

**GULF OF MEXICO STUDIES MEETING
May 12-13, 1982, Mobile, Alabama**

Prepared for
Minerals Management Service
Outer Continental Shelf Office
New Orleans, Louisiana

Under Contract Number AA851-CT1-45

June 25, 1982

Woodward-Clyde Consultants 

Consulting Engineers, Geologists and Environmental Scientists
P.O. Box 81848 San Diego, California 92138

PROCEEDINGS:
GULF OF MEXICO STUDIES MEETING

KILLIAN ROOM, INTERNATIONAL TRADE CENTER BUILDING
MOBILE, ALABAMA

MAY 12 and 13, 1982

Sponsored by

MINERALS MANAGEMENT SERVICE
NEW ORLEANS OCS OFFICE
HALE BOGGS FEDERAL BUILDING
500 CAMP STREET, SUITE 841
NEW ORLEANS, LOUISIANA 70130-3391

Arranged by

WOODWARD-CLYDE CONSULTANTS
MMS Contract No. AA851-CT1-45

JUNE 1982

This report was prepared for the Minerals Management Service under Contract Number AA851-CT1-45. The report has not been reviewed by the Service, nor has it been approved for publication. Approval, when given, does not signify that the contents necessarily reflect the views and policies of the Service, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

PREFACE

The contents of this proceedings volume are based principally on notes taken during the general meeting session and expanded abstracts provided by speakers. Arrangements for the meeting were handled by Woodward-Clyde Consultants under U.S. Department of the Interior, Bureau of Land Management Contract Number AA851-CT1-45.

Meeting facilities were generously provided by the State of Alabama at the International Trade Center Building in Mobile, Alabama. Woodward-Clyde Consultants gratefully acknowledges assistance received from the staff of the Southern Alabama Regional Planning Commission, especially Donald W. Brady, who made our task both easier and more enjoyable.

TABLE OF CONTENTS

	<u>Page</u>
Preface	i
List of Figures	iv
List of Tables	v
<u>Section</u>	
1 INTRODUCTION	1
2 GENERAL SESSION	12
<u>ABSTRACTS</u>	
- ALABAMA COASTAL CHARACTERIZATION STUDY	16
- CETACEANS AND SEA TURTLES IN THE GULF OF MEXICO STUDY PLANNING FOR EFFECTS OF OCS DEVELOPMENT	21
- THE USGS MAPPING PROGRAM	23
- THE FLOWER GARDENS PROGRAM	24
- CATASTROPHIC COLLAPSE: A POSSIBLE CAUSE FOR MISUNDERSTANDING	25
- CURRENTS AND SEDIMENTARY PROCESSES AT THE SHELF/ SLOPE BREAK IN THE NORTHWESTERN GULF OF MEXICO	29
- BIO-ENVIRONMENTAL MONITORING AT THE FLOWER GARDEN REEFS	31
- THE ECOLOGICAL COMMUNITIES OF THE CONTINENTAL SLOPE AND ADJACENT REGIMES OF THE NORTHERN GULF OF MEXICO WITH AN ASSOCIATED PHOTOGRAPHIC ATLAS	32
- SOUTHWEST FLORIDA SHELF ECOSYSTEMS STUDY, YEARS I & II	40
- SOUTHWEST FLORIDA SHELF ECOSYSTEMS STUDY	45
- SOUTHWEST FLORIDA SHELF ECOSYSTEMS STUDY - YEAR III	50

TABLE OF CONTENTS (Continued)

<u>Number</u>		<u>Page</u>
	<u>ABSTRACTS (Continued)</u>	
-	CIRCULATION STUDY OF THE WESTERN FLORIDA SHELF	52
-	MISSISSIPPI SOUND PROGRAM	58
-	SATELLITE-DEPRIVED, QUANTITATIVE SEA SURFACE TEMPERATURE OBSERVATIONS	60
-	EXAMPLES OF PRODUCTS TO BE ISSUED BY NOAA'S SLIDELL OCEAN SERVICES CENTER	64
-	STANDARDIZATION OF IDENTIFICATION OF BENTHIC POLYCHAETOUS ANNELIDS FROM THE GULF OF MEXICO OUTER CONTINENTAL SHELF	74
-	RECREATION AND FISHERIES - OFFSHORE OPERATORS COOPERATIVE PROGRAM	77
-	SUMMARY OF OVERHEAD TRANSPARENCIES	78

LIST OF FIGURES

<u>Number</u>		<u>Page</u>
1	MINERALS MANAGEMENT SERVICE ORGANIZATIONAL CHART	10
2	PROPOSED FINAL 5-YR OCS OIL & GAS LEASING SCHEDULE	11

LIST OF TABLES

<u>Number</u>		<u>Page</u>
1	MEETING PARTICIPANTS	2

1. INTRODUCTION

In view of proposed outer continental shelf lease sales such as 69, 79 and 94, within the next five years, environmental studies in the eastern Gulf of Mexico region have taken on a special significance. As a means of providing a timely and effective mechanism for the transfer of current study data and information among different project investigators in this area, the New Orleans Outer Continental Shelf (OCS) office of the Minerals Management Service (MMS) is sponsoring a series of regional studies meetings.

The first of these regional studies meetings was held in Tallahassee, Florida on October 15 and 16, 1981. This report presents the proceedings of the second meeting, held in Mobile, Alabama, on May 12 and 13, 1982. Close to 60 participants from local, state and federal government, regulatory agencies, universities and industry attended the meeting. A list of meeting participants, along with their professional affiliations and addresses, is presented in Table 1.

Immediately following the opening of the meeting, Harry B. Sieverding, Assistant Manager of the New Orleans OCS Office, announced that, heretofore, Bureau of Land Management OCS operations had now been incorporated into the U.S. Department of the Interior's newly established Minerals Management Service (MMS).

Subsequent publications by the Pacific OCS Office (POCS Current Events, June 1982) and the Oil & Gas Journal (June 7, 1982, Pages 66-67) further clarified MMS organizational structure and goals. An abbreviated organizational chart for MMS is presented as Figure 1.

The principal purpose of the expansion of MMS is to provide the petroleum industry and states one point of contact and more consistent policy for offshore oil and gas leasing. When OCS consolidation began, James Watt, Interior Secretary, wrote congressmen and Interior employees that moving all OCS activities into the new MMS will:

- Establish accountability to the secretariate and congressional oversight committees.
- Save costs by avoiding duplication of effort and overlapping functions.
- Enable Interior, "through a more efficient leasing program, to more effectively balance protection of the marine and coastal environments with developmental and security needs of the nation".

MMS will continue to report to the Minerals Management Board, chaired by the undersecretary. The expanded MMS has 3,000 employees and a fiscal 1982 budget of \$185 million.

A number of general information fact sheets and brochures explaining the MMS Environmental Studies Program were made available to meeting participants. Two of these fact sheets are reproduced in this report: Oil and Gas Statistics, Outer Continental Shelf (Pages 8 & 9), and the Proposed Final 5-Year OCS Oil and Gas Leasing Schedule published by the U.S. Department of the Interior in May 1982 (Figure 2).

Table 1. MEETING PARTICIPANTS

Name	Affiliation	Address/Phone
Avent, Robert M.	Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541
Barkuloo, James	U.S. Fish & Wildlife Service	1612 June Avenue Panama City, FL 32405 (904) 769-5430
Bedell, Charles	I.A.D.C.	P.O. Box 4287 Houston, TX
Bohne, Reed	NOAA, Office of Coastal Zone Management	3300 Whitehaven Street Washington, D.C. 20240 (202) 523-5020
Brady, Donald W.	S. Alabama Regional Planning Commission	State of Alabama International Trade Center Building P.O. Box 1665 250 Water Street Mobile, AL 36633 (205) 433-6541
Brown, James D.	U.S. Fish & Wildlife Service	Richard B. Russell Federal Building 75 Spring Street, S.W. #1276 Atlanta, GA 30303
Brown, Murray	Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541 (FTS 682-8541)
Chin, Hong	Woodward-Clyde Consultants	3489 Kurtz Street San Diego, CA 92110 (714) 225-9381
Clark, Richard M.	NOAA, National Earth Satellite Service, Satellite Services Field Center	NOAA/NESS 1120 Old Spanish Trail Slidell, LA 70458 (504) 255-6511

Table 1. MEETING PARTICIPANTS (Continued)

Name	Affiliation	Address/Phone
Congdon, Barney	Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541
Cooper, Cortis	New England Coastal Engineers	51 Washington Street Bangor, ME (207) 947-0597
Dauterine, Les	Minerals Management Service	P.O. Box 7944 3301 N. Causeway Boulevard Metairie, LA 70010 (504) 837-4720
Defenbaugh, Richard	Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541
Ditton, Robert B.	Department of Recreation and Parks, Texas A&M University	College Station, TX 77843 (713) 845-5380
Fotheringham, Nick	Dames and Moore	Houston, TX (713) 688-4551
Franks, James S.	State of Mississippi Bureau of Marine Resources	P.O. Box 959 Long Beach, MS
Garrison, Louis E.	U.S. Geological Survey Office of Marine Geology	P.O. Box 6732 Corpus Christi, TX (512) 888-3294
Gauthier, Libby	Governor's Office State of Florida	The Capitol Tallahassee, FL 32301 (904) 488-5551
Gettleston, David	Continental Shelf Associates, Inc.	P.O. Box 3609 764 Saturn Street Tequesta, FL 33458 (305) 746-7946
Giesecke, Anne G.	National Park Services Water Resources	Department of the Interior Washington, D.C. 20240

Table 1. MEETING PARTICIPANTS (Continued)

Name	Affiliation	Address/Phone
Groat, Charles G.	Louisiana Geological Survey, Department of Natural Resources	P.O. Box G University Station Louisiana State University Baton Rouge, LA 70893
Grussendorf, Mark	Minerals Management Service, Branch of Offshore Studies	18th & C Streets, N.W. Washington, D.C. 20240 (202) 343-7744
Guice, Charles	Minerals Management Service	P.O. Box 7944 3301 Causeway Boulevard Metairie, LA 70010 (504) 837-4720
Halstead, Bruce	U.S. Fish & Wildlife Service	Galveston, TX
Handley, Larry	Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541
Hill, Charles	Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541
Ivester, M. Susan	Planning Division Coastal Branch, SAMPD	U.S. Army Corps of Engineers P.O. Box 2288 Mobile, AL 36628 (205) 690-2724
Jewes, Randall	Shell Offshore, Inc.	New Orleans, LA 70130 (504) 588-6896
Johnson, Paul	Barry A. Vittor and Associates, Inc.	8100 Cottage Hill Road Mobile, AL 36609 (205) 661-7236
Johnston, James B.	U.S. Fish & Wildlife Service National Coastal Ecosystems Team	NASA/Slidell Computer Complex 1010 Gause Boulevard Slidell, LA 70458 (504) 255-6511

Table 1. MEETING PARTICIPANTS (Continued)

Name	Affiliation	Address/Phone
Johnstone, William	Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541
Keller, Cherry	U.S. Fish & Wildlife Service National Coastal Ecosystems Team	NASA/Slidell Computer Complex 1010 Gause Boulevard Slidell, LA 70458 (504) 255-6511
Keppner, Edwin J.	National Marine Fisheries Service	Environmental Assessment Branch 3600 Delwood Beach Road Panama City, FL 32407 (904) 234-5061
Kolb, Walter O.	Governor's Office State of Florida	The Capitol Tallahassee, FL 32301 (904) 488-5551
Lehman, Jacob W.	Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541
Macdonald, Keith B.	Woodward-Clyde Consultants	3489 Kurtz Street San Diego, CA 92110 (714) 225-9381
Macdonald, Mary C.	Woodward-Clyde Consultants	3489 Kurtz Street San Diego, CA 92110 (714) 225-9381
McGrail, David W.	Department of Oceanography Texas A&M University	College Station, TX 77843 (713) 845-2154
Metee, Maurice F. (Scott)	Geological Survey of Alabama	P.O. Drawer 0 University, AL 35486 (205) 349-2852
O'Neill, Patrick E.	Geological Survey of Alabama	P.O. Drawer 0 University, AL 35486 (205) 349-2852
Orr, Duane	Port of Corpus Christi	P.O. Box 1541 Corpus Christi, TX 78403

Table 1. MEETING PARTICIPANTS (Continued)

Name	Affiliation	Address/Phone
Pearson, Joseph	Mobile United	P.O. Box 1243 Mobile, AL 36633
Pequegnat, Willis E.	TerEco Corp.	P.O. Box 2848 500 University West College Station, TX 77841 (713) 846-4768
Reggio, Villere	Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541
Rezak, Richard	Department of Oceanography Texas A&M University	College Station, TX 77843 (713) 845-2155
Rinkel, Maurice	OCS Representative State of Florida	830 First Street South St. Petersburg, FL 33701 (813) 893-9100
Rogers, Robert	Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541
Sabol, Albert J.	U.S. Coast Guard Marine Safety Office	P.O. Box 2924 Mobile, AL 36652
Schroeder, William	University of Alabama	Daphne Island, AL (205) 861-2141
Shaw, Kevin	Barry A. Vittor and Associates, Inc.	8100 Cottage Hill Road Mobile, AL 36609 (205) 661-7236
Sieverding, Harry B.	Assistant Manager Minerals Management Service, Outer Continental Shelf Office	Hale Boggs Federal Building 500 Camp Street, Suite 841 New Orleans, LA 70130 (504) 589-6541
Struaght, Robert	U.S. Fish & Wildlife Service National Coastal Ecosystems Team	NASA/Slidell Computer Complex 1010 Gause Boulevard Slidell, LA 70458 (504) 255-6511

Table 1. MEETING PARTICIPANTS (Concluded)

Name	Affiliation	Address/Phone
Tucker, Debra	Governor's Office State of Florida	The Capitol Tallahassee, FL 32301 (904) 488-5551
Van Sickle, Virginia	Louisiana Geological Survey	Department Natural Resources P.O. Box G University Station Louisiana State University Baton Rouge, LA 70893
Vittor, Barry A.	Barry A. Vittor and Associates, Inc.	8100 Cottage Hill Road Mobile, AL 36609 (205) 661-7236
Wagner, Paul B.	Barry A. Vittor and Associates, Inc.	1923c Corporate Square Boulevard Slidell, LA 70458
Wermund, E.G.	Associate Director Bureau of Economic Geology	University of Texas, Austin Austin, TX 78747 (512) 471-1834
Wilson, John L.	Science Applications International Corp.	1200 Prospect Street LaJolla, CA 92037 (714) 454-3811



**NEW ORLEANS
Outer Continental
Shelf Office**

BLM FACT SHEET

**BUREAU OF LAND MANAGEMENT
U.S. DEPARTMENT OF THE INTERIOR**

RELEASE:

April 19, 1982

CONTACT:

**B. Congdon
(504) 589-6541
FTS 682-6541**

OIL AND GAS STATISTICS OUTER CONTINENTAL SHELF

Today the Gulf of Mexico (GOM) Outer Continental Shelf (OCS) is the scene of high levels of activity by the petroleum industry and is the source of some of industry's greatest challenges. From the first OCS lease sale in 1954, activity has expanded steadily until companies are currently spending hundreds of millions of dollars annually to acquire acreage and explore and develop OCS leases.

From 1954-1980, 7,544 tracts encompassing 31 million acres have been offered by the federal government for lease in the GOM. Industry has competitively bid on these tracts and has acquired 3,158 tracts covering 15.8 million acres for high bids totaling \$25.5 billion. About 1,121 of these tracts, containing approximately 5 million acres, are producing. Currently, oil and gas companies hold leases on an additional 625 tracts, or 3.1 million acres, which are subject to further exploration and possible development.

The U.S. Geological Survey (USGS) data indicate that 18,029 wells have been drilled in GOM OCS waters, 88% of them off Louisiana and 11% off Texas. At the end of 1980, 8,553 of the 9,392 wells successfully completed as producers were still producing or capable of production.

Discovery and development extending from the shallow coastal water to deep offshore waters in the total OCS has resulted in production of 277.4 million barrels of crude oil and condensate, and 4.6 trillion cubic feet of natural gas in 1980. The cumulative OCS production from 1954-1980 is 5.4 billion barrels of crude oil and condensate and 48.7 trillion cubic feet of natural gas. OCS production in 1980 was about 9% of total U.S. crude oil and condensate and 23% of total U.S. natural gas production.

From bonuses, rentals, and royalties through 1980, the federal government has realized a cumulative total of \$41.3 billion or 66% of the total cumulative production value of all OCS production, almost all of which is from the GOM. The total government share, including Windfall Profit Tax and Federal Income Tax, would be significantly higher than 66%.

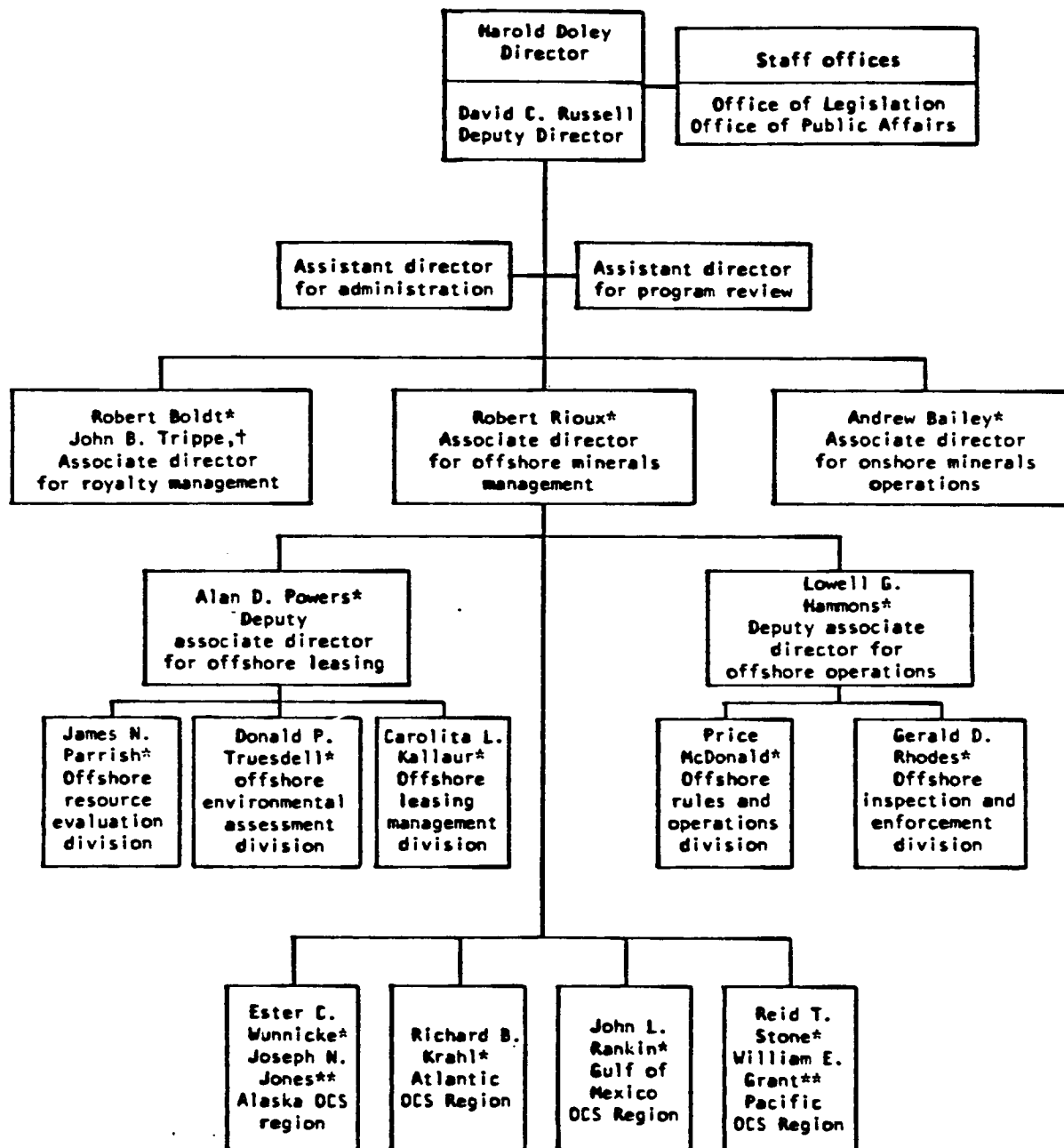
The technological evolution resulting from OCS operations has been remarkable. Marine seismic techniques have progressed unbelievably in both data gathering methods and data analysis, allowing better prospect evaluation. Drilling and producing platforms have evolved from early single-well jackets in shallow coastal waters to the multi-well platforms in deep offshore waters. The current deepwater record is held by Shell's 62-slot Project Cognac platform located in 1,025 feet of water. It is now routine to set platforms in water depths of 400-500 feet.

Greater well depths with higher pressures and temperatures have been made possible by advances in well drilling and well completion technology in the OCS. Well depths in excess of 20,000 feet are no longer rare. With bottomhole pressures approaching 18,000 pounds per square inch, high strength tubulars and wellhead equipment are being used more often in the OCS.

While extending the geological and technological frontiers in the OCS, industry takes special care with each step to insure safety and to protect the environment.

In the future, the petroleum industry sees continued development of the OCS resources. USGS estimates that the GOM OCS contains undiscovered resources of 6.5 billion barrels of crude oil and 71.9 trillion cubic feet of natural gas. These estimates exceed the volumes of oil and gas produced from the GOM OCS to date. Given the opportunity, industry will continue to make the considerable investment and develop the high technology required to find and produce these undiscovered resources.

MINERALS MANAGEMENT SERVICE



* Acting †Acting deputy associate director for royalty management operations
 ** Acting deputy minerals manager

FIGURE 1. MINERALS MANAGEMENT SERVICE ORGANIZATIONAL CHART

2. GENERAL SESSION

The remainder of the one and one-half day General Session consisted of fourteen oral presentations organized as indicated on the agenda that follows (Pages 13 and 14). Each presentation was followed by questions and discussion of pertinent issues.

An extended abstract for each of the fourteen presentations is included in the following section. The order of inclusion parallels the program agenda. The majority of these abstracts were reproduced, collated and available to participants at the time of the Studies Meeting. In some cases, additional figures or other materials were received during or subsequent to the meeting. All of these additional materials have been incorporated into the abstracts that follow.

The third meeting in this series will probably be held in Tallahassee, Florida and will be scheduled during the fall of 1982.

MINERALS MANAGEMENT SERVICE
GULF OF MEXICO STUDIES MEETING

KILLIAN ROOM, INTERNATIONAL TRADE CENTER BUILDING
MOBILE, ALABAMA
May 12 and 13, 1982

AGENDA

Wednesday, May 12

8:30 - 9:00	Introduction Harry Sieverding - Asst. Mgr. New Orleans OCS Office Dr. Keith B. Macdonald Woodward-Clyde Consultants
9:00 - 9:30	USFWS Coastal Characterization Program Dr. Scott Mettee and Patrick O'Neill Geological Survey of Alabama
9:30 - 10:00	USFWS Endangered Species Studies Ms. Cherry Keller-Slidell, LA
10:00 - 10:30	Break
11:00 - 11:30	Dr. Louis E. Garrison (Continued)
11:30 - 12:00	Salt Tectonics on the Outer Continental Shelf of the Northwest Gulf of Mexico Dr. Richard Rezak - Texas A&M University
12:00 - 12:30	Biological Studies on Outer Continental Shelf Hard Banks in the Northwest Gulf of Mexico Dr. Thomas Bright - Texas A&M University
12:30 - 2:00	Lunch
2:15 - 2:55	Deep Sea Biology Studies Dr. Willis Pequegnat - TerEco Corp. College Station, TX
2:55 - 3:25	Circulation and Sediment Movement on the Outer Continental Shelf of the Northwest Gulf of Mexico Dr. David McGrail - Texas A&M University

3:30 - 4:00 Break

4:00 - 5:00 Southwest Florida Shelf Ecosystem Study, Years I and II
 Dr. Keith B. Macdonald
 Woodward-Clyde Consultants, San Diego, CA

Dr. David Gettleson
 Continental Shelf Associates, Inc.
 Tequesta, FL

6:00 - 8:00 Reception - Ballroom D
 Sheraton Mobile

Thursday, May 13

9:15 - 9:30 Southwest Florida Shelf Ecosystem Study, Year III
 Dr. Hong Chin
 Woodward-Clyde Consultants, San Diego, CA

9:30 - 9:55 Southwest Florida Shelf Circulation Model Study
 Dr. Bryan Pearce and Cortis Cooper
 New England Coastal Engineers, Bangor, ME

9:55 - 10:40 The U.S. Army Engineer Corps Mississippi Sound Program
 Ms. Susan Ivester, Mobile, AL

10:40 - 11:05 Break

11:05 - 11:25 Satellite-Derived, Quantitative Sea Surface Temperature Observations
 Richard Clark
 National Earth Satellite Service, Slidell, LA

11:25 - 11:50 Standardization of Identifications of Benthic Polychaetous Annelids from the Gulf of Mexico Outer Continental Shelf
 Dr. Barry A. Vittor and Paul Johnson
 Barry A. Vittor and Associates, Inc.
 Mobile, AL

11:50 - 12:30 Recreation and Fisheries - Offshore Operators' Cooperative Program
 Dr. Robert Ditton
 Department of Recreation and Parks
 Texas A&M University

12:30 Adjourn

A B S T R A C T S

Abstract

ALABAMA COASTAL CHARACTERIZATION STUDY

Maurice F. Mettee and Patric E. O'Neill
Geological Survey of Alabama
P.O. Drawer 0
University, AL 35486
(205) 349-2852

In August 1980, the Geological Survey of Alabama and the U. S. Fish and Wildlife Service initiated a cooperative study of coastal Alabama (Contract No. 14-16-009-80-1016). The study includes Mobile and Baldwin Counties and is divided into three work tasks:

- Task I: Coastal Alabama Environmental Literature Review and Synthesis
- Task II: Socioeconomic Data Collection and Synthesis for Coastal Alabama
- Task III: Historical Habitat Mapping of Coastal Alabama.

Task I consists of two subtasks. Subtask 1 involves the production of a computer-based bibliography of published and unpublished reports on the biology, climatology, geology and geography, hydrology, and socioeconomic structure of the area. References are entered and can be retrieved by author, source, and key words. Also included are references to ongoing studies in coastal Alabama and contact agencies. Data collected for the coastal bibliography will be used to prepare a two-part environmental synthesis report (Subtask 2). The first portion will contain a detailed description of the natural environment of the area. The second section will present a conceptual model and supporting text on four natural (fresh-water, coastal terrestrial, estuarine, and outer continental shelf) and two manipulated (urban industrial and agricultural) ecosystems in Mobile and Baldwin Counties and also include individual models for the estuarine ecosystem and one of its components, the marsh.

