PROGRAM

(Commission Chairman, Richard H. Cory, Presiding)

Thursday (October 15)

9:00 AM

REGISTRATION

9:30 AM

GENERAL SESSION—CALL TO ORDER

INVOCATION
Reverend George F. Sexton, OMI
Sacred Heart Church; Brownsville

Roll Call—

WELCOME ADDRESS
Chairman Walter E. Odom
Texas Parks and Wildlife Department

ADDRESS
Rear Admiral J. D. Craik
U. S. Coast Guard
Commander, 8th Coast Guard District

ADDRESS
John Lyman
Chief Adviser, Oceanographic Research
Bureau of Commercial Fisheries

ANNUAL REPORT
Commission Chairman Richard H. Cory

11:00 AM

RECESS *Fifteen Minutes*

11:15 AM

THE CONFERENCE OF INTERSTATE AGENCIES
Commissioner Walter C. Sheppard
First Vice-Chairman, Gulf I.A.

ASSOCIATION ACTIVITIES
Oscar Longenecker, Jr.
[illegible] Gulf Coast Shrimp Association

SURVEY OF SALT WATER SPORTS FISHING IN GALVESTON AND TRINITY BAYS, TEXAS
William R. Mott
Texas Parks and Wildlife Department

ADJOURNMENT *Luncheon*

1:30 - 3:00 PM

REVIEW AND DISCUSSION MANUSCRIPT OF GSMFC INFORMATIONAL BULLETIN #3—SHRIMP FISHERY OF THE GULF OF MEXICO
Robert M. Ingle—Moderator
Florida State Board of Conservation

(Those responsible for agency summaries):
Gordon Gunter
Gulf Coast Research Laboratory
Edwin S. Iversen
The Marine Laboratory—Univ. of Miami
Terrance R. Leary
Texas Parks and Wildlife Department
Milton J. Lindner
Bureau of Commercial Fisheries
Jack C. Mallory
Alabama Department of Conservation
Lyle S. St. Amant
Louisiana Wild life and Fisheries Commission

RECESS *Fifteen Minutes*

3:30 PM

BUREAU OF COMMERCIAL FISHERIES PESTICIDES PROGRAM
Philip A. Butler
Bureau of Commercial Fisheries

4:00 PM

ADJOURNMENT

4:30 PM

MEETING OF RESOLUTIONS COMMITTEE

Friday (October 16)

7:30 - 9:15 AM

COMMISSION EXECUTIVE SESSION BREAKFAST

9:30 - 12:00 Noon

GENERAL SESSION—CALL TO ORDER

ANNOUNCEMENTS

SHRIMP EXPLORATIONS IN THE SOUTH WESTERN CARIBBEAN (Continued)
John R. Thompson
Bureau of Commercial Fisheries

PROGRESS REPORT, TEXAS BLUE CRAB STUDIES (Copperheads and Slides)
Terrance R. Leary
Texas Parks and Wildlife Department

RECESS *Fifteen Minutes*

THE COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT (P. L. 88-309) PROGRESS REPORT AND DISCUSSION
Russell T. Norris
Bureau of Commercial Fisheries

ADJOURNMENT

★

Gulf States Marine Fisheries Commission
312 Audubon Building
New Orleans, Louisiana 70112

Commissioners

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

Alabama
Claude D. Kelley
L. W. Brannan, Jr.
Will G. Caffey, Jr.

Florida
W. Randolph Hodges
Bruce J. Scott
Walter O. Sheppard

Louisiana
Joe D. Hair, Jr.
(Open)
Felton Daigle

Mississippi
Charles Weems
Theodore Millette (Vice-Chairman)
Joseph V. Colson

Texas
J. Weldon Watson
Richard H. Vory (Chairman)
Virgil Vaughan

★

W. Eugene Ayres
Director

GULF STATES MARINE FISHERIES COMMISSION

Fifteenth Annual Meeting

Brownsville, Texas

The Holiday Inn

October 15 (Thursday) - 16 (Friday), 1964

Pre-meeting Session GSMFC Shrimp Biological Research Committee, 9:00 A.M., October 14

Ladies Luncheon-Tour, Brownsville and Matamoros, 11:00 A.M., October 15

Reception-Buffet, Landrum's Restaurant, 7:00 P.M., October 15

Gulf States Marine Fisheries Commission

M I N U T E S

REGULAR MEETING

THE HOLIDAY INN

BROWNSVILLE, TEXAS

OCTOBER 15-16, 1964

GULF STATES MARINE FISHERIES COMMISSION
312 Audubon Building
New Orleans, Louisiana 70112

M I N U T E S

REGULAR MEETING, OCTOBER 15-16, 1964
THE HOLIDAY INN
Brownsville, Texas

OFFICIAL ATTENDANCE OF COMMISSIONERS

	PRESENT	ABSENT
ALABAMA	Will G. Caffey, Jr.	Claude D. Kelley L. W. Brannan, Jr.
FLORIDA	Bruce J. Scott Walter O. Sheppard	W. Randolph Hodges
LOUISIANA	James H. Summersgill	Joe D. Hair, Jr. Spencer G. Todd
MISSISSIPPI	Ted Millette Joseph V. Colson	Charles Weems
TEXAS	J. Weldon Watson Richard H. Cory Virgil Versaggi	
PROXIES	George W. Allen Lyle S. St. Amant Joseph V. Colson	(For Claude D. Kelley) (For Joe D. Hair, Jr.) (For Charles Weems)
STAFF	W. Dudley Gunn	

OTHER STATE GOVERNMENT REPRESENTATIVES PRESENT

Edward Bradley (Texas), Richard J. Berry (Texas), J. P. Breuer (Texas), Ray Childress (Texas), Henry Compton (Texas), Bob Cross (Texas), Raymond Davee (Texas), Wm. J. Demoran (Miss.), T. B. Ford (La.), W. H. Gooch (Texas), W. C. Hawley (Texas), Thomas L. Heffernan (Texas), J. R. Holbein (Texas), Mark Johnson (Texas), Roy B. Johnson (Texas), Edwin A. Joyce,Jr.(Florida),

B. D. King, III (Texas), W. M. Kinsey (Texas), Terrance R. Leary, (Texas) Jack C. Mallory (Ala.), Rudy Marek (Texas), George F. Martin (Texas), Rudy Martinez (Texas), Robert G. Mauermann (Texas), Alan Moffett (Texas), Bill More (Texas), George Munro (Texas), Will Odom (Texas), Jim Palmer (Texas) M. C. Pletz (Texas), Harvey Schoen (Texas), Ronnee L. Schultz (Texas), Thos. N. Scott (Texas), Ernest G. Simmons (Texas), J. R. Singleton (Texas), Roy Spears (Texas), James R. Stevens (Texas), Stephen J. Weber (Texas).

FEDERAL GOVERNMENT REPRESENTATIVES PRESENT

U. S. COAST GUARD: O. M. Abney, James D. Craik, William A. Doig.

U. S. BUREAU OF COMMERCIAL FISHERIES: Philip A. Butler, J. B. Kimsey, Milton J. Lindner, John Lyman, Russell T. Norris, John W. Reintjes, John R. Thompson, Rolf Vuhl, R. T. Whiteleather

U. S. BUREAU OF SPORT FISHERIES AND WILDLIFE: A. H. Swartz

U. S. PUBLIC HEALTH SERVICE: J. Paul Bowers, James W. Carpenter, Jr.

REPRESENTATIVES OF INDUSTRY PRESENT

Adolph Brooks, George A. Brumfield, Henry Cateore, Kenneth Clark, Marvin Conner, E. N. Dumas, Mrs. W.J.Ewing, O. P. Eymard, Hector Ferriera, Carl Gayman, Albert H. Green, Noble A. Hardee, Jr., Will Hardee, Sydney E. Herndon, Roger Hoss, W. O. Kennon,Sr., L. Glen Kratochvil, Mauricio Madero, Harry I. McGinnis, J. G. Reisman, Earl M. Rome, Walter Rull, Paul W.Shiflet, Frank Voltaggio, Morris Voltaggio, Harvey Weil, D. K. Young.

REPRESENTATIVES OF COMMERCIAL FISHERY ASSOCIATIONS PRESENT

Charles E. Jackson, Robert P. Jones, O. M. Longnecker, Jr.

UNIVERSITY REPRESENTATIVES PRESENT

Charles Caillouet, J. Y. Christmas, Lewis T. Graham, Gordon Gunter, Henry Hildebrand, John L. Munro, Henry J. Schafer.

CLERGY. . . . . NEWSMEN PRESENT

George F. Sexton

Winston Leonard

GENERAL SESSION, OCTOBER 15, 1964

Commission Chairman Cory called the fifteenth annual meeting to order at 9:35 a.m. Reverend George F. Sexton, CMI, Sacred Heart Church, Brownsville, was introduced and rendered the invocation.

Before calling upon Commission Director Gunn for the roll call of Commissioners, Mr. Cory introduced Messrs. Joseph V. Colson of Mississippi and James H. Summersgill of Louisiana; appointees to the Commission since the last regular meeting.

The Chairman next introduced Mr. Will E. Odom, Chairman, Texas Parks and Wildlife Commission. Mr. Odom was praised by Mr. Cory for his contribution to the State of Texas in the field of conservation. Mr. Odom addressed the group as follows:

"Public Law 66 passed by the 81st Congress of the United State of America, in 1949, brought into being an interstate compact 'relating to the better utilization of the fisheries of the Gulf Coast' and created the Gulf States Marine Fisheries Commission.

"You are that Commission assembled here today for its 15th annual meeting.

"Through the efforts, and with the encouragement, of this Commission much is being accomplished in the fields of research and production.

"Much more remains to be done---and will be done.

"The ever increasing population of our country is placing, and will continue to place, added demands on the fisheries industry as a source of supply of essential foods.

"The sea will be called upon to furnish an ever mounting quantity of protein.

"Perhaps---today---there are those who consider the sea as a source inexhaustible.

"You know better.

"You are completely aware of the year to year variations in production due to climatic conditions alone---to say nothing of other and significant causes.

"How to balance out these variations and keep production at a high level is one of the principal problems confronting you.

"I am confident that through the efforts of this Commission keys to the industry problems will be found.

"We, in Texas, with our more than 600 miles of Coastline and an annual commercial catch of 164,753,000 pounds valued at an estimated $30,000,000

have a deep and direct interest in the work and achievements of the Gulf States Marine Fisheries Commission.

"It is important to the growth and development of our State.

"On behalf of myself, as Chairman of the Parks and Wildlife Commission, and my colleagues, Judge A. W. Moursund of Round Mountain and Mr. James Dellinger of Corpus Christi, I cordially welcome you to our State and thank you for selecting Brownsville, Texas, as the site of your 15th Annual Meeting.

"I hope your stay is most pleasant and enjoyable. We are extremely happy and honored to have you here."

After responding to the welcome, the Chairman gave a biographical sketch of the meeting's keynote speaker and presented Rear Admiral James D. Craik, U. S. Coast Guard, Commander, 8th Coast Guard District. Copy of Admiral Craik's address is first attached to these Minutes.

Chairman Cory next introduced Mr. John Lyman, Chief Adviser, Oceanographic Research, Bureau of Commercial Fisheries, after a brief review of the latter's wide experience in oceanographic work. Copy of the presentation by Mr. Lyman is second attached to these Minutes.

Before presenting the annual report of the Commission, the Chairman reminded the delegates that copies of the 1963-64 consolidation of Gulf States' Activities and those of the Bureau of Commercial Fisheries and the Bureau of Sport Fisheries and Wildlife, were available on the literature table. Copy of the annual report is third attached to these Minutes.

A fifteen minute coffee break was taken and upon resumption of the morning session, Commissioner Walter O. Sheppard, First Vice-Chairman, Conference of Interstate Agencies, was introduced. Copy of Commissioner Sheppard's review of interstate agency activities is fourth attached to these Minutes.

The Chairman commented on the fine work the commercial fisheries associations had accomplished over the years and called upon Mr. Oscar Longnecker for a summary of current activities of the Texas Shrimp Association, of which organization he is executive secretary. Fifth attached to these Minutes is copy of Mr. Longnecker's presentation.

Mr. William R.More, Biologist, Texas Parks and Wildlife Department, was introduced to inform the group of a survey of salt water sports fishing in Galveston and Trinity Bays, Texas. Mr. More's presentation was accomplished with the aid of slides. The Texas Parks and Wildlife Department's Projects Report, 1964, to be available in the spring of 1965, will include Mr. More's paper with various tables shown at this meeting. Following is an abstract of his Brownsville report:

"A partial survey of the sport fishery was conducted in a 412 square mile area of Galveston, East Galveston, and Trinity Bays during the summer and fall of 1963 and the spring of 1964. Fisherman interviews and aerial boat counts were used to determine fishing pressure, catch rates, species composition, and estimated total yield.

"An estimated 101,966 anglers harvested 662,280 fish. The average catch per angler was 1.62 fish per man hour or 19.5 fish per party. There was an average of 2.58 anglers per party and an average trip lasted 4.6 hours.

"3.5 times as many fishermen fished on a weekend day as on weekday with catch per unit of effort declining on weekends and holidays.

"Peak fishing pressure occurred during the summer while catch rates were highest in the fall.

"Atlantic croaker and sand seatrout composed 75.6% of the total catch, followed by speckled seatrout, black drum, gafftopsail catfish, and whiting in order of importance."

The session was adjourned at 12:00 noon for luncheon.

Upon calling the afternoon session to order, Chairman Cory expressed the appreciation of the Commissioners for the biologists having met a day prior to the meeting, on October 14, to consider the extent of information currently available on the three leading commercial shrimp fisheries of the Gulf and decide if publication of such information should be recommended. Dr. Lyle St. Amant was introduced and gave the group a brief resume of the results of the October 14 session. Dr. St. Amant stated that the consensus of the scientists after having heard reports from each of the five States and the Bureau of Commercial Fisheries was that the publishing of GSMFC Informational Bulletin No. 3 was warranted. He recommended on behalf of the scientists that the Commission sanction the publication.

The next subject for consideration was the Bureau of Commercial Fisheries Pesticides Program, which program, the Chairman explained, was started several years ago at the Bureau's Gulf Breeze, Florida, laboratory. Expressing the keen interest of the Commissioners in the program's progress, Chairman Cory introduced Dr. Philip Butler, Director of the Gulf Breeze Laboratory. The report, presented with the aid of slides, is in copy sixth attached to these Minutes.

With no further business to be presented, the Chairman announced a session of the Resolutions Committee for 4:30 p.m., and adjourned the first day's General Session at 4:00 p.m.

FRIDAY (OCTOBER 16)

The Commissioners met in Executive Session with the serving of breakfast at 7:30 a.m. The session was adjourned at 9:15 a.m. for the final General Session which was scheduled to begin at 9:30 a.m.

Upon calling the final session to order, the Chairman praised the exploratory effort of the Bureau of Commercial Fisheries which was responsible for the establishment of an American shrimp fishery off the northeastern coast of South America. He then called upon Dr. John R. Thompson, Assistant Director of the Bureau's Pascagoula, Mississippi, Base for comments and a film on shrimp explorations in the southwestern Caribbean. Dr. Thompson's comments are seventh attached to the Minutes.

Chairman Cory stated that the Texas Blue Crab Studies had been underway sufficiently long to have produced some very interesting data and that it was his pleasure to introduce Mr. Terrance Leary, Coastal Fisheries Coordinator, Texas Parks and Wildlife Department, for a progress report, using slides, on the studies. Copy of comments by Mr. Leary is eighth attached to these Minutes.

The Chairman reminded the group of the support which the Commission had given S. 627 in the Congress, acknowledging with thanks the letters and telegrams sent and particularly expressing the Commission's appreciation to former Commission Chairman Will G. Caffey, Jr., Dr. Theodore Ford, and Dr. Gordon Gunter for their testimony at the Washington hearings. The fine work in connection with this legislation of former Atlantic States Marine Fisheries Commission Chairman, David Hart and that of the Commission's Executive Director, Ernest Mitts, was also acknowledged. To discuss the application of Public Law 88-309 (S. 627), The Commercial Fisheries Research and Development Act of 1964, the Chairman called upon Mr. Russell T. Norris who has been assigned Assistant to the Director, Bureau of Commercial Fisheries, to administer the Act. Copy of Mr. Norris' talk is ninth and last attached to these Minutes.

Upon being recognized, George Allen expressed Alabama's appreciation to Mississippi for supplying his state with seed oysters following the former's suffering of an 80% loss of its stocks during the year.

Referring to the Executive Session, the Chairman informed the group that a resolution was adopted in which the Commission commends the U. S. Department of the Interior, Bureau of Commercial Fisheries for the keen interest being manifested in the urgent need for oceanographic research in the entire Gulf of Mexico, and extends good wishes for every success in the projected vessel construction project and in an early completion and implementation of a program of subject character.

Continuing, Chairman Cory stated that the Commission had acted favorably upon the scientists' recommendation that the third in the series of shrimp informational bulletins be published and had budgeted the expenditure to be involved. The action also requested that every effort be made to make the

publication available prior to March 1, 1965.

Another item of general interest was a Commission recommendation that a symposium on pesticides be held one day prior to the convening of the next regular meeting of the Commission, which will be on March 17, 1965. The Chairman added that this important study session's attendance will be limited to participating speakers.

Referring to a previous Commission resolution in which the Atlantic and Pacific States Fisheries Commissions were asked to consider a joint meeting, the group was informed that the Atlantic Commission had suggested such a meeting for the fall of 1965 in the Miami, Florida area and that the Commission had passed favorably upon such a meeting.

Former Commission Chairman Caffey requested a moment and upon being recognized took the opportunity to express to Chairman Cory the gratitude of the Commission for his endeavors during the year, and as a further gesture of appreciation presented the Chairman with an appropriately engraved plaque.

The Chairman thanked the meeting speakers and the entire group for the interest displayed throughout the meeting, and again expressed the appreciation of the Commission to the Texas Shrimp Association, the Brownsville-Port Isabel Shrimp Producers Association, the Texas Parks and Wildlife Department and others who had contributed to the success of the Commission's Fifteenth Annual Meeting.

The Chairman then announced that Commissioner Ted Millette of Mississippi had been elected 1964-65 Commission Chairman and with appropriate remarks passed the gavel to him. Chairman Millette announced that former Commission Chairman Walter O. Sheppard of Florida had been elected Commission Vice-Chairman for the ensuing year but could not be presented at the time because he had left a few minutes earlier in order to make a plane connection. Chairman Millette asked for a continuance of the fine support which the Commission has received in its endeavors and extended a most cordial invitation to the group to attend the March 18-19, 1965 meeting of the body at the Admiral Semmes Hotel in Mobile, Alabama.

With no further business to be presented, the October 15-16, 1964 meeting was adjourned at 11:45 a.m.

Prepared by: W. Dudley Gunn
Director

REAR ADMIRAL JAMES D. CRAIK

ADMIRAL CRAIK'S ADDRESS WILL BE COPIED WHEN RECEIVED AND FORWARDED FOR ATTACHMENT TO THESE MINUTES.

* * * *

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Brownsville, Texas
The Holiday Inn
October 15-16, 1964

"BASIC RESEARCH AND FISHERIES"

John Lyman, Chief Adviser
Oceanographic Research
Bureau of Commercial Fisheries
Washington, D. C.

In an era when we are urged from all sides to plan ahead and produce results according to a schedule in our research programs as in all our other operations, I would like to state the case for a certain degree of support of unplanned, unprogrammed research in the ocean.

The ocean is a big piece of real estate. We seldom appreciate how big it is. As an illustration, we are well aware that the ocean is deep and that the highest mountains on land can readily be submerged in it out of sight. Yet, in proportion to its horizontal dimensions, the ocean is a very shallow place indeed. An ordinary piece of flimsy onionskin paper is a good scale model of the Pacific Ocean, representing in its length and width the horizontal dimensions and in its thickness the average depth.

The ocean is big, but it is also in balance. Few things can take place in it independently. Almost every action sets up reactions. For example, as a result of the great Alaskan earthquake last March 27th, part of the sea bed was raised along a fault line and part was lowered. Where the land rose, mud bottom appeared at river mouths, leaving the gravel bars upstream. What this means in terms of salmon spawning remains to be seen, but the outlook is not good, since salmon need gravel, not mud, for their developing eggs.

On the other side of the fault line, where the sea floor dropped, we now have clams living in water several feet deeper than previously, far outside the low-water mark. The clams are still there, and presumably just as happy, but until their offspring colonize the new intertidal area, clams are going to be a lot harder to harvest.

The surface wave generated by this earthquake did extensive damage not only in the Prince William Sound area itself but at ports as far away as Port Alberni, British Columbia, and Crescent City, California. And the earthquake waves crossed the continent and created seiche disturbances in estuaries along the Gulf Coast. No damage to property or fisheries seems to have been reported from this last effect; yet it is cited to illustrate the far-reaching effects of one single event in the ocean.

Because the ocean is so big and complicated, it is not uncommon for investigators to discover one thing when actually they are searching for some-

thing far different. The current cliche "serendipity" describes this situation. But serendipity only operates when the observers have their wits about them. They must be in a position to recognize that what they are observing is not the thing that they set out to observe, and also they must be able to interpret the significance of the new observation.

I offer two unrelated examples of the sort of discovery that can come about through this cause. Curiously enough, they both result from experimental fishing in the ocean with long lines.

In the first instance, a party of Bureau of Commercial Fisheries observers were sampling the yellowfin tuna populations on a section south of Hawaii across the Equator, from the vessel HUGH M. SMITH. They were using long-line techniques borrowed from the Japanese. Right on the Equator they found the gear streaming to the eastward, as though the ship were drifting west at several knots. It was a flat, calm, and the observed drift of the ship did not agree with the indication of a surface current setting west. Could it be that the lines were in a subsurface current setting east? The books did not say anything about such a current. But they rigged drogues and lowered them to various depths and thereby discovered the Equatorial Undercurrent--the Cromwell Current, as it is now called in memory of its discoverer, who was killed in a Mexican plane crash a few years later. Subsequent investigation showed that this current stretches in a shallow ribbon several thousand miles eastward across the Pacific, right at the Equator. Moreover, an identical current exists in the Atlantic, and there are indications of something similar in the Indian Ocean. Nobody has yet demonstrated 50¢ of practical return from this discovery; yet it has profoundly modified our ideas of ocean current circulation in tropical latitudes. After understanding follows prediction, and when we have to predict the behavior of dynamic systems in equatorial oceans the knowledge of the existence and behavior of the equatorial undercurrents will be of immeasurable assistance.

My other example pertains to the activity of an ardent fisherman who is also a scientist at Woods Hole Oceanographic Institution, Frank J. Mather III. For a long time he has been tagging and releasing the big sport fish in the waters off New England: bluefin tuna, broadbill, and the like, in order to learn something about their breeding habits, their migrations, their rates of growth, and their populations. He has worked closely with our biological laboratory at Woods Hole and also had a grant from the National Science Foundation. At the beginning of the autumn of 1962, Mather chartered the local fishing boat CAPTAIN BILL III and sent her out with his assistant, Martin Bartlett, and a long-line gear to look for tuna off New England. They found some, but they also found broadbill swordfish in commercial quantities. The skipper of the CAPTAIN BILL III suggested that Bartlett come along on the next trip as a guest, bringing his longline gear. Fishing again was good, two more trips followed, and it was now clear where the New England broadbill spent their winters.

Up to 1962, this fish had been taken commercially only in the summer in coastal waters, using harpoons. The fish "disappeared" at the beginning of autumn. Now it was demonstrated that they merely move offshore and stay in deeper water, where they are readily harvestable by long-line gear. The Bureau published a description of the long-line gear, New England and Canadian fishermen fitted out their boats with it, and a new fishery was born.

In all of 1962, 998,000 pounds of swordfish were landed by New England vessels, and the value of the catch ranked nationally just below the value of bloodworms. In 1963, 2,700,000 pounds were landed, and the 1964 figures so far show increases over 1963. North Carolina and Virginia, for example, which never previously figured as swordfish producers, between them have 1964 landings nearly equal to the 1962 New England totals.

Frank Mather's curiosity about tuna and bill fish then has led to an increase in income to U. S. fishermen of something like half a million dollars a year, and has made fresh swordfish available to the consumer as a year-round staple instead of a seasonal delicacy.

These two case histories I think demonstrate clearly the value of finding good people who are interested in working in the ocean and have problems to solve, and then providing them with the facilities to carry out their proposed work. The discoveries that result may not always result in the solution of the original problem, but on the other hand they may have significance which far overshadows it.

If Townsend Cromwell had not been able to use the time of HUGH M SMITH to satisfy his curiosity about the behavior of his fishing lines at the Equator, we might not yet have an understanding of the formation of equatorial undercurrents. And if Woods Hole Oceanographic Institution had not been the recipient of a grant from NSF that enabled Frank Mather to charter the CAPTAIN BILL III, we would not have the Eastern Seaboard longline broadbill fishery.

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M I N U T E S

EXECUTIVE SESSION, BROWNSVILLE, TEXAS, OCTOBER 16, 1964

The Commissioners and their guests (Admiral James D. Craik and Messrs. Will Hardee, Russell T. Norris, A. H. Swartz and Richard T. Whiteleather) met for breakfast at 7:30 a.m. Following breakfast, Admiral Craik spoke briefly on the Loran coverage expected for the Gulf area before leaving to attend a meeting of the Advisory Panel To Commander, Eighth Coast Guard District. Mr. Norris stated that he would be glad to meet with state administrators for any further consideration of PL 88-309, whereupon, this session was set for 12:00 noon. Mr. Swartz reported that the Bureau of Sport Fisheries and Wildlife was still looking for a location on the Gulf upon which to build a laboratory. Mr. Whiteleather stated that bids were opened October 1 for the 80 foot Gulf oceanographic vessel and that it was expected bids for the 165 foot vessel to replace the Oregon would be opened in early January 1965. Mr. Hardee spoke of the considerable interest of the shrimp industry in oceanographic research, particularly, in the Campeche area.

Guests were excused at 8:30 a.m. and the Executive Session was called to order by Chairman Cory. Dr. St. Amant moved that the Minutes of the April 1964 meeting be approved without reading. Mr. Allen seconded and upon vote the motion passed.

Copies of a suggested budget (copy herewith first attached) for fiscal year 1964-65 were distributed. The Director reported a true October 1 bank balance of $14,895.26 on hand in the National American Bank, New Orleans, with all member states having paid current year's membership dues except Mississippi (due July 1) and Alabama (due October 1). Commissioner Colson stated that the Mississippi dues would be paid in the near future.

The budget item of Publication Expense was discussed in connection with the possibility of Informational Series No. 3 (shrimp fishery bulletin) being published. It was moved by Mr. Allen that the third of the Series be published and that every effort be made to complete the work by March 1, 1965. Commissioner Summersgill seconded and upon vote the motion passed.

Returning to the proposed 1964-65 budget, Commissioner Colson moved that the budget be approved as drafted by the Commission officers but with the addition of a sufficient amount to pay for the publication of Informational Series No. 3. Asked about the cost, the Director stated he believed the expenditure could be held to approximately $600. Commissioner Colson then proposed that the Publication Expense be increased to $1200 and the total budget for fiscal 1964-65 be increased from the suggested $19,899 to $20,499. Commissioner Sheppard seconded and upon vote the motion passed.

The subject of resolutions of appreciation was brought up and discussed. Commissioner Caffey moved that the Director be instructed to prepare and distribute appropriate resolutions to Commission Chairman Cory, Texas Shrimp Association, Brownsville-Port Isabel Shrimp Producers Association, Texas Parks and Wildlife Department and the Holiday Inn. Dr. St. Amant seconded and upon vote the motion passed. Copy of each resolution in the order above mentioned is herewith second, third, fourth and fifth attached.

The Director informed the Commissioners that the Atlantic States Marine Fisheries Commission, at its September meeting in Atlantic City, selected Miami, Florida for its fall 1965 meeting, and in response to a Gulf Commission resolution of March 1963 suggesting a joint meeting, the former requested that the two groups meet at that time. The participation of the Pacific Commission was also urged. Since the 1965 fall Commission meeting is, under the rotation plan, scheduled for Florida, Commissioners Scott and Sheppard suggested that the joint meeting be held. Commissioner Colson moved for the meeting, with the Florida Delegation working with Director Gunn and the ASMFC executive officer, Mr. Ernest Mitts, in perfecting arrangements. Dr. St. Amant seconded and upon vote the motion passed.

The subject of pesticides was discussed with a resulting consensus that a symposium should be arranged and scheduled for one day immediately prior to the convening of the March Commission meeting at Mobile; that is, on March 17. The motion proposed by Commissioner Scott would limit attendance at the session to speakers only. Dr. St. Amant seconded and upon vote the motion passed.

In consideration of oceanographic work in the Gulf as envisioned by the Bureau of Commercial Fisheries, a resolution was presented by Commissioner Colson which would commend the Bureau for its interest in the subject and convey good wishes of the Commission for success in the proposed vessel construction and in an early implementation of a program. The adoption of the resolution was seconded by Commissioner Summersgill and upon vote the same was adopted. Copy of the resolution is herewith sixth attached.

The Director stated that the reason the consolidated state monthly activities report sometimes failed to include all of the member states was because some reports were not rendered. He said several of the states had advised that, since the reports depend to a large extent on biological information, it was at times impossible to provide anything new each month. Dr. St. Amant said that this was true in Louisiana's case and Mr. Allen agreed as for Alabama. Chairman Cory stated that he had found the reports very helpful. This appeared to be the consensus of other Commissioners. Following a discussion in which agreement was reached as to the future frequency of reports, Commissioner Caffey moved that the reports be rendered for consolidation every third month, and that the first of the quarterly reports cover the months December 1964 and January and February 1965. Commissioner Scott seconded and upon vote the motion passed.

