

GULF ISLANDS NATIONAL SEASHORE
COASTAL FIELD RESEARCH LABORATORY
NSTL STATION, MISSISSIPPI 39529

Research Perspectives - 1982

Submitted to:

Regional Chief Scientist
Southeast Region
National Park Service
Atlanta, Georgia



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April 22, 1982

Date

Stephen V. Shabica, Research Coordinator
and Research Oceanographer

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INTRODUCTION

The Coastal Field Research Laboratory was established by the National Park Service in March 1977 to coordinate research dealing with barrier islands and beaches of the Southeast Region. The activities of the Laboratory include implementation of field research programs as required for the proper scientific input into resources management, planning, design and construction operations; inventory classification and analysis of all land, water and vegetative resources and air and water environmental quality of the park units in the Southeast Region. In achieving these objectives, specific programs of the Coastal Field Research Laboratory have been initiated and include vegetation studies, coastal processes and near-shore sediment dynamics, remote sensing and cartographic interpretation, endangered species studies, off-road vehicle impact studies, and basic resource inventories. These studies include region-wide and park-specific activities and range in duration from three months to six years. Several projects are parts of overall Southeast Regional Office programs dealing with management problems at a variety of coastal parks. Although specific research activities are being carried out at the Coastal Field Research Laboratory, these are being performed in close cooperation with other Southeast Regional scientists and managers. In addition to these specific research activities, the Coastal Field Research Laboratory has compiled a library of current literature in the fields of terrestrial, aquatic and marine ecology, near-shore processes, barrier island dynamics, and air and water quality. This information is available to researchers working in the Southeast Region. A rapid sediment analyzer was obtained by the Laboratory which permits us to analyze the textural characteristics of up to 100 sediment samples per day.

The Coastal Field Research Laboratory is located at the National Space Technology Laboratories (NSTL) near Bay St. Louis, Mississippi, and in Ocean Springs, Mississippi at Gulf Islands National Seashore. The presence of other Federal agencies at NSTL has afforded the Coastal Field Research Laboratory an excellent opportunity to initiate cooperative projects. We are presently

receiving assistance from the U. S. Geological Survey, the U. S. Fish and Wildlife Service, the Earth Resources Laboratory of NASA, the Environmental Protection Agency, the Naval Ocean Research and Development Activity, the EROS Applications Assistance Facility, and Computer Sciences Corporation. All laboratory analyses are conducted in the Ocean Springs laboratory. It should be noted that most of our research activities require significant amounts of field work and systems development. Since the field work is subject to the vagaries of the weather, and systems development is a laborious task often requiring lengthy testing and verification, a rigorous time frame should not be assumed for the studies. Indeed, the application of the scientific method requires a step by step process in which stringent adherence to procedures is paramount.

Since its establishment, the orientation of the research activities of the Coastal Field Research Laboratory has gone through a series of changes. In 1977, we had emphasized in-house research. This in-house capability was reflected by a staff of nine persons. Many of these positions were of a temporary nature and it soon became apparent that sound research programs could not be established with temporary personnel. In February 1978, the Laboratory adopted a new orientation towards a balance of in-house and contract research. Consequently, the staff of the Coastal Field Research Laboratory is presently at two individuals and will remain at this level until directive dictates otherwise. Temporary personnel will be required only for assistance of short duration.

In addition to the in-house and contract research activities, joint projects with Northeastern Illinois University and the University of Virginia have been undertaken. Data management for the laboratory is provided by Dr. Charles Eleuterius of Ocean Springs, Mississippi. Drs. Robert Dolan and Bruce Hayden of the University of Virginia and Dr. Charles W. Shabica of Northeastern Illinois University are collaborating with the Laboratory in our studies of barrier islands in the Southeast Region in general, and intensively at Gulf Islands National Seashore. The Laboratory provides Dr. Charles Eleuterius of the Gulf Coast

Research Laboratory with hydrographic data obtained from surveys of the waters surrounding Gulf Islands National Seashore, Mississippi. Arrangements have been made with the Dredged Material Research Program of the U. S. Army Corps of Engineers Waterways Experiment Station to receive publications pertinent to dredging activities near national parks in the Southeast Region. Through an agreement with the Mobile District, U. S. Army Corps of Engineers, the Coastal Field Research Laboratory has obtained three meteorological towers. Two are presently operating, one on Horn Island, the second on Ship Island. At 20 minute intervals, wind speed and direction, maximum wind speed, air temperature, and air pressure data are obtained. The data are recorded on data loggers which require servicing only every 55-60 days. Data reduction is provided by Raytheon Ocean Systems Company of Providence, Rhode Island. Since 1980 the Coastal Field Research Laboratory has served as the coordinating agency for the National Marine Fisheries Service, U. S. Department of Commerce, Marine Mammals and Endangered Species Program's Sea Turtle Stranding and Salvage Network in the State of Mississippi.

