

TAMU-Q-70-001

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## FACTS ABOUT THE COASTAL ZONE

Population increased 20% between 1960 and 1970.

There are 25,394,003 acres of uplands, submerged lands and islands of which 80% are private, 16% state and 2% each in Federal or local government hands.

There are 760 square miles of Marshland, 2100 square miles of Bays & Estuaries, 200 square miles of Formal Wildlife Refuges, and 35 square miles of Made Land and Spoil.

There are 1890 miles of waterfront of which 1419 are bayfront and 373 front on the open Gulf.

The coastal zone contains more than 345 historical sites.

50% of the world's shrimp depend on the Texas estuarine complex.

Estuaries are 20 times as fertile as the open Gulf.

The Soviet Union published the only recent book on Gulf fisheries potential.

The region contains more than 50% of the nation's petrochemical industry and 25% of its refining capability.

One-third of the State's economy is concentrated in the 1/20th of its area within the

coastal zone.

More than 200 large tankers of over 100,000 tons cannot serve the deepest Texas ports.

Mineral production in the coastal zone exceeds 1.3 billion dollars per year. Oil reserves exceed 3.5 billion barrels and gas reserves are 50 trillion cubic feet.

In 1969, 2.9 million tourists spent more than \$190 million visiting the Gulf coast of Texas.

A hurricane hits the coast on the average of once every two years, often bringing 150+ mph winds and 15 foot tides which have flooded more than 3200 square miles with salt water.

75% of the 550 water supply systems are not approved by the State Department of Health.

Over half of the area is not covered by full-time health departments.

Municipal and industrial wastewaters contribute to our estuarine systems: 162,600+ million gallons per day, 1,269,200+ pounds of biochemical oxygen demand per day, 1,449,400+ pounds of suspended solids per day, 59,300+ pounds of phosphates per day, and 4,876,800+ pounds of chemical oxygen demand per day.

The effluent from 2/3 of 368 waste treatment plants in the coastal zone do not meet state standards. Likewise, 90% of 171 solid waste disposal sites do not meet state standards.

## FRONT COVER

*The logo symbolizing the Coastal Resources Management Program represents the objectives of responsible coastal resource management. The circle is the perfect geometric design within which the dark land mass is balanced against the white water mass. The balance between light and dark, land and water, is also symbolic of a balance between man and nature leading to a balance between preservation and development. The live oak and olive branches surrounding the circle are from the State seal and represent both strength and compassion, while the hands holding the circle represent management by man to meet the foregoing objectives.*

*Members of the Legislature and Fellow Texans:*

*As Governor of Texas and Chairman of the Interagency Natural Resources Council, a consortium of State agencies, I am pleased to transmit this summary of the Interim Report to the 62nd Legislature on the Coastal Resources Management Program of Texas. This effort was authorized by S.C.R. No. 38 passed by the 61st Legislature 1st Session and funded in the Division of Planning Coordination within my Office.*

*S.C.R. No. 38 directed the Interagency Natural Resources Council to conduct a comprehensive study of the Coastal Zone and the Gulf of Mexico seaward to our State's territorial boundaries. The resolution called for an Interim Report by December 1, 1970, and a final report in December, 1972.*

*At the Council's direction, within the guidelines established by the Resolution, the study is designed to result in an action program through which the State can preserve, protect, and develop our coastal and marine environment for future generations of Texans. This Administration has consistently emphasized the importance of our coastal resources to the State. Coastal and marine related activities in Texas have reached a new high during the past two years.*

*It is my hope as well as that of the entire Council that the Coastal Resources Management Program of Texas will assist the Legislature in coming to grips with the problems of our coastal areas. It is also our hope that this Program will serve as a model for studying regional environmental problems as part of a total interrelated system to benefit our citizens.*

