A LONG RANGE PLAN

for the

Mississippi-Alabama Sea Grant Consortium
A SEA GRANT COLLEGE

1984

Mississippi-Alabama
Sea Grant Consortium

MASGP-84-017

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A LONG RANGE PLAN

for the

MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM:

A programmatic evaluation including History,

Organization, Goals, Objectives and Expectations

1984

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I. Preface

A. The Present Program

The Mississippi-Alabama Sea Grant program has evolved from a modest beginning as a narrowly-focused single-state coherent area project to the presently broad-based coherent and balanced bi-state multi-institutional sea grant college program. The maturation process has been enhanced by strong leadership that willingly accepts the criticism and advice of site review teams, a Planning and Advisory Panel, a Program Coordinating Team and most importantly, its local and regional constituency.

As the program has grown and strengthened, it has gained recognition for its innovative advisory service and education programs and its relevant marine and coastal research activities. Program growth and reputation can be attributed, in part, to the ready willingness and ability to respond to local, state, regional and national concerns and problems in a timely manner.

A measure of the success of the program can be seen in the favorable reactions from the region. This is partially evidenced through cooperative agreements, projects, consultation and liaison with such organizations as the National Environmental Satelite Service, The National Marine Fisheries Service, The Naval Ocean Research and Development Activity, The U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service in the Public Sector and Continental Shelf Associates, and The Gulf and South Atlantic Fisheries Developement Foundation in the Private Sector.

As the program has gained momentum and stature, its institutional support base has noticeably increased. This is evident in the strong fiscal and administrative support being offered by the Chief Executives of the nine member institutions coupled with encouragement by those officials for a high level of participation by their faculties in Sea Grant undertakings. The Chief Executives have also insured that their designees to the Mississippi-Alabama Sea Grant Consortium Board of Directors take a very active role in Consortium policy making while functioning as the campus points of contact for Sea Grant. In the latter capacity, the Board members strive to insure the relevance and quality of Sea Grant work on their respective campuses. Along with this commitment from the highest institutional levels, dynamic program leadership has created a broadly based community of research expertise anxious and willing to undertake relevant marine and coastal research in response to identified, high priority local, regional and national problems. In the current program, multi-institutional, multi-disciplinary research is being conducted in a number of projects.

B. Approach: 1985

In the 1985 Mississippi-Alabama Sea Grant College program a number of steps have been taken to solidify the program and to strengthen the existing foundation for future development.

In the recent past a large portion of the overall program has been devoted to assessing the marine and coastal resources of the region through a multi-disciplinary group of projects. This undertaking was embarked upon at the recommendation of the Planning and Advisory Panel six years ago. As these assessment projects neared completion, a longer range plan was prepared which is routinely updated in response to identified needs and priorities. The long

range plan provides the basis for annual plans which explain the program concept, themes, objectives and probable opportunities for the coming year.

The current program themes are directed at resources, energy, and education. The resource theme is directed at living resources, inpact on the resources, and by products of the resources. In the energy theme research is directed at alternate fuels for the fishing fleet and drag reduction of the hulls. Our educational efforts continue to be directed at students with emphasis on minorities and competitive fellowships.

The 1985 program elements respond to the perceived and identified needs of the region while more precisely programming efforts to resolve clearly defined problems as defined by the Planning and Advisory Panel. As in past years, the rigorous review process for all proposals continues in place.

The Mississippi and Alabama Sea Grant Advisory Services continues to function as the eyes, ears and information delivery mechanism of our program. A marked expansion in staffs of the Advisory Services provides a broader base of expertise capable of responding to the diverse needs of the two states.

Program administration, planning, development and communication activities are shared responsibilities of the Director and his staff. The Director, Dr. James I. Jones provides leadership and coordination to the Consortium according to the policies established by the Board of Directors. He has the authority and responsibility for overall supervision of the affairs of the Consortium within those policies, and has the ultimate responsibility for the growth and direction of the varied components within the Consortium's range of activities, as well as for programmatic and staffing decisions. The Director shares responsibilities concerning program planning development, project initiation and rapid response components with his Associate Director for Programs, Dr. Stanley Hecker. They periodically visit each of the nine member-institutions to explain the Sea Grant program and its concepts, to seek out new expertise with which to broaden the scope of the program, and confer with institutional administrative leadership. Additionally, they work closely with the Planning and Advisory Panel and Program Coordination Team to insure that opportunities within the purview of Sea Grant are quickly recognized and made known to the Sea Grant community. They are assisted in monitoring ongoing projects by Mr. Max Flandorfer, the Program Manager who is also the coordinator of the Comprehensive Sampling Program. Mr. Flandorfer visits each current investigator quarterly to keep the Director informed of the progress of the individual projects and to forestall or resolve any problems. Program administration is conducted by Ms. Dianne Jones, the Assistant Director for Administration, who is ably assisted by the administrative staff which is headed by Mrs. Nancy Marcellus. Additional professional staff include Mrs. Sharon Walker, the Education Specialist and Mrs. Linda Skupien, the Communicator.

C. Special Features of the Program

Among the special features of the current Mississippi-Alabama Sea Grant program are the cooperative agreements with other organizations, the extremely cost effective comprehensive sampling program, the fellowship program, and the Coastal Information Management System.

The use of cooperative agreements has permitted broadening of the scope and magnitude of the MASGC program. The following projects are either in progress, recently completed or planned and awaiting initiation:

In cooperation with the Naval Ocean Research and Development Activity, an investigation was conducted into the actual location of bridge rubble from the Dauphin Island bridge which had been destroyed during hurricane Frederick. The rubble was a serious hazard to the highly productive Mobile Bay shrimp fishery. Loran C positions of the major sites have been published and detailed charts of the sites are in preparation. This "hang log" along with similar logs from Florida, Louisiana, Mississippi and Texas are being incorporated into a single computerized log covering the entire Gulf Coast.

In cooperation with the Mobile District of the U.S. Army Corps of Engineers, a comprehensive study of Apalachicola Bay and vicinity is currently in progress. This investigation is entitled "Hydrodynamic and Water Quality Modeling and Bathymetry and Sediment Characterization of Apalachicola Bay and Adjacent Waters." Included in this study is the delineation of oyster reefs and sea-grass beds in the Bay.

In cooperation with the National Marine Fisheries Service and the Gulf and South Atlantic Fisheries Development Foundation a project was recently completed which categorized shrimp boat fuel consumption patterns. This led to recommended practices to conserve fuel.

In cooperation with the National Marine Fisheries Service a proposal now pending will examine the feasibility, ramifications, and implications of constructing and siting artificial fishing reefs, including abandoned offshore oil rigs, in the Gulf of Mexico.

In cooperation with the Southeast Fisheries Center of the National Marine Fisheries Service, a fellowship program for faculty and students the intent of which is to encourage women and minorities to undertake research in the marine sciences was implemented and is in progress. Mississippi-Alabama Sea Grant Consortium awarded fellowhips to the Sea Grant programs in Mississippi-Alabama, Florida, Georgia, South Carolina, North Carolina, Louisiana, Texas and Puerto Rico.

The Comprehensive Sampling Program was initiated as an extremely cost effective means of insuring the quality and quantity of data necessary to support the many projects that require field data. It was determined that a single properly equipped organization experienced in the diverse types of field data collection necessary to support a variety of marine related research could provide the data more economically than the investigators individually collecting data for their respective projects. The single operator is under the management control and coordination of the MASGC Director and is responsible for sampling in exact accordance with data specifications established by each of the principal investigators whose projects are involved. The use of this concept has allowed the MASGC Director to realize impressive savings in equipment, personnel, and ship time with a concomitant increase in data acquisition.

A concomitant benefit is the transfer of the sampling technology, from the collecting contractor to the investigators and students on the individual projects.

Included in the management proposal this year is the Coastal Information Management System (CIMS). The system now under development integrates management, bibliographic and basic scientific information of the coastal area into a single computerized system. The system will be accessable by the Sea Grant advisory services, educators, researchers and managers.

James I. Jones, Ph.D.
October 6, 1984

II. Introduction

A. Historical Background

The State of Mississippi established the Universities Marine Center in June 1969 as the mechanism for optimizing utilization of ocean related research and education resources of participating institutions of higher learning. This center was the initial step in the development of a Mississippi Sea Grant Consortium. Similarities of terrain, hydrography, population, coastal industry, and common sociological heritage of the region suggested that a bi-state Sea Grant program be developed. This program could draw upon resources of both states and would be directed at solving problems common to them. Accordingly, in early 1972 several higher education institutions in the State of Alabama, through their Marine Environmental Sciences Consortium, joined with the Mississippi Sea Grant Consortium. In June 1972 this group was designated the first bi-state Sea Grant Program in the nation. This action initiated the Mississippi-Alabama Sea Grant Consortium.

The fundamental guiding principle of the MASGC is to foster the efficient utilization and management of coastal and marine resources while improving the overall quality of life in the region. The success of the Consortium is evidence of a significant degree of attainment of this goal.

In recognition of the development of a soundly based and evenly balanced program of research, education, and advisory service, the National Sea Grant College Program Office awarded program institutional status to the Consortium in 1979. The MASGC Director continued to provide strong and effective leadership to the bi-state program. This, coupled with an enhanced organizational structure supported academically and fiscally by the Chief Executives of the member institutions, has supported a greatly broadened array of program activities.

In 1982 Secrectary of Commerce Malcolm Baldrige acknowledged the continued excellence in research, education and public services attained by the MASGC by designating it a National Sea Grant College. This level of excellence is maintained or improved with each successive annual program.

Overall excellence continues to be the major programmatic goal of the Consortium administration. This is being accomplished with the comprehensive support of the Chief Executive officers of the member institutions.

The achievement of a high quality of research, education, and public service has received additional recognition from a variety of organizations in both the public and private sectors. The esteem with which these organizations view the MASGC has been expressed by the willing execution of memoranda of understanding and cooperative agreements. At this time documents of this type have been endorsed by the Naval Ocean Research and Development Activity, the National Environmental Satellite Service, the U. S. Fish and Wildlife Service, the National Marine Fisheries Service, and the U. S. Army Corps of Engineers in the public sector.

Copies of these documents are included in the Addendum.

B. Organization

Organization of the Mississippi-Alabama Sea Grant Consortium is unique in the National Sea Grant College Program in that it consists of nine member institutions in two states. It encompasses an area of nearly one hundred thousand square miles. Figure 1 indicates the location of the consortium member institutions.

Recognizing the potential for such a broadly structured organization to become unwieldy, the Chief Executive Officers of the nine member institutions ratified a comprehensive set of Articles of Organization and By Laws for the MASGC. These documents established a Board of Directors to whom the Sea Grant Director is responsible. The Board is composed of the nine member institution's Chief Executives or their designated representatives, and is the policy setting authority for the MASGC. Figure 2 is a diagram of this organization and table 1 lists the current members of the Board of Directors.

The Articles of Organization and By Laws are included in the Addendum.

As the program gained momentum and stature, its institutional support base has noticeably increased. This is evidenced in the strong fiscal and administrative support being offered by the Chief Executives of the member institutions coupled with their encouragement for a high level of participation by their faculties in Sea Grant undertakings. The Chief Executives have also insured that their designees to the Mississippi-Alabama Sea Grant Consortium Board of Directors take an active role in Consortium policy-making while functioning as the campus points of contact for Sea Grant activities. In the latter capacity, the Board members strive to insure the relevance and quality of Sea Grant work on their respective campuses.

The Board of Directors has demonstrated its ability to function efficiently and effectively through such actions as its timely response to recommendations from the National Sea Grant Director for enhancement of the program. It also provides the policy guidance which affords the Program Director the flexibility to develop and administer a program of broadening scope and interests essential to a Sea Grant College.

The by-laws of the MASGC charge the Director with providing leadership and coordination to the Consortium according to the policies established by the Board of Directors. They also give the Director the authority and responsibility for overall supervision of the affairs of the Consortium according to those policies. In combination, the by-laws and the Board of Directors have thus permitted the Director to exercise a dynamic leadership role in administering and developing increasingly strengthened and academically excellent programs.

In carrying out this mandate from the Board, the Director, Dr. James I. Jones, has formed an administrative and operational organization that is depicted in figure 3. In that organization, he is assisted by Dr. Stanley Hecker, the Associate Director for Programs, in matters relating to program development and coordination; by Ms. Dianne Jones, the Assistant Director for Administration, in fiscal and administrative matters; by Mr. Max Flandorfer, the Program Manager, in field studies coordination; by Mrs. Sharon Walker, the Education Specialist, Mrs. Linda Skupien, the Communicator, by Mrs. Nancy Marcellus, the Administrative Assistant; and by the Administrative Staff.

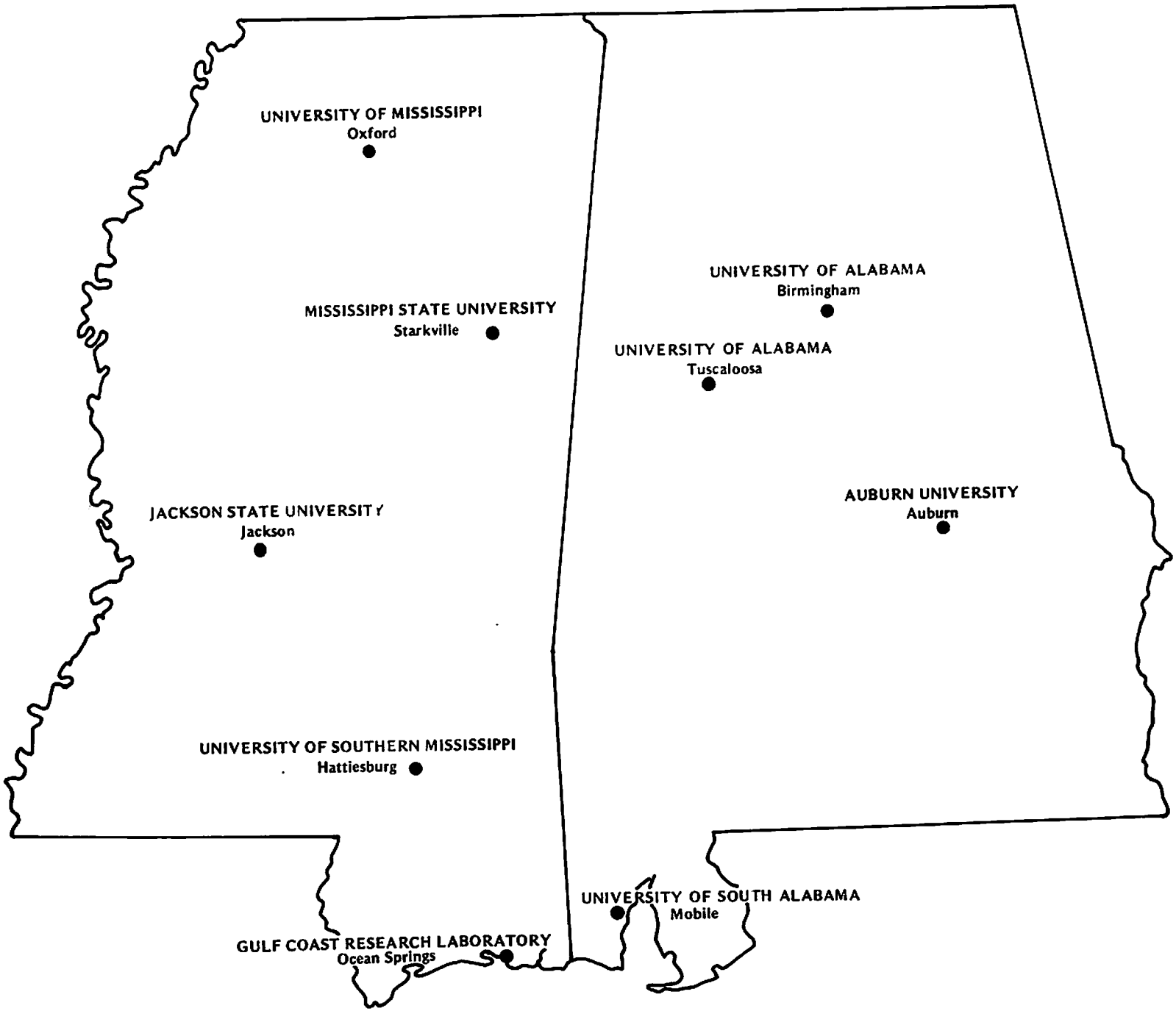


Figure 1. INSTITUTIONS OF THE MISSISSIPPI–ALABAMA SEA GRANT CONSORTIUM

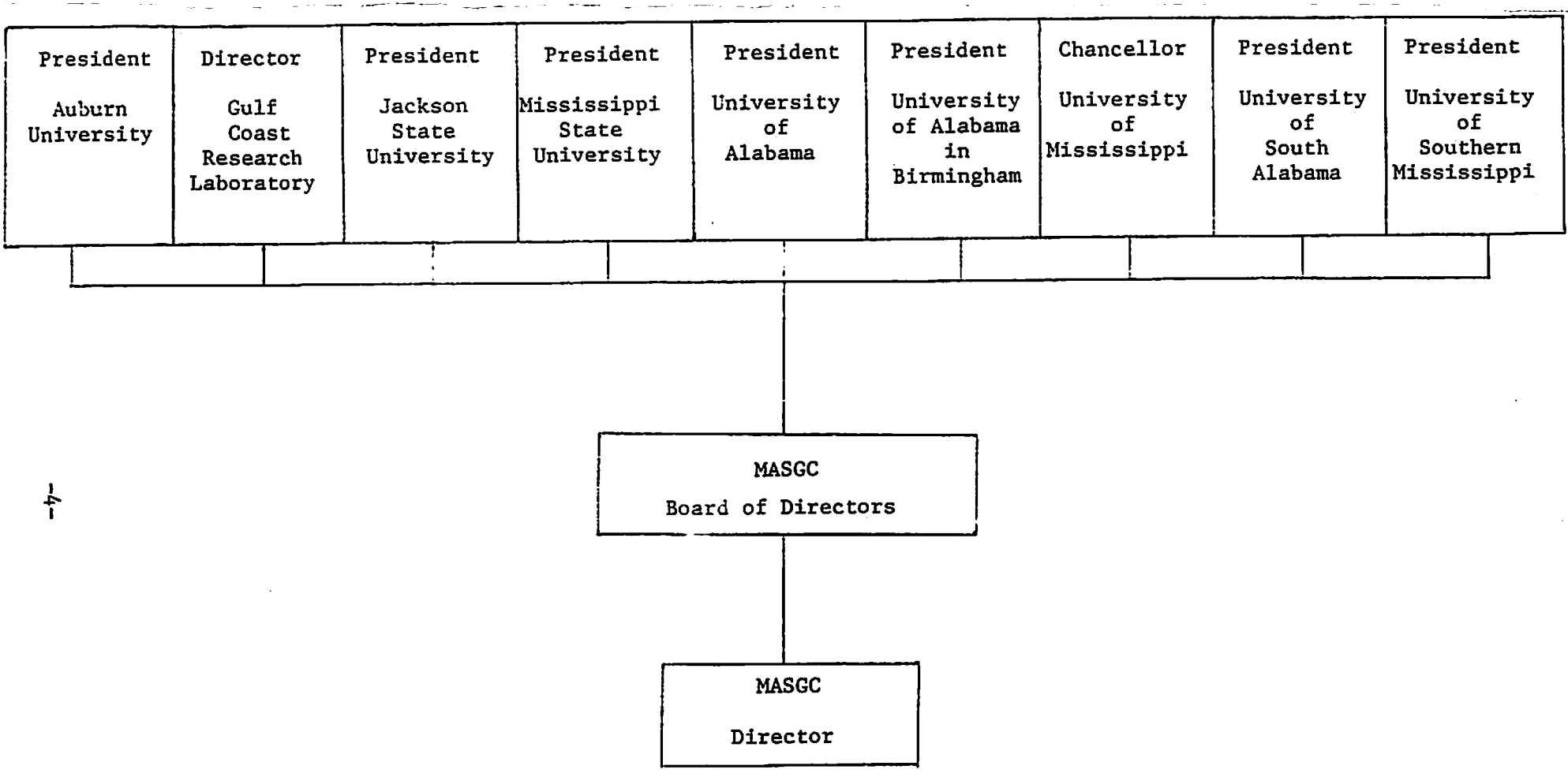


Figure 2. ORGANIZATION OF THE MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM

TABLE I

MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM

BOARD OF DIRECTORS

Dr. Gene A. Bramlett
Dean for General Extension
and Public Service
Auburn University
Auburn University, AL 36849

Dr. Harold D. Howse
Director
Gulf Coast Research Laboratory
Ocean Springs, MS 39564

Dr. Leslie B. McLemore
Graduate Dean and Director of
Research Administration and
Professor of Political Science
Jackson State University
Jackson, MS 39217

Dr. Ralph E. Powe
Associate Vice President for Research
Office of Graduate Studies and Research
Mississippi State University
Drawer G
Mississippi State, MS 39762

Dr. E. Roger Sayers
Academic Vice President
University of Alabama
Box 1933
University, AL 35486

Dr. Robert T. van Aller
Dean of The Graduate School
University of Southern Mississippi
Southern Station, Box 5024
Hattiesburg, MS 39406-5024

Dr. Robert P. Glaze
Vice President for Research
and Institutional Advancement
University of Alabama in Birmingham
202-A Mortimer Jordan Hall
Birmingham, AL 35294

Dr. Walter C. Zacharias
Coordinator of Sponsored Programs
The University of Mississippi
University, MS 38677

Dr. Sheldon F. Gottlieb
Dean, Graduate School and
Director of Research
University of South Alabama
Mobile, AL 36688

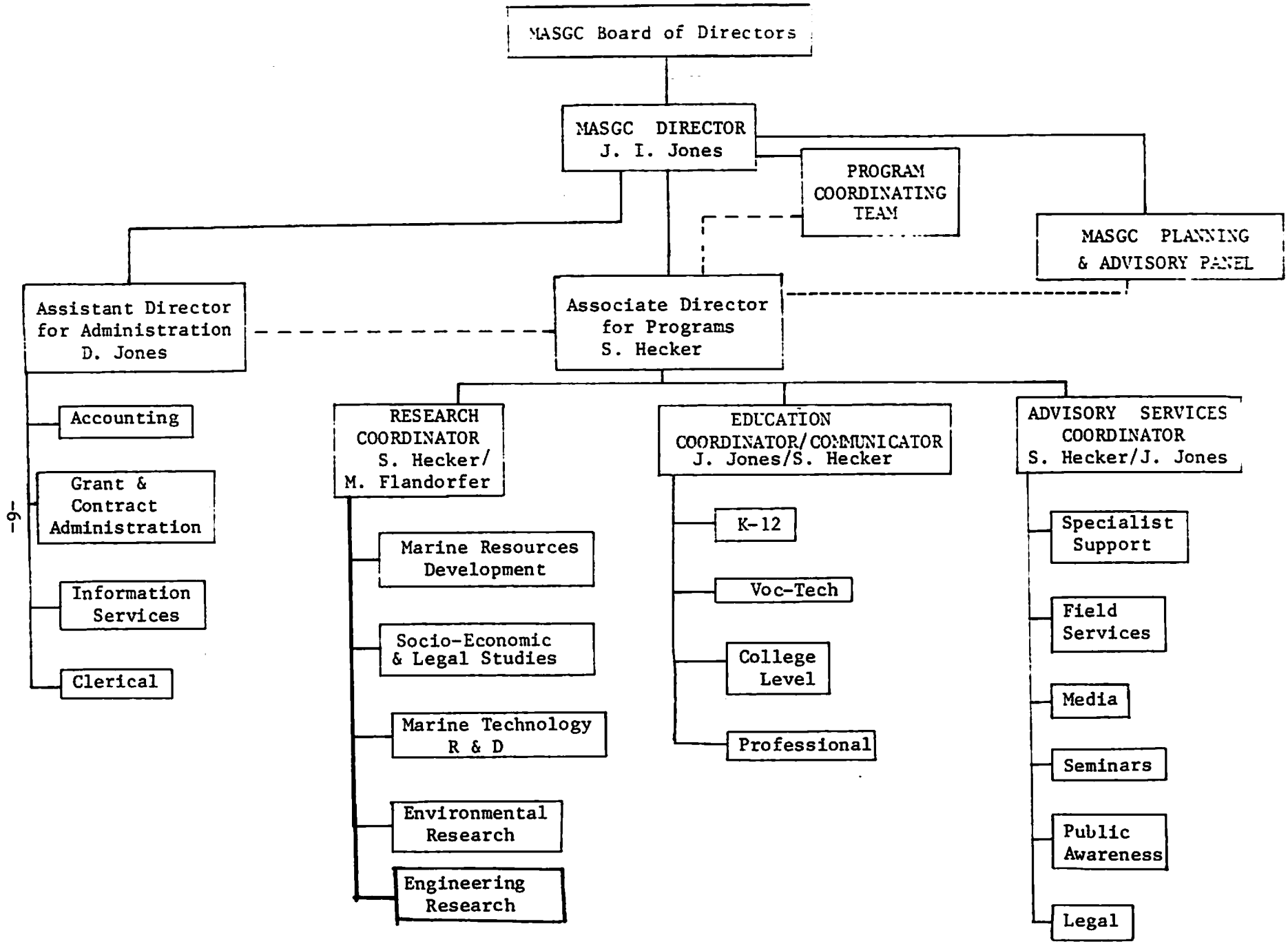


Fig. 3. ORGANIZATIONAL CHART FOR THE MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM - OPERATIONAL

C. Planning

In order to maintain the continued level of excellence, it is necessary to provide the appropriate guidance to program participants to prevent duplication and conflicts. Thus, early in the development of the MASGC program a set of broad goals and objectives were established. These goals and objectives strive to:

> Develop programs which will increase our understanding of natural and recreational marine and coastal resources to permit orderly and planned utilization within the capability of the resources to support such use.
>
> Develop an understanding of the interaction of man and the natural processes in marine and coastal environments to improve the ability of coastal managers to more efficiently plan for utilization of the coastal and marine areas.
>
> Identify and provide alternatives to enhance the quality of life in the coastal area especially among those whose livelihood is dependent on coastal and marine enterprises.
>
> Develop proposed legal alternatives and institutional arrangements for effective marine and coastal resource management.
>
> Broaden research and development of applied technology related to the activities of man in the coastal and marine areas.
>
> Develop and maintain a user oriented information exchange through which application problems can be presented to Sea Grant investigators, and solutions returned to the user.
>
> Develop marine and coastal public education curricula at all levels, to increase public awareness and understanding of marine and coastal environments throughout the two-state area.