Nine socioeconomic synthesis papers and a data appendix will be produced by Task II. Synthesis paper topics include social and demographic characteristics, industrial and residential development, agricultural production, minerals production, commercial fishing, transportation, recreation/tourism industry, multiple-use conflicts, and environmental issues and regulations.

Task III involves the classification of wetland habitats that existed in coastal Alabama circa 1955. Habitat types will be delineated on 9" by 9" black-and-white photography using the U. S. Fish and Wildlife Service Wetlands Classification System (1979). These data will be transferred to 27 U.S.G.S. stable base 7.5-minute quadrangle maps, labelled, and planimetered. A similar study of Alabama coastal wetlands in 1979 is being completed by the U. S. Fish and Wildlife Service National Wetlands Mapping Laboratory at St. Petersburg, Florida.

Three reports generated by the coastal characterization study will be printed and distributed by the Geological Survey of Alabama in Tuscaloosa. These include the Coastal Alabama Bibliography, the environmental synthesis paper with conceptual models, and the nine socioeconomic synthesis papers and data appendix. The original copies of the 1955 and 1979 wetlands delineation maps produced by the Survey and the U. S. Fish and Wildlife Service as part of Task III will be permanently housed at the Geological Survey. Copies will be available upon request.

MOBILE COUNTY

BALDWIN COUNTY

MISSISSIPPI
ALABAMA

EXCERPT from map showing SUBMERGED STATE
LAND OIL LEASE TRACTS within 3 marine miles
of shoreline, prepared by STATE OF ALABAMA,
Department of Conservation & Natural Resources,
Engineering Section.
Project No. 2; 5-L-2, dated MARCH 1958;
REVISED SEPTEMBER 1977..



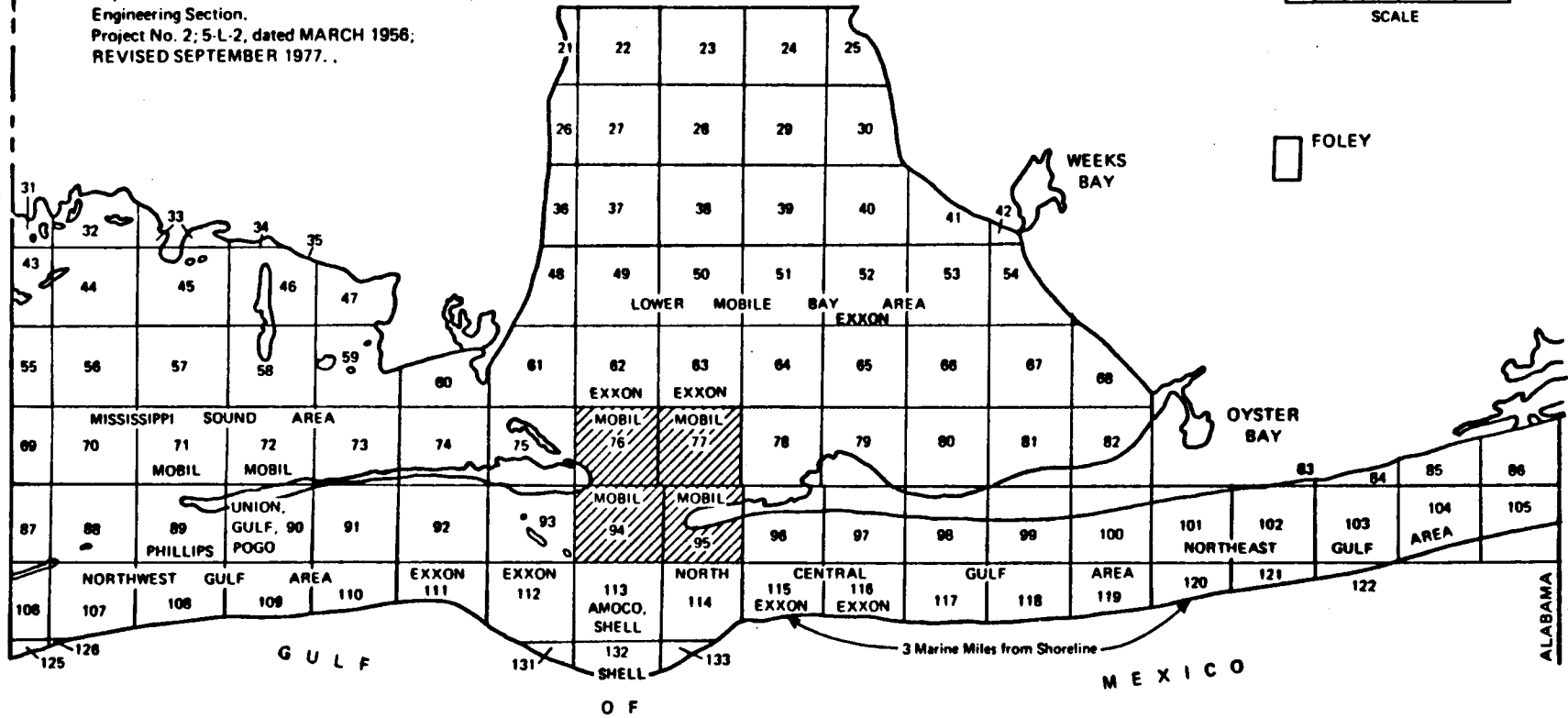
FAIRHOPE

10,000 0 10,000 20,000 30,000 FT

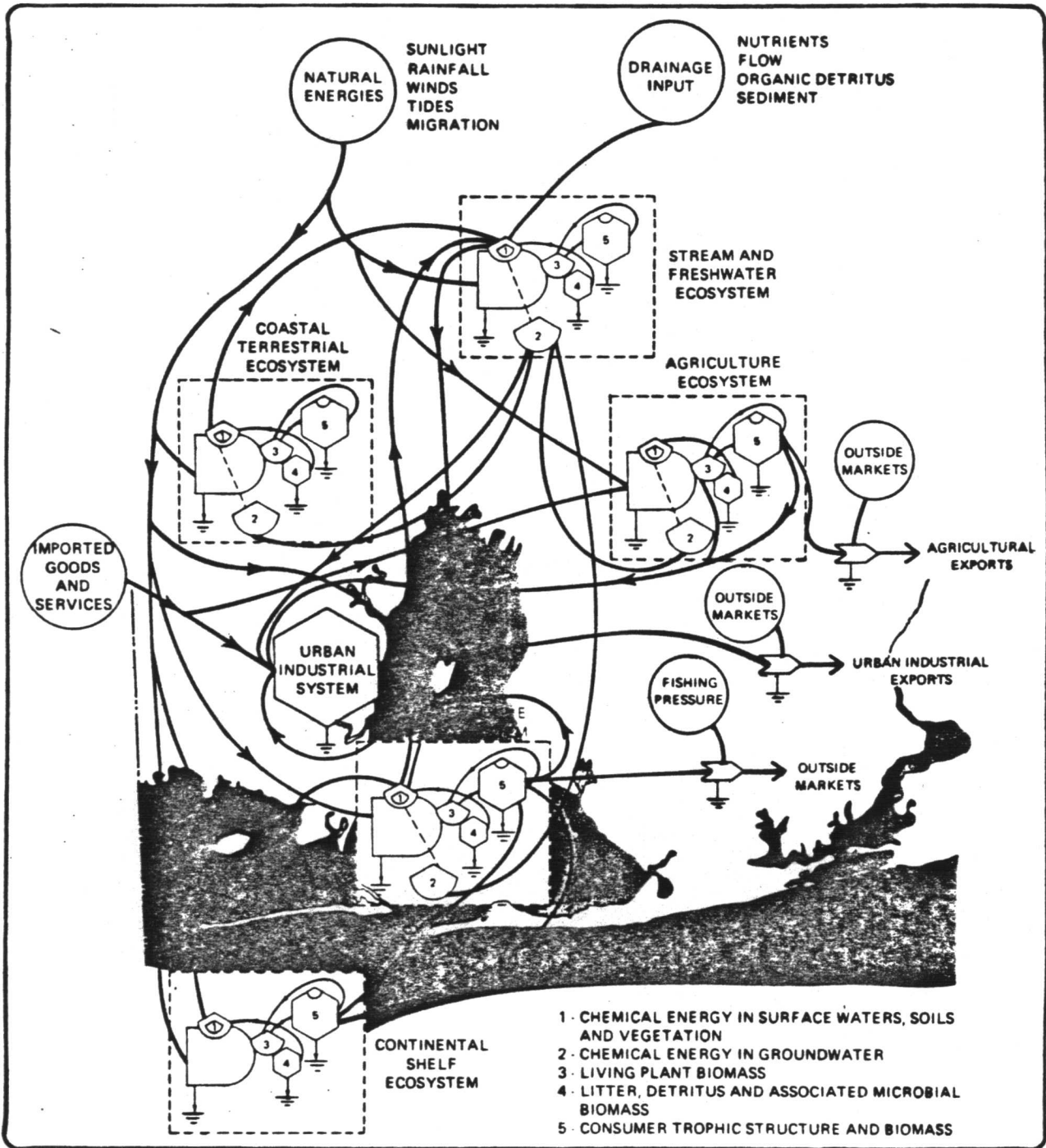
SCALE



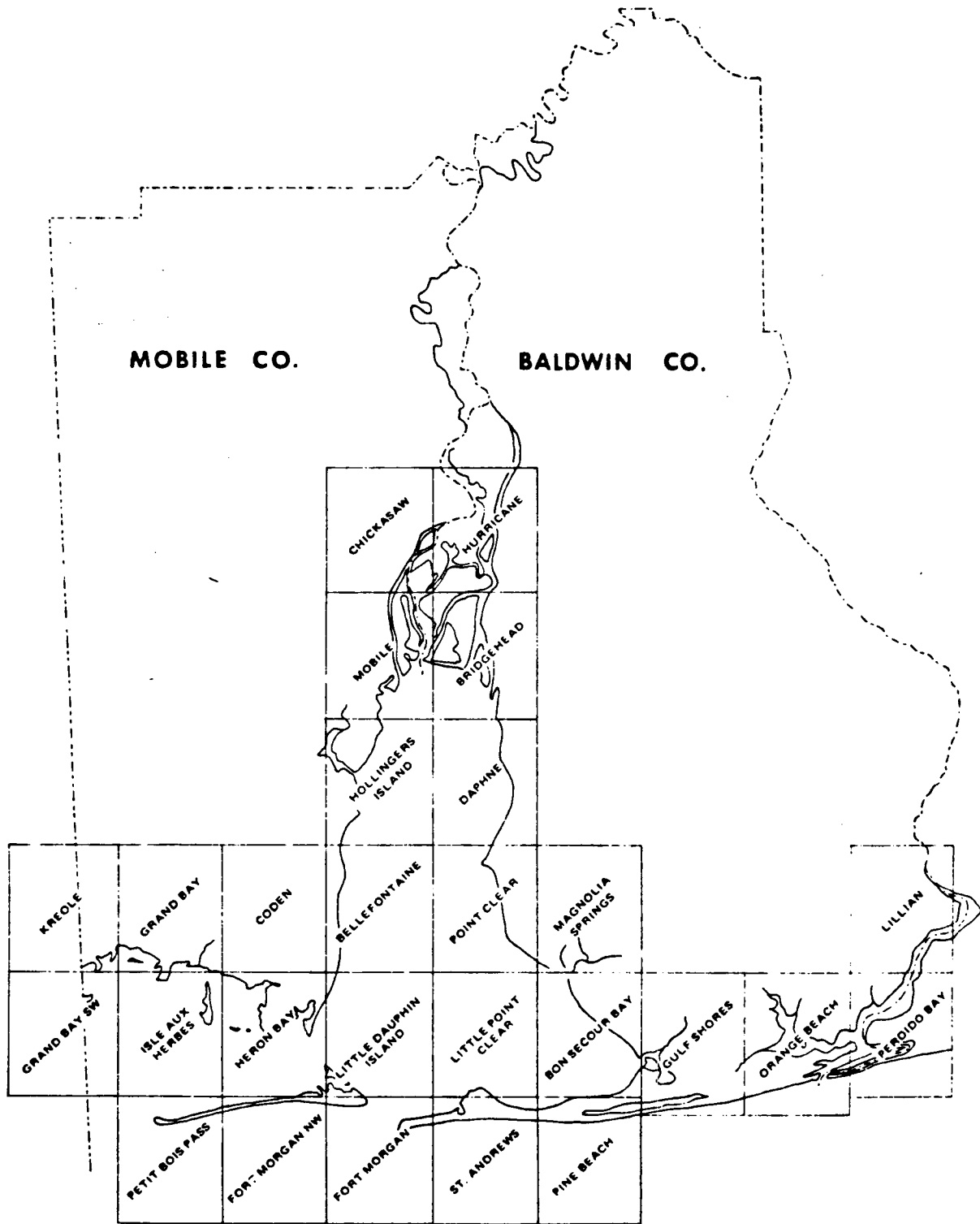
FOLEY



Submerged State Land Oil Lease Tracts in Alabama, 1980



A Conceptual Model of Energy Flow in Coastal Alabama



7 1/2' Topographic Maps Included in the Alabama Coastal Wetlands Study

Abstract

Endangered Species Studies Interagency Agreement No. AA851-IA2-13

CETACEANS AND SEA TURTLES IN THE GULF OF MEXICO: STUDY PLANNING FOR EFFECTS OF OCS DEVELOPMENT

by

Cherry Keller
National Coastal Ecosystems Team
U. S. Fish and Wildlife Service

On April 6-8, 1982 the National Coastal Ecosystems Team conducted a workshop for the Bureau of Land Management to identify information needed to determine the effects of OCS development on cetaceans and sea turtles of the Gulf of Mexico. The objectives of the workshop were as follows:

- 1) Identify ways in which cetaceans and sea turtles have been or could be affected, either directly or indirectly, by activities and events associated with offshore oil and gas development.
- 2) Identify the types and specificity of data needed to predict, detect, and mitigate possible adverse effects.
- 3) Identify and discuss advantages and disadvantages of various methods that might be used to obtain needed data.
- 4) Identify specific research and monitoring programs which would be required to obtain needed data.

Scientists who have had experience working with these animals met to discuss these goals and make recommendations. For the purpose of this discussion, I would like to summarize the major areas of conflict identified during the workshop which the committee felt should be addressed.

Sea Turtles

There is evidence of conflict between oil spills and other discharges and the viability of young sea turtles. Twenty-seven small sea turtles of three species were handled for oil or tar impact by Ross Witham of the Florida DNR since 1978. These turtles had been oiled or had tried to ingest tar balls which sealed the mouth and nostrils. All turtles which were oiled died but 11 of those impacted by tar were rehabilitated. We know very little about the early life stages of these turtles and we need to know their sensitivity to oil discharges, and to what extent oil pollution is affecting these populations. It is very likely that young turtles are moved by surface currents and may end up concentrated in drift lines. Oil moved by surface currents is likely to accumulate in the same areas.

Previous work conducted by Tom Fritts of the USFWS has also demonstrated that fresh oil can cause substantial mortality to incubating sea turtle embryos. The threshold amount of oil which begins to affect mortality has yet to be determined. Weathered oil is apparently not as toxic as fresh oil, but the extent of weathering required to remove this toxicity is also not known.

A research program is needed for determining the effects of crude oil on sea turtle embryos and hatchlings. Mortality and avoidance/attraction should be determined. This program would be aimed toward impact assessment and recommendations for the protection and cleanup of nesting beaches, hatchlings and their habitat.

Other potential problems identified by the group are the large numbers of loggerhead turtles (Caretta caretta) off the western coast of Florida where petroleum exploration and production are beginning. This may be an important feeding area for subadult turtles but more research is required to clearly identify the significance of the area to turtle populations. Concern was also expressed for the severely endangered Kemp's Ridley Sea Turtle (Lepidochelys kempii) which nests in Mexico. Part of the population moves north into Louisiana waters which are heavily developed. The cumulative effect of additional development on this population needs to be addressed.

Cetaceans

To date there has been no evidence of direct effects of oil contamination on cetaceans in the Gulf of Mexico. Studies conducted by Geraci and St. Aubin indicate that cetacean skin is not very sensitive to oil, and the probability of inhaling oil seems remote. However, the more subtle, indirect effects are not known at this time due largely to our poor understanding of cetaceans in the Gulf of Mexico. Until recently we were not even aware there was a population of sperm whales (Physeter catadon), an endangered species, off the Texas coast. As exploration and production moves into deeper and deeper water, the probability of disturbing these larger whales and other deep water species increases. Conflicts could arise from a variety of OCS-related activities. The committee felt there was a need to identify the specific habitats of these animals in the Gulf before we could even assess which animals may be affected. Tagging individuals of certain endangered species would also help to address whether Gulf populations remain here year-round. Finally, the more common bottlenose dolphin (Tursiops truncatus) should be used to study behavioral and physiological changes associated with oil and gas development.

The USGS Habitat Mapping Program

Dr. Louis E. Garrison
Corpus Christi, Texas

Since 1975 the BLM has provided support in varying amounts to USGS projects in the Gulf of Mexico/OCS. In the beginning, these funds were intended to assist in our studies of sediment instability on the Mississippi delta, but since 1978 our task has been to provide seafloor maps of continental shelf areas. Over the last four years these projects have collected a large amount of exclusive high-resolution seismic data that has been applied to a variety of maps and reports provided to BLM by USGS. In addition to these data, USGS has collected its own seismic data from shelf and upper slope areas in the Gulf of Mexico. In the current year (FY 82) our task is to synthesize all of these data, plus any other available in the public sector, into a single seafloor habitat map. This map in general will depict the surface and shallow subsurface geology over all OCS areas for which data are available. The final mapping scale will be 1:250,000 on a Universal Transverse Mercator projection. The existing NOS/USGS Topographic-Bathymetric maps prepared for the BLM Environmental Assessment Program are being used for a base.

The project is divided into four parts, all of which are going forward simultaneously under different Project Leaders, both in the Geological Survey at Corpus Christi and at LSU's Coastal Studies Institute. Completion date has been set for the end of September, and at the present time the work is reasonable well on schedule.

THE FLOWER GARDENS PROGRAM

Texas A&M University
College Station, TX 77843

Preface to abstracts by Bright, Rezak, and McGrail

Under the sponsorship of the BLM New Orleans Outer Continental Shelf Office, Texas A&M oceanographers Thomas J. Bright and Richard Rezak have conducted joint studies at the East and West Flower Garden Banks and other OCS features in the Gulf of Mexico since 1975. These studies include mapping and submersible reconnaissance of 32 banks. David W. McGrail, who joined Drs. Bright and Rezak in 1977, has focused on water and sediment dynamics, particularly at the East and West Flower Garden Banks.

Their studies at the Flower Garden Banks have intensified since 1979, when long-term monitoring efforts were initiated. Through the acquisition of hundreds of direct observations and samples, Drs. Bright and Rezak have now developed biotic zonation and sediment distribution maps of the Flower Garden Banks. Dr. McGrail's data base now includes three years of time series measurements of currents, temperature, and transmissivity at the Flower Garden Banks, as well as hundreds of seasonal profiles of salinity, temperature, depth, transmissivity, and current velocity. These profiles record simultaneous measurements made possible through the development of a sophisticated system dubbed the PHISH (Profiling-Hardwired-Instrumented-Sensor for Hydrography).

For the presentations at the 1982 Gulf of Mexico Studies Conference (abstracted here), Drs. Bright, Rezak, and McGrail have limited their reports to the most current findings. A final report will be available through the BLM New Orleans OCS office in August of 1982. The results of their most recent studies (a synthesis of all studies since 1975) will be complete in May 1983.

CATASTROPHIC COLLAPSE: A POSSIBLE CAUSE FOR MISUNDERSTANDING

Richard Rezak
Department of Oceanography
Texas A&M University
College Station, TX 77843

The concept of seafloor mobility on and in the immediate vicinity of salt diapirs has been developed over the past few years as a result of BLM sponsored studies of topographic features in the Gulf of Mexico. Several lines of evidence suggest that normal faulting and graben formation at the crests of salt domes may be catastrophic in nature. The evidence includes: 1) the removal of vast amounts of solid salt from the crest of diapirs by dissolution; 2) high-resolution seismic profiles showing recent displacement of the seafloor; 3) the nature of rock outcrops at the crests of domes; 4) changes in coral growth rates at the East Flower Garden Bank; and 5) earthquakes with epicenters on the Texas Louisiana Outer Continental Shelf and slope.

Published discussions of items 1 through 4 may be found in Rezak and Bright (1981a and 1981b). Additional data in support of items 2, 3, and 5 have appeared in the published record during the past four months. This abstract points the significance of these additional data.

Items 2 and 5: New Evidence from Seismic Profiles

Fault patterns associated with salt domes have been a concern during the present study because of their great variability. The "typical" radial pattern of faults on circular domes is the exception rather than the rule on the Outer Continental Shelf. Of particular interest are those patterns that consist of a series of faults more or less parallel to the shelf edge, such as exhibited by Elvers, Diaphus, and possibly Applebaum Banks. Because these are generally near the

shelf edge, it has been presumed that this pattern is due to tensile stresses created by the increased slope beyond the shelf edge. Confirmation of this hypothesis has been presented by Withjack and Scheiner (1982). They conclude, based upon experimental and analytical models, that regional strain, either extension or compression, significantly affects the fault patterns produced by doming. In their models, parallel fault patterns were produced on circular and oval shaped domes that were subjected to tensile stresses. The trend of the faults was perpendicular to the trend of the regional extension direction.

Collapse of the crest of the dome follows removal of solid salt by dissolution and may be triggered by earthquakes. In 1981, I was told by an oil company engineer that one of their drilling platforms had experienced an earthquake. The platform was located somewhere near the East Flower Garden Bank. The earthquake was sufficient magnitude to be felt by the drilling engineer on duty at that time. No date of the event nor location was given.

Items 3 and 5: Nature of Rock Outcrops/Earthquakes

Item 3, above, refers to the existence of relatively bare (unencrusted) Tertiary and Cretaceous bedrock in close proximity to well developed corallgal reefs. This relationship is very good evidence for very recent exposure of these bare rocks on the seafloor. One example of such an exposure is a large outcrop of very thinly encrusted basalt at Alderdice Bank. Frohlich (1982) reported an earthquake with a magnitude of about 5.0 with an epicenter near the edge of the Mississippi Fan (Figure 1). The earthquake occurred in July 1978 and the epicenter was about 250 miles southeast of Alderdice Bank. Our observations at Alderdice Bank were made during September 1978,

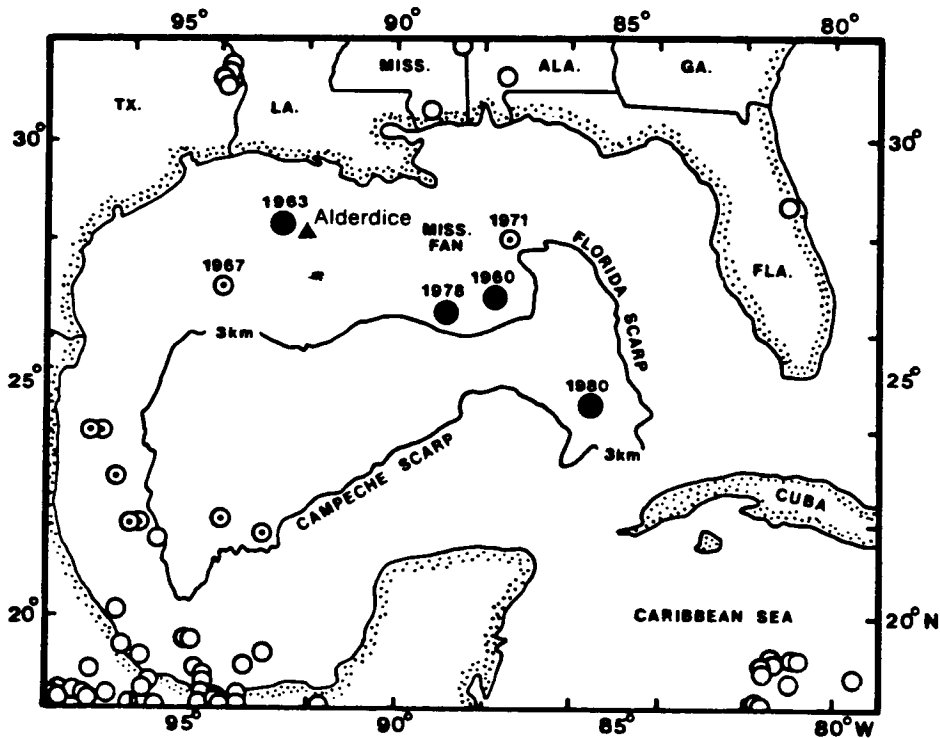


Figure 1. Locations of earthquakes reported in and near the Gulf of Mexico. Solid circles indicate epicenters reported in the central Gulf by the National Earthquake Information Service (NEIS); open circles indicate other epicenters reported by NEIS. Circles with dots indicate epicenters reported by the International Seismological Centre (ISC) and not reported by NEIS. The triangle indicates the location of Alderdice Bank. Numbers next to some events are year of occurrence. The 3 km bathymetric contour is plotted for reference. Note that most of the seismic activity shown is associated with plate boundaries in Mexico, Central America, and the Caribbean. [After Frohlich (1982).]

approximately three months after the earthquake. Frohlich lists five earthquakes that have occurred in this part of the Gulf of Mexico since 1960. Any one of these could have triggered the collapse at the crest of Alderdice Bank. However, the thin encrustations on the basalt are approximately the same thickness as those that develop on our current meters during a three-month deployment.

Conclusions

The consequences of such catastrophic movements of the seafloor due to natural causes are readily apparent. Structures such as jack-up rigs and production platforms could be seriously damaged or destroyed by minor movements of the seafloor. The drilling activity would probably be blamed for the catastrophe when in reality it was due to natural causes.

References Cited

- Frohlich, Cliff, 1982. Seismicity in the central Gulf of Mexico. Geol., 10, 103-106.
- Rezak, Richard and T.J. Bright, 1981a. Northern Gulf of Mexico Topographic Features Study. Final Report, Bureau of Land Management, Contract AA551-CT8-35, vol. 3, 99-127.
- Rezak, Richard and Thomas J. Bright, 1981b. Seafloor instability at East Flower Garden Bank, northwest Gulf of Mexico. Geo-Marine Letters, 1, 97-103.
- Withjack, Martha O. and Cynthia Scheiner, 1982. Fault patterns associated with domes -- an experimental and analytical study. AAPG Bull., 66, 302-316.

CURRENTS AND SEDIMENTARY PROCESSES AT THE SHELF/SLOPE
BREAK IN THE NORTHWESTERN GULF OF MEXICO

David W. McGrail
Department of Oceanography
Texas A&M University
College Station, TX 77843

Long-term time series measurements of current velocity, water temperature, and transmissivity (XMS), together with seasonal profiling cruises in the vicinity of the East and West Flower Garden Banks, have provided a rather unexpected picture of flow and sediment transport at the shelf edge. The mean, interior flow along the Outer Continental Shelf and upper slope is to the east at speeds of up to 100 cm/sec (two knots). Flow in the bottom boundary layer (away from the influence of the banks) is, on average, to the east-southeast at speeds of 1-5 cm/sec, 4 m above the bottom.

