GULF STATES MARINE FISHERIES COMMISSION

Biloxi, Mississippi
The Buena Vista
Sun Room
October 16 (Thursday) and October 17 (Friday) 1958

P R O G R A M

(Commission Chairman W. C. Holmes, Presiding)

9:30 AM	CALL TO ORDER	
	INVOCATION	Rt. Rev. Geoffrey T. O'Connell, Pastor Nativity Blessed Virgin Mary Rectory Biloxi, Mississippi
	ROLL CALL	
	INTRODUCTIONS	
	WELCOME ADDRESS	Honorable Carroll Gartin Lieutenant Governor State of Mississippi Introduced by: Commissioner Stanford E. Morse, Jr. State of Mississippi
	REPORT OF CHAIRMAN	
	ANNOUNCEMENTS AND DISTRIBUTION OF RESUMES OF RESEARCH ACTIVITIES OF THE GULF STATES AND THE FISH AND WILDLIFE SERVICE FOR THE PAST YEAR	
10:45 AM	RECESS	Fifteen Minutes
	MORE RECENTLY DEVELOPED FISHERY PRODUCTS INDUSTRY OF THE MISSISSIPPI COAST	
11:00 AM	Tuna	Cecil Drake Marine Sales and Service, Inc. Pascagoula, Mississippi
11:15 AM	Cat Food and Poultry Food	Tom Murphy Bluff Creek Canning Company Vancleave, Mississippi

POTENTIAL FISHERY PRODUCTS INDUSTRY FOR THE GULF

11:45 AM	Clams	Philip A. Butler Bureau of Commercial Fisheries Pensacola, Florida
12 NOON	Anchovies and Sardine-like Fishes	Harvey R. Bullis, Jr. Bureau of Commercial Fisheries Pascagoula, Mississippi
12:15 PM	RECESS FOR LUNCHEON	(No formal luncheon)
1:30 PM	REPORT: ESTUARINE TECHNICAL COORDINATING COMMITTEE	Howard T. Lee (Commitee Chairman) Texas Game and Fish Commission Rockport, Texas
1:45 PM	PROGRESS REPORT ON THE DIVERSION OF FRESH WATER INTO THE LOUISIANA COASTAL AREAS	Lyle S. St.Amant La. Wild Life and Fisheries Commission New Orleans, Louisiana
2:00 PM	PROGRESS REPORT ON RESEARCH: MISSISSIPPI RIVER-GULF OUTLET PROJECT, LOUISIANA	Walter A. Gresh Bureau of Sport Fisheries and Wildlife Atlanta, Georgia
2:15 PM	A BIOLOGICAL APPRAISAL OF GULF FISHERY STATISTICS	Clarence P. Idyll The Marine Laboratory, Univ. of Miami Coral Gables, Florida
2:30 PM	REVIEW OF FISH AND WILDLIFE SERVICE GULF SHRIMP PROGRAM	George A. Rounsefell Bureau of Commercial Fisheries Galveston, Texas
2:45 PM	RECESS	Fifteen Minutes

Friday (October 17)

8:30 AM	COMMISSION EXECUTIVE SESSION BREAKFAST	FIESTA ROOM	(SEPARATE AGENDA)
9:00 AM	SCIENTIFIC SESSION	SUN ROOM	(SEPARATE AGENDA)
11:30 AM	FINAL GENERAL SESSION	SUN ROOM	
12 NOON	ADJOURNMENT		

(M-29)

GULF STATES MARINE FISHERIES COMMISSION

NEW ORLEANS, LOUISIANA
JUNG HOTEL
AUDUBON ROOM NO. 3
AUGUST 14 (THURSDAY) & AUGUST 15 (FRIDAY), 1958

ESTUARINE COMMITTEE MEETING

A G E N D A

9:30 AM CALL TO ORDER AND REMARKS - COMMISSION CHAIRMAN W. C. HOLMES

INTRODUCTIONS

CONSIDERATIONS: ESTUARINE TECHNICAL COORDINATING COMMITTEE

COMMISSION V-CHAIRMAN H. D. DODGEN (PRESIDING)

1. DEFINE FUNCTIONS OF COMMITTEE
2. REPRESENTATION ON COMMITTEE
3. MEMBERSHIP ON COMMITTEE

GULF STATES MARINE FISHERIES COMMISSIO
312 AUDUBON BUILDING
New Orleans 16, La.

INFORMATIONAL SERIES
No. 1

To the

LEGISLATORS

And to the

MARINE FISHERIES ADMINISTRATORS

of

ALABAMA
FLORIDA
LOUISIANA
MISSISSIPPI
TEXAS

This, the first of a series of informational bulletins, been published by the Gulf States Marine Fisheries Commis as information to the Legislators and Marine Fisheries Admi trators of the several compacted Gulf States and for such c sideration as may be deemed appropriate in the developmen laws and regulations pertaining to the shrimp fishery of t respective states.

Commission biologists, together with biologists of the U Fish & Wildlife Service, were requested by the Gulf States rine Fisheries Commission to submit their recommendations uniform shrimp regulations for the compacted states. The rec mendations of the scientists, based upon biological data accu lated over a period of years, appear below:

The recommendations that follow are based upon pre knowledge of the shrimp and the shrimp fishery. Future de opments may require revision of these recommendations. purpose of the recommendations is to obtain the maxi poundage of shrimp from each year's crop without unduly h pering the industry.

We base these recommendations on the knowledge that it ıot necessary to protect the spawning stock and we assume t it is advantageous to protect the small shrimp.

While most of our knowledge is based upon research on common shrimp, **Penaeus setiferus** ,we have no reason to ieve at this time that suggested regulations will not apply ally well to the grooved shrimp, **Penaeus aztecus** and **Pens duorarum.**

The following facts concerning the life history of the comn shrimp we consider to be fundamental for the framing of ulations of the fishery:

1. Spawning occurs approximately from March through September in the offshore waters. The eggs are laid directly into the water and are not carried by the female. A female shrimp will lay between 500,000 and 1,000,000 eggs at a spawning.
2. The eggs hatch within a few hours and the young shrimp are carried by currents to the bays and estuaries which are the nursery grounds.
3. On the nursery grounds during the summer the young shrimp grow very rapidly, generally more than doubling their weight each month.
4. As they increase in size they move to waters of higher salinity. In Louisiana, Mississippi, Alabama and the west coast of Florida the young appear in abundance on the inside fishing grounds by mid-June; in Texas by mid-July.
5. Shortly after appearing in abundance on the inside fishing grounds the larger shrimp begin to move to the outside waters. Thereafter there is a constant movement of these larger shrimp from the inside to the outside waters.
6. With the approach of winter and the resultant lowering of water temperature this movement is speeded up. The result is that the larger shrimp have moved to the outside waters leaving the smaller shrimp in the inside waters. At the same time the growth rate of the shrimp is appreciably decreased due to these lower temperatures.
7. With the approach of spring and the resultant warming of the waters the small shrimp which wintered over in the inside waters assume a very rapid rate of growth and soon catch up in size with the earlier spawned individuals. Concurrently they move from the inside to the outside waters. In these outside waters spawning takes place. At spawning these shrimp are approximately one year old. Few if any survive to spawn a second year. Therefore for all practical purposes the common shrimp is an annual.

We define inside waters to be all waters landward of the three fathom line in the Gulf of Mexico. Outside waters are all waters seaward from the three fathom line in the Gulf of Mexico.

CLOSED SEASONS

Inside waters:

The first closed season for inside waters should be, for the area east of the Louisiana-Texas boundary, to and including St. Marks, Florida, from June 15 to August 31. The closed season for the inside waters of Texas should be from July 15 to September 15.

The second closed season for inside waters in all states should be from December 15 of one year to March 31 of the following year.

The first closed season is suggested to protect the small shrimp during the period of their most rapid growth. The different season suggested for Texas waters results from the fact pointed out above that the young shrimp appear later in the inside waters of this area.

The second closed season is suggested for the purpose of protecting the small shrimp that are wintering over in the inside waters. These shrimp produce the spring run.

Outside waters:

The outside waters should remain open to fishing in all states throughout the entire year.

There is at present no indication of a relationship between the number of spawners and the resulting crop. At no season of the year do small individuals predominate in the shrimp population in outside waters.

SIZE LIMITS

We recommend no size limits and that those now in effect be abolished .

When a size limit is imposed the basic purpose of the regulation is defeated by culling. Shrimp smaller than the legal size which have been killed in the fishing operation are discarded. The closed seasons recommended above **if strictly enforced** should provide adequate controls. While of no biological significance it is a fact that size limits are difficult to enforce which further detracts from their usefulness.

NIGHT FISHING

Night fishing should be permitted in all waters during open seasons.

Whether a shrimp is caught during the day or during the night the effect on the population is the same.

A ban on night fishing would almost eliminate the grooved shrimp fishery which has become of great importance and has promise of considerable development.

GEAR

No limitations are suggested on size of trawls or mesh.

We have no evidence that trawling is harmful or beneficial to the bottoms. The criticism that large trawls take an undue quantity of shrimp from the inside waters is not sound since it makes no difference to the shrimp population whether or not the shrimp are caught by a large or a small trawl. Competition between units of the fleet is an economic rather than a biological problem. Again we believe that the recommended closed seasons properly enforced should suffice for adequate control.

The size of mesh used in a trawl does not control to any marked degree the size of shrimp caught. In any case, we have already stated that the size of shrimp caught during open seasons does not need to be controlled.

The data we have shows that no significant quantities of important commercial or sport fishes are taken in shrimp trawling operations. In order to permit the escape of the small numbers of important fish which are caught it would be necessary to increase the size of the mesh to an extent which would seriously decrease the ability of the trawl to catch shrimp. The value of the shrimp caught by trawling operations is so vastly greater than the value of the fish incidentally caught that to curtail shrimping in order to prevent the capture of these fish would be unjustified.

HEADING OF SHRIMP ON THE GROUNDS

There is no necessity for prohibiting the heading of shrimp on the fishing grounds.

Shrimp are cannabalistic, they will eat their fellows dead or alive. It is highly unlikely that the presence of shrimp heads on the bottom will cause live shrimp to avoid that area. Returning shrimp heads to the sea is replacing a portion of nutrient removed.

BAIT FISHING

It is suggested that the shrimp bait fishery regulations be seriously reconsidered since there is much evidence of the abuse of this privilege.

/s/ William W. Anderson
Chief, Gulf Fisheries
Investigations
U. S. Fish & Wildlife Service

/s/ C. P. Idyll
Research Associate
Marine Laboratory
University of Miami

/s/ James Nelson Gowanloch
Chief Biologist
Louisiana Department of
Wildlife and Fisheries

/s/ Milton J. Lindner
Chief, Fishery Mission
to Mexico
U. S. Fish & Wildlife Service

/s/ J. L. Baughman
Chief Marine Biologist
Texas Game, Fish & Oyster
Commission

/s/ Francis X Lueth
Senior Biologist
Marine Laboratory
Alabama Department of
Conservation

(5-15-51)

mailed
11-12-58

GULF STATES MARINE FISHERIES COMMISSION

NINTH ANNUAL MEETING

BILOXI, MISSISSIPPI

BUENA VISTA HOTEL

OCTOBER 16-17, 1958

MEETING MINUTES

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

M I N U T E S

REGULAR MEETING OCTOBER 16-17, 1958
Buena Vista Hotel
Biloxi, Mississippi

OFFICIAL ATTENDANCE OF COMMISSIONERS

	PRESENT	ABSENT
ALABAMA:	Robert Folsom Garet Van Antwerp, III W. C. Holmes	
FLORIDA:	Ernest C. Mitts Walter O. Sheppard Vern Merritt	
LOUISIANA:	F. Lamar Clement E. J. Grizzaffi A. O. Rappelet	
MISSISSIPPI:	Chester Delacruz Stanford E. Morse, Jr. Hermes Gautier	
TEXAS:	Howard D. Dodgen	Jimmy Phillips Wilson Southwell
PROXIES:	Howard T. Lee	(For Wilson Southwell)
STAFF:	W. Dudley Gunn Secretary-Treasurer	

FORMER COMMISSIONERS PRESENT

Charles W. Bevis

COMMISSION COMMITTEE MEMBERS PRESENT

COMMITTEE TO CORRELATE FISHERY LAWS: A. J. Harris

COMMITTEE TO CORRELATE RESEARCH AND EXPLORATORY DATA: Gordon Gunter
Howard T. Lee, Donald R. Luethy, Percy Viosca, Jr.

SHELLFISH COMMITTEE: Robert M. Ingle, Lyle S. St. Amant and (listed above)
Messrs Gunter, Lee, Luethy

ESTUARINE TECHNICAL COORDINATING COMMITTEE: I. B. Byrd, Theodore B. Ford, Walter A. Gresh, W. H. Holland, Jr., Harvey L. Moore (for Howard Eckles), H. T. Odum, Paul Thompson, Seton Thompson, Bruce H. Strawbridge, Harold E. Wallace and (listed above) Messrs. Gunter, Ingle, Lee [illegible]

OTHER STATE GOVERNMENT REPRESENTATIVES PRESENT

Harlan J. Allen, James A. Allen, W. S. Cobb, Robert Craven, Carroll Gartin, James L. Goff, H. E. Maulin, Jr., James N. McConnell, Sidney Landry, Barnett B. Larrimore, W. C. Wainwright, L. A. Wilke

INTERSTATE FISHERIES COMPACT REPRESENTATIVES PRESENT

G. Robert Lunz

OTHER FEDERAL GOVERNMENT REPRESENTATIVES PRESENT

DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE: William W. Anderson, Harvey R. Bullis, Jr., Philip A. Butler, Charles R. Chapman, H. E. Crowther, Hermes G. Hague, Dudley Heiliger, Travis Love, Charles H. Lyles, George A. Rounsefell, E. Moret Smith, W. B. Wilson, Roy Wood

DEPARTMENT OF STATE, OFFICE OF UNDER SECRETARY FOR FISH AND WILDLIFE: Fred E. Taylor

U. S. CORPS OF ENGINEERS: J. C. Baehr, W. E. Shell, Jr.

INDUSTRY REPRESENTATIVES PRESENT

Alton Alario, J. E. Barr, A. J. Buquet, John Santos Carinhas, G. V. Chambers, W. E. Ceippen, Jr., Feltus A. Daigle, Cecil W. Drake, Paul Dufrene, A. G. Dunton, L. W. Graham, L. W. Graham, Jr., Leon Hall, Raymond L. Haynie, Jr., H. R. Humphreys, Jr., Paul Kalman, Clerville Kief, Sr., Hewitt A. Ledet, Wm. C. Lunsford, Jr., John Mavar, Jr., Nick Mavar, James L. McConnell, Harry L. McGinnis, J. A. McIver, J. B. McLeod, John Mehos, Thos. L. Murphy, Jr., W. R. Neblett, W. L. Parks, G. S. Leatherberry, Wallace M. Quinn, Joe Ramos, John J. Reardon, H. R. Robinson, J. H. Summersgill, Jack T. Styron, W. A. Stowe, Lawrence W. Strasburger, Harvey Smith, J. C. Simpson, Bill Simpson Robert A. Wilson

UNIVERSITY REPRESENTATIVES PRESENT

J. Y. Christmas, Albert Collier, Richard A. Collins, W. J. Demoran, Clarence P. Idyll, Edwin S. Iversen, Dale F. Leipper, Harold C. Loesch, J. G. Mackin William McFarland, Donald R. Moore, Kenneth M. Rae, S. M. Ray

CLERGY AND TRADE JOURNAL REPRESENTATIVES PRESENT

Geoffrey T. O'Connell ..... S. W. Corbino, Jack Hanicke, Wm. W. Westbrook

GENERAL SESSION, OCTOBER 16, 1958

Dr. W. C. Holmes, Commission Chairman, called the meeting to order at 9:40 AM and introduced Rt. Rev. Geoffrey T. O'Connell, Pastor, Nativity Blessed Virgin Mary Rectory, Biloxi, Mississippi, who rendered the invocation. The group remained standing following the invocation for silent prayer in memory of Walter J. Gex, Jr.

The Secretary called the roll of Commissioners after the Chairman introduced members who had been appointed since the last regular meeting, April 10-11, 1958; these being, Alabama Commissioner Robert Folsom; Louisiana Commissioner A. O. Rappelet; and Mississippi Commissioner Chester Delacruz. Howard T. Lee was seated as proxy for Texas Commissioner Wilson Southwell.

Registration cards were divided between the Chairman, Vice-Chairman and Secretary and guests of the Commission were individually introduced.

Mississippi Commissioner Stanford E. Morse, Jr., was called upon to introduce Lt. Governor Carroll Gartin of Mississippi who extended an official welcome to the Commission.

Dr. Holmes presented the Commission report for the year 1957-58, after which a 15 minute recess was declared.

Considering more recently developed fishery products industry of the Mississippi coast, the Chairman introduced first, Cecil Drake of Marine Sales and Service, Inc., Pascagoula, Mississippi, who spoke on the subject Tuna, and then Thomas L. Murphy, Jr., Bluff Creek Canning Company, Vancleave, Mississippi, for presentation of the subject Cat Food and Poultry Food.

Turning to consideration of potential fishery products industry for the Gulf, Philip A. Butler, Bureau of Commercial Fisheries, Pensacola, Florida, spoke on Clams, while Harvey R. Bullis covered the Bureau's observation on Anchovies and Sardine-like Fishes as recorded from exploratory data gathered through operation of the Pascagoula, Mississippi, stationed M/V Oregon and M/V Silver Bay.

Copies of the report and the four papers mentioned above are herewith attached in the order listed.

Starting the afternoon general session, Howard T. Lee, Chairman, Estuarine Technical Coordinating Committee, reported on the Committee's meeting of October 15. This report, herewith attached, follows the Harvey Bullis paper. A sub-committee composed of Robert M. Ingle, Florida State Board of Conservation, Ted B. Ford, Louisiana Wild Life and Fisheries Commission and Philip A. Butler, Bureau of Commercial Fisheries, are to meet at the Pensacola Shellfishery Laboratory immediately after the January 15 dead-line for the rendering of bibliographies mentioned in the Howard Lee report. The purpose of this meeting is to edit the state and federal bibliographies. A meeting of the whole Committee is scheduled for March 19, at 8:30 AM, at the Monteleone Hotel, New Orleans, Louisiana.

Next to be heard was a progress report by Lyle S. St. Amant, Louisiana Wild Life and Fisheries Commission, on Diversion of Fresh Water Into The Louisiana Coastal Areas. Walter A. Gresh, Bureau of Sport Fisheries and Wildlife, rendered a progress report on Research: Mississippi-River Gulf Outlet Project, Louisiana. These reports, both subjects of prior resolutions by the Commission, are to be found in order mentioned, following the Estuarine Technical Committee Report.

A Biological Appraisal of Gulf Fishery Statistics was presented by Clarence P. Idyll, The Marine Laboratory, University of Miami, Coral Gables, Florida, and follows the above mentioned report by Walter A. Gresh.

A Review of Fish and Wildlife Service Gulf Shrimp Program was presented by George A. Rounsefell, Bureau of Commercial Fisheries, Galveston, Texas. (Secretary's Note: The various items of research provided for in subject program, which was incorporated in a resolution adopted by the GSMFC at its Edgewater Park, Mississippi, meeting of January 21-22, 1954, would require expenditures as follows: $554,000 first year, $454,000 second and third years, $354,000 fourth and fifth years, $264,000 sixth and succeeding years).

The Clarence P. Idyll appraisal and George A. Rounsefell report are attached in order listed to these Minutes.

Following a short recess, Edwin S. Iversen, The Marine Laboratory, University of Miami, Coral Gables, Florida, spoke on the subject Progress On Research On The Tortugas Shrimp Fishery. Following is a summary of the report:

"In summary we have given a brief account of some aspects of the State-supported shrimp program. One aspect, that of the catch-effort study, is to suggest the complexity of the problem, and that if the information gathered is not clearly understood it is very easy to misinterpret this information. The fact that the shrimp vessels sell their catches in a different manner at different ports and that the sizes landed by dealers is quite different, illustrates this clearly. We feel that we will be able to provide an estimate of mortality.

"The recent reduction in the recovery rate of tagged shrimp is disturbing and efforts are being made to get back more of the recaptured shrimp. Our analysis of the tagging results is shown to be based on fishing effort and tagging effort from all over the grounds."

The remainder of the afternoon session was devoted to the shrimp fishery; the following questions were given principle consideration:

(1) As a conservation measure, should the capture and/or landing of white shrimp be prohibited, through uniform state laws or regulations, for a time during the spawning period in the waters of the open Gulf of Mexico between St. Marks, Florida, and the Texas-Mexico boundary?

(2) GSMFC Informational Bulletin No. 1 - Does the present accumulation of scientific knowledge suggest any changes?

Mr. William W. Anderson, Bureau of Commercial Fisheries, Brunswick, Georgia, presided at a panel of biologists to consider the above and other questions

on shrimp. The Apalachicola fishery was covered by Robert M. Ingle; the Alabama fishery by Harold C. Loesch; the Mississippi fishery by Gordon Gunter; the Louisiana fishery by Percy Viosca, Jr., and the Texas fishery by Albert Collier.

Copies of Commission Informational Bulletin, dated May 15, 1951, were distributed by the Secretary for consideration of Question (2).

The Secretary stated the question had been asked by the Commission from time to time as to whether or not the accumulation of biological information on shrimp suggested possible changes in the original recommendations. The Bulletin is attached to these General Session Minutes.

Mr. Anderson, who served on the committee of scientists who prepared the Bulletin, summarized the knowledge of the white shrimp which was used in preparation of the publication.

Mr. Ingle stated a system of sampling Apalachicola Bay was set up during the season 1951-52 but only intermittent checks were made; that in 1955 the system was renewed and had since been followed consistently. He said seven species were caught commercially in the Bay, each with different characteristics. According to the speaker, many brown shrimp were available in Apalachicola Bay in May; that there were no white shrimp available in June but that this species enters the Bay in July. Mr. Ingle stated that day and night sampling of the Bay, once each week, since 1956 indicated that it was better to close certain areas when the average size shrimp did not make the legal count than to have a fixed open and closed season. Such variables as water and temperature were mentioned as making such a flexible system preferable. He said the 1957 Florida Legislature put this type of regulation in effect for the Tortugas fishery.

Mr. Anderson inquired if Mr. Ingle believed in flexible regulations, open and close by size, desirable for all of the Gulf States; to which he replied - yes, for the Florida fishery but added he would not say for the other Gulf States because of not having information on their fisheries.

Mr. Loesch expressed his feeling that evidence did not point out to a relationship between spawners and resulting crop. He stated the small brown shrimp present in areas of Mobile Bay should be protected in April and May and the small of the white species in the upper Bay in July. It was said the December-March closed season was not necessary in Alabama because little shrimping is done during that period. In conclusion, Mr. Loesch stated he leaned toward flexible laws.

Dr. Gunter said there is so little shrimping done in the December-March period such closed season should be abolished. He said since the Bulletin was published more has been learned about brown shrimp. Brown shrimp, he stated, appear earlier than white shrimp and in order to protect the small brown species, closure should come some earlier. It was also pointed out that the brown shrimp work out earlier than the white shrimp and at an average smaller size. Dr. Gunter agreed with Messrs. Ingle and Loesch regarding non-rigid regulations; sample area and open and close accordingly. He said that it was not necessary to have biologists do sampling.

Mr. Viosca gave some of the highlights of the new Louisiana shrimp laws, referring particularly to the closed seasons in outside waters. He said white shrimp are coming back but that the post larval shrimp were not as abundant as they should be. With regard to gear Mr. Viosca stated that Louisiana was endeavoring to develop a new type which, if successful, would greatly benefit the fishery.

Mr. Collier said he likes the Florida system. Belief was expressed that the Bulletin's recommendation on the mesh of nets should be re-examined. Mention was made of a relative abundance of 3% of brown shrimp years ago and a 6-10% of white shrimp at present. Reference was also made to the increased shrimping effort as to species. Mr. Collier stressed the need for biological and statistical study of relationships.

Commissioner Clement inquired as to why small shrimp are not getting into the Louisiana nursery grounds. Mr. Ingle thinks offshore populations should be checked for this, and other information such as how many shrimp fish catch. Commissioner Clement said some checking was done last year on incoming shrimp. Dr. Gunter said the best way to check incomes is to go to the passes with plankton nets, then added that pass information is generally lacking.

Commissioner Rappelet inquired and was answered by Mr. Ingle as to the approximate distance offshore and area of the Tortugas Santuary. Commissioner Rappelet expressed belief that increased trawling in inside waters had caused reduction in the Louisiana white shrimp population.

Mr. John Mehos, Liberty Corporations, Galveston, Texas, and President of the Shrimp Association of the Americas, said there was a great abundance of small brown shrimp off the Texas coast last spring (65-100 count). Industry thinks, he said, it should go to the legislature and ask for a two months tie-up of boats. Dr. Gunter thought this a good idea. Mr. Collier said tests in the Aransas Bay area indicate brown shrimp come in early - latter February, may vary one or two weeks - and move out in May. He suggested legislation that would define five miles in all directions from passes for closure in order for the shrimp to scatter. Mr. Mehos said the reason they favored in and out closing was because small shrimp were everywhere last year. He added, the Texas industry favors flexible regulations.

Mr. Joe Ramos, Ramos Shrimp Company, Bayou La Batre, Alabama, asked for discussion on the effect of gear on nursery grounds. Dr. Gunter said as far as he knew there were no damaging effects. When little, he said, shrimp drift. Mr. Anderson said some think trawling is beneficial while others think it is bad.

Mr. Robert Lunz, Director, Bears Bluff Laboratory, Wadmalaw Island, South Carolina, and Vice-Chairman, Atlantic States Marine Fisheries Commission, spoke of the fluctuation in the abundance of shrimp over the years in the Carolinas fishery and of the recovery potential in due course following extremely cold years.

Mr. H. R. Robinson, Robinson Canning Company, Westwego, Louisiana, speaking of enforcement, said that a shrimp law closing outside waters would be no good unless it could be enforced. He inquired if regulations could be

enforced in outside waters. Dr. Gunter said all areas would have to be closed if any results were to be obtained. Mr. Anderson contributed that it is costly to enforce laws. Mr. Mehos agreed with Mr. Robinson and added, the Shrimp Association of the Americas appointed a committee at its last meeting for the purpose of getting the people of industry together.

In conclusion, Mr. Anderson said it seemed evident from the discussion that the Bulletin should be re-examined but added that it could not be carefully studied as it should be during the course of the meeting.

The Chairman received no response on call for other matters to be presented and the session was adjourned at 5:15 PM.

Friday (October 17)

The Commission Executive Session began at 8:30 AM with the serving of breakfast in the Fiesta Room. This session was adjourned at 11:30 AM and the Commissioners joined the scientists and others who had been in session in the Hurricane Room since 9:00 AM.

Dr. J. G. Mackin, Texas A&M Research Foundation, Thibodaux, Louisiana presided over the Scientific Session while Mr. Travis Love, Bureau of Commercial Fisheries, Pascagoula, Mississippi, acted as secretary. Mr. Seton Thompson, Bureau of Commercial Fisheries, St. Petersburg Beach, Florida; Dr. Gordon Gunter, Gulf Coast Research Laboratory, Ocean Springs, Mississippi; and Mr. Ted Ford, Louisiana Wild Life and Fisheries Commission, New Orleans, Louisiana, served as discussion leaders at this session.

On call to order, Dr. Mackin was recognized by the Chairman. In summarizing the discussions of the session, it was said to to be the consensus of the scientists that the Shrimp Bulletin be re-examined for possible changes and that thought be given to the developing of a uniform statistical procedure which would supply more information for biological considerations.

Dr. Holmes called upon the Secretary for a summary of items of general interest resulting from the Executive Session:

(1) Officers elected for year 1958-59:

Howard D. Dodgen, Executive Secretary (Chairman)
Texas Game and Fish Commission
Austin, Texas

Hermes Gautier (Vice-Chairman)
Pascagoula Ice and Freezer Company
Pascagoula, Mississippi

(2) Tenth Annual Meeting, Corpus Christie, Texas, October 15-16, 1959

(3) Resolutions:

Requests Commission Committee to Correlate Research and Exploratory Data to program an improved fishery statistical system and

report on progress at the next regular Commission meeting (Monteleone Hotel, New Orleans, Louisiana, March 19-20, 1959).