With this foundation offering the basic guidance, the Director established a Planning and Advisory Panel to assist in the preparation of a long range plan. Panel members from academia, industry, government, and private interests were invited to serve on the panel. A list of the panel members is shown in table 2. The panel members were provided with the goals and objectives of the MASGC, and copies of recent programs and annual reports to familiarize themselves with the efforts of the program. They were also asked to visit with their colleagues and constituents to discuss views and thoughts related to marine and coastal needs.

The Planning and Advisory Panel meets infrequently, since the broad goals and objectives which they address are consistent over periods of several years. At its meetings, Panel members develop an agenda of goals for the MASGC and assist in its development, culminating in a set of problem statements. These are refined to become the central themes of the MASGC long-range plan.

TABLE 2

SEA GRANT PLANNING AND ADVISORY PANEL

Mr. Donald W. Brady
208 Program Manager
South Alabama Regional Planning Commission
Mobile, Alabama 36601

Dr. Michael Carothers
State of Mississippi
Department of Education
Division of Instruction
P.O. Box 771
Jackson, Mississippi 39205

Dr. James R. Carpenter
Mississippi Cooperative Extension Service
201 Bost Ext. Center
P.O. Box 5446
Mississippi State, Mississippi 39762

Mr. Robert Clark
Community Development Specialist
Recreation & Tourism
Alabama Cooperative Extension Service
Auburn University, Alabama 36849

Mr. David Armand DeKeyser
Star Fish and Oyster Company, Inc.
P.O. Box 26
Mobile, Alabama 36601

Mr. Duane Diaz
Kuljis Seafood and Ice Company
East Beach Boulevard
Biloxi, Mississippi 39530

Mr. Cecil Dubuisson
Office of Congressman Trent Lott
P.O. Box 1557
Gulfport, Mississippi 39501

Dr. Herbert C. Eppert, Jr.
Director of Ocean Science and Technology Laboratory
NORDA Code 300
NSTL Station, Mississippi 39529

Dr. William Hosking
Coordinator and Marine Economist
Alabama Sea Grant Advisory Services
3940 Government Boulevard, Suite #5
Mobile, Alabama 36609

Mr. Herbert Johnson, Editor
Mobile County News
P.O. Box 396
Bayou La Batre, AL 36509

Dr. Andrew Kemmerer, Director
National Fisheries Engineering Laboratory
National Marine Fisheries Services
NSTL Station, Mississippi 39529

Dr. R. Warren McCord
State Leader
Alabama Sea Grant Advisory Services
Alabama Cooperative Extension Servic
101 Duncan Hall
Auburn University, Alabama 36849

Mr. E. R. Morrissette
Executive Assistant to U.S. Senator Heflin
401 Federal Court House
Mobile, Alabama 36602

Dr. John I. Paulk
Associate Dean of Engineering
Mississippi State University
Drawer DE
Mississippi State, Mississippi 3976

Mr. Paul D. Pella
Port Director
Jackson County Port Authority
3033 Pascagoula Street
Pascagoula, Mississippi 39567

Dr. Ernest Mancini
State Geologist
Geological Survey of Alabama
P.O. Drawer O
University, Alabama 35486

Mr. Cy Rhode
1101 Hickory Drive
Long Beach, Mississippi 39560

Mr. Tommy Schultz
869 Bleuer Drive
Biloxi, Mississippi 39531

Mr. Grady Seaman
President
Bay Shrimpers' Association
P.O. Box 593
Bayou La Batre, Alabama 36509

Mr. Michael A. Taylor
Port City Rubber & Gasket
P.O. Box 1009
Theodore, AL 36582

Mr. Jay Trochesset
110 Lawrence Court
Biloxi, Mississippi 39532

Dr. C. David Veal, Leader
Mississippi Sea Grant Advisory
Services
4646 West Beach Boulevard
Suite 1-E
Biloxi, Mississippi 39531

Dr. Robert L. Wells, III
Assistant Vice President for Research
University of Alabama
P.O. Box 2846
University, Alabama 35486

III. PROGRAM DEVELOPMENT

The development of an effective Sea Grant program requires strong ties to both the public and private sectors, augmented by effective interaction with the faculties of the nine member institutions. The Director and his staff devote a significant portion of their time toward the development and implementation of programs, as well as consultation with members of the public and private sectors, and the academic community. These activities ensure that the overall program output will meet the expressed and actual needs of the states, the region, and the nation.

An effective and responsive Sea Grant program requires a solid foundation of research, education, and advisory services. These elements need to be reviewed regularly and selectively redirected to meet the changing needs of the Sea Grant constituency. Thus, the management team is routinely involved in reassessment of needs and priorities. Furthermore, it is essential that the Director be able to respond rapidly to short-term needs by initiating projects out of the normal program development cycle, to minimize the loss of critical research and other opportunities.

The combination of the annual program development cycle, efforts to foster interest in and knowledge of Sea Grant activities, and to publicize the MASGC long-range plan and short-term opportunities obligate the Director and staff to spend a significant portion of their time on the individual campuses of the member institutions. This researcher-administrator interaction is critical to the success of the MASGC College Program. In addition to publicizing the plans and opportunities of MASGC, the campus visits are used to:

Encourage a university's approach to marine activities so that the Sea Grant concept is fully appreciated by the university community and may become an integral part of the university's objectives.

Provide an institutional structure such that subject areas related to the development of marine resources will be adequately identified as having relevance to marine programs. These areas may be further developed to improve library systems, laboratories, and research equipment to foster excellence in marine related education.

Develop procedures to stimulate the interest of new faculty, high quality students, and others in marine resource development studies and activities and in problems of the marine environment.

Develop, in cooperation with the Mississippi-Alabama Sea Grant Consortium, the ability to identify the significant institutional entities within the marine resource community, and to develop effective working relationships with each of them.

Foster sufficient understanding and appreciation of the joint goals of the member institutions and the Mississippi-Alabama Sea Grant Consortium Directorate, so that individuals of the marine community and others will recognize the leadership of the program and its justification for continued and increased support.

A. Development Process

The development of a Sea Grant program containing the essential balance among the research, education, and advisory service elements while achieving a high level of relevance to local, regional, and national needs, requires an exhaustive program development process. Two groups, under the leadership of the Associate Director for Programs, play primary roles in this process. Figure 4 illustrates the developmental mechanism, which will be explained in the following text.

The Planning and Advisory Panel, composed of members from academia and the public and private sectors, provides a broad range of diverse interests for the early development of program plans. This group brings needs, thoughts, ideas, and problems from the local, regional and national levels to the program. It then assists in molding that information into a long range plan which is periodically updated.

The primary advisory group during the program development cycle is the Program Coordinating Team, listed in Table 3. This team is comprised of persons from academia, government and industry who represent a variety of disciplines. The team provides academic balance and input to the Planning and Advisory Panel. It later refines the long range plan and advises in the preparation of the annual opportunities document.

This document entitled "Discussion of Potential Research Opportunities for the Mississippi-Alabama Sea Grant Consortium Program for the near term and the Future" is provided to the member institutions for distribution to their faculties. This discussion paper contains the MASGC history, organization, broad goals and objectives, a discussion of the program development process, a description of the most recent program, problem statements and potential related research opportunities, and the most recent program proposal guidance from the National Sea Grant College Program Office.

In the fall of each year, the Associate Director for Programs visits the member institutions to discuss potential research and education opportunities being considered by faculty members. At that time pre-proposal submissions are invited.

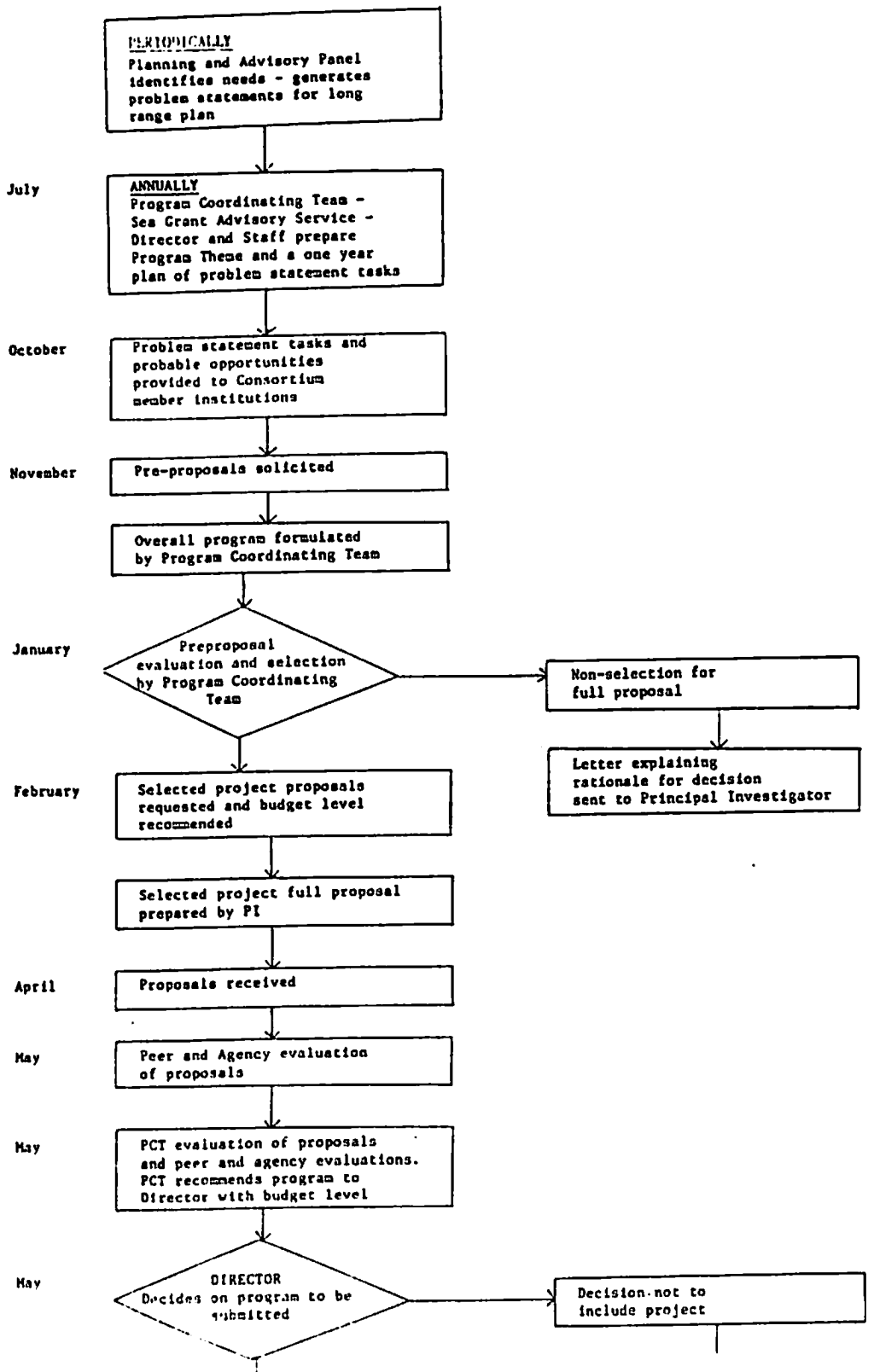
B. Pre-Proposal Review

The Program Coordinating Team reviews each pre-proposal individually prior to meeting, and again collectively at a meeting in January. The team also uses best available information to analyze National Sea Grant, State, and University budgets to determine an overall program target budget.

The next step is for the team to formulate a relevant program within the constraints of the target budget and with reasonable balance in research, education and advisory services, utilizing continuing projects and those new projects selected from those reviewed. This is the first selection point in the annual program development cycle.

Figure 4.

PROGRAM DEVELOPMENT PROCESS



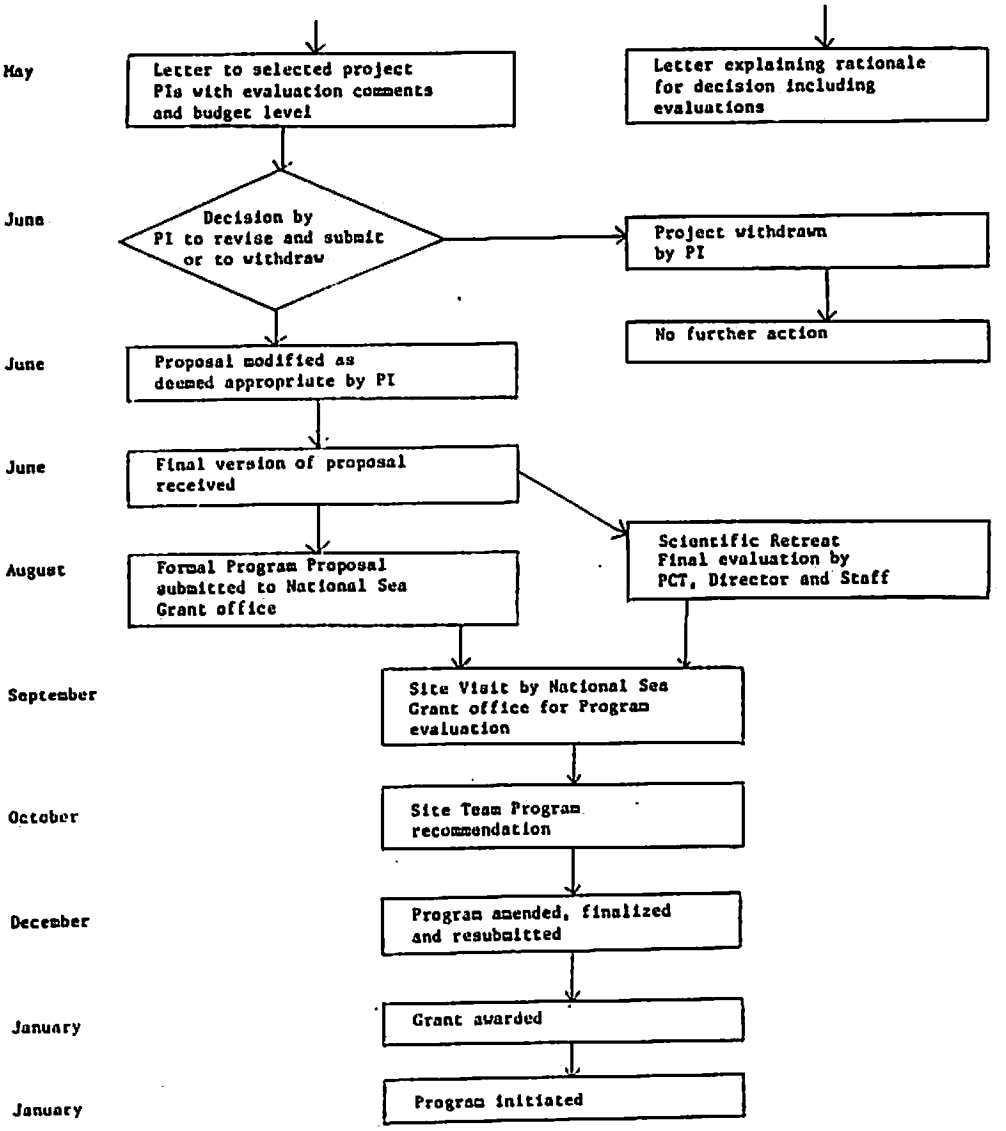

May
Letter to selected project PIs with evaluation comments and budget level
Letter explaining rationale for decision including evaluations
June
Decision by PI to revise and submit or to withdraw
Project withdrawn by PI
No further action
June
Proposal modified as deemed appropriate by PI
June
Final version of proposal received
Scientific Retreat Final evaluation by PCT, Director and Staff
August
Formal Program Proposal submitted to National Sea Grant office
September
Site Visit by National Sea Grant office for Program evaluation
October
Site Team Program recommendation
December
Program amended, finalized and resubmitted
January
Grant awarded
January
Program initiated

TABLE 3
PROGRAM COORDINATING TEAM

Co-Chairman

Dr. Stanley Hecker
Associate Director for Programs
Mississippi-Alabama Sea Grant Consortium
Caylor Building
Gulf Coast Research Laboratory
Ocean Springs, Mississippi 39564

Co-Chairman

Dr. Roger Hanson
Director of Coordinated Curricula for Basic Allied Health Sciences
RTI-118
University of Alabama in Birmingham
Birmingham, Alabama 35294

Members

Dr. Herbert C. Eppert, Jr.
Director of Ocean Science and Technology Laboratory
NORDA Code 300
NSTL Station, Mississippi 39529

Dr. Dennis R. Leyden
Dean, College of Business and Industry
Professor of Economics, Dept. of Economics
Mississippi State University
Mississippi State, Mississippi 39762

Dr. B. J. Martin
Research Coordinator
College of Science and Technology
University of Southern Mississippi
Hattiesburg, Mississippi 39401

Dr. H. C. Morgan
Associate Dean
School of Veterinary Medicine
Auburn University
105 J. E. Green Hall
Auburn University, Alabama 36849

Dr. John I. Paulk
Associate Dean of Engineering
Mississippi State University
Drawer DE
Mississippi State, Mississippi 39762

Dr. Kenneth Pruitt
Assistant Vice President - Research
University of Alabama in Birmingham
University Station
Birmingham, Alabama 35294

Dr. James E. Wall, Sr.
College of Education
Mississippi State University
Drawer JW
Mississippi State, Mississippi 39762

Dr. Robert L. Wells, III
Assistant Vice President for Research
University of Alabama
P.O. Box 2846
University, Alabama 35486

Ex-Officio Members

Dr. C. David Veal, Leader
Mississippi Sea Grant Advisory Services
4646 West Beach Boulevard
Suite 1-E
Biloxi, Mississippi 39531

Dr. William Hosking
Coordinator and Marine Economist
Alabama Sea Grant Advisory Services
3940 Government Boulevard, Suite #5
Mobile, Alabama 36609

Letters containing the comments of the Program Coordinating Team are sent to each principal investigator who submitted a pre-proposal. Those whose projects are selected are invited to prepare detailed proposals considering the recommendations provided by the Program Coordinating Team. Those whose projects are not selected are given the reasons for this decision and in some cases invited to submit redirected proposals in a subsequent year. The PCT attempts to plan a program which will span two years considering project completions and new project initiations in each of the years.

C. Peer and Agency Review

Detailed proposals are due at the Director's office before an established deadline in March.

The next stage of program development consists of critical review of all the proposals under consideration, by peers, state and federal agencies, the Coordinating Team, Mississippi and Alabama Sea Grant Advisory Services, and Director's staff. Each proposal is evaluated quantitatively in each of the following categories:

- Overall merit of project
- Appropriateness of problem and significance of research
- Problem and/or hypothesis clearly stated
- Adequacy of experimental design and methodology
- Uniqueness and innovation
- Attainability of objectives
- Budget evaluation: realistic, adequate, excessive

Each reviewer receives a letter explaining the purpose of the review, noting that supporting comments are extremely valuable in the evaluation process. Additionally, each is advised that his or her comments will be provided anonymously to the principal investigators to aid in strengthening their proposals. During this process, each project proposal is subjected to a number of peer and agency reviews.

D. Program Coordinating Team Review

Peer and agency reviews are received in early May and copies are sent to the Program Coordinating Team with copies of each proposal. Subsequently, the team meets to develop a recommendation to the Director on the content of the proposed program which will be submitted to the National Sea Grant College

Program Office. In its deliberations the team, whose members have previously reviewed each proposal, discuss each peer and agency review in detail and add their own comments. The team considers the following questions in discussing each proposal:

- Is the work needed?
- If so, what is its priority?
- Will the project be able to achieve the objectives?
- Will it have utility? To whom?
- Is the cost realistic and reasonable?
- Is the potential payoff worth the cost involved?

The team then prepares a program recommendation and submits it to the Director. Letters are again sent to each principal investigator with the comments of the reviewers and the team. Those selected for the program are asked to consider these comments in preparing final versions of their proposals.

E. Retreat

A scientific retreat is scheduled during the summer at which time the finalized program is presented and critiqued. At this retreat each principal investigator presents his or her proposal to the Program Coordinating Team and the MASGC Director and his staff. Continuing project personnel present their accomplishments to date while new project personnel present the details of the work they propose to do. The Program Coordinating Team and the Director and his staff constructively criticize the scope of work and the presentations, to assist in improving them and to insure that coordination and cooperation between projects are clearly explained and understood.

In addition to the principal investigators for the coming biennial program, the Program Coordinating Team, and the MASGC Director and his staff, principal investigators who had participated in Sea Grant projects in the recent past and selected members of the scientific community and Planning and Advisory Panel are invited to attend the retreat. This provides an opportunity for investigators to engage in informal discussions with a variety of persons who can further advise them from a variety of viewpoints.

Upon completion of the project presentations, the retreat attendees are asked to participate in a group of multidisciplinary workshops chaired by members of the Program Coordinating Team. At the workshops, ideas are exchanged and developed into suggestions for future program themes and research opportunities. This provides yet another source from which the aggregated information may be injected into long and short range program plans.

F. Site Review

During alternate years, an on site review of the MASGC proposed program is scheduled to be held in the late summer. A project which has weathered the very lengthy program development process and extremely rigorous review process is one of exceptional merit. Thus, projects presented to the Site Review Team are done so with the full confidence of the MASGC Director.

IV. PROGRAM DESCRIPTION

The central themes of the 1985 Mississippi-Alabama Sea Grant program provide an indication of the evolution and broadening of the program. The thematic emphasis responds to the long range plan that was generated in part by the Planning and Advisory Panel. These emphases fall into three major categories: Resources, Energy, and Education.

The Resource Theme contains six projects in three subject areas. These projects will investigate living resources, impacts on those resources, and by-products of the resources. The Living Resource subject area contains one continuing project and two being initiated in 1985. These investigations will evaluate selected aspects of the flora and fauna of the marine environment. R/LR-12 will continue its study of the trophic dynamics, growth, and condition of Red Drum Larvae (Sciaenops ocellatus)in Mississippi. The ability to initiate molting in blue crabs (Callinectes sapidus) using certain enzymes is the subject of the research in R/LR-14. Success in this new project can be of significant financial benefit to the soft shell crab industry. R/LR-16 plans to investigate the algal productivity in Mississippi marshes and its functional importance to the entire ecosystem.

