Received 10/19/82
82034

Cruise Report (Administrative)

1. Ship name: R/V GYRE
2. Cruise no.: 11-G-82
3. Parent Project: Ocean hard mineral resources; 9840 02005
4. Funding Agency: Principal agency Office of Marine Geology, U.S. Geological Survey, Atlantic-Gulf Branch, Woods Hole, MA 02543. Ancillary support by cooperating organizations, below.
5. Funding Amount
6. Contract no.: not applicable (SRI funds)
7. Contract start and end date: not applicable
8. Area of operations: Blake Plateau Mineral Target area
9. Dates: Embark Morehead City, North Carolina, Sept. 18, 1982; Disembark Miami Florida, Sept. 28, 1982
10. Chief Scientist: Frank T. Manheim
11. Names and affiliations of scientific party:

F.T. Manheim, Chief Scientist, USGS Woods Hole
P.C. Bowker, Curator and Core and Dredging, USGS Woods Hole
B. Wooding, Chief core tech, WHOI
Sue Williams, Navigation and data curator, USGS Wood Hole
Greg Miller, Electronics technician, USGS Woods Hole
H. Yoshida, Sumitomo Metals Mining Co., Multifrequency acoustic system, Tokyo
K. Kawasaki, Sumitomo Metals Mining Co., Tokyo
Earl Young, Angus/Argus system team head, WHOI
John Porteus, Angus/Argus system team head, WHOI
Rodney Catanqach Angus/Argus system team head, WHOI
Ray Hall, watch and paleontology, USGS Woods Hole
John DeYoung, watch and geostatistics, USGS Reston
Phil Aruscavage, watch, USGS Reston
Candace Lane, watch, USGS Woods Hole
Karl Sundquist, watch and acoustics, Virginia Polytechnic Inst.
Dave Porta, acoustics, Datasonics Corp., Cataumet

In addition, Theo Duis, Texas A&M served as marine technician with the scientific party.

Ship's complement
D. Armand, Master
R. Else, First officer
B. Proda, 2nd officer
J. Cussen, Chief engineer
R.V. Pittman, Electrician Duelly OS
D. Davis, deck engineer
A. Doschall, Asst. Engineer
T. Gayton, AB
R. Danesi, Steward
A. Schmidt, O.S.

12. Purpose of cruise

Testing new techniques for determining the thickness, distribution and quality of mineral deposits on the Blake Plateau, with special reference to the manganese nodules and manganese-phosphate pavements. Wide-range bottom photographic methods (Angus/Argus) provided by a

Woods Hole Oceanographic Institution team were to give visual information on all phases and especially provide ground truth for the Sumitomo Metals Mining Co. MFES system (Multifrequency exploration system), which detects nodule concentration on the bottom from a ship underway. Pavement "pinginging" by lowering bottom reflection and refraction gear would attempt to ascertain thickness of pavement, and specially designed corers would attempt to recover pavement samples. The data gathered will be used to asses Blake mineral resources and assist the Dept. of Interior (Minerals Management Service) in evaluating future offshore mineral leasing potentials. The knowledge of the geological nature of the deposits is also expected to aid in evaluating the environmental setting and potential multiple use conflicts.

13. Navigation techniques

Loran C (Northstar) using Hatteras and Jupiter slave stations calibrated by satellite (INS). Computer correction systems and position guidance with CRT screens and automatic position readout.

14. List of scientific equipment

Angus/Argus three-camera, wide range bottom camera system with onboard processing (35 mm color).

Sumitomo Corp. MFES system (Multifrequency Exploration System) for remote monitoring of manganese nodules on seafloor.

S Datasonics Inc. three-frequency towfish, multifrequency pinger and hydrophone system (for bottom lowerings), subbottom profiler transceiver and oscillograph (sound frequency monitor).

S 3 EPC graphic recorders, multichannel tape deck

N INS Satellite-Loran C navigation system with CRT screens and automatic positioning system

Impact coring system with special hardened core noses (with and without piston)

Polarizing and binocular microscopes and rock testing equipment

48", 36" and 24" dredges (4), core extruders

Miscellaneous sample processing and packaging equipment

15. Other information

Days at sea: 10½

	48 hm 88 km	camera lowerings (approx. 45 hrs, 18,000 photos)
	540 1000 km	3.5 kHz (high resolution) acoustic profiling
	54 100 km	multifrequency profiling (MFES)
No. stations: 28	3 xx	bottom reflection lowerings
No. dredges: 18	1 no.	bottom refraction experiments
No. cores: 11	300 kg	rocks recovered