Chairman Cory explained that Mr. George Brumfield ceased to be on the GSMFC and Commission Vice-Chairman with the expiration of his term of office as Chairman of the Mississippi Marine Conservation Commission in May 1964. Commissioner Ted Millette was elected to serve the unexpired term of Mr. Brumfield by the Mississippi delegates on the Commission, as provided in an October 1955 Commission adopted resolution. It was explained that the resolution also provides that the official so elected shall be confirmed in office at the next meeting of the Commission. Commissioner Colson moved for such confirmation. Commissioner Caffey seconded and upon vote the motion passed.

Commissioner Colson nominated Commission Vice-Chairman Millette for the office of Commission Chairman. Commissioner Versaggi seconded. No further nominations were presented and Commissioner Millette was acclaimed Commission Chairman for the year 1964-65.

Commissioner Sheppard was recognized when call was made for the nomination of a Commission Vice-Chairman. Commissioner Sheppard praised Commissioner Scott for his services to the Commission and stated that he would have liked exceedingly to nominate his Florida colleague for the office but for the fact that Commissioner Scott did not enter the last race for the Legislature and would not therefore be on the Commission after November 3. Commissioner Scott expressed his regrets for having to leave the Commission. He then spoke of the fine work Commissioner Sheppard had rendered in past years as a member of the body and as a former officer. Commissioner Sheppard was nominated by Commissioner Scott for the office of Vice-Chairman for the ensuing year. Dr. St. Amant seconded. No further nominations were presented and Commissioner Sheppard was acclaimed Commission Vice-Chairman.

No further business remained to be transacted and the Executive Session was adjourned at 9:15 a.m. for the final General Session scheduled to begin at 9:30 a.m.

Prepared by: W. Dudley Gunn
Director

RESOLUTION

WHEREAS, Richard H. Cory, legislative appointee of Texas on the Gulf States Marine Fisheries Commission, has served as Chairman of the Commission for the years 1963-64; and,

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

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

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The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission, October 16, 1964, at a regular Commission meeting held at The Holiday Inn, Brownsville, Texas.

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

RESOLUTION

BE IT RESOLVED that the Commissioners and Staff of the Gulf States Marine Fisheries Commission express to the Texas Shrimp Association and the Brownsville-Port Isabel Shrimp Producers Association their most sincere appreciation for the enjoyable Ladies' Tour and Luncheon and the very lovely Reception and Buffet tendered them and delegates during the course of the October 15-16, 1964 meeting at Brownsville, Texas; and,

BE IT FURTHER RESOLVED that the Commission's gratitude be expressed to Mr. Oscar Longnecker for his most valued assistance in perfecting meeting arrangements and to Miss Coylene Damron for her excellent handling of registrations.

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The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission, October 16, 1964, at a regular Commission meeting held at The Holiday Inn, Brownsville, Texas.

W. D. Gunn

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

RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission express its sincere appreciation to the Texas Parks and Wildlife Department for the most cordial hospitality extended upon the occasion of the October 15-16, 1964 meeting of the body at Brownsville, Texas; and,

BE IT FURTHER RESOLVED that this Commission is particularly appreciative of the excellent transportation provided by the law enforcement personnel of the Department.

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The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission, October 16, 1964, at a regular Commission meeting held at The Holiday Inn, Brownsville, Texas.

W. D. Gunn

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

RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission express its sincere appreciation to the management and staff of The Holiday Inn for the cordial hospitality and splendid food and service enjoyed by the group on the occasion of the October 15-16, 1964 meeting of this Commission at Brownsville, Texas.

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The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission, October 16, 1964, at a regular Commission meeting held at The Holiday Inn, Brownsville, Texas.

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

RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission commends the United States Department of the Interior, Bureau of Commercial Fisheries for the keen interest being manifested in the urgent need for oceanographic research in the entire Gulf of Mexico; and,

BE IT FURTHER RESOLVED that this Commission wishes the Department every success in the projected vessel construction project and in an early completion and implementation of a program of subject character.

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The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission, October 16, 1964, at a regular Commission meeting held at The Holiday Inn, Brownsville, Texas.

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

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GULF STATES MARINE FISHERIES COMMISSION
Brownsville, Texas
The Holiday Inn
October 15-16, 1964

"COMMISSION ANNUAL REPORT 1963-64"

Richard H. Cory, Chairman
Gulf States Marine Fisheries Commission

It has been 12 years, almost to the day, since the Commission last met in Brownsville. In reading over the minutes of the October 16-17, 1952 meeting, one is amazed to learn how little fishery research and associated work was being done at that time. All of the member state agencies had oyster biological research and reef development programs under way. Florida was studying the mullet, while Texas was researching the speckled trout, redfish, drum and flounder. Alabama and Louisiana were planning taxonomical work on the fin fishes of commercial and sports interest. Mississippi then had a study of the flounder progressing and one planned for the speckled trout. The report states that work on the life history and habits of shrimp was indicated for the coming year and as a joint state-federal program. The Commission continued to emphasize the need for better statistical information on the fisheries.

The Fish and Wildlife Service Laboratory at Pensacola was pursuing a study of the enemies of the oyster. The Pascagoula-based exploratory vessel M/V Oregon was nearing completion of a general survey of the Gulf of Mexico for new exploitable stocks of shrimp. Coverage remained of the area off the coast of Mexico between the Rio Grande and Carmen. Exploration for tuna was under way but the discovery of a yellow-fin fishery was to come later. The Commission had requested that a record be maintained of the species of fishes taken incidental to shrimp trawling by the Oregon. This project was designed to provide data for those who might be interested in the utilization of trash fish. The Service's Galveston Laboratory was continuing the Gulf survey for concentrations of fish eggs and larvae, using the M/V Alaska for that purpose. A study of the chemical constituency of sea water was another program of the laboratory.

I thought you might better appreciate the Resume of State and Federal Activities for 1963-64 after a look into the past. So many times we have to take a look backward in order to realize how far we have come. Our research has made commendable progress over the years but we prefer to consider past and present efforts only as a foundation for the work which must be accomplished if the marine fishery resource is to be sustained.

Preliminary landings figures for the year 1963, which have been provided by the Bureau of Commercial Fisheries New Orleans office, compare favorably with those of 1962:

The shrimp fishery produced 203 million pounds, heads-on weight. This represents a 43% increase over 1962. The excellent white shrimp crop in the Louisiana coastal waters was the primary reason for the gain.

1963 menhaden landings were 8% below the previous year, but even so, 968 million pounds were harvested.

The industrial bottom fish resource produced 79 million pounds.

The brightest spot production-wise was the oyster fishery. A 28% increase is recorded. With 24 million pounds of meats produced, the oyster industry enjoyed its best year since 1939.

With 27 million pounds, round weight, of crabs harvested, a 2% increase over 1962 was attained. However, that figure is approximately 10 million pounds below the 1960-61 production. Terry Leary will report on the Texas blue crab studies Friday morning.

During the past year we supported Senate Bill 1988 which passed and became Public Law 88-308. This badly needed legislation, which prohibits fishing in territorial waters of the United States, was the subject of a Commission resolution. Bruce Scott was responsible for similar and earlier legislation in Florida which was used in early 1964.

Other Commission-supported legislation which became Federal law during the year was Senate Bill 627; now known as Public Law 88-309, the Commercial Fisheries Research and Development Act of 1964. If implemented under the most recent formula for distribution, on a 75-25 percentage basis, one and a tenth million dollars of Federal Funds would be made available annually to the states party to the Gulf fisheries compact, for research and development projects. Russell Norris will discuss the Act Friday morning.

We are very grateful to our former Commission Chairman Will Caffey, to Dr. Ted Ford and to Dr. Gordon Gunter for appearing and testifying at the Washington hearings of S. 627. Also, we wish to thank the several state agencies for their letters, wires and telephone calls. This total effort was of considerable assistance to our State Delegates in the Congress who have most loyally supported requests of this Commission since its inception.

At the last April meeting of the Commission in New Orleans, a resolution was adopted which requested the United States Coast Guard to take no action with respect to any changes in the specifications and requirements covering Obstruction Markings and Navigational Aids associated with offshore platforms, located in and around the fishing grounds of the Gulf, until the views of the fishing industry could be expressed. Industry had such an

opportunity on August 7 at Eighth Coast Guard District headquarters in New Orleans. We are indebted to Admiral Craik, not only for having arranged such a conference, but for suggesting that the fishing industry of the Gulf organize a permanent Advisory Committee to meet with the Coast Guard from time to time. And, again, our appreciation to the Admiral for postponing any decision as to changes of rig navigational appurtenances until May of 1965.

The Shrimp Biological Research Committee met twice during the past year. One session was held a day prior to the October Commission meeting at Biloxi and a second while the Oyster Institute of North America was in session at New Orleans last June and again yesterday. We will learn of the results of the Committee's deliberations later today.

The Commission sponsored a study of state fisheries laws by state representatives who met in New Orleans last April. A resolution recommending the entering into of reciprocal agreements among the Gulf States resulted from the meeting.

In conclusion, please permit me to express the most sincere thanks of the Commission to the laboratory directors and staffs of the two Bureaus of the U.S. Fish and Wildlife Service, the U.S. Public Health Service, and the five Gulf States, for their cooperation throughout the past year. Such measure of success as has been attained by the Commission during the year can well be attributed in considerable part to the untiring efforts of its long list of cooperators engaged in the many fields of fisheries activity. We have well proven the close relationship of joint endeavor to accomplishment. Let us continue to promote the fisheries of the Gulf through team effort.

In conclusion, I would like to express my special thanks to Oscar Longnecker, the Texas Shrimp Association, the Brownsville-Port Isabel Shrimp Producers Association for the ladies tour and luncheon of this morning and the reception and buffet which we are to enjoy this evening. We are indebted to Virgil Versaggi and Weldon Watson for meeting in Brownsville to arrange this meeting and to the Parks and Wildlife Department and its enforcement staff for the transportation being furnished. For the fine cooperation given the Chairman during the year by the Commissioners and the Commission's staff, I am indeed grateful.

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GULF STATES MARINE FISHERIES COMMISSION
Brownsville, Texas
The Holiday Inn
October 15-16, 1964

"CONFERENCE OF INTERSTATE AGENCIES"

Walter O. Sheppard, First Vice-Chairman
Conference of Interstate Agencies
Council of State Governments (Sponsor)
Fort Myers, Florida

The General Assembly of the States being representatives from each of the State Legislatures in all fifty states recognized the increaseduse of interstate compacts throughout these United States and the increased attention paid to the compacts in the states by the Federal Government, resolved that the Council of State Governments, which is an organization supported by the fifty State Legislatures should staff and sponsor a meeting of interstate agencies. This resolution was adopted by the 15th Biannual General Assembly of the States meeting at the Sheraton Hotel in Chicago, Illinois on December 2, 1960.

The Council of State Governments called a meeting of the interstate agencies in February of 1961 in Chicago, Illinois, with the major emphasis being on Federal-State relationships regarding interstate compacts and agencies. At that time, there was before the United States District Court of Appeals for the District of Columbia the case of Arthur J. Tobin vs. United States, more familiarly known as the New York Port Authority case. The decision of the United States Court of Appeals reversed a former conviction of Mr. Tobin obtained in the United States District Court just prior to the first meeting of the interstate agencies. This case is reported in 195 Federal Supplement at Page 588. In the Port of New York Authority case, the Authority, which is an interstate compact established in 1921 between New Jersey and New York and controls the entire harbor of the City of New York and its airports, had been engaged in a controversy with the Judiciary Committee of the United States House of Representatives.

Early in 1961, Emmanuel Seller, United States Representative from the State of New York, who is Chairman of the House Judiciary Committee, informally requested the records relating to internal administration of the New York Port Authority. Refusal of this request prompted Mr. Seller to ask for a committee power of subpoena for use in studies and investigations of the activities and operations of the interstate compacts. This power was granted by the House in June of 1960 and subsequently, in response to the subpoena, the Port Authority did not furnish to the Committee all of its records relating to the interstate administrations. Withholding of these internal administration records led to the request that the House of Representatives cite the Chairman, Secretary and Executive Director of the

Port Authority for contempt of the House. The House issued such contempt citations on August 31, 1961, but only Executive Director Tobin was prosecuted by the Federal Government.

In the District Court and the Court of Appeals, the case was argued on constitutional grounds relating to the basic power of Congress over compacts. The unanimous opinion of the three judges expressly declined to decide the case on constitutional grounds and avoided the constitutional question. The constitutional question involved is under the compact clause of the United States Constitution in Article I, Section 10, Clause 3 which states, among other things, that "no state shall, without the consent of Congress, enter into an agreement or compact with another state".

The General Assembly of States felt that all interstate agencies should have a common meeting ground, thus the birth of the Conference of Interstate Agencies which was created by the aforementioned resolution.

Until 1921, the subject of relationship to interstate agencies and Federal and State and local Governments in the plan of American Law did not exist, since until that year, interstate agencies were unknown to our law. In 1921, the Port of New York Authority was created in order to try and solve the problems of their common port. The approach which the two states employed was the creation of a joint and common agency to achieve their goals on port development, promotion and protection. The Port of New York Authority was created by a compact of New York and New Jersey to which Congress consented and it was the first interstate agency known to our law.

The power of the states to enter into interstate compacts is not derived from the Federal Constitution. The power preceded the adoption of the Constitution and exists by reason of the reserved sovereignty of the states. Inter-colonial compacts were not unknown and the power of the states to contract or compact with each other was confirmed by Article I, Section 10, Clause 3 of the Federal Constitution.

At the creation of the Conference of Interstate Agencies, a Steering Committee was appointed by the Conference at its first meeting. The Steering Committee felt that there exists a need for discussion of several topics common to all compact agencies and to inform compact agencies of recent developments as regard their ports in the Federal Government. Congressional investigations such as the Port of New York Authority case, recent court decisions in both Federal and State Legislations pertaining to interstate compacts have raised questions which the Steering Committee of the Conference of Interstate Agencies felt should be thoroughly studied and reports made back to the Council of State Governments and to the various interstate agencies. As a result of the first meeting of the Conference of Interstate Agencies, the Council of State Governments, upon recommendation of the Conference, now puts out an interstate agencies circular letter which goes to every interstate agency in the United States, as set forth in this directory which was compiled in July of this year. The Conference of Interstate Agencies is now an es-

tablished agency for the exchange of information among the variety of agencies created by two or more states. Services of the Council of State Governments in the formation of this agency was invaluable and their aid and guidance in the future promises an active and useful conference. The next Conference of Interstate Agencies will be held in 1965, May 9th through 11th, at the Deauville Hotel in Miami. Any problems which the Gulf States Marine Fisheries Compact might have should be submitted to the Council of State Governments prior to that date so that the problem may be planned on the agenda and thoroughly discussed.

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GULF STATES MARINE FISHERIES COMMISSION
Brownsville, Texas
The Holiday Inn
October 15-16, 1964

"ASSOCIATION ACTIVITIES"

Oscar Longnecker, Jr.
Executive Secretary
Texas Shrimp Association
Brownsville, Texas

In this talk I am attempting to outline the work and activities of the shrimp associations. I am closely associated with Southeastern Fisheries Association, Texas Shrimp Association, and the Shrimp Association of the Americas. Of course I am aware that there are other shrimp industry associations representing several states, but I am intimately familiar with the work of the three I have named, and by failing to cover the work of others it is not my intent to ignore them, I just know more about the ones I am associated with.

I would like to begin with what is going on here in Texas through the Texas Shrimp Association. This association has been effective in its legislative program and was successful in getting a new and more realistic shrimp conservation act out of the last session of the Texas Legislature which has been effective in eliminating a number of abuses in the shrimping industry along the Texas coast. The Association was also successful in obtaining a law to curb the illegal selling of shrimp by shrimp boat crews and the buying of shrimp by unauthorized persons. The Association actively supported a number of Federal bills that are of interest to the fishing industry, namely: promotion of state commercial fishery research by the matching of state and federal funds, medicare for owner-captains of fishing boats, the fishing industry ship building subsidy bill, and opposed the labor bill that would give fishermen a voice in the ex-vessel sale of the catch. The Association is presently appraising the legislative needs of the Texas shrimping industry to determine what legislation might be proposed to the new session of the Legislature at the beginning of the year. The Shrimp Conservation Act is being studied in the light of two seasons experience with it, and several proposals are being considered for making the law covering illegal sale of shrimp more effective. The Association is considering insurance programs which may also include legislative proposals.

There is interest in water resources and conservation plans for Texas and in the subject of water pollution as these two subjects relate to the coastal nursery grounds where at least 90% of the fish and shellfish caught commercially in the Gulf of Mexico spend part of their lives. The Texas shrimping industry has been interested in the program to extend LORAN in the Gulf of Mexico west and south of the Mississippi mouth, recognizing the potenti-

alities of deep trawling. Representatives of the Association have assisted in promoting this development and in the acquisition of a site at the south tip of Padre Island.

There has been close cooperation between the Association and the Texas Parks and Wildlife Commission regarding the proper dates for shrimp trawling within the discretionary limits granted in the law to the Commission. For biological reasons it was necessary to change the opening date of the season this past June after that date had already been established, a change which the Association endorsed.

Along with the Shrimp Association of the Americas and local organizations the Texas Shrimp Association has proposed a Federal oceanographic-hydrographic study of the Gulf of Mexico, possibly in cooperation with Mexico, to develop information concerning the fishery, bottom sediments, currents, etc., and the revision of the antique navigation charts of that part of the Gulf of Mexico from the mouth of the Rio Grande to the Yucatan.

In the joint emergency assistance program conducted by Southeastern Fisheries Association and the Texas Shrimp Association for shrimp boats that must enter Mexican ports for assistance the Texas Shrimp Association rendered assistance to three Texas shrimp boats that were seized by the Mexican Government in the vicinity of Tuxpam last Easter. The Association advanced funds for payment of fines and assisted in obtaining release of the boats and subsequently assisted in filing claims with the United States Government for reimbursement under the Fishermen's Protective Act. Four Texas boats were seized the year before and similar assistance was rendered as a regular service of the Association.

The Texas Association maintains an emergency pump program in cooperation with the United States Coast Guard Air Rescue Unit at Corpus Christi. Coast Guard planes fly to the relief of distressed boats in the Gulf of Mexico and drop pumps by parachute. This service is rendered to all boats and the cost of maintaining the pumps is defrayed by the Association, and replacement pumps are purchased for those which are lost. Reports from the Coast Guard show that 24 boats were serviced with pumps during a 12 months period last year.

A committee of the Association is seeking means to establish a vocational education program for the training of shrimp boat personnel with the objective of upgrading the crews that operate the boats.

The Texas Shrimp Association undertook an interesting project last spring for participation in the Texas Exhibit at the New York World Fair for 1964 and 1965 for the purpose of featuring and promoting Texas Shrimp. A very considerable amount of money was subscribed for the enterprise, and which was returned to the donors when the Association was unable to complete a mutually acceptable contract with the sponsors of the Texas exhibit.

Southeastern Fisheries Association has a new Executive Secretary- Robert Jones - who began his work with the Association in July. Southeastern is building its membership and finances and is pursuing an aggressive program of activities. A goal of 800 members has been set for 1964-65.

Of particular interest is the joint marketing program which has been launched by the Florida Board of Conservation, U. S. Bureau of Fisheries, and Southeastern Fisheries Association. The program is designed to secure more markets for Florida produced seafood. The Board of Conservation has appropriated $15,000 for the program, the U. S. Bureau is providing manpower and technical assistance, and Southeastern has been raising funds for billboard advertising, radio spots, and TV interviews with leaders of the fishing industry. The program is working well and various marketing approaches have been accomplished.

The Association's Legislative Council, Committee on Fisheries and Natural Resources, is preparing an aggressive program covering such fishing problems as a 70 count shrimp law, closed mullet season, consideration for repeal of the sponge crab law and a variety of corrective items.

Annual Seafood Promotion Dinners have been inaugurated to raise funds in connection with the marketing program.

Southeastern maintains an emergency service for Florida shrimp boats off the Mexican coast. This service, which is self liquidating, is for boats that must enter Mexican ports in various emergencies. A system of agents is maintained in the Mexican ports to care for the needs of the Florida and Texas shrimp boats.

Three of the major shrimp industry organizations of North America make up the membership of the Shrimp Association of the Americas, and contribute a major part of their income to that international association. They are the Camara Nacional de la Industria Pesquera, Southeastern Fisheries Association and Texas Shrimp Association. SAOTA, as the organization is called, is organized to promote standardization and quality control in the processing of shrimp, to conduct studies and engage in research to aid the shrimping industry, promote advertising and publicity to increase consumption of shrimp, among other objectives. Of course, these activities are international in scope because of the international nature of the organization.

SAOTA is active in standardization and quality control and for a number of years has maintained two research fellowships in marine biology at the University of Miami. Its most active field is that of publicity and advertising of shrimp. In the past 10 years SAOTA has spent some $600,000 publicizing shrimp and we believe this investment has been the major factor in maintaining a relatively stable market.

Imports have grown from 5 million pounds of shrimp in 1940 to 40 million pounds in 1950, to more than 151 million pounds in 1963. There were 24 countries exporting shrimp to the United States market which sent no shrimp

into the United States 14 years ago.

It must be remembered that our government imposes no quotas or tariffs on imported shrimp. SAOTA has used its resources on advertising and promotion, combating the import problem by promoting the United States market to consume greater and greater volumes of shrimp, both domestic and foreign produced. The Association's accomplishments toward that end have not been sufficient to stay ahead of increasing imports.

The Board of Directors of SAOTA, in its annual meeting in Mexico City last May, recognized that financial help is needed from foreign producers of shrimp for greater promotion in the United States and for developing markets in other countries. Authorization was given for the organization of an international council whose primary objective would be advertising and promotion, and funds were appropriated to carry it through its organization stage. Mr. Charles Jackson of Washington, D. C. was engaged to do this work and in April of this year the International Shrimp Council was chartered. Its membership is intended to be worldwide throughout the shrimp producing nations. First steps have been taken to interest the American importers, who in a sense are representatives of the foreign producers, and if that move should not be successful, then a program of direct contact, which would be much slower and difficult, will no doubt be undertaken. Some commitments for participation have been obtained from interests in Central and South America, and in the Caribbean area which will form the nucleus of the new organization. SAOTA would become a contributing member of the International Shrimp Council.

With growing imports, without restrictions, only market chaos can result if promotional efforts should cease. This is a problem of, and should be of interest to, every individual who has a stake in the United States shrimping industry.

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GULF STATES MARINE FISHERIES COMMISSION
Brownsville, Texas
The Holiday Inn
October 15-16, 1964

"BUREAU OF COMMERCIAL FISHERIES PESTICIDES PROGRAM"

Dr. Philip A. Butler, Laboratory Director
Bureau of Commercial Fisheries
Gulf Breeze, Florida

DR. BUTLER'S PAPER WILL BE COPIED WHEN

RECEIVED AND FORWARDED FOR ATTACHMENT

TO THESE MINUTES.

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GULF STATES MARINE FISHERIES COMMISSION
Brownsville, Texas
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October 15-16, 1964

"SHRIMP EXPLORATIONS IN THE SOUTHWESTERN CARIBBEAN
(Comments and Film)

John R. Thompson, Assistant Director
Bureau of Commercial Fisheries-Exploratory Base
Pascagoula, Mississippi

For the past fifteen years, we have attempted to expand the horizons and broaden the outlook of the U. S. fishing industry. We have done this by pushing our explorations ever deeper in the Gulf of Mexico for royal red shrimp, food fish, deep water crabs, and Danish lobsters and into the pelagic layers for tunas and other free-swimming fishes including the herringlike species; and we have ventured farther and farther away from home into the Caribbean Sea and the tropical waters of the Atlantic Ocean.

Why, in the face of all of the problems that beset our domestic industry of today have we been so anxious to do these things? Why shouldn't we just stay around home and content ourselves with minor grounds extensions and development of new products in local areas?

Perhaps the main reason is that today we are facing a most serious crisis. Foreign fleets are moving into the Gulf, the Caribbean, and adjacent sections of the Atlantic in ever increasing numbers. They are taking the initiative away from us on and near our home grounds. They are forcing us to take a look beyond our present horizons--beyond the Straits of Florida and the 25-fathom curve--into areas of possible expansion for our own fleets. We can no longer afford to remain complacent. If we are to remain in the fishing business, it appears that we are going to have to meet this competition and meet it fast.

In our minds, the main avenue of geographical expansion for the domestic fleets extends out through the Caribbean Sea into the waters of the tropical Atlantic. Explorations by the Oregon in waters of the Caribbean Sea and the tropical western Atlantic began in a small way in 1954 with a limited amount of longline tuna fishing in and near the Windward Passage. Some acceleration of the Caribbean and Tropical Atlantic Program has been seen since then, with 2 cruises of the Oregon being devoted to the area each year since 1957, although it was not until 1962 that separate funds were made available to partially cover the work.

Explorations performed in 1957-58 have resulted in the discovery and development of one of the world's major shrimp grounds, off the Guianas. A fleet of over 200 U. S. shrimp boats is now working these grounds profitably. A recheck of the area in 1963 resulted in extensions of the grounds off French Guiana.

Explorations in the Caribbean have been devoted so far to preliminary coverage of the shelf and slope areas off the continental boundary of the Sea. In 1957, 1959, 1961, 1962, and 1963, individual portions of the general area extending from Honduras to Trinidad were investigated, particularly with shrimp trawls.

Our topic today is the potential for shrimp fishing in the southwestern Caribbean. We can define the southwestern Caribbean for present purposes as extending along the mainland coast from Nicaragua to the Colombia-Venezuela border. Most of our attention, however, will be focused on the Colombian coast, the site of the most promising potential for shrimp to date.

The coastline of Nicaragua, as charts of the area clearly indicate, is rugged and strewn with reefs. Very little bottom that is fit for trawling with shrimp trawls is to be found, and only light shrimp catches have resulted to date from shrimping in areas where dragging is possible.

There does appear to be a large potential for snapper trawling with roller rigged trawls throughout the reef area. All of the snapper species found in the Gulf are present, with yelloweye predominating, plus one or two species endemic to the Caribbean. Unfortunately, these fish do not seem to bite particularly well on handlines, but one of the first projects to be undertaken with our new vessel is to be an investigation of the area with roller-rigged fish trawls adapted for rough-bottom fishing.

For one and one-half years, we had a spiny lobsterproject active in the Republic of Panama. Explorations were carried out primarily in the Pacific waters of the Republic, but limited explorations were also carried out in the Caribbean, and one cruise of the Oregon was carried out partially in the Gulf of Mosquitos area of the Caribbean off western Panama. Trawling during the lobster project was restricted largely to attempts to take bait for the lobster traps, but few shrimp were taken in the 40-foot flat trawls used either during the lobster project or during the explorations of the Oregon, in contrast to the situation on the Pacific coast where good shrimp catches were made. There does not at this time appear to be a potential for U. S. shrimping in Caribbean waters of the Panamanian coast.

Last June, the Oregon made a cruise off Colombia to complete the preliminary shrimp trawl coverage of the mainland coast of the Caribbean. Details of the cruise will be shown you in the accompanying motion picture and will be brought out during the narrative. Of prime importance, however, was the discovery of an area of trawlable bottom of about 700 square miles off the Gulf of Darien. Here exploratory catch rates of brown shrimp ranged up to five boxes of shrimp per two nights fishing with double rigged gear.

Reaching beyond the southwestern corner of the coast, into international waters off Venezuela for a moment, it might be added that the Oregon made a cruise off Venezuela in the fall of 1962. The only area where shallow water shrimp showed up in any quantity at all was off the mouth of the Gulf of Maracaibo--the site of a considerable Venezuelan shrimp fishery. It would appear that the potential along the Venezuelan coast is restricted to inshore areas, with most of the present production coming from the Gulf of Maracaibo. Eastward of this point, moderately good royal red shrimp fishing was found off the Peninsula of Paraguana, but inshore shrimp catches were light and scattered. A fishery officer from Cumana, Venezuela,was aboard for the last portion of the cruise, and several shrimp trawl drags made under his direction in the Gulf of Paria and along the eastern edge of the Caribbean coast of Venezuela failed to turn up significant findings.

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GULF STATES MARINE FISHERIES COMMISSION
Brownsville, Texas
The Holiday Inn
October 15-16, 1964

"PROGRESS REPORT: TEXAS BLUE CRAB STUDIES"

Terrance R. Leary, Coordinator
Coastal Fisheries
Texas Parks & Wildlife Department
Austin, Texas

The blue crab fishery in Texas has been developed largely since 1960 and is located on the upper and less saline portion of the Texas Coast. Landings at first rose steadily as the fishery was expanded but have declined in 1963 and 1964. Fluctuations in production are common in the crab industry. Our study is aimed at determining the extent and cause of any variations in the crab populations.

The blue crab study is an offshoot resulting from collections associated with the older shrimp and finfish programs. The crab study is in only its third year.

Methods employed in the study include sampling of the larval stages at the Gulf passes, sampling of juvenile and adult stages with seines and trawls, tagging of the adult stage, and checking the commercial catches.

Sampling of the larval crab stages is accomplished simultaneously with our sampling for shrimp post larvae. One method employs a large plankton net, towed in the Gulf passes for a standard period at different depths. The net is one meter in diameter, has a mesh size of one quarter millimeter, and has a water flow meter installed in the mouth. The net is similar to one used at the University of Miami in their pink shrimp research.

Another device used for collecting larval crabs and post larval shrimp is the small sampler pulled on foot in an arc around a stake located at the edge of a pass. The line between the stake and the sampler is a standard length to provide a standard distance of towing. This sampler is patterned after one used by the Bureau of Commercial Fisheries out of the Galveston Laboratory.

A small beam trawl towed along the bottom of the pass channel is the third kind of larvae sampler. The liner within the webbing of the trawl is small enough to retain the crab larvae.

A comparison of the abundance of megalops larvae in the pass samples with an earlier check of abundance of sponge crabs in adult crab sampling does not necessarily show a relationship. These early indications in our work tend to parallel Pearson's work in Chesapeake Bay where he found no corre-

lation between the number of sponge crabs and their progeny. Similarly, we are finding the same fluctuations in crab populations both in areas with and without heavy fishing pressure on the crabs. Our state has no restrictions on the fishery.

