

Columbia University
in the City of New York

DEPARTMENT OF GEOLOGY
LAMONT GEOLOGICAL OBSERVATORY
PALISADES

INDEX

Research Vessel VEMA

CRUISE N° Y-21

CRUISE LEG—From NEW YORK To MIAMI

TIME ZONE +5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. \checkmark	Long. \checkmark		
F									
E	STATION								
B ₁₂	A					38 43	72 39		
	CORE # 1								
	SURFACE								
	PLANKTON # 1					38 43	72 39		
F	STATION								
E	B								
B									
F ₁₂	PLANKTON					36 05	70 24		
13									
	CORE # 2					36 05	70 24		
	CAMERA # 1					36 05	70 24		
F	W. B. B. L. # 1	12 00	03 12	12 00	03 12	36 05	70 24		15 HITS - 11 EXPOSURE
E	# 1	FIRST EXPOSURE	13 50	03 10	03 10				6-1-5
B	TIGRAD # 1	EXPOSURE	14 40	02 10	02 10	36 05	70 24		PLUS-X FILM
									ADVANCE PROBABLY
F	STATION								
E	C								
B									
14	PLANKTON					34° 02'	67° 06'		
	HYDRO ST. # 1					34° 02'	67° 06'		
	STATION D.								
F	CAMERA # 2					31° 12'	66° 13'		
E	CORE # 3					31° 12'	66° 13'		
B	W. B. B. L. # 2					31° 12'	66° 13'		
17	T. G. R. A. D.					31° 12'	66° 13'		
	PLANKTON					31° 12'	66° 13'		
F	W. B. B. L. # 3					30° 24'	69° 55'		
E	CAMERA # 3					30° 24'	69° 55'		
B	PLANKTON					30° 24'	69° 55'		
18	HYDRO ST. # 2					30° 24'	69° 55'		

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Research Vessel VEMA

CRUISE N° V. 21

CRUISE LEG—From BERMUDA To MIAMI

TIME ZONE Z+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
	FEB STATION (E)								
18.	CORE #4					30°14'	69°55'		
	T. GRAD #3					30°14'	69°55'		
	STATION (F)					30°14'	69°55'		
F	T. GRAD #3					29°32'	73°10'		
E	CORE #4					29°32'	73°10'		
B	PLANKTON					29°32'	73°10'		
	B.T. #3					29°32'	73°10'		
	CAMERA #4					29°32'	73°10'		
	WBBL #4					29°32'	73°10'		
	STATION (G)								
F	WBBL #5 & 6					26°41.5'	73°54'		
E	T. GRAD #5					26°41.5'	73°54'		
B	CORE #6					26°41.5'	73°54'		
20	PLANKTON					26°41.5'	73°54'		
	STATION (H)								
F	WBBL #7					25°38'	71°59'		
E	CAMERA #5					25°38'	71°59'		
B	PLANKTON					25°38'	71°59'		
21	HYDRO #3					25°38'	71°59'		
	CORE #7					25°38'	71°59'		
	T. GRAD #6					25°38'	71°59'		
F	STATION (I)								
E	CORE #8					25°21'	72°41.5'		
B	T. GRAD #7					25°21'	72°41.5'		
21	CAMERA #6					25°21'	72°41.5'		
	PLANKTON					25°21'	72°41.5'		
	STATION J								
FEB	CORE #9					25°17'	72°40'		
21									

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CRUISE N° U-21

CRUISE LEG—From BERMUDA To MIAMI

TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
F	STATION (K)								
E	PLANKTON					25°04'	73°20'		
B	CAMERA #7					25°04'	73°20'		
22	CORE #10					25°04'	73°20'		
	T. GRAD #8					25°04'	73°20'		
F	STATION (L)								
E	PLANKTON					25°11'	73°40'		
12	WBBS #8+9					25°11'	73°40'		
22	T. GRAD #9					25°11'	73°40'		
	CAMERA #8					25°11'	73°40'		
	CORE #11					25°11'	73°40'		
F	STATION (M)								
E	PLANKTON					25°23'	74°15'		
E	CAMERA #9					25°23'	74°15'		
B	T. GRAD #10					25°23'	74°15'		
23	CORE #12					25°23'	74°15'		
F	STATION (N)								
F	WBBS #10, 11, 12, 13			2520		25°40'	75°30'		
E	T. GRAD #11			2520		25°40'	75°30'		
B	PLANKTON			2520		25°40'	75°30'		
23	CORE #13			2520		25°40'	75°30'		

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CRUISE LEG—From MIAMI To PANAMA

TIME ZONE Z+5

[illegible]

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CRUISE N° 21

CRUISE LEG—From Miami To Cristobal, Z.

TIME ZONE

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long.		
M									
A									
R	CORE #15					2441	8439		
3	T. GRAD #13					2441	8439		
M	MPS #5					2441	8439		
A									
R	BPS #5					2441	8439		
3									
M	BPS #5					2441	8439		
A									
R	CAMERA #10					2441	8439		
3									
	NEPHERO METER (L. S. M) #2					2441	8439		
M									
A									
R	CORE CAMERA #2					2441	8439		
3									
	STATION C								
M	PLANKTON					22°43	84°24		
A	B.T. #9					22°43	84°24		
R	T. GRAD #14					22°43	84°24		
4	CAMERA #11					22°43	84°24		
	CORE L.M.					22°43	84°24		
	CORE CAMERA					22°43	84°24		
	STATION D								
M	WIBBL					20°24	85°17		
A	T. GRAD #15					20°24	85°17'		
R	CORE #17					20°24	85°17'		
5	BT #10					20°24	85°17'		
	PLANKTON					20°24	85°17'		

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CRUISE N° V-21
CRUISE LEG—From Miami To CRISTOBAL

TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
M	STATION E								
A	PLANKTON					18°40	86°02		
R									
G	CORE #18					18°40	86°02		
M	CAMERA #13					18°40	86°02		
A	TGRAD #10					18°40	86°02		
R	CORE CAMERA #4					18°40	86°02		
G	W.B.					18°40	86°02		Lost Multiple corehead.
	CORE L.M.					18°40	86°02		
M	STATION F.								
A									
R	W.B.					18°40	85°42		
	STATION "G"								
M	CORE #19					17°28	83°29		
A	T.GRAD 17					17°28	83°29		
R	CAMERA #14					17°28	83°29		
G	PLANKTON					17°28	83°29		
	STATION "H"								
M	TGRAD #18					17°39	83°29		
A	CAMERA #15					17°39	83°29		
R	CORE #20					17°39	83°29		
G	PLANKTON					17°39	83°29		
	STATION I								
M	T.GRAD #19					18°38	82°11		
A	CORE #21					18°38	82°11		
R	PLANKTON					18°38	82°11		
P									

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TIME ZONE Z+5

CRUISE LEG—From MIAMI To CRISTOBAL.

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CRUISE N° V-21

CRUISE LEG—From _____

BALBOA To TAHITI

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>W</i>		
MAR 15	"A"								
	CORE #25					5-43	81-30		
	T. GRAD #23					5-43	81-30		
	L.S.M 3					5-43	81-30		
	PLANKTONS					5-43	81-30		
	"B"								
MAR 15	CORE #26					4-36	82-44		
	T. GRAD #24					4-36	82-44		
	K. 17					4-36	82-44		
	PLANKTONS					4-36	82-44		
MAR 16	"C"								
	CORE #27					3-14	84-26		
	T. GRAD #25					3-14	84-26		
	K. 18					3-14	84-26		
	PLANKTON					3-14	84-26		

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CRUISE LEG—From BALBOA To TAHITI

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TIME ZONE +6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>W</i>		
	"D"								
MAR 17	CORE 28					1-05	87.11		
	T. GRAD 26					1-05	87.11		
	W. B					1-05	87.11		
	PLANKTON					1-05	87.11		
	L M 7					1-05	87.11		
	"E"					5	W		
MAR 18	CORE 29					0-57	89.21		
	T. GRAD 27					0-57	89.21		
	K. 19					0-57	89.21		
	PLANKTON					0-57	89.21		
	"F"								
MAR 18	CORE 30					1-13	89.40.5		
	T. GRAD 28					1-13	89.40.5		
	K. 20					1-13	89.40.5		
	PLANKTON					1-13	89.40.5		

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CRUISE LEG-From BALBOA To TAHITI

TIME ZONE + 6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
	"G"					1°50	90°28		
	CORE	31				1°50	90°28		
MAR									
18	T. GRAD	29				1°50	90°28		
	L.S.M					1°50	90°28		
	W B					1°50	90°28		
	PLANKTON					1°50	90°28		
	"H"								
	CORE	32				3°48	92°05		
MAR									
19	CORE	33				3°48	92°05		
	T. GRAD	30				3°48	92°05		
	T. GRAD	31				3°48	92°05		
	K-21					3°48	92°05		
	PLANKTON					3°48	92°05		

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TIME ZONE + 6

Date	STATION and No.	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. N		
	"I"								
	CORE 34					5°22'	93°38'		
MAR							93°22'		
20	T. GRAD 32					5°22'	93°38'		
							93°22'		
	W-B					5°22'	93°38'		
							93°22'		
	A-	22				5°22'	93°38'		
							93°22'		
	PLANKTON					5°22'	93°38'		
	"J"						93°22'		
	CORE 35					7°31'	95°19'		
MAR									
21	T. GRAD 33					7°31'	95°19'		
	L-S.M					7°31'	95°19'		
	PLANKTON					7°31'	95°19'		

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TIME ZONE + 6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>S</i>	Long. <i>W</i>		
	"K"								
	CORE 36					8°18'	96°14'		
MAR									
21	T. GRAD 34					8°18'	96°14'		
	K- 23					8°18'	96°14'		
	W-B					8°18'	96°14'		
	PLANKTON					8°18'	96°14'		
	"L"								
	CORE 37					7°42'	98°43'		
MAR									
22	T. GRAD 35					7°42'	98°43'		
	K- 24					7°42'	98°43'		
	W-B					7°42'	98°43'		

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TIME ZONE + 6

Date	STATION and No.	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. N		
	"M"								
MAR 23	CORE 38					7°07'	101°35'		
	T. GRAD 36					7°07'	101°35'		
	K- 25 25					7°07'	101°35'		
	PLANKTON					7°07'	101°35'		
	"N"								
MAR 24	CORE 39					6°19'	104°44'		
	T. GRAD 37					6°19'	104°44'		
	K- 26					6°19'	104°44'		
	PLANKTON					6°19'	104°44'		
MAR 24	"O"								
	CORE 40					5°31'	106°46'		
	T. GRAD 38					5°31'	106°46'		

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CRUISE LEG—From BALBOA To TAHITI

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TIME ZONE +7

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start <u>S</u>	End <u>W</u>	Lat.	Long.		
	"O" CONT.								
	K- 27			5'31	106'46				
	PLANKTON			5'31	106'46				
	"P"								
	CORE 41			4'43	109'25				
MAR 25	T. GRAD 39			4'43	109'25				
	K- 28			4'43	109'25				
	PLANKTON -			4'43	109'25				
	"Q"								
MAR 26	CORE 42			4'20	112'22				
	T. GRAD 40			4'20	112'22				
	K. 29			4'20	112'22				
	PLANKTON			4'20	112'22				
	"R"								
MAR 27	CORE 43			4'57	114'01				

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CRUISE LEG—From Bahoa To 1 Ahu

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TIME ZONE + 7

Date	STATION and No	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start S	End W	Lat.	Long.		
MAR 27	"R" CONT.								
	T. GRAD 41			4'57	114'01				
	K-30 30			4'57	114'01				
	PLANKTON			4'57	114'01				
	"S"								
	CORE 44			6'10	116'58.5				
MAR 27	T. GRAD 42			6'10'	116'58.5				
	K- 31			6'10'	116'58.5				
	L.M			6'10'	116'58.5				
	PLANKTON			6'10'	116'58.5				
	"T"								
MAR 28	CORE 45			7'08	119'54"				
	T. GRAD 43			7'08	119'54				
	K- 32			7'08	119'54				
	PLANKTON			7'08	119'54				

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CRUISE LEG—From

Befone To Tahite

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TIME ZONE + 1

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CRUISE N° 121

CRUISE LEG—From _____

Bulboa To Tahiti

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TIME ZONE + 8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
MAR 30	W-CONT. K- 34					9°31'	126°22'		
	PLANKTON					9°31'	126°22'		
	"X"								
MAR 31	CORE 49					10°29'	129°08'		
	T. GRAD 46					10°29'	129°08'		
	L.M					10°29'	129°08'		
	PLANKTON					10°29'	129°08'		
	WX-B					10°29'	129°08'		
MAR	"Y"					Z + 9			
APR 1	CORE 50					11°10'	131°05'		
	T. GRAD 47					11°10'	131°05'		
	K- 35 35					11°10'	131°05'		
	PLANKTON					11°10'	131°05'		

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CRUISE LEG—From

Balboa To Tahiti

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TIME ZONE + 9.

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
	"Z"					12°02'	133°15'		
APR									
1	CORE 51					12°02'	133°15'		
	T. GRAD 48					12°02'	133°15'		
	W-B					12°02'	133°15'		
	K 36					12°02'	133°15'		
	PLANKTON					12°02'	133°15'		
	"A-1"								
APR									
2	CORE 52					14°53'	135°03'		
	T. GRAD 49					14°53'	135°03'		
	W-B					14°53'	135°03'		
	L-M —					14°53'	135°03'		
	PLANKTON					14°53'	135°03'		
APR	"B-1"								
3	CORE 53					17°39'	136°43'		
	T. GRAD 50					17°39'	136°43'		
	W-B					17°39'	136°43'		
	L-M					17°39'	136°43'		
	PLANKTON					17°39'	136°43'		

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CRUISE LEG—From

Balboa To Tahiti

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TIME ZONE +9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
	C-1					18°58'	136°36'		
APR 4	CORE 54					18°58'	137°36'		
	T-GRAD 51					18°58'	137°36'		
	H- 37					18°58'	137°36'		
	PLANKTON					18°58'	137°38'		
	D-1			"D-1"					
APR 4	CORE 55					21°07'	138°49'		
	T-GRAD 52					21°07'	138°49'		
	L-M 58					21°07'	138°49'		
	W B					21°07'	138°49'		
	PLANKTON					21°07'	138°49'		
APR 5	E-1								
	CORE 56					23°47'	140°26'		
	T-GRAD 53					23°47'	140°26'		
	H- 38					23°47'	140°26'		
	W-B					23°47'	140°26'		
	PLANKTON					23°47'	140°26'		

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TIME ZONE +9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
	<u>E-1</u>								
<u>APR</u> <u>6</u>	<u>CORE</u>	<u>57</u>				<u>25°36'</u>	<u>142°23'</u>		
	<u>T. GRAD</u>	<u>54</u>				<u>25°36'</u>	<u>142°23'</u>		
	<u>W. B</u>					<u>25°36'</u>	<u>142°23'</u>		
	<u>K-</u>	<u>39</u>				<u>25°36'</u>	<u>142°23'</u>		
	<u>PLANKTON</u>					<u>25°36'</u>	<u>142°23'</u>		
<u>APR</u> <u>7</u>	<u>G-1</u>								
	<u>CORE</u>	<u>58</u>				<u>26°39'</u>	<u>143°38'</u>		
	<u>T. GRAD</u>	<u>55</u>				<u>26°39'</u>	<u>143°38'</u>		
	<u>K.</u>	<u>40</u>				<u>26°39'</u>	<u>143°38'</u>		
	<u>PLANKTON</u>					<u>26°39'</u>	<u>143°38'</u>		
	<u>H-1</u>								
<u>APR</u> <u>7</u>	<u>L. M</u>					<u>28°03'</u>	<u>145°38'</u>		
	<u>PLANKTON</u>					<u>28°03'</u>	<u>145°38'</u>		
	<u>TRIGGER</u> <u>CORE</u>	<u>59</u>				<u>28°03'</u>	<u>145°38'</u>		

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CRUISE LEG—From _

Balboa To Tahiti

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TIME ZONE +10

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CRUISE LEG⁵ From

TAHITI To HONOLULA

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TIME ZONE +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
APR 14	STATION - A -					16° 15'	150° 27'		
	K 42					16° 15'	150° 27'		
	L.M.					16° 15'	150° 27'		
	PLANKTON					16° 15'	150° 27'		
APR 15	Station "B"								
	W.B.					13° 46'	152° 08'		
	Plankton					13° 46'	152° 08'		
APR 16	Station "C"								
	L.M.					11° 06'	153° 58'		
	K. 43					11° 06'	153° 58'		
	PLANKTON					11° 06'	153° 58'		
APR 17	Station "D"					1° 08'	158° 26'		
	L.M.					1° 08'	158° 26'		
APR 19	PLANKTON					1° 08'	158° 26'		

Chief Scientist

DEPARTMENT OF GEOLOGY
LAMONT GEOLOGICAL OBSERVATORY
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CRUISE N° V-21

CRUISE LEG—From Honolulu To Tokyo

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TIME ZONE 2 + 10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
M	CORE	#	59	STATION		20° 55'	158° 06'		
A	PLANKTON			" "		20° 55'	158° 06'		
Y		#		A					
7									
M	CORE	#	60	STATION		20° 51'	158° 09'		
A	W.B	#	86	" "		20° 51'	158° 09'		
Y				B					
7									
M	CORE	#	61	STATION		21° 36'	161° 26'		
A	PLANKTON			" "		21° 36'	161° 26'		
Y	W.B	#		C		21° 36'	161° 26'		
8	RADON	#	1						
M	CORE	#	62	STATION		22° 14'	165° 14'		
A	W.B			" "		22° 14'	165° 14'		
Y	T-GRAD	#	56	D		22° 14'	165° 14'		
	L.S.M	#	20			22° 14'	165° 14'		RET. TIME TO 2+11.
9									
M	CORE	#	63	STATION		22° 51'	169° 41'		
A	PLANKTON			" "		22° 51'	169° 41'		
Y	W.B	#		E		22° 51'	169° 41'		
10	T-GRAD	#	57			22° 51'	169° 41'		
M	CORE	#	64	STATION		23° 29'	173° 14'		
A	W.B.			"F"		23 27	173 14		
Y	T-GRAD	#	58			23 27	173 14		
	PLANKTON					23 27	173 14		
11	RADON	#	2			23 27	173 14		
	CAMERA	#	44			23 27	173 14		

Chief Scientist

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CRUISE N° V21

CRUISE LEG—From Honolulu To Tokyo

TIME ZONE Z+11

[illegible]

Chief Scientist

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Research Vessel YEMA

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TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
	CORE #	70		STATION		27° 05'	166° 04'		
M	T-GRAB #	64		" "		27° 05'	166° 04'		
A	W.B			" "		27° 05'	166° 04'		
Y	PLANKTON					27° 05'	166° 04'		
18	CAMERA #	48				27° 05'	166° 04'		
	Dredge #	1				27° 05'	166° 04'		
M	CORE #	71		STATION		27° 54'	162° 31'		
A	T-GRAB #	65		" "		27° 54'	162° 31'		
Y	W.B			" "		27° 54'	162° 31'		
	PLANKTON					27° 54'	162° 31'		
19	CAMERA #	49				27° 54'	162° 31'		
	Dredge #	2				27° 54'	162° 31'		
M	CORE #	72		STATION		28° 47'	158° 50'		
A	T-GRAB #	66		" "		28° 47'	158° 50'		
Y	W.B			" "		28° 47'	158° 50'		
	PLANKTON					28° 47'	158° 50'		
20	L.S.M #	23				28° 47'	158° 50'		
M	CORE #	73		STATION		29° 28'	154° 36'		
A	T-GRAB #	67		" "		29° 28'	154° 36'		
Y	W.B			" "		29° 28'	154° 36'		
	PLANKTON					29° 28'	154° 36'		
21	CAMERA #	50				29° 28'	154° 36'		
	DREDGE #	3				29° 28'	154° 36'		
				STATION					
M	CORE #	74		STATION		29° 51'	150° 50'		Time change. Ret to 2-10
A	T-GRAB #	68		" "		29° 51'	150° 50'		
Y	W.B			" "		29° 51'	150° 50'		
	PLANKTON					29° 51'	150° 50'		
22	L.S.M #	24				29° 51'	150° 50'		

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CRUISE LEG—From _____

Honolulu To Tokyo

TIME ZONE 240

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M	CORE	#	75	STATION		30° 04	147 41		
A	T-GRAD	#	69	" "		30 04	147 41		
Y	W.B.			Q		30 04	147 41		
	PLANKTON					30 04	147 41		
23	CAMERA	#	51			30 04	147 41		
	DREDGE	#	4			30 04	147 41		
M	CORE	#	76	STATION		30° 25	144° 30		
A	T-GRAD	#	70	" "		30 25	144 30		
Y	W.B.			R		30 25	144 30		
	PLANKTON					30 25	144 30		
24	CAMERA	#	52			30 25	144 30		
	DREDGE	#	5			30 25	144 30		
M	CORE	#	77	STATION		30 49	141° 59		
A	T-GRAD	#	71	" "		30 49	141 59		
Y	PLANKTON			S		30 49	141 59		
	W.B.					30 49	141 59		
25	L.S.M	#	25			30 49	141 59		
M	CORE	#	70	STATION		33 05	140 25		
A	T-GRAD	#	72	" "		33 05	140 25		
Y	CAMERA	#	53	T		33 05	140 25		
	PLANKTON					33 05	140 25		
26	W.B.					33 05	140 25		
Time change Ret To 2-g.									

