PROGRAM

Wednesday (October 6)

8:30 - 9:30 AM

REGISTRATION ASSEMBLY FOYER

9:30 AM

CALL TO ORDER—PRE-SESSION REMARKS ASSEMBLY EAST
Walter O. Sheppard, Chairman
Conference of Interstate Agencies

JOINT GENERAL SESSION
Ronald W. Green, Chairman
Atlantic States Marine Fisheries Commission, Presiding

INVOCATION
Reverend Charles H. Corbett
South Miami Lutheran Church

ROLL CALL—ASMFC, GSMFC

WELCOME ADDRESS
Attorney General Earl Faircloth
State of Florida

ADDRESS
Under Secretary John A. Carver, Jr.
Department of the Interior

ADDRESS
William C. Herrington, Special Assistant for Fisheries & Wildlife to the Under Secretary
Department of State

PESTICIDE RESEARCH & CONTROL PROGRAMS—USPHS
Eugene T. Jensen, Chief
Shellfish Sanitation Branch
Public Health Service

11:00 AM

RECESS FOR COFFEE ASSEMBLY FOYER

11:15 AM

FISH AND SEAFOOD—A KICKOFF TO PROFIT
Frederick P. Longeway, Jr.
Executive Director
National Fisheries Institute

THE VIRGINIA KEY MARINE RESEARCH CENTER
F. G. Walton Smith, Director
Inst. of Marine Science, U. of Miami
Burton Clark, General Manager
Miami Seaquarium
Seton H. Thompson, Regional Director
Bureau of Commercial Fisheries, Region 2

ADJOURNMENT *Luncheon*

1:45 - 2:45 PM

JOINT GENERAL SESSION
Ted Millette, Chairman
Gulf States Marine Fisheries Commission, Presiding

GLAMOURIZE AND MERCHANDISE
Robert E. Finley, Chief
Division of Industrial Research
Branch of Marketing, BCF

ECONOMIC ANALYSIS & BUSINESS DECISIONS IN THE COMMERCIAL FISHING INDUSTRY
Virgil J. Norton, Chief
Supply & Resource Use Research Section
Branch of Economic Research, BCF

THE WEST GERMAN FISHERIES GO MODERN (Slides)
C. P. Idyll, Chairman
Division of Fishery Sciences
Inst. of Marine Science, U. of Miami

RECESS *Fifteen Minutes*

3:00 - 4:00 PM

FISH PROTEIN CONCENTRATE
Harold B. Allen, Chief
Branch of Technology, BCF

DISCUSSION—AUTOMATION OF OYSTER SHUCKING
Mrs. David H. Wallace, Director (Leader)
Oyster Institute of North America

PESTICIDES MONITORING PROGRAM
Philip A. Butler, Director
Gulf Breeze Biological Laboratory
Bureau of Commercial Fisheries

ADJOURNMENT

Thursday (October 7)

FIELD TRIP:
Virginia Key Marine Research Center (Transportation Leaving DuPont Plaza 8:15 AM)
Seaquarium Show Starting 9:00 AM. Later, Visits BCF's Tropical Atlantic Biological & Institute of Marine Science Laboratories.
NO SCHEDULED GSMFC GENERAL SESSIONS THIS DAY

4:00 PM

EXECUTIVE SESSION ON P.L. 88-309 FOR BCF OFFICIALS & GSMFC STATE FISHERY DIRECTORS BOARD ROOM

GSMFC RESOLUTIONS COMMITTEE—
Chairman Millette's Suite

Friday (October 8)

7:30 - 9:15 AM

GSMFC EXECUTIVE SESSION BREAKFAST RIVER ROOM "C"

9:30 - 12:00 Noon

GSMFC GENERAL SESSION—TERRACE ROOM
Chairman Ted Millette, Presiding

ANNUAL REPORT—The Chairman

ACTIVITIES REPORT
Bob Jones, Executive Secretary
Southeastern Fisheries Association

POSITIVE THINKING IN MARINE FISHERY MANAGEMENT
George W. Allen, Chief
Division of Seafoods
Alabama Department of Conservation

COMMERCIAL FISHERIES RESEARCH AND DEVELOPMENT ACT OF 1964
I. B. Byrd
Administrator, P.L. 88-309
Bureau of Commercial Fisheries, Region 2

RECESS *Fifteen Minutes*

WILDLIFE & WATER IN S. FLORIDA (Slides)
Arthur Marshall, Field Supervisor
Florida Branch of River Basin Studies
Bureau of Sport Fisheries & Wildlife—Region 4

JUVENILE SHRIMP RESEARCH—EVERGLADES NATIONAL PARK ESTUARY
E. S. Iversen and Durbin C. Tabb
Inst. of Marine Science, U. of Miami

DESIGN ASPECTS OF THE FISHERIES RESEARCH VESSEL OREGON II
Francis J. Captiva
Base Fleet Supervisor
BCF, Pascagoula

ADJOURNMENT

12:30 PM

LUNCHEON ASSEMBLY WEST

★

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.
Vernon K. Shriner

Florida
W. Randolph Hodges
(Open)
Walter O. Sheppard (Vice-Chairman)

Louisiana
Joe D. Hair, Jr.
Spencer G. Todd
James H. Summersgill

Mississippi
Charles Weems
Ted Millette (Chairman)
Joseph V. Colson

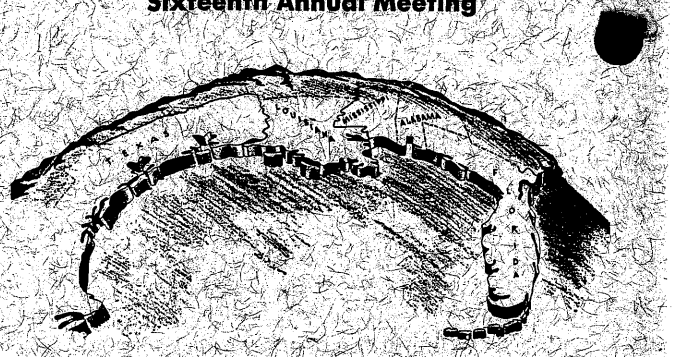
Texas
J. Weldon Watson
Richard H. Cory
Virgil Versaggi

★

W. Dudley Gunn
Director

GULF STATES MARINE FISHERIES COMMISSION

Sixteenth Annual Meeting



In Joint Session With

ATLANTIC STATES MARINE FISHERIES COMMISSION

Miami, Florida

Dupont Plaza Hotel

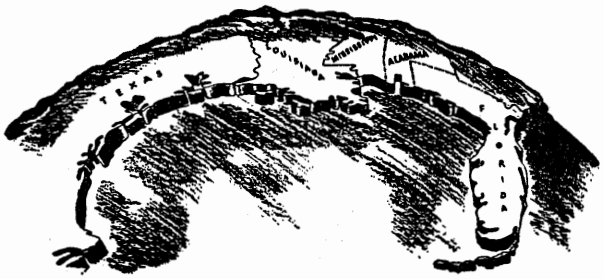
October 6 (Wednesday) - 8 (Friday), 1965

THE CAPITOL
STATE OF FLORIDA
TALLAHASSEE

Gulf States Marine Fisheries Commission

CHAIRMAN
WALTER O. SHEPPARD
POST OFFICE DRAWER 2139
FORT MYERS, FLORIDA 33902

VICE-CHAIRMAN
JAMES H. SUMMERSGILL
1819 SOUTH BAYOU DRIVE
GOLDEN MEADOW, LOUISIANA
70357



DIRECTOR
W. DUDLEY GUNN

OFFICE SECRETARY
MRS. WALTER B. HOOVER

HEADQUARTERS OFFICE
312 AUDUBON BUILDING
NEW ORLEANS, LOUISIANA 70112
TELEPHONE: 524-1765

M I N U T E S

SIXTEENTH ANNUAL MEETING

IN JOINT SESSION WITH

ATLANTIC STATES MARINE FISHERIES COMMISSION

MIAMI, FLORIDA

DUPONT PLAZA HOTEL

OCTOBER 6-8, 1965

A T T E N D A N C E

Commissioners, ASMFC:

MAINE	Ronald W. Green Rep. Plato Truman Vernon P. McFadden
NEW HAMPSHIRE	Bernard W. Corson Thomas V.Binmore
MASSACHUSETTS	Charles H. W. Foster Sen. Stanley J. Zarod
RHODE ISLAND	Thomas J. Wright (Proxy for F. C. Lees) Byron B. Blount
CONNECTICUT	Rudy Frank (Proxy for Norman C. Comollo) Edward S. Stolarz
NEW YORK	Dr. W. Mason Lawrence Robert L. Doxsee
NEW JERSEY	Raymond T. Richardson David H. Hart
PENNSYLVANIA	Sen. James S. Berger Elliot J. Goldman
DELAWARE	Dr. Franklin C. Daiber (Proxy for Norman G. Wilder) Sen. Curtis W. Steen M. Haswell Pierce
MARYLAND	Fred W. Sieling (Proxy for Joseph H. Manning) Sen. J. Frank Raley, Jr. George T. Harrison
VIRGINIA	Milton T. Hickman Rep. Walther B. Fidler William P. Hunt
NORTH CAROLINA	Dr. David A. Adams Robert Ballance
SOUTH CAROLINA	Dr. G. Robert Lunz, Jr.

GEORGIA	David H.G. Gould (Proxy for Rosser Malone) Jack Cofer
FLORIDA	Harmon W. Shields (Proxy for Randolph Hodges) Rep. F. Charles Usina John R. Salvador

Commissioners, GSMFC:

ALABAMA	Vernon K. Shriner George W. Allen (Proxy for Claude D. Kelley
FLORIDA	J. Lorenzo Walker Walter O. Sheppard
MISSISSIPPI	Ted Millette Joseph V. Colson
LOUISIANA	Lyle S. St. Amant (Proxy for James H. Summersgill)
TEXAS	Terrance R. Leary (Proxy for J. Weldon Watson & Virgil Versaggi)

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GUESTS:

Charles Banks Belt, Chm., Marine Resources Committee, 233 Broadway, New York, N.Y.
George Brumfield, Plant Mgr., Mississippi Menhaden Products,Moss Point, Miss.
Burton Clark, Gen. Mgr., Miami Seaquarium, Rickenbacker Causeway, Miami, Fla.
Rev. Charles H. Corbett, Asst. Pastor, South Miami Lutheran Church, Miami, Florida
John E. Cramer, Pres., Silver Bay Oyster Co., Inc., Route 1, Box 225, Melbourne Beach, Florida
Arthur E. Dammann, Dir., Virgin Islands Marine and Insular Ecology Research Station, College of the Virgin Islands, Caribbean Research Institute, Virgin Islands.
L. E. Roy Demarest, Treas., The Laitram Corp., P.O.Box 50699, New Orleans,La.
Mrs. Ruth B. Dennis, FISH BOAT Magazine, Hialeah, Florida.
Hon. Earl Faircloth, Attorney General, State of Florida, Tallahassee, Fla.
C. A. Fore, Outdoors Editor, Bradenton Herald, Bradenton, Florida.
Lewis T. Graham, Dean of Liberal Arts, U.S.L., Lafayette, La.
Charles Tom Henderson, Chm., Florida Commission on Interstate Cooperation, Assistant Attorney General, Tallahassee, Florida
Hon. Walter J. Hoey, State Senator, 702 Marshall Street, Milford, Delaware.
Robert P. Jones, Exec. Secty., Southeastern Fisheries Assn., 330 South Adams Street, Tallahassee, Florida
Ted Longeway, Jr., Exec. Dir., National Fisheries Institute, Inc., 1614 Twentieth Street, N.W., Washington, D.C.
H. K. Lourdin, Westinghouse Electric Corp., Sarasota, Florida
D. H. McKee, D. H. McKee, Inc., P.O. Box 10192, Tampa, Florida

GUESTS (continued)

James McPhillips, Southeastern Industries Corp., P.O.Box 1685,Mobile, Ala.
William R. Neblett, Exec. Dir., National Shrimp Congress, Inc., P. O. Box 431, Key West, Florida
John Ray Nelson, Bon Secour Fisheries, Inc.,Bon Secour, Alabama
Robert M. Norris, Jr., Exec. Secty., Potomac River Fisheries Commission, Colonial Beach, Virginia
Cornelius Poillon, Exec. Secty., Long Island Fishermen's Assn., Westhampton Beach, Long Island, New York
Fred Richardson, Vice-Pres., Blount Seafood Corp., Warren, R.I.
W. Lee Trent, Zoology Dept., North Carolina State Univ., Raleigh, N. C.
Clifford V. Varin, President, Fire Island Sea Clam Co., West Sayville, N.Y.
Dick Vaughan, Route 1, Leander, Texas
Leon Verhoeven, Exec. Dir., Pacific Marine Fisheries Commission, 741 State Office Building, 1400 SW 5th Ave., Portland, Oregon.
Mrs. Elizabeth M. Wallace, Dir., Oyster Institute of North America, 22 Main Street, Sayville, Long Island, N. Y.
John P. West, U.S. Border Patrol, Ret., Hialeah, Florida

U. S. DEPARTMENT OF STATE, Washington, D.C.

Hon. William C. Herrington, Special Assistant for Fisheries and Wildlife to the Under Secretary
Burdick H. Brittin, Depty Special Assistant for Fisheries and Wildlife to the Under Secretary

U. S. DEPARTMENT OF INTERIOR, Washington, D.C.

Hon. John A. Carver, Jr., Under Secretary of Interior

U. S. Fish and Wildlife Service:

Keith D. Brouillard, Foreign Affairs Specialist, Washington, D.C.

Bureau of Commercial Fisheries,
Washington, D.C.

Donald L. McKernan, Director
Russell T. Norris, Assistant to the Director
Dr.Robert L. Edwards, Deputy Assistant Director, Division of Biological Research
Dr. Roland F. Smith, Chief, Branch of Shellfisheries, Division of Biological Research
H. B. Allen, Chief, Branch of Technology, Division of Industrial Research

Arlington, Virginia

Dr. Virgil J. Norton, Chief, Supply & Resource Use Research Section, Branch of Economic Research

Bureau of Commercial Fisheries (contd)

Chicago, Illinois
Bob E. Finley, Chief, National Marketing Services Office, Branch of Marketing.

REGION 3.
John T. Gharrett, Regional Director, Gloucester, Mass.
William R. Beckmann, Federal Air Coordinator, Gloucester, Mass.
Keith A. Smith, Dir., Exploratory Fishing & Gear Research Base, Gloucester, Mass.
Dr. George J. Ridgway, Asst. Dir., Biological Laboratory, West Boothbay Harbor, Maine
Dr. James E. Hanks, Laboratory Director, Milford, Connecticut
James B. Engle, Chief, Shellfish Advisory Service, Oxford, Md.

REGION 2.
Seton H. Thompson, Regional Director, St. Petersburg Beach, Fla.
I. B. Byrd, Federal Aid Coordinator, St. Petersburg Beach, Fla.
Jack Brawner, Regional Coordinator, Branch of Marketing, St. Petersburg Beach, Florida
James E. Sykes, Station Chief, Biological Field Station, St. Petersburg Beach, Florida
Dr. Kenneth A. Henry, Laboratory Director, Beaufort, N. C.
Lloyd E. Johnson, Supervisory Fishery Reporting Specialist, Branch of Fishery Statistics, Miami, Fla.

Tropical Atlantic Biological Laboratory, Miami, Florida
Dr. Thomas S. Austin, Director
Mert Ingham, Chief, Physical Oceanography Program
Albert C. Jones
Paul Sund, Oceanographer
John P. Wise

Gulf Breeze, Florida
Dr. Philip A. Butler, Laboratory Director

Pascagoula, Mississippi
Dr. John R. Thompson, Asst. Dir., Exploratory Fishing & Gear Research Base
Francis Captiva, Base Fleet Supervisor, Marine Services.

New Orleans, Louisiana
George W. Snow, Regional Supervisor, Statistics, Market News

Bureau of Sport Fisheries and Wildlife:
Washington, D.C.
Dr. Raymond E. Johnson, Asst. Dir., Division of Sport Fisheries
Albert Swartz, Asst. Chief, Division of Fishery Research

Bureau of Sport Fisheries and Wildlife (contd)

Upper Darby, Pennsylvania
George P. Spinner, Supervisor, Branch of River Basin Studies

U.S.DEPARTMENT OF HEALTH, EDUCATION AND WELFARE:

Public Health Service
Eugene T. Jensen, Chief, Shellfish Sanitation Branch, Bureau of State Services, EEFP, Washington, D.C.
Dr. Carl N. Shuster, Jr., Dir., Northeast Shellfish Sanitation Research Center, Narragansett, Rhode Island
George Morrison, Regional Shellfish Consultant, New York, N.Y.
J. David Clem, Regional Shellfish Consultant, Atlanta, Georgia

Gulf Coast Shellfish Sanitation Research Center,Dauphin Island,Ala.
R. J. Hammerstrom, Director
Jack L. Gaines, Marine Biologist

Dallas, Texas
James W. Carpenter, Jr., Regional Shellfish Sanitation Consultant.

COMMITTEE MEMBERS, STATE PERSONNEL, GUESTS FROM MEMBER STATES:

MAINE	Dana E. Wallace,Dept. of Sea & Shore Fisheries, Augusta (Co-Chairman, Biological Committee)
MASSACHUSETTS	Department of Natural Resources: Frederick C. Wilbour,Jr., Director, Division of Marine Fisheries, Boston Frank Grice, Chief of Research, Division of Marine Fisheries, Boston
RHODE ISLAND	Thomas J. Wright, Chief, Division of Fish & Game, Dept. of Natural Resources, Providence
CONNECTICUT	Department of Agriculture and Natural Resources: Rudy Frank, Commissioner, Board of Fisheries & Game,Hartford. Theodore B. Bampton, Director,Board of Fisheries & Game, Hartford George C. Maltezos, Marine Biologist, Board of Fisheries & Game, Old Saybrook
NEW YORK	Division of Marine Fisheries,State Conservation Dept. David H. Wallace, Director, Oakdale, L.I., (Co-Chairman, Biological Committee) John C. Poole, Senior Aquatic Biologist, Oakdale,L.I.

COMMITTEE MEMBERS, STATE PERSONNEL, GUESTS FROM MEMBER STATES(contd)

NEW JERSEY	Chris H. Riley, Director, Division of Shellfisheries, Dept. of Conservation & Economic Development, Trenton. Paul E. Hamer, Principal Fisheries Biologist, Division of Fish & Game, Nacote Creek Laboratory, Absecon.
DELAWARE	Otis H. Smith, Member, Delaware Commission of Shellfisheries, Lewes Dr. Franklin C. Daiber, Assoc. Professor of Biology, Univ. of Delaware Marine Laboratories, Newark.
MARYLAND	Fred W. Sieling, Chief, Natural Resources Mngt., Dept. of Chesapeake Bay Affairs, Annapolis. Natural Resources Institute, Univ. of Maryland: Dr. L. Eugene Cronin, Director, Solomons Dr. Frank J. Schwartz, Research Assoc. Prof., Solomons.
VIRGINIA	Va. Commission of Fisheries: Lewis Jones, Assoc. Commissioner, Urbanna C. R. Bagnell, Conservation Officer, Newport News. Va. Institute of Marine Science, Gloucester Point: Dr. William J. Hargis, Jr., Director Dr. Edwin B. Joseph, Senior Marine Scientist Dr. Willard A. Van Engel, Senior Marine Scientist Jackson Davis, Assoc. Marine Scientist
NORTH CAROLINA	Petro Kulynych, Chmn., Commercial Fisheries Committee, Dept. of Conservation & Development, North Wilkesboro Institute of Fisheries Research, Univ. of N.C.: Dr. A. F. Chestnut, Director, Morehead City Dr. E. E. Deubler, Assoc. Prof., Morehead City
GEORGIA	Georgia Game and Fish Commission: Howard Zeller, Asst. Director, Atlanta David H.G. Gould, Regional Manager, Coastal Fisheries, Brunswick Thomas L. Linton, Asst. Professor, Univ. of Georgia Marine Institute, Sapelo Island
FLORIDA	Florida Board of Conservation, Tallahassee: Robert M. Ingle, Director of Research Harmon W. Shields, Director of Marketing

COMMITTEE MEMBERS, STATE PERSONNEL, GUESTS FROM MEMBER STATES (contd.)

FLORIDA (contd)	Institute of Marine Science, Univ. of Miami: Dr. F. G. Walton Smith, Director Dr. C. P. Idyll, Chmn., Div. of Fishery Sciences Jim Higman (Exec. Secty., Gulf & Caribbean Fisheries Institute) Dr. Donald P. De Sylva Durbin C. Tabb, Fishery Biologist D. A. Hughes, Assistant Professor Edwin S. Iversen, Associate Professor Donald R. Moore, Assistant Professor Dr. John L. Munro, Assistant Professor Richard A. Wade, Instructor Bernard J. Yokel, Instructor George F. Arata, Jr. Martin Roessler Gerardo A. Chica, Graduate Student Constantino Tapias, Graduate Student
ALABAMA	George W. Allen, Chief, Division of Seafoods, Alabama Dept. of Conservation, Dauphin Island. Walter R. Nelson, Resident Marine Biologist, Alabama Marine Laboratory, Dauphin Island
MISSISSIPPI	W. J. Demoran, Marine Biologist, Mississippi Marine Conservation Commission, Gulf Coast Research Laboratory, Ocean Springs.
LOUISIANA	W. Dudley Gunn, Director, Gulf States Marine Fisheries Commission, Audubon Bldg., New Orleans Dr. Lyle S. St. Amant, Chief, Div. of Oysters, Water Bottoms & Seafood, Louisiana Wild Life & Fisheries Commission, New Orleans. Dr. Ted B. Ford, Asst. Chief, Div.of Oysters, Water Bottoms & Seafood, Louisiana Wild Life & Fisheries Commission, New Orleans.
TEXAS	Terrance Leary, Coastal Fisheries Coordinator, Texas Parks and Wildlife Department, Austin.

JOINT GENERAL SESSION, OCTOBER 6, 1965

Atlantic States Marine Fisheries Commission Chairman Ronald Green called the meeting to order at 9:45 a.m. and introduced Gulf States Marine Fisheries Commission Chairman Ted Millette, stating that the latter would preside over the afternoon general session.

Chairman Green presented for rendering of the invocation, Reverend Charles H. Corbett of the South Miami Lutheran Church. Former Commissioners and other distinguished delegates were introduced following the calling of the roll of active Commissioners.

Florida Attorney General Earl Faircloth was introduced for the purpose of extending an official welcome to the group. Copy of his remarks are herewith first attached.

A series of three presentations followed. Under Secretary of the Interior John A. Carver, Jr. spoke on the subject "The Oceans...A Challenge to Federal-State Leadership." William C. Herrington, Special Assistant for Fisheries and Wildlife to the Under Secretary, Department of State, addressed the group on the subject "The Ocean's Challenge To The 'Sea Lawyers'". "Pesticide Control Programs Of The Public Health Service" was the topic chosen by Eugene T. Jensen, Chief, Shellfish Sanitation Branch, Public Health Service. Copies of papers are herewith second, third and fourth attached.

The morning session was resumed following a fifteen minute recess with the introduction of Frederick P. Longeway, Jr., Executive Director, National Fisheries Institute, who spoke on the subject "Fish and Seafood--A Kickoff To Profit". Copy of the address is herewith fifth attached.

The subjects next considered were intended to give the delegates information preliminary to a scheduled field trip, October 7, to Virginia Key. F. G. Walton Smith, Director, Institute of Marine Science, University of Miami, spoke on "The Virginia Key Marine Research Center". Burton Clark, General Manager of the Miami Seaquarium, spoke on the subject "Miami Seaquarium - A Partner In The Virginia Key Marine Research Center". Speaking on the topic "Expanding Research In The Tropical Atlantic" was Seton H. Thompson, Regional Director, Bureau of Commercial Fisheries, Region 2. Copies of the above three papers appear herewith as attachments, six, seven and eight.

The afternoon joint general session was called to order by Chairman Millette at 1:45 p.m. Leon Verhoeven, Executive Director, Pacific Marine Fisheries Commission was introduced. He extended greetings from that body and a cordial invitation to that Commission's November meeting at Boise, Idaho. Robert E. Finley, Chief, Division of Industrial Research, Branch of Marketing, Bureau of Commercial Fisheries, presented "Glamourize And Merchandise". Copy of his remarks is herewith ninth attached. "Economic Analysis And Business Decisions In The Commercial Fishing Industry" was the subject presented by

by Virgil J. Norton, Chief, Supply and Resource Use Research Section, Branch of Economic Research, Bureau of Commercial Fisheries and copy of same is herewith tenth attached. Clarence P. Idyll, Chairman, Division of Fishery Sciences, Institute of Marine Science, University of Miami, spoke on "The West German Fisheries Go Modern", using slides. Copy of the presentation is herewith eleventh attached.

Following a short recess, Chairman Millette introduced Harold B. Allen, Chief, Branch of Technology, Bureau of Commercial Fisheries who spoke on "Fish Protein Concentrate". Copy of this paper may be found herewith twelfth attached. Mrs. David H. Wallace, Executive Director, Oyster Institute of North America chose as her subject, "Automation of Oyster Shucking". Copy of this paper is herewith thirteenth attached. The "Pesticides Monitoring Program" was explained by Philip A. Butler, Director, Gulf Breeze Biological Laboratory, Bureau of Commercial Fisheries. Copy of the report is herewith fourteenth attached.

The session was adjourned at 4:15 p.m. following no response to the Chairman's call for other business.

OCTOBER 7 (THURSDAY), 1965

The group assembled for an 8:30 a.m. departure by bus for Virginia Key, going first to the Miami Seaquarium where Burton Clark, Seaquarium General Manager and the Commissions' host, welcomed the some 150 participants of the field trip. While coffee and juices were being served and informational packets were being passed out, Mr. Clark introduced Captain William Gray, Director of Collections and Exhibits, who along with the former, reviewed the many interesting features of the exhibits and performances which were to be enjoyed by the group as the morning progressed.

Leaving the Seaquarium, a conducted tour of the Institute of Marine Science further impressed the group of the marine research facilities and effort at Virginia Key. Earlier in the year, a visit to the BCF Tropical Atlantic Biological Laboratory was planned but due to construction delays, that future Virginia Key facility was taken from the schedule.

The two Commissions met separately Thursday afternoon. The Gulf Commission's State Directors and staffs met with BCF officials to discuss programs which might be implemented under Public Law 88-309. The GSMFC Resolutions Committee also held a scheduled afternoon session.

OCTOBER 8 (FRIDAY), 1965

Separate sessions of the two Commissions were programmed for Friday morning.

Chairman Ted Millette, GSMFC, called the final general session to order at 9:30 a.m. in the Terrace Room following adjournment of the Commission executive session. The Chairman's annual report of the Commission was first

presented and copy of same is herewith fifteenth attached. Bob Jones, Executive Secretary, Southeastern Fisheries Association, was next heard on the subject "Report On The Activities Of The Southeastern Fisheries Association". Copy of his report is herewith sixteenth attached. "Positive Thinking In Marine Fishery Management"was the topic treated by George W. Allen, Chief, Division of Seafoods, Alabama Department of Conservation. It has been reproduced and is herewith seventeenth attached. Speaking on the subject "Commercial Fisheries Research and Development Act of 1964" was I. B. Byrd, Administrator, P.L. 88-309, BCF Region 2. Copy of the talk is herewith eighteenth attached.

Following a fifteen minute recess the Commission was honored by the visit of two distinguished Floridians, former Governor Fuller Warren and Justice Richard Ervin, Florida Supreme Court, each having been instrumental in the passage of legislation which enabled the State of Florida to become party to the Gulf States Fisheries Compact. Each spoke briefly, extending their best wishes for the continued success of the Commission in the accomplishment of its objectives.

Next introduced was Arthur Marshall, Field Supervisor, Florida Branch of River Basin Studies, Bureau of Sport Fisheries and Wildlife, Region 4,who spoke on the subject "Wildlife and Water In South Florida". Copy of subject matter is herewith nineteenth attached. Speaking on subjects related to the above were E. S. Iversen and Durbin C. Tabb, both of the Institute of Marine Science, University of Miami. Copies of the papers, "Tortugas Shrimp And Rainfall" (Iversen) and "Estuaries and Fisheries" (Tabb) are herewith in order, twentieth and twenty-first attached.

Francis J. Captiva, Base Fleet Supervisor, BCF, Pascagoula, spoke on "Design Aspects Of The Fisheries Research Vessel Oregon II". Copy of this concluding morning's presentation is herewith twenty-second attached.

Chairman Millette expressed the Commission's appreciation for the interesting papers presented at the session; then, reporting on the earlier executive session, informed the conferees that the subject of the resolution presented for consideration by the Oyster Institute of North America had resulted in a committee of three being appointed to study the matter for reporting at the March 17-18, 1966 Commission meeting at the Broadwater Beach Hotel, Biloxi. It was stated that October 20-21, 1966 had been selected for the next annual Commission meeting; the same to be held at the Monteleone Hotel, New Orleans.

The Chairman then announced that James H. Summersgill of Louisiana had been elected Commission Vice-Chairman for the year 1965-66 and that current Commission Vice-Chairman Walter O. Sheppard of Florida had been named Commission Chairman for the ensuing year. After expressing his deep appreciation for the splendid assistance furnished his office during the year, Commission Chairman Sheppard was introduced. With appropriate wording, the Chairman presented Mr. Millette with a plaque indicative of the Commission's gratitude for his service during the past year and in addition presented a gavel similar to the one he had used during his term of office.

With no further business to be transacted, the Chairman adjourned the final general session at 12 noon with the reminder that all were expected for luncheon at 12:30 p.m. in Assembly West.

Atlantic States Marine Fisheries Commission Chairman Green, serving as Master of Ceremonies at the luncheon, introduced GSMFC Chairman Sheppard who presented a plaque to former ASMFC Chairman David H. Hart in recognition of his services in that office over the years.

Nearing the conclusion of the luncheon, John West, Retd. U. S. Border Patrol, entertained with a unique revolver shooting routine.

Prepared by: W. Dudley Gunn
Director

M I N U T E S

EXECUTIVE SESSION, MIAMI, FLORIDA, OCTOBER 8, 1965

ROLL CALL OF COMMISSIONERS BY STATES

	PRESENT	ABSENT	PROXIES
ALABAMA:	Vernon K. Shriner	Claude D. Kelley L. W. Brannan, Jr.	George W. Allen
FLORIDA:	J. Lorenzo Walker Walter O. Sheppard	W. Randolph Hodges	
LOUISIANA:		Joe D. Hair, Jr. Spencer G. Todd James H. Summersgill	 Lyle S. St. Amant
MISSISSIPPI:	Ted Millette Joseph V. Colson	Charles Weems	
TEXAS:		J. Weldon Watson Richard H. Cory Virgil Versaggi	Terrance R. Leary Terrance R. Leary

Commission Chairman Millette called the session to order in River Room "C" immediately following breakfast and at 8:15 a.m.

Commissioner Sheppard moved that reading of the Minutes be dispensed with as Commissioners had received copies following the Mobile, Alabama, meeting. Commissioner Colson seconded and upon vote the motion passed.

Copies of a suggested budget (copy herewith first attached) for fiscal year 1965-66 were distributed. The Director reported a true October 1 bank balance of $17,000.17 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).

Following a brief discussion, Commissioner Colson moved that the 1965-66 budget as presented by the Commission's officers be approved. Commissioner Shriner seconded and upon vote the motion passed.

The Director stated that under the rotation plan the October 20-21, 1966 meeting would be held in Louisiana. Dr. St. Amant moved that the meeting site be New Orleans and that the Monteleone Hotel be meeting headquarters. Commissioner Sheppard seconded and upon vote the motion passed.

Commissioner Shriner moved that the Director be instructed to prepare appropriate resolutions of appreciation to be addressed to outgoing Commission Chairman Millette; Miami Seaquarium; Convention Bureau, City of Miami; and the Dupont Plaza Hotel. Commissioner Colson seconded and upon vote the motion passed. The resolutions appear in the order listed above as attachments to these Minutes; second, third, fourth and fifth.

The following resolution was submitted by Mrs. David H. Wallace, Executive Director, Oyster Institute of North America, for consideration by the Resolutions Committee at its October 7 meeting and was next discussed at length:

"WHEREAS The oyster industry is technologically under-developed, and,

"WHEREAS The Minimum Wage Hour Act has made the need for an oyster shucking device increasingly imperative, and,

"WHEREAS The economy of the communities will profit with the stimulation of an invigorated oyster industry, and,

"WHEREAS No one oyster company nor any one state is able or willing to sponsor the entire project of developing the automation of the opening of oysters,

"THEREFORE Be it resolved that the Atlantic States Marine Fisheries Commission and the Gulf States Marine Fisheries Commission endorse the concept that the states unite to cooperatively develop an oyster shucking machine and convey this endorsement to the appropriate state and federal officials."

* * * * *

It was the consensus of the Resolutions Committee that the proposal be given careful study and the same feeling was expressed at the executive session. Commissioner Sheppard moved that a study committee be appointed and report rendered at the March 1966 Commission meeting. Commissioner Colson seconded and upon vote the motion passed. Chairman Millette appointed on the Committee Mr. Allen of Alabama, Dr. St. Amant of Louisiana, and Commissioner Colson of Mississippi.

The election of officers for the year 1965-66 was the next order of business. Commissioner Colson nominated Commission Vice-Chairman Sheppard for the office of Chairman. Mr. Leary seconded. No further nominations were presented and Commissioner Sheppard of Florida was acclaimed Commission Chairman for the coming year.

Mr. Allen nominated Commissioner Summersgill of Louisiana for the office of Vice-Chairman. Commissioner Sheppard seconded. No further nominations were presented and Commissioner Summersgill was acclaimed Commission Vice-Chairman for the coming year.

No further business remained to be transacted and the session was adjourned at 9:15 a.m. with the announcement by the Chairman that the final general session was scheduled to begin in the Terrace Room at 9:30 a.m.

Prepared by: W. Dudley Gunn
Director

SUGGESTED BUDGET FOR FISCAL YEAR 1965-66

Estimated Income F/Y 1965-66

Alabama	$3,500.00		
Florida	4,500.00		
Louisiana	6,000.00		
Mississippi	1,500.00		Estimated
Texas	6,000.00	$21,500.00	Funds Available
Cash on hand close F/Y 1964-65		$ 5,071.37	$ 26,571.37

	EXPENSES	
	Per Audit 1964-65	Suggested 1965-66
Salaries	$13,684.00	$14,000.00
Traveling	1,584.55	1,600.00
Office rent	1,080.00	1,080.00
Stationery, printing & supplies	337.09	400.00
Telephone & telegraph	506.46	500.00
Postage	223.60	250.00
Electricity	39.11	42.00
Equipment maintenance	44.29	50.00
Accounting	250.00	250.00
Insurance	248.94	265.00
Meeting expense	283.43	650.00
Publication expense	562.09	570.00
Payroll taxes	307.53	433.70
Depreciation	74.60	75.00
Sundry	81.64	90.00
TOTAL	$19,307.33	$20,255.70

The 1964-65 Budget was $20,266.25

True Bank Balance, 10/1/65		$17,000.17
Due (7/1/65) Mississippi	$1,500.00	
Due (10/1/65) Alabama	3,500.00	5,000.00
Anticipated funds for 1965-66		$22,000.17

R E S O L U T I O N

WHEREAS, Ted Millette, Mississippi Legislative member on the Gulf States Marine Fisheries Commission has served as Chairman of the Commission for the year 1964-65; and

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

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

* * * * * *

This is to certify that the foregoing is a true copy of an original Resolution adopted by the Gulf States Marine Fisheries Commission, October 8, 1965, at a regular Commission meeting held at the Dupont Plaza Hotel, Miami, Florida.

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

R E S O L U T I O N

BE IT RESOLVED that the Gulf States Marine Fisheries Commission express most sincere appreciation to the Miami Seaquarium for its generosity in inviting the delegates of the Atlantic and Gulf Commissions to view the very interesting and educational exhibits of marine life and the spectacular performances of the dolphins and seals on Thursday morning, October 7, 1965 at Virginia Key.

BE IT FURTHER RESOLVED that this Commission express to Mr. Burton Clark its gratitude for his participation on the program of the meeting and for his kind hospitality extended during the visit to the Seaquarium.

This is to certify that the foregoing is a true copy of an original Resolution adopted by the Gulf States Marine Fisheries Commission, October 8, 1965, at a regular Commission meeting held at the Dupont Plaza Hotel, Miami, Florida.

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

R E S O L U T I O N

BE IT RESOLVED that the Gulf States Marine Fisheries Commission express its sincere appreciation to the Convention Bureau, City of Miami, Florida, for the assistance rendered in the registration of delegates at the October 6-8, 1965 joint meeting of the Atlantic and Gulf States Marine Fisheries Commissions and for the valuable information furnished when such meeting was in the planning stage.

This is to certify that the foregoing is a true copy of an original Resolution adopted by the Gulf States Marine Fisheries Commission, October 8, 1965, at a regular Commission meeting held at the Dupont Plaza Hotel, Miami, Florida.

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

R E S O L U T I O N

BE IT RESOLVED that the Gulf States Marine Fisheries Commission express its most sincere appreciation to the management and staff of the Dupont Plaza Hotel for the cordial hospitality and splendid food and service enjoyed by the group on the occasion of the October 6-8, 1965 joint meeting of the Atlantic and Gulf States Marine Fisheries Commissions at Miami, Florida.

This is to certify that the foregoing is a true copy of an original Resolution adopted by the Gulf States Marine Fisheries Commission, October 8, 1965, at a regular Commission meeting held at the Dupont Plaza Hotel, Miami, Florida.

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

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"ADDRESS OF WELCOME"

Attorney General Earl Faircloth
State of Florida
Tallahassee, Florida

It is a pleasure to extend greetings to the representatives assembled here in Miami for the 16th Annual meeting of the Gulf States Marine Fisheries Association and the first joint meeting of the Atlantic and Gulf States Marine Fisheries Commissions. It is extremely gratifying to know that this meeting has attracted such a splendid representation from across the country.

The scope of an Address of Welcome does not permit a State by State review of your joint efforts in behalf of our Marine Fisheries. However, when I survey the breadth of the undertakings and accomplishments of this organization, I cannot help but marvel at the splendid concept of cooperation that you have undertaken.

The inter-state compact is a unique device in our form of government for positive cooperation among our various states. It is as old as the country itself, stemming from Section 10 of Article 1 of our Constitution. It is here that the States retain the privilege of joining together for a mutually desired purpose. Thus, the provision is made for two or more States to establish a mechanism for resolving problems whose influence extends beyond the political boundaries of an individual State without burdening the Federal Government.

The conservation, propagation and protection of our fisheries in streams, the Ocean and the Gulf, which are adjacent to the several States, is one of the problems whose resolutions have been sought by means of interstate compacts.

You have used this device well to bring together the fifteen States along the Atlantic coast and the five Gulf coast States for this joint meeting here in Miami.

It is an extreme pleasure to meet with you here and observe this example of State governments and industry in action. It is pleasing to see how representatives of an industry and representatives of government can and do get along together in solving problems that might develop in our Marine Fisheries.

I have always liked these lines, "Let us be as separate as the fingers and as united as the fist". In short, any profession, any group, any agency can do much in that one profession;but they can't do as much as when they are working together. "Coming together is a beginning; keeping together is progress; thinking together is unity; and working together is success"I commend you for coming together to this meeting and urge you to work together for the highest degree of excellence.

* * * *

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"THE OCEANS - - A CHALLENGE TO FEDERAL-STATE LEADERSHIP"

Under Secretary John A. Carver, Jr.
Department of the Interior
Washington, D. C.

From Sealab II to Gemini V, Scott Carpenter, an astronaut himself, but now an aquanaut, communicated with his former colleagues. Sealab II was but feet away from man's normal environment; Gemini V was about as many miles away. In each case, man had constructed a capsule wherein he could take the essentials of normal life into an alien and forbidding world--there to study himself and the environment and push outward the frontiers of his knowledge about each.

When I became Under Secretary 10 months ago, the world of the oceans and fisheries was opened to me, new and different from the parks, Indian, and land management world which I'd known as Assistant Secretary for Public Land Management. I have been impressed by some similarities between these apparently dissimilar worlds.

For example, I sense a parallelism between fisheries and conventional agriculture. Fisheries is now in a transition equivalent to that of a couple of hundred years ago when we moved from the age of pastoral hunters to the age of the plow and disciplined farming. I've heard a lot about "marine engineering." Is it not really nothing more than a more complicated way of talking about "farming"?

The fisheries biologist's theories for "aggregation engineering" is putting a complicated handle on a principle known to the cowboy as "herding." A sheep herder's dog has been practicing "olfactory engineering" for a long time.

The temptation to make the frontiers of oceanography more esoteric than they really are has some hazards in it. I suspect a lot of people fall off the sled as a result of the technological jargon and fail to appreciate either the logic or the necessity for the effort. No cattle or sheep raiser today would question the need for applying the principles of herding or would deny the validity of fences as a means of keeping his stock where he wants them at the time he wants them there. The far-out proposals for chemical fences, air bubble curtains, and artificial attractants are solidly proven principles of ranch and farm management that don't take any magic to sell.

The time which man took to move from the age of hunting to the age of farming amounted to at least several thousand years. Civilized man has been hunting for fish for about as long as he has hunted for other food. Agriculture now replaces the process of hunting for fruits and vegetables and the like, and we have domesticated the animals which provide much of our meat.

Because the seas were difficult to explore and offered man a hostile environment, we have stayed in the age of the hunter for our fish. The current national oceanographic program represents a really monumental effort to telescope the transition from the age of hunting to the age of farming into a decade or two because we will not be patient enough to wait thousands of years for this revolution.

It helps to understand the science of oceanography by putting it in a familiar context and I am convinced most people would understand the relevance of oceanography if we were less often so mysterious about it.

I would like to carry my analogy one step further by suggesting that fisheries problems and the conservation issues of fisheries are not at all unlike those we have faced before. Take the buffalo. The heartland of our continent was settled and westward migration nourished on the carcasses of millions of buffalo. By the time we became conscious of our foolishness this great animal was near extinction. The national conscience said "stop" at a time only barely short of the point of no return. The Wood Buffalo, one species, is gone forever.

Isn't this exactly the same issue we face with the world's population of whales?

For 100 years the oceans' stock of whales fed a thriving New England industry and nurtured the economic development of the northeastern United States. The lusty tales of down-East whalers have a quality comparable to the raucous history of the mining camps in the West. Both breeds of men are gone now, and the whaling industry which supported New Bedford, Mystic and the other whaling ports of New England.

However, the conservation issue involving whales is unresolved, and, like the buffalo, time is running out for us to act. Some authorities think we may already be too late to save the great Blue Whale from extinction. Almost no authorities deny the whale catch now exceeds a sustainable supply.

We were fortunate in the case of the buffalo to have had it as a problem within the grasp of national action. This is not true of whales. The United States has no whaling fleet of consequence and our leverage is limited to a moral dimension. This makes it all the more essential.

The technological horizons in fisheries easily excite the imagination. On a recent inspection visit to the Bureau of Commercial Fisheries laboratory in Hawaii I saw experiments with tuna that may in a short time take much of the guesswork out of that fishery.

The scientific breakthrough represented by control of the sea lamprey in the Great Lakes is comparable to the introduction of insecticides into the agricultural economy, though in the case of the lampreycide, rigorous scientific assumptions will hopefully avoid the hazardous implications of wide-spread use of agricultural pesticides.

One of the more intriguing technological developments in fisheries is nearing payoff. After many years of research effort an economically feasible means of producing large quantities of fish protein concentrate seems near

at hand. The availability of low-cost high-quality protein in large quantities has implications for world-wide human nutrition of revolutionary dimensions. This kind of approach is also representative of a new dimension of the conservation effort itself--namely, to find economic ways to translate material regarded as waste--this case trash fish--into an economic asset. This same principle supports current research efforts to clean up the gases coming out of coal-burning industrial plants by extracting marketable sulfuric acid under methods that will make the process of cleaning up our air pay its own way. Similar research is being made on junked cars.

If I have tried to simplify the technological frontiers of the ocean sciences--and I have--I find it considerably more difficult to simplify the governmental and industrial hurdles over which the United States fishing industry must somehow climb if the industry is to keep pace with the scientific innovations being made available to it. I say nothing new with the observation that the United States fishing industry is substantially behind the other world's major fisheries in almost every category by which industrial progress can be measured. The fleet is not modern. Ports are too small and confine too much of the fishery effort to small-scale operations inshore. The economic units of the industry are often too small to be viable and too dependent to see utility in cooperative action. The ability of the industry to lift itself is severely handicapped by various forms of economic inertia and the unpredictable fluctuations of a resource the supply of which the industry has no control. The fishing industry works in an environment of water, the quality and quantity of which cannot be controlled. The inshore fisheries resource is often at the mercy of distant agricultural land practices which produce silt or from which flow minute but significant traces of chemicals capable of changing or wiping out a local fishery.