Station data (see appended sheets)

Archival information

Magnetic tapes: 5 seismic analog magnetic tapes; 3 navigation tapes

Folded geophysical charts (continued)

	From	To
Datasonics 15-kHz-27 kHz sheet 1 of 2	0202z 020919	0330 SOL-1 820919
	1100z 820919	2157 C-2 820919

	From	To
	2313z 820919	0530 820920 A-1
	1420z 820920	1450z 820920
	1420z 820920	1450 820920
	0644 820921	1427z 82092, EoA1, SOL 5, S6
	0045z 820922	0745z 820922 A2 EOA2
	1109z 820922	1450z A3B-EOA3B 820922
	0045z 820923	0525z 820933 SOL7
	0332z 820924	2104z 820924 SOA S16 EeAS15
Datasonics 15 kHz/27 kHz sheet of 2 of 2	2107z 820925	0045z 820926 SO
Datasonics 3.5 kHz (deep tow) sheet 1 of 4	0202z 820919	0330 LI 820919
	1100z 820919	2157 S2A/S262 820919
	2320z 820919	0536z SOA1 820920
sheet 2 of 4	1420z 820919	2030z S3C3 820920
	0644z 92092	1215z SOL5 820921
sheet 3 of 4	1245z 820921	1427z 820921
	0038 820922	0800z L6 820922 16B
	0045z 820923	0525z L7 820923

	From	To
	0332z	2104z SOAS16
sheet 4 of 4	2107z 820925	0045z L8 820926
Hullmounted 3.5 kHz	2030z 820918	0150z TL SI 820919
	0332z 820919	1100z 820919 S2
	1805z 820919	2034z 820919

STATION DATA September 18-28, 1982

Sta.	Depth (m)	Latitude	Longitude	Time (z)	Time	DTG (EDT)	Samples
1	38	33°19.7′	77°17.6′	19/0002	18/2002		C1
2	550	32°18.5′	77°41.0′	19/1351	19/0951		D1(20) C2A,CTB
	(535-365)	32°09.5′	77°44.8′	19/2345	19/1945		Start Angus 1
3	530-551	32°11.5′	77°45.2′	20/1432	1032		C3, C4, C5, C6
4	-	31°22.0′	77°18.6′	21/0458	0058		Mf acoustic
5	-	31°29.2′	77°16.4′	21/0958	0553		Change L4 to 5
6	825	31°42.7′	77°29.4′	21/1301	1101		D2 one cobble
7	891-900	31°39.0′	77°25.5′	21/1637	1237		D3, D4
8	952-957	31°33.4′	77°22.2′	21/2002	1602		D5
9		31°25.9′	77°43.4′	22/0025	21/2025		Start Angus
10		31°46.7′	77°45.0′	22/0825	22/0425		Start acoustic
11		31°46.7′	77°45.0′	22/1756	22/1356		D6
12	722-724	31°43.4′	77°41.7′	22/2020	22/1620		D7(lost)
13		31°53.8′	77°49.0′	23/0043	22/2043		Start Angus and towfish
14	705-719	31°55.5′	77°36.4′	23/0902	23/0502		C8, C9
15	632-635	31°24.6′	78°30.6′	23/1947	23/1547		D8
	796+10	One square kilometer centered at this point and with 45° angles at points of the compass					
16		31°01.32′	78°23.15′	23/2329	23/1929		Drop 119 patio blocks
17	796	31°01.3′	78°23.3′	24/2245	24/1845		D9
18	800	31°01.0′	78°23.1′	24/2352	24/1952		D10
19	825-840	30°59.8′	78°21.5	25/0218	24/2218		D11
20	800	31°00.0′	78°23.3′	25/0407	25/0007		C10,11 Reflection
21		31°07.8′	78°56.5′	25/1620	25/1220		Acoustic line
22		31°06.8′	78°50.7′	25/2044	25/1644		*/Angus
23	670	31°07.4′	78°56.6′	26/0226	25/2226		D12
24	696-735	31°06.3′	78°50.6′	26/0415	26/0015		D13(lost) D14
25	760-777	31°00.5′	78°59.6′	26/0859	26/0459		D15
26	740-825	30°52.15′	78°49.47′	26/1112	26/0712		D16
27	835	30°42.89	78°37.83′	26/1324	26/0924		D17
28	810-815	30°34.99′	78°39.11′	26/1501	26/1101		D18

Notes: z refers to Greenwich mean time; DTG (EDT) is Eastern Daylight time. C is core, mainly special short-barreled punch core for hard substrate. D is dredge. Mf is multifrequency acoustics. Asterik in Station 22 data refers to special bottom lowering of reflection and refraction experiments (pavement pinger). See special sheet for Angus camera lowerings.

