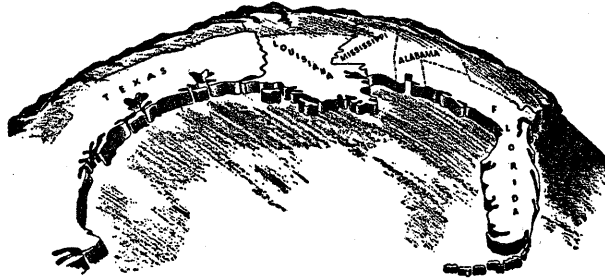
The Breaux Vista

Hurricane Room

March 16-17, 1961

A special meeting of the Gulf States Marine Fisheries Commission was held on March 16-17, 1961, at the Breaux Vista Hotel in Biloxi, Mississippi.

Gulf States Marine Fisheries Commission
112 Ambush Building
New Orleans 94, Louisiana



Gulf States Marine Fisheries Commission

312 AUDUBON BLDG., NEW ORLEANS 16, LA.

M I N U T E S

REGULAR MEETING

BUENA VISTA HOTEL

BILOXI, MISSISSIPPI

March 16-17, 1961

GULF STATES MARINE FISHERIES COMMISSION
312 Audubon Building
New Orleans 16, Louisiana

M I N U T E S

REGULAR MEETING MARCH 16-17, 1961
Buena Vista Hotel
Biloxi, Mississippi

OFFICIAL ATTENDANCE OF COMMISSIONERS

	<u>PRESENT</u>	<u>ABSENT</u>
<u>ALABAMA</u>	William C. Younger (3/16)	(3/17) Will G. Caffey, Jr. W. C. Holmes
<u>FLORIDA</u>	Ernest C. Mitts (3/17)	(3/16) Walter O. Sheppard Vern Merritt
<u>LOUISIANA</u>	Alvin Dyson James H. Summersgill	L. D. Young, Jr.
<u>MISSISSIPPI</u>	William G. Simpson (3/16) Stanford Morse, Jr. (3/17) Hermes Gautier	(3/17) (3/16)
<u>TEXAS</u>	Howard D. Dodgen	Richard H. Cory Wilson Southwell
<u>PROXIES:</u>	George W. Allen " " " Robert M. Ingle Joseph C. Jacobs James N. McConnell Howard T. Lee	(For Will G. Caffey, Jr. - 3/17) (For William C. Younger - 3/17) (For Ernest C. Mitts - 3/16) (For Walter O. Sheppard - 3/17) (For L. D. Young, Jr.) (For Richard H. Cory)
<u>STAFF</u>	W. Dudley Gunn Secretary-Treasurer	

FORMER COMMISSIONERS PRESENT

Charles W. Bevis, Bert E. Thomas

OTHER STATE REPRESENTATIVES PRESENT

Governor Ross R. Barnett, T. B. Ford, Elmer Gautier, Jack Mallory, Lyle St. Amant, Max W. Summers, George Williams, Percy Viosca, Jr.

FEDERAL GOVERNMENT REPRESENTATIVES PRESENT (U. S. FISH AND WILDLIFE SERVICE)

Harvey Bullis, Philip A. Butler, Francis Captiva, Russell Fielding, Joseph Graham, George Rounsefell, George W. Snow, Mrs. Mary Thompson, Paul Thompson, R. T. Whiteleather

REPRESENTATIVES OF FIRMS CONNECTED WITH THE FISHING INDUSTRY PRESENT

George A. Brumfield, Don Glover, Jos H. Humphrey, J. S. Ramos, Mike Sekul, Larry Strasburger

UNIVERSITY REPRESENTATIVES PRESENT

J. Y. Christmas, Jr., Kirby Drennan, Gordon Gunter, Albert E. Jones

CLERGY AND OTHERS PRESENT

Reverend L. C. Hoff, Sidney Landry

GENERAL SESSION, MARCH 16, 1961

Former Commission Chairman Hermes Gautier, serving in the absence of Commission Chairman Walter O. Sheppard, called the meeting to order at 9:45 AM and introduced Reverend L. C. Hoff, Pastor, East Howard Baptist Church, Biloxi, Mississippi, who rendered the invocation.

Prior to Roll Call, Chairman Gautier introduced Commissioners Simpson and Summersgill who are attending their first meeting of the Commission.

Commissioner Simpson, who was presented for the purpose of introducing the welcoming speaker, remarked as follows:

"Good morning, Ladies and Gentlemen.

"This is a good day for me.

"I stand before you in the presence of my fine associates on the Mississippi Marine Conservation Commission whose untiring efforts have already aided and advanced almost every segment of our industry. Their future labors and yours will surely establish and perpetuate a booming business in Gulf seafoods. I am highly honored by my membership on the Gulf States Marine Fisheries Commission as the representative of our Mississippi Marine Conservation Commission.

"I am grateful for this opportunity to join with the quality of seafood leadership that is gathered here in a mutual effort to conserve the vast wealth stored in the mighty Gulf of Mexico, so that this immense benefit can be brought to all of our people.

"I am very proud to be allowed to present to this distinguished audience the gracious unpretentious gentleman who will welcome you to Mississippi.

"Our speaker is the ideal man to address this group. The plans and programs of the Gulf States Marine Fisheries Commission must depend for success on close cooperation and hard work. Cooperation is the cornerstone of the Barnett administration and hard work is the personal trade mark of Ross Barnett.

"The seafood industry is a subject very close to his heart. He advocated and strongly supported our present seafood law by which the Mississippi Marine Conservation Commission was created and empowered to administer the affairs of the industry. This new law was introduced as a major, priority part of the administration program.

"He worked hard, in complete cooperation with all interested groups, and with our legislators including our able and aggressive Senator Stanford Morse, who, besides being a very valuable member of this Commission, is the Chairman of the Fisheries Committee in our State Senate. Our speaker's clearly spelled out, specific plan, won approval and was incorporated into what is a modern, workable, flexible seafood law which we firmly believe will be the solution of our industry and a firm basis for future growth and expansion.

"Take a solid, practical plan, advise and consult with experts and specialists, adopt a reasonable, cooperative attitude toward all, work out a sound answer and go to work. Practice conservation to protect the present. Employ research, study and planning to insure the future. This is the formula and we believe in it. It has helped us and will continue to move us forward. We feel at home here with you because we think this is your system, too.

"The great States of Texas, Louisiana, Alabama and Florida are fine company to travel with. We are happy to be with you. You can count on our complete cooperation.

"With genuine pleasure and pride, I now present to the distinguished leadership of the seafood industry in the Gulf area our dedicated, beloved leader, His Excellency the great and gallant Governor of Mississippi, the Honorable Ross Barnett."

(Governor Barnett)

"It is a genuine pleasure for me to welcome you to the State of Mississippi and our beautiful Gulf Coast region for this important meeting of the Gulf States Marine Fisheries Commission.

"Bill Simpson is doing a wonderful job as chairman of the Mississippi Marine Conservation Commission which regulates our great seafood industry. This commission has adopted a program which is designed to restore the Mississippi Gulf Coast to the prominence it once enjoyed as the seafood center of the world. We are proud of the good work the Marine Conservation Commission is doing.