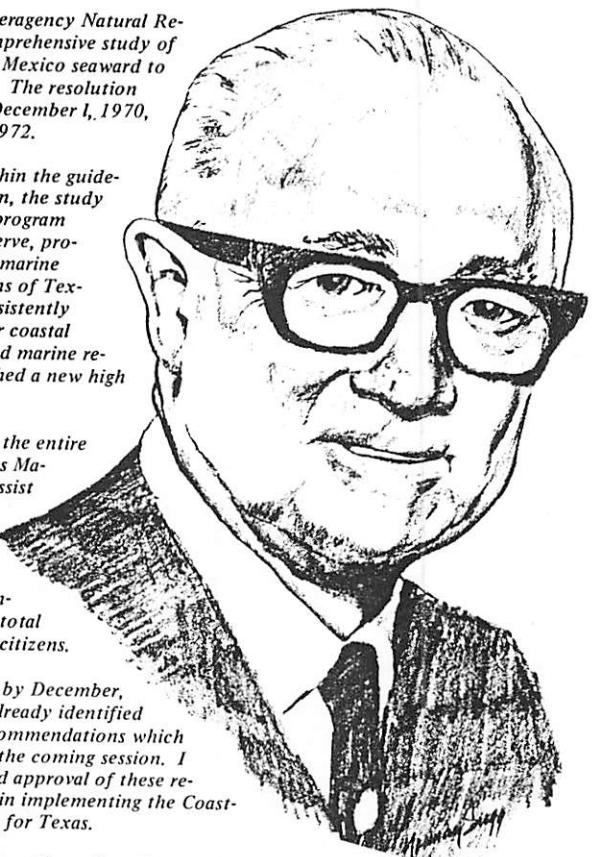
*Much work remains to be done by December, 1972. However, the Program has already identified specific problems and presents recommendations which need your immediate attention in the coming session. I urge your careful consideration and approval of these recommendations as the first action in implementing the Coastal Resources Management Program for Texas.*

*The Interagency Natural Resources Council and its member agencies pledge their continued support in working with you on coastal environmental problems and other matters related to our invaluable natural resources.*

December 1, 1970

*Sincerely,*

*Preston Smith*  
Preston Smith  
Governor of Texas



THE COASTAL RESOURCES  
MANAGEMENT PROGRAM OF TEXAS  
A SUMMARY

A Report to the  
62nd Texas Legislature  
Presented by the

INTERAGENCY NATURAL RESOURCES  
COUNCIL

Governor Preston Smith, Chairman  
December, 1970



## INTRODUCTION

The Coastal Zone of Texas contains the most diverse grouping of valuable natural resources in the

State. Its problems are complex and its boundaries are imprecise. The great rivers of Texas empty their

waters and water-borne wastes into the bays and estuaries of the Coastal Zone where they react with the waters of the Gulf. Urban centers in this area are attracting an increasing population with resultant demands on natural resources generating significant environment change.

Fortunately, much of man's impact upon the Coastal Zone has been concentrated in nodes of urban development such as the Houston-Galveston area. Much of the Coastal Zone is relatively unspoiled. This fact will enable us, through proper study and action, to safeguard the environmental integrity of the Coast for future generations of Texans, while fully utilizing coastal resources.

The Coastal Resources Management Program will examine the natural resource base for undesirable symptoms, define problems, and present solutions within an area of Texas extending from the Sabine River to the Rio Grande and from about 80 miles inland to the three league boundary in the Gulf. It will not only examine each resource separately, but also as each resource related to all others in an environmental system.

The Coastal Zone of Texas is an extremely valuable resource for the people of this State. It should be conserved, developed and preserved to serve the goals of the people while respecting individual rights. The area's value to Texas cannot be measured by economic benefits alone. The social value of our coastal environment is high for those who live and work there, as well as for all other Texans.

