

Cruise Report
(South Texas OCS Project)

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CORPUS DOES THEIRS
76015

1. Ship: R/V FAY
2. Cruise Number/Leg: 015
3. Area of Operations: South Texas OCS between Matagorda Bay and the U.S./Mexico international border. Work extended from the 30 ft. isobath to the shelf break at 600 ft. Area encompassed within 26°0'-28°25' N. latitude, and 95°57'-97°15' W. longitude.
4. Dates of Operations & Port Stops: Cruise period was from 5-21-76 to 5-25-76. The ship departed from, and returned to, the port of Corpus Christi, Texas. One port stop at Port Isabel.
5. Personnel & Affiliations:

Ship Captain	James Olander
Chief Scientist	Ronald Miller (USGS)

Scientific Crew

Stan Lindquist	(USGS)
Fran Firek	"
Bob Vitaglione	"
Betty Willingham	"
Cindy Rice	"
Ken Parolski	"
Neal Lillard	"
Bill Buendel	"
Tim Martin	"
George Wiley	"
Steve Barnes	"
Paul Berezna ^k	(Western Geophysical)

6. Purpose: The general scientific objective of the cruise was to obtain quasi-synoptic information on the suspended-sediment transport system within the South Texas OCS. Specific objectives consisted of the following: A) Obtaining samples of the water column for textural analysis and water chemistry, in order to establish seasonal textural patterns, B) Obtaining vertical transmittance-temperature profiles, in order to establish seasonal turbidity patterns, C) Casting drift bottles to measure surface currents during the cruise period. D) Phleger cores for clay analysis, E) Hydrocarbon cores
7. Scientific Equipment: Equipment utilized includes: transmissometer system (25 cm path) with temperature and depth sensors (Martek), precision depth recording system, 30-liter Niskin water sample bottles, X-YY' plotter and EPC recorder, mini-sparker system, Phleger corer, stainless steel hydrocarbon corer.

8. Navigation Techniques: The stations were positioned by the satellite navigation system.
9. Data Acquired: 1. Vertical transmittance-temperature profiles of the water column at 26 stations; 2. Three water column samples (surface, mid-depth, bottom) at each of 26 stations; 3. A total of 190 drift bottles were cast; 4. Phleger cores taken at 26 stations; 5. One seismic track; 6. Two hydrocarbon cores.
10. Comments: This cruise was the last of three cruises designed to evaluate the seasonal variability of suspended sediment transport patterns within the South Texas OCS region.
11. Tabulated Information:
- a. Days at sea - 4 1/2
 - b. Working days at sea - 4 1/2
 - c. Total ship's track (km) - 900
 - d. Continuous data (km) - 900
 - e. Total number of stations - 26
 - f. Number of sample types: 78 water samples (3 samples at each of 26 stations); 26 vertical transmittance-temperature profiles; 26 Phleger cores; 2 hydrocarbon cores.
12. Track Chart: Attached

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Phone call to Lou Miller
m 15 June 76
JR
minisparker
90km