The mean flow is strongly modulated by oscillations with periods of ~ 25 hours, ~ 30 hours, ~ 48 hours, and ~ 96 hours. The 96-hour oscillations appear to be directly forced by atmospheric disturbances (northers). The 25-hour oscillations appear to be inertial oscillations generated by the northers and by storms of tropical origin. If the mean flow is strong, the modulations take the form of alternations of the direction between northeasterly and southeasterly. If the mean current is weak, the modulations are manifested as clockwise rotations of the velocity vectors through 360° . The origins of the 30- and 48-hour oscillations are not yet known. The most likely candidates at the moment are (a) 48-hour free shelf wave and (b) 30-hour large scale oscillations which are a normal mode of the Gulf of Mexico. The storm-generated inertial oscillations decay over a period

of three to five cycles. They penetrate all the way to the bottom and induce strong on-offshore flow ($\sim 10-20$ cm/sec) within 4 m of the bottom.

Time series records of XMS from within 4 m of the bottom are not statistically correlated with speed. That is, the water does not become more turbid with increasing speed nor does it clear with decreasing speed, at that height above the bottom. In fact, lowest XMS values correspond to low-speed, onshore flow. These records, together with profiles taken on transects across the shelf and upper slope, suggest that changes in XMS at 4 and 12 m above the bottom are the result of advective processes. In particular, convergence of upwelling along the slope and downwelling from the shelf produce a doming of the boundary layer and nepheloid layer. The location of the convergence migrates with varying intensities of the upwelling and downwelling systems. It is important to note that the upwelling system does not penetrate to the surface.

Large quantities of sediment are swept off the shelf and into the eastward flowing slope waters when the bottom waters of the shelf flow offshore along density interfaces. This process is particularly important in the winter when dense water is formed on the shelf during cold air outbreaks.

BIO-ENVIRONMENTAL MONITORING AT THE FLOWER
GARDEN REEFS*

Thomas J. Bright
Department of Oceanography
Texas A&M University
College Station, TX 77843

Exploratory drilling for oil and gas adjacent to the Flower Garden reefs began in 1975. Production drilling at the East Flower Garden is now underway. Between 1979 and 1981, quantitative determinations were made of coral population levels and rates of coral recruitment, growth, and mortality. The resulting data are now being used as baseline information for environmental monitoring associated with continuing petroleum drilling and production near the banks.

The 1979-1981 coral reef studies indicate that living coral covers 54-73% of the hard-bottom and that 23-40% of the living coral is Montastrea annularis. Encrusting growth rates vary substantially with coral species, averaging approximately 0.45 mm/mon for Montastrea annularis. Occurrences of coral mortality result in lateral retreat of tissue at substantially higher rates. Coral spat tend to settle in greatest numbers during the summer.

To date we have identified no apparent man-induced effects on coral populations at the Flower Garden reefs, other than obvious instances of mechanical damage by anchors and anchor chains. Therefore it is recommended that anchoring by vessels greater than 100 feet in length be prohibited at the East and West Flower Garden Banks, and that such prohibition be indicated on all nautical charts.

*The phrase "Flower Garden reefs" refers to the living coral reefs at the East and West Flower Garden Banks. Bank refers to the entire topographic feature.

THE ECOLOGICAL COMMUNITIES OF THE CONTINENTAL SLOPE
AND ADJACENT REGIMES OF THE NORTHERN GULF OF MEXICO
WITH AN ASSOCIATED PHOTOGRAPHIC ATLAS

Contract Number AA851-CT1-12

Willis E. Pequegnat, Ph.D.
Project Director
TerEco Corporation
College Station, Texas 77841

GENERAL

Since the last reporting period emphasis in this project has been centered primarily on the development of the community concept as it relates to the deeper aspects of the Gulf of Mexico. Admittedly we are dealing with truncated faunal communities in that we are not working with other than macrofaunal and megafaunal groups and even in these we are only giving consideration to the following important taxonomical categories, viz.,

Crustacea
Echinodermata (except Crinoidea)
Pisces

DENDROGRAM CONSTRUCTION

An important part of this effort involves an investigation of whether the faunal elements are distributed in a continuum down the slope or are in actuality arrayed in more or less discrete groups or clusters along a line of increasing depth. In short we are attempting to determine if faunal zones exist in the deeper parts of the Gulf of Mexico or if the clusters that we observe are an artifact of sampling deficiencies.

Using an index of similarity can give some insight as to the existence of clusters of species that are a function of depth. The indices can be used to erect a dendrogram that permits one to formulate a visual image of the maze of numbers involved in the calculations.

The index of similarity that TerEco Corporation uses is in its simplest form that of Mountford, as follows:

$$I = \frac{2j}{2ab - (a + b)j}$$

where a and b are the respective number of species in two samples and j is the number of species common to both samples. This method tends to classify stations into groups of similar stations on the basis of the fauna collected at each and makes use not only of the index of similarity between a pair of single stations but also of an index between two groups of stations. The index between a station B and a group composed of A₁ and A₂ is defined as

$$I(A_1A_2;B) = \frac{I(A_1B) + I(A_2B)}{2}$$

The numbers of species in the various taxonomic groups that we are using to carve out the megafaunal zones are shown in Table 1.

Table 1. Numbers of Species Within Major Taxonomical Groups

		Total Number	*Number Used in Calculations
CRUSTACEA:	Cirripedia	16	6
	Isopoda	2	1
	Penaeidea	22	19
	Caridea	33	24
	Macrura (except Polychelidae and Nephropidae)	4	1
	Polychelidae	5	4
	Nephropidae	4	4
	Anomura (except Galatheidae)	24	19
	Galatheidae	30	18
	Brachyura	45	31
		185	127
ECHINODERMATA:	Asteroidea	20	10
	Ophiuroidea	24	13
	Echinoidea	29	10
	Holothuroidea	40	29
	113	62	
PISCES:		202	129
TOTAL SPECIES		500	318

* Species which occurred at more than one station.

After the indices have been calculated they are arranged in a matrix (Table 2). The highest index of similarity, between isobaths 3200 and 3400 meters, has been boxed, whereas the third highest, between 2000 and 2100 meters, has been underscored. The second highest value was found to be between the 3000 meter isobath stations and the group formed by isobaths 3200 and 3400 meters. After construction of the dendrograms, we look for faunal breaks. In the case shown in Figure 1, such breaks appear between 200 and 300 meters, between 550 and 750 meters, and between 1450 and 1750 meters. Others are also apparent.

The actual dendrogram being developed in the present expanded study is shown in Figure 2. Preliminary analysis of this as yet uncompleted figure indicates that there are some reasonably discrete clusters of species in the deeper aspects of the northern Gulf of Mexico.

SPECIES DIVERSITY INDICES

Well aware of its shortcomings, particularly its bias for sample size, we still find calculation of the Shannon-Wiener species diversity indices to be illuminating in some respects. We are determining these values as well as theoretical maximum possible diversities and equitabilities for all stations and for each 50m depth increment using the major megafaunal groups employed in the determinations of the similarity indices.

Some species diversity indices at stations above the 1000 meter contour are 2.9872, 4.1717, 2.4312, 2.5658, 3.8348, and 3.4115; some below 1000 meters are 4.2697, 3.9288, 2.8504, 2.6582, 3.6731, and 3.9525.

Thus far, indices below 1000 meters appear to be comparable to those above 1000 meters.

PHOTOGRAPHIC ADJUNCT

As of April 1, 1982 TerEco Corporation was awarded a modification of the subject contract to permit inclusion of bottom photographs in the study. The

Table 2. Indices of similarity for stations near the designated isobaths. Perimeter numbers are depths in meters.

	200	300	350	450	550	750	850	900	1000	1100	1300	1350	1450	1750	2000	2100	2200	2450	2650	3000	3200	3400	3650
200		.0105	.0063	.0137	.0325	.0010	.0012	.0005	.0003	.0004	.0004	.0005	.0005	.0005	.0007	.0007	.0008	.0008	.0008	.0012	.0010	.0010	---
300			.0930	.0133	.0132	.0031	.0044	.0026	.0017	.0021	.0019	.0025	.0023	.0026	.0037	.0033	.0041	.0041	.0041	.0060	.0051	.0051	---
350				.0174	.0230	.0048	.0042	.0039	.0016	.0020	.0018	.0024	.0022	.0025	.0036	.0032	.0019	.0019	.0019	.0028	.0024	.0024	---
450					.0746	.0123	.0091	.0055	.0028	.0035	.0032	.0033	.0030	.0034	.0036	.0021	.0012	.0012	.0012	.0018	.0018	.0018	---
550						.0278	.0183	.0107	.0054	.0067	.0061	.0061	.0037	.0065	.0066	.0038	.0022	.0022	.0022	.0033	.0028	.0028	---
750							.0741	.0437	.0144	.0150	.0093	.0095	.0088	.0071	.0045	.0031	.0028	.0009	.0009	.0013	.0011	.0011	---
850								.1608	.0290	.0275	.0168	.0157	.0129	.0092	.0057	.0039	.0038	.0011	.0011	.0016	.0014	.0014	---
900									.0381	.0383	.0212	.0197	.0163	.0101	.0081	.0044	.0031	.0010	.0010	.0014	.0012	.0012	---
1000										.1377	.0444	.0316	.0257	.0141	.0083	.0057	.0038	.0020	.0020	.0030	.0028	.0028	---
1100											.0878	.0484	.0368	.0187	.0120	.0082	.0055	.0028	.0025	.0037	.0031	.0031	---
1300												.0642	.0442	.0193	.0136	.0107	.0060	.0040	.0040	.0033	.0028	.0028	---
1350													.1608	.0429	.0301	.0230	.0128	.0080	.0080	.0061	.0052	.0052	---
1450														.0516	.0384	.0260	.0179	.0120	.0103	.0094	.0063	.0063	---
1750															.1107	.0718	.0442	.0235	.0208	.0159	.0109	.0109	---
2000																<u>.2884</u>	.1180	.0810	.0439	.0348	.0234	.0234	---
2100																	.2338	.0878	.0581	.0518	.0339	.0339	.0130
2200																		.1282	.1044	.0714	.0456	.0456	.0181
2450																			.1282	.0878	.0641	.0541	.0181
2650																				.2500	.1180	.1180	.0279
3000																					.3658	.3658	.0417
3200																						.4524	.0351
3400																							.0351
3650																							

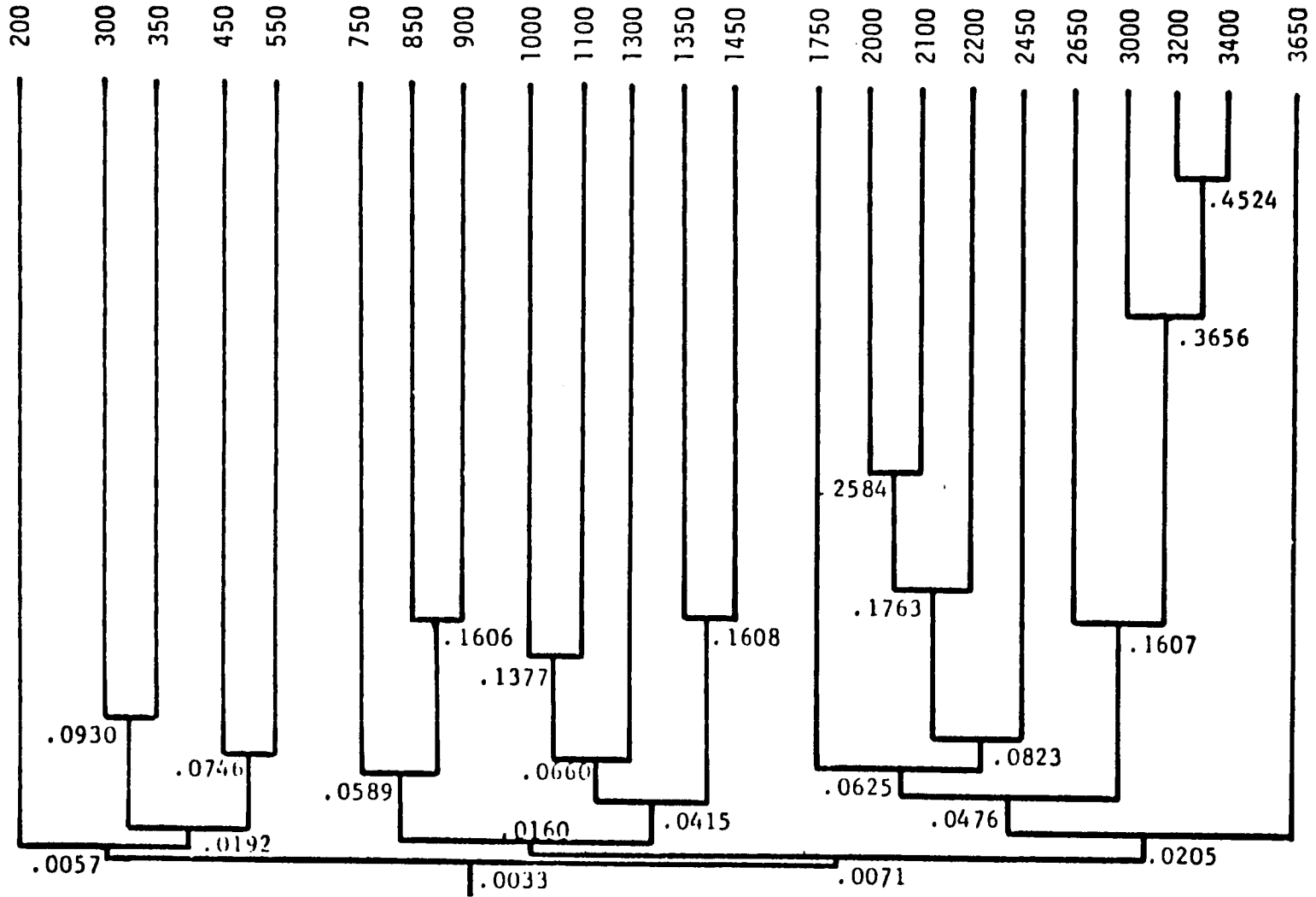


FIGURE 1 Dendrogram derived from indices of similarity. Uppermost numbers represent stations (depth in meters) whereas numbers within figure are indices of similarity.

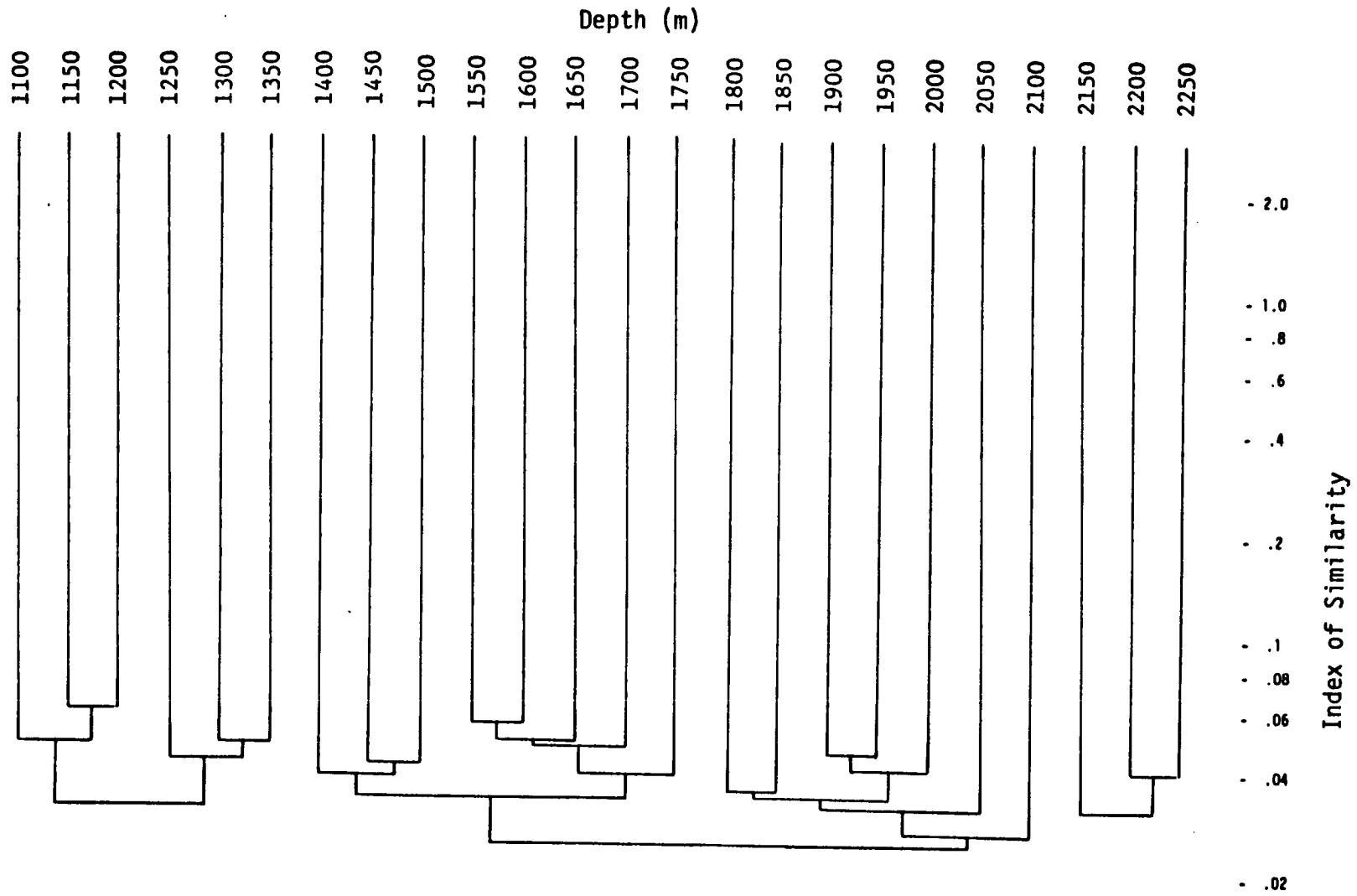


Figure 2. Faunal similarity dendrogram. Compiled from data on similarity of species collected from stations near the designated isobaths. Continues on next page.



Figure 2. (continued)

photos will be used in two important ways. First, those that depict one or more aspects of the subject being discussed in the corpus of the study will accompany the essay. Among these are pictures of organisms, portrayal of burrows or feeding depressions of organisms, evidences of currents, of slumping or of downwelling, etc. Second, those pictures that portray the nature of the bottom environment along given isobaths in the NE and NW gulf will be compiled as an addendum atlas. We believe that judicious use of photographs will enhance the environmental usefulness of the volume to be produced to a substantial degree.

Abstract

SOUTHWEST FLORIDA SHELF ECOSYSTEMS STUDY, YEARS I & II

BLM Contract Nos. AA851-CT0-50/CT1-45

Contractor: Woodward-Clyde Consultants

Project Manager: Dr. Keith B. Macdonald

All seven cruises scheduled for Years I and II have been completed with close to one hundred percent sample/data recovery. Three cruises involved sea-floor geophysics, underwater television and underwater still camera surveys. The remaining four cruises have provided approximately quarterly sampling (October-November 1980; April-May 1981; July-August 1981; and January-February 1982) of water column variables and sea-floor biological assemblages. Some 20 hard (live) bottom and 19 soft bottom stations, at depths between 20 and 200 m, have been sampled either two or four times each (Figures 1 and 2). Progress on specific program objectives is as follows:

Sea-Floor Habitat Maps (Visuals) - showing the location and distribution of various bottom substrates and broadly classified biological assemblages across the Southwest Florida Shelf have been completed in draft form. Developed from the geophysical, television and camera data, these are being submitted for final in-house/BLM approval this month.

Water Column and Bottom Sediment Data - laboratory analyses are all finished and interpretation of Year I data has been completed. Examples of the water column data are included as Figures 3 and 4.

Hydrocarbon and Trace Metal Data - were reported on at the Tallahassee meeting, October 1981. The Shelf sediments are generally "pristine", being characterized by low levels of primarily biologically derived hydrocarbons. Significant additions of crude oil and/or refined hydrocarbons would be readily detected should they occur. Trace metal abundances in the carbonate-rich sediments are also very low, again indicating "pristine" conditions.

Biological Data - collected to characterize the species composition and ecological function of principal bottom communities within the area, are all worked up for Year I and about 90 percent completed for Year II. Year I samples yielded a higher total biomass and more species (>2,500) than anticipated. Preliminary data analysis confirms a complex distribution of species assemblages across the Southwest Florida Shelf, although cluster analysis of some individual data sets hint at distinct inner and outer shelf assemblages.

All of the preceding data sets will provide input to an assessment of the potential impacts of OCS oil and gas offshore leasing/development activities on live (hard) and soft bottom habitats and communities, which are integral components of the Southwest Florida Shelf ecosystem.