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TIME ZONE Z-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	CORE	# 79		STATION		34° 02'	138° 22'		
U	CAMERA	# 54		" "		34 02	138 22		
N	T-GRAD	# 73		A		34 02	138 22		
E	PLANKTON					34 03	138 22		
15									
J	CORE	# 80		STATION		30 37	136 32		
U	PLANKTON			"B"		30 37	136 32		
N	T-GRAD.	# 74				30 37	136 32		
E									
16									
J	CORE	# 81		STATION		29 02	136 30		
U	T-GRAD	# 75		"C"		29 02	136 30		
N	CAMERA	# 55				29 02	136 30		
E	PLANKTON					29 02	136 30		
17									
J	CORE	# 82		STATION		27 56	138 13		
U	T-Grad	# 76		"D"		27 56	138 13		
N	L.S.	# 26				27 56	138 13		
E	PLANKTON					27 56	138 13		
18	W.B.					27 56	138 13		
J	CORE	# 83		STATION		27 54	140 03		
U	T-GRAD	# 77		"E"		27 54	140 03		
N	CAMERA	# 56				27 54	140 03		
E	PLANKTON					27 54	140 03		
19									
J	CORE	# 84		STATION		27 57	141 22		
U	T-GRAD	# 78		"F"		27 57	141 22		
N	L.S.	# 27				27 57	141 22		
E	PLANKTON					27 57	141 22		
19									
J	CORE	# 85		STATION		27 58	142 30		
U	T-GRAD	# 79		"G"		27 58	142 30		
N	CAMERA	# 57				27 58	142 30		
19	PLANKTON					27 58	142 30		

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
20	J CORE # 86	STATION				27° 53'	145° 03'		
	U T-GRAD # 80			"H"		27° 53'	145° 03'		
	N CAMERA # 58					27° 53'	145° 03'		
	E PLANKTON					27° 53'	145° 03'		
20									
	J CORE # 87	STATION				27° 53'	146° 35'		
	U T-GRAD # 81			"I"		27° 53'	146° 35'		
	N CAMERA # 59					27° 53'	146° 35'		
	E PLANKTON					27° 53'	146° 35'		
21									
	J CORE # 88	STATION				25° 20'	146° 30'		
	U CAMERA # 60			"J"		25° 20'	146° 30'		
	N PLANKTON					25° 20'	146° 30'		
	E T-GRAD # 82								
21									
	J CORE # 89	STATION				23° 35'	145° 39'		
	U T-GRAD # 83			"K"		23° 35'	145° 39'		
	N PLANKTON					23° 35'	145° 39'		
	E								
22									
	J CORE # 90	STATION				23° 57'	144° 23'		
	U T-GRAD # 84			"L"		23° 57'	144° 23'		
	N PLANKTON					23° 57'	144° 23'		
	E					2			
23	C								
	J CORE # 91	STATION				23° 25'	143° 23'		
	U T-GRAD # 85			"M"		23° 25'	143° 23'		
	N PLANKTON					23° 25'	143° 23'		
	E								
24									
	J CORE # 92	STATION				23° 00'	143° 10'		
	U T-GRAD # 86			"N"		23° 00'	143° 10'		
	N PLANKTON					23° 00'	143° 10'		
24	L.S. # 28					23° 00'	143° 10'		

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Tokyo To Naha.

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Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	CORE # 93	STATION				24° 37'	142° 20'		
U	T-GRAD # 87			"O"		24 37	142 20		
N	CAMERA # 61					24 37	142 20		
E	PLANKTON					24 37	142 20		
25									
J	CORE # 94	STATION				23 12	141 47		
U	T-GRAD # 88			"P"		23 12	141 47		
N									
E	PLANKTON.					23 12	141 47		
26									
J	DREDGE # 1	STATION				24 00	141 36		Big Rock Dredge
U	PLANKTON			"Q"		24 00	141 36		
N	CAMERA # 62					24 00	141 36		
E									
26									
J	CORE # 95	STATION				23 57	139 31		
U	T-GRAD # 89			"R"		23 57	139 31		
N	PLANKTON					23 57	139 31		
E	CAMERA # 63					23 57	139 31		
27									
J	CORE # 96	STATION				23 27	139 02		
U	T-GRAD # 90			"S"		23 27	139 02		
N									
E									
27									
J	CORE # 97	STATION				23 41	136 05		
U	T-GRAD # 91			"T"		23 41	136 05		
N	L.S. # 29					23 41	136 05		
E	PLANKTON.					23 41	136 05		
28	W.B.					23 41	136 05		
J	CORE # 98					23° 06	134 26		
U	T-GRAD # 92					23 06	134 26		
N	PLANKTON					23 06	134 26		
29	CAMERA # 64					23 06	134 26		

Chief Scientist

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Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	CORE # 99			STATION		23 32	132 14		
U	T-GRAD # 93			"V"		23 32	132 14		
N	W.B.					23 32	132 14		
E	L.S. # 30					23 32	132 14		
30	PLANKTON								
J	CORE # 100			STATION		23 35	131 26		
U	T-GR # 94			"W"		23 35	131 26		
N	PLANKTON					23 35	131 26		
E	CAMERA # 65					23 35	131 26		
30									
J	CORE # 101			STATION		23 29	131 01		
U	T-GRAD # 95			"X"		23 29	131 01		
N	W.B.					23 29	131 01		
E	L.S. # 31					23 29	131 01		
30	PLANKTON					23 29	131 01		
J	CORE # 102			STATION		26 30	125 09		
U				"Y"		26 3			
L	CAMERA # 66					26 30	125 09		
Y	PLANKTON					26 30	125 09		
3									
J	CORE # 103			STATION		27 54	126 12		
U	CAMERA # 67			"Z"		27 54	126 12		
L	PLANKTON					27 54	126 12		
Y									
3									
J	CORE # 104			STATION		27 48	126 13		
U	PLANKTON					27 40	126 13		
L				"A"					
Y									
3									

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[illegible]

Chief Scientist

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Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	CORE #106			STATION		25° 48'	127° 10'		
4	PLANKTON			" "		25° 48'	127° 10'		
L				A					
Y									
9									
J	CORE #107			STATION		25° 36'	127° 25'		
4	PLANKTON			"B"		25° 36'	127° 25'		
L	CAMERA #68					25° 36'	127° 25'		
Y									
9									
J	CORE #108			STATION		25° 44'	127° 34'		
4	PLANKTON			"C"		25° 44'	127° 34'		
L	T-GRAB #97					25° 44'	127° 34'		
Y									
10	C								
J	CORE #109			STATION		25° 10'	126° 56'		
4	PLANKTON			"D"		25° 10'	126° 56'		
L	CAMERA #69					25° 10'	126° 56'		
Y	T-GRAB #98								
10									
J	CORE #110			STATION		24° 34'	127° 34'		
4	T-GRAB #99			"E"		24° 34'	127° 34'		
L	PLANKTON					24° 34'	127° 34'		
Y									
10									
J	CORE #111			STATION		24° 30'	128° 31'		
4	T-GRAB #100			"F"		24° 30'	128° 31'		
L	PLANKTON					24° 30'	128° 31'		
Y	CAMERA #70					24° 30'	128° 31'		
11									
J	CORE #112			STATION		23° 55'	127° 58'		
4	T-GRAB #101			"G"		23° 55'	127° 58'		
L	CAMERA #71					23° 55'	127° 58'		
12	PLANKTON					23° 55'	127° 58'		

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Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	CORE # 113			STATION		23° 40	128° 17		
U	T-GRAD #102			"H"		23 40	128 17		
L									
Y	PLANKTON					23 40	128 17		
13									
J	CORE # 114			STATION		22 08	130 00		
U	T-GRAD #103			"I"		22 08	130 00		
L	PLANKTON					22 08	130 00		
Y	L.S. # 32					22 08	130 00		
14	W.B					22 08	130 00		
J	CORE # 115			STATION		19 52	132 08		
U	T-GRAD #104			"J"		19 52	132 08		
L	PLANKTON					19 52	132 08		
Y									
15									
J	CORE # 116			STATION		19 24	134 30		
U	T-GRAD #105			"K"		19 24	134 30		
L	PLANKTON					19 24	134 30		
Y	CAMERA # 72					19 24	134 30		lost camera.
16									
J	CORE # 117			STATION		17 54	140 59		
U	T-GRAD # 106			"L"		17 54	140 59		
L	L.S. # 33					17 54	140 59		
Y	W.B					17 54	140 59		
18	PLANKTON					17 54	140 59		
J	CORE # 118			STATION		15 53	137 23		
U	T-GRAD #107			"M"		15 53	137 23		
L									
Y	PLANKTON								
20									
J	CORE # 119			STATION		15 32	136 24		
U	T-GRAD #108			"N"		15 32	136 24		
L	PLANKTON					15 32	136 24		
20									

Chief Scientist

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Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	CORE # 120			STATION		15° 16'	135° 22'		
Y	T-GRAD # 109			"O"		15° 16'	135° 22'		
L	L.S. # 34					15° 16'	135° 22'		
Y	PLANKTON #					15° 16'	135° 22'		
20									
J	CORE # 121			STATION		14° 46'	134° 22'		
Y	T-GRAD # 110			"P"		14° 46'	134° 22'		
L	PLANKTON					14° 46'	134° 22'		
Y									
21									
J	CORE # 122			STATION		15° 07'	133° 20'		
Y	T-GRAD # 111			"Q"		15° 07'	133° 20'		
L	PLANKTON					15° 07'	133° 20'		
Y									
21									
J	CORE # 123			STATION		14° 11'	131° 04'		
Y	T-GRAD # 112			"R"		14° 11'	131° 04'		
L	W-B					14° 11'	131° 04'		
Y	L.S. # 35					14° 11'	131° 04'		
22	PLANKTON					14° 11'	131° 04'		
J	CORE # 124			STATION		14° 00'	130° 04'		
Y	T-GRAD # 113			"S"		14° 00'	130° 04'		
L	PLANKTON					14° 00'	130° 04'		
Y									
23									
J	CORE # 125			STATION		13° 41'	128° 29'		
Y	T-GRAD # 114			"T"		13° 41'	128° 29'		
L	PLANKTON					13° 41'	128° 29'		
Y									
23, 24									
J	CORE # 126			STATION		13° 00'	127° 03'		
Y	T-GRAD # 115			"U"		13° 00'	127° 03'		
L	PLANKTON					13° 00'	127° 03'		
24									

Time Ret. From 2-9 To 2-8.

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Chief Scientist

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Chief Scientist

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Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
A	CORE # 131			STATION "D"		16°03'	119°06'		
U	C-Ca # 7					16 03	119 06		
G	C-L.S.m # 38					16 03	119 06		
5	T-Grad # 118					16 03	119 06		
	CAMERA # 76					16 03	119 06		
	P.D. # 9					16 03	119 06		
	PLANKTON					16 03	119 06		
A	CORE # 132			STATION "E"		15 11	119 22		
U	C-Ca # 8					15 11	119 22		
G	C-L.S.m # 39					15 11	119 22		
	T-GRAD # 119					15 11	119 22		
b	CAMERA # 77					15 11	119 22		
	P.D. # 10					15 11	119 22		
	PLANKTON.					15 11	119 22		
A	CORE # 133			STATION "F"		18 57	122 23		
U	C-Ca # 9					18 57	122 23		
G	C-L.S.m # 40					18 57	122 23		
10	T-GRAD # 120					18 57	122 23		
	CAMERA # 78					18 57	122 23		
	P.D. # 11					18 57	122 23		
	PLANKTON					18 57	122 23		

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Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long. E		
A	CORE # 134	STATION				20° 43'	126° 23'		
G	C-Ca. # 10		"G"			20 43	126 23		
G	C.L.S.m # 41					20 43	126 23		
	T-GRAD # 121					20 43	126 23		
11	CAMERA # 79					20 43	126 23		
	W.B. # 164					20 43	126 23		
	PLANKTON					20 43	126 23		
	P.D. # 16					20 43	126 23		
A	CORE # 135	STATION				21° 28'	130° 03'		
G	C-Ca # 11		"H"			21 28	130 03		
G	C.L.S.m # 42					21 28	130 03		
12	T-GRAD # 122					21 28	130 03		
	CAMERA # 80					21 28	130 03		
	P.D. # 13					21 28	130 03		
	W.B. # 165					21 28	130 03		
	PLANKTON					21 28	130 03		
A	CORE # 136	STATION				23° 27'	134° 04'		
G	C-Ca # 12		"I"			23 27	134 04		
G	C.L.S.m # 43					23 27	134 04		
	T-GRAD # 123					23 27	134 04		
13	CAMERA # 80					23 27	134 04		
	P.D. # 12					23 27	134 04		
	W.B. # 167					23 27	134 04		
	PLANKTON					23 27	134 04		

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Manila To Adak

TIME ZONE

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CORE # 137			STATION		24 30	136 56		
4	C-Cam # 13			"J"		24 30	136 56		
G	C-L.S.M. # 44					24 30	136 56		
	T-GRAD # 124					24 30	136 56		
14	CAMERA # 81					24 30	136 56		
	P.D. # 13 13					24 30	136 56		
	W.B. # 168					24 30	136 56		
	K.S.M. #						126 56		
	PLANKTON					24 30	136 56		
A	CORE # 138			STATION		26 02	139 29		
4	C-Cam # 14			"K"		26 02	139 29		
G	C-L.S.M. # 45					26 02	139 29		
	T-GRAD # 125					26 02	139 29		
15	CAMERA # 82					26 02	139 29		
	P.D. # 14					26 02	139 29		
	W.B. #					26 02	139 29		
	PLANKTON					26 02	139 29		
A	CORE # 139			STATION		27 47	144 10		
4	C-Ca # 15			"L"		27 47	144 10		
G	C-L.S.M. # 46					27 47	144 10		
	T-GRAD # 126					27 47	144 10		
16	PLANKTON					27 47	144 10		
A									
4	CORE # 140			STATION		28 33	146 53		
G	C-Cam # 16			"M"		28 33	146 53		
	C-L.S.M. # 47					28 33	146 53		
17	T-GRAD # 127					28 33	146 53		
	PLANKTON					28 33	146 53		
	CAMERA # 83					28 33	146 53		
	P.D. # 15					28 33	146 53		
	W.B.					28 33	146 53		

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TIME ZONE 2-10

CRUISE N° V21

CRUISE LEG—From

Manila To Adak

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Manila To A dak

2-11
TIME ZONE 2 10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CORE # 144		ST	A T	ION	32° 41'	160° 01'		
4	C-Cam # 20			" Q "		32° 41'	160° 01'		
G	C-L.S.M. # 51					32° 41'	160° 01'		
	T-GRAD # 131					32° 41'	160° 01'		
21	W.B.					32° 41'	160° 01'		
	PLANKTON					32° 41'	160° 01'		
	CAMERA # 86					32° 41'	160° 01'		
	P.D. # 18					32° 41'	160° 01'		
									Time Adv. From 2-10 to 2-11
A	CORE # 145		ST	A T	ION	34° 03'	164° 50'		
4	C-Cam # 21			" R "		34° 03'	164° 50'		change core head.
G	C-L.S.M. # 52					34° 03'	164° 50'		
	T-Grad. # 132					34° 03'	164° 50'		
22	W.B.					34° 03'	164° 50'		
	CAMERA # 87					34° 03'	164° 50'		
	P.D. # 19					34° 03'	164° 50'		
	PLANKTON					34° 03'	164° 50'		
A	CORE # 146		ST	A T	ION	37° 41'	163° 02'		change core head.
4	C-Cam # 21			" S "		37° 41'	163° 02'		
G	C-L.S.M. # 52					37° 41'	163° 02'		
	T-GRAD # 133					37° 41'	163° 02'		
23	PLANKTON					37° 41'	163° 02'		
A			ST	A T	ION				
4	CORE # 147			" T "		39° 33'	162° 05'		
G	C-Cam # 22					39° 33'	162° 05'		
	C-L.S.M. # 53					39° 33'	162° 05'		
24	T-GRAD # 134					39° 33'	162° 05'		
	W.B.					39° 33'	162° 05'		
	PLANKTON					39° 33'	162° 05'		
	CAMERA # 88					39° 33'	162° 05'		
	P.D. # 20					39° 33'	162° 05'		

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Manila To Adak

TIME ZONE 211

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CORE # 148			STATION		42° 05'	160° 36'		
U	C-Cam # 23			" U "		42 05	160 36		
G	C-L.S.M. # 54					42 05	160 36		
	T-GRAD # 135					42 05	160 36		
25	W.B.					42 05	160 36		
	PLANKTON					42 05	160 36		
	CAMERA # 89					42 05	160 36		camera out of order. (lens break.)
	P.D. # 21					42 05	160 36		
A	CORE # 149			STATION		45° 08'	160° 28'		
U	C-Cam # 24			" V "		45 08	160 28		
G	C-L.S.M. # 55					45 08	160 28		
	PLANKTON #					45 08	160 28		
26	T-GRAD # 136					45 08	160 28		
A				STATION					
U	CORE # 150			" W "		48° 00'	162° 01'		
G	C-Cam # 25					48 00	162 01		
27	C-L.S.M. # 56					48 00	162 01		
	T-GRAD # 137					48 00	162 01		
	W.B.					48 00	162 01		
	PLANKTON					48 00	162 01		
	P.D. # 22					48 00	162 01		
A	CORE # 151			STATION		52° 16'	163° 38'		
U	C-Cam # 26			" X "		52 16	163 38		
G	C-L.S.M. # 57					52 16	163 38		
	T-GRAD # 138					52 16	163 38		
28	W-B					52 16	163 38		
	PLANKTON					52 16	163 38		

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Research Vessel VEMA

CRUISE N° ✓21

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TIME ZONE 2-12
2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CORE #152			STATION		55° 47'	165° 39'		
4	C-Cam # 27			"Y"		55 47	165 39		
G	C-L.S.M. # 58					55 47	165 39		
	T-GRAD # 139					55 47	165 39		
29	W.B.					55 47	165 39		
	PLANKTON					55 47	165 39		
A	CORE #153			STATION		57° 21'	168° 19'		
4	C-Cam # 28			" "		57 21	168 19		
G	C-L.S.M. # 59			"2"		57 21	168 19		
	T-GRAD # 140					57 21	168 19		
30	PLANKTON					57 21	168 19		
	W.B.					57 21	168 19		
A	CORE #154			STATION		58° 06'	169° 37'		
4	C-Cam # 29			"A2"		58 06	169 37		
G	C-L.S.M. # 60			"A2"		58 06	169 37		
	T-GRAD # 141					58 06	169 37		
30	PLANKTON					58 06	169 37		
									Time Adv. From 2-11 to 2-12.
A	CORE #155			STATION		57° 47'	172° 08'		
4	C-Cam # 30			"B1"		57 47	172 08		
G	C-L.S.M. # 61			"B1"		57 47	172 08		
	T-GRAD # 142					57 47	172 08		
31	PLANKTON					57 47	172 08		

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CRUISE N° V21

CRUISE LEG—From Adak To Dutch Harbor

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	CORE # 158			STATION		53° 22'	176° 11' W		
E	C-Cam # 33					53 22	176 11		
P	C-L.S.m # 64			"A"		53 22	176 11		
T	T-Grad # 145					53 22	176 11		
b	Camera # 90					53 22	176 11		
	P.D. # 23					53 22	176 11		
	PLANKTON					53 22	176 11		
Sep 7	CAMERA # 91			STATION		55 24	177 11 W		
	P.D. # 24					55 24	177 11		
S	CORE # 159			"B"		55 24	177 11		
E	C-Cam # 34					55 24	177 11		
P	C-L.S.m # 65					55 24	177 11		
T	T-Grad # 146					55 24	177 11		
7	PLANKTON					55 24	177 11 W		
S	CORE # 160			STATION		57° 30'	179° 50' E		
E	C-Cam # 35			" "		57 30	179 50 E		
P	C-L.S.m # 66			"C"		57 30	179 50		
T	W.B.					57 30	179 50		
8	T-GRAD # 147					57 30	179 50		
	PLANKTON					57 30	179 50		
	CAMERA # 92					57 30	179 50		
	P.D. # 25					57 30	179 50		
S	CORE # 161			STATION		59 34	179 15 E		
E	C-Cam # 36			" "		59 34	179 15		
P	C-L.S.m # 67			"D"		59 34	179 15		
T	T-GRAD # 148					59 34	179 15		
9	W.B.					59 34	179 15		
	CAMERA # 93					59 34	179 15		
	P.D. # 26					59 34	179 15		
	PLANKTON					59 34	179 15		

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Adak To Dutch Harbor

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	CORE	# 162		STATION		58° 33'	177° 13'		
E	C-Cam.	# 37		"E"		58 33	177 13		
P						58 33	177 13		
T	PLANKTON					58 33	177 13		
10	CAMERA	# 94				58 33	177 13		
	P.D.	# 27				58 33	177 13		
S	CORE	# 163		STATION		58 02	176 07		
E	C-Cam	# 38		"F"		58 02	176 07		
P						58 02	176 07		
T	T-GRAD	# 149				58 02	176 07		
10	PLANKTON					58 02	176 07		
	CAMERA	# 95				58 02	176 07		
S	CORE	# 164		STATION		56° 24'	172° 26'		
E	C-Cam	# 39		"G"		56 24	172 26		
P	C-L.S.M	# 60				56 24	172 26		
T	T-Grad	# 150				56 24	172 26		
11	W.B					56 24	172 26		
	PLANKTON					56 24	172 26		
	CAMERA	# 96				56 24	172 26		
	CAMERA	# 97		STATION					
S	CORE	# 165				56° 01'	172° 27'		
E	C-Cam	# 40		"H"		56 01	172 27		
P	C-L.S.M	# 69				56 01	172 27		
T	T-Grad	# 151				56 01	172 27		
11	PLANKTON					56 01	172 27		

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Research Vessel VEMA
CRUISE N° V 91
CRUISE LEG 12 From Dutch Harbor To Honolulu

TIME ZONE 2 + 10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	CORE # 170			STATION		52° 21'	165° 34'		
E	T-GRAD # 155			" "		52 21	165 34		
P	PLANKTON # 175			A		52 21	165 34		
T									
17									
S	CORE # 176			STATION		49° 52'	164° 50'		(change core head)
E	T-GRAD # 156			" "					
P	PLANKTON # 176			B					
T	C-L.S.M # 73								
17	CAMERA # 99								
	P.D. # 28								
	W.B. # 189					49° 52'	164° 50'		
S	CORE # 172			STATION		47° 40'	164° 20'		
E	T-GRAD # 157			" "					
P	CAMERA # 100			C					
T	P.D. # 29								
18	PLANKTON # 177								
	C-L.S.M # 74					47° 40'	164° 20'		
S	CORE # 173			STATION		44° 22'	163° 33'		
E	T-GRAD # 158			" "					
P	W-B # 190			D					
T	C-L.S.M # 75								
19	CAMERA # 101								
	P.D. # 30								
	PLANKTON # 178					44° 21'	163° 33'		