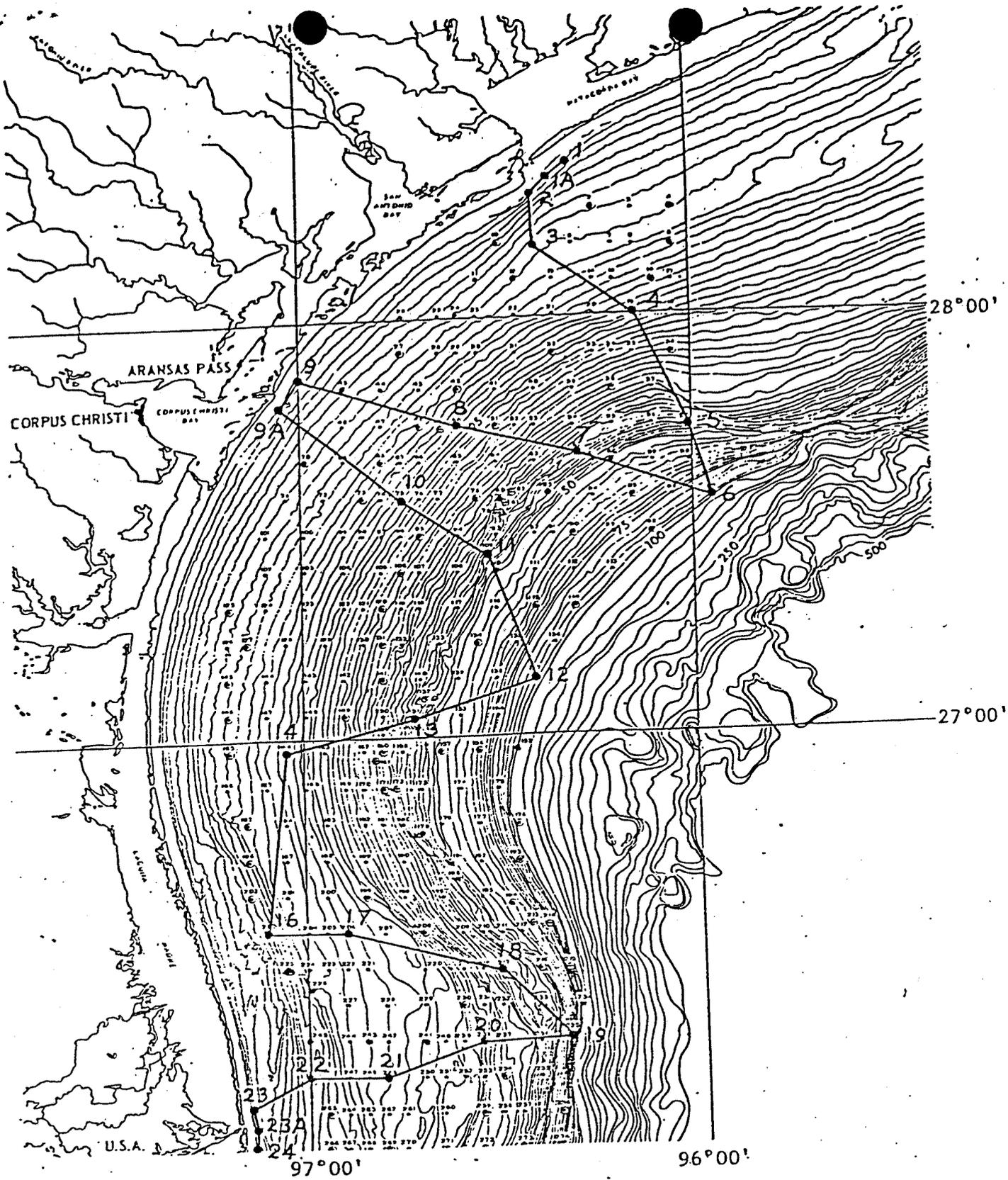


Figure 1 - Ship Track Chart

Survey Vessel

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FAY 015-35
IN CRUISES

The vessel used for the two cruises completed during the second quarter was the R/V FAY owned by TRACOR MARINE and under lease to the Atlantic-Gulf of Mexico Branch of the U.S. Geological Survey.

Scientific Crews

A total of 17 scientists and technicians participated in the two cruises. Cruise reports were transmitted at the completion of each cruise. The names of the participants by cruise are as follows:

USGS Cruise No. 015, Suspended sediments; transmissometry, 5/21/76 - 5/26/76.

Ronald Miller	↑ ?	Chief Scientist
Frances Firek		(Geologist/Sedimentology)
Steven Barnes		(Geochemist)
Stan Lindquist		(PST, Geochemistry)
Betty Willingham		(PST, Sedimentology)
Cindy Rice		(PST, Geochemistry)
George Wiley		(Marine Tech.)
Scott Heald		(Marine Tech.)
Bob Vitaglione		(Marine Tech.)
Ken Parolski		(Elec. Tech.)
NEA/ LILLARD		

Navigation and Positioning

Navigation and positioning for occupying field stations was carried out by precision navigation. The system employed was an integrated satellite, LORAN C built and installed aboard the R/V FAY by the Western Geophysical Company. The system included a shipboard computer and Calcomp Plotter providing both real time and post-station plotting aboard ship.

PART II - INVENTORY OF FIELD DATA

As noted earlier in the report, two types of samples were collected during the second quarter sampling period: cores of benthic sediments, and sampling for extraction of suspended inorganic particulate matter.

Cores of benthic sediments in the gas seep area were obtained with a standard gravity-fall pipe employing removable plastic liners of 3 in. ID. The ability to plot position in both real and post time aboard ship permitted the selection of a precise position above the general targets selected for sampling. A precoring geophysical survey of the general target area was completed using the high resolution seismic reflection profiler. The precise sampling site was selected after examination of the seismic profiles and the ship was then positioned over the site using post-plot data computed from the real-time plots.