"Mississippi is proud to be host to this meeting of the Gulf States Marine Fisheries Commission. We like for people from other states to visit Mississippi. We like for you to see and enjoy our natural resources; we like for you to see some of the results of our economic development program, and we like for you to meet and mingle with us in that atmosphere of true southern hospitality for which Mississippi is so famous.

"You have assembled here on the broad expanse of the Mississippi Gulf Coast, which is appropriately called one of the most scenic and beautiful section of our nation. It is a delightful playground which attracts thousands and thousands of tourist each year from all over the United States, who enjoy the longest man-made beach in the world. I sincerely hope that those of you who are attending this conference will have an opportunity to enjoy the Gulf Coast facilities and combine some personal pleasure along with the serious discussions which brought you here.

"To my way of thinking, your organization---the Gulf States Marine Fisheries Commission---is performing an outstanding service for the fisheries interest in the Gulf States. Your research activities have in the past and are at the present of tremendous value to those of our people engaged in commercial fishing, as well as to those of us who occasionally have the opportunity of doing a little salt water fishing just for the sport of it. Your organization is offering a great contribution to all communities where it functions.

"I cannot help but feel that, though much progress has already been made in the field of scientific research on our marine life, there are great opportunities ahead for additional progress and that you gentlemen will contribute much through your programs to bring this about.

"You may be assured of the fullest cooperation from the governor's office in Mississippi on those projects which you undertake in the interest of further development of our marine resources. It is essential that the Gulf states move forward in this area of development if we are to keep pace with other sections.

"Again may I say that we are happy to welcome you to our state and I am hopeful that your session here will be most successful and productive of good results.

"I thank you very much."

The Chairman told Governor Barnett of the deep appreciation of the Commission for his participation on the program, thanked him for his words of encouragement, and assured him of a continuing and cooperative effort on behalf of the Gulf fisheries resource.

Assistant Regional Director Richard T. Whiteleather of the Bureau of Commercial Fisheries, St. Petersburg Beach, Florida, was next introduced for presentation of the Bureau's views on the subject of "Present Needs and Future Prospects of the Gulf Fisheries."

"This morning I am going to deviate slightly from the program listing, because Bureau of Commercial Fisheries activities have been admirably covered in the Commission's recent annual report. With your permission then, I would like to talk some about the future and look to the horizon around this great ocean area consisting of the Gulf of Mexico and adjacent waters to the southward. It is good sometimes to stop and take stock of what we are facing and relate it to what has been done and to what can be done. Granted, appraisals of this kind have been presented to the Commission before, but there is no harm in repeating the effort because changes take place almost every day. New knowledge and fresh ideas usually alter the outlook.

"Our Bureau has been giving some special thought to these factors and, within this region, we have drafted a preliminary report on the commercial fisheries of the Gulf and South Atlantic and their needs. We expect to talk with you, both individually and collectively, on this later in the course of its more final formulation. It is hoped that the finished product will be recognized as a guide to dynamic future activity as characterized in the President's Special Message on Natural Resources to the Congress recently.

"From the research and exploration that have been accomplished, mainly in the past decade, it is becoming evident that we have just scratched enough of the surface to gain a glimpse of the fisheries bounty existing in these waters that touch on the Gulf coast. Every new piece of evidence stimulates the imagination and accelerates thinking on means of digging deeper into this massive potential. Considering that the Gulf of Mexico already supports a shrimp fishery, which is the Nation's first-ranking fishery from the dollar standpoint, and a substantial part of the menhaden fishery, which is the largest fishery in volume in the United States, and that the deep-water potential of this ocean area has not even been fully charted, our Bureau and the States are confronted with two basic situations. One is the need for a reasonably accurate determination of the latent resources not yet touched. The other is careful attention to the existing fisheries to assure their maximum productivity.

"This is a unique area. It is unique because it has several factors that set it apart from most other areas of interest to the United States fishing industry. Most important of these are:

- (1) Climatic zones that vary from temperate in the north to tropical in the southern part, resulting in a wide range of ecological conditions and a great variety of fauna.
- (2) An area fused into one vast oceanographic unit by current patterns but with the Gulf of Mexico and the Caribbean Sea, two partially-enclosed adjoining seas, different in nature and conditions.
- (3) The gigantic extent of the estuarine area and major river discharges.
- (4) The variety of genera and species of animal life. Where else could almost 3,000 individual species of marine life and about 175 new species be taken in the relatively few years that the vessel Oregon has been exploring these waters? Yes, this is a very unique area and one that awaits the rousing challenge of development.

"A prediction of possible future production of the relatively well-exploited species can be made on the basis of recent harvests, conditions of fishing pressure, markets and facilities. While these cannot be hard and fast figures, they do represent the best estimates of people most closely informed on productivity of these waters. In this forecast, advances have been assumed in both processing technology and marketing, as well as in harvesting methods. On this premise, a potential increase of 40 million pounds in the shrimp catch is indicated for the Gulf, an increase of 10 million pounds for oysters, 30 million pounds for crabs, 100 million pounds for mullet, 10 million pounds for snappers and 670 million pounds for industrial fish.

"In arriving at these figures, for example, it is expected that technological advances will permit commercial use of some additional species. Increased knowledge of shrimp growth and mortality rates, perhaps coupled with the use of savings gear, should increase the poundage from currently exploited stocks. The increase in oyster production could well come from propagation of oysters on presently large uncultivated bottom areas. The blue crab is very abundant throughout the region and the industry is in its infancy, relatively speaking. The increase postulated for mullet is likely an under-estimate since these fish are extremely abundant along the entire perimeter of the western Gulf where they are scarcely fished at all. The fishery for industrial species has expanded rapidly and may eventually even far exceed the estimated potential since this estimate has not included the amounts that may be harvested in depths beyond 20 fathoms. Certainly this figure is not too far out of line when considering the ratio of trash fish to shrimp as taken by the large fleet of trawlers plying the Gulf of Mexico.

"Apparently some species are only partially exploited because their habits and migrations are not fully known. For instance, the young immature age-classes of menhaden are principally taken in Gulf catches. The older mature fish are not found in the schools which support the commercial fishery. If more biological information can be obtained on these fish, and they can be located and caught as they are on the South Atlantic coast, the estimated large increase in production is well justified.

"Another potentially great resource, which has only recently been thought of in terms of some magnitude, is the ocean shellfish. From exploration so far, there is reason to believe that there are large new beds of clams and scallops capable of supporting large fisheries. Probably less sizeable, but also worth mentioning is the spiny lobster fishery particularly along the Florida coast and in the Caribbean area.

"Some of the most abundant fish inhabiting this region, such as sharks, anchovies, and herring-like fishes, are hardly touched commercially.