Many of the Coastal Field Research Laboratory studies require volunteer assistants for up to 15 days at a time. The Earthwatch organization of Belmont, Massachusetts has provided three research teams per year to the Coastal Field Research Laboratory since 1980. Each team consists of six highly motivated individuals who work with the Coastal Field Research Laboratory on the Barrier Island Dynamics study during field surveys. We anticipate their support through 1984.

To facilitate review, 1982 projects have been classified under two major programs: Coastal Processes, and Physical and Geographical Studies.

PERSONNEL INVOLVEMENT - 1982

	Research Oceanographer GS-12	Secretary GS-5	Program (Man Years)
Coastal Processes	.35	.20	0.55
Physical & Geographical Studies	.30	.10	0.40
Equipment Acquisition/Maintenance	.02	.05	0.07
Clerical		.20	0.20
Administration	.30	.25	0.55
Total Man Years	.97	.80	1.77
Yearly Appointment (MY)	.90	.80	1.70

INLET DYNAMICS: CAMILLE CUT REGENERATION
Gulf Islands National Seashore

Project Description

During Hurricane Camille in 1969, Ship Island was divided into West and East Ship Islands when the storm breached the island and created a shallow, 3,900-m wide cut. At present the inlet is 1,900 m wide. During historical time, Ship Island has been breached three other times, but each time sand accumulation in the breach resulted in the reconnection of the east and west sections of the island.

Objectives

To monitor the rates of erosion and accretion on the western and eastern tips of East and West Ship Islands, respectively. In addition, the study will monitor sediment deposition within the breach. These studies are directed towards determining whether or not the two sections will reconnect and the rate at which this can be expected. At present, small boats use the breach as a "short cut" from Mississippi Sound to the Gulf of Mexico. This factor, which was probably not present after the prior breaches, may impede the processes of sediment deposition due to the effects of propellor-wash and slow down the reconnection process.

Methods

Transect range poles have been established on both the western and eastern tips of East and West Ship Islands, respectively. Beach profiles and bathymetric profiles are obtained along these transects seasonally (three times per year). Sediment tracer studies with dyed sand and current meter studies will be carried out to characterize the inlet sediment budget and inlet current patterns. From these data, rates of erosion, accretion, shoreline change, and sediment deposition are being obtained. Estimates of the effects of propellor-wash in the breach will be experimentally determined.

Progress to Date

The planning phase of the study is completed and a literature search performed. Transect posts were placed and surveyed during the summer of 1980. A total of six beach and bathymetric profile surveys have been completed. Since initiating the research, the inlet has narrowed almost 200 meters.

Duration

Experimental studies have been initiated. Completion of the program is anticipated in 1984.

Principal Investigators: S. Shabica, and C. Zapel (Louisiana State University)

COASTAL PROCESSES, GEOMORPHOLOGY, AND NEAR-SHORE SEDIMENT
DYNAMICS OF PETIT BOIS, HORN, AND SHIP ISLANDS

Gulf Islands National Seashore

Project Description

This study, which initially focused on Petit Bois Island, has been expanded to include Horn Island, the western tip of Dauphin Island, and East and West Ship Islands.

Petit Bois Island, located approximately 12 km offshore, represents the eastern boundary of a chain of four Mississippi barrier islands. A high degree of shoreline variation in the area results from erosional and depositional processes brought about by seasonal wind, current, and tidal regimes and severe storms, especially those of a tropical origin. In response to the dynamic nature of the environment, Petit Bois Island, as well as Horn and East and West Ship Islands, is migrating westward.

Port facilities of the Mississippi Sound region necessitate maintenance dredging of a channel (12 m deep and 107 m wide) through Horn Island Pass which lies on the immediate western margin of Petit Bois Island. Rapid shoaling in this area requires the average annual removal of 471,712 cubic meters of dredged material. Following its separation from Dauphin Island 200 years ago, Petit Bois Island has migrated 14 km westward, representing an average migration rate of 70 m per year. During this same time frame, over one-half of the original 24-km length has eroded, representing an average erosion rate of approximately 60 m per year. Although of a lower migration rate, West Ship Island, in a similar manner to Petit Bois Island, is migrating into the Ship Island bar channel which serves the Port of Gulfport.