Within the Resource Theme we are including one new project which will investigate selected impacts on the coastal ecosystem. This project is categorized in the Marine Enviromental Research subject area. R/ER-16 will undertake research to determine the origin of fecal coliforms by characterizing DNA profiles of the plasmids. Perfecting this technique will permit rapid, precise identification of contamination sources.

Marine Technology Research and Development is the third subject area in the resource theme. This subject area includes one continuing project and one being initiated. Project, R/MT-6, continues an investigation of inhibition of mineral and biomineral scaling. This project has a great deal of potential for use in industrial, military, and commercial sectors.

The maintenance of shellstock oysters is of significant economic importance to the oyster industry. R/MT-10 proposes to investigate the conditions necessary for their proper maintenance to minimize spoilage.

The Energy Theme includes two continuing projects within the Engineering Research subject area. LNG as an alternative fuel for diesel powered fishing vessels may demonstrate a significant additional benefit by providing refrigeration as its by product. R/EN-4 is completing an investigation into the use of LNG and its benefits. The other energy related project, R/EN-5, is investigating reducing drag of ship hulls by the use of hydrophilic surface coatings.

Education continues to be one of the thematic emphasis areas of our program. The Marine Education and Training subject area in this theme contains a continuing competitive fellowship program E/O-16. This project provides opportunities for qualified students to gain support through a program wide competition judged by an impartial external committee.

Enhancing the interest of minority university students in marine studies continues to be a goal of our program. E/O-21 presents a well structured program directed at minority students who can engage in guided marine related research and studies.

The Advisory and Public Service subject area is not organized as a separate theme because its efforts cross the lines of all of our program themes. We are including in this subject area our Mississippi and Alabama Sea Grant Advisory Service programs A/O-9. These programs will continue to provide the transfer of technological information to their constituencies. They will also continue to bring information from the users to the MASGC Directorate which can be factored into future program plans.

The Mississippi-Alabama Sea Grant Legal program, R/SL-4 is another that crosses thematic and project lines. It provides a service not only to those projects requiring it but also to our communities and region through the mechanism of its research publications and newsletter.

A new project included in this subject area is A/O-13. This effort will plan, organize, and conduct the Third International Symposium on River Sedimentation. The central theme of this symposium is Estuarine and Coastal Sedimentation.

1985 MASGC PROGRAM

Project Number	Project Title	Principal Investigator	Institution
M/PA-1	Program Management: Administration and Planning	J. Jones	Mississippi-Alabama Sea Grant Consortium
M/PA-2	Information and Data Acquisition Capabilitites for the Mississippi-Alabama Sea Grant College	E. Blancher	University of South Alabama
M/PD-1	Project Initiation, Rapid Response Capability	J. Jones	Mississippi-Alabama Sea Grant Consortium
R/LR-12	Trophic Dynamics, Growth and Condition of Red Drum Larvae (Sciaenops ocellatus) in Mississippi Coastal Waters	J. Laroche J. Steen	Gulf Coast Research Laboratory
R/LR-14	Use of 20-hydroxyecdysone to Initiate Pro-ecdysis in Intermolt Blue Crabs, Callinectes sapidus. 1. Establishment of Intermolt Integumental Stages	J. Freeman H. Perry	University of South Alabama Gulf Coast Research Laboratory
R/LR-16	Functional Importance of Algal Productivity in Mississippi Salt Marshes	M. Sullivan	Mississippi State University
R/SL-4	Mississippi-Alabama Sea Grant Legal Program	C. Jarman W. Hooper	University of Mississippi
R/MT-6	Prevention of Mineral Scaling and Biomineral Fouling of Marine Surfaces by Potent Natural and Synthetic Inhibitors of Crystal Growth	S. Sikes	University of South Alabama
R/MT-10	Microflora Modification in Temperature Abused Shellstock Oysters	D. Cook	Gulf Coast Research Laboratory
R/EN-4	LNG as an Alternative Fuel and Refrigerant for Diesel Powered Fishing Vessels	E. Brett W. Schaetzle	The University of Alabama
R/EN-5	Hydrophilic Surface Coatings for Drag Reduction in Marine Propulsion	C. McCormick R. Hester	University of Southe Mississippi
R/ER-16	Determination of the Origin of Fecal Coliforms Isolated from the Mississippi Sound	J. Evans R. Taylor	University of Southe Mississippi
E/O-16	Sea Grant Fellowship Program	Committee	R. Hanson, Chairman University of Alabama in Birmingham

Project Number	Project Title	Principal Investigator	Institution
E/O-21	Jackson State University Undergraduate Research Training Program in Marine, Atmospheric and Environmental Sciences	S. Morgan	Jackson State University
A/O-9	Mississippi-Alabama Sea Grant Advisory Services Programs	D. Veal	MS-Sea Grant Advisory Services - Biloxi
		W. Hosking	AL-Sea Grant Advisory Services - Mobile
A/O-13	Third International Symposium on River Sedimentation with Central Theme on Estuarine and Coastal Sedimentation	S. Wang	University of Mississippi

V. FUTURE GROWTH AREAS, RESEARCH PRIORITIES AND RELATED OPPORTUNITIES:

Statements of Problems of Significance to the Marine and Coastal Region of the States of Alabama and Mississippi and Potential Opportunities for Related Research

A. Introduction

Included here is a set of problem statements, developed in part by the Planning and Advisory Panel. Following each problem statement are a group of related potential opportunities which may be used as "food for thought" for those interested in participating in the Sea Grant program.

Note particularly, that as written, each of the potential opportunities may cover a range of subjects and therefore may appear under more than one of the problem statements. This will hopefully lead to the generation of multidisciplinary projects which address many aspects of a problem. This type of research is strongly encouraged in carrying out the Sea Grant concept.

The problem statements are generally quite broad and therefore are not expected to change too frequently. The potential opportunities, on the other hand, may change as work is accomplished which provides a solution to part of a problem. It should also be borne in mind that there may be many solutions to a particular facet of a problem and that each approach may lead to a viable Sea Grant project.

It is evident that the magnitude of the problem statements precludes the accomplishment of all necessary research, education, and advisory service programs to overcome any single one in a short term group of efforts. A review of recent annual reports and MASGC programs will exhibit the scope of work that has been undertaken within the limitations of fiscal resources available.

B. Problem: Resource Assessment

The resources of the coastal area of Mississippi and Alabama are vital to the overall well-being of the region, its people, and its industry. Planned and orderly development of the resources, within the capability of those resources to support development, will enhance the quality of life in the region. Sound decisions in support of orderly development necessitate a comprehensive understanding of the resources and their current and potential capabilities.

Acquisition and analysis of such resource information will permit an accurate description of the coastal area, determination of beneficial or adverse impacts of industrial or urban developments, cause and effect of saltwater intrusion, effect of offshore discharge of onshore generated effluents, and other problems of general public concern.

An assessment of the natural, human, industrial, and economic resources of the coastal area will provide the essential information to develop guidance, response and/or actions by those in positions of responsibility.

Some Related Potential Opportunities:

Estuarine systems play an important role in specific phases of the life cycles of many important commercial and recreational fishery species. The environmental quality of these systems may be affected by changing land use patterns with an attendant change in productivity. There is no clear understanding at this time of the relationship of the estuaries, their sediments, and adjacent land use patterns. Research opportunities in this topical area include the investigation of the impact of fresh water input on estuarine systems. Fundamental questions need to answered to define the impacts on primary productivity and the health of the estuaries and to determine the ultimate effects on commercially important species.

Natural resource exploration and exploitation activities become increasingly important as the need for new sources of mineral materials becomes more acute. Mineral deposits may be identified through research projects with ancillary and development activities including topics such as recovery equipment design and onshore support requirements.

Channel deepening and maintenance dredging for harbor access is essential to the health of domestic and international commerce. There is a compelling and continuing need to develop effective and innovative mechanisms to safely and economically dispose of large volumes of spoil material. Additionally, alternate uses of spoil material appears to be a fruitful area of investigation.

The majority of the Nation's people presently live in the coastal region with this percentage increasing annually. Investigations to determine the myriad impacts of these changing population patterns on the socio-economic and natural systems of the coastal zone is a research priority.

Our coastal and marine areas include the habitats of numerous animal and plant species. While some have become valuable economic assets to the region, many more have gone along virtually unused. Research efforts to identify potential uses for of the less utilized species is a significant opportunity. Similarly, market development for the potential new products remain an area that can provide a benefit to the region.

At this time the national seafood processing industry is experiencing a critical problem which could ultimately develop into an economic burden of sufficient magnitude to force many plant closures. The problem of achieving acceptable disposal of seafood processing wastes has become more difficult with industry growth and more stringent regulations. Research could be undertaken to investigate methods and techniques to minimize this problem.

Underutilized fishery species continue and will remain to be a subject of considerable interest. Some existing fisheries are experiencing severe economic problems which could be partially offset by a viable alternate fishery. A programmed team, or multi-disciplinary approach to investigating the various facets of selected underutilized species could provide valuable information on the feasibility of participating in a supplementary or alternate fishery.

A number of investigations have been conducted in this region to identify the variety and amount of pollutants entering our coastal waters. This information could appropriately be applied to studies of impact on the life stages of

commercially important fishery species.

Marine products and by-products have been found to contain substances that have utility in medicine, agriculture, and other industries. Research might be undertaken in this growing field to identify marine products and by-products that may be used to further develop additional products of value.

C. Problem: Fisheries Development

The fishing industry is an integral part of most coastal communities in the Northern Gulf of Mexico. This industry is a significant contributor to the coastal economy as it provides a wide range of employment, food products, and income.

The industry considered in its entirety includes a number of components, each of which is essential to its overall health. Those components include identification of marketable, currently underutilized-species, and harvesting, processing, and marketing of the traditional catch.

Within each of the above components a number of subcomponents can be found which contribute not only to the significance of that component but also to the overall industry. Once a marketable species is identified, its life history must be determined, followed by an assessment of the natural stock to define optimum sustainable yield.

The next step is harvesting technology. In this component, increasingly cost-effective and energy efficient platforms and equipment must be designed and manufactured to maximize the harvest and minimize operating and energy costs. Catch and effort information is needed to ensure the viability of this component. At times, such as in the case of formerly underutilized species, it may also be necessary to retrain the fishing community in new procedures and techniques.

Processing requires efficient equipment which must be engineered to optimize the economy of the operation. Packing techniques and materials must be developed to maximize product shelf life and marketability. Handling and transportation facilities must be assembled to ensure market delivery of the product in optimum condition.

Finally, new markets must be developed. All aspects of product utility need be investigated, including those of human or animal consumption or by-product usage, such as fertilizer.

Thus, in the area of fisheries development documented needs exist for a wide range of technical, operational and economic information and innovation which may be used to improve many aspect of the industry.

Some Related Potential Opportunities

Estuarine systems play an important role in specific phases of the life cycles of many important commercial and recreational fishery species. The environmental quality of these systems may be affected by changing land use patterns with an attendant change in productivity. There is no clear understanding at this time

of the relationship of the estuaries, their sediments, and adjacent land use patterns. Research opportunities in this topical area include the investigation of the impact of fresh water input on estuarine systems. Fundamental questions need be answered to define the impacts on primary productivity and the health of the estuaries and to determine the ultimate effects on commercially important species.

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The broad area of marine fouling biotechnology is of major interest to the seagoing community in its relationship to the reduction of biofouling, with attendant improvement in fuel economy and reduction of maintenance costs. Technology and processes might be developed to control the process thereby providing a significant benefit to the region and the nation.

Underutilized fishery species continue and will remain to be a subject of considerable interest. Some existing fisheries are experiencing severe economic problems which could be partially offset by a viable alternate fishery. A programmed team, or multi-disciplinary approach to investigating the various facets of selected underutilized species could provide valuable information on the feasibility of participating in a supplementary or alternate fishery.

A number of investigations have been conducted in this region to identify the variety and amount of pollutants entering our coastal waters. This information could appropriately be applied to studies of impact on the life stages of commercially important fishery species.

D. Problem: Energy Effeciency of Marine Industries

Rising energy costs are adversely impacting many marine industries. In particular, the highly energy-intensive shrimp fishing industry is reaching the point where the return on the product is insufficient to overcome the operating cost. Thus a negative cost-benefit ratio is being realized and many operators are unable to continue in business.

It is appropriate to investigate means of improving the energy efficiency of the marine industries from two vantage points. The first, to improve present methods, equipment and techniques to enhance energy efficiency and the attendant cost-benefit ratio. The second, to design and construct new and more efficient equipment.

It is apparent that without a significant improvement in shrimp fishing energy efficiency, this energy intensive marine industry will be lost to the economy. Thus, a severe economic blow will be dealt the region and the nation.

Some Related Potential Opportunities:

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E. Problem: Expansion of Scientific and Technical Marine & Coastal Expertise

Expansion of scientific and technical marine and coastal expertise in the region would provide a catalyst to attracting or initiating high technology marine industry. Additionally, such expertise would enhance the capabilities of existing industries. While larger industries can overcome the lack of local expertise by going out of the area, smaller industries are financially unable to "import" high-technology expertise.

Thus, the expansion and development of a broader base of local and regional marine and coastal expertise would be an asset to the public and private sectors in education and industry.

Some Related Potential Opportunities:

Over the years a large amount of K-12 marine education material has been developed. Much of this material can provide an excellent foundation for marine literacy. In order to fully utilize these materials it is necessary to educate teachers and potential teachers in their content. If properly done, appropriate interest can be generated in administrators and teachers so that they will enthusiastically include marine education in their on-going school programs.

Building a cadre of trained marine professionals can contribute to improving the understanding of marine matters and strengthening marine related enterprises. Expanding on the broad spectrum of research that has been and continues to be sponsored by Sea Grant, programs might be developed at the university level to enhance marine literacy in the student community. This could take the form of courses in selected marine matters as well as active student participation in marine related research.

F. Problem: Regional Development

The Coastal Area of Mississippi and Alabama is itself a rich resource which requires comprehensive management if it is to provide optimum benefits to the region. The development of sound management strategies requires that the highest consideration be given to mechanisms which will insure balanced utilization of coastal resources, growth of the coastal area and measurement of beneficial and adverse impact of industrial and urban development.

The information gathered in the course of resource assessment activities will help to provide a valid scientific basis from which local and regional leaders can develop sound plans for comprehensive resource management. Such information is essential for the development of both long and short range area development plans to provide for the balanced and orderly growth of the region.

Some Related Potential Opportunities:

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Natural resource exploration and exploitation activities become increasingly important as the need for new sources of mineral materials becomes more acute. Mineral deposits may be identified through research projects with ancillary and development activities including topics such as recovery equipment design and onshore support requirements.

Channel deepening and maintenance dredging for harbor access is essential to the health of domestic and international commerce. There is a compelling and continuing need to develop effective and innovative mechanisms to safely and economically dispose of large volumes of spoil material. Additionally, alternate use of spoil material appears to be a fruitful area of investigation.

The majority of the Nations's people presently live in the coastal region with this percentage increasing annually. Investigations to determine the myriad impacts of these changing population patterns on the socio-economic and natural systems of the coastal zone is a research priority.

Practical economic investigations of existing or potential marine and coastal enterprises that can be used to determine the fiscal viability of those enterprises should be of value to the community and region. Many of the potential opportunities in this document, should they become the subject of scientific investigations, will also require economic feasibility studies.

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G. Problem: Industrial Expansion

The increasing demands of heavy industry for siting and relocating their plants can have both beneficial and adverse impacts on a region. An influx of heavy industry can be extremely beneficial to the economy of the region through such things as increased tax revenue, payroll, utilities payments, and requirements for services provided by local companies. On the other hand, local governments will have to provide essential services not only for the industry but also for its personnel. In many cases a substantial lead-time may be necessary to prepare services such as expanded water and waste water systems, schools, and other items needed to support a population increase.

Planning for the specific siting and construction of plants also necessitates detailed analysis of the region from the practical, aesthetic and economic views. Additionally, local and regional governments require accurate information on many topics to allow sound decisions to be made on most aspects of industrial expansion.

Some Related Potential Opportunities:

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Marine transportation is perhaps the most economical method of moving large volumes of cargo over great distances. This has created a need for port facility modernization which will provide accessibility for larger bulk carriers and rapid cargo handling equipment. This lends itself to a broad range of potential research efforts, ranging from the engineering of specific equipment to the redesign of an entire port complex.

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H. Problem: Port Expansion

The increasing demand for low cost water transportation of bulk cargo requires evaluation of port expansion opportunites. As ports are expanded, or new port facilities are planned, consideration must be given to items such as types of carriers, types of cargo, transhipment, port facilities and their efficiency of operation. Additionally, consideration must be given to the aesthetics of the area as well as to any changes which may be made to the adjacent ecosystems which are the mainstays of certain fisheries. This information should be made available to port commissions and planners to permit orderly decision-making and development of ports and facilities.

Some Related Potential Opportunities:

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Increasing domestic and international cargo movement through ports, harbors, and waterways may necessitate a "new look" at such things as diversification or specialization of port facilities in a region. As competition increases, information on these subjects will be essential to the eventual decisions that will be required.

VI. CURRENT NATIONAL PRIORITIES: (from NSGCP Office)

A. Introduction: Sea Grant Proposal Guidance For FY 1985

1. PURPOSE

This statement is prepared in anticipation of proposal receipt and review for early Fiscal Year 1985 funding. The intent is to uniformly inform the Network of the opinions held by the National Sea Grant College Program (NSGCP) staff. It is not implied that only efforts in areas stated to be of highest priority will be supported but it is intended that dissemination of this guidance will skew the distribution towards such areas.

2. GENERAL

In the review process no proposed effort will be considered of high priority unless the rationale, and user relations are considered to be adequate. Expansion of understanding for its own sake is not considered appropriate for Sea Grant. The focus should be on increasing the value of public benefits from marine resources.

An ideal that will be striven for is that each project (or group of projects) attacks a well-defined problem that society surely will have to face in the future, or is currently struggling with. Ideally, the organization or people whose task it will be to make related management decisions will have been identified and made contact with. The proposer will understand what constitutes necessary and sufficient information for responsible decisions, and the project, by itself or in concert with other planned activities, promises to generate such information. Finally, the proposed activities should have sufficient intellectual content to make them appropriate university functions.

B. Priorities (categorized)

1. FISHERIES

Fishery Sciences - High priority is given to the development of cost-effective techniques for improving capabilities for assessing stock size and distribution. Particular attention should be given to increasing the predictability of yields. This would necessitate research in determining the period in the life cycle at which age-class strength is established, and the biotic and abiotic factors most important to recruitment. The possibility of modifying existing single and multispecies population and yield models to improve their predictability should be pursued. High priority is also given to improving our understanding of the relationship between fish productivity, and habitat and how these may be managed in the context of multiple use resources. Included in this priority is research on determining environmental factors limiting fish productivity, and developing means for estimating the consequences of environmental stress on fish populations.

Fishery Restoration and Enhancement - Most species of fish presently exploited have high enough market value to warrant research into means for increasing their abundance or accessibility. Species or stocks that have been over-exploited or declined in response to habitat loss or degradation may be restored. To this end, high priority is given to research that seeks means for restoring or enhancing exploited fish species. Approaches that are

appropriate include: developing and evaluating means for effectively managing exploited fish stocks; seeking methods and practices that will aid in restoring self-sustaining healthy populations; and evaluating the utility and consequences of enhancement techniques.

Fishery utilization - Sea Grant has sponsored many studies on underutilized species. High priority is given to those studies that are truly multi-disciplinary. Effort should be focused as much on the socio-economic and marketing assessments as the biological assessments needed to develop a new fishery.

2. AQUACULTURE

General - High priority is assigned to research directed toward the enhancement of commercial aquaculture operations involving marine or Great Lakes species that are economically viable or nearly so. This includes: salmon, marine-shrimp, prawns, hard clams, mussels and oysters. Although lower priority is given research on other species, exploratory studies, necessary to identify new candidate aquaculture species, are expected to constitute roughly one-third of the Sea Grant aquaculture research in FY 1985 and may represent 100% of the aquaculture work in some institutions.

Aquaculture research on non-marine organisms (those that do not occur naturally in the Great Lakes, oceans, or brackish water during any part of their life cycle) is low priority, especially those for which the Departments of Agriculture or Interior have assumed responsibility. Researchers should keep in mind that pilot-scale testing and demonstration plant operations is generally considered to be the purview of private industry by Federal officials.

Nutrition and Feed Development - Studies leading to more cost-effective artificial diets for crustaceans and finfish are high priority as are improvements in natural diets, their culture and feeding procedures for molluscs. Improved understanding of the nutritional requirements for specific life stages for hard clams, oysters, prawns, and salmon is also high priority. The development of commercial rations is considered to be the province of private industry.

Pathology and Disease Control - Determination of the causes of major disease-related mortalities in culture systems and the development and testing of procedures and substances to prevent or control these mortalities is assigned a high priority for oysters, salmon, and shrimp. Disease poses no constraint at this time on mussels and prawns, thus work of this type on those animals is low priority.

Environmental Requirements - The lack of a more adequate understanding of this aspect of aquaculture continues to be manifested by problems of production variability in prawn and shrimp ponds, and stress and related problems of salmon in ponds and net pens. Research directed toward these problems is high priority as is work on determining the carrying capacity of the natural environment for growth of cultured organisms, including mussels and salmon.

Genetics and Selective Breeding - High priority is assigned to research to understand the basic genetic makeup of the organisms in culture sufficient to determine the potential for improvement of the species, and to identify the most promising methods for making these improvements. Work to bring about species improvements for clams, oysters, prawns, salmon, and shrimp

is also high priority, as is improved control of maturation and reproduction of crustaceans. There is a high-priority need to develop procedures for conserving wild gene pools for all organisms in which cultured individuals are mixed with those in the natural environment.

The following section on Biotechnology addresses additional aquaculture-related priorities.

3. MARINE BIOTECHNOLOGY

Biochemistry and Pharmacology — High priority is assigned to the chemical study of secondary metabolites of marine organisms to evaluate their potential for applications in medicine or in agriculture. Because the natural products of marine microorganisms have had no significant level of study, they may offer special opportunity. Low priority is assigned to generalized screening for antibiotic properties unless the assays are geared to be specific for microorganisms pathogenic to humans or agricultural crops. Since most new natural products are difficult to obtain in large quantity, high priority is assigned to development of biological assays that require only small amounts of test substances. The definition of new mechanisms of pharmacological action of marine substances is considered important.

Chemical Feedstocks — Exploratory research on the chemistry of algae, particularly single-cell marine algae, to determine the feasibility of their use as sources of useful chemicals, especially as raw material feed stocks for the chemical industry, is high priority. Mass culture of these algae could reduce our dependency on petroleum resources for this purpose.

Marine Polymers -- The whole field of marine polymers is relatively unexplored. Although some macroalgae have been studied and polymers are produced commercially from them, they have not been thoroughly studied and little research has been focused on the polymers of microalgae, other microorganisms, or animals. Polymers from marine organisms are optically active and for this reason may have unique and useful properties different from petroleum-derived polymers which are not optically active. The advantages offered by hydrogen bonding and controlled crystallinity in natural polymers will provide control of physical and chemical properties that may make possible production of chemicals with sophistication that transcends the capabilities of petrochemicals.

Genetic Engineering — Manipulation of the genetic complement of plants, animals, and microorganisms to produce useful chemicals and diagnostic reagents, to control diseases of marine organisms, to detoxify wastes, or to enhance the growth and competence of aquacultural species is of high priority.

Biochemical Engineering — At some point development of procedures for producing useful marine substances on an economic scale should follow their identification. Bioengineering information will be required to determine the yield potential of individual products and biochemical engineering will be required, for example in design and operation of fermenters, other bioreactors, and reactors using immobilized biocatalysts, in aseptic operation of microbiological processes, in

product recovery, and in instrumentation and process control. Special opportunities may exist in photobioreaction and in use of marine microorganisms in detoxification of wastes and effluents.

Microbiology and Botany -- Fundamental studies in marine microbiology are likely to be the key to control of biofouling and microbially mediated marine corrosion. The technology for control of biofouling and corrosion is hampered by a limited understanding of the diverse processes involved. This lack of information is largely due to the complexity of environmental conditions and their effect on the microbial mediation of chemical, biochemical, or electrochemical processes leading to biofouling or dissolution of metals.