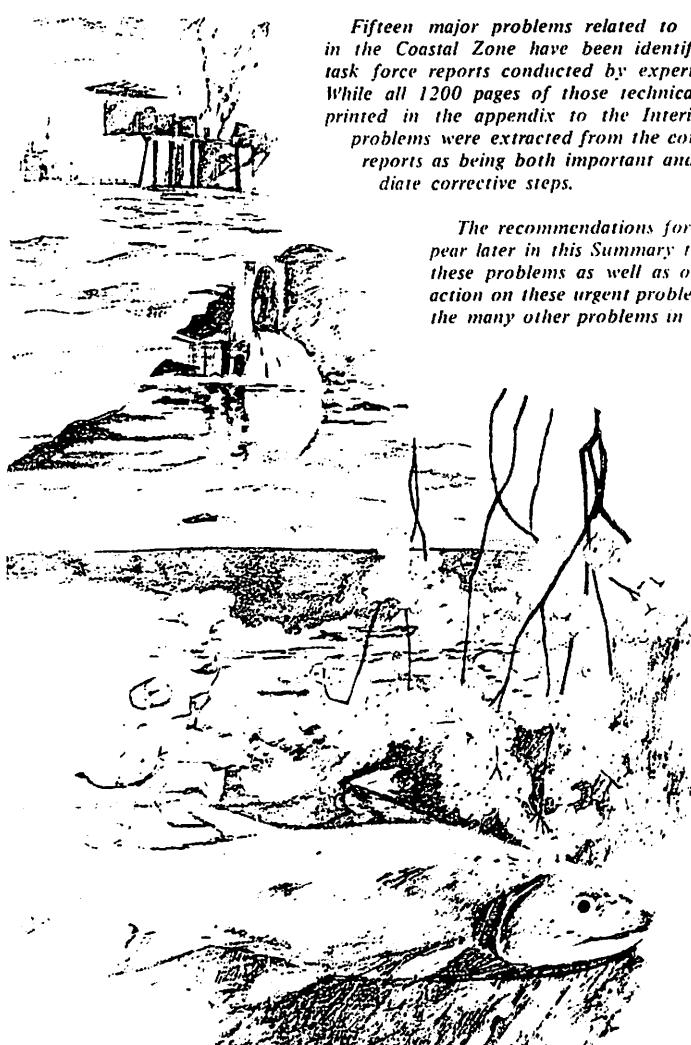
Natural resources are defined here

as those things existing in a state of nature which are of either actual or potential economic or social value to man. They are often grouped under broad categories such as land, water, air, fish and wildlife, minerals and vegetation.

These resources are limited in quantity and therefore in use. While some resources such as water are well suited for multiple use, others are not. Certain uses complement each other with no serious effect on the total environment and others are mutually exclusive. The same land resource cannot be used for suburban development and a wildlife refuge. It should be recognized that the use of land impacts in different ways upon other resources. Each link in the chain of natural resource uses must be carefully traced to determine ultimate effects on society.

Problems of natural resource use are normally related to the use of the land or water resource. Possible solutions, as will be noted later, indicate that the key to coastal resource management is the proper understanding and management of the land and water resources of the Coastal Zone.

State and local governments have a responsibility to insure the preservation of unique resources, replenishment of renewable resources and conservation of irreplaceable resources. Man's role in his environment demands income and employment opportunities as well as leisure pursuits. Texas can assist man to improve his living standard and surroundings in the Coastal Zone while maintaining a desirable balance with nature. The goals of man and nature do not have to be mutually exclusive.



*Fifteen major problems related to natural resources in the Coastal Zone have been identified from the 21 task force reports conducted by experts in their fields. While all 1200 pages of those technical reports will be printed in the appendix to the Interim Report, these problems were extracted from the conclusions of these reports as being both important and requiring immediate corrective steps.*

*The recommendations for action which appear later in this Summary touch on all 15 of these problems as well as others. Corrective action on these urgent problems will impact on the many other problems in the Coastal Zone.*

## IMMEDIATE PROBLEMS

- Fish and wildlife resources may be and sometimes are destroyed by the runoff from urban and agricultural

land areas as well as discharge of inadequately treated municipal and industrial wastewaters into the bays,

estuaries and their tributaries. Unwise use and development of water resources can have a similar impact. This presents a potential health hazard and aesthetic eyesore to man.

- Ill-defined boundaries coupled with dynamically shifting landforms, unavailable public information, and a heretofore poorly defined State policy toward the use of its coastal lands results in unwise development and poor management in the Coastal Zone.

- Wildlife habitat is being destroyed and potential park land lost through urban/industrial expansion and environmental degradation, which adversely affects recreational opportunities.

- Limited public access to beaches of the Gulf Coast hampers recreational pursuits.

- The existing structure of State laws, regulations, and governmental management is inadequate to deal with the complex, diverse, and dynamic problems of the Coastal Zone.

- The 200 million dollar a year commercial fishing industry is in danger of collapse due to institutional barriers, inadequate insurance availability, international competition, low utilization of technology, and archaic legal regulation, and badly needs the State's assistance.