Objectives

The research will establish base line data and design environmental models for the following problem areas, and supply possible management alternatives for this resource: (1) determine the rate and extent of variations of beach and offshore geomorphology; (2) relate these variations to the parameters of wind,

wave height, wave period, wave velocity and direction, and tide; (3) determine rates and specific sectors of erosion and accretion of beaches; (4) monitor and estimate sediment transport in the near- and off-shore environments; (5) determine and model rates of barrier island migration.

Methods

Beach profile surveys are performed on the eastern and western beaches of the selected islands three times per year. Permanent geodetic markers, installed by the National Oceanic and Atmospheric Administration, will provide the horizontal control data essential to the accomplishment of the research. No vertical control data have been available for the islands. Marigrams provided by the Gulf Coast Research Laboratory are being used to reference all stations to the Mean Low Water Datum for the Gulf of Mexico. Utilizing standard surveying techniques, sampling range lines have been established along the appropriate beach sectors.

Sampling includes beach and offshore profile surveys, underwater current measurements, visual surveys and sediment collection. Offshore profile surveys are made in conjunction with beach profile surveys. Bottom configuration will be charted along the established range lines with a recording fathometer. In order to identify and quantify on- and off-shore and littoral and sublittoral sediment drift, sediment traps will be placed in areas along the established range line. Placement of collecting bottles, perpendicular to the approaching wave trains, will show movements of suspended sediment load in off-shore areas.

Measurements will be made to identify and quantify near- and off-shore current regimes. Methods will include drogoue buoys, bottom drifters, and current meters at selected depths.

Significant changes in beach topography will be correlated with wave activity during specific times of the tidal cycle. These time-series studies will be of 2-3 week duration under winter and summer conditions.

Sediment tracing studies, with fluorescent dye markings, will be conducted to correlate sand movements with winds, waves, currents, swash, and

sediment texture.

Laboratory studies include: (1) compilation of historical navigation charts and aerial photographs to establish a 100-year data base for island migration and erosion. Time-lapse overlays will be utilized for representation of data; (2) analysis of sediment samples to determine textural parameters; (3) data reduction in order to draft maps, charts and graphs of the resource; and (4) generation and verification of physical models.

The island tips are the most dynamic areas on these islands and thus require a more intensive survey base. The interior shorelines are less dynamic and are therefore being monitored on a yearly basis, through aerial photogrammetric methods developed at the University of Virginia.

Progress to Date

Surveys of the available literature concerning the Mississippi Gulf Coast have revealed the necessity for this particular type of research. The historical data base, taken from existing navigation charts, has shown the relatively rapid displacement of the barrier islands by hurricane force winds and storm surges. The tropical storms associated with the Gulf Coast area have probably had the most noticeable effect on the Gulf islands, separating Dauphin Island and Petit Bois Island, and dividing Ship Island into two distinct islands. With the data base and area problems defined, this research will furnish information for a previously unsampled area.

On the west end of Petit Bois Island, seven transect poles for three transect range lines have been set up. The white PVC poles were set in concrete and should be relatively permanent through time. Six of the poles are located on the leading edge of the island and are referenced to a seventh pole which was set eastward of the primary dune. The seventh pole is our primary benchmark for the west end of the island and is in the position of relative dune stability. On the east end of Petit Bois Island, 13 posts were placed which make a total of six transect range lines. These extend from the tip of the island, down the axis of the island for approximately 1,500 m to the 13th pole which is a primary benchmark for the east end. This post is located on a dune which is well

vegetated, westward of the primary dunes. Nineteen and ten posts have been placed on East and West Horn Islands, respectively. In May 1980 the tips of East and West Ship Islands were surveyed and station posts placed: east, East Ship: 15; west, East Ship: 9 (due to extensive accretion there are presently 13 survey posts); east, West Ship: 12; and west, West Ship: 7.

To date 15 beach and bathymetric profile surveys, beginning in August 1978, have been carried out.

Work has begun on detailing shoreline changes of each island between tips, based on aerial photography for the past 25 years. The ground surveys will be used to increase the precision of detectable shoreline changes based on the aerial photography.

Computer programs are being developed for analyzing and visually presenting the results of the study. All beach profile data has been card punched and verified.