The nitrogen-fixing thermophilic and non-photosynthetic sulfur bacteria from marine environments may be promising subjects for fundamental studies that could provide the basis for their application in industrial processes. For example, enzymes that function at high temperature could be useful in chemical processing.

4. SEAFOOD SCIENCE AND TECHNOLOGY

General -- Of high priority for Sea Grant are research projects that address the problems preventing delivery of fresh and frozen domestic seafood products of high microbiological and organoleptic quality to consumers in the U.S. and in foreign countries. The research may encompass development of concepts for new products that could create new domestic markets; allow U.S. fishery resources, including underutilized species, to be used in traditional foreign markets; and enhance productivity by providing uses for food - or feed-grade materials currently wasted in processing. Other work relevant to these problems may include efforts to improve practices in handling, processing, transporting, and storing fish and fishery products so that safe food of consistent high quality can be expected from the industry. Of equal importance is research directed toward development of generic techniques for improving efficiency in processing which can and should include engineering approaches.

Processing Wastes -- One important issue confronting seafood processors is increasingly stringent regulation of quality of effluents. Consequently, research directed at alleviating this growing problem is important. A wide range of approaches are appropriate from, for example, development of methods for decreasing volumes of effluents to development of useful products from waste materials and development of new, inexpensive biological or physical methods for making effluents conform to regulatory standards.

Bioavailability -- Sea Grant research in seafood science has included studies on microconstituents of seafood and on its nutritional quality. Work of this type is still appropriate if it is justified on the basis of its relevance to well-defined problems of health or safety. In some quarters, there has been concern about bioavailability, especially of inorganic constituents. Studies which will develop reliable information on bioavailability in many cases require the use of human subjects and careful controls. Experiments of this type are expensive and, if undertaken through Sea Grant, should be on the basis of highly significant problems or opportunities in development of resources. Of low priority is work directed toward cataloging concentrations of chemical constituents of seafood without a justification based on specific problems or opportunities.

Basic Studies -- Research in seafood science and technology is or can be directly relevant to realizing opportunities for significant expansion and improvement of the U.S. fishing industry and concommitant reduction of the national deficit in foreigh trade. Because much of this research is applied and can be quickly and directly transferred to industry, heavy emphasis is put on interaction and cooperation with industry and advisory agents as well as with the three technological laboratories of the National Marine fisheries Service which are also engaged in research of this type. It is recognized, however, that appropriate studies may be basic in nature. For example, to solve certain problems in seafood quality, it would be logical and cost-effective to first develop a fundamental understanding of the factors that affect the organoleptic quality of seafood, and then to apply this knowledge to specific problems.

5. MARINE GEOLOGICAL RESOURCES

Development of marine geologic resources, as with the exploration of any resource, must be approached systematically. The decision to utilize a particular geologic resource, although primarily based on economics, must take into account environmental considerations. The commercial feasibility of developing a given geologic resource will depend on the delineation, extent, and quality of the resource, its useability and beneficiation requirements, production costs, market value, and various rules and regulations.

Priority should be assigned to research that will identify and lead to additional sources for strategic or critical minerals or materials. Strategic or critical minerals or materials would normally be considered as those identified by Congress or the Administration.

There also should be priority assigned to those projects that could identify means for, or lead to the use of the sea- or subseafloor for the storage of waste products of civilization.

Products integrated with related engineering, environmental assessments, or economic studies are appropriate. Such integration could be accomplished on one campus, one university system, or institutions scattered through the network.

High priority should be accorded research on the following:

1) To assess at suitable scales the resources of the coastal and marine environments and to evaluate potentialities for utilization. For example:

   - o Assessments of OCS hard minerals and newly discovered deep sea minerals (polymetallic sulfides and cobalt-rich manganese crusts), particularly those of strategic significance.

2) To develop innovative exploration technologies, alternative methods and systems for mining, beneficiating, and processing of marine minerals resources as well as systems for monitoring effects of extraction on the environment. For example:

- o Development of a suite of monitoring techniques that accurately sense change in the marine environment from extraction activities, and which can be conducted in an efficient and cost-effective manner.
- o Development of separation methods that selectively extract trace heavy metals from manganese nodule waste.
- o Refinement of development of mineral exploration and prospecting technology that conserves time, energy, and that has direct application and benefit to private industry.

3) To assess through adequate research on marine geologic resources in the public domain that data essential to decision-making and management in the public interest are available, along with data to encourage the rapid commercialization of such resources. For example:

- o Studies supporting the objectives of the deep seabed mining marine environmental research plan.
- o Investigation of the options available to the United States, given that the U.S. elected not to sign the Law of the Sea treaty.
- o Provide adequate research on marine geologic resources in the Exclusive Economic Zone (EEZ) to provide data necessary for rational decision making and management.

Low priority is assigned to research projects directed at resources for which generic questions related to assessment of the resource, the technology for exploration and recovery, environmental effects, and economics generally have been answered. For example:

- o Resource research and assessment of manganese nodules on the deep seafloor.
- o Economics of deep seabed manganes nodule mining activities.
- o Marine sand and gravel resources (except in the Arctic environment).
- o "How to" design research for most local needs.

The latter two items are very pertinent activities from the marine advisory service perspective.

6. COASTAL AND SEAFLOOR PROCESSES

Coastal and marine commerce depend upon sound coastal and ocean engineering. In turn, efficient and safe marine engineering design depends upon understanding coastal and seafloor sediment dynamics. Coastal protection, shoreline erosion or deposition in coastal waterways, and seabed stability are the subjects commonly associated with understanding coastal and seafloor processes.

Priority should be accorded research on the following:

- o Field experimentation at inlets which, building upon inlet investigations of the Corps of Engineers', will lead to increased understanding of the natural behavior of inlets, especially mechanisms governing sediment storage and bypassing.

- o Quantifying the functional behavior of groins, groin fields, and nourished beaches in groin fields.

- o Quantifying the role of rising sea level on the coast in terms of one to ten decades, and its implications for shore protection and management methods.
- o Outreach activities presenting results of the Corps' low cost shore, protection study.

Low priority should be given to research directed at subjects for which generic questions related to the process or procedure have been answered. For example:

- o Rote descriptive coastal geomorphical studies.
- o Low-cost shore-protection devices except those that failed during the Corps study.

The Corps low-cost shore-protection methods study has been completed and reports made available to Sea Grant programs, researchers, and advisory specialists. Based on structural or functional behavior, the devices/systems studies by the Corps were placed into 3 categories: a) satisfactory behavior; b) partially satisfactory; and c) not satisfactory. Data collected in the course of the program is being collated, archived and made available to engineers and scientists for research purposes. Those structures/systems rated unsatisfactory may indicate areas suitable for research.

7. ENERGY

A continuing need is seen for a few Sea Grant institutions to nurture an ocean energy expertise by maintaining high-quality, low-level research, development, and evaluation effort in these areas. Competency and innovative thinking with regard to energy extraction from waves or salinity gradients are scarce commodities in academia. On the other hand, university capability for ocean thermal energy has been adequately built up.

Environment Related -- New leases off California and in Georges Bank will generate renewed interest in environmental questions. Future large scale shifts to alternative energy sources will have a similar effect. A priority need is recognized for appropriate Sea Grant institutions to accept responsibility for providing informed views, anticipating controversy, and undertaking timely research to ward off extremist speculation when appropriate.

Social Sciences -- Development of alternate energy sources, i.e., synfuels, shale, coal-oil and coal-water slurries, will have tremendous impact on water supplies and transportation systems—in the Great Lakes region in particular. While the day when these alternate sources will become important has been put off, a need is anticipated for appropriate Sea Grant institutions to develop special competence for addressing socio-economic questions that are a direct fallout of these impacts.

Power Plant Impacts -- Further generic research in this area is considered low priority because a substantial body of information now exists. Specific site location problems should be funded by industry or the local government.

8. OCEAN ENGINEERING

Many ocean engineering studies will be for the purpose of establishing the feasibility and/or probable payoff of the development of a new technology. Others may be directed toward collection of geographically specific information needed for advising particular groups. In general, to extend studies

past the initial short-term effort in either of these cases, a carefully developed rationale is needed, clearly showing a large and general benefit to be expected. Therefore, some attempt at "systems" studies and "sensitivity" analysis at the program level is usually indicated.

The ideal is development of the new technologies needed for the better development or management of marine resources. Routine engineering design or commercial practices, and increased sophistication of a mathematical model for its own sake are of very low priority.

In the development of efficient aquaculture production systems, engineering support appears to be one of the weak links at the systems study level and also in the development of the necessary transfer and mixing processes which are necessary for the proper growth of the species in its various life stages. Engineering studies in the support of Sea Grant aquaculture programs are high priority.

The U.S. fisheries industry is suffering badly from greatly increased costs in the harvesting operation because of high fuel costs and high interest rates. High priority is given to those engineering studies which show promise of significantly affecting the efficiency of fisheries harvesting. These might include gear development, propulsion, or hull design, for example, but isolated studies should not ignore the systems context and the question of whether a particular improved technology will really make a difference. When it is possible to assemble a team which can properly analyze the entire harvesting-processing-marketing interelationships, this is especially encouraged.

Working in the marine environment is hazardous and the design, construction, and maintenance of ocean structures is hampered by poor knowledge of the fundamental engineering properties of marine soils and a lack of experience in dealing with hazards unique to this environment. High priority is given to development of reliable means of measuring marine soil mechanics properties and for methods of analyzing geotechnical information in relation to foundation stability. High priority is also given to improving the safety of working in the marine environment. This includes dealing with special hazards such as collisions with offshore structures, as well as the control and acoustic communications problems which presently limit the replacement of humans in hazardous work situations by robots.

It has been estimated that the cost of marine corrosion to the U.S. is $7 billion annually. Attempts to handle this ubiquitous problem with strictly empirical methods have led to slow advances. High priority is give to (1) fundamental studies of the corrosion process and the associated biofouling problem; (2) to basic electrochemical studies related to the cathodic protection process, and aimed at improving the capability of designing such systems; and (3) to studies of the use and degradation of non-metallic and/or composite materials for structural purposes in the marine environment.

9. MARINE TRANSPORTATION

The marine transportation system is a large and vital part of the ocean sector of the U.S. economy, and its health is necessary for significant gains from future marine transportation industry, it is poorly underpinned (except for vessel construction and operations) by integrated education, training, and research. Physical, social, and management science research in all aspects

of port development, management, and safety is high priority. The tripartite and multidisciplinary character of Sea Grant is particularly applicable to this area.

10. MARINE ECONOMICS

The declaration by the United States in March 1983, of a 200-mile Exclusive Economic Zone presents an opportunity for a sustained research effort to study the economic resources of this vast area. Research contributing to understanding the significance of these resources to our economic well-being, and the management and allocation of them, is considered high priority.

Fisheries management remains a priority research area. The design of more efficient mechanisms to allocate fishery resources without resulting in major industry dislocations should be a primary focus. Research goals are to determine how fishermen respond when presented with new economic opportunities and constraints; to contrast benefits from management with regulatory costs, both from public outlays and from burdens imposed on the industry responding to controls; and to develop empirical techniques that will provide comparable measures of the value of fish stocks under alternative use schemes. Routine economic baseline studies in support of fisheries management are expected to receive less support than in the past.

Research on the economics of fisheries developments also timely. Goals here are the development and estimation of meaningful indicators of the economic performance of the industry; a better understanding of the economic structure of all sectors of the domestic fishing industry and the markets within which they operate; and the study of the competitive position of the United States seafood industry in world trade, and how it is impacted by foreign investment and joint venture arrangements.

Generally, there is still a need to better understand the economics of the sports fishing industry, an often overlooked dimension of fisheries development. Some of these issues go beyond local ones, and where appropriate, regional and national research efforts are encourgaged.

The economic issues related to the development of other marine industries—recreation and tourism, aquaculture, mining, transportation, energy, etc.—rank as an important research area. Industry-specific research on productivity, performance, structure, etc., is viewed as a higher priority than the more general studies such as provided by regional impact and input-output models.

Water use, water quality, and waste management issues in coastal areas, especially related to coastal land use policies, present important research opportunities. The economics of ocean waste disposal relative to land-based alternatives needs some solid research. The design of market-like mechanisms to control pollution is also an important area of study.

The valuation of non-market goods--such as marine recreation, wetlands, pollution, aesthetics, environmental quality, habitat loss--is priority research when it can be demonstrated that it is important to account for these values, and if the research promises to advance and empirically test the methodologies employed in valuing this class of goods.

11. Recreation and Tourism

Recreation and tourism activities are important uses of Great Lakes and coastal resources. Sea Grant support of research and advisory service efforts in this area should continue, recognizing that opportunities exist for bringing the program to a better focus.

The "Recreation and Tourism" subprogram is not a tightly bounded discipline area. It involves economists, sociologists, psychologists, geographers, lawyers, engineers, natural scientists, diving and safety experts, and others working on studies of recreation participation and facilities investment, resource valuation, economic impact analysis, access questions, health and safety problems, and related issues. In general, interdisciplinary approaches to recreation and tourism research are encouraged.

Since Sea Grant early-on was the dominant supporter of marine recreation and tourism research, it was quite natural that a fair amount of baseline work emerged from Sea Grant in the first decade. The results of this initial effort were a patchwork of studies for specific coastal areas which provided a needed data base, but which was also subject to rapid aging. Fortunately, much of this work had a theoretical and methodological content which has proved of more lasting value than the specific observations.

Basically, research projects which offer only a descriptive picture or an inventory for yet another geographical area should be avoided. This may be difficult since often this is the type of study identified by industry and sometimes by state agencies as what they want from Sea Grant. Alternative ways should be found to respond to these needs, perhaps with financial support from the industry or agency, or by taking a "quick look" using the knowledge of the marine advisory service. Support of formal research projects of this genre would be seen as low priority, unless done on a regional basis with strong industry support.

The valuation of recreational resources (non-market goods) and the economic and social impacts on coastal communities resulting from recreation and tourism are relatively young research areas. Progress will come only if the conceptual questions and empirical methods remain in the forefront of the research. Simply applying standard techniques to different geographic locales must be avoided. Valuation and impact research must be driven by the goal of advancing the theory and methods of analysis, even more than the need for the specific information. The national focus in recreation and tourism must be based on sharpening these research techniques and applying them to interesting questions which have a bearing beyond the needs of the geographic area under study. Research which cannot meet these criteria will be seen as low priority.

The opportunities for multi-institutional cooperation in recreation and tourism should be explored. Boating and tourism development research on the Great Lakes is one example where Sea Grant has supported several institutions to undertake complementary research. Marina development, access problems, artificial reefs, and marine recreational fishing represent area Sea Grant has been heavily involv with, but which are more geographically diffuse. The purpose of any initial networked projects might be to document what is known and what is transferable elsewhere. Follow-on regional research efforts would be encouraged and mechani

should be explored to accommodate them when this approach has clear advantages. The regional analysis of national data bases, such as the NMFS recreation fishing surveys and the FWS hunting and fishing survey, might be an example of useful starting points for regional efforts.

Often recreation and tourism issues cut across related research areas such as fisheries, coastal zone management, water quality, transportation, education, and others. Sea Grant should be sensitive to funding interdependent research aimed at broader issues. For example, claims to fish resources are made by competing user groups which might include sports fishermen, subsistence fishermen, and commercial fishermen, and very often competing gear types within the commercial fishery. Here, recreation research would only be part of the broader resource use question. Another example of where an interdependent research approach might be called for would be related to multiple use of coastal resources. Better comparative social and economic values for resources in alternative uses, including extractive, residential, commercial, industrial, recreational, etc., could provide a stronger basis for public and private land-use decisions.

Many recreation and tourism questions are in need of research. Examples recently cited by researches in the field include the importance of catch success in sports fishing and the related question of how to separate the value of the fish resource from the value assigned to the recreation experience; the substitution of resources which has bearing on questions such as the public versus private provisions of recreation facilities and the treatment of quality and time; the economics and sociology of tourism promotion; urban recreation as it relates to waterfront development and harbor management; and the investigation of technologies favorable to the development of the recreation and tourism industry. An area of high interest to NOAA currently is the question of nautical chart use and safety, particularly as it relates to increased chart fees; and the economic consequences of severe weather phenomena on the recreation industry.

The above should be considered as an example of reseach areas which will move Sea Grant away from the more descriptive and inventory type of work that characterized much of the early effort. Whether they are high priority areas will depend on demonstrating that the proposed research not only promises to meet important local and regional needs, but also can offer scholarly and analytical advancements, and perhaps generate results applicable beyond the immediate case study at hand.

12. UNDERSEA RESEARCH

The emphasis on diver physiology remains constant. This includes efforts that focus on safety and survival of commercial and recreational divers.

There is growing recognition that many facets of decompression are not well understood. This is evidenced by the broader interest in the various manifestations of decompression from saturation dives in many research laboratories. As data on dives continues to accumulate, it is also becoming increasingly clear that existing standard decompression tables will require modification to increase the margin of safety for certain combinations of dive profiles. To get around impractically long decompression times required for some industry work, higher-oxygen-proportion

gas mixtures are being tried with some degree of success. Decompression tables for various combinatons of oxygen to inert gas ratios are not standard, however, and as this trend continues, such standards will have to be developed. This will probably require a reconsideration of some aspects of gas transport at the capillary and tissue level of the body, and the relevance of diffusion of gas through body tissue and how it relates to gas flow.

Work with bubble onset detection and improved measuring techniques are also priority areas of decompression-related research. Bubbles are always present when "bends" sickness develops although the appearance of bubbles does not necessarily result in bends.

Another related area of research meriting more attention is the subject of sensitivity to carbon dioxide. Diver sensitivity to CO2, varies among individuals and some research results suggest it may be the cause of some unexplained accidents.

Research related to the specific case of the human female response to hyerbaric conditions during early pregnancy or at various stages of the menstrual cycle should continue to diminish. The risks involved have been established to the point where pregnant females should not engage in decompression diving. Further refinement of these risks is considered very low priority.

There is a need for better dissemination of information to divers, especially those whose work or recreational activities involve repetitive dives. Existing decompression tables are know to have inadequate margins of safety for certain combinations of dive profiles. Even experienced divers, who "know" their own individual limits, may unknowingly place themselves at unnecessary risk. In addition good education programs can help create awareness among divers on the location of emergency facilities and management of emergency dive situations.

13. ENVIRONMENTAL STUDIES

There is a need for research which addresses the issue of estuaries and wetlands and their contribution to the marine resources of the nation. High priority is given to research that is directed to understanding the importance of fresh water inputs to estuarine productivity and the fluxes of nutrients through and within the estuary and their role in estuarine productivity. Understanding the consequences for the estuarine ecosystem of increased nutrient and sediment loads is of major importance also. Other important research areas include the determination of the role that estuaries and their ajoining wetlands play in the productivity of coastal waters, the understanding of the actual pathways that link primary and secondary producers, and the assessments of the relative importance of and ecological efficiency of these pathways. There is a need to better understand the roles that estuaries and wetlands play in the life cycles of ecologically or commercially important species.

Hydrodynamic and circulatory models are of low interest unless they are a necessary part of an integrated research program. Unless a significant advance in the state-of-the-art is anticipated, the development of new models is of low priority. Existing models should be adapted and modified as needed.

Four problem areas in marine environmental quality are of particular research interest. These are synthetic organics, eutrophication, pathogens and natural

toxins, and habitat degradation.

For synthetic organics, there is a continued need to elucidate the physical, chemical, and biological pathways of selected organic compounds such as chlorinated hydrocarbons. There is a need for creative biological effects research which addresses the effects of interacting pollutant and natural stresses on critical species and life stages.

The development of methodology for the early detection of ecosystem alterations as a function of nutrient changes is of high priority.

Development of rapid, specific, and sensitive detection methods for bacteria, viruses, and natural toxins is of very high priority. Research progress on these organisms and compounds is strongly inhibited by the cumbersome complex methods currently in use.

There is a need for a better understanding of the behavior of pathogenic bacteria and viruses in the natural marine environment, including sources, transport, survivability, and rates of uptake by important marine organisms.

Research into the life cycles of the toxic dinoflagellates that produce PSP toxins and ciguatoxin is of high priority, as is research focused on monitoring, predicting, and controlling toxic outbreaks of these organisms.

Understanding and developing predictive techniques to assess the impacts of habitat alteration of the life cycles of ecologically or commercially important species is of high priority.

The development of multi-investigator, multiproject coherent programs to address priority issues in ecological and environmental quality research is, of itself, a high priority goal.

14. OCEAN LAW AND POLICY

Projects which demonstrate a significant benefit to potential users will be given highest priority by the Sea Grant Office. Interdisciplinary studies present one of the best opportunities to conduct research with the greatest benefit to potential users. Interdisciplinary studies, then, will be accorded the highest priority. Proposals which do not specifically address user involvement in the development of the proposal and in the dissemination of results to users are not likely to be funded. Legal advisory service efforts can be an effective way to translate research into practical use and the Sea Grant Office will give advisory service activities high priority.

Projects which consider generic issues of significance to a group of states or a region and are structured to be used by more than one state also will high priority.

15. MARINE POLICY AND SOCIAL SCIENCES

State and local units of government concerned with the management of marine and coastal resources frequently lack the data and tools for organizing and implementing management policies and procedures; the same may be true of federal agencies with marine-related national responsibilities. It will continue to be appropriate, therefore, for Sea Grant researchers to aid in

establishing sound management practices. There are many ways of doing this, including specification of alternative public policies, marshalling arguments pro and con the alternatives, and examining the likely intended and unintended consequences of the alternatives.

The following research areas appear to merit attention. The list is not meant to be exhaustive, and it does not preclude initiatives in research topics that are local or regional in scope. But it does emphasize topics that provide opportunities for networking among programs, institutions, and disciplines, and a focus for the development of further research opportunities.

- o Consequences of the development of new marine resources such as polymetallic sulphides and cobalt-rich crusts;
- o Marine recreation (e.g., assessment of coastal recreational populations and their activities and preferences, identification of alternate recreational fisheries and other marine recreational opportunities, and impacts of recreational activities on marine communities and ecosystems);
- o Coastal zone issues (e.g., impacts of offshore resource-extraction activities on coastal communities, effects of changes in the demographic composition of coastal populations, and studies of occupational and socio-cultural adaptations for coastal industrial development);
- o Problems and opportunities for cooperative international marine research;
- o Marine fisheries (e.g., nature, causes, and effects of violations of fishery regulations; issues related to territorial use rights in fisheries; and examinations of the ways in which nations establish regulations for foreign fishing in their exclusive economic zones, and the social consequences of those regulations).

16. EDUCATION AND TRAINING

College and graduate level course development — Grants for improvement of university-level courses and curricula are generally for short periods of time, with the academic institution expected to pick up responsibility for full support of the new courses or curricula after the first few years. At least in the case of the more mature Sea Grant institutions, it is expected that there will probably not be much need for this type of assistance; but the newer Sea Grant institutions may need assistance in improving or initiating marine-related courses. All institutions are encouraged to borrow and adapt what has been developed elsewhere in this regard.

Pre-college education and teacher training — By and large, the development of pre-college educational materials under Sea Grant auspices has come to an end. This does not preclude projects to develop educational materials for special groups or to adapt materials developed elsewhere. Teacher training and information dissemination projects, on the other hand, can be expected to continue for several more years as Sea Grant educators work to promote awareness and use of available educational materials. Testing the pedagogical effectiveness of the materials which were developed under Sea Grant support is a high priority. Institutional programs should be aware of new opportunities for support of pre-college educational activities through other agencies such as the National Science Foundation.

Technical and vocational training -- Sea Grant has generally followed a conservative approach toward supporting projects in vocational and technical

training, preferring to see that there is a need for training before supporting the establishment of new courses of instruction. There is no convincing evidence why this approach should be changed at this time.

The Yasso report on the educational needs of the commercial fishing industry made a number of recommendations on associate degree programs, departments or schools of fisheries, a three-tiered educational system with easy re-entry for working fishermen, and research facilities. It is appropriate for Sea Grant institutions to act as advisors and facilitators in implementing some of the recommendations.

Sea Grant Fellowship Program — The purpose of this program is to provide educational assistance to qualified individuals at graduate and undergraduate levels in fields of study related to oceanic and coastal resources. Special emphasis is placed on extending this educational assistance to minorities, women and the handicapped. Pursuit of a vigorous fellowship program is high priority.