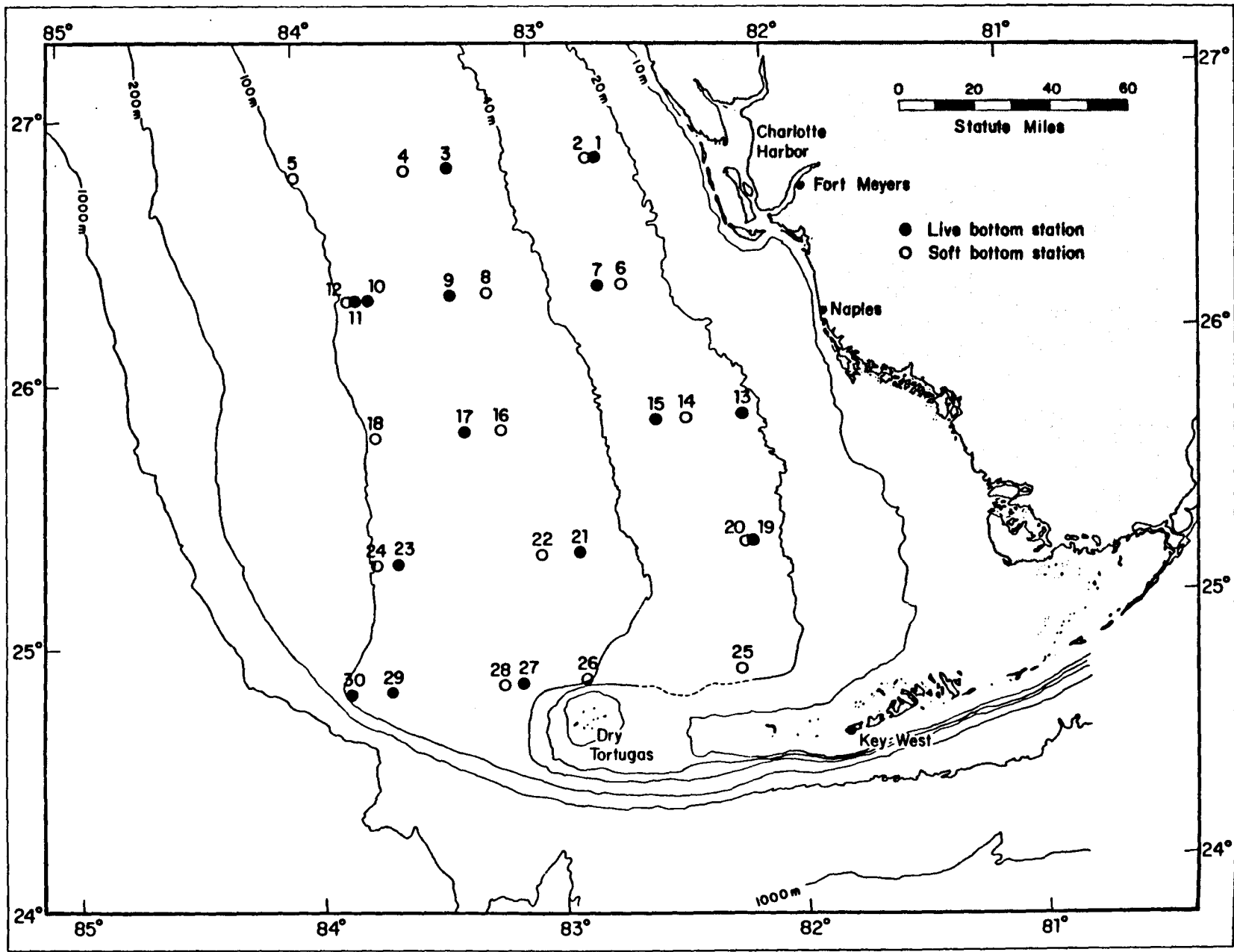


Figure 1. Year One

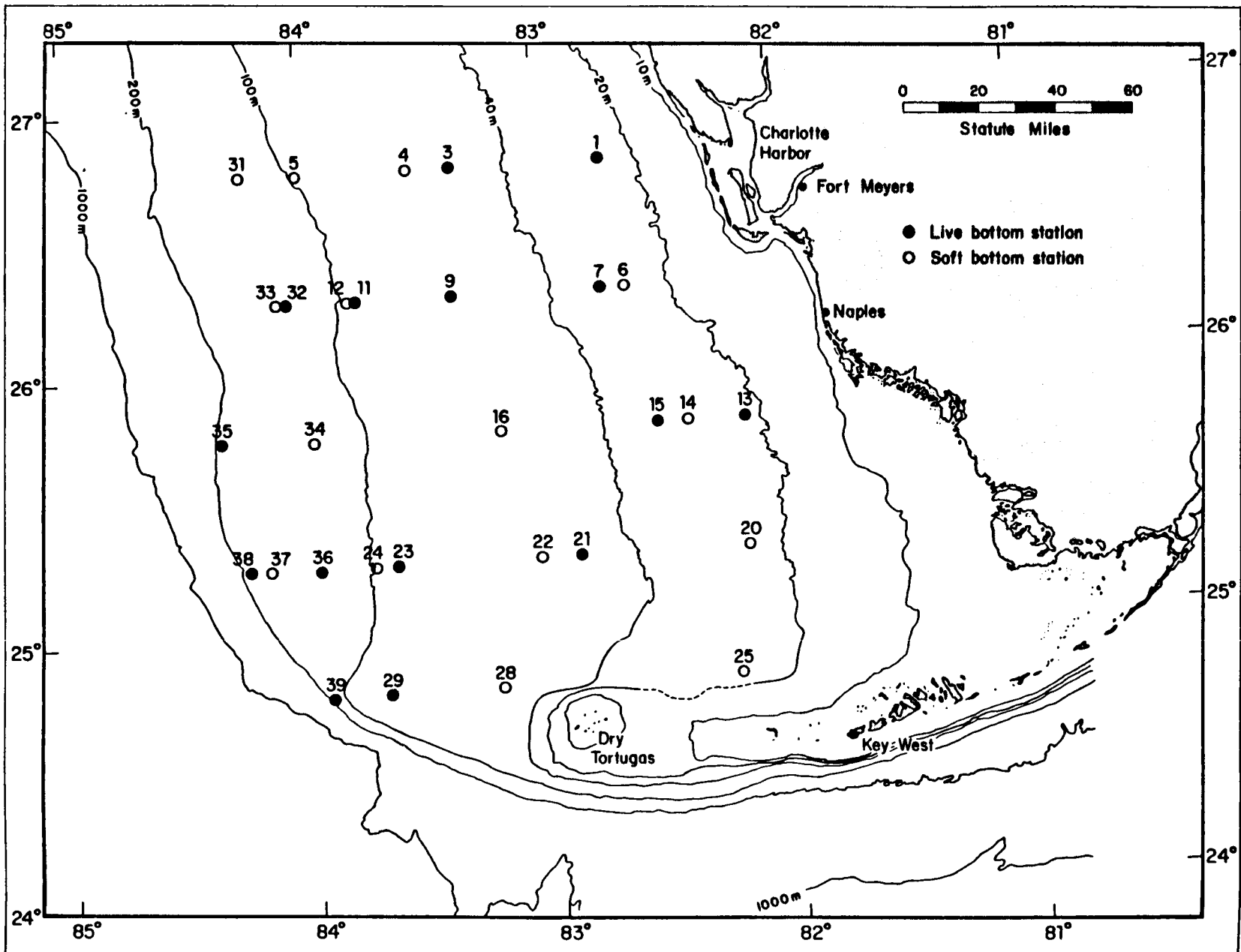


Figure 2. Year Two

Temperature °C Apr-May 1981

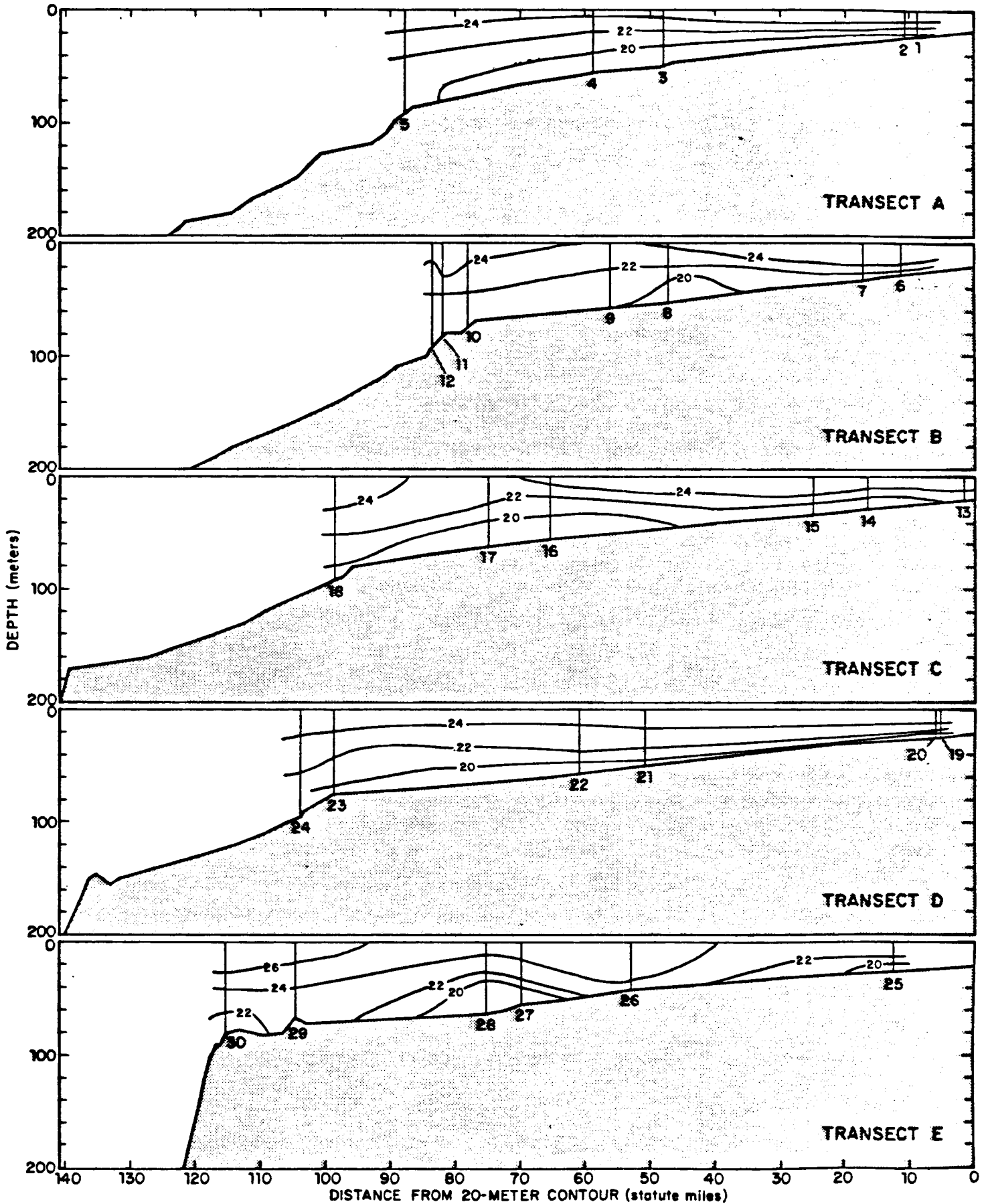


Figure 3.



Salinity ‰ Apr-May 1981

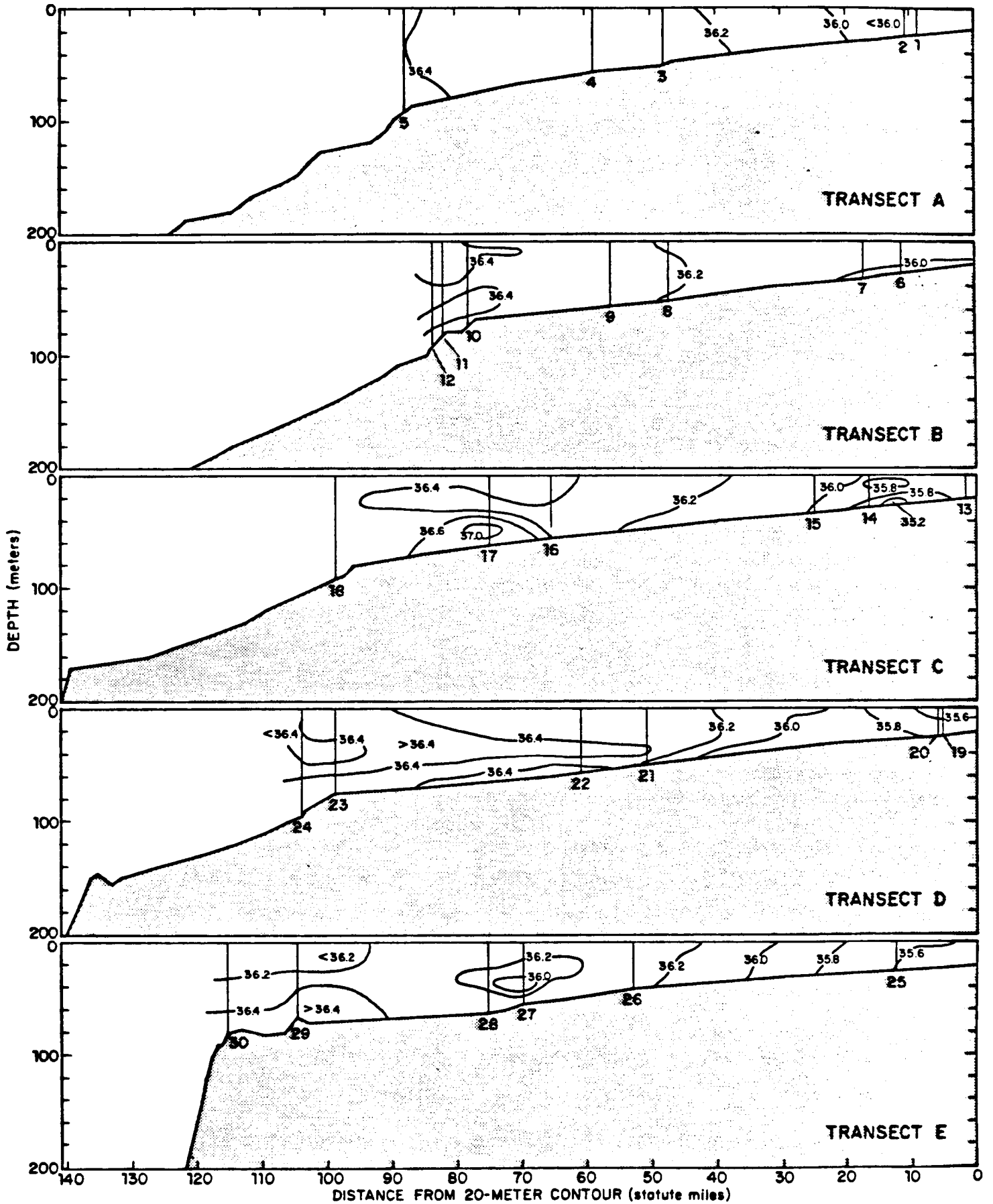


Figure 4.



Abstract

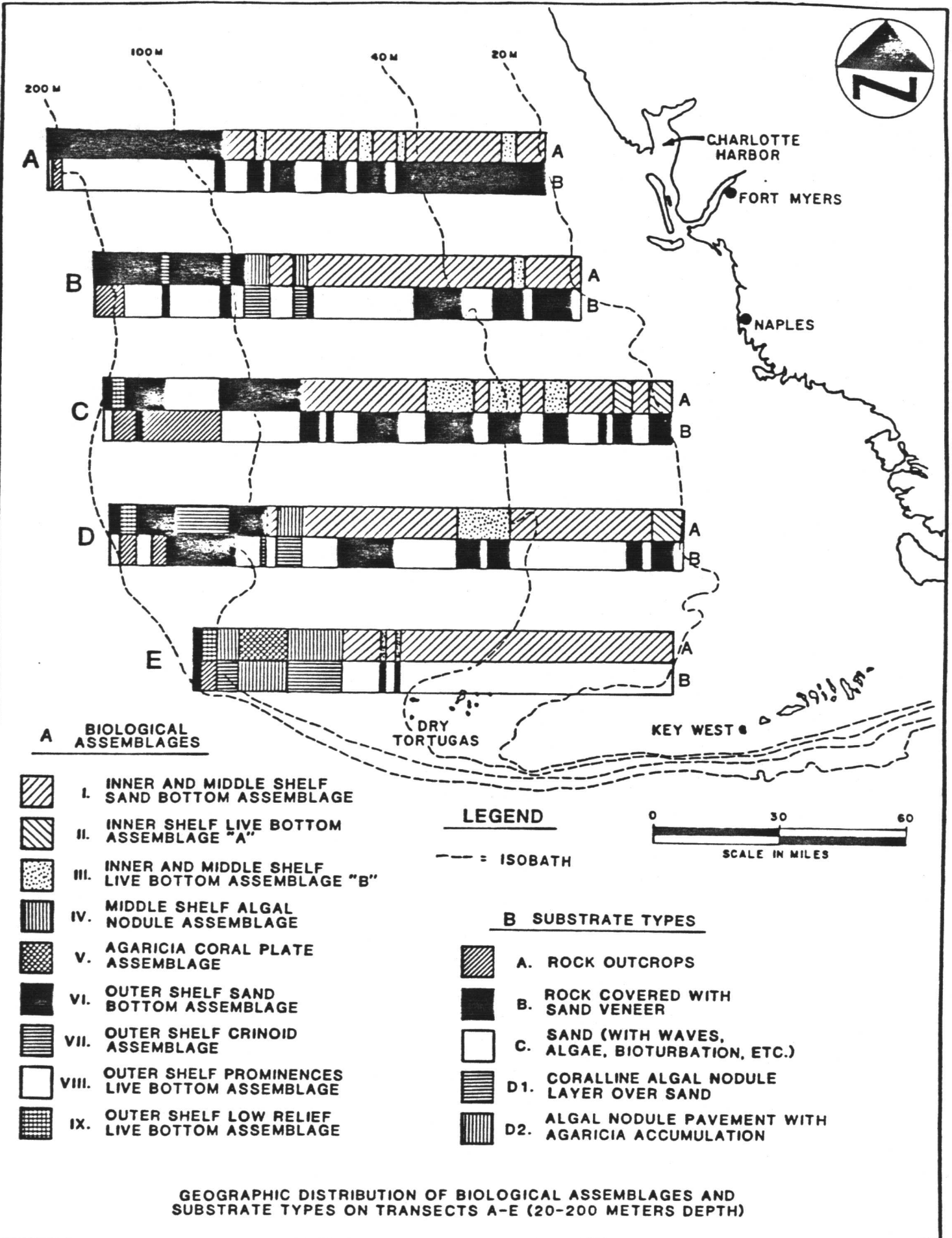
SOUTHWEST FLORIDA SHELF ECOSYSTEMS STUDY

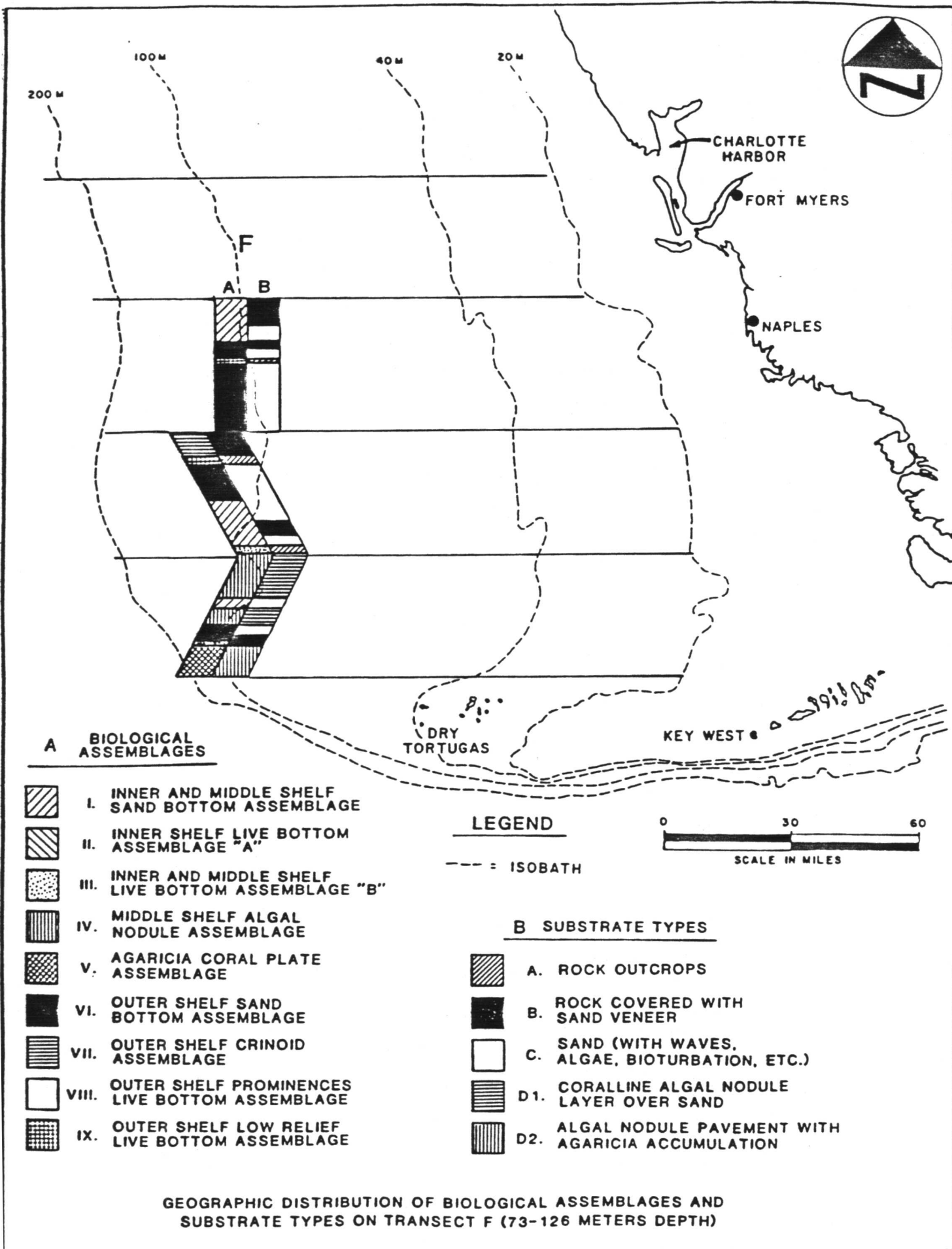
Contract Nos. AA851-CT0-50/CT1-45

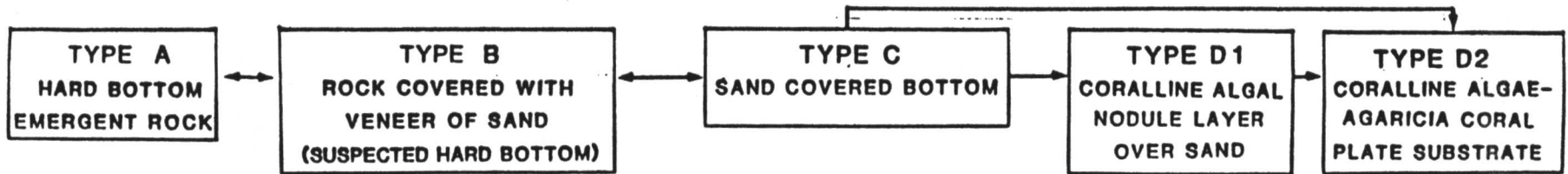
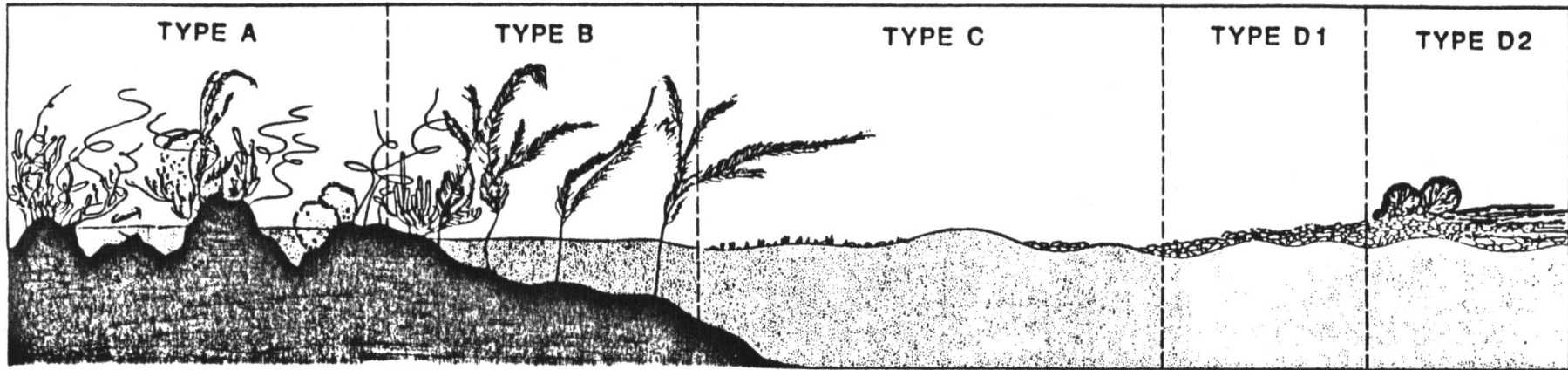
Subcontractor: Continental Shelf Associates
Subcontractor Manager: Dr. David A. Gettleson

A general description of the program including the types of samples and data collected have been previously reported (First Ternary Eastern Gulf of Mexico Studies Meeting - October 15-16, 1981, Tallahassee, Florida). In the intervening six months, the underwater television and still camera data from the two characterization cruises (October 10-22, 1980 and July 8-15, 1981) have been synthesized. These cruises included continuous television coverage of five east-west transects (20 to 200 m water depths) and one north-south transect (~50 to 100 m water depths). The qualitative data were examined and biological assemblages and substrate types discussed. The results of this effort are generalized in Figures 1, 2, and 3 as well as Table 1. They show that nine biological assemblages and five types of substrate were identified.

The qualitative (television, dredge tows, and trawls) and quantitative (still photographs and box core) samples and data at the 30 sampling stations are now being compared to the data from the characterization cruises. These samples and data were collected during four sampling cruises. The degree of agreement between the data and samples from the characterization and sampling cruises is not yet known.







GENERALIZED CLASSIFICATION SCHEME FOR BOTTOM TYPE
CHARACTERIZATION OF SOUTHWEST FLORIDA CONTINENTAL SHELF

PERCENT COVERAGE BY BIOLOGICAL ASSEMBLAGES
(20-200 meters depth)

Assemblages	Transects (% coverage)					
	A	B	C	D	E	F
I	49.6	58.8	46.7	58.2	70.3	27.1
II	-	-	6.6	4.4	-	-
III	9.9	1.8	14.6	5.3	1.5	2.7
IV	-	7.2	-	5.9	14.8	15.7
V	-	-	-	-	10.7	8.8
VI	40.5	30.1	20.6	13.8	0.8	38.7
VII	-	2.1	0.1	9.1	-	5.3
VIII	-	-	10.4	-	-	-
IX	-	-	1.0	3.3	1.9	1.7

Table 1.

SOUTHWEST FLORIDA SHELF ECOSYSTEM STUDY

YEAR III

Contract No. AA851-CT1-45

Contractor: Woodward-Clyde Consultants

Project Leader: Dr. Hong Chin

The third phase of this multi-year program is designed to investigate interrelationships between environmental variables and phytoplankton primary production across the middle and outer southwest Florida continental shelf. In particular, the role of Loop Current eddies crossing the shelf break is being examined from several points of view. Two field programs have been scheduled.

The first data collection cruise was successfully completed in early April 1982. Using NESS IR surface temperature maps to delineate successive positions of Loop Current eddies, a cruise plan involving multiple transects across the continental shelf and slope was executed as an eddy progressed from north to south through the study area (roughly 25°-27°N, 82°-85°W). Concurrent with shipboard sampling, surface chlorophyll gradients were mapped from U-2 aircraft overflights using NASA's Ocean Color Scanner (OCS). Preliminary examination of these radiometric data suggest appreciable surface chlorophyll gradients just west of the shelf break sample area. A series of 110 separate stations were sampled at the shelf break and across the shelf for primary productivity, ambient light characteristics, and hydrographic parameters. Data collected during this cruise included weather and wave observations, solar transmittance for reduction of the OCS data, temperature and salinity profiles across the shelf and along the 1000m isobath, and chlorophyll-a fluorescence. Water samples were collected for analyses of chlorophyll-a + phaeopigment-a, nutrients, oxygen, Carbon-14 productivity, and phytoplankton enumeration.

Ambient light measurements included profiles of scattering, irradiance, color, and transmission. Suspended sediment concentrations were measured at selected stations and depths for correlation with the optical data. Preliminary examination of these data suggest the presence of a highly productive area near the eastern end of one of the cross-shelf transects on about the sixth cruise day.

The second data collection cruise is presently scheduled for August 1982. August has been chosen because shelf waters are more stratified in the summer and subsurface intrusions of colder waters may penetrate further across the shelf. Since these colder waters may contain relatively high nutrient concentrations, it is predicted that productivity will be enhanced where intruded waters are present.

A number of related analyses and data set intercomparisons are scheduled to answer basic questions about the shelf environment and the field study methods. These analyses include, but are not limited to, the following:

- correlation analysis of hydrographic data to determine dominant scale of activity
- comparison of surface chlorophyll-a results developed by different methods
- characterization of the euphotic zone in terms of color, primary productivity, and standard biological parameters
- determination of shelf break productivity rates, the effects and roles of frontal eddies, and evaluation of interactions between shelf water, slope water and Loop Current meanders.

A comprehensive workshop to evaluate, synthesize, and critique these data and analyses is presently scheduled for mid-October 1982. At that time, recommendations for future work to further understand this area will be developed and reported.

Abstract

CIRCULATION STUDY OF THE WESTERN FLORIDA SHELF

Study for: BLM, Contract No. AA851-CT0-72

Performed by: NECE, Inc.

Existing and prospective energy-related development on the western Florida Continental Shelf (WFS) pose potential negative impacts to other uses of the shelf and coastline. In order to investigate impacts, the Bureau of Land Management (BLM) has recently funded the application of a circulation model to the WFS. The model is to provide information on: 1) surface current velocities for input into oil spill trajectory models; 2) mid-water circulation to predict dissolved and suspended matter transport; 3) near bottom currents to predict long-term sediment transport and 4) the important driving mechanisms. To adequately fulfill these requirements, a 3-dimensional circulation model must be used. The model being applied is based upon the equations of conservation of momentum and mass. A brief review of the model formulation is given.

As part of the study, a review of the existing data base in the region has been performed. Much of the study has involved analysis of data with special relevance to model tuning, verification and production runs. The results of the review and some of the more important data analyses are summarized.

Tuning and verification of the model requires either velocity or surface elevation data with which to compare model simulations. To accurately simulate the currents and surface elevations, one must adequately specify the forcing mechanisms such as wind, density field, etc. and this requires further data. Three data sets were selected for tuning and verifying the model:

- Data from the winter of 1978 which includes 25 days of velocity data from four current meters moored at two sites to the west of Cedar Key. Wind data is available from a weather buoy and four coastal stations, and surface level elevation is available from three coastal stations.
- Data from the winter of 1973 which was taken during the 1973-74 Shelf Dynamics Experiment (SDE) conducted along the WFS break south of Tampa. Data includes 30 days of velocity information from two current meters moored at one site in 50 m, as well as calculated offshore wind, observed wind at four coastal stations, and observed surface elevations at three coastal stations.
- Data from the summer of 1974 which consists of two months of calculated offshore winds, observed winds from four coastal stations, and observed surface elevations from two coastal stations.

Detailed comparisons of the data with the model are presented. The results can be summarized as follows:

- The model generally hindcasts the coastal surface elevations quite well being within ± 5 cm in a range of 40 cm. The exceptions to this are the summer of 1974 and stations at the northern and southern boundary, where the signal is only about ± 5 cm. In this range, modeling and data measurement errors become large compared to the true signal.
- The model hindcasts the winter 1978 velocity data reasonably well, generally being within ± 5 cm/s over a range of 15 cm/s.
- The model hindcasts of the winter 1973 SDE velocity data indicate that wind forcing plays only a minor role in determining the measured currents. Flow is dominated by eddies propagating from the Loop Current shoreward with characteristic time and length scales on the order of 15 days and 150 km.