For juvenile crabs, shrimp, and fish a six foot bar seine is pulled in the shallow back bays and bayous. This seine can be operated by one man and works fairly well over submerged grass.

A 60 foot minnow seine is pulled in the productive estuarine nursery area and the juvenile fish, shrimp, and crabs are counted and measured. Spring and late summer peaks of crab abundance are reflected in the sampling.

Twenty and ten foot trawls are used at deeper water stations to obtain crabs for tagging and to measure the abundance of adults and juveniles. Any individuals parasitized with Sacculina are noted.

This year the number of juvenile crabs in the 10 foot trawl samples has increased considerably over the index from previous years. This gives us hope for an improved fishery next year.

Crab traps like those used by commercial fishermen also provide adult crabs for tagging studies. Several types of tags have been employed. Spaghetti dart tags were inserted in the posterior lateral suture or in the muscular portions of a swimming leg between the carapace and the coxa. However, these tags did not always permit the crab to shed and considerable dexterity was required in placing the tag. A method used by Van Ingle and in which the tags were inserted along the split line on the under surface of the shell had similar results.

The method used most successfully is one described by Cronin and used in Virginia. It consists of a monel wire with loop at each end fastened over the lateral spines. A Petersen disc is threaded on the wire. The tag is of course lost in shedding; so this method is restricted to adult crabs, generally 150 to 180 mm. in width.

The longest time a tagged crab has been free before being returned was 237 days. There has been a greater percentage of return of tags from male crabs than from the female, probably because the females move out of the area of the bay fishery to spawn. One female tagged as a sponge crab in the bay in mid-April was recovered on the Gulf beach in early June after she had spawned. Although there has been no pattern to the movement of male crabs from the tag returns, the females have shown definite movement from the upper bay towards the passes after mating.

Finally, a check of the commercial plants gives us an indication of production and yield, which may range from 18 to 12 pounds of meat per 100 pounds of crabs depending on the condition. Sponge crabs with a low meat

yield are taken commercially in Texas and for a period in the spring constitute a large part of the landings. Protection of the sponge crab as well as a minimum size limit has been advocated both as a conservation measure and as an economic measure for the processing plants. At this time we do not see a biological need for such restrictive measures; but should conditions warrant action in the future our studies will assist us in determining the course to take.

* * * * * * * * *

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Brownsville, Texas
The Holiday Inn
October 15-16, 1964

"COMMERCIAL FISHERIES RESEARCH & DEVELOPMENT ACT OF 1964"

Russell T. Norris
Assistant to the Director
Bureau of Commercial Fisheries
Washington, D. C.

It is a great pleasure to appear before you today to discuss the Commercial Fisheries Research and Development Act of 1964. We in the Bureau of Commercial Fisheries welcome the opportunity to tell your something about this new law which, in our opinion, is one of the most significant developments in fisheries legislation since the passage of the Fish and Wildlife Act of 1956. Surely those of you involved in commercial fisheries work along the Gulf Coast will have a great interest in the implementation of this legislation as it develops. We believe it will provide for an acceleration of State efforts into commercial fisheries problems, and we are sure these increased State efforts will complement our Federal research program.

This new law has had a long legislative history, starting with the introduction of a bill by Congressman Coffin of Maine in the 86th Congress in 1960. The Coffin bill would have apportioned to the States all funds which the Bureau now has under the Saltonstall-Kennedy Act. Senator Gruening of Alaska introduced a similar bill that same year, which would have doubled the amount of funds available under the S-K Act and made part of them available for apportionment to the States. Both of these bills died with the adjournment of the 86th Congress. Several other bills introduced into the 87th Congress met similar fates.

Progress on this legislation during the first session of the 88th Congress went something like this. Senator Bartlett of Alaska introduced S. 627 on January 31, 1963. There were 28 co-sponsors for this bill. Other identical bills were introduced in the House, along with several similar bills. Senate hearings were held in April 1963, and the bill was reported out of committee on June 27. It was passed by the Senate on July 22, 1963, by a 51-22 vote.

No House hearings were held during the first session of the 88th Congress, but the Committee on Merchant Marine and Fisheries did hold hearings in March 1964. The House version of this bill was reported out of committee on April 28, and it passed the House on May 4 of this year. Two days later, the Senate concurred with the House amendments, and on May 20, the bill became Public Law 88-309.

During this long and arduous process, many State and industry people were of great assistance in obtaining passage of this legislation. The House and

(Norris #2)

Senate hearings contain many pages of testimony by several of you in this room. Without your help we might not have this legislation today.

Now, let us review briefly the language of this Act. I should like to quote directly from Section 3 (a): "The purpose of this Act is to authorize the Secretary of the Interior to cooperate with the States through their respective State agencies in carrying out projects designed for the research and development of the commercial fisheries resources of the Nation. Federal funds made available under this Act will be used to supplement, and to the extent practicable, increase the amounts of State funds that would be made available for commercial fisheries research and development in the absence of Federal funds."

I should like to place particular emphasis on the last sentence in the above quotation from Section 3(a). State funds must be additional funds provided for this program, and not funds diverted from some other commercial fishery project, except that during fiscal years 1965 and 1966, the fact that a State legislature did not meet after approval of the Act will be considered evidence that it is not practicable for the State agency to furnish funds that have not been previously used for other commercial fishery projects.

Section 3(b) allows two or more States to act jointly in carrying out a project. In this section, the Congress also consents to any compact or agreement between any two or more States for the purpose of carrying out a project.

Section 4 of the Act authorizes the appropriation of funds to the Secretary of the Interior to carry out the purposes of this legislation. The major portion of such funds ($5,000,000) would be apportioned to the States to provide the Federal share of the costs of research and development projects. In addition, $400,000 are authorized to be appropriated, which will be made available to the States in such amounts as the Secretary may determine appropriate for the purpose of the Act, provided that preference shall be given to those States in which there is a commercial fishery failure due to a resource disaster arising from natural or undetermined causes. These funds may be used either by the States or directly by the Secretary in cooperation with the States for any purpose that the Secretary determines is appropriate to restore the fishery affected by the failure or to prevent a similar failure in the future. Also, $100,000 are authorized to be appropriated, which will be made available to the States in such amounts as the Secretary may determine for developing a new commercial fishery therein. The resource disaster and new commercial fishery funds do not require State matching monies.

Please note that this legislation does not appropriate funds. It simply authorizes the appropriation of funds during the first fiscal year after enactment and in the four subsequent fiscal years. Only $400,000 have been appropriated to date to implement this legislation. These funds, which were added to the Interior Department appropriation bill on the Senate floor, are to be used by the Secretary in States suffering a commercial fishery failure due to a resource disaster arising from natural or undetermined causes. A determination has been made that such a failure exists in the chub fishery of the

Great Lakes as a result of the several deaths which were traced to botulism in smoked fish last fall. Therefore, all of these funds will be used to alleviate the serious situation which exists in this segment of the industry in fiscal year 1965. In subsequent years, such funds as are necessary will be available to other segments of the industry suffering from similar fishery failures arising from resource disasters.

I wish I could announce today that the other sections of the Act had been funded, but unfortunately this is not the case. However, great progress has been made during the past year. We now have a law, one section of which is funded, and we are optimistic that at least partial funding of the balance of the program during this fiscal year will be possible. You can be assured that full attention is being given this matter at all levels in government. The interest in this program in the Congress, particularly among the sponsors of the legislation, is evident. At a recent hearing on a supplemental budget request, which did not contain this particular item, Senator Bartlett urged immediate action to appropriate the funds necessary to fully implement the program. This Act provides an initial authorization of five years beginning this year, the first fiscal year after enactment. Any delay in appropriation of funds until fiscal year 1966 would result in a loss of one-fifth of the total program.

It is Section 4(a) and the funds which it authorizes to be appropriated which are of the most interest to you. This section of the Act specifies an annual figure of $5,000,000 which can be made available by Congressional action. These we call research and development funds, in contrast to the resource disaster and new fishery funds authorized in Section 4(b) and 4(c) of the Act.

This $5,000,000 or some lesser amount, when appropriated, will be apportioned to the States, by the Secretary, on July 1 of each year or as soon as practicable thereafter, according to a somewhat complicated formula reflecting the value of the fishing industry in the various States. These apportionments are based on the three most recent calendar years for which data satisfactory to the Secretary are available. No State may receive an apportionment for any fiscal year of less than one-half of one percent of the funds, or more than six percent of the funds.

Any apportionment for any fiscal year remains available to carry out the purposes of the Act until the close of the succeeding fiscal year and if unobligated at the end of that year, the sum is returned to the Treasury of the United States.

The law provides that the Secretary is authorized to cooperate with the States "through their respective State agencies" which are defined as "any department, agency, commission, or official of a State authorized under its laws to regulate commercial fisheries." The Secretary has already asked each Governor to identify the agency or official within his State with whom contact is to be maintained.

After the appropriations of funds, any State desiring to avail itself of the benefits of the Act may, through its State agency, submit to the Secretary full plans, specifications, and estimates of any project proposed for that State. If the Secretary approves these plans, specifications and estimates, he will notify the State agency and immediately set aside so much of the appropriation made available under Section 4(a) of the Act as represents the Federal share payable under the Act on account of the project, which sum shall not exceed 75 percent of the total estimated cost of the project.

Section 8 of the Act authorizes the Secretary to make such rules and regulations as he determines necessary to carry out the purposes of the Act. These rules and regulations appeared as a "Notice of Proposed Rule Making" in the Federal Register on July 10. Copies were furnished to all States and other interested individuals or organizations. Comments, suggestions, or objections with respect to these draft regulations have been submitted and evaluated. The regulations were promulgated in final form by publication in the Federal Register on October 3 and will serve as a guide in the administration of this Act. Copies have been sent to each State and an additional supply is available here today.

In anticipation of an early appropriation of funds we are making all the necessary preparations so that the program can proceed without delay. Preliminary guidelines or criteria to be used in evaluating project proposals have been prepared, and copies are being made available to State administrators at this meeting. We solicit your comments, and we will be glad to discuss them with you. The same criteria were discussed with State people at the Atlantic States Marine Fisheries Commission meeting in Atlantic City last month. Since that time we have received comments on them, and they are subject to considerable revision before final adoption. We also plan to meet with the Pacific States Commission in San Francisco next month, and a special meeting will be arranged with the State administrators of the Great Lakes and other inland States.

We are confident that the research and development programs financed under this Act will benefit the commercial fishery resources of all the States. This increased financial support to State fishery agencies will help strengthen their staffs and facilities. This will, in turn, lead to improvement of the total fishery effort in the United States.

The Bureau is anxious to get on with this work and we look forward to working with you on this new program as soon as the necessary funds are available.

* * * * * *

PROGRAM

(Commission Chairman, Richard H. Cory, Presiding)

Thursday (April 9)

9:00 AM

REGISTRATION

9:30 AM

CALL TO ORDER

INVOCATION
Reverend John B. Koelemay
Gentilly Methodist Church

ROLL CALL

WELCOME ADDRESS
Chairman A. J. Buquet
Louisiana Wild Life & Fisheries Commission

ADDRESS
Chancellor Homer L. Hitt
Louisiana State University In New Orleans

IMPORTANCE OF THE ESTUARINE ENVIRONMENT
J. Laurence McHugh
Assistant Director for Biological Research
Bureau of Commercial Fisheries

11:00 AM

RECESS *Fifteen Minutes*

11:15 AM

PROGRESS REPORTS:

STATE AND FEDERAL GULF ESTUARINE RESEARCH
Theodore B. Ford
Louisiana Wild Life & Fisheries Commission

Spencer H. Smith
Bureau of Sport Fisheries & Wildlife

BUREAU OF COMMERCIAL FISHERIES PESTICIDES PROGRAM
Philip A. Butler
Bureau of Commercial Fisheries

ADJOURNMENT *Luncheon*

1:45 PM

GULF SHRIMP CROP PROSPECTS FOR 1964
Robert M. Ingle—Moderator
Florida State Board of Conservation

Panel:
J. Y. Christmas
Gulf Coast Research Laboratory
Joseph H. Kutkuhn
Bureau of Commercial Fisheries
Terrance R. Leary
Texas Parks & Wildlife Department
Jack C. Mallory
Alabama Department of Conservation
Lyle S. St. Amant
Louisiana Wild Life & Fisheries Commission

2:45 - 3:00 PM

DISCUSSION

RECESS *Fifteen Minutes*

3:15 PM

PROGRESS REPORT: GULF MENHADEN RESEARCH
Dr. Kenneth Henry
Bureau of Commercial Fisheries

REVIEW: INDUSTRIAL BOTTOMFISH FISHERY OF THE GULF 1959-62
Charles M. Roithmayr
Bureau of Commercial Fisheries

4:00 PM

ADJOURNMENT

4:30 PM

MEETING OF RESOLUTIONS COMMITTEE

Friday (April 10)

7:30 - 9:15 AM

COMMISSION EXECUTIVE SESSION
BREAKFAST—ROBERT E. LEE ROOM

9:30 - 12:00 Noon

GENERAL SESSION—QUEEN ANNE ROOM

ANNOUNCEMENTS

PROGRAM: GULF COAST SHELLFISH SANITATION RESEARCH CENTER
Richard J. Hammerstrom
U. S. Public Health Service

April 9-10-1964 Monteleone, New Orleans

FLORIDA'S RESEARCH ON SHELLFISH PURIFICATION

Robert M. Ingle
Florida State Board of Conservation

DISCUSSION: POSSIBILITY OF UP-DATING GSMFC INFORMATIONAL SERIES NO. 2, THE SHRIMP FISHERY OF THE GULF OF MEXICO (RIO GRANDE RIVER TO ST. MARKS, FLORIDA), MARCH 1959

Gordon Gunter—Moderator
Gulf Coast Research Laboratory

Panel:
William J. Demoran
Mississippi Marine Conservation Commission

Robert M. Ingle—Florida
Jack C. Mallory—Alabama
Lyle S. St. Amant—Louisiana
Terrance R. Leary—Texas
Joseph H. Kutkuhn—BCF

ADJOURNMENT

★

Gulf States Marine Fisheries Commission
312 Audubon Building
New Orleans, Louisiana 70112

Commissioners

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

Alabama
Claude D. Kelley
L. W. Brannan, Jr.
Will G. Caffey, Jr.

Florida
W. Randolph Hodges
Bruce J. Scott
Walter O. Sheppard

Louisiana
L. D. Young, Jr.
Alvin Dyson
Feltus Daigle

Mississippi
George A. Brumfield (Vice-Chairman)
Open
Hermes Gautier

Texas
J. Weldon Watson
Richard H. Cory (Chairman)
Virgil Versaggi

★

W. Dudley Gunn
Director

GULF STATES MARINE FISHERIES COMMISSION

Annual Spring Meeting

New Orleans, La.

The Monteleone Hotel

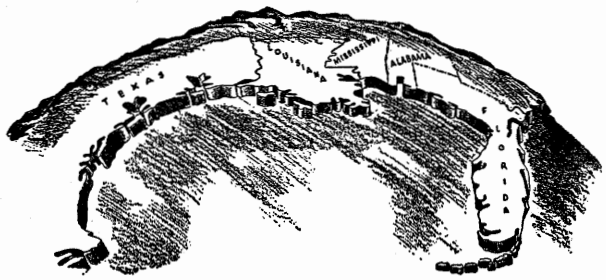
Queen Anne Room

April 9 (Thursday) - 10 (Friday), 1964

Pre-meeting Session State Representatives on Fisheries Laws, 10:30 a.m., April 8 (Wednesday)—Iberville Room.

THE CAPITOL
STATE OF LOUISIANA
BATON ROUGE

Gulf States Marine Fisheries Commission



M I N U T E S

REGULAR MEETING

MONTELEONE HOTEL

NEW ORLEANS, LOUISIANA

APRIL 9-10, 1964

GULF STATES MARINE FISHERIES COMMISSION
312 Audubon Building
New Orleans, Louisiana 70112

M I N U T E S

REGULAR MEETING, APRIL 9-10,1964
MONTELEONE HOTEL
New Orleans, Louisiana

OFFICIAL ATTENDANCE OF COMMISSIONERS

	PRESENT	ABSENT
ALABAMA		Claude D. Kelley L. W. Brannan, Jr. Will G. Caffey, Jr.
FLORIDA	W. Randolph Hodges Bruce J. Scott Walter O. Sheppard	
LOUISIANA	L. D. Young, Jr. Alvin Dyson	Feltus Daigle
MISSISSIPPI	George A. Brumfield Theodore Millette	Hermes Gautier
TEXAS	J. Weldon Watson Richard H. Cory Virgil Versaggi	
PROXIES	George W. Allen Jack C. Mallory Bruce J. Scott Lyle S. St. Amant	(For Claude D. Kelley) (For Will G. Caffey) (For W. Randolph Hodges, 4/10/64) (For L. D. Young, Jr., 4/10/64)
STAFF	W. Dudley Gunn Mrs. Ellen S. Hoover	

FORMER COMMISSIONERS PRESENT

E. J. Grizzaffi, Ernest C. Mitts, James H. Summersgill.

OTHER STATE GOVERNMENT REPRESENTATIVES PRESENT

Gerald Adkins, Barney Barrett, J. G. Broom, Delano R. Crawford, Joseph A. D'Alfonso, Theodore B. Ford, Wilson Gaidry, H. V. Gibson, Thomas S. Gilbert, Steve Harmon, Robert M. Ingle, Edwin A. Joyce, Jr., Terrance R. Leary, J. R. Singleton, William J. Demoran.

FEDERAL GOVERNMENT REPRESENTATIVES PRESENT

BUREAU OF COMMERCIAL FISHERIES: Harvey R. Bullis, Jr., Charles R. Chapman, Kenneth A. Henry, Joseph H. Kutkuhn, Milton J. Lindner, J. L. McHugh, Charles Roithmayr, Ed Smith, George W. Snow, James E. Sykes, Seton H. Thompson.

BUREAU OF SPORT FISHERIES AND WILDLIFE: William H. Herke, Spencer H. Smith, R. O'Neal Smitherman.

COAST GUARD: Ottis H. Abney, George L. Oakley.

FOOD AND DRUG ADMINISTRATION: Jean A. Gaul, Richard F. Heuermann.

PUBLIC HEALTH SERVICE: J. Paul Bowers, Jack L. Gaines, Richard J. Hammerstrom.

DEPARTMENT OF STATE: William C. Herrington

UNIVERSITY REPRESENTATIVES PRESENT: Charles Caillouet, J. Y. Christmas, Jr., Lewis T. Graham, James B. Higman, Homer L. Hitt, John S. Lynch, Jos. A. Riehl.

REPRESENTATIVES OF INDUSTRY PRESENT: A. J. Buquet, Lester J. Cheramie, Jr., John Clegg, L. E. Demarest, J. Roy Duggan, T. B. Holcombe, Clerville Kief, Sr., Emile Lapeyre, Jr., John Mehos, James L. McConnell, Harry I. McGinnis, James McPhillips, Gordon M. Millet, John Ray Nelson, Waldo J. Orrson, Harold Plaisance, Wallace Quinn, Earl M. Rome, Samuel Sazer, Paul P. Selley, Ray Skrmetta, L. W. Strasburger, John Versaggi, Robert P. Waldron.

REPRESENTATIVES OF COMMERCIAL AND SPORT FISHERY ASSOCIATIONS PRESENT:

William J. Allen, F. P. Longeway, Jr., O. M. Longnecker, Jr., Bernard Lorino, William R. Neblett, Joseph S. Ramos, H. R. Robinson, Ted Shepard, Mrs. David H. Wallace.

CLERGY.....NEWSMEN PRESENT:

John B. Koelemay

Marvin R. Fox, Bern Rotman

GENERAL SESSION, APRIL 9, 1964

Commission Chairman Cory called the meeting to order at 9:45 a.m. The group was asked to stand in silent tribute to the late James N. McConnell and Chester A. Delacruz prior to the rendering of the invocation by Reverend John B. Koelemay, Pastor, Gentilly Methodist Church of New Orleans.

Preceding the calling of the roll of Commissioners, the Chairman introduced Commissioner Theodore Millette, recently appointed legislative representative from the State of Mississippi.

Mr. A. J. Buquet, Chairman, Louisiana Wild Life and Fisheries Commission, was introduced for the purpose of welcoming the group. Copy of his remarks is first attached to these Minutes.

The keynote speaker for the session was next presented. Copy of the address by Dr. Homer L. Hitt, Chancellor, Louisiana State University in New Orleans, on the subject "Our Common Resources" is second attached to these Minutes.

Dr. J. Laurence McHugh, Assistant Director for Biological Research, Bureau of Commercial Fisheries, next spoke to the group on "The Importance of the Estuarine Environment." Copy of Dr. McHugh's paper is third attached to these Minutes.

Chairman Cory expressed appreciation for the splendid presentations of the opening session and invited all delegates to join the Commissioners for coffee.

Resuming the morning's General Session and continuing consideration of the estuarine environment, the Chairman called upon Dr. Theodore Ford, Louisiana Wild Life and Fisheries Commission and Chairman of the GSMFC Estuarine Committee, who presented a resume of the research activities of the fisheries agencies of the member states. Copy of the report is fourth attached to these Minutes.

For an estuarine research progress report on activities of the Bureau of Sport Fisheries and Wildlife, Mr. Spencer Smith, this region's supervisor of the Branch of River Basin Studies, was presented. Copy of Mr. Smith's comments is fifth attached to these Minutes.

Dr. Philip A. Butler, Director, Bureau of Commercial Fisheries Shellfish Research Laboratory, Gulf Breeze, Florida, was scheduled to render a report on the Bureau's pesticides research program but was unable to be present.

Sufficient time was available before the scheduled adjournment for luncheon for reports on the Bureau of Commercial Fisheries Gulf vessel construction program. Mr. Harvey R. Bullis, Director, Gulf and South Atlantic Exploratory Fishing Program, Pascagoula, reported on replacement plans for the exploratory vessel OREGON. Dr. Joseph H. Kutkuhn, Assistant Director, Biological Research Laboratory, Galveston, told of plans for an oceanographic research vessel. Blueprints of both vessels were on display in the meeting room.

The session was adjourned for luncheon at 12:15 p.m.

The Chairman called the afternoon session to order at 1:45 p.m. and announced that Mr. Robert M. Ingle, Florida State Board of Conservation, would preside at a panel consideration of "Gulf Shrimp Crop Prospects For 1964". The following were introduced as panelists: J.Y.Christmas, Gulf Coast Research Laboratory; Dr. Kutkuhn; Terrance R. Leary, Texas Parks and Wildlife Department; Jack C. Mallory, Alabama Department of Conservation; and Lyle S. St. Amant, Louisiana Wild Life and Fisheries Commission.

Mr. Ingle, Chairman, GSMFC Shrimp Committee, spoke briefly of the Committee's efforts in appraising the shrimp research programs of the Gulf States and the Federal Government on a continuing basis, and, how in working cooperatively procedures had been standardized. He added that Alabama and Florida did not have programs at present which would indicate possible abundance of the 1964 shrimp crop. Reports from Mississippi, Texas, the Bureau of Commercial Fisheries and Louisiana are grouped and appear sixth attached to these Minutes.

Resuming the session following a short recess, the Chairman introduced Dr.Kenneth A. Henry who recently was appointed Director, Bureau of Commercial Fisheries, Biological Laboratory, Beaufort, North Carolina, and who is responsible for Atlantic-Gulf menhaden research. Copy of Dr. Henry's "Progress Report on Gulf Menhaden" is seventh attached to these Minutes.

The closing presentation for the session was given by Mr.Charles M. Roithmayr who is project leader for the Bureau of Commercial Fisheries Industrial Bottomfish Program,Pascagoula. His report, "A Review of the Industrial Bottomfish Fishery of the Gulf of Mexico-1959-62" was highlighted through the showing of slides.Copy of the review is eighth attached to these Minutes.

Chairman Cory not receiving any response oncall for further matters for presentation, expressed the appreciation of the Commissioners for the interesting and enlightening presentations of the day and the very representative attendance. He reminded the delegates of the Seafood Soiree which was scheduled for 6-8 p.m. in the Louisiana Wild Life and Fisheries Building, by co-hosts, the Louisiana Shrimp Association and the Louisiana Oyster Dealers and Growers Association.

Representatives of State and Federal Government and Industry met with Mr.William C.Herrington, Department of State, from 4 - 6 p.m. in the council chamber of the Wild Life and Fisheries Building

The GSMFC Resolutions Committee composed of Messrs. Allen, Mallory, Millette, Scott, St. Amant and Versaggi, and accompanied by Chairman Cory, Vice-Chairman Brumfield and Director Gunn, met from 6-6:45 p.m. in the Wild Life and Fisheries Building.

Friday (April 10th)

The Commission Executive Session began with the serving of breakfast in the Robert E. Lee Room at 7:30 a.m. Upon adjournment, the Commissioners proceeded to the Queen Anne Room for the closing General Session of the meeting.

Upon calling the session to order, Chairman Cory expressed the very sincere appreciation of the delegates to the Louisiana Oyster Dealers and Growers

Association and to the Louisiana Shrimp Association for the entertainment of Thursday evening. He also extended thanks to the Louisiana Wild Life and Fisheries Commission and its staff for their contribution in making the evening such an enjoyable one. The Chairman praised the Monteleone management and staff for the cordial hospitality extended, and excellent food and services enjoyed, during the course of the meeting.

Of general interest, the Chairman advised the group of two resolutions which had been adopted at the Executive Session; one which requests the U. S. Coast Guard not to take action with respect to any changes in the specifications and requirements for lights and fog signals on offshore platforms until an advisory panel having fishing interests represented could be appointed and have had an opportunity to study any suggested changes in the aids to navigation; and a second which resulted from a pre-meeting session of state representatives on fishery laws and which resolution requests the member states to enter into reciprocal agreements pertaining to commercial fishing license requirements.

Continuing with the session, the presiding officer introduced Dr. Richard J. Hammerstrom, Director, U. S. Public Health Service Gulf Coast Shellfish Sanitation Research Center, Dauphin Island, Alabama. Copy of Dr.Hammerstrom's review of the Laboratory's program is ninth attached to these Minutes.

Mr. Ingle was unable to attend the Friday session and speak on the subject, "Florida's Research on Shellfish Purification". Mr. Delano R. Crawford of the Florida State Board of Conservation, St. Petersburg Laboratory, was introduced to address the group on the same subject. Copy of this paper is tenth attached to these Minutes.

The following scheduled discussion was postponed: "Possibility of Up-dating GSMFC Informational Series No. 2....The Shrimp Fishery of the Gulf of Mexico (Rio Grande River to St. Marks, Florida), March 1959. Dr. Gordon Gunter, Director, Gulf Coast Research Laboratory, was to have served as moderator. Panelists were to have been Messrs. Demoran, Ingle, Mallory, St. Amant, Leary and Kutkuhn. Dr. St. Amant explained to the group that Messrs. Ingle and Demoran were absent and that Dr. Gunter and Mr. Ingle were two of the four authors of Informational Series No. 2. It was his suggestion that the subject be considered at a later meeting.

Chairman Cory received no response upon call for additional subjects for consideration. Before adjourning the meeting, he again expressed the Commission's appreciation for the contribution made by the several speakers on the program and for the interest exhibited by the delegates. The group was informed of and cordially invited to attend two future scheduled meetings of the body: October 15-16, 1964, Holiday Inn, Brownsville, Texas, and March 18-19, 1965, Admiral Semmes Hotel, Mobile, Alabama.

The meeting was adjourned at 12:10 p.m.

Prepared by: W. Dudley Gunn
Director

M I N U T E S

EXECUTIVE SESSION, NEW ORLEANS, LOUISIANA, APRIL 10, 1964

The Commissioners met in the Robert E. Lee Room of the Monteleone Hotel at 7:30 a.m. for breakfast. Mr. Seton Thompson, Director, Region 2, Bureau of Commercial Fisheries, was invited to join the group for breakfast and to present two matters which he said were of interest to the Commission. Mr. Thompson first spoke of the movement in the Gulf of certain foreign fishing vessels which he said appeared to be carrying on exploratory fishing. He was of the opinion that, while such traffic was infrequent at present, it was likely to increase steadily in the months ahead. The Bureau committed itself to keeping the Commission's New Orleans office informed of the fishing endeavor of foreign flag vessels in the Gulf.

Mr. Thompson distributed a memorandum which covers the second item he wished to present; copy of which is herewith first attached. In discussion of the matter of the OREGON being transferred for work in the South Atlantic area and explorations in the Gulf being drastically reduced to provide an approximate two year period in which the technical personnel at the Pascagoula base would assemble and process data collected over the years by the OREGON, it was suggested to Mr. Thompson that with prospects for Gulf fishing by foreign craft appearing so real it might be better to continue with the exploratory effort in the Gulf. Mr. Thompson excused himself at 8:15 a.m. and Chairman Cory called the Executive Session to order. The Bureau's plans for the exploratory work was not discussed further.

The Chairman called upon Director Gunn who inquired as to the Commission's pleasure regarding the reading of the Minutes of the last meeting. Mr. Allen moved and Mr. Dyson seconded that the October 1963 meeting Minutes be approved without reading. Upon vote the motion passed.

The Director presented the following financial statement which was prepared March 31, 1964:

Balance In Bank, June 30, 1963		$1,727.50
Received from States, 1963-64		20,500.00
		$22,227.50
(Alabama	$3,500)	
(Florida	4,500)	
(Louisiana	5,000)	
(Mississippi	1,500)	
(Texas	6,000)	
Budget, 1963-64		$20,266.25
Estimated Balance In Bank, June 30, 1964		$ 1,961.25

There were no comments on the financial position of the Commission. Mr. Scott moved for approval of the Statement. Mr. Watson seconded and upon vote the motion passed.

Reporting on the status of S. 627, a bill designed to promote State commercial fishery research and development projects and for other purposes, the Director said the bill, which passed the Senate last July 26 was still being considered in House committee. As for S-1988, he said that on March 25 the bill was favorably reported to the House. This bill, which was said to have passed the Senate October 1, 1963, is designed to prohibit fishing in territorial waters of the United States by persons other than nationals or inhabitants of this country. Both of the mentioned bills were previously approved by resolution of the Commission and supported at the Washington hearing by both the Commission and state representatives.

