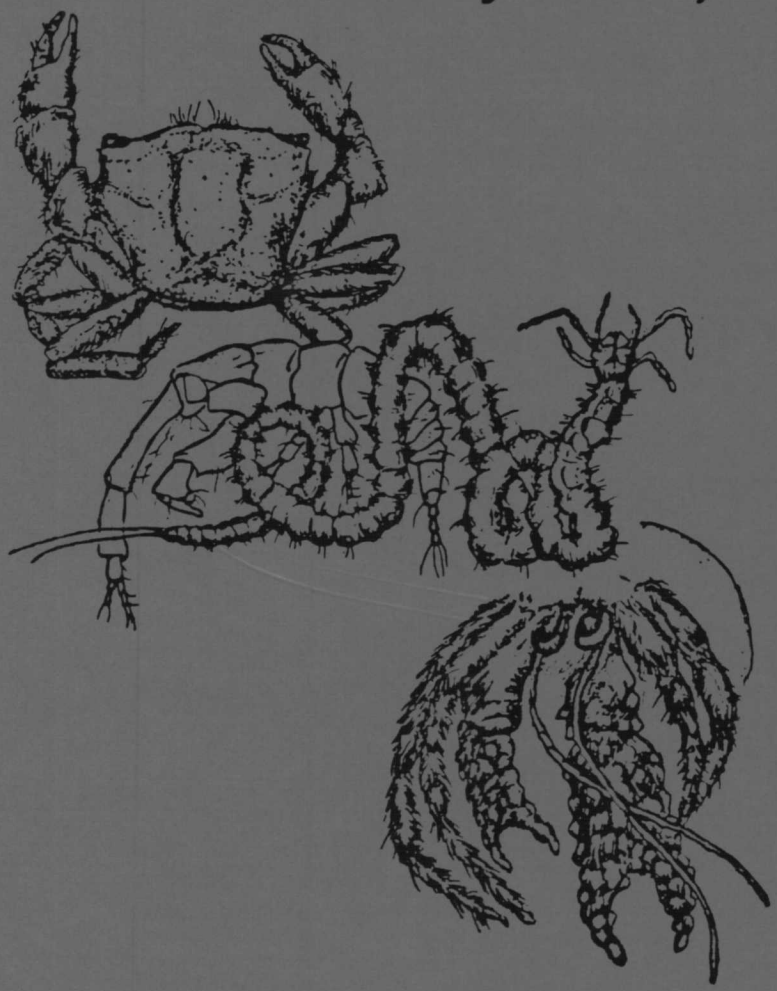
GULF OF MEXICO
OUTER CONTINENTAL
SHELF REGIONAL OFFICE

Proceedings

WINTER TERNARY GULF OF MEXICO STUDIES MEETING

January 18-19, 1983, Biloxi, Mississippi

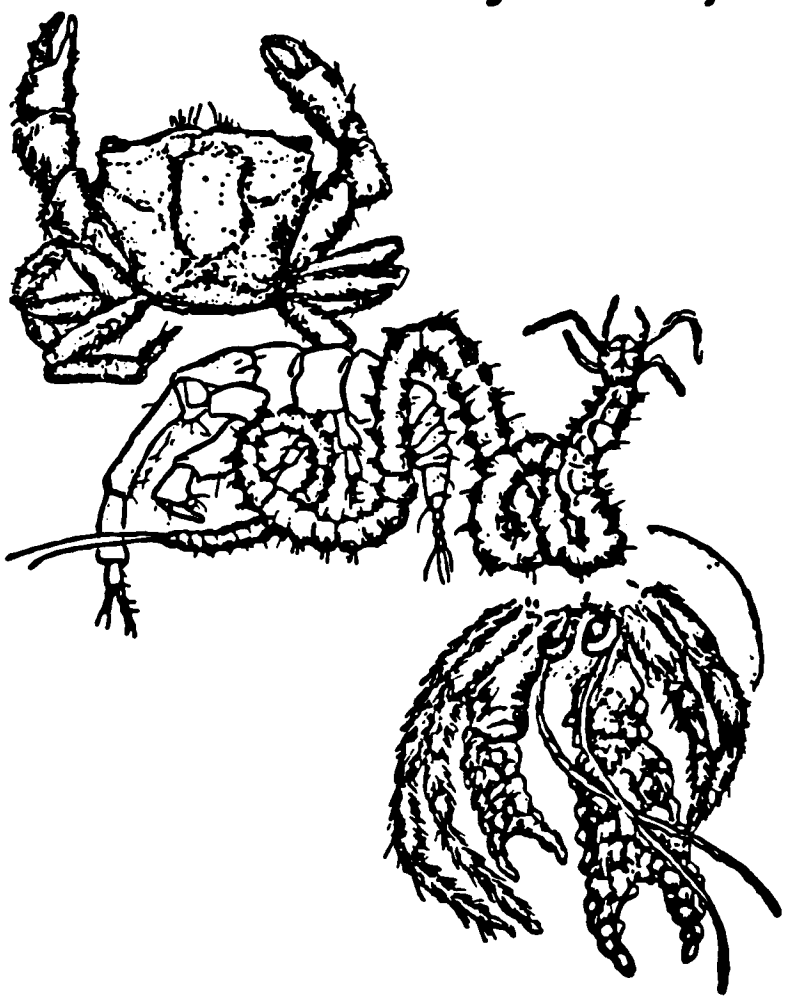


Woodward-Clyde Consultants

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

Proceedings

WINTER TERNARY GULF OF MEXICO STUDIES MEETING January 18-19, 1983, Biloxi, Mississippi



Prepared for

U. S. Department of the Interior
Minerals Management Service
Gulf of Mexico OCS Region
Metairie, Louisiana

Under Contract No. 14-12-0001-29144

February 25, 1983

Woodward-Clyde Consultants

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60756

This report was prepared for the Minerals Management Service under Contract Number 14-12-0001-29144. The report has been reviewed by the Service, and approved for publication. Approval 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 (WCC) under U.S. Department of the Interior, Minerals Management Service Contract, Number 14-12-0001-29144.

The Winter Ternary Gulf of Mexico Studies Meeting was held January 18 and 19, 1983, at the Marine Education Center on the Biloxi Campus of the Gulf Coast Research Laboratory, Biloxi, Mississippi. We are particularly grateful to Laboratory Director, Dr. Harold Howse and his staff, for allowing us to use the splendid facilities of the recently completed Marine Education Center.

Woodward-Clyde Consultants is also pleased to acknowledge assistance received from Mr. 'Corky' Cochran and Mr. Errol White (projectionist) of the Marine Education Center; Mary Macdonald (WCC, meeting coordination and arrangements); and the staff of the Buena Vista Motel in Biloxi, all of whom made our task both easier and more enjoyable.

Original art for the cover illustration was provided by Dr. Robert M. Rogers of the Gulf of Mexico OCS Region, Metairie, Louisiana.

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1. INTRODUCTION

In view of recently completed and proposed outer continental shelf federal lease offerings, 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) Region 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. The second meeting was held in Mobile, Alabama on May 12 and 13, 1982. This report presents the proceedings of the third meeting, held in Biloxi, Mississippi on January 18 and 19, 1983. More than 70 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, addresses and phone numbers is presented in Table 1 (pp.2 - 7).

The Studies Meeting was called to order by Dr. E. A. Wermund, Chairman, and Texas Representative, of the Regional Technical Working Group (RTWG; formerly known as the Intergovernmental Planning Program for Onshore Transport of Offshore Oil and Gas, IPP) and roll call of RTWG representatives in attendance was taken. Dr. Wermund's opening remarks were followed by brief introductions from Dr. Robert Avent on Minerals Management Service goals for the meeting, and by Dr. Keith Macdonald (WCC) on the meeting program and logistics.

Dr. Richard Defenbaugh presented a brief overview of the status of the Minerals Management Service, Gulf of Mexico OCS Environmental Studies Program.

A number of general information fact sheets and brochures explaining the MMS Environmental Studies Program were made available to meeting participants. One of these was: Environmental Studies Program for the Gulf of Mexico: Quarterly Status Report, January, 1983. Another of these fact sheets is reproduced in this report: The Outer Continental Shelf (OCS) Mineral Leasing Program (pp. 8 - 12). This describes a number of the general bidding, environmental studies and leasing procedures followed by the Department of the Interior during administration of mineral resource development of offshore areas under federal jurisdiction.

Other booklets available to participants presented summaries describing the facilities, staff, ongoing research and publications of both the Gulf Coast Research Laboratory and the Mississippi-Alabama Sea Grant Consortium.

The U.S. Department of the Interior, Minerals Management Service OCS lease offering schedule entitled, "Final 5-Year Oil & Gas Leasing Schedule/ Proposed Sale Dates" and dated July 21, 1982, is reproduced as Figure 1, (p. 13) for general information.

Table 1. MEETING PARTICIPANTS

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GULF OF MEXICO
Outer Continental
Shelf Region

MMS FACT SHEET

MINERALS MANAGEMENT SERVICE
U.S. DEPARTMENT OF THE INTERIOR

THE OUTER CONTINENTAL SHELF (OCS) MINERAL LEASING PROGRAM

Under the Outer Continental Shelf Lands Act, as amended, 43 U.S.C. 1331 et seq., the Department of the Interior is charged with administering mineral resource development of offshore areas under federal jurisdiction on the OCS. In the case of oil and gas development and production, this involves selection of areas for possible leasing, compliance with the National Environmental Policy Act, evaluation of potential resources, supervision of geological and geophysical exploration, holding of lease sales by competitive bidding procedures, and supervision of drilling and production activities on awarded leases. The agency within the Department that is primarily charged with these responsibilities is the Minerals Management Service (MMS).

The Act requires that oil and gas leases be issued as a result of competitive bidding (by sealed bids) under one or more approved bidding procedures. Although other approved systems may be used from time to time, the following are most commonly used:

1. cash bonus bid with fixed royalty;
2. cash bonus bid with sliding scale royalty; and
3. variable royalty bid with a fixed cash bonus.

Being charged with Departmental responsibility for OCS mineral leasing, the Service pursues the following objectives:

1. to make OCS energy resources available to meet national energy needs;
2. to balance OCS energy resource development with protection of the human, marine, and coastal environments;
3. to insure receipt of fair market value for those resources; and
4. to preserve and maintain free enterprise competition.

The Department's leasing function on the OCS consists of the following major components:

1. Proposed OCS Planning Schedule
2. Request for Resource Reports
3. Call for Information
4. Area Identification for Environmental Analysis
5. NEPA Document (EAR, DEIS, Public Hearings, FEIS)
6. Secretarial Issue Document (SID)
7. Proposed Notice of Sale
8. Notice of Sale/Sale
9. Post Sale Analysis

10. Exploration
11. Development
12. Production

During each step of the OCS leasing procedure, the MMS coordinates with many federal and state agencies on a continuing basis.

The information used by both government and industry on the hydrocarbon potential of various OCS areas is acquired by geological and geophysical surveys. These data are collected by specialized data collection firms under permits issued by the MMS. Usually these firms are under contract with the MMS and/or one or more oil companies to gather such data. The information is then used by industry and by MMS for environmental assessments and resource evaluation.

ENVIRONMENTAL STUDIES

Except for the Gulf of Mexico and southern California, the federal OCS is an area with relatively little prior marine minerals development. Generally, detailed environmental information in all the OCS areas is lacking; therefore, in 1974 the Department established an Environmental Studies Program that would identify information gaps and subsequently provide an adequate data base upon which to make sound management decisions. Since 1974, however, the program has evolved with a major goal and the present concept of providing "information needed for predicition, assessment, and management of impacts on the human, marine, and coastal environments of the OCS and nearshore areas which may be affected by OCS oil and gas activities in such area or region . . ." *(Federal Register* 43:3893; January 27, 1978; 43 CFR Part 3301.7). The studies program design attempts to link the information needs of the decisionmaker and the environmental studies that are to be conducted. The design requires identification of the OCS management decisions and leads to development of specific studies to aid in making these decisions. The studies are designed to:

1. provide information on the status of the environment upon which the prediction of the impacts of OCS oil and gas development for leasing decisionmaking may be based;

2. provide information on the ways and extent that OCS development can potentially impact the human, marine, biological, and coastal areas;

3. ensure that information already available or being collected under the program is in a form that can be used in the decisionmaking process associated with a specific leasing action or with the longer term OCS minerals management responsibilities; and

4. provide a basis for future monitoring of OCS operations.

The Gulf of Mexico OCS Regional Office staff prepares annual study plans with participation, review, and comment of federal and state agencies, the scientific community, and the interested public.

PROPOSED OCS PLANNING SCHEDULE

The proposed planning schedule establishes the tentative timing of significant leasing actions. The leasing program consists of a schedule of proposed lease sales which will best meet national energy needs for the five-year period following its approval. The schedule is prepared and maintained

consistent with principles established by the OCS Lands Act as amended. The timing and location of leasing is selected, to the maximum extent practicable, so as to obtain a proper balance between the potential for environmental damage, the potential for discovery of oil and gas, and the potential for adverse impact on the coastal zone.

RESOURCE REPORTS

In order to obtain the broadest possible spectrum of information on an area proposed for possible leasing, technical resource reports are requested from interested state and local governments as well as all appropriate federal agencies. Such factors as geology, geophysics, mineral occurrence, coastal zone management, sport and commercial fishing, recreation use, environmental values, oceanography, navigation, biology, wildlife, economics, defense activity, and sociological values are included in these reports. Resource reports are usually requested several months prior to a Call for Information.

CALL FOR INFORMATION

The Call for Information is an official notice to all interested parties, published in the *Federal Register* and news media, to obtain an indication of which areas should be considered in the DEIS for possible lease offering and which areas should be excluded from oil and gas leasing or leased only under special conditions. "Calls" are issued for large contiguous areas usually embracing several million acres offshore. A Call for Information is an information gathering component of the MMS's leasing procedure and does not commit the Department to leasing within the area of the Call, nor any particular block(s).

AREA IDENTIFICATION FOR ENVIRONMENTAL ANALYSIS

After information has been received and recorded, specific areas are identified for future intensive environmental analysis (DEIS). This is a responsibility of the MMS. In the area identification process the Department compares the identified areas to detailed geophysical, geological, engineering, economic, and resource information. The MMS's responsibility involves evaluation and review of: (1) the degree of interest in the area; (2) the need to initiate leasing in wildcat areas in terms of industry development capability, competition, and timely future availability of resources to consumers; (3) area leasing history; (4) interest patterns; (5) consideration of a mix of blocks by water depth and distance from shore; (6) identification of blocks deleted from prior sales for environmental impact reasons; (7) identification of blocks where special environmental stipulations have been recommended; (8) a technical evaluation to ensure proper consideration of the development of geologic structures and trends; (9) identification of blocks in imminent danger of drainage (due to possible development activity immediately adjacent); (10) blocks which are most prospective for production; and (11) blocks showing immediate potential, therefore, conducive to prompt drilling and development. Based on the analyses, a MMS field office recommendation is made. The Washington Offices of MMS, after review of the field report, recommends area identification for announcement by the Secretary of the Interior prior to initiation of the draft NEPA document.

ENVIRONMENTAL ANALYSIS (EAR, DEIS, Public Hearings, FEIS)

This component of the leasing program involves preparation of a NEPA document under Section 102(2)(c) of the National Environmental Policy Act of 1969. Consultation and coordination with interested federal agencies, state and local governments, institutions, groups, and individuals are

routinely undertaken during the preparation of this document covering the proposed OCS lease sale. The MMS considers all data collected and evaluates the effect of the proposed sale on components of the environment in the area during exploration, development, and operational phases of mineral operations. The new NEPA document design, as set forth by the Council on Environmental Quality (CEQ), is divided into 11 sections:

1. Cover Sheet
2. Summary
3. Table of Contents
4. Purpose and Need for Action
5. Alternatives, Including Proposed Action
6. Affected Environment
7. Environmental Consequences
8. List of Preparers
9. List of Agencies
10. Index
11. Appendices

This document is made available to the public and is submitted for review to federal agencies with jurisdiction or expertise, to state and local agencies authorized to develop or enforce environmental standards, and to any interested member of the public who requests a copy. The President's Council on Environmental Quality (CEQ) states that a public hearing may be held no sooner than 15 days after the document has been made available.

SECRETARIAL ISSUE DOCUMENT

Along with the preparation of the NEPA document, a Secretarial Issue Document (SID) is also prepared. The SID brings to the decisionmaker's attention the factors associated with the proposed action. The factors discussed in a SID include the economic, social, and environmental impacts of the proposal. *(This document, in conjunction with the NEPA document, provides the Secretary of the Interior with information necessary to evaluate the total impact of the proposed action.)*

PROPOSED NOTICE OF SALE

Having arrived at a tentative sale decision, the Secretary of the Interior notifies the respective affected state of the Interior's intention to hold a lease sale. This presale step provides a 60-day period for state review of the sale notice. This step occurs prior to the "Notice of Sale" to the public.

NOTICE OF SALE/SALE

The terms and conditions of each lease sale are published in the *Federal Register* at least 30 days prior to the sale date. Sales are conducted by the MMS OCS Regional Office pursuant to the detailed procedures that are issued prior to each sale. Following the opening of all sealed bids, the bids are checked for legal adequacy and the sufficient one-fifth bonus submitted at the time of bidding.

BLOCK EVALUATION

Immediately after a lease sale, the MMS field office evaluates the blocks receiving bids. The field office develops a mean range of values (MROV) and a discounted MROV (DMROV), calculated using a discounted cash flow method for each block evaluated.

POST SALE ANALYSIS

Following a sale, the MMS conducts a review of the high bids. The primary emphasis in the Post Sale Analysis is on the receipt of fair market value. Determination of fair market value involves a consideration of the reliability rating of the information and the high bid as a percent of the MROV, the DMROV, and the average evaluation for each block.

Factors considered in the analysis of sale competition are the average number of bids per block, the competitive bidding performance of high bidders, and the average number of bids on all blocks on which high bidders bid. Information concerning the number of times a block has been offered, including bids submitted and rejected, and the status of production in the area is also considered.

NOTE: In the normal course of events, the procedural steps relating to a specific lease sale (starting with a request for resource reports) consumes a period of approximately 25 to 36 months.