16. Page size track charts: see Appendix II

Appendix I: Angus lines

Number	Time (z)	EDT	Latitude	Longitude	Depth (m)
LI	192345	191945	32°09.5′	77°44.8′	565
	200030	192030	32°11.6′	77°44.2′	575

	0532 200~~432~~	200132	32°32.3′	77°44.0′	365
L4	210719	210319	31°27.9′	77°24.4′	935
	210944	210544	31°29.1′	77°16.9′	995
L6	210055	212055	31°26.8′	77°43.0′	770
	21~~2322~~ 0322	212322	31°29.1′	77°43.1′	
L6	221119	221030	31°37.2′	77°43.8′	
	221430	221030	31°44.4′	77°38.1′	
L7/S13	230043	230116	31°53.8′	77°49.0	635?
	230516	230116	31°57.6′	77°29.5′	835
S16	240330	232330	31°01.0′	78°23.6′	(Criss-cross of 1 km^2
	242102	241702	31°00.7′	77°23.5′	area about 800 m)
L8	252140	252049	31°06.1′	78°50.5′	
	~~260040~~ 260119	252049	~~31°07.~~8′ 31°7.5′	~~78°57.8′~~ 78°57.3′	

CRUISE REPORT

SHIP UTILIZATION DATA

UNOLS
REV. 11/7

SHIP NAME GYRE	OPERATING INST. Texas A&M	
CRUISE (LEG) NO. G-11	DATES 18-28 Sept. 82	
AREA OF OPERATIONS: Blake Plateau	PORT CALLS: PLACE / DATES	
DAYS AT SEA 11 / DAYS IN PORT		

PARTICIPATING PERSONNEL

CODE	NAME	TITLE	AFFILIATION
1.	F.T. Manheim	Chief Scientist	USGS
2.	P.C. Bowker	Curator and Core and Dredging	USGS
3.	B. Wooding	Chief core tech.	WHOI
4.	Sue Williams	Navigation and data curator	USGS
5.	Greg Miller	Electronics tech.	USGS

WAS RESEARCH CONDUCTED IN FOREIGN WATERS? no COUNTRY: _____

PRIMARY PROJECTS (those which govern the principal operations, area and movements of the ship)

PROJECT TITLE AND PRINCIPAL INVESTIGATOR	SPONSORING ACTIVITY	GRANT OR CONTRACT NUMBER	PARTICIPATING PERSONNEL (AS CODED ABOVE)
Ocean Hard Mineral Resources Frank T. Manheim	U.S. Geol. Survey	9840-02005	1-5, 8-16

ANCILLARY PROJECTS (which are accomplished on a not-to-interfere basis and contribute to the overall effectiveness of the cruise)

PROJECT TITLE AND PRINCIPAL INVESTIGATOR	SPONSORING ACTIVITY	GRANT OR CONTRACT NUMBER	PARTICIPATING PERSONNEL (AS CODED ABOVE)
Multifrequency Exploration System H. Yoshida	Sumitomo Metal Mining Co.		6-7

SIGNATURE [signature] DATE _____
CHIEF SCIENTIST

(Continue personnel and project listings on reverse if additional space needed)

ATTACH PAGE SIZE CRUISE TRACK

COST ALLOCATION DATA

DAYS CHARGED	AGENCY OR ACTIVITY CHARGED	GRANT OR CONTRACT NO.

SIGNATURE _____ DATE _____
Institution Official

PARTICIPATING PERSONNEL (cont.)

CODE	NAME	TITLE	AFFILIATION
6.	H. Yoshida		Sumitomo Metals Co., Tokyo
7.	K. Kawasaki		Sumitomo Metals Co., Tokyo
8.	Earl Young	Angus/Argus system team head	WHOI
9.	John Porteus	Angus/Argus system team head	WHOI
10.	Rodney Catanach	Angus/Argus system team head	WHOI
11.	Ray Hall	watch and paleontology	USGS
12.	John DeYoung	watch and geostatistics	USGS, Reston
13.	Phil Aruscavage	watch	USGS, Reston
14.	Candace Lane	watch	USGS
15.	Karl Sudquist	watch and acoustics	Virginia Polytechnic Inst.
16.	Dave Porta	acoustics	Datasonics Corp., Cataumet