The Commissioners were advised that Mr. Versaggi, in company with Mr. Oscar Longnecker, Texas Shrimp Association Director, had visited possible headquarters locations in Brownsville for the October 15-16, 1964 meeting and had selected the Holiday Inn of that city.

It was decided that the March 18-19, 1965 meeting site selection of either Mobile or Point Clear be left to the Director.

The Chairman called upon Dr. St. Amant to explain two resolutions which had been approved at the Resolutions Committee session on Thursday evening. The first recommended resolution resulted from the Wednesday, April 8, meeting of state people to consider fishery laws, licenses, etc. Following discussion Dr. St. Amant moved for adoption of the resolution, which concerns the entering into reciprocal agreements by the member states. Mr. Dyson seconded and upon vote the resolution was adopted. Copy of the resolution is herewith second attached.

A second suggested resolution concerns requesting the U. S. Coast Guard not to take action with respect to any changes in the specifications and requirements for lights and fog signals on offshore platforms until an advisory panel having fishing interests represented could be appointed and have had an opportunity to study any suggested changes. Dr. St. Amant moved that the resolution be adopted. Mr. Brumfield seconded and upon vote the motion passed. Copy of the resolution is herewith third attached.

Mr. Dyson moved that the Director be instructed to prepare appropriate resolutions of appreciation and addressed to the Louisiana Wild Life and Fisheries Commission, the Louisiana Shrimp Association and the Louisiana Oyster Dealers and Growers Association. Mr. Scott seconded and upon vote the motion passed. The resolutions appear in the order listed above as attachments hereto; fourth, fifth and sixth.

Mr. Sheppard moved that a resolution of appreciation be prepared and addressed to the management and staff of the Monteleone Hotel. Mr. Dyson seconded and upon vote the motion passed. Copy of the resolution is herewith seventh attached.

Mr. Allen said Mr. Scott had made a suggestion that would add considerable attractiveness to the setting at Commission meetings. Mr. Scott explained his thought to be that flags of the five Gulf States should be displayed at meetings. He so moved, adding that the State Directors be asked to furnish flags. Mr. Allen seconded and upon vote the motion passed.

Mr. Watson moved that the Commission Chairman be given the authority to waive the two weeks advance notice clause for special meetings of the Commission as is provided in the Rules and Regulations. Mr. Allen seconded and upon vote the motion passed.

Chairman Cory advised the Commissioners that an additional $25 was needed the evening of April 9 to cover the cost of oyster shuckers at the soiree and that he had instructed the Director to provide that amount and enter same in his April expense account.

No further business remained to be transacted and the session was adjourned at 9:15 a.m., whereupon the group proceeded to the Queen Anne Room for the closing General Session of the meeting.

Prepared by: W. Dudley Gunn
Director

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF COMMERCIAL FISHERIES

PASCAGOULA FISHERY STATION
P. O. BOX 630
PASCAGOULA, MISSISSIPPI

April 7, 1964

MEMORANDUM TO THE GULF STATES MARINE FISHERIES COMMISSION

Gentlemen:

As you know, the Gulf of Mexico Exploratory Fishing and Gear Research Program was established in 1950 at the request of this Commission. In that year the Oregon, a surplus vessel constructed in 1946, was transferred to the Gulf to serve this program. Through the ensuing 14 years, the Exploratory Program staff has endeavored to conduct surveys and projects with strong industry orientation and to provide results that had either immediate value to the fishermen and producers, or were designed to stimulate vessel crews and vessel owners to broaden their horizons by providing fishing information on species available but not utilized and on grounds beyond the existing range of the fisheries. Our efforts have been largely guided by the expressed desires of this Commission and have been put into operation by a staff of imaginative practical technical experts who have devoted themselves to the expansion of the Gulf fishing industry.

The budget for the Gulf Exploratory Program has not changed much since the Program started. We have not appealed to the Commission for increased funding. We have put every effort into living within the existing budgetary framework. As equipment and vessel facilities were found to be inadequate for undertaking some of the tasks at hand, these were noted, and justifications were submitted through regular channels. We are pleased to report that now the basic and fundamental elements of these requests have been included in the future program of the Bureau.

The first tangible evidence can be seen in the completed plans for the replacement of the Oregon with a modern, larger, and more powerful vessel specifically designed for our type of work. Construction funds are provided in next year's budget. Also, a smaller vessel designed for inshore clam and scallop surveys is in the foreseeable future.

April 7, 1964

At the present, two things are needed. First, we urgently need to summarize the total exploratory effort to date. There are numerous promising leads for future projects. Locked within the records accumulated over these 14 years is the information needed to evaluate these leads and determine priorities. Second, if further activities of exploratory fishing and gear research are to receive internal support within the Government, we must provide our superiors with justifiable, meaningful, long-range plans, and we must utilize the tremendous backlog of data now locked in our files to do this.

It is quite apparent to us that we cannot undertake this comprehensive review, evaluation, and planning step and simultaneously continue full scale sea-going research and development activities. The staff is too small and the program is not funded for extra or additional tasks of this magnitude. It might seem that this would be a good time to plead for increased funding and staffing. Considerable thought has indicated that this would not provide the best solution. We need the men who have participated in the field work to turn to the records and data they have accumulated for review and summation. Additional staffing at this time would provide only men new and unexperienced in the program operations and objectives.

Thus, for the interim between July 1, 1964, and the time we take delivery of Oregon II (an estimated maximum of 30 months), we have proposed a rather drastic reduction in the sea-going operations of the Gulf Program. We estimate that this will cover a period of some two years, sufficient to complete the tasks outlined above.

On July 1, we propose to transfer the Oregon to Brunswick, Ga., to be used in exploratory operations along the southeastern U.S. By elimination of charter payments on the presently chartered Silver Bay, we can effect a savings of some $25,000. Activities remaining within the structure of the Gulf Exploratory Program until delivery of Oregon II will be:

1. Detailed review of accumulated fishing records.

2. Long-range planning for new vessel.

3. Preparation of detailed fishing atlases for use by fishermen showing seasonal distribution patterns of species by depth and water temperatures.

4. Continuation of the "off-season" survey of menhaden stocks utilizing the George M. Bowers and chartered vessels.

5. Assembling serial bottom photographs of the Continental Shelf areas off the U.S. coasts to prepare an atlas of trawling conditions for use by U.S. fishermen.

6. Continuation of shrimp gear research projects under way concerned with the development of electrical trawls.

We do not like to see the Oregon go out of the Gulf of Mexico. In the minds of many, the names Oregon and Gulf explorations go hand-in-hand. It is our duty, however, to prepare well to meet the increasingly powerful demands of the future. The best way to do this is to clear the decks of on-hand data and plan a solid course of action for Oregon II. We have no good alternative to what I have proposed. I can assure you of our interest and desire to conduct an effective program. We believe that this is the best way to do it, and believe in our ability to prove to you through action in 1967 and subsequently with Oregon II that we haven't led you astray today. We solicit your trust that we can make the name Oregon II mean as much in your minds as has Oregon I. We would like your concurrence and support.

Harvey R. Bullis, Jr.
Base Director
Gulf and South Atlantic Exploration
and Gear Research Base

RESOLUTION

WHEREAS, certain member states of the Gulf States Marine Fisheries Commission have reciprocal agreements with reference to commercial fishermen and boat licenses; and

WHEREAS, apparently existing legal authority is vested in the director of conservation of each member state, except Texas, to enter into reciprocal agreements pertaining to commercial fishermen and boat licenses.

NOW, THEREFORE, BE IT RESOLVED that the Gulf States Marine Fisheries Commission recommends that each member state enter into reciprocal agreements with each other with reference to commercial fishing license requirements with a view towards elimination of the distinction between resident and non-resident license requirements among the member states of this Commission.

* * * * * * * *

The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission, April 10, 1964, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.

W. D. Gunn

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

RESOLUTION

WHEREAS, at a public hearing held by the United States Coast Guard Merchant Marine Council on March 23, 1964, consideration was given to Item X of the Agenda for such hearing, entitled "Amendments to Subchapter C-Aids to Navigation - (33 CFR 67)", and it was thereupon determined to defer any further action relative to said Item X for a period of ninety (90) days subsequent to the date of such hearing in order to permit additional study and comment by the various interests concerned; and

WHEREAS, the fishing fleets of member states of the Gulf States Marine Fisheries Commission in the course of their business operations regularly enter upon and navigate the waters of the Gulf of Mexico and in connection with such navigation rely on the obstruction lights and fog signals, installed on offshore platforms situated in and around the fishing grounds located in said waters, for their safe passage,

NOW, THEREFORE, BE IT RESOLVED that an Advisory Panel be created and composed of representatives of the full range of interests concerned with navigation upon the aforesaid waters, including representatives of the fish and shellfish industries; and

BE IT FURTHER RESOLVED that no action be taken with respect to any changes in the specifications and requirements covering Obstruction Markings and Navigation Aids located in subject waters until such Advisory Panel shall have been appointed and shall have had sufficient time to study and evaluate any suggested changes and submit its recommendations concerning such proposals to proper authority.

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The foregoing resolution was adopted by the Gulf States Marine Fisheries Commission, April 10, 1964, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.

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

RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission express its most sincere appreciation to the Louisiana Wild Life and Fisheries Commission for the most cordial hospitality extended upon the occasion of the annual spring meeting of the body at New Orleans on April 9-10, 1964.

BE IT FURTHER RESOLVED that this Commission especially express its gratitude to the enforcement staff of the Division of Oysters, Water Bottoms and Seafood for hosting the group to the delightful Seafood Soiree on the evening of April ninth. This acknowledgment is also extended to the Division of Education and Publicity for an excellent coverage of all sessions of the meeting.

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The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission, April 10, 1964, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.

W. D. Gunn

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

RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission express to the Louisiana Shrimp Association its sincere appreciation for the delectable Shrimp 'N Oysters Soiree tendered the group on the evening of April 9, 1964 at the Louisiana Wild Life and Fisheries Building in the City of New Orleans.

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The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission, April 10, 1964, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.

W. D. Gunn

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

RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission express to the Louisiana Oyster Dealers and Growers Association its sincere appreciation for the delectable Oysters 'N Shrimp Soiree tendered the group on the evening of April 9, 1964 at the Louisiana Wild Life and Fisheries Building in the City of New Orleans.

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The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission, April 10, 1964, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.

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

RESOLUTION

BE IT RESOLVED that the Gulf States Marine Fisheries Commission express its sincere appreciation to the management and staff of the Monteleone Hotel for the cordial hospitality and splendid food and services enjoyed by the group on the occasion of the April 9-10, 1964 meeting of this Commission at New Orleans, Louisiana.

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The foregoing Resolution was adopted by the Gulf States Marine Fisheries Commission, April 10, 1964, at a regular Commission meeting held at the Monteleone Hotel, New Orleans, Louisiana.

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

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GULF STATES MARINE FISHERIES COMMISSION
New Orleans, Louisiana
The Monteleone Hotel
April 9-10, 1964

"REMARKS OF WELCOME"

A. J. Buquet, Chairman
Louisiana Wild Life & Fisheries Commission

I am doubly grateful for the opportunity to welcome you to the spring meeting of the Gulf States Marine Fisheries Commission. Not only in my capacity as chairman of the Louisiana Wild Life and Fisheries Commission, which has always been deeply interested and vitally concerned in gulf marine fisheries; but also as an individual whose business is in oysters and shrimp, two of the most important marine fisheries with which this group is concerned.

When I consider the importance of Louisiana's annual production of oysters, shrimp and other forms of seafood, and blend it into the economic importance of marine fisheries resources to the people of Alabama, Florida, Mississippi and Texas, it becomes increasingly clear that the five gulf states are bountifully blessed by marine resources which have far from reached their full utilization.

Through the efforts of this marine fisheries commission, we are making great progress in research and production. I sincerely believe that continued research is the key to expanded production. Those of you gathered here in New Orleans from the five states making up the Gulf States Marine Fisheries Commission play a vital role in the future of gulf marine fisheries. The work that you have cut out for yourselves is challenging but the rewards are visible already and will continue to mount in the years ahead.

You will see communities fringing the Gulf of Mexico flourish with new-found prosperity. There is little doubt that the economic well being of the people engaged in marine fisheries and associated industries from Florida to Texas will continue to expand. Your efforts are fruitful already but, broadly speaking, you have just begun to tap the vast resources of marine fisheries in the Gulf of Mexico.

During the course of this meeting, you will hear from many distinguished speakers who have a message to tell and information to share that will ultimately benefit all of our people in the five-state area bordering on the gulf. The economic benefits will not end there. They will be radiated throughout the country. It is impossible in this day and time to upgrade the economy of any single area of this nation without finding growing prosperity seeping out to bolster every industry, from manufacturers of household appliances to manufacturers of clothing, automobiles and the thousand other products that serve

to make this country one of the world's finest examples of what free enterprise in a free world can bring about.

Climatic conditions play an important role in the year-to-year production of marine fisheries products. There is a way that we can jointly anticipate these changes and do what we can to keep production at a high level. Research intensification, along with manipulation of those seasons for harvesting marine fisheries products is one answer. We are making outstanding progress along that line. New avenues of research approach are continually being opened up. We should leave no stone unturned in following them.

In welcoming you to New Orleans, I would like to speak briefly about the importance which Louisiana places on its commercial fisheries, most of which are located along the coast and hinged in great degree to gulf marine fisheries.

It is extremely difficult to census the total worth of all segments of gulf fisheries. Aside from the fishermen themselves, there are many industries which participate economically in the overall value of the resource. These include boat yards, engine sales, fuel sources, ice, freezer plants, container manufacturers, transportation, even printing, and numerous other industries and manufacturers who have a definite stake in what is produced from the gulf and its estuaries.

Figures assembled by the Louisiana Wild Life and Fisheries Commission about two years ago revealed that Louisiana's gulf fisheries industry represents an estimated and conservative outlay of about $85,000,000 and employs directly over 37,000 persons.

The overall picture at that time, embracing allied industries connected with gulf fisheries operations, showed a value of around $266,000,000 invested in equipment alone. This figure is steadily growing, and the total number of persons associated with the industry, either directly or indirectly, is well over 304,000.

One of the most valuable segments of the fisheries industry is the annual shrimp crop. The broad network of bays, bayous and lakes serve as nursery grounds. Sound conservation laws in Louisiana today govern the harvesting of shrimp in both inside and outside waters. Combined efforts of commercial and sporting interests, spearheaded by the Louisiana Wild Life and Fisheries Commission, have brought the annual shrimp-take back up from a low peak; just before the 1958 Louisiana Legislature passed the present laws governing trawling and closed seasons.

I am certain that you gentlemen are well aware of shrimp production in the five gulf states. Increases were recorded in 1961, 1962 and 1963. The latter year was one of the best on record.

Research, especially on shrimp, was greatly expanded in the past two years and much progress has been made, although there remains much to be done.

Accurate predictions of shrimp growth rates and location of shrimp concentrations have been made by our biologists. I feel certain that the Louisiana Wild Life and Fisheries Commission will play an increasingly greater role in the future of the shrimp industry in Louisiana. Our research is now geared toward that end and the results will become obvious in the years ahead.

The challenge of providing food for the future is increasing. We, in the Louisiana Wild Life and Fisheries Commission, are meeting that challenge to the best of our ability. I feel that all of the delegates to this meeting share the same beliefs and are dedicated to the same tasks of research and production.

We have a unity of purpose and we are making progress. This meeting of the Gulf States Marine Fisheries Commission is a clear indication of that.

It is my sincere hope and belief that this will prove to be a most satisfactory and informative meeting. Much good will be generated and shared.

On behalf of the Louisiana Wild Life and Fisheries Commission, I repeat that it is a pleasure to welcome you to New Orleans. You will find the city pleasant and courteous.

I extend my own personal wishes for a fruitful meeting and continued progress.

Thank you.

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GULF STATES MARINE FISHERIES COMMISSION
New Orleans, Louisiana
The Monteleone Hotel
April 9-10, 1964

"OUR COMMON RESOURCES"

Homer L. Hitt, Chancellor
LSU IN NEW ORLEANS

It is quite a pleasure and quite an honor to be with you today, and to address this opening session of your annual spring meeting. You are here, of course, to discuss the business, the problems and the prospects of our Gulf States Marine Fisheries, which are matters of great importance to all of us in this Gulf of Mexico region, and which indeed are matters of importance to our entire nation. You are here as knowing and educated experts, in a cooperative spirit, to combine your many talents and bring your joint forces to bear upon the enlightened development of one of our most significant natural resources. I am here as an invited guest -- as a layman, if you will -- to voice a few thoughts of a general nature which might have some relation to your sphere of interest, and which might help establish a proper atmosphere for your activities. My theme is a rather broad one, which will permit me to relate your interests to my own. It will allow me to relate your interests to the most far-reaching interests of humanity itself. This gives me a broad range to roam. I shall speak of our natural resources as our potential wealth and power, and I shall call them our common resources. I shall consider our use of them in our continuing effort to live contented and satisfactory lives.

To establish a closer rapport at the outset, let me admit that I am not altogether a layman. I have more than a passing academic interest in the marine life of this vicinity, owning a boat of sorts, as I do, and spending the diligent hours that I do with a hook, line, and sinker out on Lake Pontchartrain. If there is anything you gentlemen can do to improve my success out there, I shall be forever grateful. Perhaps you can educate those fish and inspire them to take more interest. I read somewhere recently about some scientist who had learned to educate fish.

This fellow, I believe, was educating rainbow trout. He had learned that most of the little ones got gobbled up by their elders before they could reach maturity, so he decided to teach them some new tricks of survival. He placed them in tanks with some tin fish the size of the fish who would eat them, and he gave the tin fish a bit of an electric charge. When the little trout came near a tin fish they got shocked, and they finally learned to keep at a distance. Turned loose in the river, they gave the big fish wide berth, and fewer of their numbers got digested. I don't recall how they fared when they themselves reached adulthood and found a good meal of little fish a difficult thing to come by.

This brings to mind a story that a rancher once told me out west. It has little to do with marine life, maybe, but it does have something to do with Nature. A group of cattle ranchers out in Northern Texas were being troubled by coyotes, who were getting so numerous that they were beginning to attack their herds. They decided to exterminate these coyotes. They got out their guns and did some intensive hunting, and before too long they very nearly succeeded. When the coyotes were gone, however, the prairie-dogs ran hog-wild, and prairie-dogs soon were eating up all the grass that was supposed to feed the cattle. The only solution was to go to Wyoming and bring home a carload of coyotes. After all their efforts, they were right back where they started.

The point is that sometimes our human ingenuity brings disappointing results, because even when our rational principles are good we sometimes don't know all the facts. Or maybe we know the facts and simply overlook them. We are human, after all, and we do have limitations, and it is really only in relatively basic situations that we can truly keep our experiments under complete control.

Getting back to the sea, and to the fish, mollusks, and crustaceans therein--but not forgetting the prairie-dogs -- I would like to muse for a moment upon the challenge facing our fisheries, and to relate it if I can to the challenges facing civilization and humanity.

First there is the economic challenge. Economic gain, I think we are quite safe in saying, is the prime motivating force which sends us down to the seas in fishing boats these days, certainly along the American shores of the Gulf of Mexico. Our region wants and needs that hundred million dollars a year that it gets when its catch goes to market, and it would like to keep increasing its share of the total national sales. In order to do this, it must improve its fishing techniques, remove as many political obstructions as possible, and try to stimulate consumption of fish products. One-and-a-half billion pounds of seafood a year is impressive, but with a growing population and an increasing demand, we can and we shall get more.

This leads to the technological challenge, the scientific challenge, and the political challenge, the factors which brought this commission into being and which it is facing quite competently. You have established research centers for the study and improvement of tackle and fishing technique. You have hired marine biologists to observe the habits of the various forms of marine life, to give nature a helping hand wherever possible -- for the benefit of a certain fair-haired species of mammal -- and to control potential disaster and disease. Finally, you have entered into agreements and formulated rules which make for constructive cooperation and mutual assistance. You have done in the field of fishing what man must do in every field of his activity if he is to enjoy the fruits of civilization. Confronted with opportunities -- and with obstacles -- you have brought that most significant of human faculties, the intellect, to bear.

It may be that your concern with the sea will eventually save all of us from starving. About two-hundred years ago a famous English economist named Thomas Robert Malthus let the growth of the world's population arouse his curiosity. Malthus lived at the first perceptible beginnings of what we now refer to as a population explosion. Prior to his birth, in all of history -- reaching back to the very origin of homo sapiens -- the total human population of the earth had barely reached half-a-billion. In the sixteenth centuries between Christ and the Renaissance it had done no more than doubled. The Renaissance started something, however, and in Malthus's own lifetime the world's population almost doubled again. By the time he died it had reached a full billion, and the accelerating rate of increase was enough to cause alarm.

Using what knowledge was available to him, and what intuition he possessed, Malthus decided that food supply was the natural factor which sooner or later would limit the world's population, and he observed with some alarm that the rate of population increase already was outrunning man's increase in his ability to procure sustenance. The implication was that unless some change was made in one factor or the other, some kind of crisis lay ahead.

Some very remarkable changes have indeed occurred since Malthus. The earth's population now approaches four billion, having doubled again most recently within the past half-century, and even the rate of acceleration is still accelerating. Man has fantastically increased his food-producing capacity, through the opening up of fertile new land areas and through scientific research. The spectre of Malthus's fear, however, is still with us. By the year 2000, our numbers will double again. If nothing is done to halt the trend, by the year 2200 the figure will reach five-hundred billion, and seven-hundred years from now there will be one human being for every square foot of land area on the surface of the globe. That's counting the mountains and the deserts and the tundras of Siberia. Somebody is going to get trampled in case of fire.

Up until the dawn of the Space Age -- which was not so long ago -- one might reasonably have suspected that standing room would be the final limiting factor in this business of population, even if the nuclear bomb or a shortage of food did not solve things in the meanwhile. Now, of course, we are not so sure of that. Who knows? Maybe when we really start exploring out there in the heavens we'll find all sorts of spherical Shangri-La's just waiting for our colonizing offspring. Maybe history is just holding its breath for some celestial Columbus.

As I have observed, though, we have not yet shaken off Malthus, and even though we Americans are up to our ears these days in such things as surplus wheat -- even though we sometimes plow under our crops and limit production to stabilize the market -- the fear of famine has not vanished from all parts of the world, and there is still reason to wonder if the growing hordes can be fed. The people in India and China have difficulties now and then, and just last year the Russians were running short of bread. Gentlemen, the gravity of the situation can hardly be exaggerated. In spite of all our advancements in knowledge and in technology, and in spite of all our political efforts, two-thirds of the people on this planet live in misery and undernourishment, many of these in

physical pain and suffering. Here and there we save a life, and here and there we manage to awaken hope, but some authorities feel we are still on a collision course with doom.

It may be that until we crowd each other off into the ether our fisheries will sustain us. There are some who suggest that plankton, that basic source of food for all the life in the ocean, could be consumed directly by human beings, without first being transformed into shrimp and cod and oysters. It seems to be more than plentiful as it is, and with proper cultivation the crop could be improved. The sea, in fact, if properly developed, could easily become man's graden. Your own activities would seem to lead toward such an eventuality.

I wonder how soon you will begin exploring in an exciting new direction. The Frenchman, Jacques Cousteau, the inventor of the aquatic lung which made possible the fad of skin-diving, has envisioned cities built underneath the sea. He has even asserted that man could be given gills with the proper surgery, and return to live naturally in the element out of which he is reputed by some to have come. Evolution, we think, has made such adventures possible for some of our cousins, such as the porpoise and the whale. When things get too hot, or two crowded, on our traditional terra firma, we may decide not to wait for evolution.

At one of your future annual spring meetings, then, you may find yourselves studying fish Latin, in order to instruct our finny friends to move over.

The question naturally arises, though as to why we don't do something to control our population, rather than racing on treadmills in frenetic attempts to sustain it. This is a good one. There are some who maintain that this is the fundamental problem facing civilization, and that unless we are willing to face it head-on we are wasting our time with all our lesser worries.

There are only two ways, of course, of controlling the population of the earth, until such a time as we can fire our surplus off into the heavens. One is to increase our death rate, and the other is to reduce our birth rate. No one has seriously proposed, as yet, a deliberate increase in the death rate, and it is inconceivable that anyone would do so. That seems to leave us stuck with the alternative.

Birth control is a very delicate subject, in view of rather widespread feeling that such things are the business of the Lord. There are many, many people on earth who think that man is transgressing his prerogatives when he tampers with the process of human reproduction. Their views have traditionally been respected. On the other hand, there is increasing clamor from blunt-spoken individuals, who feel that if we dump our fundamental problem into the lap of the Lord, we might as well dump all our other problems along with it, and cease our needless exertions.

Fortunately there are methods of controlling the birth rate which are not necessarily rejected by most established religions. While these methods might not be the most effective available to us, they do give us room for discussing

the issue without necessarily treading upon toes. Our concern with human wellbeing prompts us to such discussion. Few of us accept the philosophy of inactivity in the face of danger.

Danger is apparent almost everywhere. The most spectacular population growth today is occurring in the teeming, under-developed nations of the world which only recently have begun to leap unprepared into the twentieth century. Some of them have been dragged or pushed into the twentieth century, by circumstances which could not have been foreseen a few decades ago. In some of these nations, prior to World War II, a man's life expectancy was about what it was in Europe five centuries ago, or just about thirty-three years. In some of them today, it approaches that which prevails in America, and most of us can expect to live to be seventy.

Bringing these nations up-to-date economically and politically would be a staggering task if they just kept their present populations. With their populations actually exploding, we can scarcely hope even to make sensible plans. Nevertheless, these peoples have been awakened and have been handed weapons. They are demanding the benefits of civilization. If civilization cannot find ways to help them, there is a sinister possibility that in trying to embrace civilization they will destroy it.

Even the ocean is not limitless. If the multitudes need fish, the fishing fleets of the various nations are sure to grow, and there are bound to be disputes about territorial waters. There are bound to be other disputes concerning the various resources of the earth, and their proper distribution. There are sure to be political conflicts, and there could possibly be war. War might ease the pressure, of course, and it might be Nature's way of restoring an equilibrium. Man has prospered, however, by conquering Nature, not in surrendering himself to its dispassionate forces.

Earlier in my reflections I spoke of the prairie-dogs of Texas, to illustrate the possible danger of good intentions somehow going astray. I now would like to consider the jack-rabbits of Minnesota, in another illustration, to suggest a danger more serious then starving cattle, and even more serious than war.

Maybe some of you read about these jack rabbits, in an article which recently appeared in Time Magazine. It is a rather interesting story. It was entitled "A Self-Corrective For the Population Explosion."

Experiments with the Minnesota jack-rabbit, it seems, have demonstrated that their numbers in a selected and protected area have little to do with the available food supply. Given enough food to support many thousands of them, the rabbits began to grow ill and die when their numbers reached just a few hundred. Their corpses were well-nourished and showed no signs of epidemic disease. Their internal organs, however, were found to be fat-clogged, degenerated, and damaged by hemorrhages. Overcrowding seemed to have upset their pituitary and adrenal glands, causing their abnormal secretations to trigger a long chain of fatal troubles.

Similar experiments with rats and mice revealed social ills as well as physical ills. The behavior of the overcrowded animals resembled that of humans in the most degenerate, crime-ridden city slums.

These observations might suggest, to a person of imagination that if human crowding really gets out of hand, Nature may have more deadly weapons than war for checking further increase. One is led to suspect that in frantically seeking cures for some of our fatal maladies we may be fighting a rather hopeless battle. The only real cures might be the removal of the basic causes.

We humans really have got ourselves into some perplexing situations since our ancestors crawled out of the sea and up upon the beaches, or since they got expelled from paradise and began the long and frustrating process of trying to get readmitted. We became the king of the beasts, and then transcended the beasts, because we learned to master the elements around us, and because we learned to harness Nature to our own advantage. We developed a civilization. Civilization, indeed, has been our prime accomplishment. Not only is it our most striking monument, but it is also our fortress, within which we live protected from the hostile forces of the universe. But we now are totally committed to this civilization, since modern man cannot exist outside it. The taller the structure, the higher the cost of its maintenance. Nature, for all its seeming benevolence, is a gigantic and frightful brute, quite capable of destroying us from without or destroying us from within.

No man alone, and no small group of men alone, can hope to be victorious in the fight for life and for a satisfactory civilized existence. Civilized and enlightened, we must combine our efforts and do our collective best with the resources at our disposal. At times, of course, we shall make mistakes. We shall not always correctly anticipate the results of our experiments, and sometimes our well-intentioned actions may create more problems than they solve. Still, we must exert ourselves. We have got to keep running now, and running hard, not only to realize our hopesfor further progress but also in order to stay just where we are.

You gentlemen, with your Gulf States Marine Fisheries Commission, are so exerting yourselves,and I am happy to report that your colleagues in the field of higher education are doing likewise. At about the same time your Commission was established, a group of governors, educational leaders, and business and industrial leaders in the various states of our Southern Region, joined forces in establishing a Southern Regional Education Board, with headquarters in Atlanta, for the purpose of combining forces in meeting the challenge facing our Southern universities. Those challenges, as you can imagine, are manifold in this era when knowledge is expanding more rapidly than ever before and when society demands far more from each individual than at any previous period in our history. We know today that our human intellects -- like the minerals in the earth and like the fish in the sea -- are one of our vital resources, and we know that widespread and intensive higher education is necessary if they are to be refined. Instead of plotting our separate courses, we have joined together in mapping a general advancement. Our problems and our opportunities -- whether social, economic, political, or technical -- are matters of importance to us all.