- Lives are lost and property destroyed or damaged by severe hurricanes on the average of once every two years.

- The effect of diminishing mineral resources on the Coastal Zone's economic and financial base is not under-

stood and is not being examined.

- The Coastal Zone's aquatic ecosystems are seriously threatened by numerous and diverse physical processes such as poor drainage, land subsidence, sedimentation, erosion, accretion, dredging, bulkheading, and alteration of estuarine circulation patterns. These dangers, while more subtle than waste discharges, are very real.

- Discharge of gases and particulates into the atmosphere creates a health hazard, presents a nuisance, and causes property damage.

- Improper and inadequate solid waste disposal practices pollute both air and water and create health hazards from rats, flies, and other disease sources.

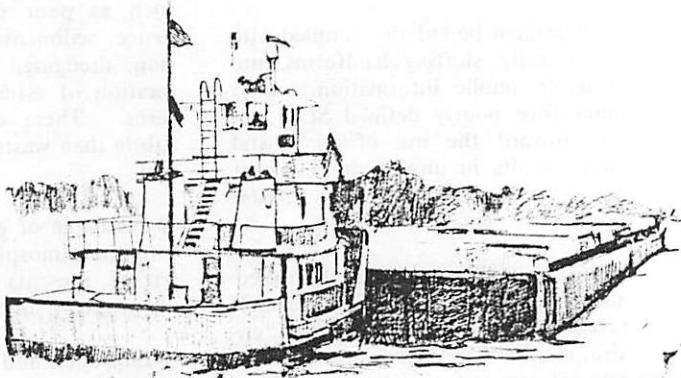
- Present methods of extracting minerals have adversely altered the environment and will continue to do so until economically feasible alternatives are developed which do otherwise.

- Growth, combined with rapid advances in transportation technology, necessitates coordinated, long-range transportation planning, especially concerning super-draft port facilities and transfer points between various types of transportation.

- The heritage of Texas, represented by its many cultural and historical sites, is being lost to unplanned urban and commercial expansion.

- Frequent minor oil and chemical spills are cumulatively very damaging to the Coastal Zone environment.

*Approaching the environment as a balanced system is the cornerstone of the Coastal Resources Management Program. The system approach both ties the parts together and establishes priorities for decisions.*



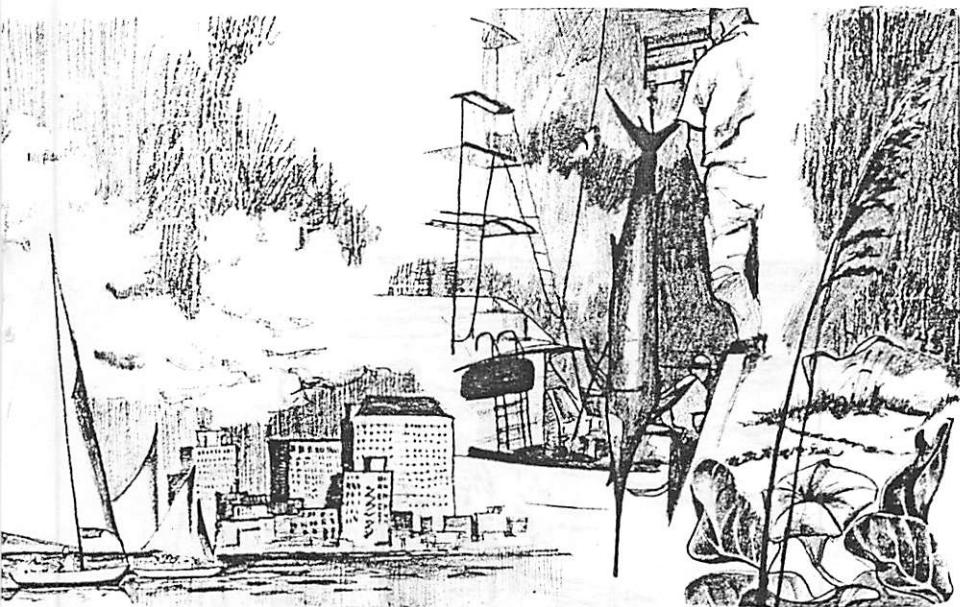
## AN ENVIRONMENTAL SYSTEM

Any attempt to define the complex relationships which form an environmental system is doomed to failure. The system operates under conditions which are infinitely more complex than our minds can comprehend, even with the aid of computers. However, man makes decisions daily which affect the environment and he must attempt to understand their consequences.

