



# **“America’s Sea at Risk”**

**First Progress Report  
on the  
Gulf of Mexico Program**

**JULY 1990**



"America's Sea at Risk"

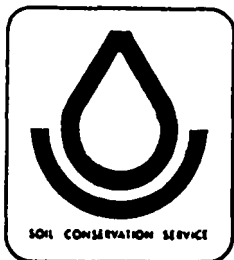
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Gulf of Mexico Program

Listed below are the logos from the various agencies with membership on the Gulf of Mexico Program Policy Review Board or who are actively participating in the Program committee structure.

Their contributions and assistance to the Gulf Program effort have been outstanding and speak for the spirit of interagency cooperation and commitment which has made the Gulf Program work.



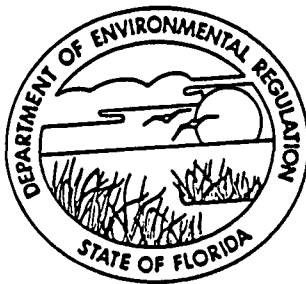
US Army Corps  
of Engineers



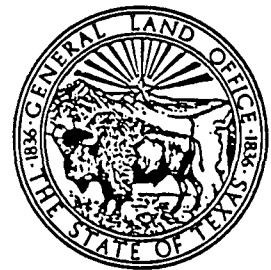
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In addition, the Gulf Program also gratefully acknowledges the important contribution and support received from the following agencies and organizations:

U. S. Department of Agriculture - Forest Service, Alabama Geological Survey, Florida Department of Natural Resources, Louisiana Department of Natural Resources, Mississippi Bureau of Geology, Mississippi Bureau of Marine Resources, Texas Department of Parks and Wildlife, Northwest Florida Water Management District, Louisiana Litter Control and Recycling Commission, Louisiana Geological Survey, Soil and Water Conservation Districts (Gulfwide), Louisiana Department of Wildlife and Fisheries, Mississippi Forestry Commission, Texas Department of Health, Louisiana Office of Public Health, Florida Department of Health and Rehabilitative Services, Alabama Department of Public Health, Mississippi Department of Health, University of South Alabama, University of New Orleans, Louisiana State University, Gulf Coast Research Laboratory, University of Texas, Port of Corpus Christi, Gulf Ports Association, Texas A&M University, Sea Grant (Gulfwide), Gulf of Mexico Fisheries Management Council, Audubon Society, Sierra Club, Louisiana University Marine Consortium, Mote Marine Laboratory, Hausel & Associates, Inc., American Petroleum Institute, Mobil Oil, Inc., Amoco Oil, Inc., Center for Marine Conservation, University of South Mississippi, Purdue University, Alabama Dauphin Island Sea Lab, Tulane University, Nichols State University, University of Alabama, University of Florida, and the University of Mississippi.

## PREFACE

This report covers activities conducted within the Gulf of Mexico Program from its initiation in August of 1988 through December, 1989. The purpose of this progress report is to present the status of various activities within the Program up to that time and does not include activities occurring after January, 1990.

Future progress of the Gulf of Mexico Program will be presented in subsequent annual and periodic status reports.

FIRST PROGRESS REPORT  
FOR THE  
GULF OF MEXICO PROGRAM

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## EXECUTIVE SUMMARY

In 1988, Regions 4 and 6 of the U.S. Environmental Protection Agency initiated the development of a Gulf of Mexico Program. The major purpose for the program is to develop a comprehensive strategy to protect and enhance the environmental quality of the Gulf of Mexico. This intergovernmental initiative is a geographical approach to resolving major environmental issues. The program advocates:

- o a systemwide approach to address emerging environmental issues;
- o development of interjurisdictional solutions for resolving environmental problems;
- o working to address environmental issues before the damage is too costly to repair; and
- o serves as a model for public policy development through greater public involvement in the decision-making process.

It would be difficult for the United States or the five-state Gulf region to assess the social and economic value of the Gulf of Mexico unless it was lost to the effects of pollution. In the past, the warm waters of the Gulf have provided an impressive wealth of resources for the taking. However, recent trends and information have indicated that we risk serious long-term environmental damage to this vast and unique marine system if we do not begin comprehensively planning today.

The Gulf of Mexico Program was created as an intergovernmental response to signs of increasing environmental degradation, that are now pervasive throughout the Gulf system. These problems include:

- o Up to 3,000 square miles of oxygen deficient (hypoxia) bottom waters known as the "dead zone" have been documented off the Louisiana and Texas coast.
- o Fish kills and toxic "red tides" were an increasing phenomenon in the Gulf during the 1980's.
- o Four of the top five states in the nation in total surface water discharges of toxic release inventory chemicals are found in the Gulf region (Alabama, Mississippi, Louisiana, and Texas).
- o Almost two tons per mile of marine trash covered the shores of Texas beaches alone in 1988.
- o 3.4 million acres (57%) of the shellfish-growing areas along the Gulf Coast are permanently or conditionally closed. Such closures will increase unless environmental conditions are improved, e.g., increased toxic chemicals and growth of waste concentrations.

- o Louisiana continues to lose valuable coastal marsh habitat at the rate of 50-60 square miles per year. Such losses could threaten the natural productive cycles of commercial shrimp and fishery resources in the Gulf.

The Gulf of Mexico Program has identified key issues which are pervasive in the Gulf and which threaten the future long-term viability of the Gulf of Mexico system. The tremendous wealth of economic and social values contributed by the Gulf benefit the United States and Gulf Coast region. In order to protect this valuable resource there is a need to make the future management and protection of the long-term environmental quality of the Gulf a national priority. A recent editorial in the New Orleans Times-Picayune stated, "The Gulf coastal wetlands are a common asset we must work in common to protect...The advocacy of a united Gulf South can be a powerful asset to take to Washington, whose financial help will be decisive in a wetlands defense operation of the required scope." This report has been developed for the purpose of reporting on the progress achieved during the first year of the Program and raising recommendations to improve future Program development.

#### Accomplishments

Through the efforts made during the first year of the Gulf of Mexico Program, consensus is now beginning to emerge on the priority issues which should be addressed to protect the long-term health and productivity of the Gulf. Those issues deemed most pervasive at this point in the program effort are:

- 1) Habitat loss - to include coastal wetlands, seagrass beds, and dunes.
- 2) Toxic substances and pesticides contamination - from industrial and agriculturally-based sources, both point and nonpoint.
- 3) Nutrient enrichment - from industrial and agriculturally-based sources, both point and nonpoint.
- 4) Marine debris - from both land-based sources and shipping/boating activity in the Gulf.
- 5) Freshwater diversions away from coastal estuaries for purposes of flood control, navigation, recreation and support to growing coastal populations.
- 6) Public health threats - from water contact or contaminated seafood products.
- 7) Coastal and shoreline erosion - from natural and manmade causes.

In addition, the program established a Gulfwide committee framework and infrastructure to initiate communication and information exchange among multiple levels of government, the public, and multiple Gulf user groups. This structure currently consists of three main committees and nine technical subcommittees.



Other program activities and accomplishments during the first calendar year include:

- o Program Office established and opened - August 22, 1988.
- o Program Office staffed through a combination of EPA, SCS, COE and NOAA staff.
- o Established a five-year framework to guide the planning and development of a Gulf of Mexico comprehensive plan.
- o A technical background paper supporting special area designation of the Gulf of Mexico under MARPOL Annex V was drafted and released for public comment. This paper will serve as technical justification and support for applying the special area criteria of the MARPOL treaty to the Gulf under Annex V.
- o A Coastal and Shoreline Erosion Subcommittee was created for the purpose of evaluating and highlighting this issue as pervasive in the Gulf.
- o A federal/state program coordination workshop was convened in July, 1989 to improve information exchange and planning of research and management information needs. Plans are already being made to make this workshop an annual event.
- o Procurements were initiated by all Gulf of Mexico Program subcommittees in an effort to gather and assess existing information on key Gulf issues and begin the process for developing environmental characterization studies.
- o Multiple communication efforts were initiated to promote the program. Some examples include publishing a bimonthly newsletter called "Gulfwatch," production of a fact sheet, distribution of video tapes on the program, supporting the "Take Pride Gulfwide" beach cleanup effort with 100,000 brochures and 20,000 bumper stickers, and supporting the convening of a Gulf conference in Galveston, Texas (November 1988).

#### Future Direction

The future direction of the program will be determined through consensus of program participants. For the immediate future, however, the program will focus on completion of the steps identified in the five-year planning strategy: 1) prepare environmental characterization reports, 2) prepare environmental assessments, 3) develop an interactive data management system, 4) prepare predictive assessments, 5) development of an environmental management plan, and 6) develop an environmental monitoring

plan. After working with the committee structure and program in actual practice during the previous year, a number of recommendations have come forth that will improve the effectiveness of a comprehensive Gulfwide environmental effort. Among those key recommendations are:

- a. Planning must begin on intergovernmental structure needed for implementation of the framework for action.
- b. The Gulf of Mexico Program should be given a mechanism to allow for interagency budget planning. This would not only elevate the status of the Program, but would provide for receiving the transfer of funds from other Federal agencies. Also, it would allow the budget process to recognize and address the critical needs of the cooperative Program.
- c. Cooperating agencies should highlight the Gulf of Mexico Program in their FY91 and 92 budget requests as it relates to priority issues.
- d. Collocation of Federal and State personnel at the Gulf of Mexico Program Office should be encouraged and continued.
- e. Additional funds should be identified to provide travel funds for certain State personnel and private citizens associated with the Program to attend specific Program meetings. This travel is critical for the operation of the committees and subcommittees, and thus is critical for the success of the Program.
- f. Lines of communication should be established with various emergency response teams in the Gulf of Mexico, as well as with NOAA's Coast Watch Program, so the Gulf of Mexico Program can be aware of emergency environmental situations as they develop. Establishing these lines of communication and advance agreements could foster improved coordination of high tech equipment and information in the event of a future environmental problem in the Gulf of Mexico.