At this point, before coming to a close, I should like to mention a particular possibility for bringing the resources of higher education and those of the Gulf States Marine Fisheries Commission into a form of alliance. It happens that a 155 acre piece of property on the New Orleans Lake Front, currently the site of the U. S. Army's Camp Leroy Johnson,, is soon to revert to the Orleans Levee Board, and that the Levee Board is currently considering proposals for the future utilization of this property. The tract lies very near the campus of Louisiana State University in New Orleans, and we have submitted a proposal that it be made available to us for the establishment of a research center. We know that scientific research is the foundation and the key to the future progress of this city, this state, and this entire region, and if we get this property we hope to arouse the interest of industries and of agencies and commissions such as your own, to which research is vital.

The location of this site is ideal. It fronts on Lake Pontchartrain. It is almost adjacent to the New Orleans Airport. It is just a few blocks away from a rapidly developing state university campus, which has realistic ambitions of becoming one of the leading scientific centers in the South. I invite your attention to this prospect, in order that you might recognize a great potential opportunity. A final decision has not yet been made by the Levee Board, but we at LSUNO are optimistic.

We are optimistic about many things. We intend to develop and maintain for this region a respected national position in our particular field of endeavor, and to help maintain for America a respected position in the world. More than this, we expect to strengthen humanity itself in its struggle for survival, and in its struggle toward our highest human goals. In spite of the complexity of our task, and in spite of our limitations, I am sure that we shall succeed. I cannot help but believe there are better ways of controlling prairie-dogs than importing a truck load of coyotes from Wyoming.

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GULF STATES MARINE FISHERIES COMMISSION
New Orleans, Louisiana
The Monteleone Hotel
April 9-10, 1964

"OCEANOGRAPHIC RESEARCH AND THE FISHERIES OF THE GULF OF MEXICO"

J. L. McHugh
Asst.Director for Biological Research
Bureau of Commercial Fisheries
Washington, D. C.

Shrimp are a highly popular seafood in the United States. Domestic landings account for about 20 percent of the total landed value of the United States fish catch. Menhaden also are of primary importance in our domestic catch. Landings of menhaden amount to more than 40 percent of the total landed weight of all our catch, and more than half of this 40 percent comes from the Gulf. Your coastal lagoons and estuaries also abound in oysters, crabs, and a variety of fishes, all of which spend important parts of their lives in the estuarine environment.

Variations in Abundance

Although adult shrimp and menhaden spawn offshore, the young soon make their way into shallow inshore estuaries and lagoons where they spend a substantial part of their first year of life. In these shallow waters, they are subject to large and sudden changes in environment, which undoubtedly influence their growth and survival. It has been amply demonstrated that changes in temperature and salinity of the water have substantial effects upon the young.

Man also has important effects upon the estuarine environment, as you well know. I do not need to describe to you the many changes that man has made, and is making, in the inshore waters of the Gulf. We do not understand very well the effects of these changes on our marine life, but we are fearful that they are not beneficial.

The abundance of shrimp, menhaden,and other living resources of the Gulf varies tremendously from year to year. It is obvious that these variations are not entirely caused by man, for if they were, the result would be a more-or-less steady decline in abundance. But you know from recent experience that great natural variations in abundance occur. Your shrimp catches are now increasing as the effects of recent years of poor survival are passing. But changes in abundance hurt the industry just as much whether they are caused by man or by natural factors. It is our job to gather the information necessary to prevent man from being the cause of reduced catches and to forecast, if possible, the effects of natural forces.

Importance of the Estuarine Environment

In the past few years it has been popular to call attention to the estuaries and lagoons as the important environment for shrimp, menhaden, and many other valuable fishery resources. This has been because we have learned that the young congregate inshore in great numbers shortly after hatching. There is no doubt that these inshore waters are most important as nursery grounds. But we must not forget that the offshore waters are important, too. The adults spawn offshore, and somehow the young must find their way eventually into the inshore zone. In these delicate early stages their powers of swimming are not well developed. Normally they must be aided in their early migrations by the prevailing onshore current that exists near the bottom. This shoreward-moving current can be eliminated or reversed by a change in winds or major ocean current patterns. What happens then?

In stressing the importance of the estuaries for producing food from the sea, we are emphasizing the favorable characteristics of this environment. Estuaries are among the most highly productive regions of the sea, biologically. They receive a constant flow of nutrients from land drainage, supplemented by an inshore flow of sea water. The waters are shallow and in constant motion so that every drop is exposed to the life-giving flow of energy from the sun.

But this nutrient-rich, productive environment is a harsh environment, too. The sudden changes of temperature and salinity to which it is subject, and the great turbulence and scouring caused by storms, generate conditions that sometimes are highly unfavorable to adult forms of marine life, not to mention the tiny delicate larvae or young. One cold snap, one freshet, or one hurricane at the proper place and time can affect your livelihood for years to come.

Importance of the Oceanic Environment

Our research programs are just beginning to throw faint glimmerings of light on the complexities of biological productivity. We have learned in some places that the young stages which normally enter the estuaries at a very small size do not always move inshore at the same early stage of growth. In some years this inshore movement is delayed. Is this a catastrophe or is it a benefit to the fishing industry? It is too early to be certain, but we have some extremely interesting clues. For example, the year 1958, which produced what was probably the greatest crop of menhaden that the industry on the Atlantic Coast has ever known, did not look very promising to our biologists at first. The young menhaden did not appear in the estuaries in any great abundance at the expected time. Our people were pessimistic and predicted poor fisheries for the following year. Later, however, young fish began to appear in the estuaries in phenomenal numbers. It was obvious that something had held them outside in the ocean long past their usual migration date. They found favorable conditions inshore, and survived in record numbers. What might have been their fate if they had moved in earlier? Would they have perished in large numbers through some adverse act of nature, and the survivors persist to

support only a mediocre fishery? We cannot answer this question. But this unusual circumstance made a valuable addition to our knowledge in another way. It told us that if the young do not move into the estuaries immediately after hatching, they do not necessarily perish. Under some circumstances such a delay may be advantageous, by holding the delicate early stages in the more conservative, less variable offshore environment until they are better able to withstand sudden changes in temperature and other perils.

I do not mean to say that the estuaries are less important than we thought they were. We have abundant evidence that they are necessary for the well-being of many valuable fishery resources, including your Gulf shrimp and menhaden. What I am pointing out is that many of our most important coastal fishery resources also may spend critical parts of their lives outside the enclosed coastal estuaries. Conditions in the ocean can have equal importance in determining the harvest of the sea.

Causes of Environmental Changes Not Always Local

Conditions that affect the environment of marine animals and control their survival are not all of local origin. The northers that sweep across the Gulf coast in winter, bringing cold snaps that sometimes kill millions of fish, are generated by conditions that have their beginnings in distant quarters of the globe - - in the far north, over the Pacific, or miles up in the atmosphere over our heads. The circulation of the Gulf and its estuaries, and the physical and chemical characteristics of the water are profoundly affected by such distant events.

The Gulf is affected greatly from another direction, also, by a massive flow of water that begins in the Southern Hemisphere along the coast of Africa. The Atlantic Ocean differs from the Pacific in many respects. One of the most important, from your point of view, is that the South Atlantic is not isolated from the North Atlantic, but instead contributes large quantities of water across the equator from southeast to northwest. Much of this water sweeps along the northeastern coast of South America and enters the Gulf through the Caribbean Sea. Variations in the strength and direction of this equatorial current can have substantial effects on the circulation and characteristics of the waters of the Gulf. This in turn can influence the migrations and abundance of important Gulf fishery resources.

Research Must Have A Broad Base

Although the United States has increased her scientific research efforts in the Gulf of Mexico in the past few years, this research still is not adequate to describe the widespread events that influence the marine environment and cause the distribution and abundance of living resources to fluctuate. Until we understand thoroughly the interactions of large-scale weather phenomena and oceanic conditions on the high seas with the local environment of the Gulf and inshore waters, our ability to harvest maximum sustainable yields from these rich waters will be imperfect. We are increasing rapidly the facilities and skills necessary to provide the necessary understanding. We welcome the support and encouragement you have given us.

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GULF STATES MARINE FISHERIES COMMISSION
New Orleans, Louisiana
The Monteleone Hotel
April 9-10, 1964

"THE GULF STATES ESTUARINE RESEARCH AND PROBLEMS"

Theodore B. Ford, Asst. Chief
Division of Oysters, Water Bottoms & Seafood
Louisiana Wild Life & Fisheries Commission
New Orleans, La.

The Gulf States have several common problems associated with the coastal fisheries in their estuarine areas adjacent to the Gulf of Mexico. These problems are largely due to competition for use of these areas by other interests which threaten this unique habitat by a direct loss of area or by indirect means through ecological changes. Categorically, such problems can be broadly summarized as follows:

(1) Competition for the available freshwater which has historically flowed into the coastal marshes and Gulf;

(2) Large and small scale navigation projects;

(3) Reclamation of coastal marshes and embayments and hurricane protection works;

(4) Industrial developments; and,

(5) Water quality as affected by domestic and industrial effluents.

Each of the respective Gulf States is experiencing various aspects of some of these problems and some states are having to deal with all types, some with extensive ramifications materially influencing large areas.

Florida has extensive estuarine studies underway in fivemajor areas with a long-term substantial ecological study having been completed in the Apalachicola Bay area. A clam survey is in progress on Choctawhatchee Bay. Shrimp and fish studies are in progress in the Tampa Bay area by both the state and Bureau of Commercial Fisheries. In the area from St.Petersburg to Naples, the state is conducting red tide studies, while the spiny lobster study is centered at Stuart. Several aspects of population dynamics relating to the three principal species of Florida shrimp are being studied and evaluated in the St. Johns River area. All of these enthusiastic studies are designed to provide specific information about each particular animal or group as well as general background ecological information about the area. Such knowledge should be extremely useful in the management of the resources and contribute to the preservation of coastal areas.

The upper part of the Mobile Bay estuary is an area of concern to Alabama. The problem deals with the most feasible means to all interests of crossing this coastal area with the interstate highway so as to leave this area as undisturbed as possible. Concurrently, work is in progress from the new laboratory to expand available knowledge about their estuarine area which will be helpful in its management and preservation.

In Mississippi the development of an industrial complex along a canal being excavated between Biloxi Bay and Bay of St. Louis is in progress. Although this work is now underway, it is my understanding that excavation and site developments will be paced with prospective occupancy. The full influence and effect of this development on these two small estuaries is incompletely known. Some reclamation work as well as concern about water quality represent other problems insofar as loss of or affected marine habitat. Presently, shrimp studies are providing good related ecological data for their coastal area. This will augment substantial existing knowledge.

Currently, in Louisiana, there are some seventeen major projects across the coast representative of all the major types outlined above, which are of considerable interest to us. Salt-water intrusion in brackish and fresh marshes as a result of the various channel developments constitutes one of the major problems.

Efforts to reduce the flooding effect of hurricanes will also affect sizeable areas. Industrial developments and their attendant problems, as well as indirect effects, including potential site developments, oil and gas fields, and pipe lines, are competitive forces contributing to ecological changes in the extensive Mississippi River estuary. As a result of aggravated salt-water intrusion problems in some areas, serious attention is being given to freshwater needs for domestic, industrial, agricultural as well as fish and wildlife purposes. Other interests are struggling to cope with this new problem as it exists. Water quality and quantity are commanding problems for us.

Studies in progress in coastal Louisiana are designed to provide immediate information which will contribute to the current management of the various fish and wildlife species, as well as to accumulate basic background data which will augment knowledge about its ecology. Although this work is centered in the Barataria Bay and southwest Louisiana areas, periodic sampling and short-term studies in the other coastal areas provide information which reinforces a broader, better understanding of coastal conditions. This knowledge is becoming increasingly more helpful in our management and preservation efforts.

Moving westward, it is evident that Texas is experiencing its full share of related problems. The competition from multiple interests is superimposed over historial problems associated with nature such as drouths, floods,

freezes, etc., as experienced by all of us from time to time. There is the big problem of competition for available freshwater and the probability of it being diverted from one system to another thereby affecting the ecology of coastal embayments. Landfilling or reclamation of coastal marshes is becoming more pronounced as is the excavation of channels to marinas and homesites. Hurricane protection works may affect extensive embayments. In the industrial field, petrochemical effluents are of concern. Then, as experienced by our other Gulf States, there is a substantial interest in water quality as it may be affected by domestic sewerage.

Progress is being made on the immediate problems associated with the management of their coastal fish and wildlife resources. Attention is also being given to increasing their overall knowledge of the ecology of the coastal system.

Generally, in conclusion, it is clearly evident that those of us who have enjoyed the relatively unobstructed and non-competitive use of the Gulf coastal estuaries - the nursery grounds for some of this country's more important marine fisheries, both dollar-wise and poundage-wise - must face up to the fact that there is already a tremendous competition for this area from multiple interests. It is entirely probable that these other interests are only in their infancy with many more to come or expansion of existing ones. Therefore, it behooves us as scientists working closely with the various fisheries interests as the action group, to apply our united efforts diligently and effectively towards the improved management and preservation of this coastal complex, our estuarine areas, if they are to be retained with little or limited ecological changes. The scientists will continue to be better able to predict changes attendant to the various developments as our investigative programs continue and improve, as well as to recommend preventive measures to maintain the estuaries. Nevertheless, it will be the strong voice of the fisheries industry, recognizing the importance of these coastal areas, which will command the public interest for proper consideration of this fish and wildlife habitat in future developments.

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GULF STATES MARINE FISHERIES COMMISSION
New Orleans, La.
The Monteleone Hotel
April 9-10, 1964

"BRANCH OF RIVER BASIN STUDIES- ACTIVITIES OF
INTEREST TO THE GULF STATES MARINE FISHERIES COMMISSION"

Spencer H.Smith, Regional Supervisor
Branch of River Basin Studies
Bureau of Sport Fisheries & Wildlife-Atlanta,Ga.

Land and water development programs have in the past been, and shall in the future be, a continuing step by step process emerging to meet the needs of people.

The Branch of River Basin Studies is a planning function with the mission to fit fish and wildlife needs into the development program. The function activities are carried out cooperatively with the States and the Bureau of Commercial Fisheries.

Inherent with the planning function is the obligation to assist in keeping the resource administrators informed on both the short-and long-range changes that can affect and govern their interest. The major interest of the Gulf States Marine Fisheries Commission, as the name implies, is marine fisheries, both commercial and sport. The primary basis of mutual interest between the Commission and the planning assistant function are development projects which will affect estuarine areas.

One of the most simple, and yet descriptive definitions of an estuary states: "An estuary is a passage where the tide meets the river current." Three items are involved here. First the passage, or the configuration of the land in which the other two source items of sea water and land water meet. It follows then that a change in any of the items can affect the estuary.

The two items meriting your attention are the status trends of the land water source and configuration. Status, as used herein, refers to manmade alteration; therefore, it is assumed for purposes of these comments the sea water source will remain constant.

Land Water Source

The Select Senate Committee report on the Nation's water resources divided the 48 conterminous States into 22 water resource regions. Two regions of particular importance to the Commission are the Western Gulf and the Southeast. Both serve well in depicting the water use trends, and the resulting land water source for the estuaries, in that the drainage runoff and discharge points are contained within the resource region. Also, for all practicable purposes, the drainage courses and outlets have not been altered or diverted.

Plate 1 graphically illustrates the availability of water, its 1954 level of consumptive use, the projected consumptive use and the pollution abatement and storage requirements for the years 1980 and 2000.

The projections are based on a minimum project cost basis to meet the median human population increases. Consumptive uses or depletions are for agricultural, mining, manufacturing, stream electric power cooling and municipal use. Pollution abatement requirements are established to maintain 4 milligrams per liter. Storage requirements are based on full development of the runoff.

A review of Plate 1 points up some of the more salient factors that can have a governing effect. The comparison of water availability within the two regions depicts the base difference in rainfall pattern and the current use status. The Western Gulf is now using 1/5 of its 56 million gallons available daily. Availability within the Southeast Region exceeds that of the Western Gulf by three times. Consumptive use here is currently near 1 percent.

An appraisal of the Western Gulf projection points out by 2000 at least one half of the available water will be consumptively used. Also, the trend depicted by the pollution abatement needs reflects sharply increased non-consumptive uses in 1980. Increased control techniques are expected to reduce the pollution abatement requirements by 2000. As shown, the volume of storage will increase over seven times by 2000, with a projected storage of 79.2 million acre-feet.

While the Southeast Region water trend does indicate sharp increases of future consumptive use, the ratio of increase to availability is somewhat less than that of the Gulf Region. The difference in ratio of pollution abatement requirements for the two regions indicates that by 2000 pollution control will not be as critical as that envisioned for the Western Gulf Region. The storage of water in the Southeast will increase from 16 to 89 million acre-feet, representing about a fivefold increase by the year 2000.

It is recognized the Southeast drainage area extends beyond the Gulf of Mexico area: however, the similarity of the streams throughout the region permits its use as representative of the Gulf area.

The presentation of the water use trend is not done on the basis that all changes are detrimental, rather it is done to point out the magnitude of change which can be expected and to emphasize the consideration which must be given by the estuarine managers in supplying the fresh water source to the estuaries.

Configuration

It is not necessary to outline the effects of changes in configuration of estuaries to members of the Commission. All are intimately aware of the project-occasioned effects resulting from navigation channels, dredge and fill operations, sedimentation, and other manmade changes in estuaries along the Gulf Coast.

Configuration (contd)

The point to be emphasized here is the increased competition for use of estuarine areas. The above water use trends are based on human needs, therefore they reflect a continuing increase in the human population. If history repeats itself, and there is good evidence that it will, industry and the people will continue to locate near estuarine areas. Associated with this trend will be the demand for additional port, navigation, highway, and hurricane protection projects, and the increased competition for conversion of estuarine areas into urban, agricultural, and industrial sites. Again, these comments are not on the basis of objection to change, but serve to point up the need of having the interest of this Commission (Marine Fisheries) given its appropriate place in future land and water programs of the Gulf Coast area.

The urgency and immediacy given to the many ramifications involved in planning for the estuarine areas of this important coast area will require the coordinate efforts of the Federal, State and local interest.

New Programs of Interest

The following activities are relatively new programs involving your interest and merit specific attention of the Commission.

Interstate Highway Construction: Highway alignments across estuarine and coastal river areas must be planned to protect the estuary environs. The Interstate Highway Program is administered by the Bureau of Public Roads. In accordance with recent agreements between the Bureau of Public Roads and the Bureau of Sport Fisheries and Wildlife, all State highway agencies have been directed to coordinate future interstate road planning with the State game and fish agencies. Most of you are in the process of negotiating agreements covering planning procedures with your State highway departments.

Southeast River Basins - Comprehensive Water Quality Management Project, Public Health Service, Health, Education and Welfare:

The Public Health Service is initiating a long-term (5-year) comprehensive planning program to establish water use plans for all the rivers in Georgia, Florida, Alabama, and Mississippi, except the Savannah, Tennessee, and Mississippi drainages. This program will undoubtedly offer opportunity for planning to each of you.

Public Law 566 -Small Watershed Projects, Soil Conservation Service:

As previously mentioned, interest in conversion of coast lowland and marsh areas to higher agricultural use has been initiated under the Public Law 566 program. Examples here are projects under consideration in southwest Louisiana, east of Lake Calcasieu. Future projects of this type can be expected along the Gulf Coast.

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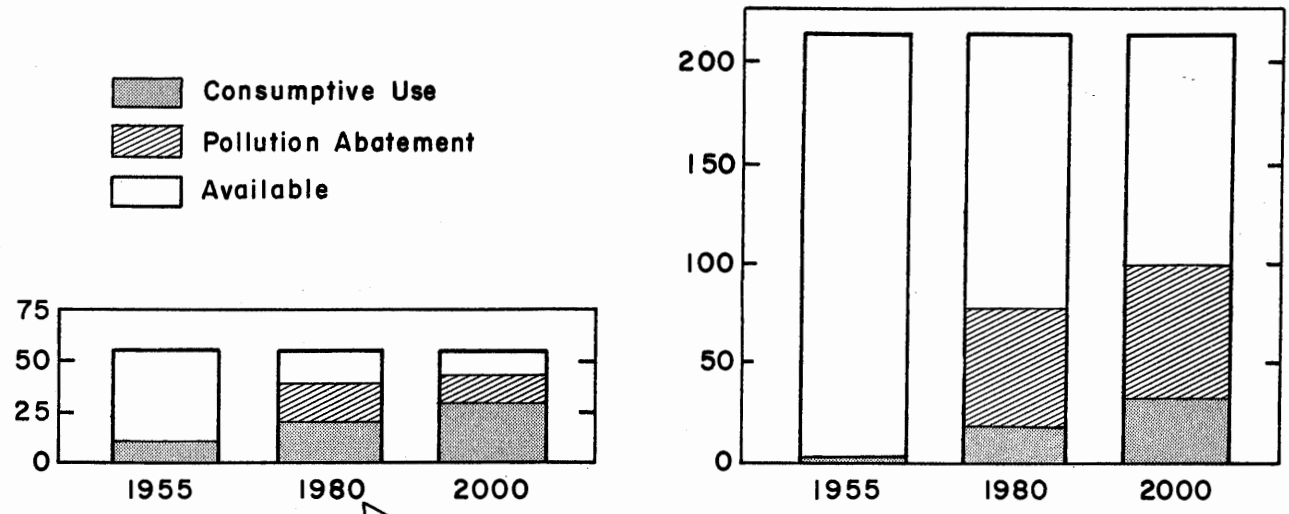
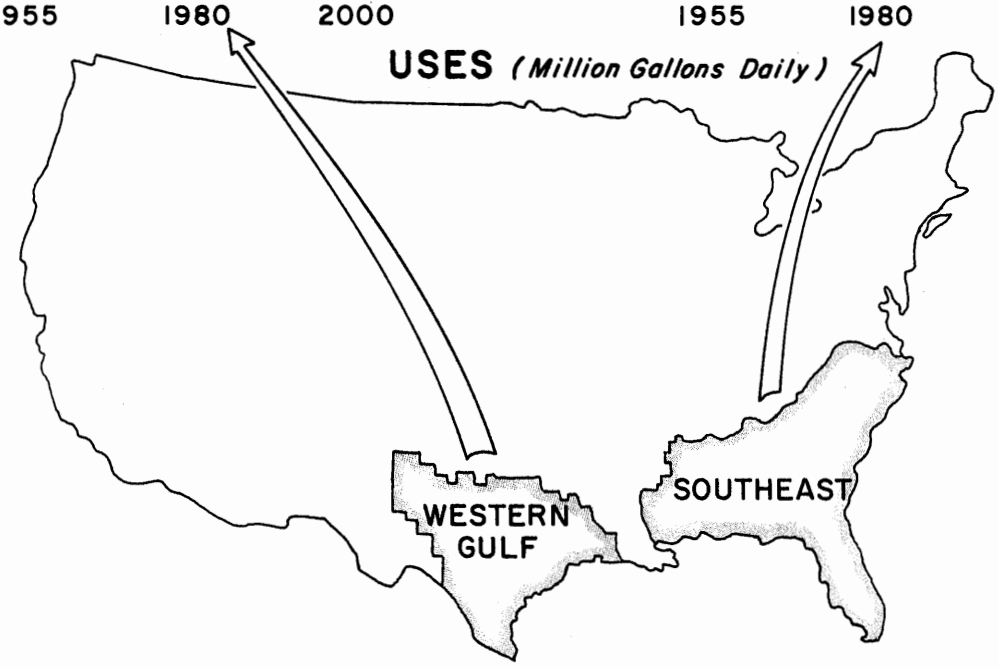
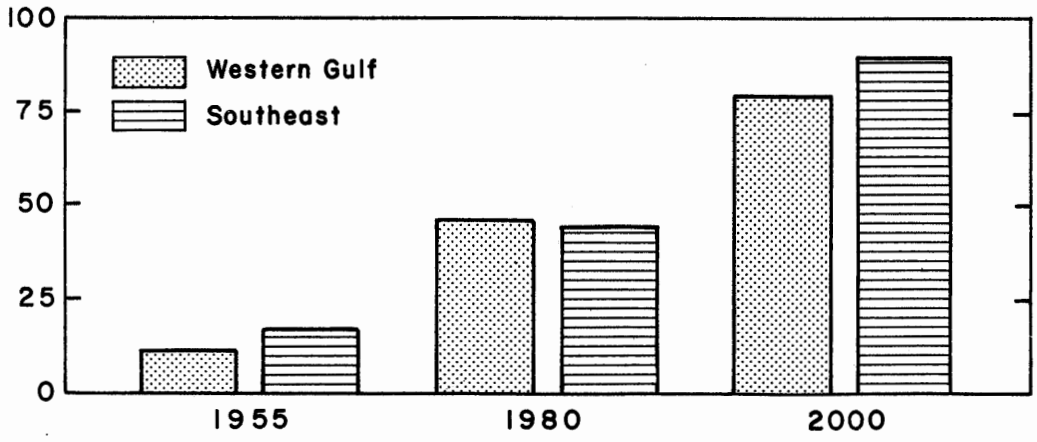
TREND OF WATER USE IN WESTERN GULF AND SOUTHEAST WATER RESOURCE REGIONS



USES *(Million Gallons Daily)*



STORAGE *(Million Acre Feet)*



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GULF STATES MARINE FISHERIES COMMISSION
New Orleans, Louisiana
The Monteleone Hotel
April 9-10, 1964

"GULF SHRIMP CROP PROSPECTS FOR 1964"

J. Y. Christmas
Gulf Coast Research Laboratory
Ocean Springs, Miss.

The study of postlarval commercial penaeids in Mississippi Sound was started at the Gulf Coast Research Laboratory in November 1962 under contract with the U. S. Fish and Wildlife Service. Stations were established on all of the islands between Pascagoula and the Mississippi state line. Mainland stations that can be reached by land extend from the mouth of the Pascagoula River to Bayou Caddy, west of Bay St. Louis. Samples were taken between Wednesday and Friday of each week. After preliminary work was completed, eighteen locations were selected for regular weekly sampling which was continued until the postlarval population disappeared in December 1963.

Almost 32,000 postlarvae were taken in regular samples between November 1962 and the end of October 1963. In general, pink shrimp dominated the late fall catch, browns were dominant in the spring and continued in smaller numbers throughout the summer. White shrimp appeared in the catch in May and continued to come in through the summer months.

Specific composition of postlarvae caught at inshore stations was almost identical to that of the 1962 commercial catch in Mississippi Sound. In the area from Pensacola to the Mississippi River the percentage of pink shrimp in the commercial catch was lower. Since over forty percent of the pink shrimp in the area commercial catch were caught in Mississippi Sound, this is not surprising.

Sampling was reduced in December 1963 when samples failed to produce postlarvae. Brown shrimp postlarvae appeared in samples taken the first week in February 1963 and sampling effort was increased. Since relatively few shrimp were caught at barrier island stations, most of these were dropped and additional stations were established in Biloxi Back Bay where lower salinities would be encountered. Seven inshore stations which were worked in 1963 and 1964 have been selected for comparison.

Brown shrimp postlarvae were caught three weeks earlier this year and have continued to increase rapidly. Average catch for these stations is as follows:

	Feb.	March	Apr. (1st week)
1963	0.25	40.00	43.90
1964	7.85	116.67	298.00

It is evident that brown shrimp postlarvae are several times as abundant this year as they were a year ago.

(Christmas #2)

However, caution is indicated for prediction of an exceptionally large crop. Growth of postlarvae seems to be slow. Juveniles have not been taken in our samples this year. In 1963 a few small juveniles were caught in the first part of April. Some postlarvae should be at least three weeks older than any were at the same time last year.

Water temperature has been consistently lower this year with the exception of one period early in February last year. Averages for last week were about 5°C less than they were a year ago.

Salinity has been lower and is expected to drop drastically when high water on the Pearl and Pascagoula Rivers reaches the Sound.

Although counts have not been made, numbers of postlarval and juvenile fishes in our catch are much larger this year. This is particularly true of spot (Leiostomus xanthurus) and it is possible that predation on young shrimp will be greater.

Unless there is an unusually heavy mortality of young brown shrimp, it is probable that there will be another very large crop of brown shrimp available to the fishery in the Mississippi Sound area in the 1964 season.

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PANEL CONTINUED - "GULF SHRIMP CROP PROSPECTS FOR 1964"

Terrance R. Leary
Texas Parks & Wildlife Department
Austin, Texas

The Texas Department is in its third year of sampling regular plankton stations in the Aransas Pass located at Port Aransas. Three methods of sampling are used.

A small, beam sampler is towed along the bottoms of the channel. This sampler is similar to a beam trawl and readily takes Mysids, Penaeid post larvae, Sergestids, and crab larvae and post larvae. The average sample strains about 187 cubic meters of water.

Another sampler, pulled by a wading man along the sand flat adjacent to the channel, takes fewer post larval Penaeids and Mysids and even less of the post larval crabs, probably because of the more shallow water depth. The average sample strains about 70 cubic meters of water.

The other sampler used is a large plankton net with an opening equivalent to a square meter. This net which is towed each time at bottom, midwater, and surface depths is our most efficient method for most of the small forms desired. Its average sample strains about 940 cubic meters of water.

(Leary #3) PANEL CONTINUED

The number of post larval Penaeids taken by us in the Aransas Pass was lower in 1963 than in the preceding year, 1962. This corresponds to the commercial production in Gulf Statistical Area 20, the location of the fishery of the Aransas shrimp, even though the state-wide production was higher in 1963 than in 1962.

The 1964 samples show a greater number of post larval Penaeids in the Aransas Pass this year than last and at an earlier date. This would give some hope for improved brown shrimping prospects this season in Area 20.

Our most reliable method of monitoring the shrimp populations, however, lies in sampling the juvenile shrimp in each of the bay systems. This year we have increased the number of our stations to give a more accurate picture of the relative abundance of juvenile shrimp in the bay nursery areas. It is still too early for us to have an accurate picture of the whole coast. In some areas we were not yet taking this season's hatch of juvenile browns in our samples at the end of March. We did however take a large number of these young brown shrimp (about 23 mm or almost one inch in length) in the Lower Laguna Madre. The average number of shrimp in these preliminary samples is considerably larger than comparable samples in the previous three years. The Lower Laguna Madre contributes shrimp to the fishery off Brownsville and the Upper Mexican Coast.