Sea Grant Internship Program — The internship program supports the training of graduate students who are judged likely to make significant contributions to the development and wise use of marine resources, especially at the federal policy-making level. The program continues to be high priority. It will be administered as in past years.

17. SEA GRANT INTERNATIONAL PROGRAM

When funds become available, Sea Grant will pursue an active international program designed to accomplish the program's goals of enhancing the marine research and development capabilities of developing countries and promoting the international exchange of marine information and data. Institutions which find it in their interest to maintain international projects within their current institutional programs should adhere to the following guidelines:

- o Projects should, to the extent possible, build upon existing relationships with institutions in elegible developing countries.
- o Emphasis is on education and training projects.
- o Projects should not raise unfounded expectations in developing countries.
- o Projects should be genuinely cooperative, with real evidence that the foreign partner is committed to the work.
- o Tropical Africa is a priority geographical area.

Until funds become available to support Sea Grant international projects, the Office of Sea Grant will continue its efforts to identify alternative sources of support.

18. COMMUNICATIONS

Highest priority should be given to communications projects that are cost-effective and address the Sea Grant mission. Publications, media material (fact sheets, public service announcements, news releases, etc.) and information activities (exhibits, etc.) should provide information deriving from Sea Grant - supported work for a spectrum of audiences while promoting awareness of Sea Grant accomplishments and an appreciation of ocean and Great Lakes resources and issues.

In reviewing communications proposals (or the communications protion of MAS proposals), the National office will look for evidence that the program has made an effort to evaluate the effectiveness of its communications products, and that distribution is being kept efficient through targeting and regular culling of mailing lists.

In general, fiscal prudence would dictate that high budget items such as videotapes should have considerable "shelf life" and/or be aimed at a broad audience. Items more ephemeral in nature and aimed at a smaller audience should be low budget.

Proposals should be detailed, where appropriate, regarding such information as circulation and readership of newsletters, quantities and distribution of various types of publications (technical reports, advisory bulletins), level of effort in electronic media, and staff positions.

Proposals should also reflect an awareness of Sea Grant communications activity regionally and nationally, and show how the Sea Grant network is being used to avoid duplication of effort and to multiply resources.

Also, as a routine practice, communications activities should seize opportunities to describe the accomplishments of the individual programs within the broader context of the Sea Grant network as a whole. Such products as magazine and feature articles could be written to incorporate related work at other Sea Grant programs. When possible, effort should be made to describe the National Sea Grant College Program as a network of institutions linked together to pursue marine resource development goals of benefit to the nation as a whole.

19. MARINE ADVISORY SERVICE

a. Commercial Fishing

Commercial and recreation fisheries remain a significant element of most Marine Advisoy Service Programs. Each program tends to emphasize different elements of the fishing industry based on local needs and staff resources. The programs are basically successful and should be continued in this format.

* Priority: A desire for a closer working relationship with Sea Grant and Marine Advisory Services has been expressed by the National Marine Fisheries Service at the Regional and National levels. These working relationships are seen as desirable in planning and implementing educational programs. It is critical that MAS management maintain a nonadvocating role promoting objectiv educational information and avoiding program relationships that may be interpreted as regulatory or enforcement. Look to Sea Grant Director leadership and guidance in regional meetings to address mutual programs and information transfer activities.

b. Seafood Technology

* Priority: One of the major opportunities in seafood technology is to improve the quality of the seafood product being delivered to the consumer. This opportunity addresses primarily the fresh seafood market but can also include frozen, processed, and packaged products. One of the major problems inhibiting greater use of the U.S. domestically produced fish is the widespread inabilit

to produce fresh fish of adequate quality to provide sufficient shelf life to be used in most major retail outlets in inland and coastal states. MAS can play a significant role in improving the quality of the product delivered to the consumer. Program consideration includes the total market channel from catch to the consumer's table. Advisory Service programs directed at sanitation and handling of the catch are needed to improve the shelf life of fresh products and the quality of processed, packaged and frozen products. This effort would improve the quality of fisheries products, resulting in both increases in demand volume and profits for all segments of the commercial fishing/processing industry.

c. Recreation/Tourism

Recreation/tourism remains an important economic activity in most coastal areas and is a program that merits MAS consideration. MAS programs need to examine this program area for opportunities and plan carefully their involvement to avoid being swamped by demands for assistance. Consideration for working with multiplying factors in program delivery would be good advice; for example, working with tourism support industries rather that the tourist directly.

Recreation fishing is an important element of the recreation and tourism industry. It should remain a part of MAS programs that identify it as a needed program area. Programs that have not developed this area are encouraged to investigate its potential within existing resources. Recreation fishing makes a good transition program for the traditional commercial fisheries program interested in getting into the recreation-tourism program area.

Marine industries, marinas, boat manufacturers, boat yards, bait shops, dive ships, tourism development associations, chambers of commerce, etc. are depending on needs of local communities, potential constituent groups.

d. Ports and Marine Transporation

* Priority: The National Sea Grant College Program (NSGCP) is interested in increasing technology transfer and application to these industries. The contribution of advisory service programs to this segment of marine industries has been spotty. Greater emphasis is anticipated in the future. Sea Grant programs are encouraged to increase effort in this program area. MAS programs are encouraged to review port and marine transportation facilities and industries within their regions to determine if useful advisory services can be developed.

e. Coastal Zone Management

Coastal Zone Management (CZM) can be improved through educated coastal constituents, therefore, MAS should play an active role in education. Educational programs and forums to voice ideas and opinions can be productive in formulating effective CZM plans. Most CZM plans are now in place. States are carrying out the implementation phase. MAS can be helpful in aiding communities in developing education and implementation programs. MAS programs are encouraged to participate in this program area within the parameters of their local Sea Grant

Program, but it is extremely important that this is done in an objective rather than advocacy role.

f. Aquaculture

* Priority: The continued development of aquaculture in the U.S. will be aided by technical assistance provided through advisory/extension services. A continued effort to assist public and private aquaculture organizations, either through cooperation with the Cooperative Extension Service or educational and demonstration projects through MAS, is seen as high priority.

g. Education

* Priority: In-service educational opportunities for MAS staff are essential to keep abreast of the changes in their field of expertise. In order that MAS programs operate efficiently, the staff must be aware of improvements in operational techniques and program expertise. Each program should address this issue to ensure there are adequate training opportunities within the resources available. It will be helpful to reflect regional and national perspectives to needs for specific training programs.

Marine Advisory Programs involved in education programming should refer to the Guidelines for Education to determine appropriate program emphasis.

h. Pollution

Aspects of pollution and environmental problems permeate almost every aspect of the MAS program. Rather than being treated as a separate category, these problems should be linked to specific programs within existing parts of individual MAS programs and the Sea Grant research efforts.

i. Safety

* Priority: MAS programs are encouraged to emphasize safety in all elements of programming conducive to this program thrust. This will encourage awareness and knowledge that will make the marine environment safer for those who live, work, and/or play within the confines of marine and Great Lakes resources. Program areas include, among others, diving safety, seamanship and navigational safety, industrial safety, safety in recreation, ship safety, and public safety in coastal areas.

Natural Hazards Response is a program area that has been successfully addressed in several states. These cooperative programs with the National Weather Service, National Ocean Survey, U.S. Coast Guard, Red Cross, etc., have shown exceptional results with minimum investment. MAS programs are encouraged to consider this program area. The NSGCP stands ready to render assistance in establishing linkages to NOAA organizational elements and/or the other related organizations. This should remain a high priority activity for those states that are particularly vulnerable to such natural hazards as hurricanes, storm surges, tsunamis, flooding, etc.

j. MAREP

* Priority: MAS programs are encouraged to work with NWS to implement a Marine Reporting (MAREP) system where the current sea surface observations are transmitted from the boaters to shore, forwarded to the nearest NWS forecasting facility, and incorporated into the next marine forecast. The most advanced Sea Grant effort in the MAREP program is in Delaware. In January 1984, the Delaware Sea Grant at Lewes, Delaware commenced transmitting and relaying weather information between the boaters and NWS. The MAREP effort in Delaware is unique in that the University of Maryland's computer system is being utilized. With telephone modems connected to an inexpensive home computer, the boater/fishermen can access the University of Maryland computer system on a 24-hour basis to obtain the most current marine weather forecast. Such information is critical to sail/no sail decisions.

VII. The Sea Grant Trilogy: Research, Education, Advisory Service

A. Research and Education

Estuarine systems are known to be among the most naturally productive ecosystems in terms of their contribution to the nation. Improving our knowledge of the many factors involved in the productivity of the estuaries permits them to be managed more effectively, thereby further enhancing their value. The development of sound management strategies requires that the highest consideration be given to understanding those mechanisms in order to insure balanced utilization of the estuarine resources, growth of the adjacent areas, and the ability to recognize beneficial or adverse impacts of alterations to estuarine systems.

The preeminence of the Mobile Bay and Mississippi Sound estuarines in the Mississippi-Alabama coastal region dictated a need to develop a comprehensive understanding of those systems. This was recognized by the MASGC Planning and Advisory Panel as it developed the problem statements which provide the basis for this long-range plan. Toward developing that understanding, programmatic emphasis in the last several years have been upon assessment and evaluation of estuarine resources. More recent research efforts are being directed at development of the resources under the concept of understanding the cause-and-effect relationships of the natural environment in its response to man's activities. To gain such understanding, it becomes necessary to investigate many aspects of the natural resources, the human resources and the industrial and commercial resorces of the region. This research program will provide a range of information which not only identifies the spectrum of resources, but also examines their precise interrelationships with man and nature. The investigations of these interrelationships will identify employment opportunities, potential social, economic and environmental impacts, and probable by-products.

It is evident that the range of information which will be developed can contribute significantly to improving the quality of life in the region. This, though, can only be accomplished by means of a concerted effort to deliver the findings to the public. Two public-delivery mechanisms are available to the Sea Grant network. First, formal education programs delivered through the primary, secondary, and post-secondary education systems of the region can enhance the marine literacy of the student bodies which will eventually provide community leadership. This means of delivery is achieved through the educational component of MASGC. The Sea Grant Advisory Service programs provide the second delivery mechanism in their function as an educational outreach component transferring new technology to the general public. This provides not only a somewhat personalized medium for information delivery to the public, but also returns current problems and community needs to the MASGC Directorate for translation into potential research opportunities. Additionally, the scientific community has its own mechanisms for the dissemination of scientific results of research activities. These include publication in scholarly journals, oral and published presentations at professional meetings, published reports in a variety of media, and personal contact between investigators.

Thus, the programmatic aspects of this plan make provision for the classic Sea Grant Trilogy of research, education and public service. The public service component of this plan encompasses the Sea Grant Advisory Service programs, the MASGC Legal Program, the Coastal Information Management System, and other service projects. In order to insure the efficient operation of the program,

the MASGC Directorate provides the appropriate administrative support.

Within the perspective of a long-range plan it is necessary to speculate on the projected needs of the states, the region and the nation using the best available information. In so doing, the plan must have sufficient flexibility to allow for frequent changes as needs vary with time. Accordingly, this plan was prepared based on the perceptions of the Planning and Advisory Panel, the Program Coordinating Team, The Mississippi and Alabama Sea Grant Advisory Services, the MASGC Directorate, and National Sea Grant College Program guidelines.

B. Sea Grant Advisory Services

The future development of the Alabama and Mississippi Sea Grant Advisory Service Programs are described below. Each of these proposed programs has been developed independently. Coordination of these efforts will be accomplished through the MASGC Directorate.

1. Alabama Sea Grant Advisory Service

Philosophy and Approach to Planning

Historically, Sea Grant Advisory Service efforts in Alabama have been and must remain flexible. Many factors impact the coastal community in which the Advisory Service operates, including but not limited to the following: environmental conditions, legal and regulatory changes, weather, availability of seafood resources, development of new industry, and changes in the national and state economic situation.

Many of our activities are and should be predicated on helping our clientele respond to changes in these and other conditions as they occur. Thus, any long-range plan for Advisory Service activities must include a substantial portion of non-committed time to deal with emerging problems, conflicts, and opportunities that connot be anticipated.

For planning purposes, past experience suggests that approximately 25 percent of total time should be allocated to dealing with unforeseen events and conditions. Thus the objectives, activities, and goals identified in the balance of this document deal only with the 75 percent of total effort that we believe can be foreseen.

Although the necessity to provide rapid response to changes in conditions has been identified, without a long-range plan an Advisory Service Program may suffer from a lack of continuity and direction. By setting long-range objectives, even if they must be modified to meet changing conditions, great benefit is provided by focusing the program in a predetermined manner.

The intent of this long-range plan is to provide guidelines, not to promote rigidity in structure or in direction. It will be used and adhere to only as long as it remains relevant ot the need, concerns, and opportunities that develop in coastal Alabama during its time span.

In the development of our long-range plan, we attempt to retain a broad perspective by considering the identification of priorities and needs as discussed below. The process used in assessment and review asures that while broad problems are addressed, localized needs are adequately considered.

National Priorities and Needs

The National character and base of support for the entire Sea Grant Program helps provide guidance and direction in the development of the Alabama Sea Grant Advisory Program. Participation in National meetings, the review of published National priorities (OSG, NMFS, S-K) and direct contact with OSG personnel and other Sea Grant Programs provide the basis for an understanding and appreciation of the needs and problems that confront our entire country.

Many of the National priorities have also been identified as regional and/or local concerns. In most instances, local concerns have direct applicability to at least a portion of the National problem. Within this constraint, the Alabama Program attempts to address those needs for which the necessary financial and personnel resources are available to deal with these questions in a positive fashion.

In 1982, the diciplines in the Alabama Sea Grant Advisory Service basic staffing plan were changed to include a seafood technologist. This change was heavily influenced by information from the Seafood Science and Technology Workshop sponsored by the National Sea Grant College Program, the National Marine Fishery Service and the National Fisheries Institute in 1982. The seafood technologist position was filled in early 1983.

Regional Priorities and Needs

Participation in the Southeast Marine Advisory Service (SEMAS) network has proven to be an excellent means of sharing information, identifying regional needs and priorities, and transferring successful program techniques between Gulf and South Atlantic states from Texas to North Carolina. Initial steps toward identifying and formalizing regional priorities were taken by the SEMAS network in early 1984. Further refinement and discussion will lead to a listing of priorities important to the region on both a long-term and short-term basis.

The NMFS Regional Office has been effective in informing Alabama and other SEMAS participants of NMFS Regional priorities. The regional priorities identified in the Saltonstall-Kennedy solicitations also provide guidance that is incorporated into the Alabama programming efforts.

As a part of the Mississippi-Alabama Sea Grant Consortium, guidance on priorities from the two-state area is provided by input made by the advisory group convened by the Consortium. Inputs from all of the sources mentioned above are considered in the development of the Alabama Sea Grant Advisory Program. Examples of such topics include joint Mississippi-Alabama projects in fishing vessel energy, dredge spoil disposal, and others.

Local Priorities and Needs

Advisory Service Programs work closely with local clientele and hence receive almost a continual input that helps to identify local needs, concerns, problems, and priorities. Much of this communication is done on a one-to-one basis when Advisory Specialists meet with individuals and groups of industry members. Many of these efforts fall into the "responsiveness" mode discussed earlier. Questionnaires, newsletters, and personal letters are also used to solicit recommendations and identification of industry needs on a regular basis.

A more formal planning process is also utilized. In 1980-1981, a group of seafood industry, general business, and agency representatives was convened for the purpose of providing guidance in the development of a long-range plan for the Alabama Sea Grant Advisory Service. The plan developed spanned five years and has provided direction to the program. Both formal and informal meetings with this group and others provide annual updates and direction.

During 1984, the long-range planning group was reconstituted and helped develop guidelines for program direction from 1985-1990. To be most effective, this or any other long-range plan that is developed must be reviewed and reassessed periodically. The review function will be performed by an Advisory Panel composed of constituents and members of the user groups, representatives of federal and state agencies concerned with coastal issues, and representatives of state and local governments.

This group will be convened annually to review and make recommendations on the specific tasks, activities, and plans for the next year. Those items included in this overall plan, will form a framework of projected areas to be better defined, shaped, and directed by the the Advisory Panel on an annual basis.

General Framework and Definitions

As indicated, this is intended to be a dynamic plan and therefore is not highly structured to the point that it enumerates specific tasks to be completed at a given date. It does specify a set of goals and objectives that have a logical progression. To facilitate discussion and understanding of the proposed goals, the five year period has been divided into two sub-units. To conform with the time frame of our current two-year proposal, the first time period considered will be 1985-1986. For purposes of discussion, this will be identified as the Near Future planning horizon.

The remaining years in this plan, 1987-1990, will be considered the Distant Future planning horizon. Of necessity, those items discussed in the Distant Future portion will not be as specific as those covered in the 1985-1986 time period.

To help provide structure and coherence to the long-range plan, the following format will be used. An overall summary of the intent of the program thrusts and direction during both the Near Future and Distant Future time periods will be given at the beginning of each section. This will provide a general view of the rationale for the objectives and activities proposed during the time period under discussion.

All plans and projections are based on the assumption that basic staffing patterns and levels will at least be maintained and possibly expanded. This provides for a minimum of four professional staff plus secretarial and administrative support required for successful program implementation.

Following the Summary, the following factors will be addressed for each specific item planned.

1. Situation
2. Objective
3. Expected Results
4. Resources Required
5. Time Frame

NEAR FUTURE TIME FRAME
1985 and 1986

Summary

During 1983 and 1984, the Alabama Sea Grant Advisory Service was substantially restructured to increase emphasis on providing educational assistance and information to the commercial fishing industry. By redirection and focusing of program efforts on one major segment of the coastal economy, it was possible to provide an expanded and improved level of services to this important group. This emphasis will be continued during the Near Future time frame.

Reduced staffing levels in preceeding years resulted in decreased levels of involvement with some components of the coastal community. The resumption of normal staffing levels in 1983-1984 enabled the program to somewhat diversify and deal with varied audiences. However, efforts to focus and concentrate on the commercial fishing and other marine-related industries will be continued.

In the past, the majority of efforts directed to marine fishermen were focused on the commercial fishing sector. During 1985 and 1986, the program will be modified to also better address the needs of marine recreational fishermen. Although the two groups share a common resource they have a long history of conflict and friction in their relationship. The Advisory Service Program will attempt to help reduce this level of conflict.

During the Near Future planning horizon, concerted efforts to aid Alabama seafood processors in new product development will be made. This work will focus on utilizing new processes or methods to change the market form or level of processing currently employed on standard products; the use of presently under-utilized species for new products or marketing efforts will also be pursued. This effort will involve all members of the Advisory Service staff.

Earlier efforts to make the seafood industry aware of the potential markets for seafood export will be expanded and continued. The export of seafood products from Alabama has increased in recent years, but has not yet attained its potential. Information and assistance is available from numerous sources, but tends to be more abstract and theoretical than of a practical value to potential exporters. It is the intent of our program to work with existing agencies and organizations to provide a more basic and practical approach to the complexities of seafood exporting. This effort will be conducted in conjunction with the product development efforts discussed above.

Although Advisory Service efforts in the past have focused attention on educational programs for the general public, this program will be continued and expanded during the next two years and use at least one major Conference/Symposium annually as a focus on efforts in marine resource development and utilization. These programs will be organized, and coordinated by the Sea Grant Advisory Service in cooperation with various groups and agencies.

The Near Future time frame will be used as an exploratory period to develop a program structure which allows the flexibility to blend the existing Sea Grant Advisory Service Program with the concept of an expanded role in the coastal community. An administrative structure that allows the Advisory Service to actively seek and participate in other than totally Sea Grant/State funded efforts will be developed. Additional projects that might be undertaken will be limited to those that fall within the context of the overall Sea Grant mission and philosophy. This includes projects that either complement or supplement present and planned Sea Grant efforts. In many instances, these may be projects that would have been funded by Sea Grant if sufficient finances were available.

It is anticipated that some projects may be conducted cooperatively, with other groups providing a portion of funds and/or personnel and the Advisory Service providing some portion of matching. In other cases, the Advisory Service may contract to provide all services and personnel required to perform the project with funds supplied by the sponsoring group or agency.

Potential sources of funding include agencies of state government, state/local groups or agencies, federal agencies and organizations, and private foundations. The result of this type of structure would be to focus involvement in activities related to the Alabama coastal area on the Sea Grant Advisory Service Office. It would also provide information and educational material to be used by the Advisory Service that would not be available from other sources.

The mechanism envisioned is either temporary or short-term employment of additional personnel to perform the work under the direction of the permanent Advisory Service staff. If incomes generated by these activities develop to the levels necessary to support the employment of one or more full-time positions, these individuals would be utilized to actively support ongoing Sea Grant Advisory Service activities at no cost to Sea Grant.

This arrangement was previously used when two man-years of a Public Affairs/Technical Writer were provided to the Advisory Service Program at no cost by the Alabama Cooperative Extension Service. This individual had the responsibility of conducting a program under contract with the U.S. Corps of Engineers. When not completely employed in performing this task, he was fully utilized by the ongoing Advisory Service Program. Current plans are to expand this technique and actively pursue additional sources of ancillary funding to expand the Sea Grant Advisory Service role beyond that available with current levels of funding.

Specific Projects

Situation: Commercial fishermen and sport fishermen in Alabama have a long history of conflict and strained relationships. This situation is not unique to our state but exists in almost all other parts of the nation. The controversy has recently become more intense due to "gamefish status" for speckled trout and Redfish.

Objective: The Advisory Service will initiate contacts with moderates in both factions and attempt to provide a forum for continuing discussion of issues. Unless the opportunity for dialog exists, this situation can only deteriorate.

Expected Results: Although discussions between the two groups have been attempted in the past, they have been on a "crisis" basis. By establishing a small, but representative group composed of moderates on both sides, better results are anticipated.

Resources Required: No additional personnel or financial resources will be required.

Time Frame: If this objective is attained in the short-term it will definitely be continued. Without success, it is probable that no basis for continuation in the long-term will exist.

Situation: The nation's coastal regions are preferred locations for living, recreation, and business and industrial activities. Coastal areas have many unique attributes but also have numerous problems characteristic only to the coast. This fact is not well known and understood throughout the inland portions of our nation or in many instances even by the residents of the coastal areas.

Objective: Advisory Service activities are concentrated in the coastal area and hence it is in this region that we can be most effective in increasing the general public's awareness of marine and coastal resource questions. To increase public understanding of the many issues to be considered, at least one major Conference or Symposium will be sponsored annually by the Sea Grant Advisory Service.

Expected Results: Participation and sponsorship by national, state, and local units of government, agencies and organizations, and business will provide the basis for educating a relatively small but influencial sector of the population. Proceedings of this meeting will be published and made available for wide-scale distribution.

Resources Required: Financial support from co-sponsors will be requested and is expected. Additional financial resources may be required from Sea Grant to help cover the cost of publications.

Time Frame: This is intended to become a continuing effort throughout the duration of this plan.

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Situation: Several species of marine turtles have been identified as endangered or threatened species. These turtles are sometimes taken incidental to shrimping operations. To combat this problem, NMFS has developed a turtle excluder device (TED) which has been renamed a trawl efficiency device. This device has received limited use by Alabama shrimpers.

Objective: Workshops to inform Alabama shrimpers of the benefits and values of the TED will be held in cooperation with the NMFS, Pascagoula facility. The use of TEDs will be promoted on the basis of exclusion of by-catch. TEDs will be placed on a minimum of two local boats for use by fishermen and evaluation by Advisory Service personnel.

Expected Results: Research indicates that a substantial portion of the by-catch can be excluded without decreasing shrimp catch. If this fact can be demonstrated by commercial shrimpers and the information disseminated by Advisory Service, acceptance and use of TEDs can be accelerated.

Resources Required: A proposal for Saltonstall-Kennedy funding to carry out this project has been submitted for FY-85. If approved, no additional Sea Grant resources will be required and this project will be conducted as a Sea Grant Advisory Service Program. If S-K funding is not approved, additional Sea Grant funding will be needed.

Time Frame: This effort will terminate at the end of 1986 unless it is determined earlier that the industry has accepted the use of TEDs.

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Situation: The shrimp industry nationwide is faced with increased competition from foreign produced shrimp. One factor that often plays an important role is poor quality of U.S. product. Onboard handling of shrimp by U.S. fishermen must be improved.