FINAL 5-YEAR OIL & GAS LEASING SCHEDULE

Proposed Sale Dates

U.S. Department of the Interior
Minerals Management Service

July 21, 1982

1982		1983		1984	
RS – 2	August	*70 St. George Basin	February	80 S. California	January
71 Diapir Field	September	76 Mid Atlantic	April	82 N. Atlantic	February
52 North Atlantic	October	72 C. Gulf of Mexico	May	83 Navarin Basin	March
69 Gulf of Mexico	October	78 S. Atlantic	July	81 C. Gulf of Mexico	April
57 Norton Basin	November	74 W. Gulf of Mexico	August	87 Diapir Field	June
		73 C. & N. California	September	84 W. Gulf of Mexico	July
		79 E. Gulf of Mexico	November	88 Gulf of Alaska/Cook Inlet	October
				89 St. George Basin	December
1985		**1986**		**1987**	
90 S. Atlantic	January	95 S. California	January	108 S. Atlantic	January
85 Barrow Arch	February	96 N. Atlantic	Febuary	109 Barrow Arch	February
92 N. Aleutian Basin	April	107 Navarin Basin	March	110 C. Gulf of Mexico	April
98 C. Gulf of Mexico	May	104 C. Gulf of Mexico	April	86 Shumagin	June
111 Mid Atlantic	June	97 Diapir Field	June		
102 W. Gulf of Mexico	August	105 W. Gulf of Mexico	July		
91 C. & N. California	September	99 Kodiak	October		
100 Norton Basin	October	101 St. George Basin	December		
94 E. Gulf of Mexico	November				

Secretary of the Interior

*The Department will consult with the Alaska Land Use Council following the issuance of the Proposed Notice of Sale.

Figure 1.

2. GENERAL SESSION

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

We were particularly fortunate to hear presentations from four guest speakers not previously in attendance during this sequence of Studies Meetings: Dr. Harold Howse, our Host, who spoke about research activities at the Gulf Coast Research Laboratory; Dr. James Jones who taked about the Mississippi-Alabama Sea Grant College program; Dr. Charles Holmes with MMS, Corpus Christi, who presented a summary of his research on post-Miocene development of the southwest Florida shelf; and, Mr. Ray Partridge from the National Data Buoy Center, Mississippi, who talked about the MMS/NOAA Drifting Buoy Program.

Extended abstracts or fact sheets for twelve of the thirteen presentations are 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.

Another meeting in this series will probably be held in Corpus Christi, Texas during the early summer of 1983.

MINERALS MANAGEMENT SERVICE
GULF OF MEXICO WINTER STUDIES MEETING

GULF COAST RESEARCH LABORATORY
MARINE EDUCATION CENTER, BILOXI, MISSISSIPPI
January 18 and 19, 1983

AGENDA

Tuesday, January 18

8:00 am Registration

8:30 Opening of the Meeting. Dr. E.G. Wermund, Bureau of Economic Geology, University of Texas. IPP Chairperson and Texas Representative.

Introduction. Dr. Robert Avent, MMS: Dr. Keith Macdonald, Woodward-Clyde Consultants

Minerals Management Service Environmental Studies Programs. Dr. Richard Defenbaugh, MMS

Gulf Coast Research Laboratory - Research Activities. Dr. Harold Howse

Mississippi-Alabama Sea Grant College - Research Activities. Dr. James Jones

10:00 Coffee Break

Southwest Florida Shelf Ecosystem Study, An Introductory Overview and Habitat Characterizations. Dr. Keith Macdonald, Woodward-Clyde Consultants.

Southwest Florida Shelf Regional Biological Communities Survey. Mr. Keith Spring, Continental Shelf Associates, Inc.

12:00 Lunch

1:15 pm Post Miocene Development of the Southwestern Florida Shelf. Dr. Charles Holmes, MMS, Corpus Christi, Texas

Southwest Florida Continental Shelf: A Loop Current mechanism for Productivity Enhancement and Questions for Further Study. Dr. Hong Chin, Woodward-Clyde Consultants

2:45 Coffee Break

Coastal Characterizations of the Eastern Gulf of Mexico

(1) Introduction & Mississippi Deltaic Plain Regional Ecological Atlas. Dr. James Johnson, USF&WS, Slidell, Louisiana
(2) Alabama Coastal Characterization Study. Dr. Scott Mettee, Geological Survey of Alabama
(3) Florida Panhandle and Big Bend Literature Search and Synthesis. Scott Schomer, Florida Department of Environmental Regulation, Tallahassee

6:00 Reception & Discussion

Wednesday, January 19

8:30 am Gulf of Mexico Physical Oceanography Program. Dr. Evans Waddell, Science Applications, Inc., Raliegh, N.C.

MMS/NDBO Drifting Buoy Program. Mr. Ray Partridge, National Data Buoy Center, Mississippi

Gulf Environmental Radiofax (GERAF) Program. Mr. Richard Barrazotto, NOAA/NESS, Slidell, La.

Reformatting Digital Data Tapes of MAFLA and South Texas OCS Study Programs. Mr. Craig Brandt, Quantus, Inc. Clinton, Tennessee

10:30 Coffee Break

General Discussion and Closing Remarks

12:00 Adjourn Studies Meeting

01:30 IPP Meeting Begins Marine Education Center Library

A B S T R A C T S

GULF COAST RESEARCH LABORATORY
TEACHING AND RESEARCH STAFF

HAROLD D. HOWSE, Ph.D., Tulane University, 1967. Laboratory Director. Research interests: comparative histology, histochemistry and ultrastructure of the several organ systems (especially the muscular and cardiovascular systems) of marine invertebrates and vertebrates; histochemistry and ultrastructure of pathologies of marine invertebrates and vertebrates.

EDWIN W. CAKE, JR., Ph.D., Florida State University, 1975. Section head, Oyster Biology. Research interests: marine invertebrate zoology and ecology; aquaculture of marine and estuarine molluscs; marine and estuarine malacology; parasites, pathogens and predators of marine and estuarine molluscs.

DAVID W. COOK, Ph.D., Mississippi State University, 1966. Section head, Microbiology. Research interests: bacteriology of estuarine waters and sediments including taxonomy, physiology, and distribution; sanitary microbiology; seafood microbiology; diseases of fish and shellfish.

C. E. DAWSON, B.S., University of Miami, 1953. Section head, Systematic Zoology. Research interests: systematic ichthyology; distribution and ecology of tropical shore fishes.

WILLIAM J. DEMORAN, B.S., University of Southern Mississippi, 1952. Section head, Fisheries Management. Research interests: marine fisheries management; dynamics of oyster populations.

CHARLES K. ELEUTERIUS, M.S., University of Southern Mississippi, 1969. Section head, Physical Oceanography. Research interests: estuarine hydrodynamics, hydrodynamics of the continental shelf; air-sea interactions; numerical modeling of hydrodynamic processes.

LIONEL N. ELEUTERIUS, Ph.D., Mississippi State University, 1974. Section head, Botany. Research interests: plant ecology and taxonomy (tidal marshes); physiological ecology of seagrasses; marine algae and economic uses; coastal vegetation and mapping (ecosystems).

WILLIAM E. HAWKINS, Ph.D., University of Mississippi Medical Center, 1973. Section head, Microscopy. Research interests: histophysiology and ultrastructure of tissues of marine organisms; histopathology and ultrastructure of intracellular protozoa infecting marine organisms; histopathology and ultrastructural pathology in aquatic toxicology.

RICHARD HEARD, JR., Ph.D., University of Southern Mississippi, 1976. Associate biologist. Research interests: taxonomy and systematics of higher crustaceans; ecology and life histories of metazoan parasites; feeding ecology of marine and estuarine fishes; ecology and taxonomy of salt marsh, estuarine and beach macroinvertebrates.

G. JAYALAKSHMI, Ph.D., Sri Venkateswara University, Tirupati, India, 1971. Physiologist. Research interests: physiological responses of various toxicants on marine animals; osmotic and ionic regulation in brackish water and marine animals; aquaculture.

ADRIAN LAWLER, Ph.D., College of William and Mary, 1971. Parasitologist. Research interests: culture of freshwater and marine organisms; parasitology (external parasites of fishes); marine and freshwater toxicology studies; larval fish development.

JULIA S. LYTLE, Ph.D., University of Texas at Austin, 1970. Section head, Environmental Chemistry. Research interests: organic geochemistry of marine sediments; pollution chemistry of water and sediments; bio-geochemistry of ancient environments; petroleum geochemistry.

THOMAS F. LYTLE, Ph.D., University of Texas at Austin, 1971. Section head, Analytical Chemistry. Research interests: trace metal geochemistry; nutrient chemistry; paleochemistry; marine analytical methodology.

TERRY McBEE, Ph.D., Texas A&M University, 1975. Ecologist. Research interests: spatial and temporal changes in benthic community structure; effects of predation on benthic communities.

THOMAS D. McILWAIN, Ph.D., University of Southern Mississippi, 1978. Section head, Anadromous Fishes and Fisheries Research. Research interests: fisheries management; biology of estuarine fishes including life history and population analysis; culture of fishes.

ERVIN G. OTVOS, Ph.D., University of Massachusetts, 1964. Section head, Geology. Research interests: coastal geomorphology; quaternary stratigraphy, northeastern Gulf coast; barrier island genesis and evolution; coastal environmental geology.

ROBIN M. OVERSTREET, Ph.D., University of Miami, 1968. Section head, Parasitology. Research interests: descriptive marine parasitology; experimental marine parasitology; pathology of aquatic organisms; biology of commercial fishes.

SALLY RICHARDSON, Ph.D., College of William and Mary, 1972. Associate Ichthyologist. Research interests: systematics and development of marine/estuarine fish larvae; ecology and population dynamics of ichthyoplankton; fish life histories and reproductive strategies; resource assessment via fish eggs and larvae.

A. VENKATARAMIAH, Ph.D., Sri Venkateswara University, Tirupati, India, 1965. Section head, Physiology. Research interests: osmotic and metabolic responses in marine animals; physiological responses of toxicants in marine animals; aquaculture of commercially important crustaceans.

WILLIAM W. WALKER, Ph.D., Mississippi State University, 1972. Microbiologist. Research interests: toxicology of xenobiotics to freshwater and estuarine species; fate and degradation of pesticides in the estuarine environment; microbiological degradation of pesticides.

ROBERT WOODMANSEE, Ph.D., Western Reserve University, 1952. Section head, Ecology. Research interests: rate of photosynthesis measurement; plant pigments in phytoplankton; phytoplankton; zooplankton.

THE MISSISSIPPI-ALABAMA SEA GRANT CONSORTIUM

James I. Jones, Director
Mississippi-Alabama Sea Grant College
P. O. Box AG, East Beach
Ocean Springs, Mississippi 39564

The National Sea Grant College Program is approximately 14 years old and consists of 29 institutions and consortia, of which nineteen have been designated as National Sea Grant Colleges. The Sea Grant Program is a part of the Department of Commerce, housed within the National Oceanic and Atmospheric Administration. Through its stewardship of public funds it serves the public through education, research and advisory service activities. It is based on a national network involving strong local program input. It has proven to be a unique partnership of government, universities and industry working for sound economic development and appropriate use of our nation's marine, Great Lakes and coastal resources. This nation's marine potential, though largely undeveloped, represents a major segment of our economy. Sea Grant mobilizes scientific researchers from academic institutions - oceanographers, engineers, marine biologists, as well as economists, lawyers, educators, sociologists and physicians to solve national, regional and local marine problems.

The Mississippi-Alabama Sea Grant Consortium, in existence for approximately 12 years, consists of the following universities and institutions: in Mississippi - the University of Mississippi, Mississippi State University, Jackson State University, the University of Southern Mississippi and the Gulf Coast Research Laboratory; and in Alabama - the University of Alabama in Birmingham, the University of Alabama - Tuscaloosa, Auburn University and the University of South Alabama. This Consortium was designated a National Sea Grant College in September, 1982, being the 18th Sea Grant program so designated.

In its role as a Sea Grant Coherent Area Program, Institution and finally College, the Consortium utilizes the broad range of talent within its research, education and advisory services components provided by the member institutions to provide a problem-solving capability for scientific and technical advice to its public constituency.

Some recent contributions of the Mississippi-Alabama Sea Grant Consortium which have provided documented economic benefit to the public include the following examples.

- Technical assistance provided by the Sea Grant Advisory Service, cooperating with State agencies, developed a mechanized oyster depuration facility which is currently providing a substantial portion of the production of three oyster processors in Mississippi. The annual ex-vessel value of oysters produced by the system is approximately $108,000 annually; the cost to Sea Grant was $1,500.

- Many of the local oyster stocks are located in waters closed to harvesting because of pollution. Sea Grant Consortium attorneys, in cooperation with State agencies were instrumental in establishing a bottom-leasing program. Other Sea Grant Consortium researchers then developed a low-mortality relaying system by which oysters could be moved to clean, leased-sites for natural depuration. This program is currently producing an annual yield of approximately $80,000. The cost to Sea Grant was less than $2,000.

- An economic recovery plan developed for a seafood processor by the Sea Grant Advisory Service saved the company from foreclosure and bankruptcy. Five to ten full-time jobs, 100-125 part-time jobs and a annual gross income of $1.2 million were thus retained in the community. The cost to Sea Grant was $2,000.

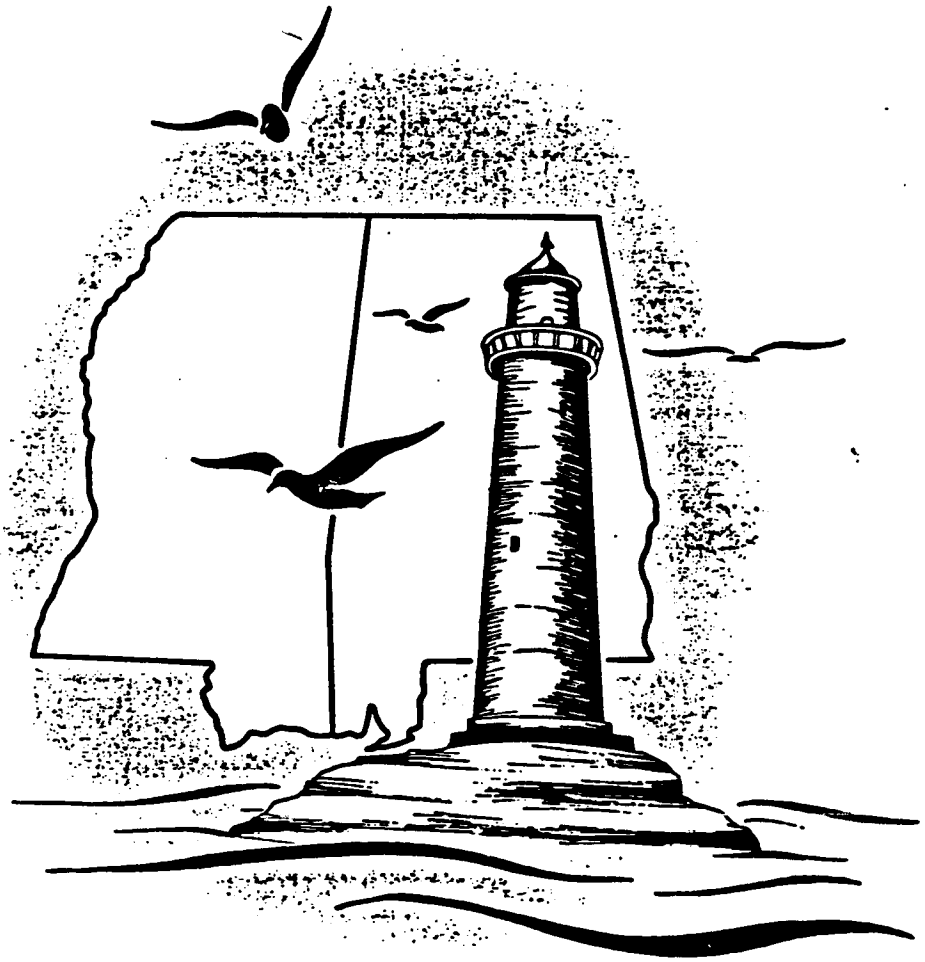
- In cooperation with the National Marine Fisheries Service and the Gulf and South Atlantic Fishery Development Foundation, the Mississippi-Alabama Sea Grant Consortium initiated a project to categorize shrimp boat fuel consumption patterns, ultimately demonstrating that fuel savings of 8 to 10% are possible with improved fuel management practices. Applied throughout the Gulf shrimp fleet this could save an estimated $25 million annually. Cost to Sea Grant was $32,000 over a two-year period.

- In cooperation with the U. S. Army Corps of Engineers, Sea Grant Consortium researchers provided information for the construction of a breakwater which will reduce storm and wind damage to homes, wharves, moored vessels and business facilities in a northern Gulf of Mexico city. Average annual benefits are estimated to be $499,000. The cost to Sea Grant was $40,000.

Non-economically, but of no less importance, the Mississippi-Alabama Sea Grant Consortium has been involved in a wide range of efforts to increase general public awareness and appreciation of marine and coastal resources. Sea Grant educators and Advisory Service personnel have emphasized both formal and informal marine and coastal education projects for students, teachers and the general public.

The Sea Grant College Program has carried out the intent of Congress, and has proved to be both effective and cost-efficient. It continues to have a needed role in future national ocean policy and development activities. At the present time it need be reauthorized for five years without major changes, and at a funding level sufficient to carry out the Congressional mandate.

Sea Grant Publications
1971-1982



MISSISSIPPI-ALABAMA
SEA GRANT CONSORTIUM

December 1982

Grant No.: NA81AA-D-00050
Project No.: M/PA-1

Publication Number:
MASGP-81-027

SOUTHWEST FLORIDA SHELF ECOSYSTEMS STUDY
AN INTRODUCTORY OVERVIEW AND HABITAT CHARACTERIZATIONS

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Contract Nos. 14-12-0001-29142/29144

PROGRAM OVERVIEW

The Southwest Florida Shelf Ecosystems Study is a multiyear, multidisciplinary OCS environmental studies program. Years I and II of the program described and mapped the generalized distributions of seafloor substrates and benthic communities represented across the southwest Florida shelf. Year III examined the influence of Loop Current impingement on the southwest Florida shelf in relation to hydrographic characteristics and primary production. Year IV studies are presently being conducted to further refine and expand information obtained during the Year I and II programs. Specific goals include further, more detailed examination of "interesting areas" (pockmarks, pinnacles, algal nodules, Agaricia corals), expansion of knowledge into shallower areas (i.e., shoreward to the 10 m isobath), and quantitative evaluation of visual sampling techniques.

STATUS

The Year I program has been completed and draft reports submitted to Minerals Management Service (MMS). All Year II field and laboratory work have also been completed. Final data analyses are awaiting submission of data corrections by the primary subcontractor. The Marine Habitat Atlas has been completed from combined first and second year data, reviewed by MMS, and final report copies are currently in press. All analyses for the Year III program will be completed shortly and draft reports should be submitted in early February 1983. Year IV program work is presently underway and will be discussed in a subsequent presentation.