It is still a little early for us to make any predictions on the Texas shrimp fishery for this year. On the basis of the preliminary data, we are optimistic.

PANEL CONTINUED - "GULF SHRIMP CROP PROSPECTS FOR 1964"

Joseph H. Kutkuhn
Bureau of Commercial Fisheries
Galveston, Texas

Introduction: Since early 1960, the Bureau of Commercial Fisheries at Galveston, Tex. has been exploring the utility of a postlarval index in forecasting supplies and production of commercial-size shrimp. This index rests on the simple premise that the abundance of fishable shrimp on inshore and offshore trawling grounds during periods of peak commercial fishing activity is more or less consistently proportional to the number of postlarval shrimp entering inshore nursery grounds three to four months earlier. Raw data from which it is derived are obtained by sampling for postlarval density in a standardized fashion and on a regularly scheduled basis at fixed, strategic locations in entrances (or passes) through which postlarvae move from offshore spawning grounds to inside nursery areas. The establishment of sampling stations at sites so located has evolved from two important considerations, viz., (1) accessibility in terms of overall cost as well as ease of sampling operations, and (2) acquisition of data that are statistically "efficient" because sampling occurs at a time when the immigrating postlarvae

experience maximum concentration (i.e., greatest number per unit volume) due to the constrictive influence of the entrance channels themselves. Soon after collection, the postlarvae contained in each sample are enumerated and their numbers tabulated according to species. The final indices are derived by averaging the sample counts over one-month intervals. In so doing it is hoped that much of the variation from all sources is self-compensating, and that the resulting values provide reasonably reliable indices to the abundance of postlarvae during the periods represented.

Previous Use of Index: To date the Bureau's efforts in developing and putting such indices to use have been centered in the Galveston area, with sample counts of postlarvae being obtained routinely just inside the entrances to Galveston Bay and Sabine Pass. Under the assumption that year in and year out the Galveston Bay system accommodates the greater share of young brown shrimp produced on spawning grounds off the upper Texas coast, the relative numbers of postlarvae entering the system each spring have, over the past four years, provided surprisingly good indications of what could be expected in terms of the summer and fall harvest of those that survived to fishable size.

Beginning in 1961, appropriate postlarval indices have been referred to corresponding values obtained in 1960--a year of record brown shrimp landings--which has since served as the basis for comparison. Thus, the spring indices of 1961 forecast for that year a poor harvest relative to that of 1960; those of 1962 a harvest not as good as in 1960 but better than in 1961; and those of 1963 a harvest almost as great as that of 1960 (see figure 1). In each instance there were made available to serve as confirmatory evidence before releasing any forecasts, indices of subsequent juvenile abundance computed from statistics provided by a very active (commercial) bait shrimp fishery. Comparable success with the white shrimp has not yet been realized. This failure is attributed, at least in the Galveston area, to the species' unpredictable and poorly defined pattern of postlarvae movements. Attempts to overcome the difficulties presented by postlarval white shrimp are continuing.

Because the postlarval index offered such promising results from the start, it was soon adopted for use as a forecasting device elsewhere along the Gulf coast. Perhaps it has rendered greatest service to the Louisiana Wild Life and Fisheries Commission whose biologists used it to predict, particularly in the case of the brown shrimp, a good harvest from that State's waters in 1962, and an even better one in 1963.

Outlook for 1964: As of this writing, sufficient data with which to forecast supplies of brown shrimp and probable fishing success off Texas during the forthcoming season have not been obtained by Bureau biologists working in the Galveston area. All indications are that the build-up to peak influx of postlarvae, usually reached sometime during the first two weeks of April, is running somewhat behind schedule. Unfortunately, development of an April index comparable to those of previous years will not be possible until late in the month. Postlarvae are now present in good quantity but it is too early to say how their average density compares with that determined for the corresponding period in previous years.

(Kutkuhn #5) PANEL CONTINUED

Research on Index Reliability: One other aspect of Bureau activity concerning the postlarval index seems worthy of brief comment here. In continuing attempts to define and assess environmental as well as other factors influencing index reliability, two series of intensive sampling operations were conducted in the past year during periods when influx of brown shrimp postlarvae was expected to be greatest. These entailed, in the first series, replicate collections made with the standard sampling gear every two hours over a 96-hour interval at an established, shore-zone station just inside Galveston Entrance. The second series, completed just a week ago, consisted of collections with three kinds of sampling gear, each fished at a different depth across the Entrance every three hours over a 72-hour interval. Throughout each operation, detailed records were kept of tide elevation, salinity, temperature, and meteorological conditions.

Results of the latest series have not yet been processed for analysis, but those obtained during the first week of April a year ago are shown in the accompanying figure (2). These findings are by no means conclusive, however, and reveal little more than an indication that tidal flow and light intensity combine to exert a fairly high degree of influence on the movement of postlarvae through passes such as Galveston Entrance--once the postlarvae reach the passes and are no longer affected by oceanic circulation. Of great additional interest in this particular study was the remarkably good consistency of postlarval counts between the (3) replicate samples collected every two hours.

It is hoped that through further studies of this kind we will eventually accumulate the information needed to establish the kind of routine sampling operations which will provide forecast indices possessing consistently high reliability.

* * * * * *

Units of Measurement Used on Accompanying Graph
(Figure 1)

I--Average number of postlarvae in "standard," semiweekly and weekly samples taken in Galveston Entrance and Sabine Pass, respectively; postlarvae range in length from 10-15 mm. (about 5/8 in.).

II--Average catch of juvenile shrimp (in pounds) per hour's trawling throughout the Galveston Bay System; trawls average about 15 ft. in width and have a mesh of 1½ in.; juvenile shrimp range in length from 40-100 mm (1½ - 4 in.); data are obtained from commercial bait-shrimp fishery which operates continuously.

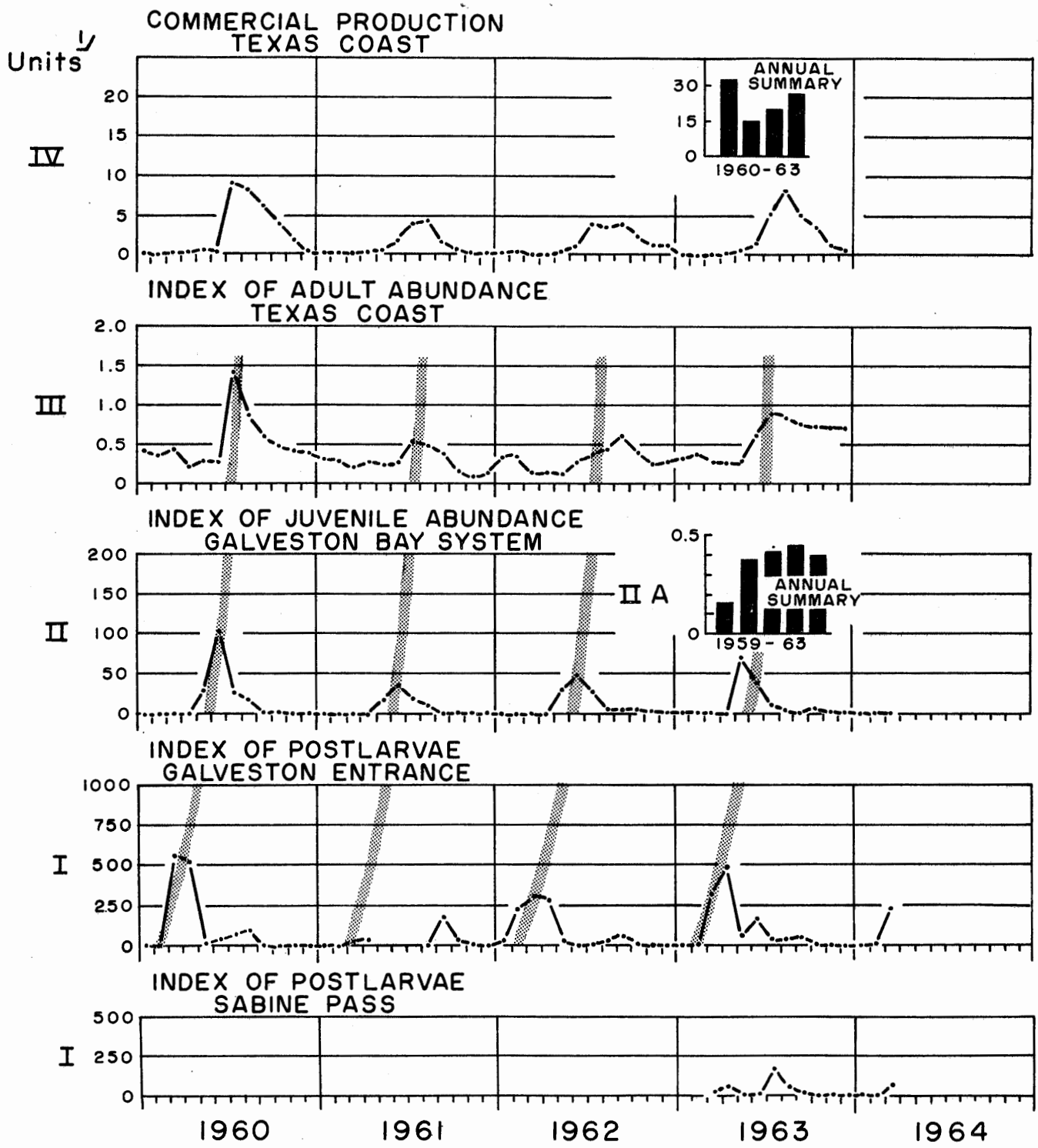
IIA--Millions of pounds, whole.

III--Average catch of (headless) commercial-size shrimp (in 1000's of pounds) per 24 hours' trawling off the Texas coast; adult shrimp range in length from 110-200 mm. (4½ - 7½ in.); data from offshore commercial fishery.

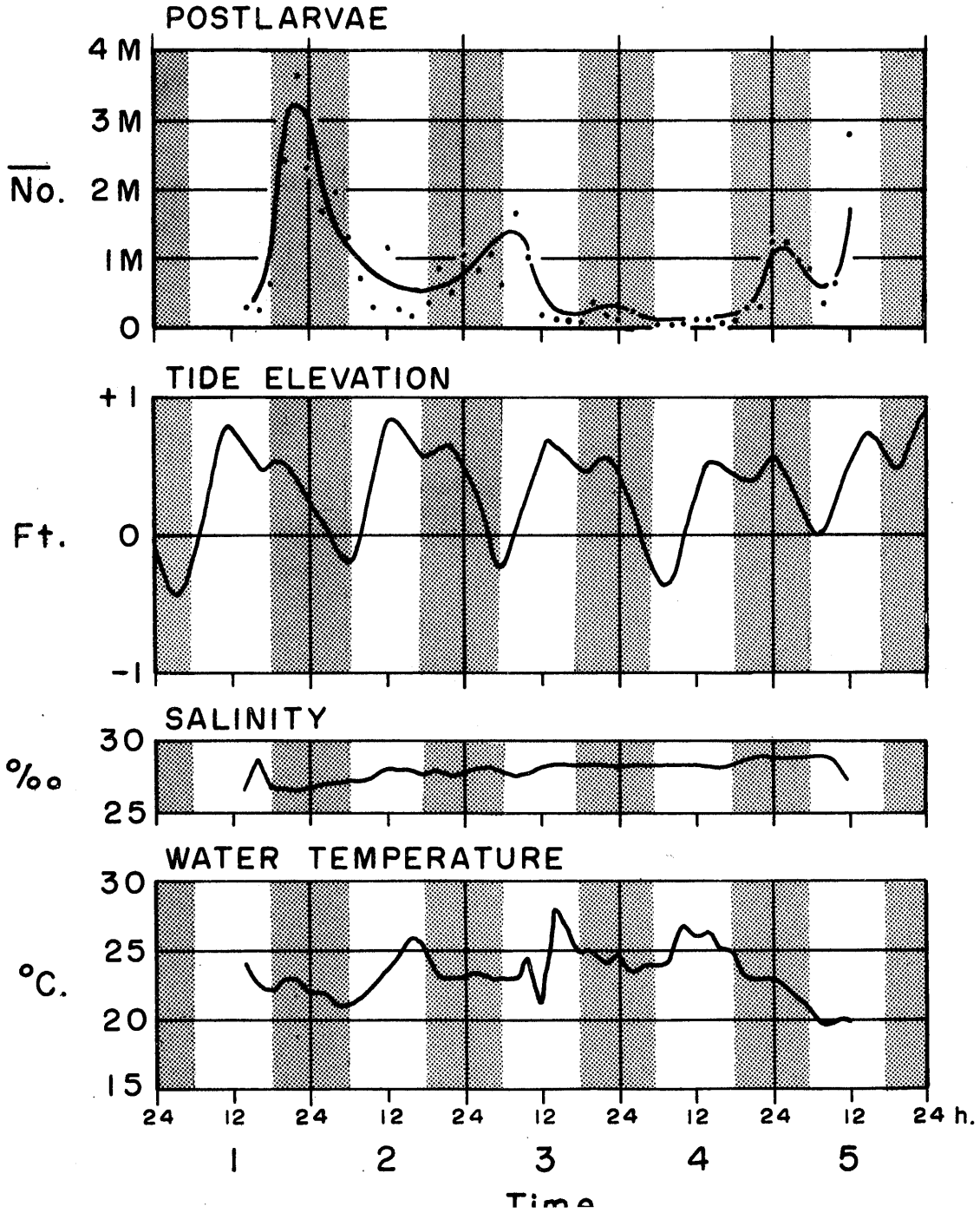
IV--Millions of pounds, headless.

1.

BROWN SHRIMP
TRENDS IN ABUNDANCE AND PRODUCTION
TEXAS GULF COAST
1960 - 64



BROWN SHRIMP
GALVESTON ENTRANCE
APRIL 1963



"GULF SHRIMP CROP PROSPECTS FOR 1964" - PANEL CONTINUED (#6)

Lyle S. St. Amant
Louisiana Wild Life & Fisheries Commission
New Orleans, La.

In Louisiana our shrimp program is designed to collect data which will give us some idea of the conditions of the shrimp crop on the bedding ground prior to the opening of the season. On the basis of the data collected during the spring period we normally attempt to set the season. Generally there is not enough data available to make reasonable predictions until about mid-April and because of this the early meeting dates of the Gulf States Marine Fisheries Commission prevented any earlier attempt to discuss the current shrimp problem. This year, however, the Gulf States Marine Fisheries Commission's meeting is being held during the second week of April which allows for the consideration of more data and should give some idea as to how we go about predicting the shrimp season.

The first consideration, of course, is the postlarval data for 1964. Postlarvae arrived in the passes some two or three weeks earlier in 1964 than they did in 1962 or 1963. Density figures indicate that early postlarval movements are several hundred percent greater than in the two previous years. During the last two weeks in February and the first week in March tremendous movements of postlarvae into the nursery ground occurred. With the advent of a cold spell postlarval movements declined considerably but still remained above such movements during the same period in 1963. From the standpoint of postlarval densities alone our early data would tend to indicate the 1964 shrimp crop will be as good or better than 1963.

On the other hand by mid or late March the juvenile picture usually can be well coordinated with postlarval movements. In 1964, however, this did not happen. Water temperatures are considerably cooler than in 1963 and the juvenile shrimp appear to be some two to three weeks behind the growth schedule of previous years. Although juveniles were found during mid-March, which is the approximate time of their normal appearance, sizes for 1964 only averaged 34 mm, which is some 15 percent smaller than the 39 and 40 mm length determined for the same period in 1962 and 1963. The actual rate of growth as computed to this date indicates that the juveniles are growing at .57 mm per day in 1964 as compared to 1.1 mm per day in 1963 and 1.7 mm in 1962. This slow growth rate is to be expected in view of the colder water temperatures, but there is evidence that as soon as the water is 70°F., growth rates will increase, probably to the extent that the 1964 crop will reach a marketable size by May 15. This prediction, however, is entirely dependent upon warmer weather conditions occurring in the very near future and being maintained for the remainder of the spring.

Of greater concern and less clarity to us is the distribution pattern shown by the juvenile shrimp now obtainable on the nursery area. Although there is evidence that a great deal more postlarvae have moved into the nursery area, 66 percent of our stations still show negative for shrimp as compared to 7 percent in 1963. At first glance this would tend to indicate that there are less juveniles than in 1963 and presumably a shorter crop. This, however,

may not be the case since we are sampling a different size shrimp because of their slow growth and because many of the tiny shrimp may be in the grassy areas where they are not available. It is our belief at this time that the discrepancy in the number of stations showing no shrimp as well as in the number of shrimp being caught per unit of effort indicates that we are seeing a difference in net efficiency rather than an actual difference in the volume of shrimp on hand. We will not really know the answer to this question for another two or three weeks.

Examinations of stations throughout the coastal area tend to indicate that a similar spotty distribution of juveniles occurs from Texas to the Mississippi line. Size ranges in all areas are comparable. The one bit of evidence indicating more shrimp than in 1963 has occurred on the east side of the Mississippi where we have found considerably more juveniles than we did in the previous two years.

Considering the hydrographic picture it should be pointed out that salinities are considerably lower than for the same periods during 1963. Much of the northern marsh areas across the State are quite fresh and most of the juvenile shrimp are being found in those areas of reasonably high salinities. It is probable that low salinities caused by high river stages and rainfall may be adversely affecting the total crop on the nursery ground. Water temperatures, as pointed out earlier, are considerably lower than in previous years and it would appear that the general water temperature will not exceed the 70°F mark until some two or three weeks later than in 1963.

It is obvious that at this point we cannot make an accurate prediction of the 1964 shrimp season. However, it is believed that by the last week in April relatively accurate predictions can be made.

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(COPY)

GULF STATES MARINE FISHERIES COMMISSION
New Orleans, Louisiana
The Monteleone Hotel
April 9-10, 1964

"PROGRESS REEORT - GULF MENHADEN RESEARCH"

Kenneth A. Henry, Director
Biological Laboratory-Bureau of Commercial Fisheries
Beaufort, N. C.

At your meeting in Mississippi last fall, Mr. Whiteleather pointed out the growing importance of the gulf menhaden fishery in recent years. From 1949 to 1958 the annual catch averaged only 200,000 tons and did not exceed 280,000 tons in any year. Beginning in 1959 the fishery began to grow and in 1962 the catch amounted to 528,000 tons. The 1963 catch of approximately 484,000 tons, although below the 1962 catch exceeded the catch in the Atlantic for the first time. 1963 landings in Texas were down 19 percent from 1962, Louisiana down 8 percent, and Mississippi down 5 percent.

Mr. Whiteleather also gave you some of the background in the development of a Gulf Menhaden Research Program. He mentioned several studies which were conducted by different organizations throughout the 1950's. Although all of this work provided a useful foundation for the Gulf Menhaden Research Program, the appropriation from Congress in August 1963 was the first regular financing for a full-scale program of research on this important fishery.

I would like to briefly outline once again our current program for Gulf Menhaden Research and indicate some of the problems that we face and some of the things we've been able to accomplish so far. Our initial program consists of 4 biological and an exploratory fishing project and we hope to add a tagging program in the not too distant future.

Project 1. Size and Age Composition of the Commercial Menhaden Catch in the Gulf of Mexico.

Preliminary indications are that the Gulf Menhaden Fishery is fishing on young fish only 1, 2, and 3 years old. It is important to know the ages of the fish to determine if there are older segments of the population which are not being utilized. Unfortunately, Gulf menhaden apparently do not form a definite annulus each year as do Atlantic menhaden, so we will have to develop other methods of age determination. We plan to conduct a catch-sampling system similar to that for the Atlantic Coast beginning with the 1964 fishing season.

Project 2. Collection, Completion and Analyses of Catch Statistics and Logbook Data.

Through this project, catch and fishery effort data will be organized and assigned to various fishing areas on the basis of logbook records maintained

by fishing vessel captains or pilots. These data will aid in a study of the relation between the fishery and the menhaden stocks.

Project 3. Investigation of the Biology and Population Structure of Gulf Menhaden.

Whereas we are dealing with only a single species of menhaden in the Atlantic fishery, the presence of possibly three different species in the Gulf fishery again complicates matters. We have to identify what species is being caught and in what quantities; and we also have to delineate any possible subpopulations. These are important if we are to relate fluctuations in the catch to either environmental factors or to the fishery.

Project 4. Estimation of Juvenile Abundance in Estuarine Nurseries.

Under this project we propose to develop methods of estimating the relative abundance of each new year class of juvenile menhaden in Gulf estuarine nurseries. Then, on the basis of yearly relative abundance estimates, in conjunction with calculated mortality rates of older fish, we will be able to make predictions on the relative abundance of fish expected to be available to the fishery.

In addition to these 4 biological projects, there also is an exploratory fishing project wherein both vessels and an airplane are used to locate menhaden in the offseason. Many of you have already received reports on this investigation.

Since the money for the Gulf Menhaden Research Program was not appropriated until last August, we have not as yet had the opportunity to gather a great deal of data; but have been developing our program and acquiring personnel and equipment.

However, we have spent considerable time in recent months photographing old catch records, some dating back to the 1940's, from the various Gulf menhaden plants. These will give us valuable background in assessing the relations between the fishery and the stocks.

We also have developed a descriptive key for field identification of Gulf menhaden by species. We are planning to use this key in the field this year to test its validity.

Finally, and fortunately, we anticipated the need for data on juvenile abundance and made some preliminary surveys in the Gulf Area in both 1962 and 1963. Although it should be noted that this project is just getting started and the techniques, scope and reliability of the counts must still be verified, preliminary comparisons of 1963 and 1962 counts suggest a lower abundance for the 1963 year class of Gulf menhaden. Just what effect this will have on the 1964 fishery we cannot say at this time.

* * * * * *

REVIEW - INDUSTRIAL BOTTOMFISH FISHERY, 1959-62

by

Charles M. Roithmayr
Bureau of Commercial Fisheries
Pascagoula, Mississippi

Introduction

The problem of unwanted fish caught in commercial harvests is not new to the American fishing industry. An effort to find a solution resulted in a report published in 1907 by the United States Bureau of Fisheries. The only practical suggestion offered at that time was to develop the utilization of those species having no market.

In 1952, the Gulf coast fishing industry attempted to solve the problem of marketing small bottomfish, weighing less than 1 pound each and caught incidentally in shrimp trawls, by constructing a petfood plant at Pascagoula, Mississippi.

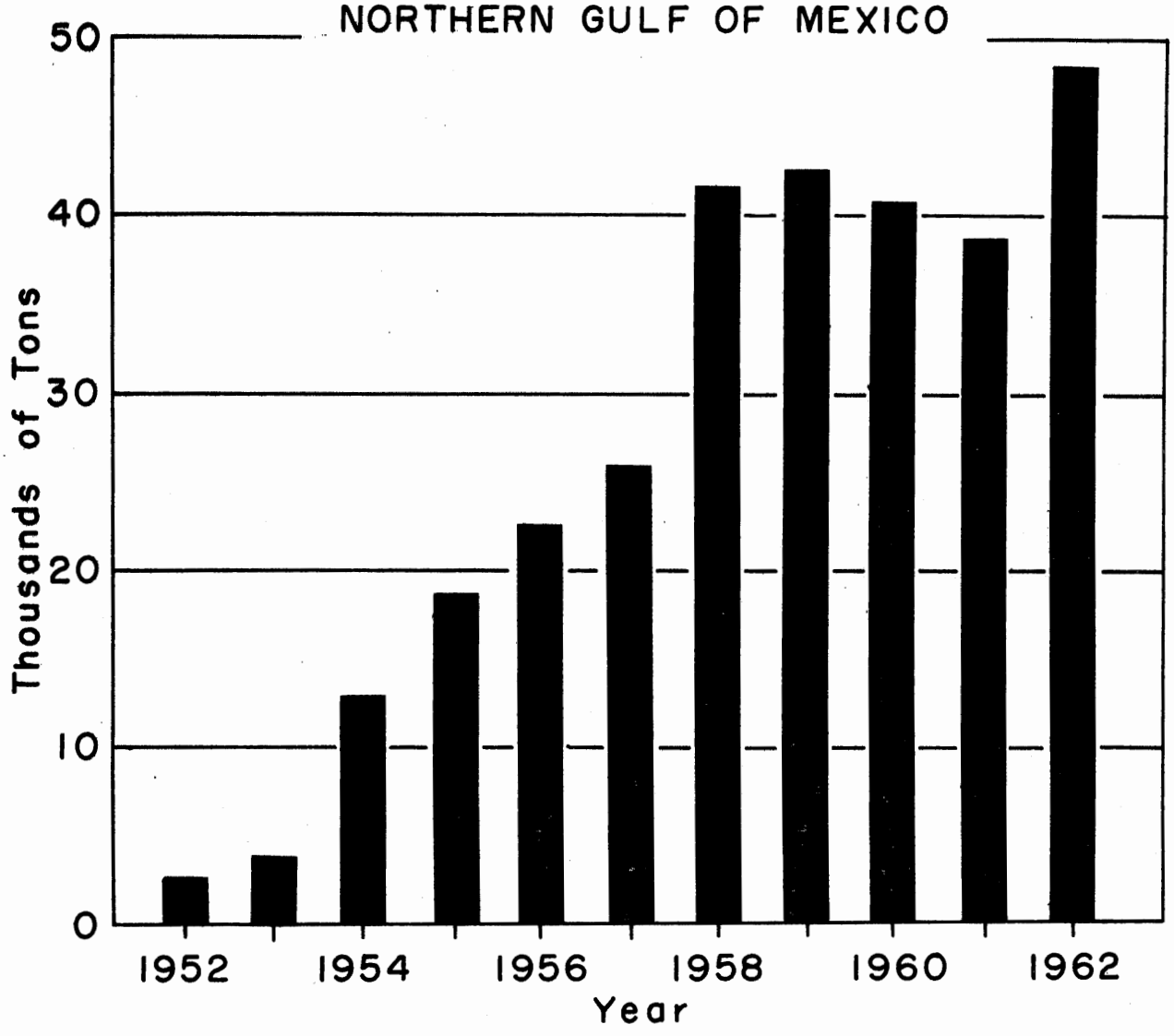
Production of such fishes gradually increased each year thereafter, and by 1958 ten plants at 6 ports located in Mississippi and Louisiana processed approximately 41 thousand tons (SLIDE I). Additional use of fish was made at this time by the poultry industry in the form of fish meal, and by the fur farming industry, especially for the feeding of mink. Production decreased slightly in 1960 and 1961, but increased again in 1962 to a record catch of 48 thousand tons valued at 1.6 million dollars to the fisherman. Of the total catch processed, 85 percent was canned as petfood, while the remainder was frozen for mink food and crab bait, and dehydrated into fish meal. Mississippi led all states, accounting in 1962 for 40 percent of the total United States petfood pack with a value of 14.9 million dollars to the Mississippi canners. The total U. S. pack of animal food from fishery products in 1962 amounted to 7.8 million cases and was more than twice the salmon pack, and exceeded one-half of the tuna pack for human consumption.

In 1958, the Gulf States Marine Fisheries Commission recommended that funds be made available to make a study of the industrial fishery of the northern Gulf of Mexico. Later that year the Fish and Wildlife Service assigned biologists to survey the species and size composition of landings made by the bottomfish fleet at Pascagoula, Mississippi. The principal objectives of the study are to detect changes that may occur in the fish populations, and to obtain life history information for the major species. The present report deals with some of the results obtained from 1959 through 1962.

I

INDUSTRIAL BOTTOMFISH LANDINGS

NORTHERN GULF OF MEXICO



Fishing for bottomfish is presently conducted over the inner Continental Shelf near the Mississippi River Delta (SLIDE II). A resident fleet of approximately 50 trawlers generally seek fish in 4 to 20 fathoms from Ship Shoal, Louisiana to Pensacola, Florida; and land their catches at Golden Meadow, Louisiana, as well as in Gulfport, Biloxi, and Pascagoula, Mississippi. Within this area, the 10-fathom curve averages about 10 miles from shore. The sea bottom consists largely of mud and sand, and is generally level, providing excellent trawling conditions.

The shallow waters of the northern Gulf are characterized by an abundant variety of fish. Sixty-five families of fishes, including over 170 species have been identified in the commercial bottomfish landings.