Requests State Directors on the Commission to appoint a technical committee of five members to study possible revision of Commission Informational Bulletin No. 1 on the shrimp resource; such committee to furnish report at the March 19-20, 1959 Commission meeting.

Reaffirms the Commission resolution, adopted in January 1954, which recommends a Federal Gulf shrimp research program, and recognizes that such items of expense as were incorporated in the suggested program be considered minimum amounts due to increased costs over the intervening years. The affirming resolution urges that past and future biological data be assembled and expeditiously published and distributed.

Dr. Holmes recognized the newly elected Commission Chairman and Vice-Chairman and turned the meeting over to Mr. Dodgen. Louisiana Commissioner Grizzaffi, 1956-57 Commission Chairman, was introduced. Mr. Grizzaffi presented Dr. Holmes a plaque in recognition of his service to the member states as Commission Chairman for the past year and six years previous as Alabama's citizen representative on the Commission.

Mr. Dodgen received no response on a call for other business and after thanking the conferees for their attendance, and recognizing the contribution of the Buena Vista toward the success of the meeting, adjourned the ninth annual session at 12:15 PM.

Prepared by: W. Dudley Gunn
Secretary-Treasurer

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Biloxi, Mississippi
Buena Vista Hotel
October 16-17, 1958

ADDRESS

Presented by Dr. W. C. Holmes, Chairman
Gulf States Marine Fisheries Commission

Since the eighth annual Gulf States Marine Fisheries Commission meeting, which was held last October 10th and 11th, at Mobile, there has been one regular Commission meeting. This meeting was held on April 10th and 11th at Clearwater.

At the meeting last October, the Commission recommended a conference be held of state, federal and university marine biologists. The scientists met at the Gulf Coast Research Laboratory, February 6th and 7th of this year. Shrimp, menhaden and other industrial fishes, and oysters were the principal fisheries discussed at the two-days' session. Problems concerning the estuaries, sloughs, marshes, lagoons and swamps that fringe the Gulf coast were also discussed. Resumes of recommendations resulting from the meeting were presented to the Commission in April and by resolution those relating to the fisheries proper were adopted for further recommendation to the five Gulf States' marine fisheries agencies cooperating with the Commission. With reference to recommendations involving the environment, the Commission resolved that a program be undertaken separate and independent of any planned or heretofore approved development project and be coordinated as a cooperative effort between federal and state agencies. A technical coordinating committee composed of two officials of each of the Bureaus of the Fish and Wildlife Service and two members from each of the five states, was suggested.

With further reference to the fishery recommendations, some research, either underway or planned, can be found in the federal and state summaries furnished you this morning; while other such research will be covered in reports to be heard during this meeting.

The referred to Estuarine Technical Coordinating Committee has been formed. Reports of the Committee's progress, which has resulted from a meeting in New Orleans, August 14th and 15th and a second one here yesterday, will be presented at this afternoon's session.

Going back to action taken at the last annual Commission meeting, we are advised that the resolution concerning ecological and associated studies in connection with the Gulf Tidewater Channel Project, Louisiana, has been given considerable attention by both the Corps of Engineers and the Fish and Wildlife Service. We will be favored today with a report on that particular research.

The Convention between the United States and Cuba for the conservation of the shrimp resources of the Eastern Gulf of Mexico was signed at Havana,

Cuba, on August 15, 1958. The Convention contemplates international cooperation between the two countries aimed at developing the maximum sustainable yield from these shrimp resources. Legislation concerning the Convention is expected to be presented to the United States Senate early in the next session. This Commission, in October 1957, approved a measure enacted by the 1957 Session of the Florida Legislature to establish a sanctuary in a portion of the Tortugas Area.

Again referring to the spring meeting at Clearwater, a resolution was adopted which calls attention to the need for additional fresh water in the Louisiana coastal areas during dry periods to assist the fishes, shellfish and wildlife. The Corps of Engineers and the Fish and Wildlife Service, in cooperation with the Louisiana Wild Life and Fisheries Commission, have been giving consideration to this matter and the Commission will be favored with a report on the subject this afternoon.

Another resolution adopted at the last regular meeting, favors the use of Saltonstall-Kennedy funds for research in the cultivation of shrimp in completely controlled and in partially controlled ponds and reservoirs. We are informed parts of existing federal research are already producing information which is of value to the study of shrimp culture and that further research plans are being prepared.

On March 21st of this year the Commission had the honor of participating in dedication ceremonies of the Pascagoula Fisheries Laboratory. The Commission is particularly pleased to see the several sections of the Bureau of Commercial Fisheries adequately housed at Pascagoula. The Commission recognized the need for full time, on the ground, technological assistance for the Gulf commercial fishing industry some years ago and feels the laboratory and staff at Pascagoula will render a valuable service.

The Commission's Technical Summary on the important Gulf speckled trout and the two species of white trout, was delivered October 10th. The Commission is deeply indebted to Mr. William C. Guest of the Texas Game and Fish Commission and Dr. Gordon Gunter of the Gulf Coast Research Laboratory for preparation of the manuscript. It is believed the publication will prove particularly helpful to fishery legislative committees, fishery administrators and university marine science students.

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

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GULF STATES MARINE FISHERIES COMMISSION
Biloxi, Mississippi
Buena Vista Hotel
October 16-17, 1958

"TUNA"

Presented by Mr. Cecil Drake
Marine Sales and Service, Inc.
Pascagoula, Mississippi

The first tuna canned in the United States dates back to 1903 when 700 cases were processed. Southern California canneries were engaged in packing other fish varieties, especially sardines at that time. When in 1903 sardines failed to appear the tuna canning commenced as a substitute for the other varieties. This was done by Albert P. Halfhill who is now recognized as the "father of the tuna industry". Tuna canning is now done most extensively on the west coast and four of the largest canners pack in excess of 1,000,000 cases annually.

The early tuna fishing was done by small boats for the albacore species in the Catalina channel off California. These vessels were 40 to 50 feet long, powered with gasoline engines. Soon diesel engines became available and replaced the gasoline, giving the boats more range of operation.

Because the season was a short one, the fishing operation was extended to Turtle Bay and Cape San Lucas in Lower California. The fleet of small boats was run to those areas and their catches were delivered to mother ships or tenders. The fish was packed in ice and brought to San Pedro and San Diego canneries, sometimes in a very poor condition. It was recognized that the catching boats could take better care of their fish and range to wider areas if they were larger. In the 1924-26 period the beginning of the long range tuna fleet took place, with the construction of the Patricia II, Lusitania, and Atlantic, all in the 100 foot class. These boats were equdpped with refrigeration to retard the melting of ice

The Van Camp Sea Food Company had come into being and Frank Van Camp, its president, cleverly named their pack "Chicken of the Sea". One of the other early packers was Wiley Ambrose, who called his pack "Breast of Chicken". A long court battle ensued between these two companies over the use of the word chicken in both labels. The decision of the court allowed both to continue their respective names.

In the meantime the tuna fleet began to grow and in 1932 the first boat was fitted with brine refriger tion. This improvement made the range of the boats practically unlimited, as melting ice was no longer a problem. Soon new fishing banks were discovered at greater distances - Costa Rica, Panama, and Galapagos Islands became regular fishing areas. New vessels continued to be built as the country recovered from the depression in which tuna hit a new low price of $80 per ton. The boat construction just before World War II was in the 13 5' class with capacities over 300 tons. In 1940 the U. S. pack reached a new high of 4 million cases. With the price of

yellowfin tuna reaching $200 per ton during the war. At the outbreak of the war 32 of the best vessels of the tuna fleet were requisitioned by the Navy. These vessels were in such good condition and had an almost unlimited cruising range that they were immediately put to duty in the South Pacific. Many of their personnel who were fine seamen enlisted as crew members. The first Christmas dinner delivered to Guadacanal was taken by a tuna clipper. The fishing at home was continued by the remainder of the fleet, which contributed substantially to the supply of food. For 30 days, however, the fishing was interrupted when the Japanese fleet left home base for what proved to be the battle of Midway, it was believed they might attempt an attack on our West Coast. The tuna boats at home formed a picket line offshore to warn the mainland in such an event. Several of the tuna clippers were lost during the war, so rebuilding of the fleet commenced at its termination. The demand for tuna was steadily increasing, necessitating a larger fleet. This fleet reached a peak in number during 1951 of 234 vessels. Likewise, when the war was over the Japanese began rebuilding their fishing fleet. This was sponsored to a great extent by their government, possibly with the use of some of our money. Excess production by the Japanese and high U. S. prices began a stream of imports from Japan. This flow increased until it now absorbs about 46% of our market. There is no tariff on raw tuna, but canned tuna in oil has a sufficient tariff to retard its shipment. Tuna canned in brine bears a tariff of 12½%. Thus imports on this pack reach a large volume in the U. S. Legislative action to curb imports or established quotas has been proposed for several years. No favorable action has been taken by Congress. These imports have reached such proportions that the American tuna fleet has been idle much of the time in recent years. This once prosperous and efficient source of supply is rapidly declining. At present the fleet has shrunk to 138 vessels. Losses due to natural causes are not being replaced. Aside from the plight of the tuna fleet, the industry has continued a rapid growth. Sales of tuna in the U. S. in 1957 reached 14 million cases, a new record, and 1958 is running 10% ahead of last year. The future looks bright for this easy to serve healthy food, so popular with children and adults alike. The canning industry, in order to keep itself more competitive with other foods has sought cheaper supplies of fish and lower canning costs. Van Camp have a sizeable canning operation in Somoa. This cannery is being supplied by Japanese longline vessels. The production is shipped to the U. S. duty free; also their cannery in Puerto Rico can ship to the U. S. duty free. To counter these measures to some degree, Star-Kist have tuna catching and freezing facilities in Peru and Chili. Breast of Chicken have extensive installations in Peru. It is reported that Star-Kist are about to break ground for a tuna cannery in San Juan, Puerto Rico.

Tuna is found in the temperate zones around the world. This makes the Atlantic a large potential source, as well as the Caribbean and Gulf of Mexico. New England is likely to produce well in the summer months as good catches this year indicate. The Gulf of Mexico shows promise as the work of the Fish and Wildlife vessel Oregon and the commercial boats have proven. The Japanese have made great strides to expand their operation worldwide. They have made fishing agreements with many countries. They have 30 large longline vessels fishing the Atlantic. More such vessels are fishing in the Indian Ocean, as well as in the Pacific. These former ships are supplying Italy and Brazil, and those based at Havana after processing their fish

into frozen loins are shipping to the United States. The vessels based at Haiti are supplying Van Camp at Ponce, Puerto Rico, and some will no doubt supply Star-Kist at San Juan, P. R. Trans-shipments from the Panama Canal by steamer have been received from Japanese vessels which have produced their catches in the Atlantic. These shipments have gone to Star-Kist and Columbia River Packers. It is conclusive that a definite trend is underway for movement of tuna canning toward the Atlantic, Gulf and Caribbean. This statement is made based on the following facts:

1. Van Camp is already operating in Puerto Rico and Star-Kist is reported to be breaking ground for a cannery at San Juan.

2. Japanese are operating 30 vessels in the Atlantic and part of this catch is available to American canners.

3. Canning on the Atlantic Coast is increasing this year due to good catches in New England from traps and by a purse seine vessel.

4. The more consistent catches by longline in the Gulf of Mexico and the discovery of new areas of fish population as well as the expansion of sales by Bluff Creek Canning Company dictate increased activity.

5. Continued interest in this area by West Coast canners who are aware of the possible new fish supply and the proximity of same to the population center of the U. S.

It is recognized that the Gulf Coast area is possibly the most attractive place in the United States to can tuna. A favorable labor supply at a economic rate is available. Freight savings can be effected over most of the shipments from the West Coast. The tuna is available to the canners at lower prices than on the West Coast. With reference to the waters we are most interested in - those adjoining the Gulf States - there is no doubt but that enough production of tuna can be made to support fair sized canning operations. The exploratory work of the vessel Oregon, which embraced several years, indicates the large areas bearing tuna population. The fish were found throughout the Gulf, but were the most plentiful in the northern and southwestern portions. The Oregon's most consistant work was done by the longline method, although more limited efforts were made by seining and live bait. These latter methods were not too promising, although it is likely that a year's steady fishing of these styles by experts from the West Coast could make it pay. The log sheets of the vessels Milmar and Alfhild show the presence of surface schools of yellowfin and skipjack each trip. These fish are so needed for canning that it is hoped that attempts to catch the surface schools will be made soon. A small boat has been fishing by longline method out of Vera Cruz and for several months has done well. The vessels Milmar and Alfhild are fishing consistently by longline. Their catch rates are averaging near 1 - 3/4 tons per day's fishing. The average of a West Coast tuna clipper for each day's fishing considering absence from port is only 2.53 tons per day. The vessel Milmar has delivered 40 tons of tuna

to the Bluff Creek Canning Company in a 4 week period. The actual fishing time during this trip was only about 2 weeks. The Alfhild has delivered 149½ tons to the cannery from April 20 to September 30. This boat has caught 7 tons in a single day. The key to increased canning in our Gulf States is to get more boats tuna fishing. Likewise, with larger production proven more canning will follow.

In conclusion, it appears that the tuna supply and canning operation has taken on an international aspect; that the Japanese tuna production is now one of worldwide activity; that the American tuna fleet will continue to decline, unless some immediate remedial measures are given; that the American tuna canners will be placed in a vulnerable position for the supply of tuna if they become solely dependant on foreign imports or in the event of hostilities; that the consumption of tuna in the U. S. will continue at a healthy rate of expansion.

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GULF STATES MARINE FISHERIES COMMISSION
Biloxi, Mississippi
Buena Vista Hotel
October 16-17, 1958

"CAT FOOD AND POULTRY FOOD"

Presented by Mr. Tom Murphy
Bluff Creek Canning Company
Vancleave, Mississippi

Mr. Chairman, ladies and gentlemen. It is a pleasure for me to be here this morning and to have the opportunity to say a few words in regard to the utilization of our so called "scrap fish" or industrial fish in the manufacturing of pet foods and poultry feeds.

First, since it is of the oldest duration here on the Coast, I would like to talk briefly about the utilization of these fish in the manufacturing of pet foods. The scientists tell me that our lowely croaker, head, scales, fin, tail and all, as he comes from the water, contains approximately 17% animal proteins plus many other vitamins and minerals as well as the unknown growth factors found in fish.

Now when we compare the cost of producing this same amount of protein from the cow, including all of the grains, pastures, and other necessary tending required to produce it, against the small amount of labor required in the harvesting from the Gulf of the scrap fish, we can readily see a vast difference in the cost of production from the different sources of protein. A superior type is being delivered to our docks for less than 2¢ per pound, and the present market value of the cow on the hoof is in excess of 20¢ per pound. You can readily see that our Gulf is an almost unlimited reservoir of cheap protein.

As you look from the windows of this hotel, visualize the Gulf of Mexico there as a great, almost endless field, producing day and night hundreds of thousands of tons of very high quality proteins, and every time the rains fall on the interiof of Mid- America, these rains leech the soil and another load of fertilizer is on its way down the rivers and streams to fertilize this great field -- the Gulf. Therefore, we have at our doorstep, a field which requires only going into with our harvesting machinery. Our boats with their nets are not unlike great combines that go into the wheat fields of the Mid-West, and you can imagine the joy and profit to be derived by a Mid-West farmer if the only effort he had to put forth was to go into his fields with the combines and harvest the grain, assuming that it grew there without any seeding, fertilizing, or expenditure, or effort whatsoever on his part.

Now, after being in the business of harvesting this wealth of protein from our great field-the Gulf for the past seven years, I am convinced that our boats and equipment on the whole are out-dated, just as the first reaper that Silas McCormick built that went into the fields pulled by a mule, is

out dated. This being the case, the boat builders, equipment manufacturers, and net makers face a real challenge, and at the same time have a great opportunity for profit to design, build, and maintain boats that will efficiently harvest this crop of fish that our Gulf is continuously producing. We manufacturers, together with the technologists and chemist, are also missing a great opportunity if we do not study and seek even better and more economical means to convert and produce this wealth of raw materials and make it available to both humans and animals.

Bluff Creek Canning Company at Vancleave produces Red Heart Cat Food for John Morrell & Co., the meat packers, and this cat food is shipped throughout the United States. We believe that we are producing a cat food using Gulf industrial fish, which is superior to any cat food produced elsewhere. Cats in cages at the laboratory of John Morrell & Co. have been fed through the eighth generation of cats, they continuously thrive and reproduce, eating absolutely no other food than Red Heart Cat Food as it comes from the can. We are now in the process of expanding our production at Bluff Creek Canning Co. More than a year and a half ago, I pioneered with a small plant at Empire, Louisiana, a method whereby these industrial fish could be manufactured into a high vitamin, high energy whole fish meal to be used as a supplement in poultry rations, more particularly for broilers. Many difficulties were experienced in the production of this whole meal. However, we now have a plant using up to 8 tons of raw fish per hour, and which is producing a product that is preferred by some of the largest feed manufacturers in the industry, such as the Alabama Flour Mills at Decatur, Alabama, Crosby-Hodges Milling Company at Vicksburg, Mississippi. All of these feed manufacturers are also in the broiler business and since they are feeding their own chicks, they prefer our superior fish meal to any other on the market. This is evidenced by the fact that our entire production from this plant is sold to these manufacturers for the next 12 months. This high vitamin whole meal is used not so much for its protein content, but for the unknown growth factors which makes the chicks produce more pounds of meat per pound of feed eaten.

We are very fortunate in the fact that the people in the broiler industry have greatly increased their production here in the Southern states, with Mississippi in the past 10 years moving from 30th place in broiler production to 4th place, and it is up to we manufacturers to harvest and process this feed supplement and make it available to this thriving industry at a reasonable cost.

It has been a pleasure to have had this opportunity to say these few words, and should there be any questions, I would be most happy to attempt to answer them. Thank you very much for your attention.

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GULF STATES MARINE FISHERIES COMMISSION
Biloxi, Mississippi
Buena Vista Hotel
October 16-17, 1958

"POTENTIAL OF THE GULF HARD CLAM INDUSTRY"

Presented by Dr. Philip A. Butler
Bureau of Commercial Fisheries
Gulf Breeze, Florida

Shellfish, including the oyster and hard clam, are particularly sensitive to environmental changes since they are relatively fixed in position and cannot escape as do the migratory fish when drastic changes occur. Clam populations are especially hard hit by such changes because the long time it takes clams to reach a marketable size exposes them to relatively more dangers. Of course, any industry which is dependent on the exploitation of a wild crop is likely to fluctuate uncontrollably and much of our research effort is directed towards understanding how to control such fluctuations, or if not control, at least predict them.

A major step towards stabilizing clam production was taken nearly ten years ago when the Milford Laboratory of the Bureau of Commercial Fisheries devised successful methods for culturing large numbers of seed clams under laboratory conditions. It then became important to discover the best ways to utilize these seed clams, not only in New England, but in other coastal areas where there were possibilities for starting a successful industry. In 1951, we initiated a series of growth experiments to determine what might be expected of these seed clams planted in Gulf waters. This brief report summarizes some of the major conclusions to be derived from our work during the past few years.

The most obvious and significant result is the knowledge that hard clams do grow faster in Florida than they do in New England - much faster in fact. Quarter-inch seed clams attain a length of one inch in a year, two inches in 2-3 years and 3 inches or a marketable size in the fourth year. These rates are from 2 to 7 times the rates reported for clam producing areas in New Jersey and more northern areas. Many of the clams entering the New England harvest are 10-15 years old and in some cases considerably older.

What are the reasons for this better growth in the South? Water temperatures appear to be one of the answers; but it is not so much a question of warmer water, but longer periods of temperate water. In the north, clams hibernate 3-4 months of the year without feeding or growing. During these same months of November-March, one-inch seed clams planted in Florida doubled in size. During peak water temperatures in August and September, however, clams in the south grow much more slowly than they do in the north. The net result is that in the south we have a 10-11 month growth period compared to an 8-9 month period in the north.

There are at least two other factors of importance in this growth picture. One of these is the quality of the local environment. This

inclusive term covers many items or factors we still know little about; such as amount of food, effect of crowding, and type of bottom. Only last year, hundreds of bushels of one-inch clams were transplanted from one bay to another in New England in the hope of finding a better growing area. These clams, the size of our 1-2 year olds were known to be 15 years old. Several biologists have reported significant differences in clam growth rates in populations only a few hundred yards apart.

A second and equally important factor is the hereditary make-up of the clams. We have found differences of 500 percent in the average meat yield of two groups of clams whose only difference was their parentage. From the time these clams were larvae until four years later, they had been kept side by side under identical conditions, but they had been spawned from different parental stock.

A final important advantage from the commercial viewpoint that we have found in culturing these clams is the unusually low mortality in our experimental trays. Groups of clams have gone from 18 to 24 months without a single loss, and average mortalities based on the data from many groups have been approximately 3 percent per annum.

We have established the facts of: easy procurement of seed clams, rapid growth and low mortality. These make up the optimistic side of the picture. Not so reassuring is the equally clear picture of widespread and disastrous predation whenever these clams are planted, unprotected on the natural bottom. When I spoke of the low mortality rates, they included only the unexplained mortality figures. Clams, kept in experimental trays and protected with wire covers of adequate mesh, experience practically no mortality. Placed on the open bottom, they are soon a complete loss. In north Florida there are at least two kinds of crabs and three types of snails which soon wipe out an unprotected clam planting. The ways these predators kill clams are quite characteristic and the different predators are easily identified by the type of damage they cause in opening the shells.

Early in our studies we began testing various kinds of protective trays and, more recently, fenced pens on the natural bottom. These enclosures of galvanized wire fencing, which extend above high water, are not only expensive, but they do not provide in themselves adequate protection. Small crabs and snails swim or crawl through the mesh and grow up on the inside to the size where they are able to damage the clams. During this past summer, it has been necessary to maintain several crab traps within each pen and to bait them daily. We have a small (8' x 14') cement tank for growing the very young seed clams. Crab larvae enter this tank with the water supply through the pump, and grow up in the tank. At the height of the crab season, we were trapping 10-20 juvenile crabs daily from this one tank and mortalities were still quite high.

Assuming that these same conditions hold true in other Gulf estuarine areas, the question arises as to whether or not, with the present state of our knowledge, clam culture has any commercial future here. The importance of the crab commercially rules out any possibility of using one of the

pesticides such as lindane for chemical control. Such a program might damage the crab and shrimp industry more than it helped the clams. The chances of finding suitable growing areas in the bays free from predators are poor because of the similar environmental tolerance of both clams and predators. And, finally, the costs of adequate fencing appear to be prohibitive.

Some worth-while possibilities are suggested however, if we combine these studies with the exploratory work of the Pascagoula Laboratory. Their recent surveys indicate concentrations of the Gulf hard clam along parts of the west coast of peninsular Florida. This area formerly supported a commercial fishery and canning plant but they died out - presumably because of overfishing.

Since the clam population has reestablished itself here, the area must be reasonably free of natural predators. With our knowledge of hatchery production of seed and with an intelligent planting program, it may be possible to increase greatly the size of these beds and the number of clams. Then, with adequate control of harvesting, an economically sound fishery having/a sustained annual production could be established.

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GULF STATES MARINE FISHERIES COMMISSION
Biloxi, Mississippi
Buena Vista Hotel
October 16-17, 1958

"EXPLORATORY FISHING DEVELOPMENTS ON SARDINE-LIKE FISHES"

Presented by Mr. Harvey R. Bullis, Jr.
Bureau of Commercial Fisheries
Pascagoula, Mississippi

INTRODUCTION:

Gulf Fisheries may be conveniently divided into two groups: (a) those dependent upon bottom (or near bottom) dwelling species, and (b) those utilizing pelagic stocks.

In the first group are included the trawl fisheries (shrimp, trash fish), the dredge and rake fisheries (clam, scallop, oyster), pot and line fisheries (crabs, snapper, grouper) and a few others.

The second group, at present, includes the gill net, trammel net, and seine fisheries for food and industrial fishes. This group may be divided on the basis of utilization into: (a) meal and oil fishery (menhaden), (b) foodfish fishery (spanish mackerel, mullet, tuna, trout) and (c) bait fishery (supplying cigarfish, scad, etc. to snapper, tuna, crab and party boats). It is this group, dependent upon pelagic species, which is the present concern.

In its current state, the pelagic fisheries are far behind the fisheries for ground species as regards knowledge (quantity and quality) of stocks, methods of efficient capture, and ultimate utilization. It may be generally said that, in respect to the smaller offshore schooling fish, the mid-water region of the Gulf is still unexplored.

The menhaden industry, in terms of tonnage landed, is the largest fishery in the world. It constitutes an old, well-founded segment utilizing purse seining and methods essentially similar to those in use for the past 100 years. Its existence presently depends upon the seasonal availability of menhaden; several species of the genus Brevoortia. From these are derived various reduction products (oil, meal and solubles). A second group also utilizing fish for reduction has made a remarkable growth during the past two years. This faction is concerned with the manufacture of high quality meals; generally these meals are vitamin enriched. The main source of raw materials is trawl-caught ground fish.

Both of the two above industry segments are interested in expanding, extending, discovering new sources of raw fish, and new and more efficient methods of obtaining fish. For this reason they have expressed considerable interest in recent midwater work of the Oregon, and two firms have also been exploring the possibility of modified west coast lampara fishing methods. These private industry explorations are still in the formative stages and little concrete data is available yet.

A rather small seasonal fishery has been existent for some years, on the Florida west coast, depending largely on seining scad and sardines as a source of bait for snapper and tuna vessels and charter boats. Recently, one group near St. Petersburg, Florida has been using a lampara net for this purpose, and catching variable quantities of Spanish sardine, Sardinella anchovia. This operation is nowin its second year and apparently demand far exceeds the present production. The bait fisheries sell their products whole and generally frozen.

Finally, several north Gulf canneries, concerned over the questionable future of canning small shrimp locally, have been seeking new products and have shown considerable interest in sources for, and methods of obtaining fish to can for human consumption.

OREGON EXPLORATIONS AND GEAR RESEARCH:

Last fall, the Oregon began an investigation of mid-water and surface school fish potentials in the Gulf of Mexico. This program was occasioned by industry interest; regular and frequent sightings of schools by the Oregon, Silver Bay, and commercial vessels; and backed up by recommendations by the Gulf States Marine Fisheries Commission. Objectives set up at the initiation of the project were

1) Identification of school fish species in the Gulf

2) Development of efficient method of fishing and fishing gear

3) Determination of geographic range and seasonal availability

4) Determination of available quantity

The preliminary survey has been carried to a point where sampling of fish schools and identification of their major components has been accomplished over a considerable portion of the eastern Gulf. This has provided a basis for future work, as well as having established the desirability of more comprehensive study. During the four Oregon cruises on this project, extensive use of a small 40' square mid-water trawl was made. Although hampered by lack of depth telemetering devices and inexperience, this gear was proved successful under certain conditions (i.e., turbid, cool water-shallow water areas), and sampling sets ranging up to 2000 pounds were made. It became quite apparent that additional fishing methods would be necessary to cope with the diversity of species and conditions encountered and future work will make use of a wider variety of gear.

Perhaps the most important aspects of the work to date have been (1) sampling of schools, and (2) correlation of echo-tracing with specific fish species groups. The sampling activities indicate that at least six little used or unused species of fish are present in the Gulf in possible commercial quantity. These are

1) Razor bellies or pilchard (Harengula P. pensacolae)

2) Cigar fish or Scad (Decapterus punctatus)

3 & 4) Anchovies (Anchoa hepsetus and A. mitchelli)

5) Round herring (Etrumeus sadina)

6) Thread herring (Opisthonema oglinum)

In addition, Spanish sardines (Sardinella anchoa) are apparently locally abundant, in season, along the coast of Florida, and indications are that the chub mackerel (Pheumatophorus colias) may also be abundant. Butterfish (Poronotus sp.) while not generally associated with mid-water, were also taken in quantity. A more detailed consideration of the above species is appended.)

