

TR-112
McMaster

UNIVERSITY OF RHODE ISLAND
Graduate School of Oceanography

Kingston, R. I. 02881

CRUISE REPORT

R/V TRIDENT Cruise TR-112

'PSCHITT'

Schedule

Departed from Dakar, Senegal at 1620 hours on Wednesday, 8 March 1972;
Arrived at Monrovia, Liberia at 1528 hours on Saturday, 1 April 1972;
Departed from Monrovia, Liberia at 1902 hours on Saturday, 1 April 1972;
Arrived at Monrovia, Liberia at 1450 hours on Sunday, 2 April 1972

Region Investigated

Two areas (figure 1) were investigated during TR-112. The principal project locality, off southern Sierra Leone and Liberia, was the site of geological and associated investigations on the continental shelf and upper slope. A separate area, extending along a meridional section crossing the Equator at 14° West, was the location for a current study.

Duration of Cruise

25 days

Scientific Party

Dr. R. L. McMaster, URI, Chief Scientist 1

Dr. P. Betzer, U. of S. Florida, Co-Investigator 2

Dr. K. Carder, U. of S. Florida, Co-Investigator 3

Mr. J. Vogel, URI, Graduate Student 12

Mr. L. Miller, URI, Graduate Student 11

Mr. R. Fillon, URI, Graduate Student 10

Mr. D. Eggiman, U. of S. Florida, Graduate Student 9

Mr. A. Ashraf, URI, Research Assistant 4

Mr. A. Buddington, URI, Marine Technician 5

Mr. M. Weisham, URI, Marine Technician 8

Mr. W. Hahn, URI, Marine Technician 6

Mr. J. Sammons, URI, Electronics Technician 7

Scope and Objectives

The principal objective of cruise TR-112 was a broad investigation (R.L. McMaster) of the nature of geological processes involved in the cycle of erosion, transportation, and deposition of silts and clays on the continental shelf and upper slope off southern Sierra Leone and Liberia. A wide range of oceanographic equipment was utilized: elements of the water column, bottom surface, and shallow sub-bottom strata were investigated or sampled by various methods.

Geological activities (R. L. McMaster) included grab sampling, gravity and piston coring, bathymetric surveying, shallow sub-bottom seismic profiling, and bottom photography. Physical oceanographic work (L. Miller) employed water sampling, stationary and over-the-side current meters, and expendable bathythermographs to describe the current structure of the project area in the context of ongoing sedimentary processes.

Chemical work (P. Betzer) involved determinations of total suspended load variations and depth distributions of particulate silica, aluminum, iron, manganese, and calcium from samples collected in the water column. The chemical program was complemented by an optical study (K. Carder) that included determinations of particle size-distributions by Coulter counter and of light-scattering values by spectrophotometer.

Cruise TR-112 had two important secondary objectives. One was a sub-investigation within the main project area of shallow sub-bottom geological relations associated with Pleistocene events and the Holocene transgression, of related depositional environments, and of elements of the microfaunal ecology. This study (J. Vogel) utilized piston and gravity cores, grab samples, bathymetric and sub-bottom profiles, and plankton tows.

The other investigation (L. Miller) was a detailed study of the Atlantic Equatorial Undercurrent and an exploration of deeper currents (from 500 to 1500 m depths) apparently associated with it. This work, part of a separate physical oceanographic study utilizing current meters, bathythermographs, and water samples, was continued during the subsequent cruise (TR-113).

009 A) 18
 44
 22
 84 XBT's

6) 60
 7) 8
 68 H₂O

3. 14 c m

Summary of Scientific Operations

Information Obtained

Purpose

(Sierra Leone and Liberia Area)

✓ a) 18 Bathymetric profiles ✓

Definition of shelf/slope relief.

b) 14 Seismic profiles

Delineation of silt/clay deposits and shallow structural relations.