Coring for studies of rates of sedimentation, originally begun during the November 1975 cruise using a hydraulically dampened tripod-housed corer, was completed during the May 9-19 cruise using a gravity corer. As pointed out in the report for the first quarter, the hydraulically dampened corer proved to be a failure in the characteristically soft

benthic sediments of the South Texas OCS. Consequently, the coring was completed using a gravity corer employing very careful handling procedures, particularly doing retrieval of the plastic liner from the core barrel to minimize any disturbance of the cored sediments. Furthermore, the sampling grid was altered to give a better regional coverage. See figure 1 for stations cored.

During the final seasonal synoptic cruise, water samples for extraction of suspended sediments were obtained at each of 26 stations by Niskin casts. At each station, samples of water were taken at three levels in the water column: near surface; mid depth or just below the thermocline if present; and one meter above the bottom. Subsampling for studying suspended sediments was as follows:-- particulate grain size at all three levels; trace metals content and clay mineralogy at surface and near bottom for 12 of the 26 stations. The subsampling plan followed that used during the two previous seasonal sampling periods. In addition to the samples collected at each station, turbidity levels or amounts of particulate concentration were measured in the water by use of a Martek transmissometer, and surface to bottom profiles were obtained at each sample station. Some malfunctioning encountered with the Martek transmissometer during the first seasonal cruise and to a minor degree in the second, was no problem during the third cruise. See figure 2 for stations occupied during sampling for suspended sediments.

A summary list of stations sampled and total samples collected follows. The listing is the final tally of the categories of samples indicated for the second year of field investigations. Column 1 lists