Other recommendations are also listed in the final section of the report entitled, "Future Challenges."

FIRST ANNUAL REPORT  
FOR THE GULF OF MEXICO PROGRAM

In January 1811, Dr. Flood, a duly designated representative of President James Madison, reported, "I am greatly impressed with the beauty and value of this coast. The high sandy lands, heavily timbered with pine, and the lovely bays and rivers, from Pearl River to Mobile, will furnish New Orleans with a rich commerce and with a delightful Summer resort."

Since those early years, however, troubling environmental trends have been observed in the Gulf of Mexico which concern many people throughout the Gulf Coast region. For example, the occurrence of up to 3,000 square miles of hypoxic bottom waters known as the "dead zone" have been documented off the Louisiana and Texas coasts; of the five states leading the nation in total surface water discharges of toxic release inventory chemicals, four are found in the Gulf region (Alabama, Mississippi, Louisiana and Texas); and almost two tons per mile of marine trash covered the shores of Texas beaches in 1988 alone. In addition, at any given time, 3.4 million acres (57%) of the shellfish-growing areas along the Gulf coast are permanently or conditionally closed. Such closure areas are growing as a result of inadequate sewage treatment and growing populations in coastal areas.

The critical need for the multi-agency Gulf of Mexico Program is found in a quote from Lee Thomas, former Administrator of the U.S. Environmental Protection Agency (EPA): "The Gulf is a large water body and a great source of abundance. But it is not without limit in its capacity to absorb the increasing pressures to which it is being subjected. Clearly, the ecological integrity of the Gulf of Mexico is at risk." Support from the EPA Administrator and Regions IV and VI Administrators Greer Tidwell and Robert Layton, enabled the Program to begin officially in August 1988. Since then, considerable progress has been made toward implementing the Program.

Although the EPA has provided seed-money and leadership to initiate the Gulf Program, the long-term goals will not be achieved without active participation of the many State and Federal agencies involved in the Program. Because of overall budget constraints, this approach is a logical way of maximizing limited resources to maintain the environmental integrity of the Gulf before the damage is irreversible or too costly to repair. This approach is a proactive planning effort and is in step with the Agency's philosophy of pollution prevention. This report has been developed for the purpose of reporting on the progress achieved during the first year of the program and raising recommendations to improve future program development.

#### STRATEGY

A primary purpose of the Gulf of Mexico Program is to provide a broad-based forum for defining and addressing environmental problems that face the Gulf of Mexico. The Gulf Program is designed to coordinate the collaborative efforts of the many different organizations that carry out programs affecting the Gulf of Mexico. The Gulf Program is not intended to be another layer of bureaucracy.

A committee infrastructure has been developed which includes all appropriate Federal agencies, the Gulf States, academia, and user groups to provide the mechanism for dealing with the many complex environmental issues that affect the Gulf. Over time, a framework for action will be developed to mitigate pollution and restore the Gulf's former environment. The Gulf Program will direct its available resources toward issues meeting the following general criteria:

- o The problems are cross-jurisdictional and pervasive.
- o The problems result in a threat to beneficial uses of the Gulf's resources.
- o A reasonable prospect exists for a solution to the problem.

The Gulf is approached from a broad geographical perspective because it provides commercial and recreational activities to many people as well as supplies seafood to consumers throughout the Nation. In short, the Gulf of Mexico offers a wealth of resources to the United States and thus confers great responsibilities on the Nation. Therefore, the continued health and productivity of the Gulf must become a national priority.

The evaluations of impacts on living resources in the Gulf have been approached by the Gulf Program in a holistic or systemwide manner and it is anticipated that the Gulf Program, with time, will have international dimensions. Because the environmental problems of the Gulf of Mexico are the result of multistate and international activities, effective solutions will require Gulfwide coordination and cooperation. Over the past three years, numerous experts have identified and developed a consensus on major problems facing the Gulf that fall into the following categories -- the presence of toxic substances and pesticides, habitat degradation, nutrient enrichment, public health, marine debris, freshwater diversion, and coastal erosion. While the effects of such environmental threats to the Gulf may be seen locally, overall these problems result from sources and activities that are regional in nature.

There are numerous Federal, State, and local agencies working on their own legislative directives that are generally independent of each other. These agencies, recognizing the need for coordination, support development of the Gulf of Mexico Program to prevent further degradation of the Gulf. The Gulf Program will improve communication among affected Gulf users, build coalitions, and work toward consensus on technical solutions to achieve more effective protection of these valuable coastal resources.

The long-term strategies of the Gulf Program are: 1) to protect, restore, and maintain the integrity of Gulf waters; 2) to protect human health and sustain living resources; 3) to take actions to further control pollution of these waters; and 4) to ensure that uses and economic growth are managed in an environmentally sound manner. These efforts will be guided by the following principles:

- o The Gulf of Mexico Program will be oriented towards protecting and restoring uses.
- o The Gulf of Mexico will be treated as a system, taking into account systemwide concerns and cumulative effects.
- o Site-specific problems and issues will be viewed within the context of Gulfwide priorities.

Early in this first year the Gulf of Mexico Program published its Five-Year Strategy for 1988 to 1992, in which five-year programmatic goals and objectives were presented. The two principal goals and their objectives are as follows:

Goal I. Establish an effective infrastructure for resolving complex environmental problems associated with man's use of the Gulf of Mexico.

Objective 1: Establish and provide support to a Gulf of Mexico Program Office.

Objective 2: Establish and implement a Gulf of Mexico Program committee structure.

Objective 3: Establish a public education network that includes information transfer, educational outreach, and participation activities.

Goal II: Establish a framework-for-action for implementing management options for pollution controls, for remedial and restoration measures for environmental losses, and for research direction and environmental monitoring protocols.

Objective 1: Prepare environmental characterizations to determine actual system problems and develop historic status and trends.

Objective 2: Prepare environmental assessments to determine the extent of environmental damage and measurable baseline information.

Objective 3: Develop an interactive data management system for use in providing a range of possible technical solutions and improve information management and application to environmental problem solving.

Objective 4: Develop predictive assessments to determine the course and effect of proposed solutions.

Objective 5: Develop and implement plans for a Gulf of Mexico Monitoring Plan to assure the long-term environmental health and quality of the Gulf and determine the impacts of changes made.

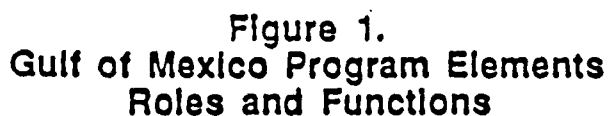
## ACCOMPLISHMENTS

During this first year of the Gulf Program, a significant effort was focused on establishing an effective infrastructure by holding coordination meetings and informing participants about their potential roles and responsibilities in the Gulf of Mexico Program. The Gulf of Mexico Program Office was officially established August 22, 1988, and the three working committees making up the principal program infrastructure were all convened by December, 1988. Additionally, a public education work plan is being developed and information transfer, educational outreach, and participation activities have been initiated. The organization of the Gulf Program and the roles and functions of the various EPA offices are summarized in Figure 1. The highlights of accomplishments made during the first year of operation are shown in Table 1 and will be discussed in more detail in this report.

Many agencies (Federal, State, and local) currently have technical and management responsibilities in marine and estuarine waters and adjacent coastal areas around the Gulf of Mexico. The establishment of interagency relations through memoranda of understanding and agreements will help improve cooperation, minimize duplication of effort, and provide consistency in data acquisition and analysis procedures. This will result in the maximum application of limited resources to the most significant environmental problems. The establishment of these formal agreements of mutual cooperation is the standard procedure for fostering interagency cooperation. Because these agencies have various and occasionally divergent interests and responsibilities, it is essential that they be kept apprised of the Gulf Program Office activities and be allowed to provide input to program planning as early as possible. To facilitate this close coordination and collaboration between Federal and State programs administering the protection and regulation of Gulf of Mexico resources, collocation of agency personnel at the Program Office will be established when possible. To date, an Interagency Agreement has been established between EPA and the Soil Conservation Service (SCS) and discussions have been held with the U.S. Army Corps of Engineers (U.S. Army COE) and the National Oceanic and Atmospheric Administration (NOAA). It is anticipated that more permanent and formal arrangements will be finalized with NOAA and ACOE in the coming year.

## GULF OF MEXICO PROGRAM OFFICE AND COMMITTEE STRUCTURE

During the first year of the Gulf Program, a significant effort was made to staff the Gulf of Mexico Program Office, establish its committee structure (Policy Review Board, Technical Steering Committee, and Citizens Advisory Committee), convene committee meetings, and establish and direct subcommittee activities. This institutional structure is intended to provide a regional focus to propose solutions that are on the same scale as the identified problems.