X c) 60 Hydrostations taken on shelf transects

Characterization of shelf/slope water and circulation pattern.

d) 2 current meter arrays off Sierra Leone

"

e) 1 current meter array off Liberia

"

f) 7 Over-the-side current meter stations off Liberia

"

✓ g) 44 XBT's

"

h) 195 Particulate matter samples from 55 suspended material stations

Determination of suspended load, clay mineral content, concentrations of particulate matter, particle size-distributions, and light-scattering values.

i) 36 Grab samples

Determination of sedimentary and environmental processes and their evolution through time.

j) 37 2-1/2" Gravity cores

"

k) 22 2" Piston cores

"

l) 7 Zooplankton tows ✓

Determination of microfaunal ecology.

m) 10 Camera Stations ✓

Revelation of current action and bottom micro-features around shelf break.

(Equatorial Region)

n) 4 Current meter arrays ✓

Characterization of the Atlantic Equatorial Undercurrent, associated deeper waters, and circulation pattern.

o) 22 XBT's between African work area and equatorial region

"

p) 8 Hydrostations ✓

"

q) 64 Particulate matter samples from 8 suspended material stations ✓

Determination of suspended load, concentrations of particulate matter, particle size-distributions, and light-scattering values.

115
 6
 259

44
 115
 63

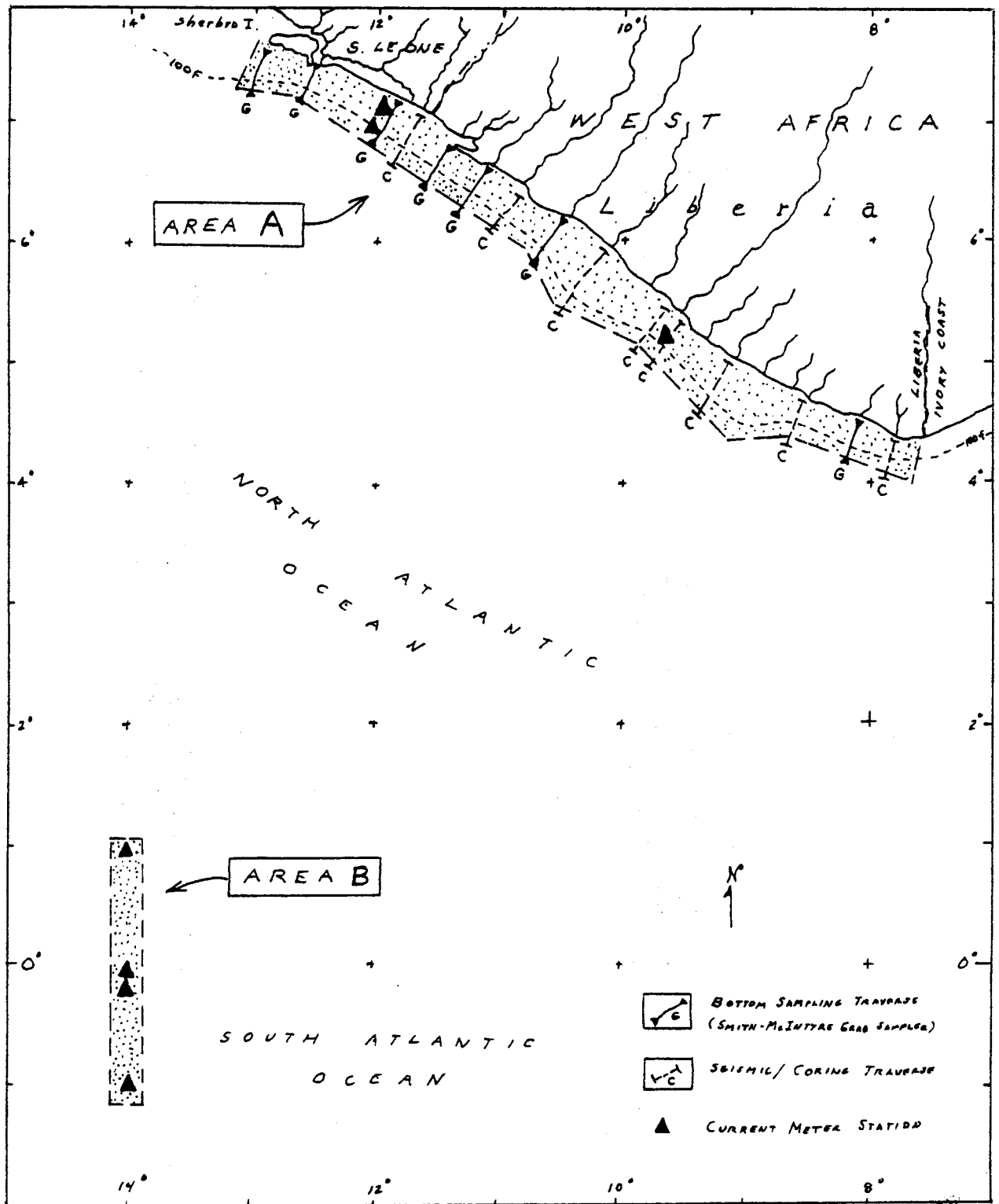
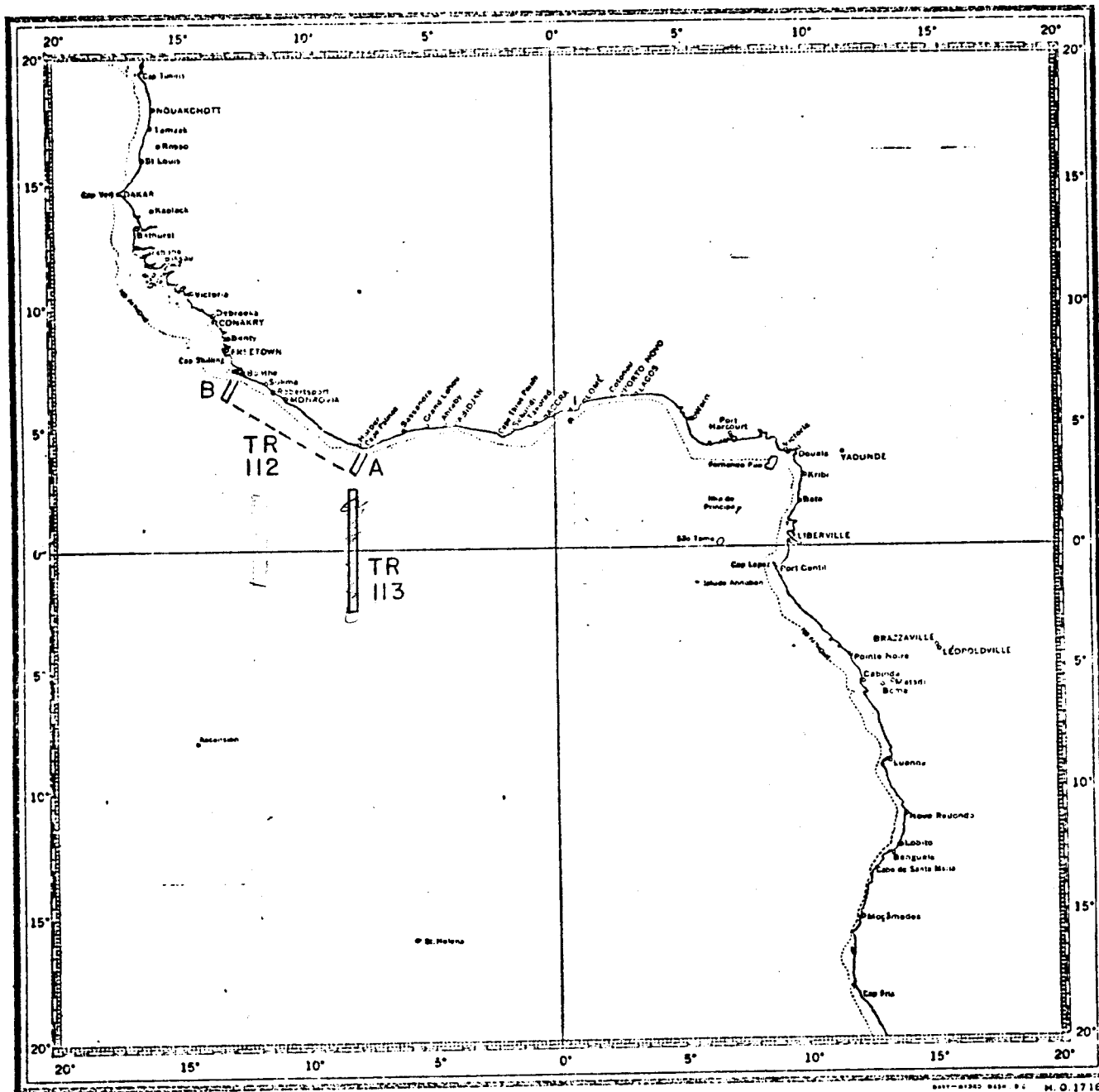