Experience has indicated the futility of making "blind sets" on midwater schools. The depth recorder, therefore, is an indispensable aid in locating subsurface schools. With the high sensitivity incorporated in most contemporary depth recorders, it is possible to not only find the schools, but, with experience, to make at least rough identification of the species present once a school appears. Preliminary attempts at correlating these recordings with samples obtained have been instructive. Results are pretty well explained on the chart. With further experience, it should be possible to more concisely delimit species by their behavior and characteristic echo. One serious difficulty, however, lies in the fact that many schools are "mixed" -- consisting of two or more species. So far our study suggests that in mixed species schools, the configuration of the school approaches that of the dominant species. It is also possible that the characteristics of a school of a given species changes from season to season or under drastic weather variations.

Correlations between species and their schools as shown on the echograph (Elac Model LAZ6B) follow:

I. Verticle schools; discrete schools characterized by greatest dimension in the vertical plane.

1. This type of school seems to be definitely associated with anchovies(Anchoa hepsetus and Anchoa mitchelli).

2. Anchovies were present in 58% of the schools of this type. Their absence in the remainder seems possibly to be due to an avoiding reaction or to some other phenomenon as evidenced by their usual predominating presence in contiguous tows.

3. No other single species was present in any appreciable number of tows of this type.

4. See comment under horizental schools.

II Horizontal schools; discrete or continuous schools arrange horizontally with respect to the longest dimension.

1. Harengula pensacola were present in 97% of the schools showing this configuration; in most cases comprising 2/3 or more of the catch.

2. These schools were only rarely "clean" but usually contained Opisthonema, Anchovies, and/or Etrumeus as well as ground fish in smaller numbers.

3. In regard to the anchovies which constituted up to 30% of 1/3 of the school, it is tentatively postulated that the mixed species school (Harengula and Anchoa in this case) takes on the appearance of the major species.

III. "Block schools: discrete schools of equal dimensions (or nearly) in both planes. Dense.

1. This type, or analysis, proves to be the same as the "horizontal" school and all remarks, therefore, made under the latter category apply.

2. The "block" appearance may be due to the presence of predators - in two instances Spanish mackerel were caught in a school of this type and in one instance birds were working the school.

3. This "type" is not sufficiently distinct to merit separate consideration.

IV. Scattered or Diffuse schools.

1. In over 90% of the cases, these contain Etrumeus mixed with other species including chub mackerel, Trachurus, butterfish, etc.

2. In Etrumeus - anchovy schools, little intermixing occurs and both species retain school characteristics (Station 2121).

All told, some 104 mid-water tows have been made to date. Some of the particulars on various species caught are as follows:

A. Harengula pensacolae - (Razor bellies or pilchards)

1. Dominant species in ABT: 20% of samples
2. Largest single catch: 920 lbs.
3. Occurred in "clean" and mixed schools; generally mixed (In one instance razor bellies comprised 95% of the catch.)
4. Taken from 4 to 27 fathoms
5. Largest concentrations seen off Mississippi River and along Chandeleur - Breton Island - South Pass Coast- off Horn and Petit Bois Islands
6. Were occasionally observed under night lights, but deep in water

B. Brevoortia patronus - (menhaden)

1. Dominent in two samples
2. Largest single catch: 1250 lbs. (Station 2126)
3. Generally "clean" schoolers, although freguently small numbers of menhaden observed with other species.
4. Taken in cold, turbid water near South Pass (Station 2126, 2095)

5. Not attacted to lights
6. Depth Range: 10-18 fathoms

C. Decapterus - (Cigarfish or Scad)

1. Only taken in mid-water trawl in small numbers, but present in shallower waters in quantity.

D. Anchoa sp. (mitchelli and hepsetus) - (Anchovies)

1. Dominant in 10 tows
2. Largest single catch, on deck, 140 lbs.; however, were observed streaming out of rips and between meshes of nets.
3. Frequently present in "mixed" schools with Harengula
4. Usual depths - 6-30 fathoms
5. Taken in north Gulf in largest quantities. Also occurred off Florida and Texas.
6. Variable reaction to light--occasionally occur in large masses.

E Etrumeus - (Round herring)

1. Dominant in 16 tows
2. Largest single catch 120 lbs.
3. Usually mixed with Decapterus, Anchovies, Chub mackerel, etc.
4. Depths: 7½-29 fathoms
5. Taken off Tampa, off Miss. River Delta, and in Campeche; best catches off Tampa (roughly Tarpon Springs - Fort Myers)

F. Opisthonema - (Thread herring)

1. Dominant in 4 stations
2. Largest catch: 75 lbs.
3. Taken off Delta in winter
4. Observed in large surface and mid-water schools off W. Florida coast throughout the year. Schools range from 1-100 tons. Aerial observation indicates that this fish is too fast and maneuverable for mid-water trawls.
5. Occasionally comes to night light

With this first phase largely complete, attention is being shifted to more extensive geographic and seasonal coverage to determine more exactly the quantities and species of fish available. Gear testing and experimentation will be a very important phase of the work. Determination of efficient design(s) for capture of the various species, and proper operating techniques may open up a new fishery.

Among promising gear, the Pacific coast lampara and a modified version of the west African purse lampara seems to be worthy of extensive trials. Both types of net are now being redied, a seine skiff has been constructed and these nets will see considerable action during the coming year.

Mid-water trawl fishing will also continue, with larger and modified gear. The Oregon will spend the major portion of her time on this project during the next two years.

Much needs to be learned concerning details of the life history, migrations, and behavior of these mid-water fishes. To this end, biologists from the Service's biology laboratory in Galveston have been assigned to Pascagoula in accord with the Commission's recommendations. The Technology Branch has run some encouraging test canning of several of these species. Cooperation with interested industry members look promising to be even closer and more profitable than in the past.

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GULF STATES MARINE FISHERIES COMMISSION
Biloxi, Mississippi
Buena Vista Hotel
October 16-17, 1958

"REPORT: ESTUARINE TECHNICAL COORDINATING COMMITTEE"

Presented by Mr. Howard T.Lee
Texas Game and Fish Commission
Rockport, Texas

The Estuarine Technical Coordinating Committee met formally for five and one-half hours yesterday to discuss some of the problems confronting us in the inland salt waters of the five States. A full committee membership of fourteen attended and quite a few visiting scientists were present.

It was unanimously decided that the first step to be taken should be an assessment of our present state of knowledge of various estuaries. Much useful information has been published with regard to specific areas and marine forms. There is, however, much additional information available only to the individual agencies in the form of unpublished reports.

Each of the participating agencies has agreed to scan its own files for such material and furnish the committee an annotated listing of that which may be applicable. A separate subcommittee will meet early next year to organize and evaluate these listings.

As a second item to be undertaken, a need was seen for an atlas which would define the estuaries of the entire coast and attempt to show their relative importance. Information to be included here would be such things as surface area, depths, vegetative types, average hydrographic features, important fish and wildlife species utilizing the area, extent of usage for navigation, mineral development, use by industry as cooling water, process water or as a means of waste disposal, and finally the status of development programs in each area. These maps are to be prepared before the next regular Commission meeting.

Considerable discussion then followed as to what the next step should be. It was finally decided that any other action should be deferred until steps one and two have been evaluated.

In summary it may be said that the Committee is planning these things:

1. Itemize and evaluate the work that has already been done.

2. Determine the work that is being done.

3. Define the areas in which work is to be done.

At the next meeting of the full committee it is hoped that we will be able to say what additional work should be done and how this work is to be done.

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GULF STATES MARINE FISHERIES COMMISSION
Biloxi, Mississippi
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October 16-17, 1958

"PROGRESS REPORT ON THE DIVERSION OF FRESH WATER INTO THE LOUISIANA COASTAL AREAS"

Presented by Dr. Lyle S. St. Amant
La. Wild Life and Fisheries Commission
New Orleans, Louisiana

The Need For Fresh Water

Some may ask why the need for fresh water in the Louisiana coastal area. The reason is principally the uniqueness of the area itself and the nature of its geological formation. The bays, bayous, ponds and marshes across the bottom of Louisiana were formed by silt deposits from the Mississippi River and its distributaries. This area was maintained and nourished with nutrients by annual overflow from these rivers and became extremely productive in seafoods, fish and wildlife.

With the advent of flood control measures on the lower Mississippi River, the dredging of the intracoastal canal, and the numerous ship channels, rechanging of the area periodically with fresh river water has ceased, normal drainage patterns have been disrupted, and salt water intrusion and beach and marsh erosion has increased. Furthermore a recent dry weather cycle has complicated the problem by increasing salinities to a point approaching seawater.

Why is Erosion Salt Water Harmful

Excesive salt water is detrimental to oysters because it increases diseases and predation and reduces the production of seed oysters and seed areas. High salinities and lack of nutrients apparently reduce the concentration of the white shrimp. Fur and waterfowl are affected since choice food and plants for these animals cannot grow in highly saline waters. As an indication of the loss in production, oyster statistics may be used. Between 1940 and 1949 the average annual production was 2,700,000 bushels but between 1950 and 1957 the annual production dropped to 2,000,000 bushels. This is a loss of 25%. Furthermore, to keep the loss within these limits the total acreage of leased oyster growing areas had to be increased nearly 100%.

Why Do We Think Fresh Water Will Help

It is generally agreed among most technical personnel and oyster growers that controlled introduction of fresh river water into the bays and marshes of Louisiana will reduce salinities at the proper time of year, increase fertility of the water and generally flush out waters thought to be overly infected with the oyster fungus, Dermocystidium marinum. Records of the accidental flooding of marsh areas, crevasses, spillway openings, high river stages and heavy rainfall years all tend to show a marked increase in seafood production particularly

oysters. Such production increase has been quite significant when the accidental introduction of fresh water came at the proper time of the year. Furthermore, such benefits are so apparent to both Mississippi and Louisiana oyster growers that they have made frequent demands on the Louisiana Wild Life and Fisheries Commission to find ways and means to introduce fresh water.

Progress of Program to Construct Freshwater Outlet

Initial planning of freshwater outlets began in 1955 at hearings on Mississippi River Tributaries projects. A request was made for freshwater outlets below New Orleans. In 1957 at a conference held at the Corps of Engineers District Office in New Orleans, Louisiana, Corps officials suggested that project plans, specifications, and cost benefits be prepared by a cooperative effort of the Louisiana Wild Life and Fisheries Commission and the U. S. Fish and Wildlife Service. This project document is now complete, favorable cost benefit ratios were found and the Corps of Engineers have tentatively accepted the project subject to certain minor changes. Final project documents will be submitted to the Corps in time for the next meeting of the U.S. Congress in 1959. If the work is authorized and funds allocated for the work construction could start soon thereafter.

The project as presently planned calls for four outlets. Two on the west side of the river and two on the east side. First priority is given to an outlet on the west side of the river designed to furnish fresh water for Barataria Bay.

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GULF STATES MARINE FISHERIES COMMISSION
Biloxi, Mississippi
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"PROGRESS REPORT ON RESEARCH: MISSISSIPPI RIVER-GULF OUTLET PROJECT, LOUISIANA"

Presented by Mr. Walter A. Gresh
Bureau of Sport Fisheries and Wildlife, Atlanta, Georgia
and
Mr. Charles R. Chapman
Bureau of Sport Fisheries and Wildlife, Slidell, Louisiana

The Mississippi River/Gulf Outlet project, known as Public Law 455 was approved by Congress on March 29, 1956. The authorization provides for an additional east-bank, deep-draft outlet and tidewater harbor by modification of the existing project, Mississippi River, Baton Rouge to the Gulf of Mexico project.

The plan of development provides for: (1) a deep-draft outlet and tidewater harbor by construction of connecting harbor channel 36 feet deep and 500 feet wide at the bottom, extending from the inner harbor canal to a turning basin south of Micheaud; and (2) a channel 36 feet deep and 500 feet wide at the bottom, extending as a land and water cut, on tangents and easy curves, from this turning basin southeasterly to and along the south shore of Lake Borgne and through the marshes to and through Chandeleur Sound and Islands, at or north of Errol Island, to deep water in the Gulf of Mexico, a distance of approximately 70 miles.

Provision also is included for a permanent retension dike across Chandeleur Sound and for parallel jetties from Chandeleur Island to the 20-foot depth contour in the Gulf of Mexico. A wing dike across the islands would be constructed as required. The channel through the jetties and across the bar would be flared to provide a width of 600 feet at the 38-foot contour.

When it has been economically justified, replacement of existing locks or construction of additional lock in the vicinity of Mereaux, La., has also been planned.

The project was designed to serve shipping interests by providing a shorter route from New Orleans to the Gulf than is now provided by the Mississippi River. Distance will be reduced from 113 miles to 70 some odd miles. In addition the project will provide for expansion of the New Orleans port facilities. Estimated cost of the project is $92,000,000 and $1,000,000 per year for maintenance.

At the Clearwater, Florida meeting of the Gulf States Marine Fisheries Commission last spring, we reported on our preliminary studies of this project and submitted for review a preliminary work plan which

outlined a four year intensive investigation beginning July 1, 1958. Subsequently, the Service has initiated two contracts with Texas A. and M. Research Foundation; the first a preliminary hydrographic investigation and the second preliminary studies of marsh vegetation.

The U. S. Fish and Wildlife Service is actively engaged to fulfil the requirements outlined in the preliminary work plan. We have established a subfield office in Slidell, La., for the express purpose of directing field operations of this investigation and coordinating the contract work with all other phases of the overall investigation. Mr. Charles Chapman has been named Biologist in charge of this office. The staff presently consists of Mr. Chapman and Mr. Robert J. Lemaire, and very shortly a secretary will be added.

At this time I would like to call on Mr. Chapman to summarize our activities on the Mississippi River/Gulf Outlet project:

Mr. Chapman:

Our investigation of the Mississippi River/Gulf Outlet project as defined in our preliminary report work outline was divided into five major investigational categories. These are:

1. hydrographic investigations
2. vegetative investigations
3. fisheries investigations
4. economic evaluation
5. experimental studies

I will discuss these five categories separately.

A preliminary hydrographic contract was initiated on May 28, 1958 with Texas A. and M. Research Foundation. The work is under the direct supervision of Mr. Albert Collier. The contract specifies:

1. plan how best to determine general types, locations, extent and variations of hydrographic and meteorlogical factors within the area of project influence.
2. devise and complete procedures to determine sampling need, number, location and frequency of stations to ascertain by detailed studies, the complete hydrological conditions and variations within the area of consideration.
3. prepare contract specifications for detailed hydrological studies of the area of consideration to predict and measure project occasioned effects.

I am pleased to report that this contract is nearing completion and that the intensive phase of the field endeavor is scheduled to start in January 1959.

A preliminary vegetative investigation contract was initiated on June 23, 1958, also with the Texas A. and M. Research Foundation and is under the direct supervision of Dr. Sperry. This contract specifies:

1. based on interpretation of aerial photographs supported by field observations and other available information, prepare a generalized vegetative type map of Southeastern Louisiana. This area is approximately 2,166 square miles. Aerial photographs have been located and ordered, personnel assembled and field observations to coordinate the photo's with ground observation scheduled to start in November.

The second phase of the vegetative investigation is of an intensive nature and will include permanent transect and plot studies. Mr. Lemaire of our Slidell office will direct this work. Final planning is now underway and field work is expected to start shortly.

The fishery investigation was divided into several major categories, including:

1. distribution and abundance study
2. fish food study
3. migration and movement study
4. establishment of environmental tolerances and limiting environmental factors for the major species
5. determination of habitat requirements and classify if possible, major habitat types, their location and extent.

Several meetings have been held with the Louisiana Wild Life and Fisheries Commission, Bureau Commercial Fisheries and the Bureau Sport Fisheries and Wildlife to determine how best to initiate this phase of the investigation.

The fourth category, an economic evaluation of the fish and wildlife resources, was divided into the following studies:

1. commercial fishery inventory
2. bait fishery inventory
3. sport fishery inventory
4. waterfowl and hunting inventory
5. fur resources inventory
6. review of related economic development

Plans are nearing completion to start our program to determine sport fishing and hunting utilization in the project area. We plan to initiate this program in January 1959 and continue for two years. In addition, compilation of commercial fishery statistics and waterfowl usage records is well underway. This work is being done in cooperation with the Louisiana Wild Life and Fisheries Commission and the Bureau Commercial Fisheries.

The fifth phase of our investigation, experimental studies, requested that the U. S. Army Corps of Engineers do a model study of the project. However, this request was rejected because time would not permit such an undertaking. In lieu of the model study, we will study the effects of the pilot (access) channel as it progresses through the study area. This will afford an excellent opportunity to evaluate changes as they occur, but still afford time to request project modification for the benefit of fish and wildlife resources and habitat. The pilot channel is scheduled to be started in January 1959 and be completed in November 1960.

This briefly summarizes our efforts to date. I will now return the podium to Mr. Gresh:

Mr. Gresh:

The day before yesterday (October 14) representatives of Texas A. and M. Research Foundation, Bureau of Commercial Fisheries and Bureau of Sport Fisheries and Wildlife met in New Orleans to discuss final planning, contracts and scheduling of the Fish and Wildlife Service investigation of this project. It was proposed that a field study team composed of the immediate project leaders of the various activities of the investigation be formed. This would permit coordination of each phase of the investigation at field levels.

Excellent cooperation has been received from all participants in this investigation as well as many other interested groups. I wish to take this opportunity to thank the Gulf States Marine Fisheries Commission for their intense interest in this project and also for affording us the opportunity to report on the status of our investigation and progress to date.

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GULF STATES MARINE FISHERIES COMMISSION
Biloxi, Mississippi
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October 16-17, 1958

"A BIOLOGICAL APPRAISAL OF GULF FISHERY STATISTICS"

Presented by Dr. C. P. Idyll
The Marine Laboratory
University of Miami

Statistics ordinarly have about as much popular appeal as a lump of clay. They have another similarity to clay too, since it is frequently declared, with some cynicism, that statistics can be molded into any shape required by the current purpose.

A few simple souls, on the other hand, find statistics not dull, but alive and full of meaning. Even people in the fishing industry suddenly see something different about landing figures and other fishery statistics when their livelihood is involved. This is because statistics can play a large part in decisions concerning the need for and the kind of regulations applied to commercial fisheries; concerning disputes between commercial and sport fisheries; justifications for channel building or deepening; the value of a marine resource whose existence is threatened by dredging and other onslaughts of population growth.

Even more dependent on statisticsis the fishery scientist. If you limit the scientist's task to the working out of the life histories and the ecological relationships of the animals in the fishery, then he can do a fine job of pure biology without ever looking at a table of landings. But this is much too narrow a concept of his responsibility, which is to provide information which permits administrators to manage the resource effectively. In such circumstances, the fishery scientist cannot operate without statistics, and these have to be the very best that the money and available manpower will provide.

A characteristic of research is that the scientist never knows exactly what line ahead; what new directions his work will take, and what kinds of information he is likely to need to solve his problems. Since statistics is one of the basic tools of fisheries research, it follows that statistics will have to change as the problem and the progress towards its solution change. A scientist who fails to pause frequently and evaluate his position, and to discover whether the work he is doing is the right kind to solve his problem, is likely to be delayed in getting the right answers, or to fail entirely. It follows, then, that it is necessary for the scientist to stop occasionally and examine the statistic he is getting. He should ask the following questions:

1. Are the statistical data I am getting providing the kinds of answers intended when the program was set up?

2. Are the figures accurate enough to give me trustworthy data?

3. Even if the statistics are satisfactory in the above two categories, are the present needs the same as those originally conceived?

4. If not, what new needs require different types of data, and how can these needs be satisfied?

I will not pretend to answer these questions for the statistical program of the Gulf States, but I will attempt to analyze a part of the Florida statistical system. At the same time I would hope that those responsible for the collection and the use of fisheries statistics in the area - both Federal and State people - might examine their own systems.

There is always the danger of fishery programs setting up separate compartments labelled "Statistics," "Biology," "Exploratory Fishing" and whatever, with the various scientists running their research individually and without reference to each other, and forgetting that these are all aspects of the same problem - the management of the fish resource. Biology is particularly dependent on statistics, and constant guard must be maintained against regarding statistics as an end in themselves. It is easy to allow a statistical program to become nothing but the sterile collection of numbers to fill up tables in a report. I suggest that we must be severe in demanding that the figures collected have a useful purpose.

First, it must be remembered that there are two principal purposes for statistics and it would be useful to separate these.

Statistics such as total landings and value of the catch are useful for business purposes. Businessmen also sometimes require quantities of gear used, numbers of fishermen and shore workers employed, prices paid to the fishermen, warehouse and freezer stocks on hand, quantities of manufactured products made, shipments of fish, imports and exports of fishery products. In some instances it is vital for the fishery industry to have these business aids and to the extent that this is true the figures should be collected. Some re-examination of the reality of such need requires to be made.

The other use of statistics is in scientific work. Here again total landings and value figures, and some measure of fishing effort are the data required, but the other information listed under business aids are not usually necessary. It is important for the person running a statistical system to examine his collections and be sure the purely business data are necessary for the industry needs and that their collection is not justified in terms of the supposed needs of the biologist.

All too frequently we go to great labor and expense to collect information supposedly of interest to the scientist but which does not really fill his needs. For example, one prime necessity in scientific analysis of a fishery, is a trustworthy measure of fishing effort. Unfortunately, the method of collecting this is sometimes so rough that the information is useless. Often the measure of the number of boats, for example, is only an annual estimate and fails to take into account their size or the

length of time they operate during a season. The accuracy of gear counts or other measures of fishing effort made in the course of a large-scale, multi-species statistical program is usually far short of the scientist's needs. I suggest that this type of data, if it is justified in terms of biological use, should be examined with a sternly critical eye, and the practical decision made as to whether it actually fulfills its stated scientific purpose. If it does not, then it should either be altered to increase the frequency of observations, or the accuracy of the figures until it can be used, or it should be dropped. For example, certain aspects of the general canvass made annually do not serve much purpose to the scientist. Unless they provide useful data to the business man, they should be discontinued.

If statistics are sometimes collected in the name of science, where in fact they are useless as scientific data, the biologist is frequently at fault. The statistical agent may only be collecting what we said we wanted. It is only when we are well into the problem of a specific fishery that we realize how we want the landings - whether it is sufficient to have them monthly, or whether they must be tabulated by the day, whether catch per boat-month is enough, or whether it has to be catch by drag. We may find it is vital to have the landings shown by areas a tenth the size of the ones in use; a breakdown by numerous size categories may be vital to the analysis; it may, in fact, be valuable to have information on a score of different variables that were never guessed when the project was planned.

Obviously we can't blame the statisticians for this situation; neither can we blame the biologist. The dynamical character of fisheries research can only be accepted as another of its difficulties, and we must arrange our statistical program to be equally dynamic. We must be certain, in other words, that the statistical program is capable of change as needed.

I am alarmed occasionally by a tendency for statistical programs to become ossified. There is a danger that in our zeal to get a big enough sample, we may allow the quality of the data to suffer. Let us examine our statistics with great care and be sure that we are not having numbers pulled out of thin air in order to fill a quota - a minimum sample size. Administrators should be careful to explain to field men that they can destroy the whole usefulness of statistics by tossing in false or questionable figures. Nothing is more discouraging than to have to discard whole sets of data because we know some are false, but cannot separate these from the honest figures.

Some specifics in regard to the Florida statistics are now in order. Starting in 1938 the State collected an annual production figure for fishery products. This was incomplete and inaccurate, and was replaced in 1950 by a system of monthly reports from wholesalers. The monthly system was put into effect as a cooperative program of the Fish and Wildlife Service and The Marine Laboratory of the University of Miami, acting for the State Board of Conservation. Since this start in 1950 gradual but steady improvement has been made in the statistics. Through continuous contact with the industry the fish dealers have been educated to accept the work

involved in preparing reports, and in preparing them conscientiously. The forms have been gradually improved, a greater percentage of the dealers have been brought into the system, and many loopholes and errors have been slowely eliminated.

The original system of monthly reports provided a long step forward from the annual canvass, but it still left much to be desired. Among the deficiencies of such a system are these:

1) It is often desirable to have landings recorded oftener than once a month. Weekly or even daily catches sometimes show trends of great value to the researcher. In the shrimp fishery, for example, it is essential that we have daily landing figures in order to understand the effects of storms, moonlight, and a dozen other variables on the availability of shrimp.

2) The monthly system does not show where the fish were caught. The place landed is not necessarily the area of capture; in any case it is sometimes important to have a finer area breakdown than a whole county, which is the division shown on the monthly forms.

3) The monthly report system does not provide a measure of fishing effort. Again, the annual canvass of quantities of gear, which presently supplements the monthly landing reports, is not useful in biological work.

4) The type of gear used to catch the fish is not provided by the monthly reports. In studying a fishery in terms of management, the exploitation by various gears is a necessity.

5) The monthly system depends on the fish dealer collecting all his fishermen's receipts, adding up the totals by species, and recording these on the form. There is a large chance of error in this system - error caused by carelessness and deliberate error, to conceal actual production.

To get around these deficiencies of the monthly report system we have gone one step further and have instituted the beginning of a fish ticket system in Florida. We issue to a sample of fish dealers - about 75 of them at present, out of roughly 425 in the state - books of "fish tickets," or receipts for the fisherman's catch. These tickets, made out in triplicate, are issued for each sale, and show the name of the boat, the name of the fisherman, the date, the quantity of each species landed, the place of capture, the place of landing, the gear used, the number of days fishing involved, the number of fishermen, and the unit price. Hence we have a daily record of catches, with all of the information now regarded as important recorded on an individual sale basis. Accuracy of total landings is increased because each sale should be accounted for. This is aided by having each ticket number in series, so gaps in the sequence can be traced.

Naturally this system is not fool-proof. As always, the completeness and accuracy of the records are in direct proportion to the cooperation

of the dealers, so statistics is still to a large extent a public relations job, and a field job, involving constant contact, and encouragement, and prodding of the dealers. The potential for accuracy and for data of far greater usefulness is in the ticket system however, and we are satisfied that it will eventually entirely replace the older system in Florida.

Two large gaps in our statistics concern landings by sport fishermen and by bait fishermen. We are now trying to close the latter gap to some extent, and are getting partial reports of bait production. This must be much more complete eventually, and it appears that we may need a clarification of the law to get more bait dealers to produce records.

The sport catch of some species exceeds the commercial catch, and for a large number of species is of major importance. Not to record it, therefore, is to render landings of these species useless - or worse. Last year we tested a system of collecting sport landings through a sampling system. Florida, with it huge coastline and its numerous anglers, is a tough problem in this regard, and the principal conclusion of our study was that it would require a sizeable effort to get trustworthy results. The biggest problem is to set up a good sampling panel, and this requires considerable manpower. The job would be very much easier if anglers were licensed, since we would then have a ready-made panel from which usable sub-samples could be drawn. Meanwhile this deficiency in the statistics remains a serious one.

Finally, let me discuss briefly the shrimp statistics in Florida. In this fishery, justifiably enough, we have progressed farthest with our system. The Fish and Wildlife Service has built a fine system of collection of data, and we at The Marine Laboratory have put it to very good use. Total landings are, of course, collected, but the data go much beyond this. It includes catch by species, by grid areas, by size, by depth, and shows the number of trips. These valuable data are collected by means of interviews with fishermen at the ports of landing. The interviews are, naturally, on a sampling basis, since it would be impossible to contact every boat. Beginning in January of 1958 not only have projections of the whole catch, based on the interview samples been issued, but the actual interview data have been published. This is an improvement since formerly some records were included in the interview data that were not actually interviews - a harmful and misleading practice.

We would like to see certain additional information provided to biologists regarding the shrimp fishery. We need the pounds of shrimp landed by size, by boat, by company, for each day, from both the interview and landing slips. We are actually getting this material ourselves, by the somewhat painful method of extracting it from Fish and Wildlife Service forms, which are copies of sales slips of the wholesale companies. Also, monthly and yearly totals broken down in this manner are needed.

These data are being collected by the Fish and Wildlife Service, but they are not being recorded on the IBM forms, nor totaled and published.