"While some of these are currently under-utilized, because of the small market demand at present, they, nevertheless, represent a vast potential under favorable conditions. I doubt that it is possible even to guess with any accuracy at their commercial potential, but the following examples will indicate the broad prospects for their future. The thread herring occasionally are taken by menhaden vessels along the Gulf and South Atlantic coasts. It is usually avoided as a "low oil" fish in the summer months. Observations and exploratory sampling now lead to the belief that this species, with relatively high oil yield through the winter, is probably more abundant than the menhaden. Estimates of year-round quantity available along the west coast of Florida alone run

from 1/2 billion pounds to 2 billion pounds. It also occurs abundantly in the remaining Gulf coastal areas. In fact, this fish occurs in prodigious quantities, the availability of which is still an unlocked secret.

"Several species of anchovies occur on our coasts. Still, except for incidental utilization in the industrial fishery, anchovy species are untouched and little is known of their availability. Even less information is on hand on many other pelagic species, such as Spanish sardines, round herring, gizzard shad, bumpers, butterfish, two species of scad, pilchards, and chub mackerel, to name a few. Bottom dwelling fishes are also known in substantial abundance, and there are several species of snappers, deep water flounders, and porgy which are not being utilized at present. The tunas should not be overlooked and perhaps we know more about them than any other pelagic species. The apparent richness of Atlantic tuna stocks has been demonstrated by the Japanese and some U.S. exploitation in recent years.

"So you can see that our fisheries in this area have for the present almost unlimited room for expansion. We are not even close to completing the basic inventory of the most promising species. The wide gaps in this information can only be filled by persistent exploration and biological study. The speed of filling them depends entirely on the time, effort, and facilities available.

"Now I come to that part of the problem related to keeping productive the presently exploited fisheries. Here we know somewhat more about that with which we are dealing, and perhaps my comments can be less lengthy on this subject. The root problem is acquisition of knowledge for use in managing an array of factors affecting these fisheries. There are two distinct categories here -- the natural elements and the human factors. Although man may find some future means of influencing the natural elements, there is little he can do today about floods, storms and climatic changes which often wreak catastrophic changes in fisheries production. Man can control man and, therefore, if armed with the right information he can regulate to some degree such human factors as industrial pollution, permanent modification of estuaries, and pesticide damage inimical to the fish and shellfish environment.

"Again, if armed with proper biological data, he can intelligently regulate the fishery harvest. Time doesn't permit going into the details, but biological research must answer the questions of life history, migrations, natural mortality, rate of growth and other factors that influence the abundance of fish and shellfish, and their availability to the fishermen in maximum amounts. Biologists have been diligently seeking and have found some answers through research mainly on Gulf shrimp and oysters. Some studies on control of predators and diseases have also been rewarding. But what about all the other facts that are needed on shrimp and oyster populations and on other fisheries? Here, again, the field is wide open for research expansion with returns equal in value to these in exploration of new fisheries.

"Earlier, I said that changes take place. One of the most constructive changes that has occurred is in the recognition given the fisheries of this area during the last decade. The Gulf States have acquired a substantial number of fishery biologists and are delving into problems which previously were entirely neglected. The Bureau programs in this region have been strengthened and the administration of the fisheries is no longer the stepchild of previous years. With the Gulf States Marine Fisheries Commission continuing in its role of coordination of all programs to bring them to bear on the most urgent problems, those funds available, both from State and Federal sources, will find efficient use. If these programs are effectively supplemented by technological studies of better products, and markets promoted when consumer outlets need expansion, the fisheries of the Gulf of Mexico and waters to the southward have every prospect of being the greatest ever known in our domestic production."

The Chairman informed the group that Mr. Bosch of the Louisiana Wildlife Federation was unable to attend the meeting and present his paper "Stock, Organized Sportsmen equals Shrimp," because of illness. He advised that effort would be made to secure the paper for inclusion in the Minutes. (Copy of paper is last attached to these General Session Minutes). Chairman Gautier then called upon Commissioner Summersgill who explained the important contribution made by the Federation in the enactment of the Louisiana shrimp legislation of 1958. Mr. McConnell expressed the appreciation of the Louisiana Wild Life and Fisheries Commission for the work done by the Federation in connection with the same legislation.

Following a short recess, Mr. Allen of the Alabama Department of Conservation, was introduced for the presentation of a paper on "Recent Economic Survey of the Alabama Seafood Industry." Following is copy of this report:

"For many years Alabama, like many other states, has found that her seafood industry has been not so much forgotten as misunderstood. The true relationship of the seafood industry to the other industrial efforts within the state has not been clearly defined. Many other industries have brought forward many public relation programs explaining in detail the effect that their particular industry has on the economic welfare of the state or nation. A good example of this type of activity can be found in the field of forest products where the forest industries have gone to great length to prove the impact of the creation of a toothpick or a Dixie-cup on the entire economy of the area.

"In the past the economic revelations of the seafood industry has consisted of a series of numbers that are meaningless to the general public. We can find in many references that in 1958 a certain area succeeded in bringing in an amount of shrimp equaling 579 tons. To the general public, and to myself to be honest about it, 579 tons of shrimp do not mean much more than an awful big pile of shrimp.

"In our state, as in many others, the representatives that are responsible for the passage of seafood legislation have found themselves in the position that while many of their associates from the other parts of the state are interested in the passage of such worth while legislation that our representatives may place upon their respective floors for passage into law, the majority of them have no idea or conception of the industry itself, the number of people involved or the magnitude of the operations. The representative of the seafoods industry must therefore have available the information that he can use to justify his proposals. To his fellow associates 579 tons of shrimp mean very little, and very likely do not mean much more to him.

"One of the purposes therefore of an economic study of the type we have completed is to have available to our representatives the facts and figures of our industry in terms and relative comparisons that can be understood by individuals who do not have an acquaintanceship with the industry. It is very possible that when the legislature convenes this year, every member will find a copy of the survey on his desk, so that he may become acquainted with the industry for the first time since he has been in either the senate or the house. This understanding alone would be worth the relatively small cost of the survey.

"Another objective that can be accomplished by the use of tangible evidence obtained through such a survey is the unlimited information that suddenly becomes available to the seafood biologist, administrator or enforcement officer in the field of public information and relations. If the field data is analyzed in the light of the possible uses to which the information may be used, there are facts and figures evolving that can be used as specific points in the field of public information. For instance, a better picture of the field of net and webbing manufacturing is understood if it is realized that each shrimper pays 9 cents of every dollar produced in the purchase and maintenance of nets than the mere facts that so many thousands of dollars are spent for nets on a state or national level. The same can be true of any of the activities and expenditures involved in the industry. This is easily seen when it might mean that a price change of two cents a gallon for fuel might seriously effect the twenty some percent that the fisherman pays for his fuel out of his gross income.

"In a discussion of a survey of this type the revealing of incomes and costs in a dollar and cents manner means little, for each/^{state} community will find a variation in these figures between their own and those of an adjacent area. The best picture can be obtained from percentage of gross income per unit individual, which should not vary from the mean average to a great extent. The important item that soon appears in an analysis of the figures developed from the survey, is that the different communities appear to have a variation in the percentage of gross income figures for the various expenditures, even though the samples are taken within the same state. While basic expenditures appear to remain at a fairly constant level there is a wide variation in the costs of associated items such as home rental, home purchase costs and groceries, in other words those items which are associated with the industry in a more secondary degree than such direct costs as labor and cable.