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	CORE # 174			STATION		40° 08'	162° 30'		
E	T-GRAD # 154			"E"					
P	C-L.S.m. # 76								
T	C-Cam # 39								
21.	PLANKTON # 179					40° 08'	162° 30'		
22	CORE # 175			STATION		38° 22'	161° 06'		
S	PLANKTON # 180			"F"					
E	T-GRAD # 160								
P	C-Cam # 40								
T	C-L.S.m. # 77					38° 22'	161° 06'		
23.	CORE # 176			STATION		34° 54'	160° 19'		
S	T-GRAD # 161			"G"					
E	C-Cam # 41								
P	C-L.S.m. # 78								
T	W.B. # 191								
	PLANKTON # 181								
	DREDGE # 2					34° 54'	160° 19'		
S	CORE # 177			STATION		33° 52'	160° 08'		
E	T-GRAD # 162			"H"					
P	C-Cam # 42.								
T	C-L.S.m. # 79								
23	PLANKTON # 182								
	P.D. # 31					33° 52'	160° 08'		
	CORE # 178			STATION		31° 31'	159° 42'		
S	T-GRAD # 163			"I"					
E	C-Cam # 43								
P	C-L.S.m. # 80								
T	W.B. # 192								
24	PLANKTON # 183								
	DREDGE # 3					31° 31'	159° 42'		

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CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	CORE # 174			STATION		40° 08'	162° 30'		
E	T-GRAD # 154			"E"					
P	C-L.S.m. # 76								
T	C-Cam # 39								
21.	PLANKTON # 179					40° 08'	162° 30'		
22	CORE # 175			STATION		38° 22'	161° 06'		
S	PLANKTON # 180			"F"					
E	T-GRAD # 160								
P	C-Cam # 40								
T	C-L.S.m. # 77					38° 22'	161° 06'		
23.	CORE # 176			STATION		34° 54'	160° 19'		
S	T-GRAD # 161			"G"					
E	C-Cam # 41								
P	C-L.S.m. # 78								
T	W.B. # 191								
	PLANKTON # 181								
	DREDGE # 2					34° 54'	160° 19'		
S	CORE # 177			STATION		33° 52'	160° 08'		
E	T-GRAD # 162			"H"					
P	C-Cam # 42.								
T	C-L.S.m. # 79								
23	PLANKTON # 182								
	P.D. # 31					33° 52'	160° 08'		
	CORE # 178			STATION		31° 31'	159° 42'		
S	T-GRAD # 163			"I"					
E	C-Cam # 43								
P	C-L.S.m. # 80								
T	W.B. # 192								
24	PLANKTON # 183								
	DREDGE # 3					31° 31'	159° 42'		

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CRUISE LEG—From Dutch Harbor To Honolulu

TIME ZONE 2+10

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Honolulu To Panama - 1965

To 2+5
TIME ZONE 2+10

Station	Day	Hour Stop	Start	Stop Depth	Start Depth		C	CK	L	T	W	P	K	KD	D	N	W		
A	4-10-65	1				2+10	186	51	—	171	197	191	102	32	—	19	49	157	14
B	11-10-65	1235	1509			—	187	—	—	17	—	192	103	33	—	20	52	158	09
C	12 Oct	1744	2045			—	188	—	89	172	198S	193	104	34	—	18	39	155	47
D	13	1438	1810			—	189	—	90	173	—	194	105	—	—	16	49	154	11
E	14	1600	1850			—	190	—	—	174	—	195	—	—	—	14	19	152	21
F	15	1323	1609			—	191	—	—	—	—	196	—	—	9	13	44	150	00
G	16	1012	1312			—	192	—	—	—	200S	197	—	—	10	13	10	147	45
H	17	0855	1143			2+10	193	—	—	—	201S	198	—	—	11	12	19	145	08
I	18	0652	0922			2+9	194	—	—	—	—	199	—	—	12	11	43	142	48
J	19	1100	1335			2+9	195	—	—	—	202S	200	—	—	13	10	45	139	24
K	20	1444	1730			2+8	196	—	—	—	203S	201	—	—	14	09	48	136	01
L	22	0700	0930			—	197	—	—	—	204WB	202	—	—	—	08	38	130	11
M	23	0600	0915			—	198	—	91	—	205S	203	—	—	—	08	00	126	49
N	24	0943	1200			2+7	199	—	92	—	—	204	—	—	—	06	46	122	57
O	25	0925	1155			—	200	—	—	—	—	205	—	—	—	06	13	119	31
P	26	0453	0703			—	201	—	92	175	206S	206	—	—	—	05	41	116	45
Q	27	0004	0243			—	202	—	93	176	207S	207	—	—	—	05	03	113	49
R	27	2035	2308			2+7	203	—	94	177	208	208	—	—	—	04	23	110	53
S	28	1333	1535			2+6	204	—	95	178	209S	209	—	—	—	03	50	108	43
T	29	0635	0836			—	205	—	96	179	210S	210	—	—	—	03	11	106	23
U	30	1025	1343			—	206	—	97	180	211	211	—	—	—	01	37	103	10
V	31 Oct	1551	1806			—	207	—	98	181	212S	212	—	—	—	00	01	100	17
W	1 Nov	1348	1546			2+6	208	—	99	182	—	213	—	—	—	00	50	97	28
X	2-11-65	0715	1320			2+5	209	—	—	183	—	214	—	—	15	01	29	95	20
Y	3 Nov	2012	2147			—	210	—	—	184	—	215	106	—	—	02	44	90	19
Z	4 Nov	0953	1053			—	211	—	—	185	—	216	107	—	—	03	00	88	23
AA	5	0432	0635			—	212	—	—	186	213	217	108	—	—	02	50	85	08
BB	5-6	2318	0100			—	213	—	—	187	—	218	109	—	—	03	11	82	25
CC	6	1130	1317			—	214	—	—	188	—	219	110	—	—	03	50	80	38
DD	6	2120	2328			—	215	—	—	189	214	220	111	—	—	04	24	79	10
EE	7	0945	1100			—	216	—	—	190	215	221	112	—	—	05	15	77	36
FF	7-8	2218	0029			—	217	—	—	191	216S	222	113	—	—	06	11	78	57
GG	8	1544	1745			—	218	—	—	192	—	223	114	—	—	07	15	78	34
HH	9 Nov	0645	1047			2+5	219	—	—	193	—	224	—	—	—	06	55	79	29

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Panama To New York

TIME ZONE 2+4

Station	Day	Hour Stop	Start	Stop Depth	Start Depth		C	CK	L	T	W	P	K	KD	D		N		W	
A	Nov 15	1244	1509				220	—	100	194	—	225	116				10	03	81	54
B	11-16-65	1351	1615				221	—	101	195	217	226	117				11	33	81	32
C	18	1239	1545				222	—	102	196	218	227	118				14	27	77	14
D	19	1300	1444				223	—	103	197	—	228	119				16	06	76	20
E	20	1311	1545				224	—	104	198	219	229	120				16	17	74	29
F	21	1247	1535				225	—	105	199	220	230	121				17	00	72	55
G	22	1422	1642				226	—	106	200	—	231	122				17	34	72	13
H	23	1610	1823				227	—	107	201	—	232	123				17	38	74	50
I	24	1446	1706				228	—	108	202	—	233	124				19	12	75	14
J	26	1224	1526				229	—	109	203	222	234	125				23	39	73	52
K	27	0602	0857				230	—	110	—	—	235	126				24	51	73	02
L	27	1617	1920				231	—	111	—	223	236	127				25	07	73	17
M	27-28	2304	0154				232	—	112	204	—	237	128				25	10	73	10
N	28	1536	1842				233	—	—	—	224	238	—				25	25	73	03
O	28	2020	2340				234	—	—	205	—	239	—				25	20	72	56
P	28-29	2340	0252				235	—	—	—	—	—	—				25	18	72	55
Q	29	1020	1303				236	—	—	206	—	240	—				25	15	72	47
R	29-30	2330	0202				237	—	—	—	—	—	—				25	16	72	47
S	30	1650	1946				238	—	—	—	—	241	—				25	14	72	40
T	30-1 Dec	2120	0017				239	—	—	—	—	—	—				25	12	72	51
U	1-12-65	0058	0442				240	—	113	207	225	242	129				25	06	72	56
V	1 Dec	1030	1310				241	—	—	—	—	243	—				25	15	72	50
W	1	1822	2111				242	—	—	—	—	244	—				25	03	72	45
X	2	0136	0522				243	—	114	—	—	245	130				24	21	73	01
Y	2	0645	0949				244	—	—	208	—	246	—				24	29	73	01
Z	3	1028	2155				245	—	115	209	226	247	131				27	26	75	46
AA	4	1637	1944				246	—	116	210	227	248	132				28	31	75	19
BB	5	1110	1435				247	—	117	211	228	249	133				30	10	74	44
CC	6	0838	1155				248	—	118	212	229	250	134				32	39	72	39
DD	9	0648	0857				249	—	119	213	230	251	135				39	04	71	32
EE	9	1013	1113				—	—	120	—	—	—	136				39	08	71	41
FF	9	1254	1347				—	—	121	—	—	—	137				39	14	71	53
GG	9	1535	1618				—	—	122	—	2315	—	138				39	20	72	07
HH	9	1745	1815				—	—	123	—	—	—	139				39	30	72	20

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CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

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TIME ZONE 2+10

Date	STATION and No	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	CORE # 183			STATION		27° 15'	157° 00'		
E	C-Cam # 48			" "					
P	C-L.S.M # 85			" "					
T	T-GRAD # 168								
27	PLANKTON # 188								
	DREGE # 6					27° 15'	157° 00'		
S	CORE # 184			STATION		25° 03'	157° 54'		
E	C-Cam # 49			" "					
P	C-L.S.M # 86			" "					
T	T-GRAD # 169								
28	W.B # 195								
	PLANKTON # 189								
	DREGE # 7					25° 03'	157° 54'		
S	CORE # 185			STATION		23° 01'	159° 20'		
E	C-Cam # 50			" "					
P	C-L.S.M # 87			" "					
29	T-GRAD # 170								
	W.B # 196								
	PLANKTON # 190								
	DREGE # 8					23° 01'	159° 20'		

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TIME ZONE 2+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
D	NEPHELOMETER	1110	1106	1255	1350	39° 08'	71° 41'		K-N#12
E	#120								Lithograph from R/L
C									
9									
D	CAMERA	1255	1342	1181	1182	39 14	71 53		K-N#12
E	#137								Lithograph from R/L
C									4 hits
9									
D	NEPHELOMETER	1255	1342	1181	1182	39 14	71 53		K-N#12
E	#121								Lithograph from R/L
C									
9									
D	CAMERA	1525	1611	880	880	39 20	72 07		K-N#12
E	#138								Lithograph from R/L
C									4 hits
9									
D	NEPHELOMETER	1535	1611	880	800	39 20	72 07		K-N#12
E	#122								Lithograph from R/L
C									
9									
D	CAMERA	1746	1808	400	400	39 30	72 20		K-N#12
E	#139	1808							Lithograph from R/L
C									4 hits
9									
D	NEPHELOMETER	1746	1808	400	400	39 30	72 20		K-N#12
E	#123		1808						Lithograph from R/L
C									
9									

Research Vessel YEMA

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CRUISE LEG—From Panama To New York

TIME ZONE 2+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
DEC 9	WBB4 V21-230					39 04	71 32'		
DEC 9	T-GRAD V21-213	0710	0845	1440		39 04	71 32		HF-2? - 2 probes in badly damaged.
D	BIO 251	0704	0852			39 04	71 32		SP: Heavy sample, Medium phosph.
E	SP	0704	0847						MPS-S (0-100m) Medium sample, Light phosph.
C	MPS	0842	0852						MPS-M (100-250m) Medium sample, Heavy phosph.
9	BT	0840							MPS-D (250-500m) Med-Heavy sample, Medium phosph.
D	CAMERA	0847	0822	1437		39 04	71 32		K-N #12
E	135								Lithograph from film
C									6 1415
9									
D	NEPHELOTR	0847	0822	1437		39 04	71 32		R-N #12
E	#119								Lithograph from film
C									
9									
DEC 9	NOOK 230-5	1620	1710			39 26	72 18		50 gals processed.
D	CAMERA	1000	1106	1355		39 08	71 41		K-N #12
E	136								Lithograph from film
C									4 1415
9									

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TIME ZONE 2+5
2+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
DEC 5	T-GRAD V21-211	1129	1310	2345		30° 10'	74° 44'		HF = .8 real / m ² / sec - 3 p - 0.1 sec 19
DEC 6	WB34 228-S (LIFE)					32 39	72 39		Fairly heavy sample - green colored
DEC 6	CORE V21-248	0856 HIT	1120 0939	2805 HIT	2802	32 39	72 39		Penetration 298 cm. Total core 972 cm. flow begin somewhat around 298 cm. 0-61 cm. brownish lutite followed by intercalated beds of light olive gray (58 3/4) lutite an fine to medium grained sand.
DEC 6	T-GRAD V21-212	0850	1120	2805		32 39	72 39		HF = 2 - 1 probe m - to n off
DEC 6	WB34 V21-229					32 39	72 39		
DEC 6	Bio 250 SP MPS BT	1057 1057 1123 1120	1143 1127 1143			32 39	72 39		SP Heavy sample MPS-S (0-100m) Light sample MPS-M (100-250m) Medium-Light sample MPS-D (250-500m) Very Light sample Time Adv 2+4 L, 2+5
DEC 6	CORE V21-249	0707 HIT	845 0730	1440 HIT	1465	32 39	71 32		Penetration: 452 cm. TOTAL Core: 596 cm Good Core: 435 cm 0-191 cm. Silty lutite, dr olive br (58 3/4) very compact and firm. Sharp bottom contact. 191-435 cm: Lutite, dark gray (85) to mod greenish gray (56 1/2). Hard, brittle abundant. Moisture content high zone by plastic.
			TOPOGRAPHY	FLAT.					
		Pipe #1	SLIGHTLY	Bent.					

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TIME ZONE Z+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long.		
D	NEPHELOMETER	1638	1904	2629		28° 31'	75° 19'		K-N#12
E	#116								Livograph pan film
C									
5									
D	Bio 249	1252	1335			30° 10'	74° 44'		SP Med-Heavy sample
E	SP	1252	1312						VP-D (0-500m) Light sample
C	VP	1310	1335						
5	BT	1325							
D	CAMERA	1118	1314	2345		30° 10'	74° 44'		K-N#12
E	#133								Livograph pan film
C									20 hits - 19 exposures
5									
D	NEPHELOMETER	1118	1314	2345		30° 10'	74° 44'		K-N#12
E	#117								Livograph pan film
C									
5									
D	CAMERA	0832	1112	2800	2801	30° 10'	74° 44'		K-N#12
E	#134								Livograph pan film
C									20 hits - 20 exposures
5									
D	NEPHELOMETER	0832	1112	2800	2801	30° 10'	74° 44'		K-N#12
E	#118								Livograph pan film
C									
5									
DEC	CORE	1129	1306	2342	2349	30° 10'	74° 44'		Penetration: 1183 cm. Total core: 1183 cm. Good core: 1183
5	V21-247	HIT	1211	HIT	2342				0-73 cm. Pale yellowish brown (10% 1/2 Lutite +
		TOPOGRAPHY: ON DRAINING							73-153 cm. Greenish gray (50% 1/2) Lutite rich in
		CONDITION OF CUTTING EDGE + TUBES: GOOD							hydro trilite. Indurated zone from 350-860 cm.

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TIME ZONE 2+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
D	CAMERA	1828	2033	2560	2560	27° 26'	75° 46'		K-N#12
E	131								Lithograph from film
C									20 hits 20 exposures
3									
D	NEPHELOMETER	1828	2033	2560	2560	27° 26'	75° 46'		K-N#12
E	# 115								Lithograph from film
C									
2									
D	Bio 248	1845	1938			28 31	75 19		SP: Med-Heavy sample, Heavy phosph.
E	SP	1845	1920						MPS-S (0-100m) Light sample
C	MPS	1927	1938						MPS-M (100-250m) Light sample
4	BT	1935							MPS-D (250-500m) Very light sample
									Phosph. not measured
DEC	CORE	1645	1852	2632	2625	28 31	75 19		Total core 1205m. all good. core taken from bottom
4	V21-246	HIT	1743	HIT	2629				top unit a pale brown. followed by
									a greenish gray detrit. fine white calc. in situ
									unit found between 618-685m & area 1178-1205m.
DEC	NRBL					28 31	75 19		
4	V21-228								
DEC	T-GRAD	1645	1905	2632		28 31	75 19		HF = 1.2 kcal/cm ² /sec - 4 probes 14
4	V21-210								
D	CAMERA	1638	1904	2629	2629	28 31	75 19		K-N#12
E	132								Lithograph from film
C									20 hits 20 exposures
4									

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TIME ZONE 2+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
D	CAMERA	0142	0410	2868	2866	24° 21'	73° 01'		K-N# 12
E	130								Lithograph from film
C									20 hits - 20 exposures
2									
D	NEPHELOMTR	0142	0410	2868	2866	24° 21'	73° 01'		K-N# 12
E	# 114								Lithograph from film
C									
2									
D	Bio 246	0718				24° 24'	73° 01'		SP: Med sample; MPS-S (0-100m) Light sample
E	SP	0718	0748						MPS-M (100-250m) Light sample; MPS-D (250-500m):
C	MPS	0659	0710						Very Light sample, Phosph. in all samples
2	BT	0745							MPS-D net torn
D	V-21	1844	2040	2540	2540	27° 26'	75° 46'		Penetration: 1143 total CORE: 1047 Good Core: 1055
E	CORE 245	HIT	1935	HIT	2540				0-115cm moderate yellowish brown (10YR 4/2) lutite becoming
C		TOPOGRAPHY: FLAT							slightly silty at basal contact. 115-350cm. moderate olive
3		CUTTING EDGE: GOOD							gray lutite grading to pale yellowish brown. 350-1035cm.
		TUBES: STRAIGHT							olive gray lutite grading to silty lutite with depth.
D	MBBL					27° 26'	75° 46'		
E	# 226								
C									
3									
D	T-GRAD	1840	2100	2540		27° 26'	75° 46'		HF = 2 1.2 meq/cm ² free - 4 probes in
E	# 209								
C									
3									
D	Bio 247	2019	2135			27° 26'	75° 46'		SP: Medium sample Heavy phosph.
E	SP	2019	2049						MPS-S (0-100m) Light-Med sample, Heavy phosph.
C	MPS	2059	2104						MPS-M (100-750m) Light-Med sample, Light phosph.
3	BT	2135							MPS-D (250-500m) Light sample, Medium phosph.

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TIME ZONE 2+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
D	Bio 243	1045	1230			25° 15'	72° 50'		SP: Medium-Heavy with no phosph.
E	SP	1045	1145						VP-S (0-100m): Med-Light with Light phosph.
C	VP	1102	1203						VP-M (0-250m): Med-Light, with Medium phosph.
I	BT	1230							VP-D (0-500m): Med-Light, with Light phosph.
DEC	CORE	1836	2105	2898	2897	25 03	72 45		1240 am. Penetration 1228 good 1510m. Total.
I	V21-242	HIT	1932	HIT	2891				Intervoluted layers of brownish yellow lutite and greenish gray lutite.
	FLAT								
D	Bio 244	1918	2045			25 03	72 45		SP Medium-Heavy sample, Heavy phosph.
E	SP	1918	1948						
C	VD	1925	2028						
I	BT	2045							
D	T-6RAD	0150	0430	2870		24 21	73 01		HF = 8 - 1 probe in - pipe broke
E	# 208								
C									
2									
D	Bio 245	0320	0350			24 21	73 01		SP Med. sample, Heavy phosphorescence
E	SP	0320	0350						
C									
2									
DEC	CORE					24 21	73 01		Penetration Core length Good Core, 426 cm
2	V21-243								Intervoluted lutite and calcareous sand. Lutite greenish in color, is very compact and in many places indurated. Calcareous sand granules slightly larger than coarse grain size.
	CORE	0645	0910	2877	2875	24 29	73 01		Penet 390m. Total 1078 Good 365m.
	V21-244	HIT	0742	HIT	2876				Core is a brown lutite in various shades a fine grained unit and is found at 8m many brown sand layers are found throughout.