HABITAT CHARACTERIZATIONS

Habitat characterizations of the southwest Florida OCS region were conducted during the first and second year study programs. Geophysical studies were used to identify and map the distribution of major substrate categories and benthic communities across the shelf. Underwater television and still camera observations were used to "ground-truth" the geophysical data, each data set contributing to more accurate and complete interpretation of the other.

The overall results of these characterization studies have been summarized in a two-volume Marine Habitat Atlas. Volume 1 contains index and summary maps at a scale of 1:500,000 and detailed maps and cross-sections of the survey transects at a scale of 1:48,000. Volume 2 is an interpretive report that discusses the field surveys, data analyses, and mapping procedures. Five substrate categories and nine benthic assemblages were described and mapped (Figures 6-1 and 6-2). Relationships between

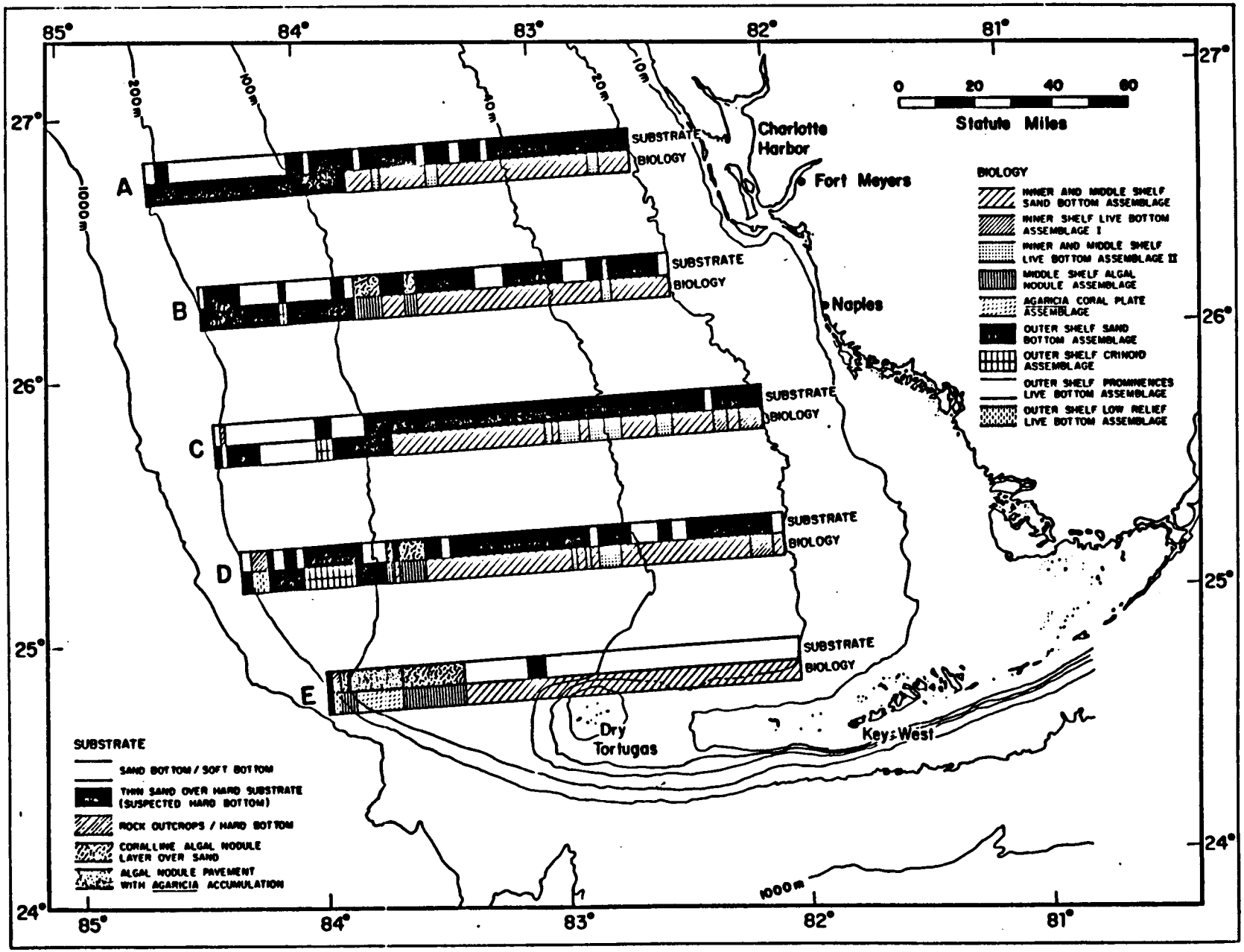

Figure 6-1. Generalized map of marine habitats along Transects A through E.

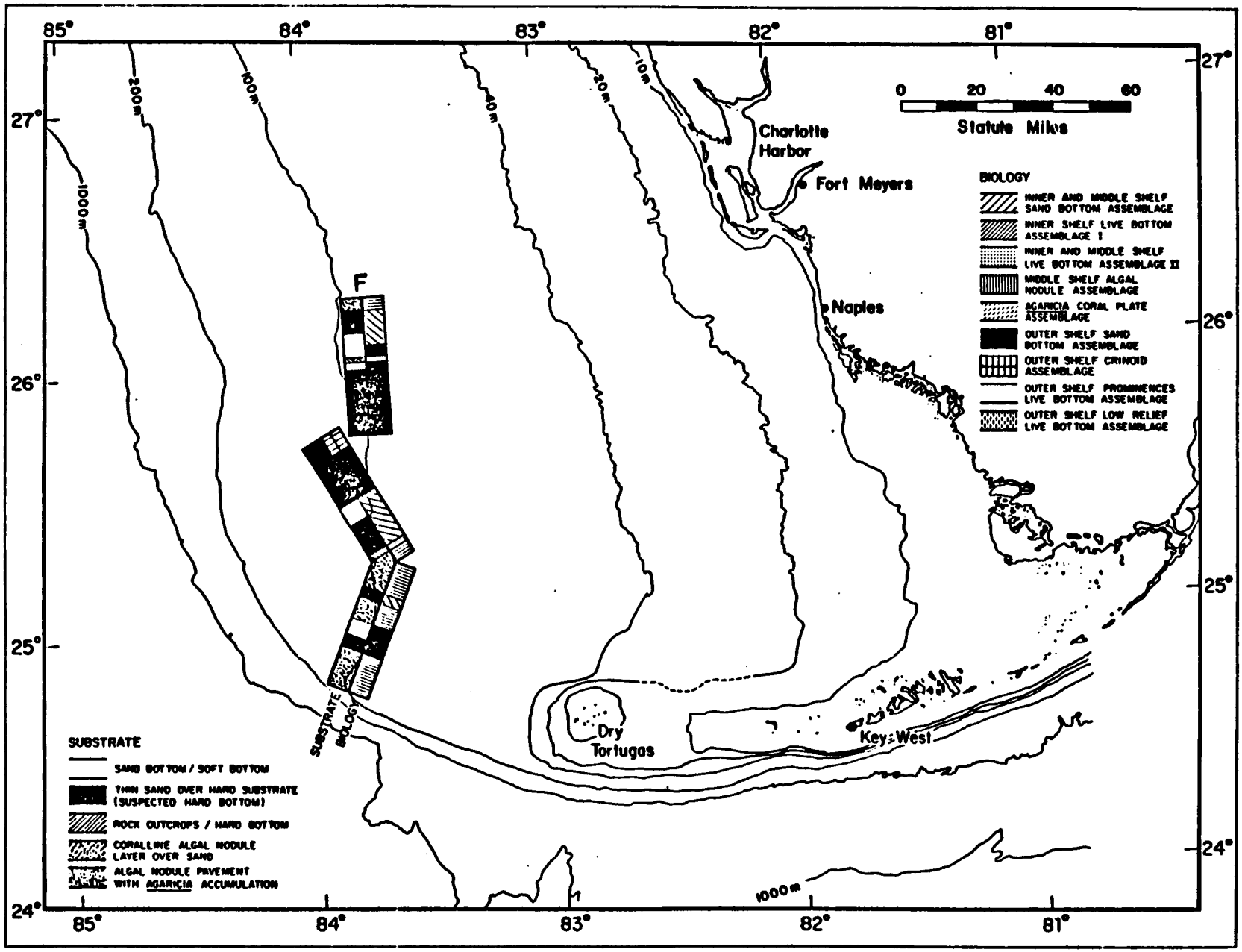

Figure 6-2. Generalized map of marine habitats along Transect F.

water depth, substrate types, and biological assemblages are summarized in Table 6-1. Brief descriptions of the substrates and assemblages categorized are presented below.

SUBSTRATE TYPES

Rock Outcrops/Hard Bottom

This bottom type includes local, continuous, bedrock outcrops; areas of scattered bedrock outcrops; partially buried bioherms and (dead) coral pinnacles. Rock areas are covered with distinctive indicator epibiota.

Thin Sand over Hard Substrate

Bottom type consists of extensive areas with a mobile, thin, sand or silt veneer overlying a hard substrate. The hard substrate may be bedrock, a calcrete layer, or calcareous rubble over softer sediment. This substrate predominates over much of the study area in 20 to 100 m water depths. Sparse populations of attached epifauna (gorgonians, sponges) are generally characteristic.

Sand Bottom/Soft Bottom

This substrate category consists of a "featureless" soft sediment bottom, with variable sediment composition and grain size. Bedforms, such as ripplemarks and sandwaves, areas of bioturbation, and soft bottoms covered with varying densities of green and brown algae may be present. Attached epibiota are generally absent in these areas.

Coralline Algal Nodule Layer over Sand

This bottom type represents soft bottom areas covered by a varying thickness of coralline algal growths, usually in the form of loose nodules.

Algal Nodule Pavement with Agaricia Accumulations

This bottom type represents areas with a fused pavement of coralline algal growths, coralline debris and corals. In many places encrusting coral (Agaricia spp.) plates accumulate and form a distinctive crust.

BIOLOGICAL ASSEMBLAGES

Inner and Middle Shelf Sand Bottom Assemblage

This assemblage is found in areas of sand bottom or with thin sand veneer in water depths ranging from 20 to 90 m. Predominant biota include algae, echinoids, asteroids, holothuroids, sea pens, and bryozoans.

Inner Shelf Live Bottom Assemblage I

This assemblage is found in water depths of 20 to 27 m where there is an exposed hard substrate. The average density of attached macrofauna is greater than one per m^2. Predominant biota include large gorgonians, sponges, hard corals, ascidians, hydrozoans, and algae.

Table 6-1. Relationships between water depth, substrate types, and biological assemblages.

Assemblage	Transect with Water Depth Range in Metres	Substrate Types[1]				
		Rock Outcrops/ Hard Bottom	Thin Sand over Hard Substrate	Sand Bottom/ Soft Bottom	Coralline Algal Nodule Layer over Sand	Algal Nodule Pavement with *Agaricia* Accumulations
Inner and Middle Shelf Sand Bottom	A (27-44)		X	X		
	B (20-81)		X	X		
	C (23-79)		X	X		
	D (20-88)		X	X		
	E (20-67)		X	X		
	F (77-98)		X	X		
Inner Shelf Live Bottom I	C (19-26)		X			
	D (22-26)		X			
Inner and Middle Shelf Live Bottom II	A (25-65)		X			
	B (31-33)	X	X			
	C (30-72)		X			
	D (43-53)		X			
	E (56-62)		X			
	F (78-93)	X	X			
Middle Shelf Algal Nodule	B (62-84)				X	
	D (76-93)				X	
	E (67-125)				X	
	F (73-89)				X	
Agaricia Coral Plate	E (69-90)					X
	F (79-85)					X
Outer Shelf Sand Bottom	A (74-212)		X	X		
	B (84-204)		X	X		
	C (79-200)		X	X		
	D (93-202)		X	X		
	E (180-205)		X			
	F (90-116)		X	X		
Outer Shelf Crinoid	B (98-167)		X			
	C (85-137)	X	X			
	D (117-142)		X			
	F (116-127)		X			
Outer Shelf Prominences	C (137-168)			X		
Outer Shelf Low-Relief	C (164-185)	X				
	D (127-178)	X				
	E (125-180)	X				
	F (91-115)	X				

[1] "X" indicates the occurrence of a given assemblage on a specified substrate. If a transect is not listed, it indicates the assemblage was not observed in that transect.

Inner and Middle Shelf Live Bottom Assemblage II

This assemblage is found in water depths of 25 to 71 m where there is an exposed hard substrate. This assemblage has a higher number of species of sponges and a lower biomass per unit area than assemblage "I". Predominant biota include sponges, hard corals, small gorgonians, ascidians, bryozoans, hydrozoans, and algae.

Middle Shelf Algal Nodule Assemblage

This assemblage is found in water depths of 62 to 108 m. The nodules are formed by the combination of coralline algae with sand, silt, and clay particles. Small sponges, corals, and other algae are also present.

Agaricia Coral Plate Assemblage

This assemblage is found in water depths of 64 to 90 m. Live hard corals, gorgonians, sponges, and algae live on a dead hard coral-coralline algae substrate.

Outer Shelf Sand Bottom Assemblage

This assemblage occurs in water depths of 74 to 200 m. It is distinguished by a lack of algae. Characteristic fauna include ophiuroids, asteroids, echinoids, sea pens, crinoids, crustaceans, anemones, and occasional sponges.

Outer Shelf Crinoid Assemblage

This assemblage occurs in water depths of 118 to 168 m. Large numbers of crinoids and small hexactinellid sponges occur on a coarse sand or rock rubble substrate.

Outer Shelf Prominences Live Bottom Assemblage

This assemblage occurs in water depths of 135 to 170 m where rock and coral pinnacles are found. The assemblage includes soft corals, crinoids, hard corals, hexactinellid sponges, and hydrozoans attached to the pinnacles.

Outer Shelf Low-Relief Live Bottom Assemblage

This assemblage occurs in water depths of 105 to 200 m where there is an exposed low-relief hard substrate or very thin sand veneer. Predominant biota includes small sponges, soft corals, crinoids, hard corals, and hydrozoans.

SOUTHWEST FLORIDA SHELF REGIONAL BIOLOGICAL COMMUNITIES SURVEY

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The Southwest Florida Shelf Regional Biological Communities Survey was designed to answer questions arising from the first two years of the Southwest Florida Shelf Ecosystems Study and to expand the study area into nearshore regions. It was also decided to use several different methodologies of data collection to compare the reliability and usefulness of various methods in analyzing benthic habitats and communities.

The survey was divided into three cruises with the first being a remote sensing cruise collecting underwater television/still camera, side-scan sonar, subbottom profiler, and precision depth recorder data. The survey transects consisted of eastward extensions of the Southwest Florida Shelf Ecosystems Study Year I Transects B, C, and D to distances of 15, 15, and 31 nautical miles, respectively; a north-south tie-line between these extensions; north-south tie-lines between Transects A-E in 50 meters water depth; and a north-south tie-line between Transects C and E in approximately 150 meters water depth (Figure 1). Surface temperature and salinity data was collected every 5.4 nautical miles or once every hour (whichever generated the most measurements) during survey transects and steaming distances greater than 20 nautical miles. Vertical STD/DO and transmissivity profiles were made at the beginning and end of each survey transect.

Cruises II (Winter) and III (Summer) are biological sampling/hydrography cruises with Cruise III repeating Cruise II procedures. Ten soft bottom and five hard bottom sampling stations were selected in water depths of less than 20 meters based on observations made during Cruise I (Figure 2). The station selection criteria were to select stations that represented as many significantly different biological habitats as possible while providing a maximum geographical coverage of the study area.

Soft bottom station sampling consisted of the diver collection of 10 infaunal cores, three sediment grain size cores, and three hydrocarbon cores. An additional 50 infaunal cores and 15 sediment grain size cores were collected at an intensive sampling station (one of the hard bottom stations) to evaluate variations in soft bottom infauna with distance from hard bottom areas.

Hard bottom station sampling consisted of STD/DO and transmissivity profiles at each of the five stations, remote television/still camera data collections following techniques used during the first two years of this study, and dredge and trawl sample collections. All remote data collections were conducted at night at each hard bottom station and were repeated during daylight hours at the intensive sampling station to evaluate day-night differences. A sediment trap rack, supporting three replicate traps at two different heights above the sea floor and an acoustic pinger, was also deployed at each hard bottom station. In-site

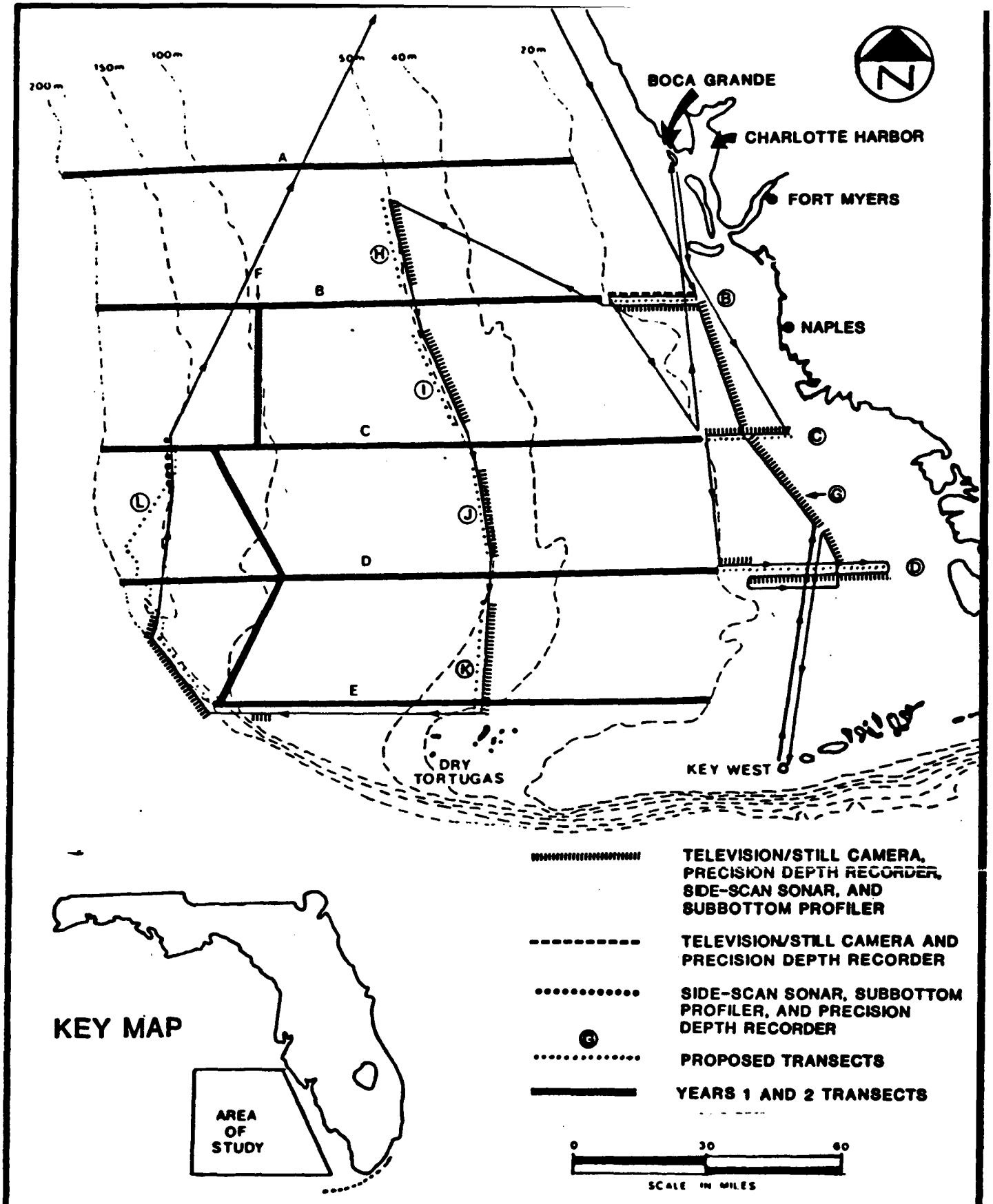

FIGURE 1. SOUTHWEST FLORIDA SHELF REGIONAL BIOLOGICAL COMMUNITIES SURVEY CRUISE I TRANSECTS.