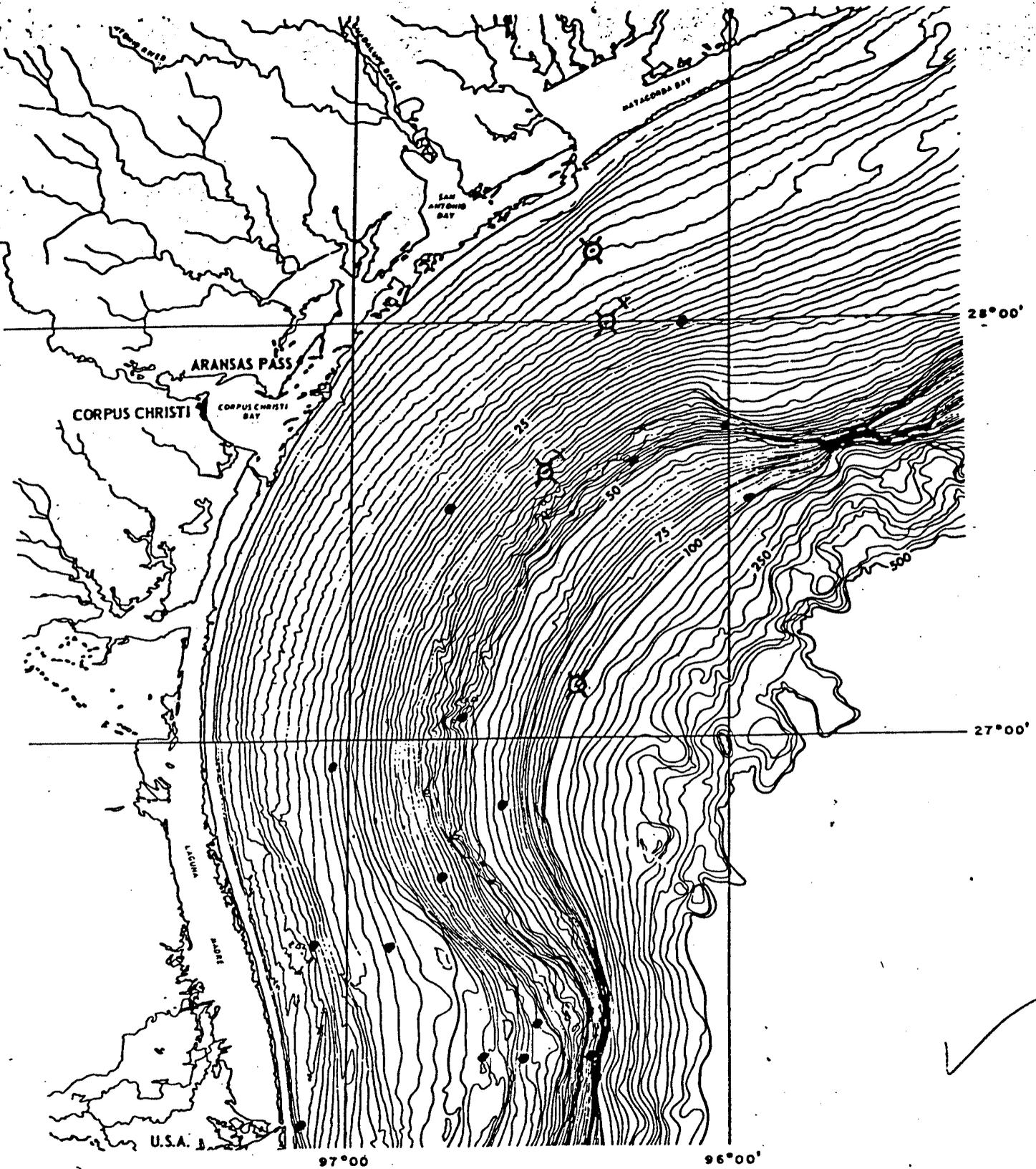


Figure 1. Core sites for dating rates of sedimentation by use of Pb Alpha²¹⁰.
 ● Hydraulically dampened core;
 ○ Gravity core;
 ○ Cores dated.

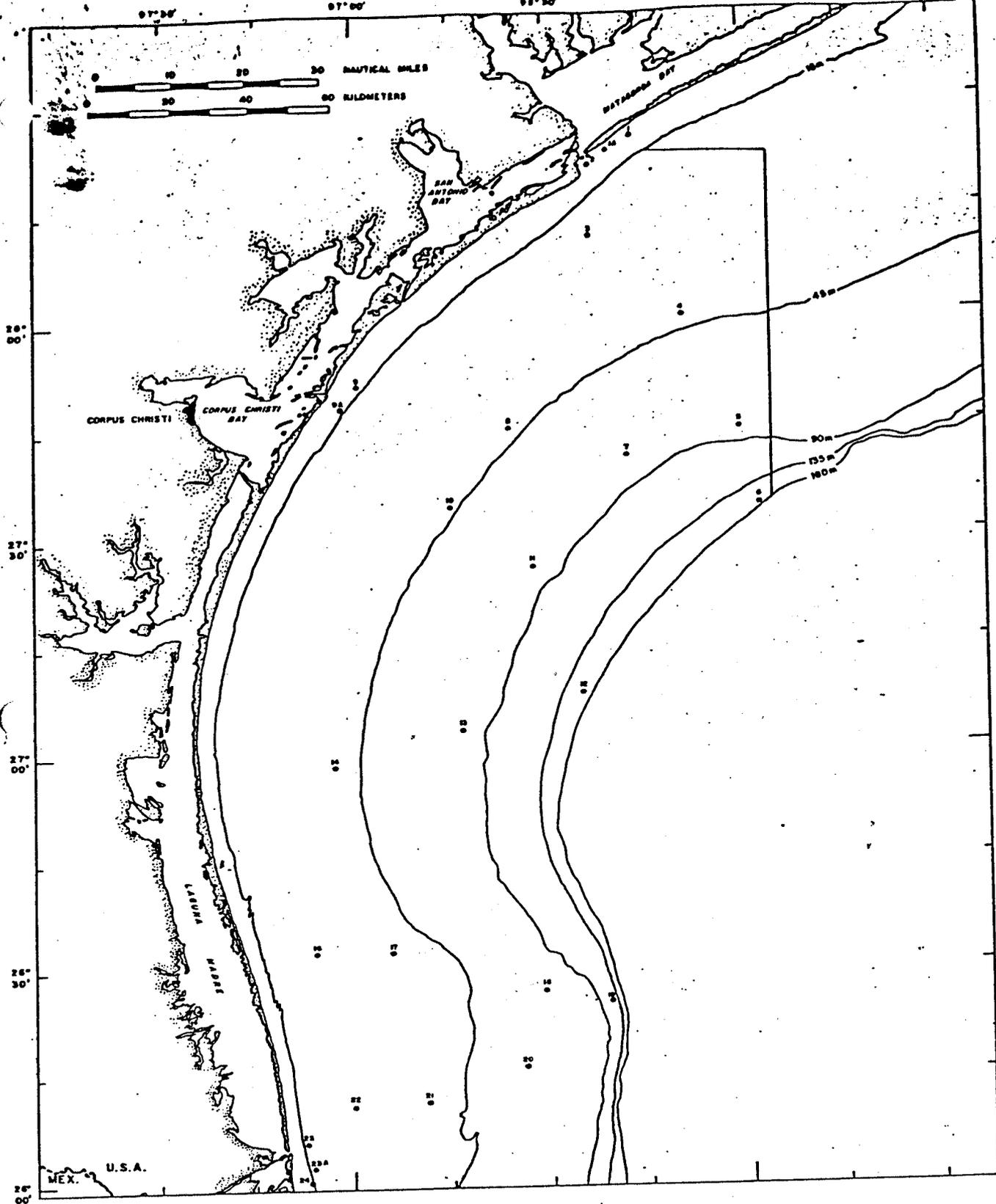


Figure 2. Suspended sediment sample stations.

the number of samples specified in the work plan; column 2 lists the number of samples actually collected; and column 3 shows the deviation from the number specified. The locations of the 26 stations occupied for sampling suspended sediments in both geographic and Lambert coordinates were listed in Table II of the report for the first quarter.