John Ewing
Chief Scientist

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TIME ZONE 2+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
NOV 30	V21-239 CORE	2130 HIT	2354 2225	2890 HIT	2878 2886	25° 12'	72° 51'		Penetration 942 cm. Total core 1010 Good core 954 moderate yellowish br (10 VR 5/2) lutite followed by silt and sand layers. occurs from 0-759 cm. yellowish gray lutite intercalated with very light reddish br. ^{very pale orange} coccolith ooze. occupy remainder of core . Entire core rich in manganese
DEC 1	V21-240 CORE	0132 HIT	0410 0239	2873 HIT	2875 2874	25 06	72 56		Bottom 200 cm very compact Total core 1039 cm. 1015 cm good core. Core is intercalated layers of brown lutite and green gray lutite. A pinkish core from lutite 736-766 cm.
	NOBL V21-225								
D E C I	T-GRAD #207	0140	0410	2873		25 06	72 56		HF 3 .8 kcal/cm ² /sec - 3 probes 14
D E C I	CAMERA #129	0111	0338	2873	2873	25 06	72 56		K-N#12 Livograph per film 20 hits - 20 exposures of questionable quality
D E C I	MEDICOLOR #113	0111	0338	2873	2873	25 06	72 56		K-N#12 Livograph per film
D E C I	Bio 242 SP MPS BT	0324 0324 0356 0330	0406 0356 0406			25 06	72 56		SP - Medium sample, heavy phosphorescence MPS-S (0-100m) Light sample, medium phosph. MPS-M (100-250m) Very Light sample, light phosph. MPS-D (250-500m) Light sample, <u>no</u> phosph.
D E C I	Core V21-241	1030 HIT	1240 1126	2887 HIT	2880 2886	25° 15'	72 50		Penetration: 861 cm TOTAL core: 1028 Good core: 870 cm Top 375 cm composed of lutite varying in color, rich in manganese and with low carbonate content. Remainder of core is an intercalation of compact brownish lutites, layers and coc. ooze layers.
		TOPOGRAPHY:	FLAT						
		CUTTING EDGE: GOOD	TUBES: STRAIGHT						

John Ewing
Chief Scientist

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TIME ZONE Z+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
NOV 29	CORE	0015	0230	2872	2875	25° 18'	72° 55'		Penetration: 42' total core length: 1010 Good Core:
	V21-235	HIT	0108	HIT	2875				alternating layers of light olive gray (5Y 4/2), pale brown (5YR 5/2) and moderate greenish gray (5GY 5/1) lutite. Light olive gray lutite becomes silty with depth. Carbonate content, nil, throughout.
		TOPOGRAPHY:		FLAT					
N	Bio 240	1034	1143			25 15	72 47		SP - Medium-Heavy, no phosph.
O	SP	1034	1134						VP-S (0-100m) Medium, little phosph.
V	VP	1118	1143						VP-D (0-300m) Medium, little phosph.
29	BT	1055							
NOV 29	CORE	1025	1336	2886	2894	25 15	72 47		Penetration: 682 cms. Core length: 744 cm. Flow begins at 700 cm.
	V21-236	HIT!	1117	HIT!	2888				0-94 cm mod. yellowish. lutite. / 94-262. Grayish orange lutite. / 262-397 cm. white calcilutite. / 397-406 - white fine carb. sand. / 406-447 in. yellow gray lutite. / 447-495 cm white calcilutite. / 495-503 yellow gray / 503-529 white
		TOPOGRAPHY is flat and appears to have an erosional feature.							
NOV 29	T-GRAD	1025		2887		25 15	72 47		HF = ? - 2 p-obs in - one failed.
	V21-200	HIT.	1117	HIT	2888				calcilutite. / 529-625 cm. intercalated layers of lutite with pale yellow bl. and yellow gray and yellow gray / 625-700 cm white calcilutite
N	CORE	2840	0150	2886	2889	25 16	72 47		Penetration: 536 cm Total core: 855 Good Core: 580 cm.
O	V21-232	HIT.	0038	HIT.	2885				Predominantly a lutaceous core going from moderate yellowish br (10YR 5/2) at top to grayish orange (10YR 7/4)
V		TOPOGRAPHY	FLAT						lutite rich in carbonate. Manganese nodules (2 1/2 diameter) followed by light brown (5YR 6/2) lutite occurs from 48-66 cm.
29/30		CUTTING EDGE: GOOD CONDITION							
		TUBES:	Bent	~5°	NEAR JOINT				
NOV 30	CORE	1700	1915	2888	2892	25 14	72 48		Penetration 413 cm. Total core 401 cm. all good. Core is predominantly a pale brown lutite. Penetration area (190-252 cm). White bioherms (med. to coarse). 252-262 cm.
	V21-238	HIT	1753	HIT	2890				
		FLAT							
N	Bio 241	1804	1904			25 14	72 48		Medium sample, Heavy phosphorescence
O	SP	1804	1904						
V									
30									

John Ewing
Chief Scientist

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TIME ZONE 2+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
NOV 27/28	V21-282 CORE	2312 HIT	0132 0008	2835 HIT	2825 2828	25° 10'	73° 10'		Penetration 1131 cm. Total core 804 cm. all good. Core top down to a little better pale yellow br. (10YR 6/2) and grayish orange (10YR 7/4). 137-140 cm. highly compressed light olive gray (5Y 5/2) lentic. Rest of core a brownish yellow.
			FLAT						
N	Bio 238	1654	1838			25 25	73 03		SP Heavy sample - green plankton, Heavy Phosph.
O	SP	1654	1804						MPS-D Very Light sample, some phos. is No
V	MPS	1829	1838						MPS-S or MPS-M. Nets caught on net frame
28	BT	1720							+ clamp on way down - due to small wire angle.
NOV 28	CORE	1555	1816	2859	2858	25 25	73 03		Penetration: 42' total core: 1068 cm Good core: 1050 cm
	V21-233	HIT	1647	HIT	2858				Pale yellowish brown (10YR 6/2) lentic grading in color to moderate olive gray lentic. Both layers abundant between 299 cm 400 cm. Intercalation of olive gray and mod. greenish gray lentic from 400-1050 cm. Indicated laminae of lentic generally separate these layers.
			TOPOGRAPHY		FLAT.				
			CUTTING EDGE		TUBES: GOOD CONDITION				
NOV 28	WB3L V21-224					25 25	73 03		
NOV 28	CORE	2034	2315	2867	2870	25 20	72 56		Penetration: 686 cm. 1150 cm. Total Flow from 660 cm.
	V21-234	HIT	2130	HIT	2870				Core is a lentic better moderate yellowish brown (10YR 5/4) & grayish orange (10YR 7/4) There is a hard mang. layer lentic 262-271 cm. followed by a reddish pink lentic. (V21-233 is similar)
			Phos between 2		moderations.				
N	Bio 239	2032	2215			25 20	72 56		SP Med-Heavy sample, Heavy Phosph.
O	SP	2032	2132						VP-S (0-100m) Med sample, Med Phosph.
V	VP	2147	2215						VP-D (0-300m) Med sample, Med. Phosph.
28	BT	2040							
NOV 28	F. GRAD V21-205	2034	2300	2877		25 20	72 56		HF = 3 - 2 probes in - both form of

John Ewing
Chief Scientist

Columbia University
in the City of New York

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Research Vessel YEMA
CRUISE N° V 21
CRUISE LEG—From Panama To New York

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TIME ZONE 2+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
N	Bio 236	1743	1907			25° 07'	73° 17'		SP Medium-Heavy, MPS-S (0-100m) Light sample
O	SP	1743	1813						MPS-M (100-250m) Light, MPS-D (250-500m) Very-Light
V	MPS	1858	1907						Phosphoresence in all samples. Strong
27	BT	1820							Phosph. in SP
N	CAMERA	1618	1840	2786	2787	25 07	73 17		K-N #12
O	#127								Lithograph pan film
V									20 Kils - 19 exposures
27									
N	NEPHELOTR	1618	1840	2786	2787	25 07	73 17		K-N #12
O	#111								Lithograph pan film
V									
27									
N	Bio 237	0038	0124			25 10	73 10		SP Medium sample, VP-S (0-100m) Med-Light,
O	SP	0038	0109						VP-D (0-300m) Med-Light. SP & VP-D had
V	MPS	0101	0124						heavy phosphoresence, VP-S had Med. Phosph.
28	BT	0045							
N	T-GRAD	2315	0132	2835		25 10	73 10		H F = 8 Recorder failed
O	#204								
V									
28									
N	CAMERA	2205	0131	2830	2830	25 10	73 10		K-N #12
O	#128								Lithograph pan film
V									20 Kils - 14 exposures
27-8									
N	NEPHELOTR	2305	0131	2830	2830	25 10	73 10		K-N #12
O	#112								Lithograph pan film
V									
27-8									

John Ewing
Chief Scientist

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in the City of New York

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TIME ZONE 2+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Nov	CORE	0618	0842	2867	2868	24° 51'	73° 02'		Penetration 749cm. Total core 917cms. Good core 740cm.
27	V21-230	HIT	0707	HIT	2868				Core is predominantly greenish gray lutite. Mottled a few bumpy brown lutite. A white foramin. sand is found between 497-537cms. Upper lens 0-71cm is a little like grayish orange (10YR 7/4) and pale
		ABYSSAL	PLAIN						
Nov	T-GRAD	1066	1240	0810		24° 51'	73° 02'		HF = ? 3 probes in - bottom two yellowish
28	V21-203								torn off brown (10YR 6/6)
N	Bio 235	0618	0835			24° 51'	73° 02'		VP-D (0-300m) Light sample; VP-S (0-100m)
O	SP-A	0618	0648						Very light sample. SP-A+B Medium samples.
V	VP	0705	0808						Phosphorescence in VP-D only. Scattering layer
27	BT	0835							began going down @ 0632. Descended to 120 Fms
	SP-B	0800	0830						
N	CAMERA	0804	0832	2868		24° 51'	73° 02'		K-N #12
O	# 12B								Lithograph from film
V									20 hits - 20 exposures
27									
N	REFLECTOMTR	0604	0832	2868		24° 51'	73° 02'		K-N #12
O	# 11D								Lithograph from film
V									
27									
Nov	CORE	1635	1839	2785	2787	25° 07'	73° 17'		Penetration: 818 cm total core 1010 cm. Good core: 835 cm
27	V21-231	HIT	1734	HIT	2786				0-835cm. Lutite, light yellowish br (10YR 6/6) grading to moderate yellowish br (10YR 5/4). Carbonate content ~10%, decreases with depth. Manganese content light but increases with depth. Core appears slightly mottled.
		TOPOGRAPHY:	FLAT						
		CUTTING EDGE:	GOOD						
		TUBES:	STRAIGHT						
Nov	WDBL					25° 07'	73° 17'		
27	V21-222								

John Ewing
Chief Scientist

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TIME ZONE 2+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
NOV 25	WBBL V21-221 S (L172)	1015	1103						processed 50 gallons for particulate matter
NOV 26	CORE V21-229	1240	1500	2620	2616	23 39	73 52		Penetration 350 cm, Total core: 446 Good core 446 0-16 cm. Foram. Lutite; moderate yellowish brn (10YR 5/2) 16-24 cm. Lutite; pale orange brn (10YR 7/2) 24-160. Foram. sand intercalated by light br. (5YR 6/2) Lutite. 160-446 cm. Foram. Lutite intercalated by layers of argillaceous limestone pebbles.
		TOPOGRAPHY: ONDULATING		CUTTING EDGE: Bent		10cm ABOVE CUTTING EDGE			
		TUBES: Pipe #1 Bent 30°							
NOV 26	WBBL V21-222					23 39	73 52		
N	Bio 234	1411	1512			23 39	73 52		SP sample Medium-Light; MPS-S (0-100m) sample
O	SP	1411	1511						Light, MPS-M (100-250m) Light, MPS-D (250-500m)
V	MPS	1502	1512						Light; Phosphorescence in MPS-M & D only.
26	BT	1415							
N	CAMERA	1230	1452	2616	2612	23 39	73 52		K-N #12
O	#105								Lithograph pan film
V									20 hits - 19 exposures
26									
N	WHEELONTR	1230	1452	2616	2612	23 39	73 52		K-N #12
O	#109								Lithograph pan film
V									
26									

John E. Murray
Chief Scientist

Columbia University
in the City of New York

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CRUISE LEG—From Panama To New York

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TIME ZONE 2+4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
N	NEPHELOMTR	1633	1730	825	840	17° 38'	74° 50'		K-N #12
0	#107								Lithograph pen film
V									
24									
23									
N	Bio 232	1715	1819			17 38	74 50		SP sample heavy including 14 one inch
0	SP	1715	1746						flat fish; MPS-S medium, MPS-M+D Light
V	MPS	1810	1819						Phosphorescence in all samples except SP
23	BT	1755							
N	Bio 233	1635	1705			19 12	75 14		SP sample Medium-Light; MPS-S + MPS-M
0	SP	1635	1705						samples Light; MPS-D Sample Medium
V	MPS	1651	1700						Phosphorescence in all samples except SP
24	BT	1645							
NOV	CORE	1525	1643	1665	1703	19 12	75 14		Penetration 594 cm, Total core 440 cm. Dood core #26
24	V21-228	HIT	1558	HIT	1687				alternating zones of grayish orange (10YR 7/4) lutite and
		Topography: Side of slope							pale greenish yellow (10YR 8/6) lutite. Coarse fraction
		Pipe #1 Bent at 30°							very small but predominantly <i>Globocera</i> sp., <i>Globostella</i>
									sp., ptirapods and sponge spicules
NOV	T-GRAD	1523	1643	1663		19 12	75 14		HF = 1.2 kcal/cm ² /sec - 2 probes in
24	V21-202								
N	CAMERA	1451	1636	1670	1687	19 12	75 14		K-N #12
0	#124								Lithograph pen
V									20 hits - 19 exposures
24									
N	NEPHELOMTR	1451	1636	1670	1687	19 12	75 14		K-N #12
0	#108								Lithograph pen
V									
24									

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Chief Scientist

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CRUISE N° V21

CRUISE LEG—From Panama To New York

TIME ZONE 2 + 4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
N	V-21 CORE	1439	1605	2025	1970	17° 34'	72° 13'		Penetration 666 Total core: 680 Good core 636
O	# 226	HIT	1514	HIT	1980				Tubes bent 45°. Brownish foraminiferal lutite.
V		TOPOGRAPHY:		SLOPE					predominantly composed of fine grain Globigerina sp.
22									mineral content small, comprising mostly of light
									minerals. Small percentage of volcanic glass throughout
N	Bio 231	1515	1637			17 34	72 13		SP Medium-Heavy sample; MPS- Shallow (0-100)
O	SP	1528	1558						Light sample; MPS-Middle (100-250m) Light
V	MPS	1628	1637						sample; MPS-Deep (250-500m) Medium sample.
22	BT	1515							Phosphorescence in MPS-M and D only.
N	CAMERA	1428	1614	1980	1970	17 34	72 13		Camera - Nephelometer # 12
O	# 122								Livograph pan film
V									20 hits - 19 exposures
22									
N	NEPHELOMTR					17 34	72 13		
O	# 106	1428	1614	1980	1970				K-N # 12
V									Livograph pan film
22									
NOV	CORE	1729	1810	839	840	17 38	74 50		Penetration 609 cm. total core: 772 cm Good core: 400 cm.
23	V21-227	HIT	1746	HIT	840				yellowish br. to greenish yellow foraminiferal lutite.
		TOPOGRAPHY:		ROUGH					compr. primarily of Globigerina sp and Globobulimina sp.
									Dominant test size is very fine grain. ~15um
									decore lost at 96cm while separating pipes.
NOV	T-GRAD	1726	1825	840		17 38	74 50		HF = 1.8 kcal/cm ² /sec - 2 probes 17
23	V21-201								
N	CAMERA	1633	1730	825	840	17 38	74 50		K-N # 12
O	# 123								Livograph pan film
V									20 hits - 19 exposures
23									

John Ewing
Chief Scientist

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TIME ZONE 274

John E. Egan
Chief Scientist

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TIME ZONE 2+5

CRUISE N° V21

CRUISE LEG—From Panama To New York

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John Ewing
Chief Scientist

Columbia University
in the City of New York

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TIME ZONE 2+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
N	Bio 227	1436	1529			14° 27'	77° 14'		Middle net failed to open. Medium-light samples in deep + shallow nets; medium sample in surface net. Phosph. in deep sample only. Net failure may be due to loose lock screw in triggering mechanism
O	SP	1436	1511						
V	MPS	1519	1529						
18	BT	1445							
N	CAMERA	1246	1459	2155	2154	14 27	77 14		K-N#12
O	118								Liveograph pan film
V									20 hits - 19 exposures
18									
N	NEPHELOTR	1246	1459	2155	2154	14 27	77 14		K-N#12
O	#102								Liveograph pan film
V									
18									
N	V-21-CORE	1310	1459	1120	1122	16 06	76 20		Densitometer 844 cm. Total core 1176 cm. Good core 630 cm. cannot find problem. all measurements all correct. Core is a moderate yellowish brown (10 YR 5/4) butte. Foraminifera abundant throughout.
O	#223	HIT!	1324	HIT!	1116				
V									
19	TOPOGRAPHY: HILLY								
N	TGRAD	1310	1459	1120	1116	16 06	76 20		HF \approx 1.2 real / unit/sec. -3 probes in
O	#192								
V									
19									
N	CAMERA	1302	1408	1120	1123	16 06	76 20		K-N#12
O	#119								Liveograph pan film
V									20 hits - 19 exposures
19									
N	NEPHELOTR	1302	1408	1120	1123	16 06	76 20		K-N#12
O	#103								Liveograph pan film
V									
19									

John Early
Chief Scientist

Columbia University
in the City of New York

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CRUISE LEG From Panama To New York

TIME ZONE 2+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
N	CAMERA	1353	1540	1576	1586	11 33	81 32		Camera - Nephelometer # 12
O	117								Livograph pen film
V									21 hits - 20 exposures
16									
N	NEPHELOMETER	1353	1540	1576	1580	11 33	81 32		K-N #1
O	101								Livograph pen film
V									
16									
NOV	WABH	1425	1600	1575	1576	11 33	81 32		32 gallons processed for particulate matter
16	V21-217								
N	Bio 226	1514	1606	1575		11 33	81 32		Very light sample in shallow net, medium
O	SP	1514	1545						sample in deep net, med-heavy sample in
V	MPS	1556	1606						surface net. Phosphoresence in deep net
16	BT	1550							only. Middle net failed to open - might be
									piston sticking, or lock lever wrong size
NOV	CORS	1251	1456	2155	2155	14 27	77 14		TOTAL LENGTH 1134cm Good core 352cm
18	V21-222	HIT	1348	HIT	2296				ALTERNATING ZONES OF FORAMINIFERAL LUTITE, SAND, AND LUTITE
									SAND ZONES RICH IN MICA (BIDITE) AND CONTAIN WOOD OR PLANT
									DEBRIS. FORAMINIFERAL ZONES ARE PRIMARILY COMPRISED
									OF GLOBIGERINA, GLOBOROTALIA, SPICULES AND ORBICULARIA UNIVERSA
NOV	T-GRAD	1251	1456	2155	2155	14 27	77 14		HF = 2.0 megal / cm ² / sec - 2 probes 14
18	V21-196								
NOV	WDBL					14 27	77 14		
18	V21-218								

John Ewing
Chief Scientist

Columbia University
in the City of New York

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Research Vessel VEMA

CRUISE N° 21

CRUISE LEG—From PANAMA To NEW YORK.

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TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
NOV.	CORE	1252	1422	1390	1390	10° 03	81° 54		The penetration is doubtful. A core is seen up to 21.5 ft.
15	V21-220	HIT:	1343	HIT:	1366				Possible fallover. The pipe is bent about 20° 15' above the cutting edge. Flow begins at 383 cm. The core is (0-12 cm)
	HILLY TOPOGRAPHY								a moderate yellowish brown (10YR 2.5/4) micaceous lutite.
									(12-94 cm) light olive gray (5Y 2.5/2) lutite. (94-383 cm)
NOV	T-GRAD	1252	1422	1390	1390	10 03	81 54		Moderate greenish gray (5G 4.5/1) lutite. Two greenish
15	V21-194								black (5G 1.5/1) fine grained sands are found at 31 cm
									and 149 cm.
									HF = 1.4 kcal/cm ² /sec - 2 probes 14
N	Bio 225	1421	1459			10 03	81 54		Light sample in surface net, medium light
O	SP	1421	1451						sample in middle net, med-light sample
V	MPS	1448	1459						In surface net-green color. Deep net failed
15	BT	1440							to open or Middle net opened prematurely - perhaps
									due to malfunction of lock lever in frig. mach.
N	CAMERA	1310	1432	1360	Ping	10 03	81 54		Camera-Nephelometer #12
O	#116								Lithograph pan film
V									20 hits - 18 exposures
15									
N	NEPHELOMETER	1310	1432	1360		10 03	81 54		Camera-Nephelometer #12
O	#100								Lithograph pan film
V									
15									
NOV	CORE	1425	1600	1575	1576	11 33	81 32		Penetration 410 cm. Total core 245 cm. all good.
16	V21-221	HIT	1436	HIT:	1578				Running and hanging was necessary for 160-245 cm.
									0-38 cm. Fine orange (10YR 7/4) lutite.
	SLOPING TOPOGRAPHY								38-245 cm. light olive gray (5Y 4/1) fine grained
									sand grading into a medium sand.
NOV	T-GRAD	1425	1600	1575	1576	11 33	81 32		HF = 6
16	V21-195								

John Ewing
Chief Scientist

Columbia University
in the City of New York

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CRUISE N° V21

CRUISE LEG—From Honolulu To Panama

TIME ZONE 2+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <u>N</u>	Long. <u>W</u>		
NOV 8	CORE	1605	1714	1528	1460	07°15'	78°34'		Pentameter 847m. Total core 1090m. Flow 927m.
	V21-218	HIT	1637	HIT	1484				Core is a grayish olive (10Y4/2) siltite. May faintly mottled and getting slightly lighter in color with depth. A piece of wood is found between 272-273cm.
		GENTLY RISING							
N	T-GRAD	1605	1714	1532		07°15'	78°34'		HF = 2.2 kcal/cm ² /sec - 3 probes 14
O	#192								
V									
8									
N	Bio 223	1614	1744			07°15'	78°34'		
O	SP	1614	1742						
V	MPS	1733	1744						
8	BT	1730							
N	CAMERA					07°15'	78°34'		Camera 64-5
O	N4								Lithograph pan film
V									20 hits - 1 exposure; flash tube went
8									bad after hit #1.
NOV 9	CORE	0653	0807	1754	1757				Pentameter 1367 Total core 1192 flow begin 1060
	V21-219	HIT	0726	HIT	1756				Core is a grayish olive (10Y4/2) siltite - and becomes slightly lighter with depth. A piece of wood is found between 963-964cm.
		GENTLY ROLLING							
NOV 9	T-GRAD	0653	0807	1754	1759				HF = 2.4 kcal/cm ² /sec (3)
	V21-193								
N	Bio 224	0845	0925						
O	SP	0845	0917						
V	MPS	0908	0920						
9	BT	0925							

Chief Scientist

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CRUISE LEG From Honolulu To Panama

TIME ZONE 2+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
N	Bio 221	1055	1148			05° 15'	77° 36'		
O	SP	1055	1126						
V	VP	1138	1148						
T	BT	1100							
N	CAMERA	1049	1134	494	368	05 15	77 36		Camera 65-A
O	112								Lithograph per film
V									20 hrs - 18 exposures
T									
NOV	CORE	2241	2358	1735	1743	06 11	78 57		Penetration 1465cm. Total core 1660cm. Amenable to
T	V21-217	HIT	2316	HIT	1738				till where flow began - Some vertical attenuation of
									hydrothermal. begins at 1010cm. A piece of wood
									is found at 167cm.
NOV	T-GRAD	2241	2358	1735	1743	06 11	78 57		HF 3 4.3 kcal/cm ² /sec. - 3 probes in
T	V21-191								
NOV	NOBL					06 11	78 57		
T	216-5								
	(LAZ)								
N	Bio 222	2305	0023			06 11	78 57		
O	SP	2305	2335						
V	MPS	0012	0023						
T	BT	0005							
28									
N	CAMERA	2226	2351	1730		06 11	78 57		Camera 65-A
O	113								Lithograph per film
V									20 hrs
T									