**Figure 1.**  
**Gulf of Mexico Program Elements**  
**Roles and Functions**

# **1988/89 GULF PROGRAM ACCOMPLISHMENTS**

- **Program Office Established - August '88**
- **Program Office Staffed - EPA/SCS/NOAA/COE**
- **Committee Structure Established and Functional**
- **Identified Major/Pervasive Gulf Environmental Issues Through Technical Consensus**
- **Five Year Program Strategy Completed**
- **Multiple Information/Communication Efforts**
- **Special Area Designation Paper Drafted**
- **Coastal Erosion Task Force Initiated**
- **Environmental Characterization Studies Initiated**
- **Federal/State Program Coordination Workshop**



Task force or subcommittee structures and schedules will be developed to address specific priorities identified by their respective committees. Each subcommittee will be guided and directed by the parent committee and the Gulf of Mexico Program Office. The first step for each subcommittee was to gather existing information on Gulf problems for the environmental characterization.

#### Program Office

The Gulf of Mexico Program Office was established in August 1988, and overall responsibility for the Program was assigned to the Program Director, Dr. Douglas A. Lipka. The Program Director executes program management functions within the authority granted by the Memorandum of Understanding between Regional Administrators of EPA Regions IV and VI, and is supported by a staff of both EPA personnel (Mr. William R. Whitson, Assistant Director, and Dr. Frederick C. Kopfler, Chief Scientist) and other Federal personnel collocated at the Program Office at the Stennis Space Center in Mississippi. During the past year, the Gulf of Mexico Program Office was staffed to reflect the interagency nature of the Program; the agencies represented in the staff include EPA, SCS, NOAA, and the COE. Recent additions to the Gulf of Mexico Program Office include Kenneth Blan (SCS), Dr. Herb Kumpf (NOAA), and Tom R. Campbell (COE). Lloyd Wise and Russell Putt serve as liaisons from EPA Region IV and Region VI respectively.

#### Policy Review Board

The Policy Review Board for the Gulf Program consists of senior-level representatives from State and Federal agencies, including the two EPA Regional Administrators, and representatives from the technical and citizens committees. This Board is chaired by the Regional Administrator of EPA, Greer Tidwell (Region 4) and co-chaired by Robert Layton, EPA Regional Administrator (Region 6). The overall function of the Board is to guide and review activities of the Gulf of Mexico Program. The Board approves program goals and objectives, and establishes program priorities and directions. The Board will make recommendations, weighing the realities of time and resource constraints with environmental benefits and public opinion. The Policy Review Board provides broad-based support for the program in all policy matters. Differences concerning program recommendations that arise in the Technical Steering Committee, Citizens Advisory Committee, or other committees will be addressed by the Policy Review Board. Although the Board guides, reviews, and evaluates the program, it leaves the operational duties to the other working committees and the Program Office. It is anticipated that the Policy Review Board will meet at least annually.

At the first Policy Review Board meeting held in December 1988, the Board concurred with recommendations of the Technical Steering Committee to designate subcommittees to evaluate in more detail the highest priority problems designated by the Technical Steering Committee. The subcommittees are co-chaired by a Federal and a State representative. Also, the FY89 resource allocation for the Gulf Program was approved at this meeting.

The second meeting of the Board was held in July 1989. A charter for the Board was formally adopted under the Federal Advisory Committee Act (FACA) and a committee designated to prepare bylaws. The Board also approved the adoption of the Citizens Advisory Committee's bylaws. After reviewing the FY90 budget for the Gulf of Mexico Program, the Program Office staff emphasized that the \$1 million budgeted for the Program was "seed" money and that the Program is dependent upon support from other Federal and State agencies. The Board approved the concept of forming a Coastal Erosion Subcommittee if the Technical Steering Committee requests such action.

#### Citizens Advisory Committee

The Citizens Advisory Committee consists of representatives of five sectors (environment, agriculture, business/industry, development/tourism, and fisheries) from each of the five Gulf Coast States. The Citizens Advisory Committee members are appointed by the Governor of their respective states. This committee usually elects its own chairman and provides a mechanism for structured citizen input into the Gulf Program from each of the Gulf Coast States, and for dissemination of information relevant to the goals and results of the program. The committee is active in public outreach, consensus building and implementation of program strategies. The Citizens Advisory Committee ensures representation of program strategies and public concerns while options are fluid, rather than after data have been collected, analyses have been completed, and decisions have been made. Public support for the implementation of program strategies is more likely if the public has been involved throughout the program.

The Citizens Advisory Committee held its first meeting in December 1988. At this meeting each State delegation -- Florida, Alabama, Mississippi, Louisiana, and Texas -- elected a State delegation chairman. The chairmen formed the membership of a Citizens Advisory Committee Executive Committee. The Executive Committee met and elected Joseph Dial (Texas) as chairman, Walter Chandler (Alabama) as vice-chairman, and Michael Evans (Louisiana) as Secretary of the Citizens Advisory Committee. A second election was held at the Advisory Committee's second meeting in May 1989. Members of the Executive Committee were reelected and two additions were made to represent business/industry and to represent the environment. The Citizens Advisory Committee prepared and approved bylaws that were subsequently approved by the Policy Review Board.

Examples of actions taken by the Citizens Advisory Committee are as follows:

- o Establishment of an Agricultural Forum, the purposes of which include encouragement of agricultural organizations to focus on the impact of selected legislation on their members and to initiate mechanisms for improved communication and cooperation between agricultural organizations and Federal and State agencies; organizations present represented approximately 100,000 agricultural producers in Texas.

- o Meetings with senior state officials, CAC members, and the Director of the Gulf of Mexico Program in four of the five Gulf states.
- o The involvement of the Gulf of Mexico Program in designing a curriculum for the Palacios Marine Production Vocational Program in Texas.
- o Organized a meeting with and distributed a questionnaire to representatives of the major environmental groups in Florida.
- o Grassroots efforts have been organized to involve people in the Citizens Advisory Committee in five Texas counties.

During the first year of the Program, Mr. Dial, Chairman of the Citizens Advisory Committee, made from 30 to 40 presentations on the Gulf Program and reported that the public response was positive and enthusiastic. According to Mr. Dial, public opinion is in favor of the Gulf Program; the citizens of the Gulf Coast States are very supportive and want to know what they can do to make the program work.

#### Technical Steering Committee

The Technical Steering Committee consists of representatives of State and Federal agencies, academia, and private and public sectors as appointed by State governors or approved by the Policy Review Board. The Director of the Gulf of Mexico Program is chairman of the Technical Steering Committee. The Technical Steering Committee's principal responsibility is to provide technical support to the Policy Review Board in the form of development and evaluation of environmental issues and regulatory strategies, and development of program options. The Committee provides advice and guidance related to research, data management, modeling, and sampling and monitoring efforts that affect the scientific adequacy of the program. The committee conducts peer review of studies, reports on the status and trends in the Gulf, and alerts the Policy Review Board to emerging environmental problems. The Committee has responsibility for scientific rigor and quality, including oversight of issue-specific subcommittees.

The Technical Steering Committee held its first meeting in October 1988. The Committee accomplished three main tasks: (1) identified priority issues by determining the major physical and biological processes that contribute to the deteriorating environmental quality of the Gulf of Mexico; (2) ranked the priorities that committee members placed on the issues; and (3) formed eight subcommittees to more explicitly address the issues and assigned tasks to these subcommittees.

The discussion leaders at the committee meeting presented information on five priority problems (habitat degradation, nutrient enrichment, toxic substances and pesticides, freshwater diversion, and public health) previously identified by experts throughout the Gulf States.

Subissues were listed under each category and were ranked by participants as either pervasive (Gulfwide) or local in the area affected; and as major, moderate, or minor in intensity of their impact. The additional issues of improved collaboration, marine debris and public education also were presented and discussed.

### Habitat Degradation

Habitat degradation was considered to be the central theme of the problem issues presented by the discussion leaders. Unless habitat degradation is halted, the environmental quality and living resources of the Gulf of Mexico will continue to decline. The interrelationship of the priority problem areas (issues) are shown in Figure 2. Each of the other problem areas can affect habitats and the declining trend in productive habitats such as wetlands is probably due to the resulting impacts to a variety of environments along the coast. Subissues discussed by participants included the physical loss of wetlands due to modifications such as dredge and fill, sea-level rise, and other human and natural causes. The loss of submerged aquatic vegetation (SAV) and other benthic habitats also was discussed. For example, Tampa Bay has lost up to 80% of original (SAV) habitat and coastal Louisiana is currently experiencing losses of vital coastal marsh habitat at a rate of up to 60 square miles per year.

### Nutrient Enrichment

The large number of agriculture activities in the Gulf Coast States and the increasing population along the Gulf Coast have caused nitrogen and phosphorus runoff that could lead to increased problems in the Gulf of Mexico. The increase in nutrients leads to more algal blooms, which can cause dissolved oxygen problems, possible increases in toxins (red tide), and adverse impacts to SAV. The "dead zone" which results from low dissolved oxygen concentrations is probably related to high nutrient loadings from the Atchafalaya and Mississippi River Basin. The Committee identified possible sources for the increase in nutrients to the Gulf and rated agricultural and riverine sources as major and pervasive. Other sources discussed included urban, forest, commercial, atmospheric, and marine sediments.