When this survey was started it was doubted by many that the contacted persons would furnish us with the information that was desired. Many questions bordered on information and facts that most people are reluctant to divulge. Public relations by our own divisional personnel was started to build up the advance notice and the many reasons why such information was needed. The project was casually mentioned to many people and at the various meetings of the fisheries groups. At the end of six month period we felt that we had sold the program as well as we could and were then ready for direct contact.

"The next phase was the working press and a number of stories in the various issues of the daily papers that would stimulate a concentrated interest prior to the actual field representatives contacting the industry. There were a total of three items that appeared in the local papers concerning the project with detailed description of the information that we needed, the use of the information and further assurance that none of the information obtained would ever be released against or in conjunction with any individual or firm about which the statistics were gathered.

"The third step was the writing of a letter to everyone in the industry and again explaining the program. They were told that within a very short time they would be contacted by an employee of the Department of Conservation who was attempting to obtain some information concerning the industry. Their help was requested and again assurances were given concerning the confidence of the information. A review of all the questionnaires handled by our field personnel would fail to show anywhere the name or address of a single person or business interviewed. It is very doubtful if even the field personnel could look at an interview form and have any idea of the name or address of the individual from whom the information was obtained.

"The personnel for the field survey were not especially chosen for any particular attribute or ability, but rather were temporary personnel who desired the work and whom we felt had at least a pleasing personality and enough intelligence to be able to follow printed instructions. We soon found that this was a mistake. It so happened that the individuals so chosen were well known in the area, and instead of being an asset, their familiarity with everyone soon proved to be a handicap. The one individual that was unknown in the area was able to get more information than the former residents of the area. We also found that there is a natural reluctance to talk about your profit and losses to your neighbor, while a stranger on official business can obtain the information without too much trouble. As a result we removed all the individuals who were known in the survey areas, and replaced them with individuals who were not known. The answers on the questionnaires became much easier to obtain, and the progress was increased a great deal. As a result of this we came to believe that the use of our regular staff of wardens or the employment of an individual known in the area was not the best method to use.

"The identification of field personnel prior to interview again created a problem. Although the individual could carry a letter of introduction, this letter was not always given much credit or weight by the individual interviewed.

We found that if the field personnel drove a car well marked with the state markings and parked it where the individual being interviewed could see it, the question of officialdom was settled. An unmarked car or pickup truck spelled failure before every interview.

"The percentage of samples used in this survey varied with the category that was involved. The minimum percentage used was 12.5, while maximum was 51%. In a relatively concentrated area as is present in Alabama a 51% was possible. In a state where the industry would be scattered such a large sample would be impractical. It is believed that the percentage involved would depend on the particular phase of the industry in which you are interested.

"Shrimp boats for instance vary greatly in size, costs, fuel, crew, depreciation and repairs. Each size boat would develop different sets of figures. Because of this variation an attempt to construct the average shrimper would call for as heavy a sample percentage as it would be possible to achieve within practical means.

"Oyster boats, to the contrary, present little variation in their size or other characteristics, and the average oysterman is not so difficult to construct.

"As a result of our survey we came up with a number of rather amazing figures and statistics. In the past the officials had considered the Seafood Industry a 2½ million dollar industry. Just what this covered no-one was ever able to determine, but we now have definite information to give us the following data on direct costs and investments.

CAPITAL INVESTMENT:

Buildings	3,628,000.00
Boats	8,957,500.00
Real Estate	1,950,000.00

TOTAL CAPITAL \$14,535,500.00

ANNUAL INCOMES:

Seafood Businesses	41,600,000.00
Shrimp Boat Income	4,140,000.00
Oyster Boat Income	1,318,000.00
Seafood By-Products	1,001,000.00

TOTAL INCOMES \$48,059,000.00

PAYROLLS PER YEAR:

Seafood Businesses	3,420,000.00
Shrimp Boats	1,656,000.00
Seafood By Products	580,000.00

TOTAL PAYROLLS \$ 5,656,000.00

TOTAL \$68,250,500.00

Dr. Philip A. Butler of the Bureau of Commercial Fisheries was called upon for a progress report on the federal pesticides program, which follows:

"The Bureau of Commercial Fisheries is concerned with the effect of pesticides on commercial marine fish and shellfish. In 1959 a pesticide research program was initiated at laboratories in Milford, Connecticut; Gulf Breeze, Florida; and Galveston, Texas. Research in Juneau, Alaska, was added to this program in 1960. This research was designed to determine the extent of the problem, methods for assaying pesticide effects and the concentrations needed to kill or cause distress to fish and shellfish.

"As pollution in the environment has great influence on marine creatures, the effect of pesticides on food organisms and the transport of pesticides in the water are important considerations. The peculiar ability of clams and oysters to accumulate chemicals in concentrations greater than in the surrounding water also endangers their use as human food. Many pesticides are of value because of their specific toxicity to pests that are closely related to marine forms of considerable economic value.

"Some of the preliminary results of the pesticide research conducted by the Bureau of Commercial Fisheries are presented in the following tables. Table 1 indicates the highest concentration in parts per billion of certain pesticides tolerated by five species of phytoplankton used as food for shellfish larvae.

Herbicides

Monuron	0.02
Diuron	0.04
Lignasan	0.06
Neburon	0.4
Fenuron	290.0

Insecticides

Toxaphene	10.0
Sevin	100.0
Lindane	500.0
DDT	1000.0

These results indicate, as might be expected, that the compounds designed to control terrestrial plants have a marked effect on the plants in the sea. Extremely low concentrations can be harmful to organisms important as food for clams and oysters.

Table 2 shows some preliminary data on the concentrations in parts per billion which cause a 50% mortality in shrimp or loss of equilibrium in crabs in 24 hours.

	<u>Stone Crab</u>	<u>White Shrimp</u>	<u>Brown Shrimp</u>	<u>Post-larval Shrimp</u>
Endrin	10.0	-	5.0	0.5
Lindane	-	-	8.0	2.0
DDT	10.0	15.0	-	-
Sevin	1000.0	33.0	27.0	-
Heptachlor	-	43.0	20.0	11.0
Dieldrin	10.0	60.0	10.0	15.0

"It should be noted that the smaller size shrimp is less resistant than crabs or larger shrimp to the pesticides. The younger and smaller shrimp grow in the upper parts of the estuaries nearest the source of pesticides and are doubly vulnerable.

"Tests with several pesticides show that shellfish larvae are sensitive to low concentrations. These experiments indicate that mortality may not be the most important effect of the pesticides. The larval growth rate was retarded (50% of normal) at much lower concentrations of the pesticides than would cause death. The larval stage is the most vulnerable in the life cycle and the major losses from all causes occur at this time. Any increase in the larval period will, therefore, result in greater mortalities.

