



United States Department of the Interior

87001

GEOLOGICAL SURVEY

CRUISE REPORT
Cayman Trough, 1987

R/V STARELLA

Depart: Kingston, Jamaica 7 Jan 1987
Arrive: Kingston, Jamaica 19 Jan 1987

Scientific Party: (Branch of Atlantic Marine Geology unless otherwise noted)

W. Dillon	Co-Chief Scientist
T. Edgar	Co-Chief Scientist
D. Nichols	Electronics Technician
D. Mason	Seismic Technician
C. Heywood	Nav.-Grav. Technician (Branch of Pacific Marine Geology)
C. Delorey	Watch Stander, Cruise Data Curator
R. Diaz	Watch Stander
H. Carvajal	Watch Stander and Observer (INGEOMINAS, Colombia)
J. Banhan	Watch Stander and Observer (Geological Survey of Jamaica)

Systems:

Single channel seismic profiling using 120in³ airgun
Magnetometer
Echo sounder
Gravity system
Starfix navigation system

Narrative:

The cruise operated in the eastern Cayman Trough, northeast and north of Jamaica, and in the central Cayman Trough, south of the Cayman Islands. Our purpose was to provide further geophysical data to aid the interpretation of a GLORIA survey conducted in the area in October, 1985 and to obtain knowledge pertinent to the general structural analysis of the northern boundary of the Caribbean Plate. The GLORIA survey consisted of a grid in the central Cayman Trough and a single swath eastward through the Trough to the Windward Passage.

The seismic system operated well throughout the cruise, once initial streamer problems were worked out. End points of seismic profiles are indicated in the appendix. A total of 1270 nautical miles (2352 km) of seismic data were collected. The Starfix navigation system worked perfectly throughout the cruise, giving excellent results. The gravity system also worked well. Unfortunately, both the magnetometer and seismic tape recorder failed early in the cruise, and, after considerable effort, were found to be unrepairable. The tape recorder had mechanical problems in the tape takeup system. The magnetometer first developed noise due to inadequate amount of fluid in the bottle resulting from a broken pressure-compensating diaphragm. An emergency repair was made by D. Nichols, consisting of removing the diaphragm, sealing the pressure compensation holes in the bottle, and filling it with clean diesel fuel. This worked well and provided excellent, quiet data for about a day. However, further problems developed due to short circuits in the tow cable, which were unrepairable.

grav
2352 km
mag
397 km

APPENDIX

Waypoints, Cayman Trough, Jan, 1987

A. Eastern Cayman Trough Survey

<u>Line #</u>	<u>Latitude</u>	<u>Longitude</u>
1.	line aborted	
2.	18°25'N 18°55'	76°15'W 75°55'
3.	" 18°38'	" 75°05'
4.	" 18°30.5'	" 75°08'
5.	" 19°06.5'	" 76°46'
6.	" 19°06.5'	" 77°08'
7.	" 18°19'	" 75°00'
8.	" 18°09'	" 75°04'
9.	" 19°05'	" 77°40'
9A.	19°08.5' 19°06.5'	77°40.' 77°08.0'
9B.	" 18°53'	" 77°23'
9C.	" 19°03'	" 77°44'
9D.	" 18°57.5'	" 77°44'
9E.	" 18°49.5'	" 77°26'
9F.	" 18°49.5'	" 77°46'

B. Central Cayman Trough Survey

<u>Line #</u>	<u>Long.</u>	<u>Lat.</u>	<u>n.mi.</u>	<u>hrs.</u>	<u>cum. hr.</u>
10	77°46' 77°55.5'	18°49.5' 18°38'	14	2.3	2.3
11	77°59'	18°38'	3	0.5	2.8
12	78°02'	18°45'	6	1.0	3.8
13	78°35'	18°38'	32	5.3	9.1
14	79°22'	18°20'	48	8	17.1
15	80°16'	19°14'	74	12.3	29.4
16	80°23'	18°49'	25	4.2	33.6
17	80°40'	19°18'	33	5.5	39.1
18	80°51'	18°54'	26	4.4	43.5
19	81°08'	19°11'	24	4.0	47.5
20	81°13'	18°51'	20	3.4	50.9
21	81°30'	19°12'	26	4.4	55.3
22	81°33'	18°46'	25	4.2	59.5
23	81°58'	19°08'	31	5.2	64.7
24	81°53'	18°41'	27	4.5	69.2
25	82°10'	19°03'	28	4.6	73.8
26	82°28'	18°58'	18	3.0	76.8
27	82°00'	18°31'	36	6.0	82.8
28	81°26'	18°22'	33	5.5	88.3
29	80°38'	17°39'	60	10	98.3
30	80°21'	18°23'	49	8.3	106.6
31	79°44'	18°03'	44	7.3	113.9
		PULL GEAR			
Kingston			200	22	135.9



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Rec'd DEC 30 1986
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GEOLOGICAL SURVEY
Branch of Atlantic Marine Geology
Office of Energy and Marine Geology
Woods Hole, MA 02543

UNITED STATES GOVERNMENT
MEMORANDUM

DATE: 30 December 1986

FROM: William P. Dillon

SUBJECT: Pre-cruise Report

VESSEL: R/V Starella

DATES AND PORTS: 6 Jan depart Kingston, Jamaica
19 Jan arrive Kingston, Jamaica

PERSONNEL:

- W. Dillon, Co-chief scientist
- N.T. Edgar, Co-chief scientist
- D. Nichols, Seismic Tech.
- D. Mason, Seismic Tech.
- C. Heywood, Nav-grav. Tech.
- C. Delorey, Watch stander, cruise data librarian
- R. Diaz, Watch stander
- H. Carvajal, Colombian observer
- J. Banham, Jamaican observer

PURPOSE: The cruise will collect geophysical data in two regions of the northwestern Caribbean, where GLORIA data was obtained in October, 1985. One of these areas is the eastern end of the Cayman Trough north of Jamaica, where we will study structures produced in the early opening stages of the Cayman Trough, when major changes in plate motions apparently occurred. The second region is the central Cayman Trough, where we will study structures related to the present spreading center and recent plate motions. Seismic profiling, magnetic intensity and gravity data will be collected.