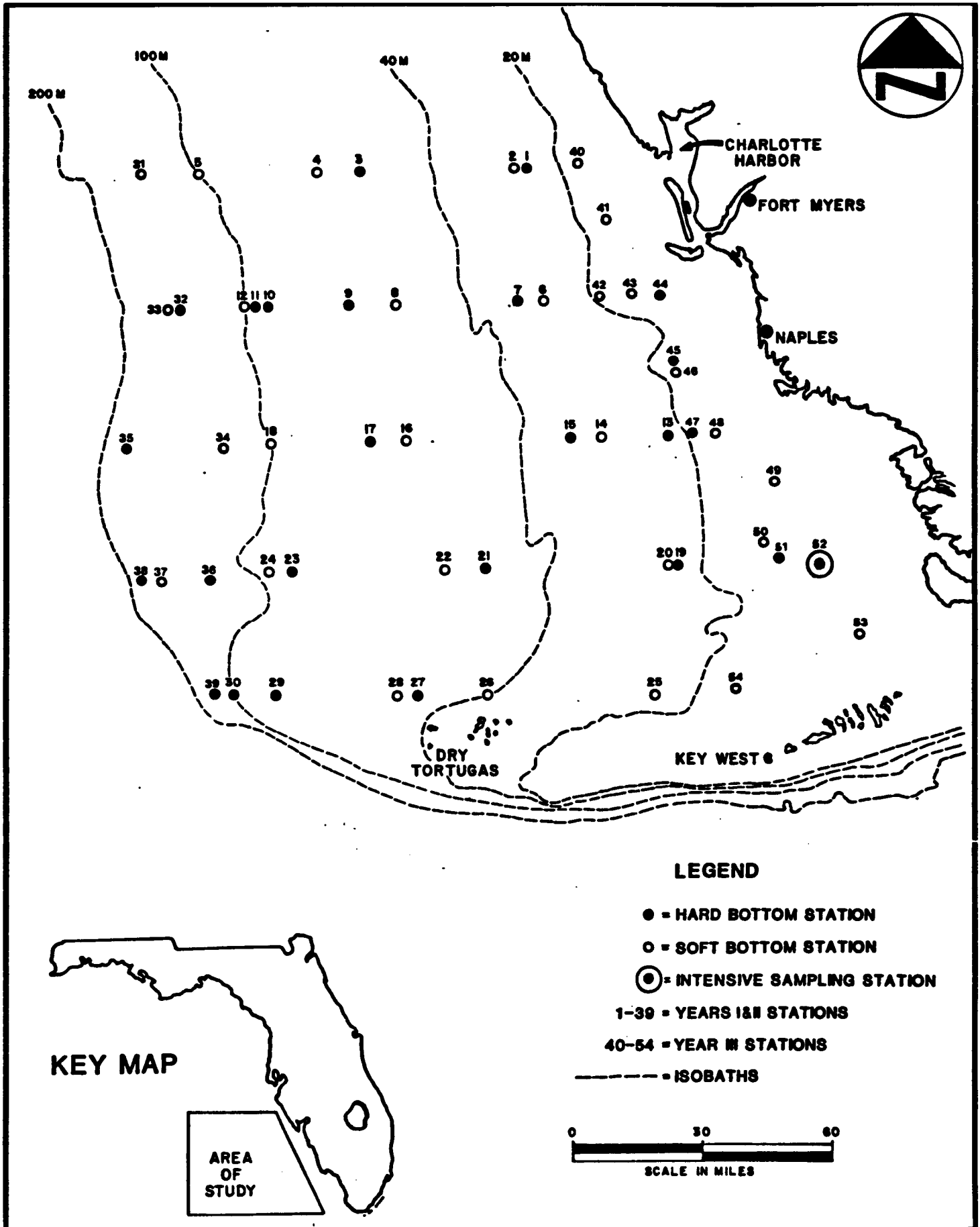

FIGURE 2. GEOGRAPHIC LOCATIONS OF ALL SOUTHWEST FLORIDA SHELF STUDIES BIOLOGICAL SAMPLING STATIONS.

recording thermographs were attached to the racks at the northern and southernmost stations. The traps and thermographs will be recovered during Cruise III_2. At each hard bottom station, divers randomly deployed thirty-five 0.5 m^2 quadrates on the bottom, photographed each, and collected all included epibiota to compare to remotely collected quantitative still photo data. Divers also recorded all fish species observed for comparison to remote visual fish observations.

POST MIOCENE DEVELOPMENT OF THE SOUTHWESTERN FLORIDA SHELF

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Corpus Christi, Texas 78411

Actively growing carbonate banks, extending southwest from the Key West Region, form a topographic ridge along the southern limit of the Florida shelf. The organisms constructing these banks are fed by nutrient-rich waters of the Florida Current. High-resolution single-channel seismic data have shown that these banks are founded on off lapping sediments originating on the shelf to the north. These sediments have migrated south under the influence of a strong current, which apparently is presently moving 5-m-high sand waves southward.

The sequence of reefs overlying offlapping sediments occurs three times within the sedimentary section, each successive sequence extending the shelf southward. The shallowest reef is the modern system. The intermediate reef (90 m below sea level) can be traced north and crops out on the central shelf. The deepest reef (200 m below sea level) forms the shelf break along the western margin of the shelf. These three sequences bury the Miocene platform that crops out to the east as the Portales Terrace and to the west as a narrow ledge. This accretion, which has extended the Florida platform into the Florida Straits since the close of the Miocene, is the result of the combined effect of reef growth fed by the Florida Current and sediment transport by the Loop Current.

There are four zones in which geologic hazards occur. These hazards are: 1) Karst developed throughout the area more commonly found in the northern section of the study; 2) Creep zone on the upper slope-outer shelf; 3) Block slides lower-upper slope in the northern portion of the study area; and 4) Sand scour, the outer shelf between Howell Hook and Pully ridge (central reef).

SOUTHWEST FLORIDA CONTINENTAL SHELF: A LOOP CURRENT MECHANISM FOR PRODUCTIVITY ENHANCEMENT AND QUESTIONS FOR FURTHER STUDY

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Contract No. 14-12-0001-29144, Modification No. 1
Southwest Florida Shelf Ecosystem Study

In early April 1982, the first of a series of two data collection cruises at the shelf break off southwest Florida (25° to 27°N, 83° to 85°W) was completed as a means of investigating the effects of a potentially major source of offshore nutrients for the regional ecosystem. Previous studies by Yoder et al. (1981) and Atkinson (1982) off the southeastern U.S. coast showed that upwelling associated with the Gulf Stream front in the vicinity of the shelf break formed a major source of nutrients for the South Atlantic Bight. This study was conducted to determine

1. if an analogous mechanism was active at the Loop Current front in the Gulf of Mexico, and
2. what the hydrographic and productivity characteristics of such a mechanism were in comparison to its Gulf Stream counterpart.

Figure 1 presents a time sequence of the positions of the Loop Current/Shelf water front off the southwestern Florida shelf between 1 and 4 April 1982. Each successive position of the finger-like eddy was determined from Nimbus-7 AVHRR imagery during cloud-free periods. By 4 April, the front had progressed about 56 km across the shelf at an approximate west-to-east propagation speed of 16 cm/sec. On 6 April, the RV GYRE sampled across the cold core frontal eddy. The data showed an increase in nutrient concentrations greater than 10μM at depths of 100 to 140m. A subsurface chlorophyll maximum coincided with the 1μM isopleth of nitrate at a depth of 40m during the intrusion. These features are illustrated in the nitrate and chlorophyll-*a* + phaeopigment-*a* shelf break cross-sections in Figures 2 and 3, respectively. A schematic of the three-dimensional structure within the eddy is presented in Figure 4.

During a second data collection cruise in September 1982, a time series of cross-sections to the 1000m isobath at about 26°N showed a similar intrusion situation beneath a more pronounced seasonal thermocline.

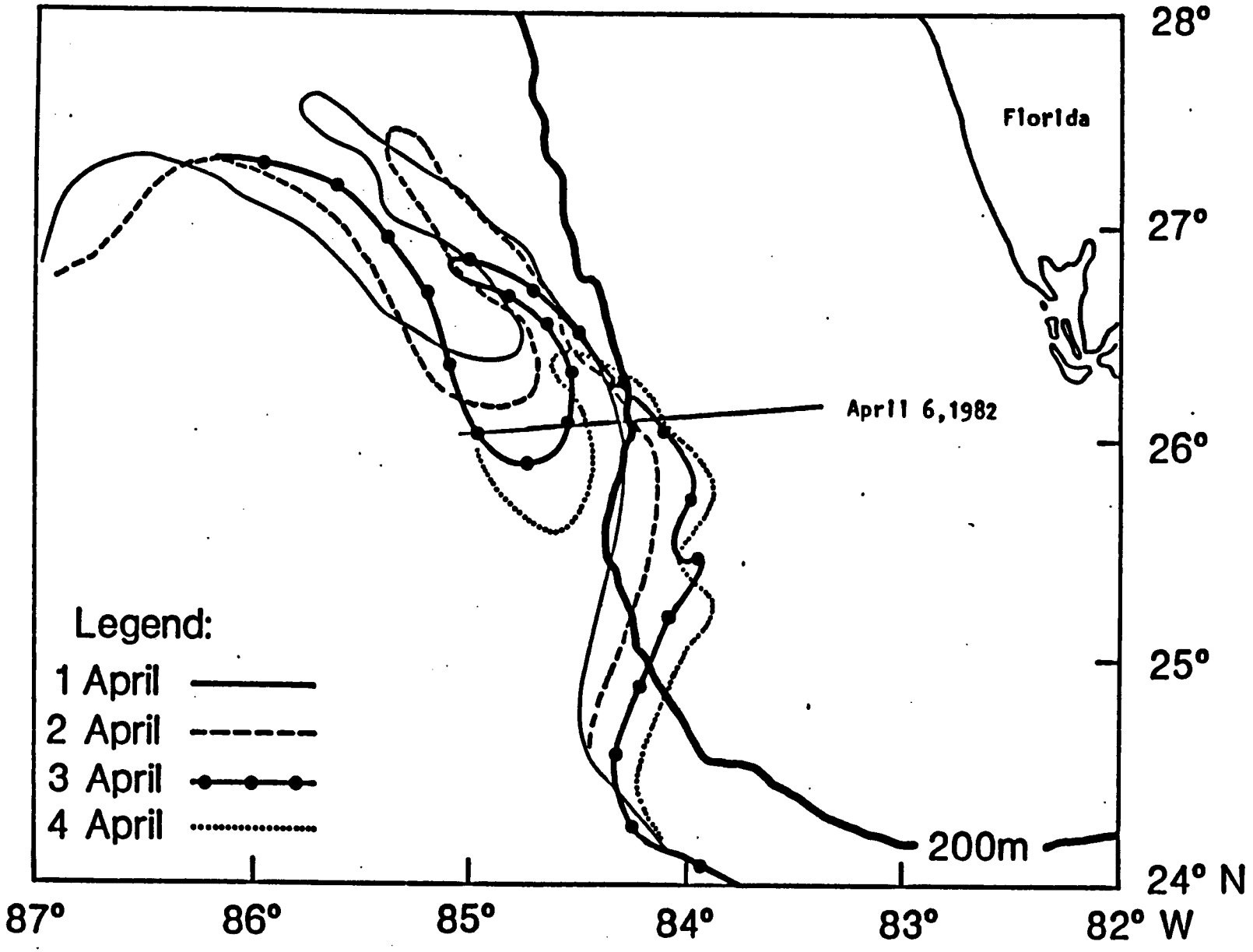


FIGURE 1

A time series of the sea surface temperature contour which defines the Loop Current/Shelf water Front (approx. 24 C). The sea surface temperatures were derived from data from the Advanced Very High Resolution Radiometer (AVHRR) aboard the NOAA-7 polar orbitting satellite.

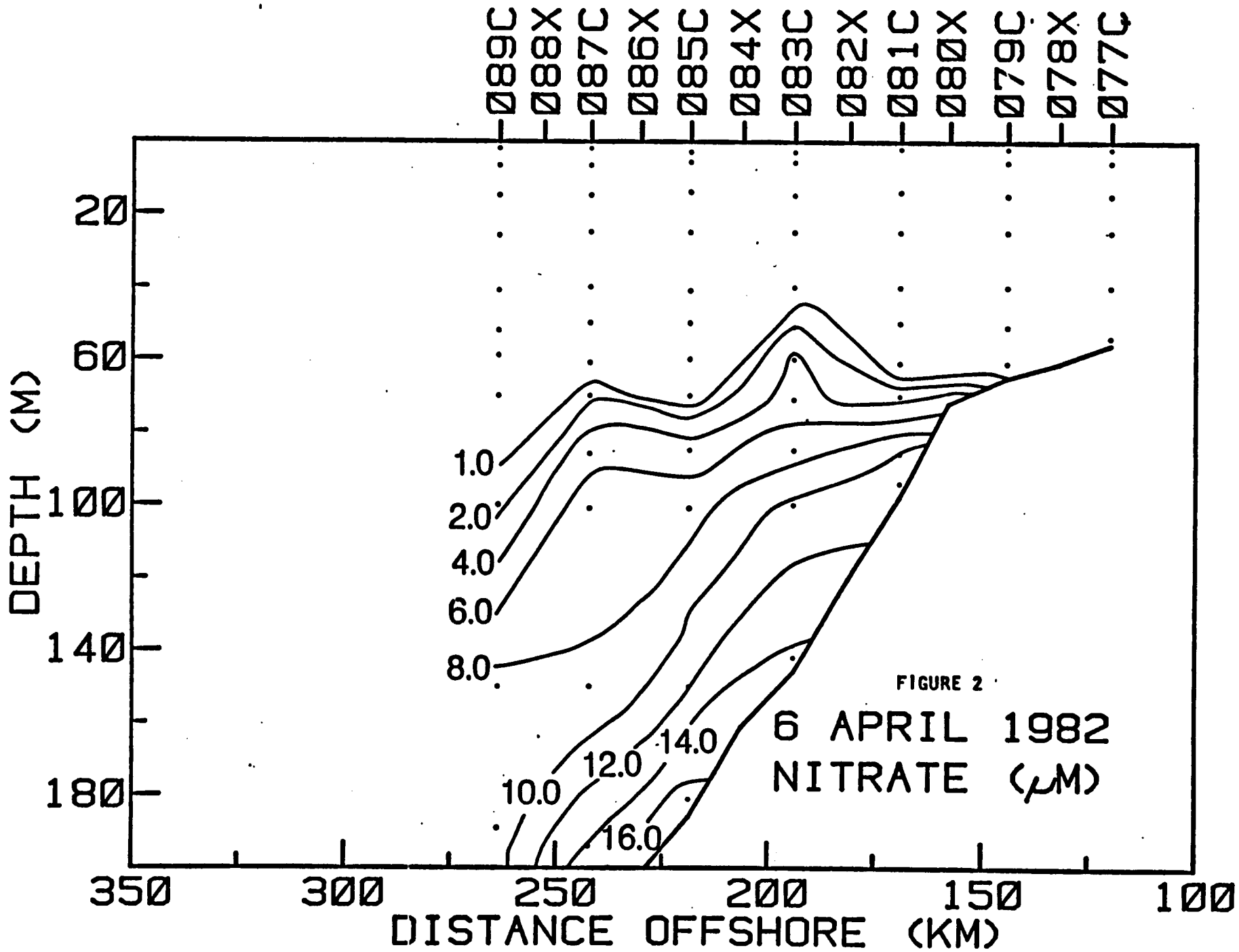


FIGURE 2

6 APRIL 1982

NITRATE (μM)