The Coastal Resources Management Program has attempted to understand the environmental complexities of the Coastal Zone by breaking the environment into 21 major components, examining them separately and then looking at the ways they react with all the other components. In this way a simple artificial environment has been created which is, at least, a

beginning towards understanding the complex.

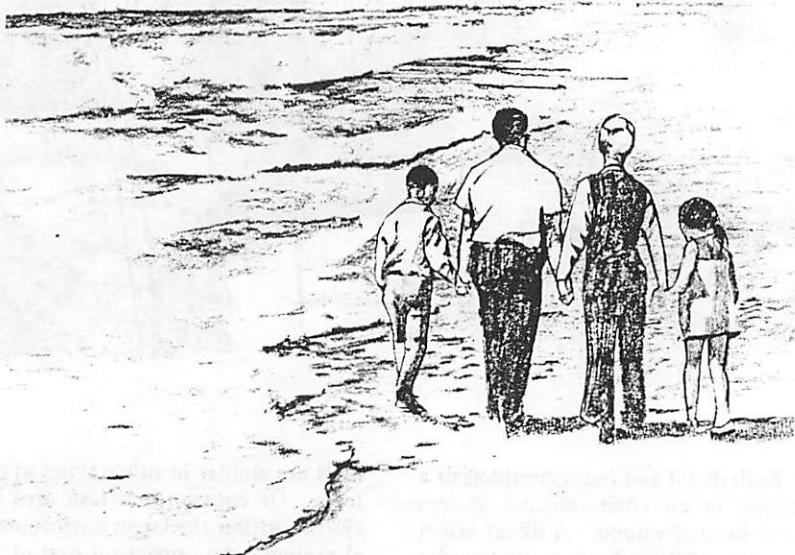
The 21 task areas are: (1) Physiography (Land) and Climate, (2) Minerals and Mining, (3) Water Availability, (4) Fish and Wildlife (including flora), (5) Agriculture, (6) Energy and Power, (7) Transportation, (8) Recreation, (9) Oceanographic Activities, (10) Land Use Patterns, (11) Land Ownership, (12) Pollution Problems, (13) Social and Economic Implications, (14) Public Health, (15) Cultural and Historical Sites, (16) Financial Institutions, (17) Ongoing Coastal Planning Activities, (18) Federal Legislation, (19) Texas' Intergovernmental Relations, (20) Education and Communication, and (21) Forecasting: Technological and Social.



Both direct and indirect effects of a change in an environmental system must be understood. A direct effect can be explained as a first order effect between two or more task areas such as the direct effect on fish of polluted waters. An indirect effect is the second or third order effect as the system change reverberates through the entire system. An example might be the effect on financial institutions of decreased commercial fisheries catches which stem from the depletion of fish resulting from water pollution. In this example, the impact of water pollution upon financial institutions is traced through several intermediate steps.

While the previous example includes facets of biology, chemistry and society, the direct and indirect ef-

fects are similar in other types of systems. Of course, each task area is a system within the larger environmental system. An impact on part of the smaller system can have direct and indirect effects within it and upon other sub-systems as well. If we affect any link in the biological food chain, the balance of nature is upset and the system changes to a new equilibrium condition. Problems arise when the system cannot naturally cope with the change, in which case, the sub-system may be eradicated. This leaves a void with many attendant complex possibilities. It is in hopes of understanding some of these effects that the environment is being studied as a complex system.



## ROLE OF GOVERNMENT

Government in the United States has been well founded upon a legal system designed to provide equal jus-

stice for all. Citizens have relinquished certain of their rights to the State in order to promote their

general welfare. The State, in turn, has a responsibility to its citizens not to violate their public trust.

The roles of the various levels of government in coastal resource management must be well defined to avoid confusing Federal, State and local authority and responsibilities. Management means that restrictions or a set of constraints will be placed upon uses of certain resources in order to serve public goals. However, undue infringement on the property rights of private citizens must be avoided at all costs.