Chief Scientist

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TIME ZONE 2 + 5

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Chief Scientist

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in the City of New York

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CRUISE N° V21

CRUISE LEG—From Honolulu To Panama

TIME ZONE 2+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>W</i>		
N ^o 1	T-6 RAD	2323	0013	1033		03° 11	82 25		No record.
5/6	121-287								
N	CAMERA	2319	0018	1050 fms.		03 11	82 25		Camera 65-A
0	#109								Liveograph ran
V									20 hits - 20 exposures
5-6									
N	T-6 RAD	1142	1255	1200		03 50	80 38	HF	2.4 kcal/cm ² /sec - 3 probes in
0	#188								
V									
6									
N	V-21	1141	1255	1200	1232	03 50	80 38		Penetration 1695cm. Total core 1680. Good
0	CORE #214	HIT	1207	HIT	1207				core 1603cm. Core is a green lutite. with
V									a whorl gray ash at 413-416cm and 1013-1016cm
6	TOPOGRAPHY 1			PLAT					
N	Bio 219	1216	1255			03 50	80 38		
0	SP	1216	1248						
V	VPMS	1230	1255						
6	BT	1220							
N	CAMERA	1135	1315	1210 fms.		03 50	80 38		Camera 65-A
0	110								Liveograph ran film
V									20 hits - 19 exposures
6									
N	Bio 220	2210	2315			04 24	79 10		
0V	SP	2210	2243						
6	MPS	2303	2315						
	BT	2300							

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CRUISE N° V21

CRUISE LEG From Honolulu To Panama

TIME ZONE 2+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
NOV 5	CORE	0445	0634	1794	180P	02° 50'	05° 08'		Penetration 1452 cm. Total core 1245 cm. The core is a green fine breccia. A grayish white altered tuffaceous breccia 771-779 cm. flow begins at 1187 cm.
	V21-212	HIT	531	HIT	1780				
		TOP DEPTH 1780							
NOV 5	T-GRAD	0451	0624	1790		02 50	05 08		HFZ 1.2 m/sec/cm²/sec - 4 probes in
	V21-186								
NOV 5	WGBL					02 50	05 08		
	V21-213								
N	Bio 217	0451				02 50	05 08		
O	SP	0451							
V	MPS								
5	BT								
N	CAMERA	0434	0552	1795	Pu ₃	02 50	05 08		Camera GS-A
O	LOG								Liveograph from Blm
V									20 hrs
5									
N	Bio 218	0000	0046			03 11	02 25		
O	SP	0000	0034						
V	MPS	0036	0046						
6	BT	0030							
NOV 5/6	CORE	2323	0013	1033	1060	03 11	02 25		Penetration 1362 cm. One depth 1103 - all good. Lost this guy later. Mean of alternating light and dark.
	V21-213	HIT	2350	HIT	1057				
		FLANK OF SEAMOUNT							

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Honolulu To Panama

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TIME ZONE 2+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
NOV 2	DREDGE V21-15					01° 29'	95° 20'		UNSUCCESSFUL - The dredge apparently hung up on the bottom and when it was freed, came up without the 1/2 meter bio net and the frame was bent up. Dredge was thrown overboard.
N 6 V 3	CAMERA LOG	2015	2013	1150 fms.		02 44	90 19		Camera 65-A* "Camera 65-A" was built aboard ship with parts from cameras 63-1 and 63-5, spare camera parts, and machine shop stock. 20 hits - 20 exposures
NOV 3	BIO-215 SP MPS BT	2104	2142			02 44	90 19		
NOV 4	CORE V21-211	0959	1036	780	770	03 00	88 23		Penetrator 1097 cm. Core length 887 cm. all good medium grain yellowish gray (54 7/8) foraminiferal sand. core washed. at surface from the sampling.
NOV 4	TOPOGRAPHY: ROUGH HIT ON A STEEP SLOPE								
NOV 4	T-GRAD V21-185	0959	1036	780		03 00	88 23		HF 3 .6 mial / cm ² / sec - 4 probes 14
V 0 V 4	Bio 216 SP MP BT	1004	1049			03 00	88 23		
NOV 0 4 4	CAMERA 107	0955	1041	750 fms.		03 00	88 23		Camera 65-A Lithograph pan 20 hits - 11 exposures Note: after 11 hits, water leaked through strobelight pass through an shatter in.

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Honolulu To Panama

TIME ZONE 2+6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
N	Bio 213	1439	1529			00° 50'	97° 28'		
O	SP	1439	1509						
V	VP	1453	1520						
I	BT	1405							
N	NEPHELOMTR	1355	1537	1842	PWS	00 50	97 28		Nephelometer 007
O	# 99								Lithograph pan film
V									
I									
N	T-GRAD	0725	0849	1700		01 29	95 20		No penetration
O	# 183								
V									
I									
N	V-21	0725	0849	1700	1828	01 29	95 20		Penetration 178 cm. Core length 183 cm. all good.
O	CORE #209	HIT	0800	HIT	1700				Core is a manganese sulfate later pale yellow brown (10YR 6/2) and grayish orange (10YR 7/4) (0-39)
V									(39-131) - Very pale orange (10YR 8/6) calcareous
I	TOPOGRAPHY: FLAT								(131-157) - Pale yellowish brown medium grained sand. [magn. module found at 183 cm]
N	Bio 214	1235	1304			01 29	95 20		(157-180 cm) Very pale orange calcareous (10YR 8/2)
O	SP	1235	1306						
V	VP	1244	1304						
I	BT	1300							
N	CORE	2017	2145	1155	1130	02° 44' N	90° 19' W		Penetration 1311 cm. Total core 1800 cm. - all good.
O	V21-210	HIT	2045	HIT	1148				(0-27 cm) slightly sandy magn. sulfate later pale yellowish brown (10YR 6/2) and moderate yellow brown (10YR 5/4).
V									(27-194 cm) slightly sandy sulfate later light
I									No record, greenish gray (5GY 8/1) and
N	T-GRAD	2018	2115	1150					greenish gray (5GY 7/1) Core is greenish gray
O	V21-184								some hydrous oxide in force throughout
V									
I									

Research Vessel *VFMA*

CRUISE N° *V21*

CRUISE LEG From

Honolulu To *Panama*

TIME ZONE *2+6*

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Oct	CORE	1608	1732	1790	1780	00° 01'	100° 17'		Penetration 1013 cm. Total core 1082 cm. Flow begins at 930 cm.
31	V21-207	HIT!	1646	HIT!	1793				Core is a pale yellowish brown (10YR 6/6) and moderate yellowish brown (10YR 5/4) manganese lute and grayish orange (10YR 2/4) lute.
		TOPOGRAPHY: HILLY							
Oct	T-GRAD	1608	1732	1790	1793	00° 01'	100° 17'		H.F. = 3 - No record.
31	V21-181								
Oct	WBBL					00° 01'	100° 17'		
31	V21-2125 (LAZ)								
O	NEPHELOMETER	1655	1609			00° 01'	100° 17'		Nephelometer 00.7
a	#98								Lithograph per film
T									Neph. brought up after 300 fms. due to bad cable angle.
31									
O	P.D. 212	1644	1802			00° 01'	100° 17'		
C	SP	1644	1714						
T	MPS	1715	1802						
31	BT	1725							
Nov	CORE	1403	1536	1834	1843	00° 50'	97° 28'		Penetration 1041 cm. Core length 855 cm. - all good.
1	V21-208	HIT!		HIT!	1842				0-50 cm. Manganese lute water moderate yellowish brown (10YR 5/4) and dark yellowish brown (10YR 4/2)
		TOPOGRAPHY: FLAT							
									50-840 cm. Highly oxidized yellowish gray (5Y 8/1) and light greenish gray (5G 8/1) lute.
Nov	T-GRAD	1405	1536	1834	1842	00° 50'	97° 28'		H.F. = 4.4 kcal/cm ² /sec - 4 probes 14
1	V21-182								

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CRUISE N° V21

CRUISE LEG-From Honolulu To Panama

TIME ZONE 2+6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
O	NEPHELOMETER	0645	0825			03° 11'	106° 23'		Nephelometer 007
C	#96								Lino graph pen film
T									Condensation on window - light failed
29									
O	WBBL	0644	0745			01 37	103 10		
C	V21-Z105								
T									
30									
O	Bio 211	1200	1539			01 37	103 10		
C	SP	1211	1241						
T	MPS	1524	1539						
30	BT	1200							
Oct	CORE	1038		1817	1795	01 37	103 10		Penetration meter - apparent bar failure over. Sensor
30	V21-206	HIT	1225	HIT	1783				was up to pipe #2 top unit - pressure failed sensor.
	TOPOGRAPHY & HILLS								followed by a very poor orange (104R ⁸ /2) color photo.
									flow began at 310cm. A large fragment of volcanic
									glass (black) in found at 310 - apparently about
Oct	F-GRAD	1038	1327	1817	1785	01 37	103 10		H F 2 - 1 probe in stopped core.
30	V21-180								
Oct	WBBL	1038	1327			01 37	103 10		processed for particulate matter.
30	V21-211								
O	NEPHELOMETER	1031	1202			01 37	103 10		Nephelometer 007
C	97								Lino graph pen film
T									
30									

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PALISADES

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CRUISE N° V21

CRUISE LEG From Honolulu To Panama

TIME ZONE 2 + 6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
O	Bio 209	1430	1533			03° 50'	108° 43'		
C	SP	1434	1514						
T	MPS	1523	1533						
28	BT	1430							
Oct	W1302	1615	1650			03° 50'	108° 43'		50 gullions processed for the marine biologist.
28	V21-2095								
O	NEPHELOMETER	2047	2328			04° 23'	110° 53'		Neph. 007
C	#94								Lineograph pen
T									condensation in window
27									
O	NEPHELOMETER	1241	1608			03° 50'	108° 43'		Neph 007
C	#95								Lineograph pen
T									condensation
28									
O	V-21-205	0648	0825	1987	1950	03 11	106 23		Pneumatic 716cm. Total core 1863cm. Good 1
C	CORE	HIT!	0733	HIT!	1940				core 677cm. This core consists of a pale
T									yellow brown (104% 1/2) brownish white
29	TODOGRAPHY, HILL								and fine yellowish green (56% 1/2)
									luteol.
O	T-GRAD	0648	0825	1987	1950	03 11	106 23		HF = 1.8 kcal/cm²/sec ? - 2 probes in
C	#129								
T									
29									
O	Bio 210	0648	0830			03 11	106 23		
C	SP	0648	0730						
T	MPS	0805	0830						
29	BT	0653							

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CRUISE N° V21

CRUISE LEG—From Honolulu To Panama

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TIME ZONE 2+6
2+7

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
O	Nephelometer	0020	0140	2160		05° 03'	113° 49'		Linograph run from Nephelometer 007
C	936								
T									
27	2								
O	Bio 208	2201	2304			04 23	110 53		
C	SP	2201	2232						
T	MPS	2255	2304						
27	BT	2205							
Oct	CORE	2100	2303	2098	2098	04 23	110 53		Penetrator 1185cm. Total core 1335cm. Flowin begins at 995cm.
27	V21-203	HIT: 2147		HIT: 2098					The core has a top soil of mangrove litter between moderate brown (5YR 7/4) and dark yellowish brown (10YR 4/2)
	TOPOGRAPHY: HILLY								Grayish brown (10YR 7/4) litter is the remainder - the
	LOCATION: Eastern Equatorial Pacific								section is highly hummed and mottled and the color varies greatly - darker & lighter throughout.
Oct	T-GRAD	2100	2303	2098	2098	04 23	110 53		HF = 1.0 kcal/cm²/sec - 3 probes in
27	V21-177								
Oct	WOBLE	2100	2303	2098	2098	04 23	110 53		46 gallons processed for particulate matter
27	V21-208	TRIP: 2140							
	WIRE OUT AT TRIP: 2135 fms.								
Oct	CORE	1340	1523	2036	2060	03° 56' N	108° 43' W		Time Adv. From 2+7 to 2+6.
28	V21-204	HIT 1431		HIT: 2040					Penetrator 1097cm. Total: 1640cm. Good core 992cm.
	TOPOGRAPHY: HILLY								Core consists of Mangrove litter - brown
									pale yellowish brown (10YR 6/2) and dark
									yellowish brown (10YR 7/2) and grayish red
									(10YR 7/4) litter.
Oct	T-GRAD	1340	1523	2036	2066				HF = 1.8 kcal/cm²/sec - 2 probes in
28	V21-178								

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CRUISE N° V21

CRUISE LEG—From Honolulu To Panama

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TIME ZONE 2+7

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
O	Bio. 206	0502	0702			05° 41'	116° 45'		
C	SP	0517	0547						
T	MPS	0513	0526						
26	BT	0540							
	VD	0647	0659						
O	NEPHELOMETER	0625	0833	2440		08° 00'	126° 49'		Nephelometer 007 (built aboard ship)
C	#91								Linagraph pen film
T									No record—both housings flooded
23									
O	NEPHELOMETER	0535	0659	2250		05° 41'	116° 45'		Nephelometer 007
C	#92								Linagraph pen film
T									Too little light getting to film—condensation in housings.
26									
Oct	CORE	0015	0225	2137		05° 03'	113° 49'		Penetration 1267cm. Total core 1620cm. flow logs at 1225cm. There is a major fault between moderate moderate brown (51R 4/4) and purple brown (51R 5/2) and grayish brown (10YR 2/1) butts. Some butte montmorillonite in green.
27	V21-202	HIT	0122	HIT	2156				
Oct	T-GRAD	0015	0225	2137	2156	05° 03'	113° 49'		butte 296-305cm.
27	#176								HF 3 1.0 mcal/cm ² /sec — 3 probes in
O	Bio 207	0112	0225			05° 03'	113° 49'		
C	SP	0112	0202						
T	MPS	0154	0206						
27	BT	0225							
Oct	WBSL	0312	0358			05° 03'	113° 49'		51 gallons processed.
27	V21-2025								

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CRUISE N° V21
CRUISE LEG—From Honolu

To Panama

TIME ZONE

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Oct 23	MPS 203	0858	0908			08° 00'	126° 49'		
Oct 23	UP 203	0747	0751			08° 00'	126° 49'		
Oct 24	CORE	0946	1154	2380	2345	06° 46'	122° 57'		Penetration 812 cms., Total core 1520 cm. Flow begins at 815 cm. A dense mangrove nodules (3 cm) is found at the top and the core is grayish orange (10YR 7/4) with some mangrove butte between moderate yellowish brown (10YR 6 3/4) and moderate brown (5YR 4/4).
Oct 24	U21-199	HIT	1053	HIT	2400				
Oct 24	BT	1100							
Oct 25	BIO 205	1015	1143			06° 13'	119° 31'		
Oct 25	SP	1113	1143						
Oct 25	MPS	1121	1134						
Oct 25	BT	1015							
Oct 25	VD	1035	1140						
Oct 25	CORE	1012	1142	2075	2090	06° 13'	119° 31'		Sample on pipe up to 842 cm. Total core 1240 cm. Flow begins at 1125 cm. Core is a moderate yellowish brown (10YR 6 3/4) mangrove butte, and some color variation.
Oct 25	U21-200	HIT	1057	HIT	2090				HF 30 unit not working properly
Oct 26	T-GRAD #175	0509	0653	2246	2250				
Oct 26	CORE	0509	0653	2244	2250	05° 41'	116° 45'		Penetration 1173 cm. Total core 1265 cm. Flow begins at 963 cm. (0-25 cm) grayish orange (10YR 7/4) sandy butte. (25-963 cm) butte butte moderate brown (5YR 4/4) and light brown (5YR 6/4).
Oct 26	U21-201	HIT	0553	HIT	2257				

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CRUISE N° V21

CRUISE LEG—From Honolulu To Panama

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TIME ZONE 2+8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Oct	MPS	0822	0835			08° 38'	130° 11'		
22	202								
Oct	BT	0905				08° 38'	130° 11'		
22	202								
Oct	CORE	0615	0900	2370	2350	08° 00'	126° 49'		Penetrator 935m. Total core 1232m. Flow began at 912m. Main core (0-1274) little sandy water 10-17cm. followed by a manganese sulfate.
23	V21-198								
		HIT: 0731	HIT: 2465						
		TOPOGRAPHY: HILLY							
Oct	WBBL					08° 00'	126° 49'		
23	204								
Oct	WBBL	1050	1134			08° 00'	126° 49'		
23	205-5 (L12)								
Oct	SP	0755	0800			08° 00'	126° 49'		
23	203	0852	0853						
		0855	0908						
Oct	BT	0900				08° 00'	126° 49'		
23	203								

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CRUISE N° V21

CRUISE LEG—From HONOLULU To PANAMA

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TIME ZONE 2+8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>W</i>		
Oct	DREGE	1439				09°48'	136° 01'		~ 50 very large magnesian nodules. (6 cm).
20	V21-14	1542		2560 Fms.					
		1558							
Oct	WBBL					09 48	136 01		
20	203-5								
Oct	SP	1700	1730			09 48	136 01		
20	201								
Oct	VP	1720	1729			09 48	136 01		
20	201								
Oct	BT	1720				09 48	136 01		
20	201								
Oct	CORE	0714	0923	2594	2595	08 38	130 11		Penetrator 1767 m. Total core: 1552 m. Alternating layers of grayish sand (10YR 7/4) siltstone and a magnesian siltstone which pass yellow brown (10YR 6/4) and dark yellowish brown (10YR 4/4).
22	V21-197	HIT!	0818	HIT!	2600				
Oct	SP	0830	0900			08 38	130 11		
22	202								

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CRUISE N° V21

CRUISE LEG—From Honolulu To Panama

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TIME ZONE 2+8
2+9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
OCT 19	DREDDGE V21-13	1106	1314			10° 45'	139° 24'		~200 pebble sized manganese nodules. sand bottom unsifted. manganese manganese nodule fragments.
		HIT	1202	2538	FMS.				
		LPT	1217						
OCT 19	WGBL 202-5 (LAZ)					10 45	139 24		
									Time Adv. from 2+9 To 2+8.
OCT 19	SP 200	1204	1234			10 45	139 24		
OCT 19	MPS 200	1325	1333			10 45	139 24		
OCT 19	VD 200	1219	1305			10 45	139 24		
OCT 19	BT 200	1210				10 45	139 24		
OCT 20	CORE V21-196	1447	1704	2540	2569	09 48	136 01		Remittator 1022cm. Total length: 1138cm, flow - 934cm. Gravelly sand (10YR 7/4) later followed by a dark yellowish brown manganese luteous.
		HIT	1551	HIT	2363				

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Research Vessel VEMA

CRUISE N° 21

CRUISE LEG—From HONOLULU To PANAMA

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2 + 10

TIME ZONE +9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
0	VD	1036	1129			12° 19'	145° 08'		
C	198								
T									
17									
0	CORE	0707	0914	2675	2700	11 43	142 48		Penetration: 1384 cm. (up to top of sample); Total length
C	V21-194	HIT: 0808		HIT: 2710					1245 cm. - no flow in. Core is a grayish orange (10YR 7/4)
T	TOPOGRAPHY: ROUGH								white with dark yellowish brown (10YR 6/2) mottling
10									
	DREDGE	0653	0910			11 43	142 40		Sample is a medium grained sand consisting of
	V21-12	HIT: 0749		HIT: 2705					foraminifera, radiolarians and pterosols with
		HIT: 0804							few biological specimens. Sample stored in a
									micro-pulse sample bottle and shipped to Panama
									from Panama.
0	SP	0838	0908			11 43	142 40		
C	199								
T									
18									
0	VP	0823	0855			11 43	142 40		
C	199								
T									
18									
0	BT	0915				11 43	142 40		
C	199								
T									
18									
Oct	CORE	1110	1310	2555	2610	10 45	139 24		Penetration: 82 cm. Core length: 193 cm. flow begins @ 75 cm.
19	V21-195	HIT: 1204		HIT: 2538					Grayish orange (10YR 7/4) with (10-25 cm). A manganese
	Rough Topography:								rust is present with 35-45 cm. and followed by a
									sequence of sandy white (intermediate yellow
									(5Y 9/6) and sandy yellow (5Y 6/6)

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CRUISE N° 21

CRUISE LEG—From HONOLULU To PANAMA

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TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
O C T 16	BT 197	1245				13° 10'	147° 45'		
Oct 17	CORE V21-193	0909 HIT: 1017	1136 HIT: 2927	292°	2837	12° 19'	145° 08'		Penetration 1433cm (Mined corehead) Total core 1262cm. no flow in. Top unit (0-362cm) is a mangrove lutite between pale yellowish brown (10YR 4/2) and moderate yellowish brown (10YR 4/2). The section is highly laminated and mottled. Mangrove is concentrated between 270-280cm, and 350-362. The rest of the core 362- 1262cm is a grayish mangrove (10YR 4/4) lutite with pressed 88 gallons of water for many acres particulate matter. of mangrove found throughout. Highly laminated and mottled. Area between 785-800cm appears to be a tubular montmorillonite(?).
Oct 17	DREDGE V21-11					12 19	145 08		
OCT 17	WBBL 201-5 (LAZ)					12 19	145 08		
O C T 17	SP 198	0915	0946			12 19	145 08		
O C T 17	VP 198	0900	0952			12 19	145 08		
O C T 17	BT 198	1140				12 19	145 08		