A joint survey program, with personnel from the Mississippi Bureau of Marine Resources and the Polar Oceanography Branch of NORDA, is underway in order to establish the vertical control of all survey posts relative to the mean low water datum as set by the National Ocean Survey in 1981. NORDA is providing an electronic distance meter for the survey and the Bureau of Marine Resources, the surveyors data.

In May 1979, 1980, and 1981, the Gulf of Mexico shore of Horn Island was surveyed in a program designed to better understand the relationship between off-shore, near-shore and shoreline geomorphology and configuration. Over 5-day periods, near-shore bathymetry, beach profiles and sediments were surveyed and sampled at 100-meter intervals along the entire shoreline. Two hundred and five stations were occupied. In addition, the field survey was complemented with concurrent aerial photography. Samples were also taken at five locations (mid-berm, berm-crest, foreshore, swash-zone, and trough) along each transect for analysis.

Duration

Because the project involves observations of seasonal trends and

modeling for future conditions, a five-year data base for each island is required to allow for the effects of weather which could cause atypical variations in erosion, accretion, tides, and currents. Completion is scheduled for 1984.

Principal Investigator: S. Shabica

SHORELINE EROSION AND POTENTIAL BEACH SITES
FOR DREDGED MATERIAL DISPOSAL
Gulf Islands National Seashore

Project Description

The western tip of Santa Rosa Island and the eastern tip of Perdido Key (now within Gulf Islands National Seashore, Florida) have been used as sites for the disposal of dredged material from the Caucus Channel, Pensacola Bay Channel, and Pensacola Bay turning basin (U. S. Army Corps of Engineers, Mobile District, 1978). Available records show that in 1959, dredged material was placed on the western tip of Santa Rosa Island, along the Sound side of Santa Rosa Island, and along the Gulf side of Santa Rosa Island in the Fort Pickens area. In 1968, approximately 700,000 cubic yards of dredged material were placed on Pickens Point and the nearby gulf beaches (U. S. Army Corps of Engineers, Mobile District, 1978). At the request of the Superintendent, Gulf Islands National Seashore, a survey of potential beach and nearshore disposal sites is being undertaken for areas within Gulf Islands National Seashore on Santa Rosa Island and Perdido Key. The survey will identify those sites within the seashore where dredged material disposal can be effectively accomplished while maintaining the biophysical and aesthetic characteristics of the area. The Superintendent has identified for consideration five areas within the seashore previously utilized as disposal sites for dredged material: (1) the western tip of Santa Rosa Island, Pensacola Bay side (site of 1959 disposal); (2) the western tip of Santa Rosa Island, Gulf of Mexico side (sites of 1959 and 1968 disposal); (3) the western tip of Santa Rosa Island; (4) the eastern tip of Perdido Key in the Caucus Shoal areas; and (5) the eastern tip of Perdido Key on the site of the old intracoastal waterway and the spoil island to the north of the old intracoastal waterway.

Objectives

Disposal sites were surveyed at Gulf Islands National Seashore. The following themes were addressed: (a) the physical size of each potential

disposal area; (b) potential volumes of dredged material which could be placed in each disposal area will be calculated, with emphasis placed on maintaining the continuity of bottom slope and shore topography so as not to alter the bio-physical and aesthetic characteristics of each site; (c) textural parameters of the sediments and beach sands within each disposal area are being characterized in order to determine the textural ranges that potential dredged material should have; (d) organic carbon and carbonate fractions of sediments and beach sands within each disposal area will be characterized; (e) physical oceanographic parameters of the nearshore zone will be assessed to identify stable and unstable areas; (f) major marine grass and shellfish sites have been identified within potential disposal areas; and (g) terrestrial flora and fauna present in disposal areas will be identified.

Methods

Beach profile and bathymetric profile surveys using standard survey techniques were conducted to characterize the nearshore and beach geomorphology in the potential disposal areas. Survey range lines were established and their positions determined by triangulation with known physical markers. Sediment samples were collected from the potential disposal areas for analyzation by standard techniques. General vegetation cover and components are being identified and critical habitats noted in the potential disposal areas. Animals present in the disposal area and those which require disposal-area habitats for parts of their life history are being identified.

Progress to Date

All field work and sediment analysis has been completed. All data has been analyzed, and figures and tables for the report have been prepared. The text of the final report is in preparation.

Duration

It is anticipated the final report will be completed in June 1982.