"In experiments with adult oysters, most of the common pesticides cause an immediate decrease in growth. Even at concentrations of 0.1 ppm Toxaphene, for example, completely stops the growth of oysters after three weeks of exposure.

"Our laboratory research to date indicates that pesticides in the marine environment can have important effects on commercial fish and shellfish. However, our knowledge is limited of the actual concentrations of pesticides which occur in the sea. We hope to expand our research into this area as soon as funds and personnel become available."

Dr. Theodore B. Ford, Louisiana Wild Life and Fisheries Commission and Chairman of the Estuarine Technical Coordinating Committee next reported on the special meeting of that committee which was held the afternoon of March 15. Dr. Ford's report follows:

"This committee with 20 scientists and representatives present met for over three hours and discussed several topics as follows:

1. The status of the proposed estuarine atlas. It was agreed that the committee accept the kind offer of Dr. George Rounsefell of the Galveston Laboratory to complete the black line drawings in a uniform manner from charts prepared by the states since Dr. K. M. Rae, who had originally undertaken this work, is leaving Texas A&M to work in Alaska. The purpose of the uniform black line drawings of estuarine areas is to permit the reproduction of 8"x10" looseleaf worksheets and micro-cards for distribution purposes.

11. The committee discussed extensively estuarine "type" projects, such as the influence of pesticide, domestic and industrial pollution, navigation, industrialization, etc., on estuarine areas requiring research beyond the scope of any individual state because of personnel requirements or funds.

Drs. Rounsefell and Joseph Graham of the Galveston Biological Laboratory presented for discussion a suggested "Program for Estuarine Research in the Gulf of Mexico," including three general categories of work, as follows:

- A. Problems with the estuaries
 - 1. Distribution, abundance, and movements of species in relation to their environment.
 - 2. Relation of selected species to artificial alteration of their estuarine environment.
 - 3. Establishment of monitoring stations in selected estuarine locations on the perimeter of the Gulf.

- B. Problems of the laboratory
 - 4. Zones of tolerance and resistance of selected species to environmental identities (i.e., light, heat, salinity, etc.)
 - 5. Performance of selected species with the range of their tolerance to a given identity.
 - 6. Nutrition studies of selected species.

- C. Problems in the Gulf
 - 7. Distribution of ocean properties along the Gulf coast.
 - 8. Oceanic ecology of those species dependent upon the estuary at some stage of their life history.

In presenting the above suggested program, it was emphasized that they were trying to establish a framework for estuarine research along the Gulf satisfactory to this committee, the five states and the Bureau. Discussion among the committee brought out the fact that this approach ^{would} probably meet long-range needs, but that additional work in the specific localities would be necessary to meet the needs of the various "type" projects which would appear to be threatening estuarine areas. Mr. Whiteleather stated that they were soliciting specific suggestions for incorporation in the proposed program. Dr. Graham requested that these be furnished to him at the Galveston Laboratory by state representatives.

Dr. Gunter moved that "The Gulf States Marine Fisheries Commission endorse the broad program of the estuarine research presented by the Bureau of Commercial Fisheries, U. S. Fish and Wildlife ^{Service} and encourage the states and U. S. Fish and Wildlife Service to attempt to carry it out." Mr. Ingle seconded the motion. The motion was passed and the matter in resolution form will be referred to the Commission for its consideration. The referred to program is first attached to these General Session Minutes.

Mr. Albert C. Jones, Marine Laboratory, University of Miami, presented for discussion and suggestions from the committee a "Proposed Study of the Effect of Everglades Floodway on Hydrography and Biota of Northern Florida Bay." Several

ideas were offered. This was considered as a "type" estuarine project which needs attention and one which probably can be undertaken locally within the state. No committee action was taken on the matter.

In general, it was recognized that the estuarine research projects and programs require considerable money and skilled technical personnel.

III. The committee discussed briefly suggestions for improvement of methods to aid recovery of marked or tagged animals. Several ideas were suggested: the most important was to recognize the value of the research work and establish a high reward value. No action was taken.

IV. The committee decided that the state representatives could respond individually to the questionnaire concerning "Problems needing research and/or demonstrations in mosquito control and fish and wildlife management practices." Copies of the material will be furnished to committee representatives.

V. Mr. Ingle discussed the limited extent of research work which had been done on the dynamics of the pink shrimp and the importance of this work as it related to other commercial species of the coastal states from North Carolina to Texas. After discussion of the various aspects of the problem, Dr. Gunter moved that "The proposal for increased and additional research of the problem of pink shrimp dynamics by the U. S. Fish and Wildlife Service be considered by the Commission." Mr. Howard Lee seconded the motion and it was passed by the committee.

The resolution follows:

"Resolved by the Gulf States Marine Fisheries Commission that there be an expansion of biological research to include the dynamics of the pink shrimp, by the U. S. Fish and Wildlife Service; such studies to include natural mortalities and desirable times, places and sizes for harvest, in accordance with a proper utilization of the fishery."

The meeting adjourned at 5:30 PM."

To apprise the group of fishery legislation anticipated at the 1961 legislative sessions the Chairman introduced in turn the following state directors: Commissioner William C. Younger, Director, Alabama Department of Conservation; Ernest C. Mitts, Director, Florida State Board of Conservation; and Howard D. Dodgen, Executive Secretary, Texas Game and Fish Commission.

Commissioner Younger:

"It is indeed a pleasure to be here and to appear on the panel of administrators to discuss proposed legislation. I had hoped that Senator Will G. Caffey, Jr., our Legislative Member, could represent Alabama on this panel because as administrator I can only recommend but as a very strong and influential member of our Senate, Senator Caffey is in a position to do something about it and I regret that pressing business prevented Senator Caffey from attending this meeting.

"First of all, we hope to get the necessary legislation this time to raise our contribution to the Commission up to our assessment. Senator Caffey introduced a bill to do this last time, but it got bogged down in a filibuster and did not get passed. We hope to have more luck this time. With the able help and leadership of Senator Caffey, I am sure it will pass.

"It is hoped that legislation will pass this time to rectify a situation existing concerning our salt water sports fishing licenses. Presently, a resident of the State of Alabama must have a fishing license to sports fish in our salt waters but a non-resident is not required to have a license for this purpose. Our residents are being discriminated against and they want the injustice corrected. With the help of our able Senator from Mobile County, there is a great possibility of this injustice being corrected.

"Another item of proposed legislation of interest to you concerns an effort to levy a marine tax in lieu of and in the place of the present highway tax on marine gasoline. The plan calls for this levy to apply to marine gasoline stations only and there would be no prohibition against a boat owner purchasing gasoline at service stations.

"Collections of such a tax from our two coastal counties would go to our Seafoods Division for its normal operations and the remainder would go into our Water Safety Program. At this time it looks like this proposed legislation has a good chance of passing. It would be very popular with both the seafoods people and the boating public in general. Our Legislature meets this coming May and we have great hopes of their favorable consideration of these proposals."