The State and local governments are best suited to cooperate in solving the unique natural resource related problems of Texas and its coastal areas. Since the Coastal Zone represents an area of vital concern and value to the United States, the Federal agencies will be involved, but largely in providing advice and financial assistance.

Since Texas began these studies for a Coastal Resources Management Program, the number of bills related to the environment pending congressional action in Washington has increased from 75 to well over 500. All of these bills would, if enacted, affect the natural resources of Texas' Coastal Zone.

Three bills before Congress deserve special mention in this summary. They are S. 2802 and H.R. 15099, which are identical bills entitled the "National Estuarine and Coastal Zone Management Act of 1970," and a

third bill, S. 3354, the "National Land Use Policy Act."

Under S. 2802 and H.R. 15099, \$61 million would be appropriated annually for program development and implementation. \$5 million of which would be used in establishing estuarine sanctuaries. The Federal share would be limited to 66 2/3% of the total cost of the State's coastal resources management programs. A single State agency would be designated to receive and administer the Coastal Resources Management Program. That agency must have powers of land and water use zoning, acquisition, land and facilities development, issuance of bonds and borrowing of money. Although these bills, if enacted, have some desirable features, we cannot concur that the structure of Texas State Government needed for solving its unique coastal problems should be determined elsewhere.

S. 3354, while similar to S. 2802 and H.R. 15099, would apply to all the nation's lands. The land use bill involves longer range planning and is not considered likely to pass at the 2nd session of the 91st Congress.

The legalistic aspects of the Coastal Resources Management Program proposed in this report are being examined by legal scholars so that the role of the several levels of government can be well defined before implementation of the Program. Texas is pledged to define its own goals in coastal resources management and to solve its own unique problems.

# CONCLUSIONS AND RECOMMENDATIONS

## CONCLUSIONS

- The Coastal Zone of Texas represents an invaluable, and, in many respects, irreplaceable resource to the State and Nation. Its economic value is great. Greater still is its total social and economic value as a living, working, and recreational environment for man and nature as they interact one with the other.
- The inevitable pressures of urban, commercial, industrial, and agricultural growth are causing a general degradation of the Coastal Zone environment which will worsen unless steps are taken to balance preservation, conservation, and development through a Coastal Resources Management Program.
- If Texas does not move ahead with its own program in coastal management, the Federal Government will develop one for us; Texas cannot afford this because: (1) State and local cooperation insures a responsiveness to unique local conditions, and (2) State and local groups can maintain better controls, do a better job and do it at less cost.
- The agencies and institutions of the State acting in concert through the Interagency Natural Resources Council and armed with the mandate of S.C.R. No. 38 comprise the logical team to develop a plan and implement a program for managing Texas' coastal resources. The participation of private, local, and Federal interests must be and has been insured. No

program that may be developed can succeed or even begin without the support of the Legislature.

- The remainder of the development phase of the Program should concentrate on coastal environmental problems, their solution, and the legalistic mechanisms necessary for full implementation of the Program.

## SPECIFIC ACTION

It is recommended that the 62nd Legislature:

- Provide to the individual agencies comprising the Interagency Natural Resources Council sufficient funds to assure that each agency's activities in support of the Coastal Resources Management Program might be carried out, and provide the Executive Office with sufficient funds for continuing the coastal activities of the Council, including the Coastal Resources Management Program.
- Give careful consideration to the recommendations of Legislative Interim Committees as those recommendations relate to the natural resources and environmental problems of the Coastal Zone. Special attention should be given to recommendations with regard to land use and pollution controls and interagency cooperation.
- Continue to define and improve the responsibilities and roles of the State agencies pertaining to natural resources of the Coastal Zone.

● It is also recommended that the 62nd Legislature direct the Interagency Natural Resources Council to provide the mechanism through which significant coordination will be achieved. Specific tasks to be performed by the Council working with the appropriate agencies include the following:

1. Delineate the role and responsibility under existing statutes of each State agency in matters pertaining to the natural resources of the Coastal Zone;
2. Work with the General Land Office and the Attorney General in establishing a comprehensive policy concerning coastal lands, including: (a) policies on the sale and subsequent use of Texas' submerged lands, (b) clarification of ownership of lands resulting from erosion/accretion shifts, (c) delineation of limits of state and private ownership, and (d) equitable compensation for all economic uses of State lands;
3. Give every assistance to member pollution control agencies in their continued anti-pollution activities;
4. Work directly with the Institute of Marine and Coastal Law and other experts on legal problems of coastal resource management;
5. Work with the Coordinating Board for Higher Education, State supported universities and colleges, the Advisory Council for Technical-Vocational Education and the Texas Education Agency in encouraging the development of marine-related cur-

ricula and conservation education at all levels;