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CRUISE N° V21

CRUISE LEG—From Honolulu To Panama

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TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
O C T 15	BT 196	1530				13° 44'	150° 00'		
Oct 16	CORS V21-192 TOPOGRAPHY - GENTLY ROLLING	1019 HIT: 1134	1252	2890 HIT: 2974	2872	13° 10'	147° 45'		Smell on pipe was up to 186cm. Hood core 55cm. The top 6cm was pebble sized manganese nodules and fragments. 6-12cm was a manganese crust. 12-30cm. Luteite with dark yellowish orange (10YR2.5/6) and grayish orange. 30-55cm. Pale yellowish brown (10YR2.5/2) manganese luteite.
Oct 16	WBBL-5 V21-700 (LAZ)	1356	1445			13° 08'	145° 37'		processed for particulate matter. The sample was deposited with the shipboard biologist. [COR 2 V21-192 (cont) 55-157cm flow in - very sandy. Large pieces of grayish white luteite (highly compacted) and chert fragments and some manganese nodule fragments.
Oct 15	DREDGE V21-9	1330 HIT: 1436 LIFT: 1451	1555			13° 44'	150° 00'		Three small manganese nodules, one shank tooth and a few fragments of porous sandy luteite granules.
Oct 16	DREDGE V21-10	1020 HIT: 1132 LIFT: 1147	1247			13° 10'	147° 45'		~ 50 pebble sized manganese nodules and nodule fragments. A few shank teeth and a small fish is also found.
O C T 16	SP 197	1205	1235			13° 10'	147° 45'		
O C T 16	MPS 197	1302	1311			13° 10'	147° 45'		

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LAMONT GEOLOGICAL OBSERVATORY
PALISADES

Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Honolulu To Panama

217

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
O	SP	1707	1740			14 19	152 21		
C	195								
T									
14									
O	MPS	1703	1714			14 19	152 21		
C	195								
T									
14									
O	BT	1745				14 19	152 21		
C	195								
T									
14									
Oct	CORE	1338	1600	2815	2730	13 44	150 00		Penetration: outside measured 305cm. Hammer,
15	V21-191	HIT: 1443		HIT: 2772		0-5 cm. is a			* 878cm. of good core. Core is a radiolaria ooze between
		TOPOGRAPHY: HILLY				dark yellowish			moderate yellowish brown (10YR 5/4) and dark yellowish
		SOUTH OF CLARION FRACTURE				brown interval.			brown (10YR 7/2). The core grades with depth into
		ZONE							a radiolaria ooze between moderate yellowish brown
	CORE	The latter edge was smashed. and at 800m							(10YR 5/4) and grayer ooze (10YR 7/4). The core is highly
	V21-191	a large angular fragment (approx 3cm) of							laminated and mottled. Among the layers are filled
	(CON'T)	chert is found.							with white radiolaria ooze. The bottom of the good
									core is marked by moderate brown (5YR 7/4) manganese
									interval (very soft)
O	SP	1450	1521			13 44	150 00		
C									
T									
15									
O	VP	1557	1606			13 44	150 00		
C									
T									
15									

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Research Vessel YEMA
CRUISE N° V21
CRUISE LEG—From Honolulu To Panama

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TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
O	SP	1541	1611			16° 49'	154° 11'		
C	194								
T									
13									
O	BT	164	1555			16° 49'	154° 11'		
C	194								
T									
13									
O	CAMERA	1441	1703	2716		16° 49'	154° 11'		Camera 64-8 bolted to Nephelometer #7
C	#105								Livograph pen film
T									Camera & Nephelometer lost—see report
13									
O	PEBBLE	1441	1705	2716		16° 49'	154° 11'		Pumice
C	DREDGE								
T	#39								
13									
O	NEPHELOMTR	1441	1708	2716		16° 49'	154° 11'		Nephelometer #7 bolted to Camera 64-8
C	#90								Livograph pen film
T									Camera and nephelometer lost—see report
13									
OCT	CORE	1606	1850	2770	3122	14° 19'	152° 21'		Hit was very weak. There was no penetration. The
14	V21-190	HIT:	1714	HIT:	2880				bottom edge was ahead of the pipe. The pipe was straight. There was
	TOPOGRAPHY: DOUGL								a small fragment of the core caught midway into the pipe.
									The core was an irregular fragment of manganese nodules from
									coarse granular mass with a rubber sized nodules (50mm.)
OCT	7-GRAB	1606	1850	2770	3122	14° 19'	152° 21'		Unit # MK-II-5 lost—clamps broken
14	V21-174								

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CRUISE N° V21

CRUISE LEG—From Honolulu To Panama

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TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
O C T 12	BT 193	2035				18° 39'	155° 47'		
O C T 12	CAMERA 104	2375 1754	2260 2035	2375	2035	18° 39'	155° 47'		Camera 64-8 bolted to Nephelometer #7 Lithograph pan film Dredge attached 23 W/S - 22 exposures
O C T 12	PEBBLE DREDGE #34	1754	2035	2375		18° 39'	155° 47'		NO SAMPLE
O C T 12	NEPHELOMTR #89	1754	2035	2375		18° 39'	155° 47'		Nephelometer #7 bolted to Camera 64-8 Lithograph pan film
Oct 13	CORE V21-189	1505	1735	2719	2642	16° 49'	154° 11'		Continuation 274 cm. Total core 970 cm, good core 298 cm. A thin crusty corundum matrix and some smoky mica is found at the top of the core (~1 cm). The core is a fine pale yellow brown (10YR 6/2) matrix, with two oblique grains (5Y 4/2) sandy matrix found between 84-94 cm and 202-227 cm. The flow in this zone is distinct, appearing like domed laminae(?).
Oct 13	T-GRAD V21-173	1505	1735	2719	2642	16° 49'	154° 11'		Bottom probe in but no useable records obtained.
Oct 13	WBBH V21-199					16° 49'	154° 11'		

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CRUISE N° V21

CRUISE LEG ^B From Honolulu To Panama

TIME ZONE 2410

Chief Scientist

Research Vessel VEMA

CRUISE N° V 21

CRUISE LEG¹³ From Honolulu To Panama

213

TIME ZONE 2 + 10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
O C T 4	SP 191	2003	2033			19° 49'	157° 14'		
O C T 4	MPS 191	2258	2314			19 49	157 14		
O C T 4	BT 191	2055				19 49	157 14		
OCT 11	CORE V21-187	1307	1510	2000	2020	20 52	158 09		CORE in south of Oahu, Hawaii - at bottom of continental slope. The core is a pale yellowish brown (100% R ₂ O ₂) slightly sandy, lute. The water has dark areas due to manganese precipitate (very slight). The sand fraction is about 15%. The core is 1316 cm. Penetration 1077 cm, good core, 1000 cm.
O C T 11	CAMERA #103	1230	1415	2017	2017	20 52	158 09		Camera 64-8 about 50%, some very sandy. Lithograph from 114-117 cm. Drills attached 297-309 cm. and a specimen of sand at 204 cm.
O C T 11	PEBBLE DRENGE #33	1230	1415	2017		20 52	158 09		NO SAMPLE
OCT 12	CORE V21-188	1755	2003	2245	2330	2			Penetration ~ 30 cm. (no machine core pipe) - T-grid probe #2 was shined up. The core was washed out of the pipe at surface. 1/2 gal. of sand collected. Core is 60 cm of black medium to coarse grained sand. Some foraminifera - Globobulimina and other species are found. No grading is apparent.

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PALISADES

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CRUISE N° V21

CRUISE LEG 13 From Honolulu To Panama

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TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Oct 4	CORE V21-186					19° 49'	157° 14'		Multiple core head + 1956 fms. of wire lost due to "frozen" drum on the winch.
Oct 4	T-GRAD V21-171	2020	—	2420	—	19 49	157 14		Unit #3 lost — wire cut
Oct 4	WBBN V21-197					19 49	157 14		
O C T 4	CAMERA #102					19 49	157 14		Camera # 64-8 Lineograph pan Trouble with hydrowinch — camera hoisted before hit
O C T 4	PERBLE DREDGE (110) -32					19 49	157 14		Trouble with hydrowinch — camera + dredge hoisted without hitting
O C T 4	(CORE) BATHY-10MTR #88					19 49	157 14		Lost with multiple core head
O C T 4	ORE CAMERA #51					19 49	157 14		Lost with multiple core head

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CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>W</i>		
S	SP	0611	0641			23° 01'	159° 20'		
E	190								
P									
29									
S	MPS	0725	0736			23 01	159 20		
E	190								
P									
29									
S	VD	0503	0725			23 01	159 20		
E	190								
P									
29									
S	BT	0625				23 01	159 20		
E	190								
P									
29									
SEPT	DREDGE	0402	0637	2580	2582	23 01	159 20		Dredge sample: One pebble (3cm) of scoria, one flat piece of marginal (crust). Many arenaceous foraminifera, some pteropods, 2 ophiuroids, one coral (circular) and a pelagopod. Sample in plastic jar with geologist's.
29	V21-D8	ON BOTTOM: 0517		HIT 2582					
		UP: 0537							
		20 min		WIRE #1 12°					
		ON BOTTOM							
S	CORE	0408	0750	2582		23 01	159 20		Lithograph pen
E	NEPHELOMETER								
P	# 87								
29									
S	CORE	0408	0750	2582		23 01	159 20		Lithograph pen
E	CAMERA								24 exposures
P	# 50								
29									

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CRUISE N° V21

CRUISE LEG-From Dutch-Harbor To Honolulu

TIME ZONE 240

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	SP	0840	0911			25° 03'	157° 54'		
E	189								
P									
28									
S	MPS	0926	0934			25° 03'	157° 54'		
E	189								
P									
28									
S	BT	0940				25 03	157 54		
E	189								
P									
28									
S	VD	0815	0953			25 03	157 54		
E	189								
P									
28									
Sept	CORE	0415	0750	2580	2582	23° 01'	159° 20'		Penetration: 76 cm. Core length 90 cm. Core is a a manganese crust 15 cm. at the top of the core very firm but (dark yellow brown 10/10 1/2). Gradually into a series consolidated silt stone. Pullout was very stiff - was necessary to dig in the core. Some corals extending out of the outer edge. - HF = 3 1 probe in Silt stone stopped Under top manganese crust, penetration there is a thin crust at the base of the first lithologic unit (19 cm.)
29	V21-185	TRIP: 0515		H17 2583					
		TOPOGRAPHY: 5 SHORING							
Sept	T-GRAD	0415	0750	2580	2582	23 01	159 20		
29	V21-170								
Sept	WABL	0415	0750	2580	2583	23. 01	159 20		
29	V21-196	TRIP: 0510		TRIP: 2582					processed for particulate matter

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CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

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TIME ZONE Z+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S E P 27	BT	1600				27° 15'	157° 00'		
S	CORE	0650	0938	2557	2562	25 03	157 54		Penetration 191cm. Total core length 419cm. Flow begins at 130cm. Text is a moderate yellowish brown (10YR 5/4) micaceous. A layer of basalt fragments showing a cooled margin (glass) is found between 89-93cm. Many fragments of basalt are found in the flow in between 307-340cm. HF = 3 1 probe in - core fell over
E	V21-184	HIT:	0747	HIT:	2556				
O									
T									
28									
S	7-GRAD	0650	0938	2557	2562	25 03	157 54		proceed for particular matter.
E	V21-169								
O									
T									
28									
S	WBBL	0650	0924	2557	2562	25 03	157 54		Livograph ran
E	V21-195	TRIP:	0740	TRIP:	2520				
O					(WIRE COUNTER?)				
T									
28									
S	(CORE)	0639	0937			25 03	157 54		Livograph ran
E	NEPHELOTR								
R	# 86								
28									
S	CORE	0639	0937			25 03	157 54		Sundry bio. specimens - two jelly fish and one crustacean. Stomach of shipboard geologist.
E	CAMERA								
R	# 49								
28									
S	DREDGE	0635	0950	2557	2562	25 03	157 54		
E	# 7	HIT:	0751	HIT:	2555				
P		OFF:	0802						
28									

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CRUISE N° 21

CRUISE LEG—From DUTCH HARBOR TO HONOLULU

TIME ZONE +10

Chief Scientist

Research Vessel YEMA

CRUISE N° V 21

CRUISE LEG From Dutch Harbor To Honolulu

DEPARTMENT OF GEOLOGY
LAMONT GEOLOGICAL OBSERVATORY
PALISADES

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	(CORE)	1837	2236	3050		29° 51'	157° 02'		Lithograph jam
E	NEPHELOMETER								
P	#84								
26									
S	CORE	1837	2236	3050		29 51	157 02		Lithograph jam
E	CAMERA								
P	#.								
26	47								
S	DREDGE	1825	2140	3062	3104	29 51	157° 02'		Manganese nodules predominantly egg-shaped.
E	#5	ON: 1950		HIT 3085					some sharks teeth with manganese coating
P		OFF: 2012							and one large crustacean.
26									
S	(CORE)	1330	1647	3006		28° 24'	159° 11'		Lithograph jam
E	NEPHELOMETER								
P	#82								
25									
S	CORE	1330	1647	3006		28° 24'	159° 11'		Lithograph jam
E	CAMERA								
P	#45								
25									
S	DREDGE	1315	1550	3006	3007	28° 24'	159° 11'		Manganese nodules predominantly egg-shaped.
E	#4	ON: 1432		HIT: 3010					several sharks teeth
P		OFF: 1453							
25									
Sept	CORE	1305	1610	3025	3020	27 15	157 00		Penetration: 896 cm. Total core: 1162 cm. Cannot tell where
27	VR1-183	HIT: 1420		HIT: 3025					flourish begins. Core is a little bit more pale yellowish
		TOPOGRAPHY:		HILLY					brown (10 VA 9/2) and moderate yellowish brown (10 VA 9/4)
									grading into a moderate yellowish brown (10 VA 9/4)

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CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

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TIME ZONE Z+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Sept	W004	1840	2238	3062	3104	29° 50'	157° 02'		processed for particulate matter.
26	V21-194	TRIP!	2000						
S	(CORE)	0222	0542	2815 Fms		28° 51'	158° 21'		Lithograph pen
E	NEPHCOMTR								
P	# 83								
26									
S	CORE	0222	0542	2815 Fms		28° 51'	158° 21'		Lithograph pen
E	CAMERA								31 exposures
P	# 46								
26									
S	SP	2040	2128			29° 51'	157° 02'		
E	187								
P									
26									
S	MPS	2214	2229			29° 51'	157° 02'		
E	187								
P									
26									
S	BT	2050				29° 51'	157° 02'		
E	187								
P									
26									
S	VD	0516				29° 51'	157° 02'		
E	187	2105	2123						
P									
26									

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TIME ZONE 2+10

CRUISE LEG—From Dutch Harbor To Honolulu

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TIME ZONE 2+10

CRUISE N° 021
CRUISE LEG—From Dutch Harbor To Honolulu

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PALISADES

Research Vessel YEMA

CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

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TIME ZONE 2 +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>W</i>		
S	MPS	1449	1501			31 31	159 42		
E	183								
P									
29									
S	BT	1430				31 31	159 42		
E	183								
P									
24									
S	SP	2158	2228			30 43	159 34		
E	184								
P									
24									
S	MPS	2134	2149			30 43	159 34		
E	184								
P									
24									
S	BT	2130				30 43	159 34		
E	184								
P									
24									
S	(CORE)					30 43	159 34		Lithograph near film
E	NEPHELOWER								
P	#81								
24									
S	CORE					30 43	159 34		Lithograph near film
E	CAMERA								
P	#44								
24									

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PALISADES

TIME ZONE 2+10

CRUISE LEG—From Dutch Harbor To Honolulu

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Sept 24	WBBAL VZ1-192	1150	1520	3028	3030	31° 31'	159° 42'		processed for particulate matter.
S	(CORE)	1143	1524	3025	FWS	31 31	159 42		Lithograph pan
D	DEPTOMTR								
P	#80								
24									
E	CORE	1143	1524	3025	FWS	31 31	159 42		Lithograph pan
D	CAMERA								
P	#43								
24									
S	DREDGE	1120	1500	3028	3030	31 31	159 42		Manganese nodules. The nodules are egg shaped and show no orientation of top or bottom. A small sharks tooth (no many cones) and one covered with manganese. A small polychaete (Annelid?) and small crustaceans also came up.
F	#3	ON: 1315		HIT: 3030					
P		OFF: 1330							
24									
Sept 24	CORE VZ1-179	2630	0010	3000	3042	30 43	159 34		Restoration: 1038m. Total core; 1315m. unable to determine flow in! Initial water grayish orange (10YR 7/4) and moderate yellowish brown (10YR 5/4). - manganese increases with depth, grades into a moderate brown (5YR 3/4).
		HIT: 2143		HIT: 3055					
		TOPOGRAPHY: FLAT							
Sept 24	T-GRAD VZ1-164	2030	0015	3060	3055	30 43	159 34		HF ≈ 1.6 kcal/cm²/sec - 3 probes in
	WBBAL					30 43	159 34		
	VZ1-193								

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TIME ZONE 2+10

CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S E D 23	BT 182	2145				33° 52'	160° 08'		
S D P 23	(CORE) NEPTHELON #79	1848	2230	3150		33 52	160 08		Livograph from film
S D P 23	CORE CAMERA #42	1848	2230	3150		33 52	160 08		Livograph from film
S D P 23	PEBBLE DREDGE (100) - 31	1835	2145	3150		33 52	160 08		NO SAMPLE
S E P 24	SP 183	1322	1422			31 31	159 42		
SEPT 24	CORE V21-178	1145	1530	3028	3030	31 31	159 42		Penetration: 1160cm. Total core length 1283cm. The bottom of core is homogeneous and unable to determine flow in. The core is a marginalist lutite. Very small % at top & increases with depth. Two yellowish orange layers exposed at 741-742 cm & 895-897 cm.
Sept 24	7-GRAD V21-163	1145	1540	3028	3030	31 31	159 42		HF ≥ 1.4 kcal/cm ² /sec - 4 probes in

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu.

TIME ZONE 2 +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	(CORE)	0857	1229	2980		34° 54'	160° 19'		Lithograph from R14
E	NEPHELOTR								
P	# 78								
23									
S	CORE	0857	1229			34 54	160 19		Lithograph from R14
E	CAMERA								14' exposure — head buried in mud
P	# 41								
24									
S	DREDGE	0845	1230	2960	2980	34 54	160 19		Bio-trawl with 1/2 meter nylon net — serving as a geology dredge.
E	# 2	ON: 1029		HIT: 2957					
P		OFF: 1045							
24									Several hundred irregular manganese nodules — about 2-3 inches in diameter.
Sept	CORE	1848	2240	3162	3145	33° 52'	160 00		Penetration 1184cm. Total core length: 1250cm. Unable to determine flowin. Core is a grayish orange mass, but gradually into a moderate brown mass, but very even grading, and no stratum except one tuffaceous (?) layer at 882cm. Pullout: 5th
23	V21-177	HIT: 2005		HIT: 3186					H.F. = 1.6 kcal/cm²/sec — 4 probes in
		TOPOGRAPHY: ROLLING							
Sept	T-GRAD	1848	2240	3162	3145	33° 52'	160 00		
23	V21-166								
S	SD	1028	1058			33° 52'	160 00		
E	182	2116	2147						
P									
23									
S	MPS	2151	2208			33 52	160 00		
E	182								
P									
23									

Chief Scientist

Research Vessel VEMA
CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

TIME ZONE Z+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	CORE	0905	1239	2960	2980	34° 54'	160° 19'		Penetration: 926 cms. Total core length 823 cm. The rig was a 3-pipe. pipe #1 crimped & broke at the coupling at hit. Safety wire attached. 0-214 cm out of pipe #8 and appears disturbed and wavy. (good core?) The core is a grayish brown Mayaguez lutite grading into a moderate brown gray lutite. Bottom unit 752-797 is a tuffaceous unit.
E	V21-176	HIT: 1015		HIT: 2980					
P	V21-176								
T		TOPOGRAPHY:	ROLLING						
23									
	T-GRAB	0905	1239	2960	2980	34 54	160 19		
	V21-161								
									HF = ? - 2 probes in - bottom probe damaged
	WABL	0910	1230	2960	2990	34 54	160 19		processed for particulate matter.
	V21-191	TRIP: 0948							
S	SP	1243	1313			38 22	161 06		
E	180								
P									
22									
S	MPS	1319	1333			38 22	161 06		
E	180								
P									
22									
S	BT	1200	1300			38 22	161 06		
E	180								
P									
22									
S	SP	1028	1058			34 54	160 19		
E	181								
P									
23									

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CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

TIME ZONE 2-H0

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	SP	1220	1250			40° 08'	162° 30'		
E	179								
P									
ZI									
S	VP	1109	1112			40° 08'	162° 30'		
E	179								
P									
ZI									
S	BT	1330				40° 08'	162° 30'		
E	179								
P									
ZI									
S	CORE	1000	1320	3015	3010	38 22	161 06		Penetration: 1316 cm. Total core length 1186 cm. Core is a little bit greyish orange (core 74) and moderate yellow brown (104/125/4). Topography: Hilley - in the Mendocino Seascarp area.
E	V21-175	HIT: 1116		HIT: 3009					
P									
T									
ZI									
S	T-GRAD	1000	1320	3015	3009	38 22	161 06		Geochem magnetic orientation samples taken. HF \approx 1.0 mcal/cm ² /sec. - 4 probes in Mendocino Escarpment Area
E	V21-160								
P									
T									
ZI									
S	(CORE)	0956	1312	3009	Plus,	38 22	161 06		Lithograph from film
E	NEPHELOMETER								
P	#77								
ZI									
S	CORE	0956	1312	3009	Plus	38 22	161 06		Lithograph from film 30 exposures.
E	CAMERA								
P	#40								
ZI									

Chief Scientist

Research Vessel VEMA
CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. λ	Long. ω		
S	CAMERA	1110	1416	2920		44°22'	163°33'		Camera 63-5 — Livograph pan film
D	101								Dredge
P									Compass
9									21 hits — 0 good exposures
S	PEBBLE	1110	1416	2920		44°22'	163°33'		S-6 manganese covered pebbles
E	DRENCE								
P	(K01)-30								
9									
S	(CORE)	1117	1518	2920		44°22'	163°33'		Livograph pan film
E	NEPTHELOMOR								
P	#75								
9									
Sept	CORE	1000	1337	3020	3025	40°08'N	162°30'W		Penetration: 1277 cms. Total core 1280 cms. / Good core 690 cms. *
21	#21-174	HIT 3023		HIT 3023					Little between grayish orange (10YR 7/4) and moderate yellowish brown (10YR 5/4). * Difference in core length (good 690 cms and penetration) appears to be a mistake on core measurement. However, no mud on piston (to) with trigger line length (?)
		HIT: 1117							
		Topography: gently rolling							
		Undercurrent: North Pacific							
Sept	T-GRAD	1000	1337	3020	3025	40°08'	162°30'		HF = 1.6 kcal / cm ² / sec — 4 probes in
21	V21-159								
S	(CORE)	0959	1334	3025		40°08'	162°30'		Livograph pan
E	NEPTHELOMOR								
P	#76								
21									
S	CORE	0959	1334	3025		40°08'	162°30'		Livograph pan film
E	CAMERA								26 exposures
P	#39								
21									