The Department of Interior sees these problems of American fisheries as inadequately understood. We see that the ecological framework and interdependence of the resource on the land and inthe sea must be better understood.

There is a gap between the goals of fishery conservation and the laws by which they are managed. A law, for example, which limits oyster harvesting to inefficient hand tongs, channels the inventive genius of an industry away from concern with the resources to concern with the tools.

Laws which would require foresters to cut trees with axes instead of power saws and move logs with horses instead of hauler trucks would be laughed at. But we require hand tonging and sail power for oyster vessels. Isn't this really a kind of backward approach to conservation--legislating tools instead of legislating conservation goals.

Along with the cooperative efforts between all levels of government to assist needed technological change in the exploration and use of ocean resources, it seems to me that one of the major opportunities for Federal-State leadership and cooperation lies in the field of conservation law and the definition of conservation goals. As a future source of food, of minerals, and even large quantities of fresh water, the oceans are the last frontier on the planet. It may be a fact that man will stand on the moon long before very much is

known about the seas, but under the opportunities offered by such cooperative programs as the new Commercial Fisheries Research and Development Act, this frontier cannot fail to give way to the thrust of knowledge.

President Johnson stated the challenge of the seas when he said,

> "For tens of thousands of years--ever since man has possessed the power to sense and reason--he has been aware of the seas around him. This awareness has varied from disdain to superstition, as man alternately sailed and fished the sea on the one hand, and worshipped it on the other.
>
> "But never until recently did man seek great understanding of the oceans, because he saw little necessity. There was always a new frontier, an unexplored land, unexploited territory.
>
> "Now our view of the seas has had to undergo a drastic change. We have always considered them as barriers to invasion; we now must see them as links, not only between people, but to a vast new untapped resource."

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"THE OCEAN'S CHALLENGE TO THE 'SEA LAWYERS'"

William C.Herrington, Special Assistant
for Fisheries & Wildlife to the Under Secretary For Economic Affairs
Department of State
Washington, D. C.

Webster defines a "sea laywer" as "an argumentative, captious sailor". In my experience modern usage goes somewhat beyond this, so I am going to propose a slightly different definition- that is any person who has all the answers (right or wrong) about law of the sea which deals with fisheries. I think most of us qualify under this definition, at least some of the time, when we profess to know or say what international fisheries law is or should be. Sometimes these two categories (what international law is and what we think it should be) get mixed up somewhat and we may be inclined to maintain that international fisheries law is what we would like to have it. Perhaps this is not surprising since the international rules with which we deal in managing international fisheries range thru the spectrum from international law, developing international law, international practice and multilateral and bilateral agreements. Among some of my international lawyer friends the differences in views about international fisheries law are about as great as are the differences in views among some of my friends in the scientific field on conservation and population dynamics questions. If you have audited some of the international debates on North Pacific fisheries or on tropical tuna and the waters in which they swim you will know what I mean.

The great oceans, covering the major part of the earth's surface, pose many challenges. Secretary Carver has eloquently described one of these. We are all aware of the ocean challenge faced by mariners down thru the centuries and how this challenge has been met. However, I do not know that it is so clear that with the development of increasingly efficient and far ranging gear for harvesting the living resources of the sea, the oceans now are casting their challenge more than ever before, at the feet of the lawyers, the scientists and the administrators. If we ever are to achieve the often cited goals of those looking to the sea to meet the increasing world demands for food, we must have a forward looking system of international law which encourages and assists the full development of the living resources of the high seas and stimulates the devising of procedures to increase the oceans' basic production of useful products.

All thru history, while developing increasingly efficient systems of agricultural production, man has never graduated much beyond the "hunting stage" in his exploitation of the high seas. By hunting stage I mean that stage of development involving the capture of animals in their native environment which man has not modified to make more productive. It is roughly comparable to hunting deer or hunting buffalo on the open prairies. The most we have

achieved, and this in distressingly few situations, are procedures which protect the breeding stock and the young rapidly growing fish. Properly developed, these procedures lead to our "maximum sustainable yield" concept which has achieved general scientific and conservational respectability only in the past decade. Recent increased production from the sea has come primarily from technical developments which have made our means of production more efficient and capable of expansion to the high seas and distant seas. The ultimate which we can expect from perfection of the "hunting stage" is the "maximum sustainable yield" from all the stocks and mixed stocks of fish whose products are useful to man, with such adjustments or compromises as are made necessary by the intermingling of stocks. This objective requires that in the aggregate no stocks will be overfished and none will be underfished. How close are we to this goal? The experts do not agree on this but it would be of interest to examine our present fisheries to determine where we fall short of this goal and whether the reason for such short falls is lack of markets, inadequate gear, or inadequate management, involving among other things, inadequate law.

Regardless of whether the realization of maximum production under the "hunting stage" of exploitation is 10 years or 50 years off, it is clear that to make full use of the seas' potential for food we must progress from the "hunting" to the "farming stage." We have already made a beginning on this. As examples I can cite oyster and clam farming, artificial spawning and rearing of salmon, and seaweed cultivation in the Orient, particularly in Japan, all carried on in inshore areas. Imaginative fisheries experts and oceanographers have many ideas on how to increase the seas' basic production of useful products. These range thru artificial fertilizing of limited water bodies, stirring up nutrients from the sea bottom, and growing and processing plankton in a form for human use. There are many more possibilities.

In order to provide a favorable climate for the development and application of these and other essentially farming ideas we need legal systems both domestic and international, which will stimulate and not hold back initiative. Many think they have the answer to our high seas fishery problems through application of their views to international law or, modification of international law. Perhaps they should examine how we are doing domestically. Do our laws stimulate progressive development and use of marine resources or do they retard or prevent their full and efficient use? (Consider domestic regulations and views related to regulation of fishing gear to control its efficiency, limited licensing to control excessive fishing effort, and limitation or prohibition of fishing for certain species in spite of evidence that they are not being fully utilized.) How do our proposals for international law look when examined in this light? You know that these domestic problems are difficult to work out. When we seek to work such problems out internationally they are much more complex. To do this requires the best efforts of the lawyers and scientists working together.

Perhaps at this point we might lump these two groups, the lawyers and scientists dealing with fisheries, together as "sea lawyers". Neither has all of the answers regarding the international law we need to make the oceans most productive although some may think they do. Nevertheless, I hope and believe

that between them they will come up with a system of international law which provides the needed favorable environment for realizing the potential food production from the sea. This is not an impossible hope. To support this conclusion regarding what such cooperation will do I will very briefly review events from 1950 to 1958 which led to the Geneva Fishery Convention of 1958, a major step forward in developing international law respecting fisheries.

During 1950 thru 1953 the International Law Commission, the legal body of the UN, was working on various problems concerned with Law of the Sea, referred to it by the General Assembly of the UN. Regularly at the end of each session the Commission circulated its draft articles dealing with fisheries, among UN members for comment. Just as regularly we in the US working with international fisheries problems, disagreed with the ILC drafts as unrealistic in the context of current international problems. However, as fishing operations were extended international problems increased and in the early summer of 1954 it occurred to some of us that we should try to bring together the skill and experience of the scientists and that of the international lawyers and develop a set of rules which fitted the current situation. After some intensive consultation among our own scientists and industry advisors and with our Canadian and some overseas friends, in the fall of 1954 we proposed that the UN convene a technical-legal conference to develop international fisheries law. We soon learned that the international lawyers were somewhat jealous of their prerogatives in the field of international law and were not prepared to agree to have the technical people sit with them around the same table to tinker with their sacrosanct regime. This forced us to do a bit of maneuvering and politicking and we came up presently with an acceptable compromise - a UN Technical Conference on Conservation of the Living Resources of the Sea. The General Assembly approved this in December 1954 and the Conference was convened in Rome in the following April, representing a speed in preparation that experienced conference organizers had said it was impossible to achieve. The attendance at the Rome Conference included leading fisheries experts from all the fishing nations. It also included about as many lawyers as technical people.

Out of this Conference among other things came the first generally accepted definition of conservation, involving the concept of maximum sustainable yield, and agreement on the obligation of nations fishing international resources to cooperate in conservation studies and management.

The Vice-Chairman of the Rome Conference was a member of the ILC and he used the conclusions of the Conference as the basis for a complete revision of the International Law Commission's draft articles on fisheries. During the ILC deliberations in 1955 and 1956 some of the fisheries experts were on hand to provide technical advice to the Commission members. As the result of the Commission's studies, successive redrafts of the articles, and comments from governments, the Law Commission report in 1956 was, to a large extent, in line with our thinking on what was needed to advance the fishery situation. In 1956 the General Assembly considered this report, and other law of the sea subjects as well as fisheries, and authorized the 1958 Conference on Law of the Sea.

(Herrington #4)

The work of the Conference was carried on in four committees dealing with the territorial sea, high seas, fisheries, and the continental shelf. Four conventions were adopted by these committees and all were approved by a 2/3 or more vote of the Conference. The terms of the fishery Convention include:

"(1) The right of all states to engage in fishing on the high seas subject a) to their treaty obligations, b) to the interests and rights of coastal states as provided for in the convention, and c) to the conservation provisions of the Convention; (2) the duty of all states to adopt necessary conservation measures and to cooperate with other states in conservation programs; (3) the definition of conservation; (4) the special interests of coastal states in the maintenance of the productivity of the resources in the high seas adjacent to their territorial sea and the special privileges which go with this, one of these being the right to adopt unilateral measures of conservation provided negotiations with other states concerned have not led to agreement within six months and provided that there is an urgent need for such measures, that they are based on scientific findings and that they do not discriminate against foreign fishermen; and (5) a procedure is included for settling disputes regarding the need for conservation measures and the kind of measures to be applied."

The four Conventions adopted by the 1958 Conference require 22 ratifications to come into effect. The present ratifications are:

Territorial sea	25	Fisheries	18
High Seas	32	Cont. Shelf	28

Now, what conclusions do I draw from all this? I draw only these:

1. Before you turn to international law to solve your fishery problems be sure that what you advocate will indeed solve these problems without creating others that are more serious.

2. Be sure that what you consider international law is not based on wishful thinking.

3. If you propose to change international law be sure that you have a reasonable proposal which can muster wide international support.

4. And finally: It is possible for fishery scientists and international lawyers to work together and come up with results which make sense to both.

BUT 'TAINT EASY.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"PESTICIDE CONTROL PROGRAMS OF THE PUBLIC HEALTH SERVICE"

Eugene T. Jensen, Chief
Shellfish Sanitation Branch
Public Health Service
Washington, D. C.

The development and application of pesticides is undoubtedly one of the great milestones in man's technological developments. There can be no question but that our modern pesticides have contributed greatly to the prevention of disease, have made a very substantial contribution to the quality and quantity of man's food and fiber supply, and have had numerous other salutary and economically beneficial effects including protection of our forestry resources, and protection of garments and home against damage to list only a few examples. In the health field the use of pesticides for the control of the insect vectors of malaria, typhus, and yellow fever has been outstanding. The spectacular success of DDT in stopping an outbreak of typhus fever in Italy during World War II was a remarkable public health accomplishment.

The development of DDT occurred under the emergency conditions of World War II. There was a great need for such material for the control of the insect-vector of many diseases, and time did not permit long-term studies to identify its hazards to wildlife and fish. This is not to say that there was no concern with toxicity, for substantial efforts were directed toward identifying the acute toxicity characteristics of this and related materials. The immediate post war period saw the development of new pesticides and rapid growth in their use. There was, of course, continuing concern with acute toxicity but only a few weak voices protested that this growing use might also have undesirable consequences.

Perhaps the first, certainly the best documented, report of economic damage from pesticides occurred in the United States in the fall of 1959. At that time Food and Drug Administration scientists became aware that a portion of the cranberry crop was contaminated with a herbicide which was associated with thyroid tumors in rats. The action of the Administration in the removal of the contaminated cranberries from the market attracted a great amount of public attention and resulted in substantial economic damage to the cranberry industry. Despite this undesirable consequence the incident did focus attention on the need for growers to follow the directions on registered pesticide labels.

Publication of the book Silent Spring by Rachel Carson gave further impetus to the development of effective research, surveillance, and regulatory activities in the pesticide field. The book brought the problem to the attention of a substantial portion of our population and helped to gain Congressional understanding of the problems which the official agencies were facing in their attempts to develop adequate technical controls.

The Public Health Service (PHS) has had an active interest in the use of various pesticides for a great number of years. This interest extended, on the one hand, to the public hazards associated with the production, formulation, packaging, and application of pesticides and, on the other, to the use of pesticides for the control of insect-borne diseases. In succeeding years these interests have spread into other PHS functional areas including water supply, water pollution control, milk sanitation, and shellfish sanitation. It is impossible to discuss the full scope of these varied activities in a reasonable period of time. This discussion will, therefore, be limited to a brief outline of the pesticides programs now being conducted by the several PHS administrative units.

The oldest of the PHS pesticide programs is found in the Communicable Disease Center (CDC). Although CDC is primarily concerned with the utilization of pesticides to control insect-borne disease, it has carried on long-term research programs on analytical methods for the detection of pesticides, the development of improved formulations and methods of use which will accomplish the desired control methods without undue public hazards, and studies on the toxicity of various pesticides. CDC maintains pesticide laboratories at Savannah and Atlanta, Georgia, and Wenatchee, Washington.

The newest pesticide activity in PHS is found in the Office of Pesticides, which was established in the Bureau of State Services (BSS) in 1965. The efforts of this organization will be focused primarily on the direct health effects of pesticides on man. Emphasis will be placed on the medical results of massive doses and on acute and chronic effects in terms of disease induction. The Office of Pesticides has established community studies in ten selected areas, and it is anticipated that two additional areas will be added in FY 1966. These community studies will attempt to identify the extent of pesticide use and, through sophisticated epidemiological studies, to detect any adverse effects of pesticides on man. The projects include communities in the coastal States of Florida, New Jersey, Louisiana, and Texas.

In support of these projects, the Office of Pesticides has also established a research laboratory on the South Campus, University of Miami, Perrine, Florida. This facility, now with a staff of about 13, and with a projected staff of 40, for FY 1966 will concentrate on the development of better analytical methods and on toxicological-pharmacological studies. Emphasis will be placed on the human health aspects of pesticides. The Office of Pesticides has already made a significant contribution to the analytical field through its development, on contract basis, of a handbook on analytical procedures for the detection and measurement of pesticides in all environmental media and in body tissues of man and animals. It is anticipated that further efforts will be directed toward keeping this material current to reflect the rapid developments which are taking place in the analytical procedures field. The Office of Pesticides has also been charged with representing the PHS views on pesticide registrations before the United States Department of Agriculture (USDA). Many of you know that registration with USDA is a prerequisite to interstate sale of these materials. Finally, the Office of Pesticides is undertaking the development of an intelligence program to obtain information on pesticide levels in man. In summary, the Office of Pesticides carries on a series of people-oriented programs designed to assess the public-health hazards associated with the use of these materials.

The Office of Resource Development (ORD) also in the Bureau of State Services actively sponsors pesticide research and the training of research scientists through the grant mechanism. In the current fiscal year over $1.5 million in pesticide research and training is being supported at various universities and not-for-profit research organizations throughout the United States. The following research titles demonstrate the types of projects which are being supported: Fate of Pesticides; Toxicology of Pesticides in the Environment; Mechanisms of Pesticide Toxicity; Kinetics and Distribution of Pesticides in the Ecosystem; Interactions of Pesticides and Soils; and Factors Affecting Pesticide Toxicity. ORD also provides support for training research scientists in toxicology, epidemiology, ecology, and analytical chemistry.

The PHS through the cooperative efforts of the Division of Water Supply and Pollution Control (DWSPC) and the Division of Environmental Engineering and Food Protection (DEEFP) has carried on a series of programs including investigation and tabulation of fish kills; maintenance of basic data programs on levels of chlorinated hydrocarbon pesticides in major U.S. river basins; and research projects oriented toward the development of effective, sensitive, analytical procedures; persistence and characterization of pesticide run-off; the effect of pesticides on fish and their food chains; and, enforcement actions to abate pollution, including those situations in which improper manufacture, formulation, or application of pesticides result in decrease of water quality.

The Division of Water Supply and Pollution Control has received 485 official reports of pollution-caused fish kills during 1964. Approximately 1.5 million of the reported 18.4 million fish deaths were attributed to toxic substances from agricultural operations. A complete report on these fish kills is contained in Public Health Service Publication Number 847 "Pollution Caused Fish Kills in 1964." Copies of this publication are available from the Public Health Service.

The Division of Water Supply and Pollution Control basic data program is quite extensive and has collected a great amount of information on the levels of chlorinated hydrocarbon pesticides in the major river systems. Since 1958 more than 5,000 water samples collected from 131 stations have been analyzed for pesticides. The following table identifies those sampling stations at which the highest levels of dieldrin, endrin, DDT, and DDE were found. However, a complete report was published in the June 1965 issue of Public Health Reports under the title "Chlorinated Hydrocarbon Pesticides in Major U.S. River Basins."

Pesticides are considered by DWSPC and DEEFP as a form of water pollution and substantial research efforts are being directed to the development of sensitive analytical procedures for determination of pesticide levels, to study how pesticide affects plankton, bottom fauna, and fish populations; and to removal of pesticides from water by treatment processes. Studies are carried out at Division laboratory facilities and through research grants programs. A great amount of information is therefore being developed on pesticides as a water pollutant.

The Division of Water Supply and Pollution Control also has legal responsibilities for pollution abatement in interstate waters. During the past year a Federal water pollution control conference was called to consider the fish kills in the lower Mississippi River. This Conference concluded that the pesticide endrin was the causative material and associated the pollutant with industrial wastes in the vicinity of Memphis, Tennessee. Studies of pesticide levels in the lower Mississippi River are continuing. The Department could take similar action in calling an abatement conference if other situations are found in which pesticides are identified as a significant pollutant of interstate waters.

The Division of Environmental Engineering and Food Protection is concerned with the presence of pesticides in milk, public water supplies, and in shellfish growing areas. The programs which are carried on by the Shellfish Branch are probably those of most immediate concern to this group. These studies are carried on at laboratories in Rhode Island, Alabama, Washington, and Ohio and through research grants. Specific projects have been related to the development of analytical procedures for pesticides in salt water and in shellfish, on uptake of pesticides by shellfish under field conditions, and on surveillance programs on the Gulf Coast. The Division has also cooperated with the Division of Water Supply and Pollution Control on studies of pesticides in shellfish taken from interstate estuaries. The levels of pesticides in shellfish have been generally found to be very low.

The National Shellfish Sanitation Program, which is administered jointly by PHS and the several coastal States, considers pesticides in the classification of growing waters. Under the requirements of this program, an area which is contaminated with pesticides cannot be approved as a harvest area for shellfish to be shipped in interstate commerce. Despite the absence of specific tolerances for shellfish (which by law are established by Food and Drug Administration) no difficulties have thus far been encountered with the shipment of pesticide-contaminated shellfish in interstate commerce.

The establishment of tolerances is an exceedingly complicated task which is in part due to "zero tolerance" provisions of the Federal Food, Drug, and Cosmetic Act. While this approach seemed realistic at the time the law was written, subsequent developments in analytical procedures, which make it possible to detect pesticides at the part per trillion level, have made the concept almost unworkable. This problem has attracted much attention at high levels of Government and has resulted in a study conducted by the National Academy of Sciences (NAS) under contract to FDA and USDA. The report of the NAS Pesticide Residue Committee issued in June 1965 discusses the inherent technical and administrative limitations of "zero tolerance" and proposes the concepts of negligible or permissible residue.

Many units of the PHS are concerned with application of pesticides, their effect on health, or their presence in food and water supplies. A similar pattern of interest can be found in many other Federal agencies. To assure that there would be coordination between the several Federal agencies on the use of pesticides, a Federal Committee on Pest Control (FCPC) was established. Representation appointed includes the Departments of Health, Education, and Welfare (HEW); Defense; Interior; and Agriculture. Other agencies including the Tennessee Valley Authority, Atomic Energy Commission, National Aeronautics and Space Administration, Federal Aviation Agency, and

TABLE I 1/

Levels of dieldrin, endrin, DDT, and DDE, by order of decreasing concentration for 10 synoptic sampling stations at which the highest levels were observed, September 1964

River and location	Dieldrin (1)	River and location	Endrin (1)	River and location	DDT (1)	River and location	DDE (1)
Savannah:North Augusta,S.C.	> 0.118	Potomac:Great Falls, Md.	> 0.094	Maumee:Toledo, Ohio.	0.087	Maumee:Toledo, Ohio.	0.015
Merrimack: Lowell, Mass.	> .071	Rio Grande: El Paso,Tex.	.067	Red (North): Grand Forks, N. Dak.	.072	Bear: Preston, Idaho.	.011
Potomac:Great Falls, Md.	> .040	Big Horn: Hardin, Mont.	.026	San Joaquin: Vernalis,Calif.	.066	Mississippi:St. Paul,Minn.	.011
Rio Grande: El Paso, Tex.	.032	Mississippi: Vicksburg, Miss.	.025	Atchafalaya: Morgan City, La.	.047	South Platte: Julesburg, Colo. (2)	.009
Schuylkill: Philadelphia, Pa.	> .032	Connecticut: Northfield, Mass.	.025	Mississippi: Vicksburg, Miss.	.041	Delaware:Martins Creek Pa.	.008
Platte: Plattsmouth, Nebr.	.023	Red (North): Grand Forks, N. Dak.	.023	Bear: Preston, Idaho.	.034	Mississippi:West Memphis,Ark.	.007
Connecticut: Northfield, Mass.	> .022	Mississippi: New Roads, La.	.023	Columbia:Clatskanie,Oreg.	.034	Columbia:Clatskanie,Oreg.	.005
Savannah: Port Wentworth, Ga.	.020	Yellowstone: Sidney,Mont.	.021	Red (South): Alexandria,La.	.031	San Joaquin: Vernalis,Calif.	.005
Mississippi: Vicksburg, Miss.	.017	Columbia: Clatskanie,Oreg.	.019	Willamette:Portland,Oreg.	.029	Snake: Payette, Idaho.	.005
Mississippi: New Roads, La. (3)	.016	Atchafalaya: Morgan City, La.	.018	Apalachicola: Chattahoochee, Fla.	.027	7 different sampling points.(4)	.004

1/Excerpt from "Public Health Reports"June 1965,Volume 80,Number 6, U.S.Department of Health, Education, and Welfare,Washington, D. C. 20201

(1) Concentration, ug./l. (3) Apalachicola River at Chattahoochee,Fla. (4) See Table 1 in reference.

(2) Adopting average of north and south channels (see table 1 in reference).

Federal Housing Administration also participate in some committee activities. The responsibility of the committee is review of all Federal pest control programs to assure coordination of agency interests. The committee has been quite successful in meeting its objectives despite the lack of specific legislative authority.

Committee activities are carried out through three principal sub-committees--monitoring, research, and public information. The monitoring subcommittee is perhaps of greatest interest to this group. This subcommittee has developed plans for the establishment of a nationwide pesticides monitoring program. Under this program, which would be carried out by the Federal agencies, a routine sampling network would be established for water, soil, fresh water, fish, estuaries, and humans. Specifically, samples of shellfish and silt would be collected three times per year from 24 estuarine sites extending from Maine to Washington. In some instances, State agencies will be requested to assist in sample collection.

The research subcommittee is charged with coordinating the pesticide research and development programs of the various Federal agencies. In monitoring the environment of pesticides there is a great need for emphasis on the development of uniform analytical procedures. This problem has been especially difficult because of the rapid development of new pesticides and by great advances in analytical procedures.

The public information subcommittee is concerned with the dissemination of information on pesticide levels in the environment and their effects on man.

It appears that enormous progress has been made in the administrative and technical control of pesticides. Highly-sensitive, accurate methods of analysis are now in use and other methods are being developed. An enlightened policy of standards setting is evolving. Fundamental research on the effects of pesticides usage on man is being undertaken. A National Monitoring Program has been established through the FCPC embracing all agency activities which, in conjunction with State efforts, will help to define both existing levels and trends. Finally, pesticides are recognized as a potential environmental pollutant and research and administrative programs are being directed toward efforts which would limit economic damage and health effects attributed to their use. When one considers that most of these advances have been made within a relatively short time span it appears that the outlook for a better understanding of pesticides is extremely favorable.

This presentation has been limited to pesticides at the request of your program chairman. However, I would hope that those of you who are responsible for the direction of State fishery programs would not lose sight of the fact that pesticides are only one of a series of environmental contaminants of concern to public health. For example, we were recently concerned with radioactive materials and detergents. The problems of the future cannot be predicted, but one might make an educated guess that we shall become increasingly concerned with lead or other industrial chemicals in the total environment. Agencies, both State and Federal, must be prepared to meet these new developments. This will require effective communications, coordinated research programs, and a high degree of administrative flexibility.

The responsibilities of the conservation agencies in preventing shellfish harvesting from polluted areas may, in fact, be your most important area of endeavor as measured by either public health or economic impact. A significant failure of patrol which would allow the harvesting of shellfish from a polluted area and thereby causing an outbreak of disease, would have a profound economic effect upon the fisheries industry. I want to emphasize that this is not a problem of concern only to the commercial fisheries for there is a substantial amount of recreational harvesting of shellfish. On a more positive side, your agencies have the opportunity to be of great assistance to the commercial fisheries in the adoption and early application of depuration processes. Where this process may be impractical for a variety of reasons there should be further opportunities for the relaying of shellfish from polluted to unpolluted areas to limit the health hazards associated with these unused resources.

It is also noteworthy that the Conference of State Sanitary Engineers recommended the establishment of State interagency committees similar to the Federal Committee to provide leadership and cooperative guidance for the use and control of pesticides. The Conference also recommended Federal leadership through rendering technical assistance and support to State agencies on the use of pesticides which impinge on man's health through his environment, including the development of an expanded training program for State and local agencies on the use, measurement, and control of pesticides.

In closing, I would point out that we live in a period of rapid technological change and that we must be prepared, at both Federal and State levels, to meet the challenges of new technological problems, such as pesticides, without sacrificing our older and still needed control measures which were also adopted to meet specific needs. It seems unescapable that this requires additional resources--personnel and dollars--as well as a constant search for new or more efficient methods of carrying out these programs. These dual technological and administrative challenges are part of the contemporary scene and are forces with which we must learn to cope.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"FISH & SEAFOOD - A KICKOFF TO PROFIT"

F.P.Longeway,Jr., Executive Director
National Fisheries Institute, Inc.
Washington, D. C.

Ladies and Gentlemen: I'm going to talk to you about the food that has everything...glamour, variety, nutrients, ease of preparation. Only fish and seafoods have it. Elysian personified.

In recent years foods from our oceans, rivers, lakes and streams have become so important that only four years ago President Kennedy, in a letter to the then Vice-President Johnson, said; "The seas offer a wealth of nutritional resources. They already are a principal source of protein...within two decades our own nation will require over 2 billion more pounds of seafood than we now harvest."

Just this past June, President Johnson wired the Southeastern Fisheries Association meeting in Miami, "Your products contribute significantly to our nutritional well-being and to a welcome variety in our diets."

Scientists all over the world are looking to the seas to feed the millions of people yet unborn...the population that is exploding at an awesome rate. "Let the Sea Nourish Your Health" is the title of an article written a year or so ago for a national magazine by one of our top medical writers, Earl Ubell.

This great interest in seafoods for health...seafoods for variety in menu planning...seafoods for just plain good eating...is well deserved.

Getting this important message to Americans is one of the operations of the National Fisheries Institute. We help to guide the consumer in buying fish and shell fish and how to handle and serve these products properly.

No matter how much care we take in providing quality products, if these products are mishandled during distribution, they will lose some of their quality.

One of the greatest difficulties we have is with the homemaker. She exercises extreme care and caution when selecting from the frozen food box, goes through the check-out line with the irritation of an army mule, places two or three sacks of groceries, including the frozen foods, in the trunk of her car, roars out of the parking lot -- ostensibly on her way home - but really to stop off at Mabel's for a cup of coffee and at least an hour and a halves conversation.

By the same token, no matter how good the products are to begin with, if homemakers, chefs, cooks don't know how to prepare seafoods, the quality is again lost.

The National Fisheries Institute provides services which tie in with these needs...and I would like to tell you about some of them. First, let me say that "convenience seafoods" such as breaded shrimp, heat-and-serve fish sticks, steaks, portions, heat-and-serve fish dinners are all changing the basic composition of seafoods on the dinner table. This trend will be accentuated... is being accentuated right now...as the industry concentrates on developing more ways to add value to seafoods consumed, at the same time adding more seafoods to the table.

* * *

While the Institute represents all facets of the commercial fisheries, two divisions especially important to the American consumer..whether they dine at home or dine away from home..are technology and promotions.

Let me illustrate the first---Technology. The reason the consuming public can obtain fishery products of high quality is three-fold:

First, voluntary Federal inspection under which Government inspectors working right in the processing plants carry on continuous inspection, to be sure that products comply with quality standards set by industry and government.

Second, the National Fisheries Institute Technology Department...fishery scientists who work with the government and industry in raising the quality standards for our products and in keeping them high...work closely with industry and government in research and periodic inspections.

Third, packers of fish and seafoods maintain significant research and quality control technologists who are highly trained. They are seeking new ways to process fish rapidly after it has been caught...to clean and fillet it or cut it into steaks...to quick-freeze it...to keep it frozen until it reaches your refrigerator or freezer. National Fisheries Institute is an effective force in coordinating quality control and research, so that you will continue to have increasingly better products.

* * *

The second division of the Institute activities so important to Americans... no matter whether they buy their seafoods in retail stores, for family dinner tables, or eat them in restaurants, drive-ins, hotel dining rooms, or any of the numerous other eating-out places...is our Promotions Division.

I'm sure you will agree there is a fascinating story to tell about marine foods. Think of their variety. There are about 170 different fishery products to add interest to American dinner tables. Long ago, someone said, "I have a thousand favorite dishes, and they are all just one thing...Fish."

(Longeway #3)

Seafoods have a romantic history in our country. Hundreds of thousands of men have gone down to the sea in ships during our short history. A few years after Columbus' three tiny boats reached America, fishermen were enduring the hardships of catching cod and haddock off the Grand Banks of Newfoundland. The Massachusetts Town of Gloucester, Marblehead, New Bedford and Nantucket became important ports from which fleets of fishing boats sailed far into the North Atlantic. Now American fishing trawlers go out from ports along our entire seacoast...from Maine to the Gulf...from the tip of Southern California to the icy waters of the Bering Sea.

The Institute has a remarkable nutrition story to tell, too. All seafoods are noted for their high-quality protein, vitamins and minerals..all necessary for our health and feeling of well-being. Added to that, we have the story of the polyunsaturated fats which are present in fishery products. These fats do not add the amounts of cholesterol to the blood stream in the human body that saturated fats do. Furthermore recent research points up the fact that polyunsaturated fats actually depress levels of blood cholesterol which as you know is the number one suspect in heart disease and hardening of the arteries.

* * *

We give newspaper, radio, television and magazine food editors..through a steady stream of releases, recipes, scripts, articles, nutrition information, fact sheets...the most up-to-date information about the El Dorado of Foods.

To the quantity-feeding magazine writer and editor,we send recipes and photographs and background information easily understood by any chef or cook and designed to quicken his interest in marine delicacies. We work to help the restaurant operator cut labor costs, prepare foods in the minimum of time and without waste, and above all..,make a good profit.

To newspaper food editors we release articles with tested, nutritionally sound, interesting recipes, which they can print in their columns, knowing that the readers will be intrigued. We send photos taken especially for newspaper reproduction, believing that they will illustrate the recipes in such a way they appeal to your readers as practical, usable and appetite-appealing.

To the television and radio broadcasters, we send scripts which they can use on the air at any time..for the telecasters, savory telegenic recipes...for the broadcasters, simple recipes which all listeners can comprehend.

Last fall, in New York, in speaking before the Nation's newspaper food editors, the President of the National Fisheries Institute said: "Through your efforts, today's homemakers are much better informed about our industry products,.. the many delicious varieties, interesting and delightful recipes and serving ideas, and the important nutritive values and facts about fish and seafoods.

"Economists tell us that with the continued upward surge in our standard of living, we can expect an upgrading of the national diet and an increased interest in health, quality, convenience, and variety of foods contributing to our better way of life. You, above all, realize how perfectly our modern fish and seafoods fit this pattern.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"THE VIRGINIA KEY MARINE RESEARCH CENTER"

F.G.Walton Smith, Director
Inst. of Marine Science-University of Miami
Miami, Florida

I appreciate the hospitality of Commissioners Millette and Green and of my two friends, Directors Dudley Gunn and Ernest Mitts in inviting me to address the joint meeting of the two commissions. Having participated in the work of both commissions from the time of their inception I am especially happy to renew my association with them and to see so many good friends.

Before a meeting such as this there is no necessity for stressing the importance of developing our marine resources. I cannot resist reminding you, however, that the most productive part of the oceans, the easily accessible Continental shelf, is greater in area than the entire surface of the inhospitable and unrewarding moon. It is not unrealistic to suggest that we direct to the waters of the shelf and the open ocean at least a portion of the effort we are expending on the moon. One step in this direction has been taken in the evolution of a marine science complex which your program chairman has happily christened, The Virginia Key Marine Research Center.

Over thirty years ago, when I first visited Woods Hole, I was impressed by the existence of a scientific community in which so many were assembled for such a variety of scientific objectives, but having the oceans and marine life as their common interest. I refer, of course, to an oceanographic laboratory, a fisheries laboratory, and a biological laboratory. I was less impressed by the extent of communication between these groups. It appeared that the opportunity for stimulating and productive exchanges of ideas was not fully exploited.

Years later, the opportunity to found a marine research institute at Miami came my way and, with Woods Hole in mind, I began to dream of a marine science community that would provide for the tropics what Woods Hole provided for the temperate and colder seas. Moreover, in Miami there was also the possibility of adding to the community a university training program. This concept was published in an article in SCIENCE about twenty five years ago and is only now emerging as an accomplished fact, with the dedication of the Institute of Marine Science of the University of Miami and the Tropical Atlantic Biological Laboratory of the Bureau of Commercial Fisheries on Virginia Key, adjacent to one of the world's most modern aquaria.

The program calls for me to describe the development of the Institute of Marine Science. Mr. Seton Thompson will describe the Tropical Atlantic Biological and Mr. Burton Clark will describe the Seaquarium. But I should like to emphasize, from the start, the importance of the concept of a scientific

community and to reiterate that, to me at any rate, The Virginia Key Marine Research Center is the important thing, overiding that of the individual units.

During the past two decades the South Florida area has emerged as a leading center for oceanographic research and training. It is ideally situated, geographically and climatically, for this purpose. Essentially tropical although located 150 miles north of the Tropic of Cancer, Miami is the only large city on the North American continent where it is possible to study, in nearby waters, living coral reefs, mangrove swamps, the building of limestone rock, and other phenomena associated with tropical seas and shores. The greatest river in the sea, the Gulf Stream, passes within sight of shore, and studies can be made of its currents and productivity, as well as the topography of its bottom, without the need to launch extensive and expensive expeditions. The shallow and extensive Bahama banks are only 50 miles away and can be reached easily in small craft and the Gulf of Mexico and Caribbean areas are nearby. It is also admirably located for deep ocean studies in the area between West Africa, Brazil, Bermuda and Florida, with unrivalled connection by air transport with the major science centers both of the USA and abroad.

For these reasons, the Miami Institute of Marine Science has been frequently called upon to advise in fishery developments on both sides of the Atlantic as well as in the Gulf of Mexico and Caribbean.

Focal point of the great marine research complex that has grown up in south Florida is Virginia Key. Here, on a small island only ten minutes by automobile from downtown Miami, are located the University of Miami's Institute of Marine Science, the newly-built Tropical Atlantic Research Laboratory of the U.S. Fish and Wildlife Service, the world-reaching International Oceanographic Foundation, a tropical aquarium and the unique Marine Stadium.

Tropical marine research began in North American in 1905 when the Carnegie Institute established a laboratory at Loggerhead Key, Dry Tortugas, Florida. A great deal of valuable scientific work was performed at this remote outpost 70 miles west of Key West, but its inaccessibility to scientists and its isolation from transportation facilities and necessary services eventually rendered it obsolete and it was closed in 1939.

The following year I was invited to Miami in order to establish a marine science research institute and graduate school for the University of Miami. Despite the favorable location, the difficulties were many -- one of the major obstacles being the astronomical price of waterfront land in Miami; and another being the complete lack of endowment funds or government or state subsidies. Finally these problems were partly overcome through the gracious support of many private individuals and, in recent years, by government support as well.

In the beginning, one room at the University's North Campus comprised the entire marine science facility. Then in 1943 the Marine Laboratory was officially established and a temporary laboratory was set up in an abandoned boathouse at Belle Isle, on the Venetian Causeway. The building was dilapidated and actually unsafe (it eventually collapsed and fell into the water),

so the new Marine Laboratory was again denied access to the sea. Facilities at the North Campus were again employed until the generosity of friends made it possible to build a waterfront laboratory and the Dade County Commission, with admirable foresight, provided the land.

During the war years the Institute was engaged in important studies on ship-bottom fouling. Also sponsored by the U.S. Navy was a special laboratory set up in the mangrove swamps for the study of the effects of tropical heat and moisture on naval electronics equipment. For this work the Director was awarded the Naval Ordnance Development Award.

By February, 1948, the research staff of the Marine Laboratory consisted of six scientists. During this year the Gulf and Caribbean Fisheries Institute was set up. Research was being conducted on red tide and pollution, on ship-bottom fouling organisms, and on the development of commercial products from the sea. It was at this time that the State recognized the valuable pioneering work of the Institute in the saltwater fisheries. Thanks to the efforts of Dante Fascell, now U.S. Congressman the legislature passed a Bill whereby the research on which conservation laws should be based, hitherto entirely lacking, could be carried out by the Institute. Most of today's progressive marine conservation measures in Florida were based on research performed by the marine Laboratory during the years 1945-1960. It was unfortunate that this valuable program was arbitrarily terminated, with more haste than grace, four or five years ago.

In 1949 the Department of Marine Science was established, with courses given in fishery science, marine biology and oceanography, leading to the M.S. in oceanography.

In 1952 the Marine Laboratory secured a long-term lease of about six acres of waterfront land on Virginia Key from the Date County Commission. A stipulation of the lease was that construction should begin on a laboratory building within one year. Through the generosity of local residents, anglers and yachtsmen the funds were raised and Miami's first well-equipped seaside research laboratory, known as the Agassiz Building, was opened in 1953. By this time the staff consisted of 58. Three vessels were then in operation. At this time the famous Seaquarium was established, to display a wide range of marine life to the public.

In 1955 the Marine Laboratory's second building with running salt water, the Collier Building, was completed. That same year the Laboratory's first ocean-going ship, Research Vessel Gerda, was acquired through the generous gift of Brigadier-General Robert Wood Johnson. Designed along the lines of a North Sea trawler, the 78-foot R/V Gerda has put in more than ten years of hard service in the Atlantic, the Gulf of Mexico, and the Caribbean, and has accomplished more important oceanographic work than any other vessel of its size. The acquisition of R/V Gerda led to the establishment of what has become one of the largest fleet of oceanographic research vessels stationed in tropical waters.

Construction of the Institute's Main Building was begun in 1957. Half of it was completed that year and another wing was added in 1959. In September, 1959 the doctoral program was inaugurated. A total of 100 graduate students are now enrolled. Eighty-one Master of Science degrees have already been awarded by the Institute, which is today a principal source of trained marine scientists for the U.S.A.

In July, 1963, the Institute's 176-foot research ship, R/V John Elliott Pillsbury was commissioned. R/V Pillsbury has already logged more than 550 days and 75,000 miles at sea on expeditions and cruises for IMS and has made many new and important oceanographic discoveries. She is returning to Miami this month from her longest expedition to date, a 23,000-mile cruise which took her south to the mouth of the Amazon River, east to Africa's Gulf of Guinea, and then through the Mediterranean and Black seas.

In 1963 the Alfred C. Glassell, Jr., Laboratory, a marine life controlled environment building, was completed. Here for the first time biologists are able to study marine animals of all sizes from sharks to protozoa under strictly controlled environmental conditions.

The Physical Sciences wing is now being completed. With it, the Virginia Key campus of the Institute of Marine Science is almost complete. IMS now covers research and training in all branches of oceanography, including fisheries, biology, geology and engineering. The recently established graduate division of oceanographic engineering is an important and unique effort towards solving the present great need for trained marine engineers. It is in line with the pioneering attitude that has always been associated with the Institute and has attracted nation-wide interest.

A final building, planned for completion next year, will act as a Marine Science Center. Field facilities have been extended by the opening of the Institute's Pigeon Key Field Laboratory in the Florida Keys but more space is drastically needed.

As the Institute of Marine Science has grown to full maturity over the past 21 years, other marine interests have recognized the tremendous advantages to marine research and other marine activities of the south Florida-Bahamas areas. The U.S. Navy is building a gigantic complex known as AUTEC east of here on Andros Island. In the unique Tongue of the Ocean, torpedos, missiles, submarines and other submersibles will be tested extensively.

Both the deep-water submarines Aluminaut and Alvin are stationed in the Miami area and are being tested extensively in the Gulf Stream. Dr. Jacques Piccard will also test his newest manned submersible in our waters. Marine Acoustical Services has also located in Miami, and this unique company is performing work for both the Institute of Marine Science and the AUTEC complex.

The International Oceanographic Foundation was formed in Miami about ten years ago. With its headquarters now on Virginia Key, the-profit I.O.F. now has more than 30,000 members throughout the world and its popular but authoritative magazine Sea Frontiers stands alone in its field. The Foundation has

granted scholarships to worthy students in marine science and has set up the Nordic-American Exchange Program, through which Scandinavian scientists have been given the opportunity to study in the United States, and American scientists have been sent to Scandinavia. The International Oceanographic Foundation has plans to build in the near future the world's first modern museum of marine science. Along with the Seaquarium the IOF stands for public education in ocean science.

Most recent and most important development is the building of the Tropical Atlantic Biological Laboratory of the Bureau of Commercial Fisheries. This, as it were, puts a Federal seal on Virginia Key and establishes it as a national center for marine research.

The coming into being of this major center of marine research depends upon the juxtaposition of two research institutes, namely the Bureau of Commercial Fisheries and the Institute of Marine Science, the Graduate School of Oceanography and also the continual stream of distinguished scientific visitors--all on Virginia Key. Added to this is the information service and the vessel and financial support of the International Oceanographic Foundation, and the public edification and entertainment given by the Seaquarium. You will hear more of these other organizations from their Directors this morning.

In order to obtain the greatest exchange of ideas from such a diverse group of scientific talent the Institute will shortly begin construction of a Marine Science Center, open to all persons in the Virginia Key complex, including students and scientific visitors. This will encompass the Marine Science Library, an Auditorium, Biological Reference Collection, Ecological Data Files, and the IBM Data Reduction and Retrieval Systems. On the ground floor will be a first-class dining room and conference rooms. Thus, it is hoped this will become a vital communication center for the growth of scientific ideas for the exploration and development of the oceans.

It is fitting that this culmination of the development of the Virginia Key Marine Research Center be marked by a joint dedication of the University of Miami and the Bureau of Commercial Fisheries buildings on November 20, 1965. This also marks the 21st anniversary of the founding of the Institute.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"MIAMI SEAQUARIUM -- A PARTNER IN THE VIRGINIA KEY MARINE RESEARCH CENTER"

Burton Clark, Vice President & Genl.Manager
Miami Seaquarium
Miami, Florida

It is a pleasure to be able to report to you that the Miami Seaquarium management and staff members are eagerly anticipating the numerous and varied opportunities we will have to make a solid contribution to the Virginia Key Marine Research Center, which my good friend Dr. Walton Smith has just described for you in such stimulating detail.

The fundamental function of the great modern marine aquaria is to display fish and aquatic creatures in a manner which simulates their natural habitat, and then to invite the public to view the exhibits for purposes of pleasure and education. There is no blueprint for the building of a major marine aquarium. The problems that must be solved include everything from algae to electrolysis. If these problems are solved successfully, the result will be not only a delightful recreational exhibit attractive to people of all ages, races and degree of education, it will also be the creation of rare and costly facilities which can be most useful for study and scientific research.

The Seaquarium management is keenly aware that because we do have unique facilities and world-wide fame we have certain responsibilities.

We feel that we must not only satisfy the natural curiosity of our visitors, whose interest in the marine world is aroused by our exhibits but try honestly and effectively to help those people whose interest is shown by their ever-increasing letters and requests for aid and information. And we cooperate wholeheartedly whenever possible with students and marine scientists by making our facilities available for research projects. In these two fields—making information available and cooperating in study and research--we think that we have been making a valued contribution to the sum total of mankind's knowledge of the world beneath the sea. We welcome the opportunities we will have to do even more along these lines.