Objective: During the Near Future time frame, concerted efforts to establish an On-board Quality Control/Sanitation Program will be carried out. Materials and information to conduct this program are presently being accumulated. If the quality of shrimp landed can be related to increased market demand and product price, cooperation of the vessels can be obtained.

Expected Results: Several major seafood processors in Alabama have verbally committed to participate in this program. It has not yet been determined if they will be willing to offer price premiums for quality shrimp, but this possibility does exist. If an increase in quality consciousness among Alabama shrimpers can be developed, it may help Alabama products compete more favorably in the market.

Resources Required: No additional personnel will be required to conduct to this project. Additional funding for visuals and video equipment would be highly desirable.

Time Frame: This project is planned for annual emphasis during the long-range planning period.

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Situation: Many of the seafood resources of the Gulf of Mexico are not fully utilized because no market for these species exist in the United States. Alabama has the potential to provide large amounts of under-utilized species for export. However, because most processors are relatively small they do not have the necessary personnel or knowledge base required to enter the export market.

Objective: In order to compete in world markets, Alabama processors must have more information on methods, regulations, opportunities, and financing available to exporters. In cooperation with NMFS, SBA, the Alabama Trade Center, and other organizations the Advisory Service will conduct and implement an educational program dealing with these voids in knowledge on a practical (how-to) level.

Expected Results: By providing information in the form of workshops, written materials, and personal support, it is anticipated that an additional group of Alabama producers can be stimulated into entering the export field. Positive steps in this direction were taken in 1984 when Advisory Service and NMFS personnel were instrumental in the formation of a group of crab processors willing to enter the export market.

Resources Required: No additional personnel resources will be required from Sea Grant. Efforts will be made to obtain substantial involvement from other agencies and private industry to conduct this program. Some additional financial support may be required to help defray the cost of technical consultants.

Time Frame: This effort will be a long-term project and should be continued throughout the duration of the long-range plan if appreciable progress is to be made.

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Situation: Commercial fishermen in Alabama are more interested in gear changes and developments than any other topic. One Advisory Service position filled by a knowledgeable ex-commercial fisherman would be extremely valuable. Due to the academic requirements and financial considerations, such individuals are not readily available.

Objective: Negotiations are underway between the Mississippi-Alabama Sea Grant Director, the Alabama Advisory Service, and the National Marine Fisheries Service, Mississippi Laboratories Director to implement a Sea Grant/NMFS Cooperator agreement. This individual would actually take part in NMFS gear development activities and convey the information obtained to the Sea Grant constituency in both Alabama and Mississippi.

Expected Results: Gear information developed by NMFS would receive broad dissemination throughout the Sea Grant network. This would not only improve the ability of NMFS to disseminate information more rapidly, but also enhance the type of information available from Sea Grant personnel. It is anticipated that this effort would result in greater support by the commercial fishermen for both Sea Grant and NMFS.

Resources Required: No additional personnel resources will be required. NMFS will provide on-scene logistical and administrative support for the cooperator. The Cooperator will be a staff member of the Alabama Sea Grant Advisory Service.

Time Frame: This arrangement would be contingent upon the agreement of all parties concerned. If it proves to be effective, it is expected that it would be maintained for the foreseeable future.

DISTANT FUTURE TIME FRAME
1987 to 1990

Summary

Many of the projects discussed in the 1985-1986 time period provide a basis for expansion during the Distant Future time frame. They have been identified as areas which should be continued throughout the duration of the long-range plan, contingent upon the results obtained during the initial implementation. These projects will not be specifically covered in this portion of the plan. Only projects that are either new or substantially changed will be discussed below.

As explained in the earlier section, it is anticipated that the necessary administrative structures to facilitate the Alabama Advisory Service seeking and obtaining supplementary funding from sources other than the Sea Grant Program will be in place and functioning prior to 1987. This fact should not be construed to reduce the importance of funds from Sea Grant. Sea Grant funding is imperative to provide a "core" operation. Without the personnel resource base which the Sea Grant Program provides, no other means of sustaining the concept exists.

Although additions to staff were kept to a minimum during 1985 and 1986, it will become necessary to increase personnel commitment with the start of 1987 if the program is to continue to be effective and expand into new areas. At present, the Alabama Sea Grant Advisory Program is somewhat unique in that no agents are employed. The staff serves both as agents and as specialists. In this capacity, they are the prime source for general and technical information, and also the delivery mechanism used.

In order to allow the current specialists an opportunity to obtain a greater depth of knowledge in their subject areas, marine agents will be employed for each of the coastal counties. The agent responsible for Bayou La Batre will primarily serve the interest of the commercial industry; the agent in the Bon Secour/Gulf Shores area will have the responsibility of working with both the commercial industry and the recreational fishing industry. These individuals will provide the major day-to-day contact with constituents.

The specialists will thus have more time to devote to developing and increasing subject matter competence and be able to provide greater amounts of specific technical assistance to clientele. In many instances, because of the diversity of demands on the specialists, it has not been possible for them to pursue and respond to specific requests for information to the degree desired by the user group. The addition of agents will help eliminate this problem and allow the specialists to become more deeply involved in demonstration projects. It is anticipated that these demonstration efforts will take numerous forms, some of which are described in the balance of this summary.

Discussions currently underway with firms in the commercial fishing industry and with the U.S. Food and Drug Administration, Fisheries Research Branch may result in the establishment of a local Seafood Quality and Sanitation Laboratory. Under consideration is the possiblity of an agreement that would make a portion of the FDA facilities available to the Alabama Sea Grant Advisory Service. The Advisory Service seafood technologist would be responsible for supervising a Consortium fellowship graduate student from one of the Mississippi or Alabama Sea Grant institutions.

It is anticipated that the student would spend approximately six months in residence on Dauphin Island and during this time would gain valuable practical experience in conducting chemical and microbiological testing of seafood products. Arrangements for completing formal academic course work during this time and housing considerations are yet to be determined.

The Seafood Quality and Sanitation Lab would not function in any regulatory capacity, but rather would be available as a service to the industry to help eliminate official citations. Fees for service performed would be charged and after the initial period of establishment, it is possible that the operation could become partially self-sustaining. The laboratory could be used by Sea Grant Consortium University researchers working in areas related to seafood technology. FDA staff members might be available to act as graduate student advisors and to help supervise work being performed.

With the completion of the gear development activities project discussed in the Near Future time frame, it will become important to have an easily accessible and structured method of testing and aiding in the adoption of gear and equipment innovations. The method proposed is an annual commitment to lease the services of a working shrimp boat for demonstrations and trials.

Depending upon the amount of work to be conducted and financial limitations, it is initially suggested that approximately 20 sea days per year be planned. A portion of the financial support for this effort may be available from the industry itself; the balance of the funds needed would have to be obtained either from state or Sea Grant sources.

During the Distant Future time frame, the program will be moving into the realm of high technology including more emphasis on computer and video equipment use. This will enable the use of materials and/or computer programs developed elsewhere to be applied to the Alabama coastal situation. To facilitate the use of this equipment, a combination conference/visual/computer room would be an additional office requirement. This facility would provide the opportunity for working with small groups (less than ten people) in a relaxed and informal atmosphere. Funds to procure additional computer and video equipment will also required. By 1987, our current computer equipment will be five years old and may require replacement in addition to the new equipment anticipated.

Specific Projects

Situation: The Alabama Sea Grant Advisory Service personnel currently function as both specialists and agents. The necessity for frequent interaction with clientele substantially reduces the amount of time that can be devoted to maintaining and developing subject matter competence.

Objective: To help maintain and increase the industry support of the Sea Grant Advisory Service Program it is necessary that the specialists have the flexibility and time to investigate specific technical questions and problems. The planned addition of two Sea Grant Advisory Agents would both enhance the routine, daily contacts with the industry and provide the flexibility needed by the specialists.

Expected Results: The addition of Advisory Service Agents whose prime responsibility is the maintenance of channels of communication and contact with members of the Sea Grant user group would provide greater exposure and recognition for the Sea Grant Program in Alabama. By having more time available to devote to increasing their technical capablities, Advisory Service specialists could more effectively and efficiently meet the increasing demands for information and assistance.

Resources Required: Additional state and/or county funding to employ agents will be requested; however, commitment of additional Sea Grant funds to these positions would substantially enhance the probability of success.

Time Frame: When added to the staff, Agents will become a visible and important portion of the program. It is anticipated that they will remain in place throughout the duration of this plan.

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Situation: U.S. seafood products must compete with increasing market pressures from foreign imports. Due to numerous considerations, in many instances the foreign products are more competitive price-wise and in some instances in terms of quality. Higher quality in U.S. seafood products would help obtain a greater market share for our nation's seafood.

Objective: Because of the highly fragmented structure of the Alabama fishing industry, many small firms do not have the necessary resources or personnel to maintain in-plant quality control or laboratory facilities. A local Seafood Quality and Sanitation Laboratory would help improve the level of product quality from Alabama processors.

Expected Results: This would be a non-regulatory activity and provide the necessary information and assistance to help Alabama processors produce a better product. This laboratory will also provide valuable practical training and experience for graduate students in the area of chemistry, microbiology, and seafood technology thus adding to the pool of trained resource personnel available in the Gulf Coast region.

Resources Required: After establishment, it is anticipated that no additional funds beyond the Consortium graduate fellowship would be needed to maintain the operation. Additional funds would be required for project initiation and establishment. Acceptance of the concept should generate the commercial seafood industry participation necessary for the laboratory to become essentially self-sustaining.

Time Frame: The project should be continued for the duration of this plan if required levels of industry interest, commitment, and participation to make it a self-sustaining operation are obtained.

Situation: Fishermen are most receptive to changes in technology and gear design and modification when the results are proven and demonstrated by other commercial fishermen. In order for energy efficient or catch efficient modification to be accepted by the majority of the fleet, they must first be proven by other commercial fishermen.

Objective: To build on the Sea Grant/NMFS Cooperator arrangement described in the Near Future time frame, the Alabama Sea Grant Advisory Service plans to enter into a lease agreement with a working Alabama shrimp vessel. This arrangement would allow the testing of gear modifications primarily developed by NMFS and Alabama net and gear suppliers.

Expected Results: Trials and demonstrations conducted by bona fide commercial fishermen would have greater credence among the commercial fishing industry than any research efforts. Advisory Service personnel would take an active part in both the trials and evaluation of any demonstrations that were conducted. Cooperating fishermen would be expected to participate in the dissemination of results and hence provide greater and more rapid acceptance of this information.

Resources Required: Funding for this type of an operation will be sought from established industry organizations and foundations. Partial Sea Grant financial support would indicate a commitment to providing practical and current gear information to the commercial fishing industry.

Time Frame: No specific time has been established for this activity. Continuation will be based on results and response from the industry.

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Situation: The commercial fishing and processing industry in the Gulf of Mexico is tradition-bound and slow to incorporate major technological advances. This reluctance results in reduced profitability and the inability to rapidly adapt to changes in conditions and regulations.

Objective: Recent advances in computer technology and applications have made it possible for even small firms to have relatively sophisticated management and marketing information, communication, and record keeping capabilities. The Advisory Service Program can substantially aid firms in the marine and commercial fishing industry to make this transition.

Expected Results: Information and guidance on computer applications for the commercial fishing and marine industries of Alabama will help them attain a more competitive position. Initially, this effort may be adopted only by the larger firms, but after it demonstrates success, the main beneficiaries will be the smaller companies.

Resources Either a part-time staff member or an advanced graduate student with computer knowledge will be required to begin this program. This will be an innovative step for the industry and financial support for both personnel and equipment may be required from Sea Grant.

Time Frame: It is anticipated that this effort will require a development phase of several years. At the end of this time, it should be absorbed as a portion of the ongoing Advisory Service Program and require minimal additional support.

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2. Mississippi Sea Grant Advisory Service

INTRODUCTION

This document contains several sections comprising a comprehensive five year plan for the Mississippi Sea Grant Advisory Service Program. In order to outline both staff development and programmatic development over the next five years, it is necessary to document the present stage of development.

The Mississippi coastal area is one of the most intensely used areas in the United States, containing a hundred miles of coastline, seven rivers, several hundred miles of shoreline, and two major ports. The economic basis of the coastal zone is as diverse as the counties which comprise it. It is largely dependent on water transportation. Personal income is derived from manufacturing, government employment and expenditures, agriculture, and marine-related industries with manufacturing and government employment showing the greatest impact on per capita income in the coastal zone.

The exodus of both people and industries to the Sun Belt has had a very real impact on all Southern states, especially in Mississippi's coastal counties. Higher than average rates of growth have aided the economic development of the coastal area, but the assimilation of large numbers of people has placed demands on the public sector to provide increased levels of services.

RECREATION AND TOURISM

Tourism is one of the largest industries in coastal Mississippi. It is a healthy and progressive industry because of the natural advantages of sand, sea, and sun. These assets, coupled with modern tourist facilities, are an excellent indication that greater demand will be placed upon our coastal resources.

Marine recreation and tourism activities are important contributors to the economy of the Mississippi coastal area. Expenditures made by Mississippi sport fisherman for gas, bait, lodging, charter boats, and related services roughly exceed $10 million annually.

Various governmental officials and people from the private sector are interested in coastal recreational development, but their efforts lack coordination. Leaders and decision-makers must work closely with governmental agencies and boards in developing and implementing long-range plans for sensible and adequate coastal recreational development in conjunction with other land-uses required to strengthen the coastal economy. A coordinated effort must be made to maintain a resonable level of protection to the area's natural resouce base.

COMMERCIAL FISHERIES

The development of Mississippi fisheries as a primary target program parallels the recent commitment of the federal government to develop a national

tisheries policy. Significant increases in employment and income could be realized if development efforts in the fisheries sector are accelerated and encouraged. Due to successive rounds of spending, beneficial effects would be felt not only by persons directly employed in the fisheries industry but also in virtually every other sector of the economy.

Sea Grant development efforts are expected to result in the use of fishery resources that are presently not utilized or are under-utilized by U.S. fishermen. Six fisheries from all coastal areas of the U.S. have been identified as comprising the major share of development opportunity in both volume and value; the Gulf of Mexico groundfish was one resource cited for development.

A study by the Mississippi Cooperative Extension Service's Food and Fiber Center established the economic impact of Mississippi's commercial fishing industries with the exception of those fishery species classified as industrial fish--i.e., those utilized in producing pet food and fish meal. This study found that Mississippi's seafood processing industry annually processes 20 percent of the entire shrimp catch of the Gulf of Mexico; Mississippi fishermen land only 25 percent of that processed. Seventy-five percent of the shrimp processed in Mississippi must be imported from other Gulf states, and the actual cash value of Mississippi's shrimp processing industry is estimated at $50 million with an overall economic impact of some $130 million per year.

Like the shrimp processors, Mississippi's oyster processors find it necessary to import nearly 85 percent of their raw product. The value of the oyster industry is approximately $4 million at the processor's door and ultimately causes an overall economic impact on the Mississippi coastal community of approximately $10 million.

Traditionally, the impact of the seafood industry on the economy of the coastal area has been dependent upon the shrimp harvest. Now, in addition to natural fluctuations in shrimp abundance, the impact of man on the shrimp fishery is becoming increasingly important. There are not only more boats to share in the harvest but also technological advances in trawl design and electronics to hasten the depletion of the shrimp population.

ENVIRONMENTAL ISSUES

The single most important marine environmental issue facing Mississippi in the 1980's is the selection of dredge spoil disposal techniques and locations. Large volumes of material must be dredged to maintain present ship channels; additionally, the expansion of port and harbor facilities requires new and enlarged channels and thus necessitates the movement and disposal of huge volumes of dredge spoil material. Serious environmental questions arise in relation to dredging and disposal of spoil material. Currently, the major concerns are changes in water circulation patterns, additional turbidity, and sediment transport and deposition--all items which could easily upset the delicate ecological balance in our coastal waters. Continued development of harbor and port facilities is extremely important to the area's economy, but must be carried out with minimal adverse effects to our marine resources.

PROGRAM MISSON AND GOALS

Although the Advisory Service Program is an educational program, its educational efforts must go beyond straight line informational flow of research results. It must emphasize public education in such a way that reflects a basic concern for people and the developmental goals of society. Such an approach mandates a system that permits the interpretation of new knowledge and the retrieval of established facts and information. It requires the application of knowledge to establish new experiences, practices, attitudes, and skills. It helps people organize for worthwhile purposes and assist individuals in developing their leadership potential. It organizes programs to support and expand its own educational efforts. Its mission goes beyond educating people who wish to expand their intellectual scope; it is "education in action."

Advisory Service's mission, to provide a mechanism for the transfer of useful information to and from those interested in marine affairs, is a useful tool in giving guidance and direction to the Advisory Service Program. According to Advisory Service philosophy, its activities are devoted to four long term objectives. Of course, each of these objectives is further refined so that individual working objectives of both the staff and individuals are identified and can be implemented. The long range objectives of the Mississippi Sea Grant Advisory Service Program are as follows:

1. Support and complement the Sea Grant program by familiarizing a wider segment of the educational community and general public with the Sea Grant program and concept;
2. Carry out intensive educational programs for specific audiences including, but not limited to, commercial fisheries, seafood processing, resource utilization and management, community-industry-government relations and youth education;
3) Seek out means for developing stronger working relationships with government and non-government groups and/or agencies; and
4) Program planning, problem and audience identification.

APPROACH

The Mississippi Sea Grant Advisory Service Program addresses the problems in the Mississippi coastal zone through a broad-based, diverse educational program using a variety of educational techniques and methods. These include conferences, workshops, and seminars to present information to specific clientele groups on identified topics. Also, extensive use is made of mass media, information sheets, newsletters, and other publication forms, to reach a broad spectrum of clientele groups and the general public.

The Mississippi Cooperative Extension Service maintains a permanent office in the coastal area which serves as headquarters for the Mississippi Sea Grant Advisory Service Program. In addition, the Cooperative Extension Service provides a full array of state specialists and county personnel who are

interested and involved in Advisory Service activities. With the help of Cooperative Extension Service specialists, Sea Grant principal investigators and others, Advisory Service is continuing to use case studies, occasional consultations, and demonstrations to solve and/or typify solutions to specific problems.

Of course, Advisory Service involvement in Sea Grant research, along with the researchers involvement in Advisory Service's educational programs, is an integral part of the Sea Grant system. Every effort is made to maintain liaison with Sea Grant researchers at all participating institutions of the Mississippi--Alabama Sea Grant Consortium.

STAFF DEVELOPMENT

Prior to late 1980 the full time Advisory Service staff consisted of three FTE's--the program leader, an economist, and a marine resource specialist. During late 1980, the departure of one staff member and the inability to fill that position because of available budgeting decreased the full-time program staff to two FTE's, the program leader and the marine resource specialist.

The marine economist had primary responsibility for dealing with commercial fishermen and the commercial fishing industry; because of program commitments for the other staff, it was necessary to decrease the total program effort in commercial fishing. Thus, the program took on a significant change in terms of the scope of activities compared to previous years.

During early 1983 the staff of the Mississippi Advisory Service Program consisted of one FTE, David Veal, program leader; one FTE devoted to recreation, tourism, environmental concerns, and youth development, with primary responsibility falling to Dr. John Kelly, and a two-thirds FTE internship. Unfortunately, Dr. Kelly left the program early 1983. The position held by Dr. Kelly was subsequently reoriented towards commercial fisheries. That position was filled by Mr. David Burrage during mid-December 1983.

PRESENT STAFFING

As the program entered the 1984 calendar year, its staff consists of David Veal, program leader, Mr. David Burrage, marine resources specialist with primary responsibility for work with commercial fisheries, and Mr. Ron Lukens, a graduate intern. The internship terminated in April, 1984. The Advisory Service Program will have 2.3 FTE staff time available for the 1984 calendar year.

Because of the reorientation of the position previously held by Dr. John Kelly towards commercial fisheries, the program will again undergo a major change in direction. During much of the 1984 calendar year, the program leader's time, as well as the time of Mr. David Burrage, will be spent in redeveloping programs in commercial fisheries. It is difficult to anticipate the full scope of this effort since little work has been conducted with commercial fishermen as a programmatic effort since the late 1970's.

PROPOSED STAFF

The 1985 Sea Grant proposal contains within the objectives and the budget, the request for the addition of a third staff member to the Mississippi Advisory Service Program. After careful discussion and deliberation with the administrative offices of the Mississippi Cooperative Extension Service and the Mississippi--Alabama Sea Grant Consortium, the consensus of opinion is that the greatest payoff for dollar expended will be with the addition of a competent marine economist. While our initial efforts will include a search for a competent professional with a Ph.D., we fully recognize that this individual may not be available, nor within the scope of funds available to the program. If necessary, we will reorient the position to that of a professional economist, with a master's degree and experience in marine extension programs.

It is anticipated that the marine economist will assume initial responsibility for the coordination of all economics work ongoing in the coastal area, within the Cooperative Extension Service framework. The Cooperative Extension Service Food and Fiber Center devotes a substantial amount of staff time each year to marine related efforts, particularly as they affect coastal shipping, commercial fishing, and seafood processing. These efforts, coupled with intensive educational programs conducted by an on-board specialist, as well as exploratory research, which is routinely conducted by Cooperative Extension Service economist, will add greatly to the programmatic efforts of the Mississippi Advisory Service Program.

For 1985, the proposed staff resources for the Mississippi Sea Grant Advisory Service Program include the following:

Sea Grant Advisory Service Program Leader: Primary responsibilities are for administration and development of program goals and for coordination of the Advisory Service Program activities. In addition, the program leader serves as resource specialist in engineering and food processing. Additional responsibilities include general public education and work with government agencies and firms dealing with the development of coastal resources.

Fisheries Development Specialist: Primary emphasis is on assisting commercial fishing, seafood processing, and agencies and groups involved in utilizing Mississippi's fishery resources. This individual is responsible for the majority of the work devoted to these industries. In addition, he will be responsible for a major portion of the youth oriented work for the program.

Marine Economics Specialist: Primary emphasis will be on assisting the commercial fishing, seafood processing, and related agencies and groups, as well as a broad range of other Mississippi marine industries, with discovery and educational endeavors. This individual will be responsible for coordinating all the work undertaken by the Mississippi Cooperative Extension Service as it relates to marine economics.

STAFF DEVELOPMENT

During the period from 1985 through 1990, substantial growth should be seen in the Mississippi Sea Grant Advisory Service Program. It is anticipated that fiscal support for staff growth will be derived from funds provided by the Mississippi--Alabama Sea Grant Consortium and from the Mississippi Cooperative Extension Service, through funds directly appropriated by the Mississippi Legislature. In 1977 and 1978, the Advisory Service Program, with extensive input from marine clientele groups, proposed a comprehensive list of staff specialists needed on a full-time basis in order to adequately serve the major marine audiences addressed by the Advisory Service Program. This staff consisted of the following professionals:

1. engineer
2. fisheries specialist
3. recreational specialist
4. marine economist
5. marine education specialist
6. communications specialist
7. consumer education specialist
8. three marine agents located in coastal counties

As of mid-1984, the Advisory Service staff consists of an engineer and a fisheries specialist. The following is a time table for the proposed addition of the recommended staff members:

1985

Existing Staff--engineer
fisheries specialist

Proposed Staff--economist -- The marine economist will be primarily responsible for development of educational programs involving a broad spectrum of accounting, record keeping, tax management, as well as information identification. It is anticipated that this specialist will develop a broad range of programs supporting recreational, fisheries, seafood processing, and other clientele groups.

1986

Existing Staff--engineer
fisheries specialist
economist

Proposed Staff--recreational specialist -- The recreational specialist will assume primary responsibility for working with recreational boating and sport fishing clientele, as well as limited work with the coast's well-developed tourist industry. It is anticipated that this individual will assume a leadership role in these areas. This individual will also assume the role of coordination of effort between the various municipal, county, and state agencies involved in developing and managing Mississippi's marine resources as they affect tourism and recreational industries.

1987

Existing Staff--engineer
fisheries specialist
economist
recreational specialist

Proposed Staff--communications specialist -- In general, the Cooperative Extension Service philosophy is that individual professional staff are responsible for writing and developing materials which support and complement their educational programs. However, because of the diversity of the clientele groups we serve, and because of the diversity of the educational endeavors used to provide information to these audiences, it is felt that the addition of a communications specialist will greatly enhance the capability of both the existing and proposed professional staff. The communications specialist will be responsible for coordinating all communication efforts of the marine related extension staff.