Research Vessel VEMA
CRUISE N° V21

CRUISE LEG—From Dutch Harbor to Honolulu

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
	WABL	1140	1519	2920	2920	44°22'	163°33'		processed for particulate matter.
	V21-190	TRIP	1224						
S E P 18	SP	1641	1711			47°40'	164°20'		
S E P 18	MPS	1649	1700			47°40'	164°20'		
S E P 18	BT	1645				47°40'	164°20'		
S E P 19	SP	1308	1358			44°22'	163°33'		
S E P 19	MPS	1445	1507			44°22'	163°33'		
S E P 19	BT	1400				44°22'	163°33'		

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CRUISE LEG—From DUTCH HARBOR To HONOLULU

195

TIME ZONE +10

[illegible]

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PALISADES

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Research Vessel YEMA

CRUISE N° V21

CRUISE LEG—From Dutch Harbor To Honolulu

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	BT	0135				52° 21	165° 34'		
E	175								
P									
17									
S	SP	2139	2209			49 52	164 58		
E	176								
P									
17									
S	VP	2140	2205			49 52	164 58		
E	176								
P									
17									
S	BT	2250				49 52	164 58		
E	176								
P									
17									
S	CAMERA	2337	0157	2680		49 52	164 58		Camera 63-5 - Liveograph from film
E	#99								compass
P									Pebble Dredge
17-18									21 hits - 21 exposures
S	PEBBLE	2337	0157	2680		49 52	164 58		1 garnet pebble
E	DREDGE								
P	#28								
17-18									
S	(CORE)	1950	0015	2685		49 52	164 58		Liveograph from film
E	WEDGEMAN								
P	#73								
17									

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PALISADES

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CRUISE N° 21

CRUISE LEG—From DUTCH HARBOR To HONOLULU

TIME ZONE +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long.		
Sept 17	CORE VZ-170	0030	0410	3747	3753	52°21'N	165°34'W		Aleutian Trench Core. Penetration 309cm. Core was stopped by sand layers. Core is predominantly a greenish gray silt with ^{buff} sand units. Pipe #1 was bent at 40° & about 3m. from cutting edge. Total core length - 277cm. all good! Topography: Flat.
Sept 17	T-GRAD #155	0030	0410	3747	3753	52 21	165 34		Aleutian Trench - 1.4 kcal/cm ² /sec - based on 2 probes
Sept 17	CORE VZ-171	1950	0015	2668	2676	49 52	164 58		Penetration: 676cm. Total core length 1262cm. good core 632cm. Penetration was stopped by buff layers. The core was a brownish gray (5YR 4/1) silt, silt, color becomes lighter with depth. Thin black buffaceous units present. Topography flat.
Sept 18		Hauling was slow because winch popped out of gear and inspection made at about 2550 Fms.							.8 kcal/cm ² /sec - 2 probes in
Sept 17	T-GRAD #156	1950	0015	2668	2676	49 52	164 58		
Sept 17	WABL #189	1950	0015	2668	2676	49 52	164 58		10 Fms. above core head. The sample was processed for particulate matter. 44 gals were processed.
S	SP 175	0126	0159			52 21	165 34		
E									
P									
17									
S	MPS 175	0737	0752			52 21	165 34		
E									
P									
17									

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PALISADES

CRUISE LEG—From Adak

To Dutch Harbor

192

TIME ZONE 2410

[illegible]

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Research Vessel VEMA

CRUISE N° V 21

CRUISE LEG—From Adak To Dutch Harbor

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S E P 14	BT	1455				52° 52'	163° 45'		
Sept 15	CORE #168	0815		94		54° 55'	166° 45'		
Sept 15	CORE #169					54° 16'	168° 19'		
S E P 15	SP	0817	0840			54° 55'	166° 45'		
S E P 15	BT	0825				54° 55'	166° 45'		
S E P 15	SP	1601	1635			54° 16'	168° 19'		
S E P 15	MPS	1723	1737			54° 16'	168° 19'		

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PALISADES

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Research Vessel YEMA

CRUISE N° V21

CRUISE LEG—From Adak To Dutch Harbor

TIME ZONE 2 +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Sept 12	CORE #166	2305	0320			51° 25'	169° 12'		Greenish gray, lenticular with several dark layers.
Sept 12	T-GRAD #152	2305		3800	3800	51° 25'	169° 12'		Two probes in - light source failed on way down.
Sept 14	CORE #167					52° 52'	163° 45'		
Sept 14	T-GRAD #153	1115	3693	3693	3698	52° 52'	163° 45'		All wires cut by trigger-cable.
S E P 14	(SPECIAL) CORE NEPTHELOMETER #71	1110	1515	3700 fms.		52° 52'	163° 45'		Lithograph from Aln Neptelometer # 7 stopped due to jam
S E P 14	SP	1405	1435			52° 52'	163° 45'		
S E P 14	MPS	1330	1348			52° 52'	163° 45'		

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PALISADES

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CRUISE N° V21

CRUISE LEG—From Adak To Dutch Harbor

TIME ZONE 2 +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	BT	1815				56° 01'	172° 27'		
E									
P									
T									
11									
S	CAMERA	1700	1820			56° 01'	172° 27'		Lithograph pen film
E	#97								Camera 63-5
P									20 hrs - 14 exposures (together with jammed in
11									"up" position after #14)
S	(CORE)	1715	1845			56° 01'	172° 27'		Lithograph pen film
E	NEPHELOMETER								
P	#89								
11									
S	(SPECIAL)	2303	0244	3500	Runs	51° 25'	169° 12'		Nephelemeter #7 strapped to swell core head + pipe
E	(CORE)								Lithograph pen film
P	NEPHELOMETER								
12-13	#7 #70								
S	SP					51° 25'	169° 12'		
E									
P									
13									
S	MPS					51° 25'	169° 12'		
E									
P									
13									
S	BT					51° 25'	169° 12'		
E									
P									
13									

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PALISADES

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CRUISE N° 21

CRUISE LEG—From AOK To DUTCH HARBOR

TIME ZONE +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Sept 11	CORE #165	1710	1840	1376		56° 01	172° 27		Soft grayish olive luteous
Sept 11	T-GRAD #151	1710	1840	1376	1394	56 01	172 27		HF = 1.6 kcal/cm ² /sec
Sept 11	WATER #188					56 01	172 27		
S	SP	1155	1205			56 24	172 26		
E									
P									
11									
S	MPS	1301	1312			56 24	172 26		
E									
P									
11									
S	BT	1300				56 24	172 26		
E									
P									
11									
S	SP	1723	1751			56 24	172 26		
E									
P									
11									

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PALISADES

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CRUISE N° V21

CRUISE LEG—From Adak To Dutch Harbor

TIME ZONE Z +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	CAMERA	1637	1800	1725		58°22'	176°07'		Camera 63-5
E	#95								Lithograph pan film
P									20 w/5 - 8 exposures - Hydroline caught on dredge
10									release mechanism, fooling camera. Dredge program
									suspended indefinitely.
S	CORE	1637	1800	1725		58°02'	176°07'		Lithograph pan film
E	CAMERA								27 exposures
P	#38								NOTE: Camera trigger magnet sheared off. Core
10									camera program ended until another trigger
									mechanism can be obtained
SEPT	CORE					56°24'	172°26'		
11	#164								
Sept	T-GRAD	1140	1305	1075	1041	56°24'	172°26'		H F \approx .8 kcal/cm ² /sec
11	#150								
	NOBL					56°24'	172°26'		
	#187								
S	CAMERA		1245	1100		56°24'	172°26'		Lithograph pan film
E	#96								Camera 63-5
P									
11									
S	(CORE)					56°24'	172°26'		PLUS-X film
E	NEPHELOMETER								
P	#68								
11									

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PALISADES

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CRUISE N° V21

CRUISE LEG—From Adah To Dutch Harbor

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TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S	MPS	1170	1131			58°33'	177°13'		
E									
P									
10									
S	BT	1115				58°33'	177°13'		
E									
P									
10									
S	SP	1648	1718			58°02'	176°07'		
E									
P									
10									
S	BT	1760				58°02'	176°07'		
E									
P									
10									
S	CAMERA	0957	1159	940		58°33'	177°13'		Camera 63-5
E	#94								Livograph from film
P									Dredge attached
10									20 hits - 14 exposures (camera tangled in dredge(?))
S	PEBBLE	0957	1159	940		58°33'	177°13'		NO SAMPLE
10	DREDGE								
	#27								
S	CORE					58°33'	177°13'		Livograph from film
E	CAMERA								No nephelometer this station
P	#37								
10									

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PALISADES

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CRUISE N° V21

CRUISE LEG—From

Adak

To Dutch Harbor

TIME ZONE Z + 10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S E P	SP	1515	1545			59 34	179 15	E	
9									
S E P	MPS	1531	1545			59 34	179 15		
9									
S E P	BT	1535				59 34	179 15		
9									
Sept 10	CORE #162	1006				58 33	177 13		grayish olive lute (0-274 cm) over a dark greenish gray (SG 14/1).
SEPT 10	CORE #163					58 02	176 07		grayish olive (1074/2) lute.
Sept 10	T-GRAD #149	1640	1830	1772	1762	58 02	176 07		Two probes in - bottom probe town off
S E P 10	SP	1015	1049			58 33	177 13		

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 PALISADES

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Research Vessel VEMA

CRUISE N° 21

CRUISE LEG—From ADAK To DUTCH HARBOR

TIME ZONE +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
9	CORE #161	1340	1530	1762		59°34'	179°15'E		Intake between Obispo gray (51 1/2%) and dark greenish gray (86 1/2%).
9	T-GRAD #148	1340	1530	1762	1245	59 34	179 15		HF = 1.4 kcal/cm²/sec
9	WBBL #186					59 34	179 15		
S E P 9	CAMERA #93	1320	1500	1790		59 34	179 15		Camera 63-5 Lithograph pen film Dredge attached 20 exposures
S E P 9	PEBBLE DREDGE #26	1320	1500	1790		59 34	179 15		Biological specimens (3) — turned over to Biology
S E P 9	(CORE) NEPHCOWTR #67	1333	1532	1790		59 34	179 15		Plus-X film
S E P 9	CORE CAMERA #80	1333	1532	1790		59 34	179 15		Lithograph pen film 0 exposures — core head buried — trigger line broke

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PALISADES

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CRUISE N° V21

CRUISE LEG—From Adak To Dutch Harbor

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
S	SP	1710	1744			57°30'	179°50'	E	
F									
P									
8									
S	MPS	1755	1810			57°30'	179°50'		
E									
P									
8									
S	BT	1750				57°30'	179°50'		
E									
P									
8									
S	CAMERA	1525	1715	2030		57°30'	179°50'		Camera 63-5
E	#92								Liveograph pan film
P									Reel 2 drage attached
8									20 hits - 13 exposures (hydroline tangled in drage release mechanism)
S	REBBLE	1525	1715	2030		57°30'	179°50'		No sample
E	DREDGE								
P	#25								
8									
S	(CORE)	1537	1751	2030		57°30'	179°50'		Plus-X film
E	NEPHROMETER								
P	#66								
8									
S	CORE	1537	1751	2030		57°30'	179°50'		Liveograph pan film
E	CAMERA								12 exposures
P	#35								
8									

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From Adak To Dutch Harbor

TIME ZONE Z+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <u>N</u>	Long. <u>W</u>		
S	CORE	1631	1829	2022		55° 24'	177° 11'	W	Lithograph pan film
E	CAMERA								
P	# 34								
7									
S	T-GRAD	1550	1800	2030	2032	57° 30'	179° 50'	E	HF \pm 2.0 kcal/cm ² /sec
E	#147								
P									
T									
8									
Sept 8	CORE	1550	1800	2030	2032	57° 30'	179° 50'	E	Soft dark greenish gray (56Y4/1) tuffite.
	#160								
Sept 8	WBBL					57° 30'	179° 50'	E	
	185								
S	SP	1641	1711			55° 24'	177° 11'	W	
E									
P									
7									
S	MPS	1843	1858			55° 24'	177° 11'	W	
E									
P									
7									
S	BT	1840				55° 24'	177° 11'	W	
E									
P									
7									

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PALISADES

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Adak To Dutch Harbor

TIME ZONE 2+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Sept 6	CORE #158	2040	2330	2006	2007	53°22'	176° 11'		Core is an light olive gray (5Y ⁵ / ₂) lutite with a thin (17cm) moderate brown top unit. Some sandy areas are found.
Sept 6	T-GRAD 145	2040	2330	2006	2007	53°22'	176° 11'		Two probes in - both torn off
Sept 7	CORE #159	1630	1845	2020	2022	55°24'	177° 11'		grayish olive lutite.
Sept 7	T-GRAD #146	1630	1845	2020	2022	55°24'	177° 11'		HF = 1.8 meq/cm ² /sec
S E P 7	CAMERA #91	1615	1815	2022		55°24'	177° 11'	Camera 63-5 Livingston pan film Dredge attached	20 hits - 11 exposures Film transports too fast on camera # 63-5.
S E P 7	PEBBLE DREDGE KO-24	1615	1815	2022		55°24'	177° 11'		NO SAMPLE
S E P 7	CORE NEPHELOMETER #65	1631	1829	2022		55°24'	177° 11'		Livingston pan film

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PALISADES

Research Vessel VEMA

CRUISE N° 21

CRUISE LEG—From ADAK To DUTCH HARBOR

180.

TIME ZONE +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
S E P	SP	2133	2235			53° 22'	176° 11'		
6									
S E P	MPS	2245	2257			53 22	176 11		
6									
S E P	BT	2245				53 22	176 11		
6									
S E P	CAMERA # 90	2018	2222	2005 RWS		53 22	176 11		Camera 63-5 Lithograph from film dredge attached 21 exposures - 201 hits
6									
S E P	PEBBLE DREDGE KD-23	2018	2222			53 22	176 11		No sample
6									
S E P	(CORE) NEPHELO- METER #64	2015	2250			53 22	176 11		Lithograph from film
6									
S E P	CORE CAMERA # 33	2015	2250			53 22	176 11		Lithograph from film
6									

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PALISADES

Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Manila To Adak

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TIME ZONE Z-12

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
S	SP	1955	2025			55°05'17.2" N	177°00'00" E		
E						54°39'17.7" N	177°00'00" E		
P									
I									
S	MPS	2037	2050			55°05'17.2" N	177°00'00" E		
E						54°39'17.7" N	177°00'00" E		
P									
I									
S	BT	2000				55°05'17.2" N	177°00'00" E		
E						54°39'17.7" N	177°00'00" E		
P									
I									
S	CORE					54°39'17.7" N	177°00'00" E		
E	#157								
P									
T									
I									
S	T-GRAD	1922	2020	615	619	54°39'17.7" N	177°00'00" E		HF = 1.5 kcal/cm ² /sec
E	#144								
P									
T									
I									
S	(CORE)	1922	2003	615		54°39'17.7" N	177°00'00" E		Lithograph pan
E	NEPHELOM								
P	#63								
I									
S	CORE	1922	2003	615		54°39'17.7" N	177°00'00" E		Lithograph pan
E	CAMERA								27 exposures
P	#32								
I									

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PALISADES

Research Vessel YEMA
CRUISE N° V21
CRUISE LEG—From

Manila To Adak

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TIME ZONE 2-12

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <u>N</u>	Long. <u>E</u>		
S	CORE	1339	1532	1690		55°05'	176°20'		Lithograph from P. 144
G	CAMERA								
P	#31								
I									
A	SP	1230	1300			57°47'	172°08'		
V									
G									
31									
A	MPS	1243	1256			57°47'	172°08'		
V									
G									
31									
A	BT	1245				57°47'	172°08'		
V									
G									
31									
S	SP	1434	1504			55°05'	176°20'		
E									
P									
T									
I									
S	MPS	1459	1510			55°05'	176°20'		
E									
P									
I									
S	BT	1450				55°05'	176°20'		
E									
P									
I									

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Manila To Adak

TIME ZONE 2-12

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	(CORE)	1157	1316		1620	57° 47'	172° 08'		Libograph pan film
V	NEPHELOMETER								
G	#61								
31									
R	CORE	1157	1316		1620	57° 47'	172° 08'		Libograph pan film
V	CAMERA								
G	#30								
31									
Sept 1	LAL	1145				55 18	176 05		
	#183								
Sept 1	CORE					55 05	176 20		
	#156								
Sept 1	WBBH					55 05	176 20		
	#184								
Sept 1	CORE	1345	1535	1690	1840	55 05	176 20		HF = 1.0 kcal/cm ² /sec
	#143								
	T-Grad								
S	(CORE)	1339	1532	1690		55 05	176 20		Libograph pan film
E	NEPHELO-								
P	METER								
1	#62								

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CRUISE LEG—From Manila

To Adak

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TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
AUG 30	CORE #154					58° 06'	169° 37'		
	T-GRAB 141	2310	0200	1802	1798	58° 06'	169° 37'		H F = 1.6 kcal/cm ² /sec
# LAZ 182						58° 06'	169° 37'		
A U G 30	(CORE) NEPHELOTRON #60					58° 06'	169° 37'		Lithograph from film
A U G 30	CORE CAMERA #29					58° 06'	169° 37'		Time Adv. From 2-11 to 2-12. Lithograph from film
AUG 31	CORE 155	1200				57° 47'	172° 08'		
AUG 31	T-GRAB #142	1200	1330	1620	1620	57° 47'	172° 08'		H F = 1.2 kcal/cm ² /sec

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CRUISE N° V21
CRUISE LEG—From

Manila To Adak

TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CORE	1227	1415			57°21'	168 19		Lithograph from film
V	CAMERA								came head buried in mud - 0 exposures
6	#28								
30									
A	SP	1318	1403			57 21	168 19		
V									
G									
30									
A	MPS	1412	1426			57 21	168 19		
V									
G									
30									
A	BT	1410				57 21	168 19		
V									
G									
30									
A	SP	2325	2355			58 06	169 37		
V									
G									
30									
A	MPS	2330	2348			58 06	169 37		
V									
G									
30									
A	BT	2330				58 06	169 37		
V									
G									
30									

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PALISADES

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Manila To Hdak

TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	SP	1905	1950			55° 47'	165° 39'		
U									
G									
29									
A	MPS	1943	1943			55 47	165 39		
U		1928							
G									
29									
A	BT	1910				55 47	165 39		
U									
G									
29									
AVG	CORE					57 21	168 19		
30	#153								
AVG	WCBK					57 21	168 19		
30	182								
AVG	T-GRAD	1225	1430	1910	1900	57 21	168 19		HF 3 1.6 secal / uniz / sec
30	#140								
A	(CORE)	1227	1415			57 21	168 19		Linograph pen film
U	NEDELOWIR								
G	#59								
30									

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PALISADES

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CRUISE N° V21

CRUISE LEG—From Manila To Adak

TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
A	CORE	1448				52° 16'	163° 38'		Linograph pen R. m
V	CAMERA	1722							2.3 exposures
G	# 26								
28									
A	T-GRAD	1450	1725	2650	2703	52 16	163 38		HF = 1.8 kcal/cm ² /sec 33
V	#138								
G									
28									
AVG	CORE					55° 47'	165° 39'		
29	#152								
A	T-GRAD	1825	2010	1768	1767	55 47	165 39		HF = 3.0 kcal/cm ² /sec
V	#139								
G									
29									
	WBL					55 47	165 39		
A	#180								
V									
G									
29									
A	(CORE)	1820	2014			55 47	165 39		Linograph pen
V	NEPHELOMTR								
G	#58								
29									
A	CORE	1820	2014			55 47	165 39		Linograph pen
V	CAMERA								24 exposures
G	# 27								
29									

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CRUISE N° V21

CRUISE LEG—From

Manila To Halak

TIME ZONE

2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	PEBBLE	1000	1218	2940	Swg	48° 00'	162° 01'		One small igneous rock, well rounded.
U	DREDGE								
G	# 22								
27									
A	SP	1543	1613			52 16	163 30		
U									
G									
28									
A	MPS	1526	1538			52 16	163 30		
U									
G									
28									
A	BT	1600				52 16	163 30		
U									
G									
28									
AVG	CORE					52 16	163 30		
28	# 151								
AVG	WBB L					52 16	163 30		
28	170179								
A	(CORE)	1448	1722			52 16	163 38		Lithograph par.
U	NEPHELOMETER								
G	# 57								
28									

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CRUISE N° V21
CRUISE LEG—From Manila To Hak

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TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CORE					45° 08'	160° 28'		Linograph from film
U	CAMERA								
G	# 24								
26									
A	T-GRAD	1015	1300	2940	2885	48 00	162 01		H F = 1.6 secal/cm ² /sec
G	#137								
G	WOL 478								
27	CORE								
	#150								
A	SP	1055	1125			48 00	162 01		
U									
G									
27									
A	MPS	1240	1253			48 00	162 01		
U									
G									
27									
A	BT	1245				48 00	162 01		
U									
G									
27									
A	(CORE)	1012	1256	2940	PWS.	48 00	162 01		Linograph from film
U	NEPHELO-								
G	METER								
27	#56								
A	CORE	1012	1256	"		48 00	162 01		Linograph from film
U	CAMERA								strobelight did not work
G	# 25								
27									

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CRUISE N° V21

CRUISE LEG—From

Manila To Adak

TIME ZONE Z-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	SP	1259	1329			42° 05	160 36		
U									
G									
25									
A	MPS	1331	1348			42 05	160 36		
U									
G									
25									
A	BT	1320				42 05	160 36		
U									
G									
25									
A	SP	1210	1241			45 08	160 28		
U									
G									
26									
A	MPS	1239	1254			45 08	160 28		
U									
G									
26									
A	BT	1245				45 08	160 28		
U									
G									
26									
A	Nephelometer					45 08	160 28		Lithograph from R. L. H.
U	#55								
G									
26									