The American public and to a smaller degree, perhaps, the citizens of other countries, look upon education per se as an occupation lacking in glamor. The public aquarium finds itself in the unique and enjoyable position of offering education which is glamorized by the novelty and strangeness of its subject, by the implied atmosphere of adventure and by the vicarious thrill sensed by those who feel they are personally investigating an intriguing branch of natural history.

We feel that we create in our visitors an empathy with and an interest in the creatures of the sea that makes your work as conservationists easier.

All of this begets a growing flood of inquiry. It is easy to answer those who have even a small amount of accurate knowledge. It is no small feat to give a worthy and satisfactory answer to the school boy who writes "tell me all about the ocean and the fish that are in it. I hope it isn't too much trouble". In our field we have quite consciously stimulated the quest for knowledge of the sea, both among children and among adults, and we believe to provide honest and adequate answers is a vital responsibility. As one of the great marine aquaria, we feel that we have contributed to the current spate of curiosity and enthusiasm for exploring the world beneath the sea, and we recognize the necessity to respond to the multitudes who look to us for their answers.

There will never be enough materials, enough properly worded printed pamphlets, enough photographs of desirably high quality, enough color slides, enough really good color motion pictures available at a cost that makes their distribution both easy and within reach of those who want and need them for educational purposes. I am afraid also that there will never be enough time for those who assume the responsibility of dealing with each request for information with the care that each deserves.

But at the Seaquarium we try, very earnestly. We feel that an aquarium indulges in expensive luxury if it contains an extraordinary diversity of specimens, beautiful and accurate displays, and yet neglects to help the questing people whose aroused interest asks for more information. For some time we have had an ever-growing program which provides files of photographs, sets of color slides, duplicated informational papers and lists for reading reference available without charge. For loan to responsible individuals and organizations are photo enlargements of many subjects, preserved marine specimens and much other material of this nature. Several members of our staff are qualified for and prepared to address groups, to appear in panel discussions and to take part in educational television programs. These persons are provided with motion pictures in color and sound, produced by the Seaquarium, and with the equipment to show them. These films are loaned without fee on request to schools, clubs, television stations, and have been seen not only throughout this country but on an international scale.

Upon the files of photos, color transparencies and films of the Seaquarium, serious writers and publishers in many countries constantly draw. An objective that nears completion is the duplication of over 400 specimen slides with an accurate catalogue useful both to the amateur and the serious student. This will be available to qualified institutions and individuals at cost, plus only the actual expense of handling.

When you visit the Seaquarium tomorrow we will have specially prepared for you information kits containing some of the diverse material we have prepared to answer inquiries.

Along with the responsibility of providing material that will continue to stimulate the growing public interest, we at the Seaquarium also recognize the responsibility of serious, ready and productive cooperation with scientific and economic marine research. Too many aquaria have unique facilities and valuable specimens for research projects which are not being used for this. Too few marine study centers and conservation bureaus have enough of either of these. Both fields of endeavor are complementary.

It is a profound satisfaction that our facilities are available without restriction to the staff and graduate students of our distinguished neighbor, the Institute of Marine Science of the University of Miami. We have been happy to supply desirable specimens for biological and medical research. Many of our exhibits, designed to enthrall the general public, have also served research projects in which ecology had to be controlled. For example, for a six-week period not long ago, a group of graduate students and their professor moved in at the Seaquarium each night, when the paying customers moved out, in a project involving marine bio-acoustics.

We have, for a number of years, been making every effort not to bury our talents, but to put them to work, and we believe that as a result the Seaquarium is today valued as a cultural, and educational asset, as well as a splendid recreational attraction. We feel that as our neighbors in the Virginia Key Marine Research Center grow, we will have even more opportunity and responsibility to cooperate with them to the utmost. Believe me, we will welcome this role.

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GULF STATES MARINE FISHERIES COMMISSION
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"EXPANDING RESEARCH IN THE TROPICAL ATLANTIC"

Seton H. Thompson, Regional Director
Bureau of Commercial Fisheries
St. Petersburg Beach, Florida

The establishment of the Tropical Atlantic Biological Laboratory on Virginia Key marks the beginning of a new chapter in the efforts of the Bureau of Commercial Fisheries to know and understand the oceans and ocean resources within reach of the United States fishing industry.

The western tropical Atlantic and the Caribbean Sea are not new areas for our Bureau. These waters have been undergoing a sort of gradual exploration for the past fifteen years by the Bureau's Pascagoula Exploratory Fishing staff. A large segment of the U.S. shrimp industry is now operating out of Surinam, Trinidad, Barbados, and British and French Guiana as a result of these explorations, and the products of that fishery now are worth upward of $6 million a year.

The new Tropical Atlantic Biological Laboratory will be concerned with those waters too, and many more. Its survey area will lie between 30 degrees north and 30 degrees south,and between South America and Africa. Within this vast area, data and samples are being collected for studies of the surface and subsurface physical, chemical, and biological characteristics of the environment. Since the tunas in this area offer the greatest potential for industrial development, particular attention is directed to the occurrence of surface schools. Specimens taken will be used in studies of stock composition, feeding habits, spawning, and growth. Hopefully, the staff will determine the relationship between tuna occurrence and the measurable environmental factors. If such a relationship can be established, it will be possible to forecast where, when, and how many tuna may be available to U. S. fishermen.

There has been a growing interest in tuna in the Atlantic over the past eight to ten years. The catch of all species--bluefin, yellowfin, bigeye, and skipjack--has more than tripled, increasing from 80,000 tons to 253,000 tons. Of this, the U.S. catch is only between 10,000 and 12,000 tons, and comes mostly from the North Atlantic; no U.S. vessels are operating in this western tropical Atlantic or Caribbean.

The program of the laboratory in the Eastern Atlantic, in cooperation with the developing coastal nations of West Africa, got under way several years ago when it was located in Washington, D.C. Through this international cooperation, comprehensive statistics of commercial operations are currently being gathered, along with biological samples from the catches, and a cooperative tagging program, using commercial vessels, is presently being planned. In addition, four fishery-oceanography cruises in the area have already been completed.

In the western tropical Atlantic and Caribbean, the program is closely coordinated with our Exploratory Fishing Program. Fishery methods and equipment specialists accompany the biologists and oceanographers on their cruises. If the tuna potential turns out to be as promising as it looks now, simulated commercial operations will be conducted by the exploratory staff unless, as seems likely, U.S. tuna vessels enter the picture. This, of course, would be the best possible commercial test of the resource.

Because this is a high-seas resource, and since at least 18 nations are currently harvesting it, plans are being made now to assure that its conservation needs are met. Two work conferences of interested nations have been held under the auspices of FAO. A draft treaty has been prepared to include the tunas and tuna bait resources of the entire Atlantic, and an international conference of plenipotentiaries is scheduled to consider its adoption early next year. So there is an immediate need for the kind of information this laboratory is assembling. Without it, this country will be at a disadvantage in negotiations at the conference table.

In addition to the laboratory structure on Virginia Key, two 143-foot ex-Navy tugs--the Geronimo and the Undaunted--have been adequately remodeled for ocean research and are assigned to this investigation. The Geronimo is on its first cruise to the western tropical Atlantic area now, and the Undaunted will cover much the same area soon after the first of the year. Appropriately, in this Year of International Cooperation, these cruises are closely coordinated with the U.N. Special Fund Fisheries Project for the Caribbean, and with the individual countries themselves.

There were several reasons for the selection of the Miami area for this newest laboratory of our Bureau. First, it is near the area of operation. Second,there is a good deep-water port for mooring the ocean-going vessels attached to the station. Third, there is a ready supply of good quality sea water for laboratory use. And fourth, and most important, is the opportunity for close association with the established and world-recognized staff and facilities of the Marine Institute of the University of Miami. We see in this scientific community many opportunities for mutually advantageous exchanges--library, fish collections, specialized equipment, etc. Also, we hope we will be able to offer on-the-job training with pay to students at the Institute.

I want particularly to express our appreciation to the Dade County Commission for making available the ground on which the laboratory has been built. Dr. Walton Smith was most helpful in working out this acquisition; the architectural firm of Steward and Skinner here in Miami did the design work; and the Navy's Bureau of Yards and Docks in the Sixth Naval District handled the contracts and inspection. We did not ask for the acid test, but Hurricane Betsy came close enough three weeks ago to give us proof we have a fine structure.

Our only regret now is that we cannot open the building for your inspection at this time. We have had some construction delays.You will be able to see it at a distance as you visit the other facilities on Virginia Key. On behalf of Laboratory Director Tommy Austin and his staff,however, I cordially invite you to visit the Tropical Atlantic Biological Laboratory on your next trip to Miami.

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"GLAMOURIZE AND MERCHANDISE"

Robert E. Finley, Chief
Division of Industrial Research-Branch of Marketing
Bureau of Commercial Fisheries
Chicago, Illinois

According to government procedure on beginning an address, I am to list each person in the audience according to rank. With all the important people here today, this would take so long, my allotted time would be up. We had a problem on this at the Shrimp Association of the Americas meeting a couple of months ago where I spoke. I told Bob Jones and Harmon Shields that the old style government manual we had was so old (it told how to seat the ambassador from Afghanistan and all this sort of thing), but actually it was so old that I just decided I would tell a few jokes and pass over all these dignitaries, so the secretary suggested that I write Ann Landers and ask her what to do. Well, this is really not a good policy for the government to write to Ann Landers for advice, so we didn't do this, but if you see in Ann Landers column, beginning "Dear Confused:" about the Miami meeting, you will know what she is referring to.

We were concerned about coming down in the middle of the hurricane season. There is an elderly lady in my building that told me that Miami is a wonderful town as long as it is standing still--but these resort towns are really something. I was recently in Las Vegas. It is amazing how the towns--and you hear these jargons around the city--the natives talk. In Las Vegas, I asked a little girl, "How old are you, sweetheart?" She said, "Four, the hard way." So, we are going to take it the easy way today to show you some presentations and ideas we have on merchandising.

Ossie Norris told me if I went over my allotted time, he was really going to clobber me. Here about two months ago, I spoke to the Shrimp Association of the Americas meeting. You see I speak quite rapidly, and I slowed down my talk so much that I went way past my allotted time. So, today you may not understand me, but I am going to end up on time.

In the Bureau, the Department of the Interior, we have many services we perform. I'll start with the Bureau--even in the Department, we have all kinds of groups. There is a Bureau of Indian Affairs, and someone from this Bureau told me that several years ago they had received a letter from a New England spinster to the Bureau of Indian Affairs saying, "Please send me a male 28 years old. I have been wanting to have an affair with an Indian for years." So the <u>affairs</u> we are interested in today really are the affairs of marketing,

consumer education and I am going to show you some of the ideas we have developed in Chicago on our consumer education programs. I will show you some of our food materials; our photographs we take. We have continuing programs which I will tell you about and some of our special promotions which we do at various times throughout the year.

During the past years that we have been in the demonstration business, we have conducted nearly 4000 school lunch demonstrations. During the first three months of the year alone, our home economists and marketing specialists conducted over 2000 hours on television, and in Chicago the materials that we produce in our office are what we feel are sharp, up-to-date promotional materials. We do not have the funds the Department of Agriculture has to put out tons and tons of data, so consequently we have tried to stress quality. In the materials that we release, we try to set very high standards with the latest food trends and this sort of thing.

You will find during the presentation that I am a name-dropper. Whenever we release a press release or food release from our office, we do say that these are fresh from the Test Kitchens of the U.S.Department of Interior, Bureau of Commercial Fisheries. This is a quasi-endorsement of the product. This is why we do control a lot of space in newspapers, and if the materials we release are comparable to those from other food groups, many food editors will prefer ours in preference to those from other food groups, because of the federal tie-in.

I hope you will bear with me on this presentation. I am using some slides that I have not used for quite a while. You will see a lot of shrimp slides in there, because these are the same slides I developed for the Shrimp Association of the Americas meeting sometime back, but I will say that in all programs, we do promote all seafoods and all fisheries products are given a fair share, depending on what is in good supply. I hope you will bear with me on this.

On making mistakes, I am reminded of the story of the small boy that came home with two black eyes. His mother said, "Where did you get the black eyes?" He said, "Up at the Reilly's." She said, "I thought the Reillys were friends of yours." He said, "Well, I made some cracks about the Pope." And she said, "Well, you know the Reillys are Catholics." He said, "Yes, but I didn't know the Pope was." (laughter) So, please bear with me.

We feel the school lunch program is one of the most important single continuing programs that we work with, and as I told you, during the last several years we have conducted over 4000 school lunch demonstrations for buyers, dieticians, and school lunch managers. We feel that as the twig is bent, so grows the tree. This represents about 25 million meals a day in the national program. We made a presentation a year ago this summer for the American School Service Association called "The Day the Fish Went to School." We have been requested, and we have given this presentation in many places through regional and state meetings; we are also developing at this time a presentation for the National Restaurant Convention on seafoods which will be attended by 60,000 participants. We are also working on a presentation for nursing homes and one on automatic vending at the same time. In keeping

with the idea that we eat with our eyes, this is the way we would like to present foods to you to show the cooks in schools the way the foods should be presented to young people. These are haddock fillets, baked with orange, with a little bit of fat over the top to keep them moist. Again we do emphasize color and eye appeal in all of our releases and our materials.

We also find that we can get very good acceptance by using foods the young people are familiar with. For example in this case, fish was used; this was a fish pizza. So we take a food that is already popular and adapt our recipes to it in the test kitchens at College Park to promote it to young people and to encourage them to eat fishery products.

Also, to get the cooks to use the fishery products we use foods that are familiar to them. For example, this is a basic cabbage slaw to which tuna has been added to increase the protein. We also would take this same recipe, add gelatin to it and make a mold that also meets the 2 oz. of cooked protein requirement. We believe, as you see there, again, people eat with their eyes. See how attractive these foods appear when they are presented to young people.

We also believe young people like foods that stir their imagination. You see here we have taken a basic tuna salad, made a tic-tac-toe cheese design on the top of the bun, and also cheese sails on the salad to give it interest and eye appeal to young people. This also gives a lot of possibilities on the menus posted on the bulletin boards and in the cafeteria.

During the past year, we have released nearly a million recipe cards to schools all over the United States. They are the standard 5 x 8 recipe cards that readily fit into the school lunch files. During February and March, we wrote two articles for the School Lunch Journal--this is the bible of the school lunch industry and goes to about 40,000 people representing approximately 25,000,000 meals a day in the United States. We used Dr. George Horn from Baltimore, Maryland, who is an international authority on the use of visuals to design some seafood visuals that can be used in the schools and in the cafeterias to stimulate interest with young people. This is the publication we put out due to the tremendous demand called, "Fish Go In Schools." and is being distributed all over the United States in schools to school lunch workers.

We believe that you <u>can</u> arouse interest and awaken appetities. For example, this scene was in a school in Nashville, Tennessee, where we did a tremendous job of food education. This was the "Day with Fish." As you see, the menu in the back says, "Today's Menu--Fish."

Mrs. Bradley, the school lunch manager, is using a globe to show where the fish comes from. On this particular day they had salmon croquettes, and the globe is being used to tell about the salmon. The children have built a fish model over the mantle, and the whole theme of the day is seafoods. A wonderful job of education, which we do encourage and tell them how to use. These are the salmon croquettes that they had in that school on that day. Because salmon is unfamiliar to them, and because mountains are common in Tennessee, salmon croquettes in this school are called "Little Brown Mountains," so they put a sauce on top of them and called them "Little Brown Mountains with Snow". But, it is merchandising and getting young people to eat something with which they are unfamiliar.

We encourage art classes, for example, to design posters. This was done by a seventh grade art student, and they had a competition on fisheries posters which were used to decorate the walls and to stir interest. Even the second graders had their own ideas about art.

In areas where fishing is part of the everyday scene, we encourage art classes to do a little more sophisticated work for decorating the cafeteria walls and competition in the art classes.

Trips to educational exhibits we encourage through our materials, and this one was taken at Woods Hole. Trips to aquariums are also encouraged. We have even worked with the Singer Sewing Machine people in New York and asked them to design for us some seafoods aprons which the home economics classes could make for the cooks in the cafeteria on the days fish was served to stir interest in the product itself. These are some of the hot pad holders we also had them design and make the patterns available to school lunch people all over the U.S.

Restaurants are a very important part of our work. The National Restaurant Association is in Chicago, and we work with them daily on various projects. During the year we have released thousands of recipe cards. One promotion we are involved in at this time is October Fish and Seafood Month. We have just released about 128,000 recipe cards and they will be distributed by the various restaurant groups around the U.S.

This is a typical merchandising kit that we make for restaurant groups. We have 20 recipes right from our test kitchens; we have a fresh and frozen buying manual which has just been up-dated and we have menu-magic with fish and shellfish. In other words, we show them good copy, and how to write attractive copy for the menu. Here are some of the photographs taken from the school lunch room, and this should please, you, Ronnie. These are toasted sardine cheese sandwiches. These appeared in the school lunch presentation, but I am showing you how we make multi use from our materials. For example, these were taken for the school lunch article presentation, as were these fish stick cheeseburgers, and here you see these two items in the magazine called "Volume Feeding," which goes to the leading volume feeders all over the U.S.

We have a tremendous amount of materials placed. It is sort of like a snowball rolling down the mountainside. We had not planned to go into this field,but they liked the quality of the materials we were presenting, and now we have magazines knocking at our doors most of the time for fresh materials.

We are also developing materials for utilities home economists--gas home economists, electric home economists--this sort of thing, and this is typical of a small part that we put out. As you can see, we do not like to have a typical government look to our materials; we like to use a fresh approach. These are little recipe packets,"Seventeen Seafood Salads to Make Your Summer Sing," and these fit into a small packet and the cost is very low, about one cent each.

We felt that outdoor fish cookery is really a coming thing, and during this past summer we released a book called, "Fish and Shellfish Over the Coals," in full color, a 24 page book which the Government Printing Office purchased 75,000 copies and has put them on sale at 40¢ each. We also understand that the Government Printing Office liked the publication so much that they are going to release nationally one and one-half million full color advertisements for this publication which will be released next spring.

We feel that suburbia is a very important place, and many of the recipes we develop and the ideas we try to present are pointed to the young suburban housewife. She has a lot of imagination; she is also feeding a bunch of young people that we like to have oriented towards fish eating.

This was the first outdoor fish cookery pamphlet that we released last year. It was a very small folder and the cost for 100,000 was roughly $900.00. We had people write in for this publication; it was announced, and even Readers' Digest carried this as being free. Over 100,000 people wrote in for this little publication to indicate the popularity of our Outdoor Fish Cookery.

This was a photograph released in conjunction with that promotion to announce the publication to newspaper articles. As you can see, I do have an obligation to all areas of the country; for instance, scallops, New England; Northwest, salmon; yellow perch in the Great Lakes; and your Middle Atlantic and Gulf areas with crabs and shrimp. As a result of the popularity of the publication, we moved into the full color cookbook, and the verticals I will show you are the pages taken from the book. Now, in addition to the publication, to show you how our materials get multi use, you will also see that the same transparencies are released to newspapers. Now here are the two transparencies you have just seen as they appeared in the Milwaukee Journal, one of the fine newspapers in the country, with a circulation in the vicinity of one-half million copies. These are smoked mullet fillets and this picture has had tremendous acceptance nationally. For example, here is the picture as it appeared in the Chicago Tribune in full color, and the daily circulation is right at one million copies. So the circle you see at the bottom is announcing the full color publication through the Superintendent of Documents.

This is some of the wonderful work done by Jack Brawner. This is in the Florida area, and this is an area in which I think we can make tremendous gains. This is Florida TV GUIDE of September 5. There is the full color picture of the smoked mullet fillets. I particularly like these publications, because they stay on the cocktail table and around the house for a full week, and it is a full week's exposure as opposed to a day or two with a newspaper.

This is tuna waldorf salad, barbecued halibut steaks and king crab legs, a full page color. Here you see the same page from the Dallas Morning News with a circulation of a little over a quarter million.

This picture I am particularly pleased with, and I think it is an example of unusually fine photography. It shows several points. For example, this is red snapper fillets, broiled. You see the raw product as it appears. We like to show the raw product wherever possible so the consumer w'll know what it looks like and be familiar with it when she sees it in the stores. We also show the method used to prepare or to cook the item. The snapper fillet method

was the wire-hinge rack. We also show the methods of laying it out to present it to your guests, and the suggested garnishing along with it, and also the white wines and accompanying items.

Here is the picture as it appeared in the Sunday Section of the Newark News, with a circulation right at half a million and with the Bureau credits. Here it is as it appeared in the St. Petersburg Times, and I use this to emphasize one point, the importance of color in merchandising our product. Here you see our product in full color, as opposed to one of our competitors at the bottom in black and white.

This is as it appeared in the Dallas Times-Herald with the picture at the bottom, "Fish Cookery Poll Notes Popularity," and above is another one of our releases, "Salmon Burgers and Tuna Barbecue".

Special holidays are very important to us because they offer some rare opportunities for promotions. Some of the most important days of the year we find are excellent seafood merchandising days. For example, in this release we tried to go into the Thanksgiving promotion by the back way, you might say, with a turkey stuffing, and in this we use oyster stuffing, scallop stuffing, and shrimp stuffing, and I might say this photograph although it is about two years old gets tremendous replays each year at Thanksgiving.

This is a promotion we did with the City of New Orleans. These are oven-fried curried shrimp with an orange marmalade sauce. You will note the props are all New Orleans, everything says "New Orleans" all along.

This is a promotion we did in the State of Maryland, an eastern shore dinner. It had tremendous response for Fourth of July week-end editions.

This is our August Sandwich Month; we again tie in with the Wheat-Flour Institute for national releases of August Sandwich Month. It is a shrimp sandwich with sour cream, pineapple, and mayonnaise mixed together with shrimp.

This is our Christmas promotion for this year, and again you will see it was used all over the United States. We have used the theme, "International Christmas." We have on the lower mat from Copehhaven an hors d'oeuvre from our test kitchens developed for us with rye bread, with little thin pieces of cucumber and herring in sour cream. We have shrimp and beer on the lower right, smoked fish-stuffed eggs up above from France; we have the typical American oyster stew, which is always served on Christmas Eve, and at the top we have Lutefisk and I might say this was unusually difficult to photograph, and that's why you see it back in the corner.

Last year we released a shrimp Christmas tree which Mr. Brawner saw at a buffet party here in Miami, and we requested the Test Kitchens to write the recipe for us. It had tremendous popularity and was referred to as the Shrimp Christmas Tree, and we have had so many requests for it that this year we redid the photograph and it is our understanding that there will be several hundred thousand Christmas cards sent out by the Florida Board of Conservation

with this on the outside and the recipe for making it on the inside, with Season's Greetings, to extension people all over the U.S. The tree is about two and one half feet tall and is inexpensively made with styrofoam. It has received a tremendous amount of popularity.

Our Lenten promotion was built around seafood styles, and we call it "The Bureau of Commercial Fisheries' Sophisticated Look at the Spring Seafood Styles." Women's clothes always come out in the spring, and our entire promotion was built around spring styles. Here is a technique we used for our Lenten promotion; you see the clear glass bowl that we used to photograph the product. We used king crab in this photograph, and you see the pieces of king crab through the clear glass bowl, which is part of the merchandising techniques used.

Here is another technique we used in our promotional programs. This was called "The Elegant, the Exotic and the Easy!' The Florida Board of Conservation made colored mats available to newspapers all over the country of this series of recipes. This is a technique we like to use. It is called "The Elegant, The Exotic, and the Easy" - - the elegant being the shrimp and sour cream with mushrooms; the exotic, snapper with curry sauce over the top. Now, here is the secret on the next one. Fish portions have an image nationally as being a drive-in item or a fast-service item, so in order to elevate the stature of the portions, you see them placed in a copper chafing dish with a quick cheese sauce over the top, almonds over the top of that, and we have associated the portions with two elegant items to give it stature, and the response to it has been tremendous.

This was a publication we did in cooperation with the Florida Board of Conservation and the Southeastern Fisheries Association, and this color publication was released at the same time as our Lenten program, which did give it a lot more strength. This was one of the photographs in the promotion, a crab-avocado salad that shows how, in addition to promoting the seafoods which are native to the area, we also tie in the props you see with the other products that are grown in the state also.

I told you earlier in the presentation that I am a name-dropper, and I want to drop a name now, and I am very pleased with this association. During this promotion you are now involved in, October Fish and Seafood Month, in which we are working with the National Fisheries Institute, we were looking around for an idea. I had the idea that we might ask Warner Brothers for their permission to use their "My Fair Lady" theme. I thought we'd call "Fish Recipes For Fall For My Fair Lady," or something along this line, so our people in California contacted Warner Brothers and they were extremely pleased, but they told us they had a movie coming out this month called "The Great Race." It is a 12 million dollar movie, starring Tony Curtis, Natalie Wood and Jack Lemmon. It is going to be the biggest single vehicle to come out of Warner Brothers this year. Beginning this month, they are spending $2 million in national advertising so they asked us if we would like to work with them on this promotion; consequently this is our theme for fall promotions. It is called, "Let Yourself Go With Fish for Fall." You see, we have tied in to a small degree with "The Great Race," in the lower right hand corner. This is a typical press kit that we will send out on an exclusive basis to food editors all over the U. S., and it sets the pace for the theme. Our photographs sometimes, when

possible, are keyed with the over all theme. In the press releases you see across the bottom and in the center, at approximately a penny for about eight pages, we give them line art. For example, this shows them, as you see on the right center, a suggested layout; it shows how you might lay out the page using our materials, and it has been very effective because we are already getting materials in at full pages where they have followed the instructions we have given them. We are quite pleased with the technique and it is proving quite successful. There is going to be millions of dollars of advertising just a few pages back from the food section in the theatre section, so we feel we are going to have quite a successful promotion with it.

This picture is part of this promotion. It is called a shrimp pie, and it is my understanding from Mr. Brawner that this picture will appear tomorrow in full color in the Miami Herald, in addition to a flounder recipe which is also a part of this promotion on the fall theme.

This is Crab Norfolk; again we have used Crab Norfolk with king crab, and again you see we have used this technique. These are ocean perch-herbed fillets. We have associated a product with lower acceptability with a popular product to build its acceptance to a greater degree. This is the picture which you just saw as it appeared in the Washington Post last September 16, with a line from our test kitchens in the lower right-hand corner.

Our new program starting this month in full color is one that Don McKernan and Laurie McHugh have been after me for a long time to do, and that's fish for breakfast, and we are calling it "Top of the Morning with Fish and Shellfish," and we have a great assortment of recipes in this thing. I will show you some in just a moment, but actually, and this is a little "fun" thing--I checked with our Administrative Officer and asked him--I said, "You know, Laurie has been so hot on this thing that I would like to dedicate this book to him." And Mr. Layton told me that he had to be dead first, and it just wasn't worth all the trouble to dedicate this to Laurie. This is the cover of the publication; it crops off left, it crops right, please don't be concerned. I realize this is bare on these sides, but this picture crops left and crops right, the title goes up to the very top on the boards, "Top of the Morning with Fish and Shellfish." We use Rainbow Trout on the cover because trout is accepted as a breakfast item in many areas. These are broiled fillets with eggs. Here you see Lobster waffles; these are chunks of lobster meat added to waffles. We tried to take basic breakfast items and add fisheries products to them. We have another one, Clam-Corn Griddle Cakes, where you take corn flakes and add chopped clams to them.

These are broiled scallops and peaches. This picture will appear in full color in the November issue of Food Service Magazine with a statement by Mr.McKernan on "Fish for Breakfast."

These are peppered shrimp and eggs; you see in the corner we have moved the Wall Street Journal in the lower left-hand corner to give a little elegance.

Here you see the center spread, and this is a new innovation for us. This is a center spread of a publication -- King Crab Newburg and Tuna Egg Scramble, and we present three recipes in 25-50 and 100 portions. I am calling this

section, "Brunch for a Bunch", and encouraging brunches and hearty morning meals.

One of the finest things to emphasize some of our other activities is the work being done by the Florida Board of Conservation, the Southeastern Fisheries Association, and Mr. Brawner here in Florida. There is a chain of restaurants out of Pennsylvania called the Dutch Pantry Restaurants. There are now 22 of these restaurants, and it is my understanding that they will offer franchises and by 1970 there will be 500 of the Dutch Pantry Restaurants. It is a very fine restaurant; it has two services --they have a counter service operation, and this is their red carpet operation, but we find that if we check the recipes and check their menus that it is typically Pennsylvania Dutch, and the flavor of the recipes is Pennsylvania Dutch. Now, there are no fish items; we have just researched this in Chicago. There are no fisheries items in the normal Pennsylvania Dutch food pattern. They are built basically around pork products, cabbage, and this sort of thing. But, they have one fish item on their menu, so Mr. Shields, Bob Jones, Mr. Brawner got with these people, and I think they have about 8 restaurants in the Miami area, and asked them why didn't they put more fishery products on there, trying to find new markets for mullet and some of the other products. And, here is what we have done. Through the Florida Board of Conservation this menu is being redesigned. Now, keep in mind this chain is only 22 restaurants right now, but will go to 500 by 1970. They are going to give the entire back half of this cover, as you see it, over to seafoods, mullet, royal red shrimp, soft-shell clams, and a couple of other seafood items. But these pictures we have taken to show them the techniques we feel are important in selling. Now the pictures you are going to see are not quite as glamorous as the ones we released to newspapers and cookbooks. These are for eye appeal on a restaurant menu.

These are deep-fried mullet loins. We had a lot of trouble photographing these, because as you can see, the Pennsylvania Dutch motif surrounding the outside is very "busy", so you have to make the products extremely generous in order to do this, but this is what they are offering, because they found the food cost of seafoods represented about 24%. They do have a technique which is very good where they separate the food with a little endive, notice thatwall of endive, and we asked the Vice-President of the Company, he was there when we photographed these, and he insisted upon this. I think it is an excellent technique.

Here are the broiled mullet fillets. This is a combination seafood platter that they will offer, and it will be in full color on the back of the menu. There will be fried mullet, broiled mullet, Chesapeake Bay soft-shell clams, shrimp and crab cakes.

I have four slides left on there and I want to show them to you. This is a promotion we are doing on fresh water fish. We have been asked, on the Arkansas Rice Program, to put out a publication on fresh water fish, mainly buffalo fish is what it is. And, I want to emphasize my point of "Glamourize and Merchandise." There is probably no fish in the country that is much lower on the totem pole in acceptability than buffalo fish, because of the name for one thing, and several other reasons, floating rib bones, etc. But, here I want to show you how we have taken buffalo fish fillets and merchandised

them. You see, we have shown the fillet in the background to make the consumer aware of the product--what the fillet looks like. These are golden buffalo fish fillets with marjoram, buttered and broiled. These are buffalo fish, broiled outside and called Buffalo Fish Capers. It has capers in it, as you can see. This is buffalo fish pizza, and you see we made the portions unusually generous so they would look good, hearty portions. This is buffalo fish gelatin salad, which we think is extremely handsome. All these you have seen will be on a full page in the book.

I want to thank you for the opportunity to tell you a little bit about our program, and I would like to remind you of something which someone told me a long time ago,

"He who whispers down a well,
"About the things he has to sell,
"Will never reap those golden dollars,
"Like he who shows his wares and hollers."

Thank you.

* * * * * *

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"ECONOMIC ANALYSIS AND BUSINESS DECISIONS IN THE COMMERCIAL FISHING INDUSTRY"

Virgil J.Norton, Chief
Supply & Resource Use Research Section-Branch of Economic Research
Bureau of Commercial Fisheries
Arlington, Va.

Any society, capitalistic or socialistic, no matter how rich or how poor, how large or how small, must come to grip with three basic questions:

1. What and how much to produce.
2. How to produce it.
3. How to distribute this production among the individuals within this society.

If we were asked how our society answers these questions - How do we decide what products to produce- How much of each product - Who produces these products - How are they produced- Does everyone get an equal share of the wealth or products that are produced, or do some individuals get more than others- we would probably be quick to reply, "These questions are answered by our market system."

But how many of us have ever really stopped to think about how our market system--this free enterprise capitalistic system--works. How does this complex system of ours come up with these answers.

Robert Heilbioner, in an interesting book concerning the development of our economic society, poses these questions in this way:

"Suppose, for instance, that we were called on to act as consultants to one of the new nations emerging from the continent of Africa. We could imagine the leaders of such a nation saying, 'We have always experienced a highly tradition-bound way of life. Our men hunt and cultivate the fields and perform their tasks as they are brought up to do by the force of example and the instruction of their elders. We know, too, something of what can be done by economic command. We are prepared, if necessary, to sign an edict making it compulsory for many of our men to work on community projects for our national development. Tell us, is there any other way we can organize our society so that it will function successfully--or better yet, more successfully?'

Suppose we answered, 'Yes, there is another way. Organize your society along the lines of a market economy.'

'Very well,' say the leaders. 'What do we then tell people to do? How do we assign them to their various tasks?'

'That's the very point,' we would answer. 'In a market economy no one is assigned to any task. The very idea of a market society is that each person is allowed to decide for himself what to do.'

There is consternation among the leaders. 'You mean there is no assignment of some men to mining and others to cattle raising? No manner of selecting some for transportation and others for cloth weaving? You leave this to people to decide for themselves? But what happens if they do not decide correctly? What happens if no one volunteers to go into the mines, or if no one offers himself as a railway engineer?'

'You may rest assured,' we tell the leaders, 'none of that will happen. In a market society, all the jobs will be filled because it will be to people's advantage to fill them.'

Our respondents accept this with uncertain expressions. 'Now look,' one of them finally says, 'let us suppose that we take your advice and let our people do as they please. Now let's talk about something important, like cloth production. Just how do we fix the right level of cloth output in this 'market society' of yours?'

'But we don't,' we reply.

'We don't! Then how do we know there will be enough cloth produced?

'There will be,' we tell him. 'The market will see to that.'

'Then how do we know there won't be <u>too much</u> cloth produced?' he asks triumphantly.

'Ah, but the market will see to that too!'

'But what is this market that will do all these wonderful things" Who runs it?'

'Oh, nobody runs the market,' we answer. 'It runs itself. In fact there really isn't any such thing as 'the market.' It's just a word we use to describe the way people behave.'

'But I thought people behaved the way they wanted to!'

"And so they do,' we say. 'But never fear. They will want to behave the way you want them to behave.'

'I'm afraid,' says the chief of the delegation, ' that we are wasting our time. We thought you had in mind a serious proposal. But what you suggest is madness. It is inconceivable. Good day, sir!" 1/

1/ Robert L. Heilbroner, "The Making of Economic Society", <u>The Economic Problem.</u> 1962. pp.15-16

How does this market system in our economic society really function? How do we assure there will always be enough cars, enough engineers, enough secretaries, enough gas stations, enough fishermen -- but still not too many?

Adam Smith, an 18th century philosopher and economist, known as the "father of economics" said, "The answer to this is simple. There is an 'invisible hand' that guides individuals within this society to do what is best for society. "That is," he explained, "if a society wants more gloves and less shoes, this 'invisible hand' will guide businessmen to produce more gloves and less shoes."

Does this sound like a fairy tale? Not really. This 'invisible hand' is very much in existence in our economy today. A further word of explanation from Adam Smith helps. He said, "if this society wants more gloves and less shoes, the price of gloves will be bid up and the price of shoes will go down. As this happens, profit in shoe making will go down, profit in glove making will go up and businessmen will switch from making shoes to making gloves." Thus, this 'invisible hand' that guides business to do what society wants them to do is really not some majestical power, but rather, the simple old fashioned profit motive.

We must keep in mind, therefore, that the overriding factor in essentially any business decision is profit. This is no less true in the fishing industry than in any other industry in the United States. Likewise, it is true in all phases of the fishing industry -- harvesting, manufacturing and processing, transportation, wholesaling and retailing.

Before we go any further, we should ask ourselves one more question. Can we really say profit as such is the factor on which business decisions are based? The answer is <u>No</u>. We cannot say profit, rather, we should say profit expectations. We never really know what actual profit will be made--a month from now or a year from now or five years from now-- as a result of a business decision made today. We can talk about expected or hoped for profit.

This is true because we never have perfect knowledge about what is going to happen. However, the better the knowledge, the less difference between expected and actual profit. The aim of economic analysis in the commercial fishing industry is to improve the knowledge on which the entrepreneur or manager base their decisions. In doing this, economic analysis provides and interprets information or actually makes available a framework through which rational business decisions in the fishing industry can be made. It should be noted that because of our growing economy, the environment in which business decisions are made is becoming more and more complex. Thus, this information is becoming more essential.

At this point, each of you might ask, "Does the economist really do <u>all</u> of this?" This answer to this question is <u>No</u>. In reality, the economist must rely, in part, on information furnished by the technologist and the biologist. The economist simply takes this basic information and goes one step further-- applies cost and value. Thus, economic analysis, which is limited by the extent of biological and technological information available, attempts to put each segment of the fishing industry in perspective relative to other segments of the industry as well as to other industries. This is done by introducing cost and value. Because of the importance of technological and biological information

in economic analysis, it is essential to have a unified plan for obtaining information.

The increase in imports of fishery products during the past decade has brought growing concern about how to increase the domestic commercial catch of fish.

There are some aspects of this problem that we must understand. The fishing industry is an integral part of our overall economy. As such, the fishing industry affects and is affected by all other industries in the U.S. That is, our fishing industry must compete with other industries for the factors of production: land, labor, capital and management resources.

An expansion in our domestic industry can come about by:

1. Increases as a result of expansion of fishing firms presently in the industry.
2. Increases as a result of new firms entering the industry.
3. A combination of the above.

Any of the three will require added investment in management and capital, and we must realize that the cost of investing capital and management in the fishing industry is what these factors of production can earn in other industries. Thus, if an expansion takes place, the industry must be more profitable than other industries in order to be able to attract resources.

Now to turn to a specific example, let's consider the business management problem that must be answered when someone considers entering a fishery--this would represent the entry of a new firm into the industry and thus, result in expansion of the fishery. What are some of the basic questions he must ask and what information does he have to have at hand.

First, should he even invest in the fishing industry? Assuming as I indicated before, that profit expectations will influence this decision, investment of his management and capital should be made in the fishing industry only if it will provide at least the same returns or profit as would investment elsewhere. If he believes the commercial fishing industry will provide an adequate profit on his investment, in which fishery should he invest? Is expected profit greater from shrimp, from haddock, or from menhaden? If he decides to invest in the haddock fishery, which phase will provide the greatest expected return-- a vessel, or a processing firm or a combination of the two?

If he decides to invest in a vessel in the haddock fishery, what size vessel, what type, what combination of capital and labor should be used? Should this vessel be designed only for haddock fishing, or should it be designed for each converting to other types of fishing or for use in other industries such as oil exploration. In reality, these are only a few of the many decisions facing a manager today.

All of these decisions will be made on the basis of profit expectation. At this point, we should stop for a minute and see how profit is determined. Profit is simply total revenue minus total cost. But what are the components of each of these aspects--total revenue and total cost.

The cost of harvesting a pound of fish is determined by the cost and amount of labor and other factors of production involved. In other words, price and quantity of the factors of production used. What determines the quantity of factors and how can this be estimated? The amount of fish that can be harvested with a given amount of factor inputs is determined by the abundance and availability of the specie and by the efficiency of the catching operation.

Thus, abundance and sustainable yield estimates are essential for making long run decisions of this type. The decision maker must know what the long run as well as the short run prospects for the physical yield of this fishery are. Likewise, it is necessary to know something of the availability estimate, relative physical efficiency of different types of gear, and seasonality aspects of the fishery. These data must be provided by the biologist and technologist. However, just knowing the physical yield of the factors of production is not enough.

Other questions relating to the cost of harvesting this specie, not only now but also in the future, must be answered. For example, what is the price of these factors of production as determinedin our overall economy. Will these factors be available in the future at the same cost as now.

For example, a recent study of the Boston offshore trawler fleet shows a medium age of these fishermen of 57. This means half of the force was over 57 years of age. Further, more than three-fourths of these fishermen have only an eighth grade education or less. Considering these facts, what is the opportunity for training the present labor force for adopting new technology? Training is a cost and what is the possibility of recapturing this cost when the fishermen are in this age group? If we cannot expect to be able to retrain the present fishermen, what are the prospects for bringing in new fishermen? Most of this labor force was born in Canada. However, Canada is presently having a labor shortage of its own in its own commercial fishing industry. Thus, these considerations will affect the cost of labor in the future.

The components of total revenue can also be stated in terms of price and quantity. That is, the total revenue received by the business firm is the amount he sells times the price. Now the basic question is if a firm sells a given amount of fish, what determines the price he will receive. Price is determined by what the consumer is willing to pay on one hand and the quantity supplied by all firms in the industry on the other hand. Thus, the investor must be aware of what his competitors are doing as well as demand. But he must consider future along with present demand. What will happen to the consumption of this item in the future? As incomes rise, will people tend to consume more or less of this item?

It is the money spent by consumers for the things they desire to buy that becomes the gross sales to the individual firm and in turn enables him to hire labor, purchase capital equipment and organize all these into turning out goods that can be sold to consumers. Thus, we see that the individual firm is in competition with all other firms at two points in the economy, first in bidding for the scarce resources to be used in a productive process, and secondly in selling to the consumers who are rationing their scarce incomes among the wide range of items available to them in the market.

Therefore, the purpose of economic analysis is to synthesize this physical, cost, and value information, considering both the short run and the long run, and present it in a form as required for rational business decisions. The need for this information of this type was pointed out by Gordon C. Broadhead, Senior Analyst for Van Camp Sea Food Co., in a talk given at the FAO meeting in Rome last year:

> "The fishing industry in general and the tuna industry specifically have been backward in the employment of research techniques as aids to business decisions." (Mr. Broadhead includes as scientists the biologist, mathematician, market analyst and economist.)
>
> "The problems facing management in fishing companies are becoming more complex each year as the supplies of raw material, their processing, sales and distribution become global in nature. We in the industry recognize this change, and I believe that in the very near future this phase of our research will be expanded at a rapid rate . . . .
>
> "Some (problems) are unique to the fishing industry, while others are common to processing and distribution in general.
>
> "Answers to these problems, in most cases, are expensive when personnel and computer time are considered. Nevertheless, I believe the management in the fishing industry is beginning to realize that the non solutions are much more costly.
>
> "Appropriate research techniques are available now and are in common usage in other industries. We need only to adapt them to our own particular areas." 1/

In summary, the purpose of economic analysis in business decisions in the commercial fishing industry is to synthesize and interpret information which must come from different disciplines and to provide this in the proper form to the decision maker. As our economy grows, the decision making process, not only in private business, but also in public policy will become more and more complex. Thus, the importance of this information will also increase.

1/ Gordon C. Broadhead, Some Aspects of Research Related to Business Decisions in the United States Tuna Industry. Rome. September, 1964.

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"THE WEST GERMAN FISHERIES GO MODERN"

C. P. Idyll, Chairman, Division of Fishery Sciences
Inst. of Marine Science
University of Miami

World fisheries are changing, with "the balance of power" among nations shifting rapidly. It seems likely that the countries which ultimately dominate the major marine fish production areas will be those which are aggressively moving to the high seas with large ships equipped with processing machinery, and those nations vigorously seeking new fishing grounds and better methods of protecting and exploiting fish stocks. If these are really the things that count in the world fishery picture, then the Federal Republic of Germany should increase its influence greatly.

My observations on the fisheries of West Germany are the result of a trip to that country in May of this year, in the company of five other American fishery scientists. I suspect that you would get six different accounts of the German fisheries from the group, depending on what part of this complicated industry seemed of greatest interest. At the same time, there are certain aspects of the German fisheries which impressed all of us, and I think we are all likely at least to mention these aspects even if the emphasis given might be different.

For example, there is the heavy emphasis in the West German industry on off-shore fishing, conducted with large vessels. The vessels themselves are of great interest, all the latest ones being large-sized stern trawlers with processing facilities aboard. I suspect also that all six of us were struck by the kinds of fish caught by the Germans, especially by the importance of herring.

But if there are several striking differences between the West German fishing industry and ours, some of their problems - including the difficulties of maintaining crews and shore workers - seemed very familiar to those faced by our own fishing industry.

Landings of fish in West Germany in 1963 totalled 646,900 metric tons. This put the Federal Republic in 7th place among European nations and in 17th place among the nations of the World. By comparison, the United States landed 2,712,000 metric tons in 1963, with a rank of fifth in the world.

The German fishing industry is divided into three segments. The nearby fisheries are conducted largely by small vessels called cutters. Some of their major catches are flatfish and shrimp, and the gears used are trawls and a large variety of other devices. Herring and other species are caught in the North Sea and waters relatively close to home by ships called luggers, the

gear being drift gill nets or trawls. Finally, increasing large proportions of the German catch is being made in far offshore waters by large trawlers, the species being groundfishes, chiefly cod and coean perch.

The deep-sea trawlers are the backbone of the West German fishing industry. These ships fish far from home- in the Faroes, Iceland, Greenland, and in recent years as far away as Newfoundland and Labrador. They catch mostly cod, ocean perch, and haddock; a large number of other species are also landed, in lesser quantities. In 1963 these vessels accounted for 64% of the German landings, with the proportion rising each year.