Commissioner Mitts:

"The key to our Legislative program this session is alteration and refinement. Most of the basic concepts of our regulatory system were established in prior sessions. We find that minor changes are necessary from time to time to conform to new knowledge or changing conditions. Most emphasis will be in connections with the shellfish industry (Oysters and clams). We are attempting to provide the best and most favorable possible governmental climate for private cultivators. We hope to continue to expand our private lease enterprises."

Commissioner Dodgen

"There is a proposal before the Texas Legislature to substantially recognize the administrative functions of the Game and Fish Commission. This proposal would, in effect, create at least five regional offices within the State, two of which would be situated in the coastal area. The functions of the regional offices would be quite similar to the Fish and Wildlife Service organization with which you are familiar. The plan would give closer administrative supervision to all of the department's programs. The plan is largely contingent upon

legislative appropriation, although there are four bills in addition to the Appropriation Act, that would serve to implement the reorganization plan in one way or another.

"Another bill to allow the use of nets and seines in Laguna Madre for the purpose of taking black drum only, is being considered. This is an area that has long been closed to netting of any kind. Studies made of this area caused our technicians to believe that netting in these waters would be advantageous both to the recreational and commercial fishermen. I hasten to add that there is considerable public opposition to it.

"The laws relating to the taking of shell from the bays find two measures before the Legislature that would amend them. One, a Senate bill, sets up a separate director for coastal affairs and would fix a minimum price of 15¢ per cubic yard on shell taken from the bays. Another bill, introduced in the House, would prohibit any dredge from operating closer than one mile of the shoreline, or any island, or any oyster reef. Conflicts between recreational fishing and shell dredge operations have brought about these proposals.

"There is another bill in the House that would amend our present Shrimp Conservation Act, intending to strengthen its language for the sake of clarity, and for better enforcement. It would reduce the pounds of shrimp taken daily by bait dealers so as to discourage bait shrimp from entering the food market. Further it would amend the present law that permits bay-bait shrimp boats to buy licenses only in January and February of each year, and would allow the licensing of such boats at any time, provided they were replacement craft or newly constructed ones.

"There is a Senate bill that would provide for long term leases of submerged lands, but only after screening by a board created for that purpose."

With no further subjects being offered for consideration, Chairman Gautier adjourned the session at 12 noon with a reminder that the field trip would get underway at 12:30 PM.

The group was welcomed at the U. S. Fish and Wildlife Service Pascagoula Laboratory by officials of the Bureau of Commercial Fisheries. Following the sampling of fishery products, which included shrimp, scallops and smoked mullet, Mrs. Mary Thompson explained on-tour the work of the technological unit. Mr. Harvey Bullis later conducted a tour of the Bureau's exploratory and gear development facilities, including the exploratory fishing vessel M/V Oregon

The group next visited the local animal food plant of the Quaker Oats Company.

Enroute to Biloxi, Commissioner and Mrs. Hermes Gautier were hosts to the Commissioners and guests at a reception which was held at the "Old Place," ancestral estate of the Gautier family on the Singing River at Gautier, Mississippi.

Friday (March 17)

The Commission Executive Session began at 9:00 AM with the serving of breakfast in the Fiesta Room of the Buena Vista Hotel.

Guests at the meeting were hosted by Dr. Gordon Gunter on a field trip to the Gulf Coast Research Laboratory, Ocean Springs, where a scientists' round table was scheduled for the morning.

A final General Session was called to order at 11:30 AM in the Buena Vista's Hurricane Room. The following action was reported for the Executive Session by the Secretary: An oceanographic program recommended by the Estuarine Technical Coordinating Committee was voted for study until the October 1961 Commission meeting. Tabled for further study until the fall Commission session was a resolution which was presented at the October 1960 session, and which concerns the requesting of Saltonstall-Kennedy funds for fishery products sales promotion. Adopted was a resolution requesting an expansion of the federal shrimp research program which would include the dynamics of the three leading commercial species of the Gulf of Mexico shrimp by the U. S. Fish and Wildlife Service; such studies to include natural mortalities and desirable times, places and sizes for harvest, in accordance with a proper utilization of the fishery. (The Estuarine Technical Coordinating Committee recommendations on the subject included only the pink shrimp, not the brown and white of the species). Decision was reached to prepare a prospectus of needed shrimp research.

The subcommittee to study fishery products check-out points did not meet as scheduled due to the inability of members to be present. Galveston, Texas, was selected as the site for the March 15-1962 meeting.

Acting as Chairman for the session, Commissioner and former Commission Chairman Dodgen, expressed the appreciation of the body for the attendance and participation at the meeting and extended a cordial invitation to the October 19-20, 1961 meeting to be held at the Monteleone Hotel in New Orleans.

The meeting was adjourned at 12 noon.

Prepared by: W. Dudley Gunn
Secretary-Treasurer

M I N U T E S

Executive Session, Biloxi, Mississippi, March 17, 1961

Joining the Commissioners and proxies in the Fiesta Room for breakfast at 9:00 AM were: Messrs. Bruce Burglass, Russ Fleming, John Fielding, Robert Ingle, Paul Thompson and R. T. Whiteleather.

Commissioner Summersgill introduced Messrs. Burglass and Fleming of the recently formed Barataria Fishermen's Association, Louisiana.

Former Commission Chairman Howard D. Dodgen, in the absence of Chairman Walter O. Sheppard, acted as chairman for the session.

Mr. Ingle was called upon to explain a resolution on shrimp research which had been submitted for Commission consideration by the Estuarine Committee.

Mr. Whiteleather stated that prospects for an oceanographic program in harmony with President Kennedy's special message, looked very promising. He said considerable enthusiasm is being developed in the Gruening bill which would raise the current Saltonstall-Kennedy fund by 30%, such resulting monies being earmarked for expenditure by the states. Vice-Chairman David Hart, Atlantic States Marine Fisheries Commission, who expected to attend the meeting and discuss the bill was not able to attend.

Mr. Fleming requested the cooperation of the member states in having questionnaires of the outdoor recreational fresh and salt water survey completed and returned as early as possible following their receipt.

Guests were excused and a discussion of the draft for estuarine research in the Gulf of Mexico (prepared by the Galveston Laboratory, Bureau of Commercial Fisheries and approved for consideration of the Commission, March 16, by the Estuarine Committee) followed. The suggested program is last attached to these Executive Session Minutes. Commissioner Mitts moved that the draft be studied until the next regular Commission meeting. Mr. Lee seconded. On vote, the motion unanimously passed.

Concerning the subcommittee meeting of Commissioners to consider fishery product check-out points, which was requested at the fall session, the meeting was not held as scheduled and no action was taken by the Commission. The Secretary read the following telegram from the subcommittee chairman, Commissioner Caffey: "Urgent legal and legislature matters prevent my attending meeting in Biloxi. Suggest matter of check-out controls be passed to fall meeting since possible may be handled on governors level. Please advise subcommittee members."

The consensus was that no action should be taken on the October 1960 proposed resolution which might make S-K funds available for use by the Commission for sales promotion of fishery products, at least until final disposition of the Port of New York Authority case is made. Commissioner Mitts made the motion, Mr. McConnell seconded. On vote, the motion unanimously carried.