Principal Investigators: S. Shabica and R. Burge

FORT MASSACHUSETTS FOUNDATION PROTECTION
AND SHORELINE EROSION STUDY
Gulf Islands National Seashore

Project Description

In recent years, the northern shore of West Ship Island in the vicinity of Fort Massachusetts has experienced shoreline erosion. This process has resulted in the foundation of the Fort being exposed to the undermining effects of Mississippi Sound waters. On two occasions, 1972 and again in 1980, sand obtained from the Gulfport shipping channel was used to reconstruct the north shore beach and provide short term protection to Fort Massachusetts. Historically, Fort Massachusetts has been exposed to both the Gulf of Mexico and Mississippi Sound waters, however. In the late 1800's, the north shore advanced while the south shore retreated, exposing the Fort's foundation to potential undermining by Gulf of Mexico waters. Research performed by the Coastal Field Research Laboratory suggests that the island tips are subject to this type of oscillation, of advance and retreat, much like a dog wagging its tail. Essentially, the erosive trend observed today may at some future time reverse itself.

Objectives

Establish a beach nourishment monitoring program for Fort Massachusetts. The research will provide a mathematical model with which, given a variety of meteorologic and hydrographic conditions, park management will be able to predict the time remaining before the Fort would again be awash, and the quantities of sand required to nourish the beach. The model will provide ample lead time for management to arrange for beach nourishment before the Fort's foundations are exposed.

Methods

Beach profiling, employing level rod and surveyors level, will be utilized to measure shoreline and topographic changes and to determine the direction and deposition of eolian sands. Aerial photogrammetric methods and navigation

chart overlays will be employed to identify historical shoreline changes in the vicinity of the Fort.

Progress to Date

Nine beach profile transect stations were established and surveyed in February 1981. To date, five surveys have been carried out. Aerial photographs have been analyzed and a twenty-five year data base established.

Duration

Coastal processes and shoreline changes require long term data acquisition to ascertain the effects of seasonal and storm conditions. Surveys will be performed three times per year. Completion and verification of the model is scheduled for 1984.

Principal Investigator: S. Shabica

AERIAL EVALUATIONS OF ISLAND DRIFT
Gulf Islands National Seashore

Project Description

A study of historical nautical charts has shown that the islands comprising Gulf Islands National Seashore are migrating westward. This migration should be recorded so that future movement can be estimated.

Objectives

This study will provide a series of aerial photographs which will be used to derive a map which will illustrate the islands' change in space.

Methods

Map overlays will be generated from photographs on loan from Gulf Coast Research Laboratory, Mississippi, and photographs acquired from the National Archives. These photos will be enhanced at the EROS Applications Assistance Facility, where with the aid of their sophisticated equipment, a final map product will be generated.

Progress to Date

The available aerial photos have been located. Permission to use the photos has been given, as well as permission to use EROS enhancing equipment. Tide control has been established. Data analysis for the Gulf of Mexico shoreline is complete. Data preparation for the Mississippi Sound shorelines will be completed in the summer of 1982.

Duration

This study will be completed during 1982.

Principal Investigator: S. Shabica

OFF-ROAD VEHICLE IMPACTS ON PERDIDO KEY

Gulf Islands National Seashore

Project Description

This research appeared under two titles in the 1980 Research Perspectives: Phytosociological Study of Perdido Key, and Off-road Vehicle Impacts on Perdido Key, Gulf Islands National Seashore. The objectives of these studies were re-considered as a consequence of Hurricane Frederic which impacted Perdido Key in September 1979. Hurricane Frederic extensively overwashed the eastern 11 km of Perdido Key. Approximately 90 percent of the dunes were flattened and the sand redistributed, forming a hurricane beach on the island and extensive sound-side washover fans. In one location, one meter of sand had been deposited over the pre-hurricane land surface by overwash. The Gulf of Mexico shoreline eroded back to, in some places, the pre-hurricane primary dune line. The sound-side marshes were covered with sand and the beach widths increased on the Big Lagoon side of Perdido Key. The washover extensively buried the insular flora across the entire island and along its full length, although vegetation, primarily sea oats, was still evident in numerous places. The extensive overwash events covered or removed most evidence of man's recent utilization in the area from the Johnsons Beach Day Use Facility to the Perdido Key Historic Zone. Off-road vehicular trails were still identifiable in several areas, although approximately 95-99 percent of ORV impacts were no longer visible. Perdido Key, at that moment in time, was probably as natural as it ever had been in recorded history. This study is focusing on both the vegetation and geomorphologic recovery of the island following hurricane perturbation.