1988

Existing Staff--engineer
fisheries specialist
economist
recreational specialist
communications specialist

Proposed Staff--educational specialist -- The educational specialist will assume primary responsibility for the development and implementation of a broad range of educational programs aimed at youth and adults. These programs will be non-specific in nature. As such, they will not involve technology transfer, but will endeavor to broaden the general understanding of the complexities of the marine environment and its importance to Mississippi, the south, and the nation. This specialist will be responsible for developing programs conducted through the Cooperative Extension Service 4-H program as well as an extensive array of educational programs conducted through public school systems.

1989

Existing Staff--engineer
fisheries specialist
economist
recreational specialist
communications specialist
educational specialist

Proposed Staff--consumer education specialist -- The addition of a consumer education specialist will round out the technical staff needed to conduct a broad range of educational and developmental activities. This individual will be responsible not only for development of educational materials needed to promote Mississippi and the Gulf seafood products, but will be responsible for direct work with other specialists of the Cooperative Extension Service and the Mississippi--Alabama Sea Grant Consortium in packaging, merchandising, marketing, and other aspects of natural resource development and promotion.

1990

Existing Staff--engineer
fisheries specialist
economist
recreational specialist
communications specialist
educational specialist
consumer education specialist

Proposed Staff--three marine agents, Hancock, Harrison, and Jackson Counties During 1990, in addition to the above complement of specialists, it is hoped that three marine agents will be located in Harrison, Hancock and Jackson Counties. These agents will be responsible for maintaining direct contact between the specialist staff and the clientele groups which they serve. The addition of these agents will allow specialists to devote more time to planning and program development, and less time to immediate response activities.

It is anticipated that the full complement of professional staff outlined above will use the team approach in developing educational programs and problem solving. For example, fishery development work might include the engineer, fisheries specialist, consumer specialist, communications specialist, and the economist. Conversely, the development of a recreational program might include the recreational specialist, the engineer, the economist, and the communications specialist. Development of broad-based, diverse educational programs aimed at the general public and other audiences might include the educational specialist, the communications specialist, and any of the remaining technical specialists. Individual staff members will assume responsibility for major development of educational efforts. However, they will be supported by a competent and readily available team of specialists also working in their same general discipline areas. This technique will make maximum use of the staff time available.

The addition of the above identified specialists to the existing staff will also allow the Advisory Service Program to attack major educational needs of the seven audiences identified as major clientele groups. As of 1984, most of the educational efforts are oriented towards commercial fisheries, with minor activities in recreation and tourism, and general public education. As

additional staff members are added, it is anticipated that a significant portion of the educational needs of the clientele groups identified will be met by developing or expanding Advisory Service programs.

AUDIENCE IDENTIFICATION

In order to develop educational programs for the various marine-related clientele groups served by the Advisory Service Program, a detailed analysis of the educational needs of those clientele groups must be performed. The Advisory Service Program has, for a number of years, maintained an ongoing analysis of the audiences it attempts to serve, and has classified the informational needs of each of the audiences identified. In general, the audiences receiving the major portion of Advisory Service's educational activities from 1985 through 1990 will be the following:

AUDIENCE: General Public

NEED: Information necessary to insure rational and informed decision making concerning the coastal zone. Topics will include:

1. physical environment
2. economics
3. decision making process

AUDIENCE: Seafood and Related Industries

NEED: General Industry

Information necessary to insure rational and informed decision making concerning the well-being of the seafood industry. Topics include:

1. general industry trends
2. government--industry relations

NEED: Specific Industry

In general, each segment of the industry needs specific information in the following areas:

1. business management--economics
2. intra-industry relationships
3. governmental--industry relations
4. technological changes
5. industry--community relations
6. inter-industry relations
7. public decision making

Specific Audiences

commercial fishermen
processors
retailers
cold storage
shipbuilders
equipment suppliers
docks and harbors
state government agencies
federal government agencies
local government agencies
charter boat fishing businesses
bankers
insurance brokers

AUDIENCE: Recreational Community

NEED: General Industry

Information necessary to insure rational and informed decision making concerning their industry or recreational past-time, specifically:

1. industry trends
   a. economics
   b. statistics
2. public decision making
3. resource--recreational--industry competition

User Needs

1. information on availability of resource
2. information on techniques for using resource
3. user conflicts
   i. intra-recreational
   ii. inter-industry

Specific Audiences

sports fishermen
beach users
boaters
campers
divers
conservation societies

Supplier Needs

1. business management/economics
2. intra/inter industry relationships
3. government-industry relationships
4. technological changes
5. industry--community relationship
6. public decision making

motel owners
restaurant owners
fishing camp owners
marina owners
recreational equipment retailers
campground owners
state, federal, and local government agencies

AUDIENCE: Governmental Community

NEED: Information necessary to make knowledgeable decisions concerning the resources controlled and/or influenced, specifically:

1. information on the need for a decision
2. informed alternative solutions
3. specific industry trends

Specific Audiences

Mississippi Bureau of Marine Resources
National Marine Fisheries Service
Board of Economic Development
Research and Development Center
Environmental Protection Agency
Food and Drug Administration
Mississippi Department of Natural Resources
regional planning commissions
county and city planning commissions
city councils
county governments
port and harbor commissions
Cooperative Extension Service
Coast Guard
Corps of Engineers
Gulf States Marine Fisheries Commission
state and federal legislators
chambers of commerce
tourist councils
development commissions

AUDIENCE: Industry Organizations

NEED: Information necessary to insure rational and informed use of resources in the specific areas of concern of each organization, specifically:

1. physical environment
2. economics
3. public decision making

Specific Audiences

Southeastern Fisheries Association
Texas Shrimp Association
Louisiana Shrimp Association
National Shrimp Canners and Processors
National Shrimp Breaders
National Fisheries Institute
local fishermen's associations
Mississippi Gulf Fishing Banks Association
Charter Boat Captains Association
restaurant associations
Gulf Coast Innkeepers Association
local fishing rodeos

AUDIENCE: Educational Community

NEED: Informational materials and training necessary to include marine science curriculums and vocational training programs within present educational structures, specifically:

1. educational materials
2. curriculum design
3. information on demand for specific educational needs and/or training
4. teachers need to be acquainted with resources available

Specific Audiences

state board of education
local school boards
individual teachers
private schools
junior colleges
adult education programs
vocational training programs

AUDIENCE: Miscellaneous

NEED: Information necessary to insure that each group is acquainted with community problems and development plans and to insure informed inter-industry and industry--community relations.

Specific Audiences

media
real estate developers
energy suppliers
civic and service organizations
shipping
miscellaneous industry organizations

PROGRAM DEVELOPMENT

Because of changes in staff and program direction between the late 1970s and 1984, the 1984 and 1985 Advisory Service Program staff will focus their actions on coordinating activities with other specialists from the Cooperative Extension Service, the research community sponsored by the Mississippi—Alabama Sea Grant Consortium, as well as interaction between the staff and the clientele groups served by the program. As a result of these one-on-one personal contacts, the Advisory Service staff will have at their disposal a broader range of resource specialists upon whom to draw for the development of a coherent system of workshops, seminars, publications, mass media efforts, and other educational endeavors. It goes without saying that the primary goal will be the establishment of a functional network between Advisory Service groups,—i.e., users of marine-related research and the university-related research community.

Program planning has long been the mainstay of the Mississippi Cooperative Extension Service. A significant amount of time is devoted each year to the development of a plan of work specifying the proposed activities and accomplishments of each professional staff member of the Advisory Service Program. In 1984 the Advisory Service Program undertook a new procedure, the development of a four-year plan of work and the evaluation of this plan of work. This plan of work resulted from the continual contact maintained between the Advisory Service staff, Cooperative Extension Service administrative staff, the administrative staff of the Mississippi--Alabama Sea Grant Consortium and its advisory committees, state and local governments, as well as the clientele groups which the program endeavors to serve. It goes without saying that the primary source of guidance remains the marine community.

As part of the Advisory Service Program's interaction with the research community, the program leader serves as a member of the Mississippi—Alabama Sea Grant Consortium's Program Coordinating Team. This committee meets several times each year to discuss, critique, and review both new and continuing proposals submitted to the Consortium. The intergration of the Advisory Service Program leader in this review process promotes involvement of the Advisory Service Program in the research efforts of the Consortium and provides the opportunity for the Advisory Service Program to provide input into the proposal selection process.

FIVE YEAR GOALS

Situation	In order to carry on an effective educational program an extensive array of planning and evaluation tools must be used. This is of primary importance in an expanding program.
Goal	Continue individual program evaluation on a case-by-case basis. Develop advisory committees with expertise in major program areas to provide continuing program review and guidance.
Situation	The retrival of general information on industries served by Advisory Service is an increasingly difficult task. Not only is this information essential for program planning but it is needed for individual consultation and problem solving.
Goal	Develop an in-house data storage and retrieval system with graphics and limited data manipulation capability. This will necessitate determining the type of data maintained, key staff, and input system.
Situation	The Gulf of Mexico shrimp fishery is experiencing problems of over-capitalization and a reduction in the catch per unit of effort.
Goal	Coordinate and stimulate efforts to develop techniques to make fishing more efficient by reducing cost and increasing catch.
Goal	Pursue the development of alternative species for harvest including shark, coastal herring, and squid.
Situation	With the large increase in numbers of people moving to coastal areas and the increase in purchase of recreational boats, there is a need coastwide for more and improved launching ramps and support facilities.
Goal	Coordinate with local governments efforts which can assist in the development of more and better facilities for use by public recreational boaters and fishermen.
Goal	Survey the number of boaters using existing launch and support facilities to assist in planning and development of new and better facilities.

Situation — With an increasing population in the coastal counties, increasing interest in sport fishing is inevitable. Satisfaction from fishing efforts helps to insure that people will continue to spend money to pursue the past time.

Goal — Develop and implement educational programs aimed at providing novice and experienced sport fishermen needed information on techniques, seasons, target species, and locations to help people have successful sport fishing experiences.

Situation — With increasing pressure being placed on fish stocks from recreational and commercial fishing interests, more precise and timely fishery management information and techniques are essential.

Goal — Coordinate and stimulate input information from clientele groups of commercial and recreational fishermen to create better fishery management plans with the cooperation and assistance of management groups such as the Mississippi Bureau of Marine Resources, National Marine Fisheries Service, Gulf of Mexico Fishery Management Council, and Gulf States Marine Fisheries Commission.

Situation — With the importance of coastal resources, mainly wetland areas, becoming a major issue on a local, state, and federal basis, public awareness and sensitivity to these issues is essential toward making sound and informed decisions.

Goal — Develop and implement, on the community and public school level, educational programs to add to the base of knowledge concerning marine ecological issues.

Situation — User conflicts over limited resources is a continual problem which is aggravated by the increase of population along Mississippi's coast.

Goal — Develop educational programs aimed at such target groups as sport fishing clubs, commercial fishing associations, and sport diving groups to aid in alleviating problems which arise in the area of user conflict.

Situation	With research efforts becoming more and more utilitarian or applied in scope, general public and institutional awareness of completed and ongoing research is essential.
Goal	Develop an ongoing program of information dissemination so that clientele groups are more readily aware of the type and scope of research presently being conducted and may obtain results of research as completed.
Goal	Through continued cooperation and association with researchers, assist in the development of research efforts which will make these efforts more timely and more immediately available for use.
Situation	Though some under-utilized species are being harvested for human use, marketing still remains a major roadblock towards success.
Goal	Develop informational programs on under-utilized seafood to aid in public acceptance of the product.
Goal	Develop cooperative programs with Extension county home economists to demonstrate cooking and preparation of seafood for homemaker groups to aid in public acceptance of seafoods.
Situation	Increased interest nationwide and internationally in soft-shell crabs for human consumption has placed a great demand on producers, sometimes greater than their capability to produce. More research is required to refine systems for soft-shell crab production with the goal of overall increased commercial production.
Goal	Continue development efforts with commercial crabbers and soft-shell crab producers in South Mississippi leading to the development of a valuable natural resource which will provide jobs and also aid the economy of the area.
Situation	Many members of our younger generation exhibit an acute lack of awareness when it comes to issues concerning our marine and coastal ecosystems.
Goal	Work in conjunction with 4-H and other youth organizations to sponsor and conduct such activities as shoreline seminars, field trips, and educational programs aimed strictly at younger audiences.

Situation	The 11.5 percent population growth in coastal Mississippi during the time frame 1985-1990 will happen concurrently with a rise in industrial development. This will engender a need for individuals trained to enter the marine and coastal labor force.
Goal	Work in conjunction with local institutions of higher learning to develop courses in marine vocational education.
Situation	There has been a vast influx of Vietnamese people to the entire Gulf Coast in the past several years. Mississippi has particularly been affected because its fishing industry and region is analogous to coastal Viet Nam. This new socio-economic group has experienced some difficulty in melding into the traditional fishing community in Mississippi.
Goal	Provide a forum for an open and healthy exchange of ideas between the user groups.

C. The Mississippi-Alabama Sea Grant Consortium Directorate

Presently the staff of the Directorate of the MASGC consists of 6 professional and 5 support (administrative) personnel. The name and function of these persons have been included above. It is not anticipated that the professional staff need be increased unless the program size were to increase three-fold. The administrative support staff (secretarial and fiscal) will need to increase incrementally with overall program size increase. It is anticipated that a three fold increase in program size would require the addition of 2 more support persons.

Program Coordination

The existing mechanisms for program coordination and development described earlier have been found to provide the necessary information and evaluative mechanisms for successful program planning and implementation. No significant alteration of these aspects of the program are anticipated. Similarly, the present methods and mechanisms for proposal evaluation and review are sufficient and require no significant change.

It need be understood that the Office of the Director performs a much broader function for the MASGC than that of administrative support alone. All aspects of program planning, development, monitoring and evaluation are carried out through this office. It also serves as the base for educational programs and communication activities for the Consortium. An additional service of this office is to annually develop the Cooperative Sampling Program for the Consortium, which provides field sampling activities to obtain guaranteed high-quality samples for investigators at minimal cost, while providing the opportunity for student and faculty participation and training within the sampling activity. The effectiveness and economies of this mechanism for sample and data acquisition have been noted nationally. The program itself is considered a model of efficiency, education and cost-effectiveness within the Sea Grant community. There is no intention to alter this highly effective program.

VIII. Conclusion

The Mississippi-Alabama Sea Grant Consortium program is a mature, well-balanced and managed Sea Grant College effort. Its only significant limitation is that of fiscal restriction. Realistically, the Consortium's program could effectively be increased by an order of magnitude within the next 3 to 5 years and those dollars spent effectively and well. An additional three-fold increase could be justified in the following 5 years. In terms of 1984 dollars these increases would provide a Federal budget component of $10 million and $30 million respectively.

The potential of the Mississippi-Alabama Sea Grant Consortium and the National Sea Grant College Program to provide a range of social and economic benefits through extremely cost-effective programs and mechnaisms is very great indeed. Its predication upon the Land Grant College Program could easily match and surpass the accomplishments of those of the Land Grant Colleges given similar resource levels and sufficient time for development.

The Mississippi-Alabama Sea Grant Consortium provides a unique mechanism for utilizing the states' academic resources in concert with public agencies and private sector businesses for the benefit of their citizens. No other existing entity can provide the singular combination of intellect, creativity, application, education and technology transfer as does Sea Grant. Broader application of the Sea Grant concept, through an increased resource base will further demonstrate the validity of this concept as a primary mechanism to improve the well-being of the citizens of Alabama, Mississippi and the nation.

IX. A D D E N D U M

Mississippi-Alabama Sea Grant Program

1. Articles of Organization and By Laws for the Mississippi-Alabama Sea Grant Consortium

2. Memoranda of Understanding and Cooperative Agreements
   - A. Naval Ocean Research and Development Activity
   - B. National Environmental Satellite Service
   - C. U. S. Fish and Wildlife Service
   - D. National Marine Fisheries Service
   - E. U. S. Army Corps of Engineers

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ARTICLES OF ORGANIZATION FOR THE MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM

ARTICLE I.

Name

The name of this organization shall be the Mississippi-Alabama Sea Grant Consortium. All references in these articles to "the Consortium" are to such organization.

ARTICLE II.

Purpose

1. The principal purpose of the Consortium shall be to provide a mechanism for the further development and management of a Sea Grant program for the states of Mississippi and Alabama consistent with applicable fiscal constraints as prescribed by Mississippi and Alabama state laws.

2. The duration of this organization shall be perpetual pursuant to the conditions set forth in Article IV.

ARTICLE III.

Location

The principal office of the Consortium shall be physically located at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.

ARTICLE IV.

Membership

1. Membership. The membership of the Consortium shall consist of Auburn University, Gulf Coast Research Laboratory, Jackson State University, ~~Marine Environmental Sciences Consortium,~~ Mississippi State University, The University of Alabama, The University of Alabama in Birmingham, University of Mississippi, University of South Alabama, University of Southern Mississippi, and such other institutions as may be added from time to time.

2. Classes of Membership. There shall be the following classes of membership:

a. Regular Members. Regular members shall be institutions of higher learning located in the states of Mississippi and Alabama as named in Article IV. 1.

b. Associate Members. Associate members shall include corporate, industrial, or other organizations not qualified for regular membership. Associate members are not entitled to full representation on the Board of Directors but each may appoint a nonvoting representative to provide communication with the Board.

3. Terms of Membership and Resignation. The terms of membership shall be perpetual with the right of any institution to resign from the Consortium effective at the end of any fiscal year in which notice of resignation is given.

4. Conditions of Membership. The conditions of membership shall include the payment of an annual subscriber fee determined by the Board of Directors and a willingness and ability to further marine and coastal research, education and advisory services.

5. New Membership. A majority of the members of the Consortium may vote the admission of a new member institution or associate member into the Consortium.

6. Voting. The total number of Board votes which may be cast by the member institutions within the State of Alabama shall be equal to the total number of votes which may be cast by the member institutions within the State of Mississippi. A quorum of any meeting of the Board or any committee of the Consortium shall consist of a simple majority of the Board or committee.

ARTICLE V.

Board of Directors

1. Membership. The Board of Directors for the Consortium shall be composed of one representative from each of the regular member institutions. An institution's representative shall be appointed by the chief executive officer of the member institution and shall serve at the discretion of said officer.

2. Officers of the Board. The officers of the Board of Directors shall be Chairman, Vice Chairman, and Secretary. The officers shall be elected annually by the members of the Board but shall not serve more than two consecutive terms. In general, the chairmanship shall alternate each year between representatives of the two states. The Chairman and Vice Chairman shall not be from the same state.

3. Executive Committee. The Board of Directors shall have a standing Executive Committee composed of the Chairman, Vice Chairman, Secretary, and the Chief Executive Officer of the member institution which functions as fiscal agent for the Consortium. The Director shall be an ex officio, nonvoting member of the Board.

ARTICLE VI.

Director

1. Appointment. The Board of Directors shall have the express power to employ an executive director to be known as the Sea Grant Director. The salary and fringe benefits for this position shall be determined by the Board and shall derive from such funds directly assigned to the Consortium.

2. Responsibilities. The Sea Grant Director shall be responsible directly to the Board of Directors of the Consortium and shall serve under the terms and conditions outlined in a letter of appointment. The Board shall be empowered to delegate to the Sea Grant Director whatever authority it deems necessary to accomplish the primary purpose of the Consortium. The Director shall provide leadership and coordination of the Consortium according to the policies established by the Board of Directors. The Director shall have overall supervision of the affairs of the Consortium according to policies formulated by the Board, the Articles of Organization, and any bylaws adopted for the governance thereof. The Director shall be empowered to request, receive, and disburse funds in the name of the Consortium from local, state, federal, and private sources.

ARTICLE VII.

Autonomy of Institutions

Membership in the Consortium shall in no way infringe upon the autonomy of any member institution.

ARTICLE VIII.

Amendments

These Articles of Organization may be amended by the Board of Directors at any meeting of the Board by the affirmative vote of two-thirds of the Directors present as a quorum, provided that notice of the proposed amendment shall have been given each member of the Board in writing at least ten (10) days prior to the scheduled meeting.

ARTICLE IX.

Effective Date

These Articles of Organization shall be effective upon ratification by the President or Chief Executive Officer of each member institution. Such ratification shall be indicated by the signatures of said officers to be affixed below.

BYLAWS

MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM

ARTICLE I.

Offices

Section 1. Principal Office.

The Board of Directors shall determine the principal office and such other offices as it deems necessary to establish from time to time.

ARTICLE II.

Board of Directors

Section 1. Management.

The program management of the Consortium is vested in its Board of Directors (herein called "the Board") whose members shall be designated as provided in the Articles of Organization.

Section 2. Membership.

The Board shall be composed of one representative from each of the regular member institutions. The chief executive officer of each member institution shall appoint the institution's representative.

Section 3. Officers.

Paragraph 1. The officers of the Board shall be Chairman, Vice Chairman, and Secretary.

Paragraph 2. The chairmanship of the Board shall alternate each year between representatives of the two states. The Chairman and Vice Chairman shall not be from the same state.

Paragraph 3. The Chairman of the Board shall preside at all meetings of the Board and perform all other duties customarily associated with the office of Chairman of the Board.

Paragraph 4. The Vice Chairman shall serve in the absence of the Chairman, assuming his duties when necessary, and shall also perform such tasks as designated by the Chairman.

Paragraph 5. The Secretary shall be responsible for all minutes and records of the Board.

Section 4. Tenure.

The members of the Board shall serve at the discretion of the chief executive officer of the respective institution.

Section 5. Duties and Responsibilities.

The Board shall determine the general policies of the Consortium consistent with applicable fiscal constraints of the participating states.

Section 6. Meetings.

Paragraph 1. Designation: The Board shall hold quarterly meetings and such other regular meetings as it may deem advisable each year. Special meetings may be called by the Chairman of the Board on written request of at least four members with at least seven days written notice of said meeting being given to the members.

Paragraph 2. Quorum: A quorum shall be a majority of the Board and all actions of the Board shall be determined by majority vote of those present subject to restrictions on state representation, as set forth in Article IV, Paragraph 6 of the Articles of Organization.

Paragraph 3. Mail Vote: A mail vote of the Board may be taken on any question of routine procedure but, on matters of policy or changes of bylaws, only when a meeting previously called failed of a quorum and provided that full and complete notice of such question has been previously sent to all of the members of the Board.

Section 7. Committees and Other Officers.

Standing and ad hoc committees of the Board may be established by the Board and appointed by the Chairman as needed. In addition, the Board, as it deems desirable, may elect or appoint officers other than those designated herein, who may or may not be members of the Board, to have such responsibilities and to exercise such authority as the Board may from time to time prescribe.

Section 8. Removal.

Any officer or agent elected or appointed by the Board may be removed by the Board whenever, in its judgment, the best interests of the Consortium would be served thereby, but such removal shall be without prejudice of contract rights.

ARTICLE III.

Executive Committee

Section 1. Composition.

The Executive Committee of the Consortium shall be composed of the officers of the Board of Directors (Chairman, Vice Chairman, and Secretary) and the Chief Executive Officer or his designee of the member institution which functions as fiscal agent for the Consortium. The Director (Article IV) shall be an ex officio, nonvoting member.

Section 2. Officers.

Paragraph 1. The officers of the Executive Committee shall be the same as the officers of the Board of Directors.

Paragraph 2. The Chairman of the Executive Committee shall preside at all meetings of the Executive Committee and shall perform all other duties customarily associated with the office.

Paragraph 3. The Vice Chairman shall serve in the absence of the Chairman, assuming his duties when necessary.

Paragraph 4. The Secretary shall be responsible for minutes and records of the Executive Committee.

Section 3. Tenure.

The officers of the Executive Committee shall be elected annually by the members but shall not serve more than two consecutive terms. The chairmanship shall alternate each year between representatives of the two states. The Chairman and Vice Chairman shall not be from the same state.

ARTICLE IV.

Director

Section 1. Appointment.

The Board of Directors shall have the express power to employ an executive director to be known as the Sea Grant Director. The salary and fringe benefits for this position shall be determined yearly by the Board and shall derive from such funds directly assigned to the Consortium.

Section 2. Responsibilities.