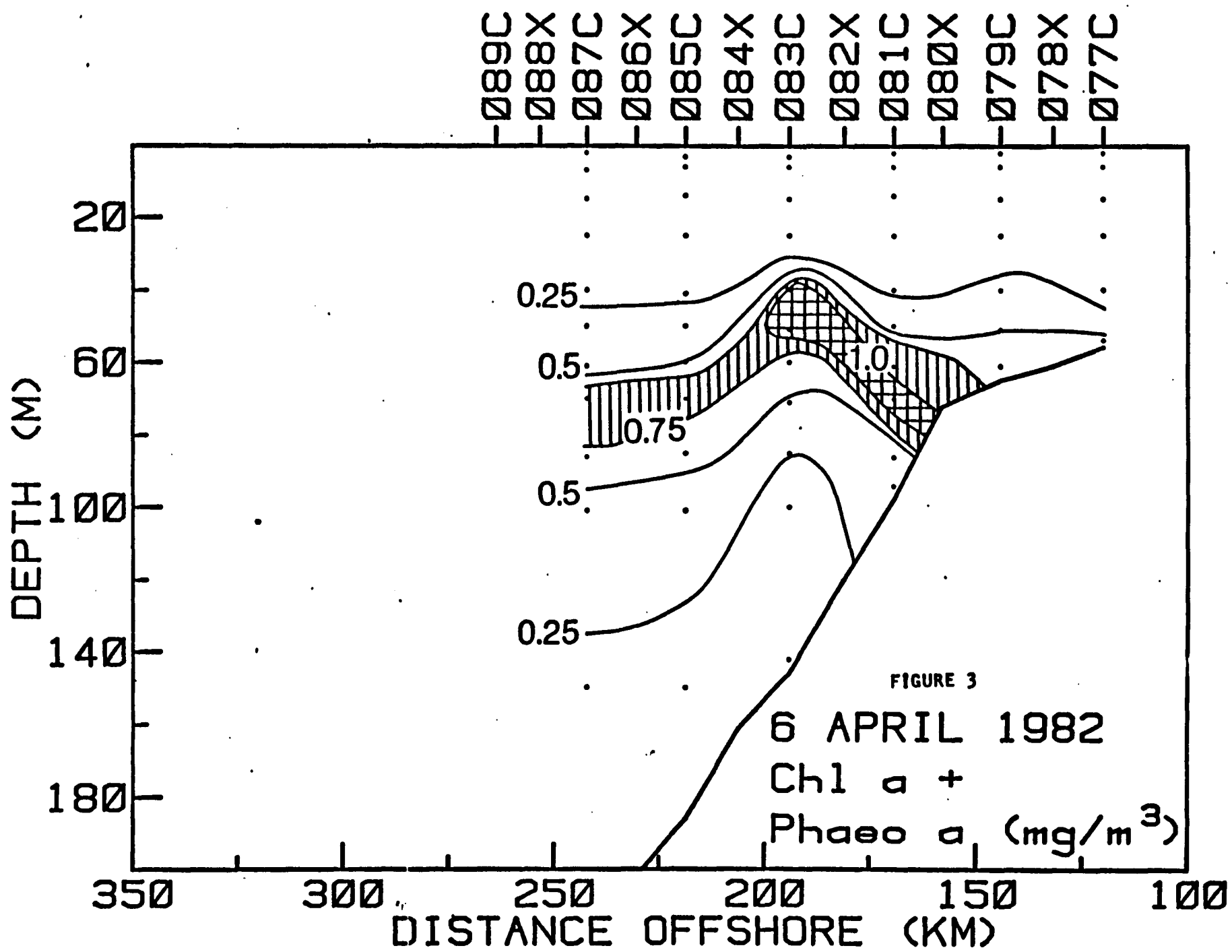

089C
088X
087C
086X
085C
084X
083C
082X
081C
080X
079C
078X
077C
20
60
100
140
180
DEPTH (M)
0.25
0.5
0.75
1.0
0.5
0.25
350
300
250
200
150
100
DISTANCE OFFSHORE (KM)
6 APRIL 1982
Chl a +
Phaeo a (mg/m3)

FIGURE 3

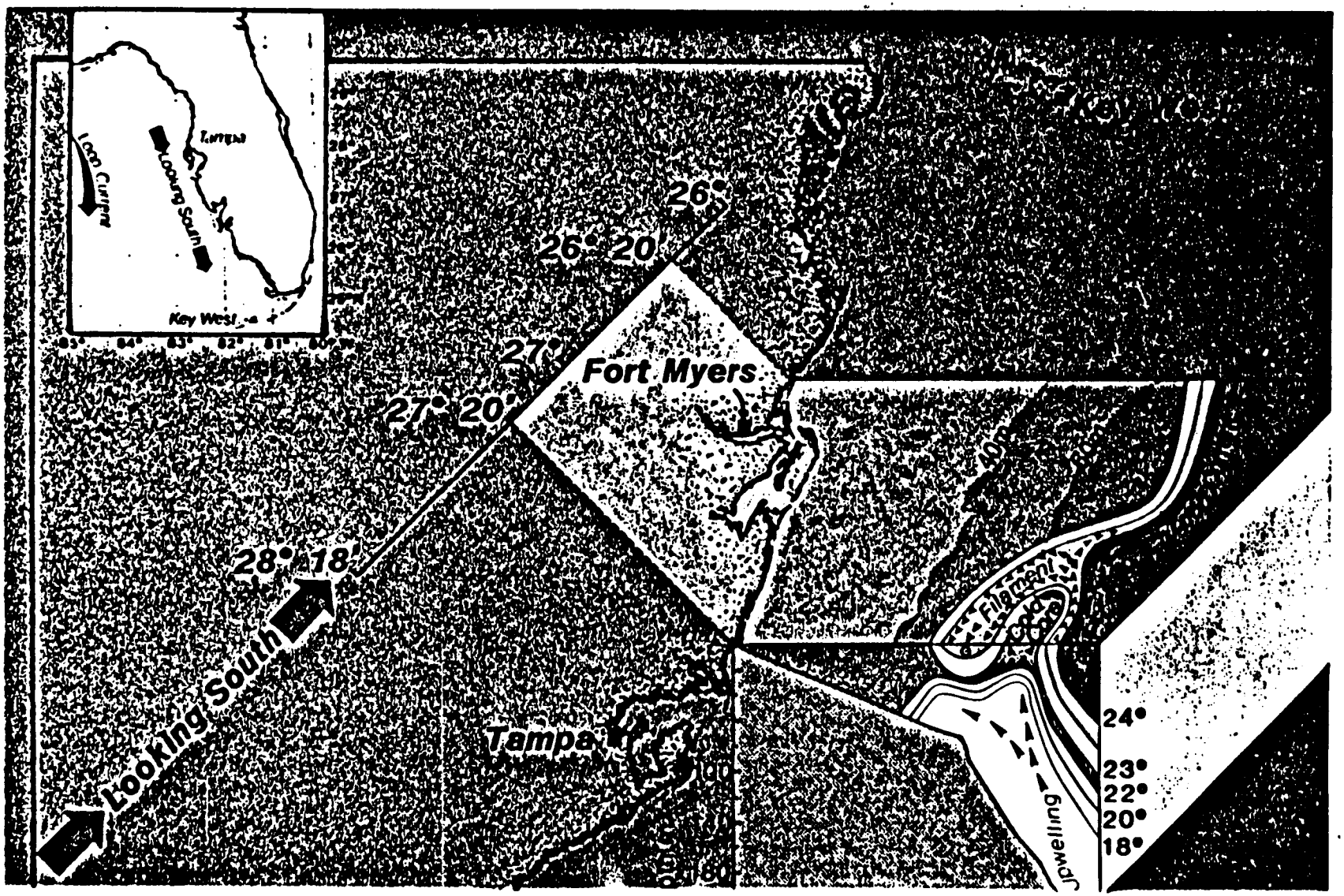


FIGURE 4

Gulf Loop Current Eddy at
Southwest Florida Shelf Break

In light of the results obtained during the first two years of the Southwest Florida Shelf Ecosystem Study and the ramifications of such an upwelling mechanism as a potential driving force for the regional ecosystem, several important questions need to be considered. For example,

- To what extent does the "new" (upwelled) nitrate contribute to the observed primary production relative to other nitrogen sources (regenerated nitrogen)?

- What fraction of the total available nitrogen is contributed by upwelled sources? What are the frequencies of these shelf intrusions?

- What are the relative contributions of phytoplankton and benthic macroalgae as sources of carbon for this ecosystem?

- What role does this nutrient source play in forming and/or maintaining the reef system of the Florida Keys?

  Recent studies around the Great Barrier Reef (Andrews and Gentien, 1982) have shown the reefs to be "an ecological response to tropical upwelling". Does a similar situation exist in the waters off southwest Florida?

- What is the dominant mode of transport and mixing of these nutrient fluxes across the shelf? Is the process turbulent or isotropic (double diffusive)? This has a direct effect on area distributions and gradients.

If we accept the results of the first two years of study that show phosphorus input from onshore deposits and shelf sediments, then the answers to most of these questions for the oligotrophic (i.e., deficient in plant nutrients) conditions present in the study area lies in the investigation of nitrogen dynamics. That is, the processes undergone during nutrient uptake and nitrogenous regeneration from ammonia to nitrite to nitrate. Several of these recommended studies are discussed.

References:

Andrews, J.C. and P. Gentien (1982): Upwelling as a source of nutrients for the Great Barrier Reef ecosystems: A solution to Darwin's questions? Marine Ecology - Progress Series, vol. 8, p. 257-269.

Atkinson, L.P. (1982): Hydrographics of the SAB in the summer: A review of 1979 and 1981 observations. Fall AGU meeting paper 021B-01.

Yoder, J.A., L.P. Atkinson, T.N. Lee, H.H. Kim, and C.R. McClain (1981): Role of Gulf Stream frontal eddies in forming phytoplankton patches on the outer southeastern shelf. Limnol. Oceanogr., 26(6), p. 1103-1110.

GULF OF MEXICO
Outer Continental
Shelf Region

MMS

MINERALS MANAGEMENT SERVICE
U.S. DEPARTMENT OF THE INTERIOR

Environmental
Studies
Information
Announcement

ANNOUNCEMENT OF REPORT/DATA AVAILABILITY

TITLE

The MMS-supported ecological atlas referenced below has been approved for release and is available to the public as indicated:

MISSISSIPPI DELTAIC PLAIN
REGIONAL ECOLOGICAL ATLAS

MMS INTERAGENCY AGREEMENT NO. AA851-MU8-28
WITH U.S. FISH AND WILDLIFE SERVICE

EARTH SATELLITE CORPORATION

JANUARY 1983

AUDIENCE

Primary users of this atlas will be MMS and USFWS decisionmakers and other federal and state agencies responsible for environmental and resource management programs, involving the Louisiana and Mississippi coastal zones and the adjacent outer continental shelf. Considerable information on a wide varity of topics is portrayed on the maps in order to aid coastal planners in the resolution between land uses and natural resources.

The Minerals Management Service, Imperial Office Building, Metairie, Louisiana 70010

AVAILABILITY

Copies of the Ecological Atlas are available from the Minerals Management Service by inquiring at the address below:

Records Management Section
Gulf of Mexico OCS Region
Minerals Management Service
Imperial Office Building
3301 N. Causeway Blvd.
P.O. Box 7944
Metairie, Louisiana 70010
(504) 837-4720 Ext. 305 or
FTS 680-9305

PROJECT/REPORT DESCRIPTION

The Ecological Atlas consists of a brief narrative volume and a series of base maps and data set overlays. The narrative volume provides explanatory material as well as the sources of mapped information. The 1:100,000 scale maps cover the coastal region of Louisiana and Mississippi from Vermilion Bay, Louisiana, to the Mississippi-Alabama State line. Each map quadrangle is composited in turn with each of six data sets: socioeconomic features; oil and gas infrastructure and mineral resources; soils, geologic/geomorphic features and man-made lands; climatology and hydrology; active coastal processes; and biological resources. Although 13 base maps were included in the study area, only 12 were actually included in the atlas series due to the small amount of land area shown in the White Lake Quadrangle. This resulted in a total of 72 maps. Similar atlases are in preparation for the Texas Barrier Islands Region, coastal Alabama, and the western coast of Florida from the Alabama State line to include Monroe County.

ALABAMA COASTAL CHARACTERIZATION STUDY

Maurice F. Mettee and Patrick E. O'Neil
Geological Survey of Alabama
P. O. Drawer O
University, Alabama 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. AA851-MUO-20). The study includes Mobile and Baldwin Counties and is divided into three work tasks:

Task I.-- Coastal Alabama Environmental Literature Review and Synthesis

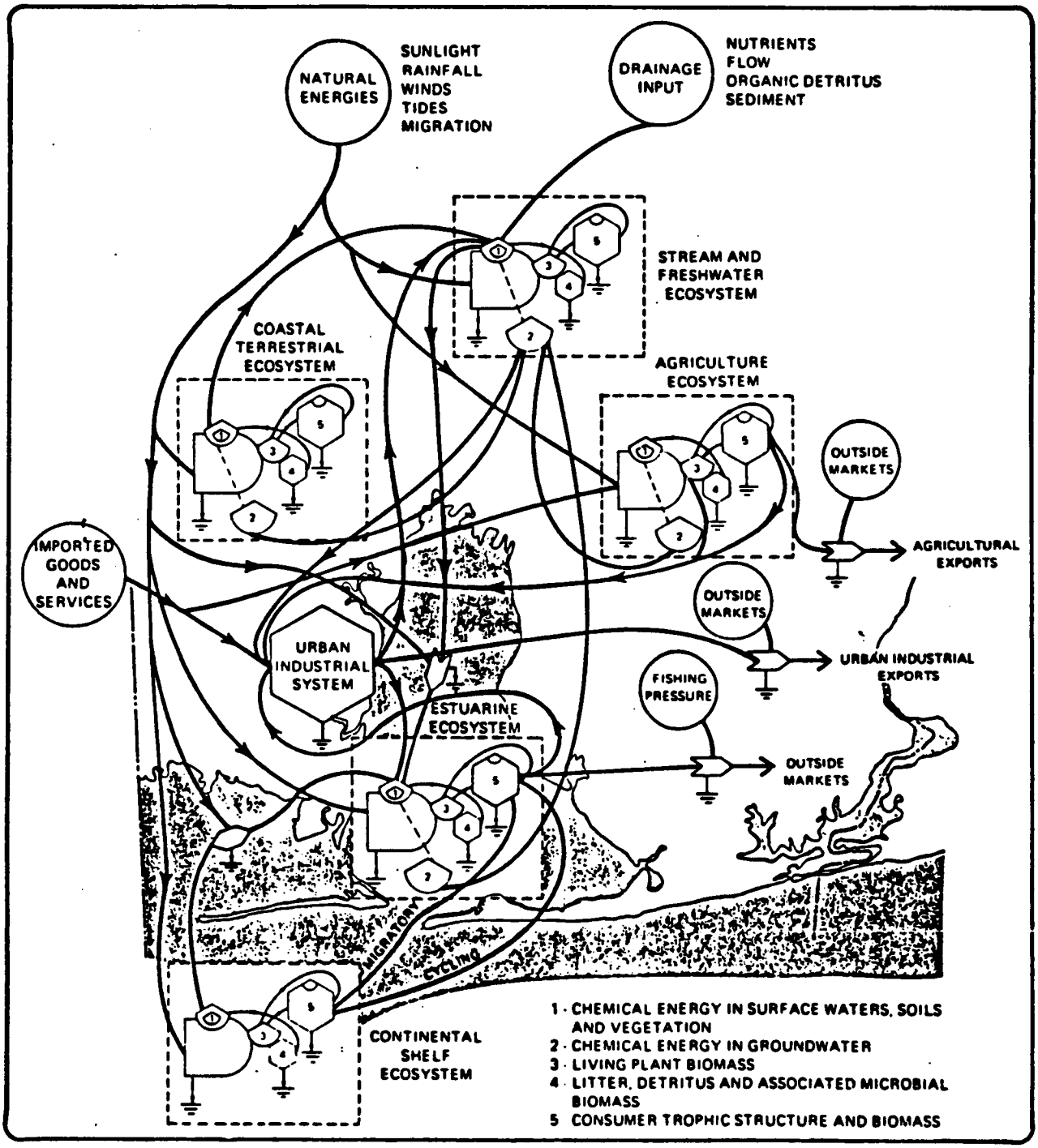
Task II.-- Socioeconomic Data Collection and Synthesis for Coastal Alabama

Task III.-- Historical Habitat Mapping of Coastal Alabama.

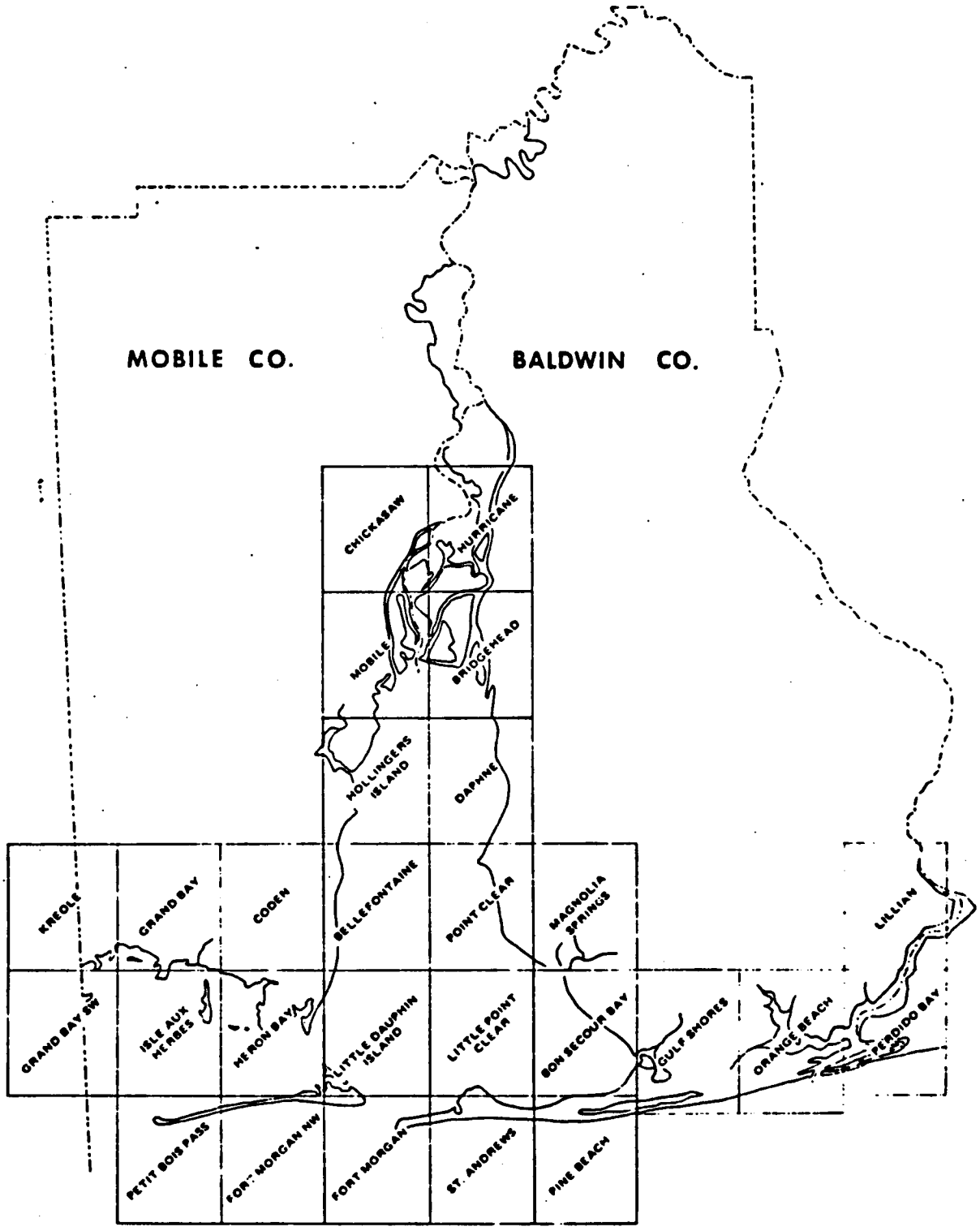
Task I consisted of two subtasks that generated three final products. Subtask 1 involved the production of a computer-based bibliography of published and unpublished reports on the biology, climatology, geology and geography, hydrology, and socioeconomic structure of the area. References are entered and can be retrieved by author, source, and key words. Also included are references to ongoing studies in coastal Alabama and contact agencies. Final products include a computer tape containing the FAMULUS Information System and a user's manual to the system. Data collected for the coastal bibliography were used to prepare a two-part environmental synthesis report. The first portion contains a detailed description of the natural environment of the area. The second section presents a conceptual model and supporting text on four natural (freshwater, upland 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, and marsh.