In the absence of Chairman Sheppard, the Secretary reported briefly on the February 2-3 Chicago Interstate Agency Conference. It was reported that the Atlantic and Gulf fisheries compacts seem to have made on the whole better progress than other interstate agencies and this was attributed principally to their operations having been administered entirely by the Commissions and within the scope of the legislative enactments creating such compacts.

Commissioner Mitts moved for adoption of the St. Petersburg Beach Minutes as mailed out, December 27, 1960, without reading. Commissioner Gautier seconded. On vote, the motion unanimously passed.

The Secretary reported that the Commission should end the current fiscal year with about \$100.00 uncommitted, as against approximately \$73.00 as provided for in the 1960-62 budget.

The Secretary stated that all arrangements had been completed with the Monteleone, New Orleans, for the October 19-20, 1961 meeting.

The Texas Commission Delegation selected Galveston as the site for the March 15-16, 1962 meeting.

The shrimp biological research resolution suggested by the Esturine Committee, March 16, and explained by Mr. Ingle at this session was next discussed. Commissioner Mitts expressed the opinion that research on shrimp in the Gulf was not receiving an expenditure commensurate with the value of the fishery and to this Mr. Allen agreed. Commissioner Mitts suggested that a trip be made by Commissioners to Washington to contact Congressional Delegates in interest of obtaining a better division of available research funds. Chairman Dodgen stated that possibly better planned research would result in a more equitable distribution. Mr. Allen asked if funds might be made available as in the case of Dingwall-Johnson allocations. Chairman Dodgen pointed to certain undesirable features connected with the acceptance of D-J funds and suggested that the more research that is requested and secured from the federal government, the more expansion in this field could necessarily be expected by the states. Mr. Ingle pointed out that the securing of desired data on the shrimp was too large a program for states to handle individually because of financial problems involved and added that because of the statistical compilations essential to such studies the work could best be accomplished through one agency, the Bureau of Commercial Fisheries.

The program suggested by the Estuarine Committee and appearing in the General Session Minutes, was amended to cover not only pink shrimp but also the white and brown of the species. The amended resolution is first attached to the Executive Session Minutes. The resolution voted upon involved the mentioned trip to Washington to discuss the need for additional biological data on the shrimp with the Congressional Delegates of the Gulf states and the Fish and Wildlife Service. The Secretary was instructed to have a prospectus prepared which would incorporate the studies outlined in this resolution, the one adopted at the October 1960 St. Petersburg Beach meeting, and any other pertinent information needed on the biology of the shrimp. It was agreed that the Washington group would meet at the Roger Smith Hotel at eight in the evening of April 9 and that contacts would follow on April 10-12. As for finances in connection with the Washington trip and the printing of the prospectus, the Secretary stated he would return the \$250.00 advanced to him by the Commission for travel and that this amount should about cover the additional cost., which was not anticipated when the 1960-61 budget was adopted.

Mr. McConnell moved for adoption of the resolution and the accompanying project. Commissioner Mitts seconded. Upon vote, the consolidation unanimously passed.

With no further business to be presented the meeting was adjourned for the Final General Session at 11:15 AM.

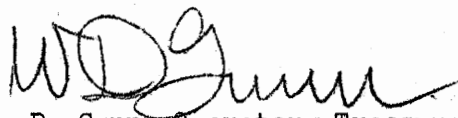
Prepared by: W. Dudley Gunn
Secretary-Treasurer

RESOLUTION

Resolved by the Gulf States Marine Fisheries Commission that there be an expansion of biological research to include the dynamics of the three leading commercial species of Gulf of Mexico shrimp, by the U. S. Fish and Wildlife Service; such studies to include natural mortalities, and desirable times, places and sizes for harvest, in accordance with a proper utilization of the fishery.

* * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission, March 17, 1961, at a regular Commission meeting held at the Buena Vista Hotel, Biloxi, Mississippi.


W. D. Gunn, Secretary-Treasurer
Gulf States Marine Fisheries Commission

**PROGRAM
FOR ESTUARINE RESEARCH
IN THE GULF OF MEXICO**

**Biological Laboratory
Bureau of Commercial Fisheries
U. S. Fish and Wildlife Service
Galveston, Texas
March 1961**

INTRODUCTION

The total catch of fish and shellfish for the Gulf of Mexico tripled within the past 14 years. In 1959 it exceeded one billion pounds. The 1959 catch was 22 percent of that taken in the United States, approaching \$87,000,000 in value. Some of the more important fish and invertebrates that produced this valuable catch were shrimp, menhaden, and mullet. These and others, such as oysters, tarpon, croakers, and many industrial fishes, have one thing in common; they are estuarine-dependent.

We observe that engineering projects are altering the Gulf estuaries. Industries look toward estuaries as a source of water for cleaning and cooling; municipalities tap their inflowing streams for consumption and agriculture for irrigation; real estate promoters often like to fill them in; and those interested in navigation wish to dig them out. Thus, there is considerable competition in the multiple use of estuaries. Each segment of interest in this multiple use obtains what it feels is the proper information, evaluates it, and presents what it concludes to be its requirements. These requirements are usually featured in a cooperative decision as to how the waters will be shared. If any one interest is not adequately represented in these decisions, it is likely that the "wise use" or conservation of the estuarine resources will not obtain.

The Gulf States Marine Fisheries Commission is concerned with the coordination of research on estuarine problems. Conservation agencies of the several states involved are active in the application of such research. Under the U. S. Fish and Wildlife Coordination Act the staff of the Galveston Laboratory has been advising the Office of River Basin Studies on research aspects of the effects on estuaries of federal engineering projects. Also, we have been requested to advise the U. S. Study Commission of Texas in its purpose of formulating an enduring water supply and control program for the State of Texas. Similar aid is being rendered the Southeast River Basin Studies by our Regional Office. Some of the major federal projects requiring and receiving advice on research aspects are the Trinity River Project in Texas; the Mississippi River-Gulf Outlet and the Lake Pontchartrain Hurricane Protection projects in Louisiana; the Central and Southern Floodway Project in Florida; and a host of others of similar and lesser scope.

Any advice or evaluation rendered is only as good as the data upon which it is based. With this in mind we wish to state the problem confronting us as: what data must we obtain to place the commercial fishing industries in a position to compete in the multiple use of estuaries?

INFORMATION REQUIRED

This program should give an understanding of the relation of the environment to the standing crops of estuarine life in order to predict the effects on fisheries of artificial alterations in the estuaries. Damages by such alterations are to be mitigated and fishery values enhanced through recommendations based on prediction.

There is a considerable range of physical conditions in Gulf estuaries (and the adjacent shelf waters). All estuarine waters have some similarity but differ sufficiently in detail so that it is difficult to apply generalizations to their physical and biological conditions. The response of estuarine fauna to local environmental variations is reflected in differences in their distribution and abundance from place to place. Their inherent physiological makeup may not change significantly over their geographical distribution. Therefore, we need three types of information:

1. Relation of estuarine species to their environment.
2. Physiological responses of estuarine species.
3. Long-term hydrographic and meteorological observations at selected stations to permit interpretation of local, seasonal, and annual variations.