We need this information in our study of the effect on catches of changes in weather, moon phase, jellyfish abundance, "grass" and other

variables. Landings by individual boat, by company, are important because each boat has different behavior, and each company different buying procedures which need to be taken into account in detailed studies. Furthermore most boats fish seasonally, and it is important to know where they are fishing at various times. Again, variation in the length of fishing trip has been found to be related to the size and age of the vessel - a factor of importance in the analysis of catch per unit effort.

It is possible that these extra data may not be needed indefinitely, and that later they can be dropped. Now they are needed, however, and a plea is extended again for flexibility of the system.

Statistics of size could be made more useful to the biologist if they were in regular intervals of five counts. Presently they are reported 21 - 25, 26 -30, then jump by tens, 31 - 40, 41 - 50. Some dealers might have to change their system, but others do record their sizes in five-count intervals. It would be worthwhile to revive a consideration of the size groupings suggested by the Quality Control Committee of the Shrimp Association of the Americas some years ago, and attempt to get uniformity throughout the industry.

In summary, it appears that we are making good progress in improving fishery statistics, but a close examination of the real needs of the businessman and biologist is urged, with attention being closely paid to the question of whether the statistics fill these needs. We require to keep the pressure on to increase the scope and accuracy of our statistics. It is suggested that fish tickets appear to be one way to accomplish this, but of greater importance is constant review of the various statistical systems. Some specific suggestions are made for making the shrimp statistics more useful to the analysis of that fishery.

REVIEW OF FEDERAL GULF SHRIMP RESEARCH

George A. Rounsefell
Chief, Gulf Fishery Investigations
U. S. Bureau of Commercial Fisheries

Commencing in the 1930's research on the shrimp of the Gulf was carried on by Milton Lindner, William Anderson, Percy Viosca, Martin Burkenroad and Gordon Gunter among others. These researches were chiefly on the white shrimp (Penaeus setiferus). All of this activity culminated in the appointment of an ad hoc committee at the Tampa meeting of the Gulf States Marine Fisheries Commission in October of 1953. This committee drew up a program for shrimp research which the Commission published in January, 1954, at their meeting in Edgewater Park, Mississippi.

At this meeting the Commission formally endorsed this program with its annual budget of over $500,000. The Commission further resolved to take all necessary steps to obtain these funds, and to appoint a permanent committee on shrimp research.

Despite this endorsement by the Commission, adequate funds have not been available; only portions of this 1954 program have been started and only a few carried out on an adequate scale. Five years have elapsed since this meeting and I propose to mention briefly the work carried out by the Bureau of Commercial Fisheries of the Fish and Wildlife Service during this period. I cannot give you many details on the work carried out by various state and other organizations.

1. The first item on the Commission's program called for studies of the life history. The data on white shrimp collected some years earlier by Lindner and Anderson were analyzed and published in 1956. This covers certain phases of the life history of this species, chiefly offshore movements, spawning seasons, size distribution, and growth of the larger shrimp. An anatomical atlas of the white shrimp has been prepared under contract with the Fish and Wildlife Service by Dr. Joseph Young of Tulane University and is now in press. He has also done considerable work comparing the white shrimp anatomy to the brown and pink shrimps.

2. The second item on the program called for sampling of the commercial shrimp catches at a number of ports to obtain data by species on the seasonal and areal changes in size and in spawning. One of the chief values of this sampling would be an accurate evaluation of the sizes actually represented in the size categories by which the shrimp statistics

must be collected. This portion of the 1954 program, which called for 11 biologists to do the sampling, has not been fully implemented. We have carried out limited sampling at Galveston, especially of the bait fishery. Under contract with the Fish and Wildlife Service, the Marine Laboratory of the University of Miami is just completing a full year of sampling of the Tortugas pink shrimp. We believe that several of the states, especially Florida, have sampled shrimp in some areas.

3. The third item called for a study of the mechanisms which lead the post-larval shrimp from the offshore spawning grounds into the inside nursery areas. Although we have obtained limited data on the seasonal influx of young through the passes, we have done no field work on the factors involved. We are presently considering a contract to study these factors in one area. This will involve identification of the younger stages, abundance and drift of the post-larvae, the pattern of circulation, and variations in physical and chemical factors. One important aspect of this study is to decide whether the scarcity of passes between outside and inside waters has any bearing on the seeding of the nursery grounds.

4. The fourth item concerned the tagging of shrimp to obtain data on migrations, growth and mortality.

Since 1954 the use of vital stains for marking shrimp was developed by Charles Dawson through a Fish and Wildlife Service contract with the University of Texas at their Port Aransas laboratory. We have now completed a successful large-scale field trial of this method in Biscayne Bay, and have recently marked several thousands in Everglades National Park to determine what nursery areas are supporting the Tortugas fishery. We are very hopeful that these vital stains will give us better information on growth and mortality since the shrimp can molt successfully and still retain the stain.

The University of Miami Marine Laboratory has been recently tagging large numbers of pink shrimp for the Florida State Board of Conservation on the Tortugas fishing grounds to obtain fishing mortality and movements on the fishing grounds.

5. The fifth item on your program called for laboratory studies of live shrimp. The purpose was to obtain information on the effect of variation in certain factors on the health and growth of shrimp. These factors included temperature, salinity, pollution, food requirements, and so forth. We have carried out some work on these topics at our Galveston laboratory. For instance, we have studied the effects of certain

insecticides, benzene hexachloride, dieldrin and heptachlor on shrimp mortality. The spreading use of these powerful insecticides represents a real threat to our fisheries. We have just commenced a study of the nutritional requirements of shrimp using artificial diets while holding the shrimp in artificial sea water. Most of the basic research on raising shrimp which we discussed last year at your meeting in Mobile cannot be started until funds are available for construction and maintenance of a sea water system for which we have since had plans drawn for us by the District Office of the Corps of Engineers.

6. The sixth item called for a study of shrimp in an inside area to determine their relation to other organisms, the competition between species of shrimp and the effect of changing water conditions on their abundance. Since this item requires neither a large vessel nor an expensive sea water system, we have made a good start on it. We commenced working on a bayou on the western shore of Galveston Island but within a few months we were forced out by the ever-present dredge of the real estate developers who are gradually converting many of the inside nursery areas of the Gulf into waterfront lots, each fronting on a narrow cul-de-sac without adequate water circulation and without the shallow vegetated shores so valuable for the young shrimp.

For nearly a year we have been working in Clear Lake, a tributary of Galveston Bay, and have obtained interesting information on the seasonal cycles of the white and brown shrimp in this area. Their periods of abundance appear to alternate sufficiently so that competition between the species may not be as great as was feared. The brown shrimp leave the nursery areas at a much smaller size than do the white shrimp, and some may be moving out into the Gulf at the same time post-larval white shrimp are moving in. There are some indications of competition between fair-sized white shrimp and juvenile browns during late summer.

7. The seventh item on your program asks for continuous recording of conditions in inside areas because of their importance as nursery areas for shrimp, menhaden, redfish, speckled trout, etc., and because these inside waters are subject to continuous modification from dredging, draining, channelization and building of levees.

Although this particular item is of paramount importance, it cannot be adequately implemented by the funds and personnel presently available to the Bureau. I know that the states are deeply concerned with this problem and I believe several have made some progress. Portions of the data we are currently taking on red tide, menhaden, and

shrimp bear on this problem, but we cannot hope to attack this problem in its own right without greater facilities.

8. The eighth item called for the collection of adequate statistics on shrimp landings. This is one item on which we are proud to say that the Bureau has done a fine job. Under the direction of Mr. Charles Lyles, the Statistical Branch with headquarters in New Orleans has collected detailed statistics of both fishing effort and catch, by area, depth, and sizes of shrimp since January, 1956. These have been placed on IBM cards and tabulated. Last month we hired a biometrician to further analyze these data for abundance of shrimp by species and area. The Commission should thank the states which have cooperated in this endeavor.

9. The ninth item on the program mentions the necessity for identifying the separate stocks of shrimp of the same species in order to fully understand causes underlying changes in abundance. This is a complex problem since the shrimp spawn offshore and only by detailed work from a vessel can we trace the inshore drift of the larval shrimp from the spawning grounds. We are starting to trace the reverse movement of the young and semi-adult shrimp from the inside waters to the fishing and spawning grounds by the use of vital stains. This important phase of the work also needs to be intensified.

10. The tenth and last item on your program is directed toward perhaps the most important problem facing us. How fast do young shrimp grow in weight and how fast do they die from natural causes, including predators. When we know these two facts, we shall be able to say how large we should allow shrimp to grow before commencing to harvest them. We are hopeful that further use of the recently developed marking methods will soon start giving us actual answers to this controversial question.

Our biological staff held a meeting with Mr. Seton Thompson, our Regional Director, this summer at which we reviewed all items on your original program.

We found that your program does encompass all of the current needs for conservation. All ten items I have mentioned are important and I therefore have refrained from assigning any priority. All that is needed is to implement this program.

The shrimp research budget presented in the Commission's 1954 report requested $747,000 for the first year, and $507,000 annually thereafter. Since then many of the costs of research have increased. Also the need for the information has become more pressing as the number of shrimp vessels has increased in the face of declining catches. I have made up a budget that I feel is necessary if research on shrimp, our most valuable aquatic resource, is to keep pace with research on our other fisheries, such as, salmon, tuna, sardines, haddock, to mention but a few.

To carry out a minimum research program designed to answer many of our questions within a reasonable length of time will require $904,000 the first year and $547,000 per year thereafter.

The budget submitted in the 1954 program requested $747,000 the first year and $507,000 thereafter. However, the budget I am suggesting does not include the collection of statistics which was budgeted in 1954 for $80,000 nor the overhead for a coordinating staff budgeted for $54,000, so that it represents an increase for the biological research from $373,000 to $547,000 for the biological portion of the program.

A portion of this increase represents increased costs. Thus, for the portions of the 1954 program which list numbers of personnel, we are requesting 40 persons instead of 47.

At present we do not even have regular appropriations for shrimp research but are doing what we can with available S-K funds.

Let me emphasize that the budget given here does not include the collection of statistics. Good statistical coverage of the fishery is absolutely essential to an understanding of the biology and for intelligent management of the resource. The details of the budget are attached to this report and I shall not read them.

There is a tremendous lack of knowledge concerning shrimp biology compared to what has been discovered concerning other important species. It will require the best coordinated effort of federal, state, and other research biologists to fill this gap in the next few years if adequate financing is available.

It is my hope that your Commission, broadly representative of the region, can give us the support and guidance needed to achieve the fully coordinated program I envisage.

BUDGET FOR BIOLOGICAL SHRIMP RESEARCH
(exclusive of cost of collection of statistics)

	Recurring	Non-recurring
Sampling of the commercial catch		
Personnel - 8 biologists, 4 clerks	$ 50,000	
Travel, cars, other expenses	16,000	
Inshore migrations of post-larvae		
Shrimp trawler, 65' with full scientific & fishing equipment		$ 70,000
Vessel operation	35,000	
3 biologists, 3 aids	38,000	
Travel and expenses	12,000	
Shrimp cultivation in ponds and Laboratory		
Sea water system	10,000	250,000
Chemist, physiologist, 2 fishery biologists, 4 aids, 1 clerk	45,000	
Specialized scientific equipment		10,000
Travel and expenses	15,000	
Marking for migration, growth, and mortality		
Vessel charter	50,000	
4 biologists, 4 aids	40,000	
Travel, rewards, advertisting	20,000	
Equipment	2,000	5,000
Life history, sizes, distribution in inside waters		
Vessel charter (4 vessels)	60,000	
8 biologists, 4 aids	55,000	
Scientific equipment, nets	4,000	12,000
Travel and expenses	6,000	
Field Laboratory operation	12,000	

	Recurring	Non-recurring
Ecology of inside waters		
Vessels (use of above)		
4 biologists, 4 aids	$ 35,000	
Specialized equipment	6,000	$ 10,000
Travel and expenses	6,000	
Analysis of shrimp statistics		
Biometrician, biologist 2 statistical aids	20,000	
IBM analysis	10,000	
Grand total	$ 547,000	$ 357,000

M I N U T E S

Executive Session, Biloxi, Mississippi, October 17, 1958

The Commissioners and Mr. Howard T. Lee, proxy for Commissioner Southwell met for breakfast in the Fiesta Room of the Buena Vista Hotel at 8:30 AM.

Present at the breakfast to hear guest speaker Mr. Fred E. Taylor, of the Department of State, discuss fishery affairs at the international level were the following industry association representatives: Messrs. James Barr, Charles Bevis, John Mehos, and William Neblett. Also present for the breakfast and discussion were Messrs. A. J. Harris and James N. McConnell, both of whom remained after the other guests joined the Scientific Session.

Commissioner Dodgen moved that the Minutes of the last meeting, Clearwater, Florida, April 10-11, 1958, be approved as mailed to the Commissioners April 30, 1958. Commissioner Merritt seconded. On vote the motion unanimously passed.

Mr. Lee proposed a resolution requesting the Committee To Correlate Research and Exploratory Data to program an improved fishery statistical system and report on its progress at the next regular Commission meeting. Commissioner Van Antwerp seconded. On vote the resolution was unanimously adopted. Copy is herewith first attached.

It being Texas turn for the fall 1959 meeting, Commissioner Dodgen requested that Corpus Christi be selected as a site and suggested the Robert Driscoll Hotel. All were agreeable to the request (meeting dates, October 15-16, 1959).

The budget for the fiscal year 1958-59, as approved by the Commission officers, was presented. The Secretary stated the Commission would have in the neighborhood of $1,500 on hand to start the new fiscal year, July 1, if the cost of items of expense maintain present levels. The budget is herewith second attached. The Secretary was asked to visit the Scientific Session while finances were further discussed. In his absence, two resolutions were unanimously adopted. One resolution, presented by Commissioner Gautier, and seconded by Commissioner Folsom, concerns an increase in annual appropriations by the States of Alabama (to $3,500), Mississippi (to $3,500) and Texas (to $6,000); Florida and Louisiana, no increase. This resolution is herewith third attached. The second resolution increases the salary of the Commission Secretary-Treasurer by $500 per annum, effective November 1, 1958. This resolution presented by Commissioner Mitts and seconded by Commissioner Dodgen is herewith fourth attached.

Commissioners Clement and Rappelet jointly presented a resolution which requests State Directors on the Commission to appoint a technical committee of five members, one from each of the member states, to study revision of Informational Bulletin No. 1 on the shrimp resource and furnish as much detail as possible on the implementation of any recommendations; such committee to furnish a report at the March 19-20, 1959 Commission meeting.

Commissioner Van Antwerp seconded. The unanimously adopted resolution is herewith fifth attached.

Commissioner Dodgen proposed a resolution reaffirming the Commission resolution adopted in January 1954, which recommends a Federal shrimp research program, and recognizing that such items of expense as were incorporated in the suggested program be considered minimum amounts due to increased costs over the intervening years. The affirming resolution urges that past and future biological data be assembled and expediously published and distributed. Commissioner Holmes seconded. This unanimously adopted resolution is herewith sixth attached.

Commissioner Grizzaffi spoke of the fine manner in which Dr. Holmes had administered the duties of Commission Chairman and proposed a resolution of appreciation for his services. Commissioner Gautier seconded. This unanimously adopted resolution is herewith seventh attached.

Commissioner Grizzaffi nominated Commissioner Howard D. Dodgen of Texas for the office of Commission Chairman for the year 1958-59. The nomination was seconded by Commissioner Gautier. No further nominations were presented. Mr. Dodgen was unanimously elected Commission Chairman.

Commissioner Rappelet nominated Commissioner Hermes Gautier of Mississippi for the office of Vice-Chairman for the year 1958-59. The nomination was seconded by Commissioner Morse. No further nominations were presented. Mr. Gautier was unanimously elected Commission Vice-Chairman

No further business remained to be transacted and the session was adjourned at 11:40 AM for the closing General Session.

Prepared by: W. Dudley Gunn
Secretary-Treasurer

RESOLUTION

WHEREAS, the Gulf States Marine Fisheries Commission realizes the need for accurate and detailed statistical information relative to the harvest of marine resources; and

WHEREAS, the present systems of gathering, compiling and publishing of this information by the member States is not uniform; and

WHEREAS, the present state of knowledge indicates that common stocks of resources are being exploited by the several States; and

WHEREAS, there has been expressed a desire to standardize the methods of statistical reporting; now therefore,

BE IT RESOLVED that the Committee to Correlate Research and Exploratory Data assume the additional duty of programming an improved system to fulfill the needs as herein expressed and that said Committee be instructed to report on its progress at the next regularly scheduled meeting of this body. Said Committee shall seek the advice of such persons as it shall deem necessary in the preparation of a suitable program.

* * * * * *

The foregoing is a copy of a resolution adopted by the Gulf States Marine Fisheries Commission at a regular meeting held October 16-17, 1958 at the Buena Vista Hotel in the City of Biloxi, Mississippi.

W. D. Gunn

W. D. Gunn, Secretary-Treasurer

GULF STATES MARINE FISHERIES COMMISSION

COMPARATIVE EXHIBIT: OPERATING EXPENSES FOR 1957-58
AND SUGGESTED OPERATING EXPENSES BUDGET FOR 1958-59

	PER AUDIT 1957-58	BUDGET 1958-59
Salaries	$11,400.00	$11,400.00
Rent of office	1,080.00	1,080.00
Stationery, printing and supplies	709.87	400.00
Traveling	1,332.41	1,200.00
Telephone and Telegraph	336.66	330.00
Postage	127.09	248.00
Electricity	96.41	95.00
Accounting	225.00	225.00
Insurance	238.41	250.00
Meeting expense	637.02	112.00
Payroll taxes	175.49	212.25
Sundry	7.20	5.50
Publications	-	967.25
Total cash outlay	$16,365.56	$16,525.00
Depreciation (non-cash item)	450.06	450.00
	$16,815.62	$16,975.00

RESOLUTION

RESOLVED that the Gulf States Marine Fisheries Commission request that the Governors and Legislatures of the States of Alabama, Florida, Louisiana, Mississippi and Texas give favorable consideration to approving appropriations for the support of the Gulf States Marine Fisheries Commission, as follows:

Alabama	$ 3,500.00
Florida	3,500.00
Louisiana	5,000.00
Mississippi	3,500.00
Texas	6,000.00
	$21,500.00

BE IT FURTHER RESOLVED that the recommended schedule become effective July 1, 1959.

* * * * * *

The foregoing is a copy of a resolution adopted by the Gulf States Marine Fisheries Commission at a regular meeting held October 16-17, 1958 at the Buena Vista Hotel in the City of Biloxi, Mississippi.

W. D. Gunn, Secretary-Treasurer

RESOLUTION

WHEREAS, Dr. W. C. Holmes, Alabama Citizen Member on the Gulf States Marine Fisheries Commission has served as Chairman of the Commission for the year 1957-58; 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 States through attendance and participation at numerous meetings and conferences concerning the marine fisheries.

NOW THEREFORE, BE IT RESOLVED that the Gulf States Marine Fisheries Commission express to Dr. W. C. Holmes 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 progressed.

* * * * * *

The foregoing is a copy of a resolution adopted by the Gulf States Marine Fisheries Commission at a regular meeting held at the Buena Vista Hotel in the City of Biloxi, Mississippi, October 16-17, 1958

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

RESOLUTION

RESOLVED that the Gulf States Marine Fisheries Commission reaffirms the resolution adopted at its January 21-22, 1954 special meeting held at the Edgewater Gulf Hotel in the City of Edgewater Park, Mississippi, which requests the U. S. Fish and Wildlife Service to join in a program of shrimp research in the Gulf of Mexico as outlined in such resolution.

BE IT FURTHER RESOLVED that the Gulf States Marine Fisheries Commission feels that such items of expense required for projects, as outlined in the subject shrimp research program, should be considered as minimum amounts due to increased costs over the intervening years.

BE IT FURTHER RESOLVED that the Gulf States Marine Fisheries Commission urges the U. S. Fish and Wildlife Service to assemble past and future biological data on the Gulf of Mexico shrimp fishery and expeditiously publish and distribute such information.

* * * * * *

The foregoing is a copy of a resolution adopted by the Gulf States Marine Fisheries Commission at a regular meeting held at the Buena Vista Hotel in the City of Biloxi, Mississippi, October 16-17, 1958.

W. D. Gunn, Secretary-Treasurer

RESOLUTION

RESOLVED that a technical committee be appointed to study the revision of Gulf States Marine Fisheries Commission Informational Bulletin No. 1 and that such committee furnish as much detail as possible on the implementation of the recommendations.

BE IT FURTHER RESOLVED that each of the five State Marine Fisheries Directors on this Commission appoint one person to represent their respective State on this technical committee.

BE IT FURTHER RESOLVED that such committee furnish a report on its accomplishments at the March 19-20, 1959 meeting of the Gulf States Marine Fisheries Commission at New Orleans.

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The foregoing is a copy of a resolution adopted by the Gulf States Marine Fisheries Commission at a regular meeting held at the Buena Vista Hotel in the City of Biloxi, Mississippi, October 16-17, 1958.

W. D. Gunn, Secretary-Treasurer

RESOLUTION

RESOLVED that the Gulf States Marine Fisheries Commission increase the salary of its Secretary-Treasurer by the sum of $500.00 per year - to be effective November 1, 1958.

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The foregoing is a copy of a resolution adopted by the Gulf States Marine Fisheries Commission at a regular meeting held October 16-17, 1958 at the Buena Vista Hotel in the City of Biloxi, Mississippi.

W. D. Gunn

W. D. Gunn, Secretary-Treasurer

GULF STATES MARINE FISHERIES COMMISSION

Clearwater, Florida
Fort Harrison Hotel
Colonial Room
April 10 (Thursday) & April 11 (Friday), 1958

PROGRAM

(W. C. Holmes, Commission Chairman, Presiding)

9:30 AM	CALL TO ORDER ROLL CALL INTRODUCTIONS	
	ADDRESS	Hon. Richard W. Ervin, Attorney General State of Florida Introduction by: Commissioner Ernest C. Mitts, Director Florida State Board of Conservation
	ANNOUNCEMENTS	
	REPORT OF CHAIRMAN	
	RECOMMENDATIONS BY SCIENTISTS ON SUBJECTS CONSIDERED AT THE SCIENTIFIC MEETING, OCEAN SPRINGS, MISSISSIPPI, FEBRUARY 6-7, 1958	
10:00 AM	Shrimp	Kenneth M. Rae, Director Galveston Laboratory Department of Oceanography and Meteorology Texas A&M College
10:20 AM	Menhaden and other Industrial Fishes	George A. Rounsefell, Chief Gulf Fishery Investigations Bureau of Commercial Fisheries U. S. Fish and Wildlife Service
10:40 AM		(Recess, Twenty Minutes)
11:00 AM	Oysters	Lyle S. St.Amant, Marine Biologist Division of Oysters, Water Bottoms and Seafood Louisiana Wild Life and Fisheries Commission
11:20 AM	Coastal Environment	Gordon Gunter, Director Gulf Coast Research Laboratory

11:40 AM PROGRESS REPORT: MISSISSIPPI RIVER - GULF OUTLET PROJECT

Roy Wood, Regional Supervisor
Branch of River Basins, Region 4
Bureau of Sport Fisheries and Wildlife
U. S. Fish and Wildlife Service

12 Noon RECESS FOR LUNCHEON (No formal luncheon)

1:30 PM A PROSPECTUS FOR RESEARCH ON THE ESTUARINE ENVIRONMENT

Albert L. Tester, Chief
Division of Biological Research
Bureau of Commercial Fisheries
U. S. Fish and Wildlife Service

2:00 PM MEETING THE NEED FOR FISHERIES VOCATIONAL TRAINING IN THE GULF STATES

Charles W. Bevis, Executive Secretary
Southeastern Fisheries Association

2:20 PM PROGRESS REPORT: GULF FISHERIES EXPLORATION AND GEAR RESEARCH PROGRAM

Harvey R. Bullis, Jr., Chief
Gulf Fisheries Exploration and Gear Research
Bureau of Commercial Fisheries
U. S. Fish and Wildlife Service

2:40 PM PROGRESS REPORT: GULF TECHNOLOGICAL RESEARCH PROGRAM

Travis Love, Chief
Gulf Technological Research
U. S. Fish and Wildlife Service

3:00 PM RESERVED FOR ANY UNSCHEDULED SUBJECTS

3:20 PM ADJOURNMENT GENERAL SESSION

3:30 PM INFORMAL DISCUSSION OF THE TECHNOLOGICAL NEEDS OF INDUSTRY ON THE FLORIDA WESTCOAST - - - - - - PINELLAS ROOM

Travis Love, Presiding

3:30 PM INFORMAL MEETING OF STATE DIRECTORS FOR DISCUSSION OF COMMON PROBLEMS - - - - - - - CHAIRMAN'S SUITE

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

3:30 PM THIS PERIOD IS SET ASIDE FOR THE SCIENTIST WHO HAS SOME MATTER HE WISHES TO DISCUSS WITH ANOTHER SCIENTIST OR SCIENTISTS ..... A STRICTLY INFORMAL GET-TOGETHER - - - - - - - PATIO

6:00 PM to 8:00 PM RECEPTION - - - - - - - CIRCUS ROOM AND PATIO

FRIDAY (APRIL 11)

8:30 AM to 11:00 AM COMMISSION EXECUTIVE SESSION BREAKFAST - - - - - - - CIRCUS ROOM

8:30 AM TOUR OF LABORATORIES OF THE FLORIDA STATE BOARD OF CONSERVATION, ST. PETERSBURG, AND THE U. S. FISH AND WILDLIFE SERVICE, ST. PETERSBURG BEACH. TOUR ENDS AT PASS-A-GRILLE BEACH

11:15 AM COMMISSIONERS DRIVE TO PASS-A-GRILLE BEACH

12:30 PM FRIED MULLET - HUSHPUPPIES — COMMUNITY CENTER PASS-A-GRILLE BEACH

CONCERNING REGULAR MEETINGS OF THE
GULF STATES MARINE FISHERIES COMMISSION

In a continued effort to enhance the productivity of regular meetings, the Commission voted at the March 15-16, 1956 meeting in Edgewater Park, Mississippi, to the effect that future meeting programs provide for General Sessions in the morning and afternoon of the first day, and that all reports and papers be presented in summary form with limited discussion to follow ..... that the second day provide a morning Scientific Session for discussion by State staff representatives, representatives of Fish and Wildlife Service, and other interested persons in attendance, previous day's reports and papers and other matters relating to the marine sciences ..... that the Commissioners meet on the second morning in Executive Session, with the session beginning with the Commissioners assembling for breakfast.

W. D. Gunn
Secretary-Treasurer
(August 15, 1956)

GULF STATES MARINE FISHERIES COMMISSION

SCIENTISTS' MEETING
GULF COAST RESEARCH LABORATORY
OCEAN SPRINGS, MISSISSIPPI
FEBRUARY 6 (THURSDAY) AND FEBRUARY 7 (FRIDAY), 1958

(In furtherance of the general purpose of the Commission in maintaining or improving the fishery resources, the objectives of the meeting are to discuss the general biological problems facing the administrators and biologists in the Gulf of Mexico; to determine the extent of knowledge becoming available from the various research programs; to determine what further information is needed; and to improve coordination between the efforts of the several member States and the Federal Government through the Gulf States Marine Fisheries Commission).