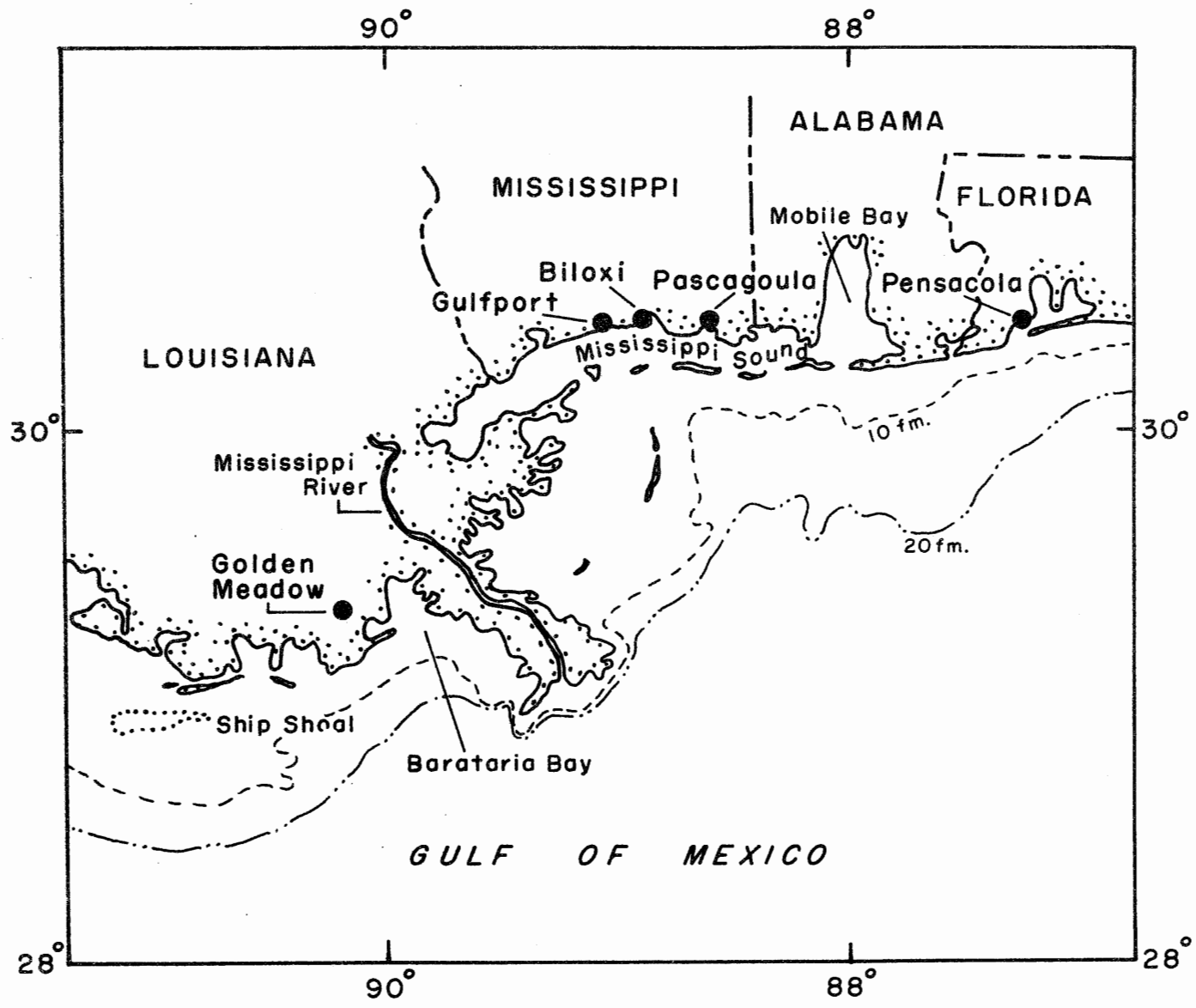
Four members of the Sciaenidae, or drum family, contributed significantly to the overall production (SLIDE III). On the average, croaker, spot, sand seatrout, and silver seatrout accounted for 72 percent of the annual landings during the 4-year period. The croaker was by far the most important species harvested each year, averaging 52 percent of the total catch, and ranged from 19 thousand tons in 1959 to 28 thousand tons in 1962. By comparison, the maximum commercial production of croaker in Virginia and North Carolina, where it was a principal foodfish, was 30 thousand tons in 1945.

The croaker of the Gulf was largely responsible for the marked increase in the bottomfish landings in 1962. The 4 members of the drum family were present in the trawl catches throughout the year, while the cutlassfish, or silvereel, made seasonal contributions to summer and fall catches. The croaker was equally abundant in catches from all grounds with the exception of the nearshore area in 1 to 7 fathoms east of the Delta, where reduced abundance may have been due to the presence of large amounts and a great variety of other species. The spot was approximately two times more abundant east of the Delta, while both species of seatrout were two to three times more abundant west of the Delta. The cutlassfish was more plentiful in catches from the nearshore grounds east and west of the Delta.

A major portion of the life history project involves the separation of age groups, or year classes, of each of the four major species contributing to the fishery, the purpose being to expose any variation in relative abundance of successive age groups, and to determine what effect it has on the commercial catch. One to eight life history samples were obtained each week from commercial catches landed at Pascagoula, Biloxi, and Gulfport, Mississippi since July 1961.

II

PORTS OF LANDING AND FISHING GROUNDS
INDUSTRIAL BOTTOMFISH FISHERY

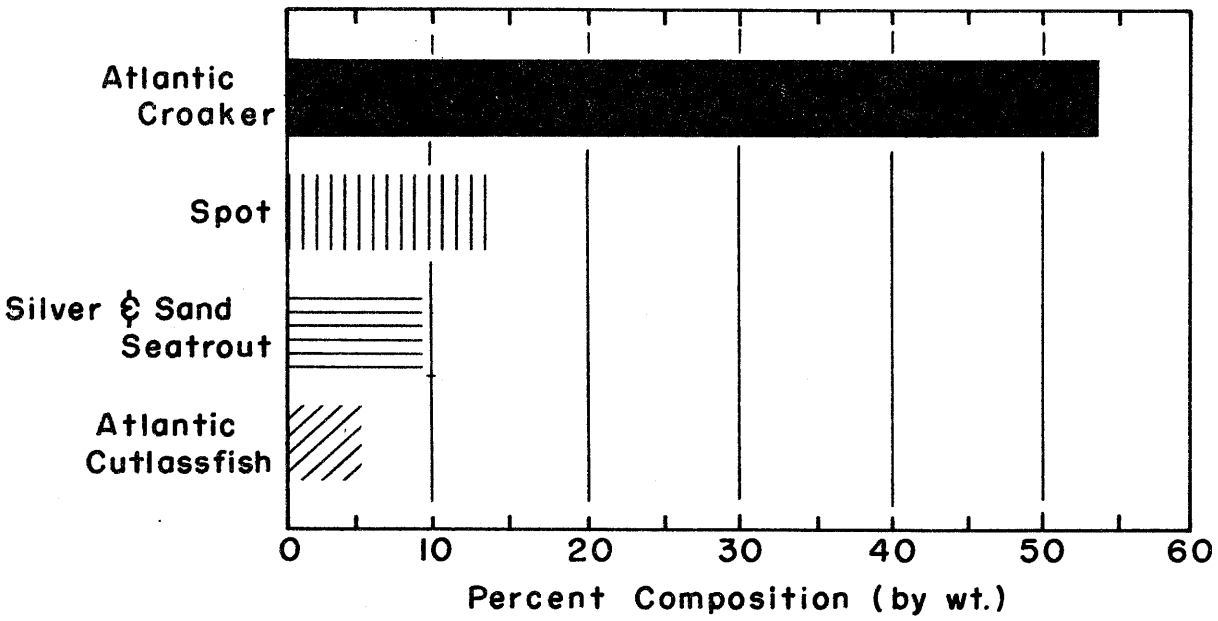


III

RELATIVE PRODUCTION OF PRINCIPAL SPECIES, 1959-'62

INDUSTRIAL BOTTOMFISH FISHERY

NORTHERN GULF OF MEXICO



One hundred fish per sample were measured for total length. Subsampling every fifth fish provided scales for age studies, weight measurements, sex, and stage of sexual maturity.

The findings reported in the following discussion are restricted to the croaker. Attempts to use the scale method of age determination have had limited success since annuli, or year marks, are difficult to determine. Therefore, analysis of length and weight distributions, despite acknowledged subjectivity, has had to be relied on for age determination. The results reported in this study are to be considered preliminary. Samples of croaker were available from the inshore estuaries and sounds, as well as from the nearshore areas in the Gulf in abundant quantities for the first time in October 1963. The inshore material was obtained from collections made in Mobile Bay and Mississippi Sound by personnel of the Alabama Marine Resources Laboratory.

Length measurements of 4100 fish clearly show the presence of two size groups from east of the Mississippi River Delta between Chandeleur Island and Mobile Bay (SLIDE IV). The average length of fish caught inshore in Mobile Bay and Mississippi Sound was 12 centimeters, or almost 5 inches. Fish captured nearshore in 2 to 7 fathoms in the Gulf averaged 17 centimeters, or nearly 7 inches.

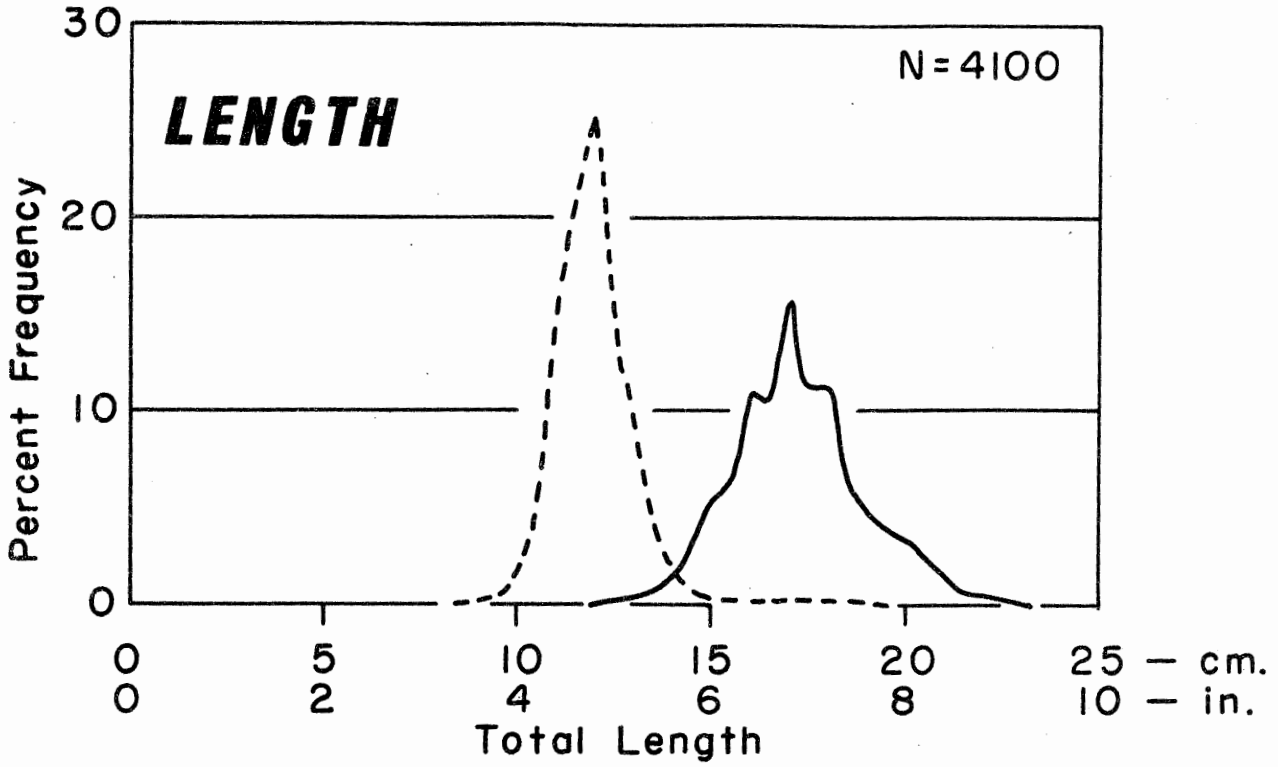
A similar separation of croaker into two size groups was evident by using the weight determinations of 1500 fish. The average weight of inshore fish was 15 grams, or approximately one-half ounce, while nearshore fish in the Gulf averaged 50 grams, or nearly 2 ounces.

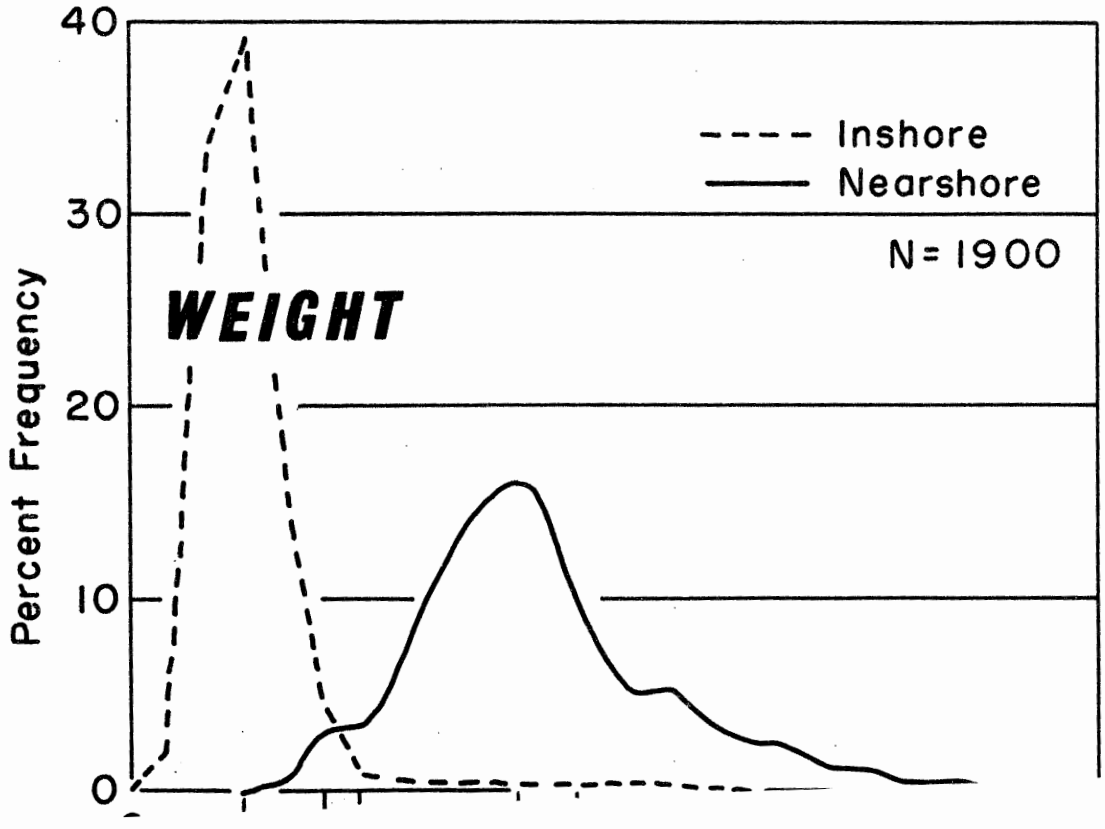
Associated data on sexual maturity of these fish showed that 97 percent of the inshore fish examined were virgin, and the remainder were in spawning condition, or had recently spawned. On the other hand, no virgin fish were evident in nearshore samples from the Gulf, while 43 percent were either ripening or ripe.

Previous studies of croaker east of the Delta since 1961 showed that quantities of ripe fish were present from 3 to 7 fathoms in the Gulf from September through November. Assuming this to be the principal spawning period, it is hypothesized that the smaller size group of 5-inch fish present in the inshore waters during October 1963 was spawned in fall 1962, and may be identified as the 1962 year class. Larger fish, which average 7 inches in length, are 1 year

IV

FREQUENCY DISTRIBUTIONS - ATLANTIC CROAKER
EAST OF DELTA, OCTOBER 1963





older, constitute the 1961 year class, and are spawning for the first time. It is tentatively concluded, therefore, that these are largely 1 and 2 year old fish.

The unweighted samples, grouped by 3-month periods, illustrate in a general way how year classes contribute to the commercial fishery (SLIDE V). In fall 1961, spawning of fish 2 years old and older produced the 1961 year class. In spring 1962, juvenile fish less than 1 year old first appeared in Gulf catches near the estuaries. During the fall of 1962, fish at age I were largely unavailable. Not until summer 1963 did this year class contribute appreciably to the catch. By fall 1963, when spawning occurred for the first time at age II, it supplied the major tonnage to the fishery.

A similar sequence of events is observed for the 1960 year class. Small quantities of 1-year-old fish were present in late 1961 and early 1962 catches. A gradual increase began in summer, and by fall 1962, at 2 years of age, they contributed most of the catch. They continued to provide the bulk of the catch until summer 1963, but were largely absent from the industrial bottomfish fishery by fall at age III.

Fish presumably 3 years old were present in November 1961 samples collected from exploratory tows in 30 to 40 fathoms off the Mississippi River Delta by the Fish and Wildlife Service research vessel Oregon. They measured an average of 21 centimeters, or 8 inches, and weighed about 3 ounces. Commercial gill nets operating inshore near Gulf Shores, Alabama during October 1963 yielded fish averaging 30 centimeters, or 12 inches, weighing 1 pound. It is estimated that these fish are between 5 and 7 years of age.

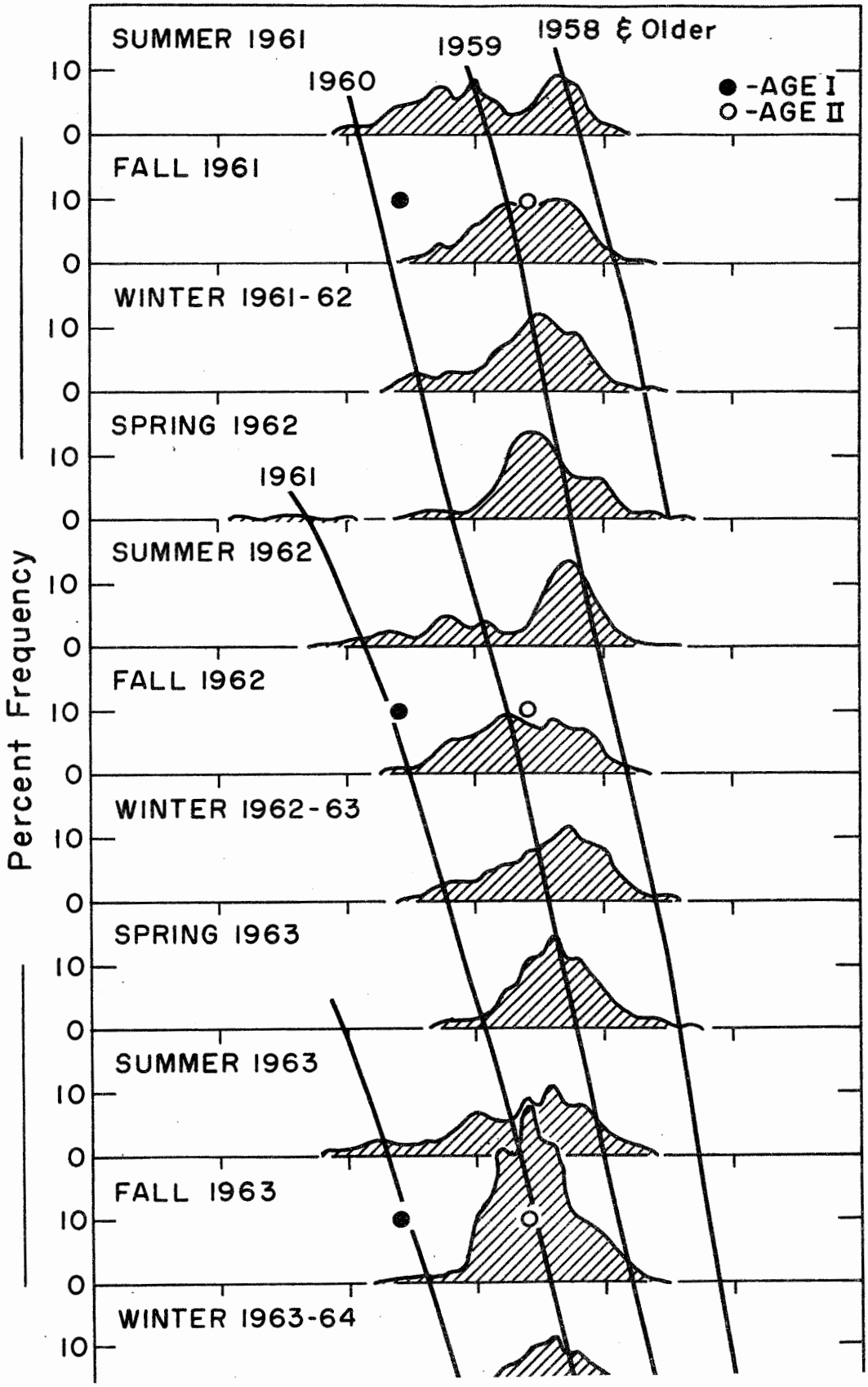
To measure changes in the relative abundance of bottomfish, it is important to have complete and detailed records of catch from year to year. Such information is being obtained from the records of individual vessel landings kept by the processing plants. In addition, we must obtain not only information as to the amount of fish caught, but also information regarding their location, and the time required to capture them. These data are being collected by means of personal interviews, and from log books being kept by the boat captains.

Annual landings varied only slightly from an average of approximately 40 thousand tons during the period 1959 - 1961, but increased to 48 thousand tons in 1962 (SLIDE VI). Landings originating

V

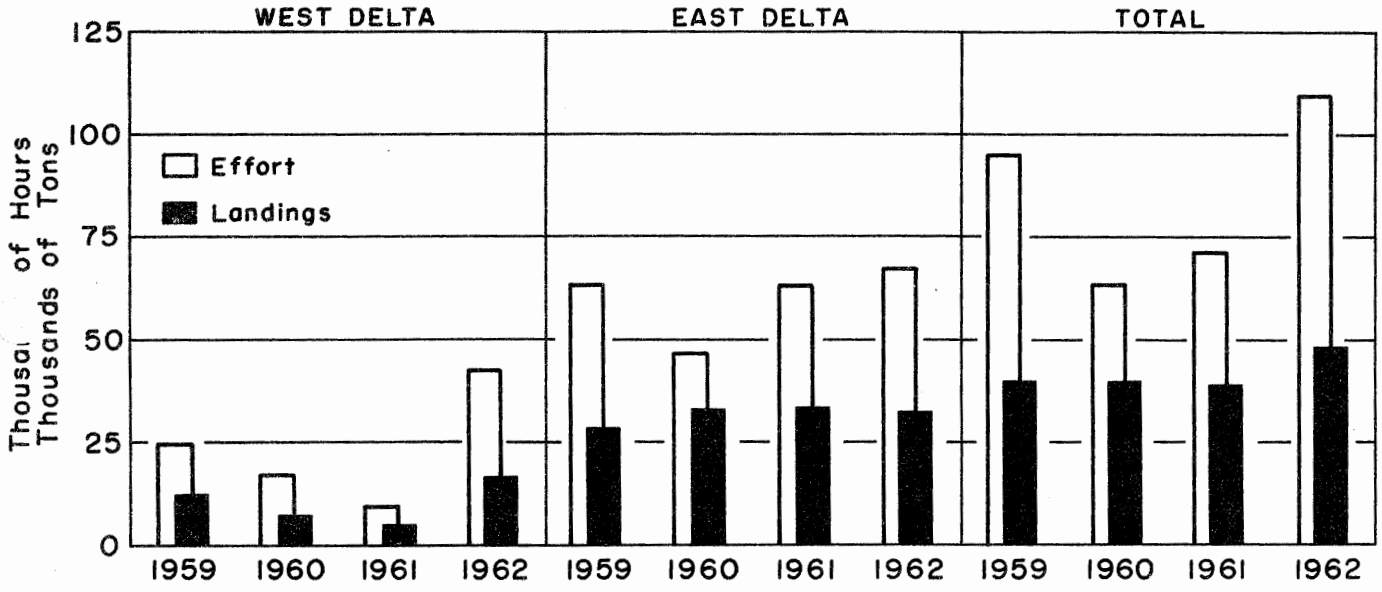
LENGTH FREQENCY DISTRIBUTION - ATLANTIC CROAKER

INDUSTRIAL BOTTOMFISH FISHERY
NORTHERN GULF OF MEXICO



VI

EFFORT AND CATCH STATISTICS
INDUSTRIAL BOTTOMFISH FISHERY
NORTHERN GULF OF MEXICO



east of the Mississippi River Delta remained comparatively level during the 4-year period, averaging 31 thousand tons, or 76 percent of the overall total. On the other hand, landings from west of the Delta declined by more than one-half between 1959 and 1961, but increased threefold in 1962. Comparative effort data show that the increase in total landings in 1962 was the result of the increased effort expended by the fleet on west Delta grounds.

On the average, fishing from December through May occurred between Point au Fer, Louisiana, and Southwest Pass, Louisiana; and from Pass a Loutre, Louisiana, to Perdido Bay entrance, Florida; and offshore to a depth range of 20 to 30 fathoms (SLIDE VII). The grounds most heavily fished each year were in 8 to 12 fathoms off Horn Island, Mississippi. Seventy percent of the total effort was expended in the area east of the Delta from December through May.

Fishing from June through November was generally limited to the nearshore grounds between Ship Shoal and Southwest Pass, Louisiana; and between the Chandeleur Islands and the entrance to Perdido Bay (SLIDE VIII). East of the Delta, the amount of seasonal effort increased markedly nearshore, particularly within 5 miles of the beaches adjacent to Mobile Bay entrance. On the average, intensive fishing in this area accounted for 39 percent of the total effort expended in the north-central Gulf between June and November.

Part A of the illustration compares the average relative abundance for all bottomfish species, and for croaker, in tons per hour, from 1959 through 1962 (SLIDE IX). Minimum values for all species and for croaker are evident in March. A twofold increase takes place by June followed by a decreasing trend through November, and increasing again in December. Obviously the croaker governs the seasonal variation in the overall relative abundance of the bottomfish resource.

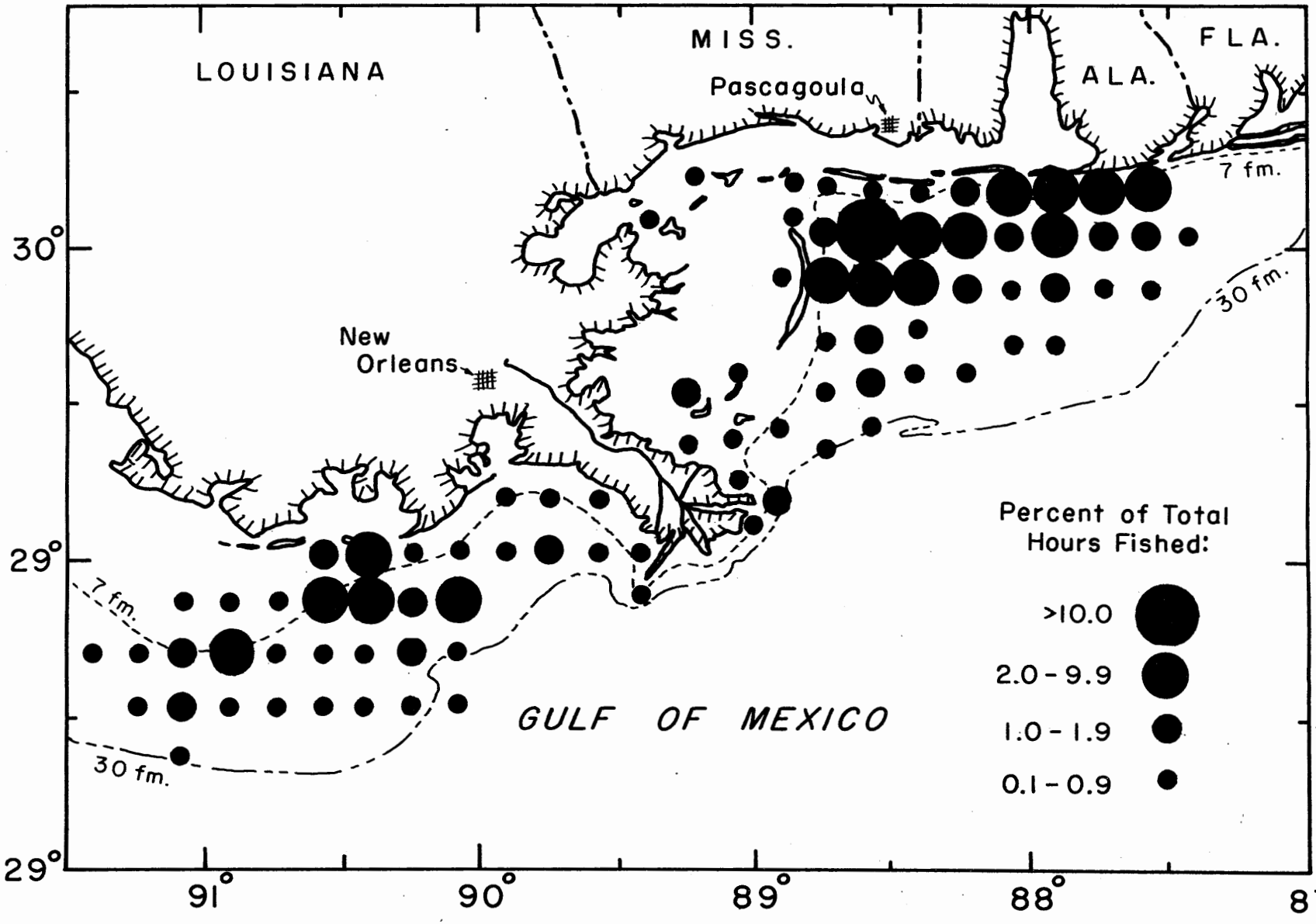
Part B reveals that the average depth fished by trawlers in February is 12 fathoms, while shallower depths of 5 to 6 fathoms are fished from June through October.

In Part C it is evident that the average tow takes 2-2/3 hours in March, while shorter tows of about $1\frac{1}{2}$ hours each are made in June, July, and August. Most apparent from these data is that the evident change in bottomfish abundance from spring to summer is largely due to a real increase in the croaker yield on the nearshore grounds.