Since the primary purpose of the modeling is to provide BLM with estimates of the residual circulation on the WFS, it has been necessary to estimate the various forcing mechanisms on a climatological scale. The mechanisms which contribute to net advection are: the winds, horizontal density gradients, and the Loop Current.

A review of the wind data suggests three periods: October through February, March and April, and May through September. Figure 1 shows the mean monthly offshore and wind vectors as well as the vectors representing the three periods. Figure 2 shows the surface currents on the WFS due to typical winds during October through February.

A preliminary compilation of all known hydrographic data on the shelf implies that the density is higher in the southern one-third of the WFS. Figure 3 shows a plan view of the isopycnals in the surface layer of the WFS during the summer. Hydrographic data on the WFS is sparse particularly in the northern half of the shelf and so the standard deviation (and uncertainty) associated with Figure 3 is quite high.

The Loop Current appears to always affect circulation in the southern half of the WFS from the shelf break to at least the 50 m isobath. Its influence is primarily in the form of eddies as described above, although a net southerly advection seems likely and is supported by drift card studies. The northern portion of the shelf also appears to be significantly affected by the Loop. Model sensitivity studies indicate that the Loop tends to generate a net southerly advection over the entire shelf as shown in Figure 4, although it is possible that a more complicated, weak two gyre system is set up during certain times as shown in Figure 5.

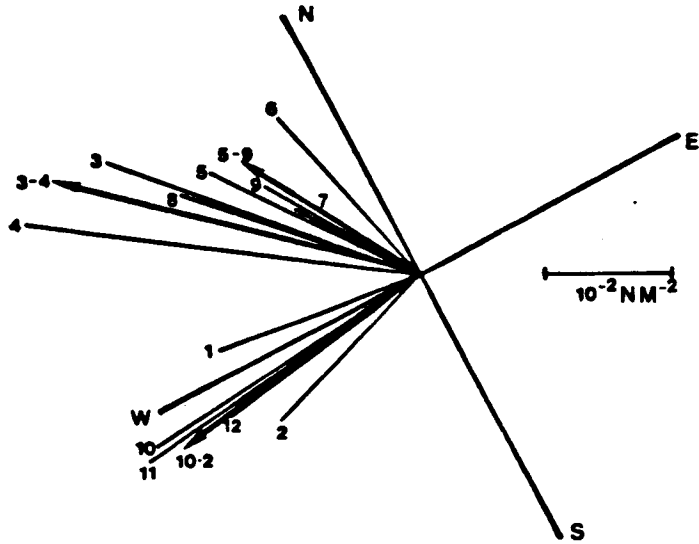


Figure 1:
 Average monthly wind stress vectors at Key West (1973-1977.) Note,
 monthly winds have been further averaged to three seasons indicated
 by heavy vectors with arrowheads.

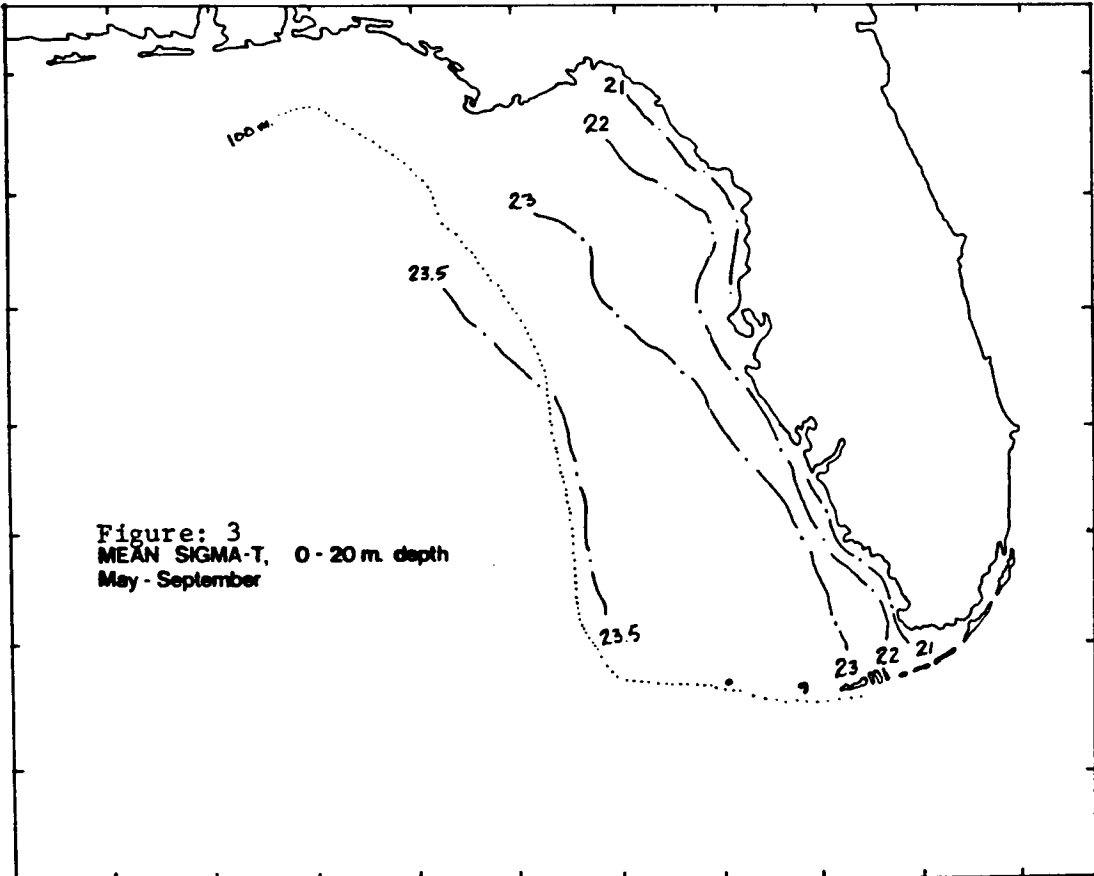


Figure: 3
 MEAN SIGMA-T, 0 - 20 m. depth
 May - September

Figure 2: Residual surface currents on West Florida Shelf for winter season. (1 feather = 0.5 cm/s)

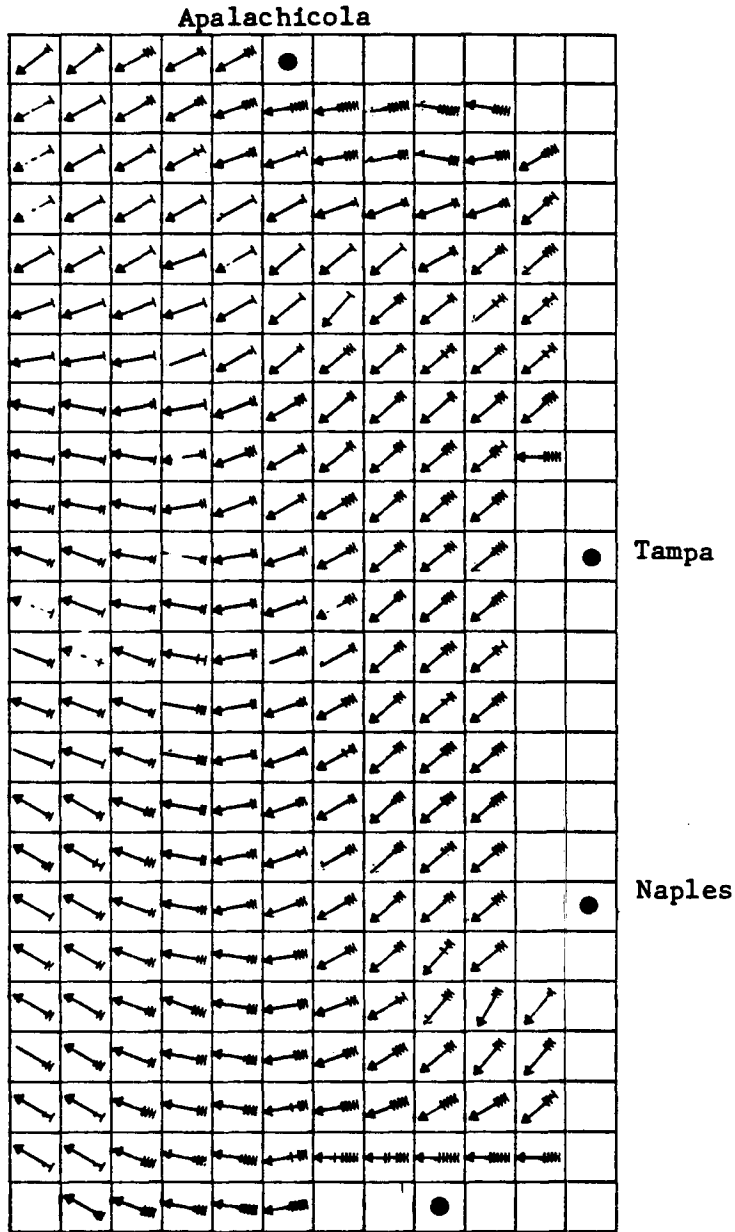
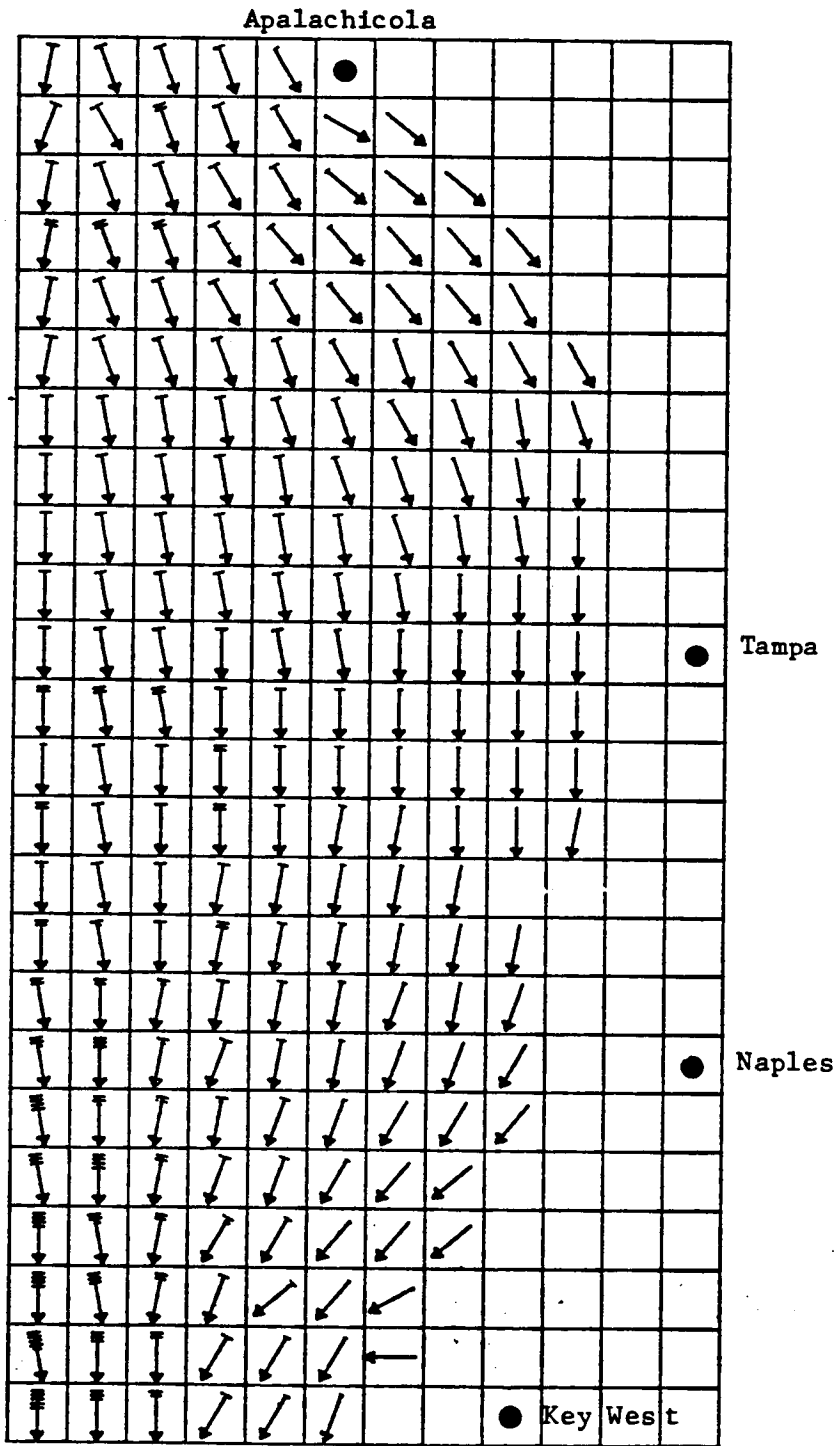


Figure 4: Modeled surface currents due to Loop Current of 100 cm/s impinging on southern half of West Florida Shelf (ramp function)



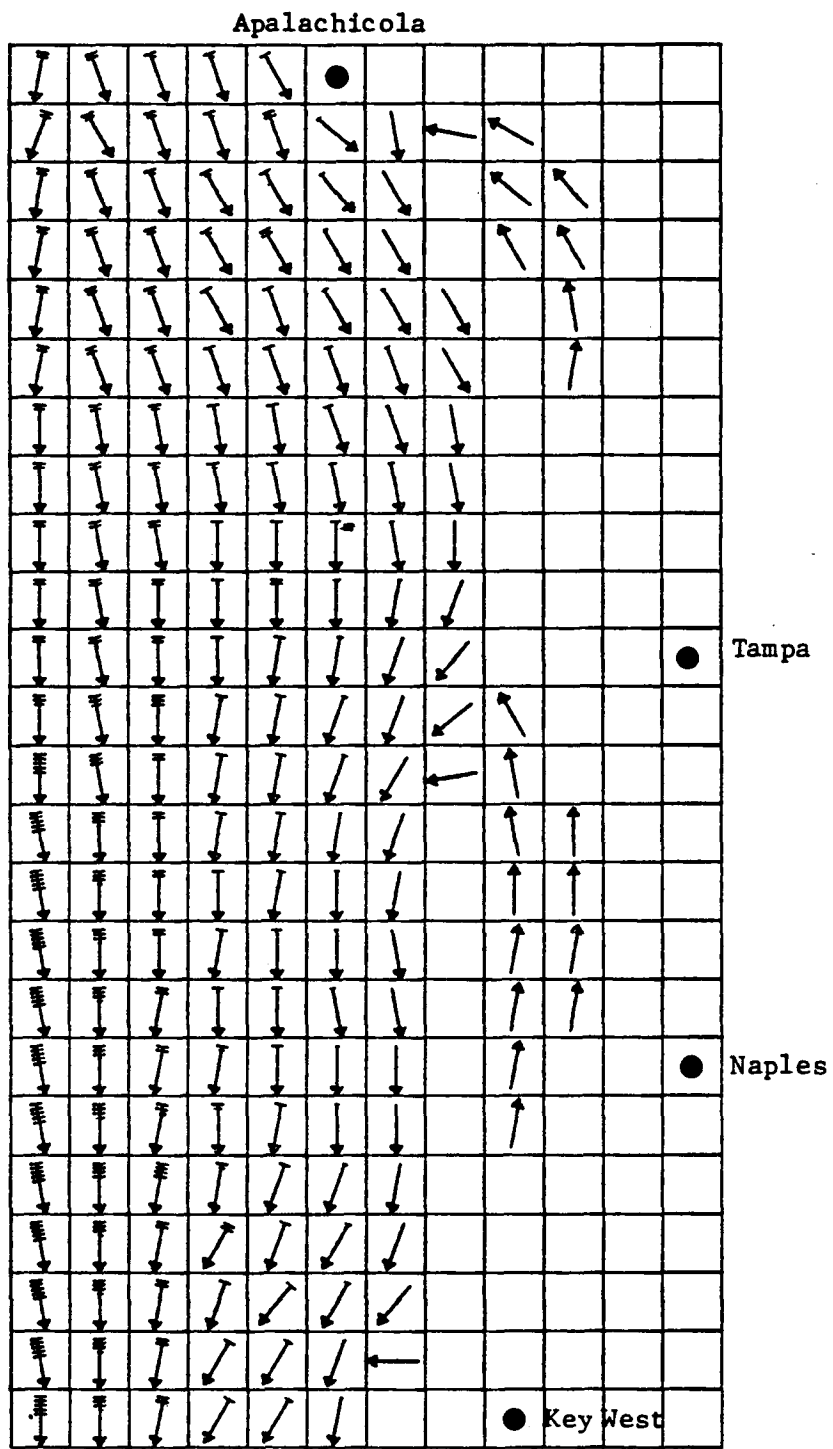
WFSCM - RUN 13-20 - LATERAL SHEAR SENSITIVITY RUN

TIME =96.00 H DEPTH =0.0 M

N




1 FEATHER LENGTH = 0.200 M/S

Figure 5: Modeled surface currents due to Loop Current of 100 cm/s impinging on southern half of West Florida Shelf (step function)



WFSCM - RUN 13-17 - LATERAL SHEAR SENSITIVITY RUN

TIME =99.00 H DEPTH =0.0 M

 N
 0.00 KM 60.00
 0.00 VEL (M/S) 2.20

MISSISSIPPI SOUND PROGRAM

Susan Ivester
Department of the Army
Mobile District, Corps of Engineers
P. O. Box 2288
Mobile, Alabama 36628

In 1977, the Congress Legislature authorized the Corps of Engineers to conduct a study to determine whether present and proposed dredging activities in coastal Mississippi and Alabama could be modified to increase economic efficiency and promote environmental quality. The study area encompasses portions of Alabama and Mississippi from Lake Borgne on the west to the eastern shore of Mobile Bay, extending south to the 120-foot depth contour of the Gulf of Mexico and north to Interstate Highway 10 (Figure 1).

The three-stage study program was developed to: (1) provide an overview of the resources and economy of the area, (2) investigate existing dredging and dredged material disposal practices, (3) analyze the effect of these practices on the resources and economy, and (4) determine if these practices should be modified.

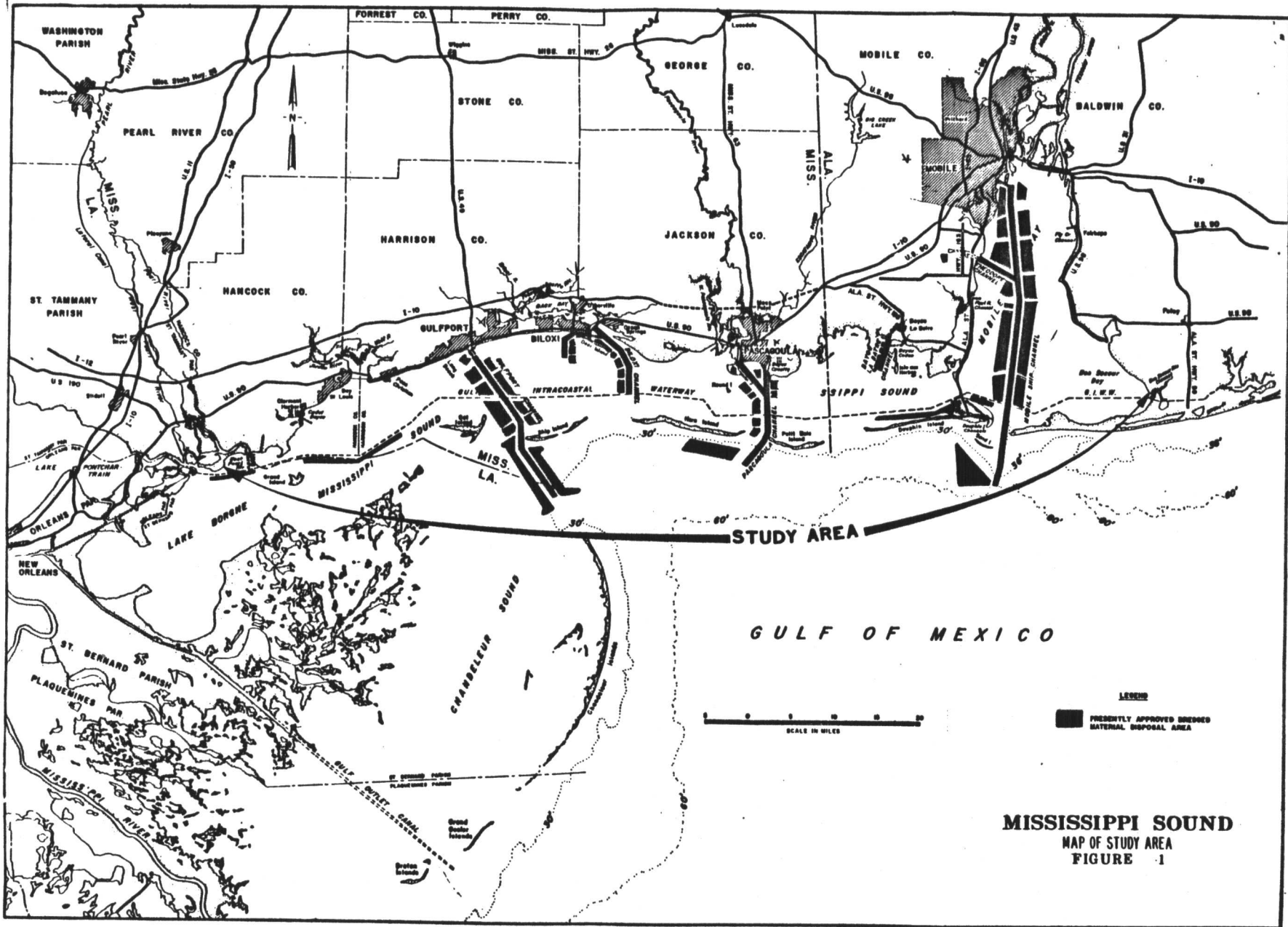
As part of the Stage I study effort, completed in 1979, a number of data gaps were identified for further study. These data gaps related to water circulation, sediment transport, properties of dredged material, location of critical environmental areas, values of submerged bottoms, and nontraditional dredging equipment.

The Stage II study effort, scheduled for completion in November 1982, was aimed at filling these data gaps and developing or adapting numerical models to aid in understanding the ecosystem and predicting future conditions. Extensive data collection efforts were undertaken in 1980-81 to develop baseline data for macroinfauna, sediment distribution, and hydrographic conditions in Mississippi Sound and the inshore Gulf of Mexico.

Macroinfauna have been grouped into communities based on species and environmental parameters including sediment characteristics, salinity, temperature, depth, and total organic carbon. Within Mississippi Sound, five community groupings have been delineated: (1) Mobile Bay mud, (2) inshore shallow bottom (coastal margin) mud, (3) deep bottom (open sound) muddy sand, (4) clean sand in tidal passes, and (5) shallow sound clean sand. Three offshore faunal assemblages have been delineated primarily on sediment type and species: (1) mud bottom, (2) mixed bottom (muddy sand), and (3) clean sand. Analyses are presently being conducted to investigate sound-offshore faunal similarities.

Data have also been collected on salinity, temperature, current velocity and direction and meteorological conditions. These data are being analyzed to determine to what extent circulation is driven by density effects, wind stress and tidal currents, how persistent currents and circulation features are within the Sound, what is a representative flushing time for the Sound, how does the Sound respond to high river discharge events, etc.

A two-dimensional numerical model has also been developed for the Mississippi Sound which will be utilized to simulate changes in circulation patterns due to dredging and disposal practices.