Figure 1. Location Map showing project areas and principal traverses completed for RV Trident Cruise TR-112. Area A, off Sierra Leone and Liberia, was the principal project area and the site of geological and associated operations. Area B, spanning the equator, was the site of a current meter study.



URI TRIDENT CRUISE IR-112

(West African Continental Shelf and Upper Slope off Liberia and Sierra Leone)

GEOLOGICAL SAMPLE INVENTORY

A. List of Piston Cores
(2-inch diam. modified Kullenberg Corer Utilized)

Station & Core No.	Date (1972)	Contact Time	Corrected Water Depth (meters)	Core Length (inches)	Shelf Transect No.	Nearest Coastal Locality	LOCATION	
							Latitude	Longitude
.106	3-25	0825	33	111	9	L. St. John R.	5°51.9'N	10°09.8'W
.109	"	1130	91	82	9	"	5°42.5'N	10°16.5'W
.111	"	1326	492	45	9	"	5°36.4'N	10°19.0'W
.124	3-26	2020	55	112	10	L. Cestos R. (SE)	5°22.5'N	9°36.9'W
.130-a	3-27	0400	414	9	10	"	5°10.3'N	9°49.0'W
.131	"	0551	192	102	10	"	5°12.0'N	9°48.0'W
.140	3-28	0608	86	120	14	L. Cape Palmas	4°12.0'N	7°44.7'W
.142-a	"	0747	167	2	14	"	4°08.6'N	7°44.5'W
.146	"	1249	626	58	14	"	4°08.0'N	7°44.1'W
.152-b	"	1600	65	100	14	"	4°14.7'N	7°43.9'W
.160-c	3-29	1215	59	117	12	L. Dubo R.	4°33.8'N	8°27.0'W
.164-c	"	1820	699	124	12	"	4°23.0'N	8°31.0'W
.171-c	3-30	1730	501	76	11	L. Sino R.	4°32.7'N	9°12.5'W
.172	"	1855	203	83	11	"	4°36.9'N	9°14.0'W
.194	3-31	2230	61	119.5	10-A	L. Cestos R. (NW)	5°24.2'N	9°44.3'W
.200	4-1	2316	1044	113	7	L. St. Paul R.	6°06.7'N	11°04.2'W
.201	4-2	0208	526	117	7	"	6°08.6'N	11°00.3'W
.202	"	0347	162	75	7	"	6°10.6'N	11°01.1'W
.206	"	0715	54	120.5	7	"	6°15.8'N	10°55.3'W
.208	"	0957	36	120.5	7	"	6°15.6'N	10°52.5'W
.176	3-30	2240	59	119	11	L. Sino R.	4°54.2'N	9°05.0'W