The Sea Grant Director shall be responsible directly to the Board of Directors of the Consortium and shall serve under the terms and conditions outlined in a letter of appointment. The Board shall be empowered to delegate to the Sea Grant Director whatever authority it deems necessary to accomplish the primary purpose of the Consortium, consistent with applicable fiscal constraints

as prescribed by Mississippi and Alabama state laws. The Director shall provide leadership and coordination of the Consortium according to the policies established by the Board of Directors. The Director shall have overall supervision of the affairs of the Consortium according to policies formulated by the Board, the Articles of Organization, and any bylaws adopted for the governance thereof. The Director shall be empowered to request, receive, and disburse funds in the name of the Consortium from local, state, federal, and private sources.

ARTICLE V.

Administrative Offices

Section 1. Location.

The administrative offices of the Consortium shall be physically located at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.

Section 2. Residence.

The Director shall administer the program of the Consortium from the administrative offices.

ARTICLE VI.

Quorum

A quorum of any meeting of any committee of the Consortium shall consist of a simple majority of the membership of that committee.

ARTICLE VII.

Fiscal Year

The fiscal year of the Consortium shall be determined by the Board of Directors.

ARTICLE VIII.

Exculpation of Directors and Officers

No officer, director, or any other agent of the Consortium or its facilities shall be liable to anyone for any acts on behalf of the Consortium committed by such officer or director except for his or her willful neglect or fault.

ARTICLE IX.

Implementation of Bylaws

These bylaws shall become effective upon their approval by the Board of Directors.

ARTICLE X.

Amendments

Section 1. Enactment.

The bylaws may be amended by a two-thirds majority vote of a quorum of the membership of the Board of Directors.

Section 2. Circulation of Amendments.

Such amendments shall be circulated to the Board members at least ten days in advance of the meeting at which a vote will be taken.

ARTICLE XI.

Rules of Order

Roberts' Rules of Order (current edition) shall be the deciding factor in all parliamentary disputes not covered by these bylaws.

ARTICLE XII.

Waiver of Notice

Whenever any notice is required to be given to any member or director of the Consortium under the provisions of these bylaws, a waiver thereof in writing, signed by the person or persons entitled to such notice, whether before or after the time stated therein, shall be deemed equivalent to the giving of such notice.

MEMORANDUM OF AGREEMENT
BETWEEN NAVAL OCEAN RESEARCH AND DEVELOPMENT ACTIVITY
AND THE MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM

I. PURPOSE

The purpose of this memorandum of agreement is to establish policies and administrative arrangement which will provide a working relationship between the Naval Ocean Research and Development Activity (NORDA) and the Mississippi-Alabama Sea Grant Consortium (MASGC) for the purpose of providing more effective procedures for planning, coordinating, developing, and prosecuting programs of mutual interest for the benefit of the people of the States of Mississippi and Alabama and of the Nation.

II. BACKGROUND AND AUTHORITIES

The Naval Ocean Research and Development Activity is charged with the responsibility of carrying out a broadly based RDT&E program in ocean science and technology, with emphasis on understanding ocean processes through measurement and analysis, and the effects of this ocean environment on navy systems and operations.

As part of the National Sea Grant Program, MASGC conducts research, education and training and advisory services for the purpose of increasing the understanding, assessment, development, utilization, and conservation of marine resources.

Many programs conducted by NORDA and MASGC are of mutual interest to both agencies. Accordingly, cooperation and coordinated efforts in the conduct of such programs will be mutually beneficial and will avoid needless duplicative efforts.

III. RESPONSIBILITIES OF AGENCIES

Pursuant to this Agreement, NORDA and MASGC will:

1. Cooperate in the design, development and support of programs and materials of mutual interest through which appropriate information generated may be disseminated to the people of the States of Mississippi and Alabama and the Nation.

2. Cooperate in the preparation of educational programs and materials that may be used on a national, regional, state or local basis.

3. Keep each other informed on the status of activities including negotiations relating to cooperative program developments.

4. Provide feedback and information concerning problems of mutual concern to assist in evaluating cooperative programs and in developing new programs of mutual interest.

5. Keep each other informed on the status of national and regional objectives of their respective programs.

IV. PROGRAMMING, BUDGETING, AND REIMBURSEMENT ARRANGEMENTS

This Agreement is not a fiscal or funds-obligating document. Any joint endeavors involving reimbursement or transfer of funds between the parties to this agreement will be handled in accordance with prescribed financial procedures.

V. PUBLIC AFFAIRS/PRESS LIAISON

Publications, releases to the press, public announcements and communication with the Congress concerning or stemming from joint programs can be made by either party to this Agreement, or by both jointly, following approval by the appropriate representative of the other party. Credit will be given to NORDA and MASGC interests as appropriate.

VI. AMENDMENTS AND REVIEW

This Agreement may be amended at any time by the mutual written consent of the parties to this Agreement.

This Agreement will be reviewed periodically, but not less than annually. It may be subject to reconsideration at such other times as may be required and as agreed to by the parties to this Agreement.

VII. IMPLEMENTATION

NORDA and THE MASGC will each assign a senior staff member to serve in a liaison capacity to satisfy the requirements of this Agreement.

VIII. TERMS OF THE AGREEMENT

This Agreement will become effective upon the signature of both approving officials of the respective agencies entering into this Agreement.

The terms of this Agreement will remain in effect until terminated by (1) mutual agreement, or (2) ninety-day advance written notice by either party.

15 O, 1982
Date

James E. Andrews
Technical Director, Naval Ocean Research and Development Activity

3 Nov. 1982
Date

James I. Jones
Director, Mississippi-Alabama Sea Grant Consortium

MEMORANDUM OF AGREEMENT BETWEEN
THE NEW ORLEANS OCEAN SERVICES CENTER AND
THE MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM

I. PURPOSE

The purpose of this memorandum of agreement is to establish policies and administrative arrangements which will provide a working relationship between the New Orleans Ocean Services Center (OSC) and the Mississippi-Alabama Sea Grant Consortium (MASGC). The Ocean Services Center is composed of personnel of both the National Weather Service's New Orleans Weather Service Forecast Office (WSFO) and the National Earth Satellite Service's New Orleans Satellite Field Services Station (SFSS). Both units are part of the National Oceanic and Atmospheric Administration (NOAA). It is expected that this agreement will provide for more effective procedures for planning, coordinating, developing and implementing programs of mutual interest for the benefit of the people of the States of Mississippi and Alabama and of the Nation.

II. BACKGROUND AND AUTHORITIES

The National Oceanic and Atmospheric Administration (NOAA) is charged with the responsibility of carrying out programs relating to the exploration, development and conservation of marine resources, both living and nonliving, which contribute to the health, safety and welfare of people, and for the efficient use of the environment in accordance with the provisions contained in the Executive Reorganization Plan Number 4 of 1970 (84 Stat. 2090). Within NOAA, the New Orleans

OSC is charged with the responsibility of providing observations, analyses, forecasts and warnings of marine environmental conditions for the Gulf of Mexico coastal and offshore waters.

As part of the National Sea Grant Program, MASGC conducts research, education, training and advisory services for the purpose of increasing the understanding, assessment, development, utilization, and conservation of marine resources. Many programs conducted by the New Orleans OSC and MASGC are of mutual interest to both agencies. Accordingly, cooperation and coordinated efforts in the conduct of such programs will be mutually beneficial and will avoid duplicative efforts.

III. RESPONSIBILITIES OF AGENCIES

Pursuant to this Agreement, the New Orleans OSC, and MASGC will:

1. Cooperate in the design, development and support of programs and materials of mutual interest through which appropriately generated information may be disseminated to the people of the States of Mississippi and Alabama and to the Nation.
2. Cooperate in the preparation of educational programs and materials that may be used on a national, regional, state or local basis.
3. Inform each other of the status of activities, including negotiations, relating to cooperative program development.
4. Provide feedback and information concerning problems of mutual concern to assist in evaluating cooperative programs and in developing new programs of mutual interest.

5. Keep organizations with similar or related programs informed of the status of national and regional program objectives.

IV. PROGRAMMING, BUDGETING, AND REIMBURSEMENT ARRANGEMENTS

This Agreement is not a fiscal or funds-obligation document. Any joint endeavors, involving reimbursement or transfer of funds between the parties to this agreement, will be handled in accordance with prescribed financial procedures.

V. PUBLIC AFFAIRS/PRESS LIAISON

Publications, releases to the press, public announcements and communication with the Congress, concerning or stemming from joint programs, may be made by any party to this Agreement, or by the two jointly, following approval of the appropriate representative of the other parties. Credit will be given to the New Orleans OSC or MASGC interests as appropriate.

VI. AMENDMENTS AND REVIEW

This Agreement may be amended at any time by the mutual written consent of the parties to this Agreement.

This Agreement will be reviewed periodically, but not less than annually. It may be subject to reconsideration at such other times as may be required and as agreed to by the parties to this Agreement.

VII. IMPLEMENTATION

The New Orleans OSC and the MASGC will each assign a senior staff member to serve in a liaison capacity to satisfy the requirements of this agreement.

VIII. TERMS OF THE AGREEMENT

This Agreement will become effective upon the signature of both approving officials of the respective agencies entering into this Agreement.

The terms of this Agreement will remain in effect until terminated by (1) mutual agreement, or (2) ninety-day advance written notice by either party.

January 26, 1982
Date

David P. Barnes, Jr.
MIC(AM) WSFOSIL

January 26, 1982
Date

Richard M. Clark
New Orleans SFSS

Date

James I. Jones
Director, Mississippi-Alabama
Sea Grant Consortium

MEMORANDUM OF AGREEMENT BETWEEN REGION 4, FISH AND WILDLIFE SERVICE, U. S. DEPARTMENT OF THE INTERIOR, AND THE MISSISSIPPI/ALABAMA SEA GRANT CONSORTIUM

I. PURPOSE

In furtherance of the Memorandum of Agreement between the Fish and Wildlife Service, U.S. Department of the Interior and the National Oceanic and Atmospheric Administration, U.S. Department of Commerce dated December 15, 1977, and December 7, 1977, respectively, the purpose of this agreement is to establish policies and administrative arrangements which will provide a working relationship between Region 4, Fish and Wildlife Service (FWS), U.S. Department of the Interior and the Mississippi/Alabama Sea Grant Consortium (MASGC) for the purpose of providing more effective procedures for planning, coordinating and developing fish and wildlife advisory services of mutual interest for the benefit of the people of the States of Mississippi and Alabama and of the Nation.

II. BACKGROUND AND AUTHORITIES

The FWS is charged with the responsibility for carrying out programs relating to fish and wildlife throughout the Nation, in accordance with the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661 et seq.) and the Fish and Wildlife Act of 1956, as amended (16 U.S.C. 742a et seq.); and with other authorities.

The National Oceanic Atmospheric Administration (NOAA) is charged with the responsibility of carrying out programs relating to the exploration, development and conservation of marine resources, both living and nonliving, which contribute to the health, safety and welfare of people and the efficient use of the environment in accordance with the provisions contained in the Executive Reorganization Plan Number 4 of 1970 (84 Stat. 2090).

In connection with such programs, NOAA is authorized under the Sea Grant Program Improvement Act of 1976, as amended (33 U.S.C. 1121 et seq.) and the Fish and Wildlife Act of 1956, as amended (16 U.S.C 742a et seq.), to conduct advisory and cooperative programs for the purpose of disseminating useful information pertaining to marine resources and marine environmental use to marine users and others.

As part of the National Sea Grant Program, MASGC conducts research, education and training and advisory services for the purpose of increasing the understanding, assessment, development, utilization, and conservation of marine resources.

Many programs conducted by Region 4, FWS, and MASGC include the dissemination of useful and practical information of mutual interest to both agencies. Accordingly, cooperation and coordinated efforts in the conduct of such programs will be mutually beneficial and will avoid needless duplicative efforts.

III. RESPONSIBILITIES OF AGENCIES

A. Pursuant to this Agreement, Region 4, FWS, will:

1. Provide technical assistance on fish and wildlife matters to marine extension and advisory programs.

2. Make its published information available to marine extension and advisory programs.

3. Cooperate with the MASGC in the design, development and support of educational programs and materials of mutual interest through which appropriate information generated by Region 4, FWS may be disseminated to the people of the States of Mississippi and Alabama and the Nation through marine extension and advisory programs.

4. Cooperate with marine extension and advisory programs in the preparation of educational programs and materials that may be used by marine extension and advisory programs on a regional, state or local basis.

5. Keep the MASGC informed on the status of Region 4, FWS activities with marine extension and advisory programs, including negotiations relating to cooperative program developments.

6. Provide feedback and information to the MASGC concerning fish and wildlife problems of mutual concern to assist MASGC in evaluating cooperative programs and in developing new programs of mutual interest.

7. Keep MASGC informed on the status of FWS national and regional objectives.

8. Solicit active participation by the Alabama Department of Conservation and the Mississippi Department of Wildlife Conservation in the Sea Grant Program.

B. Pursuant to this Agreement, MASGC will:

1. Cooperate with Region 4, FWS in the design of appropriate educational programs and materials for dissemination to the people of Mississippi and Alabama and the United States through interested marine extension and advisory programs.

2. Provide channels of communication and distribution to marine extension and advisory programs of information relating to such educational programs and materials.

3. Encourage effective involvement of marine extension and advisory programs in appropriate Region 4, FWS programs.

4. Encourage coordination between marine extension and advisory programs and Region 4, FWS in the development and conduct of fish and wildlife programs.

5. Encourage marine extension and advisory programs to seek effective involvement, when appropriate, of Alabama Department of Conservation and Mississippi Department of Wildlife Conservation in cooperative marine advisory and Region 4, FWS efforts.

6. Provide feedback and information from marine extension and advisory programs concerning fish and wildlife problems and to assist Region 4, FWS in evaluating cooperative programs and in developing new programs of mutual interest.

IV. PROGRAMMING, BUDGETING, AND REIMBURSEMENT ARRANGEMENTS

This Agreement is not a fiscal or funds-obligating document. Any joint endeavors involving reimbursement or transfer of funds between the parties to this agreement will be handled in accordance with prescribed financial procedures, and will be the subject of subsidiary agreements that shall be effected in writing by representatives of both parties to this Agreement.

V. PUBLIC AFFAIRS/PRESS LIAISON

Publications, releases to the press, public announcements and communication with the Congress concerning or stemming from joint programs can be made by either party to this Agreement, or by both jointly, following approval by the appropriate representative of the other party. Credit will be given to Region 4, FWS and MASGC interests as appropriate.

VI. AMENDMENTS AND REVIEW

This Agreement may be amended at any time by the mutual written consent of the parties to this Agreement.

This Agreement will be reviewed periodically, but not less than annually. It may be subject to reconsideration at such other times as may be required and as agreed to by the parties to this Agreement.

VII. IMPLEMENTATION

Region 4, FWS and THE MASGC will each assign a senior staff member to serve in a liaison capacity to satisfy the requirements of this Agreement.

VIII. TERMS OF THE AGREEMENT

This Agreement will become effective upon the signature of both approving officials of the respective agencies entering into this Agreement.

The terms of this Agreement will remain in effect until terminated by (1) mutual agreement, or (2) ninety-day advance written notice by either party.

OCT 30 1979
Date

Kenneth E. Black
Regional Director, Fish and Wildlife Service, Region 4, Atlanta, Ga.

NOV 01 1979
Date

James L. Jones
Director, Mississippi and Alabama Sea Grant Consortium

MEMORANDUM OF AGREEMENT BETWEEN MISSISSIPPI LABORATORIES, SOUTHEAST FISHERIES CENTER, NATIONAL MARINE FISHERIES SERVICE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION AND THE MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM

I. PURPOSE

The purpose of this memorandum of agreement is to establish policies and administrative arrangements which will provide a working relationship between the Mississippi Laboratories (ML), Southeast Fisheries Center (SEFC), National Marine Fisheries Service (NMFS) and the Mississippi-Alabama Sea Grant Consortium (MASGC) for the purpose of providing more effective procedures for planning, coordinating, developing, and prosecuting programs of mutual interest for the benefit of the people of the States of Mississippi and Alabama and of the Nation.

II. BACKGROUND AND AUTHORITIES

The National Oceanic and Atmospheric Administration (NOAA) is charged with the responsibility of carrying out programs relating to the exploration, development and conservation of marine resources, both living and nonliving, which contribute to the health, safety and welfare of people and the efficient use of the environment in accordance with the provisions contained in the Executive Reorganization Plan Number 4 of 1970 (84 Stat. 2090). Within NOAA, NMFS is charged with the responsibility of carrying out programs related to fisheries.

As part of the National Sea Grant Program, MASGC conducts research, education and training and advisory services for the purpose of increasing the understanding, assessment, development, utilization, and conservation of marine resources.

Many programs conducted by ML and MASGC are of mutual interest to both agencies. Accordingly, cooperation and coordinated efforts in the conduct of such programs will be mutually beneficial and will avoid needless duplicative efforts.

III. RESPONSIBILITIES OF AGENCIES

Pursuant to this Agreement, ML and MASGC will:

1. Cooperate in the design, development and support of programs and materials of mutual interest through which appropriate information generated may be disseminated to the people of the States of Mississippi and Alabama and the Nation.

2. Cooperate in the preparation of educational programs and materials that may be used on a national, regional, state or local basis.

3. Keep each other informed on the status of activities including negotiations relating to cooperative program developments.

4. Provide feedback and information concerning problems of mutual concern to assist in evaluating cooperative programs and in developing new programs of mutual interest.

5. Keep each other informed on the status of national and regional objectives of their respective programs.

IV. PROGRAMMING, BUDGETING, AND REIMBURSEMENT ARRANGEMENTS

This Agreement is not a fiscal or funds-obligating document. Any joint endeavors involving reimbursement or transfer of funds between

the parties to this agreement will be handled in accordance with prescribed financial procedures.

V. PUBLIC AFFAIRS/PRESS LIAISON

Publications, releases to the press, public announcements and communication with the Congress concerning or stemming from joint programs can be made by either party to this Agreement, or by both jointly, following approval by the appropriate representative of the other party. Credit will be given to ML and MASGC interests as appropriate.

VI. AMENDMENTS AND REVIEW

This Agreement may be amended at any time by the mutual written consent of the parties to this Agreement.

This Agreement will be reviewed periodically, but not less than annually. It may be subject to reconsideration at such other times as may be required and as agreed to by the parties to this Agreement.

VII. IMPLEMENTATION

ML and THE MASGC will each assign a senior staff member to serve in a liaison capacity to satisfy the requirements of this Agreement.

VIII. TERMS OF THE AGREEMENT

This Agreement will become effective upon the signature of both approving officials of the respective agencies entering into this Agreement.

The terms of this Agreement will remain in effect until terminated by (1) mutual agreement, or (2) ninety-day advance written notice by either party.

Oct 10, 1981
Date

Andrew J. Kemmerer
Director, Mississippi Laboratories,
Southeast Fisheries Center, National
Marine Fisheries Service

Date

James I. Jones
Director, Mississippi-Alabama Sea
Grant Consortium

MEMORANDUM OF AGREEMENT

Between U. S. Army Corps of Engineers,
Mobile District and the Mississippi-
Alabama Sea Grant Consortium

I PURPOSE

The purpose of this memorandum of agreement is to establish policies and administrative arrangements which will provide a working relationship between the U. S. Army Corps of Engineers, Mobile District and the Mississippi-Alabama Sea Grant Consortium (MASGC) for the purpose of providing more effective procedures for planning, coordinating, developing, and prosecuting programs of mutual interest for the benefit of the people of the States of Mississippi and Alabama and of the Nation. Through cooperative efforts, information data and analytical tools developed by either party can be shared and therefore provide more effective use of efforts by all parties. The level of expertise available in MASGC member institutions can provide enhancements to studies being conducted by the Mobile District.

II BACKGROUND

The Mobile District, U. S. Army Corps of Engineers, has both civil and military functions. The military mission of the Mobile District covers 200,738 square miles with the major portion of the military mission being the design and supervision of construction of new facilities for the Army and Air Force. This work is located in Alabama, Mississippi, Tennessee, and Florida; and in the U. S. Defense Area, Panama.

The civil mission of the Mobile District covers 96,330 square miles and includes the supervision of all rivers, harbor and flood control works within the drainage basins of the Wolfe, Pascagoula, Black Warrior-Tombigbee, Alabama-Coosa, Apalachicola-Chattahoochee-Flint, St. Marks and intervening river systems, and on the Intracoastal Waterway and at all Gulf Coast harbors between Rigolets, Louisiana, and St. Marks, Florida. This mission embraces all factors and functions, including comprehensive river basin planning; reconnaissance and feasibility studies for proposed projects, design and construction of approved projects, operation and management of completed project in rivers, harbors and flood control works.

Also the civil mission includes beach erosion control works, flood plain management services, environmental studies and planning for all projects, reimbursable work for other agencies or political subdivisions, and core drilling and subsurface exploration for other districts.

Many programs conducted by the Mobile District Corps of Engineers and MASGC are of mutual interest and cooperation and coordination of efforts in such programs will be beneficial and avoid needless duplication. One particular program currently underway is the Mississippi Sound and Adjacent

Areas Study. Specific data and analytical tools have already been identified which can be shared by both parties in the Mississippi Sound Study.

III RESPONSIBILITIES OF AGENCIES

Pursuant to this Agreement:

1. The Mobile District and MASGC will cooperate in the design, development and support of programs and materials of mutual interest through which appropriate information generated may be disseminated to the people of the States of Alabama and Mississippi and the Nation.

2. The Mobile District and MASGC will keep each other informed on the status of activities including negotiations relating to cooperative programs developments.

3. In the Mississippi Sound and Adjacent Areas Study the Mobile District Corps of Engineers will provide Dr. Donald C. Raney of the University of Alabama the following data and information which he will use to complete his efforts in a research and development grant from MASGC. The Mobile District will provide Dr. Raney:

(a) A listing of the source code for the Mississippi Sound two-dimensional depth average numerical model as developed by the U. S. Army Corps of Engineers Waterways Experiment Station (WES) in Vicksburg, Mississippi and the Gulf Tide model developed by Drs. Reid and Whitaker for WES.

(b) Copies of data collected for calibration and verification of the Mississippi Sound numerical model.

(c) Copies of the coded topographic data, as developed by WES, for its Mississippi Sound global grid numerical model.

4. MASGC and Dr. Raney will provide the Mobile District a calibrated fine grid code of the WIFM for two Federal navigation project areas of the Alabama-Mississippi Coast. The limits of these codes will be determined through close coordination between the Mobile District and Dr. Raney.

5. The Mobile District and MASGC will establish mutually agreed administrative procedures for those proposals in which the Mobile District chooses to fund, through the National Sea Grant Office, work proposed by MASGC members if such work assists or enhances Corps goals and/or objective of authorized Corps studies.

IV PROGRAMMING, BUDGETING, AND REIMBURSEMENT ARRANGEMENTS

This agreement is not a fiscal or funds-obligating document. Any joint endeavors involving reimbursement or transfer of funds between the parties to this agreement will be accomplished by either an amendment to this agreement or by entering into a new agreement, whichever is deemed expedient to the interest of the parties.

Funding, scheduling, project monitoring requirements, review procedures of end products and other pertinent requirements will be specified in a letter of agreement covering each proposal with the National Sea Grant Office, and will be in accordance with applicable financial procedures for each agency.

Should disagreements arise as to the interpretation of the provisions of this agreement that cannot be resolved by the immediate parties the area(s) of disagreement shall be reduced to writing by the parties and exchanged for consideration at least 30 days prior to being forwarded to the respective division levels of authority for appropriate resolution.

V PUBLIC AFFAIRS/PRESS LIAISON

Publications, releases to the press, public announcements and communication with the Congress concerning or stemming from joint programs can be made by either party to this agreement, or jointly, following review and approval by appropriate representatives of the parties. Credit will be given to Corps and MASGC interest as appropriate.

VI AMENDMENTS AND REVIEW

This agreement may be amended at any time by the mutual written consent of the parties to this agreement. This agreement will be subject to review periodically, but no less than annually and at such other times as agreed to by the parties to this agreement.

VII TERMS

The Mobile District and MASGC will each assign a person to serve in a liaison capacity to satisfy the requirements of this agreement.

This agreement will become effective upon the signature of both approving officials of the Mobile District Corps of Engineers and MASGC.

The terms of the agreement may be terminated by mutual agreement or thirty-day advance written notice by either party.

VIII APPROVAL

DR. JAMES JONES
DIRECTOR, Miss-Ala. Sea Grant
Consortium

Date: _____

Robert H. Ryan

ROBERT H. RYAN
Colonel, CE
Commander and District Engineer
U. S. Army Corps of Engineers

Date: 15 FEB 1982