Thursday, February 6

9:00 AM	CALL TO ORDER AND OPENING REMARKS	W. C. Holmes
	WELCOME	Gordon Gunter
	INTRODUCTION OF AND REMARKS BY	Seton H. Thompson
	COMMISSION COMPACT RESPONSIBILITIES	Howard D. Dodgen
	DISCUSSIONS	Gordon Gunter, Presiding

(1) SHRIMP

(2) MENHADEN

(3) OYSTERS

(4) OTHER FISHES

(5) OTHER SHELLFISH

12:00 Noon LUNCHEON

2:00 PM DISCUSSION OF MORNING SESSION SUBJECTS TO CONTINUE IF NOT COMPLETED PRIOR TO NOON RECESS. CONFEREES WILL BE THEN DIVIDED INTO GROUPS FOR FURTHER CONSIDERATION OF SUBJECTS

5:00 PM ADJOURNMENT

Friday, February 7

9:00 AM GENERAL DISCUSSION ON ENVIRONMENTAL CONDITIONS Seton H. Thompson, Presiding

12:00 Noon ADJOURNMENT

1:30 PM RESERVED FOR SCIENTISTS TO BE APPOINTED WHO WILL BE RESPONSIBLE FOR THE SUMMARIZING OF SUBJECTS DISCUSSED DURING THE OCEAN SPRINGS SESSION AND THE PRESENTATION OF SAME AT THE APRIL 10-11, 1958 REGULAR MEETING OF THE COMMISSION AT THE FORT HARRISON HOTEL, CLEARWATER, FLORIDA

only copy

GULF STATES MARINE FISHERIES COMMISSION

REGULAR SPRING MEETING

CLEARWATER, FLORIDA

FORT HARRISON HOTEL

APRIL 10-11, 1958

MEETING MINUTES

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

M I N U T E S

REGULAR MEETING, APRIL 10-11, 1958
Fort Harrison Hotel
Clearwater, Florida

OFFICIAL ATTENDANCE OF COMMISSIONERS

	PRESENT	ABSENT
ALABAMA	Wm. H. Drinkard (4-11-58) W. C. Holmes	Garet Van Antwerp, III
FLORIDA	Ernest C. Mitts Walter O. Sheppard Vern Merritt	
LOUISIANA	F. Lamar Clement E. J. Grizzaffi Wilfred A. Duet	
MISSISSIPPI	Hermes Gautier	Walter J. Gex, Jr. Stanford E. Morse, Jr.
TEXAS	Howard D. Dodgen	Jimmy Phillips Wilson Southwell
PROXIES	A. J. Harris J. N. McConnell Hermes Gautier Howard T. Lee	(For Garet Van Antwerp, III) (For F. Lamar Clement - 4-10-58 AM) (For Stanford E. Morse, Jr.) (For Wilson Southwell)
STAFF	W. Dudley Gunn Secretary-Treasurer	

FORMER COMMISSIONERS PRESENT

Charles W. Bevis, Bert E. Thomas

COMMISSION COMMITTEE MEMBERS PRESENT (Not Listed Above)

Gordon Gunter, Robert M. Ingle, Upton Sisson, Lyle S. St. Amant, Percy Viosca, Jr.

STATE GOVERNMENT REPRESENTATIVES PRESENT

Wilber G. Dees, Mrs. Bonnie Eldred, Richard W. Ervin, Theodore B. Ford, Robert F. Hutton, Sidney Landry, Ronald C. Phillips, B. E. Shaffer, Franklin Sogandares, Victor G. Springer, Ken Woodburn.

INTERSTATE FISHERIES COMPACT REPRESENTATIVES PRESENT

Wayne D. Heydecker, G. Robert Lunz

FEDERAL GOVERNMENT REPRESENTATIVES PRESENT

A. W. Anderson, Harold L. Blakey, Harvey R. Bullis, Jr., Philip Butler, Edward Chin, T. J. Costello, Walter A. Gresh, Gordon E. Hall, Charles J. Hunter, H. A. Hunter, Travis Love, Charles H. Lyles, Harvey L. Moore, William E. Shell, Jr., Spencer H. Smith, Albert Tester, Paul Thompson, Seton Thompson, Earl T. Walker, John E. Watson, R. T. Whiteleather, Roy Wood.

UNIVERSITY REPRESENTATIVES PRESENT

Thomas R. Hellier, Jr., Clarence P. Idyll, Edwin S. Iversen, Richard A. Kahn, Kenneth M. Rae.

INDUSTRY REPRESENTATIVES PRESENT

J. Roy Duggan, John C. Ferguson, Max Lawrenz, James L. McConnell, Don McKee, Buster Mirabella, Frank H. Palvores, H. S. Plummer, W. J. Pugh, A. H. Ramos, J. S. Ramos, Charlie C. Rice, Howard O. Sturgis. K. M. Tuttle.

CLERGY, CLUB AND PRESS REPRESENTATIVES PRESENT

D. P. McGeachey, Mrs. F. L. Basler, Mrs. N. B. Beecher, Mrs. Stephen Chase, Mrs. Robert H. Davis, Mrs. Winfield Lott, Fred Manter, Mrs. Betty Thornton, C. J. Devlin, Ken Musson.

GENERAL SESSION, APRIL 10, 1958

Dr. W. C. Holmes called the meeting to order at 9:30 AM and introduced Dr. D. P. McGeachey, Pastor, Peace Memorial Presbyterian Church, Clearwater, Florida, who rendered the invocation.

The Secretary called the roll of Commissioners after the Chairman had introduced Florida Commissioner Walter O. Sheppard and Louisiana Commissioner Wilfred A. Duet. Proxies were seated.

Florida Commissioner Ernest C. Mitts was called upon to introduce Attorney General Richard W. Ervin of Florida for presentation of the opening address of the meeting. Copy of the address is herewith attached.

Following announcements, the Chairman briefly reviewed the objectives of the some forty scientists who met in Commission sponsored sessions at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi, February 6-7, 1958 and called

upon those scientists who, following the February meeting, prepared reports outlining certain recommendations for consideration by the Commission.

Reporting the scientists' recommendations regarding Shrimp was Dr. Kenneth M. Rae of Texas A&M College.

Dr. George A. Rounsefell of the Federal Gulf Fishery Investigations prepared the report on Menhaden and other Industrial Fishes which in his absence was read by Mr. Seton Thompson.

Reporting on the subject of Oysters was Dr. Lyle S. St. Amant of the Louisiana Wild Life and Fisheries Commission.

Findings of the scientists regarding the Coastal Environment was presented by Dr. Gordon Gunter of the Gulf Coast Research Laboratory.

Copies of each of the above four reports are herewith attached in the order listed.

The concluding presentation at the morning session was a report by Mr. Roy Wood of the Branch of River Basins, Region 4, Bureau of Sport Fisheries and Wildlife. Copy of the report covering progress of the Mississippi River - Gulf Outlet Project, in Louisiana, is herewith attached.

Dr. Albert L. Tester, Division of Biological Research, Bureau of Commercial Fisheries, was introduced as the first speaker on the afternoon agenda. Copy of his Prospectus for Research on the Estuarine Environment is herewith attached

Meeting the Need for Fisheries Vocational Training in the Gulf States, presented by Mr. Charles W. Bevis, executive officer of the Southeastern Fisheries Association, is herewith attached in copy.

Reporting on Progress of the Gulf Fisheries Exploration and Gear Research Program was Mr. Harvey R. Bullis, Jr., who is in charge of that program for the Bureau of Commercial Fisheries. Copy of a resume of the report is herewith attached.

The concluding paper for the afternoon was presented by Mr. Travis Love, head of the Gulf Technological Research Program of the Bureau of Commercial Fisheries. Copy of this progress report, Gulf Technological Research Program, which is incorporated in an illustrated pamphlet, is herewith attached.

The Chairman called for any other matters to come before the General Session but with no response forthcoming, called upon the Secretary for announcements. It was announced that Mr. Love would meet with industry in Rooms 969-71 to discuss the technological needs of industry located in the southwest Florida area.

It was also announced that the scientists would meet informally on the Patio to discuss with one another problems of mutual interest.

A list of Federal and Interstate representatives were asked to remain in the Circus Room for a meeting with the Commission and Commission committee members

in connection with considerations to be given the coastal environment. The list included:

Messrs. A. W. Anderson, Walter A. Gresh, Charles H. Lyles, Albert L. Tester, Paul Thompson, Seton Thompson, and Roy Wood; Fish and Wildlife Service.

Harold L. Blakey, Gordon E. Hall, and William E. Shell, Jr., Corps of Engineers.

Wayne D. Heydecker and G. Robert Lunz; Atlantic States Marine Fisheries Commission

Chairman Holmes expressed the appreciation of the Commission for the fine presentations heard during the day and adjourned the General Session at 3:30 PM. The three separate sessions mentioned above began at 3:45 PM.

Reporting on the technological session, Mr. Love stated it was pointed out in discussion that if a greater amount of bisulfite was used in the control of black spot in shrimp than had been found to be the proper proportions, an organic breakdown would result in cooking; thus causing a sulfide odor to evolve. Industry expressed a desire for fresh frozen mullet taste tests on that commodity packed in Cry-O-Vac bags to continue; initial taste tests, according to the Pascagoula Laboratory, have been exceedingly satisfactory. The group was advised that the Laboratory had completed canning both mullet and white trout in several tomato sauces and a hot sauce, and were to ship samples to two foreign brokers for testing who had expressed a desire to purchase less expensive type fish so prepared.

The session on environment was given some details on the preliminary draft of a proposed work program of fish and wildlife study in connection with the Mississippi River - Gulf Outlet Louisiana Project, by Mr. Wood, whose previously mentioned and attached report on this project makes reference to coordination already accomplished and that which is to be accomplished.

The Commission Secretary referred to the resolution adopted at the October 10-11, 1957 meeting at Mobile, which requests the Corps of Engineers to allocate additional and sufficient funds for thorough ecological and associated studies in connection with the project, and recalled having advised the Commissioners of the Corps acknowledgement of receipt of the resolution, stating that the Fish and Wildlife Service had been allocated funds for fiscal year 1958, and that requests for additional funds would be given full consideration as received and the need therefore fully justified as a necessary adjunct to the project.

The previously mentioned and attached report by Dr. Gunter on recommendations of the scientists and that by Dr. Tester concerning a suggested estuarine research program, were discussed and a committee was appointed by the presiding Commissioner, Vice-Chairman Howard D. Dodgen, to draft a resolution setting up a technical coordinating committee for estuarine research planning and other duties, for consideration by the whole Commission. Appointed to serve on such resolution drafting committee were Commissioner Hermes Gautier, Chairman; Harold Blakey, Walter Gresh, A. J. Harris, Robert Ingle, Howard Lee, James N. McConnell, and Seton Thompson.

The Southeastern Fisheries Association tendered a reception for the Commissioners and their guests the evening of April 10th in the Grand Ballroom of the Fort Harrison Hotel.

Friday (April 11)

At 8:30 AM a tour began from the Fort Harrison Hotel of the laboratories of the Florida State Board of Conservation, St. Petersburg, and the Fish and Wildlife Service, St. Petersburg Beach.

The Commission Executive Session also began at 8:30 AM with the serving of breakfast in the Circus Room. This session was adjourned at 11:15 AM.

Those who made the trip to the laboratories and the Commissioners met at the Pass-A-Grille Beach Community Center where the Florida State Board of Conservation and the Southeastern Fisheries Association entertained with a luncheon of fresh fried mullet and hushpuppies.

The regular spring meeting of the Commission was officially closed at the conclusion of the luncheon.

Following is summary of items of general interest taken from Minutes of the Commission Executive Session of April 11, 1958 -

(1) Future scheduled Commission regular meeting:

Buena Vista Hotel, Biloxi, Mississippi, October 16-17, 1958

(2) Resolutions:

Requests the Fish and Wildlife Service and the five Gulf States to appoint a committee on estuarine environment which would be responsible for planning investigations into that broad subject.

Calls attention to the need for additional fresh water in the Louisiana coastal areas during dry periods to assist the fishes, shellfish and wildlife and requests the Corps of Enginners and the Fish and Wildlife Service, in cooperation with the Louisiana Wild Life and Fisheries Commission, to make this possible

Favors use of Saltonstall-Kennedy funds for research in the cultivation of shrimp in completely controlled and in partially controlled ponds and reservoirs.

Requests the Fish and Wildlife Service and the marine fishery administrations of the member states to proceed expeditiously with the procurement of necessary data on shrimp, menhaden and other industrial fishes, and oysters, as recommended in reports resulting from the Commission sponsored conference of scientists, February 6-7, 1958; such reports having been presented at the Commission's regular meeting at Clearwater, Florida, April 10-11, 1958.

Prepared by: W. Dudley Gunn
Secretary-Treasurer

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Clearwater, Florida
Fort Harrison Hotel
April 10-11, 1958

ADDRESS

Richard W. Ervin, Attorney General
State of Florida

It is a real pleasure for me to be with you ladies and gentlemen at your association meeting. I had had the honor of addressing you on other occasions and of participating in some of your group activities and I am indeed appreciative of having been again invited to join you.

We in Florida are very pround to have your Commission meet here with us this year, and to the beautiful City of Clearwater we welcome you! I am sure there is no need for me to point out to you the scenic beauty of Clearwater and its harbor--because to you who come here from areas not so well favored by providence the natural charm of this area is probably more apparent than to those of us who, being natives, from familiarity fail "to see the forest for the trees". In any event, we are proud and happy to have you here and we hope your visit will be a very pleasant one.

I note you have in attendance representatives of both the state and federal government, state universities, and industry - as well as an interested public.

This attendance indicates the respect held for your Commission by these influential groups. It attests to the value of your Commission as a governmental compact group working to further mutual understandings and implements agreements between the gulf coastal states in the fisheries field.

Your Commission is one of the many evidences of the success of a democracy. It is an agency recognized as being scientifically and technically able to produce more beneficial public results than would otherwise be the case if the gulf states' problems were handled by officials in Washington or perhaps by on-the-spot-agreements made from time to time and usually under emergency conditions by the governors of the several gulf coastal states.

Your Commission is a continuous working agency which collects data, channels information, makes studies, and plans ahead for mutual working agreements prior to the time conflicts of jurisdiction and disputes arise, and for the most part is successful in avoiding them.

It is the governmental aid of the industry's trade associations composed of members of the fisheries industry and other associated segments of the industry. It has a responsibility to both the fisheries industry and the public and acts as an umpire.

While it has no strong law enforcement potential or lawful ability to compel enforcement of its determinations, yet because of its prestige and the respect it has gained throughout its years of operation, the decisions of your Commission are for the most part respected and adhered to by those affected.

The State of Florida is particularly proud of its long standing record of cooperating with other gulf coastal states. Just now it is giving full cooperation to the other four gulf coastal states in the fight to preserve the tidelands (that is to say, those extending into the Gulf three marine leagues) given the states under the Submerged Land Act. Incidentally, it may be of interest to you to know that this case will be argued before the United States Supreme Court on October 13 of this year.

The United States Government, through the Justice Department, has injected into the case the question of international law. We believe that this effort is both extraneous and immaterial. It is certainly contrary to the campaign pledges made by the President.

Even if the United States unilaterally has tried to indicate through its Executive branch under some concept of international law that the territorial seaward boundaries of the United States are three miles--and, of course, there is some debate about that--that fact of itself does not appear to me to preclude the gulf coastal states from the benefits granted under the Submerged Land Act.

If the Congress could not give the gulf coastal states anything beyond the three-mile limit because under international law it had nothing to give, still the Submerged Land Act should act as a federal recognition of the claim of title (or perhaps quitclaim thereto) of the gulf coastal states to take oil and minerals out to certain points beyond the three-mile limit as against any conflicting similar claims of the federal government which the federal government could interpose by suit or otherwise, and should also protect the states against the claims of other nations insofar as the oil, gas and other minerals are concerned. It would be inconsistent, if not immoral, it seems to me, for the United States Government to disapprove of the states' claim to these minerals on the ground of the three-mile limit under international law and at the same time claim that the federal government's title to same extends beyond such limits. Stated another way, I do not see how the federal government can defeat the states' claims under some theory of international law by applying the three-mile limit and at the same time establish the government's claim beyond the three-mile limit to the oil, gas and other minerals.

International law should not be the basis for anything more than the implementation of national policies in traditional spheres of federal governmental action. It should not be used to usurp states' titles of mineral rights in the domestic field which have nothing in common with the implementation of our international rights. And we should, of course, with equal jealousy strive to preserve our states' rights in the fisheries field.

and protection

(Ervin #3)

I wish to sound a warning to any encroachment of federal authority in fields which rightfully belong to the states both traditionally and pursuant to long established legal precedents. Your Commission is just another agency that can and will protect us against federal usurpation and encroachment in the administration of affairs that are logically capable of being handled by the states or by regional agencies of the states such as your Commission. Were it not for your Commission and the encouragement you have given it, it is quite possible that the whole subject of varying rights and claims of the gulf states relative marine fisheries would be relegated to federal control and regulation.

While freely admitting there are certain spheres of action and areas of endeavor that only the federal government can appropriately administer for the nation as a whole, still there is little reason to take from local hands or regional administrators subjects which lie peculiarly and traditionally within the range of administration of the states. Your Commission is one of the manifestations of a union of federal states with reserved powers--with emphasis upon "reserved powers".

I do hope that the theory of international law will not be extended so as to remove from your Commission, and local or regional control through your Commission and other state agencies, the matter of administration of fisheries. It should extend mainly to our problems with other nations and not be used as a basis for overriding states' rights and properties in the nature of some transcendent omnipotent power.

We can understand, of course, that where another nation is involved there is real reason for federal intervention and administration, but as between the states particularly, and certainly a set of states having real points in common -- in this case the Gulf of Mexico and the fishing therein -- there is no need for federal controls.

As you know, at the present time, Commissioner Mitts has the good fortune to have a representative of the industry, the Honorable William R. Neblett, participating in the deliberations on international law now in progress at the International Conference on Fisheries at Geneva, Switzerland. In order to give Mr. Neblett enhanced legal and official status, I have designated him s Special Assistant Attorney General of my office.

Mr. Neblett has written me very helpful and interesting reports upon the deliberations underway at Geneva. He is aggressively bending his best efforts toward protecting the fishing industry of the gulf coastal states.

I should like at this time to tell the representatives of the Bureau of Commercial Fisheries how glad we are to have the Gulf-South Atlantic Regional Office located at St. Petersburg Beach. Having this office established and centrally located in the large area it is to serve will considerably assist in the development of basic information on the fishes, shellfish and their environment.

(Ervin #4)

The exchange of data between the Bureau and the several state fishery agencies, through the Commission as a central coordinating medium, should greatly facilitate the joint endeavors and be productive of such knowledge as is needed by the gulf states to implement proper laws and regulations to assure a continuous and high level abundance in the fisheries.

May I in closing again express my appreciation for the honor of your invitation to join you here today. I wish you every success in your deliberations here at this conference and want to assure you that I and my office stand ready at all times to assist in the work of your Commission in any way we can.

I thank you.

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GULF STATES MARINE FISHERIES COMMISSION
Clearwater, Florida
Fort Harrison Hotel
April 10-11, 1958

REPORT OF DECISIONS REACHED BY STUDY GROUP
ON SHRIMP AT SCIENTISTS' MEETING, OCEAN SPRINGS,
MISSISSIPPI, FEBRUARY 6-7, 1958

Presented by Dr. Kenneth M. Rae, Director,
Galveston Laboratory, Department of Oceanography
and Meteorology, Texas A&M College

It was plain from fairly lengthy discussions of the work on shrimp now in progress that two main approaches are being used. The division between the two is by no means clear-cut, but in very general terms they can be described as (a) the biological and (b) the biometric.

In the first, the biological, effort is being made to understand the intimate biology of the three main species of shrimp, the 'white', the 'brown' and the 'pink'. Agencies are investigating the breeding cycles of shrimp, their migrations, feeding habits, reactions to environmental changes, preferences for various types of sea bottoms, burrowing habits, etc.

In the second, the biometric, the emphasis is on the collection of statistics and so a measurement of the existing stocks of shrimp, the fluctuations in these stocks and their effect on the commercial landings. Or, alternatively, the effect of fishing effort on the natural stocks and on the return per unit effort to the fisherman. Statistics of this sort do, of course, also provide information on the growth rate and movements of the shrimp.

From the standpoint of conservation or rational fishing, that is from the viewpoint of the Commission, both these approaches are essential. Neither can be meaningful without the other. Whereas statistics are necessary to show the state and fluctuations of the stocks and therefore must be collected in as comprehensive manner as possible, a great deal more information on the behavior and biology of the shrimp will be required to explain these fluctuations. Without more basic knowledge recommendations for conservation measures can only be taken on a trial and error basis and so at the risk of being costly to the industry.

It was for this reason that the committee dwelt on recommendations which have certainly been made before. They were inclined to re-iterate the need for the basic information about the ecology of the shrimp rather than to suggest any drastic change in the lines of approach. Several times, it was stressed that we must know much more about the biology of all three species before we can make constructive suggestions about ways and means of regulating the fishery.

At present, therefore, the requirement is for greater emphasis on fundamental work on the shrimp and the immediate need is to find more support and facilities for such research.

Although there are many aspects which call for urgent attention, we believe that extra effort must be devoted to the following general fields of study. They are not listed in order of priority. In fact, most of them are interdependent.

(a) We should find some means of describing adequately all the young stages of P. setiferus, P. duorarum and P. aztecus and also other penaeid species in the Gulf which might be confusable with them. Until this is done field work on the distribution and movements of the larvae may, at the best, prove misleading. The most important step in this direction would be to master techniques for breeding shrimp in captivity and much more effort should be devoted to this by as many agencies as possible.

(b) In addition to these breeding trials, a great deal more experimental work must be done on shrimp in the laboratories. Before field observations can fall into the right perspective, we must learn more about the diet, feeding habits and metabolism of the shrimp. The use of radioactive isotopes should be used to amplify experiments now being made. More information is also required from laboratory experiments on the reaction of shrimp and their tolerance to changes in the physical and chemical environment and on their behavior under a variety of controlled conditions. Knowledge of this sort is essential if we are to understand the natural fluctuations in the stocks or to differentiate between changes in the environment and in fishing effort in their effects on commercial catches.

(c) Too little work has so far been done on the distribution of nutrients and the food cycles on the nursery grounds. We accept the fact that certain bays are highly productive without being competent to say why this is so. Regular analyses of the inorganic and organic content of the water and bottom deposits should be made together with estimates of the standing crop of plankton and primary production at various seasons and at various states of river flow. Comparisons should be made between the nutrient cycles on nursery grounds showing faster and slower growth rates for young shrimp. We believe that more fundamental information of this kind is essential if we are to appreciate properly the possible effects of pollution and other man made changes on the natural resources.

(d) Intensive hydrographic and plankton work should be done in selected bays and passes in an attempt to understand the mechanism behind the transport of post-larvae in to their nursery grounds. This will entail very close sampling both in space and time and so may require cooperation between agencies to make the experiments effective. Such work may be very relevant to the design and location of ship channels and artificial passes now proposed.

(e) A study should be made into the design of tagging experiments to obtain information on growth rates, migration and the interchange between stocks. Standardization of technique might lead to progress, if agreement could be reached on the most promising method. Information on the interchange between shrimp on different fishing grounds and on the contribution of different breeding stocks to the various nursery grounds and vice versa is clearly a vital factor in designing conservation measures.

(f) A review of the practicality of pond culture remains of prime importance. The empirical approach should continue to be used whenever the opportunity for a pilot experiment presents itself. However, we feel that such trials cannot become purposeful until a great deal more is known about the ecological requirements of the shrimp. Here again we would emphasize the need for a more intensive effort on laboratory experiments designed to define the optimum environment for the young of the white, brown and pink shrimp. Until we have securer knowledge on this, we are unlikely to know whether failures in pond trials are due to physical or chemical factors or to an unsatisfactory biological balance.

It seems profitable to explore at the same time the possibility of culturing brackish or even fresh water species. They may be less discriminating in their requirements but yet satisfactory for the bait market.

(g) Concern was expressed about the delay in formal publication of results and the shortcomings of the present means of interchanging data between agencies. It was felt that this was one of the major handicaps to progress. We recommend, therefore, that the Commission set up a committee to review ways of improving the dissemination of information between scientists.

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GULF STATES MARINE FISHERIES COMMISSION
Clearwater, Florida
Fort Harrison Hotel
April 10-11, 1958

REPORT OF DECISIONS REACHED BY STUDY GROUP
ON MENHADEN AND OTHER INDUSTRIAL FISHES
AT SCIENTISTS' MEETING, OCEAN SPRINGS,
MISSISSIPPI, FEBRUARY 6-7, 1958

Presented by Dr. George A. Rounsefell, Chief,
Gulf Fishery Investigations, Bureau of Commercial
Fisheries, U. S. Fish and Wildlife Service

This fishery has developed with extreme rapidity, and it is apparent that the industry is anxious to exploit the clupeoid species other than menhaden which so far has made up the bulk of the catch. The industry feels that by using modern gears and fishing for a variety of species, both the total catch and the season of availability will be stabilized.

Tulane University is illustrating the development and juvenile stages of the menhaden in a beautiful set of half-tone plates. Because of the current interest in all Gulf fishes found in sufficiently large concentrations for profitable fishing, the illustration of all of the herring-like fishes of the Gulf is being considered. Dr. Suttkus has discovered incidentally that the menhaden along the Florida West Coast as far north at least as Cedar Keys are Brevoortia smithi not the B. patronus of the northern Gulf.

The Gulf Coast Research Laboratory at Ocean Springs, Mississippi, is working on the identification of stocks of menhaden, but has so far been unable to locate any spawning schools.

The Bureau of Commercial Fisheries are attacking the industrial fish problems from several angles. At the Pascagoula Laboratory the research vessel OREGON has just commenced a 2-year study to discover the potential availability of all the herring-like fishes in the Gulf - menhaden, shads, anchovies, thread herrings, etc. - to modern fishing gears. The purpose is two-fold, to determine the location and abundance of the different species, and to determine seasonal availability in order to extend the present fishing season that is shortened by the seasonal disappearance of the menhaden schools.

The Galveston Laboratory is sampling the commercial catch on a very limited scale to determine whether the ages of these southern menhaden can be successfully determined from their scales. Results to date are encouraging and indicate the possibility of determining natural causes for fluctuations in abundance of menhaden, by following the relative abundance of successive annual broods.

Oceanographic knowledge as an aid to understanding the distribution, migrations, and life history of clupeoid fishes is stressed by oceanographers.

To date most of the work in the Gulf has been a physical oceanography but biological work is now being undertaken by Texas A. and M., which has just acquired a new building for a laboratory in Galveston.

Biologists from the Corps of Engineers mentioned their interest in the effect that engineering projects for flood control, canals, and jetties along the coast might have on the production of young fish from the inside nursery grounds.

The topic evoking most discussion was the large amount of fishery data that could be obtained during the next two years from the cruises of the OREGON if some way could be found to provide biological personnel.

The group approved three draft resolutions to present to the Gulf States Marine Fisheries Commission for their consideration at their April meeting. The text of these suggested resolutions to be tendered the Commission is:

Resolution No. 1. Recommending biological research on industrial fishes.

Whereas, the fishery for industrial species, so far chiefly menhaden, has increased since 1939 from 13 million to over 500 million pounds, and

Whereas, the industry is progressively constructing large refrigerated vessels to prosecute the fishery over a wide range, and

Whereas, the short season when menhaden are available makes it difficult to operate profitably, and

Whereas, the industry is now actively commencing to seek other species during the off season for menhaden, and

Whereas, our present state of knowledge of the menhaden stocks is insufficient to gauge the effects of the fishery on its maintenance, and

Whereas, the research vessels of the Bureau of Commercial Fisheries are now actively engaged in assessing the distribution and commercial availability of other clupeoid fishes with modern gears, and

Whereas, valuable biological information concerning all the clupeoid fishes can be obtained at little extra cost compared to the value of this information during these exploratory operations (and no biologists are now available to collect these data), and

Whereas, this information will soon be sorely needed to understand the potential of this expanding fishery for industrial fishes,

Therefore, be it resolved that:

The Gulf States Marine Fisheries Commission recommend that sufficient funds be provided to make a thorough study of this industrial fishery, especially the collection of the biological data presently available from exploratory fishing operations.

Resolution No. 2. Need for working meetings of scientists.

Whereas, there are now a number of laboratories, federal, state, university and private along the Gulf Coast working on marine problems directly or indirectly related to fisheries, and

Whereas, the work of all toward solving fishery problems is hampered by lack of sufficient interchange of ideas and information, and

Whereas, it is important to the fishing industry that the most research be accomplished with available funds and personnel,

Therefore, be it resolved that:

The Gulf States Marine Fisheries Commission sponsor semi-annual working sessions of staff scientists to discuss mutual problems and arrange for cooperative work.

Resolution No. 3. Recommending support of oceanographic research.