The deep-sea trawlers are large, modern, highly mechanized vessels. Furthermore, the fleet is constantly moving in the direction of still larger, still more modern and mechanized vessels, fewer in number but more efficient. In 1963 the number of these trawlers declined from 171 to 167, but 7 new stern trawlers joined the fleet and there was a net increase of 5565 tons.

The new vessels are magnificent boats. The most impressive examples are the University-class trawlers, like the Bonn, 6 of which have been or are being built in Bremerhaven. They are 270 feet long, with 700 gross tons, and they cost $2.5 million to build. These are stern trawlers, pulling the net up a stern ramp. The ships carry heading, filleting and skinning machines, and freezing equipment with a daily capacity of 12 tons and holding capacity of 220 tons. These vessels can operate in worse weather and can haul their nets more quickly than the side trawlers. Catches are handled below decks, under shelter, with more workers, room and better equipment. Their operation is so much more efficient than the old system that stern trawlers are rapidly replacing side trawlers, and none of the latter have been built for the German fleet for some years. There are now about 50-60 stern trawlers in the fleet. By contrast the American fishing industry has only a single stern trawler - and it is not fishing.

While the Germans are moving more and more toward the use of stern trawlers having freezing facilities and fish meal plants, they do not operate any of the enormous factory ships like those of the Russians and the British. They are, however, building 2 factory ships for the Soviet Union in Kiel. These have 16,000 tons; they are 404 feet long, and carry crews of 250 men.

The stern trawlers stay at sea about 90 days. Until recently the first part of their catch was frozen and the last part brought home on ice, but the most modern ships freeze all their catch. The frozen fish is brought to shore in 67½ pound blocks. These are sawn into consumer size packages; the sawdust is sold to mink farms and trout hatcheries. The price for sea-frozen fish is higher than that of fish brought to the dock in ice.

The stern trawlers have liver oil plants and fish meal plants aboard. The fish meal plants use the trash fish and the scraps from the filletting operations. They have a capacity of 20 tons daily. In 1963, 12,200 tons of fish meal were produced aboard German ships, compared to 67,000 tons in shore factories.

The second class of German vessels are the luggers. They catch herring and they are used for middle-distance fishing for flatfishes and other species.

(Idyll #3)

The herring fishery is of great importance in Germany. A total of 119,180 tons were caught in 1963--21.3% of the total German landings. Chief herring ports are Bremen and Bremerhaven. This species looms so large in the industry that there are two great categories: "herring" on one hand and "fish" --everything else combined--on the other.

Luggers are vessels about 130 feet long and of about 250-350 gross tons. They carry crews of about 20 men. In years past the dominant gear was the drift gill net, and some vessels still employ this. These nets are each 93 feet long, and 10 to 15 miles of nets may be fished by a single vessel.

Nowadays herring are caught mostly by trawls, which are much more effective than the gill nets. Both bottom trawls and two-boat floating trawls are used and the newest herring ships fish only with trawls. A small amount of herring is caught by gill netters, in the Baltic and elsewhere.

The herring luggers go to sea carrying 1000 to 1600 empty wooden barrels. The fish are gutted aboard, and salted-down in the barrels, about 220 pounds of fish in each. A voyage lasts about 30 days. On shore the herring are repacked, and are eventually sold in a surprising variety of forms - as matjes herring (a rich, dark salt herring of high price, made from fat pre-spawning fish); rollmops, (fillets of herring rolled around onions and pickles), mild-salted herring, hot smoked, cold smoked, bratinge - (fried herring canned in vinegar), marinated "Bismarck" herring, and many more.

By contrast, herring is a species nearly ignored in the United States. Some herring are made into meal in Alaska, and a small quantity of juvenile herring are canned as sardines in Maine. By and large, however, we are leaving our herring stocks to the Russians and to other nations fishing off our northeast coast. The Germans find this incomprehensible; when we told one man this in Bremen, he expressed incredulity that people could exist without rollmops.

The smallest class of German fishing vessels are the cutters. They fish in coastal waters in the North and Baltic Seas, mostly inside German territorial waters, and usually shallower than 55 feet. They produce about 25% of the quantity and 16% of the value of German landings. These fisheries have changed greatly since pre-war days. There are now about 3000 cutters fishing on 300 miles of coastline compared to a similar number on a former coastline of 780 miles. The difference is the coast of former German territories in the Baltic. The cutters catch a variety of species, including flatfishes and shrimp, using two boat trawls, beam trawls, floating trawls and many other gears.

The German fishing industry is highly concentrated, with the great bulk of the catches being landed in only four ports. Bremerhaven and Cuxhaven each land over 40% of the high seas catch, with Hamburg and Kiel producing about 8% each. The Cuxhaven market on the North Sea at the entrance to the Elbe River, is typical of these big ports. The market is owned by the government and run under lease by a private firm. It is 150 acres in extent. About 160,000 tons of fish were landed here last year.

(Idyll #4)

Unloaded from the boats at night, the fresh fish are displayed in plastic boxes on the floor of enormous sheds. The fish are inspected by government quality-control officials and assigned a grade. Grade S is very good quality; 2-5% of the fish earn this. Grade A is good, and 25-30% are assigned this grade; B is standard and includes about 50% of the fish; C denotes fish which may not be sold as food; these go to fish meal plants.

Early in the morning the fish are auctioned, in an elaborate ritual, with much shouting and gesticulating. The owner's label is tossed into boxes of fish purchased, and these are then hustled into processing plants nearby, or into trains or trucks for shipment to market. Fish frozen at sea are not auctioned.

Besides the major fisheries, for groundfishes and herring, there are some smaller fisheries of considerable interest.

In the Baltic there is a small but valuable salmon fishery. Atlantic salmon (Salmo salar) are caught mostly by gill nets. This fishery is supported by salmon which spawn in Swedish rivers. In Sweden, as elsewhere, hydroelectric dams have blocked off many salmon spawning areas. The power companies are required to maintain hatcheries, and to produce as many salmon as the original spawning grounds once did. The total catch of salmon is 4000-5000 tons, 70% by the Swedes. The German catch is about 200 tons.

The shrimp caught in Germany is principally Grangon vulgaris, a species much smaller than our shrimp, and similar to those caught in Alaska. About 40,000 tons are produced each year, but only 6000 tons are sold as food. The rest go to fish meal plants. In recent years shrimp meal has brought a better price in Germany than fish meal.

The shrimp are caught by small cutters, 37-50 feet long, dragging a beam trawl. There are about 500 of these shrimp boats in Germany. Average catches are about 100 pounds a day; a very good catch is 500 pounds. The size is about 200 to 350 whole shrimp per pound. Shrimp are cooked aboard the vessels for about 5-15 minutes, in salted water. They are landed un-iced in North Sea ports like Busum.

Automatic peelers have not been successful with these cooked shrimp, and in some ports they are parcelled out to families for peeling. Shrimp peeling is thus a cottage industry, with the whole family, including mother and the children, taking part.

Eels support an important fishery in Germany and smoked eel is a high priced and common item of seafood on the menu. Eeels are caught in the estuaries in traps and in fresh water in various kinds of gears.

The retail price of shrimp is about 32¢ a pound unpeeled and $1.75 a pound peeled. Yield is about 30-32% of the whole cooked shrimp.

Fishery research in Gernany is active and effective. There are a number of federal and state government laboratories, and several universities, notably Hamburg and Kiel, are carrying on basic research on the fisheries. The federal

government runs two large modern research vessels, the Anton Dohrn and the Walther Herwig. Research by the Dohrn is largely biological. The particular research functions of the Walther Herwig concentrate on improving catches through new techniques and new gear, and on finding new fishing grounds. The Herwig is the newest and most impressive of the German research ships. Launched in 1963, she is 249 feet in length. This ship is magnificently equipped, with experimental filleting machinery, freezing plants, fish meal and oil plants, and a variety of research laboratories. She has the latest electronic equipment, including one large room given over entirely to various kinds of echo sounders and echo rangers. The Herwig has a wireless room; she also has a weather station, is staffed by a professional meteorologist. He broadcasts weather reports for the guidance of the fleet. The Herwig carries a crew of 40 and has space for 10 scientists. This ship costs $3 million to build and has another million dollars worth of equipment. She has already made a number of long voyages, and next year plans to work off the south Atlantic coast of South America.

The main research laboratory of the Federal Fisheries Research Board of Germany is in Hamburg. It has a staff of 160, including 60 scientists. The laboratory conducts gear research, and investigations on the biology of important species. Gear work includes the development of knotless synthetic fibre netting, and of pelagic trawls. Electrical fishing is being tested on herring and other species.

A shortage of trained fishermen plagues the German industry. To ease this situation the Agriculture Chamber of the States of Schleswig-Holstein and Lower Saxony, with the help of the state governments,maintains a fishermen's school in Busum, on the North Sea. This is a trade school, replacing high school for some students. In other German trade schools students go to school one day a week and work at their trade the remainder of the time. In the fisheries school they fish in summer and go to school for one month in the winter, for three years. The boys are taught courses in navigation, engine maintenance, radio-telephone, fishing gear, biology, law and German language. A man cannot be licensed as a captain of a coastal trawler without a certificate from this school. About 120-200 students are trained here each year. Tuition is free, but the students pay for their housing at a nominal rate.

The Germans lost 82% of the tonnage of their fishing vessels in World War II. They have struggled to recover from this disaster, and have made great progress. But they still face severe problems. The rebuilding of their fishing fleets has been hampered by inadequate credit, and this situation has been aggravated by the necessity to build very large and expensive vessels. Changes in the post war world have forced this development, the chief of these being changes in the international law of the sea. Many of the traditional fishing grounds formerly used by the Germans, three miles and more off the shores of nearby countries, have been closed to them by the extension of territorial limits by those countries. In addition, large areas of former German coastline in the Baltic Sea are now no longer open to West German fishermen. Longer voyages in bigger boats have been one answer, but these have produced their own problems. The big stern trawlers have been costly to build, and with crews of 55-60 men, daily running costs are about $2500. Profits have therefore been elusive.

In addition, it has been found difficult to keep crews on the boats. On the stern trawlers they have better quarters and they often make more money, but with the high efficiency possible, the vessels are only a few days in port between trips, and the fishermen become very tired of the sea. In Bremerhaven we were told of one captain of a fine new stern trawler who quit to go back to a poorer paying command on a smaller boat so that he could have some time at home. Crews are mostly Italians and Spaniards; the female workers in the processing plants ashore are largely Portuguese and Spaniards too, since there is no unemployment in Germany and German women can get better jobs.

The German fish processing industry is forced to depend more and more on foreign imports for its raw material; this should have a familiar ring to American fishing ears. By 1963 home landings supplied only 25% of the raw material for fish processors; total imports of fish consumed in Germany rose from 16% in 1952 to 29% in 1963.

The herring industry is in severe straits. German boats cannot land herring as cheaply as the Swedish and Netherlands industry can put it on the German market. Declining prices and obsolescent boats are putting a financial squeeze on this fishery. Hydrographic and biological changes in the North Sea are affecting catches of herring and other species there.

Consumption of fresh fish in Germany has stagnated. To overcome this situation the industry is struggling to improve the quality of fish offered to the public, and is modernizing its marketing procedures.

But all of these problems are being faced. The average German eats nearly 24 pounds of fish a year, compared to about 10½ pounds per capita by Americans, and this difference is generally indicative of the relative importance of the two industries. I got the impression that fish are at least twice as important to the Germans as they are to us. Despite difficulties the Federal Republic is making good progress in its efforts to go modern. The Government gives substantial help to the fishing industry in attempting to strengthen its position. Subsidies are paid on new vessel construction, amounting to 3% of the 6½% interest on loans. Premiums are also paid for dismantling obsolescent ships. Quality incentives are given on fresh fish - 2½% of the selling price for trawler-caught fish and 4% for cutter-caught fish earning S or A grades. Help is given with insurance costs. In Bremerhaven the Government operates fish cookery demonstration kitchens where 8000 to 10,000 fish dealers, institutional cooks and housewives each year witness fish cooking methods.

The vigor and progressiveness of the German fishing industry, and the strong support given to it by government, makes it likely that it will overcome its difficulties and considerably strengthen its position in global fisheries. The American industry and the American government could profitably examine some of the German techniques.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"FISH PROTEIN CONCENTRATE"

Harold B. Allen, Chief
Branch of Technology-Bureau of Commercial Fisheries
Washington, D. C.

Thank you Mr. Chairman and members of the Atlantic and Gulf States Marine Fisheries Commissions.

FPC A New Concept

Fish protein concentrate, or its older name, fish flour, has been on the lips of fishery technologists for the past decade or more. But only in the past few years has this name, FPC, and the concept which it describes, been discussed intensively by members of the fishing industry, by scientists, and by those attending meetings such as this.

As this new "FPC" concept has developed, many people have not realized how uniquely different the idea of preparing a protein powder from whole fish is from anything else which has been done in the food industry. The development of FPC is really the development of an entirely new means of preserving fish in a different form. Fishermen and processors have been working on the preservation problem for centuries. It has been an extremely difficult problem to solve because fish generally spoil more rapidly than other protein foods such as red meat. Solutions to the problem have involved the development of drying, smoking, salting, pickling, cooling, freezing, and canning processes. All of these processes are designed to inhibit the breakdown of fish tissue, either by the action of bacteria or by natural enzymes. But in each case the fish is preserved in a form closely resembling that of the original raw material. Thus, preserved products usually take the form of either whole dressed fish, steaks, or fillets. This preoccupation with preserving fish in its original form has, no doubt, been responsible for much of our failure to take full advantage of our oceans' rich fishery resources.

It is necessary when using the more expensive preservation processes to seek the valuable species of fish such as salmon, cod, haddock, and tuna. In doing this, we neglect the vastly abundant fishery resources which are represented by species such as hake, anchovy, herring, mullet, and the many small schooling fish of all oceans of the world. These many species represent a tremendous potential for economic growth of the world's fishing industries, as well as an ideal and abundant source of rich protein food which can be used to supplement the many foods now in use which are of lesser nutritive value.

(H.B.Allen #2)

World Fishery Resources

Biologists, although they are not in complete agreement, have estimated that seas of the world could sustain an annual catch of between 400 and 500 billion pounds of fish. At the present time, less than 20 percent of this potential worldwide supply is being utilized. Only in areas where fishing has long been practiced, such as on the Grand Banks of Newfoundland, is the fishery resource utilized more or less fully. Even our own coastal areas and inland waters could support much greater fishing activity. Potential yields from presently known domestic unutilized stocks have been estimated at, at least 7 billion pounds per year. This amount would more than double the present United States yearly marine food yield of 5 billion pounds. The economic benefits which would accrue to our domestic fishing industry as the result of the increased catch and profitable marketing of these fish, perhaps in the form of FPC, would be of tremendous importance and could place our industry once again among the top fishing nations of the world.

FPC A Worldwide Nutritional Need

We know world population is increasing at a phenomenal rate. Significantly, the areas of the world with the most rapid rate of population growth are also the parts of the globe where land animals do not thrive or are not widely produced for human food. Namely, these are areas of southeast Asia, tropical Africa, and South America. Obviously, fish can play an increasingly important role in feeding these people if more efficient means are found to harvest them from the sea, and if an inexpensive, well preserved protein such as FPC can be manufactured from the catch. Our action in developing a research program to assist the domestic fishing industry and at the same time to help the people of the future world, was based on the following assumptions:

1. The world supply of protein in usable form is critically short.

2. Not all the vegetable protein is of optimum quality. Vegetable proteins, which are the world's principal protein source, are lacking in certain essential amino acids and therefore must be supplemented by animal proteins such as those found in fish to form an optimum healthful diet.

3. A vegetable protein of low nutritive quality, when supplemented with only a small quantity of animal protein, gives growth nearly equivalent to that obtained with animal protein alone.

4. In ordinary market form, animal proteins are now prohibitively expensive for all but a small fraction of the world's population.

5. What is needed, then is an animal protein, available in enormous quantities and at a low cost.

6. Fish protein concentrate offers one practical solution.

7. Although many difficulties still remain to be overcome before the people of the world can benefit from fish protein concentrate, these problems are largely technological and social and can be solved by the application of science.

(H. B. Allen #3)

FPC Research Program

In 1963, the Bureau of Commercial Fisheries began an intensive research effort to develop satisfactory methods for the manufacture of a variety of fish protein concentrates which would be suitable for use as dietary supplements in the United States and throughout the world. Our work has been carried out at the technological laboratory in College Park, Maryland. It is presently funded at a level just under $500,000 per year. In beginning our attack on this research problem, our efforts were concentrated on making a world survey of the many research efforts which have been undertaken to develop a satisfactory FPC product. We learned by visiting countries throughout the world that many had tried and failed, or met with only limited success, because of the vast number of problems involved. Detailed plans for a research program were developed, building on the background of the vast amount of information collected during these visits. We were determined not to make the same mistakes which caused others to fail.

Before many months had lapsed in 1963, we had begun studies on two of the three principal techniques by which FPC could be manufactured. The first of these is a chemical method, carried out through the use of a solvent extraction. The second is a biological fermentation of whole fish. The third method involves physical techniques for separating fish components. Our initial studies dealt with chemical and biological methods only. The common objective of all three processes is to remove the water and oil from the whole fish so that the product remaining consists of a dry, white, bland powder containing most of the protein and minerals of the original raw fish.

Our first work was done on a laboratory bench scale using equipment consisting of glass and stainless steel. On the basis of results obtained in these first studies, a preliminary engineering design was developed for a larger model scale FPC production plant capable of manufacturing 100 pounds of FPC per day through either the chemical or the biological procedures. While research continued at the laboratory, construction began on the larger model scale unit. It was completed in the spring of 1965, and during the past summer, it has been used for an intensive program to make preliminary information on the manufacture of FPC through solvent extraction procedures available to the fishing industry at the earliest possible date.

Wholesomeness

Early in the course of the development of our FPC research program, it became evident that in order to make the product available to those who need it most, the price must be low. Since one of the major costs in producing FPC is the price of the raw materials, only fish which can be easily harvested in large numbers and then delivered to the FPC plant without further processing, are economically suitable. This means that whole fish must be used as the raw material for FPC manufacture, without resorting to heading or filleting or other expensive procedures. In view of the economic requirement that we use whole fish, exhaustive studies were carried out at the College Park laboratory to determine the nutritive value and the wholesomeness of FPC made from whole fish.

(H.B.Allen #4)

National Academy of Sciences Committee

When our research program was started, and at the request of Secretary Udall, the National Academy of Sciences set up an ad hoc advisory committee on Marine Protein Concentrates. All of the experiments which were carried out in our laboratory to evaluate the wholesomeness of FPC manufactured from whole fish, were designed on the basis of advice from the advisory committee. As results began to flow in from these early experiments, the committee reviewed the information available, and expressed the preliminary belief that a wholesome, safe and nutritious FPC product could be made from whole fish. The committee emphasized, however, that their conviction remained to be proved through other collection of further data.

In 1964, the National Academy of Sciences formed a new and permanent advisory committee termed the Marine Resource Development Committee. Early in the spring of this year, 1965, in an effort to provide research data for the consideration of this committee, Secretary Udall asked the Bureau to accelerate work at the model scale unit in Beltsville, Maryland. He asked that this be done so that a report on the manufacture of FPC from whole fish could be made available to the NAS advisory committee this fall.

Accelerated Research Effort

The accelerated research that has been underway during the past summer was aimed at developing a single prototype commercial process which would make available, in the quickest possible time, a product considered suitable for chemical, nutritional, toxicological, sensory, and sociological testing. This process was developed, and FPC was produced from Atlantic red hake through the use of an isopropyl alcohol extraction procedure. Using this product, wholesomeness tests were carried out both in our laboratory and in the laboratories of several cooperating universities and private firms. The results of these many tests and experiments have now been compiled and presented to the permanent National Academy of Sciences Advisory Committee where they are currently under review. We are now awaiting the comments of the Committee as to the adequacy of the data provided in substantiation of the previously expressed opinion that whole fish may be used in the production of a wholesome FPC.

Longer Term Research Goals

Our longer term research objective is to look hard at the factors which must be considered in the commercial production of FPC by industry. A firm considering entry into this field will be faced with finding the answers to many questions. Some of the basic questions on processing procedures have been answered as a result of our work. But information will be needed on the cost of equipment and production facilities. We have estimated that a plant capable of producing 5 tons of FPC per day, would require a total capital investment of about $500,000. On the basis of raw fish costing 1 cent per pound, fish protein concentrate could be produced for 28 cents per pound. Should this plant be stepped up to a larger size, to a 50 ton per day capacity, the total capital investment is estimated to be $900,000. The cost of producing

FPC from the same raw material, costing 1 cent per pound, would be reduced to just under 14 cents a pound. Considering a sales price of about 20 cents per pound, a commercial process might be feasible.

Some of the many factors which are to be considered by our researchers in the immediate future are: (1) means to produce an even better FPC product by chemical means, (2) problems associated with product utilization and consumer acceptance, (3) further refinement of present equipment and procedures required, and (4) to the extent possible, develop means to produce a product at an even lower cost per pound through the solvent extraction approach. There also remains a whole field of exciting and challenging possibilities for future work in developing the biological and physical processes for FPC production. Good prospects lie in new FPC products with unique flavors and textures, such as that of cheese or even beef bouillon. Using the biological process, it is possible to produce an FPC product which is completely soluble in water. This would make it very useful in a wide variety of new food products.

National and International Implications of FPC

Many major food companies in the United States have expressed interest in the utilization of FPC in foods which are known to all of us today, such as cereals, special diet foods, breads, and pastries, candy, and even non-dairy infant formulas. To me, the future of FPC seems bright. I look forward to the day the domestic fishing boats can be active the entire year, fishing for conventional species, such as cod and haddock for the fresh fish market when they are available, and then turning their efforts to the presently underutilized species suitable for use in FPC, such as herring and anchovy, during the remaining part of the year. In this way, fishermen will be employed on a full time basis, and maximum use can be made of expensive vessels and equipment.

There is little doubt in my mind that FPC plants will eventually be constructed on the shores of many nations of the world to produce a high quality protein food from the waters adjacent to these shores. This type of food can be of significant benefit to millions of malnourished people in the developing areas. But even more quickly, we can expect to see FPC manufactured in all coastal areas of the United States for the economic benefit of the domestic fishing industry, and for the nutritional benefit of the entire free world.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"AUTOMATION OF OYSTER SHUCKING"

Mrs. David H. Wallace, Director
Oyster Institute of North America
Sayville, Long Island, N.Y.

The need for an automated way to open oysters has been evident for a long time. The decreasing supply coupled with an increase of price made hand shucking tolerable, until the minimum wage hour law forced the industry to pay an hourly rate regardless of production by the individual worker. As the minimum rate escalates, the margin of profit narrows and so both the crab and molluscan producer, who are more often than not the same person, must decrease the cost of processing the product or go out of business. Indeed, the struggle has become too much for the small and moderate sized businesses along the Atlantic and Gulf coasts. Many of you are aware of the abandoned shucking houses in your own shore communities. On one hand these business failures deprive the older and/or less able citizens of employment that was one time available to them. On the other hand the young, ambitious people disdain such employment. The only solution we see is that the industry become more technically advanced, and surely the first step is a method of shucking that is totally or nearly automatic.

The Bureau of Commercial Fisheries has undertaken a project in cooperation with the crab industry to improve the crab picking process. The Bureau promised attention to the shucking of oysters as soon as the commitment to the crab producers was met. Unfrotunately this has taken much longer than anticipated.

When we approached our legislator friends, they suggested our energies could be most profitably applied to the support of the Research and Development bill which has fortunately become PL 88-309, thanks to the sponsorship and efforts of this group. Since this money is so specifically dedicated to the technological advance of the fisheries, our members were urged to plead their cause before the individual state conservation agencies. Since almost all of the marine states would conceivably profit, no one state elected to finance the project alone. Thus we are here to consider the possibility of a joint project. A number of states have indicated a willingness to participate by dedicating some of their "309" money--or other funds, to a combined effort of developing a machine to open and extract the oyster meat.

The consensus of the directors of our trade association coincides with the advice of various development companies I consulted for advice on procedures and costs. Without exception a preliminary or feasibility study is estimated to cost from $25,000 to $50,000 for the first year. Thereafter, $100,000 to

$200,000 will be required until the machine is finished and the in-service tests completed. The guesstimates varied from two to five years. The development companies are much more optimistic than the industry members, since they seemed to consider the problems could be solved quickly once the proper direction was determined.

May I have the privilege of placing a resolution before the three most involved sections, namely, the Chesapeake, South Atlantic and Gulf Sections? If the final resolution could then be adopted by both the Atlantic and Gulf Commissions, we would be well on our way to making the oyster a better world for us, as well as the other way around, the world being to us -- an oyster.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"PESTICIDES MONITORING PROGRAM"

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

In earlier progress reports to this Commission, we have stressed first the necessity for developing objective methods in studying the pesticide pollution problem; second, the extreme sensitivity of marine fauna to pesticides in short-exposure laboratory experiments; and, third, the criticial importance of long exposures to low dilutions of pesticides. At low levels of pollution, the persistentpesticides may be stored as residues without apparent damage to the animal. These residues can accumulate to such an extent, that if the animal is eaten by another the predator may be damaged or killed.

This was shown by experiments in which oysters were exposed for a week to 2 ppb of DDT. At this level, there was a small but measurable decrease in shell growth otherwise the oysters appeared to be unharmed. These oysters were shucked and fed to pinfish and, within 48 hours, more than half of the fish were dead. In a similar experiment, oyster meats having DDT residues were fed to brown shrimp. At the end of two weeks, morethan half of these shrimp had died. There was a negligible mortality among control shrimp during this same period.

Data of this nature gave us cause for concern since these DDT residues, obtained under experimental conditions, are only slightly higher than values we have observed in natural oyster populations. Oysters exposed for two weeks to only 1/10th of a ppb will concentrate enough DDT in their tissues so that they will be toxic to other marine animals that feed on them. The oyster is more efficient than other animals in storing these residues and, too, admittedly there are not many estuarine animals that feed on them, so the oyster is not a probable source of danger to other animals, including man, but it is an excellent indicator of recent pesticide pollution in the environment.

The question may be asked - How likely is it that an estuary will be contaminated with a tenth of a part per billion of DDT? Easier than one might think. We have been observing DDT residues in oysters in a particular estuary comprising about one hundred square miles in area. The data lastyear were puzzling in that DDT values were negligible during the summer months and then were significantly increased in late September-October. This year we broadened our sampling to include plankton as well as oysters. We find the same negligible values in early summer, but DDT residues in plankton increased greatly in July and August. Presumably this will be followed by an increase in residues in oysters and fish as the DDT moves along in the food web.

These DDT residues were surprisingly high, so we made inquiries to determine their possible source. Investigations reveal that for the past two years

several applications of DDT as a larvicide have been made to control a beach fly. Although data are not conclusive there appears to be a significant increase of DDT in plankton one or two weeks following spraying, and a similar increase in oyster residues in about two months. The poundage of DDT used in a season is relatively small yet, if it were all placed in the estuary at one time, it would theoretically result in a concentration of 1.0 ppb or 10 times the amount necessary to cause toxic residues in the oyster.

What effects can 1.0 ppb of DDT have in an estuary? If we may project from our laboratory experimental data, it would cause a 35% decrease in the growth of oysters; in 48 hours it would kill 50% of the shrimp population and all of the juvenile mullet in the area. A concentration ten times this amount, which might easily occur locally, would kill 50% of the blue crab population within 24 hours.

Observations such as these have led us to the conclusion that in the presence of low levels of pesticide pollution there may be chronic low levels of mortality in shrimp and fish populations which pass undetected, and that oyster production may be suffering because of interference with growth. The extent of these losses cannot be even guessed at until we have extensive information on where such pollution occurs. The establishment of an estuarine monitoring system seemed to be mandatory.

There were two immediate problems to solve if a monitoring system were to be successfully established on a nationwide scale. It seemed desirable that all analyses should be done by a single agency so that there would be no question as to the comparability of the data. Consequently, there was the technological problem of handling and shipment of samples. Samples are usually frozen and shipped as quickly as possible to the analytical laboratory. This involves considerable effort in packing and timing of shipments with plane schedules; if there are delays in transit, the sample may be spoiled.

To avoid these difficulties,we experimented with various standard preservatives but found they caused significant but unpredictable losses of residues from the samples. Finally, we discovered that in the normal process of preparing samples for analysis by gas chromatography the initial step of mixing and drying the tissues in sodium sulphate resulted in a stable preparation with a 'shelf-life' at room temperatures of at least 30 days. This meant it would be possible to send samples by ordinary mail. With this problem solved, the question of manpower remained to be answered.

Exploratory talks with various agencies indicated that the objectives of an estuarine monitoring project would fit in with their own program requirements and that the work might be accomplished under contracts. It appeared, too, that state agencies would be in the best position to select monitoring sites because of their familiarity with local shellfish populations and drainage patterns which might carry pollution into estuaries. To ensure success, the program needed to be financially adequate to obtain trained personnel and to have sufficient coordination and continuity so that the data for several years could be compared.

(Butler #3)

We have drawn up a generalized contract which can be altered to fit the requirements of a particular area or agency. Basically, the contract provides $10,000 for a one year program. Duplicate samples of oysters and, in some areas, clams, fish and plankton are collected at monthly intervals, processed in the field and sent to the Gulf Breeze Laboratory for analysis. The gas chromatography techniques employed detect residues of 10 ppb, or higher, of ten of the most widely used chlorinated hydrocarbon pesticides. Samples are processed as soon as possible, in less than a month, and the analytical results forwarded to the contracting agency. Data may be released by either the agency or the Bureau.

We now have agreements or contracts in effect with several state and private agencies and are collecting samples in six states along the Atlantic and Gulf coasts. These include 44 sampling stations for oysters or clams and 15 stations for less frequent sampling of fish and plankton populations. The map indicates where samples are being collected but additional stations have been established since the map was prepared. A similar program has been instituted on the Pacific coast, where 26 stations have been established in Washington and California. The Bureau's Ann Arbor Biological Laboratory has established 22 stations in the Great Lakes region and more than 50 stations are being sampled in Alaska this summer. We have invited additional states on the Atlantic coast to participate in the program. These represent areas having extensive shellfish populations in potentially polluted areas.

What can we do with these data? There is no evidence that residues exist in any of our commercial fisheries products at levels that would constitute a human health hazard. However, knowledge of the seasonal or continuous existence of low levels of pesticide residues will make it possible to pin-point sources of pollution and perhaps enable us to eliminate it before a catastrophe occurs. Such data will help identify areas where pesticides may already be an important factor contributing to low productivity or suspected declines in commercial fishery populations. They will be of inestimable value in identifying new sources of pollution, and will put us in a much better position to protect our marine environment.

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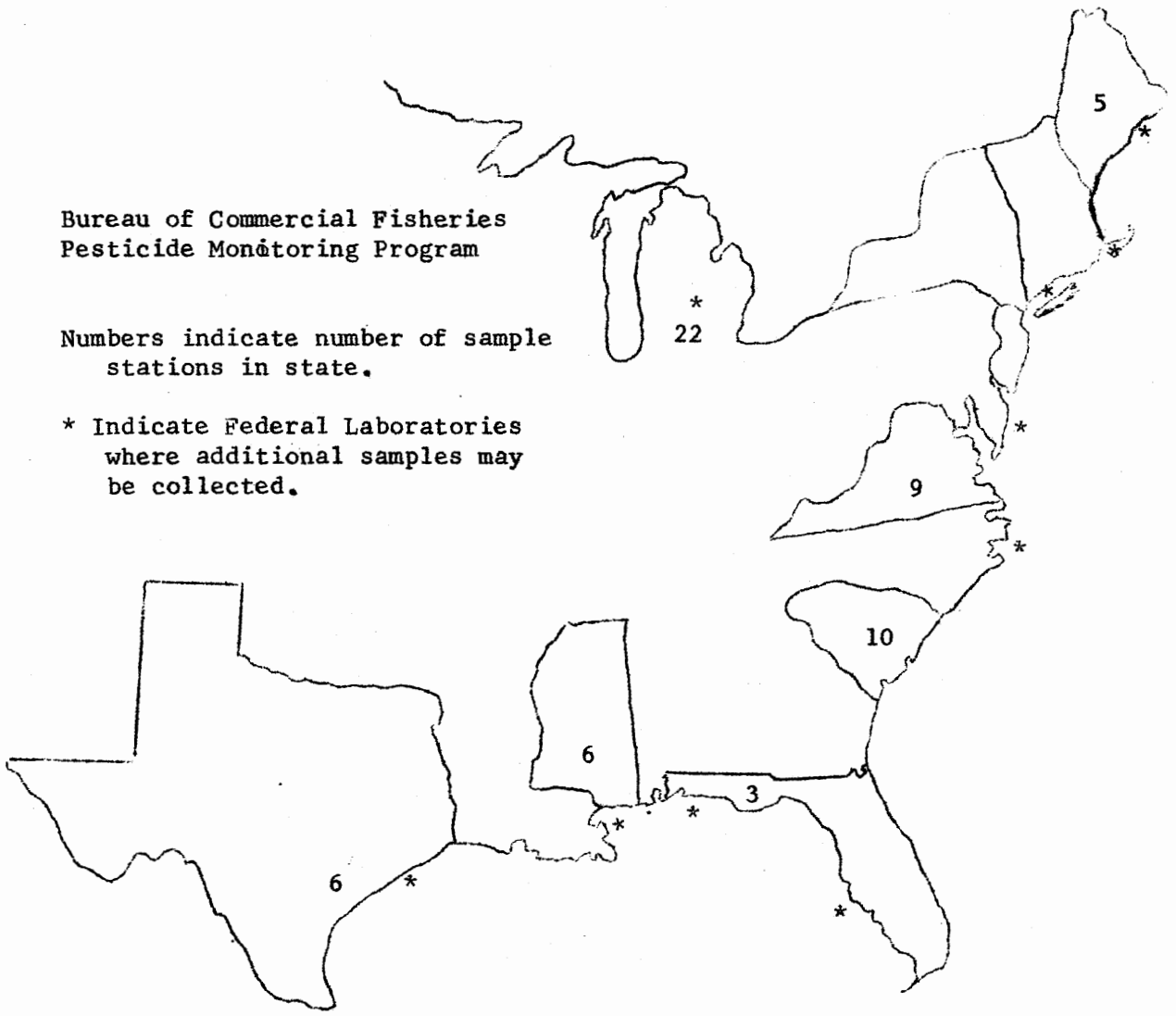
Bureau of Commercial Fisheries
Pesticide Monitoring Program
Numbers indicate number of sample stations in state.
* Indicate Federal Laboratories where additional samples may be collected.
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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"COMMISSION ANNUAL REPORT 1964-65"

Ted Millette, Chairman
Gulf States Marine Fisheries Commission

This has been another year of continued progress in marine fisheries research in the Gulf area.

As Commission Chairman during the past year, it has been one of my several duties to periodically review the status of research of all categories being accomplished by the fishery administrations of the member states of Alabama, Florida, Louisiana, Mississippi and Texas, and the Bureaus of Commercial Fisheries and Sport Fisheries and Wildlife. The resumes of activities of the several agencies which have been made available for your study, will bear out my opening statement. Undoubtedly, the 1965-66 State reports will be even more impressive as programs get underway through the use of funds becoming available under the Commercial Fisheries Research and Development Act of 1964.

The Gulf States Marine Fisheries Commission met twice in regular session during the past year. The 15th annual meeting was held at Brownsville last year while the spring session was scheduled for March of this year at Mobile.

The Gulf fishing industry advisory panel to the Commander of the 8th Coast Guard District held an organizational session during the October Commission meeting. The Commission's shrimp biological committee also held a session at this meeting. A third session held during the October meeting was one in which the Bureau of Commercial Fisheries representatives discussed with State Fisheries Directors the regulations pertaining to Public Law 88-309.

In connection with the Mobile meeting the Commission scheduled a session of State and Federal pesticides research workers for the purpose of examining the extent of knowledge available on the reaction of pesticides on the fisheries and to discuss possible research for the future.

The Commission's shrimp biological committee also met during the course of the spring session.

Commission action of general interest for the period includes the adoption of a resolution in which the Bureau of Commercial Fisheries was commended for the keen interest being manifested in the need for expanded oceanographic research to include the entire Gulf of Mexico and urged early completion of a Gulf-assigned research vessel and implementation of a broad oceanographic coverage of the Gulf. This resolution was adopted at the October 1964 meeting.

(Millette #2)

Two other resolutions, each having been adopted at the Spring 1965 meeting, concern a request for re-examination and reappraisal by the Secretary of State of the office of Special Assistant for Fisheries and Wildlife to the Under Secretary, in the light of the increasing scope of activity both domestic and international and the heavy duties of that office, and with the purpose of adding a sufficient staff and personnel to cope with the many increasing fisheries problems and matters of vital interest to the domestic fisheries. The second resolution requested that a meeting of industry and state health departments of the Gulf States be held in an attempt to establish uniform standards for interstate shipments of shellfish. The meeting was held May 7 at New Orleans.

Preliminary landings for the year 1964, which have been provided by the Bureau of Commercial Fisheries New Orleans office, indicate a grand total of 1.3 against 1.4 billion pounds in 1963; however, the ex-vessel value was up from 98.8 in 1963 to 99.3 million dollars last year. Production-wise, we all know, of course, that 1963 was one of the Gulf area's better years.

For the first 8 months of this year, we find that shrimp production was running 14% better than the corresponding period in 1964. Menhaden was up 18%. For the first 7 months of the current year oyster meat production was slightly under the 1964 figure. In the overall picture, crab production has shown a decline. Since the decline has continued for several years, we are asking our technical people to endeavor to determine if the cause is biological or economic.

The full extent of damage from the September hurricane to the fisheries, particularly in Louisiana, has not been fully determined. It is known, however, that sizeable production declines may be expected to result, especially in the oyster fishery. The Commission extends its sincere good wishes to our friends in the Louisiana industry for a speedy recovery from the aftermath of "Besty".

In conclusion, I would like to express the most sincere thanks of the Commission to our long list of cooperators with the Bureau of Commercial Fisheries, the Bureau of Sport Fisheries, Department of State Fisheries Office, the U.S. and State Public Health Services, the University Laboratories, the State Conservation Agencies, the National and Area Fisheries Associations representative of commercial and sports fishermen, and to all others who have assisted this body throughout the year in the furtherance of its mission. Additionally, we are most grateful to our people in the Congress who have in so many instances supported legislation which has resulted in funds being made available to the Federal and State Fisheries Agencies for carrying on Gulf fishery research and development. For the fine cooperation given the Chairman during the year by the Commissioners and the Commission's staff, I am indeed appreciative.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"REPORT ON THE ACTIVITIES OF THE SOUTHEASTERN FISHERIES ASSOCIATION"

Bob Jones, Executive Secretary
Southeastern Fisheries Assn.
Tallahassee, Florida

It is certainly a pleasure for me to be here today and give a brief report on the activities of the Southeastern Fisheries Association. For those not familiar with Southeastern, our organization is composed of commercial fishing interests in Florida, Georgia, Alabama, South Carolina and North Carolina. Our office is located in Tallahassee, Florida. We were organized in 1952, and since that time we have completed many beneficial programs for the commercial fishing industry in this part of the country...(at least we think we have..)

During this past year, we initiated a "Seafood Promotional Dinner" and were very fortunate in having Governor Burns of Florida as our guest of honor. Over 325 people attended this affair which proved to be a success both from a promotional and monetary viewpoint. Our purpose for holding this event, is to draw attention to our fishery products, and to improve the image of the Association. We are planning another promotional dinner for this year, and we will probably hold it within the next two months.

Last year we joined with the Florida Board of Conservation and the U.S. Bureau of Commercial Fisheries in what has turned out to be a monumental marketing program. Through the efforts of the aforementioned groups, we have been able to obtain more publicity for Southeastern-produced seafoods during the past year than has been obtained in the past five or six years. This comparison is based on some concrete fact. For instance, we know that more food photographs, more recipes, and more column inches were devoted to our products, because we have tear sheets from hundreds of newspapers gathered from all parts of the United States. Our Association feels that the Bureau of Commercial Fisheries and the Florida Board of Conservation have really initiated a program that will prove to be the answer, or part of the answer, for increasing the per capita consumption of fishery products. There is no question about our industry needing more research; better methods of production; more quality control; updated vessels; and so on, but it is my opinion that the real salvation of the commercial fishing industry in the United States will be found through more and better marketing programs. I further believe that Congress has realized this and has made a giant step forward by passing and funding P.L. 88-309....our Association feels that creating more demand for our products is the greatest challenge facing our industry today.

Along this same line, Southeastern Fisheries introduced a bill in the 1965 session of the Florida Legislature asking that fees for obtaining a wholesale seafood dealer's license be doubled, and that this increased amount of money be earmarked for promotion of Florida-produced saltwater products. The licenses formerly sold for $50, but now cost $100. With over 800 dealers in the State, this means that Florida will have at least $40,000 every year for promotion of their saltwater products.

There should be no doubt in anyone's mind that we intend to be recognized nationally as having unexcelled seafood products, and that we intend to devise methods for marketing some of our species that have been neglected, but which have a great potential. For instance, we want to make mullet (or Lisa, if you prefer) a common household word with the housewives throughout the country. In passing, I would like to point out that the aforementioned bill to increase the cost of wholesale licenses was introduced on the first day of the session, and was passed on the last day of the session. I guarantee that we had our fingers crossed, and only through the assistance of Governor Burns, Secretary of State Adams, Randolph Hodges, and several key legislators did this bill become law.

Our problems in getting this bill passed did not arise from the fact that we wanted to increase our license fees, but rather in the fact that we had also called for an increase in the cost of retail licenses in our original bill and in so doing found ourselves in a losing battle with the very powerful chain store lobby. Needless to say, we deleted the part of the bill calling for the retail store increase, and decided that it would be better to get a piece of the pie rather than none at all. When you get right down to it, the retail outlets stand to profit through our marketing efforts more than any other group, but we could not convince them that $15 per store would be a good investment. If any other state considers such an approach to establish a promotional fund, I would suggest that they limit any proposed increase to wholesale dealers. This way they would be asking the State Legislature to levy a tax on them, and not the general taxpayer, and I believe that it would have a better chance of becoming a law.

During this past session of the Florida Legislature, we also tried to get a shrimp count law passed to protect the small shrimp in Florida waters. The count we tried to get was a 47 heads-on, 70 heads-off. As some of you may have heard, this was quite controversial; even among our own members. As a result, the original bill was heavily amended and leaves many questions unanswered. We hope that prior to the next session of the Florida Legislature, the Bureau of Commercial Fisheries will complete their economic study of shrimp, and make some recommendations. To many people, conservation means being able to produce the maximum sustained yield of a fishery for the greatest amount of profit without harming that fishery. If this is the case, then we must have a completed economics study relative to Florida waters before we can definitely answer the shrimp count question. There were several other bills that Southeastern sponsored for certain areas of the State, and overall we had a successful legislative program. We hope to have a better one during the next session.

Another program we are working on is the U.S. Jaycees clean water program. On August 7, 1965, Southeastern President Heber Bell, attended the Florida Jaycees summer conference in Lakeland, and presented them with a $300 check from Southeastern. We worked with the Jaycees last year on several local projects pertaining to clean water, and our Board of Directors felt that this $300 grant would add impetus to their program for the coming year.

We are continuing to work with the Shrimp Association of the Americas in offering assistance to the shrimp fleet working along the Mexican seacoast. Our members have been most fortunate of late inasmuch as none of our boats were seized during this past year. Our biggest problem in fishing off the Mexican Coast is the high charges made to the vessels when they have to enter Mexican ports for repairs or sickness. We hope to have these charges reduced considerably within the next year.

Last month after hurricane Betsy passed through the Florida Keys, Southeastern tried very hard to obtain some small business administration loans for the crawfishermen who lost most of their fishing gear and vessels. We estimate that over 90,000 traps were destroyed, which represents over $500,000. The SBA Office in Miami was very helpful in providing all the information and advice we requested from them, and I believe that many of the loans applied for will be approved. If some help can be obtained, the crawfishermen should be at peak production in a relatively short time.

The October Fish N' Seafood Parade was launched here in Florida on October 5th. We presented Governor Burns with a seafood platter, and the story telling of this presentation has appeared in many newspapers throughout the state. We also served the Florida Cabinet an informal dinner on the 5th in Tallahassee. Through the cooperation of the Florida Board of Conservation, we have distributed over 850 color posters designed by the National Fisheries Institute. The Conservation Department paid for these posters and helped in contacting the chain stores to get permission for putting these posters on display. Many of our area chairmen will be holding seafood dinners around the State and will have as their guests, food editors of the local papers, and radio and TV personalities. We anticipate a real successful Seafood Parade here in Florida.