SATELLITE-DERIVED, QUANTITATIVE SEA SURFACE TEMPERATURE OBSERVATIONS

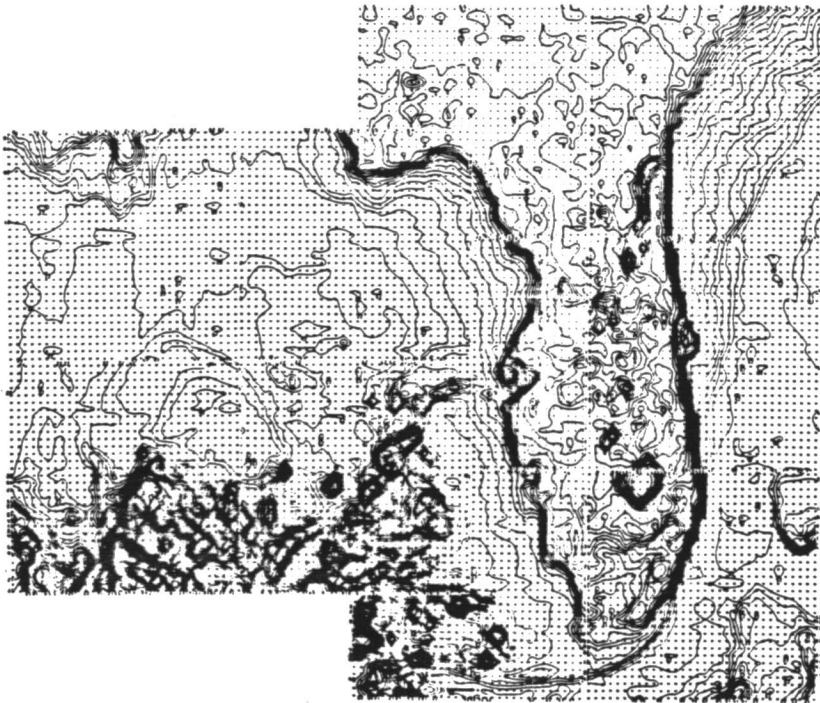
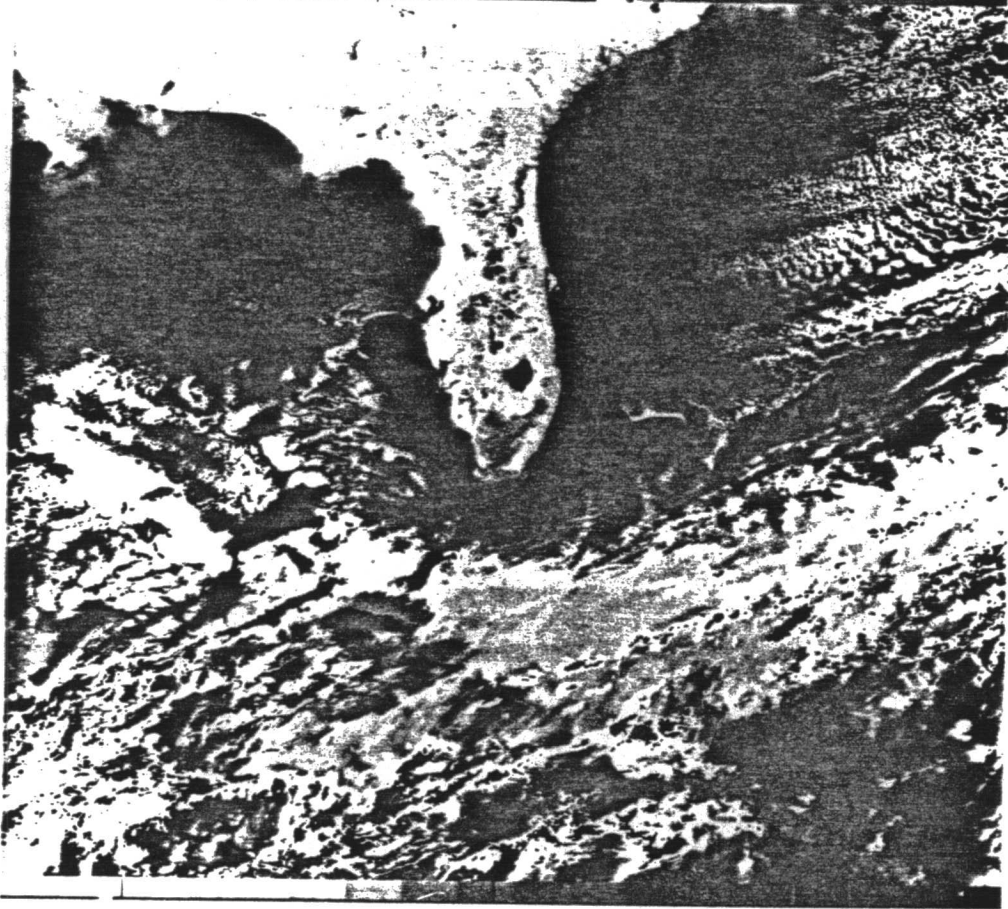
Richard M. Clark
National Earth Satellite Service
Slidell, Louisiana 70458

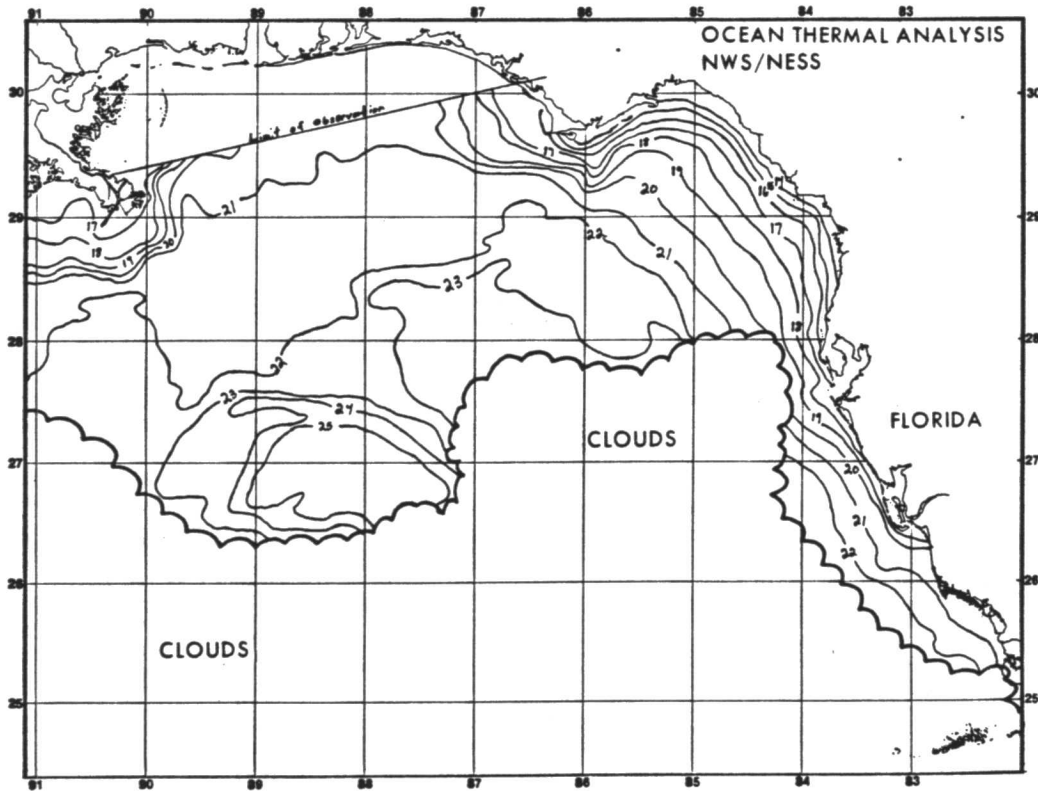
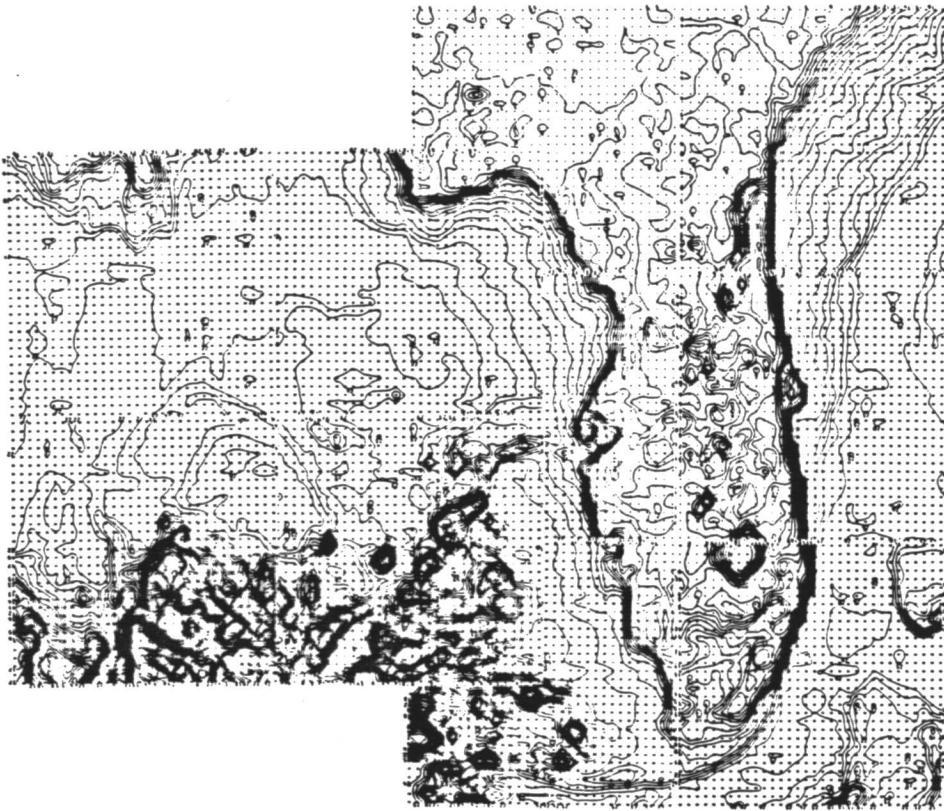
On August 24, 1981 the National Earth Satellite Service (NESS) established the New Orleans Satellite Field Services Station (SFSS) at Slidell, Louisiana. This office is collocated with the New Orleans National Weather Service Forecast Office (WSFO). The primary mission of the SFSS is to provide oceanographic and meteorologic support, through the interpretation of satellite data, to the marine user community bordering the Gulf of Mexico. To effectively carry out this mission personnel from both the SFSS and the WSFO have been combined to form an Ocean Services Center (OSC).

One of the marine products that will be operationally available from the OSC will be satellite-derived, quantitative sea surface temperature (SST) analyses. An analysis is produced from polar orbiting digital satellite data. The present operational, polar orbiting satellite, designated NOAA-7, is the latest in NOAA's TIROS-N series. NOAA-7's orbit altitude is approximately 850 km and generally makes two passes a day (0300 LST and 1500 LST) over the Gulf region. The primary sensor aboard NOAA-7 relevant to ocean monitoring is the Advanced Very High Resolution Radiometer (AVHRR). The AVHRR measures energy in five spectral bands: one visible, one near-infrared and three thermal infrared (IR). It is the three thermal IR channels that are used to derive SST's.

NOAA-7 digital satellite data are received at the Wallops Island, Virginia Command Data Acquisition Station (CDA). From there, data are sent to the NOAA computer Facility at Suitland, Maryland. There, the IR digital data are processed on the NOAA IBM 360/195 computer and SST's are derived. The temperature measurements are corrected for atmospheric attenuation by use of a multispectral algorithm. The processed data are then sent to a line-printer terminal in Slidell, Louisiana. The "print-outs" take the form of gridded, alphanumeric representations of the SST's. The SST data are hand contoured to the nearest 0.5 degrees Celsius and registered to a base map. The finished products are then disseminated by mail or telecopier. The OSC has ordered an automatic telecopier which will allow users to phone in and receive the analyses at their convenience. Future plans include the real-time dissemination to ships at sea via radio facsimile.

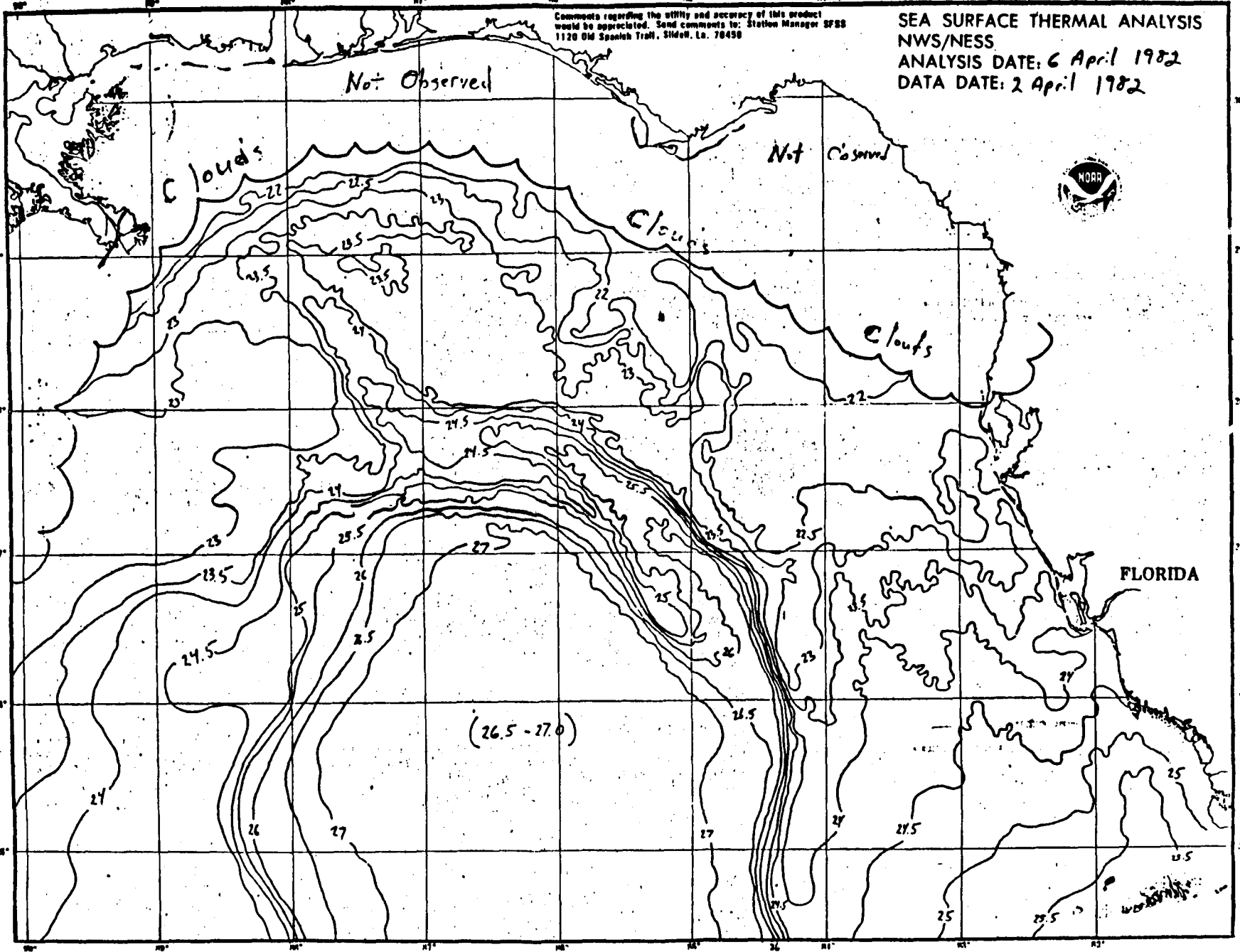
WHL 1 335:00:44:30 2413 4 640 N6 HIR 24W 30NDV80





Comments regarding the utility and accuracy of this product
would be appreciated. Send comments to: Station Manager SFSS
1120 Old Spanish Trail, Slidell, La. 70450

SEA SURFACE THERMAL ANALYSIS
NWS/NESS
ANALYSIS DATE: 6 April 1982
DATA DATE: 2 April 1982



63

EXAMPLES OF PRODUCTS TO BE ISSUED

BY

NOAA'S SLIDELL OCEAN SERVICES CENTER

**U. S. Department of Commerce
National Oceanic & Atmospheric Administration
Ocean Services Center
1120 Old Spanish Trail
Slidell, Louisiana 70458**

May 1982

COASTAL MARINE FORECAST
NATIONAL WEATHER SERVICE NEW ORLEANS LA
339 AM CST FRI MAR 27 1981

SYNOPSIS COASTAL WATERS APALACHICOLA TO PORT ARTHUR
NORTH TO SOUTH COLD FRONT NEAR LAKE CHARLES WILL MOVE EAST TO FLORIDA
PANHANDLE BY MID SATURDAY.

APALACHICOLA TO PENSACOLA OUT 50 MILES
WINDS SOUTHEAST 15 TO 20 KNOTS SHIFTING TO NORTHWEST SATURDAY. SCATTERED
THUNDERSTORMS SATURDAY.

SEAS IN PROTECTED WATERS 2 TO 3 FEET. ELSEWHERE SEAS 4 TO 6 FEET. NEXT
HIGH TIDE 3 PM AND AND LOW TIDE 2 AM SATURDAY...RANGE 1.2 FEET. TIDE 1 TO
2 FEET ABOVE NORMAL...FALLING LATE SATURDAY.

PENSACOLA TO GULFPORT OUT 50 MILES
WINDS SOUTH 15 TO 20 KNOTS SHIFTING TO NORTHWEST LATE TONIGHT. SCATTERED
THUNDERSTORMS TONIGHT ENDING SATURDAY.

SEAS IN PROTECTED WATERS 2 TO 3 FEET. ELSEWHERE SEAS 4 TO 6 FEET. NEXT
HIGH TIDE 4 PM AND LOW TIDE 5 AM SATURDAY...RANGE 1.7 FEET. TIDE 1 TO 2
FEET ABOVE NORMAL FALLING SATURDAY.

GULFPORT TO MISSISSIPPI RIVER OUT 50 MILES
WINDS SOUTH 20 KNOTS SHIFTING TO NORTHWEST TONIGHT. SCATTERED THUNDERSTORMS
TONIGHT ENDING SATURDAY.

SEAS IN PROTECTED WATERS 2 TO 4 FEET. ELSEWHERE SEAS 4 TO 7 FEET. NEXT HIGH
TIDE 5 PM AND LOW TIDE 6 AM SATURDAY...RANGE 1.3 FEET. TIDE 2 FEET ABOVE
NORMAL FALLING SATURDAY.

MISSISSIPPI RIVER TO VERMILLION BAY OUT 50 MILES
WINDS SOUTHWEST 15 TO 20 KNOTS SHIFTING TO NORTHWEST THIS EVENING. SCATTERED
THUNDERSTORMS ENDING TONIGHT.

SEAS IN PROTECTED WATERS 2 TO 4 FEET. ELSEWHERE SEAS 4 TO 6 FEET. NEXT HIGH
TIDE 8 PM AND LOW TIDE 3 AM SATURDAY...RANGE 1.3 FEET. TIDE 1 TO 2 FEET
ABOVE NORMAL FALLING TONIGHT TO NEAR NORMAL SATURDAY.

VERMILLION BAY TO PORT ARTHUR OUT 50 MILES
WINDS SHIFTING TO NORTHWEST 15 TO 20 KNOTS TODAY BECOMING NORTHERLY SATURDAY.
THUNDERSTORMS ENDING BY AFTERNOON.

SEAS IN PROTECTED WATERS 1 TO 3 FEET. ELSEWHERE SEAS 3 TO 5 FEET. NEXT
HIGH TIDE 10 PM AND LOW TIDE 3 AM SATURDAY...RANGE 1.1 FEET. TIDE FALLING TO
BELOW NORMAL BY LATE SATURDAY.

OFFSHORE MARINE FORECAST
NATIONAL WEATHER SERVICE NEW ORLEANS LA
439 PM CDT MON MAY 3 1982

SYNOPSIS GULF OF MEXICO

A BROAD BUT WEAK RIDGE OF HIGH PRESSURE OVER THE SOUTHEASTERN US WILL DRIFT SLOWLY EAST WARD.

NORTHWEST GULF NORTH OF 25N AND WEST OF 90W.

SOUTHEAST WINDS NEAR 10 KNOTS TONIGHT INCREASING TO 10 TO 15 KNOTS TUESDAY AND TUESDAY NIGHT. SEAS LESS THAN 4 FEET TONIGHT AND TUESDAY. PARTLY CLOUDY.

SOUTHWEST GULF SOUTH OF 25N AND WEST OF 90W.

NORTHEAST WINDS 10 TO 20 KNOTS TONIGHT BECOMING NORTHEAST AND EAST 10 TO 15 KNOTS TUESDAY AND TUESDAY NIGHT. SEAS 4 TO 6 FEET TONIGHT AND TUESDAY. PARTLY CLOUDY.

MIDDLE GULF BETWEEN 85W AND 90W.

EAST TO NORTHEAST WINDS NEAR 10 KNOTS NORTH PORTION AND 10 TO 15 KNOTS SOUTH PORTION THROUGH TUESDAY NIGHT. SEAS LESS THAN 4 FEET TONIGHT NORTH PORTION AND 3 TO 5 FEET SOUTH PORTION TONIGHT AND TUESDAY. PARTLY CLOUDY.

EAST GULF BETWEEN 81W AND 85W

NORTHEAST WINDS 10 TO 15 KNOTS TONIGHT THROUGH TUESDAY NIGHT. SEAS 4 FEET OR LESS TONIGHT AND TUESDAY. A FEW SHOWERS AND THUNDERSHOWERS TONIGHT...OTHERWISE PARTLY CLOUDY THROUGH TUESDAY NIGHT.

GULF OF MEXICO EXTENDED OUTLOOK
NATIONAL WEATHER SERVICE NEW ORLEANS LA
4 PM CDT FRI MAY 7 1982

MONDAY THROUGH WEDNESDAY

HIGH PRESSURE IS EXPECTED TO BE CENTERED OVER THE EASTERN HALF OF THE U.S. AND EXTEND ACROSS THE GULF MONDAY AND TUESDAY WITH A WEAK COLD FRONT MOVING INTO THE NORTHWEST GULF EARLY WEDNESDAY. LIGHT TO MODERATE MOSTLY EAST AND NORTHEAST WINDS WILL PERSIST EXCEPT BEHIND THE COLD FRONT WEDNESDAY MODERATE NORTHERLY WINDS CAN BE EXPECTED. SEAS WILL REMAIN LIGHT THROUGH THE PERIOD.

MARINE WEATHER STATEMENT
NATIONAL WEATHER SERVICE NEW ORLEANS LA
1230 PM CST WED APR 14 1982

SATELLITE AND PILOT REPORTS INDICATE THAT VOLCANIC ASH OR DUST IS DRIFTING NORTHWARD AGAIN ACROSS THE NORTHWEST GULF. AT NOON TODAY THE LEADING EDGE WAS 150 MILES SOUTH OF THE LOUISIANA COAST. WITH THE CONTINUED NORTHWARD DRIFT TO THIS DUST IT SHOULD AFFECT THE LOUISIANA COASTAL WATERS TONIGHT AND THURSDAY WITH THE GREATEST CONCENTRATION IN THE SOUTHWEST LOUISIANA COASTAL WATERS AND POSSIBLY MAY DRIFT INTO THE UPPER TEXAS COASTAL WATERS. THIS DUST MAY POSE A PROBLEM FOR OPERATIONS ON THE SURFACE AND ALOFT. VISIBILITIES WILL BE REDUCED TO LESS THAN 3 MILES INTO THE DUST.

SPECIAL MARINE WARNING
NATIONAL WEATHER SERVICE NEW ORLEANS LA
620 PM CDT SUN APR 20 1982

THE NATIONAL WEATHER SERVICE HAS ISSUED A SPECIAL MARINE WARNING EFFECTIVE UNTIL 820 PM CDT FOR THE COASTAL WATERS OF SOUTHEAST LOUISIANA EAST OF GRAND ISLE.

A WATERSPOUT WAS SIGHTED IN THE AREA OF BOOTHVILLE MOVING TOWARD THE NORTHEAST. RADAR INDICATES SCATTERED THUNDERSTORMS OVER MOST OF SOUTHEAST LOUISIANA EAST OF GRAND ISLE.

MARINE INTERESTS IN THESE AREAS...ESPECIALLY SMALL CRAFT OPERATORS... SHOULD BE ON THE ALERT FOR WATERSPOUTS ALONG WITH THUNDERSTORMS PRODUCING GUSTY WINDS AND ROUGH SEAS FOR THE NEXT TWO HOURS.

SMALL CRAFT OPERATORS SHOULD REMAIN CLOSE TO SHORE AND IF THREATENING WEATHER IS SIGHTED SHOULD SEEK SHELTER IMMEDIATELY.

SMALL CRAFT ADVISORY
NATIONAL WEATHER SERVICE NEW ORLEANS LA
339 AM CST WED APR 21 1982

A SMALL CRAFT ADVISORY IS EFFECTIVE IMMEDIATELY FROM BILOXI MISSISSIPPI WEST TO MORGAN CITY LOUISIANA FOR WINDS SHIFTING TO NORTHEAST AND INCREASING TO 20 TO 25 KNOTS AND GUSTY TODAY. SEAS INCREASING TO 5 TO 8 FEET. A SMALL CRAFT ADVISORY CONTINUES IN EFFECT WEST OF MORGAN CITY TO PORT ARTHUR TEXAS.

GALE WARNING
NATIONAL WEATHER SERVICE NEW ORLEANS LA
939 AM CST SUN JAN 10 1982

AT 10 AM THIS MORNING CHANGE THE SMALL CRAFT ADVISORY TO GALE WARNINGS FROM BILOXI MS WEST TO PORT ARTHUR TX. NORTHERLY WINDS NEAR 20 KNOTS AND GUSTY WILL BE INCREASING TO 30 TO 40 KNOTS AND GUSTY BY LATE TODAY OR EARLY TONIGHT. SEAS WILL ALSO BE INCREASING TO 8 TO 12 FEET BY EARLY TONIGHT. A STRONG SURGE OF VERY COLD AIR WILL BE MOVING INTO THESE COASTAL WATERS BY LATE TODAY AND CONTINUE INTO MONDAY.

A SMALL CRAFT ADVISORY REMAINS IN EFFECT FROM APALACHICOLA FA WEST TO

MSY FAM 261740
261800Z-270600Z
OTLK270600Z-271200Z
AMDTS NOT AVBL 02Z-11Z

GULF OF MEXICO W OF 88.5 DEG...N OF 27.5 DEG...AND ADJ CSTL PLAINS

HGTS MSL UNLESS NOTED...

TSTMS IMPLY PSBL SVR OR BTR TURBC...SVR ICG...AND LOW LVL WND SHEAR...
HI SFC WND AND WVS

01 SYNS...

CDGNT EXTNDG FM SWRN PTN OF DE SOTO CANYON AREA WSW TO NRN PTN OF
ALAMINOS CANYON AREA WL MOV SLOLY SEWD. HI PRES CNTRD INLND BHND FNT
WL MOV SLOLY EWD.

02 FLT PRCTNS...

OVR ENTIRE AREA MDT TURBC BLO 40 DUE TO STG LOW LVL WND. TURBC DCRG
AFT O0Z AND ENDG AT 03Z.

03 MARINE PRCTNS...

SMALL CRAFT ADVISORY ENTIRE AREA. SEAS 8-12 FEET. LTL CHG EXPD TIL
06Z.

04 SIGCLDS AND WX...

OVER AREA MS CANYON GREEN CANYON GARDEN BANKS EAST BANK MAT AND MUS
AREA...

CIG 15-25 BKN/OVC 40-50 100 SCT 250 SCT/BKN. VSBY ABV 7. CLDS DCRG
SLOLY E HLF THIS AREA BCMG SCT BY 06Z. W HLF AREA WIL CHG LTL THRU
PD. OTLK...VFR E HLF AND MVRF CIG W HLF.

OVER RMDR LEASE AREAS...

20-30 SCT TO CLR. VSBY ABV 7. LTL CHG EXPD. OTLK BCMG MVFR CIG FM WC
AREA WVN BY 18Z. VFR E OF WC.

CSTL PLAINS...

40 SCT TO CLR. VSBY ABV 7. OTLK...VFR.

05 ICG AND FRZLVL BLO 100...

NO ICG. FRZLVL ABV 100.

06 TURBC BLO 100...

OVR ENTIRE AREA MDT TURBC BLO 40 DUE TO STG LOW LVL WND. TURBC DCRG
AFT O0Z AND ENDG ARND 03Z.

07 WND SFC 100...

SFC 40 N 25-35 KT. 40-60 NW 15 KT. 60-100 W 25 KT.

08 WAVES...

INCRG TO 4-8 FEET WITHIN ABT 30 MI OF CST AND CONTG TO INCRS TO 8-10
FEET ACRS RMDR AREA.

MSY UWS 122300
SIGMET JULIET 1 122300-130300

LA AND ADJ CSTL WTRS
FM 30 N LCH TO MSY TO 150 S MSY TO 150 S LCH
MDT TO SVR TURBC BLO 60 DUE STG LVL WND S NEAR 45 KNOTS
WITHIN 2 THSD FT OF SFC. AENLY STG LOW LVL WND SHEAR MAINLY
NR CST. TURBC DCRG SLOLY FM S ENDC OVR LND BY 02Z BUT CONTG
OVR CSTL WTRS BYD 03Z.

MSY WA 121600
AIRMET OSCAR 1 121600-122200
CSTL WTRS LA MS AL NW FL

FM 20 S CEW TO 40 S CEW TO 90 S MSY TO 60 S LCH TO 60 S LCH TO 50 S
MSY TO 40 SW MOB
CIGS BLO 5 HND FT AND VSBY BLO 2 MI WITH FQT ZERO-ZERO CONDITIONS
IN DENSE SEA FOG WL CONT THRU AFTN AND CHG LTL. CONT BYD 22Z.