Objectives

The study is directed toward understanding natural dune growth and revegetation, vegetation recovery and growth following burial, shoreline processes and the consequences of oceanic overwash on Gulf of Mexico barrier islands. The study will also provide an environmental base line and monitoring program for off-road vehicle activities on Perdido Key. On 24 August 1981,

off-road vehicles were again permitted on Perdido Key. Vehicular travel was restricted to a marked beach route, but trespass occurred in the protected portions of the Key. One pioneer plot was traversed by a vehicle, resulting in the loss of almost two years of effort in monitoring hurricane recovery.

Progress to Date

The 20 cross-island beach profile transect stations located every 300 meters down the island's axis have been surveyed four times per year. From each survey post, a series of four photographs were taken in order to quantify dune reestablishment. The pre-hurricane air-ground interface has been determined and the sand overburden deposited by washover estimated. This is allowing us to quantify topographic changes as a consequence of aeolian and overwash processes.

Four cross-island vegetation transects were established. These represent the major community and habitat types of Perdido Key. They include a forest, swale, pioneer, and marsh. The vegetation within these transects was characterized. An 85 percent complete floristic base line documented the flora of Perdido Key and voucher specimens were deposited at the University of West Florida herbarium. Methods were developed and a study initiated for recording incident energy, evaporation, and soil pH and moisture levels. Approximately 70 plant species have been documented to date.

Duration

Beach profiles, dune photography, and sediment sampling will be carried out on an annual basis. The floristic work will be completed. Vegetation sampling will be repeated with reduced frequency, with timing adjusted to yield the most useful information. Data gathering, for the ultimate preparation of a vegetation map of the island, will be continued. In 1983, the project will de-emphasize hurricane recovery and concentrate on monitoring the impacts of off-road vehicles.

Principal Investigators: S. Shabica; and M. Cousens and J. Coling (University of West Florida) .

REMOTE SENSING AND CARTOGRAPHIC PRODUCTS
APPLICABLE TO THE SOUTHEAST REGION OF
THE NATIONAL PARK SYSTEM

Project Description

This project will identify and accumulate available aerial photography and remotely sensed imagery for each park unit in the Southeast Region. In addition, cartographic products dealing with topography, geology, vegetation, resources, etc., will be compiled.

Objective

Establish a remote sensing and cartographic data base for the national parks of the Southeast Region.

Methods

An EROS computer search will be made for each park to identify available federally sponsored photography. Federal, state, and local agencies will be contacted in order to obtain all available data.

Progress to Date

Listings of aerial photography available from NASA, NOAA, and USGS have been obtained, as well as cartographic products from USGS and the National Ocean Survey. Files have been established by park unit. Information, assistance, and photography requested by individual parks have been provided. Photo evaluation is 50 percent complete.

Duration

The data base will be updated on a continuing basis and regional, state and local sources will be contacted, subject to availability of manpower and funds. We will continue to respond to park requests for information and assistance.

Principal Investigators: J. Erickson and S. Shabica

CONTRACTS AND OTHER STUDIES IN WHICH
THE COASTAL FIELD RESEARCH LABORATORY PARTICIPATES

The following contracts, both completed and in progress, are part of the Coastal Field Research Laboratory's overall science program. The contracts were initiated at the Regional or Park level to provide management with solutions to natural resource situations, or by the Coastal Field Research Laboratory to provide expertise in certain scientific areas. In all cases, the Coastal Field Research Laboratory either prepared "Statements of Work" and/or served as Contracting Officer's representative for the contract.

1. Practical Application of Decision Analysis to Shoreline Management. NPS Contract # CX500061052. 1978-1981.

2. A Phytosociological Study of Horn and Petit Bois Islands, Mississippi. NPS Contract # CX500060993. 1977-1979.

3. Studies of the Biology of Endangered and Threatened Species of Gulf Islands National Seashore, Mississippi. NPS Contract # CX50000521. 1979-present.

4. Wilderness Feasibility Study: Submerged Lands Around Horn and Petit Bois Islands, Mississippi. NPS Contract # CX500091230. 1979.

5. A Phytosociological Study of Perdido Key, Gulf Islands National Seashore. NPS Contract # CX500091259. 1979-present.

6. Monitoring the Rates and Magnitude of Physiographic Changes at the Perdido Key Unit of Gulf Islands National Seashore. NPS Contract # CX500010470. 1981-present.