We are working very closely with the Izaak Walton League of America in trying to keep indiscriminate landfill projects down to a minimum. There is more and more encroachment on bulkhead lines up and down the coast of Florida, and if we are not careful many more nursery areas will be destroyed. We are working very hard in order to maintain a good working relationship with all the sports groups because if we can get these people to stay on our side, half the battle is won.

Very briefly then, these are the programs we have been working on during the past year. At the rate the Association is growing, I feel that our workload will continue to increase.

In closing, I would like to mention a subject that is being discussed more and more within the Association.

Many of our members have heard that under the Fish and Wildlife Act of 1956, it was intended that the Bureau of Commercial Fisheries set up a Fisheries Extension Service. This part of the Act has never been implemented to any large degree as far as I can determine. I assume that a fisheries extension service under the guidance and control of the Bureau of Commercial Fisheries would be patterned after the Agricultural Extension Service which has proven to be worth its weight in gold to the agriculture industry. It seems to me, that if the Bureau had an extension service with at least 50 home economists, and 50 fishery marketing specialists, the per capita consumption of fishery products could be increased by at least 25% within the next five years. I am sure that the Bureau, under the capable direction of Mr. Don McKernan, would devise some type of formula for the assignment of these home economists and marketing specialists based on the population figures within the regions of the Bureau.

According to the February issue of FISHBOAT Magazine, the Agriculture Department has $86,391,000 for extension service work, while the Bureau of Commercial Fisheries hasn't got a dime. Further, the Agriculture Department has thousands of home economists and demonstration agents while the Bureau probably has less than ten. We all realize that our industry is much smaller than the Agricultural industry, but we read so much about the fact that the peoples of the world will have to turn more and more to the oceans for their supply of food. We could probably get a fisheries extension service started for a million and a half dollars, and I think this idea deserves the consideration of this Commission, and all other fisheries commissions and organizations.

I hope you will think about this idea, and I sincerely want to thank you for allowing me to report on the activities of the Southeastern Fisheries Association.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"POSITIVE THINKING IN MARINE FISHERY MANAGEMENT"

George W. Allen, Chief, Division of Seafoods
Alabama Department of Conservation
Dauphin Island, Alabama

Most of us when we decide to present a paper, write a report to some important or insignificant group first decide what we can warn about, complain about, cry about or elicit sympathy for. Most of we "oldsters" in the conservation effort have been attending meetings for over twenty years. In reviewing the papers presented, both by administrators and technicians, I have yet to find one that either directly or indirectly isn't either complaining about the state of fisheries affairs, reporting another catastrophy or voicing dire predictions of things to come. I'm really very much surprised that any of us have remained in the conservation business at all, much less the extended periods of time that some of us have.

Next to perhaps mechanical engineering, I have encountered more young graduates in marine biology that are somewhat discomfited about their profession once they become professionals and are no longer amateur students. One would be inclined to believe that misapprehension is an occupational hazard. Actually in most cases, the reason for maladjustment among the newly hatched professionals is the sudden realization that marine conservation programs are 10 percent inspiration and 90 percent sweat. To the successful administrator "sweat" has become an increasingly rare and an increasingly valuable commodity. It is the principal ingredient for progress, success and a good night's sleep. The young and aspiring conservationist demands an expensive library for his research programs, when actually the most reliable volumes and those which are the most readily available is the information found in the muds, flora and fauna of the marine environment. More complaints these days are about plugged fountain pens, short circuited computers and poorly indexed file cards than there are about marsh mosquitoes and leaking hip boots.

To the older professionals, complaining about this and that has become a force of habit. Many of us have had to proclaim a sorry plight to get funding from our legislators, many of us find that agreeing with complaining factions of the fisheries industry takes the monkey off our back in the eyes of the local population. Some of us feel that by wailing about negative conditions we can minimize certain failures or inaction in or upon other problems. While I do not intend to be a Pollyanna or look through rose-colored glasses, I wonder of the effectiveness of this negative approach. Have we cried "wolf" for so long that the cry no longer means anything?

To be honest with yourselves and the industry, try to remember if you have ever heard a commercial fisherman say that things were good, or getting better,

or would work out all right? Have you ever heard an administrator or a biologist admit, or possibly even believe that he had an adequate budget, sufficient equipment or that he was not underpaid? I know of a couple of fisheries people I thought were over-paid if they received even room and board, but I am sure that they felt they were under-paid, under-appreciated and misunderstood.

Generally speaking, I am afraid we are becoming congenital complainers. In fact, come to think of it, I am complaining about complaining.

A number of years ago, I appeared before my legislative budget committee for the usual examination of our budgetary requests. In justifying my proposed budget I wept bitter tears, painted pictures of gloom and despair, told of financial losses and starving children. While in this terpsichorean orgy, my audience of legislators picked their teeth, drank coffee, doodled and hummed the score from "The Music Man". Finally, Senator Will G. Caffey from the seafood area asked what we did with the last money they gave us. He asked what success we had with the programs if we hadn't made more jobs, more public reefs, provided more effective law enforcement and a bigger and more effective program of research. After an hour of this positive approach the chairman gaveled the budget request through with no objections.

Afterwards, Will G. told me that if I had continued along my original pattern, the committee would have given up the whole program as a hopeless mess. Senator Will G. Caffey, whom all of us from the Gulf Statesknow, was one of the best, if not the best, legislative friend the Gulf Coast fishing industry has ever had; he was also chairman of the Gulf States Marine Fisheries Commission, and was always the proponent of positive thinking in any problem. From such men as these we can always learn.

This is being written on July 8, from a hospital bed, but even at this early date, I can predict what the programs and papers presented here will revolve around. There will undoubtedly be a keynote address on the dismal aspect of either MSX in East Coast oysters or the continued encroachment of foreign vessels and seafood products into the American market. We will then hear of pollution problems of one sort or another, we will discuss the estuarine infringement on our coasts, the dismal treatment we receive from health regulatory agencies. From this we will all agree the minimum wage law is killing our industry, we will very likely hear that the Texas Water Diversion Plan will kill all fishing in Texas.

Please understand that as a professional marine and estuarine conservationist, I also recognize the above problems, and in no way diminish the negative importance of such problems. Without being continually made aware of the above and many others, we are apt to forget certain situations not directly affecting our own particular problem area. But are these problems really wrapped in complete cloaks of mourning? I doubt that they are as completely as black as they first appear.

World War II, as terrible as the results might have been, brought about the development of antibiotics, jet aircraft, rockets and atomic power. It is indeed a travesty of human endeavor that it takes such a cataclysmic upheaval as a war, to bring human effort to its maximum. Only in times of relative tranquility do we develop such advances as the"Beatles, Race Riots and the Frug". In one respect, we of the fisheries effort are in a war of survival, very much as we were in World War II.

Wherein does the silver lining show on the edges of foreign ships off and in the Grand Banks? Off-hand I can see little hope for a brilliant future in polluted waters, foreign competition or MSX.

If nothing else these so called catastrophies at least got us off our complacent and padded posteriors and into concerted action on mutual problems. Even the eternal bickering between sports and commercial fishing was forgotten to a certain degree as they united against common encroachment on our natural resources.

While federal attention might, (and I emphasize might) have been eventually brought to the foreign development of fisheries and the infringement on domestic markets, I doubt if the notice would have been as rapid without the foreign ships appearing in our traditional fishing grounds. There is nothing like a blow in the britches to get some action. Because of this much needed federal aid, programs for boat owners and operators have finally gotten underway.

Had foreign competition in our national markets been supplied by fisheries resources from Australia, it is indeed doubtful if we would have received this much needed federal assistance as little as it is at the present time.

Likewise, I am sure that our pollution problem had to become as critical as it is at present before it received the attention of our Congress. It was a simple case of suffering until the pot boiled over. Once it boiled over, then the attention was focused on the problem. So far however, all we have gotten are some grumblings and rumblings in the bowels of Congress. If our federal representatives ever stop arguing about whether a tiger is yellow with black stripes, or black with yellow stripes, we will eventually get some action. Even the threat of federal action has stirred the various states into some semblance of activity, as feeble as it may be. What is needed is an anti-pollution heartburn or gas pain.

As for our state industry, federal enforcement can't come soon enough or hard enough. In our opinion, this will indeed be pollution's silver lining.

Should someone ask me how things are going in the fishing industry in our State, I would honestly have to say "not too bad".

If a legislative budget committee asks me how things are going with what he considers his money, I think I can show him positive results.

In enforcement 50 percent fewer violations, in shrimp landings an increase of 4.4 times that of 1961, 14.3 times that of 1962, 1.6 times that of 1963 and 2 times that of 1964, up to the period of this meeting.

Region-wise there has been the building and staffing of several new marine laboratories. Also we should not forget the new Federal Aid Program in relation to commercial fisheries research and development.

In management we have seen an increase in private oyster leases, development of new techniques and refinement of old ones. In the Gulf area we have seen closer cooperation between the states in mutual problems of the industry.

Generally speaking, while new problems have arisen we have been solving old ones. We might well recognize the fact that we will always have problems. We hope we will have, for without problems we would be serving a useless function.

I well imagine that as the individual in charge of seafood administration my problems and conditions are similar to those of other administrators in similar circumstances. There are not too many of us around you know. This may be good or bad depending on the position of the observer. To hear some of us complain it is again surprising we stay in this work.

I find I am continually short of needed funds, only about 50 percent of my equipment is running except on those rare days when it is not needed. I am often overlooked by the powers in the big white building on the hill. In fact my entire division was left out of the published annual report of the Department a few years ago. They did use the pictures I included, but placed them in the Game and Fish Division report. The only time I get suggestions from the industry is when there are no shrimp or fresh water has killed our oysters. Even then, these suggestions have more with what I should do as to my physical location or inferences about my progenitors than withthe problem at hand.

On the other hand, it is not too bad a route to follow. We have a nice, new laboratory and office which I like to feel I had some hand in bringing about. What we can't buy we have either built or repaired. While overlooked in some respects by the house on the hill, I thank God we have been forgotten at other times. I have a good-looking secretary without whom I am sure the Division would surely suffer. After all, if you must have a secretary, why inflict punishment on yourself? I have seen oyster production rise from new areas because of our efforts. Best of all I like the work, the people we try to serve, my associates throughout the country and finally reach the conclusion that things are not too bad after all.

Of a few things I am sure. The pollution problem will be solved if we keep working on it. MSX will be conquered if we continue our research and management efforts, foreign competition will be met and overcome when American know-how, ingenuity and private incentive gets riled up enough.

I wish most strongly to point out that in our work and efforts, as in all others,prohibitive obstacles are only seen when you take your eyes off the goal you are trying to attain.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"COMMERCIAL FISHERIES RESEARCH & DEVELOPMENT ACT OF 1964"

I. B. Byrd
Federal Aid Coordinator-Bureau of Commercial Fisheries
St. Petersburg Beach, Florida

The primary purposes of the Commercial Fisheries Research and Development Act of 1964 are to allow Federal-State cooperation in carrying out projects designed for the research and development of commercial fisheries resources of the nation; and to supplement and increase the amounts of state funds appropriated for commercial fisheries.

State funds used for matching monies must be additional funds for research and development projects and not funds diverted from existing commercial fishery projects. However, regulations provide that it will not be necessary for a state to use new funds to match the federal contributions during 1965 and 1966 fiscal years if its legislature did not meet for a significant and practicable period of time after the appropriation of federal funds for the Act.

Cooperative projects between states along with needed compacts and agreements for these projects are provided for in the Act.

The Act authorized the appropriation of funds to the Secretary of Interior for a period of five years beginning July 1965 to carry out the purposes of this legislation. Annual amounts authorized were:

(1) Section 4(a): $5,000,000 to be apportioned to states as the federal share for costs of research and development projects.
(2) Section 4(b): $400,000 to $650,000 for restoring commercial fishery failures caused by resource disasters arising from natural or undetermined causes.
(3) Section 4(c): $100,000 for developing a new commercial fishery.

The resource disaster and new commercial fishery funds provided for in Sections 4(b) and 4(c) do not require state matching monies.

This legislation did not appropriate funds. It simply authorized appropriation. The first amount appropriated under this Act was $400,000 in fiscal year 1965. All of these funds were used to alleviate a commercial fishery failure in the Great Lakes Chub industry.

A total of $4,800,000 was appropriated for the purposes of the Act for the present fiscal year 1966. Of this total, $4,100,000 was for the federal share

of the cost of research and development projects under Section 4(a); $400,000 for commercial fishery failures under Section 4(b); and $300,000 for the administration of the Act by the Bureau of Commercial Fisheries. No funds were appropriated to implement the new commercial fishery portion (Section 4(c))of the Act during the fiscal year 1966.

The $4,100,000 apportioned to the states was made according to the formula in the law which reflects the relative value of commercial fisheries industry in each state. These apportionments are based on the three most recent calendar years for which data satisfactory to the Secretary of Interior 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. For fiscal year 1966, the sum received by an individual state ranged from a minimum of $20,500 to a maximum of $246,000.

An apportionment for any fiscal year remains available to states for a period of two years to be obligated for approved projects. If the funds are not obligated within a two year period, they are returned to the Treasurer of the United States and not to a program pool for future use.

Only those state agencies designated by the governors of the respective states are authorized to submit fishery research and development projects to the Bureau of Commercial Fisheries for approval. However, other agencies or institutions may submit projects through the official state agencies.

Cooperative projects between states should be considered by the state agencies whenever possible. Carefully planned and executed cooperative research projects to investigate species and conditions common to several states would no doubt provide for more economic financing and a more efficient use of available research personnel. Certain types of estuarine studies, fish and shellfish disease and parasite investigations, blue crab studies and catch statistics are examples of projects that are worthy of consideration for cooperative study between states.

Commercial fisheries research and management project proposals should be submitted to our Regional Office at St. Petersburg Beach, Florida. Every effort will be made to complete review and evaluation for all projects as quickly as possible after they are received.

No funds are committed by the submission of the project proposal. Funds are obligated only upon the approval of the project agreement and the plans, specifications and estimates by the Secretary. Forms for submitting a project agreement and plans, specifications and estimates are forwarded to a State from the Washington Office of the Bureau following the approval of the project proposal.

Projects submitted must be directed toward an economic improvement of the domestic commercial fishing industry. Such projects should ultimately improve the productivity of the fisherman or processor; expedite early diversification of an existing industry or establishment of a new industry; or lead to increased consumption of domestic fishery products.

(Byrd #3)

Approvable projects may include but are not limited to the following types of activities:

(1) Accumulation of knowledge for the optimum utilization, restoration, or maintenance of a resource or group of resources.
(2) Location of new resources and the development of new fishing methods and equipment.
(3) Handling and processing of fishery products.
(4) Economic studies.
(5) Market promotion and development aimed at trade channels above the consumer level.
(6) Construction of research facilities and vessels.
(7) Coordination of research and development.
(8) Technical extension activities to disseminate the useful results of research and development projects.
(9) Collection, compilation and dissemination of statistics.

The following types of projects are not approvable:

(1) Projects from which the benefits appear to accrue only to a single individual or firm or to a relatively few individuals or firms.
(2) Projects dealing with law enforcement operations.
(3) Projects of a public relations nature; except that well-planned extension activities which will disseminate research and development results to the commercial fishing industry will be considered.

Certain restrictions will apply to projects which may be submitted by the state agency. Examples of such restrictions are as follows:

(1) No funds may be used for construction of facilities or vessels to be primarily for commercially harvesting, handling, or processing of fishery products.
(2) Funds obtained from other federal agencies shall not constitute any part of the state contribution to projects approved under this Act, unless specifically so provided by the Congress.
(3) Projects funded by this Act shall not be more than three years in duration. Extensions beyond three years may be considered after a comprehensive review and resubmission of project documents.

Projects must be substantial in character and design in order to be considered for financing under this Act. The major criteria to be used in establishing such substantiality are as follows:

(1) Responsiveness to basic economic problems of the commercial fishing industry segment involved.
(2) Condition and potential of the resource involved.
(3) Current and potential value of industry segment(s) involved.
(4) Competence of research organization, and availability of necessary facilities.
(5) Extent of similar state and federal research development previously conducted or in progress.

(6) Length of time and total cost to complete projects.
(7) Availability of financing from other sources.

If, on the basis of the above evaluation, a project appears to be substantial in character and design, it will be recommended for approval at either 50 or 75 percent federal funding. Such projects may be funded at the 75 percent level if they are regional, national or international in scope. If such projects are of limited local (intrastate) scope, they may not be funded at more than the 50 percent level.

The excellent response of the fishery administrators and biologists of the states to the PL 88-309 program has been most gratifying. This continued interest in the program will help insure sound, well planned projects that will lead to the development of the commercial fishery resources in the respective states and subsequently in the nation.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"WILDLIFE AND WATER IN SOUTH FLORIDA"

Arthur Marshall, Field Supervisor
Branch of River Basin Studies
Bureau of Sport Fisheries & Wildlife-Region 4
Vero Beach, Florida

Two years ago I described the Central and Southern Florida Flood Control Project and its effects on wildlife to a group of some fifteen Interior Department people. To do this, ~~I do this~~, I spoke for nearly two hours. Since then I have spent many days filling in the many points which I missed that day.

The matter is complex. Considering the few minutes I have to speak to you, I must hope that brevity breeds clarity. We both need it. Since your particular interests are the salt water resources, I will omit much material which I normally discuss and go directly as possible to the salt water aspects. I will touch on upland game and fresh water resources only as needed to make a point.

All forms of wildlife, everywhere, are dependent on water. This commonplace fact is of paramount importance in South Florida because virtually all of our surface water supplies, and some part of our ground water supplies, are being harnessed or managed by the Flood Control Project. The future of our fish and wildlife resources, including marine resources, will greatly depend on how we manage our waters.

I would like you to retain one over-riding concept. The great water surpluses of our recent past are rapidly being consumed. Very soon, perhaps within a decade, we shall have to husband that life-giving resource, and wring out of it every benefit which frugality, technical competence and imagination can produce. Waste of any part will be a luxury we cannot afford.

To get to the heart of the matter, my first slide shows the features of the Central and Southern Florida Flood Control Project.

This State-Federal project, authorized by Congress in 1948, is about one third complete. Completed elements are shown in red - uncompleted ones in green. Some features have been completed since this map was made, but this is essentially the present status. The project is an intricate and vast assemblage of newly dug canals, channelized streams, levees, water pumping stations, locks and spillways and water conservation pools.

The construction costs are shared by the Federal government-represented by the Corps of Engineers-and the State of Florida-represented by the Central and Southern Florida Flood Control District. The federal share is about 80%. Operation and maintenance of the project works, including cost of same, are a state responsibility, except that the federal government has retained control over Lake Okeechobee and the Caloosahatchee and St. Lucie Canals.

In a sense, this project is a "managed version" of the historic drainage system. In the past, rain falling on the Kissimmee valley flowed slowly southward to Lake Okeechobee, which was and is the heart of the basin. In those periods when the Lake became filled, excess waters poured over its southern rim into the Everglades. These waters, supplemented by local rainfall, slowly passed through the Glades and the present area of Everglades National Park into Florida Bay. In this passage, great quantities of the surface waters were lost to ground seepage and to the atmosphere.

This was never a system of rapid transit. Florida is too flat for that. My World War II friends liked to remind me that it is the only state with one contour line. The Kissimmee River was a braided meandering stream, often with two or more channels. In the 100 miles from Okeechobee to Florida Bay, the land falls about fourteen feet. This is less than two inches of fall per mile, which is probably flatter than the floor of this room. To think big in this situation, we have to think small.

The project is effecting major changes. Kissimmee flow is being confined to one large dug channel, with drainage to the Lake being much accelerated.

Okeechobee is almost encircled with dikes and it no longer overflows its southern rim. Much of the former overflow area south of the Lake is devoted to intensive agriculture. Surplus waters are now discharged to tidewater largely via the St. Lucie Canal and the Caloosahatchee River. A lesser amount goes to the Glades and to tidewater via the Palm Beach, Hillsborough, North New River and Miami Canals. That part of the Glades between the farming area and the Tamiami Trail is contained in three large conservation areas. Number one of these is the Loxahatchee National Wildlife Refuge. Numbers two and three are State wildlife management areas. Below the Trail, Everglades National Park contains most of the old Glades.

Not all of the man-made features for drainage or flood control were constructed by the present project. To better understand this, let us turn the clock back 100 years and examine a military map of 1856. This map, even with its early-day inaccuracies, is sufficiently correct to start us properly on the historical perspective.

Please note that the Caloosahatchee River arises in Lake Hicpochee. There was no stream connecting it with Okeechobee. A private land owner dug the three-mile canal linking the Lake and the River in the 1890's. This was the true start, I believe, of Everglades drainage.

On the south rim of the Lake a group of eight short streams carried water out of the Lake to the Glades. There the streams lost their identity and the water simply spread out over the sawgrass plain.

None of these streams remains. They were obliterated by canal and dike construction by the 1920's, or by agricultural development.

One hundred years ago, there was no St. Lucie Canal, no Palm Beach Canal, no Hillsborough, no North New River and no Miami Canal. These were all dug by the 1920's. Some of them have, of course, been enlarged under the present project.

One thing to be learned from this historic review is that a general lowering of water levels in the Okeechobee Basin had been brought about at least twenty years before the start of the present project. These early projects opened up much of the muckland south of the Lake for farming - the true beginnings of the present vast agriculture in that region.

The next slide gives us an ecological perspective of the Glades prior to the present project. This chart of vegetation was published in 1943 by Dr. John Davis of the University of Florida.

The chart readily shows us the course of the water which historically flowed south through the Glades. The central portion is the great sawgrass marsh, dotted by elongate tree islands, which curved south and southwest to Florida Bay. The basin is rimmed on the east by the coastal ridge on which this metropolitan area now stands. On the west, the land rose upward from the floor of the basin into the Big Cypress Swamp, and finally into the west coast ridge of sandy pinelands. These contours, of course, still prevail.

In the area of present Everglades Park, the Shark River basin received the flow from the north, and carried it south through the broadest mangrove belt in North America and thence to Florida Bay.

The next aspect to be considered is the source of our water- rainfall. The project area receives an average of 53 to 54 inches per year, a respectable quantity. The greater part of this- about two thirds - falls in the period June to October. This seasonality requires, of course, that water be stored in the wet months to meet the needs of the dry. Under historic conditions, this was accomplished by retention in the Kissimmee basin, Lake Okeechobee and the basin of the Everglades. The surface water moved south so slowly that for months after the rainy season, the Glades still held great quantities.

My next slide shows that averages mean little in South Florida. This is a graph of recorded flows through the Tamiami Trail into the Park area for the years 1940 to 64. Note the great variations. In 1947 and 48, for example, we see the evidence of the great flood which led to authorization of the present project. Earlier, however, in the years 1940 to 46, there was a series of water-lean years. This has again been the case in the last four years - 1961 to 1964.

In this entire project, the three areas of top concern to marine resources are the estuaries at Stuart, Ft. Myers and especially those of Everglades National Park. These have long supported healthy populations of fin and

shell fish. For example, we now know that a primary nursery ground for the commercial shrimp stocks of the Tortugas Grounds are the estuaries of the Park. We believe that estuarine conditions must continue in these areas if they are to continue to produce the kinds and quantities of sea life for which they are well known. This means that fresh water inflow into them must not be too great, nor too little.

I began by saying that to achieve all the benefits desired from the water, we must be frugal and competent managers. We must conserve and store all that we can and distribute it to all users by the most efficient means. The actual need of every user will have to be carefully defined.

In my Bureau, we believe that the concept of maximum storage should begin in the uppermost reaches of the project. We work with the construction agencies to develop regulation schedules which will attain maximum storage, provide for flood control, and meet the needs of fish and wildlife, in each of the many lakes and water conservation pools.

My next slide shows one example of this effort. This is the regulation schedule for Lake Tohopekaliga in the Kissimmee chain. The top level on this schedule is as high as flood prevention will allow. The lowest level is the minimum considering irrigation as well as the needs of fish and wildlife. The drawdown early in the year considers both fish spawning needs, and the need to provide storage space for the rains which will come in the late summer and early fall. The rise in the water to the annual maximum represents the storing of water while it is available and also meets certain needs of our wintering waterfowl. Concepts such as these are embodied in regulation schedules for all the lakes of the Kissimmee, Okeechobee, and the three conservation areas.

For Lake Okeechobee itself, the dikes are being raised so that about two extra feet of water can be safely stored there. In this Lake some 700 square miles, this is a lot of water.

One of our greatest problem areas - Everglades National Park - is of top importance to you. Everglades is a water park, and it must have ample supplies to maintain its variety and abundance of plants, fish, and wildlife. Rainfall on the Park is not enough to do the job. Additional amounts must come from the Glades north of the Park, just as they have in the natural scheme for thousands of years.

In the drought of the last few years, the Park has experienced severe drought - producing fires, reductions in birdlife, fresh water fishes and alligators, and undoubtedly, changes in its marine fin and shell fish populations.

In recognition of the problems of the Park, the Corps of Engineers has been directed by the Senate to make a three-year re-study of water management in the Project, with a particular view toward meeting the needs of the Park. The Corps report on this study is expected in December, 1967. All affected Interior agencies are participating. These are the National Park Service, the Bureau of Indian Affairs, the Bureau of Commercial Fisheries, the U. S. Geological Survey, and my own Bureau. Pending completion of this study and application of its results, the Director of the National Park Service has asked

the Corps to provide the Park with an interim supply of water. It should be understood that this schedule is based solely on hydrology - the average of past inflows to the Park - and is not at all a definition of needs as based on biological research.

By way of a brief introduction, this tells you where we are. There remain the questions of what we are doing, fish and wildlife wise, and what our problems area.

First - what we are doing.

We are continuing to work with the Corps on regulation schedules- trying to seek agreement between engineering requirements and our own. We continue making observations which might lead to further improvements in those schedules.

In the Park, large-scale research projects are underway to help define biologically the water needs. All of the Interior agencies I mentioned before are involved, as is the U.S. Public Health Service and the Marine Laboratory of the University of Miami. The next speakers are going to tell you about the marine research, and they are well qualified to do so. I would only like to say that, in addition to financing part of the studies, and some Geological Survey instrument works, my Bureau has for three years been studying salinity profiles across the broad mangrove belt of the Park.

The next slide shows you the areas covered in those studies.

(explain slide)

Thus far all of this work has been done in drought years. We plan to continue it through the first wet year. We need the data for a wet year, and we still hope we will get one.

Now, let me treat briefly some of our problems.

A matter of top concern to us is that the planned regulation schedules have, in general, been met only briefly and infrequently. This is due to many factors, including the four-year drought. But it's also due, to some extent, to higher water priority being given to other interests and to the fact that it costs the Flood Control District, the project operators, a lot of money to pump waters from Okeechobee south to the Conservation Areas or the Park. Earlier this year, large quantities of water were discharged via the St. Lucie and Caloosahatchee canals to tidewater, at a time when it was needed desperately to the south. This water was held in the Lake too late to discharge it southward before the advent of the hurricane and rainy season. The south-leading canals and pump stations are not nearly as efficient for lowering the Lake as are the Caloosahatchee and St. Lucie canals. This situation is one of those to which I refer when I say that more efficient means of delivering waters to areas which need them are necessary. It is to be hoped that such events will cease as one result of the Corps' three-year study.

(Marshall #6)

From time to time, the issue of what the Flood Control District has done, particularly to the Park, becomes immoderately heated. Both sides have cogent arguments to support their position and to assail that of their contender. Of late, I have come to believe that we might all prosper by devoting more thought to what has not been done, rather than to what has been. Rather than to concentrate on reputed sins of commission, I believe we should devote our greatest attention to the factual sins of omission.

Plans should be developed, wherever necessary, to stop wastages to tidewater. All surpluses should be directed to the Okeechobee and Glades basin, rather than to tidewater.

An efficient means of moving large quantities of water south from Okeechobee to the Glades and the Park is essential.

And certainly it is essential that the project operators, the Flood Control District, adopt the philosophy, if they do not have it, that the needs of fish and wildlife in the Conservation areas and those of Everglades National Park, are necessary project responsibilities. They do, in the final analysis, manage the waters most of the time. They run the pumps, open and shut the water control gates, including those along the Trail at the northern boundary of the Park.

These are not new concepts. House Document 643, a part of the legislative history of the project,states:

"The plan of improvement has also been developed in full recognition of the importance of Everglades National Park which has been established recently at the southwestern tip of the Florida peninsula. Release of water from conservation storage will assist in restoring and maintaining natural conditions within the national park area, by reducing damage from drought and fire which have threatened the preservation of lands, vegetation and wildlife."

and further

"The need for water will increase greatly with the expected continued development of the entire area. Therefore, both in the planning and operation of the works, provision for the storage of water should be made to the maximum practicable limit or to the extent that will meet all foreseeable demands. Until the need for fresh water has been satisfied, only the irreducible minimum that cannot be conserved should be discharged to coastal waters to be lost to the area for useful purposes."

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"TORTUGAS SHRIMP AND RAINFALL"

E. S. Iversen
Institute of Marine Science, University of Miami
Miami, Florida

As Mr. Tabb has pointed out in the preceding talk, the abundance of food in nursery areas is of great advantage to shrimp, and the rapid growth exhibited by them in these estuaries is evidence of this. He has also told you that the hydrographic conditions which occur in productive nursery areas may affect the numbers of shrimp subsequently available to fishermen.

We have evidence that a lack of freshwater reaching the Everglades nursery area may reduce the size of the Tortugas shrimp catches.

In our work on the Tortugas pink shrimp fishery we have found that the salinity of the water in the estuary and the production from the fishing grounds are related. Rainfall records provide a measure of salinity since there is a negative relationship between the amount of rain and the salinity of this estuary. During periods of low rainfall the sea water that comes into the estuary retains its high salinity because it is not diluted with freshwater, and it may even get saltier by evaporation caused by high temperatures and the effect of wind in these shallow bays. On the other hand, high rainfall dilutes the saline ocean water, making it fresher. The rainfall records we used were obtained from the United States Weather Bureau for 12 separate stations over a wide area in the Everglades.

By totaling the rainfall for these stations for each year, we obtained annual readings of between 39 and 69 inches for 8 recent years for which we have records. If we compare these annual rainfall figures with the total shrimp catches from the Tortugas fishing grounds wefind that the heavier the rainfall for any year, the larger the total catch of Tortugas shrimp one year later. This relationship holds true for all years except one. The point representing rainfall for 1958 and the catches made during 1959 departs from the general trend. For those who are interested in the statistical significance, the correlation coefficient is 0.715, which is significant at the 5 per cent level.

Gunter (1959) and Gunter and Hildebrand (1953) report similar results from their examination of the Texas white shrimp commercial catches and the total annual rainfall for the same year and two years previous. Catches of white shrimp increased when the rainfall of the same year and two previous years increased. Those authors speculated that the reason for the relationship was not due to the added enrichment of bays by the rainfall, (at least this was not the sole reason for these changes,) but rather that it was the reduction in salinity caused by the rain. We agree that this is likely and

would like to speculate further on a possible explanation of how salinity in the estuaries may affect the subsequent catches of shrimp on the fishing grounds.

For the past three years we have been taking estimates of relative abundance and sizes of pink shrimp moving out of Whitewater-Coot Bay estuary. In this Bureau of Commercial Fisheries-sponsored-research, we fished a large channel net in Buttonwood Canal, a tidal canal which serves as an exit to the Everglades nursery area. Regular monthly samples of shrimp and measurements of environmental factors, including salinity, were taken since January, 1963 on ebb tides when the juvenile shrimp move through this canal to the more saline waters of Florida Bay and thence on to the fishing grounds at Dry Tortugas.

Taking data for the two years, 1964 and 1965, during which there were high salinities at our sampling station in the canal in the Everglades nursery area, we examined the monthly relationship between salinity (as measured by hydrometers) and the size of migrating shrimp. We saw that during months of low salinity the average size of shrimp is larger than during those months when the salinity is high. The correlation coefficient for this relationship is 0.671, which is significant at the 1 per cent level. Why pink shrimp move out of the nursery area at a smaller size on high salinities is not known, but we can speculate on what effect this might have on the total Tortugas catches.

If high salinities force these migrating shrimp to leave the abundant food and the protection they find in the nursery area at a smaller size than usual, it is possible that their growth could be reduced, and that their mortality may be increased on the way to and on the fishing grounds. This, then, could reduce the catches of Tortugas shrimp.

In the future we will examine the relationship between shrimp catches and rainfall using more data and in greater detail to see if it continues. The second part of the problem, that of determining the cause of this relationship, will be many times more difficult. However, even if we are unable to solve the problem, it will not change the important conclusion that high shrimp catches apparently follow years with abundance of fresh water in the nursery area.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"ESTUARIES AND FISHERIES"

Durbin C. Tabb
Institute of Marine Science- University of Miami
Miami, Florida

In recent months there has been almost continuous debate, heated argument, and nation-wide expressions of concern over the drying up of the Everglades, and especially Everglades Park. During this time the voice of the commercial fishing industry has been strangely silent. We have wondered whether this was due to a general lack of interest in the problem or understanding of the importance of the problem to fisheries.

Whatever the reason, you should become concerned, and at once! The problem typified by Everglades National Park is affecting or about to affect your fishing throughout the coastal Gulf and south Atlantic states. This problem is principally one of alterations of water-sheds and drainage basins. It is complicated by changing of shore lines by filling, by dredging of causeways which change current patterns or close off entire bay systems, and in south Florida at least, by increasing salinity. All these things are altering the estuarine habitat.

You should ponder the fate of coastal estuaries of Texas if they should be robbed of their fresh-water by river diversion. Think of the possible effect upon the menhaden catch if the St. Johns River and others like it were put within levees and all their fertile marshes ditched and drained. Consider what might happen to the Tortugas shrimp catches if the entire south Florida coastal area from the Florida Keys northward to the Shark River and beyond became too salty for the survival and growth of pink shrimp. This will give you an idea of why scientists at the Institute of Marine Science are concerned about estuaries. We are not alone in this concern; the U. S. Fish and Wildlife Service through its Bureau of Commercial Fisheries and Bureau of Sport Fisheries and Wildlife is engaged in estuarine studies either directly, or through contract with various other agencies.

The problems are so grave that governmental agencies like the U. S. Geological Survey have hired biologists to assist them in making judgments on biological as well as purely physical grounds. The U. S. Public Health Service is concerned over water supply and pollution control in estuaries. Finally, the U. S. Army Corps of Engineers is concerned about estuaries. Their programs are so vast in conception that they literally can and do move mountains as an every-day occurrence. The scope of their programs can have a vast effect on conditions completely outside the project area (e.g. by providing drainage and other flood control devices they have precipitated the present problem in the Everglades).

(Tabb #2)

For years biologists have tried to point out the dangers to fishing inherent in destruction of the estuaries. We have shown that the estuaries are among the most fertile areas in the sea and that the mixing of fresh with sea water creates conditions conducive to the well being of the great majority of our coastal fisheries. The Institute of Marine Science showed conclusively in 1960 that spotted seatrout are dependent on the estuarine environment, and even more important, each large estuary has its own resident population which seldom moves to adjacent estuaries. This should have suggested that changes in any area causing significant damage to the stocks of spotted seatrout would have long-term effects, since we cannot depend on migration from other areas to restore the fishery.

This is only one of many examples which could be cited to show that the estuaries are more important than any of us can clearly see at this time. Our studies at Miami, and those being conducted elsewhere, indicate many different ways in which the estuaries are vital. The fact that larval shrimp move as much as 70 to a hundred miles to get to the estuaries of Everglades Park is not accidental. There has to be an advantage to the species in such behavior and whatever favors the species you are catching favors your business. There has to be an advantage to baby mullet, menhaden, anchovies, snapper, red drum, spot, croaker, and hundreds of other species by moving into the estuarine areas of our coast, or they wouldn't come in from the open sea where they are spawned. They might as well stay out at sea.

The advantages are food and some measure of security from predation while they are in a vulnerable part of their life cycle. These young animals have an advantage over the adults of the same species in respect to their ability to live in estuary, since the young seem to be able to stand the changing salinity and temperature better. Many of them can safely move into the non-tidal parts of lagoons where the water often becomes nearly fresh, and find a rich supply of food on which to grow rapidly. Then, as they reach near-adult size they move off-shore to complete the cycle of reproduction. In this offshore movement they feed a host of mackerel, bluefish, snappers, groupers and other valuable species.

We are far from being sure of all the important facts about estuaries, but we are sure enough about their importance to fisheries to get up on platforms and shout about it. We will continue to do so; each time, hopefully, we will have more confirming evidence to give you.

We are busy on several studies which will provide some of the most critically-needed answers to the emergency water problem in Everglades National Park and other estuaries. The U.S. Public Health Service, through its Division of Water Supply and Pollution Control, is supporting a large-scale study of animal kinds and numbers in relation to salinity, temperature, water depth, kinds of bottom muds and sands, and seasons of year. This study, now in its third year, is being conducted in the area between the Uppper Florida Keys and the city of Everglades just east of Cape Romano. Our stations cover the major estuaries of this entire coastal strip and are designed to give accurate indications of the seasonal changes in numbers of some 300 species of animals and plants, as well as to indicate how these numbers are regulated by salinity. Contrary to

popular opinion, there is not just one watershed involved in the Everglades system, but three. The Shark River System is largest; the Fackahatchee-Corkscrew Swamp system is second in size; the coastal plain drainage adjacent to Florida Bay is smallest.

The problems of drainage and increasing salinity is greatest in Florida Bay. The potential for large-scale alteration to the major fish habitat of the region is in the Shark River and adjacent marsh areas which depend on water from the vastly altered Everglades drainage.

We have just started a new project for the Bureau of Sport Fish and Wildlife Service that should be of interest to commercial fisheries interests as well as sport fishermen. We are studying the mangrove swamps to see how important these are in the production of fishes and other animals. Our stations cover the width of the swamp from sawgrass to tide water and we are conducting representative sampling in all water depths systematically. In the very early stages of this work, we have been surprised to find large numbers of pink shrimp of sizes up to 150 count in the fresh-water parts of this marsh. Often they are in water 2 to 4 inches deep. If they are wide-spread in this sort of habitat, it suggests more than ever that the estuary is vital to this fishery. Before I turn the podium over to Dr. Iversen to give you more details let me urge you to think about these problems. You should be concerned over losses of estuaries and the fresh-water that makes them what they are, since this will affect your pocket book.

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GULF STATES MARINE FISHERIES COMMISSION
Miami, Florida
Dupont Plaza Hotel
October 6-8, 1965

"DESIGN ASPECTS OF THE FISHERIES RESEARCH VESSEL OREGON II"

Francis J. Captiva, Base Fleet Supervisor
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In July 1963, the Congress of the United States appropriated funds for the design of a modern exploratory fishing research vessel for use in the Gulf of Mexico and adjoining seas. In August 1963, following evaluation of the relative capabilities and experience of approximately 20 naval architectural firms, a contract for design services was awarded to the firm of Robert H. Macy and Associates of Pascagoula, Mississippi.

Invitations to bid were issued in May 1965. The Ingalls Shipbuilding Corporation, Pascagoula, Mississippi was low bidder at $1,990,000.00. Award of contract for construction was issued in July 1965. Delivery is scheduled for May 1967.

This vessel, which is to be named Oregon II, is the seventh research vessel contracted for by the Bureau of Commercial Fisheries in the past three years. It replaces the aging fisheries research vessel Oregon, a converted 100-foot tuna clipper type fishing vessel which has carried out the bulk of fisheries research work in the Gulf for the past fifteen years. Oregon II will have capabilities considerably beyond that of her predecessor having been designed expressly to meet: (1) the needs that have become apparent during these fifteen years, and (2) the most desirable features expressed in the literature by many of the leading exponents of research vessel design.

The primary objective of this vessel is to increase fishery production of U.S. fishermen by conducting: (1) exploratory fishing surveys to determine the presence of commercially exploitable fishery stocks in unexplored areas; (2) fishing trials with conventional and new types of fishing gear to effect improved fishing methods and techniques; (3) surveys of the Gulf, Caribbean, and middle and south Atlantic regions to determine the identity and distributional patterns of the faunal components.

Owing to budgetary limitations, the contract plans and specifications, as issued to prospective bidders, did not reflect many of the special and unique features incorporated in the original design. However, since it is the intent eventually to equip the vessel as originally designed, many of these features are included in this paper.

That the principal requirements for a vessel for fisheries investigations are, to some extent, similar to those of ships for general oceanographic research was recognized in the early planning stages and was helpful in developing

our design concept, since a number of these vessels had been recently constructed. The requirements common to both vessels types are: seakeeping ability, seaworthiness, safety, reliability, maneuverability, speed, considerable cruising range, appropriate facilities for scientific work, habitability, and versatility. The main difference between these two vessel types was determined to be one of degree rather than one of kind. For example, there is less scientific work and more commercial-type work aboard a fisheries research vessel.

Oregon II will be an all-welded steel vessel of the North Atlantic trawler type, designed for fisheries and oceanographic research with a capability of range of operation covering all areas from cold climates to the tropics. Overall length will be 170 feet, beam 34 feet, and draft 14 feet. It will be powered by two 800 hp diesel engines driving one controllable pitch propeller through a compound reduction gear. Maximum speed will be nearly 15 knots, with an economical service speed in excess of 13 knots. Endurance will be approximately 60 days, with an operating range of approximately 11,000 miles.

There will be a partial check below the main deck, 2 superstructure decks, and a forecastle. The ship will be equipped with accommodations for a complement of twenty-five, berthed in 3 single cabins and 11 double cabins. Adequate facilities are provided for messing, off-duty relaxation, and study. All living and working spaces except for the wet and specimen laboratories will be heated and air conditioned. There will be a total of 6 laboratories, each fully equipped for the purpose intended.

The vessel's design will permit it to function as a side trawler, stern trawler, double rig shrimp trawler, gillnetter,purse seiner, or dredger, without modification to structure, machinery, or existing arrangements. Many special and unique features are incorporated in the vessel's design such as integrated control of propulsion and gear handling machinery and equipment, automation of the catch analysis complex, duplication of vital equipment, adherence to rigid stability and flooding criteria, interchangeability of parts between main and auxiliary machinery, absence of gypsy heads and overhead running rigging, modern fish detecting and communications equipment, laboratories located at the point of minimum pitching and readily accessible from the working deck, spacious protected working deck areas both fore and aft, and an all hydraulic gear handling complex designed to provide the ultimate in versatility and dependability.

The main trawl winch is main engine powered and consists of two heavy-duty single drum reversible winches, which can be mechanically inter-connected. Controls are provided at the winch and in the pilot house console. Each drum is equipped with automatic level wind, cable counter, brush and slip ring device, and a trawl warp tension indicator. Its use is primarily for heavy duty and deep water trawling operations.

Each drum has the following capabilities:

(1) Capacity for 6,000 feet of 1-inch diameter cable with flange margin to accommodate 50 fathoms of 3/4 inch diameter steel cable bridles.

(2) Line pull of 14,000 pounds at approximately 300 f.p.m. on the mean drum layer in series connection.
(3) Line pull of 28,000 pounds at approximately 150 f.p.m. on the mean drum layer in parallel connection.

An auxiliary winch also main engine powered, is located on the upper deck aft and consists of one reversible, parallel shaft, combination purse seine-trawl winch. The parallel shaft (opposed drums) arrangement provides for fishing two trawls simultaneously with a minimum of fairleads and handles the towline and purse line during seining operations. It is also used to hook up the towing warps when side trawling. It has automatic level wind, cable counters, and brush and slip rings. Control is from a central station overlooking the working deck.

The winch has the following capabilities:

(1) Line pull of 7,000 pounds at 300 f.p.m. on the mean drum layer in series connection (both drums simultaneously).
(2) Line pull of 14,000 pounds at 150 f.p.m. on the mean drum layer in parallel connection (both drums simultaneously).
(3) Line pulls are doubled for single drum operation.
(4) Drum capacity of 9,000 feet of 1/2-inch diameter cable with flange margin for bridles.

Retrieving lines to the nets (quarter ropes, lazylines, etc.) are handled by five hydraulically powered sacking winches. These winches, which take the place of the conventional winch heads, are recessed into the deck house, are remotely controlled, and have the following capabilities:

(1) Drum capacity - 250 feet of 3/4 inch diameter rope.
(2) Line pull - 4,000 pounds at mean drum layer.
(3) Line speed - 75 f.p.m. at mean drum layer.

One single drum electric-hydraulic hydro-winch with extensible A frame is installed directly over the hydro-laboratory. Operation is from the hydro-platform which is located in close proximity to the hydro-lab entrance. This winch is reversible and capable of controlled power hoisting, power lowering, and gravity lowering. It is equipped with level wind mechanism, cable counter and slip rings.

Capabilities include:

(1) Drum capacity of 12,000 feet of 3/16 inch diameter cable.
(2) Line pull of 1,500 pounds at 400 f.p.m. at the mean drum layer.

The bathythermograph winch installation is similar to that of the hydro-winch except that line pull is reduced to 500 pounds at 400 f.p.m. and capacity to 3,000 feet of 1/8 inch cable.