6. Investigate the feasibility of applying procedures of resource analysis developed in the Coastal Resources Management Program to other areas of the State;
7. Work with the Texas Water Quality Board, the Parks and Wildlife Department, the Texas Water Rights Commission, the Texas Water Development Board, the Air Control Board and other concerned agencies in investigating problems associated with power plant siting;
8. Coordinate with the Texas Historical Survey Committee and provide through the Coastal Resources Management Program for preserving culturally and historically significant sites which might be destroyed or affected by natural resource use;
9. Assist the Governor in establishing an Interagency Transportation Council and coordinate with that Council on matters related to transportation's effect on land use and resources in the Coastal Zone.

## INVESTIGATIONS

During the two years remaining for development of the final report on the Coastal Resources Management Program, the Interagency Natural Resources Council should, through its member agencies and other qualified parties conduct investigations of:

1. Existing pollution problems in-

cluding those unrelated to waste disposal; their sources, long-term effects and solutions;

2. The environmental effects of proposed hurricane protection measures;
3. A legal analysis of institutional authority and responsibility necessary for the proper implementation of a Coastal Resources Management Program;
4. An inventory of remaining mineral resources, replenishable or alternative substitutes for those resources, and means by which to extract those resources with minimal environmental losses.
5. The long-term effect of persistent man-made substances such as oils, farm chemicals, and pesticides upon the natural environment;
6. The use of a multi-disciplinary approach in developing a practical and usable method for evaluating the consequences of alternative environmental management proposals including the assessment of consequences of varying land-use patterns;
7. Means of supporting research leading to a better understanding of hurricane forecasting as well as mitigating their destructive effects;
8. Data availability for preparation of a comprehensive sourcebook of existing marine resources in the Gulf;
9. Means by which to encourage and support research in marine culture;
10. The cost to future Texans of unnecessarily depleting economically important non-replenishable resources, including effects on long-term income and employment opportunities;
11. Evaluating the economic potential of resource utilization in the Coastal Zone.