Summary listing of samples collected
by type and number of samples

	<u>1</u>	<u>2</u>	<u>3</u>
Suspended sediments	225	230	+5
Transmissometry profiles	78	78	0
Cores for study of rates of sediment deposition by the PB Alpha ²¹⁰ method	20	20	0
Cores for relating trace metals concentrations in benthic sediments to gas seeps	10	10	0

Additional data collected beyond work plan requirements and at no extra cost to project

High resolution seismic reflection profiles - total track miles collected during second quarter	300
(Total first and second quarter)	650

Summary listing of samples transmitted to USGS for analysis

No additional samples from the biological bench mark and monitoring elements of the 1976 STOCS project were delivered to USGS by the University of Texas Marine Science Institute at Port Aransas during the second quarter. Totals received to date remain as reported at the end of the

first quarter: 50 samples for textural analysis; and 29 for trace metals.

PART III - STATUS OF LABORATORY INVESTIGATIONS

Introduction

Aspects of study being conducted as parts of the geologic element of the STOCS Project include: trace element chemistry of suspended and surficial benthic sediments; textural and clay mineralogy of suspended sediments; turbidity of the water column on a synoptic basis as a complimentary investigation to the water sampling for suspended sediments; textural analysis of sediments in selected cores that were collected during the 1974-75 sampling effort; rates of late Holocene sediment deposition using the Pb Alpha²¹⁰ method; sediment transport patterns on the OCS with emphasis on storm transport; biogeologic studies to relate the role of infaunal organisms in sedimentary processes; and late Pleistocene/Holocene tectonic history as it relates to geologic conditions that might be hazardous to offshore petroleum exploration and development.

Progress reports of Principal Investigators for the geologic studies follow. In all cases where analytical techniques do not deviate from techniques described in previous quarterly reports, the techniques are not repeated.

Publications

- *Cruises: 32, 36, 41: R/V Fay Leg 006 11/15/75 to 11/21/75
R/V Fay Leg 010 3/2/76 to 3/6/76
R/V Fay Leg 015 5/21/76 to 5/26/76
- **Cruises: 46, 51, 53: R/V Ida Green 10/29/76 to 11/3/76
Decca Profiler 3/17/77 to 3/21/77
Decca Profiler 5/24/77 to 5/27/77
- *Shideler, G. L. 1977, Suspended sediments: physical characteristics, in Berryhill, H. L., Jr. (editor), Environmental Studies, South Texas Outer Continental Shelf, 1976: Geology: U.S. Geological Survey Final Administrative Report to Bureau of Land Management (Contract AA550-MU6-24), p. 22-94.
- *Shideler, G. L., 1977, Suspended-Sediment distribution of the South Texas Outer Continental Shelf, northwest Gulf of Mexico (abs.): American Association Petroleum Geologists Bulletin, Vol. 61, p. 830.
- *Shideler, G. L., 1977, Temporal and spatial variability of regional turbidity patterns on the South Texas Outer Continental Shelf, in Abstracts with Programs, Geological Society of America, V. 9, p. 1173.
- ***Shideler, G. L., 1978, Physical characteristics of suspended sediments, South Texas Continental Shelf: U.S. Geological Survey Final Administrative Report to Bureau of Land Management, 83P.
- ***Shideler, G. L., 1979, Regional surface turbidity and hydrographic variability on the South Texas Continental Shelf, Gulf of Mexico, A time-sequence study (abst): American Association Petroleum Geologists Bulletin, Vol. 63, p. 527 to 528.
- ***Shideler, G. L., 1979, Physical characteristics of suspended sediments, South Texas Continental Shelf: U.S. Geological Survey Open-File report 79-362, 68 p.
- **Shideler, G. L., 1978, Suspended sediments: physical characteristics, In Berryhill, H. L., Jr. (editor), Environmental Studies, South Texas OCS, 1977: Geology: U.S. Geological Survey Final Administrative Report to BLM, 73 p.

***Includes Cruises 32, 36, 41, 46, 51, 53