(Captiva #4)

Fishing and oceanographic gear is handled by two deck-mounted cranes which have the following features and capabilities:

(1) 360 degree continuous rotation.
(2) Two-stage hydraulically activated extensible boom which retracts to a minimum of 16 feet-6 inches and extends to a maximum of 30 feet.
(3) Sixty-degree boom topping which permits a minimum working radius of 7 feet.
(4) Dual cable hoist providing one single part hoist and one double part hoist capable of independent or simultaneous operation.
(5) Line speed of 117 f.p.m. and single line pull of 6,700 pounds.
(6) Safe load operating range of:
    a. 12,000 pounds at 7-foot radius.
    b. 5,000 pounds at 18-foot radius
    c. 3,000 pounds at 30-foot radius

The wet laboratory is located in the starboard side of the deck house aft and comprises an area of 275 square feet. It is designed to permit rapid and continuous flow of the catch from the deck through the laboratory for processing, identification, preservation,and/or ultimate disposal overboard. The system incorporates a deck-mounted hopper into which the catch is deposited, a 23-foot-long conveyor belt, a heading and filleting bench, an automated specimen sorter and tabulator, and water chutes to carry edible products to the weighing and packaging station and fish offal to the overboard discharge chute.

Other facilities include a wet gear locker, scientific stores locker, dumb waiter to freezer compartment, reference and identification room with microfilm reader and image control board, and necessary sinks and cabinets.

Services include 120 v.a.c. current, hot and cold fresh water, and sea water.

The hydrographic and chemical laboratory is located in the port side of the deckhouse aft and comprises an area of 210 square feet. It is designed for processing water samples and for technological studies of fishery products. Equipment includes Nansen bottle and bathythermograph racks, work benches, sinks, refrigerator-freezer, and storage cabinets. Equipment includes instrumentation for determination of surface water temperature, air temperature, relative humidity, barometric pressure, water depth, and vessel position. Services include 120 and 240 v.a.c., hot and cold fresh water, sea water, compressed air and gas.

The specimen lab is designed primarily for the preservation and storage of selected specimens and comprises an area of 100 square feet. It is equipped with large chemically resistant tanks and storage racks for specimen jars. Built-in pressurized tanks are provided for the preservation solutions. All sinks, work tables, etc., are of chemically resistant material. The inboard longitudinal bulkhead is removable to facilitate removal of the large specimen tanks. This laboratory has an independent air supply and exhaust system so as not to contaminate other living or working areas with toxic fumes. Services include 120 v.a.c., hot and cold fresh water, sea water, and compressed air.

(Captiva #5)

The live specimen laboratory is located forward of the specimen laboratory and comprises 75 square feet. It contains a sink, work counter, storage cabinets, four aquaria, and a sea water storage tank.

Aquaria piping and pumps are of non-toxic material.

Services include 120 v.a.c., hot and cold fresh water, compressed air, and non-toxic sea water.

The dry laboratory and the darkroom are located in the deckhouse structure forward on the starboard side. Combined area is 130 square feet. The dry laboratory is equipped with a drafting table, two desks, storage cabinets, and a cushioned laboratory counter for microscope mounting. The darkroom contains work counters, storage, cabinets, and sinks with hot and cold fresh water.

Instrumentation in the dry laboratory is generally similar to that specified for the hydro-laboratory.

Since the vessel will have considerably more than the normal amount of electronic equipment on board, it was necessary to provide a laboratory specifically for the development, testing, maintenance, and repair of electronic equipment.

Test equipment includes oscilloscopes, frequency indicators, tube checkers, and various types of built-in monitors. Services include 120 v.a.c. and variable voltage d.c. current.

Electronic aids include:

(1) Two radar transceivers. One for general navigation and one for scientific purposes.
(2) Radiocommunication equipment. Double side band transceivers (AM) for short range and single side band transceivers for long range voice communication.
(3) Loran A and C for accurate position determination.
(4) Automatic radio direction finder for position determination in areas lacking Loran coverage.
(5) Four depth sounders with range capabilities to 6,000 fathoms including a precision depth recorder.
(6) High resolution, horizontal and vertical scanning fish finders including a Humber Fish Detection System, which utilized a sea-bed lock mechanism which permits stabilized magnification of fish echoes at selected depths without the normally encountered interferences.
(7) An automatic, impressed current, cathodic protection system for corrosion control of the underwater hull.
(8) A speed-distance log which records speed and miles traveled through the water.
(9) Closed circuit television chain with monitor in the pilot house and cameras mounted in areas not directly visible from this station.

Although the technical literature provides extensive data on the distant water trawler hull form, it was considered that operational criteria for this vessel differed from the conventional trawler to such an extent that tank testing of the design was mandatory.

(Captiva #6)

Consequently the hull design was subjected to comprehensive tank tests at the Netherlands Ship Model Basin. The results indicate that Oregon II will be a highly satisfactory vessel in all respects.

The main propulsion machinery consists of two identical diesel engines directly connected to a compound reduction gear equipped with two air-actuated disconnect clutches and one controllable pitch propeller. Drive from each engine is through a torsionally resilient torque shaft to the disconnect clutch mounted on the aft end of each high speed quill pinion. Propeller speed is 240 RPM.

The main propulsion diesels and the main generator diesels are of the same manufacture, type bore and stroke to facilitate maximum interchangeability of parts and operating and maintenance familiarity.

Multiple engine propulsion was chosen because of the requirement for (1) high speed in making passage to distant areas and for towing heavy gear, and (2) low power and low speed necessary for hydrographic and experimental work. Also, this system results in a shorter engine room and provides an added measure of security.

Twin crew propulsion was not considered because of the increased risk of fouling the propellers by the fishing gear.

A controllable pitch propeller was specified to permit creeping speeds and/or hovering and because of the high power demand for the winches which necessitated main engine drive. The controllable pitch propeller also provides an almost ideal solution for maintaining constant engine power, regardless of vessel speed through the water, since it provides for optimal setting of propeller pitch under the various power demands for trawling, steaming, and creeping or hovering.

The vessel is equipped with two salt-water evaporator plants utilizing heat from the generator engine cooling water. Capacity of each plant is approximately 750 gallons per day.

Refrigeration and air conditioning machinery consists of three identical 10 hp and one each 7-1/2 and 15 hp direct expansion Freon 12 compressors. The 10 hp compressors serve the five -20 deg. F. freezer compartments. The 7 1/2 and 15 hp compressors serve the +38 deg. F. cooler and the air conditioning system respectively. Heat is furnished by an oil-fired marine-type hot water boiler.

Electrical service is furnished by two identical diesel generator sets rated 220 kw, 275 kva continuous duty, 3 phase, 60 cycle, 450 volts with automatic and manual voltage regulation to plus or minus 2% as required. AC equipment inoperable on the ship service primary voltage are supplied by transformer banks.

The most outstanding features of the vessel are probably the built-in versatility, that is the ability to function with a variety of fishing gears and methods without modification to existing structure, machinery, or arrangements,

and in the centralized orientation of the laboratories and working and living spaces.

Others include:

1. Rotating extensible cranes for handling overboard gear which eliminates booms, tackle, and hoisting machinery.

2. A system of fairleads and connectors which enables the four trawling winch drums to perform as one winch. This system offers capabilities equal to that of the oceanographic deep sea winch without the attendant problems of weight, space, and cost. With standard towing warps it is possible to make a 5-mile-deep cast or to fish trawls to 2,500 fathoms. This capability can be extended by utilizing smaller diameter cables.

3. Five refrigerated holds with a capacity to store 60 tons of fish. System design permits the catch to be brine frozen, dry frozen, iced, or kept in chilled sea water. The freezer compartments are designed for a temperature of -20 deg.F., however, back pressure regulators permit control and maintenance of temperature from -20 deg. F. to +38 deg. F. to facilitate technological studies.

4. Extended operating range. Many of the surveys to be conducted will be off the coasts of foreign countries. This requires independence at sea, since many of these countries are, as yet, relatively underdeveloped, thus making it difficult or impossible to obtain uncontaminated water, suitable fuel and lube oil, and stores. An operating range of 9,000 sea miles and 60 days endurance before return to port for bunkering and supplies was therefore considered as minimal.

5. High cruising speed. Oregon II will have a cruising speed 50% greater than the Oregon. That this feature will greatly improve the running time/working time ratio between the two vessels is clearly shown in the following comparison of the two vessels as based on records of three Oregon cruises to the northeast coast of South America.

	Oregon	Oregon II
Cruising speed	8.5 knots	13 knots
Cruise duration	53 days	53 days
Bunkers (port)	9 days (17%)	3 days (5.6%)
Steaming	29 days (55%)	19 days (35%)
Working	15 days (28%)	31 days (58%)

6. Research facilities. Adequate laboratory space and facilities for specialists (and their equipment) in the different fields of exploratory fishing, gear research, biology, technology and oceanography.

7. Simplicity and dependability of machinery components and arrangements and adherence to modern concepts of corrosion control practices to keep operational and maintenance costs to a minimum.

8. Roll stabilization- the nature of the work requires high roll stabilization. The tank tests show that the roll damping of the hull increased about twice with the application of bilge keels but provision is made for the future installation of a Flume Stabilization system should the bilge keels prove inadequate.

9. Habitability. Attractive and spacious living quarters for crew and scientists to enable effective recruiting and to insure the well-being and high productive effect of personnel during long cruises.

10. Seaworthiness. The assigned operating area lies largely within the region of occurrence of tropical cyclones, thereby requiring adequate stability under all conditions of displacement.

11. Seakindliness. This quality, which consists of the sum total of many characteristics, is not always easy to define. Our requirement was for a vessel that could conduct fishing and oceanographic operations in the open sea in sea states resulting from winds up to Beaufort 8. The ability to heave-to safely and comfortably was a special design requirement.

12. Safety. Safety standards are in accordance or in excess of applicable laws and regulations.

13. The method to "hold station" and maintain vertical wire angle will be a departure from the standard approach used by most research vessels, i.e., heading into the sea and controlling bow motion by means of a bow thruster. That this method has proved far from satisfactory due to the considerable transverse thrust demand is recognized. With Oregon II the stern will be placed into the sea and the propeller reversed to hold position. A modified cruiser stern was adopted to suit this maneuver. The bow thruster will be used to hold the bow down wind rather than into the wind and sea. This concept for holding station is, as yet, untried; however, success is expected since the vessel has a natural tendency to quarter, thus considerably less transverse thrust will be required to hold directional position.

Historically, the major problem encountered by a vessel designer is combining into a workable whole the many characteristics desired by the intended owner or operator. Since many of the desireable characteristics are in direct conflict with each other, compromises are forced upon the designer and the owner in order to obtain a ship satisfying both the needs of the owner and the expected service conditions. In this respect Oregon II has proved no exception.

We feel, however, that we have successfully resolved these imcompatibilities and that Oregon II will meet her design commitments. Stated simply these commitments are to take the fishery scientist to sea; place modern well-equipped laboratories, electronic aids, and a wide array of fishing and oceanographic gear at his disposal; permit him to fish and make observations at depths and in sea conditions once considered impractical, if not impossible; and accomplish this with a degree of security, efficiency, and comfort unknown to its predecessors.

PROGRAM

(Commission Chairman Ted Millette, Presiding)

Thursday (March 18)

9:00 AM

REGISTRATION

9:30 AM

GENERAL SESSION—CALL TO ORDER

INVOCATION
Reverend Ben A. Meginniss, Rector
Trinity Episcopal Church

ROLL CALL

WELCOME ADDRESS
James McPhillips, Vice-President
Southern Industries, Inc.

GULF COMMERCIAL FISHERIES
Seton H. Thompson, Director
Bureau of Commercial Fisheries, Region 2

GULF SPORT FISHERIES
Walter A. Gresh, Director
Bureau of Sport Fisheries & Wildlife, Region 4

EFFECTS OF DOMESTIC POLICY MAKING—
NATIONAL AND INTERNATIONAL
William R. Neblett, Executive Director
National Shrimp Congress

11:00 AM

RECESS *Fifteen Minutes*

11:15 AM

FISHERIES ACTIVITIES OF NATIONAL CANNERS ASSOCIATION
Ronald W. De Lucien, Director
Fishery Products Program
National Canners Association

BETTER FISHERY PRODUCTS THROUGH CHEMISTRY
Mary H. Thompson, Asst. Director
Gulf Technological Laboratory
Bureau of Commercial Fisheries

ADJOURNMENT *Luncheon*

1:45 - 2:45 PM

ALABAMA SALT WATER COMMERCIAL FISHERIES
John Ray Nelson
Alabama Fisheries Association

REPORT: ADVISORY PANEL TO COMMANDER 8TH COAST GUARD DISTRICT
Harry I. McGinnis, Chairman
Coast Guard Advisory Panel

LEGAL AND OTHER ASPECTS OF ESTABLISHING FISH HAVENS
George W. Allen, Chief
Division of Seafoods
Alabama Department of Conservation

RECESS *Fifteen Minutes*

3:00 PM

COMMERCIAL & SPORT FISHERMEN CAN AND MUST LIVE TOGETHER
Paul R. Kalman, Jr., President
Kalman, Rogers & Smith, Inc.
Public Relations Counselors

REVIEW AND DISCUSSION: INFORMATIONAL SERIES NO. 3—GULF SHRIMP FISHERY
Lyle S. St. Amant, Chief (Presiding)
Division of Oysters, Water Bottoms and Seafood
Louisiana Wild Life and Fisheries Commission

Panelists to be announced

4:00 PM

ADJOURNMENT

4:30 PM

MEETING OF RESOLUTIONS COMMITTEE

Friday (March 19)

7:30 - 9:15 AM

COMMISSION EXECUTIVE SESSION BREAKFAST

9:30 - 12:00 Noon

GENERAL SESSION—CALL TO ORDER

ANNOUNCEMENTS

GULF FISHERIES STATISTICAL NEEDS
George W. Snow, Supervisor, Region 2
Statistics & Market News
Bureau of Commercial Fisheries

INTERSTATE ROUTE PLANNING, MOBILE BAY AREA
Jack C. Mallory, Chief Marine Biologist
Alabama Marine Resources Laboratory

FEDERAL FINANCING AVAILABLE TO FISHING INDUSTRY
Billy F. Greer
Regional Fishery Loan Examiner
Bureau of Commercial Fisheries

RECESS *Fifteen Minutes*

RESULTS OF OCTOBER 1964 RED TIDE SYMPOSIUM
James E. Sykes, Chief
East Gulf Estuarine Investigations
Bureau of Commercial Fisheries

NEW DEVELOPMENTS IN ELECTRIC SHRIMP TRAWL STUDIES (FILM)
Norman L. Pease, Chief
Gulf Gear Research Station
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.
(Open)

Florida
W. Randolph Hodges
(Open)
Walter O. Sheppard (Vice-Chairman)

Louisiana
Joe D. Hair, Jr.
Spencer G. Todd
James H. Summersgill

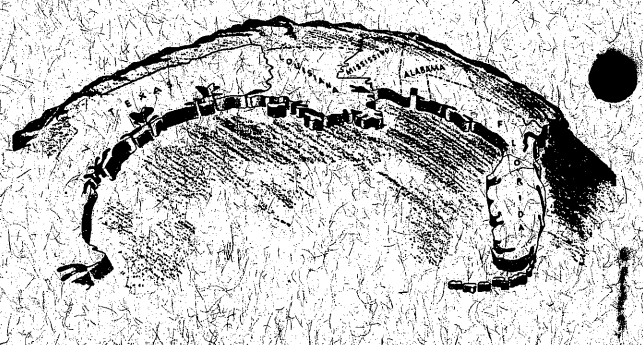
Mississippi
Charles Weems
Ted Millette (Chairman)
Joseph V. Colson

Texas
J. Weldon Watson
Richard H. Cory
Virgil Versaggi

★

W. Dudley Gunn
Director

GULF STATES MARINE FISHERIES COMMISSION



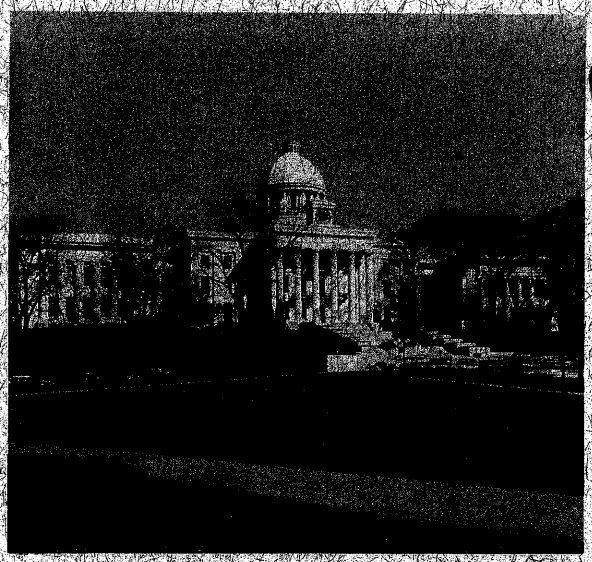
ANNUAL SPRING MEETING

Mobile, Alabama

Admiral Semmes Hotel

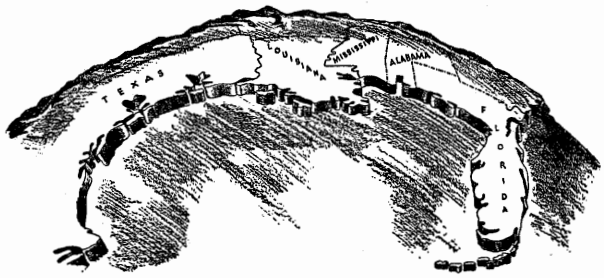
March 18 (Thursday) - 19 (Friday), 1965

General Sessions — Ballroom A
Executive Session — Wallace Pitts Room



THE CAPITOL
STATE OF ALABAMA
MONTGOMERY

Gulf States Marine Fisheries Commission



M I N U T E S

REGULAR MEETING

ADMIRAL SEMMES HOTEL

MOBILE, ALABAMA

MARCH 18-19, 1965

#42

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

M I N U T E S

REGULAR MEETING, MARCH 18-19, 1965
ADMIRAL SEMMES HOTEL
MOBILE, ALABAMA

OFFICIAL ATTENDANCE OF COMMISSIONERS

	PRESENT	ABSENT
ALABAMA		Claude D. Kelley John M. Tyson L. W. Brannan, Jr.
FLORIDA	Walter O. Sheppard	W. Randolph Hodges
LOUISIANA	Spencer G. Todd James H. Summersgill	Joe D. Hair, Jr.
MISSISSIPPI	Charles Weems (3/19/65) Joseph V. Colson Ted Millette	
TEXAS	Virgil Versaggi	J. Weldon Watson Richard H. Cory
PROXIES	George W. Allen Lyle S. St. Amant Virgil Versaggi	(For Claude D. Kelley) (For Joe D. Hair, Jr.) (For J. Weldon Watson)
STAFF	W. Dudley Gunn	

FORMER COMMISSIONERS PRESENT: Ernest S. Mitts

OTHER STATE GOVERNMENT REPRESENTATIVES PRESENT: Gerald Adkins (Louisiana) Barney Barrett (Louisiana), John D. Bonham (Alabama), I.B. Byrd (Alabama), William J. Demoran (Mississippi), T. B. Ford (Louisiana), E. A. Joyce, Jr., (Florida),Terrance R. Leary (Texas), Jim Rice (Alabama), George Williams (Mississippi).

FEDERAL GOVERNMENT REPRESENTATIVES PRESENT

BUREAU OF COMMERCIAL FISHERIES: Richard Berry, Philip A. Butler, Billy F. Greer, Milton J. Lindner, Travis Love, Russell T. Norris, Norman L. Pease, George W. Snow, James E. Sykes, Mrs. Mary H. Thompson, Seton H. Thompson.

BUREAU OF SPORT FISHERIES & WILDLIFE: James R. Fielding, Albert H. Swartz.

CORPS OF ENGINEERS: Edward Sylvest

COAST GUARD: O. H. Abney, William R. Riedel

PUBLIC HEALTH SERVICE: R. J. Hammerstrom

UNIVERSITY REPRESENTATIVES PRESENT: Charles Caillouet, J. Y. Christmas, Bennie J. Fontenot, Jr., Eugene S. Grimes,Jr., Lewis T. Graham, Gordon Gunter, Jim Higman, Conrad L. Juneau,Jr., Ronald H. Kilgen, Jack C.Mallory, Hugh McClellan, Walter R. Nelson, William S. Perret, George A. Rounsefell.

REPRESENTATIVES OF INDUSTRY PRESENT: William A. Atkins, George A. Brumfield, A.J. Buquet, Lawrence Callaway, Tyson Greaves, Adam Haab, Paul Kalman, Jr., Albert King, Harry I. McGinnis, Kenneth R. McLain, Mrs. J.R. Nelson, John Ray Nelson, Mrs. Herman Plott, Herman Plott, J. S. Ramos, Ralph A. Richards, Ted Shepard, Miss Evelyn Shriner, Vernon K. Shriner.

EXECUTIVE OFFICERS OF COMMERCIAL AND SPORT FISHERY PRESENT: Ronald De Lucien, Bob Jones, Mrs. Johnnie D. Harbin, O.M. Longnecker,Jr., William R. Neblett, John Spaulding.

CLERGY.....NEWSMEN PRESENT:

Ben A. Meginniss

Bill Corbino, Winston W. Leonard, Russell Minshew, Buddy Smith.

GENERAL SESSION, MARCH 18, 1965

Commission Chairman Millette called the meeting to order at 9:45 a.m. in Ballroom A of the Admiral Semmes Hotel. The invocation was rendered by Reverend Ben A. Meginniss, Rector, Trinity Episcopal Church of Mobile. The roll of Commissioners was called and proxies recognized.

The Chairman expressed the deep regret and sympathy of the group upon hearing of the passing of Mrs. James McPhillips as did George Allen who was asked to substitute for Mr. McPhillips in welcoming the Commission and guests to the State of Alabama for its 42nd regular meeting.

Following the extending of a cordial welcome on behalf of the Governor, the Director of the Department of Conservation, and the City of Mobile, Mr. Allen spoke briefly on the value of the estuarine areas and of the problem of maintaining those areas as the demand for water on the interior continues to mount.

Mr. Seton H. Thompson, Director, Bureau of Commercial Fisheries, Region 2, was next introduced. Copy of his presentation, "Gulf Commercial Fisheries 1965", is first attached to these Minutes.

Continuing with the morning session, the Chairman called upon James R. Fielding, Chief, Division of Sport Fisheries, Bureau of Sport Fisheries and Wildlife, Region 4. Copy of Mr. Fielding's paper, "Sport Fishing In The Gulf", is second attached to these Minutes.

The Executive Director of the National Shrimp Congress, Mr. William R. Neblett, spoke next on the subject, "Effects of Domestic Policy Making-National and International". Copy of this presentation is third attached to these Minutes.

Chairman Millette 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, Mr. Ronald W. De Lucien, Director, Fishery Products Program, National Canners Association, was introduced. Copy of Mr. De Lucien's report on the fishery activities of the National Canners Association is fourth attached to these Minutes.

Mrs. Mary H. Thompson, Asst. Director, Gulf Technological Laboratory, next spoke on the subject, "Better Fishery Products Through Chemistry". Copy of her talk is fifth attached to these Minutes.

The session was adjourned for luncheon at 12 noon.

The Chairman called the afternoon session to order at 1:45 p.m. and introduced John Ray Nelson, Pres., Bon Secour Fisheries, Inc. Mr. Nelson spoke on the Alabama salt-water commercial fisheries. Copy of the talk is sixth attached to these Minutes.

The next speaker presented a report on the activities of the advisory panel to the Commander, 8th Coast Guard District. Copy of this report, which was given by Mr. Harry I. McGinnis, Panel Chairman, is seventh attached to these Minutes.

Mr. George W. Allen, Chief, Division of Seafoods, Alabama Department of Conservation, spoke on the subject, "Legal and Other Aspects of Off-Shore Snapper Reefs". Copy of this paper is eighth attached to these Minutes.

The afternoon session continued after a short recess and Mr. Paul R. Kalman, Jr., Pres., Kalman, Rogers & Smith, Inc., Public Relations Counselors, spoke to the group on the subject, "Commercial and Sport Fishermen Can and Must Live Together". Copy of this paper is ninth attached to these Minutes.

Dr. Lyle S. St. Amant, Chief, Division of Oysters, Water Bottoms and Seafood, Louisiana Wild Life and Fisheries Commission, informed the group that time had not permitted for the Commission's Shrimp Committee to complete the drafting of a bulletin which would appear as Informational Series No. 3 - Gulf Shrimp Fishery. He stated that the work would be completed during the summer months and delivered to the Commission in time for printing prior to the fall 1965 Commission meeting.

Chairman Millette not receiving any response on call 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 that Radcliff Materials, Inc., was to host the groupat a reception in the Wallace Pitts Room from 6 - 7 p.m.

Mr. Oscar Longnecker, Executive Secretary, Texas Shrimp Association, was recognized. He extended a cordial invitation to attend a joint meeting of the Southeastern Fisheries Association and the Shrimp Association of the Americas at the Miami Beach Carillon Hotel, June 20-24.

Mr. Ernest Mitts, former Commissioner of the Gulf States Marine Fisheries Commission and presently Executive Director, Atlantic States Marine Fisheries Commission, was called upon to tell the group of the joint meeting of the Atlantic and Gulf Commissions, October 6-8, Dupont Plaza Hotel, Miami.

The session was adjourned at 4 p.m.

The Resolutions Committee met from 4 - 5:30 p.m.

Friday (March 19th)

The Commission Executive Session began with the serving of breakfast in the Wallace Pitts Room at 7:30 a.m. Upon adjournment, the Commissioners proceeded to Ballroom A for the closing General Session of the meeting.

Upon calling the session to order, Chairman Millette expressed the very sincere appreciation of the Commissioners and Delegates to Radcliff Materials for the entertainment of Thursday evening.

Of general interest, the Chairman advised the group of two resolutions which had been adopted at the Executive Session; one which requests that a meeting of Industry and State Health Departments of the Gulf States be held on May 7, 1965 at the Monteleone Hotel, New Orleans, in an attempt to establish uniform standards for interstate shipments of shellfish; and a second requesting re-examination and re-appraisal by the Secretary of State of the office of special assistant for Fisheries and Wildlife in the Department of State in view of its utmost importance to the fisheries of the United States, in the light of the increased scope of activity both domestic and international and the heavy duties of that office, and with the purpose of adding a sufficient staff and personnel to cope with the many increasing fishery problems and matters of great and vital interest to the domestic fisheries.

Continuing with the session, the presiding officer introduced Mr. George Snow, Supervisor, Region 2, Statistics & Market News, Bureau of Commercial Fisheries who spoke on the subject, "Gulf Fisheries Statistical Needs". Copy of his paper is tenth attached to these Minutes.

Next introduced for presentation of the subject, "Interstate Route Planning, Mobile Area", was Mr. Jack C. Mallory, Chief Marine Biologist, Alabama Marine Resources Laboratory. Eleventh attached to these Minutes is a copy of the presentation.

"Federal Financing Available to Fishing Industry" was the subject of a talk by Mr. Billy F. Greer, Regional Fishery Loan Examiner, Bureau of Commercial Fisheries. Copy of his talk is twelfth attached to these Minutes.

A short coffee break was called and upon resumption of the morning session, Mr. James Sykes, Chief, East Gulf Estuarine Investigations, Bureau of Commercial Fisheries, gave a report on the results of the October 1964 Bureau's Red Tide Symposium. Copy of the report is thirteenth attached to these Minutes.

Latest developments in electric shrimp trawls and other fishing gear was a subject covered by Norman L. Pease, Chief, Gulf Gear Research Station, Bureau of Commercial Fisheries. Copy of Mr. Pease's presentation is fourteenth attached to these Minutes.

Chairman Millette received no response upon call for additional subjects for consideration. Before adjourning the meeting he expressed the Commission's gratitude to the Alabama Department of Conservation, the Greater Mobile Tourist and Convention Bureau, the Admiral Semmes Hotel, the Mobile Press-Register, the Fish Boat, Fishing Gazette and TV station 10, Mobile for their contributions toward the success of the meeting. Lastly, the Chairman again expressed the Commission's sincere thanks to the several speakers on the program and for the interest exhibited by the delegates.

The meeting was adjourned at 12:15p.m.

Prepared by: W. Dudley Gunn
Director

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
The Admiral Semmes Hotel
March 18-19, 1965

"GULF COMMERCIAL FISHERIES, 1965"

Seton H. Thompson, Director
Bureau of Commercial Fisheries, Region 2
St. Petersburg Beach, Florida

The commercial fisheries of the Gulf area during the past year have been faced with a number of problems. Some are new, some are not new but continue to threaten the industry, and others are just beginning.

New, or at least new in the sense of widespread recognition and attention was the pesticide pollution of 800 miles of the Mississippi River, from Memphis to the Gulf. The first evidence of contamination was a massive fish kill, mostly of fresh water species. That was followed by investigations, public hearings, charges and countercharges. Presumably, the primary cause, a chemical manufacturer near Memphis, has been identified and steps have been taken to correct the situation.

Among the continuing problems for the Gulf industry this year was the great number of sharks in the Florida Keys. So abundant were the large bull and lemon sharks in the Marathon area, and so heavy were the gear losses in the mackerel fishery, that operations virtually stopped, although mackerel were plentiful. One operator at Marathon handled 1,800,000 million pounds of mackerel in December 1963, but had only 200,000 pounds last December when the sharks were so bad. Both the mackerel and the sharks are migratory and have moved out of the Marathon area, but we are told that shark damage still is hampering operations where fishing is in progress. Every known shark repellent was used without success, and efforts to poison them, or otherwise control their numbers, failed. This is a problem that will still be with us next year, and one for which a solution must be found. A commercial fishery for sharks would solve this problem, but the currently used shark products--hides and fins--are not valuable enough to give the fisherman a profit. Another solution might be the encouragement of a big game fishery for sharks with attractive prizes and trophies to draw fishermen in numbers. The New Zealand Chamber of Commerce advertises their Mako fishing in our sports magazines. If that pays off for them, we ought to be able to attract big game fishermen to this much closer to home opportunity.

Continuing also as a threat to our Gulf fisheries is the extensive alteration of our estuarine waters. You are well aware of the importance of these areas to most of our commercial speeies. During the year attention was focused on such major engineering developments as the Texas Basins Project, that would cut off river flow into the coastal waters of Texas, and the diversion of

fresh water from Everglades National Park and its important nursery areas for Tortugas shrimp. In addition, there has been a multitude of small dredge and fill projects all across the Gulf. Individually they are relatively unimportant, but cumulatively they create radical changes in estuarine waters. We can report, however,that we are beginning to benefit from the knowledge gained through estuarine research in recent years. For example, our ability to demonstrate a close relationship between Texas River flows and shrimp abundance has led to modification of the Texas Basin design so as to release the fresh water needed to maintain estuarine conditions. We are under no illusions that this danger to the environment for our fishery resources has been eliminated, but we do feel that some gains have been made.

An incipient problem, but one that will surely become a major danger both to the fishery resources and to the fishing industry is that of foreign competition on the fishing grounds. We only have to look at the record of foreign fishing vessel operations on other coasts of the United States to see what is in store for us. In recent years there have been fleets of 400-500 Soviet vessels fishing in the North Pacific and the Bering Sea, and as many as 200 off the New England coast. These are large, modern vessels, some as much as 280 feet long, with 3,000 gross tons capacity. They are accompanied by factoryships or motherships that range in length up to 500 feet, and carry crews of 600 or more people. On the Pacific they are catching flat fish, Pacific Ocean perch, pollock, king crab, and shrimp. On the Atlantic their catches have included herring, whiting, ocean perch, and some less important species. Our fishermen in Maine and Massachusetts are complaining that intensive Russian fishing is reducing their catches of herring and whiting. There can be no doubt that the Russian take has been large. Her fishermen have devised trawling gear that can be operated efficiently on rocky mottoms, and our people maintaining a surveillance on Russian operations, have observed catches of as much as 60,000 pounds in a one-hour drag. It would not be surprising if such intensive fishing did have an impact on the stocks on which United States fishermen have depended for many years. In fact it would be surprising if it did not.

Already there is evidence that Soviet vessels are seeking new grounds on which to operate. About a year ago we saw a small fleet using mid-water trawls off the Virginia and North Carolina coasts. Off Virginia they were taking scup and sea bass in substantial quantities, but off North Carolina they appeared to be exploring for menhaden.

We have observed their exploratory operations in the Gulf, also. Several 150-foot trawlers have been seen in the Gulf from Tampa Bay to Campeche. Since it is the practice of Russian fishermen to take everything that can be caught, we can safely assume their explorations are for menhaden, thread herring, anchovies, croakers, trout, porgies, and spot. These species probably would yield the greatest volume, and that appears to be what the Russian fishermen want.

I know you are all aware that a Russian financed Cuban fishing base, well along toward completion a couple of years ago, is now in operation.When this

was announced we were told that 150 Soviet vessels would use it as headquarters. We are quite sure the number based there now is far short of 150. We have learned, however, that during the past fall 22 Russian oceanographers were given one-year assignments to work out of Cuba, and one major research vessel is said to be based there. So far, this vessel has not been seen in the Gulf, nor have we seen any evidence of work by the 22 oceanographers. This is something we will be watching for.

While expanding its own operations in our hemisphere, Russia has undertaken to modernize the Cuban fishing fleet and to train Cuban fishermen. These vessels have easy access to the fishery resources in the Gulf of Mexico and the Caribbean. Moreover, Cuba has actual and potential domestic and export markets for its catches. Everything points to a substantial increase in Cuban fishing effort.

The U.S.S.R. and Cuba are not the only fishing nations taking an interest in what we used to call "our waters." Japanese vessels began fishing off the northern coast of South America in 1957, and have been working their way steadily northward since that time. Some are fishing for shrimp out of Surinam, but the major effort now seems to be directed toward tuna. The Food and Agricultural Organization, of the United Nations, reported that 15 Japanese tuna vessels of 100-400 tons operated out of Vera Cruz during the winter of 1963-64, taking a total of 6,000 tons of yellowfin tuna. In addition to the Vera Cruz Base for Japan's tuna operations, there is a joint Japanese-Dutch Base on the Island of St. Maartin,with freezing and storage capacity for 1100 tons of tuna and facilities to serve 24 vessels. Another Japanese Base for 60 tuna vessels is located at Trinidad, and we understand a third Japanese Base is planned for Santo Domingo. The Japanese vessels engaged in tuna fishing range in size from 124 tons to over 1,000 tons, and those boarded in Tampa andSan Juan have had on board as much as 400 tons of tuna. Some of these vessels have been away from their home ports in Japan as long as 2 1/2 years.

Judging from their operations elsewhere in the world, we can expect Japan and Russia in the not-too-distant future to be aggressive competitors for the resources of the Gulf of Mexico and the Caribbean Sea. This isn't a very bright prospect, but already action has been taken to put our industry in a position to compete profitably. The Fishing Fleet Improvement Act, passed at the last session of Congress, provides a subsidy, up to 50 percent of the cost of the vessel, to encourage the construction of new vessels of advanced design, capable of fishing expanded areas with the most modern gear available. This subsidy program is not going to benefit the small coastal fishermen, but it will encourage our industry to develop and construct imaginative new equipment to fish the same waters as other fishing nations of the world. You will hear more about this from Billy Greer later in the program.

There are other factors at work that will assist our industry. For one thing, we have been engaged in intensive ocean studies. We have not yet realized the benefits of this new knowledge, but I am satisfied that it will be translated into useful ways of improving our fish-catching ability and efficiency. There are new products such as FPC that will lead to the efficient use of

presently unused stocks, for example, thread herring and anchovies. By this fall we expect to be able to recommend to industry a complete process for the manufacture of a marketable FPC. This is,as you know, a product high in animal protein, requiring no special preservation, and easy to package and ship any place in the world.

Also favoring our domestic industry is the tremendous potential for increasing the per capita consumption of seafood products in the United States. The annual per capita consumption of seafoods of 10.6 pounds has been virtually static for years. If you sort out the components of this statistic however, you find there actually has been a substantial increase in the per capita consumption of two products, shrimp and tuna, that have been promoted vigorously by industry. I am confident that equally vigorous promotion of other high quality seafoods would result in an over-all increase in the per capita consumption.

We are out to break this per capita consumption barrier with our marketing program, and I think our cooperative State of Florida-industry-Bureau promotional effort now in progress will prove this can be done.

While some of the problems facing our Gulf commercial fisheries are formidable, I would optimistically conclude that our fishing industry will continue to grow, prosper, and have a place of increasing importance in the economy of the Nation.

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GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
The Admiral Semmes Hotel
March 18-19, 1965

"SPORT FISHING IN THE GULF"

James R. Fielding, Chief, Division of Sport Fisheries
Bureau of Sport Fisheries & Wildlife
Atlanta, Georgia

In 1955, the U. S. Fish and Wildlife Service initiated the National Survey of Fishing and Hunting. The purpose, to obtain accurate information on the effect of sport fishing and hunting on the economy. In 1960, the second nation-wide economic survey of sport fishing and hunting was conducted by the Bureau of Census for the Bureau of Sport Fisheries and Wildlife. At the same time, a supplementary survey of salt water angling was made to obtain estimates on the sport catch by regions and methods. You will recall that sport fishing in 1960 was a $2.6 billion business.

A short ten years since the first survey, we are preparing to initiate the third national and the second salt-water angling survey. What will the new surveys indicate? The January 1965 issue of "The Boating Industry" reported that in 1964, 75.3% of all customers purchasing outboard motors mentioned fishing as one of the reasons for the purchase. Fishing was mentioned by 72.8% of all customers buying outboard boats. Both represent significant increases over 1960, although slightly lower than 1963. The percentage of boats 16'7" and over sold in 1964 was 60% above the 1960 level, but again showed a decline from 1963. Dollar volume of sales increased only slightly.

You have only to visit areas along the Gulf to see that there has been a considerable change in certain areas aimed at attracting sport fishermen. In some areas this has had significant impact on business. Does this represent a concentration of the same effort or growth, or both?

In Alabama the number of charter boats and party boats in the coastal counties has remained relatively constant during the past ten years. The number of private boats registered by the State in these counties has increased over 20% in the past four years. On the Gulf of Florida, north of Monroe County, party boats have declined at least 10% in the past ten years, while it appears that the number of charter boats has increased about 30%. The number of pleasure boats in Florida has apparently continued to increase. In contrast to this is the development of Destin, Florida as a marine sport fishing center. In ten years this community has witnessed a conversion from a commercial fishing port, which accommodated some sports fishermen, to a sport fishing center. This development has been accelerated by the increased catches of large game fish close offshore.

Siebenaler reported upon this fishery at the recent Ninth Annual Game Fish Conference in Jamaica. At the present time it is estimated that 35 to 40

charter boats and 15 party boats are based at Destin. In addition, during the fishing season there are a large number of transient boats. Local observers expect the area to grow even faster in the future.

Another major development in the past decade has occurred in the Empire-Venice, Louisiana area. This development is the result of new waterways, the increased harvest of big game fish off the mouth of the Mississippi River, and the concentration of fish around offshore oil rigs. It is estimated that there are about 35 charter boats in Louisiana waters. Over one-half are found in the Empire-Venice area. The following table reflects the growth at Empire and illustrates this development:

YEAR	CHARTER BOATS	PARTY BOATS	PRIVATE OFFSHORE BOATS
1955	2	0	0
1960	10		4
1965	14	6	124

Private boats have shown the most spectacular growth. Charter boats have increased sevenfold in ten years. This does not truly reflect their growth since the present boats are larger and can furnish better accommodations to a larger number of anglers.

Other important areas in Louisiana for marine sport fishing are Grand Isle and the Lake Charles-Cameron Area. We are not as familiar with conditions in Texas.

At the present time we wonder where we are growing or concentrating, or both. The 1965 National Survey of Hunting and Fishing and the Salt-Water Angling Survey to be conducted early in 1966 should verify these changes and furnish a solid base for planning the future.

The Salt-water Angling Survey is being altered to yield more valuable information. Requests were forwarded to all coastal States soliciting suggestions for improving the survey. The nomenclature will be improved in the new survey. Species which were grouped in the 1960 survey will be separated. This is particularly true of the big game species. Methods of fishing will be broken down to determine if fishing was from a boat; if so, charter, party, or private. If fishing was not from a boat, was it pier, surf, bank, or jetty fishing. We hope questions can be developed which will furnish information on the percentage of anglers who fish salt-water only. The number of days fished per angler by region and method, his catch and something about his point of origin.

Suggestions have been received to conduct the survey on a State-by-State basis; this is an excellent suggestion and one which would benefit agencies using this report in planning. Bureau funds are not available to expand the survey in this manner and it will be conducted again on a Regional basis. There is a possibility for surveys on a State basis if States are willing to

participate as many States did in the 1960 National Survey of Hunting and Fishing.

The September 1964 meeting of the Atlantic States Marine Fisheries Commission in Atlantic City adopted a resolution requesting the Bureau to undertake a pilot study to develop methods for measuring salt-water angling, catch, and fishing methods. The Bureau plans to implement this resolution in 1965.

For the past two years the Bureau has been actively surveying the Gulf area preparing long-range plans to meet our responsibilities under the Marine Game Fish Research Act. Plans call for the construction of two laboratories in the Gulf, one in the Western Gulf, and one in the Eastern Gulf. Highly variable conditions found in the different areas of the Gulf appear to make this mandatory. This is in keeping with our national approach on research on marine sport species. The Bureau has one marine laboratory on the Pacific and one on the Atlantic, with the second one under construction. In the Gulf Area -- a void.

Several suitable laboratory sites have been tentatively selected in Florida, Alabama, and Texas, which we think would offer excellent opportunities. We are interested in developing a research program in the Gulf in order to further the search for knowledge needed to manage the resources for all the people. We think we can work harmoniously with you and hope to be able to join you in making real contributions to the growth of fishing in the Gulf.

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GULF STATES MARINE FISHERIES COMMISSION
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"EFFECTS OF DOMESTIC POLICY MAKING - NATIONAL AND INTERNATIONAL"

William R. Neblett, Executive Director
National Shrimp Congress, Inc.

Mr. Chairman, distinguished members of the Commission, ladies and gentlemen:

Very little deathless poetry or prose has been written about commercial fishermen, but I turn to the famous Izaak Walton, who wrote of sport fishermen in "The Compleat Angler" for a quotation which we must take in reverse:

"Oh, the gallant fisher's life!
It is the best of any;
'Tis full of pleasure, void of strife,
And 'tis beloved by many...."

Commercial fishing is certainly one of the world's oldest professions. Picture a man - a boat - a hook or spear or net - in the relatively shallow waters in sight of land - this is the Biblical fisherman. For him, no problem to render unto Caesar what belonged to Caesar. For him perhaps the finest existence in freedom and mode of life of any trade or profession in ancient days. He pitted his strength and his industry against Nature and the elements, but we conceive that he had little use or need for government.

In one respect there are areas of little change. There are still individual hardy fishermen wrestling with Nature and the uncertain perils of the sea for a livelihood. I point with pride to this vanishing tribe of sturdy entrepreneurs; small businessmen, if you please; self-sufficient and aggressive in the finest of American traditions. They are the last of the pioneers.....

What has happened in this world that has so significantly changed the position of the fisherman? The world has shrunk as governments have grown. Where once the oceans seemed boundless buffers of security; where once Britannia ruled the waves; now super-jets and missiles have taken over and spawned new concepts of Distance and Time.

Even before the jet age we were experiencing a change in government and its relation to the individual. The Declaration of Independence and the Bill of Rights mean something different to you today than they did to Thomas Jefferson, a scant 190 years ago. Remember, it was Jefferson who proclaimed the three-mile limit of the territorial sea in 1793, and then failed to provide any penalties for intruders. Protection of our coastal fishery rocked along for 171 years before this country took appropriate action through S. 1988 in 1964, but we managed somehow.

(Neblett #2)

How can we best describe our governmental processes and their relation to us today? Some call it creeping socialism. Others find different terms, but we all know one thing for sure: The government is more a part of our daily lives, existence and business than it was in father's day, and much, much more than in grandfather's day. The country is big and complex; technology is busting out all over; there are more involved problems and more bureaucrats working on them and perhaps causing more.

This is not a critique of government. Others may seek to reform it; let us be content if we can begin to understand it. Let us try to analyze that part which more closely affects our own lives and businesses; specifically the commercial fisheries.

Even if we cannot always define it there IS a National policy which is like a great River. This is primarily channeled and controlled by the Executive Branch of Government, with some "checks and balances" from Congress and the Courts. Presidents come and go, like boats on a stream, some up-stream and some down-stream, but the River flows on. Even party politics make little difference in the flow of the River of National Policy.

The national game is to try to get a little of this river water into your own corn patch; whether by having the right friends or clever and persuasive lobbyists. We like to present the merits of the case, well documented with good reasons.