Whereas, an understanding of the oceanic environment is of great importance to the study of the Gulf fishes, and

Whereas, projects now underway in certain institutions are studying this environment, and

Whereas, these institutions could complete successive phases of their work more expeditiously with greater facilities,

Therefore, be it resolved, that:

The Gulf States Marine Fisheries Commission recommend that these institutions receive financial support for oceanographic work.

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GULF STATES MARINE FISHERIES COMMISSION
Clearwater, Florida
Fort Harrison Hotel
April 10-11, 1958

REPORT OF DECISIONS REACHED BY STUDY GROUP
ON OYSTERS AT SCIENTISTS' MEETING, OCEAN SPRINGS,
MISSISSIPPI, FEBRUARY 6-7, 1958

Presented by Dr. Lyle S. St. Amant, Marine Biologist
Division of Oysters, Water Bottoms and Seafood
Louisiana Wild Life and Fisheries Commission

After discussion the committee agreed that the Gulf oyster industry has had serious setbacks in recent years. Production of oysters has declined in many areas and in other areas where production is apparently maintained, quality is poor, more acreage is being planted to keep up production, and the cost of production is soaring. The basic causes of these changes are manifold and complex. Increased salinities and other ecological changes in oyster producing areas has resulted in a decline in spat and seed production, has increased predation and invited the invasion of new areas by oyster drills, and has created optimum conditions for heavy summer mortalities caused by the fungas, Dermocystidium. Superimposed on these basic problems, in many areas, are additional man made problems involving the dredging of canals and deep water channels, drainage and fresh water diversion, silting and industrial pollution.

Investigations are being carried out in all of the states on some of these problems but the important problems need more intensive work. Better coordination of research efforts among the various laboratories and more frequent discussions of ideas and problems is desirable.

CURRENT INVESTIGATIONS

The Texas Game and Fish Commission is at present mapping new reef shell deposits and studying the effects of siltfrom shell dredging on live oyster reefs. More effective controls and regulations for the oyster industry are being investigated.

Investigations by the Texas A & M Research Foundation are being carried cut in Louisiana and in Texas. In Louisiana, field studies are being made of gross oil pollution resulting from pipeline breaks or excessive losses from wells on the condition, growth and mortality of oysters. Laboratory investigations of the quantative levels of oil based muds and graphite causing an oily taste in oysters have been initiated. This group is also investigating routine complaints of silting, and other damage arising from the oil industry. In Texas, the work is more fundamental and involves the reevaluation of old data and the investigation of new phases of the actual physiological requirements of oysters. The oxygen demand at various pumping rates, the effects of organic compounds and toxicity of oil on oysters are being considered at present.

(St. Amant #2)

The Louisiana Wild Life and Fisheries Commission is studying ways and means of introducing Mississippi River water into highly saline oyster areas. The comparative value of steam and reef (mud) shell as oyster cultch has been investigated and the results are available to interested parties. The effects of the oil industry on oysters in Louisiana require a great deal of technical attention. At present investigations of the various effects of oil based muds and of silting and dredging on oysters are in progress. Some work is also being done on the growth and mortality of oysters, the feasibility of chemically controlling oyster drills and the proper times of year to plant shells.

Investigations at the Gulf Coast Research Laboratory in Mississippi include.- Studies on the Toxonomy and distribution of micromollusca in Mississippi Sound. Various studies of the oyster drill Thais which include salinity and size relationships, anatomy of the drilling apparatus, and the effects of copper and other chemicals on this oyster pest. In addition they are initiating an ecological investigation of the western end of the Mississippi Sound where producing oyster beds are located.

At the U. S. Fish and Wildlife Service Laboratory at Pensacola, Florida, numerous investigations are being undertaken. Their work on the oyster drill includes: (1) The extent of its predation on oysters. (2) A Gulf Coast survey of the distribution of the drill. (3) The possibilities of biological control of the drill by parasitizing them and (4) Studies of the growth, reproduction, and physiology of Thais. Other types of research in progress at Pensacola deals directly with oysters and clams and includes studies of spatfall, reproduction and various types of cultch suitable for oysters; While Mercenaria, the clam is being investigated to see if it can be produced commercially in Gulf waters.

The State of Alabama is concerned about the effects of shell dredging on oysters in Mobile Bay. The State of Florida was not represented on the committee but it is understood that investigations of various oyster predators are being carried out there. Florida State University is making a biological evaluation of St. Andrews Bay.

NEEDED INVESTIGATIONS

Although the various types of investigations being carried out in the Gulf States cover many of the immediate problems of the industry, there is still much that needs to be done and certain phases of the present work should be greatly intensified and better coordinated. It is the opinion of the committee that the following types of work needs immediate amplification.

1. Intensive studies of the effects of canal dredging and silt deposition should be started. The studies should be directed toward ascertaining facts that will explain both direct and indirect effects of such construction. i.e., direct silting, indirect silting from changes in current velocity, and hydrographic changes if any.

2. The various effects of oil emulsion and graphite drilling muds on oysters should be looked into in considerable detail.

3. The needs for shell planting in the various states should be investigated and recommendations regarding the type of planting and amounts of shells to be planted should be developed.

4. Control of the southern oyster drill would be a boon to the industry. Considerable work could be added to the present research schedules, particularly aimed at testing the use of chemical, electrical, and biological controls of adults, eggs and larval stages.

5. In those areas where feasible, a controlled introduction of fresh river water into saline oyster areas is recommended. It is the belief of most technicians that if sufficient amounts of fresh water can be introduced into saline areas under controlled conditions many of the ills of the oyster industry can be relieved and oyster production can be significantly increased.

The above suggestions and conclusions were drawn up from the minutes of the committee meeting and circulated to the various members for approval The report as such was unanimously approved, however, certain additional research recommendations were submitted by some members for possible inclusion in the report. Since there was no time for the entire committee to act upon these new research proposals they are being submitted separately for general consideration. They are as follows:

1. Investigations into the basic oyster physiology with particular emphasis on nutrition, shell growth, glycogen accumulation and reproduction. These investigations to be carried out with the idea in mind that the results will be used for ecological interpretations.

2. Investigations of possible methods to culture strains of oysters resistant to the fungus disease, D. marinum.

3. Studies of ways and means to return oyster areas to production after they have been subjected to shell dredging. It might be possible to plant shell in the old dredged cuts to form suitable oyster bottom.

4. Continuation of a program to survey the coastal area for predator free waters, that can furnish new oyster producing areas for the industry. Since this is a large job it is probable that best results would be obtained by cooperative state and federal efforts.

GSMFC SCIENTISTS' MEETING, FEB. 6-7, 1958
Study Group on Oysters

Lyle S. St. Amant, Presiding
La. Wild Life and Fisheries Commission, New Orleans, La.

Nelson Cooley, U. S. Fish and Wildlife Service, Pensacola, Fla.

Albert Collier, Texas A&M Research Foundation, Galveston, Texas

William Demoran, Gulf Coast Research Laboratory, Ocean Springs, Miss.

T. B. Ford, La. Wild Life and Fisheries Commission, New Orleans, La.

Meredith Jones, Florida State University, Panama City, Fla.

Howard T. Lee, Texas Game and Fish Commission, Rockport, Texas

Donald R. Luethy, Ala. Department of Conservation, Montgomery, Ala.

J. G. Mackin, Texas A&M Research Foundation, Thibodeux, La.

Donald R. Moore, Gulf Coast Research Laboratory, Ocean Springs, Miss.

A. F. Novak, Louisiana State University, Baton Rouge, La.

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GULF STATES MARINE FISHERIES COMMISSION
Clearwater, Florida
Fort Harrison Hotel
April 10-11, 1958

REPORT OF DECISIONS REACHED BY STUDY GROUP ON ENVIRONMENT AT SCIENTISTS' MEETING, OCEAN SPRINGS, MISSISSIPPI, FEBRUARY 6-7, 1958

Presented by Gordon Gunter, Director
Gulf Coast Research Laboratory

The Interim Committee was appointed by Dr. W. C. Holmes, Chairman, Gulf States Marine Fisheries Commission, at the close of the Scientists' Meeting at Ocean Springs, Mississippi, February 7, 1958. The Committee, consisting of Dr. Gordon Gunter, Director, Gulf Coast Research Laboratory, Ocean Springs, Mississippi; Dr. Dale F. Leipper, Research Foundation, Texas A&M College, College Station, Texas; Dr. Lyle S. St. Amant, Marine Biologist, Louisiana Wild Life and Fisheries Commission, New Orleans, Louisiana; Mr. Seton H. Thompson, Regional Director, Gulf and South Atlantic Region, U. S. Bureau of Commercial Fisheries, St. Petersburg Beach, Florida; Mr. Harold L. Blakey, Chief Biologist, U. S. Army Engineers, Washington, D. C.; Mr. Harold D. Fields, Wildlife Biologist, U. S. Bureau of Sport Fisheries and Wildlife, Vicksburg, Mississippi met at a luncheon meeting the afternoon of February 7, 1958. Also present were Mr. W. Dudley Gunn, Secretary-Treasurer, Gulf States Marine Fisheries Commission, New Orleans, Louisiana; and Mr. Charles R. Chapman, Fisheries Biologist, U. S. Bureau of Sport Fisheries and Wildlife, Slidell, Louisiana.

The Committee discussed the requirements for a study of basic environmental conditions, elements of such a study, procedures and scope. The Committee agreed on the following:

1. To advise the Gulf States Marine Fisheries Commission of the need for an environmental study.

2. To recommend to the Commission that a committee be appointed to assay the problem and to formulate a plan for the required study.

3. To recommend a survey of state material by state agencies to summarize existing information.

The Committee requested that these recommendations be prepared in suitable form for presentation to the Gulf States Marine Fisheries Commission at the meeting to be held April 10-11, 1958 in Clearwater, Florida, and copies furnished the members for their review.

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The need for an environmental study cannot be stressed too strongly in undertaking an investigation of the relationship between the nursery and rearing grounds of coastal areas and the harvests of fish and wildlife from the Gulf of Mexico and related marshlands. The biological processes that result in the production of fish, game and fur animals which are harvested for sport or as a commercial enterprise can take place only in a favorable environment. If we are to attempt to manipulate the environment in a manner that will favor these organisms we must understand the physical and commercial characteristics of their surroundings and contribute to the success or failure of the crop. We should attempt to learn the limits of tolerance as well as the optimum conditions for production of that crop.

It may be considered axiomatic that an organism lives in a particular environment because it is suited to the conditions that exist there, and that over a length of time organisms evolve or adapt so that they can persist under a set of conditions that in the broad application of the word is their habitat. Gradual changes in habitat usually permit a gradual change in a large percentage of the inhabitants so that they continue to be "successful". Sudden changes in habitat (environmental changes) usually do not permit adaption of the organisms so that characteristics of the population change. Where the change is of a magnitude beyond the range of tolerance of the organisms, they are no longer successful in that habitat. When these organisms are of value to man, means are sought to maintain their populations. Since it is known that they were successful under the previous set of conditions, the attempt to duplicate former conditions appears as an obvious step and "restoration" has become a familiar word. Frequently restoration is not possible within practical limits and replacement or duplication of conditions must be considered elsewhere. The latter alternative does not seem practical, as the area under consideration is unique and the best opportunity for maintaining the resources which are our concern lies within the areas presently responsible for their production.

Only a small portion of the factors affecting the habitat are within the control of man, and these only to a limited degree. Within his sphere of influence man has brought about some drastic changes by construction of levees and canals. Some of these changes are known to have had an adverse effect on fish and wildlife resources, and others are suspect. The degree of the effect needs to be measured much more accurately than has been possible in the past. In the same vein, measures have been recommended to restore the productivity where decline is apparent or probable. These measures for the most part may be considered sound in that they have not been logically refuted, but again, measurement of the environmental factors has not been carried to the point where the degree to which these measures should be applied can be stated, or a reasonable estimate of the benefits made.

In the estuarine areas of the Gulf Coast, and particularly in the vicinity of the Mississippi River Delta, changes are taking place at an unprecedented rate. Our problem therefore is complicated in that present conditions must be recorded, trends observed, and future conditions predicted. Only than can adequate measures be prescribed to bring about conditions favorable to production of the organisms which are our concern.

The physical and chemical components that make up the environment are many and complex, and their action and interaction determine the biological processes that can take place. In order to prepare a program for study of environmental conditions, experts in the various fields of oceanography, hydrology, geology, meteorology, and the biological sciences should be consulted. Organization of an adequate program would take a minimum of six months and would require extensive conference with the specialists in each field. A committee to assay the problem and formulate a plan for the required study will be a prerequisite to success of this program.

One of the elements in an investigation of environmental conditions will be a search of literature and records to determine the gaps in existing information that will have to be filled by undertaking field or laboratory studies. There is much of this material in the various departments of educational institutitutions of the states that have a vital interest in the investigation. State Geological Surveys; Agriculture, Forestry and Conservation Departments, and State Universities and Colleges have collected much data over the years that will be of value. Since organization of this material will be required in any program of investigation the field studies could be started possibly a year earlier if the state departments involved would search out and organize the information contained in their respective files, so that it will be available to the group undertaking the investigation.

Resolution No. 1. To inform the Gulf States Marine Fisheries Commission of the need for an environmental study.

Whereas, the Gulf of Mexico and associated marshlands produce in abundance fish and wildlife extensively harvested commercially and for sport; and

Whereas, the harvest of these forms is of importance to both the local and national economy; and

Whereas, industrial and residential development and engineering works in the interest of navigation, flood control, and irrigation are making extensive changes in the Gulf Coastal area; and

Whereas, the effect of these changes on fish and wildlife resources is largely unknown; and

Whereas, recommendations for measures to maintain fish and wildlife resources must be based on a thorough understanding of the physical, chemical and biological factors that sustain these resources;

Now Therefore:

The Gulf States Marine Fisheries Commission is advised of the pressing need for an environmental study of the Gulf of Mexico and associated land masses.

(Gunter #4)

Resolution No. 2. Recommending appointment of a committee to assay the problem and formulate a plan for the required study.

Whereas, the success of an environmental study will require formulation of a sound plan of action; and

Whereas, such a study will involve several highly specialized sciences; and

Whereas, formulation of a plan of action will require extensive consultation with several agencies and organizations in differest localities;

Now Therefore:

It is recommended that the Commission appoint a committee to assay the problems and formulate a plan for the required study.

Resolution No. 3. Recommending a survey of State material by State agencies.

Whereas, the study of environmental conditions will require the review of existing records and past studies; and

Whereas, there is much of this data in the files of State Agencies

Now Therefore:

It is recommended that the Commission request a review of State material by State agencies as a part of the study to be undertaken.

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Clearwater, Florida
Fort Harrison Hotel
April 10-11, 1958

PROGRESS REPORT ON THE MISSISSIPPI RIVER - GULF OUTLET PROJECT

Roy Wood, Regional Supervisor
Branch of River Basins, Region 4
Bureau of Sport Fisheries and Wildlife
U. S. Fish and Wildlife Service

Mr. Chairman, members of the Commission, and ladies and gentlemen. The progress of our studies on the Mississippi River-Gulf Outlet project involves both fundamental biology and a bit of interdepartmental diplomacy. The work of the Branch of River Basins originated strictly with inland water investigations. Today, we are involved wherever and whenever there is a Federal water-resource development which may influence fish and wildlife resources. Therefore, we have on our staff men who are not only specialized in freshwater fisheries, but men who are specialized in estuarine problems as well.

Our job is to report on the progress of our investigations of the Mississippi River-Gulf Outlet, a project authorized several years ago by the Congress and only recently initiated. Fundamentally, this project consists of a channel 500 feet wide and 36 feet deep from New Orleans to the Gulf of Mexico, a distance of about 70 miles. In effect, this canal will be a major geological disturbance. Influences exerted by the construction of the canal and its maintenance therefore are expected to be intense and widespread.

Our surveys thus far have been of a preliminary nature. They have been conducted as the basis for determining if detailed studies are warranted and, if so, to collect information on which to prepare detailed work plans. It would be very nice indeed if we could report at this time that our work is complete, that we know what the effects of this project will be, and are prepared to recommend exactly what should be done to protect fish and wildlife resources. But we cannot. We are prepared, however, to advise and to suggest a plan of action.

For it is the job of River Basins to plan and to bring about coordinated effort between research and management. We must provide the link between the scientists who are conducting research and industry which is reaping the harvest. Without such a link, the efforts of either one are handicapped.

There must be a coordinated approach to all problems, whereby research and management may be brought together in an effective team. We are pleased to be that vehicle. Our progress may appear slow and sometimes a bit incorrect. Nothwithstanding, our surveys on this project have advanced to where we have completed our interim report and are prepared to coordinate it with interested agencies. I have rough draft copies with me, which I shall be

pleased to review with anyone interested. We must have the benefit of the best thinking available before we complete and release our findings and recommendations.

We have also prepared a detailed work plan which, after intradepartmental coordination, we shall be very happy to make available to the Commission. And, if the Commission so pleases, it can refer this work plan to a committee in order that we can receive the best advice as to future action.

I would like to review the status of the Mississippi-Gulf Outlet, and I invite Mr. Harold Blakey of the office of the Chief of Engineers to correct me on any point which I may have misinterpreted. The first segment of the project, which extends from the inner harbor canal to Paris Road, lies within the industrial section of New Orleans. This project segment is under construction. Some $625,000 has been appropriated for this work. Provision has been made to lagoon the spoil to be hydraulically dredged. Particular consideration is being given to preventing the spoil from finding its way southward into the valuable wildlife marshes south of Lake Borgne. The Corps is doing the best it can to protect these marshes from spoil dispersion, and we are pleased.

The next segment of the canal will extend through the marshes of Lake Borgne in a southeasterly direction to Chandeleur Sound. These marshes are some of the most valuable fish and wildlife habitat in the general vicinity. They provide excellent waterfowl shooting, and represent excellent muskrat marsh. Due to their proximity to New Orleans and easy access, they are particularly valuable for hunting purposes. We are, therefore, greatly concerned with respect to project alignment, inasmuch as it will cut through the middle of these marshes.

The next segment of work will be that part of the channel through Chandeleur Sound and Chandeleur Islands into the Gulf of Mexico. The waters of the Sound are of great importance for oysters, shrimp, and a variety of fin fishes. While the harvest of these resources is of considerable importance within the area itself, its chief value lies in its contribution to the overall resource as a nursery ground. We do not know the full extent of the contribution made by the waters of the Sound to the overall resource. We do know, however, that many of the offshore fisheries are dependent upon the waters of the Sound, as well as the open seas.

Therefore, we have proposed a study which will not be confined to the area to be occupied by the canal and the spoil excavated. We shall consider the effects of the project to include all of Chandeleur Sound, Lake Borgne, and associated marshes.

In this you may or may not concur. I remember when we first discussed our views with the Corps of Engineers regarding the possible impact of this project. Members of the Corps of Engineers assumed that inasmuch as it was a sea-level canal, we would be concerned only with the area immediately affected by channel excavation. It was natural that they should assume that because the channel would be constructed at sea level, it would not result in drainage; moreover, since it would not serve as a distributary of the

Mississippi River, no additional fresh water would be discharged into the marshes or the Sound. Assurance was given that provision would be made for handling the spoil to protect fish and wildlife resources insofar as feasible.

Our tentative findings, however, suggest that the influence may be widespread and of a permanent nature. We have made certain comparisons with other areas influenced by channel excavation. We have reviewed the effects of the Intracoastal Waterway, for example, on Lake Calcasieu. This excavation caused a very turbid condition, resulting from initial excavation and subsequent maintenance work. Because the sediments of Chandeleur Sound are very fine and intermixed with much organic debris, it is quite possible that they could be easily suspended and maintained in that state by wind and wave action and by project maintenance. The effects of increased turbidity and sedimentation may smother and otherwise depress production of basic food organisms and, consequently, the overall production of economically important fishery resources.

We also are greatly concerned with respect to the possible influence of the retaining dikes. These dikes will be constructed on either side, or possibly one side, of the canal traversing Chandeleur Sound. We are apprehensive that these dikes will strongly influence the general circulation of water and salinities in the area under consideration.

Thus, we believe that this project may exert influence over a wide area and jeopardize the future of fishery resources, as well as the people who are dependent upon them for their livelihood. We have not limited our proposed studies to an investigation which would be the basis for opinions only. Pursuant to the recommendations of the Commission, the Bureau of Commercial Fisheries, and other agencies represented here today, we have attempted to prepare a work plan which will be comprehensive in scope and intensive as to detail. We hope that by such an approach these studies will not only serve our immediate objective, but will yield basic information for the comprehensive environmental studies which Dr. Gunter and Dr. Tester have just described.

Studies of the Mississippi River-Gulf Outlet project must be a cooperative undertaking. There are too few biologists and too big a job for duplication of effort. We have not discerned individual responsibilities. Our work plan only defines the work to be accomplished and provides an outline of the job. Through further coordination, we hope to establish responsibilities, negotiate funds, and secure the necessary personnel. In preparing this plan, we sought the advice and suggestions of many. For example, Mr. Jack Watson, representing the St. Petersburg office, Bureau of Commercial Fisheries, helped our men to determine information needed. Mr. Ford, Dr. Lyle St.Amant, and others of the Louisiana Wild Life and Fisheries Commission also contributed. We are well aware of the need for the best talent available in establishing a foundation for this program.

The following is offered as a concluding remark. Back in 1928, Mr. Percy Viosca, who is with us today, expressed alarm with respect to the rapidly diminishing wetlands in the lower Mississippi Valley. He observed that drainage, flood control, and other related works were destroying lakes and

overflow areas essential to the production of valuable fishery resources. Even then, he recognized that there was an excessive production of cotton and other agricultural commodities. Therefore, he recommended that some of these areas which were being utilized to produce these surplus commodities be devoted to the production of fishery resources for which there was a greater demand.

In 1928, there was no Gulf States Marine Fisheries Commission, no Branch of River Basins, and the U. S. Fish and Wildlife Service and the State game and fish departments were not geared for action on this type of problem.

Today we are confronted with a similar problem, except now it has become even more serious. We have an even greater surplus of agricultural commodities. On the other hand, the supply of oysters, shrimp, and many other valuable seafoods has become increasingly scarce.

Therefore, I appeal for approval of our work plan, following full coordination with everyone concerned. We shall then diligently strive to achieve a mutual objective through united and concerted action.

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Clearwater, Florida
Fort Harrison Hotel
April 10-11, 1958

A PROSPECTUS FOR RESEARCH ON THE ESTUARINE ENVIRONMENT

Albert L. Tester, Chief
Division of Biological Research
Bureau of Commercial Fisheries
U. S. Fish and Wildlife Service

The number and magnitude of man-made changes in the estuaries, sloughs, marshes, lagoons, and swamps that fringe most of our south Atlantic and Gulf Coasts have been increasing steadily to meet the needs of our growing population and industry.

These areas provide an essential and unique habitat for important game, sport fish, commercial fish and shellfish resources. They provide wintering grounds and food for ducks and other waterfowl; they provide forage and cover for wild furbearers such as muskrat, mink, raccoons, and nutria. They comprise the nursery ground for many kinds of fish and shellfish; they are the spawning grounds for some, the feeding grounds for others. Commercial or sport fish, such as menhaden, shad, striped bass, croakers, weakfish, and tarpon are reared there during their early stages. Shrimp, cysters, and clams which support important fisheries spend at least part of their lives in this inshore environment. The continued existence of these game, fish, and shellfish resources depends on it.

Many of the estuarine changes have been relatively small dredging and filling operations. Considered one by one they are minor, but combined, they are affecting in some degree a very large part of our coastal waters. These minor projects have been authorized because they would not interfere with navigation. Little thought has been given to their possible effect on our natural resources.

In connection with some of the larger projects financed with Federal funds, surveys have been approved to ascertain how fish and wildlife might be affected. The surveys have been linked directly to particular development projects and usually have been authorized simultaneously with them. However, there has seldom been sufficient time for comprehensive surveys which would itemize with certainty the potential damage to fish and game, and show how such damage could be minimized or avoided entirely. There is emphatic need for a broad research program to provide a fund of basic knowledge for this purpose. Information is needed on the reaction of shellfish, fin-fish, migratory waterfowl, and marsh-dwelling game and furbearers to changes in salinity, temperatures, sedimentation, and pollution. Information is needed also on the effect of changes in depth, currents, and shore line on these organisms. Important but unknown now is the effect of changes in size of outlets to the sea on those fish and shellfish that spend a part of their lives far off shore but come to the estuaries to spawn or feed.

(Tester #2)

To assemble the information needed to manage our estuarine-dependent species, a new approach is recommended, namely, to formulate and conduct an intensive fundamental research program aimed at determining the complex biotic changes that accompany physical modification of the estuarine environment. This program must be undertaken in its own right, separate and independent of any planned or approved development project. It must be a coordinated and cooperative effort between Federal and State agencies with a sound research program, a well-defined organization, suitable research facilities, and, of course, adequate funds and personnel to do the job.

RESEARCH PROGRAM

The following general program is proposed:

Ecology

(a) General studies of typical estuarine habitats contrasting those in their natural state with those modified by development projects, the study to include hydrography, bottom fauna, plankton, flora, vertebrate and invertebrate fauna with respect to species composition and abundance, interrelationships, and food chains; and with particular reference to important commercial and sport fisheries and wildlife.

(b) Special studies of a typical estuarine habitat in its virgin state and after modification by various simulated development projects, such as, dredging, obstructions, cut-offs, etc., the study to include hydrography, bottom fauna, plankton, vertebrate and invertebrate fauna, but with particular reference to the ecological changes which are induced.

Response to Environmental Variables

(a) Investigations of the response of fish, shellfish, crustaceans, and other forms, including such larval, juvenile, and adult animals as frequent the estuaries, to variations in current, light, salinity, turbidity, silting, temperature, pH, etc.

(b) Investigations of the optimal values of, and tolerance of these organisms to the environmental variables listed above.

(c) Investigations of environmental factors influencing growth and survival, including the variables listed above and others, such as, substrate, cover, etc.

Inshore Oceanography

(a) Studies of the physical and chemical oceanography of inshore coastal areas to determine the nature and dispersion of estuarine run-off, the distribution of nutrients, and the nature of tidal exchange.

(Tester #3)

(b) Studies of the biological oceanography of inshore coastal areas, including the abundance and distribution of plankton, forage organisms, and fish, shellfish, and crustacean larvae and adults to determine the nature and extent of estuarine influence on our inshore fisheries.

Life History Studies

Special studies of the life history of commercial and sport species to establish those which are dependent on the estuarine environment, the extent of such dependence, and their present and potential contribution to the fisheries.

Effect of Estuarine Changes on Waterfowl and Fur Animals

Studies of the distribution and abundance, behavior, food, etc., of waterfowl and fur animals in typical marshland and estuarine habitats as contrasted with those modified by development projects. The results of related ecological studies would be available for use in reference to waterfowl and fur animal work. Special ecological studies will be undertaken when the need arises.

ORGANIZAGION

The estuarine program will be a cooperative effort with the two Bureaus of the Fish and Wildlife Service and affected States sharing in the work. To insure coordination of effort, there will be established a technical Coordinating Committee. Its membership will consist of two officers of each of the Bureaus of the Fish and Wildlife Service and two technical members from each State in which operations are being carried out. State members shall be ex officio on the Committee when it is considering projects of primary concern to another State. The Committee shall be responsible for planning and reviewing the program from year to year, maintaining free exchange of data and fostering the publication and dissemination of results. It will have the specific duty of insuring the utmost cooperation in planning and execution of the respective programs, and to search for and recommend such steps as may be required to avoid duplication of effort by the respective agencies.

Interstate agencies, such as the Gulf States Marine Fisheries Commission and the South Eastern Association of Game and Fish Commissioners, will be consulted for advice and assistance by the Coordinating Committee. The Committee will welcome the opportunity of presenting program plans and research results to the interstate agencies periodically for their critical review and recommendation.

Although the program will be closely coordinated by the Committee, in general, the research will be conducted by each of the separate Bureaus and State agencies, with line responsibilities following established agency organization plans.

(Tester #4)

The Bureau of Commercial Fisheries will be responsible for the basic research in each of its several spheres of interest, including ecology, tolerance and response studies, and inshore oceanography, and will conduct specialized research as needed to supply information concerning the commercial fisheries.