COASTAL MARINE ENVIRONMENT NOWCAST
ISSUED 10 AM CDT MAY 5 1982
NATIONAL WEATHER SERVICE NEW ORLEANS LA

AT 10 AM SATELLITE SHOWED A LARGE AREA OF HEAVY RAIN WITH FEW
EMBEDDED THUNDERSTORMS OVER THE NORTHERN SECTION OF THE KEATHLEY
CANYON AREA AND SOUTHERN SECTION OF THE GARDEN BANKS AREA.
THIS ACTIVITY IS MOVING NORTH AT 20 TO 25 KNOTS AND WILL BE
AFFECTING THE SOUTHERN THIRD OF EAHI WC EC VERM STI AND SMI
BY NOON TODAY.

THESE THUNDERSTORMS ARE STILL TO FAR OFFSHORT FOR LAND BASED
RADARS TO DETERMINE THEIR INTENSITY. HOWEVER...WHEN THISACTIVITY
MOVED OVER THE BOUY LOCATED IN THE SOUTHWEST CORNER OF THE
KEATHLEY CANYON AREA AT 8 AM THIS MORNING IT PRODUCED WINDS
OF 35 KNOTS AND GUSTS TO 45 KNOTS WITH SEAS INCREASING RAPIDLY
TO 10 FEET. SATELLITE SHOWS THERE HAS BEEN NO DECREASE IN INTENSITY
SINCE THIS TIME.

AIR AND SEA CRAFTS SHOULD DELAY OR SUSPEND ACTIVITY IN THIS
AREA UNTIL THE HEAVY RAIN AND THUNDERSTORMS MOVE OUT OF THE
AREA OR DECREASE IN INTENSITY.

WE SHOULD BE RECEIVING OBSERVATIONS FROM SEVERAL PLATFORMS
IN THE LEASE AREAS AND WILL PROVIDE THIS INFORMATION AS SOON
AS IT IS AVAILABLE.

THE NEXT SCHEDULED ISSUANCE 1 PM.

BULLETIN
HURRICANE ZELDA...LOCAL STATEMENT NUMBER 1
NATIONAL WEATHER SERVICE NEW ORLEANS LA
1 PM CDT THUR SEP 15 1977

THIS STATEMENT RECOMMENDS SPECIFIC ACTION TO BE TAKEN IN THE FOLLOWING LOUISIANA PARISHES...ST TAMMANY...ST BERNARD...PLAQUEMINES...ORLEANS...JEFFERSON. ST CHARLES...LAFOURCHE...TERREBONNE...ST MARY...TANGIPAHOA...IBERIA...ASSUMPTION. ST JOHN THE BAPTIST...ST JAMES...ST MARTIN...AND WASHINGTON PARISHES. PERSONS ELSEWHERE SHOULD LISTEN TO STATEMENTS ISSUED BY LOCAL WEATHER SERVICE OFFICES.

A HURRICANE WATCH IS IN EFFECT FOR THE NORTH GULF COAST FROM APALACHICOLA FLA WESTWARD TO PORT ARTHUR TEX. A HURRICANE WATCH MEANS THAT HURRICANE CONDITIONS COULD OCCUR WITHIN 36 HOURS. THE PUBLIC...INDUSTRY...AND GOVERNMENT SHOULD BEGIN PRELIMINARY PREPARATIONS AND INSURE THE READINESS OF SAFETY PROCEDURES IN CASE A HURRICANE WARNING IS POSTED. EVACUATION AND SECURING OF OFFSHORE OIL AND GAS PLATFORMS AND OTHER FACILITIES SHOULD BE COMPLETED BEFORE WINDS AND SEAS BECOME TOO DANGEROUS.

NEAR THE COAST...NEAR TIDAL LAKES...AND ALSO IN COASTAL WATERS ACTION SHOULD BE TAKEN TO INSURE THE READINESS OF PLANS FOR EVACUATION AND SECURING OF MARINE VESSELS...HOMES...INDUSTRY...AND BUSINESS ESTABLISHMENTS. RESIDENTS IN AREAS THAT MAY HAVE TO BE EVACUATED SHOULD BE SURE THEIR AUTOMOBILE TANKS ARE FULL AND KNOW WHERE TO DRIVE FOR SAFE SHELTER. REMEMBER THAT THE STORM SURGE AND FLOODING ARE THE GREATEST KILLERS. WIND IS ALSO RESPONSIBLE FOR MANY STORM DEATHS ESPECIALLY WHERE HURRICANES SPAWN TORNADOS.

REMEMBER THAT UTILITIES AND OTHER SERVICES ARE OFTEN DISRUPTED BY HURRICANES. IT IS RECOMMENDED THAT PEOPLE HAVE A STOCK OF CANNED FOOD...WATER...SPARE BATTERIE FOR RADIOS AND FLASHLIGHTS...AND OTHER PROVISIONS. FILL YOUR CARS WITH GAS. MOBILE HOMES SHOULD BE TIED DOWN AND OUTDOOR OBJECTS SECURED OR BROUGHT INDOORS. IF WARNINGS ARE POSTED MOBILE HOMES SHOULD BE EVACUATED FOR SAFE SHELTER.

WHILE ZELDA IS STILL NEARLY 500 MILES SOUTH SOUTHEAST OF NEW ORLEANS... HURRICANE WARNINGS MAY BE PLACED IN EFFECT EARLY FRIDAY AND ACTION TO INSURE THE SAFETY OF LIFE AND PROPERTY WILL HAVE TO BE TAKEN QUICKLY. STAY TUNED TO RADIO AND TV FOR THE LATEST INFORMATION ON ZELDA. CONSULT YOUR LOCAL NEWSPAPERS AND LISTEN TO NEWS MEDIA BROADCASTS AND NOAA WEATHER RADIO FOR SAFETY RULES AND LOCAL SAFETY PROCEDURES.

THE NEXT STATEMENT BY THIS OFFICE CONCERNING HURRICANE ZELDA WILL BE ISSUED AT 7 PM CDT TODAY.

SMITH

ZCZC

TBXX7 KNEW 162000 ZCZC
NEW W TBXX7 KNEW 162000
SFSS NEW GULF OF MEXICO SIM-BASED ON DATA THRU 1900Z

MESOSCALE FEATURES...CSTL WATERS AQQ...BRO OUT TO 150NM

TSTMS ARE INTSFYG IN THE CSTL WATERS OF MS/AL/FL. THE TSTMS ARE
BND BY A BIX-CEW-60SSE PNS-150S GNI-BIX LO. STGST TSTMS ARE
LCTD 40SSE MOB WITH CLD TOP TEMPS TO -50C. AREAL MOVMT IS E ABT
15KT. TSTMS ARE INTSFYG AT THE INTXN OF A NE/SW CNVTV BAND WITH
A N/S. INSTBLTY LN.

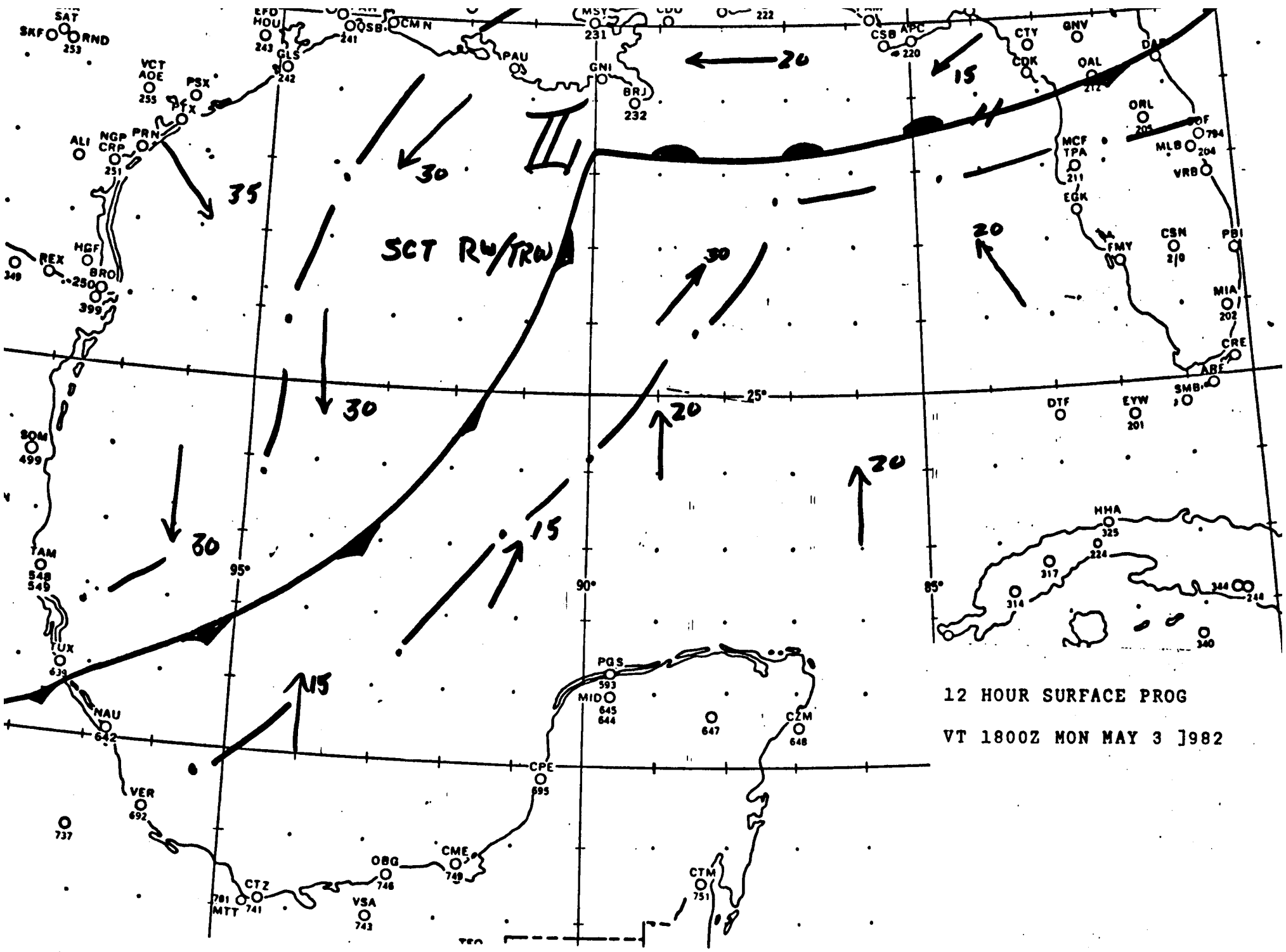
NMRS TRW/RW CVR SXNS FO AL TO THE RT OF A DHN-30W CEW-40NW MGM
LN. SVRL CELLS HAVE CLD TOP TEMPS TO -53C. TSTMS ARE INCRG AREAL
CVRG AND INTSTY. AREAL MOVMT IS E AT 20KT.

SCT TC/RW/TRW ARE DVLPG OVER SXNS OF ERN MS AND WRN AL. THE CNVTN
IS TO THE RT OF A MGM-GPT-MEI LN. STGST CELLS ARE LCTD 30E WEI
WITH CLD TOP TEMPS TO -40C.

PTCH OF FOG RMNS ALG THE LA CSTL BND BY A MARSH ISL-60ESE BLS-SABINE
PASS-CAMERON-MARSH ISL LN. CLDNS IS GRDLY DCRG AREAL CVRG.

ELSW IN THE MESO RGN...BKN-SCT SC/CU CVR THE RMNDR OF THE RGN
E OF A 100E BRO-10E HUM-20W MEI LN.

OTR SGRNT FEATURES...UPDATED...SUBTROP JET HAS DVLDPD KURTHUR N.
JET AXIS IS ALG A TAM-26N/90W-TPA LN. TRANSVERSE WAVES HAVE DVLDPD
S OF THE JET AXIS. HI ALT TURBC OFTEN ACPY TRANSVERSE WAVES.

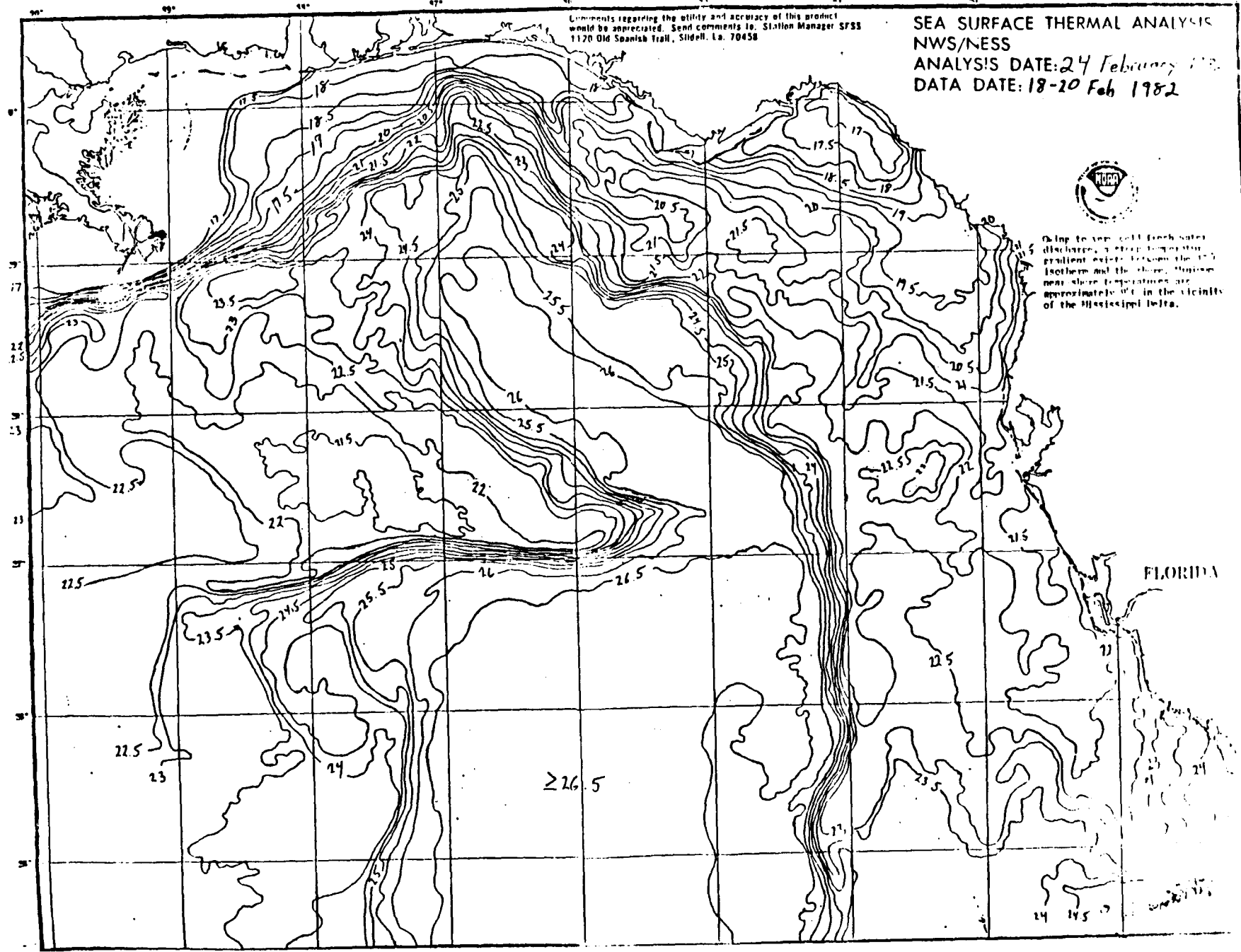


Comments regarding the utility and accuracy of this product would be appreciated. Send comments to: Station Manager SRSB 1170 Old Spanish Trail, Slidell, La. 70458

SEA SURFACE THERMAL ANALYSIS
NWS/NES
ANALYSIS DATE: 24 February 1982
DATA DATE: 18-20 Feb 1982



Due to very cold fresh water discharge, a steep temperature gradient exists between the 17.5 isotherm and the shore. Minimum near shore temperatures are approximately 0°C in the vicinity of the Mississippi Delta.



73

**STANDARDIZATION OF IDENTIFICATIONS OF
BENTHIC POLYCHAETOUS ANNELIDS FROM THE
GULF OF MEXICO OUTER CONTINENTAL SHELF**

Contract No.: AA551-CT9-35

Contractor: Barry A. Vittor &
Associates, Inc.,
Mobile, Alabama

Project Manager: Dr. Barry A. Vittor

Technical Coordinator: Paul G. Johnson

A major component of the biological characterization of offshore lease areas by the Bureau of Land Management has been the collection and analysis of thousands of benthic samples for polychaetous annelids. These small infaunal organisms have long been found to dominate marine soft bottom communities in terms of numbers of species and individuals, and were instrumental in the delineation of community assemblages along the continental shelf of the northern Gulf of Mexico during BLM studies. Their demonstrated sensitivity to environmental stress also makes them ideal candidates as possible indicators of environmental changes during future monitoring of these lease areas. This, however, requires repeatability in the taxonomic characterization of an area through accurate identification to the species level. In view of the difficulties encountered in identifying these organisms, the scattered nature of the relevant taxonomic literature, and the large number of previously undescribed species encountered during BLM offshore studies, it was felt desirable to standardize identifications of all species represented in these studies so that results could possibly be inter-compared and also compared to future monitoring programs. This is being accomplished through the acquisition, reexamination, and verification of all polychaete voucher material represented in the following BLM collections:

- 1) SOFLA - Southwest Florida Shelf Ecosystem Study;
- 2) MAFLA - Baseline Monitoring Studies, Mississippi, Alabama, Florida, Outer Continental Shelf;
- 3) CTGLF - Central Gulf Production Platform Study;
- 4) STOCS - Environmental Studies, South Texas Outer Continental Shelf;
- 5) IXTOC - Oil Spill Assessment Study.

The principal product of this research effort will be a comprehensive series of taxonomic keys and descriptions for the 600+ species, representing 296 genera in 58 families, of polychaetes found in these Gulf collections. Illustrations of diagnostic features (Figure 1), distributional maps (Figure 2), and habitat information for each species will be provided. An introductory section will describe the geographical setting, materials and methodologies, terminology and techniques used in polychaete identifications, and general information on the biology, ecology and zoogeography of Gulf polychaetes.

To date, 23 family chapters have been completed describing 371 of the estimated 600+ species to be included in the final report. Of these, 81 species (22%) are newly reported from the northern Gulf of Mexico and 119 (32%) appear to be new to science. Eight family chapters in progress or nearing completion account for an additional 91 species and 21 smaller family chapters have been assigned to authors for expected completion by July, 1982.

Intended to document and expedite the identification of the diverse, and often unique polychaete fauna of the Gulf of Mexico, this publication, once completed, will provide a common, comparable taxonomic basis for future benthic macroinfaunal investigations in this area.

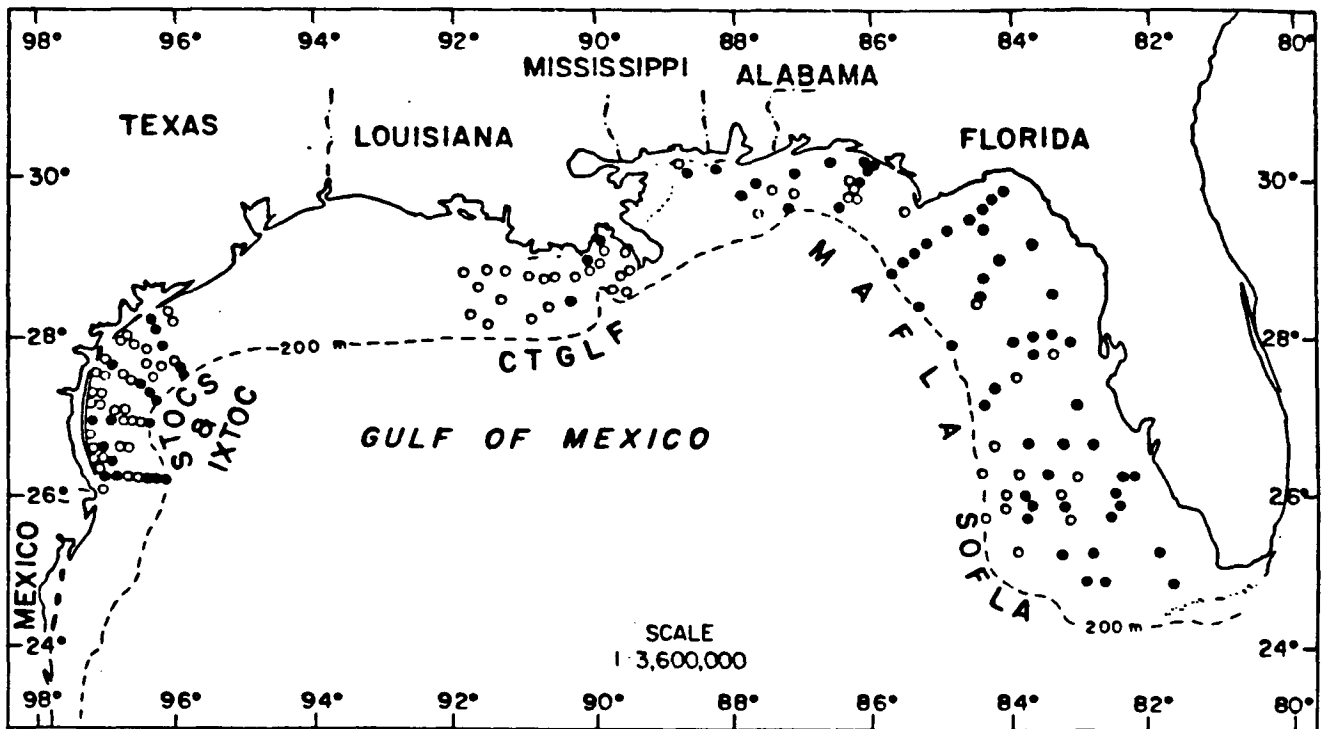


Figure 2. Distribution of *Gyptis brevipalpa* on the outer continental shelf of the northern Gulf of Mexico based on its occurrence (●) in BLM-OCS monitoring programs, 1975-1978.

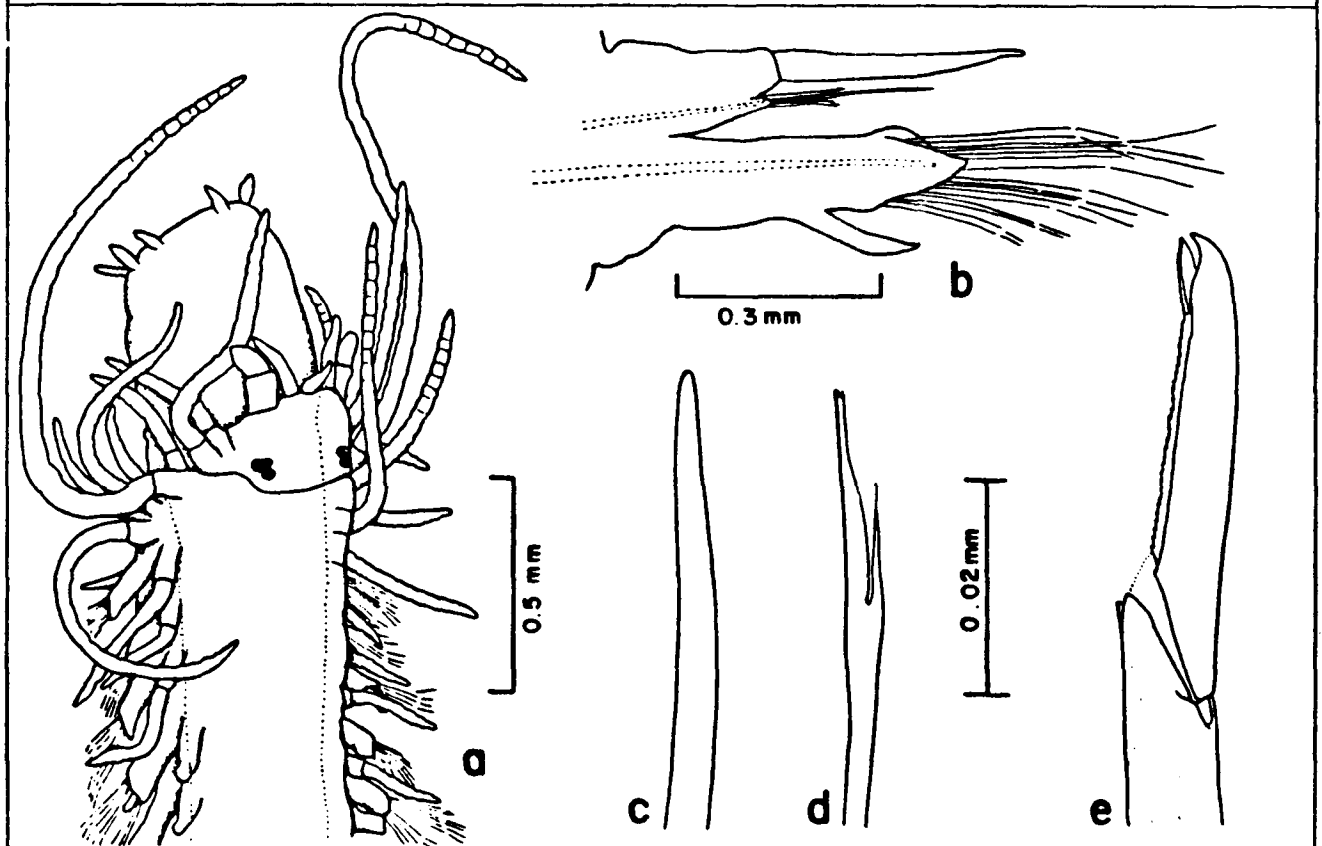


Figure 1. *Gyptis brevipalpa*: a, anterior end; b, parapodium (anterior view); c, acicular notoseta; d, furcate notoseta; e, lower neuroseta.

RECREATION AND FISHERIES - OFFSHORE OPERATORS COOPERATIVE PROGRAM

Dr. Robert B. Ditton
Department of Recreation and Parks
Texas A&M University
College Station, Texas 77843

Since 1978 a major goal of the New Orleans OCS office has been to evaluate the nature, scope and magnitude of fishing activity directly associated with oil and gas structures in the Gulf of Mexico. In partial pursuit of this goal, an extensive data base was collected during 1980-1981 with the cooperation and assistance of the Offshore Operators Committee. Company representatives used a daily reporting form devised by the BLM to record observations on the number of boats, activity group, type of fishing, suspected target species, as well as the number of personnel fishing from the platform.

We became involved when the data collection effort was completed. Our tasks were to develop a research plan for analyzing this data base and to conduct the necessary analyses so as to better understand the dynamics of platform use.