There are 23 states which border on an ocean and 6 more which border the Great Lakes, where fisheries are also important. This is a majority of states which have some fishery interest, and whose legislators, you may think,might be persuaded to pay some attention to fishery matters. Then there are legislators from inland states whose particular positions make them well aware of international fishery problems, as for example, Senator Fullbright who chairs the Senate Committee on Foreign Relations, and who hails from Arkansas.

With so many potentially friendly legislators we still have a major problem. That is to have the many segments of the fishing industry UNITED and solidly behind particular programs.

It is a scientific truth - a FACT - that each individual major U.S. fishery has a different type of problem and that very few remedies, if any, can be applied universally to cure these ills. The fact is that some of the medicine proposed from time to time might cure one fishery and kill another one.

We have coastal fisheries which scarcely get out of sight of land. We have fisheries that almost never see land, as whaling. Our Pacific salmon must breed and spend their juvenile life in a fresh-water stream, but they will travel almost to Asia before they return to the mother stream to complete their life cycle and to be harvested properly. The roving Tuna is in every ocean. The oyster is rock-bound and especially at the mercy of water pollution which scarcely affects the lobster.

(Neblett #3)

Our great River of National Policy flows on irresistibly. Its major concerns are the same as the individual's, greatly magnified. The first is security from enemies abroad and within, which is self-preservation. In this shrunken world every interest must be weighed in the balance of Security. Then comes another weighing; to balance conflicting interests as to their effect outside our country, or what we term Foreign Policy. How will such a program affect a friendly or a hostile nation?

In the years 1960 and 1961, when the shrimp industry came near disaster because of a glut of importations from more than 50 nations the National Shrimp Congress spearheaded the effort to meet this crisis. There were hearings before the Tariff Commission and bills were introduced in Congress designed to restrict imports by a tariff-quota formula.

As the leaders in this struggle moved around Washington, seeking assistance from government in the Executive and Legislative branches, again and again they were confronted by government's concern over the feelings of the nations which would be affected. Several of the nations, if not all, maintain actual lobbies in Washington, pay retainers to big law firms, and make themselves heard effectively on any issue they deem important. At that time, for example, Mr. Oscar Chapman's law firm represented Mexico. Mr. Chapman had recently been the United States Secretary of the Department of The Interior, which is the cabinet office charged especially with the protection of domestic fisheries. We found real experts on the other side, and we learned that some domestic policy is shaped inside the United States by other nations without the old-time niceties of international law, which consisted primarily of foreign ministers talking to each other at high levels. This policy making or shaping occurs on the ground floor of our own house!!

With so much attention given by our own government to the expressions of other governments through their lobbyists it becomes obvious that for any segment of the fisheries to achieve any major objective we need the entire, dissentious and disputatious fishing industry of the United States united, and the need for constant and intelligent liaison with the various other organized fisheries becomes apparent.

At the United Nations Conference on Law of the Sea in Geneva in 1958, the Northwest Salmon people were convinced that their only salvation lay in having the world accept the theory of "Abstention", which means that where a nationa has spent its own money and scientific effort to develop and preserve a fishery and is reasonably harvesting about all that's safe to harvest without depleting the stock, other nations should keep hands off. This was directed specifically at the Soviets and the Japanese.

The theory of Abstention, if allowed to expand beyond a very narrow criteria, could have been very dangerous potentially to our distant shrimp fishery. What to do? We shrimp people helped as much as possible to have our sister fishery's theory accepted. George Steele took the Frazier River salmon film; wrote a new script for it, added appropriate music, and I made a translation on a sound track in the Spanish language; and we worked hard to convince the delegates from other nations.

The United States did not obtain a two-thirds vote in Plenary for Abstention, but the Salmon people know that the Shrimp people did everything possible to help.

This is one isolated example; there are many involving national legislation, as where a key Congressman from one of our Shrimp states gave a helping hand to an oceanographic program for Tuna, whose principal situs is Southern California.

The appearance of Soviet fishing fleets off Alaska and New England started a hysterical demand for some kind of immediate remedy. The popular cry was for a fishery sea of twelve miles, although one New England state wanted 200 miles. It is hard to cope with hysteria, even when a careful scientific analysis shows that little or no protection ensues from such action. The one possible exception is for the protection of our domestic menhaden fleet in the Atlantic, but these fears have not materialized. We find that in every case where there have been some fishery difficulties the Soviets have agreed to sane and sensible solutions of conflicts. There are plenty of fish which we do not want and will not use commercially, and we cannot make a case before World Opinion which would deny these unused stocks to those nations which need them. Remember also that the Soviets do not compete with us in the MARKET; they export neither food fish nor industrial products to this nation. The preservation of our market for an established domestic fishery is the most important item we must consider.

Meanwhile, we have our little situations in the Gulf and in the Caribbean with <u>friendly</u> Latin nations which now and then object to U. S. fishermen getting too close to their shores. Did you read in the papers recently that a Nicaraguan warplane strafed six fishing boats, only to discover later that these were their own vessels? Just now, matters in that area are very touchy and there <u>are</u> some American vessels fishing in the Caribbean as well as in the Gulf.

It does not help our negotiations concerning shrimp to have this hue and cry about 12 miles. It is quite obvious at this point that any change in our domestic policy would affect other nations, if only in reprisal, and could have repercussions which could well cost us much more than we could gain.

We should never move to rock the Ship of State sailing upon the River of National Policy without knowing <u>exactly</u> what we are doing, and what adverse, as well as beneficial effects will ensue. A wise sage once said that it is better to be <u>informed</u> than to be educated. Only with considerable current information about the problems of ALL of the fisheries of the United States should we venture to propose changes in national policy which would certainly cause a backfire to us internationally.

At the beginning of these remarks we said we sought not to criticize but to understand. I spoke of a River flowing steadily through a system of bureaucracy. To us in the fisheries this bureaucracy can also be benevolent. It has been through the united efforts of the domestic fisheries that there exist offices in Washington whose primary purpose is our protection. We have in

the Departments of State and Interior competent and devoted public servants who work unusually long hours and are, in my opinion, underpaid and understaffed. The commercial fisheries of this country are entitled to and demand proper representation in the Administrative branch of government. It should be high enough in the echelon of government to have ready access to Heads of Departments where national policy is formed. Our fisheries representatives should have salaries commensurate with the importance of the undertaking and staffs sufficient to keep up with the heavy volume of work. At the present time, at least in the fishery office of the Department of State, an up-grading and re-evaluation are badly needed.

For, in any breath that we speak of National or international policies affecting U.S. fisheries, we are perforce speaking of these few key men who have devoted their lives to this work and whose dedication to duty has been of inestimable value to us in the field. In the end, it must be the impersonal public servant who mediates between the conflicting interests of the various segments of the domestic fisheries and who, by virtue of up-to-date information from qualified sources, is best qualified to propose the best policies, based upon the most good and the least harm.

Whatever else we may do or try to do to shape national and international policy, we must be firm in our resolve and in our effort to maintain at a high level of qualification and efficiency those offices in government charged specifically with our protection and advancement.

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GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
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"FISHERY ACTIVITIES OF THE NATIONAL CANNERS ASSOCIATION"

Ronald W. De Lucien, Director
Fishery Products Program
National Canners Association

It is a pleasure to be here this morning. I welcome the opportunity to report briefly on the activities of the National Canners Association's Fishery Products Program, and, most importantly, to talk about a subject of mutual interest to us all - the American fishing industry.

The National Canners Association, known to many of you, is a national trade association of canned food processors, whose membership represents approximately 85% of the total production of canned foods in the United States.

The N.C.A. may be described in these words: teamwork and service. Teamwork is exemplified by the close cooperation between the industry leaders and staff in meeting the challenges facing the canning industry. Moreover, service becomes much in evidence when the activities of the Association are mentioned. For example, the research orientation of N.C.A. is abundantly clear in view of the three N.C.A. food technology laboratories. These are located in Seattle; Berkeley, California; and in Washington, D. C. In addition, the N.C.A. maintains a broad program of activities which include, among others, the following areas of direct interest to the food canning industry: labeling, consumer claims, home economics and consumer services, government-industry relations, international trade, raw products research, and statistics and economics.

The Fishery Products Program, which was established in 1946, basically serves a two-fold purpose. First, it coordinates and supplements all of the other programs in the Association in order to effect the maximum consideration on seafood canners problems. Secondly, the Program serves the specialized interests of N.C.A. fish canners involving the Federal Government, Congress, and others.

At this point, I would like to briefly relate some of the activities of the Fishery Program.

Obviously, one of the basic functions is to maintain close contact with the Interior Department's Bureau of Commercial Fisheries. The Bureau is involved in areas which are of direct concern to commercial fisheries, such as gear research technology, fish biological studies, economics, legislation, and, increasingly, international problems. Our objectives, quite frankly, fall into two broad categories. First of all, to keep abreast of the Bureau's policies and programs in order to keep industry members fully informed, and,

secondly, to inform the Bureau of the industry's position on given matters of interest, the sole purpose of which is to insure that the Bureau is both responsive and cognizant of the interests and problems of the fish canning industry.

Since 1956, the Program has been closely involved with the Office of the Commissioner of the Fish and Wildlife Service. This is vitally important because the Commissioner's office is active in legislation and international relations concerning the fishing industry.

Another basic function of the Fishery Products Program concerns the State Department's Special Assistant for Fisheries and Wildlife. In this regard, we are represented on the State Department's Fishing Industry Advisory Committee.

Another area of activity concerns fishery legislation in the Congress. Our purpose is to fully inform fish canner members of the implications of pending legislation. The legislators and congressional staffs are informed of the views of the fish canning segments on legislation affecting the industry. I might add at this point that the N.C.A. works closely with other industry organizations in supporting legislation that would directly or indirectly benefit the fishing industry. As an example, we joined in support of Public Law 88-309, the Commercial Fisheries Research and Development Act, which was enacted in the 88th Congress. Although the measure did not directly concern fish canning interests, the basis of our support was that the states would receive assistance in expanding or developing commercial fisheries, strengthening the fishing industry as a whole. Another example, we joined in support for Public Law 88-498, the Fishing Fleet Improvement Act, cooperating with other fishery organizations which resulted in the enactment of this important legislation.

The N.C.A. Fishery Products Program works in all areas where the interests of fish canners are involved: in international trade, bringing the Program into contact with the office of the Special Representative for Trade Negotiations and the activities of the General Agreement on Tariffs and Trade; in international conservation efforts, involving liaison with the various international commissions, such as the North Pacific Fisheries Commission and the Inter-American Tropical Tuna Commission, and international organizations such as the U.S. Food and Agriculture Organization. Our objective in participating in all of these areas is to protect the immediate and long-range interests of the U.S. fish canning industry.

The National Canners Association is aware that these interests cannot be effectively protected unless the entire American fishing industry meets and overcomes the challenges facing it. I submit that these challenges cannot be met without the enlightened cooperation of all components of the total industry. It is true that each segment - fisherman, canner, or boat owner - and each fishery, such as tuna, shrimp, or menhaden, has its own particular problems. Nevertheless, these problems are interrelated and should be viewed as part of the major difficulties confronting the fishing industry as a whole.

It is for this reason that N.C.A. seeks to work with other industry organizations whenever possible, in order to serve the industry in the most effective manner. We have worked with your very able Director, Dudley Gunn, on past occasions. This has been mutually beneficial. In fact, the Gulf States Marine Fisheries Commission, a compact of states working for common goals, is an example of the spirit of cooperation and a source of encouragement to all of us.

Speaking of challenges, I would like to take a moment to refer to some of the major problems confronting the commercial fishing industry.

One of the most immediate problems facing the industry is the rapid acceleration of fishery imports into this country. Now some imports are inevitable and are needed to meet a particular demand. But the overall trend of fishery imports into this country is serious. It is an alarming fact that fishery imports into the United States in 1964 comprised nearly 63 percent of the total supply of all fishery products in this country. Yet, in contrast, imports in 1954, 10 years ago, only amounted to some 37 percent of total supply. America is the largest importer of fishery products in the world. This is often overlooked. It is a fact that this country is a prime market for fishery products. For example, in 1964 some 200,000 cases of canned shrimp were imported out of a total supply of approximately 870,000 cases. This is a serious problem for your shrimp industry in the Gulf area. Indeed, if the importation level of all fishery products continues to rise, this fact will seriously negate any of our efforts to rehabilitate our domestic industry.

This brings us to another critical problem facing our domestic industry. It is unquestionably concomitant to our import problem. This is the threat of tariff reductions on existing fishery import duties. Despite the high level of fishery imports, the Administration's Trade Expansion Act provides, among other things, for possible tariff cuts of 50 percent of existing duties for all duties on the U.S. tariff schedule. The law allows an across-the-board reduction for all fishery products which now have a duty. The effect of this law on the domestic fishing industry is not clear at present because the trade negotiations are still underway in Geneva. These talks are the so-called "Kennedy Round" trade talks under GATT, the General Agreement on Tariffs and Trade. Nevertheless, our fishing industry has been placed in a grave position.

It is true that the Trade Expansion Act is not purposely aimed at our domestic fishing industry. Fishery tariff reduction is only embraced as part of an overall scheme to reduce all tariffs. Still, the impact will be the same - an adverse and seriously detrimental impact. A look at the influx of canned shrimp imports in recent years shows what can happen when there is no tariff protection.

Therefore, it is imperative that the U.S. Government prevent further fishery tariff reductions at the current trade negotiations. Many of us in the industry see the wisdom of keeping what little protection we now have. The record clearly shows that our existing import duties on fishery products have been reduced consistently since World War II. We strongly hope the U.S. Government will not further sacrifice this industry on trade matters.

(De Lucien #4)

I would like to conclude with a reference to a political problem which confronts our industry. Although there are commercial fishing interests in all our coastal states, we have not reached a political maturity commensurate to the size of the total industry. As a result, we do not have a national voice on those issues on which the industry may have unanimity. Obviously, all segments within the industry cannot agree on all things at all times. But there are issues on which we can often reach some consensus. I believe that the various parts of industry should support each other when such support would not be inimical to self-interest. Thus, if one segment is strengthened, this may help indirectly the other segments in our industry in the long run. One of the ways to enhance the commercial fishing industry's political savvy is to maintain strong representative organizations. Needless to say, such organizations are only as good as the support that is given by their members.

I am convinced that many of us in the industry are becoming aware of the importance of political support. A look at the fishery legislation which was enacted in the 88th Congress points up, I believe, a renewed sense of interest in Congress for our industry. This legislation was not passed by accident. It was the result of hard work of many of you in the fishing industry.

In conclusion, I believe the American fishing industry can meet the challenges. Our total industry has great potential and promise. The demand for our products will continue. There will always be a need for high protein food resources. We are near some of the world's riches ocean fisheries. We have made progress in many of our commercial segments. If we all do our part - the Federal agencies, the Congress, the industry, and the States- I am confident that the American fishing industry will demonstrate its rightful viability and leadership within the world fishing fraternity.

The N.C.A. through the Fishery Products Program as well as with the other services of the Association, pledges cooperation to others who are willing to meet these challenges. We all should have, in fact, one objective in our respective roles - to serve the American fishing industry.

Thank you.

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GULF STATES MARINE FISHERIES COMMISSION
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"BETTER FISHERY PRODUCTS THROUGH CHEMISTRY"

Mary H. Thompson, Asst. Director
Gulf Technological Laboratory
Bureau of Commercial Fisheries
Pascagoula, Mississippi

Mr. Chairman, it has been some time since a member of our laboratory staff has addressed you, and since the title of my talk is somewhat ambiguous, I, like the private company whose slogan it calls to mind, would like to present a brief picture of research as it occurs at our laboratory. And then, by example, I should like to show you the way in which chemistry may make fishery products better in terms of quality and their producers happier through increased sales.

At present, we have two major programs at the Pascagoula laboratory. The first is the Microbiology of Seafoods, and the second is the Chemistry of Seafoods. Each of these two major programs has several projects in operational status. Those of the Microbiology program deal with the effects that bacteria have upon seafoods. Toward this end, we have research underway on methods to reduce and prevent the Salmonella contamination of fish meal. Further research is being carried on toward the identification and quantitation of various bacteria of public health significance in frozen precooked fishery products. The third project is to establish the role that microorganisms play in the deterioration of fish and shellfish. Lastly, in cooperation with the Atomic Energy Commission, we expect within the next year to survey various parts of the Gulf of Mexico to determine the possible presence of Clostridium botulinum type E.

The Chemistry program at Pascagoula consists of 3 major projects. The first is a project aimed at determining the composition and nutritive value of various fish and shellfish throughout the year. Within its scope, various species are examined for such things as proximate composition, amino acid content, vitamin, trace mineral, fatty acids, and phospholipid content. The second project entitled "Chemical Reactions in Processed Seafoods" has as its object the solution of problems which affect the fishing industry in the processing of its various products. These solutions may involve basic chemistry in terms of the "why" of the problem, or may involve applied chemistry in the "how to prevent" or "how to cure" the problems. The third major project is concerned with an assay of the pesticide residue content of fishery products as they are marketed.

Now you may ask what do all these projects mean in terms of practical value to the fishing industry. I should like to take the first two projects which

I mentioned in the Chemistry program and point out some of the research results of recent vintage to show how they might be of benefit to the fishing industry. The composition project has been underway at Pascagoula for two years. Each species that is studied is studied as thoroughly as possible. We are constantly aware of the nutritional aspects of this study. It is no secret that in this day and age people have become acutely aware of the diet as a national problem. There are many reasons why fishery products in general are an important part of our national diet. Not only do they contain a large quantity of the essential amino acids and trace minerals which form a necessary part of the established normal diet of the human, but in many respects fishery products are eminently suitable for many types of specialized diets. For instance, almost all fishery products processed without brining can well qualify for low sodium diets. Further, most shellfish are quite suitable for low cholesterol diets. A recent publication of the Pascagoula laboratory lists seven of these low cholesterol shellfish and was quite instrumental in their inclusion in low cholesterol diets. Although the results of this project may seem to be an indirect contribution, they will be, in time, of direct benefit to the fishing industry in terms of increased sales. A further knowledge of composition will lead to the inclusion of more fishery products in other specialized diets, as well as in the regular diet. Another benefit from this study lies in the development of new products. Many fishery products contain unusual fatty acids, steroids, and other important compounds--particularly in the oil fraction. It is possible, therefore, once a potential new product is identified, to develop an industry based upon the use of rendered fishery products as a source of chemicals with particular properties--much as various meat sources are utilized to produce such compounds as ACTH on a commercial scale. Further, the identification of various compounds contained in fishery products as they are captured from the sea and the quantitation of these same compounds can in many instances help solve long-standing industry problems. "Is there enough copper present in a blue crab to cause the bluing discoloration present in canned crab meat?" "Is there the possibility of the presence of enough free fatty acids present in the animal as caught to complicate the problems of texture in seafoods?" and so on. Such questions posed by the producer can be answered by chemists and food technologists working in this area provided they are armed with an adequate knowledge and the basic data. Thus, we see that, although this project seems to have little applied value at first glance, it does have great practical implications for the fishing industry.

The second project to which I would like to refer is the one which we call "Chemical Reactions in Processed Seafoods." This project title covers a multitude, not of sins, but of problems. Here research is done to help the fishing industry produce a better product so that the consuming public may get the best possible of seafoods on their dining room table. To date, we have been engaged in work with shrimp. Shrimp have many of the same problems as other seafoods. There are problems with texture--shrimp may become too tough or they may be too soft. The canning industry finds problems in iron sulfide discoloration (characterized by a "blackening" of the can and its contents), and in the formation of struvite crystals (objects found

in a can looking strangely like glass but soluble in vinegar and harmless). The frozen industry has problems with texture as does the canning industry. There are additional problems in processing shrimp, such as discoloration, loss of normal color, black spot, loss of normal taste, and the presence of abnormal flavors and odors. Let us take two typical problems upon which we are working at the present time and try to understand how chemistry may make a better fishery product.

There are several problems associated with the heat processing of shrimp. In cooperation with the American Shrimp Canners Association, we have attempted to alleviate these problems through experiments involving a large scale test pack with several variables. The purpose of this series of experiments was to determine the best possible method of heat processing shrimp under present commercial conditions. Several factors were to be regarded here: texture, iron sulfide discoloration, the formation of struvite, and the loss of color were chief among these. Two varieties of precook brine, two levels of salt, two put-in weights, and citric acid and lemon juice as additives, were combined to produce a total of 24 variables from which one or two single methods of processing hopefully should stand out as providing the best pack. Representative cans of each type were then removed and tested at 0, 3, and 6 months storage with the removal of the 12-month, 18-month, and 24-month samples yet to come. On evaluating texture one of the most meaningful tests which we have conducted is that of the nitrogen determination of the cans' liquor contents--as remote as it may seem from the basic problem. Since nitrogen is a basic part of all protein molecules, and since proteins are the basic component of shrimp muscle, a loss in firmness may be accomplished by a loss in protein, and therefore, nitrogen content of the solids in the can. Previous work has also indicated that a loss of nitrogen may be connected with increased incidence of iron sulfide discoloration. Following this reasoning, the question that should now be asked is "Did any one of the packs prove to be superior to the others in retaining nitrogen in the solids and also firmness?" Indications are that there <u>is</u> one method of processing which is indeed superior to the other methods in this respect, and undoubtedly, therefore, should be used to form the basis of further experimentations. The producers may question, "Do I lose profit through the use of particular additives by having to increase the amount of shrimp in the can in order to obtain a correct drained weight?" At first glance it might seem that this is so, however, our research has shown that even with the use of these additives there is no more loss from the use of the additive than there is a loss in drained weight by mere storage of the canned shrimp for three months.

There are, of course, more basic reasons for the loss in quality of most seafoods. One cannot always control the quality of the finished product without paying attention to the quality of the raw product. The question of how seafoods deteriorate under iced storage has never been satisfactorily answered in its entirety. Over the past few years several laboratories studied the deterioration in a muscle protein called actomyosin. This deterioration apparently involves a "clotting" of the actomyosin in the presence of fatty acids cauing a toughness in the frozen product. Although this is an important

type of deterioration, it is not by any means the only type. The Pascagoula laboratory is presently engaged in research on another aspect of the problem. Through the combined efforts of the Microbiological group and the Chemistry group, experiments are under way to determine the nature of the deterioration caused by the growth of marine and other organisms upon shrimp during storage. From this work, it appears that as the bacterial population increases, there is a large loss in the nitrogen content of the shellfish muscle and further a distinct softening of the texture of the raw product. The exact nature of the deterioration caused by the bacterial invasion is yet to be determined, however. It is apparently associated with a destruction of the connective tissues--an unsticking of the "glue" so to speak. The deterioration of the connective tissue reduces the ability of the shrimp muscle fibers to remain in place, allowing a softness in texture to appear upon cooking. An interesting sidelight of this work and one which few people are aware of is that we have found an increasing number of bacteria within the tissues of the shrimp itself during storage. Such an invasion of the tissue is bound to alter the structure of the shrimp and to alter its basic fresh quality. A symposium presenting the results of this experiment will be held for industry sometime in the latter part of April.

I hope that through this short talk and resume of our work at Pascagoula that I have been able to indicate to you how we can indeed "make better fishery products through Chemistry."

(COPY)

GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
March 18-19, 1965
The Admiral Semmes Hotel

"ALABAMA SALT WATER COMMERCIAL FISHERIES"

John Ray Nelson, President
Bon Secour Fisheries, Inc.
Bon Secour, Alabama

I have come to you to talk about Alabama's Seafood Industry. Alabama, as you know, has the shortest coastline of any state represented in the Gulf States Marine Fisheries Commission. It follows that we have fewer fishermen and fewer packers than the other states involved here; it should also follow that we produce less than any other of our sister states, but that would be hard to prove statistically since production figures are most often taken from the port of unloading and not from the waters where taken.

Oyster production can be the most easily pin-pointed. There has been an overall decline in production in this country since 1950--Alabama, while reflecting the general downward trend, has shown a small increase in the last few years. This is due in part to economic reasons--the East Coast production decline left room on that market for the southern product and we scurried to meet the demand-- and in part due to improved and expanded oyster culture here in our state. Our Alabama Department of Conservation--Seafoods Division-has done wonders in the past five years under the able leadership of Mr. George Allen, Chief. He has guided us through the lean years of the past when we were overcome in Mobile Bay by spring floods and it appeared the seafood business would suffer greatly.

While the problem of pollution is common to all, we in Alabama, with the smallest water area, have an even greater stake in protecting this natural asset. In the Alabama Fisheries Association we have a champion going to bat to fight for and support stronger anti-water pollution legislation and enforcement both at the state and at the federal levels. Our Association is only five years old; however we, through the leadership of Mr. Ralph Richards, have made great strides in enlightening citizens to the damage done here in Alabama by water pollution. There is an anti-water pollution bill now in the House of Representatives which has already been passed 68 to 8 by the Senate. On the state level, you may be sure that Alabama Fisheries Association will be working for consideration in our state legislature of stronger anti-pollution measures.

Another bright star on the horizon is the re-writing of the entire Seafood Code for presentation to the State Legislature. During the past twelve months officials of the Seafood Division together with members of the industry have undertaken that tremendous job and the task should be completed during the next six months, thanks again to Mr. Allen.

Since our coastline is relatively short it is important to our fishermen that they have other waters, too, at their disposal. Our Bay shrimpers, for instance, are used to starting the season, sometimes as early as March, by moving east to Florida in the Apalachicola area; they then move westward as it profits them, sometimes as far as the Grand Isle area of Louisiana. In the past, there were often complications for these men in obtaining the necessary permits and licenses as they moved from one state to another. The Gulf States Marine Fisheries Commission has been instrumental in improving the relations of fishermen with other state commercial fishing regulatory agencies. A general friendly attitude has developed between the fishermen and the state seafood agents. Alabama fishermen appreciate the ease of moving from one state to the other. The cooperation of the state agencies with the out-of-state fishermen makes them feel welcome and facilitates their complying with the necessary regulations. This same spirit of cooperation prevails on the wholesale shippers level. He can buy and sell with the same freedom from complications in complying with regulations as he moves across state lines.

There is one area of cooperation between the states as regards the seafood industry that is still to be more fully explored and that is the area of sanitary regulations and packing standards.

The U. S. Public Health Service has set up overall sanitary standards governing all phases of the oyster operation and has instituted a national cooperative shellfish sanitation control program entered into by the State Health departments and the shellfish industry. Each state health department formulates its own sanitary regulations and standards within the latitude allowed by U.S.Public Health. As it turns out, the boatman is not greatly affected by any of these regulations, but the packer and shipper has many regulations with which to comply. Since each state makes its own regulations, wide variations in degree of strictness occur from one state to another, in many instances creating an economic hardship on the businessman of one state when he proposes to ship into another state.

It is ridiculous to think that raw oysters packed in Texas, Louisiana, and Mississippi and sold in those states for raw consumption are not fit for Alabamians to eat; but the fact is that those oysters are packed in glass jars with screw top lids, and Alabama regulations say a product in a non-tamper proof container cannot be sold in this state.

Another regulation determines the free liquor content acceptable. In my shop in Alabama I pack an oyster with no more free liquor content than will pass the Alabama State Health Department regulation for sale in Alabama. My competitor from neighboring Florida has stopped selling in Alabama. He can sell oysters packed with more free liquor in Florida and other states. Now on the surface that is good for Alabama packers selling in Alabama--but it isn't sensible, it isn't fair, and it isn't really good business in the long run.

The list of inequities even applies to the regulations governing the construction of the shucking house, the temperature of the water in which the oysters are washed, and the type of truck on which shell oysters can be

transported. As far as plant construction and maintenance are concerned, Alabama sets the highest, most costly standards with Florida next. In both cases, the standards set are above U.S. Public Health requirements. The other Gulf States adhere more nearly to U.S. Public Health standards. For us in Alabama and Florida this amounts to unfair competition in that we have more capital tied up in plants than do our neighbors.

Since the Gulf States Marine Fisheries Commission was able to act in unifying the regulations as they applied to the fishermen passing from one state to another, it occurs to me that the Commission might also act as intermediary in an attempt to remove the inequities in these standards and regulations applying to inter-state shipment of shell fish.

The successful past record of the Gulf States Marine Fisheries Commission would serve as encouragement to packers and health department officials of the Gulf States to get together on their requirements. A unified set of standards and regulations would certainly improve the prosperity of the oyster packers here in Alabama and this project undertaken by the Commission would result in benefits to all the citizens of the Gulf Coast.

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GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
The Admiral Semmes Hotel
March 18-19, 1965

"REPORT: ADVISORY PANEL TO COMMANDER -8TH COAST GUARD DISTRICT"

Harry I.McGinnis, Chairman
Coast Guard Advisory Panel
New Orleans, La.

When Dudley Gunn asked me to give a report on the activities of the Coast Guard Advisory Panel it seemed like a good idea-then I tried to put down on paper what we had done. I tore that up and decided I had better talk on what we would like to do. Seriously, though, for the short time the panel has been in existence it has accomplished a lot and it looks like it has a good future.

As for the forming of this panel---in April of 1964 speaking before the Texas Shrimp Association at Brownsville, Texas, Admiral Craik suggested the forming of a Coast Guard Advisory Panel representing all segments of the Commercial Fishing Industry to act as liaison between Coast Guard and Industry, to expedite the handling of problems between the two.

About this time it was brought to the attention of certain members of the Fishing Industry that a hearing had been held by the Merchant Marine Council regarding changing the lines of demarcation for marking offshore oil rigs, both light and fog signals. It was brought to their attention that no member of the Fishing Industry was present. Inasmuch as everyone knew there was constant trouble under the existing markings, any lessening of these signals would result in utter chaos. When the resulting storm set off by this information settled down to a dull roar, a panel formed to investigate the situation, amass all the records of accidents and present this information to the Commander of the Eighth Coast Guard District, Admiral Craik, and request a new hearing be held so we could make a formal presentation of why these changes should not be made. The Panel was made up of members from the Alabama Fisheries Association, Louisiana Shrimp Association, Texas Shrimp Association. Gulf States Marine Fisheries Commission, Southeastern Fisheries Association, Gulf Menhaden Operation, American Shrimp Canners Association, National Fisheries Institute and various counsel and advisors to the Panel. Because of my centralized location in New Orleans, I was selected as Chairman.

Various meetings were held in New Orleans, Jamaica and Brownsville. All members present were asked to contact boat owners in their respective trade associations requesting them to furnish the Chairman of the Panel with reports of accidents involving oil rigs, particularly where in the opinion of the boat operator there were insufficient or inoperative warning devices. I was advised to prepare for a flood of reports. To date, I have yet to

receive the first one. I have broughtthis out not to minimize the situation but to point out what is needed. I know these accidents happen but, to be effective, we must have information.

We have gone ahead with an extensive study of this situation and with the able assistance of Dick Whiteleather and his department, we've been able to chart the fishing grounds and present to the Coast Guard a graphic picture of the fishing grounds with their relation to the oil rigs in the Gulf. With this information, we hope to get lines established for the best protection of the fishermen without excessive cost to the oil companies.

This is just a small portion of what can be done by such a panel but to be functional, we must have working members. There is no place for honorary membership. Regular meetings must be held. The Chairman must be in constant contact with Coast Guard District headquarters. This panel should be the speaking voice of the fishermen to the Coast Guard, and the voice of the Coast Guard speaking to the fishermen. It must be a two-way street. If we expect them to listen to us, we must listen to them, and one thing you are going to hear loud and often is the word "safety".

Before becoming associated with this panel, I would see an article in the morning paper where such and such fishing vessel had trouble in the Gulf and, unless it was one of ours, I didn't pay too much attention to it. I was astounded to learn that for the period November 1964 thru February 1965, there were 458 search and rescue cases in the Eighth Coast Guard District alone. 211 of these were commercial fishing vessels. That is 46%. These are the same men that would take the hide off one of their kids if they saw him run across the street without looking, yet they'll put out to sea in a fishing vessel without auxiliary pumping equipment and, in some cases, inadequate life saving gear. In some extreme cases--but known to happen-- they ship out with a busted radio they haven't had time to get repaired.

Taking the proper precautions to protect your life and your investment doesn't mean less work for the Coast Guard, it just permits them to spend more time at their most important duty, that of being able to help those who need it through no fault of their own.

This panel is new. It will take some time to form it into the working group it should be. We of the fishing industry have a golden opportunity to present the Coast Guard with the problems of our industry. At the same time it will enable the men who make their livelihood harvesting the seas to benefit from the thoughts and ideas of the men who spend a lifetime trying to make this harvest as safe as possible.

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GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
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"LEGAL AND OTHER ASPECTS OF OFF-SHORE SNAPPER REEFS"

George W. Allen, Chief
Division of Seafoods
Alabama Department of Conservation

The development of off-shore fish havens by a local, state or federal agency is one of the most popular programs upon which any such agency can embark. It is perhaps the one project in marine waters that can show obvious results in a very short period of time. The state administrators usually point with pride to these improvements, and the salt water fisherman sings the praises of such a progressive program.

It is a program where all the old, tried and true cliches can be used with most dramatic effect. They can be "pointed at with pride", they can be "viewed with enthusiasm", they can be called "direct benefit of the tax dollar", and they can be expanded with "unbounded enthusiasm".

On the other side of the question however, they can be "viewed with alarm", "anticipated with dread", and "constructed with callous indifference". Both viewpoints, and all reservations can be justifiably stated. Once again, to revert to cliches, "one man's poison is another man's meat".

The need for fish havens for the fishing public is an established fact. It cannot be disputed that even without adding to the litter on the oceans floor there are ample piles of refuse on which sporting reef fish can be found. The problem involved in the expanded use of the natural junk that is found on our bottoms is that this material cannot be definitely located by all persons who wish to fish them. Because of the inability of the average offshore fisherman to find his personal refuse heap on the oceans floor, the demand for known, located and buoyed fish havens has developed.

With this consideration in mind, the field administrator upon whose already bowed back the fish haven problem is placed will find that he has two alternatives: he can attempt to locate and permanently buoy the existing junk piles, or he can create new ones. Most of the time the second alternative is chosen. The fish-haven material is usually readily available, it has tremendous public appeal, and sports writers can write stories and take pictures of the operation with unbounded enthusiasm. The field personnel can be photographed with their hand resting on the unplanted material, with their eyes set to the future, or if a real dramatic effect is desired they can have scuba tanks, tow foot knives and diving masks in place. The opportunities are boundless for press coverage. The factors in favor of utilizing the existing reefs would be economy, and the marking of underwater objects

that can and do play havoc with the commercial fisherman's nets and trawls. Most of the public demand for such reefs comes from the operator of the smaller outboard powered fishing boats. The existing bottom material is in most cases near commercial shipping lanes, or in exposed areas. In either case such areas would not be considered as satisfactory to the small boat operator. To be satisfactory, these existing reefs would have to be permanently buoyed, which in some cases would constitute a menace to navigation. Where close to heavy commercial traffic, the fishermen themselves would be a menace to navigation where larger vessels are involved. Considering all of the above therefore, the agency concerned with the development of such fish havens generally will preclude the use of existing underwater obstructions except where the conditions are such that they would not present the aforementioned problems.

Once the program is to be based on the use of additional piles of refuse and other material to be placed in specific areas, the next problem that will arise is the material itself.

About fifteen years ago the Alabama Department of Conservation, in response to many requests, decided to make a series of fish havens out of automobile bodies. Normally one would be led to believe that metallic car bodies would sink, but this was not the case. While some of the car bodies sank,many of them floated off in the next change of tide, and there were Fords, Cadillacs and Buicks found on the ocean floor from Sand Island Light to the Campeche Banks. For years the nights catch was measured in the number of Chevrolets and Plymouths that a commercial fisherman caught for that period. In addition to the fact that many of them floated off, the project was caught in rough weather and the barge load was jettisoned to keep afloat. Where some of this material went besides into the commercial fisherman's net, is a question that has yet to be answered. This type of an operation while it gave the sports fisherman some increase in fishing areas, left a taste in the commercial fisherman's mouth that has yet to be forgotten.

With the advent and development of submarine warfare, the Department of Defense has now entered into the program of fish havens. They have established a policy wherein the use of metallic materials is not permitted in the construction of fish havens. Considering the fact that these havens must have at least a moderate life expectancy, this policy limits the materials to masonry of one sort or another. At least we won't haveto put up with car bodies anymore!

At this point let us summarize the hypothetical fish haven to the present point of our discussion. We find that the administering agency has decided to build new structures rather than utilize existing bottom debris, it has been forced into masonry materials by the Navy, and is now trying to decide where to place them. There are a number of conditions that must be met in the selection of a site. These are mentioned as follows, but not in their relative importance:

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1. Accessability to the group which desires this particular fish haven installation.

A fish haven twenty miles at sea is of little use to the outboard motor group if this is the group that desires the installation, and for whose benefit it is intended.

2. Minimum interference with the commercial fishing effort.

This problem involves the multiple use theory of water acreage. It would seem ridiculous that with the entire Gulf of Mexico in front of us, that we would be concerned with a relatively small area of ocean floor, but the competition for every square mile is great. Certainly no one element should stake claim or franchise on any of these waters, but the common use of any of these areas must be continued.

3. Non-interference with navigation.

Commercial navigation of any description should not have to worry about the danger of running down fishing parties. Neither should they worry about the obstructions reaching above the bottom to the extent that they will constitute a possible navigational hazard.

4. Bottom-type

Generally speaking it has been found that the hard sand bottom is the best for the location of fish havens. Visibility remains good most of the time even at the bottom levels, and there is no danger of the havens silting over, or working into the bottoms.

5. Tidal Currents.

For the convenience of the fisherman, and the work of the investigators, the less tidal action the better. Boats can be maintained in position over the reefs, skin diving is not so difficult, and the lack of currents do not stir up bottom sediments which will reduce the underwater visibility to a minimum.

6. Weather exposure.

This is a safety factor for the fishermen using the reefs. Generally these people apparently have no idea of the danger involved in being exposed to sudden violent summer squalls that are continually working across the Gulf Coast.

Once the location has been determined, it is well for the administering agency to have clear agreement, preferably written, if possible, with all interests concerned with the fish haven. If not, sooner or later one of them will shout protests and denial of any understanding reached on the proposed and decided location. The administrator must realize that he is directly in the middle of a hexagon consisting of sports fishermen, commercial fishermen, U. S. Army Engineers, U. S. Coast Guard, Defense

Department and the local Chamber of Commerce. If anyone believes that this is an untenable position, let me assure you that it is, but eventually you will get used to it.

I personally have long been an advocate of getting the buoys in place before the reefs are constructed, then planting the material around the buoys. Temporary buoys designating locations of fish havens have a bad habit of floating away or disappearing altogether.

In addition to the time lost in relocating the reefs, should the temporary buoys disappear, the danger of commercial fishermen hanging their rigs on the new fish havens is a certainty. Moreover the administering agency will find itself in heated discussion over paying for these nets, boards and cables. It is a proven fact that every net and its boards and cables that is lost on these underwater obstructions is brand new, was being used for the first time and was 100 percent nylon with stainless steel cables and chain.

The process of moving the material to the area is one of extremes. It will either be done with 100 percent dispatch and efficiency, or it will end up with one misfortune or error compounding another. We have had the experience of going both routes.

The first time that Alabama planted the concrete culverts, it was arranged by the main office, 200 miles from the coast. The contract was let to a private towing company with no knowledge of the equipment involved, and the location was determined by a local charter boat operator.

The barge load of material arrived being towed by a completely inadequate tug, which promptly broke down. The tug and barge were towed to shelter and the tug returned home for repairs. When it finally showed up a week or so later and pulled the material into the Gulf it was so rough that the whole caravan returned to shelter and wandered off down the inland waterway.

One Sunday morning at 6:30 we received a phone call from the contractor that the tug and tow were underway and the load would be dumped at 8:00 A.M. This was taking place 100 land miles and 30 water miles away. By the time we arrived the load was dumped because of rough weather, the location buoy was carried away by accident and only the charter boat operator knew its location and his fathometer had just broken. To this day, three years later we have yet to find 200 tons of 6 foot culvert, 12 foot long.

The last time the reefs were built the Conservation Department handled the problem at the local level. The buoys were ordered in June, the delivery was promised within 60 days, and the reefs were built in September. The buoys finally arrived in January, 6 months later. In the meantime all checks of the reefs called for location by sextant and fathometer. This could not be done unless the weather and visibility was excellent which it is not during the winter months. During this time there were a few commercial nets hung on the underwater obstructions, but not as many as were feared. Most urgently we recommend the buoys first and the reefs second. Once notice of

these obstructions is posted in "Notice to Mariners" the responsibility of net hang-up is not the responsibility of the administrative agency.

When the administering agency finally has the buoys and reefs in place, they can now start to act as arbiter between commercial fishermen, sports fishermen and skin divers. Who has the right to use these reefs? The sports-fisherman says the skin diver gets too many fish, but all the skin divers in Alabama could not take as many fish in an afternoon as two party boats on a good trip. The skin diver says the hook and line fisherman crowds him off the reef with dangerous barbed hooks. With this I must agree for swimming in fish hooks does present problems. The commercial fisherman says they both get in the way, and the skin diver and sports fishermen agree for a change that 50 foot trawls dragged through their fishing hole does have an influence on their fishing effort. The commercial fisherman serves as a convenient, if erroneous alibi for the sports fisherman who cannot catch fish. It's obvious to the sports fisherman that when his best lure cannot get a fish, the commercial fisherman have just cleaned out the area. The Administrator is in the middle of this continual wrangle until finally he becomes somewhat cynical in his approach to the problem. There have been a number of solutions to this conundrum brought forward such as:

1. Destroy the buoys and lose the fish havens.
2. Let the arguing factions have another Battle of Mobile Bay and the winner take all.
3. Agree with everyone
4. Disagree with everyone.

Once fishing starts records should be kept for measuring success of the reef.

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GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
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"COMMERCIAL AND SPORT FISHERMEN CAN AND MUST LIVE TOGETHER"

Paul R. Kalman, Jr., President
Kalman, Rogers & Smith, Inc.
New Orleans, La.

Several years ago, the editors of McCall's magazine coined a popular new word called "togetherness".

"Togetherness" was designed to show that McCall's establishes closer family ties by providing reading material of interest to each individual family member.

Whether or not the magazine actually does this is a matter of conjecture. The fact remains that it has been a clever and highly successful promotional gimmick that has brought McCall's all sorts of publicity and praise.

Soon after McCall's came out with its "togetherness" slogan, The National Council of Churches adopted a similar phrase which was given nationwide play through highway billboard signs, transit advertising, and direct mail. I'm sure you're all familiar with the slogan: "The Family That Prays Together Stays Together."

Once again, the "Togetherness" theme was predominant.

The Methodist church also publishes a monthly magazine called "Together".

About two months ago, an Eastern Airlines DC-7 bound for Richmond, Virginia crashed on takeoff from Kennedy International Airport in New York. All 75 people aboard were killed, including several husbands flying with their wives and children. Shortly after this tragedy, the word started circulating in airline circles that Eastern was adopting a new motto: "The Family That Flies Together Dies Together."

Still another type of "togetherness" exists in the diplomatic field. Here, it's called "peaceful co-existence."

"Co-existence" operates on the idea that Western Alliance and Iron Curtain countries must find a peaceful way of living together if they are to avoid perishing in a cloud of atomic fission.

"Togetherness" and "peaceful co-existence" are different phrases that mean approximately the same thing. In either case, they apply toward a goal for which commercial and sport fishing interests should be working.

There are several valid reasons for making this observation.

To start off with, the fishing resource is presently being exploited as never before in history.

In my home state of Louisiana, the Wildlife and Fisheries Commission last year issued close to 200,000 sport fishing licenses, and more than 18,000 licenses to commercial fishermen.

Incidentally, the number of sport fishing licenses is a rock bottom estimate because licenses aren't required if the angler is under 16 years of age or over 60. Also, you only need to buy a license if you're going to fish with artificial bait or rod and reel.

The figures on license sales in the other Gulf states are equally impressive.

The amount of money involved in purchasing tackle, boats, nets, fuel, deck gear, and so on adds considerably to the overall fishing expenditure.

The Sport Fishing Institute - a national organization sponsored by the big fishing tackle manufacturers - claims that the average sportsman fishing in salt water spends not less than $100 per year on his hobby. Mind you...this is a minimum figure. I'd hazard the guess that along the Gulf coast, our sport fishermen often spend two or three times this amount of money.

The investment in commercial fishing is more difficult to estimate, simply because there are so many types of fishing, with each of them involving different gear, boats, etc.

The singular fact emerging from this statistical recitation is that fabulous sums of money are spent by both elements, and that hundreds of thousands of people are involved.

In numbers alone, the army of sport fishermen vastly outnumber their counterparts in commercial fishing by an approximate ratio of 10 to one.

I stress this point to impress you with the fact that members of the commercial fishing industry can no longer ignore the sport fisherman. They must take cognizance of the fact that sport fishing is a rapidly growing and highly potent force, and that it is playing an increasingly strong role in the overall fishing scene. This growth rate, incidentally, is quite faster than that of the commercial fishing industry. I do not mean that the latter is stagnating, but rather that it isn't expanding as rapidly.