7. Migration of Barrier Islands in Mississippi Sound. NPS Contract # CX500010535. 1981-present.

COOPERATION WITH FEDERAL AGENCIES AND CONTRACTORS
LOCATED AT THE NATIONAL SPACE TECHNOLOGY LABORATORIES
AND NEARBY

Computer Sciences Corporation. As prime contractor to NASA, Computer Sciences Corporation (CSC) provides fundamental support in a wide capacity to many NSTL agencies. The Coastal Field Research Laboratory has entered into a cooperative agreement to exchange data related to ocean waves in the northern Gulf of Mexico. CSC has developed a wave spectra system for the NOAA Data Buoy Office. The test buoy is located near Panama City, Florida. Data, gathered at 3-hour intervals, on wave direction, period, and significant height is provided to our Laboratory by CSC. These data are used, at no charge to the NPS, in the CFRL barrier island dynamics studies of Gulf Islands National Seashore.

EROS Applications Assistance Facility. This facility provides professional assistance in obtaining and using remotely sensed data from aircraft and spacecraft. In addition, the facility has an aerial photography data bank, a remote sensing lending library, and laboratory facilities for interpretation and analysis of remote sensing products. The facility is used extensively by the CFRL for barrier island monitoring, and assisting SER units of the National Park Service with acquisition of remotely sensed products. We are providing the EROS office, on a loan basis, photography acquired from other agencies, for use in their remote sensing training courses.

National Aeronautics and Space Administration, Earth Resources Laboratory. We are developing a method for monitoring shoreline changes on the barrier islands through the utilization of Landsat Experimental Satellite imagery.

National Aeronautics and Space Administration, Library. Journals, periodicals, and books, and interlibrary loan services are used extensively by CFRL personnel.

U. S. Department of Commerce, NOAA Data Buoy Office. This organization has been providing hydrographic and meteorologic data from northern Gulf of Mexico data buoys, and National Weather Service synoptic surface weather maps.

U. S. Department of Commerce, NOAA-National Marine Fisheries Service. The Coastal Field Research Laboratory provides technical assistance to the National Marine Fisheries Service Office of Marine Pollution Assessment in the Southeast Region and Gulf of Mexico.

U. S. Department of the Interior, Bureau of Land Management. We are participating in the New Orleans Office of the Bureau of Land Management Program Implementation Workshop and providing assistance in identifying the problems and research needs associated with the effects of outer continental shelf oil and gas development activities on marine mammals, turtles, birds, and endangered and threatened species.

U. S. Department of the Navy, Library. Journals, books, and periodicals are utilized by the CFRL.

U. S. Department of the Navy, Naval Ocean Research and Development Activity. This office is undertaking a hydrographic survey of the Mississippi Sound area as part of their oceanographic training program. The information gained will complement the studies being carried out on the sediment dynamics of the barrier islands of the Mississippi Sound. In addition, NORDA has a scanning electron microscope and other laboratory equipment which the CFRL utilizes in analyzing the structure of the sediments collected in our coastal processes studies. This organization will analyze a variety of biological and geological samples for the presence of heavy metals for the CFRL.

U. S. Environmental Protection Agency, Pesticide Monitoring Laboratory. This agency has agreed to analyze biological samples for the presence of pesticides.

U. S. Fish and Wildlife Service, National Coastal Ecosystems Team.

The Service has reviewed research proposals submitted to the CFRL in fields in which they have the expertise. In addition, we are cooperating in their study of the Mississippi Delta Characterization, a program designed to compile all literature, secondary sources, and information pertinent to the Mississippi Sound area.

U. S. Geological Survey, Gulf Coast Hydroscience Center. The Center provides access and use of a remote computer terminal whereby we relay punch card programs to the USGS central computer and data storage center in Reston, Virginia. This agreement represents a savings to NPS of the cost of hardware and computer time for the Southeast Region's Data Collection Platform project in the Great Smoky Mountains National Park.

U. S. Geological Survey, National Cartographic Information Center.

This Center provides the most current information available on maps, photographs, geodetic control, and other cartographic products which the CFRL employs in our barrier island and air/water quality studies, as well as providing this information to other SER units of the National Park Service.

PUBLICATIONS RESULTING FROM THE ACTIVITIES
OF THE COASTAL FIELD RESEARCH LABORATORY

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