### Toxic Substances and Pesticides

Increases in population and agricultural or industrial activities can have an adverse impact on the Gulf by increasing the amount of toxic substance and/or pesticide runoff into the Gulf. Growing populations will subsequently increase the quantities of wastewater effluents, and pest control activities (domestic and agricultural) can increase the inflow of toxic chemicals into the Gulf. Presently, industrial activity in the coastal areas and tributaries of the Gulf is significant. EPA information recorded in the toxic release inventory shows four of the top five states in the nation in total surface water discharges are found in the Gulf (Alabama, Mississippi, Louisiana, and Texas). Subissues discussed by participants included the impact of toxics and pesticides on coastal and marine systems, toxic sediments, monitoring activities, and the need to improve risk assessment techniques.

## Interrelationship of the Gulf of Mexico's Priority Problem Areas

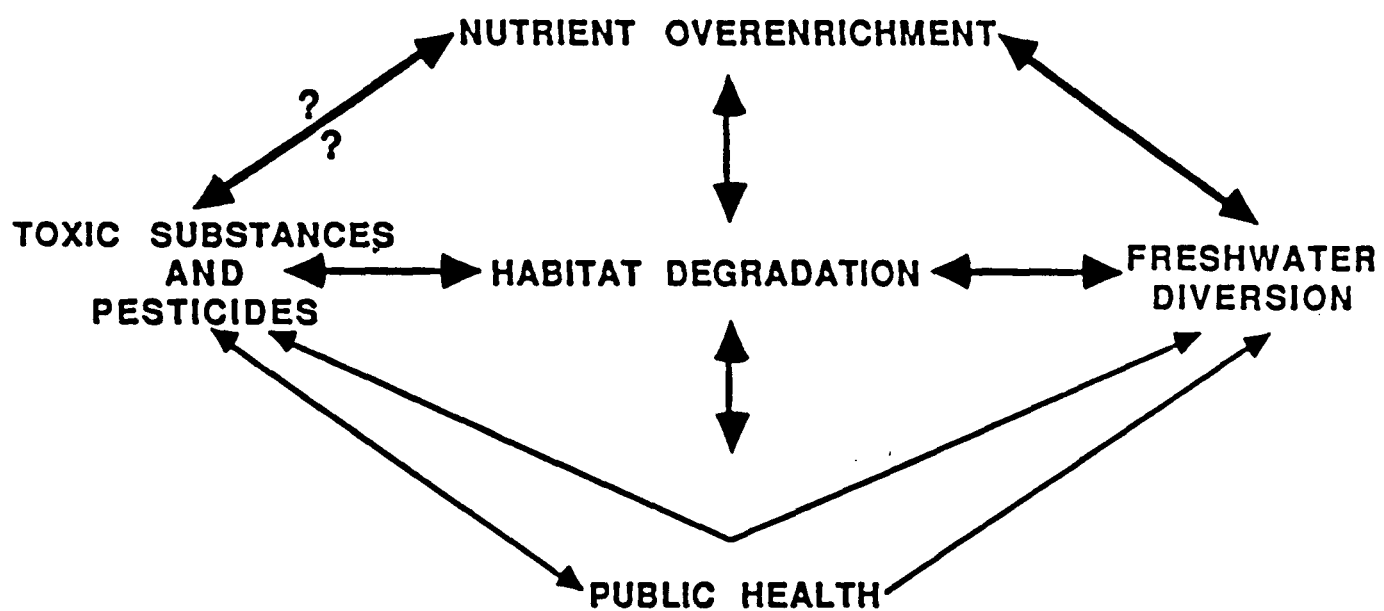


Figure 2.

## Freshwater Diversion

The Gulf of Mexico presently receives two-thirds of the continental United States' drainage and one-half of the runoff. Increases in the U.S. population along the Gulf Coast will increase the demand for freshwater for human use and, consequently, decrease the amount of freshwater flow to the Gulf. In addition, flood control measures along the Mississippi River have resulted in a lack of water to freshwater marshes. In other instances, freshwater diversion has led to less flushing in the Gulf's estuaries, increases in salinity and seawater encroachment, and habitat loss. Issues concerning freshwater diversion that were identified included reduction of the volume of freshwater inflow into estuaries, modification of seasonal flow regimes, reduction of water quality, and impacts to fish and wildlife.

The Technical Steering Committee reached consensus that the problems associated with freshwater diversion are Gulfwide; however, in devising a plan to solve these problems, the committee believes the Gulf should first be segmented by hydrological units, not by States. Each unit should then be characterized by regional inflow problems.

## Public Health

Reduced flushing of estuaries, increased population, increased toxic chemicals and waste concentration translate into greater risks for public well-being. Moreover, 57 percent of the Gulf's classified shellfish-growing areas have been closed. It is believed that these closures will increase unless these environmental conditions are improved. The issues discussed included pathogen contamination, biological toxins, marmade toxins, and risk assessment. The consensus of the committee was that the public health issues associated with the coastal environment of the Gulf of Mexico are major and pervasive; however, the committee did not feel qualified to address the magnitude and extent of specific public health issues in the Gulf of Mexico. Several public health experts were nominated to sit on the Technical Steering Committee.

## Collaboration and Public Education

The goal of the collaboration and public education discussion was to reduce duplication of efforts and to maximize the application of limited resources. The Technical Steering Committee is interested in data management and compatibility, public education, identification and effective use of existing Gulf networks, environmental education support materials, citizens monitoring network, and monitoring and segmentation schemes for the Gulf.

## Presentation of Subcommittees

The Technical Steering Committee agreed to form subcommittees to further address the priority issues that were discussed, as well as a Data and Information Transfer Subcommittee to assist in the organization and transfer of resource data and other information. A Coastal Erosion Task Force also was formed during the second meeting of the Technical Steering Committee (March 1989). The subcommittees and their chairs listed below were recommended by the Technical Steering Committee at their first meeting and approved by the Policy Review Board.

- o Habitat Degradation: Federal Co-Chair -- Dr. William Kruczynski, EPA Region IV; State Co-Chair -- Dr. Donald Boesch, Louisiana University Marine Consortium.
- o Marine Debris: Federal Co-Chair -- Villere Reggio, MMS/DOI; State Co-Chair -- Daniel Ruiz, Texas General Land Office.
- o Freshwater Inflow: Federal Co-Chair -- Dr. Susan Rees, COE/Mobile District; State Co-Chair -- James Kowis, Texas Water Commission.
- o Nutrient Enrichment: Federal Co-Chair -- James Mitchell, SCS/DOA; State Co-Chair -- Mark Chatry, Louisiana Department of Wildlife and Fisheries.
- o Toxic Substances and Pesticides: Federal Co-Chair -- Dr. Foster Mayer, EPA/ORD; State Co-Chair -- Roxane Dow, Florida Department of Environmental Regulation.
- o Data and Information Transfer: Federal Co-Chair -- Daniel Basta, NOAA; State Co-Chair -- George Collins (interim)
- o Public Education and Outreach: Federal Co-Chair -- William Whitson, EPA/Gulf of Mexico Program; State Co-Chair -- Michael Goff, Mississippi Governor's Office.
- o Public Health: Federal Co-Chair -- Frederick Kopfler, EPA/Gulf of Mexico Program; State Co-Chair -- Richard Thompson, Texas Department of Health.

The Technical Steering Committee met again twice, in March and October 1989; at these meetings a representative from each of the subcommittees reported on progress toward goals and objectives. Because the subcommittee efforts are primarily concerned with the framework for action goal, their activities will be discussed under that heading.

A representation of the progress made by the program during the first year and a 5-year schedule for completing tasks is presented in Figure 3.

#### FRAMEWORK FOR ACTION

The subcommittees formed by the Technical Steering Committee are an integral part of the framework-for-action portion of the Gulf Program's strategy. It is through these rather highly specialized work groups that the action items approved by the Technical Steering Committee are implemented. Highlights of the subcommittees' goals and objectives, issues, and action items are summarized here.

#### HABITAT DEGRADATION

The Subcommittee on Habitat Degradation considers habitat degradation to be the central theme of the problem issues identified by the Technical Steering Committee. Unless this degradation of habitat is halted, the

## GOAL I: Establish infrastructure

- Establish Gulf of Mexico Program Office
- Establish Gulf of Mexico committee structure
- Establish public information network
- Convene "Status of the Gulf" Symposium I
- Convene "Status of the Gulf" Symposium II

## GOAL II: Develop Framework for Action

- Prepare environmental characterization reports
- Prepare environmental assessments
- Develop an interactive data management system
- Prepare predictive assessments
- Develop environmental management plan
- Develop environmental monitoring plan