Project objectives were to determine:

- a. who fishes around oil and gas structures (use by activity group)
- b. where they come from (state of origin and where they go (offshore area, distance from shore, ecotone, water depth)
- c. when they fish (seasonality, weekend/weekday)
- d. what major target species do they seek and with what gear
- e. what factors most affect the scope and nature of the fishery.

An incremental approach has been taken in analyzing the voluminous data set. First, the study area was divided into distinct regions based on access points (quality of transportation links and location of marinas, charter boats and launch sites), population centers, probable fishing destinations (river versus bay versus offshore), shelf characteristics and distance from shore to platforms. This resulted in the designation of three regions, 1) the Delta region, extending east from South Pelto and South Timbalier lease areas, 2) the Bay region, from Ship Shole west to Vermillion and 3) the Cameron region (east and west lease areas). The Delta region was chosen for analysis first because of the large number of adjacent SMSA's and likely heavy fishing effort.

Data analysis is underway for the Delta region. Representatives from 14 companies made 12,056 observations at 68 structures during the one year study period. Summary findings will be presented for each of the five activity objectives. Cross tabulations will be conducted to test for relationships between variables. Analyses will be conducted for each study region (3) as well as the overall area.

SUMMARY OF OVERHEAD TRANSPARENCIES/DR. ROBERT B. DITTON

Objectives

1. To document the extent to which offshore oil and gas structures are used for marine recreational fishing (MRF).
 - o Extensivity and intensity of MRF use by adjacent gulfshore population (NMFS Study).
2. To establish patterns of use for MRF, commercial fishing, SCUBA, and platform fishing by company personnel (offshore operators TAMU Coop program).
 - o the big picture, yet structure-specific
 - o probe relationships
 - o who fishes around oil and gas structures (use by activity group)
 - o where they come from (state of origin) and where they go (offshore area, distance from shore, water depth)
 - o when they fish (seasonality, weekend/weekday)
 - o what major target species are sought and with what gear
 - o what factors most affect the scope and nature of the fishery.

Background

Currently, the Outer Continental Shelf Lands Act (OCSLA), the MMS Lease Agreement and the Geneva Convention on the Continental Shelf require that production platforms be removed after production ceases.

If the extent of other collateral beneficial uses are documented, perhaps these benefits can be perpetuated by leaving a platform in place as an artificial reef or moving it to another location.

Results

Increased alternatives for oil and gas companies

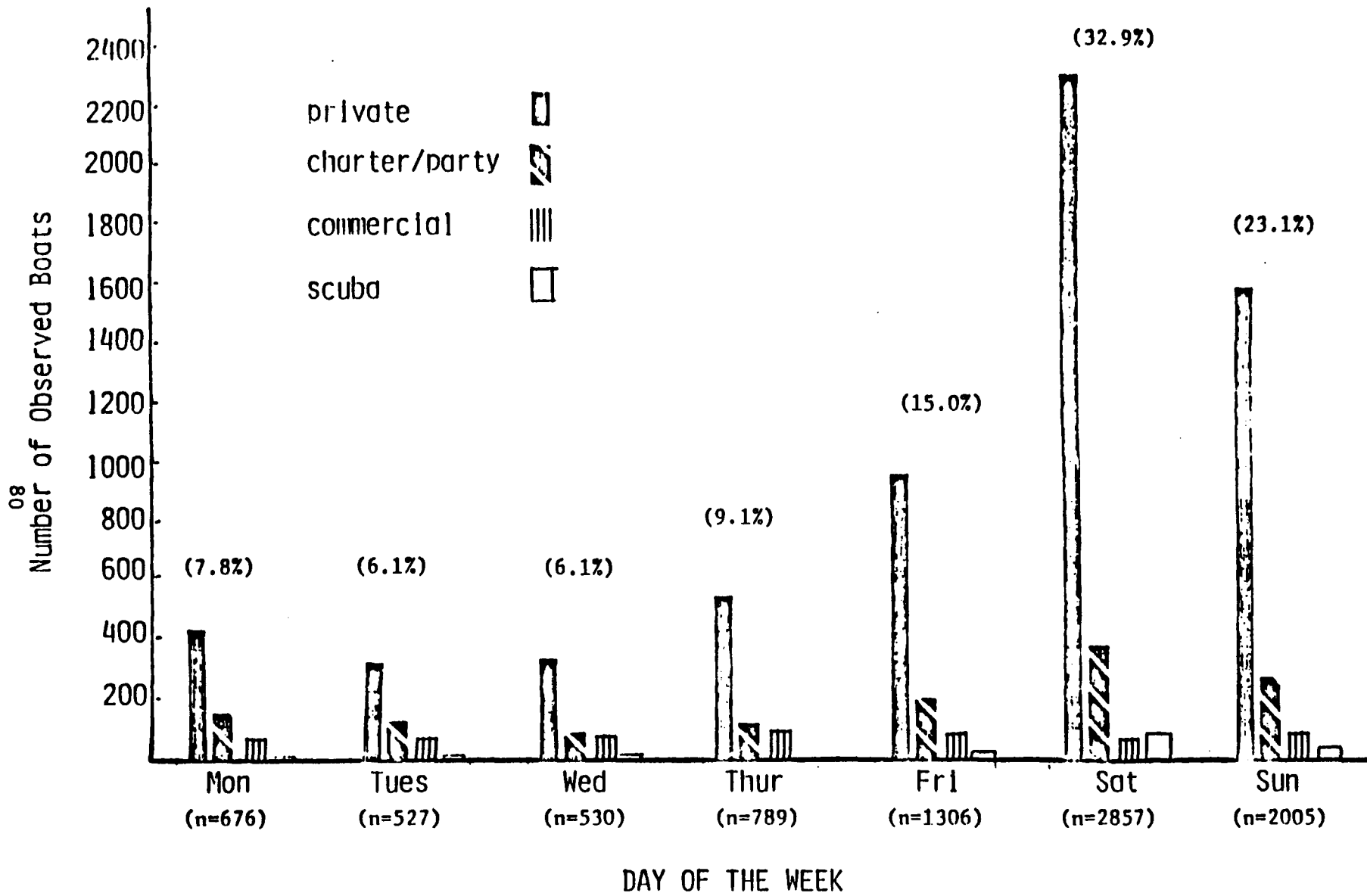
Increased recreation opportunity for the public

NUMBER OF COMPANIES CONSIDERED FOR REGION ONE (DELTA): 14

COMPANY	(CO. CODE)	# OF SOURCES USED	# OF SOURCES DELETED	TOTAL
AMOCO	(01)	1	0	1
ARCO	(02)	1	1	2
CHEVRON	(03)	24	3	27
CONOCO	(04)	2	4	6
EXXON	(05)	6	2	8
FREEPORT SULPHUR	(06)	2	0	2
GULF	(07)	14	1	15
MARATHON	(08)	2	0	2
MESA	(09)	1	1	2
MOBIL	(10)	4	0	4
SHELL	(11)	8	4	12
SUNGAS	(12)	1	0	1
TENNECO	(13)	1	0	1
TEXACO	(14)	2	0	2
TOTALS		69	16	85

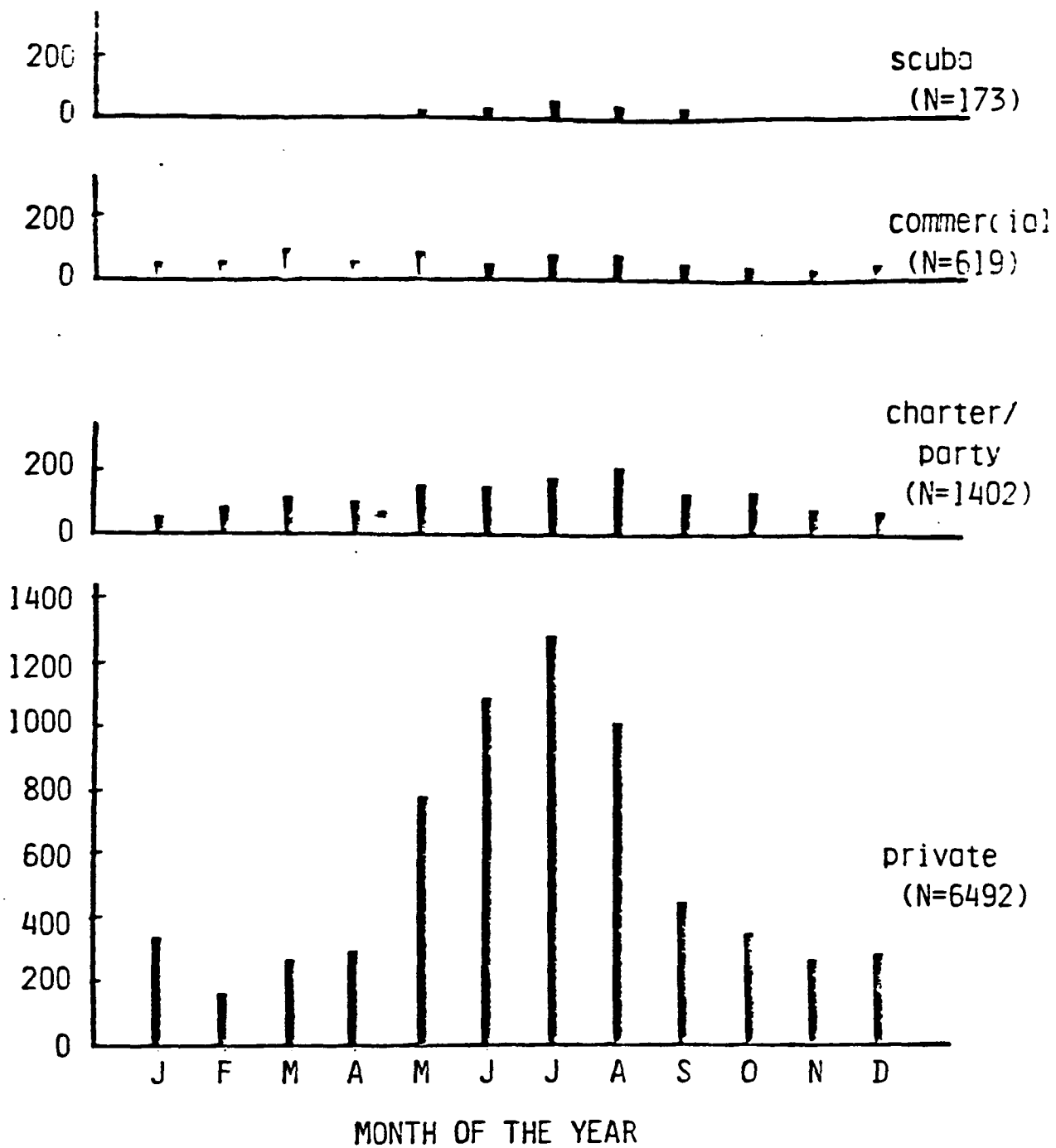
NUMBER OF LEASE AREAS IN REGION ONE (DELTA): 10

LEASE AREA	(CODE)	--RATING--				
		EXCELLENT	GOOD	MODERATE	FAIR	POOR
BAY MARCHAND	(01)	8	1	0	1	
BRETON SOUND	(02)	0		1		
GRAND ISLE	(03)	6	3	1	2	
MAIN PASS	(04)	2	2	3	2	5
MISS. CANYON	(05)			0	1	1
SOUTH PASS	(06)	1	1	1	2	4
SOUTH PELTO	(07)	0	1			1
SOUTH TIMBALIER	(08)	5	8	1	3	2
VIOSCA KNOLL	(09)	1				
WEST DELTA	(10)	7	3	0	2	3
TOTALS		30	19	7	13	16

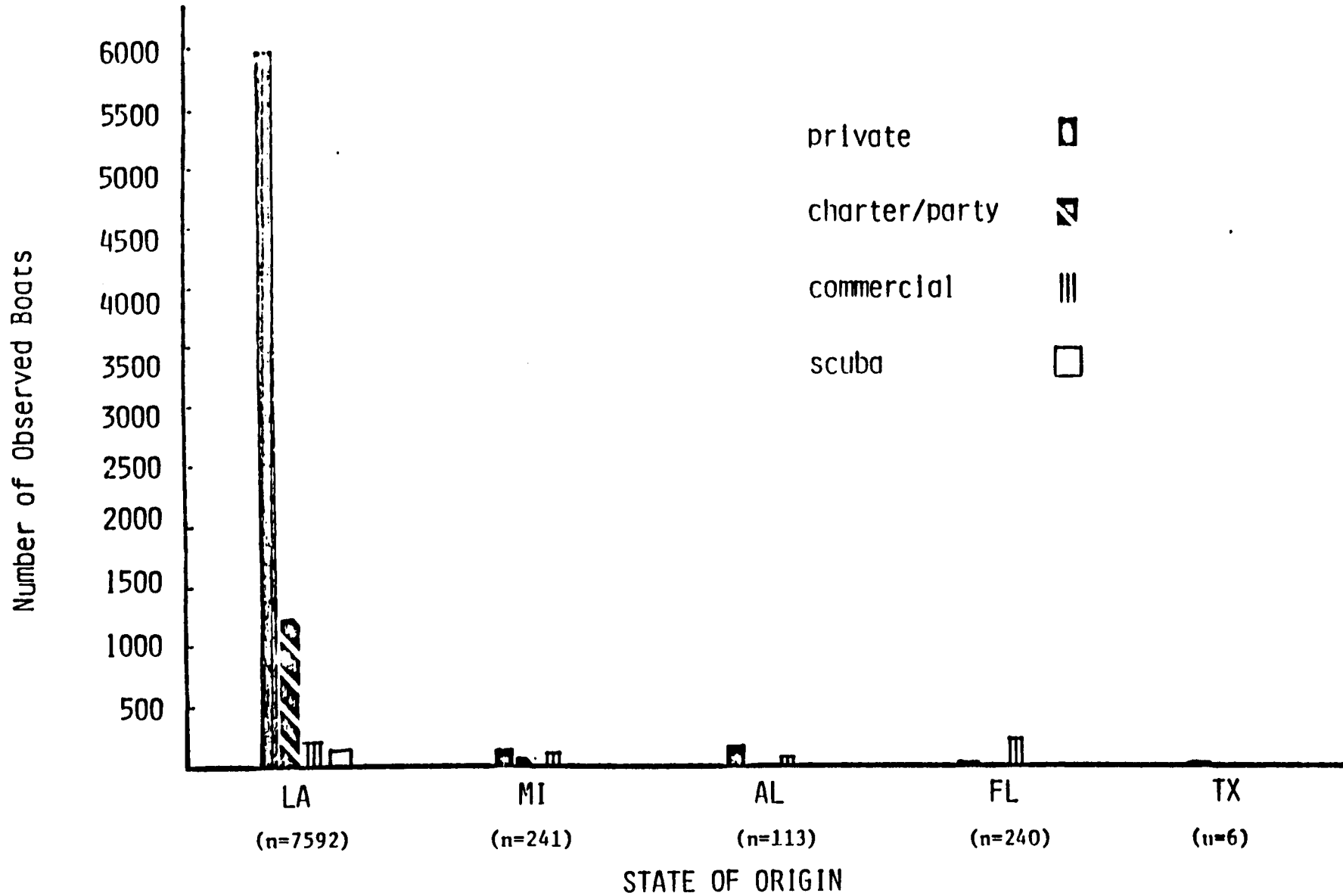


Title: Frequency of use by day of the week and by activity group for Region 1 (Delta)
(Identified N = 869)

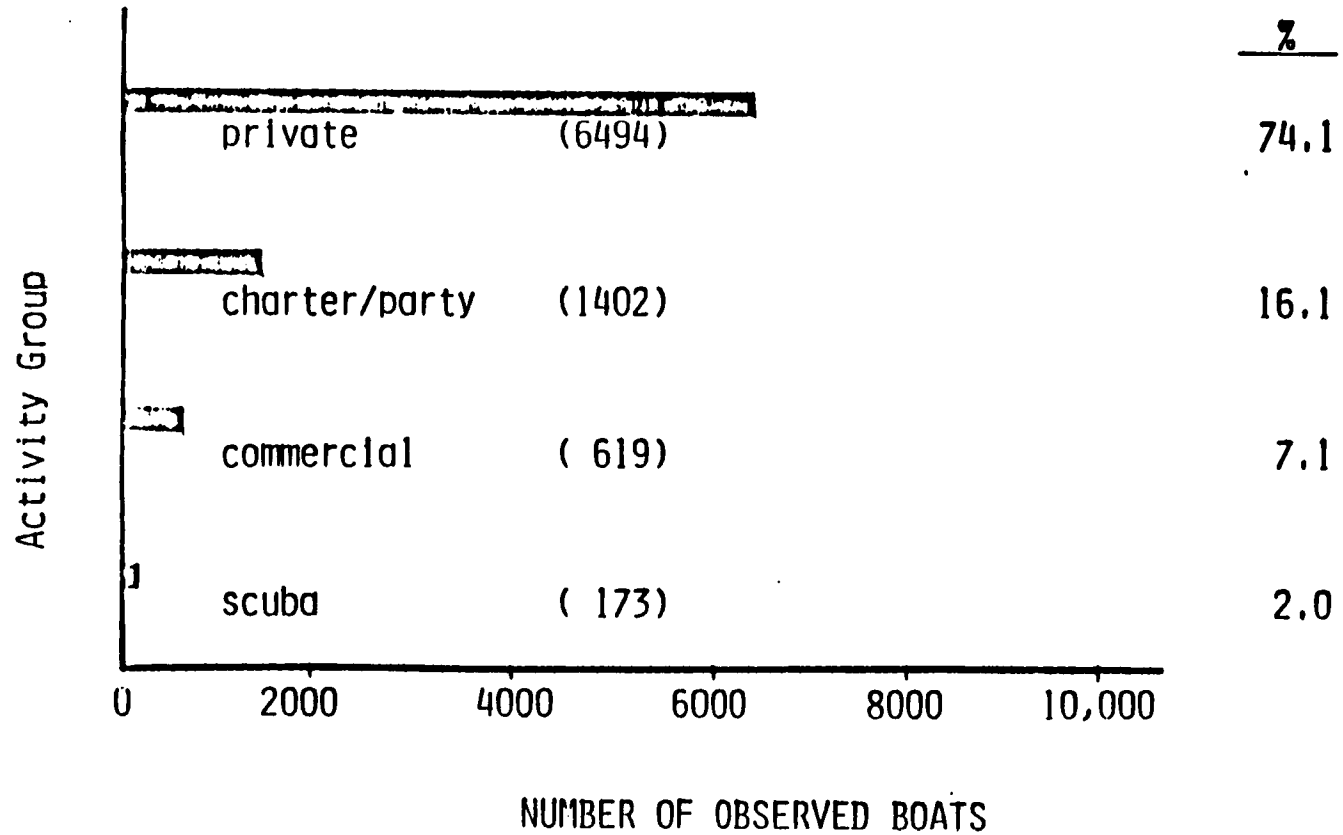
Number of Observed Boats



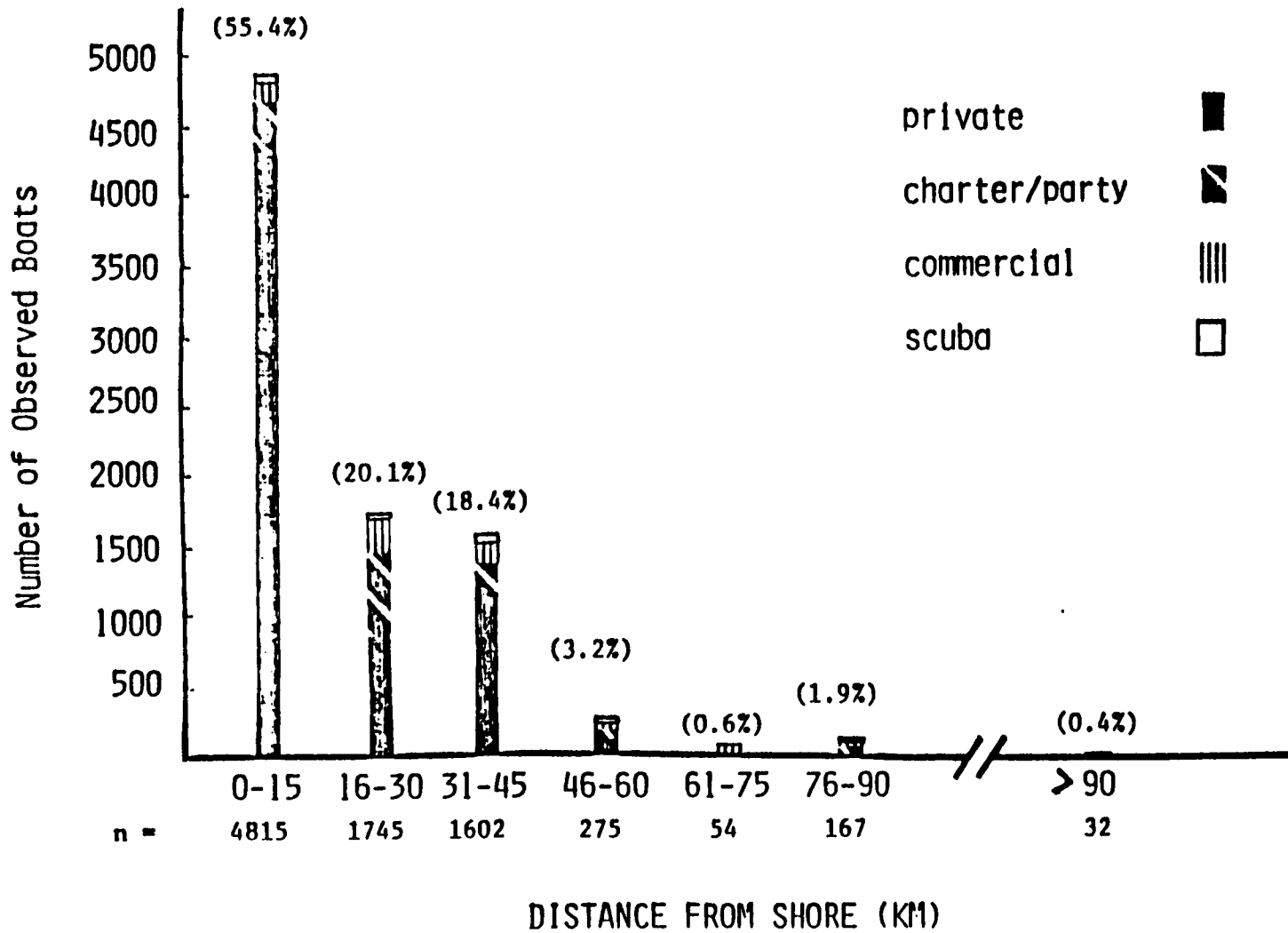
Title: Frequency of use by month by activity group for Region 1 (Delta)
(Identified N=8686)



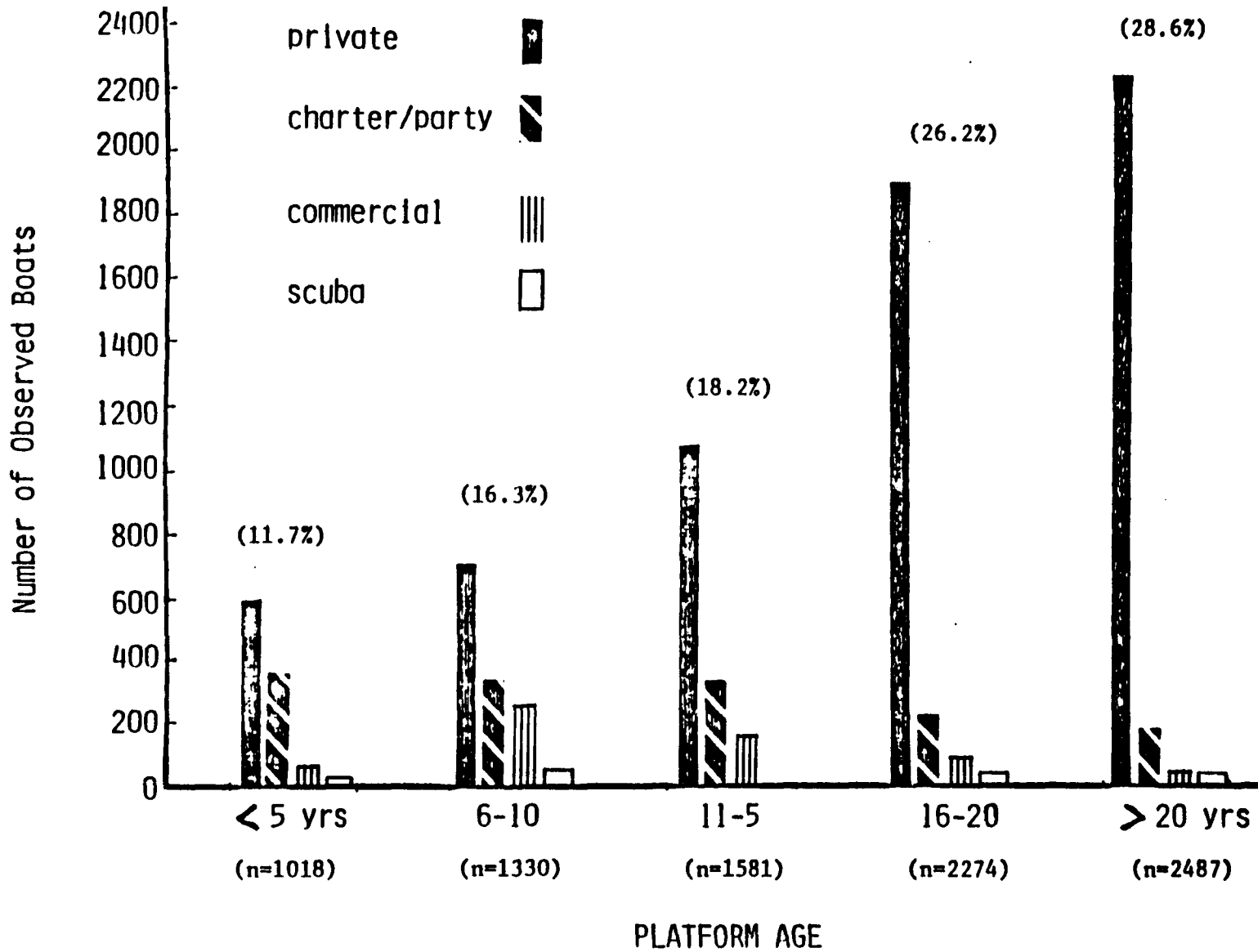
Title: Frequency of boat origin (state) by activity group for Region 1 (Delta)
(Identified N=8192)



Title: Frequency of observed boats by activity group for Region 1 (Delta)
(Identified N=8690)



Title: Frequency of structure used by distance from shore by activity group for Region 1 (Delta)
(Identified N=8690)



Title: Distribution of structures used by platform age and by activity group for Region 1 (Delta)
(Identified N=8690)



The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.