PROPOSED PROJECTS

A. PROBLEMS WITHIN THE ESTUARIES

Extensive contributions to our knowledge of the environmental relationships of the Gulf estuarine fauna are needed. Ecological studies must cover a large array of estuaries because of the wide differences in climate along the perimeter of the Gulf. Thus, to extrapolate or compare results from one estuary to another, and during different years, requires a knowledge of the environmental backgrounds existing during the studies. To provide this background a number of monitoring stations are needed to obtain continuous measurements of water and climatic properties.

1. Distribution, abundance, and movements of species in relation to their environment

It is necessary to inventory the species with respect to their seasonal and annual abundance and to relate these to their environment. In addition to such field studies, attention would be given to tagging experiments and literature research.

2. Relation of selected species to artificial alterations of their estuarine environment

Field studies should be made in relation to engineering projects in the estuarine environment. Pilot studies are to evaluate the effects of specific engineering features. Models are to be used, and whenever possible field surveys would determine the accuracies of predictions based on data obtained from the models.

3. Establishment of monitoring stations in selected estuarine locations on the perimeter of the Gulf

These stations are essential to provide environmental data as background for comparison of similar ecological studies conducted by us and others in estuaries from different areas of the Gulf. They are to permit detection and analysis of long-range environmental changes in selected estuaries and in the Gulf estuaries as a whole. Some of the properties to be monitored are: salinity, temperature, pH, humidity, precipitation, tide, and wind.

B. PROBLEMS IN THE LABORATORY

The presence or absence of a species coincident with the measurement of some identity, such as temperature and salinity, is often considered an indication of the tolerance of a given species to that identity. Similarly, the standing crops, in numbers or weight, can be considered a measure of the success of an estuarine organism. Such field observations on tolerances and optima are difficult to interpret. The nature of the response of an estuarine organism to its environment is usually complex. Often, it is obscured by the multiplicity of environmental factors or identities initiating the response. This difficulty of interpretation may be overcome by conducting studies under controlled laboratory conditions. These studies may be enhanced, in turn, by quasi-controlled studies under conditions simulating those of the actual environment. A comparison of results from controlled and quasi-controlled studies with observations made within the estuaries should allow us to predict the environmental situations essential for the survival and success of a given organism.

4. Zones of tolerance and resistance of selected species to environmental identities (i. e., light heat, salinity, etc.)

a. Experimental laboratory data is needed in conjunction with field data to predict the survival of a given species in the variable conditions of the estuaries. Those levels of an identity beyond which a selected organism can no longer live for an indefinite period of time and the periods of time required to bring about a lethal effect at a given level of the identity beyond the lethal level will be determined.

b. Experimental data in conjunction with field data are essential to predict the ability of a given species to adjust to the variable conditions in estuaries. Rates can be determined for the acclimation of a given species to an identity that is increased, decreased, and undergoing variable changes.

5. Performance of selected species with the range of their tolerance to a given identity

Experimental data in conjunction with field data are needed:

a. To predict that portion of a species' range of tolerance to an identity within which it can be most successful. Measurements of physical endurance and physiological activity, e.g., cruising speed and rate of growth, are to be made.

b. To discover those identities that allow or require a response, on the part of selected species, directed in some relation to a gradient of the identity, to determine whether the distribution of a given identity is related to the movements of selected estuarine organisms.

6. Nutrition studies of selected species

A determination is needed of nutritional value of the foods of selected species with special emphasis on detritus. The relation between the various feeding levels in many Gulf estuaries is complicated by the ingestion of detritus by almost all levels of consumers.

C. PROBLEMS IN THE GULF

The estuarine environment is dependent upon the intrusion of oceanic waters for its existence. Similarly, the estuarine inhabitants are generally marine forms that are estuarine-dependent at some stage of their life history. Thus, we are interested in the oceanography of the shelf waters and their mixing with estuarine effluents.

7. Distribution of ocean properties along the Gulf coast

A description of the seasonal distribution of oceanic properties along the Gulf coast with emphasis on the fate of estuarine effluents is desirable. Physical, chemical, and biological data should be collected utilizing standard oceanographic procedures. Cruises should extend sufficiently far offshore to encounter the major oceanic features of the Gulf of Mexico.

8. Oceanic ecology of those species dependent upon the estuary at some stage of their life history

The seasonal distribution and abundance, migration, and movements of selected species should be determined in relation to the distribution of ocean properties along the Gulf coast with emphasis on estuarine effluents. Collections of data are to be concomitant with oceanographic observations.

THE BUDGET FOR ESTUARINE RESEARCH

	<u>Recurring</u>	<u>Non-recurring</u>
A. Problems within estuaries		
1. <u>Distribution, abundance, and movements</u>		
Personnel: 5 biologists, 2 aids	40,000	
Equipment	5,000	20,000
Expenses and overhead	40,000	
Subtotal	<u>85,000</u>	<u>20,000</u>
2. <u>Ecology and alterations</u>		
Personnel: 2 biologists, 1 aid, 1 geologist	25,000	
Equipment	15,000	10,000
Expenses and overhead	25,000	
Subtotal	<u>65,000</u>	<u>10,000</u>
3. <u>Monitoring stations</u>		
Personnel: 3 biologists, 1 meteorologist	30,000	
Equipment		40,000
Expenses and overhead	30,000	
Subtotal	<u>60,000</u>	<u>40,000</u>
Total	<u>210,000</u>	<u>70,000</u>

B. Problems within the laboratory

	<u>Recurring</u>	<u>Non-recurring</u>
4. <u>Zones of tolerance and resistance</u>		
Personnel: 3 biologists, 1 aid	23,000	
Equipment	7,000	30,000
Expenses and overhead	30,000	
Subtotal	<u>60,000</u>	<u>30,000</u>
5. <u>Performance</u>		
Personnel, 2 biologists	12,000	
Equipment	7,000	30,000
Expenses and overhead	26,000	
Subtotal	<u>45,000</u>	<u>30,000</u>
6. <u>Nutrition studies</u>		
Personnel: 2 biologists	12,000	
Equipment	1,000	5,000
Expenses and overhead	12,000	
Subtotal	<u>25,000</u>	<u>5,000</u>
Total	<u>130,000</u>	<u>65,000</u>

	<u>Recurring</u>	<u>Non-recurring</u>
C. Problems in the Gulf		
7. <u>Distribution of ocean properties</u>		
Personnel: 3 oceanographers, 1 biologist	25,000	
Equipment	10,000	
Vessel maintenance and operation	65,000	
Expenses and overhead	50,000	
Subtotal	<u>150,000</u>	
8. <u>Oceanic ecology</u>		
Personnel: 1 biologist, 1 oceanographer	12,000	
Equipment	8,000	
Vessel maintenance and operation	50,000	
Expenses and overhead	30,000	
Subtotal	<u>100,000</u>	
Vessel construction		<u>900,000</u>
Total	250,000	900,000
Grand Total	<u>590,000</u>	<u>1,035,000</u>