The history of relationships between commercial and sport fishermen hasn't always been on the bright side. Indeed, it has more often been clouded with incessant charges, counter-charges, suspicions, distrust, and downright hatred.

Many sport fishermen stubbornly refuse to recognize the important contributions made by the commercial fishing industry toward the betterment of our nation's

economy. These same people will violently condemn the commercial fisherman one moment, and then turn around a minute later and feed their families on the fruits of the commercial fisherman's labors.

Commercial fishermen, on the other hand, complain that the sport fisherman often isn't a sportsman at all because he will catch more fish or shrimp than he could ever possibly need, while he disposes of the remainder by selling it to the fish market.

We had a typical situation of this kind in Louisiana a few years ago when so-called sportmen pulling 16-foot trawls were coming in with hundreds of pounds of shrimp. Most of them didn't have commercial fishing licenses and were still selling their catch in the open market.

Pompano fishermen have been particularly notorious for this type of violation. At the peak of the pompano season, an experienced fisherman should have no trouble boating 150-200 pompano weighing from two to four pounds apiece. He can then take these fish - with the entrails still intact - and sell them to our famous restaurants in the French Quarter for $1 or $1.25 a pound.

Red snapper fishermen have also been guilty of the same thing. I know of three men - all of them devoted sport fishermen - who went out to an oil rig off Pass a 'Loutre last October and loaded up with 3000 pounds of snappers. Their 22-foot boat was barely afloat when they checked into the dock at Venice and sold the catch, pocketing more than $300. True, the fish weren't wasted because they were bought by a commercial seafood dealer. But at the same time, the sport fishermen weren't licensed to fish commercially.

With this type of thing going on all the time, the commercial fisherman has a perfect right to be incensed at the sport fisherman.

Most of these arguments stem from the fact that the competing elements are literally fishing in the same pond. There is a fierce struggle for the resource, with each side claiming prior rights.

I won't hazard a guess as to who is right or who is wrong in this controversy. Both claimants have substantial and often legitimate arguments. Likewise, both sides have their discrepancies and deficiencies.

The one point both sides fail to recognize is that the other fellow has equal right to the resource. Marine fin fish and shell fish belong to the man who takesthe time and trouble to capture them provided, of course, that he complies with the proper legal requirements.

This kind of don't-give-an-inch philosophy always ends in stalemate. The opponents are like two buck deer fighting each other during the rutting season. They will lock horns and keep shoving each other back and forth until they die of exhaustion. Nobody wins, and both sides lose.

I spoke a few minutes ago of suspicion, distruct and hatred.

The latter point- hatred - is the result of the first two...suspicion and distrust. Conversely, lack of trust and suspicion generally result from ignorance.

When the other fellow is in the dark as to your true intentions, he will naturally worry about you. On the other hand, if you come forth and explain to him just who you are and what you intend doing, you immediately explode his suspicions and replace them with a feeling of trust and confidence.

To accomplish this, you need to establish avenues of communication.

As some of you may already know, I have had an opportunity to work in both the sport and commercial fishing camps. I therefore feel that I speak with some degree of authority when I say that proper communication is the Number One objective in achieving a just and lasting solution to the age-old battle between these historic adversaries.

How do we set up these communication channels? There are numerous ways and most of them are quite simple.

In the case of the menhaden industry, we have been working for the past 10 years to let sportsmen know that we share their desire to conserve the resource at the same time we are using it.

We have also concentrated on letting the sportsman know that menhaden fishermen seldom catch anything other than menhaden. We have tried to draw some parallel between cyclic conditions by explaining to the sportsman that lean years for sport fishing are usually lean years for menhaden fishing.

In doing this, we have enlisted the aid of our newspapers, radio and television stations. We have also invaded the sportsmen's own domain by participating in the affairs of their conservation organizations, taking part in their summer fishing tournaments, and assisting them in the conduct of their various and sundry projects.

In return, we have invited the sportsmen to view our own operations, to ride on our boats during the fishing season and see for themselves how the menhaden business really operates.

As I said, this program started about 10 years ago. At that time, the menhaden industry in the Gulf had done little or nothing to give the public an insight into its operations. Charter boat captains were making great sport of blaming their bad luck on the "pogy boats" instead of admitting to their clients that maybe the fish simply weren't hungry. I do not mean to imply that this charge is no longer levelled at the industry, because it is. However, such charges have been drastically reduced over the past 10 years and we are working constantly to cut them down still further.

Continuity is another key word to successful understanding.

You cannot make this a sometime project. It isn't a job of waiting for brushfire wars to break out, and then go about the business of extinguishing

them. You must prevent the wars from starting. Again, communication is the most effective preventive.

Time does not permit me to go into the intricate details, but to cover the broader aspects, I would recommend that every phase of the commercial fishing industry that isn't already doing it should undertake some kind of program to cultivate the sport fisherman's friendship. Take stock of your own operation and determine if you are doing anything that might give the sportsman a legitimate gripe. If you plan to ask the sportsman to come inside your house, you certainly want it to be clean and inviting. If your inspection of the premises discloses some shortcomings, clear them up before you extend the invitation. Don't be too proud to admit to yourself that you are not entirely perfect. You don't have to say this to anyone outside your own family, but at least be honest with yourself.

Dispose of any skeletons you might be hiding in the closet. They simply breed distrust. Open the closet door and let the sportsman examine the inside to see for himself that there is nothing to hide.

Then, to show the sportsman that it's a two-way street, you should seek to pay him a return visit. Join the sportsman's organizations in your home county or parish. They cannot do anything but welcome you. Also, don't be content to merely pay your dues. Attend the meetings, ask for appointments to the committees, serve as a delegate to their state conventions.

You will soon discover that by doing these things, the sportsman will not only stop distrusting you but also take you into his confidence. Instead of working for your destruction, he will seek to help you, just as you are helping him.

The clouds of hatred will rise and the entire fishing scene will bask in the sunshine of friendship.

This type of thinking sounds like pie in the sky but it's entirely realistic if you'll merely give it the chance to work.

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GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
The Admiral Semmes Hotel
March 18-19, 1965

"GULF FISHERIES STATISTICAL NEEDS"

George W. Snow, Supervisor,Region 2
Statistics & Market News-
Bureau of Commercial Fisheries
New Orleans, La.

Our Branch of Fishery Statistics has responsibility for supplying detailed information concerning the commercial fisheries to meet a variety of needs. We are, therefore, primarily a service unit with most of our requirements predicated upon the needs of "users" of our data. I think a brief description of our two major programs will aid in an understanding as to the extent of our data and the various uses for which they are collected.

We conduct an annual general canvass of all commercial fisheries within the coastal counties and parishes of each of the Gulf States. It provides statistics on the volume and value of catches by type of gear within specific waterbodies; employment in the fisheries and shore plant installations; the number of craft and quantity of gear used in each fishery; and the volume and value of processed fishery products.

These canvasses are national in scope, and since 1955 a complete general canvass has been accomplished for each of the eight regions into which the nation has been divided for our statistical reporting purposes. The eight regions are New England, Middle Atlantic, Chesapeake, South Atlantic, Gulf, Pacific, Great Lakes, and Mississippi River and tributaries. The phenomenal growth in importance of the Gulf area is well illustrated by these statistics. During 1950, landings at Gulf ports accounted for 12% of the total volume of domestic landings and 15% of the dockside value - by 1963, the volume of Gulf landings accounted for 29% of the national total and the value, 26% of the national total. The tremendous increase in landings during this 13-year period was in turn reflected in increased production of both the types and value of processed fishery products - value of these products during 1963 (based upon selling price at plants) was $174 million, three times greater than the $53 million value recorded during 1950. Incidentally, these annual statistics were major items used in the formula developed for determining the amount of funds to be allotted to the States under Public Law 88-309, or as it is commonly known, the Commercial Fisheries Research and Development Act. Ordinarily the data obtained in this general canvass best lends itself to long range economic and business planning and presents information with regards to the contribution of the fisheries to the national economy. The data are not, in most cases, sufficiently detailed to meet the needs of an intensive biological research program. During recent years we have had an increased number of requests for statistics on catch, fishermen, and gear operating within specific waterbodies all of which, as previously mentioned,

are collected as a part of the general canvass. The majority of these requests were in connection with river basin studies, and served to indicate the magnitude of commercial fishing which might be effected as a result of proposed man made changes in the estuarine environment.

The collection of detailed shrimp statistics, our other major program, was begun in 1955 as an integral part of an expanded shrimp research program brought about largely through the efforts of your commission. Prior to 1955 data on this most valuable species of the nation's commercial fisheries was quite limited. Annual statistics consisted of a one line entry showing only the total pounds and value of shrimp landed within each of the States. Some indication of the species and count size composition of landings at a few major ports was collected and published by the Branch of Market News - data at these ports were collected by part time employees known as contract reporters. Our present program, which provides information on the species and count size composition of all commercial shrimp landings within each State, areas of capture, and fishing effort, is generally recognized as the most comprehensive established for any major fishery.

The geographic area covered by this program, together with the tremendous volume of data collected, tabulated, and published is a costly operation. We are fortunate, however, that the nature of the data collected readily lends itself to a multi-purpose use that justifies the cost. Business and industry require accurate and current information on supplies, market conditions, and prices in order to make sound decisions with regards to short range operations. Using the detailed shrimp data originally collected for biological research purposes, our statistical agents at each of the major Gulf ports is able to compile a daily report which meets these business needs. The data are transmitted to our New Orleans Market News office, where they are incorporated in the daily Fishery Products report and mailed to over 1200 subscribers.

While both of our present programs were primarily designed to meet the needs of business-industry and biological research, they have proven equally effective in meeting other needs which have developed during recent years.

The "upgrading" of the Branch of Economics to Division status within the Bureau of Commercial Fisheries is evidence of increased emphasis in this field of activity. Our present programs provide most of the data necessary for short range economic analysis of major fisheries by the Division. Long range analysis will entail the use of additional data which we do not now collect - a few of such items which come to mind are capital investment in craft and processing plants, elements of production costs, etc. Some of these data will be supplied by other governmental agencies such as the 1963 Census of Fishery Operations conducted by the Bureau of Census which covered vessel operations. I am sure most of you who received this questionnaire can attest to the comprehensive nature of this survey.

In the field of international relations statistics have assumed an increasing importance. This is rather obvious, as you can certainly sit down at discussions with some degree of confidence when you have well documents facts

and figures at hand regarding the areas under discussion. In matters concerning territorial waters and high seas fisheries, it is essential that knowledge of specific areas where fishing is carried on be known, as well as the volume of catches taken from the specific areas. In recent studies along these lines our detailed shrimp statistics have provided invaluable information. We did not, however, have as accurate and detailed information available on the off-shore red snapper catches; we are attempting to correct this situation by having our agents at ports where snapper vessels regularly land interview as many vessel captains as time permits in order to determine specific areas of capture for their catches. In addition to more accurate data, this should enable us to follow more closely the shifting of fishing to new grounds such as the change from Campeche grounds to areas off the coast of Honduras which began early this year. Should the need arise, our continuous shrimp statistical program, with its attendant publications, will certainly serve as an important documentation in establishing our historic fishery rights off foreign coasts.

As mentioned by Mr. McGinnis during yesterday's program, efforts by the fishing industry advisory panel to the Coast Guard to obtain information on collisions, or near collisions resulting from inoperative warning devices on off-shore drilling platforms, were not at all successful. Our detailed shrimp statistics, however, furnished very specific information with regards to the number of trips and days fished in all Louisiana off-shore areas. This clearly depicted the shrimp vessel traffic in areas where changes were proposed and should aid in a determination as to whether the changes would be detrimental to shrimping interests. It is also most satisfying to us to learn of the use to which our statistics have been put by several firms in evaluating the market potential in the Gulf fisheries for such products as fishing gear and processing and packaging equipment. Neither of these uses of our statistics were envisioned when our program was originally developed.

The success and accuracy of most fishery statistical programs is dependent upon the cooperation from producers within the industry from whom data must be obtained. The excellent cooperation which we receive is evidence of industry confidence in our programs, and the realization that the data which they supply is needed and used, not merely collected for the sake of compiling a mass of statistics.

In conclusion, we feel that our present programs have proven adequate to meet nearly all statistical needs which have developed to date, and that the continuity of our present programs should be maintained. While it is recognized that a sound statistical program is costly, a lack of statistics can, in many instances, prove more costly.

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GULF STATES MARINE FISHERIES COMMISSION
Mobile, Alabama
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March 18-19, 1965

"INTERSTATE ROUTE PLANNING, MOBILE AREA"

Jack C. Mallory, Chief Marine Biologist
Alabama Marine Resources Laboratory
Dauphin Island, Ala.

Until the twentieth century most marine scientists were naturalists who recorded their observations on the sea and marine life mostly from field observations. During this century many marine scientists moved into the laboratory with their controlled experiments and became highly skilled technologists. While the quality of research improved with the new trend, the quality of the biologists suffered. Most of us became overwhelmed by the rapid growth of knowledge and in self defense became specialists in ever narrowing fields.

With the rapid expansion of our economy and population and the subsequent conflict between building programs and natural resources we are paying the price of our overspecialized interests by lack of communication between our various government agencies. It is very gratifying therefore to see a new spirit of cooperation and understanding beginning to arise between these agencies. The routing of Interstate Highway 10 across upper Mobile Bay is a fine example of this new trend toward better understanding.

In compliance with the Bureau of Public Roads Instructional Memo 25-5-63 (coordination of fish and wildlife interests) Mr. Claude D. Kelley, Director of the Alabama Department of Conservation, held a meeting in his office on March 11, 1963 to discuss the effect on fish and wildlife in the Mobile delta of the proposed highway 10. At that time he requested the Highway Department to furnish the Conservation Department with preliminary locations and layouts of I-10. Maps and plans of six proposed routes under consideration were sent to the Alabama Department of Conservation December 16, 1963.

On January 21, 1964 a meeting was held at the Alabama Division of Game and Fish Wardens Lodge on the Mobile Causeway. Representatives from the Alabama Highway Department, the Bureau of Roads, the U. S. Fish and Wildlife Service Division of River Basins, the Alabama Division of Game and Fish, the Alabama Division of Seafoods, and engineering consultants from Dixie Engineering Corporation attended and discussed the problems involved. This meeting resulted in narrowing the proposed routes to three possible choices. The federal and state conservation representatives then moved down to the Alabama Marine Resources Laboratory to further discuss the effects of the three routes of fish and wildlife.

Examination of the available data of commercial and sports hunting and fishing in the Mobile Bay and Delta showed this area to be high in economic importance.

(Mallory #2)

Values were estimated to be $18 million annually. The values were grouped as follows:

Sport fishing	$12 million
Sport hunting	$180 thousand
Commercial fishing	$6 million
Commercial fur	$20 thousand

The sport, hunting and fishing values were based on national use figures and represent a recreational-day use value. The commercial fish and fur values represent the net return to the commercial fisherman and trappers. These figures represent utilization of those forms harvested within the area and do not include the value of the existing nursery grounds vital to the production of shrimp and fish forms harvested outside of the Delta and Bay. As many researchers have recently pointed out these tidal marsh nursery grounds themselves are of great economic importance to seafood and sport fish production.

In a letter dated February 5, 1964 Mr. Claude Kelley pointed out the economic importance of the area to the Highway Department. Mr. Kelley further pointed out that if hydraulic fill construction were used provisions must be made for sufficient openings to allow an undisturbed circulation and exchange of waters within the Delta and Bay and that sediment from the pumping and dredging operations would have to be impounded to prevent the spread of sediment from damaging the existing resources within the Delta and Bay. He strongly recommended that trestle or total bridge construction be used.

If trestle construction were used the effects on existing fish and wildlife within the area would be minor. The primary effect would be the disturbance to waterfowl and the loss of hunting area. The two proposed routes north of U.S.Highway 90 would have a particularly significant effect. Based on a ten year period of record of the 9,600 acre area adjacent to and north of U. S. 90 that would be affected by I-10 furnished 30,000 waterfowl hunting days annually. If I-10 were to be constructed along this route 3,200 acres would be greatly disturbed and 1,700 acres partially disturbed with a consequent loss of 10,400 waterfowl hunting days annually. A conservative estimate of the cost of replacing this hunting loss by constructing leveed pools and water control structures to provide a combination of water level management and associated waterfowl food production would be $184,960 annually!

If trestle construction were used on the southern most proposed route 6,400 acres would be affected. This area over the past ten years has furnished 8,300 man-days of waterfowl hunting annually. The construction of I-10 along this route would affect 2,300 acres to a high degree and 500 acres to a lesser degree resulting in a probable loss of 2,875 man-days of waterfowl hunting annually. The replacement cost would run at least $88,542. The conservation interest therefore strongly recommended that the southern route be used.

After several subsequent meetings at which all factors were considered it was agreed that trestle construction would be used along the southern most route.

Without the close cooperation of the various interested parties and a clear understanding of the problems and considerations involved Alabama might have suffered the irreplaceable loss of a highly productive area.

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GULF STATES MARINE FISHERIES COMMISSION
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"FEDERAL FINANCING AVAILABLE TO THE FISHING INDUSTRY"

Billy F. Greer, Regional Fishery Loan Examiner
Bureau of Commercial Fisheries
St. Petersburg Beach, Florida

The Bureau of Commercial Fisheries administers three programs designed to assist the fishing industry in vessel financing. These are the Fisheries Loan Program, the Fishing Vessel Mortgage and Loan Insurance Program, and the recently activated Fishing Vessel Construction Differential Subsidy Program.

The first of these was established by the Fish and Wildlife Act of 1956 which authorizes the Secretary of the Interior to make direct loans to owners of fishing vessels and gear. Originally the Fisheries Loan Program was funded in the amount of $10 million but later was increased to $13 million. It is a revolving fund which must be returned to the U. S. Treasury on June 30, 1965. Since the authority expires this year, the Department has made an effort to obtain legislation to amend the Fish and Wildlife Act extending the life of the Fisheries Loan Fund to 1975. Senator Magnuson of the State of Washington introduced such a bill to Congress last month... This bill is known as S. 998.

Generally, loans from the Fund can be made to finance and refinance fishing operations, for maintenance and repair of fishing gear and vessels, for the purchase of fishing equipment, and for replacement of fishing gear and vessels which have been lost or have become obsolete. Loans are granted at 5% interest rates and have a maximum maturity of 10 years. In the South Atlantic and Gulf Region we have received 343 loan applications requesting $8.5 million. Of these, 130 were approved for $3 million. Presently there is about $6-1/2 million available for lending.

In 1958 all functions of the Maritime Administration which pertained to Federal Ship Mortgage insurance for fishing vessels were transferred to the Department of the Interior. Under the Mortgage Insurance Program the Government, under certain conditions, guarantees loans made by lenders for the construction of commercial fishing vessels. In order to qualify, the applicant must provide evidence of ability to operate the vessel successfully, that he has the ability to repay the loan out of earnings of the vessel, that the vessel is adequate collateral to secure the loan, and that the lender is capable of servicing the mortgage.

Mortgages to be insured must be made to secure a loan to assist in financing the construction of a fishing vessel by a builder submitting the lowest bid, involve a loan of not more than 75% of the cost of construction, and

have a maturity date not to exceed 15 years. The interest rate is set by the lender, which must be approved by the Department. Presently interest rates charged by the lenders throughout this region are 5% and 5-1/4%. The mortgage insurance premium charged by the Department costs 1%.

The Mortgage Insurance Program was launched in this region in 1961 and since that time we have received 44 applications requesting nearly $2 million.

As most of you know, the U.S. Fishing Fleet Improvement Act (P.L. 88-498) was passed by Congress and signed into law by the President on August 30, 1964. This program is in full operation at this time and five applications have already been submitted from this region. It is my understanding that some 20 applications have been received from New England fishermen and three applications have been received from the Northwest.

The program has been funded for the current fiscal year in the amount of $2-1/2 million. These funds should be used, or at least obligated, prior to June 30, 1965. If not, the appropriation will be returned to the Treasury. The Act authorizes a $10 million appropriation annually; however, only $5 million has been appropriated for the next fiscal year. Applications cannot be accepted under this law after June 30, 1969.

Let's take a look at the general eligibility requirements: The applicant must possess the:

1. Ability
2. Experience, and
3. Resources to operate the vessel successfully.

The vessel must:

1. Be of advanced design having advantages in utility and efficiency over a significant number of vessels engaged in the proposed fishery.

2. Be capable of fishing expanded areas....Those areas not usually fished by the majority of the fleet.

3. Be equipped with newly developed gear. That is, use the most modern gear available which is suited to the proposed fishery.

4. Not cause economic hardship to efficient vessel operators in the proposed fishery.

5. The vessel must land its catches at U.S. ports.

6. It must be documented under U.S. laws.

7. Employ only U.S.citizens or aliens legally domiciled in the United States.

The general processing of applications will be along the following lines:

1. The application is filed in Washington, and
2. If apparently eligible, it is sent to the Regional Office for investigation.
3. A Notice of Hearing is published in the Federal Register giving 30 days' notice. Anyone who feels that he would be economically injured by the construction of the vessel may petition to intervene at the hearing.
4. A Petition of Intervention must be filed 10 days prior to the hearing date and must contain:

    a. The authority to intervene,
    b. A statement of interest in the case, and
    c. Reasons showing economic hardship.

5. If a petition is filed, the applicant or his representative must be present at the hearing.
6. If no petition is filed, the applicant is not required to be present.
7. The Hearing Examiner files a report and a decision within 20 days after the hearing date.
8. The Secretary will render a final decision within 20 days after receipt of the hearing report.
9. Vessel plans then go to the Maritime Administration which takes about six weeks for review and approval.
10. A list of approved shipyards and invitations to bid are sent to the applicant. He then sends the invitations to bid to the listed shipyards and to other shipyards of his choice.
11. Bids are opened publicly by Maritime Administration on a specified date.
12. Maritime specialists estimate the construction costs of the proposed vessel on the basis of known costs of foreign shipyards.
13. The differential between the lowest responsible bid of a domestic shipbuilder and the estimated cost in a foreign shipyard establishes the amount of subsidy. The subsidy cannot exceed 50% of the cost of the vessel.
14. The applicant and shipyard then enter into a construction contract,
15. A contract for subsidy is executed by the Secretary, and
16. The subsidy payment is made at the delivery of the vessel.
17. Subsidy payments and financing through the Bureau's Mortgage Insurance Program may be a simultaneous transaction. We expect that most applications for subsidies will be accompanied by mortgage insurance applications, and this certainly appears to be a happy marraige. For example: Should you apply for subsidy payment on a vessel costing $100,000 and you, the fishery, and the vessel qualify for maximum subsidy, your payment would be $50,000. Then if you wanted to finance the remaining $50,000, the Bureau could help you finance $37,500, at simple interest rates and repayable in up to 15 years. Your down payment on the $100,000 vessel would be only $12,500.

The Vessel Subsidy Program is new and administrative procedures are still in the shake-down stages. For example, the regulations currently are being amended to provide two changes:

1. That no region may received more than 30% of the total funds available, and

2. That no applicant may apply for more than one subsidized vessel, except in years when there are surplus funds.

As we progress with this program, I feel sure that there will be other changes.

A supply of leaflets describing each of the financial assistance programs is here for your information.

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GULF STATES MARINE FISHERIES COMMISSION
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"RESULTS OF THE BUREAU OF COMMERCIAL FISHERIES RED-TIDE SYMPOSIUM"

James E. Sykes, Chief
East Gulf Estuarine Investigations
Bureau of Commercial Fisheries
St. Petersburg Beach, Florida

A Bureau of Commercial Fisheries Red-Tide Symposium was held in October 1964 at St. Petersburg Beach. There were several purposes in assembling scientists from pointsthroughout the United States to discuss the red-tide problem.

First, we had prepared an annotated bibliography through contract with Dr. Rounsefell and the University of Alabama which summarized results of the major research accomplished in this special field and in closely related disciplines. We felt that it was time to take a look at these specialized accomplishments, to determine the present rate of progress and to decide in the company of the best talent available the course which research should follow in the future. Admittedly, we have an illusive problem on our hands even though we know more about the demonical organism, Gymnodinium breve, than we know about most similar organisms. We do know about several physical and chemical limitations within which fish-killing concentrations can occur. One of the greatest headaches with which the researcher has to contend is the turmoil and anxiety created when a major outbreak occurs. The general public cries "do something," and the researcher might just as well receive an order to quell the thunder and lightning in the skies. A G. breve bloom in a pond or small lake could be stopped abruptly, but in a sea or bay area of several hundred square miles the researcher is not presently equipped to be immediately effective. I see this dilemma in the light of cancer research--where much is known, but where no one drug has yet been developed to put an end to it. We wish to be able to gain control overthis phenomenon, but we have to understand it much better than we do before we can talk seriously of control. One assuring thought is the fact that we see an almost insignificant damage to commercial fish populations resulting even from what may appear to be a massive fish kill. The minimal nature of damage was documented by a Tampa Bay study in 1963.

So, the first purpose of the Symposium was to tap the creative thinking of scientists from all over the United States, and to insure that our further research would not be wasteful or misguided. Our fellow researchers of the Florida Marine Laboratory were invited to present reports, discuss the subject, and benefit also from the collective thinking.

Another purpose of the Symposium was to bring the science of red-tide studies up-to-date. The last symposium was held in 1957, and many sharp biochemical and oceanographic minds have been honed since that time. Unfortunately but

inevitably, a scientist will be found attending these symposia who has been sitting quietly in a corner of some university experimenting with and learning all kinds of pertinent things but not communicating at all with his fellow scientists. Besides that, similar red-tide problems have developed in California and other parts of the globe which should have banded technical people together but which have not accomplished this to a significant degree. These were the major purposes of the Symposium.

Forty persons attended, and 12 specialists presented prepared talks--some on the work which they are presently doing, and some on the direction in which they think further research should go. Others presented talks spontaneously. Agencies represented were: Bureau of Sport Fisheries and Wildlife and Bureau of Commercial Fisheries of the U. S. Fish and Wildlife Service; Florida Board of Conservation; Gulf Coast Research Laboratory (Mississippi); U.S. Navy Department; St. Petersburg Junior College; Institute of Marine Science (Miami); Oceanographic Institute of Florida State University; Florida Atlantic University; U. S. Army Biological Laboratory; Haskins Laboratories (New York); Florida Presbyterian College; University of Alabama; Gulf Coast Shellfish Sanitation Research Center; and California State Fishery Laboratory.

Bob Ingle and his staff outlined research at the Florida Marine Laboratory, and we did the same for the Bureau of Commercial Fisheries Biological Station at St. Petersburg Beach.

Presently our major emphasis isupon inshore and offshore plankton succession studies in which the relation of all plankton and associated hydrology is investigated on a seasonal basis. We are also giving much attention to the automatic data processing of oceanographic and planktonic measurements made over a series of years in an attempt to define other subtle relationships not yet observed.

After hearing all the technical presentations and discussions of culture techniques, bacteria and vitamin analysis, etc., the group held a planning session and outlined eleven points needing attention in red-tide research. It was encouraging to learn that several suggested approaches were already under way at both Federal and State laboratories. The additional points can only be covered as facilities for accomplishing them are realized.

I shall comment briefly on four research objectives proposed at the Symposium, but rather than explore all of the technicalities I have elected to mimeograph them and place them at your disposal for future familiarization. The four which, in my opinion, are in need of the most immediate attention are:

1. Studies of the growth requirements of G. breve and related plankters under controlled conditions.

   a. Trace metals and growth factors (vitamins plus tannic, humic acid).

   b. Physical factors - temperature, light conditions.

c. Unique metabolic pathways.

d. Evaluation of biological potential of water.

2. Development of new techniques for identification and estimation of abundance of plankters by water coloration, etc.

a. Characterize the specific absorption spectrum in the field and laboratory.

b. Toxin levels.

c. Pigmentation.

3. Characterization of G. breve toxin and public health aspects.

a. Toxicity to biota.

4. Evaluation of potential control methods utilizing pilot studies.

In closing I would state this: It was generally agreed that one of the greatest obstacles to red-tide research in the past has been meager and "stop-and-go" financing. The problem has many diverse complications. The only hope of solving it is through steady financing and unified effort on the part of specialized talent in ecology, taxonomy, physiology, hydrography and chemistry.

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"FISHING GEAR RESEARCH IN THE GULF AND NEW DEVELOPMENTS WITH ELECTRIC SHRIMP TRAWLING"

Norman L. Pease, Chief
Gulf Gear Research Station- Bureau of Commercial Fisheries
Panama City, Fla.

To preface my comments on the recent developments and progress in the electric shrimp trawl project I think it would first be appropriate to make a few remarks on the early developmental phases of this project. In 1961, the Bureau of Commercial Fisheries, Gear Research Station, which is now located in Panama City, Florida, initiated a research project directed toward the development of an electrical shrimp trawl. This was selected for two reasons:

(1) It was recognized that the Gulf of Mexico shrimp fishery is concerned to a large degree with two species of nocturnal shrimp; the pink and brown. It was also recognized that if a practical technique could be developed for harvesting these shrimp when they are burrowed during the daytime, it would enable the shrimp fleet to operate on a 24 hour basis.

(2) It was acknowledged that, although considerable research had been carried out in recent years on the effect electricity had on various marine animals, only a small percent of that effort had been directed toward shrimp; and as far as could be determined no effort was made towards the commercial adaptation of this approach.

Preliminary laboratory experiments using an electrical stimulus demonstrated that an electrical field of relatively low energy would stimulate shrimp from their burrows into the water. Following these experiments future developmental work was programmed into 5 phases of research (1) natural behavior, (2) shrimp response to electrical stimulation, (3) electrode array and pulse generator design, (4) trawl design, and (5) field testing of prototype equipment. Because of their availability in the Panama City area pink shrimp were selected for experimentation in this project.

Results of the natural behavior studies confirmed that under most conditions pink shrimp burrow during daylight and deburrow after sunset. This was demonstrated to be at least partially, a survival technique, because during experiments when shrimp were exposed to free-swimming fish during daylight hours they were rapidly pursued, captured, and consumed. The experiments also indicated that nocturnal activities of shrimp are variable, dependent apparently on the physical conditions of their immediate environment. The activity of the shrimp after sunset appeared to be directly related to the amount of

light, or degree of visibility, in the area inhabited by the shrimp. This of course introduces additional variables such as water clarity, cloud cover, moon phase, etc. Some observations made during daylight on a soft-mud bottom indicated that varying percentages of shrimp were active, presumably because the degree of turbidity restricted the light penetration.

Another factor found to influence the burrowing habits of shrimp was the water temperature. Below 68°F. normal activity patterns became modified, and below 57°F. shrimp displayed a strong tendency to remain burrowed regardless of the light level. An additional factor found to influence the burrowing habits of shrimp was its orientation to current velocities. It was found that orientation is fairly random when bottom currents are below approximately 0.4 knot, but when bottom currents are above this figure shrimp were found to orient themselves facing the current.

During electrical experiments shrimp were found to elicit an involuntary muscular contraction of sufficient strength to force them from the substrate into the water column when subjected to a pulsed direct current. Low voltages of electricity when pulsed from 3 to 4 times per second were generally adequate. Two observations were made at this time, one of which was of more immediate concern. These were that shrimp which were oriented perpendicular to the electrodes responded to lower voltages than shrimp which were parallel to the electrodes. Of secondary importance, was that large shrimp responded to lower voltages than small shrimp.

On the basis of the results of these experiments, tests were conducted to determine a reasonable estimate of specifications for a pulse generator and an electrode array. The purpose of the electrode array is to distribute an adequate amount of electrical energy into and immediately above the substrate for a sufficient length of time to stimulate effectively the shrimp encountered. The optimum electrical field would cover the width of the trawl, be as long as necessary to provide a sufficient number of pulses at normal towing speeds, and provide adequate electrical energy throughout its area. Two array configurations were tested, one utilizing longitudinal electrodes and the other transverse electrodes. The longitudinal array was initially selected because it was reasoned that this arrangement would be less likely to become snagged on bottom obstructions. These presumed advantages however, became heavily outweighed by the problems encountered in handling this array at sea. In addition, power conservation features of the transverse design helped influence the decision to change. Therefore the transverse array has since been adopted. The electrode array consists of 3 uninsulated No. 14 and 3 insulated No. 18 copper wires inserted as a core in a 3/4 inch braided polypropylene rope. This is arranged in 4 equal lengths, approximately 2 feet apart, immediately in front of the foot-rope.

Early developmental work on the electrical gear utilized surface supplied power to the array. This had experimental advantages in that certain electrical parameters could be monitored and regulated during operation. However, the operational advantages of eliminating the electrical conductor between the vessel and gear dictated the design of battery powered equipment for

application in the fishing fleet. The necessary design parameters were approximated and supplied to interested commercial firms for hardware design and manufacture. The results offered by the Sea Technology Corporation of Sarasota, Florida were selected for experimentation. Sea Technology has since become a part of the Underwater Division of Westinghouse Electric Company. The unit devised by this company consists of a pulse generator and nickel cadmium battery encased in a water tight, 6 inch polyvinal chloride tube and is secured to the outside of one of the trawl doors. The wire for the array leads from the generator and is secured in its configuration immediately ahead of the net. The battery, when operated at a rate of 3 pulses per second, will provide power for approximately 12 hours. At the end of that time the weak battery is easily removed for recharging in a deck charging unit and a spare battery, also good for 12 hours, is placed in service.

A standard 40 foot Gulf of Mexico shrimp trawl was used initially with the electrical components. However, we felt that more efficient results could be obtained if a net was designed specifically to accommodate an electrode array. After several modifications this was accomplished. The most unique aspect of the net currently in use is a large overhang of the top section. This adequately covers the approximate 8 feet of array and is designed to prevent vertical escapement of the shrimp. To minimize the lifting effect of the trawl caused by the large overhang the wings were tapered along the bottom edge rather than along the top.

During field tests comparative catch results were made by always towing a standard or non-electric trawl, of equal size, simultaneously with the electric trawl. It was imperative to determine the daytime catch rate of the electric trawl; but this only became meaningful when it was compared with the night catch rate of a standard non-electric trawl fished in the same area. To determine this it became standard practice to make 3 or 4 night drags to establish a normal catch rate for an area, and then to work the same area the following day and compare results. This procedure was continued for the entire cruise. The catch efficiency of this gear has been tabulated up to and including the most recent cruise which was completed two weeks ago. Preliminary figures for work conducted on soft mud indicates that the electrical gear will produce up to 70-90 percent of the available shrimp during daylight based on the night catches of the standard trawl.

It was observed during the early testing of the electric trawl that rather erratic results were obtained while dragging on a sand-mud bottom. The significance of this was temporarily overlooked because most dragging at this time was being done on soft-mud bottom in the northern Gulf. A cruise to Tortugas last November, where all shrimping is conducted on sand-mud bottom, dramatically reinforced the earlier observations. Catch results of the electric trawl made during daylight produced an average of 25 to 50 percent of the night standard or non-electric trawl average. However, night electric trawl catches produced as high as 110 to 150 percent of the night standard average. The reasons for this wide disparity have not been definitely ascertained at this time but several behavioral reactions

which were observed by SCUBA divers during daylight could be contributing factors. They observed that when stimulated, the shrimp sometimes turned on their sides and swimming laterally, tried to reburrow and thus apparently escaped under the footrope. This was contrary to the usual response of swimming vertically up into the water column when stimulated. Because of the clarity of the water in this location it is possible that this reaction was due to the relatively high light level. If this is confirmed it would substantiate the results of the controlled light response experiments conducted in the laboratory which I mentioned earlier.

Another reaction observed by SCUBA divers was the apparently excessive amount of time necessary to deburrow some of the shrimp from the sand-mud bottom, using the same amount of electrical current which was used on soft-mud. Experiments conducted in the field indicated that it took approximately 5 seconds from the beginning of stimulation until shrimp emerged from the substrate. Using an average towing speed of 2.5 knots, calculations indicate that 18.5 feet of ground would be covered during a 5 second period. As our electrical array covers an area approximately 8 feet ahead of the footrope it appears that the array is probably over and past many shrimp before they have been sufficiently stimulated. At this time we do not have any solution to this problem. Should we make the electrical array 18.5 feet instead of its present 8 feet? This might make a cumbersome, awkward piece of gear to handle, because the size of our power supply would have to be immeasurably increased. Should we increase the voltage or the pulse rate? Earlier laboratory work had indicated our present power and pulse rate to be the most efficient.

We have scheduled a cruise to Tortugas next month to take a fresh look at the problems and to explore every approach. We will be using underwater TV and underwater photography to document as precise as possible all information which we hope may ultimately help solve our problem.

Several months ago it was decided to experiment with an electric trawl in the 200 fathom range of the royal-red shrimp grounds. Accordingly a pulse generator and a battery were ordered with a housing capable of withstanding the pressures found at that depth. When this was received a portion of an Oregon cruise was scheduled for preliminary trials of this gear in the royal-red shrimp grounds off St. Augustine, Florida. As I mentioned earlier, when testing and comparing the electric trawl in the pink shrimp grounds it was always customary to drag a non-electric trawl from one outrigger and the electric trawl from the other outrigger. Physical and mechanical conditions prohibited the dragging of two trawls simultaneously in the Gulf Stream; therefore, separate drags had to be made for each trawl. To duplicate each of these as nearly as possible, accurate positioning was obtained using LORAN and echo-sounding machines that enabled the consecutive drags be made over the same bottom. Also the amount of towing warp was kept constant and the towing periods were equal.

Twenty-three drags were completed during this trial. The primary objectives were to determine whether the electrical components functioned normally and whether the gear presented any unusual handling problems. The catch results from the relatively few number of drags were generally inconclusive although the largest individual catch of 94 pounds, for a two hour tow, was made in the electric net. The total catch from both types of trawls however, was nearly identical. One preliminary result worth noting was that while the catches of the non-electric trawl were equally divided by weight between shrimp and trash the catches of the electric trawl had only half the weight of trash as they had shrimp. Through the results obtained during this cruise procedures were effected which will allow a continuing program to fully evaluate the effectiveness of the electric gear in this fishery.

I was also asked to comment on projects which the Gear Development Program could undertake in the immediate future. In this regard one of our main problems in Gear Research when starting a new project has been the difficulty in obtaining "off the shelf" instruments or tools capable of being used in our work. I would like to quote a portion of an editorial from the February 1965 issue of the publication UNDERSEA TECHNOLOGY. It is as follows: --- "we must extend man's ability to measure by providing new instruments and the required supporting equipment that will operate----with uniformity and reliability. Far too many of today's oceanographic instruments are a disgrace to our design and manufacturing ingenuity. Too many require special attention, and too few oceanographers trust their instrumentation. The net result is that oceanographers spend more time developing and modifying instruments than they do in carrying out their job." This editorial was directed toward instrument manufacturing companies and in some respects is generalizing, but in our case some of the funds which are needed for research itself have to be diverted to defray the cost of developing instruments for our work. One approach we are trying to circumvent this situation is to adapt existing tools and instruments, wherever possible, to further our research in developing new techniques for the commercial fishing industry. Some examples of this which I will briefly discuss are as follows:

The first project we have called a "Captive Aerial Observation Platform For Spotting Surface Schoolfish". There is a familiar sight most of us have seen on television during post season football bowl games. This is a view of a helium-filled blimp slowly circling over a football stadium. Then a switch is thrown, and you see the stadium on your TV screen as it looks from the blimp 1000 feet in the air. At times the camera will be slowly panned around to show the surrounding city, then it might return to the stadium and ZOOM in on a baton-twirling majorette. With some modifications, this basically is what we mean by an aerial observation platform, and with it we propose to demonstrate its use for spotting surface schoolfish.

Surface surveillance for schoolfish from low-flying aircraft is not uncommon in some of Purse Seine and Live Bait fisheries in the United States. At the Bureau's Gear Research Station in Panama City some preliminary studies have been made to determine the feasibility of adapting a captive aerial observation platform for this purpose. These studies are the result of an idea

conceived early in 1962. An air or helium filled balloon or flex-wing device would be fitted out with a bottom gondola which would contain a TV camera fitted with a omni-directional antennae and controlled by a microwave transmitter from a fishing vessel. The gondola would provide 360° vision and the TV camera, in addition to having a ZOOM lens, would be equipped to tilt through 90° and to rotate 360°. A TV monitor would be installed aboard the controlling vessel. Through transmitter control from this center the TV camera could be rotated and the lens could be ZOOMED in for close observations of fish schools. The complete unit will be secured to the fishing vessel with enough synthetic line to enable the camera to reach an altitude of 1000 feet.

Funds for preliminary studies were provided this year. This has enabled us to make an initial survey of available hardware which would fill the requirements outlined. At the present time there are three manufacturers with various types of platform devices which are being evaluated before a final selection is made. The most suitable electronic equipment has already been determined.

A second project we propose is called the "Sea Floor Reconnaissance Project". One of the continuing problems in the commercial fishing of demersal marine life is determining whether bottom conditions are favorable for dragging. The next question is whether or not marine animals such as shrimp, fish, scallops, etc. are present in the area. In the first instance the fisherman is assuming that he will be able to retrieve his gear intact so that he will be able to continue fishing and in the second he hopes that he will have a good catch. In both instances he is gambling with from five to seven hundred dollars worth of fishing gear and considerable amounts of both his and his vessels time. In the near future we hope that we will be able to remove some of the guess work out of the fisherman's life.

Electronic echo-sounding machines are being used with more and more skill by today's fisherman, however in recent years there has come into existence high resolution sonars with capabilities far beyond anything being used by the commercial industry today. The reason they have not been adopted by the industry is due to the complexity of the equipment and the high acquisition costs. There are no indications today to assume that these reasons won't be valid for a long time to come.

As in aerial photography, the sea floor reconnaissance program will make use of a "family" of highly specialized vehicles and instruments. We propose a project which will incorporate the use of a high resolution SONAR along with underwater TV and underwater photography to effect a bottom reconnaissance of coastal waters which will provide information and enable the preparation of a detailed chart of bottom configuration and to delineate areas of commercial marine animal populations. SONAR units are now available commercially in a unit which can be towed behind a vessel and is connected by an armored cable to a readout unit on the vessel. The SONAR is capable of covering a half-mile track of the sea floor from a position 225 feet above the bottom, at a speed of 4 knots. With the use of sound houses the

vessels position can be maintained by triangulation. The resolution is dependent on the height of the SONAR above the bottom but can be determined from 3 inches to 5 feet. Using underwater TV in conjunction with SONAR, bottom conditions can be observed continuously aboard the vessel, and whenever it would appear to be advantageous to obtain more detailed information in any given area the underwater photographic vehicle can be utilized to obtain movie footage. The underwater photographic vehicle which will be used for this work is an unmanned, remote controlled unit, capable of being towed at speeds up to 15 knots.

We anticipate the results obtained using the methods described here would provide sufficient data in such detail that an entirely new concept of coastal charts could be produced, designed specifically for the commercial fisherman. These charts in addition to pinpointing underwater obstructions will indicate their height and shape. Through the use of high frequency pingers a simultaneous record of the bottom type will be obtained. This information will also be included on the charts.

The long range objectives of this project would be beyond the scope or function of the Gear Research Unit. We propose, however, that they acquire the hardware, establish methods and procedures for handling the equipment, then turn the project over to the Exploratory Fishing Staff for the actual mapping operations.

The next two projects we are proposing take us away from the "off the shelf" area, but because of their uniqueness and potential it seems appropriate to mention them at this time. Both of these projects involve the use of underwater sound, one using low frequency, and the other high frequency. The principle that we intend to apply is called audio-genic seizure. This has been described as a disturbance in behavior consisting of a set of psychomotor reactions which may be induced in animals by an acoustic stimulus of relatively high intensity.

The first of these projects we call the "Sonic Fish Stunner". The objectives of this study will be to determine whether sonic equipment which produces low-frequency sound can be used to stun either food fish or industrial fish, and whether such equipment could be used to increase gear efficiency. Motion picture studies and SCUBA diver observations have indicated that fish trawls do not retain all the fish which enter them. Fish have been observed maintaining a position in the mouth of the net, and then for no apparent reason increasing their speed and escaping. Underwater high-powered communication systems as well as underwater blasts which yield low-frequency sound are known to produce audiogenic seizure in several species of marine life. Consequently it is possible that the efficiency of fish trawling gear could be improved if sonic impulses that stun and immobilize fish are emitted in a net at regular intervals, thus capturing those fish which would normally escape.

The last proposal is the application of the audiogenic seizure principle to shrimp with the intention of translating this principle into gear which could be used on what is now considered to be untrawlable bottom. This would

involve the use of pulsed, high-frequency sound to stimulate shrimp out of the bottom, and to be used in conjunction with a net which is designed to function on the midwater trawl principle. In this case however, it will be regulated to work close to the bottom, but above bottom obstacles. Initial laboratory and field work will be necessary to determine desirable response parameters. When this has been completed efforts will be directed toward the design and development of a compact, self-powered unit which can be attached to the headrope of a trawl.

If this gear performs successfully, it is expected to open up thousands of square miles of coastal waters to United States fishermen.

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