## PERSONAL ACTION

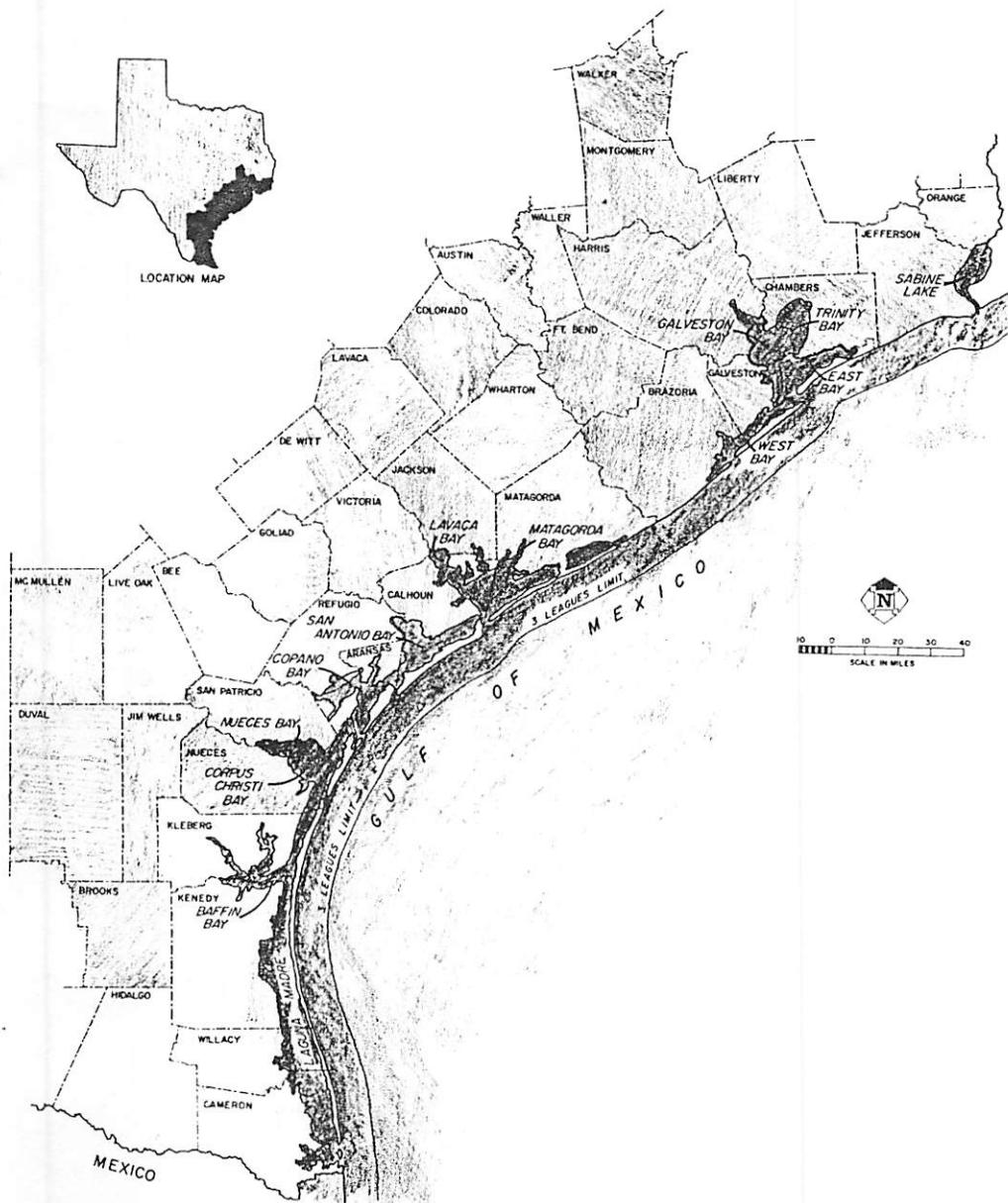
Each of us can, through our individual actions, impact on the environment. In addition to the avoidance of such things as littering, the individual should take positive steps to inform his local, State or Federal government of action they can and should take to protect the environment. The individual citizen should take special care to work closely with his State legislator. The concerned citizen should be active, never passive, when his environment is at stake.

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## TWO YEAR WORK PLAN

The two year program of work, which is fully outlined in the main report, provides for action and investigations parallel to those recommend-

ed in this summary. Extensive use of analytical techniques will be combined with expert guidance and help from every quarter of Texas to complete the development phase of the Program by December, 1972.



## ACKNOWLEDGEMENTS

*The Interagency Natural Resources Council wishes to give special acknowledgements for assistance in preparing and reviewing this report to the following organizations and agencies.*

Federal Water Quality Administration, U. S. Army Corps of Engineers, Soil Conservation Service, U.S.D.A., Bureau of Sport Fisheries and Wildlife, Bureau of Outdoor Recreation, Bureau of Reclamation, Office of Water Resources Research, Department of Housing and Urban Development, Southern Regional Environment Conservation Council of the Southern Governor's Conference, Texas State Department of Health, Sea Grant Program of Texas A & M University, Texas Transportation Institute at Texas A & M University, Bureau of Economic Geology of the University of Texas at Austin, Center for Research in Water Resources at the University of Texas at Austin, Institute of Marine Law at the University of Houston, Texas Tech University, Local governments along the Coast, Councils of Governments along the Coast, River Authorities, Members of the Texas Ports Association, Texas Water Conservation Association, Gulf Coast Waste Disposal Authority, Galveston Bay Study Group, Mid-Continent Oil and Gas Association, Trans-Continental Gas Pipeline Corporation, Humble Oil & Refining Co., Inc., Dow Chemical Co., Inc., Shell Oil Co., Inc., Central Power & Light Co., Inc., Houston Lighting and Power Co., Inc., Gulf States Utilities Co., Inc., Bank of the Southwest, American Society for Oceanography, National Audubon Society, Texas Sportsman Club, Houston Sportsman Club, American Society of Civil Engineers, Texas Conservation Council, and the Conservation Foundation.

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