The Bureau of Sport Fisheries and Wildlife will conduct such specialized research in sport fisheries as may be required in the protection of the sport fisheries; however, the basic research conducted by the Bureau of Commercial Fisheries will have general application for all fisheries. Therefore, the Bureau of Sport Fisheries and Wildlife will generally restrict its fisheries investigations to geographic areas in which the Bureau of Commercial Fisheries does not have an investigation underway, or when pursuing a special research objective in a common area will confine its efforts to studies of problems not under study by the Bureau of Commercial Fisheries.

The respective States will share the responsibility for the research to be undertaken and, within the limits of their resources, will carry out such special studies as may be deemed mutually desirable.

RESEARCH FACILITIES

A U. S. Fish and Wildlife Service Research Headquarters will be established close to a typical estuarine environment, possibly on the campus of a university, college, or research institute. It will serve the needs of both Bureaus as to office and dry laboratory facilities.

Field stations will be established within the estuarine environment as required. There may be need for mobile or floating field units. Experimental tank and pond facilities at established Federal or State laboratories will be utilized for tolerance and response studies.

Headquarters should be located in the Gulf area, perhaps close to the Mississippi delta. Later it might be desirable to establish research centers or field stations along the Atlantic coast.

FUNDS AND PERSONNEL

Planning has proceeded to the point where a tentative budget has been established. This provides for establishment of the headquarters and field stations, for supplies, permanent equipment, operating expenses and, of course, for personnel. Although it is difficult to specify the exact amounts required until a firm program has been established, we estimate that expenditures at an annual rate of about $800,000 will be required.

Although at present experienced scientists are in short supply, we believe that a staff nucleus can be assembled as soon as funds became available and that staffing can be completed within a year. To achieve a well-rounded program utilizing the team approach, specialists in fields such as hydrography, chemistry, invertebrate zoology, algalogy, protozoology, and physiology will be needed in addition to wildlife and fishery biologists.

(Tester #5)

GENERAL

It is important that the Coordinating Committee be formed immediately in order that some very fundamental stock-taking may be started. Historical documentation is primarily a job for the States, and it is an important one. What was the natural condition of the estuarine waters, what did they produce, how have they been changed, and what do they produce now? The local knowledge of State Conservation agents and the files of the Commissions will provide answers to some of these questions. Others can be obtained by interviews. An inventory of the status of our estuarine waters obtained in this way will be invaluable to both the Committee and the research teams.

Only by advance planning and advance research will it be possible to protect the estuarine-dependent fish, shellfish, and wildlife resources from the extensive water uses presently planned and contemplated for the Gulf and South Atlantic area. This plan is designed for that purpose.

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Clearwater, Florida
Fort Harrison Hotel
April 10-11, 1958

MEETING THE NEED FOR FISHERIES
VOCATIONAL TRAINING IN THE GULF STATES

Charles W. Bevis, Executive Secretary
Southeastern Fisheries Association

I had the privilege of meeting with and speaking to the Southern Regional Supervisors of Trade and Industrial Education during their annual meeting in Tampa, Florida, March 4. My subject was "The Necessity of Training for the Fishery Industry". All of the southern states were well represented and I found a great deal of interest in fishery education.

During this meeting we briefly discussed the need for vocational training in fisheries and some of the problems that we must overcome in order to organize and conduct such a program. I am sure that you are aware of the need, so I will not go into that phase of the work. I would though, like to discuss briefly with you, some of the problems that have been pointed out.

1. Scheduling and interest.
2. Geographical variations
3. Specie variations.
4. Different types of vessels
5. Hardships of occupation
6. Difference in gear used.
7. Growth and development of South
8. Lack of enumeration.
9. Lack of appreciation for education and training
10. Shortage of qualified instructors.

These problems are not necessarily listed according to their importance nor do they begin to adequately cover the field.

It has been agreed that fisheries training should be made available in the following fields. Many others could be included.

1. Seamanship
   a. Vessel Handling
   b. Safety at sea, etc.
   c. Artificial restitution, etc.

2. Meteorology
   a. Weather
   b. Weather Maps
   c. Atmosphere
   d. Air Masses and Fronts

3. Engines
   a. Maintenance
   b. Repair
   c. Operation

4. Fishing Gear and Repair
   a. Nets
   b. Gill, Seine, Trawl, Trammel, etc.

5. Processing
   a. Sanitation
   b. Preservation
   c. Butchering
   d. Waste Utilization
   e. Cleaning
   f. Canning

6. Navigation
a. Charts
b. Instruments
c. Dead Reckoning
d. Radio

7. Oceanography
a. Types of Water
b. Tides
c. Currents

8. Handling of Catch
a. Icing
b. Packing
c. Preserving
d. Survival of Catch

9. Radio and Sound Gear
a. Maintenance
b. Repair
C. Operation

10. Cooking Aboard Ship
a. Preparing meat (cutting)
b. Preserving Meat
c. Care of vegetables, etc.

11. Distribution
a. Grocery Clinics
b. Display
c. Marketing Procedures
d. Market, Price, Demand
e. Advertising
f. Management Procedures
g. Restaurants
h. Supervision

12. Freezing
a. Refrigeration

As to meeting the needs for fisheries training in the Gulf states I must say that we have only made a start. Of course, some states are ahead of others and I believe that all are formulating plans that will soon bring much progress.

Texas has just completed the following program. Reports are that this school was very successful even though the number of trainees was disappointing.

FISHERIES VOCATION SCHOOL - CURRICULUM OUTLINE - Sponsored by Texas Shrimp Association.
Notes:
1. As a preface to the course, all students will be taken aboard one of the shrimp trawlers for a few hours. The boat will proceed into the Gulf of Mexico and make several drags.
2. A course in First Aid will be included at some point in the program.
3. Students will have to be seventeen (17) years of age, or over.
4. Students must know how to swim.

INTRODUCTION - Eighteen Hours
A. Purpose of course
   1. Train for apprenticeship
   2. Safety
   3. Increase earning of individual and owners
B. The Fisherman in society
   1. Family life
   2. Religious life
   3. Social-group, individual
   4. Economic--earning capacity, standard of living

5. What the Shrimp Industry means to Brownsville-- Chamber of Commerce.

C. Shrimp--from sea to table
   1. Oral description
   2. Use film "Shrimp Please"

D. What is expected of a fisherman by owner

E. Relationship of captains, crews and owners
   1. Captain-owner
   2. Crew-members-Captain
   3. Crew statement
      a. Shares
      b. Expenses
         1. Groceries
         2. Ice
         3. Fuel
         4. Nets
         5. Maintenance
            a. Owner
            b. Crew

F. Associations
   1. Why we have associations
      a. Exchange of ideas: new trends
      b. Common interests
         1. Legislative
         2. Economics
         3. Social
   2. Brownsville Shrimp Producers Association
   3. Rio Grande Shrimpers Association
   4. Texas Shrimp Association
   5. Shrimp Association of the Americas
   6. Southeastern Fisheries Association
   7. National Shrimp Congress
   8. National Fisheries Institute

G. Description of Shrimp-boat
   1. Description of Hull
      a. Bow
      b. Wheel-house
      c. Galley
         1. Fresh Water tank
         2. Butane
   2. Sleeping Quarters
   3. Engine room
      a. Equipment
      b. Fuel tanks
      c. Auxiliary engines
      d. Pumps
      e. Switchboards
      f. Valves - pump, fuel
      g. Power take-off
      h. Line shafts
   4. Winch
   5. Mast, outrigger, boom
   6. Cables, doors and nets
   7. Icebox

(Bevis #4)

H. Hull maintenance - Insurance Adjuster
    1. Fire prevention
I. Safety at Sea and First Aid
J. Coast Guard Procedures
K. International Situation
    1. Past, present, future

II NAVIGATION -- Forty-five Hours
A. Rules of the road
B. Compass
C. Celestial guides
D. Local coastal guides -- Louisiana to Campache
E. Tides -- Louisiana to Campache
F. Dead Reckoning
Recommends increasing to sixty hours.

III RADIO, DEPTH RECORDER -- Six Hours
A. Radio
    1. Purpose of radio -- safety and work
    2. FCC regulations
    3. Procedure
        a. Operation
        b. Log
    4. Minor adjustments
        a. Changing tubes--change nunber for number only
        b. Fuses
    5. Care of radio
        a. Keep dry
        b. Keep voltage from generator 37 volts or less
B. Depth Recorder
    1. Purpose
    2. Procedure of operation
    3. Reading results
    4. Care of
        a. Tubes
        b. Adjust stylus

IV MECHANICS -- Fifty Hours
A. Principle of the Diesel Engine
    1. Definition of Diesel
    2. Pressure--Temperature Relation
    3. Cycle Phase
B. Types
    1. Types of Diesel Engines
    2. Four-cycle engine
    3. Two-cycle engine
    4. Diesel-cycle
C. Engine details
    1. Fuel systems
    2. Mechanical--Injection system
    3. Mechanical--Injection values
    4. Fuel Injections

(Bevis #5)

D. Engine Accessories
   1. Cooling system
   2. Fresh water cooling
   3. Sea-water cooling
   4. Lubricating the engine
E. Power Take-Off's
   1. Purpose
   2. Types
F. Reverse and Reduction Gears
   1. Mechanial
   2. Hydraulic
G. Propeller and shafting
   1. Shafting and Couplings
   2. Bearings
   3. Propeller
   4. Stern gland and Cutlass Bearing
H. Auxiliary Machinery
   1. Auxiliary engines
   2. Generator
   3. Pumps
I. Engine Room Piping
   1. Seawater and Bilge system
   2. Fuel
J. Steering Gears
   1. Types of steering
   2. Auto-pilots
K. Deck Hoisters
   1. Types
   2. Operations
L. Electrical Systems
   1. Generators
   2. Storage batteries
   3. Current controls
   4. Lighting

V. BIOLOGY, SANITATION -- Ten Hours
A. Emphasis on types of shrimp and where found
   1. White shrimp
      a. Types of bottoms
      b. General localities
      c. Conditions condusive to breeding
      d. Causes of production falling off
   2. Pink Shrimp
      a. Types of bottoms
      b. General localities
      c. Conditions conducive to breeding
   3. Brown Shrimp
      a. Types of bottoms
      b. General localities
      c. Conditions conducive to breeding

B. Conservation
   1. Need for
   2. Reason
   3. Ways accomplished
C. Sanitation. How to care for shrimp
   1. Heading
      a. Reason
      b. Proper method
   2. Washing
      a. Reason
      b. Method
   3. Icing
      a. Reason
      b. Method
      c. Turning shrimp, or re-icing

VI FISHING GEAR -- Seventy-five Hours
A. Blocks
   1. Description and use
   2. Rigging blocks
      a. Single
      b. Double
      c. Triple
      d. Triple and Double
      e. Double and single
B. Knots
   1. Square
   2. Bowline
   3. Half-hitch
   4. Figure eight
C. Splicing rope
D. Miscellaneous equipment
E. Operation of:
   1. Try-net
   2. Board and nets and cables
F. Nets
   1. Parts of nets
   2. How work
   3. Filling needle
   4. Mending
   5. Sewing bag
   6. Sewing rings
   7. Putting chafing gear
   8. Care
      a. Washing
      b. Drying

Louisiana has made a great deal of progress in fishing education. The organization of state and local advisory committees composed of representatives from the industry, marine biologists, state representatives and trade associations has proven to be the proper manner in which to begin such a training program. These advisory committees can be of great assistance to the educational systems and in fact can set the pace of progress as well as determine the scope of a training program. The following course is outlined for Louisiana.

(Bevis #7)

A COURSE IN SMALL CRAFT OPERATION AND NAVIGATION FOR THE LOUISIANA FISHERIES INDUSTRIES IN THE GULF OF MEXICO

PURPOSE: This is a three part course designed to introduce the fisherman and other small craft seamen to the modern and traditional methods of navigation and seamanship, and to present the laws and regulations governing inland and ocean traffic that are of concern to the small craft sailor.

METHODS: Lectures, study, visual aids, and practice designed to present the subject to the small craft sailor with average intellectual ability; special consideration intended for the seaman otherwise capable, but lacks the former education.

LIMITATIONS: It is recognized that a fisherman's time at home is not regularly scheduled, therefore, this course must be individually presented to suit the time the fisherman has available for attending classes. This course will be limited to the presentation of basic navigation techniques with the expectation of building an advanced program that will extend through Clestial and Electronic Navigation.

PRIMARY COURSE OUTLINED

I. INTRODUCTION AND ORIENTATION
   - A. Purpose of Course
   - B. Scope of Primary Course

II. CLASSIFICATION OF VESSELS
   - A. Ship Classes and Types
   - B. Motor Boat Classes
     1. Motor boat act
     2. Registration
     3. Documentation
     4. Coast Guard Certification

III. TERMINOLOGY
   - A. Names of the parts of a vessel
   - B. Nautical terms and expressions

IV. LIGHTS AND SAFETY EQUIPMENT
   - A. Lights and equipment required by law
     1. Class A
     2. Class I
     3. Class II
     4. Class III
     5. Trawlers
   - B. Equipment recommended but not required
     1. Safety equipment
     2. Navigation equipment
     3. Repair parts

V. RULES OF THE ROAD
   - A. Right of Way
   - B. Whistle Signals

VI. INLAND NAVIGATION (FUNDAMENTAL PILOTING)
   - A. Buoys, Beacons, Ranges, and Daymarkers
     1. Types
     2. Colors
     3. Shapes
     4. Location
   - B. Intracoastal Charts
     1. Meaning of symbols
     2. Use in navigation
        - a. Measuring distances
        - b. Timing run between points
        - c. Establishing position

(Bevis #8)

VII. COASTAL NAVIGATION (PILOTING (PILOTING CONT'D)

A. Coastal Aids to Navigation
   1. Lighthouses
   2. Lightships
   3. Government publications
   4. Coastal charts
      a. Symbols
      b. Soundings and fathom curves
      c. Latitude
      d. Longitude

B. Marine Compass
   1. History
   2. Construction
   3. Installation
   4. Use
      a. Steering course
      b. Taking bearings
   5. Error
      a. Variation
      b. Deviation
      c. Applying error to course
      d. Applying error to bearing

C. Sounding Lead
   1. Construction and marking
   2. Taking soundings

D. Fathometer
   1. Principle
   2. Operation
   3. Value

E. Time and Distance
   1. Clocks and watches
   2. Station WWV
   3. Relation of time, speed and distance

F. Plotting
   1. Tools
   2. Table
   3. Accuracy required

G. Establishing Course and Distance
   1. Compass rose
   2. Paraliel rules
   3. Dividers
   4. Current and drift
   5. Departure

H. Running Course
   1. Course Line
   2. Line of position
   3. Fix
   4. Ranges
   5. Compass bearing
   6. Cross bearing
   7. Advancing bearing line
   8. Bow and beam bearings
   9. Danger bearings
   10. Chain of soundings
   11. Checking course on arrival

(Bevis #9)

VIII. SUMMARY OF PRIMARY COURSE

A. Lights and equipment required on trawlers
B. Equipment recommended for trawlers
C. Rules of the road
   1. Need for observation
   2. The privileged vessel
   3. Speed reduction in harbor
   4. Speed reduction in fog
D. Judgement in seamanship

REFERENCE MATERIAL FOR COURSE IN SMALL CRAFT OPERATION AND NAVIGATION

1. A list of available films on Navigation and Seaman from:
   Mr. John MacKay, Director
   U. S. Coast Guard Auxiliary
   8th Coast Guard District
   U. S. Custom House
   New Orleans, Louisiana
2. Primer of Navigation - By George W. Mixter
   D. Van Nostrand Company, Inc.
   Princeton, New Jersey
3. H. O. Publication # 214 Vol. III
   U. S. Navy Hydrographic Office
   Washington, D.C.
4. Piloting, Seamanship, and Small Boat Handling by Charles F. Chapman
   Motor Boating
   572 Madison Avenue
   New York, New York $ 5.00
5. U. S. Coast and Geodetic Chart #1116-A - "Mississippi River to Galveston"
   U. S. Coast and Goedetic Survey
   315 Custom House
   423 Canal Street
   New Orleans 16, Louisiana
6. Nautical Charts 1116, 1117, 1276, 1278
   b. Map 1116-A
   c. Chart No. 1
   d. Tide tables, East Coast 1958
   e. Training chart 1210 TR
      U. S. Coast and Goedetic Survey
      315 Custom House
      423 Canal Street
      New Orleans, Louisiana
7. a. License Manual for Radio Operation
   b. A. guide for FCC Exam
      Rinehart and Company, Inc
      232 Madison Avenue
      New York 16, New York
8. Fishery Publication Index 1920-54
   Superintendent of Documents
   U. S. Government Printing Office
   Washington 25, D. C.
9. U. S. Coast Guard Auxiliary
   P I C Booklets
   U. S. Coast Guard Auxiliary
   8th C G District
   Room 333 Custom House
   New Orleans, Louisiana

(Bevis # 10)

INTRODUCTION MATERIALS

I. Classroom and Instructor
   A. "Piloting, Seamanship, and Small Boat Handling" by Charles F. Chapman, Motor Boating, 572 Madison Avenue, New York, New York. About $ 5.00
   B. U. S. Coast and Geodetic Chart No. 1116-A, "Mississippi River to Galveston" available at fixed price from Shannon's Hardware Co. Morgan City, Louisiana. $ 1.00.
   C. 1 paid parallel rules - about $ 3.00
   D. 1 paid dividers. About $ 3.00
   E. 1 course protractor. About $ 3.00
   F. Small Black Board - chalk, etc.
   G. Pencil Sharpener

II. Each Student
   A. Copy of "A" above
   B. 1 course protractor

NOTE: This is a basic material requirement. Advanced Piloting, Celestial Navigation, Doran and Radar will require a much more extensive material inventory.

ADDITIONAL MATERIAL

I. Catalogue of C & G S Charts and Table (Free)

II. Light Lists Atlantic & Gulf Coasts - $ 2.25
   Order from: Baker Lyman & Company
   308 Magazine Street
   New Orleans, Louisiana

III. Radio Beacon Chart - Atlantic & Gulf Coasts
   Order from: Commander
   8th Coast Guard District
   Custom House
   New Orleans, Louisiana

IV. Index Catalogue of Nautical Charts & Publications - $ 3.00
   Order from: U. S. Navy Hydrographic Office
   Washington, D.C.

V. The American Nautical Almanic
   Order from: Baker Lyman & Company
   308 Magazine Street
   New Orleans, Louisiana

Other courses being offered in Louisiana are a diesel and marine engine course at Lake Charles for menhaden and a communications course at Morgan City for the shrimp people.

Mississippi has appointed a state coordinator of fishing trades. They are now offering a course for crew captains. They plan extension courses for fishermen and plans are to begin local school type B programs in September. Frankly, I look for big things in Mississippi.

I regret to tell you Alabama has not been too successful with classes for the fishing industry. There is no lack of interest but there has been difficulty in scheduling. Alabama has had a short class in basic navigation and is beginning a class in diesel engine maintenance. There is considerable interest

in classes in boat and net maintenance, seamanship and others. The state is interested in what others are doing and has requested a copy of this report, showing much interest in providing training for the industry.

Florida has conducted a school in Ft. Myers with some degree of success, and reports on plans and progress are good. We now have a class in radio communication and navigation in Miami, a class in small craft gas engine repair and maintenance in Daytona Beach and Jacksonville.

A class in ship to shore marine radio operation and maintenance is beginning this month in Pensacola. In fact there will be a number of these schools established in the near future, in order to assist both commercial and sports fishermen to get their third class marine operators license.

Surveys are underway to determine the needs and interest in Ft. Pierce, St. Augustine, Tampa, Ft. Myers and Panama City. The interest in Florida is presently at its highest level.

In conclusion I would like to say that we have a wonderful opportunity at this time to inaugurate a training program for fisheries. It is sorely needed and if the commission, industry and everyone interested will lend the necessary help to the Departments of Education in Washington, in your state, and in your locality, we will not only be able to get the funds needed for an adequate program but will find ourselves meeting the needs that have been long due the fishing industry.

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Clearwater, Florida
Fort Harrison Hotel
April 10-11, 1958

RESUME OF EXPLORATORY FISHING RESULTS SINCE GSMFC MEETING, OCTOBER 10-11, 1957

Harvey R. Bullis, Jr., Chief
Gulf Fisheries Exploration and Gear Research
Bureau of Commercial Fisheries
Fish and Wildlife Service

Since the Commission's last meeting we have completed installation of equipment in the Pascagoula Fisheries Laboratory and Dedication Ceremonies were held on March 21. The new laboratory building provides offices and laboratory facilities for several branches of the Bureau of Commercial Fisheries. Those branches now housed in the new facilities are Exploratory Fishing, Technology, and Market Development.

Royal Red shrimp explorations off the east coast of Florida by the Combat were completed in November with a follow-up trip in November-December by the Silver Bay. A report on this work is now in draft form and should be published by this summer. The Silver Bay has devoted three cruises to exploratory and experimental trawling for red snapper and grouper in the northern Gulf. Two trips were made along the Texas and Louisiana coasts and one trip in the northeastern Gulf following the recent cold wave. Although we are having fairly good results in developing gear that can work rough bottom there are still some gear problems to be worked on. Several encouraging catches have been made but we have had difficulties in pin-pointing trawlable concentrations. At the present time we are installing two new types of electronic fish locating and bottom delineating instruments which we feel will immeasurably step up the positive results.

From mid-October to mid-December the Oregon carried out preliminary explorations for shrimp along the coasts of the Guianas and Brazil. This area was the last broad expanse of Continental Shelf area left completely unexplored in the western north Atlantic. Only drags of an exploratory nature were tried with no effort at commercial type fishing. A preliminary analysis of the 113 drags made during the trip indicates a potential trawling area of at least 10,000 square miles over most of which are encouraging signs of commercially valuable shrimp. Although this area is too far from United States ports to permit a U.S. based operation, several shrimp boat operators and fleet owners have expressed interest in the area in view of the possibility of running reefer ships back and forth with supplies and catches. There are 7 foreign countries or possessions close enough to the grounds to provide possible bases for such operations and at the present time only one of these is showing interest in self-utilization.

In January, the Oregon started on a project to assess the Gulf potential of non-utilized clupeoid fishes from the standpoints of both food fish and industrial fisheries. To date, and for the next three months the primary objective is to see if we can sample the schools observed on our depth recorder and to develop species identification patterns from recorder tracings which might provide commercial fishermen some measure of species selection. Our principle gear at the present time is a one boat, 40' square mid-water trawl. We will also be using lampara nets of the type Leon Kenney is now using whenever possible.

There is considerable current interest in this work by many of the menhaden producers and other fish meal plant operators as well as by pet food canneries. It is too early to attempt estimates on the availability of any of the species we have caught to date. It is our feeling however that on the basis of past observations and the few samples we have obtained, there may be as many as a dozen or more species of fish present representing a large and virtually untouched resource.

The Fisheries Technology Laboratory
Division of Industrial Research and Services
Bureau of Commercial Fisheries
Pascagoula, Mississippi

Fish and Wildlife Service
U. S. Department of the Interior
March, 1958

The Fisheries Technology Laboratory

The laboratory is housed in a new brick building at the City Docks in Pascagoula, Mississippi. The building is shared with the Gulf Exploratory and Gear Research Section, which operates the M/V's Oregon and Silver Bay, from facilities on the City Dock. This joint operation will be efficient, in that samples for technological study will be readily obtained from these ships. The basic purpose of this laboratory is to assist the Commercial Fishing Industry in solving technical problems in the processing of marine products, in developing new products, and in suggesting new uses for products now in production. To do these things, we may use pure laboratory research, or practical canning and freezing methods, or we may find a solution in reading publications of previous work done at other Technological laboratories. Research and development at this new laboratory is for the aid of the Commercial Fishing Industry in the area of the Gulf of Mexico. Thus, our projects are being laid out on a long-range basis, looking to the future of this area.

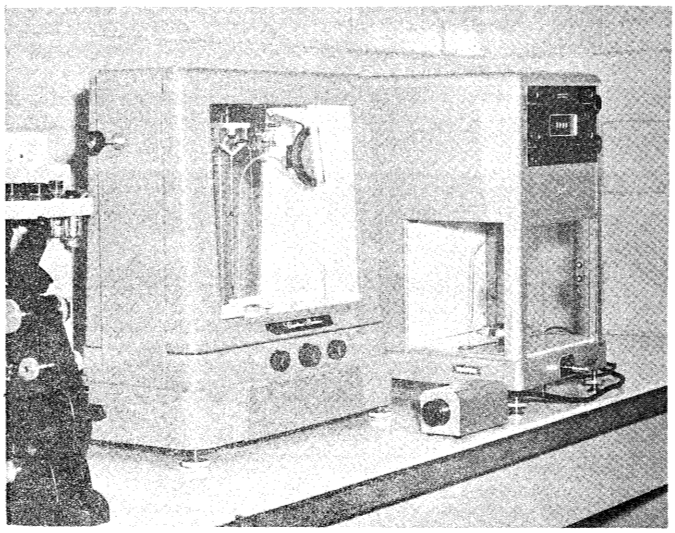
Acid resistant stone sinks and table tops over steel cabinets are used throughout the lab.

It is estimated that a minimum staff of eleven Scientists and seven to twelve Laboratory Aids are needed to operate the new facilities. Considerable expansion above that staff is possible if funds are available. Clerical and Janitorial staffs are operated as a pool, shared with the two other sections of the Fish and Wildlife Service now in the building.

The Physical Plant of the Technology Laboratory

1. A Chemistry laboratory, suitable for a staff of a Project Leader and three Assistant Chemists, and is equipped with many of the most modern instruments for analyses.

2. A delicate Instrument Room houses balances, microscopes, Spectronic colorimeter, and Ph meters on glass-topped tables which have rubber mountings to eliminate vibration and static.



Microscope, Christian Becker Balance, and Towne magnetic balance in the Instrument Room.

3. A Bacteriology laboratory suitable for a staff of a Project Leader and two Bacteriologists.

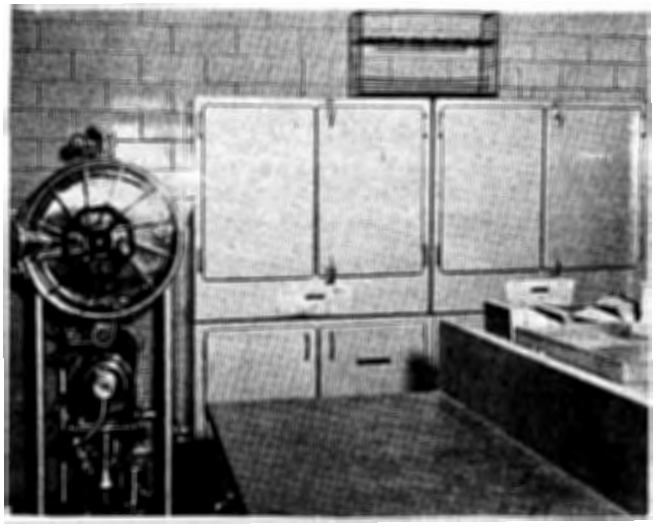
4. A pilot canning plant, complete with vacuum can closing machine, sufficient to efficiently employ a Project Leader Technologist and several assistants.

5. A 5-room experimental freezing plant, complete with stainless steel preparation tables. These five rooms are:

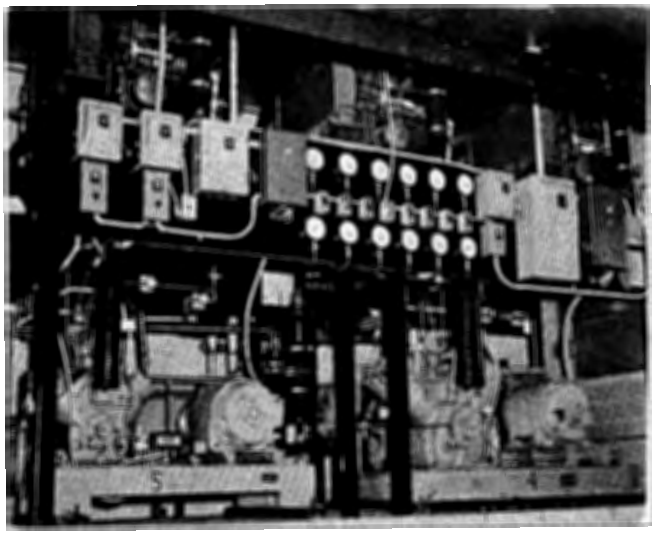
-40°F Blast Freezer
-40°F Plate Freezer
-20°F Storage Room
0°F Storage Room
35°F Controlled Thawing Room

The rooms may also be used to freeze and store specimens brought in by the Oregon and the Silver Bay.