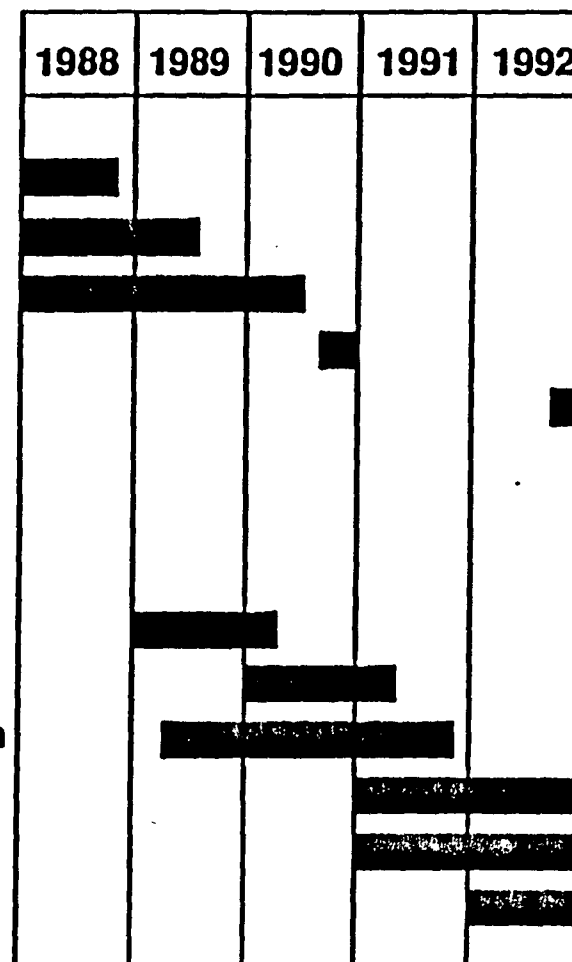


Figure 3.  
Gulf of Mexico Program  
Planning Schedule



environmental and living resources of the Gulf of Mexico will continue to decline. The subcommittee has several areas of major concern, including physical loss and modification of wetlands from human-induced dysfunctions and natural phenomenon, loss of SAV, and modification or loss of biogenic and other consolidated habitats. In order to move forward with a more complete environmental characterization of Gulf issues, problems, and courses, the short-term goals of this subcommittee are to:

- o Identify existing inventories of Gulf habitats.
- o Identify and prioritize habitat degradation issues.
- o Identify additional survey work necessary to delineate resources.
- o Prepare an assessment of the status of Gulf habitats.

The subcommittee's long-term goals are to:

- o Develop a management plan for the Gulf of Mexico to control future impacts on priority habitats.
- o Determine what mitigation and restoration is needed.
- o Develop a means to assess effectiveness of mitigation and restoration of degraded habitats.
- o Assess adequacy of laws, regulations, and programs to protect priority resources.
- o Propose legislation necessary to protect priority resources.
- o Identify research needs.

The subcommittee will focus on two major activities during FY90. The first is an analysis of existing management and protection programs in force in the Gulf Coast area to determine the successes, failures, and possible alternative ways to improve those programs. (This will be done through a contractor.) Secondly, the subcommittee will serve as a focal point for assembling technical information on wetland creation, restoration, and enhancement techniques. This will be accomplished initially through a workshop.

Currently, the subcommittee is preparing a report on the status and trends of habitats along the Gulf Coast. This report is to be presented at the Status of the Gulf Symposium in December 1990; it will include historic data on habitat types, information on natural and anthropogenic causes of habitat loss or degradation including information on dredging and spoil disposal, and a presentation of critical habitats of endangered or threatened species.

## MARINE DEBRIS

The Subcommittee on Marine Debris has set two goals with objectives. Several of the projects now underway or already completed are in support of these goals. The first goal is to eliminate the illegal disposal and careless loss of manmade solid waste in the marine and coastal environments of the Gulf of Mexico. The objectives to reach this goal are the following:

- o Encourage compliance with Federal, State, and local laws and regulations concerning the prevention of pollution by solid waste in the marine environment, especially those directed at marine vessel operators in the Gulf of Mexico region.
- o Support efforts to designate the Gulf of Mexico as a Special Area under MARPOL Annex V and thereby reduce the threat of marine debris from shipping sources. MARPOL is an international treaty which regulates the discharge of five categories of pollution from ships. MARPOL Annex V deals specifically with garbage and emphasizes plastics.
- o Encourage and develop incentives for waste reduction and recycling where practical.
- o Encourage the voluntary use of reusable, recyclable, or nonpersistent materials as a substitute for disposable styrofoam drinking containers on offshore vessels and platforms.
- o Encourage wider acceptance of MARPOL among the countries of the Wider Caribbean Basin.
- o Support pollution prevention through education (multilingual), waste reduction, recycling, and special manufacturing processes.

In Texas, the Texas Shrimp Association, the General Land Office, and Sea Grant have developed a pilot project geared toward commercial fishermen. With a grant from the Gulf and South Atlantic Fisheries Development Foundation and the cooperation of the port authorities, three ports have been funded to build trash receptacle facilities to be used by the fishermen for the disposal of debris that is caught in their nets. Two of the facilities have already been built in Palacios and Aransas Pass and are being used on a daily basis. An education campaign including brochures, posters, and stickers is being developed by the General Land Office for the fishermen to learn about the facilities and the MARPOL regulations and benefits of the project.

Several voluntary efforts have been undertaken by user groups to ban styrofoam cups on offshore oil rigs. The companies that have successfully done this are Conoco, Amoco, and Louisiana Land and Exploration Company. Other groups to be targeted are commercial fishermen and commercial shipping and cruise lines.

Education is the most important component of solving the marine debris problem. Public awareness and educational campaigns have proven to be very effective and should be expanded. The subcommittee's second goal is to foster pride and stewardship and increase understanding of the marine and coastal resources of the Gulf of Mexico (including harmful effects of marine debris) among user groups of the Gulf region. The objectives to reach this goal are the following:

- o Facilitate the planning, organization, promotion, and coordination of a volunteer Gulfwide Coastal Cleanup and Marine Debris Monitoring Program each fall during National Public Lands Cleanup Month and National Coast Weeks.
- o Encourage the establishment and subscription of beach adopting programs in the five Gulf States.
- o Encourage the designation of a National Coastal Cleanup and Appreciation Day on the next to the last Saturday in September.
- o Design and implement a standardized, five-state marine debris monitoring program for the beaches and barrier islands of the Gulf of Mexico, using trained observers and taking monthly samples.

The subcommittee has documented miles, tons, and pounds/mile of debris that were collected as part of the Take Pride Gulfwide Beach Cleanup held on Saturday, September 23, 1989. The pounds collected per mile ranged from 1,800 in Texas to 240 in Alabama.

As a result of the subcommittee's actions and recommendations, the Technical Steering Committee voted to endorse the Adopt-A-Beach program; designation of National Coastal Cleanup and Appreciation Day; a proposed Boater's Pledge; and promotion of Adopt-a-Beach in the Wider Caribbean Program.

The subcommittee has designated two projects for its first year. The first project is an inventory in the form of an annotated bibliography, presenting all projects, programs, reports, data, legislation, educational materials, and information (ongoing or proposed) on marine debris in the Gulf of Mexico. This will also include any information on recycling, especially the recycling of plastics. The subcommittee will analyze this report and pinpoint any gaps or needs and use it as a guide to future projects.

The second project is a video public service announcement (PSA) to be used by all five States. The PSA will use humor to emphasize the negative effects of marine debris on the "home" of the marine wildlife in the Gulf of Mexico. The star of the 30-second PSA will be a dolphin.

### Special Area Designation

The Special Area Designation for the Gulf of Mexico under the MARPOL Annex V Report was submitted to the members of the subcommittee for technical review. The comments were considered and used where appropriate. The report was released for public comment on December 1, 1989. It is anticipated that the final report will be ready for transmission to the U.S. delegation sometime in January 1990.

### NUTRIENT ENRICHMENT

The Subcommittee on Nutrient Enrichment has defined its long- and short-term goals and objectives as follows:

#### Long-Term Goal and Objectives

The subcommittee's long-term goal is to manage nutrients entering the Gulf of Mexico (including its bays and estuaries) for the long-term benefit of society. Its objectives to accomplish this goal are the following:

- o Develop an overall plan to manage nutrient input into the Gulf of Mexico (including its bays and estuaries) in order to protect (a) the productivity and biological diversity of living resources; (b) aesthetic and recreational values of the Gulf; (c) the public health; and (d) other uses of the Gulf of Mexico that may be valued by society (by 1995).
- o Protect the waters of the Gulf and encourage sustained productivity and biological diversity of the aquatic organisms through education, research, and other avenues (ongoing indefinitely).
- o Educate the public about the relationship between human activities and the health of the Gulf of Mexico (ongoing).

#### Short-Term Objectives (1-2 years)

- o Identify the major sources by specific areas of nutrient enrichment, the impacts and effects of nutrient enrichment on the Gulf, and determine options for management (there are existing contracts on "Sources" and "Impacts" but an "Options" work statement needs to be developed).
- o Identify existing programs that address nutrient enrichment.
- o Identify agencies involved in water quality activities.
- o Identify and determine the relationships of sources of nutrient to loadings and impacts (a work statement will be needed after "Sources and Quantities," and "Impacts" work products are finalized.)

- o Identify effects of other program policies on nutrient enrichment.
- o Identify and demonstrate success stories; solicit Public Education and Outreach Subcommittee participation.
- o Develop demonstration projects such as the following:
  - Tangipahoa River Water Quality Improvement (Mississippi and Louisiana);
  - Perdido Bay agricultural systems and industrial discharge management;
  - Evaluation of Constructed Wetland Animal Waste Disposal System in Newton County, Mississippi; and
  - Bottomland hardwood filter strips (Mississippi Delta).