Nine socioeconomic synthesis papers and a companion data appendix were 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 was the classification of wetland habitats that existed in coastal Alabama circa 1955. Habitat types were delineated on 9" by 9" black-and-white photography using the U.S. Fish and Wildlife Service Wetlands Classification System (1979). These data were transferred to 27 U.S.G.S. stabe base 7.5-minute quandrangle maps, labelled, and planimetered. Final products for this task included the 27 stable base maps and a user's guide.



Coastal Alabama Conceptual Model



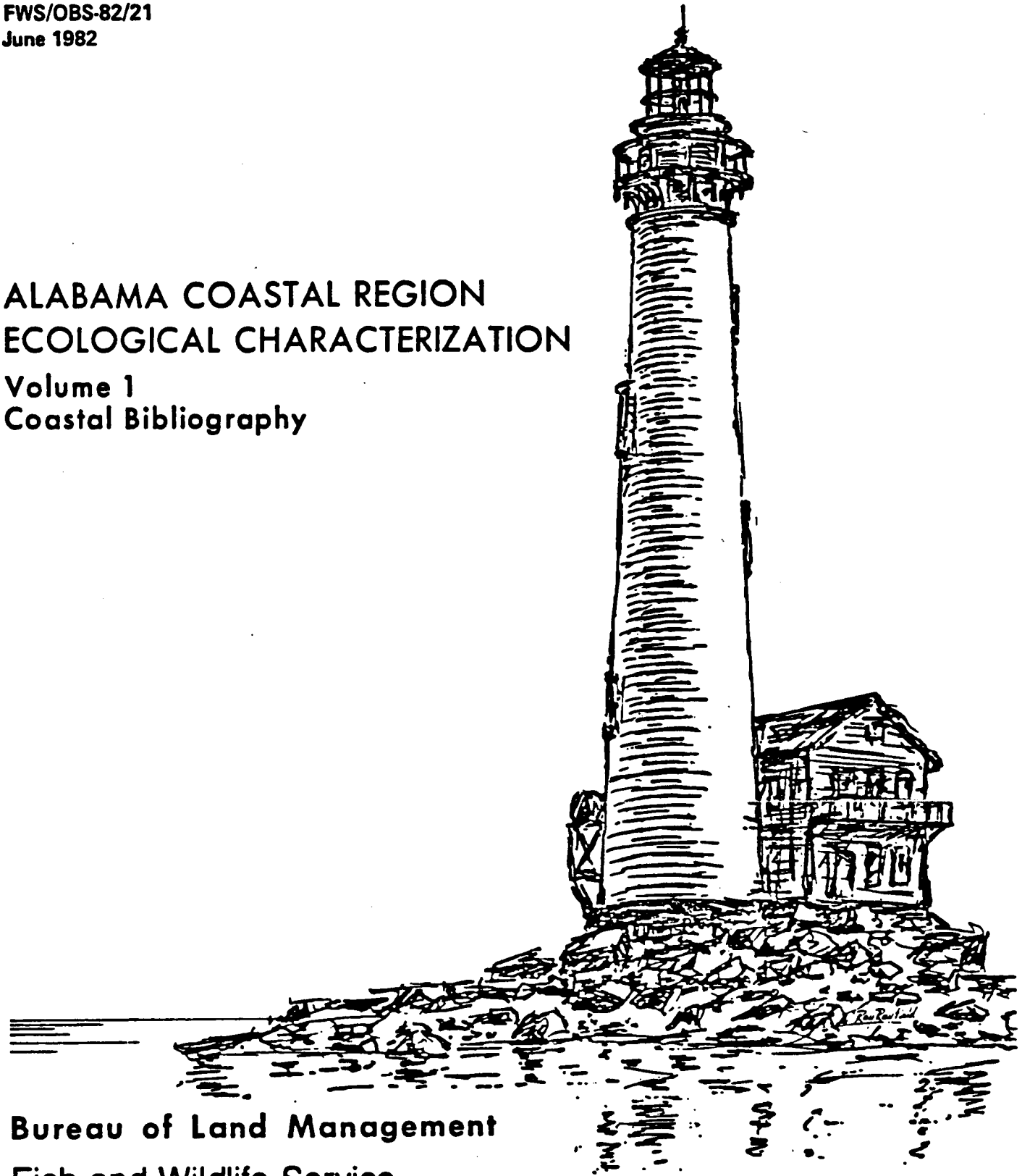
Index of USGS 7½-minute topographic maps used for wetland habitat delineations in Mobile and Baldwin Counties.

Biological Services Program

FWS/OBS-82/21
June 1982

ALABAMA COASTAL REGION ECOLOGICAL CHARACTERIZATION

Volume 1
Coastal Bibliography



Bureau of Land Management

Fish and Wildlife Service

U.S. Department of the Interior

FLORIDA PANHANDLE AND BIG BEND LITERATURE SEARCH AND SYNTHESIS

N. Scott Schomer
State of Florida
Department of Environmental Regulation
Tallahassee, Florida 32301

A total of thirteen "deliverables" are scheduled from cooperative agreement 14-16-009-80-999. These consist of a bibliographic data base and 11 documents characterizing the ecology of Florida's Gulf Coast watersheds. To date one document has been completed and published. Three other documents are in final stages of completion. It is anticipated that all three will be available for review by March 1, 1983. A capsule summary of document #1, on the lower everglades, Florida Bay and the Florida Keys follows:

A conceptual model of the study area identifies four major ecological zones: 1) terrestrial and freshwater wetlands, 2) estuarine and saltwater wetlands, 3) Florida Bay and mangrove islands, and 4) the Florida Keys. These are geographically delineated from one another by a combination of elevation gradient and positioning relative to one another and to major outside influences such as upstream watersheds, the continental shelf and major ocean current systems. These zones are delineated by differences in basic physical-chemical background factors such as substrate, climate, hydrology and water chemistry which in turn promote characteristic ecological communities. Many of these communities are similar between zones but localized differences do exist, as do significant shifts in relative abundance of community types. The terrestrial and freshwater wetlands support pinelands, sawgrass marshes, wet prairies, sloughs and occasional tree islands on freshwater peat, marl and limestone soils. The estuarine and saltwater wetlands support mangrove forests, salt marshes and oscillating salinity systems on mangrove peat, marine marl, sand or "liver mud" substrates. Florida Bay exhibits oscillating meso-to hypersaline waters over grassbeds on marine lime mud sediments. These mud banks form an anastomosing pattern surrounding deeper "lake" areas having only a thin veneer of sediment. The exposed tips of the mud banks frequently support mangrove or salt prairie vegetation. The Florida Keys support almost all of the above communities to some small degree but are more prominently characterized by extensive offshore coral reefs. The upper keys are themselves a relict reef exposed by global lowering of sea level. The lower keys are composed of rock hardened Miami oolite, a limestone formed via chemical precipitation rather than biological deposition. The productivity of these communities with regard to fish and wildlife reflects 1) the diversity and type of habitats available to species that are potentially capable of exploiting them, 2) the degree of alteration of these habitats by man and natural forces, and 3) historical, biogeographic and random factors that restrict organisms to specific environments or prohibit them from exploiting a potential habitat.

With regard to the remaining documents two target dates are significant. Documents 5 through 9, on the Apalachicola, St. Andrews/St. Joseph Bays, Choctawhatchee and Pensacola drainage systems are scheduled for September 1983. Documents 10 through 12, on the Withlacoochee/Crystal Rivers, the Suwannee/Santa Fe and the Ochlockonee,

St. Marks, Steinhatchee drainage to Apalachee Bay are scheduled for December, 1983.

Along Florida's Gulf Coast, four regions can be identified; 1) the panhandle from the Apalachicola Delta to the Alabama border, 2) the big bend from the Crystal River to the Ochlockonee River, and 3) the Southwest coast from Sanibel island through the greater Tampa Bay area, and 4) the South Florida, west coast from the Keys through the Caloosahatchee River Basin. These four areas differ signficantly from one another with respect to their climate, geology, hydrology and ecology. Superimposed upon these differences, the four areas also differ with respect to the socio-economic characteristics and development pressures. Consequently offshore oil and gas exploration activities may be expected to exert different impacts upon the different regions. Even within a single region there are profound spatial differences in socio-economic and natural resource structure and function. In order to provide a basis for anticipating such impacts it is proposed that three characterization papers be compiled from data collected by the on-going socio-economic and ecological synthesis efforts. The purpose of these papers is to describe the interactions between socio-economic activies and the natural resource base. Particular attention should be paid to identifying spatial and temporal trends in social and economic activity levels, pollutant generation, and land and water use with regard to their impact on ecological communit metabolism, species composition, abundance and life history needs. The objective of this approach is to identify sensitive areas of overlap between socio-economic activities and regional ecological functions.

GULF OF MEXICO PHYSICAL OCEANOGRAPHY PROGRAM

Evans Waddall
Science Applications, Inc.
4900 Waters Edge Drive, Suite 255
Raleigh, North Carolina 27605

In October 1982, MMS initiated a multiyear study to describe and understand circulation and conditions in the Gulf of Mexico, with emphasis on deeper water regions-- continental slope and seaward. The first of three program years will concentrate on a regional characterization of the eastern Gulf. Year 2 is expected to emphasize the western Gulf; Year 3, basin-wide processes.

In the eastern Gulf, the Loop Current is the major influence on physical oceanographic conditons. This persistent current system which enters the Gulf basin through the Yucatan Straits and exits through the Florida Straits can occupy a wide range of locations. This includes anywhere between flowing north toward the Alabama coast, curving eastward toward and then outward along the west Florida shelf, to going directly eastward from the Yucatan Straits to the Florida Straits. The major effort during Year 1 will be to document and describe the behavior of the Loop Current and its influence on regional dynamics.

Key technical elements in Year 1 include obtaining and utilizing the following observations:

- subsurface currents/temperatures
- hydrography
- Lagrangian drifters
- satellite imagery
- ship-of-opportunity program

Subsurface currents will be documented using a five-mooring array (Figure 1) containing 13 velocity/temperature sensors and two velocity/temperature/pressure sensors. The water depths at each mooring and the associated vertical position of sensors is shown in Figure 2. These instruments will be in place for one year, although rotated at regular intervals. Initial deployment will occur in January 1983.

In March and November 1983, regional hydrographic cruises will be conducted (Figure 3). Measurements to be made include CTD/XBT profiles and water samples for nutrient concentration determination. The spring and fall cruise dates were selected to help assure availability of supporting satellite thermal imagery to define sharp and diffuse frontal boundaries.

Satellite-tracked surface drifters are and will continue to be placed in important Loop Current related features by arrangement between NDBO and MMS. The resulting trajectories will be examined and evalued to provide a description of circulation, especially in the spin-off eddies shed periodically by the Loop Current.

Satellite thermal imagery will be used as a primary and supporting data source during those times of the year when detectable thermal

gradients in sea-surface temperature occur; i.e., ~ October-May. Imagery will provide information which can be used to describe sequential evolution and development of the Loop Current as well as a statistical characterization of features associated with Loop Current boundary dynamics. Thermal imagery will also be used to help in interpretive efforts involving the other major program elements. Imagery to be used include GOES and NOAA data.

The ship-of-opportunity (SOOP) will provide a repetitive, long-term measurement of vertical temperature profiles along standard transects. The resulting temperature sections will be used in other program elements to help describe key processes such as spin-off eddies and the Loop Current proper.

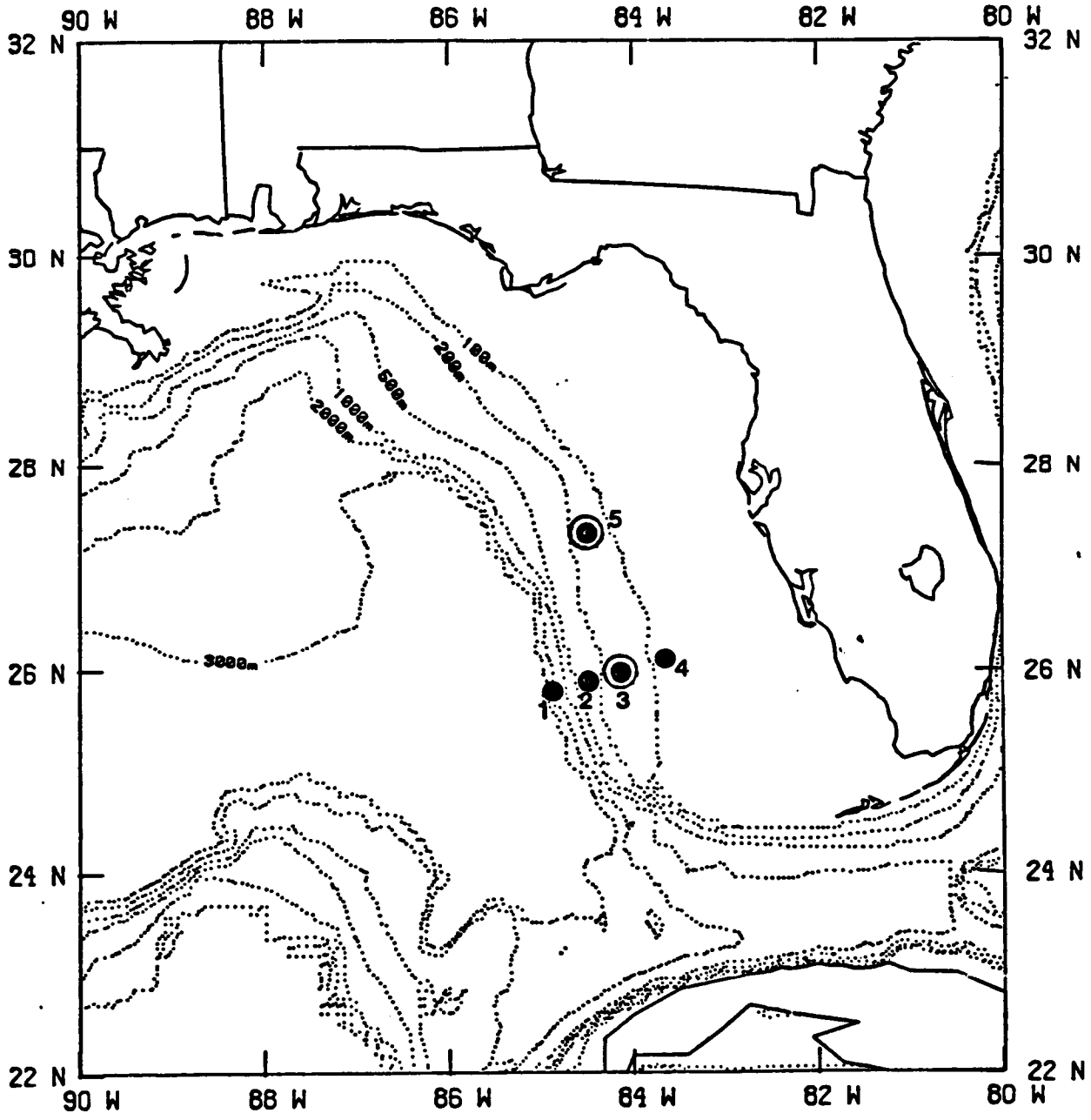


Figure 1. Location of subsurface current moorings. The deepest instrument on Moorings 3 and 5 will be a current velocity/temperature/pressure sensor. All other instruments will provide current velocity/temperature.

Mooring Number	Location	Instrument Depth (meters)	Water Depth (meters)
1	25°54'N 84°34'W	180 500 1000 1500 2000	2200
2	25°46'N 85°00'W	180 500	650
3	25°59'N 84°04'W	50 100 179	180
4	26°02'N 83°36'W	30 60	75
5	27°21'N 84°30'W	50 100 179	180

Figure 2. Location, water depth, and instrument depth for all five subsurface current instrument arrays.

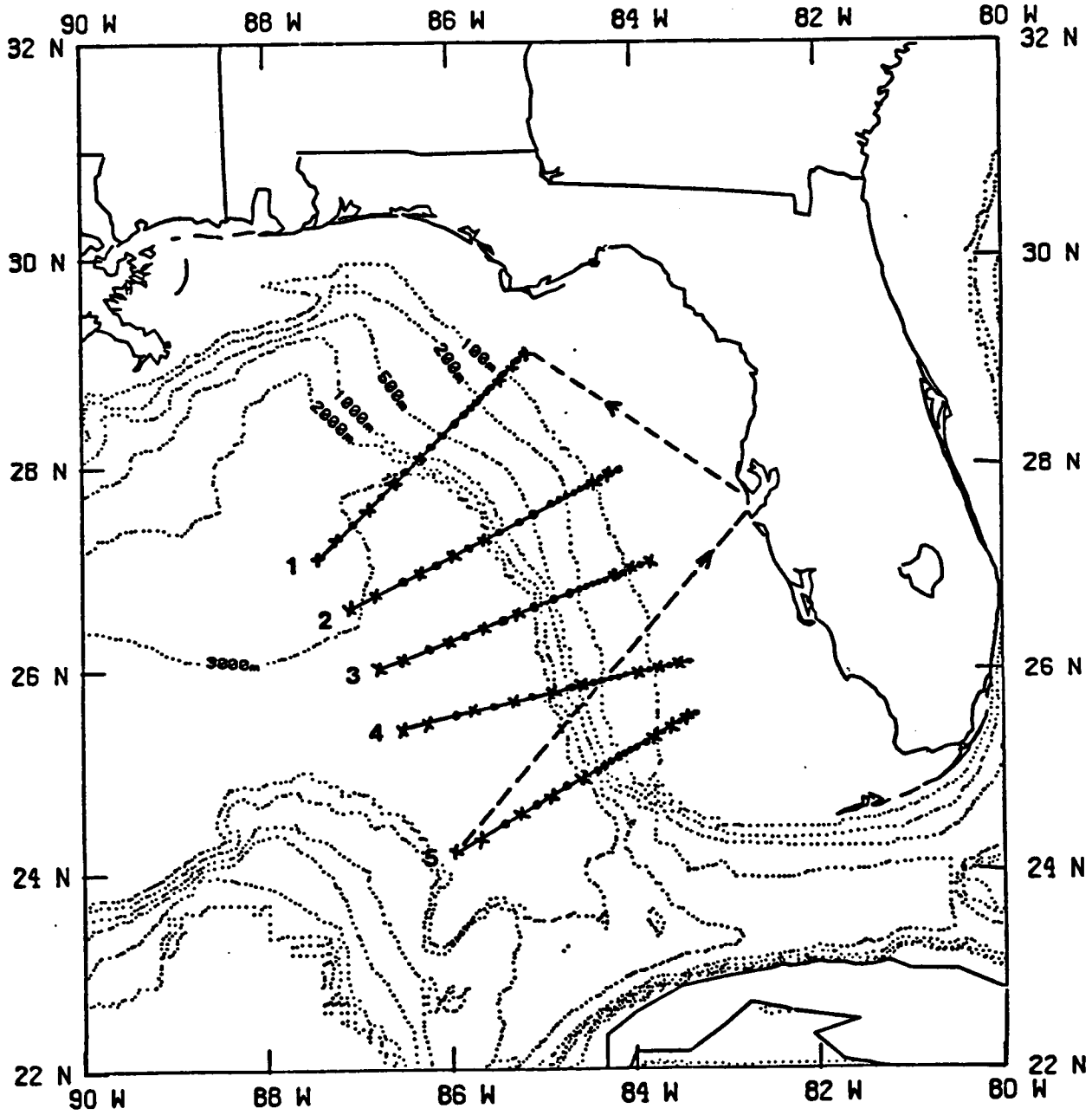


Figure 3. Approximate station location/type and cruise track for hydrographic cruises. Dots indicate CTD/water sample stations; x indicates an XBT station.