EMASTER/VOGEL

IR-112

URI TRIDENT CRUISE TR-112

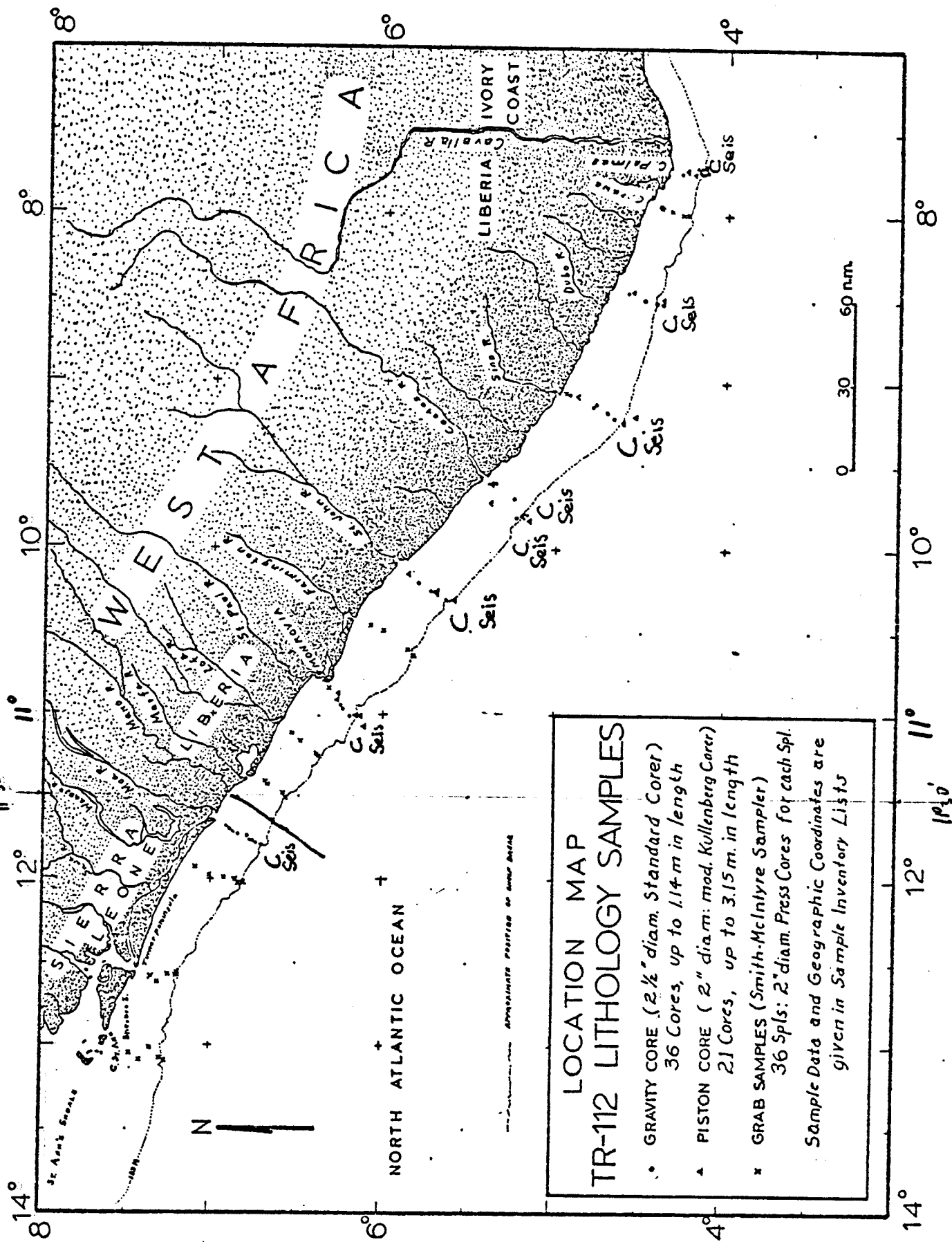
(West African Continental Shelf and Upper Slope off Liberia and Sierra Leone)