The Nutrient Enrichment Subcommittee has two major efforts underway. One project is intended to summarize existing literature and data bases to identify the sources and quantities of nutrients entering the Gulf of Mexico and its tributaries. Emphasis is on nitrogen and phosphorus from United States sources but data on a total of several other water quality parameters will be included. The other project is intended to assess the impacts and effects of nutrients on the living resources, public health, and recreational and aesthetic values of the Gulf of Mexico. Emphasis is on noxious algae blooms, nitrogen (including nitrification/denitrification within the Gulf, low oxygen conditions, chlorophyll, stratification, organic carbon, phosphorus, and silicon. Subcommittee efforts to date have been centered around nitrogen, phosphorus, and silicon. Biological oxygen demand (BOD) and organic carbon have now been recognized as nutrients that will be addressed by the subcommittee.

Additional actions planned include an assessment that can tie the "Sources and Quantities" study and the "Impacts and Effects" study together. Because not all areas of the Gulf are equally affected by nutrient enrichment, it is necessary to identify those sources that are affecting specific bays, estuaries, or areas of the Gulf.

Another planned contract will be designed to explore optional ways of accomplishing nutrient reduction including evaluations of how to get the most benefit for the least cost. The subcommittee has discussed the possibility of selecting a demonstration project that would center on on-ground application of nutrient control practices, have high public visibility, and have a high probability of success within a reasonable time. One small project that will be pursued is to provide assistance in long-term evaluation of the effectiveness of a newly constructed wetland at the Southern Coastal Plains Agricultural Experiment Station in Newton County, Mississippi. The efficiency of the wetland in removing nitrogen, phosphorus, coliform bacteria, BOD, and organic carbon will be determined.

## TOXIC SUBSTANCES AND PESTICIDES

The Subcommittee on Toxic Substances and Pesticides has proposed several goals for the short, middle, and long term. These goals are the following:

### Short-term Goals

- o Compile existing data on selected biotic contaminants and evaluate or analyze them for amounts, locations, and trends.
- o Identify locations and sources of contaminants.
- o Identify data gaps and formulate plans to fill them.
- o Compile frequency and types of water quality violations.

### Mid-term Goals

- o Differentiate between fate of toxics/pesticides on shelf and inner Gulf.
- o Quantify toxics/pesticides inputs to Gulf and calculated wasteload allocations.
- o Develop human health assay.

### Long-term Goals

- o Suggest control mechanisms for mitigating pollutants.
- o Quantify significance of Gulf pollution to global oceanic environment.

These goals were established by the subcommittee in response to the charge it was given from the Technical Steering Committee to define and rank toxics/pesticide issues, determine monitoring needs, and improve risk assessment techniques. Thus, the subcommittee will sponsor a workshop to address one part of a descriptive Gulfwide risk assessment technique and monitoring approach. The subcommittee is still considering its primary long-term goal and the following goal is under discussion: eliminate adverse ecological and human health impact from toxics and pesticides in the Gulf of Mexico system. Possible objectives include:

- o Data gathering, analysis for data gaps, and evaluation of data (risk assessment) by 1992.
- o Water quality-based controls on all point source discharges by 1995.
- o Water quality-based controls on all nonpoint sources by 2000.
- o Remediation of in-place pollutants resulting in human health or ecological impact by 2010.

The Toxic Substances and Pesticide Subcommittee has defined toxic substances (including pesticides) as materials synthesized by humans or present in the Gulf that are capable of producing an adverse effect on a biological system. Major issues discussed by this Subcommittee include the sources of toxic materials in the Gulf, as well as the fate and effects of these materials.

A knowledge of circulation and flow patterns in the Gulf is required to assess pollutant sources. The data probably exist, but may require assimilation and analysis. Linkages between freshwater systems and estuaries/Gulf need to be made with wetland/shelf coupling of processes (e.g., detritus, sediment, contaminants). Care is required to clearly distinguish between elements in a model which predicts the ultimate accumulation of toxics from true point/nonpoint source discharges. There are specific regulatory definitions for these terms in the Clean Water Act, the Ocean Dumping Act, and the Comprehensive Environmental Response Compensation and Liability Act as amended. The sources of toxic substances in the Gulf are:

- o Drainage basins of rivers and streams that serve as an interface as they flow into the Gulf and wetlands
- o Land runoff from forests, agricultural areas, and urban areas
- o Outfalls from sewage treatment plants, industries, and municipal storm drains
- o Atmospheric deposition
- o Transportation of materials (bilges, spills, etc.)
- o Ocean dumping
- o Marinas
- o Oil and gas exploration and production
- o Groundwater (hazardous waste sites and landfills), and
- o Contaminated sediments.

#### Fate and Effects of Toxic Materials

The subcommittee held a general discussion on the fate of toxic substances and pesticides. A toxicant entering the marine environment can move into the water, sediment, biota, or atmosphere. Members of the subcommittee stated that several fate models are in existence that assist in predicting the ultimate destination and accumulation of some toxicants into the compartments mentioned above. These models need to be improved. Instead of developing new models, the existing ones should be refined and more information developed for coefficients of exchange between and among compartments. The models also require validation.

The subcommittee also discussed the effects of toxic substances and pesticides. Toxicants entering the Gulf can adversely affect the biota -- from single species to populations, communities, and entire ecosystems. Unfortunately, models for predicting the effects are not as available as those for predicting the fate of toxic materials. For this reason, much effects research is conducted as toxicity studies on single or multiple species, and the results are extrapolated to other species and locations.

#### Current Activities

The subcommittee sponsored a workshop in November 1989, to begin an evaluation of risk assessment techniques related to each State's Toxic Assessment Program. Because evaluation of monitoring data is a part of risk assessment, and this evaluation is important to each State, it was decided that the goal for the workshop would be to provide a forum where participants share expertise on methods to quantitatively evaluate monitoring data on levels of toxic substances and pesticides in water, sediment, and biota in relation to State standards, proposed standards, guidelines, action levels, etc. This evaluation will provide a cohesion of methods and approaches that is needed to protect and manage the living resources of the Gulf of Mexico. The objectives are to foster state-of-the-art quantitative approaches for analyzing/interpreting toxic substances and pesticide monitoring data; to develop matrices that identify alternative quantitative methods for addressing regulatory/environmental questions about water, sediment, and biota; and to provide data for impact assessment.

Matrices were prepared by participants at the workshop relating the approaches that each State takes in evaluating toxics and pesticide monitoring data in water, biota, and sediment in relation to regulatory actions.

A product of the workshop will be a "consensus" matrix where the most useful approaches for each question will be compiled and commonalities among State approaches noted. There was some discussion of applying the approaches selected by the participants to a specific environmental evaluation (e.g., evaluation of a bay or estuary through water quality-based toxic control). This could be considered a demonstration project.

#### FRESHWATER INFLOW

The Freshwater Inflow Subcommittee's goal is to protect, preserve, and where feasible enhance the quantity of freshwater inflow to the Gulf of Mexico and the associated bays and estuaries for the purpose of maintaining the ecological health and integrity of those systems. The objectives that the subcommittee has identified in support of this goal are as follows:



- o Inventory all available data relating to water quantity and salinity in the five Gulf States.
- o Assess trends of freshwater inflow to the Gulf of Mexico.
- o Identify any possible causes of change in freshwater inflows relative to volume and timing.
- o Evaluate causes affecting freshwater inflow and relate them to any changes.
- o Draft a comprehensive plan to include recommendations for maintaining proper freshwater inflows to the Gulf of Mexico.
- o Draft a monitoring program that will assess the effectiveness of the comprehensive plan.
- o Improve communication between Gulf States on both a State and Federal level.

The subcommittee has been working with a contractor of the U.S. Geological Survey to develop a questionnaire for obtaining information concerning the nature and availability of data on the quantity and salinity of freshwater inflows to the Gulf. In addition, the questionnaire is designed to obtain information on the rules and regulations in relation to freshwater inflow into the bays and estuaries of the Gulf. The subcommittee solicited input on the design of the questionnaire from several of the major groups or agencies that they expect to obtain both data and information. This was done to ensure a greater probability of return from these groups and to ensure that the information requested would be of greater value to the subcommittee and the Gulf of Mexico Program. The cover letter that will be sent with the questionnaire will explain the purpose of the Gulf of Mexico Program. The decision was made to limit this first round of questions to information on freshwater inflow only from within the five Gulf states. The four major categories of information requested through the questionnaire are:

- o General information,
- o Data on salinity of bays and estuaries,
- o Stream flow and diversion data, and
- o Rules and regulations.

The U.S. Geological Survey representative will coordinate the mailing of the questionnaire to Federal agencies and service organizations. The State representatives will provide assistance in soliciting the information from the State agencies, research institutions and firms, and universities.

The subcommittee plans to conduct a workshop in FY90 to evaluate the information gathered from the questionnaire and to plan activities to determine data gaps, begin the assessment of trends in freshwater inflow, and hopefully to identify the causes of change in freshwater inflows relative to volume and timing. One of the major objectives of the subcommittee is the development of a close working relationship among the Gulf States on both a State and Federal level.

The questionnaires are due back by the end of November 1989. A draft data inventory would be available in January 1990. The proposed workshop is to be scheduled for late summer and will focus on the result of the data inventory and address State policies on freshwater inflow and other issues raised by the questionnaire.

The subcommittee also came to a consensus that it should be increased by the addition of five new members.

#### DATA AND INFORMATION TRANSFER

The Subcommittee on Data and Information Transfer proposed the following three projects for FY89:

- o Develop an electronic bulletin board as an integrating tool.
- o Develop an information system catalog of data sources.
- o Develop and undertake a demonstration project.