6. Two storerooms with steel shelving house chemicals, glassware, and canning plant equipment.



Automatic Sterilizer and Electric Incubators in Bacteriology Laboratory are used in the study of frozen and canned seafoods.



Bank of five compressors and motors used to operate the 5-room freezer plant.

Chem. Stores		Shower Locker
Tech. Prep.		Bacteriology Lab
Taste Panel		
Kitchen		Instruments
Office		Chemistry Lab
Office		
Dark Room		Office of Lab Chief

Diagrammatic Scheme of Tech. Lab.

The Planned Research Program

The Research Program is in the planning stage, and suggestions from members of the Gulf of Mexico fishing industry are requested. We hope to begin receiving visits and suggestions from the industry immediately for future work. Since we are a government agency, we must confine our research to industry-wide problems, and not apply our efforts in a field where the private consultants operate. Planned projects must cover a large segment of the industry, in order that our expended funds give the widest return. The program can be divided into five major projects.

1. The Canning of Seafood

The scarcity and high prices of shrimp and oysters for canning have caused a need for other products to be developed for canning. Among the many suggestions for specific projects in the pilot canning plant are:

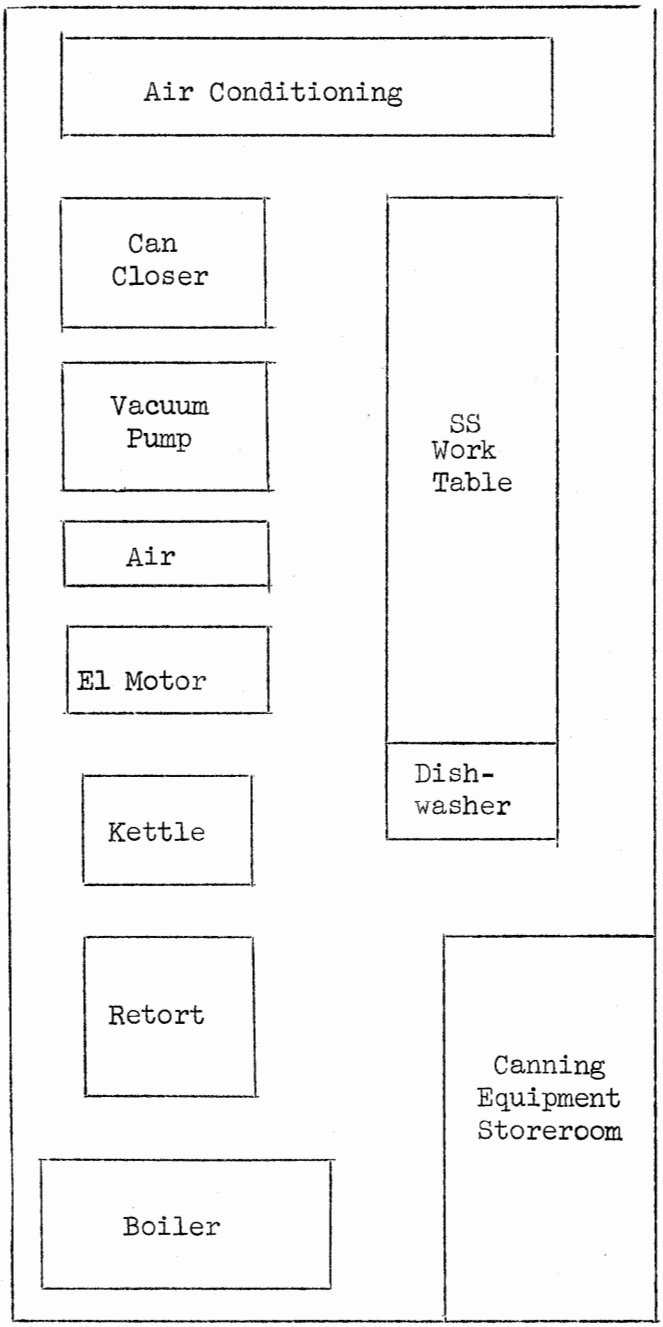
(a) Development of a canned product from the stocks of Gulf anchovies and sardine-like fishes - Preliminary work on this project has begun, and a small pilot canning operation has resulted in an Anchovy in tomato sauce and Anchovy in mustard sauce, which have good possibilities. Taste panel acceptance on the few cans packed was good.

(b) Development of a product from the large stocks of Gulf mullet - A pilot plant canning operation on mullet already has produced a product in tomato chili sauce, which has an appealing taste and appearance.

(c) Greater utilization of trash fish for animal food - This does not necessarily need to be a canned product. However, the laboratory work would be done by those technologists in the canning plant.

(d) Studies on canned prepared cooked foods, i.e., shrimp creole and gumbo, so as to obtain for the processor a higher price per pound for the basic raw materials.

(e) Additional studies on canning of tuna, especially on utilization of the trimmed-off dark meat. Attempts have been made to prepare cooked canned foods from this highly edible portion of tuna. A tuna smoked paste spread has been prepared by a local canner which has good taste appeal.



Pilot Canning Plant

2. The Freezing of Seafoods

The freezing preservation of seafoods has revolutionized the industry. Freezing after preparation and/or cooking offers a possibility of developing new and more appealing products. Work will be done here at Pascagoula, which will enable us to give technical advice to the industry on a wide variety of specie and products. Some of the projects being considered are:

(a) Freezing fish fillets and portions from most Gulf specie. These can be breaded raw or cooked.

(b) Freezing precooked prepared seafoods, such as gumbo and casserole dishes.

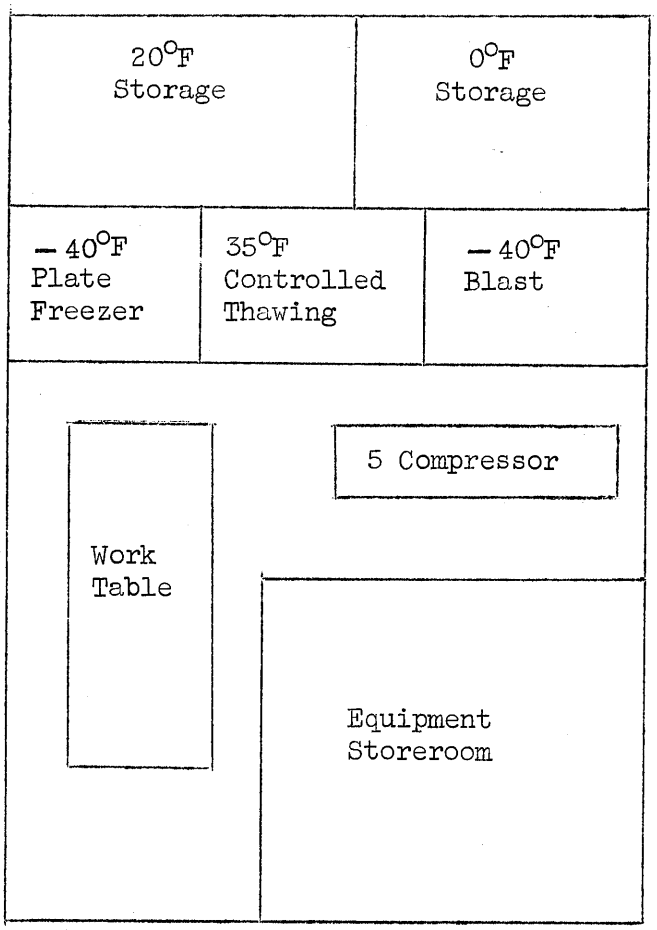
(c) Studies on freezing raw oysters with attention to storage and discoloration.

(d) Studies of the technical aspects of freezing fresh or pasteurized crabmeat.

(e) Studies on freezing raw ready-to-cook shrimp.

3. The Development of Standards of Quality for Fishery Products

Much progress has been made on this Project at other Technology laboratories. It is expected that this Gulf Coast Laboratory will be collaborating in the standards work on a continual basis. Probably not more than 5% of the Technology Project Groups' time will be required for standards work. However, if we are called on to assist the U. S. Department of Agriculture in grading and inspecting under these standards, then a considerable portion of our budget and manhours would go toward this project. We now have equipment and personnel available for grading in lots of frozen raw breaded shrimp. This service will be offered to the Breaded Shrimp Industry, as soon as a few Administrative matters are completed with the USDA.



Pilot Freezer Plant

Selecting fish for freezing experimental studies from the -20°F Storage Room.

4. The Chemistry of Marine Products

Basic Chemical Research has always been necessary in all industries to promote new products and better methods. Basic research is time consuming, and at times it is hard to see any ready value in studies of this type. It is planned that Chemical studies of all species of the Gulf Coast Area will form a major project to continue from day to day over the years. The specific items listed for study are:

(a) The composition of food fish of the Gulf - This will include fat, protein, carbohydrate, ash, and moisture at the present. The scope of the project will be broadened later to include trace elements, sodium, and some enzyme determination.

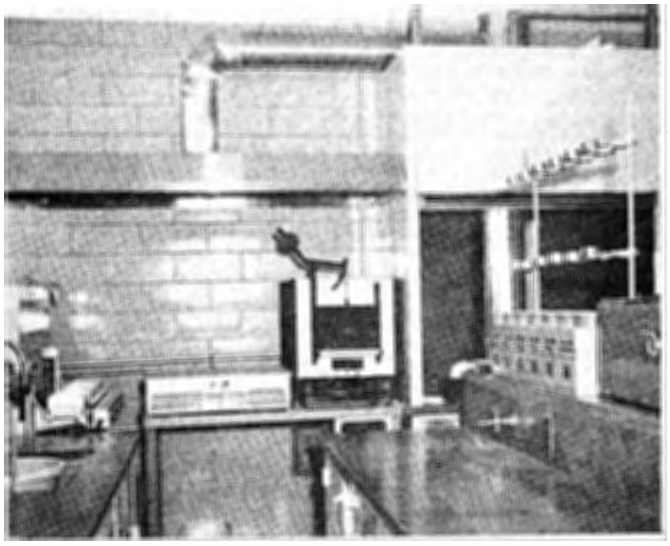
(b) The composition of oysters - Studies have been initiated at the College Park Fisheries Technology Laboratory, and by contract at two universities, to determine the chemical composition of oysters, with special attention to seasonal variations in water and solids content. Situated as we are near the center of the Gulf oyster industry, it is planned that we could efficiently do a large portion of the work at Pascagoula. This project must continue over several seasons, so as to enable us to gather data on rainy and dry seasons, and show the widest possible variations. Considerable travel will be involved and the project costs will be high.

(c) Chemistry of Industrial Fisheries - There is a large menhaden meal-and-oil industry in the immediate vicinity of the Pascagoula laboratory. With the building up of the Chemistry staff, this will probably become one of the major projects of the laboratory. Since the industry is now undergoing a transformation from non-refrigerated to refrigerated boats, one phase of the studies could be the relative value of the oils and

Analyst operating Carl Fisher Electronic Titrimeter for moisture content in fish meals. Recco electric DeSalter shown at right in lower picture.

meals produced under these two conditions. Samples could be secured at the plants and boats and transported to the laboratory in a matter of minutes. Only minor work can be done on this project during Fiscal 1959, due to our staff shortage; however, it is planned to increase the work greatly the following year.

The scope of this project can be broadened to include other industrial products, such as shrimp and crab meals, and utilization of residues from filleting operations.



Electric muffle furnace and Fume Hood used in Analyses of meal and oils of the Menhaden Industry.

(d) Decomposition Identification by Chemical Methods - For years arguments have raged over organoleptic identification of traces of decomposition in fishery products. Organoleptic analyses, using the senses of touch, smell, taste, and sight of individuals are subject to wide variations, even in the same individuals from day to day. Since aging or deterioration of fisheries products results in chemical changes, studies should be made to identify those chemical changes. With a good chemical method for judging processed seafood, we could largely obviate the human errors.

5. Direct Services to Industry

One of the major projects of all five Technological laboratories is the providing of technical advice and information to the industry. This may take the form of:

(a) Answers to written questions from the industry on technical matters
(b) Visits to industries to stimulate new products and new methods
(c) Experimental work in a plant to help solve industry-wide problems
(d) Distribution of printed matter from other Technology laboratories or other sections of the Fish and Wildlife Service.

Spectronic Colorimeter, Ph meter, and Potentiometer used in Analyses of Fish eries Products.

6. The Bacteriology of Fishery Products

The Bacteriology of fisheries products will be a major controlling factor in the production and marketing of the new convenience foods. Shelf life and flavor are related directly to the bacterial flora and enzyme content of the processed foods. In this hot humid climate, in-plant sanitation practices may make or break consumer acceptance of a product due to this fact. Food Technologists and Bacteriologists must work together on this project in the production and storage of processed seafoods. This project would follow these lines:

(a) The Bacterial and Enzymatic content of seafoods, as related to taste panel acceptance.

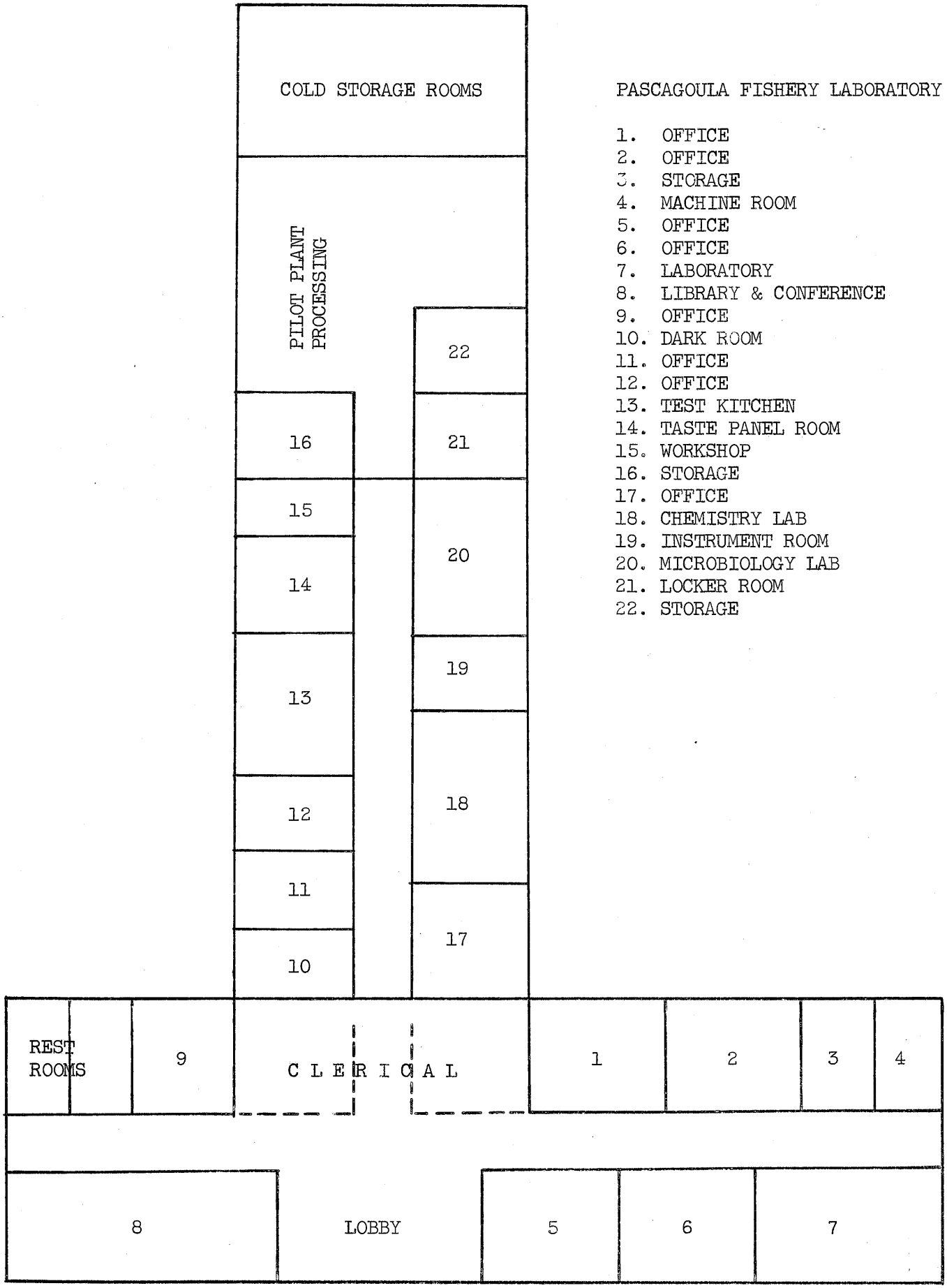
(b) Storage life of frozen seafoods, based on the number and types of bacteria present.

(c) Bacteriological analysis as a control on plant sanitation. This project could employ standard methods of APHA, to advise plants the status of their sanitation controls which, of course, would indicate the number of bacteria expected in the finished product.

SUMMARY

This outlined long-range program for the Gulf of Mexico area laboratory is one of product development and sanitation studies in the early portion. During the later years, technical production matters and more advanced chemical research will be entered upon. It is extremely necessary that all facets of the industry make suggestions and recommendations for research needed as soon as possible. We extend a welcome to visitors and to letters of inquiry at the Pascagoula laboratory.

Final identification of bacteria in seafoods is by microscope at 1000X.



PASCAGOULA FISHERY LABORATORY

1. OFFICE
2. OFFICE
3. STORAGE
4. MACHINE ROOM
5. OFFICE
6. OFFICE
7. LABORATORY
8. LIBRARY & CONFERENCE
9. OFFICE
10. DARK ROOM
11. OFFICE
12. OFFICE
13. TEST KITCHEN
14. TASTE PANEL ROOM
15. WORKSHOP
16. STORAGE
17. OFFICE
18. CHEMISTRY LAB
19. INSTRUMENT ROOM
20. MICROBIOLOGY LAB
21. LOCKER ROOM
22. STORAGE

M I N U T E S

EXECUTIVE SESSION, CLEARWATER, FLORIDA, APRIL 11, 1958

The Commissioners and proxies met for breakfast in the Circus Room of the Fort Harrison Hotel at 8:30 AM. Messrs. A. W. Anderson, Harold L. Blakey, Wayne D. Heydecker, G. Robert Lunz and James N. McConnell attended the breakfast and the session which followed.

Minutes of the Commission's last meeting, Mobile, Alabama, October 10-11, 1957, was approved as mailed to Commissioners November 22 and not read at this session. The financial report rendered is herewith first attached. The Secretary stated the Commission officers and Commissioner Gautier had selected the Buena Vista Hotel, Biloxi, Mississippi, for the October 16-17, 1958 meeting. Due to the great number of conventions held in New Orleans, the Secretary suggested if the spring 1959 meeting was to be held in that city, hotel arrangements should be made early. The Louisiana Delegation decided upon New Orleans as the meeting city and suggested first seeking accommodations at the Monteleone.

Mr. McConnell was asked by Chairman Holmes to read the resolution which resulted from the committee conference of April 10 and having to do with the broad consideration of the estuarine environment. Following discussion and amendments, Commissioner Merrit moved for adoption. Commissioner Gautier seconded. On vote, the resolution was unanimously adopted. Copy is herewith second attached.

Mr. Lee, proxy for Commissioner Southwell, moved that the scientists' recommendations on shrimp, menhaden and other industrial fishes, and oysters as presented at the April 10 General Session be referred to the Fish and Wildlife Service and the Marine Fishery Administrations of the member states, with request that necessary data be expeditiously procurred. Commissioner Clement seconded. On vote, the resolution was unanimously adopted. Copy is herewith third attached.

Commissioner Clement read a resolution which he had passed for study to Commissioners the previous afternoon and which concerned the Commission favoring the use of Saltonstall-Kennedy funds for research in the cultivation of shrimp in completely and in partially controlled ponds and reservoirs. Mr. Harris, proxy for Commissioner Van Antwerp, moved for adoption. Commissioner Gautier seconded. In discussion Mr. A. W. Anderson, answering question by Secretary Gunn, said he thought Saltonstall-Kennedy funds could be used for the purpose of building ponds and reservoirs; such construction not being considered in the same category as the construction of buildings. Commissioner Dodgen questioned if research on shrimp foods and tolerances had progressed to the point of warranting such experimentation. On vote, the resolution was unanimously adopted. Copy is herewith fourth attached.

Commissioner Clement put in motion a resolution for consideration which likewise had been passed to Commissioners the previous afternoon for consideration. This resolution concerns the need for fresh water in Louisiana coastal areas during dry periods to sustain fish and wildlife and requests aid from the Corps of Engineers and the Fish and Wildlife Service, in cooperation with the Louisiana Wild Life and Fisheries Commission, making this possible. Mr. Lee seconded the motion for adoption. Upon vote, the resolution was unanimously adopted. Copy is herewith fifth attached.

A third resolution, which also had been passed to Commissioners Thursday afternoon for their study, was presented by Commissioner Clement. This resolution proposed that the member states institute a closed season on shrimp for the months of May and June in waters of three or more fathoms in depth in effort to increase white shrimp production. States other than Louisiana appeared disinterested in the resolution and Commissioner Clement withdrew the resolution without it being officially voted upon.

The Secretary was requested to write a letter to Miss Mary Schulman wishing her a speedy recovery, and others to Mr. Charles W. Bevis and Mr. Ernest C. Mitts expressing the appreciation of the Commission for the entertainment furnished during the period of the meeting.

With no further business to be conducted, the Chairman adjourned the session at 11:20 AM.

Prepared by: W. Dudley Gunn
Secretary-Treasurer

GULF STATES MARINE FISHERIES COMMISSION

FINANCIAL POSITION
CLOSE OF BUSINESS MARCH 31, 1958

Cash in Bank	$ 7,223.04	
Petty Cash and Stamps	4.35	$ 7,227.39
Checks Outstanding		98.73
Balance		$ 7,128.66

RESOLUTION

WHEREAS, the number and magnitude of man-made changes in the estuaries, sloughs, marshes, lagoons and swamps that fringe our Gulf Coast have been increasing steadily to meet the needs of our growing population and our expanding industry; and

WHEREAS, these changing areas provide an essential and unique habitat for important game, sport and commercial fishes, shellfish, and wild furbearers; and

WHEREAS, there is definite need for a research program to provide a store of basic knowledge concerning the reaction of fin fishes, shellfish, migratory waterfowl, and marsh dwelling game and furbearers to changes in salinity, temperture, sedimentation, pollution, depth, currents and other environmental factors; therefore

BE IT RESOLVED that a new approach be taken to formulate, conduct and provide an intensive fundamental research program aimed at determining the complex biotic changes that accompany physical modification of the estuarine environment; and

BE IT FURTHER RESOLVED that such a program be undertaken separate and independent of any planned or heretofore approved development project and be coordinated as a cooperative effort between Federal and State agencies; and

BE IT FURTHER RESOLVED that in order to insure coordination of effort, there be established a technical coordinating committee composed of two officials of each of the Bureaus of the Fish and Wildlife Service and two members from each State in which operations are being carried out, said committee to be responsible for planning and reviewing the program from year to year, maintaining free exchange of data and fostering the publication and dissemination of the results of its findings, and to make recommendations to each of the said Bureaus of the Fish and Wildlife Service and to the conservation agency of the respective and affected State for such action as may be deemed necessary and expedient; that the two members of the said Bureaus of the Fish and Wildlife Service be appointed by the respective chiefs of such Bureaus and the members from the affected States be appointed by the executive director of the conservation agency or agencies of such State, and that the said committee shall meet forthwith to undertake the determination of its business and to meet at such future times and make such reports as it shall deem proper; and

BE IT FURTHER RESOLVED in the event that any project within a state be in controversy with Federal and State committee members that the controversy be resolved by the committee as a whole.

* * * * * *

The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission at a regular meeting held April 10-11, 1958 at the Fort Harrison Hotel in the City of Clearwater, Florida.

W. D. Gunn

W. D. Gunn, Secretary-Treasurer

RESOLUTION

BE IT RESOLVED by the Gulf States Marine Fisheries Commission that the Fish and Wildlife Service, the Alabama Department of Conservation, the Florida State Board of Conservation, the Louisiana Wild Life and Fisheries Commission, the Mississippi Seafood Commission and the Texas Game and Fish Commission be furnished copies of reports which resulted from the Commission sponsored conference of scientists, February 6-7, 1958, and which were presented for consideration by the Commission, April 10-11, 1958, and that these agencies be requested to proceed expeditiously with the procurement of necessary data on shrimp, menhaden and other industrial fishes, and oysters, as recommended in the referred to reports.

* * * * * *

The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission at a regular meeting held April 10-11, 1958 at the Fort Harrison Hotel in the City of Clearwater, Florida.

W. D. Gunn

W. D. Gunn, Secretary-Treasurer

RESOLUTION

WHEREAS, the natural supplies of shrimp are limited and unable to keep pace with the ever growing demand; and

WHEREAS, the cultivation of marine shrimp is an established industry in the Orient; and

WHEREAS, various experiments, observations and studies have shown that it is biologically feasible to rear our native shrimp species in controlled and partially controlled ponds and reservoirs; and

WHEREAS, a shrimp culture industry would benefit the five states of this compact as well as the Nation generally: by the creation of new jobs, by the placing of a high class protein product on the market in times of natural shrimp scarcity, and by relieving the fishing pressure on the natural supplies of juvenile shrimp used in the bait industry; therefore

BE IT RESOLVED that the Gulf States Marine Fisheries Commission go on record as favoring the use of Saltonstall-Kennedy funds for research in the cultivation of shrimp in completely controlled and in partially controlled ponds and reservoirs.

* * * * * *

The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission at a regular meeting held April 10-11, 1958 at the Fort Harrison Hotel, in the City of Clearwater, Florida.

W. D. Gunn, Secretary-Treasurer

RESOLUTION

WHEREAS, oyster production has been on the decline in the Mississippi Delta area since about 1943; and

WHEREAS, it is the general consensus of all biologists that the principal reason for this decline is increased salinities in coastal areas; and

WHEREAS, recent invasions of sea water have caused drastic changes in the ecology of the white shrimp nursery grounds, and the minute shrimp larvae cannot traverse the extensive stretches of high saline water lying between the offshore spawning grounds and the brackish water in which they can survive; and

WHEREAS, these and other related factors have contributed to the recent serious decline of the shrimp population; and

WHEREAS, these changed ecological conditions are also seriously affecting the production of other important brackish water species, such as crabs and a variety of sport and commercial fishes; and

WHEREAS, a supply of fresh water is necessary during dry years and dry seasons to rehabilitate the nursery grounds of the above mentioned highly valuable commercial shrimp, crabs, and fishes; and

WHEREAS, it is generally agreed after biological studies that the introduction of Mississippi River water into marsh areas and coastal bays will increase production of other fish and wildlife resources, such as oysters, furbearers, and waterfowl foods; and

WHEREAS, it has been established that the increase in oyster production in the Barataria Bay area alone would be on the order of $1,000,000.00 annually and oyster production of other areas would increase proportionately; and

WHEREAS, initial cost benefit ratios, when considering only oyster production, are of an order which would justify project construction; and

WHEREAS, flood control measures on the lower Mississippi River, diversion of water down the Atchafalaya River, and unusual drouth conditions in recent years are to a large extent the cause of present high salinities in the Louisiana marshes; therefore

BE IT RESOLVED by the Gulf States Marine Fisheries Commission that the Corps of Engineers and the Fish and Wildlife Service in cooperation with the Louisiana Wild Life and Fisheries Commission proceed immediately to expedite and complete the necessary surveys and request funds for the earliest possible project construction.

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The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission at a regular meeting held April 10-11, 1958 at the Fort Harrison Hotel in the City of Clearwater, Florida.

W. D. Gunn

W. D. Gunn, Secretary-Treasurer