GEOLOGICAL SAMPLE INVENTORY

B. List of Gravity Cores
(2 1/2-inch diam. standard Gravity Corer Utilized)

Station & Core No.	Date (1972)	Contact Time	Corrected Water Depth (meters)	Core Length (inches)	Shelf Transect No.	Nearest Coastal Locality	LOCATION	
							Latitude	Longitude
94	3-24	0717	33	45.5	4	S.L. Moa River	6°54.7'N	11°41.3'W
95	"	0753	44	23	4	"	6°54.4'N	11°41.7'W
96	"	0822	47	23	4	"	6°52.9'N	11°42.6'W
97	"	0900	61	25	4	"	6°50.4'N	11°43.8'W
98	"	0945	79	18	4	"	6°47.6'N	11°44.9'W
99	"	1005	94	27	4	"	6°45.5'N	11°46.3'W
100	"	1033	94	1	4	"	6°45.9'N	11°46.1'W
101	"	1040	91	5	4	"	6°45.6'N	11°46.2'W
102	"	1100	210	35	4	"	6°45.0'N	11°46.5'W
103	"	1157	495	39	4	"	6°43.0'N	11°48.0'W
107	3-25	0930	52	32	9	L. St. John R.	5°48.5'N	10°12.0'W
108	"	1025	69	9	9	"	5°44.3'N	10°15.5'W
110	"	1227	179	30	9	"	5°39.4'N	10°18.9'W
123-b	3-26	1929	34	28	10	L. Cestos R. (SE)	5°23.6'N	9°36.5'W
125-b	"	2133	56	25	10	"	5°22.0'N	9°36.4'W
126	"	2248	81	6	10	"	5°15.0'N	9°41.9'W
130-b	3-27	0500	333	11.5	10	"	5°10.9'N	9°47.6'W
135-b	"	0810	128	25	10	"	5°14.9'N	9°48.7'W
138	3-28	0506	48	19	14	L. Cape Palmas	4°17.0'N	7°44.9'W
143	"	0834	229	17	14	"	4°08.3'N	7°44.4'W
145-b	"	1220	576	38	14	"	4°07.9'N	7°44.3'W
148	"	1403	122	11	14	"	4°09.7'N	7°44.1'W
149-b	"	1427	101	2	14	"	4°10.5'N	7°44.2'W
150	"	1457	95	23	14	"	4°11.2'N	7°44.2'W
159	3-29	1049	45	30	12	L. Dubo R.	4°35.2'N	8°27.2'W
161	"	1335	73	12	12	"	4°29.5'N	8°29.3'W
163	"	1433	251	21	12	"	4°25.4'N	8°30.8'W
164-b	"	1744	556	25	12	"	4°23.0'N	8°31.3'W
173	3-30	1945	97	4.5	11	L. Sino R.	4°40.0'N	9°12.5'W
174	"	2030	84	7.5	11	"	4°42.7'N	9°11.0'W
175-a	"	2120	71	3	11	"	4°47.5'N	9°08.4'W
175-b	"	2133	71	9.5	11	"	4°47.4'N	9°08.3'W
177	"	2300	51	33	11	"	4°55.8'N	9°04.7'W
203	4-2	0545	92	21	7	L. St. Paul R.	6°12.0'N	11°00.8'W
204	"	0615	73	7.5	7	"	6°14.0'N	10°58.2'W
205	"	0645	69	24	7	"	6°14.6'N	10°57.1'W

LIBERIA SIERRA LEONE



LOCATION MAP
 TR-112 LITHOLOGY SAMPLES

- GRAVITY CORE (.2 1/2" diam. Standard Corer)
36 Cores, up to 1.14 m in length
- ▲ PISTON CORE (2" diam: mod. Kullenberg Corer)
21 Cores, up to 3.15 m. in length
- × GRAB SAMPLES (Smith-McIntyre Sampler)
36 Spls: 2" diam. Press Cores for each Spl.