The first two items have been merged into one project and a contract award made to develop an integrated information system. The electronic bulletin board will provide a platform for dialogue and facilitate the exchange of timely and accurate information among interested public, Federal, State, and local coastal resource managers of the Gulf of Mexico. The information transfer needs of the Gulf of Mexico Program mandate the establishment of a mechanism such as an electronic bulletin board that rapidly captures and disseminates information on program activities and initiatives to a variety of interested parties. This could also provide a useful dialogue between Federal, State, and local managers. It is estimated that 300 to 500 individuals from State and local governments, Federal agencies, the research community, industry, environmental interest groups, and the general public will use this service. The prototype data base management system will focus on a specific coastal resource management problem for a limited area of the Gulf of Mexico. Having various and disparate coastal resource data and information needed for regulatory and management decisions compiled into a single information system will improve a manager's ability to apply the information towards problem solving in a more systematic, consistent, and useful way. A prototype system could later be expanded to include broader issues. The users of this data base could include Federal, State, and local resource management agencies, depending on problem focus.

The subcommittee decided to address the cumulative effects of Section 404 permits on wetlands in Mobile Bay, Alabama, as the initial demonstration project. The principal agencies identified were the EPA, U.S. Fish and Wildlife Service (FWS), U.S. Army COE, Alabama Department of Economic and Community Affairs, with NOAA, SCS, and numerous other State and local agencies providing data and oversight to the effort.

The objective of this effort is to develop and demonstrate a wetland regulatory and resource management system for the Mobile Bay area that utilizes automated wetland and permit inventories, enhances determination of cumulative losses, and aids in identifying appropriate needs for mitigation, restoration, and enhancement.

The project has three major tasks: (1) establish a Mobile Bay wetland digital data base, (2) develop a regulatory (Section 404 permits) data base for the Bay, and (3) develop a user-friendly geographic information system (GIS) that will allow these two data bases to be overlaid along with other data so that the cumulative impact of both man's activities and natural processes on the wetlands in this area can be better assessed. Features of the project include the development of a comprehensive digital data base on wetlands for 1956, 1979, and 1988-89, and Section 404 permits for use by numerous Federal and State agencies. The primary GIS to be used will be the ARC/INFO system.

From the data bases, agencies will be able to determine wetland losses occurring between the mid-1950s and late 1980s, locations and types of losses, and assist in determining the causes and changes of loss as a result of various man-induced activities and natural loss. Lastly, because the cost to produce maps from aerial photography and digitization of those maps into a GIS is costly and time-consuming, this effort will explore the validity and cost-effectiveness of wetland geo-referenced data from LANDSAT thematic mapper (TM) imagery. Recently acquired TM data will be classified and compared with 1989 wetland maps to determine their validity in use for regulatory decisions.

For the first year of the project, the emphasis will be on developing an operational GIS to demonstrate the usefulness of the system to aid in managing the wetland resources of Mobile Bay, such as reviewing Section 404 permits. The geographic area selected is the northern portion of the bay, which includes a wide variety of wetland types and a high number of permit actions.

In subsequent years, the effort will focus on completing the wetland and regulatory digital data bases for the bay, analyzing the effectiveness of TM data for wetland mapping, and establishing the GIS user system for Federal, State, and local agencies.

Some of the ideas that the subcommittee has for FY90 are the following:

- o Additional Demonstration Projects -- Identify specific products that can be developed from each of the demonstration projects. The subcommittee supports this idea as an excellent way to get results to the Gulfwide user community.

- o Establish consistent Gulfwide digital files and formats for all information generated and compiled through the Gulf of Mexico initiative — This effort would ensure transferability across all groups and States, but more importantly, would establish a single, consistent framework that the Gulf of Mexico Program can implement to begin to assess Gulfwide aspects, rather than only demonstrate specific aspects in specific places.
- o Incorporate the Gulf into the plans that EPA and NOAA are developing this year for the initiation of the Environmental Monitoring and Assessment Program (EMAP) — The subcommittee feels that the gulf might be added to this year's budget and get started on the same track as the effort being made in the Mid-Atlantic States. The subcommittee will be looking at the question of how and what it will take to establish a uniform digital framework for the Gulf of Mexico.

Beyond FY90, there are more opportunities to relate more directly with a number of NOAA information systems and data transfer activities that are in various stages of development in the Gulf. There are plans to begin experimental projects in Texas and probably in southwest Florida that deal with how to transfer information to people and encourage them to use it. If these efforts are successful, the Gulf of Mexico Program might expand them to a wider area.

#### PUBLIC EDUCATION AND OUTREACH

The Public Education and Outreach subcommittee is responsible for formulating a Gulf Public Information Plan. Information included in the plan focuses on the Gulf Program and its objectives, environmental issues and resource values in the Gulf, priority target audiences and ways to reach each audience, as well as sources and availability of existing public information materials. Gulf Program Office staff and Citizens Advisory Committee members will discuss the communications goals for the Gulf Program in meetings and workshops and receive input on the implementation of this plan in the coming year. A major symposium entitled "America's Sea: A National Resource at Risk" will be convened as a national biennial event involving scientists, managers, citizens, Gulf user groups, and government representatives in December 1990. This event will provide an opportunity for people with expertise in various areas of science and management around the Gulf and the Nation to communicate and centralize their knowledge. The program, under this objective, will also support specific participation activities, such as the fostering and development of Citizens Monitoring Programs. It is anticipated that the Citizens Advisory Committee will play a large role in meeting this objective in the future.

With respect to the Gulfwide Public Information Plan, the subcommittee has requested that the major elements of the plan include: identification of major audiences, themes and messages, available communication methods, summary of activities (ongoing and planned), and coordination and implementation.

The following are highlights of two subcommittee activities:

- o Fact Sheets — Guidance for developing Gulf of Mexico Program fact sheets was developed by the Public Education and Outreach Subcommittee and submitted to each of the other seven subcommittees. This guidance explained what issues were to be addressed in each subcommittee's fact sheet. It was emphasized that the economic or environmental impacts caused by each issue should be given, along with trends. Information on what actions are being taken by the Gulf of Mexico Program Office and names of contacts should be given. Production of consistent Gulf of Mexico Program fact sheets for each major issue area will be completed using the guidance just described.
- o Video — \$50,000 for a new Gulf Program video was given by EPA's Office of Marine and Estuarine Protection. This video should include an explanation of Gulf problems, what the Gulf Program is all about, and what opportunities exist for the public to get involved.

Next year's planning efforts include ideas such as public service announcements for television (a commercial or advertisement), and the development of a Speakers Bureau.

The immediate goals of the subcommittee include completion of the work initiated on the Fact Sheets and the Gulfwide Communication Plan. Future plans include beginning work on Gulf Video II, planning a Speakers Bureau in FY90-91, closely coordinating with the Marine Debris Subcommittee, conducting a membership review, and convening a meeting in Tallahassee, Florida in December 1989.

#### PUBLIC HEALTH

The Public Health Subcommittee addresses the nature and extent of environmental risks to the health of the residents of the Gulf Coast and explores approaches to reducing these risks. In its initial year the subcommittee reviewed the known and perceived risks and reached consensus on their relative importance. In reaching this consensus the subcommittee took into consideration: 1) routes of exposure to the environmentally derived agents, e.g., airborne, direct exposure through contact with contaminated water or by consumption of contaminated seafoods, 2) the origin of pathogenic microorganisms; naturally occurring pathogens, e.g., the Vibrio and human derived, e.g., the Norwalk virus, 3) the nature of toxic substances, i.e., organic and inorganic, 4) different types of marine biotoxins that can exist in the Gulf, e.g., neurotoxic shellfish poison and ciguatera fish poison. After constructing a matrix which included all combinations of the above agents and exposure routes, the subcommittee developed the following ranking of environmentally related public health problems that it would investigate.

Ranking of Environmentally Related Public Health  
Problems in the Gulf of Mexico

<u>Agent</u>	<u>Route</u>
1. Pathogenic microorganisms	Consuming raw molluscan shellfish
2. Marine Biotoxins	Consuming contaminated seafoods
3. Toxic Substances	Consuming contaminated seafoods
4. Pathogenic microorganisms	By direct recreational and occupational exposure to contaminated water
5. Risk Assessment and Communication	

The subcommittee members agreed that the Gulf of Mexico Program should ensure that the Public Health Agencies in the five Gulf states be kept informed of the latest information on risk analysis and risk communication and that the subcommittee should make that one of its goals.

The subcommittee sponsored a workshop on November 13-15, 1989, at the Landmark Hotel in New Orleans, Louisiana. Workgroups were convened to consider the following topics. 1) pathogen exposure via molluscan shellfish, 2) human exposure to pathogens in seawater and 3) marine biotoxins and associated public health risks in the Gulf of Mexico. Experts from state, federal and academic agencies were charged with dealing with these issues and given the following tasks:

- \* To identify and rank the significance of human pathogens and marine biotoxins as they relate to public health.
- \* To assess possible avenues of collaboration among the Gulf states in order to work towards harmonization of goals and activities.
- \* To identify areas where the EPA Gulf of Mexico Program could serve to help with the harmonization efforts as well as assist with risk assessment and risk communication work throughout the Gulf area.
- \* To recommend uniform policies and procedures that can be used by the Gulf states in dealing with public health problems and to identify the political or economic constraints preventing harmonization of procedures used by the states and to recommend needed research to overcome these constraints.