VII

DISTRIBUTION OF FISHING EFFORT

INDUSTRIAL BOTTOMFISH FISHERY
DEC.-MAY, 1959-62

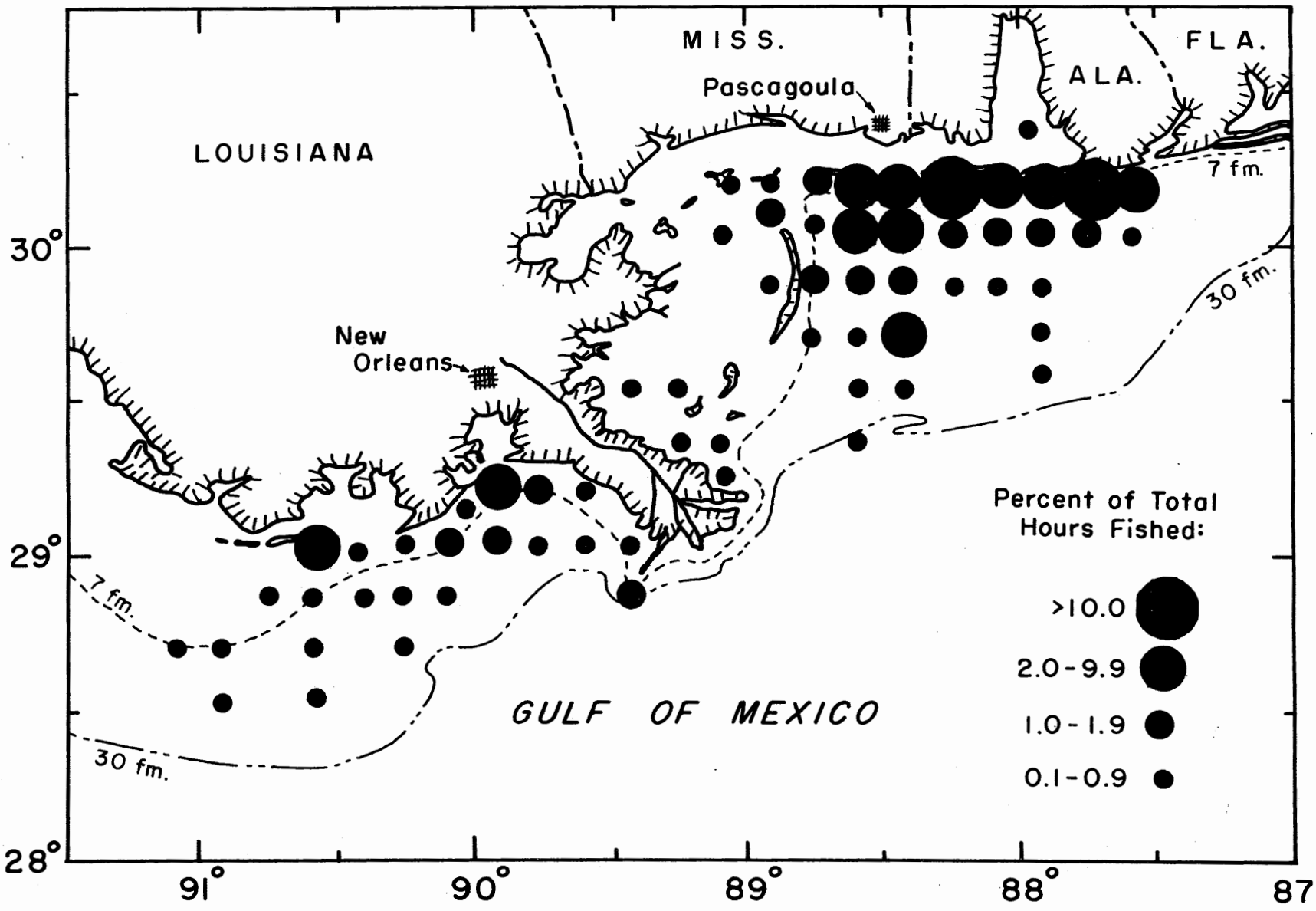


VIII

DISTRIBUTION OF FISHING EFFORT

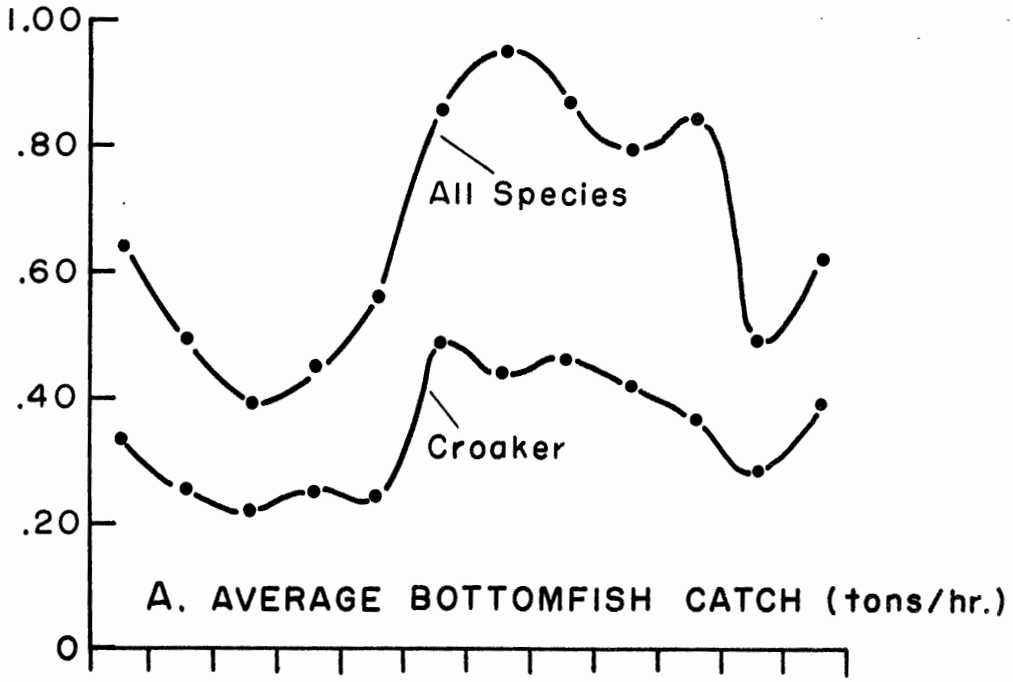
INDUSTRIAL BOTTOMFISH FISHERY

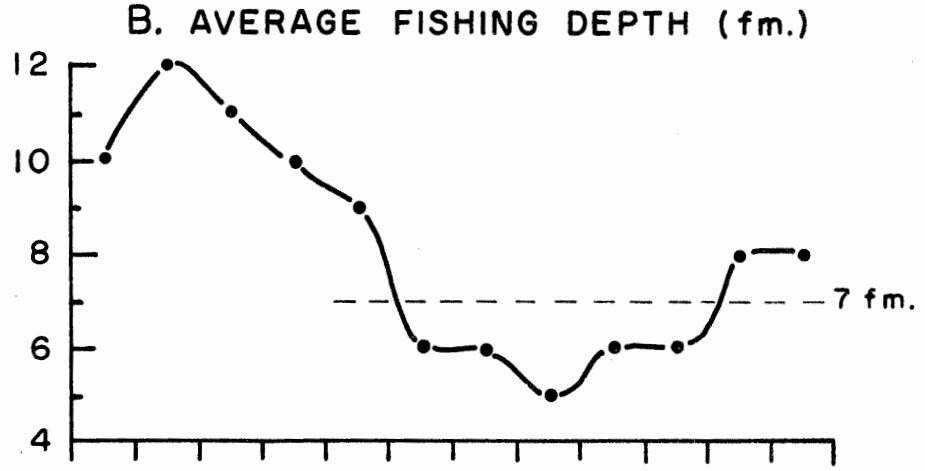
JUNE-NOV., 1959-62

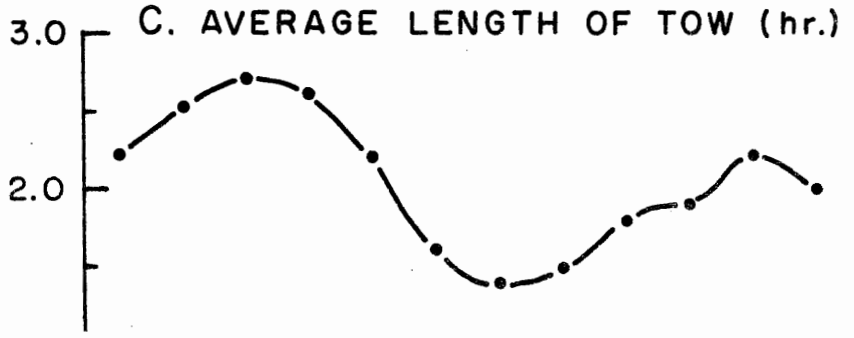


IX

CATCH AND EFFORT STATISTICS 1959-'62 INDUSTRIAL BOTTOMFISH FISHERY







More than one factor is believed to cause the seasonal increase in the yield of croaker. Analyses show that the average weight was consistently less in summer than in spring, whereas the average number of fish in each standard-weight sample was greater in summer. It is believed that yearling fish become available to the fishery in substantial amounts for the first time after leaving the estuaries. Weight determinations also showed that the average weight of age group II, which is the dominant group in the catches, increased 21 percent from spring to summer. These observations indicate that the increased summer yield of croaker may result from recruitment of 1-year-old fish into the fishery, together with a substantial weight increase of 2-year-old fish. Further investigation is being made concerning this matter.

Gross analysis of monthly catch and effort statistics for the Gulf bottomfish fishery has been completed for the period 1959 through 1962. The mean relative abundance of bottomfish, using catch per hour as an index, was almost identical for both the east and west Delta grounds. Since effort expended in west Delta waters averaged only 25 percent of the overall northern Gulf total, additional exploitation there is indicated. Another finding is that the abundance of bottomfish on the heavily fished grounds of the east Delta area remained almost the same, whereas the overall trend in catch increased measurably during the 4-year period. Continued study of the fishery will reveal whether or not increasing catches have begun to harm this resource potential.

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GULF STATES MARINE FISHERIES COMMISSION
New Orleans, La.
The Monteleone Hotel
April 9-10, 1964

"THE PROGRAM OF THE GULF COAST SHELLFISH SANITATION RESEARCH CENTER"

Richard J. Hammerstrom, Director
Gulf Coast Shellfish Sanitation Research Center-Shellfish Sanitation Branch
Dauphin Island, Alabama

At the October 1962 meeting of the Gulf States Marine Fisheries Commission on Dauphin Island, I had the pleasure of presenting a paper on the Public Health Service interest in marine food resources written by Mr. Wesley Gilbertson, Chief of the Division of Environmental Engineering and Food Protection and Mr. David Clem, formerly associated with the Division. Reference was made in this paper to the Gulf Coast Shellfish Sanitation Research Center and the plans at that time for staffing and carrying out research activities. On the occasion of that meeting there was a group visit to the site of the Research Center in its earliest stages of construction.

Today the Research Center is almost fully operational. During this interim between October 1962 and today, a number of you attended the dedication of the Center on August 3 of last year. A larger number perhaps participated in the Research Planning Conference held at the Center this past February.

The Gulf Coast Research Center is one of three research facilities established by the Public Health Service under the auspices of the cooperative State-Public Health Service-Industry program for the certification of interstate shellfish shippers to assure that shellfish shipped in interstate commerce will be safe to eat. Concern over the safety of shellfish for human consumption is well-founded because of the unique role of oysters and clams to serve as potential vectors for the transmission of diseases and carriers of toxins and other harmful agents. The ever increasing hazard of pollution of the estuarine habitats of shellfish and the unusual ability of shellfish to concentrate microbiological agents, natural toxins, and industrial and agricultural chemicals combined with the practice of eating shellfish in the raw state or with superficial cooking are factors that demand the establishment and rigid adherence to sanitation and other protective measures in the production of the final market product. All too often in the past these safeguards have broken down with resulting outbreaks of human illness and an associated economic loss to the shellfish industry.

The administration and operation of the Cooperative Program for Certification of Interstate Shellfish Shippers has been discussed at previous meetings of the Gulf States Marine Fisheries Commission. I shall not review the Cooperative Program or the respective roles of the cooperating participants since I believe most of you are acquainted with this information. I want to briefly describe the program of the Gulf Coast Shellfish Sanitation Research Center and acquaint you with some of our present and planned activities.

(Hammerstrom #2)

The principal objective of the Research Center is to conduct research and investigations on the sanitation and other public health aspects of shellfish. As the problems may be presented and as our resources and facilities permit, other edible marine fauna may be included in the research program. Staffed with individuals representing a number of professional disciplines, the Research Center has personnel resources for research projects in microbiological, chemical, marine biological, radiological, and toxicological fields.

The research and investigations program of the Center may be considered in two broad areas depending on the type and location of the particular activity. Fundamental investigations, utilizing all of the available research facilities of the laboratory, are being conducted at the Center. In these fundamental studies, the shellfish and shellfish growing waters of the immediate marine environment of the Center constitute an important field resource. However, it should be emphasized that the Center has been established to serve, on a regional basis, all of the Coastal States of the South Atlantic and Gulf of Mexico area from South Carolina through Texas. Consequently, the important and regional shellfish problems of this area will receive the attention of our fundamental research effort.

The second broad area of the research and investigations program is comprised of cooperative field investigations with State agencies concerned with shellfish sanitation control activities. These agencies include the State Health Departments and the State Conservation and Fish and Game Departments. Through these agencies, the cooperative investigations in many instances will involve the active participation of industry.

The maximum effectiveness of our research and investigations program can be attained only if it is truly responsive to the needs and problems as recognized by State control agencies, industry, and research groups interested in shellfish sanitation. The impact of domestic and industrial pollution on the reduction of available shellfish growing areas and on the marketability of shellfish taken from those areas considered as marginal is generally regarded as the major shellfish sanitation problem today. Consequently, top priority is being given in our research program to the study of shellfish depuration or purification processes.

Our research work on depuration will draw upon existing knowledge gained through prior investigations and operational experience in the purification of shellfish. Earlier studies of the Public Health Service have resulted in the development of an effective system for sterilization of sea water using ultraviolet radiation and have demonstrated that all of the commercially important species of oysters and most species of clams can be freed of coliform organisms when presented with water of appropriate sanitary quality in a flowing through system.

A sufficient understanding of the feeding-cleansing mechanism of shellfish is available to utilize this process with confidence in the depuration of shellfish, at least as measured by bacteriological indices. However, little information is available concerning the effectiveness of the process in the removal of viruses and toxic materials. Basic studies on shellfish physiology and the

influence of various physical, chemical, and biological factors in the marine environment on shellfish activity are necessary in order to accelerate the process of depuration to a point of commercial feasibility.

Purification of shellfish in depuration plants has been accomplished successfully for a number of years in other parts of the world, particularly in England, France, and Portugal. In this country, the only shellfish purification plant that has been operating for a substantial period of time is located in Massachusetts and is used for the purification of clams. The Public Health Service is cooperating at the present time with state agencies in Maine and Rhode Island on shellfish purification studies utilizing pilot depuration plant facilities. Knowledge gained from this operational experience will be applied in the investigations conducted at the Gulf Coast Research Center.

Our initial studies on depuration have been directed to the development of an experimental depuration system in the wet laboratory utilizing a closed recirculating sea water unit. The basic system consists of a primary reservoir, two aquaria, and two water pumps. Auxiliary components include two ultraviolet irradiation units and appropriate equipment for temperature control.

Experiments on the treatment and sterilization of sea water have been designed to determine the effectiveness of U.V. radiation in destroying sewage derived coliform organisms in the presence of varying concentrations of turbidity, dissolved salts, or organic matter. The effect of U.V. radiation on various plankton organisms and viruses will also be investigated.

Recognizing the importance of shellfish physiology in the depuration process, we will conduct experiments to test the effect of various factors on shellfish activity. The effect of varying degrees of turbidity, temperature, and salinity and varying concentrations of dissolved salts, organic matter, plankton, and plankton extracts will be studied. We are particularly interested in stimulants or triggering agents for stimulating shellfish activity in order to speed up the cleansing action during the depuration process.

Concurrently with these more basic studies utilizing the experimental depuration system, we are proceeding with the engineering design and construction of a pilot depuration plant. This pilot plant will permit immediate application of basic knowledge gained in the experimental system. An ultraviolet radiation system, similar to that designed and operated by the Public Health Service Shellfish Sanitation Laboratory at Purdy, Washington, has been installed in the Gulf Coast Research Center and will be a component part of the pilot depuration plant. Our experiments in this plant will be conducted with semi-commercial sized lots of shellfish. Studies will be conducted on such factors as loading, water requirements, and design of tanks and equipment.

Studies on the purification of shellfish under natural conditions by transfer to a clean marine environment have also been initiated and will be conducted simultaneously with the laboratory investigations. A suitable experimental area in the vicinity of the Gulf Coast Research Center will be selected and shellfish will be transferred to this area, being suspended in rafts and also

placed on the bottom in baskets. The shellfish will be sampled on a regularly scheduled basis to determine the rate and extent of elimination of selected bacterial and viral indices, chemical pollutants, and toxins.

Another area of research having high priority in our program is the study of accumulation and detection of viruses in shellfish. The accumulation of pathogenic bacteria by shellfish to a concentration many times that in the marine environment has been well demonstrated. Whether or not shellfish can accumulate virus particles in the same manner became an important question with the incrimination of clams and oysters as carriers of infectious hepatitis in outbreaks of this disease in Sweden and the United States.

We have started two virus research projects directing our initial efforts to acquiring basic information in the laboratory. The first research project is designed to demonstrate the accumulation of virus particles by oysters. Oysters were placed in a small salt water aquarium that had been contaminated with type 1 polio virus. At one hour intervals samples of oysters and water were removed from the system and after shucking and grinding the oysters, all samples were frozen and stored at -100°F. Sampling of the water was continued after the oysters were exhausted to study survival of the virus. We hope that a comparison of virus counts in the oysters and the water will show whether the oyster merely becomes contaminated at the same level as the water or whether it actually filters out and concentrates the virus. This system should also provide us with virus contaminated oysters with which to evaluate different techniques for virus detection and isolation.

In the second virus project we will study techniques for detection of virus in shellfish and are starting with the fluorescent antibody technique. This technique has the advantages of being extremely sensitive, yielding reportable results in a minimum time, and permitting the visualization of the antigen-antibody reaction revealing not only the presence but also the location of virus particles. We hope that if this technique can be adapted to use with shellfish tissues, it will serve as a good screening method for virus contamination and by locating the virus within the animal will yield a clue to the nature of the shellfish-virus relationship.

Studies on adverse chemicals and toxins in the marine environment and shellfish constitute another important area of research at the Gulf Coast Research Center. The danger of pollution of shellfish growing areas and shellfish from chemical and other industrial wastes, detergents, pesticides, chemical fertilizers, and weed killers is an increasing threat which requires continual surveillance to safeguard the wholesomeness of shellfish. Over the past several years the public has become increasingly concerned with the potential hazards of pesticide residue, and more attention must be given to the potential contamination of shellfish by pesticides in the natural environment. More recently, considerable interest has been shown in the Gulf Coast area in the contamination of shellfish with naturally occurring marine toxins.

(Hammerstrom #5)

Our initial studies of chlorinated pesticides and chemical pollutants in shellfish from the Gulf and South Atlantic Coastal States area have been directed to the evaluation and development of methods for the rapid and accurate determination of any pesticides or toxic chemicals that may be present. Using presently known and newly developed techniques, we are attempting to determine the levels of chlorinated pesticides and chemical wastes in the shellfish to furnish background information as to whether a public health problem or threat actually exists at the present time.

Emphasis has been placed on the determinations of chlorinated pesticides in shellfish utilizing paper, thin-layer, and gas chromatography techniques. Oyster samples from several states have been analyzed and arrangements have been made to secure additional samples from the remaining states served by the Research Center.

Prior to December 1962 the Gulf and South Atlantic Coastal States had not experienced the effects of human consumption of shellfish in which naturally occurring toxins had accumulated. At that time, several cases of human illness thought to be caused by the consumption of toxic shellfish were reported by the Sarasota County Board of Health in Florida. The Florida State Board of Health Laboratory at Jacksonville initiated bio-assays for toxicity on shellfish samples from several counties in the Sarasota Bay-Lemon Bay area of Florida. This work continued through 1963 and is still in progress at the present time. Since May 1963 the Gulf Coast Research Center and the Marine Laboratory of the Florida State Board of Conservation at St. Petersburg have been engaged in a cooperative activity of collecting oyster and water samples from the St. Petersburg-Sarasota area. Oyster samples have been analyzed in our Research Center for toxicity and studies on the development of methods of extraction and bio-assay have been conducted. The Florida State Board of Conservation Laboratory performed phytoplankton identification and counts on water samples for the purpose of correlating toxicity with the presence or absence of certain phytoplankton organisms. Since September the field sampling activity in which we have participated has been largely restricted to Lemon Bay, Florida. We hope that the studies in the Lemon Bay area will provide information on the seasonal variation in toxicity and the environmental and ecological factors correlated with shellfish toxicity.

A limited number of oyster samples from states other than Florida have been checked for toxicity but so far only shellfish samples from the St.Petersburg-Sarasota area of Florida have shown the presence of a toxin. We will continue our studies of the oyster toxin to determine the source and extent of distribution of toxic oysters so that the seriousness of the problem can be properly evaluated.

One of the most important aspects in determining the sanitary quality of shellfish growing areas is the comprehensive sanitary survey. In recent years the increase in population, the increased industrial pollution, and the use of exotic chemical and other substances have increased both volume and complexity of waste products or contaminants which enter our aquatic environment

and are eventually discharged into estuarine areas. In many instances methods for monitoring and assessing the sanitary significance of wastes are inadequate because they are lagging the rapid increase in industrial technology.

The Research Center is now in the process of initiating a study designed to evaluate present techniques of water quality measurement and instrumentation and to develop, where appropriate and essential, new techniques which may be applied to sanitary surveys of shellfish growing waters. This study will involve field investigations utilizing the current methods and equipment evaluated at the Research Center. These methods and equipment will be applied in sanitary surveys conducted in selected areas of different characteristics so that general and specific techniques for a variety of conditions may be evaluated.

Studies in the commercial practices of harvesting, handling and marketing of shellfish constitute an important segment of the over-all research and investigations program of the Center. These studies frequently involve field investigations and are generally conducted on a cooperative basis with state control agencies and with the participation of industry. A brief description of several of these projects illustrates the type of study and the method of investigational approach.

A study of the changes in the quality of eastern oysters stored under controlled time-temperature relationships will attempt to secure baseline data which can be used to establish optimum conditions for holding and shipping shellfish. Live and shucked shellfish are being stored and examined bacteriologically to determine the behavior of selected groups of index organisms after definite periods of storage at controlled temperatures. The efficiency of certain chemical procedures in defining the time-temperature conditions of shell and shucked oysters may also be determined.

A bacteriological study of commercial practices of oyster harvesting and processing, conducted in cooperation with the Alabama State Department of Public Health, is nearing completion. The objective of this study is to determine the influence of commercial harvesting and processing practices on the bacterial quality of the eastern oyster, Crassostrea virginica. Traced commercial lots of oysters were sampled at key points throughout harvesting, processing, including shucking and washing, and packing. The time-temperature relationships were determined throughout the handling cycle. All samples were submitted to bacteriological examination for standard parameters. Pertinent data about the sanitary aspects of the process were recorded.

A study of the shock immersion or "hot-dip" process in the commercial handling of shellfish is being conducted in cooperation with the South Carolina State Board of Health. The objective of this study is to preliminarily evaluate the applicability of this process to the Cooperative Program by studying the bacteriological aspects of the process. Traced lots of oysters were sampled at key pointain the process and submitted to examination for standard bacteriological parameters as also were samples of the immersion water. Time-temperature histories of each lot of shellfish were determined and pertinent information about the process was obtained at each plant. A preliminary comparative study was made to determine gross differences in stored shellfish

processed by the "hot-dip" method and by the more usual shucking procedures.

Other studies, in addition to current and planned projects, are being proposed to further investigate the commercial practices of the shellfish industry. Such studies may well include aspects of physical plant layout and equipment requirements, studies of particular problems such as shellstock washing, and studies of the effects of certain types of contaminants on the quality of shellstock and shucked stock. However, consideration of the initiation of such studies requires that a need for these research activities be expressed by Public Health Service officials concerned with the Cooperative Program, the States, or the shellfish industry.

In addition to carrying out a broad program of research and field investigations which I have described, the Research Center will serve as a technical assistance resource to the Public Health Service Regional offices in their activities in the Cooperative Program with States and industry. In the area served by the Research Center there are two such Regional offices--Region IV in Atlanta and Region VII in Dallas. At the request of the Regional offices, personnel of the Center will be available to assist in the evaluation of State shellfish sanitation laboratory facilities and operations or the review of other State shellfish sanitation program activities. Personnel will also be available to provide specialized consultation or other technical assistance to the State agencies.

The Research Center will also serve as a resource for practical training of personnel engaged in shellfish sanitation activities. Participants in such training may include personnel from State and local agencies, representatives of the shellfish industry, Public Health Service personnel, and personnel of other Federal agencies as may be indicated through program interest. We anticipate the development of training activities varying from organized training courses attended by 10 to 15 individuals, to"bench-type" of training in which a trainee may work alongside of one of our personnel.

Another of the Research Center objectives is to establish close working relationships with offices and laboratories of other Federal agencies, such as the Fish and Wildlife Service and the Food and Drug Administration, in the geographical area served by the Center. We are interested in the appropriate coordination with these agencies of research and other activities in the shellfish sanitation,marine biological, and oceanographic fields. We look forward to the establishment of cooperative investigational activities with these agencies on some of the problems in which we have a mutual interest.

We want to establish a close working association with universities and other educational institutions in the South Atlantic and Gulf Coastal States that offer courses of study or conduct research in sanitation, food technology, marine biology, and oceanography as related to the shellfish field. We hope that we will be able to facilitate the work of these institutions as well as attain our own research objectives through carefully selected research contracts.

We also want to support the consideration and awarding of grants by the Public Health Service to both educational institutions and State agencies for research and investigational activities in fields allied to shellfish sanitation

I have already mentioned the relationship of industry to the program of the Research Center. In the conduct of field investigations and cooperative studies with State agencies, participation of industry principally through individual shellfish handling establishments is frequently required. This cooperative participation of industry has in the past been most helpful and willingly given. We look forward to this continued relationship. In addition, we want to work closely with the various commissions, associations, and institutes that represent industry. It is only through such a close working association with industry that the results of our research and investigational efforts can be effectively translated into improved and continued safeguarding of the market product through the commercial handling processes.

In conclusion, this has been a review of the objectives and purposes, and the current and proposed program of the Gulf Coast Shellfish Sanitation Research Center. We are a relatively young organization, and we look forward to a long, productive, and friendly association with those of you concerned with the shellfish program. I can assure you that we will be dedicated to the cooperative effort with the States, industry, and other interested groups toward the ever continuing progress of insuring shellfish as a safe marine food of high quality and in which the public has confidence.

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GULF STATES MARINE FISHERIES COMMISSION
New Orleans, Louisiana
The Monteleone Hotel
April 9-10, 1964

"PURIFICATION OF SHELLFISH"

Delano R. Crawford, Biologist
Florida State Board of Conservation
St. Petersburg, Florida

I want to preface my talk this morning by bringing before you ladies and gentlemen some interesting facts about Florida and its status as a fish and particularly shellfish producing area.

Florida produces a greater variety of salt water products, including game and food fish than any other part of the country. Total commercial catch is over 200,000,000 lbs., with a value of more than $39,000,000.00. Approximately 20,000 persons are dependent on the industry for their subsistence.

Together with auxiliary occupations such as boat building, charter boats and sports fishing, lures and various other manufactured products the actual value of sea fisheries probably exceeds $300,000,000.00.

Oyster production last year in Florida produced commercially approximately 5,000,000 lbs. of meats with a value of over $3,000,000.00 at the dock. This figure does not include clams of various types or oysters taken from public bars for private consumption.

The potential of Florida for shellfish cultivation is boundless. With its over 8000 miles of shore line and estuaries the foundation and rudiments for this product is established.

But Florida like other states which are conducive for oyster and clam propagation, has the problem of factors which render numerous areas unfit for commercial use. The primary factor is pollution of the waters in many productive areas.

Pollution is usually two-fold. Sewage disposal - the most widespread of all-affects the shellfish by either causing a silt deposit, thus covering the beds themselves or in the more serious way of carrying many disease bacteria into bays and estuaries. Oysters absorb these harmful disease bacteria and in turn are consumed by man. Many serious diseases such as Typhoid, Dysentery, Hepatitis to name a few, have been directly traced to oysters and/or clams.

Another pollution problem - referred to as "Industrial Pollution" is as yet not completely substantiated as to the degree of effect on shellfish pollution. "Industrial Pollution" includes wastes from manufacturing plants and includes pesticides, fertilizers, weed killers, etc.

Research into methods of fighting this pollution problem has been worked on for many years - in many years - in many countries.

Purification plants (depuration) have been in use in the United States since 1927. Massachusetts was one of the first to look into this approach and constructed a depuration plant using chlorination as their medium. This plant which incidentally is owned, operated and financed by the State itself has processed many millions of bushels of clams with great success. Clams placed in the chlorinated waters of the plant cleanse themselves by pumping action and within 24-36 hours are commercially approved for distribution to the public. However it has always been admitted that this addition of chlorine to the tank water affected the normal accustomed pumping rate of the shellfish. Aware of this one factor, a new and different approach to the sterilization of the water was sought.

Research was begun a number of years ago, employing the use of Ultra Violet germicidal lamps. Both England and Japan together with other countries and also the research department of the Florida Board of Conservation began experiments and actual pilot investigation with this new theory.

From all indications - results are very favorable that this process is infinitely greater and more effective than the chlorinization type. England has a depuration plant now in operation along with Spain and Japan.

Four months ago a Mr. Joseph Loudermilk of Palmetto, Florida began the first privately owned depuration plant in this country. He and Mr. Robert M. Ingle prepared the plans. Specifications were completed and the first testing was begun on March 3, 1964. Mr. Ingle and I are working very closely with the new plant - running thorough checks and research work on its operation.

This morning I have brought slides showing the new plant in complete detail.

What is so unique about an Ultra Violet system is its simplicity and low operating cost.

Water is drawn from Terra Ceia Bay (which incidentally has approximately a 1200 MPN count) by means of a 2" plastic pipe into the main tank. The depuration tank itself is constructed of 3/4" plywood covered with a plastic overlay. The size is 8' wide by 16' long and a heighth of 4'. It is capable of holding approximately 250 bushels of clams or oysters at one run.

The U. V. tank which is at one end and above the main tank is 9' long by 3' wide and in original experiments the 6 U. V. lamps (30 W. ea.) were 28" above the water flow. Recently we dropped the distance to 12" with excellent results. First tests completely eliminated coliform bacteria in approximately 6 hours of recirculation. Dropping the lamps reduced the time to from 3 hours to 4 hours.