DISTRIBUTION OF NOAA OCEAN PRODUCTS VIA THE GULF ENVIRONMENTAL RADIO FAX PROGRAM (GERFP)

Richard N. Barazotto
Oceanographer, New Orleans SFSS
1120 Old Spanish Trail
Slidell, Louisiana 70458

On August 24, 1981, the National Earth Satellite and Data Information Service (NESDIS) 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 these two units is to provide oceanographic and meteorologic support to the Gulf of Mexico through the interpretation of satellite and conventional environmental data. To effectively carry out this mission, personnel for both the SFSS and WSFO have been combined to form a Regional Satellite and Ocean Services Unit (RSOSU). Operational products produced at the RSDSU will be disseminated via the Gulf Environmental Rado Fax (GERAF) program and automatic telecopier. Following are examples of some of the products to be disseminated along with a brief description.

a) Offshore Marine Forecast - Alphanumeric statement of wind, sea state and significant weather for offshore Gulf of Mexico for a 36 hour period.

b) Forecast Aviation/Marine (FAW) - Detailed 18 hr. alphanumeric statement of wind, sea state, and significant aviation weather (SFC to 10,000 ft.) for northwest Gulf, with additional 12 hr. outlook.

c) Surface Analysis - Graphic depiction of weather systems, wind, sea state, and weather for entire Gulf, valid at time of issuance.

d) 18/36 Hour Prog - Graphic description of the prognosis of weather systems, wind, sea state, and weather for 18 and 36 hours from issuance time.

e) Significant Weather Features - Graphic depiction and plain language summary of significant weather or observed by radar and satellite.

f) and g) Sea Surface Temperature Analysis - Primarily satellite derived, quantitative, isotherm analysis for two sections of the Gulf of Mexico:
East 90.5°-24.3°N 81.5°-90.0°W
West 25.5°-26.0°N 98.6°-97.5°W

h) Loop Current/Gulf Stream - Analysis — Gradient Analysis graphic, depicting the satellite observed position of the Loop Current and Gulf Stream from Florida Straits to Cape Hatteras.

i) Schedule for Radiofacsimile (GERAF) and automatic telecopier transmission.

This service is obviously not without expense. Enclosure (J) is a breakdown of the first year and annual recurring costs. The National Weather Service (NWS) has absorbed the initial equipment purchase the 36K of the recurring expenses. However, without external sources of funding this rado fax service will have to be terminated at the end of the year. The Minerals Management Service is one of several organizations which are presently helping NWS to defray the cost of this valuable program. I strongly encourage all organizations that benefit from this service to help pay for this service.

Comments regarding transmission of RSDSU products on telecopier or GERAF, especially those addressing possible service of funding, should be forwarded to the author.

(a)

NEWOFFNEW
WOUS00 KNEW 171500
NOCG A SILL1
OFFSHORE MARINE FORECAST
NATIONAL WEATHER SERVICE NEW ORLEANS LA
939AM CST THU FEB 17 1983

SYNOPSIS GULF OF MEXICO
LOW PRESSURE SYSTEM OVER NORTH CENTRAL FLORIDA WITH TROUGH EXTENDING SOUTHWARD TO WESTERN TIP OF CUBA WILL CONTINUE MOVING OUT OF AREA. HIGH PRESSURE WILL BUILD INTO GULF THROUGH FRIDAY.

NORTHWEST GULF NORTH OF 25N AND WEST OF 90W
NORTHERLY WINDS 15 TO 20 KNOTS THIS AFTERNOON BECOMING NORTHEAST 10 TO 15 KNOTS TONIGHT AND FRIDAY. SEAS 6 TO 9 FEET THIS AFTERNOON SUBSIDING TO 4 TO 6 FEET TONIGHT. FAIR THROUGH FRIDAY.

SOUTHWEST GULF SOUTH OF 25N AND WEST OF 90W
NORTHWEST WINDS 15 TO 20 KNOTS THIS AFTERNOON BECOMING EASTERLY 10 TO 15 KNOTS TONIGHT AND FRIDAY. SEAS 5 TO 8 FEET THIS AFTERNOON DIMINISHING TO 4 TO 6 FEET TONIGHT. MOSTLY FAIR.

MIDDLE GULF BETWEEN 85W AND 90W
WINDS NORTH AND NORTHEAST 20 TO 30 KNOTS THIS AFTERNOON DIMINISHING TO 20 TO 25 KNOTS TONIGHT AND NORTHEAST 10 TO 15 KNOTS FRIDAY. SEAS 7 TO 11 FEET THIS AFTERNOON AND DECREASING TO 5 TO 8 FEET TONIGHT. PARTLY CLOUDY THROUFG FRIDAY.

EAST GULF BETWEEN 81W AND 85W
WINDS WEST TO NORTHWESTERLY 20 TO 30 KNOTS THIS AFTERNOON BECOMING NORTHWESTERLY 20 TO 25 KNOTS TONIGHT AND NORTHERLY 10 TO 20 KNOTS FRIDAY. SEAS 7 TO 11 FEET THIS AFTERNOON DECREASING TO 6 TO 9 FEET TONIGHT. WIDELY SCATTERED SHOWERS THIS AFTERNOON. PARTLY CLOUDY TONIGHT AND FRIDAY.

OUTLOOK SATURDAY AND SATURDAY NIGHT... HIGH PRESSURE WILL CONTINUE OVER NORTHERN GULF WITH LIGHT EASTERLY WINDS.

(b)

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 WNDS 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 WNDS. TURBC DCRG AFT 00Z 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 WWN BY 18Z. VFR E OF WC.

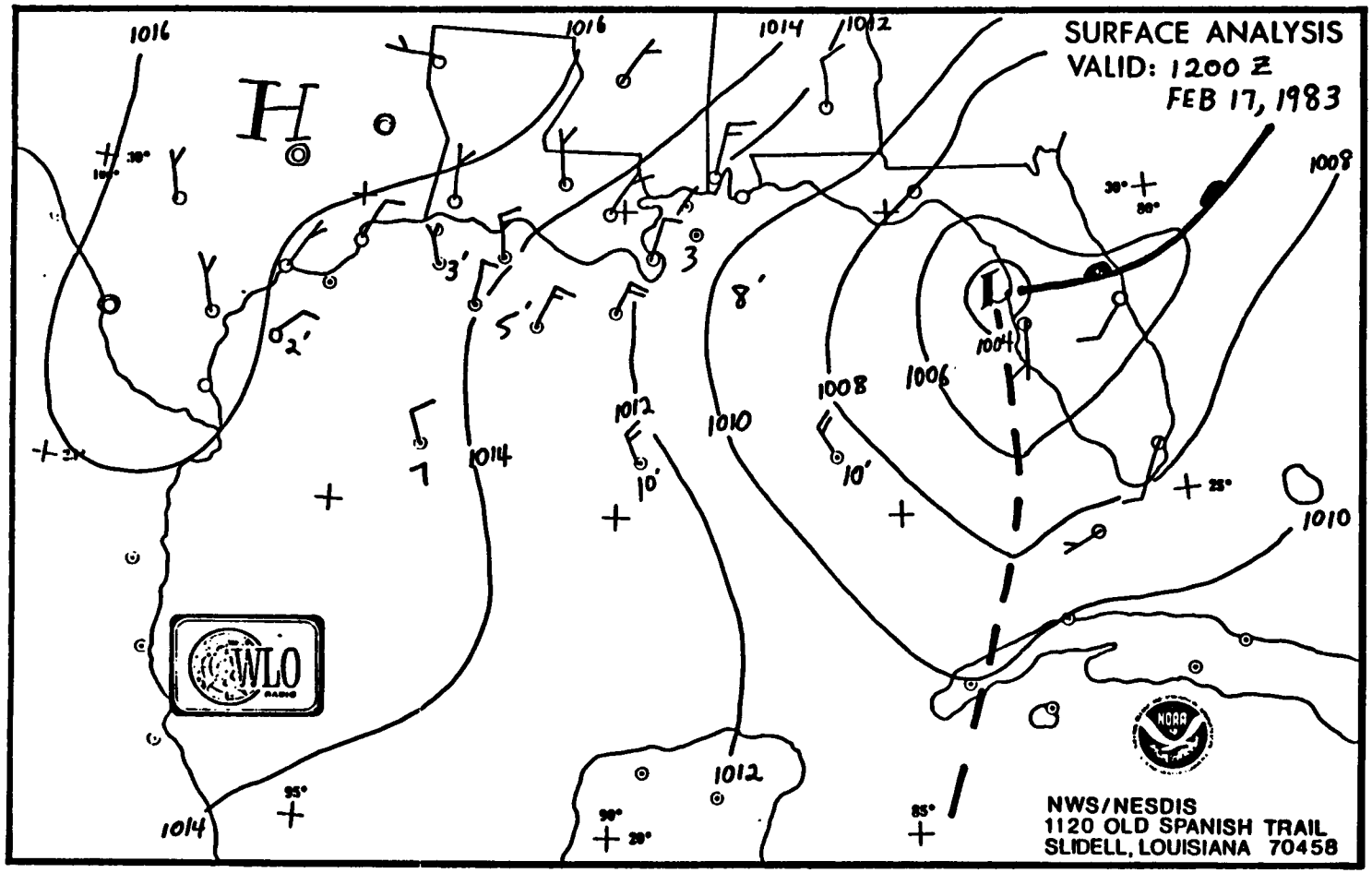
CSTL PLAINS...
40 SCT TO CLR. VSBY ABV 7. OTLK...VFR.

05 ICG AND FRZLVL BLO 100...
NO ICG. FRZLVL ABV 100.

06 TURBC BLO 100...
OVER ENTIRE AREA MDT TURBC BLO 40 DUE TO STG LOW LVL WNDS. TURBC DCRG AFT 00Z AND ENDG ARND 03Z.

07 WNDS 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.


SURFACE ANALYSIS
VALID: 1200 Z
FEB 17, 1983
H
L
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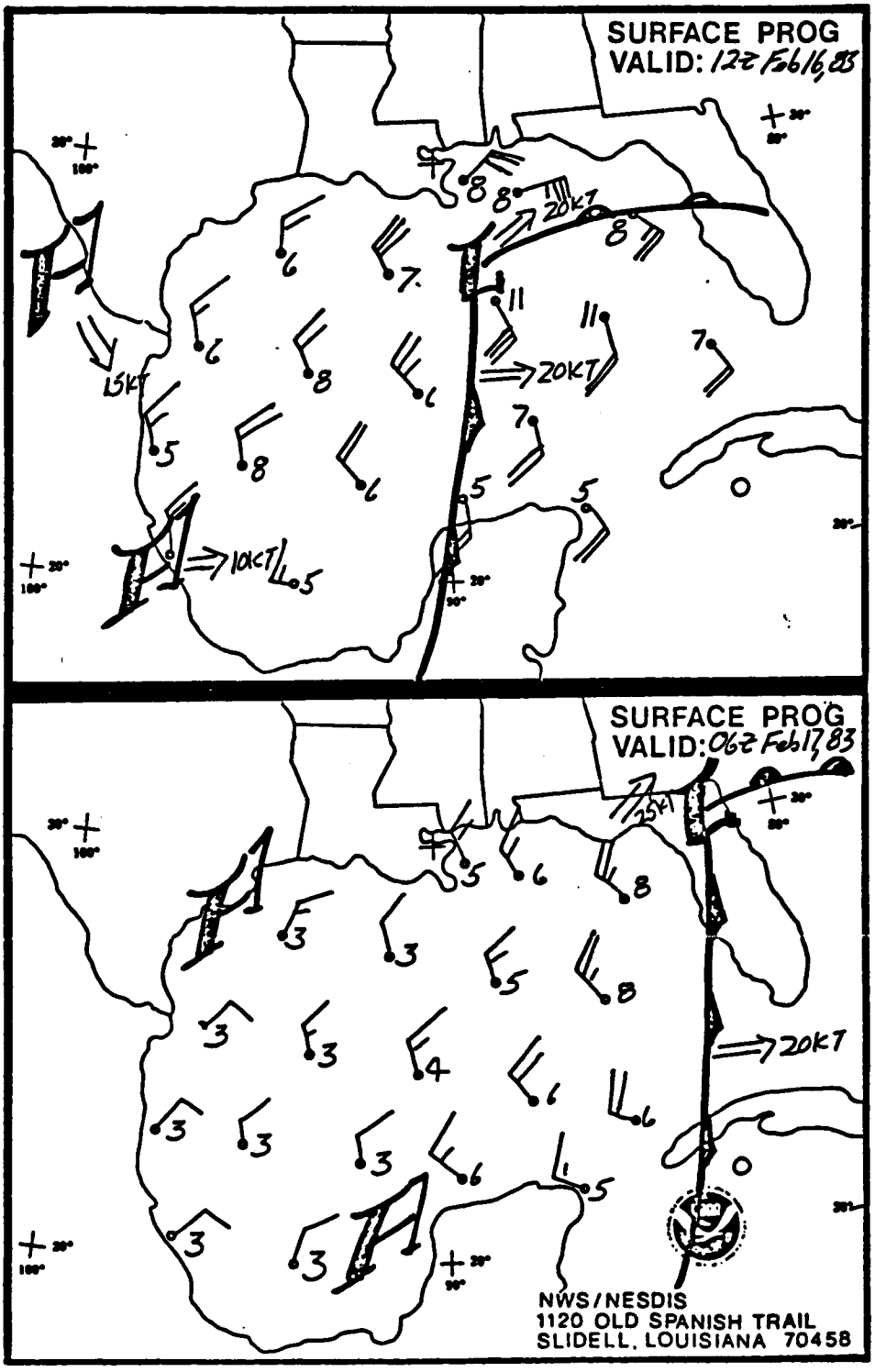
NOAA
NWS/NESDIS
1120 OLD SPANISH TRAIL
SLIDELL, LOUISIANA 70458

(c)

(d)


SURFACE PROG
VALID: 12Z Feb 16, 83
20KT
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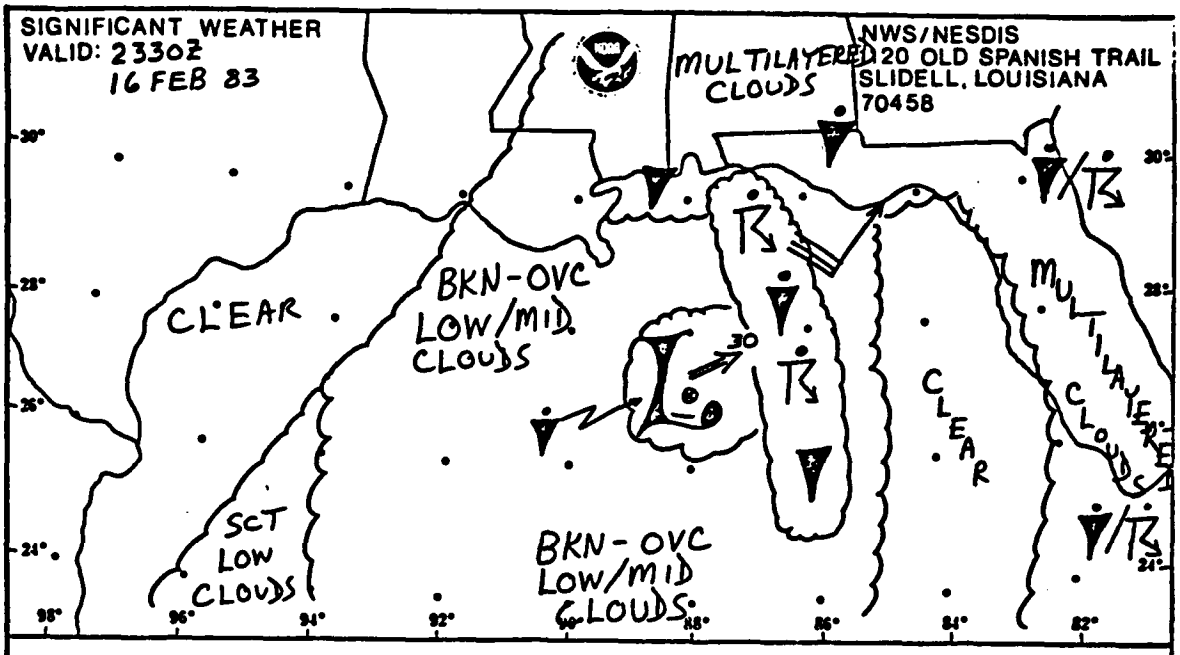
20KT
10KT
SURFACE PROG
VALID: 06Z Feb 17, 83
35KT
20KT
NWS/NESDIS
1120 OLD SPANISH TRAIL
SLIDELL, LOUISIANA 70458

(e)



A GALE WARNING IS IN EFFECT FOR THE E GULF N OF 27N AND ALL OF THE NW GULF. THE WARNING ALSO INCLUDES THE COASTAL WATERS FROM TARPON SPRINGS/FL TO PORT ARTHUR/TX.