*Sample Data and Geographic Coordinates are
 given in Sample Inventory Lists*

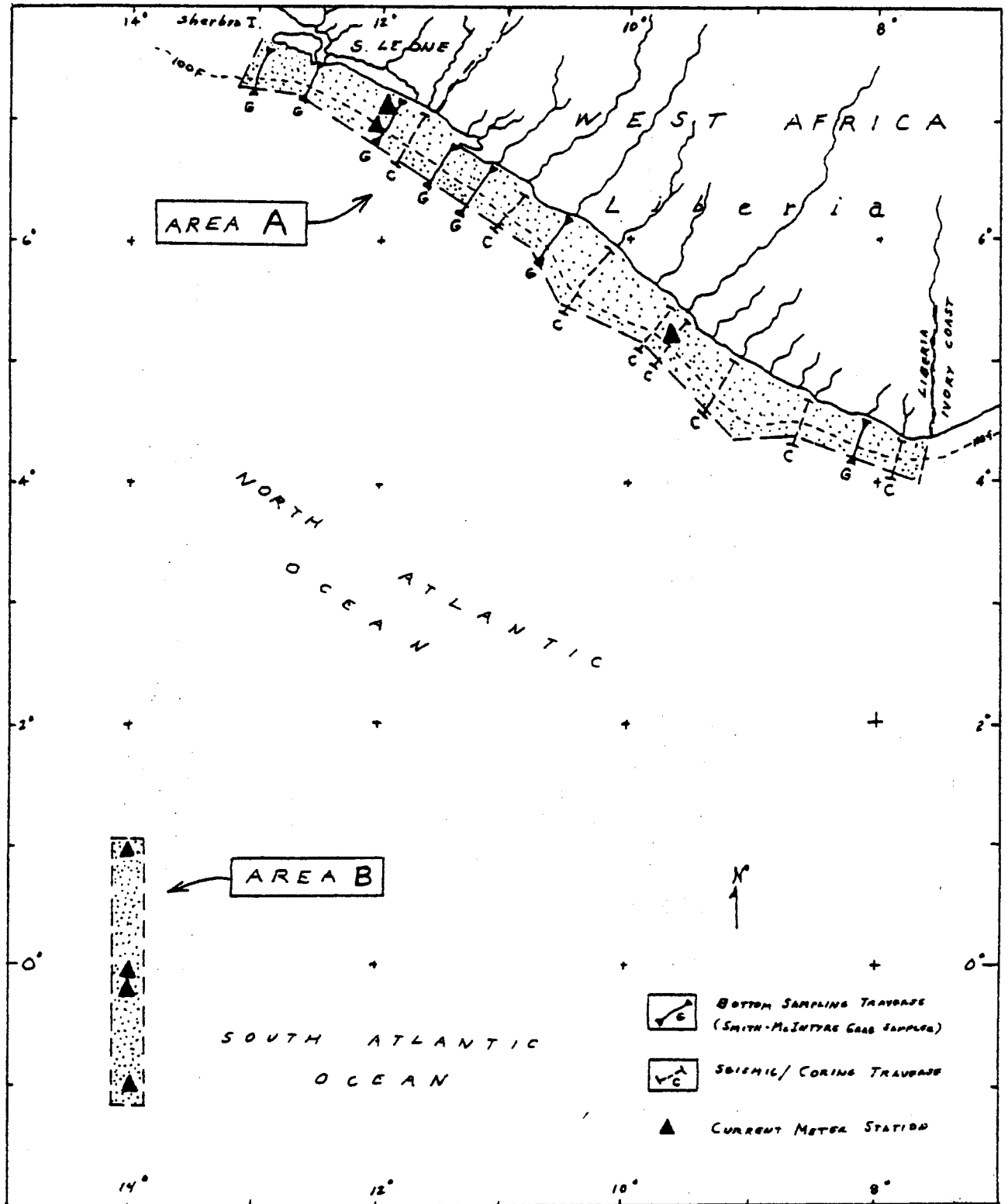


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