Some of the recommendations of the three workgroups were:

- \* The EPA should take into consideration the proximity of shellfish harvesting areas when writing discharge permits and in addition to requirements that protect the environment require that the effluents do not cause closure of these waters to the taking of shellfish for public health reasons.

- \* The Gulf of Mexico Program should coordinate and sponsor intra-state workshops with public health, shellfish, resource, wildlife and water agencies and any other appropriate state agencies to facilitate inter-state and interagency coordination of policies and procedures related to public health and shellfish.
- \* The Gulf of Mexico Program should initiate and coordinate a region-wide field evaluation of the present indicator organisms for ambient marine water quality and the indicator organisms recommended in the 1986 EPA proposed criteria. The Program Office should explore Research and Development funds to be used by the Gulf states for this project.
- \* The Gulf of Mexico Program should keep abreast of developments in the National Indicator Study for Shellfish which is being designed to differentiate between the risk to human health from consumption of raw shellfish harvested from waters containing microorganisms from non-point sources as compared to those taken from waters in which the microorganisms are from sewage treatment plant effluents or other human sources.
- \* The Gulf of Mexico Program should support increased field studies and surveillance including improvements of remote sensing technologies for detecting algal blooms and red tides at early stages of development, the use of conventional field sampling and monitoring by sea-going vessels, and improvements and standardization of methods for the detection and characterization of motile populations and cyst beds.

In the future the subcommittee intends to pursue the following:

- \* Obtain information on the current levels of residues of toxic substances and pesticides in Gulf Coast seafood.
- \* Determine the existence of historical data bases of information relevant to public health and how they may be accessed.
- \* Evaluate the report now being developed by the Shellfish Contamination Report of National Academy of Sciences.
- \* Attempt to determine the level of risk to human health posed by the reported residues in seafood products from the Gulf of Mexico.

#### COASTAL EROSION TASK FORCE (SUBCOMMITTEE)

In response to an inquiry raised by the Citizens Advisory Committee, an ad hoc Coastal Erosion Task Force was formed by the Technical Steering Committee in March 1989 to evaluate the need to establish a subcommittee for addressing coastal erosion problems in the Gulf of Mexico area, to evaluate the appropriateness of covering Gulf coastal erosion in the Habitat Degradation Subcommittee, and to make a recommendation for resolution of this issue.

The task force prepared a report to the Technical Steering Committee in which it pointed out that some overlap of activities may be unavoidable but this is appropriate to ensure that areas of concern are adequately addressed, and that care should be taken to properly coordinate subcommittee activities. If a Coastal Erosion Subcommittee was formed, it should concentrate on studying physical processes and natural and human impacts to coastlines, and should perform estimates and analyses of the costs to the environment and social well-being that may result as the shorelines continue to erode. All efforts should include the shorelines of bays, estuaries, and sounds. The limits for consideration may include contour line, vegetation, or dune lines, and in some instances, arbitrary lines may need to be agreed upon and drawn. Wetland and other habitat loss as well as freshwater inflow are critical factors in the loss of shorelines; these losses and their impacts will be assessed by other subcommittees.

It was the finding of the task force that the issues and problems of coastal and shoreline erosion are of such magnitude, severity, and complexity that special and separate treatment is appropriate. Therefore, the task force recommended establishing a Coastal Erosion Subcommittee. This recommendation was based on the support of representatives of the five Gulf States and the Federal agencies participating on the task force. The recommendation was made with the knowledge that the Habitat Degradation Subcommittee work plan includes coverage of coastal erosion and shoreline erosion issues and problems; the task force concluded that the new subcommittee is necessary to give shoreline erosion the necessary analysis and visibility.

A general description of the coastal and shoreline problems for each of the Gulf States has been prepared by the task force. This information reflects the significant losses that are occurring and suggests that the losses are accelerating.

The Technical Steering Committee agreed with the findings of the task force, and pending approval of the Policy Review Board, established a Coastal Erosion Subcommittee.

#### FUTURE CHALLENGES

The future of the Gulf of Mexico Program depends upon the following three major items:

- o Continued support and involvement from the many talented and knowledgeable people from cooperating Federal, State, and local agencies, academia, private industry, and Gulf user groups; and continued support and input from the program's citizen representatives.
- o Continued administrative and fiscal support from EPA Regions IV and VI and EPA Headquarters.
- o Support from cooperating agencies through contributions of in-kind resources or funding of cooperative projects developed from priority issues identified by the Technical Steering Committee.



Through the efforts of many individuals from cooperating agencies and institutes, significant progress has been made toward attaining the long-term goal of the Gulf Program: to protect, restore, and maintain the Gulf waters; to protect human health and sustain living resources; to take actions to further control pollution of these waters; and to ensure that alternative uses and economic growth are managed in an environmentally sound manner. It is fitting that results obtained during the first year of operation are due to the cooperative efforts of many people. This is indeed the philosophy of the program -- to obtain program goals and objectives through cooperative efforts with others involved in Gulf of Mexico environmental issues and challenges. This approach ensures that program activities do not result in another layer of bureaucracy, but actually promote a more efficient use of government resources.

The Gulf of Mexico Program is in a unique position to address many of the environmental challenges that could affect the Gulf in the future. These challenges vary from those of a local nature such as marine debris on local beaches, to those of regional dimensions such as the destruction of valuable wetlands and other coastal habitats (and the mitigation of this destruction), to the potential impacts of global trends such as warming, the destruction of upper-layer ozone, sea-level rise, and others. The program's unique position results from its capacity to take a holistic view of the Gulf because its committees and subcommittees are composed of technical experts and citizens representing various geographic regions throughout the Gulf. They are knowledgeable of ongoing and planned projects that pertain to the challenging issues. These committees and subcommittees represent a great pool of expertise and administrative ability. The program is also unique because of the high level of citizen interest and concern about environmental issues of the Gulf. It is the citizen members who, to a great extent, are responsible for informing the public of the program's goals and activities and for generating special support for the program. Perhaps most important of all, the citizens act as catalysts for the development and implementation of new projects.

The subcommittees represent the cutting edge of the Gulf of Mexico Program, and their activities will become even more important in the future. In many instances, long-range management goals have been developed by the subcommittees, and milestones for reaching them established. Alternatives for solving the problem issues must be developed as well as the critical pathways for implementation of these alternatives. Thus, the subcommittees will be in the "framework-for-action" mode, which includes the definition and identification of specific environmental issues, characterization of these issues, assessment of corrective actions, development of predictive measures, and implementation and monitoring of corrective actions. It is through the thoughtful planning and decisive action of the subcommittees that the Gulf of Mexico Program will become anticipatory as opposed to reactive, and will be able to identify pollution problems before they become financially and ecologically prohibitive.

The following recommendations, based on experiences gained during the first year of operation of the Gulf of Mexico Program, are made to assist the program as it meets the challenges of the future:

1. Planning must begin on intergovernmental structure needed for implementation of the framework for action.
2. The Gulf of Mexico Program should be given a mechanism to allow interagency budget planning. This would not only elevate the status of the program, but would provide for receiving the transfer of funds from other Federal agencies. Also, it would allow the budget process to recognize and address the critical needs of the cooperative program.
3. Cooperating agencies should highlight the Gulf of Mexico Program in their FY91 and 92 budget requests as it relates to priority issues.
4. Collocation of Federal and State personnel at the Gulf of Mexico Program Office should be encouraged and continued.
5. Additional funds should be identified to provide travel funds for certain State personnel and private citizens associated with the program to attend specific program meetings. This travel is critical for the operation of the committees and subcommittees, and thus is critical for the success of the program.
6. The Gulf of Mexico Program should sponsor thematic workshops on specific topics in order to foster focused efforts of planning and information exchange between managers and the research community.
7. The Program should provide a link between those requiring information for regulatory purposes and researchers and others who provide the information.
8. Lines of communication should be established with various emergency response teams in the Gulf of Mexico, as well as with NOAA's Coastal Watch Program, so the Gulf of Mexico Program can be aware of emergency environmental situations as they develop. Establishing these lines of communication and advance agreements could foster improved coordination of high tech equipment and information in the event of a future environmental problem in the Gulf of Mexico.
9. Additional demonstration projects should be carefully selected that are cross-cutting in nature, such as projects on remote sensing for monitoring purposes and on data and information transfer.
10. Additional emphasis should be put on the citizen volunteer monitoring efforts, including guidance to Gulf States for better links between the volunteers' efforts and States regulatory needs and networking and information exchange.

11. Continued development of grassroots networks should occur at the county/parish level to increase the involvement of local users of the Gulf resources in the identification and communication of program goals and recommendations at the local level.
12. Further development and clarification should be set forth regarding the unique relationship and long-term opportunities which exist between the Gulf of Mexico Program and the current NEP's in the Gulf of Mexico.

In summary, the Gulf of Mexico Program has progressed significantly during its first year of operation toward establishing a functioning infrastructure and short- and long-term action goals. Indeed, the program already has accomplished the majority of its short-term goals and made an impact on constructive management of pollution activities in the Gulf of Mexico. There is an evident technical need and a grassroots desire for the program to be part of the future development of the Gulf of Mexico.