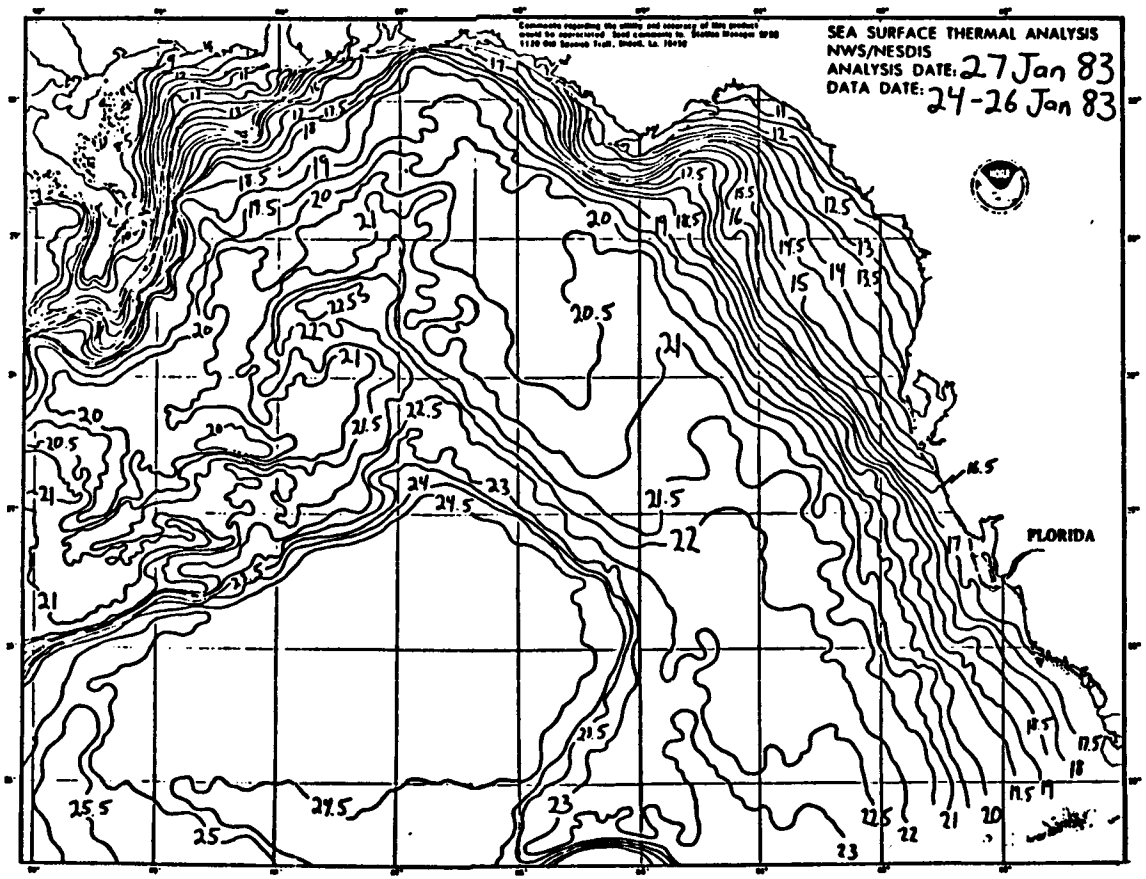
A LARGE CYCLONIC CIRCULATION IS CENTERED NEAR 27N/88W. THE SYSTEM HAS BEEN MOVING ENE ABOUT 30KT DURING THE PAST 3 HOURS. A SHARP LOW-LEVEL TROF EXTENDS SW FROM THE CIRCULATION TO 21N/94W. FRONTS ARE NOT APPARENT IN SATELLITE IMAGERY AT THIS TIME.

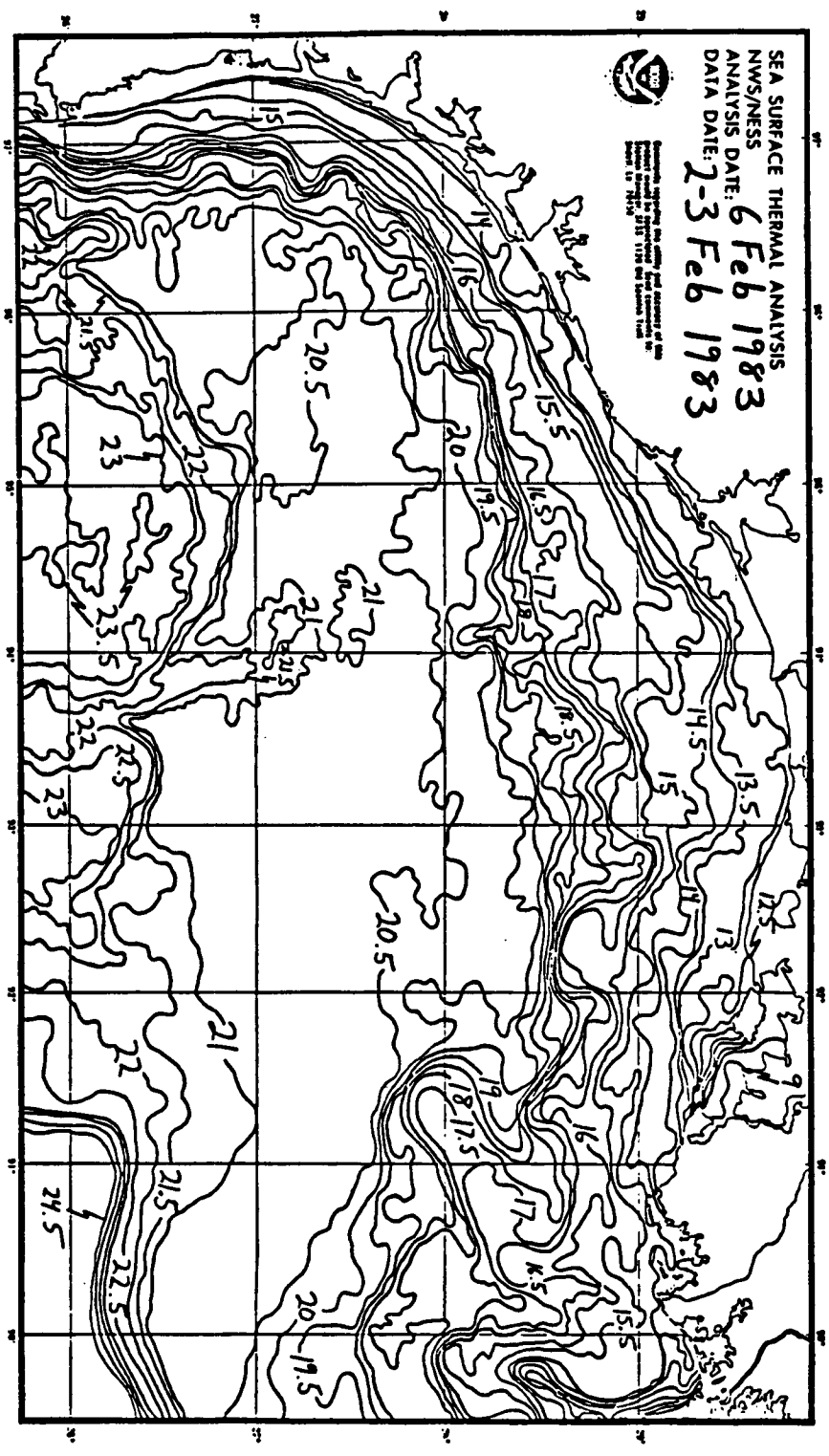
SCATTERED THUNDERSHOWERS PREVAIL OFFSHORE 50NM EITHER SIDE OF A PNS-25N/86W LINE. THE STRONGEST THUNDERSHOWERS ARE LOCATED IN THE COASTAL WATERS 40SE PNS WITH CLOUD TOPS TO 33 THOUSAND FEET. AREAL MOVEMENT IS NE ABOUT 30KT. AREAL COVERAGE IS SLOWLY INCREASING.

ELSEWHERE OFFSHORE...BROKEN-OVERCAST LOW/MID CLOUDS BLANKET THE GULF BETWEEN 85W AND A 24N/94W-27N/94W-MARSH ISLAND LINE. A FEW SHOWERS ARE CLUSTERED WITHIN 60NM OF THE CIRCULATION CENTER...AS WELL AS IN THE COASTAL WATERS BETWEEN NEW/PNS. AREAL MOVEMENT OF THIS CLOUDINESS IS E AT 10-15KT.

OVERCAST MULTILAYERED CLOUDS WITH EMBEDDED SHOWERS/THUNDERSHOWERS COVER THE REGION E OF A CTY-TPA-SRQ-60SW EYW LINE. THIS CLOUDINESS IS SHIFTING E ABOUT 30KT.

ELSEWHERE...OVERCAST MULTILAYERED CLOUDS DOMINATE THE REGION E OF A JAN-20W BTR-30SE LFT LINE. WIDELY SCATTERED SHOWERS ARE EMBEDDED WITHIN THIS CLOUD SHIELD. THE W CLOUD EDGE IS MOVING E AT 5-10KT.


SEA SURFACE THERMAL ANALYSIS
NWS/NESDIS
ANALYSIS DATE: 27 Jan 83
DATA DATE: 24-26 Jan 83
FLORIDA


SEA SURFACE THERMAL ANALYSIS
NWS/NESS
ANALYSIS DATE: 6 Feb 1983
DATA DATE: 2-3 Feb 1983

(б)

GULF STREAM SYSTEM FLOW CHART #2450

NOAA Miami SFSS

Date: 09 Feb 1983

Depicted land should not be used for navigation.

Position lines are for the edges of warmer water. The thin streamline is an estimated location for the maximum current. Measured current speeds may be shown.

(___) Position based on data 0 to 2 days old.

(- - -) Position based on data 3 to 7 days old.

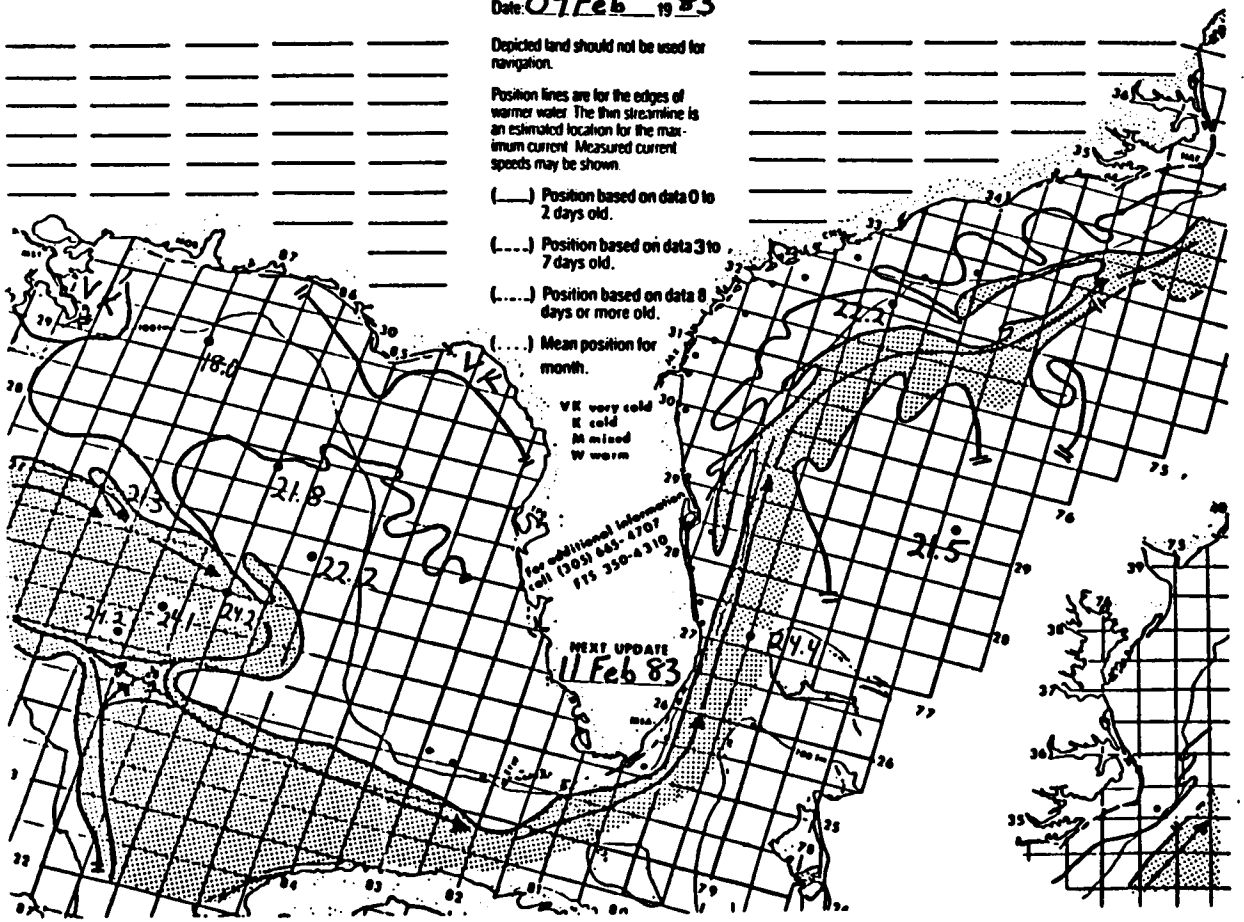
(. . . .) Position based on data 8 days or more old.

(. . . .) Mean position for month.

VK very cold
K cold
M mixed
W warm

For additional information call (305) 665-4707 FTS 350-4310

NEXT UPDATE 11 Feb 83



GULF STREAM SYSTEM FLOW CHART #2450

(h)

RADIOFACSIMILE

Schedule* on 6850.0KHz, 9157.5KHz, 11145.0KHz

0000Z Significant Weather Features
0300Z Offshore Marine Forecast
0315Z 00Z Surface Analysis
0600Z Significant Weather Features
0900Z 18/36 Hr. Surface Prognosis
0915Z 06Z Surface Analysis
0930Z Gulf Aviation Forecast**
1200Z Significant Weather Features
1215Z Radiofax Schedule (Mon. only)
1500Z Offshore Marine Forecast
1515Z 12Z Surface Analysis
1630Z Gulf Aviation Forecast**
1800Z Significant Weather Features
2100Z 18/36 Hr. Surface Prognosis
2115Z 18Z Surface Analysis
2200Z East Gulf Sea Surface Temp. Chart (Tue., Sat.)
West Gulf Sea Surface Temp. Chart (Thu., Sun.)
Gulf Stream Loop Current Chart (Mon., Wed., Fri.)

*Proposed effective date Jan. 1, 1983
**Delayed until Spring of 1983

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AUTOMATIC TELECOPIER (504) 649-5243

Schedule*

09Z to 11Z 06Z Surface Analysis
11Z to 13Z 18/36 Hr. Surface Prognosis (From 06Z)
13Z to 15Z Significant Weather Features
15Z to 18Z 12Z Surface Analysis
18Z to 20Z East Gulf Sea Surface Temp. Chart (Tue., Sat.)
West Gulf Sea Surface Temp. Chart (Thu., Sun.)
Gulf Stream Loop Current Chart (Mon., Wed., Fri.)
20Z to 22Z 18Z Surface Analysis
22Z to 00Z 18/36 Hr. Surface Prognosis (From 18Z)

*Schedule to be revised Spring of 1983 for 24 hour/day transmission service

COSTS

INITIAL EQUIPMENT PURCHASE (ALDEN SCANNER, TAPE RECORDER, MONITOR, TEST EQUIPMENT)	$ 26
LEASED COMMUNICATIONS LINE	5 (YR)
WLO BROADCAST CONTRACT	76 (YR)
TOTAL FIRST YEAR COST	$ 107K
ANNUAL RECURRING COST	$ 81K

REFORMATTING DIGITAL DATA TAPES OF MAFLA AND SOUTH TEXAS OCS STUDY PROGRAMS

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Contract No. 14-12-0001-290-88

Quantus, Inc. is reformatting the data from the MAFLA and STOCS studies into standard National Oceanographic Data Center (NODC) formats. Approximately 170 files representing 65 different data types are involved in this work. Once in NODC formats, these data will be available to any interested user through the National Environmental Satellite Data and Information Service (NESDIS). The work, which began on October 1, 1982, spans one year and has been divided into three tasks; (1) data preparation, (2) data reformatting and (3) data documentation. Data preparation and documentation tasks began in mid-October and will run until the end of the contract. The data reformatting task will begin in February 1983, with the reformatted data being submitted to NESDIS in seven monthly batches. This presentation summarizes the scope and current status of each task.

The data preparation task is divided into two subtasks. The first subtask consists of scanning each of the original data files and extracting sample and variable lists from these files. Sample lists are built for all data files, while variable lists are only bilt for those files which use codes or labels to identify the variables measured. Examples of these latter files are taxonomy (e.g. benthic infauna, nekton), chemical composition (e.g. sediment hydrocarbons) and histopathology. In addition to the sample or variable labels, these files include the number of times each label appeared in the file. The sample and variable lists are used to build cross reference tables which link the original labels with NODC approved labels. For taxonomic and chemical variables, the approved labels are, respectively, the 3rd edition NODC taxonomic codes and the Chemical Abstract Services names. Any original variable label without an approved NODC counterpart is submitted to NESDIS for label assignment.

A second component of the data prepartion task involves the definition of the reformatting schema. The schema is basically a "map" which specifies how the original data will be converted into the appropriate standard NODC file type. This "map" is built by reviewing the original formats and noting which fields are to be retained in the NODC format. The schema is submitted to NESDIS for review and approval.

Task, deta reformatting, consists of implementing the reformatting schema defined in Task 1, and processing the original data into the appropriate NODC format. Quantus is using a relational data management system on a Digital Equipment Corporation VAX 11/780 to perform this task. Within this system, data are stored as two dimensional tables in which the columns are the variables and the rows are the observations made on the variables. Once the data are loaded into the management system, they are subjected to a series of quality control tests to identify potential

errors. The sample and variable lists generated in the data preparation task are also reviewed and compared with published lists to identify possible miscodings. Any obvious errors are corrected and suspect values are noted in the accompanying data documentation. Next, the cross reference files generated in the data preparation tasks are loaded into the data management system and the data are reformatted. A program interface to the data management system is used to retrieve data form the system and reformat them into the appropriate NODC file types.

The final task is the preparation of the data documentation. Basically this task consists of reviewing published and unpublished reports and compiling methodology summaries for each data type. In addition, matrices showing the temporal and spatial extent of the samples are also compiled. The intent of the documentation is to provide the user with the necessary information to intelligently utilize the data.

Quantus has acquired the original data files from NESDIS. There was an initial delay in acquiring useable files due to parity errors on the original magnetic tapes supplied by NESDIS. We have generated the sample and variable lists from these original fiels and are currently building the cross reference tables. The reformatting schema has been formulated and submitted to NESDIS for approval. Quantus has also acquired the relevant reports describing the MAFLA and STOCS programs, and we are currently in the process of reviewing these documents and compiling the methodology summaries for the data documentation.

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.