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CRUISE N° V21

CRUISE LEG—From Manila To Adak

TIME ZONE Z11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CAMERA	1025	1230	2875	Rms	42°05'	160 36		Livograph pan film 21 hits — 5 useless exposures } Trouble found for K-89 and previous land camera stations. Small leak in lens area on wide angle camera. See notes and log.
U	#89								
G									
25									
A	PEBBLE	1025	1230	2900		42 05	160 36		plutonic ice-walled rocks (peridotite - basalt(?)) lumpy, small manganese nodules
U	DREDGE								
G	#21								
25									
A	(CORE)	1025	1230	2900		42 05	160 36		Livograph pan film
U	NEPHELOTR								
G	#54								
25									
A	CORE	1025	1230	2900		42 05	160 36		Livograph pan 27 exposures
U	CAMERA								
G	#23								
25									
AUG	CORE					45 08	160 28		
26	#149								
A	T-GRAD	1030	1350	2878	2917	42 05	160 36		Recorder failed
U	#135								
G									
25									
A	T-GRAD	1105	1410	2985	3013	45 08	160 28		Bottom probe town off.
U	#136								
G									
26									

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CRUISE N° V21

CRUISE LEG—From Manila To Adak

TIME ZONE 2-11

[illegible]

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Research Vessel VEMA

CRUISE N° 21

CRUISE LEG From MANILA To AORAK

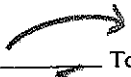
TIME ZONE -11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CORE	2133	2317			37° 41'	163° 02'		Lithograph pen Rlm O exposures - core head buried in mud & Rlm failed to transport.
U	CAMERA								
G	21								
23									
A	CORE	1410	1700	2815	2795	33° 29'			
U	#147					39° 33'	162° 05'		
G									
24									
A	WGBL					39° 33'	162° 05'		
U	176								
G									
24									
A	T-GRAD	1410	1700	2815	2795	39° 33'	162° 05'		HF = 1.2 secal/cm ² /sec
U	134								
G									
24									
A	SP	1605	1635			39° 33'	162° 05'		
U									
G									
24									
A	MPS	1652	1703			39° 33'	162° 05'		
U									
G									
24									
A	BT	1600				39° 33'	162° 05'		
U									
G									
24									

Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From

Adak  To Manila

TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	T-6 RAD	2130	2320	2074	2078	37° 41'	163° 02'		HF 3 1.0 meal / cm ² / sec
U	#133								
G									
23									
AVG	CORE	2130	2320	2074	2078	37° 41'	163° 02'		
23	#146								
AVG	LAZ	1050				37° 41'	163° 02'		
23	#175								
A	SP	2244	2316			37° 41'	163° 02'		
U									
G									
23									
A	MPS	2250	2305			37° 41'	163° 02'		
U									
G									
23									
A	BT	2300				37° 41'	163° 02'		
U									
G									
23									
A	(CORE)	2333	2317			37° 41'	163° 02'		Lithograph from film
U	NEPHELOMETER								
G	#52								
23									

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CRUISE N° V21

CRUISE LEG—From Manila To Adak

TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
<u>Aug</u> <u>22</u>	<u>WOB</u> <u>174</u>					<u>34° 03'</u>	<u>164° 50'</u>		
<u>Aug</u> <u>22</u>	<u>TCRAD</u> <u>132</u>	<u>1840</u>	<u>2200</u>	<u>3240</u>	<u>3239</u>	<u>34 03</u>	<u>164 50</u>		<u>HF = 16 meal / cm² / sec</u>
<u>A</u> <u>U</u> <u>G</u> <u>22</u>	<u>SP</u>	<u>2056</u>	<u>2155</u>			<u>34 03</u>	<u>164 50</u>		
<u>A</u> <u>U</u> <u>G</u> <u>22</u>	<u>MPS</u>	<u>2144</u>	<u>2156</u>			<u>34 03</u>	<u>164 50</u>		
<u>A</u> <u>U</u> <u>G</u> <u>22</u>	<u>BT</u>	<u>2140</u>				<u>34 03</u>	<u>164 50</u>		
<u>A</u> <u>U</u> <u>G</u> <u>22</u>	<u>CAMERA</u> <u># 87</u>	<u>1834</u>	<u>2120</u>	<u>3239</u>	<u>Plus</u>	<u>34 03</u>	<u>164 50</u>		<u>Lino-graph from film</u> <u>21 hits - 27 exposures</u> } <u>trigger weight hanging up (?)</u> <u>Photos blurred.</u>
<u>A</u> <u>U</u> <u>G</u> <u>22</u>	<u>PEBBLE</u> <u>DREDGE</u> <u>KO-19</u>	<u>1834</u>	<u>2120</u>	<u>3234</u>		<u>34 03</u>	<u>164 50</u>		<u>lumpy manganese nodules</u>

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CRUISE N° V21

CRUISE LEG-From Manila To Adak

TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	MPS	1609	1620			32 41	160 01		
U									
G									
ZI									
A	BT	1730				32 41	160 01		
U									
G									
ZI									
A	CAMERA	1403	1530	2618	ParMans	32 41	160 01		Livograph pan film - pebble dredge all at once
U	# 86								2 hits - camera brought up due to bad wire angle
G									
ZI									
A	PEBBLE	1403	1530	2618		32 41	160 01		No sample
U	DREDGE								
G	# RD-18								
ZI									
A	CORE	1410	1735			32 41	160 01		Livograph pan film
U	NEPHELOMETER								
G	# 51								
ZI									
A	CORE	1410	1735			32 41	160 01		Livograph pan film
U	CAMERA								0 exposures - came head buried
G	# 20								
ZI									
A	CORE					34 03	164 50		
U	# 145								
G									
ZI									

Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Manila To Adak

TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	PEBBLE	2015	2155	1933		31° 51'	157° 20'		Manganese nodules and pumice fragments
U	DREDGE								
G	#(KD)-17								
20									
A	(CORE)	2022	2201	1933		31 51	157 20		Lithograph from film
U	NEPHELOMETER								
G	# 50								
20									
A	CORE	2022	2201	1933		31 51	157 20		Lithograph from film
U	CAMERA								
G	# 19								
20									
AUG	CORE	1415	1745	2615	2622	32 41	160 01		greenish orange (10/12 7/14) manganese lenticles.
21	#145								
AUG	NOBL					32 41	160 01		
21	173								
AUG	T-GRAP	1415	1745	2615	2622	32 41	160 01		HF = 1.2 kcal/cm ² /sec
21	#131								
A	SP	1638	1709			32 41	160 01		
U									
G									
21									

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CRUISE LEG—From Manila To Adak

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TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	MPS	2218	2230			31° 51'	157° 20'		
U									
G									
20									
A	BT	2200				31 51	157 20		
U									
G									
20									
A	(CORE)	1155	1304			31 35	156 25		Lithograph pen film
U	NEPHELO-								
G	METER								
20	# 49								
A	CORE	1155	1304			31 35	156 25		Lithograph pen film
U	CAMERA								
G	# 18								
20									
AUG	CORE					31 51	157 20		white calcareous. with fragments of manganese nodules and chert.
20	# 143								
A	T-GRAD	2020	2230	1932	1923	31 51	157 20		No penetration
U	# 130								
G									
20									
A	CAMERA	2015	2155	1933	Purs	31 51	157 20		Lithograph pen film
U	# 85								22 hits - 21 exposures
G									
20									

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CRUISE N° V21

CRUISE LEG—From Manila To Adak

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TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
AUG 20	CORE #142					31° 35'	156° 25'		
AUG 20	WBBL #172					31° 35'	156° 25'		
AUG 20	T-GRAD #129	1200	1425	2275	2262	31° 35'	156° 25'		HF \approx 1.4 kcal/cm ² /sec
AUG 20	SP	1303	1333			31° 35'	156° 25'		
AUG 20	MPS	1219	1236			31° 35'	156° 25'		
AUG 20	BT	1400				31° 35'	156° 25'		
AUG 20	SP	2124	2154			31° 51'	157° 20'		

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TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	MPS	1820	1832			30 48	154 04		
V									
G									
19									
A	BT	1730				30 48	154 04		
V									
G									
19									
A	CAMERA	1520	1756	3130	Rws.	30 48	154 04		Livograph - pan film
V	# 84								Pebble dredge attached
G									21 hits - 7 exposures (possible that trigger weight
19									and drag line tangled)
A	PEBBLE	1520	1756	3130		30 48	154 04		Pumice fragments coated with manganese
V	DREDGE								
G	#(KD)-16								
19									
A	(CORE)	1526	1834	3130		30 48	154 04		Livograph pan film
V	NEPHELO-								
G	METER								
19	# 48								
A	CORE	1526	1834	3130		30 48	154 04		Livograph pan film
V	CAMERA								29 exposures
G	# 17								
19									
A	T-GRAD	1530	1900	3110	3080	30 48	154 04		HF \approx 2.0 mol/cm ² /sec
V	#128								
G									
19									

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CRUISE N° V21

CRUISE LEG—From Manila To Adak

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TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CAMERA	1530	1745	3130	Pattern	28° 33'	146° 53'		Lithograph from film
V	#83								21 hrs - 2 exposures
G									Pebble dredge attached
17									
A	PEBBLE	1530	1745	3130		28° 33'	146° 53'		Attached to camera
V	DREDGE								5 pumice fragments
G	#(K1)-15								
17									
A	(CORE)	1535	1843	3130		28° 33'	146° 53'		Lithograph from film
V	NEPHELO-								
G	METER								
17	#47								
A	CORE	1535	1843			28° 33'	146° 53'		Lithograph from film
V	CAMERA								0 exposures - core head buried in mud
G	#16								
17									
AUG	CORE	1530	1900	3110	3080	30° 48'	154° 04'		
19	#141								
AUG	WBB 4					30° 48'	154° 04'		
19	171								
A	SP	1629	1659			30° 48'	154° 04'		
V									
G									
19									

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CRUISE N° V21

CRUISE LEG—From Manila To Adak.

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2-10

TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
A	CORE	2048	2343	3130	3147				Lithograph pen film
U	CAMERA					27°47'	144°10'		
G	15								No exposures: trigger magnet jammed shot
16									at surface, and all pictures taken before covering
									Time Adv. From 2-9 to 2-10
A	SP	1742	1812			28 33	146 53		
U									
G									
17									
A	MPS	1814	1831			28 33	146 53		
U									
G									
17									
A	BT	1815				28 33	146 53		
U									
G									
17									
AVC	CORE	1540	1850	3130	3147	28 33	146 53		moderate yellowish brown silt. Several
17	#140								tiny lumps.
AVC	WBBd					28 33	146 53		
17	170								
A	T-6 RAD	1540	1850	3130	3147	28 33	146 53		HF \approx 1.6 kcal/cm ² /sec
U	#127								
G									
17									

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CRUISE N° V21

CRUISE LEG—From

Manila To Adak

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CORE	1557	1830			24°38'	136°56'		Lithograph pan film
U	CAMERA								20 exposures
G	#13								
M									
A	T-6 RAD	2050	2345	3180	3179	27 47	144 10		
U	#126								
G									
16									
A	SP	2215	2252			27 47	144 10		
U									
G									
16									
A	MPS	2138	2149			27 47	144 10		
U									
G									
16									
A	BT	2315				27 47	144 10		
U									
G									
16									
AUC	CORE	2050	2345	3180	3179	27 47	144 10		
16	#139								
A									
U	(CORE)	2048	2343	3180	3179	27 47	144 10		8 Lithograph pan film
G	NEEHELO-								
16	METER								
	#46								

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CRUISE N° V 21

CRUISE LEG—From Manila To Adak

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	CAMERA	1237	1430	2348 fms		26° 02'	139° 29'		Liveograph run — dredge attached 16 h/b — 20 exposures (4 accidental)
V	#82								
G									
15									
A	PEBBLE	1237	1430	2348		26 02	139 29		no sample
V	DREDGE								
G	(KO) - 14								
15									
A	(CORE)	1040	1258			26 02	139 29		Liveograph run
V	NEPHELO-								
G	METER								
15	# 45								
A	CORE	1040	1258			26 02	139 29		Liveograph run — core head buried in mud — no pictures
V	CAMERA								
G	# 14								
15									
A	CAMERA	1540	1805			24 30	136 56		Liveograph run
V	#81								
G									
14									
A	PEBBLE	1540	1805			24 30	136 56		5 pumice fragments
V	DREDGE								
G	KY-13								
14									
A	(CORE)	1557	1830			24 30	136 56		Liveograph run film
V	NEPHELO-								
G	METER								
14	# 44								

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CRUISE N° V21
CRUISE LEG—From

Manila To Adak

154
TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	BT	1815				24 38	136 56		
U									
G									
14									
A	T-GRAD	1600	1845	2740	2641	24 38	136 56		HF \approx 1.8 kcal/cm ² /sec
U	#124								
G									
14									
AWG	CORSE	1600	1845	2740	2641	26 02	139 59		moderate yellowish brown silt.
15	#138								
	WDBL					26°02'	139°59'		
	169								
A	SP	1200	1230			26 02	139 59		
U									
G									
15									
A	MPS					26 02	139 59		
U									
G									
15									
A	BT	1345				26 02	139 59		
U									
G									
15									
A	T-GRAD	1039	1300	2370	2354	26 02	139 59		HF \approx 2.6 kcal/cm ² /sec
U	#125								
G									
15									

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CRUISE N° V21

CRUISE LEG—From

Manila To Adak

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2-8

TIME ZONE

2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
A	PEBBLE	1745	1955			23° 27'	134° 04'		Sample: 1 pumice pebble
U	DREDGE								
G	#(KD)-12								
B									
A	(CORE)	1802	2037			23° 27'	134° 04'		Lithograph from film
U	NEPHELO-								
G	METER								
B	# 43								
A	CORE	1802	2037			23° 27'	134° 04'		Lithograph from film
U	CAMERA								21 exposures
G	# 12								
B									
Aug	CORE					24° 30'	136° 56'		Time Adv. From 2-8 to 2-9.
14	#137								
Aug	WBC					24° 30'	136° 56'		
14	#168								
A	SP	1815	1844			24° 30'	136° 56'		
U									
G									
14									
A	MPS	1823	1835			24° 30'	136° 56'		
U									
G									
14									

Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Hi Manila To Adak

152
TIME ZONE 2-0

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
Aug 13	CORE #136	1805	2045	2676	2679	23 27	134 04		
Aug 13	WABK #167					23 27	134 04		Particulate matter processed.
A ✓ G 13	SP	1934	2004			23 27	134 04		
A ✓ G 13	MPS	2014	2025			23 27	134 04		
A ✓ G 13	BT	1945				23 27	134 04		
A ✓ G 13	T-6rad #123	1805	2045	2676	2679	23 27	134 04		HF = 1.8 kcal/cm ² /sec
A ✓ G 13	CAMERA #80	1754	1955			23 27	134 04		Linagraph pan film / Note: Exposures slightly blurred— 22 hits—22 exposures / condensation on lens (?)

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CRUISE N° V21

CRUISE LEG—From Manila To Adak

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TIME ZONE 2-8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
Aug 12	WBBL #165					21° 28'	130° 03'		processed for C ₁₄ & particulate matter.
Aug 13	LAZ #166	0943	1057			22° 46'	132° 50'		70 gullies processed.
Aug 12	SP	1529	1600			21° 28'	130° 03'		
Aug 12	MPS	1510	1521			21° 28'	130° 03'		
Aug 12	BT	1600				21° 28'	130° 03'		
Aug 12	(CORB) NEPHELO- METER #42	1345	1640			21° 28'	130° 03'		Linagraph pan film Note: plexiglass light bowl cracked badly after lowering. caused erratic deflection of light.
Aug 12	CORB CAMERA #11	1345	1640			21° 28'	130° 03'		Linagraph pan film 19 exposures

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CRUISE N° V21

CRUISE LEG—From Manila To Adak

TIME ZONE 2-8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	MPS	1555	1609			20 43	126 23		
U									
G									
11									
A	BT	1530				20 43	126 23		
U									
G									
11									
A	CAMERA	1340	1532	2760	Pms	20 43	126 23		Livograph pan film
U	# 79								20 hits - 12 exposures (trigger weight became
G									hung up after hit # 12)
11									
A	(CORE)	1339	1623	2760		20 43	126 23		Livograph pan film
U	ALPHELO-								
G	METER								
11	# 41								
A	CORE	1334	1623	2760		20 43	126 23		Livograph pan film
U	CAMERA								20 exposures
G	# 10								
11									
A	T Grad	1350	1650	3022	3135	21 28	130 03		H F = 1.8 kcal/cm ² /sec
U	# 122								
G									
12									
AUG	CORE	1350	1650	3022	3135	21 28	130 03		
12	# 135								

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CRUISE N° V21

CRUISE LEG—From

Manila

To

Adak

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TIME ZONE

2-8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	BT	1130				18° 57'	122° 23'		
U									
G									
10									
A	T-6006	1050	1200	850	1037	18 57	122 23		
G	#120								
G									
10									
Aug	LAZ	0103	0206			19 54	124 19		
11	#163								
Aug	CORE	1340	1615	2760	2810	20 43	126 23		
11	#134								
Aug	T-GRAD	1340	1615	2760	2810	20 43	126 23		
11	#121								
Aug	WABL					20 43	126 23		
11	#164								
A	SP	1436	1506			20 43	126 23		
U									
G									
11									

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PALISADES

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CRUISE N° V21
CRUISE LEG From Manila To Adak

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TIME ZONE 2-8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	Laz	0925	1015			17° 22'	118° 56'		
U	162								
G									
9									
AUG	LORÉ	1049				18 57	122 23		
10	#133								
AUG	CAMERA	1140	1245	1030	fms	18 57	122 23		Lithograph pan
10	#78								12 hits - 11 exposures
A	CAMERA	1140	1245	1030		18 57	122 23		No sample - Pebble dredge attached to camera
U	DREDGE								No actual dredging done due to lack of time
G	#11								
10									
A	NEPHELO-	1050	1144	890	fms	18 57	122 23		Lithograph pan film
U	METER								Nephelometer suspended in core hole
O	#40								
10									
A	CORE	1050	1144	990		18 57	122 23		Lithograph pan film
U	CAMERA								15 exposures
G									
W									
A	SP	1134	1204			18 57	122 23		
U									
G									
10									

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PALISADES

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CRUISE N° V21

CRUISE LEG—From Manila To Hdak

147

TIME ZONE 2-0

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	BT	1640				15° 11'	119° 22'		
V									
G									
G									
A	T-6 grad	1456	1615	1410	1378	15 11	119 22		
V	#119								
G									
G									
AUG	LAZ	0925	1016			17 22	118 56		haz pump reaching @ start 15726 gal @ finish 15776 gal processed 50 gal - from haze pump. particulate matter deposited until Berry Allen (Biologist).
9th	#162								
A	CAMERA	1447	1610	1395		15 11	119 22		Lithograph pan film attached dredge 20 hits - 19 exposures
V	#77								
G									
G									
A	PEBBLE	1447	1610	1395		15 11	119 22		Dredge attached to camera No sample
V	DREDGE								
G	X(KO) 10								
G									
A	(CORE)	1445	1610	1395		15 11	119 22		Lithograph pan film
V	NEPHELOMTR								
G	#39								
G									
A	CORE	1445	1610	1395		15 11	119 22		Lithograph pan film String which triggers camera broke during descent. Camera did not trigger. No pictures.
V	CAMERA								
G	#8								
G									

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Manila To Adak

TIME ZONE 2-8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	(CORE)	1810	1930	1890		16° 03'	119° 06'		Lithograph pan film
U	NEPHELOMETER								
G	# 38								
S									
A	CORE	1810	1930	1890 fms		16 03	119 06		Lithograph pan film
U	CAMERA								21 exposures
G	# 7								
S									
A	SP	1942	2012			16 03	119 06		
U									
G									
S									
A	MPS	2028	2043			16 03	119 06		
U									
G									
S									
A	BT	2050				16 03	119 06		
U									
G									
S									
A	SP	1610	1640			15 11	119 22		
U									
G									
S									
A	MPS	1633	1645			15 11	119 22		
U									
G									
S									

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PALISADES

Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From Manila To Adak

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TIME ZONE 2-8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	SP	1032	1102			16° 00'	117° 55'		
V									
G									
S									
A	MPS	1130	1141			16° 00'	117° 55'		
V									
G									
S									
A	BT	1115	1130			16° 00'	117° 55'		
V									
G									
S									
AVG	CORE	1805	1945	1940	1857	16 03	119 06		Total length 1031 cm. Core is a greenish gray silt. A 10 cm. pale yellowish brown unit at top.
S	#131								
A	T-Grade	1805	1945	1940	1857	16 03	119 06		
V	#118								
G									
S									
A	CAMERA	1885	1820	1840 P.M.		16 03	119 06		Lithograph from film
V	#76								24 hits, 33 exposures — accidental hits during trawling
G									
S									pebble dredge attached
A	PEBBLE	1825	1820			16 03	119 06		Attached to camera
V	DREDGE								no sample
G	#9								
S									

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PALISADES

Research Vessel *VEMA*

CRUISE N° *✓ 21*

CRUISE LEG—From *Manila* To *Adak*

144

TIME ZONE *2-0*

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
<i>A</i>	<i>NEPHELO-</i>	<i>1608</i>	<i>1804</i>	<i>1490</i>		<i>16° 26'</i>	<i>119° 26'</i>		<i>Livingograph pan film</i>
<i>U</i>	<i>METER</i>								
<i>G</i>	<i># 36</i>								
<i>4</i>									
<i>A</i>	<i>CORE</i>	<i>1608</i>	<i>1804</i>	<i>1490</i>		<i>16° 26'</i>	<i>119° 26'</i>		<i>Livingograph pan film</i>
<i>U</i>	<i>CAMERA</i>								<i>Note: "A" will be used to designate CK stations of this series.</i>
<i>G</i>	<i># 14</i>								<i>No exposures — core head buried in mud</i>
<i>4</i>	<i># 5</i>								
<i>AVG</i>	<i>CORE</i>					<i>16° 00'</i>	<i>117° 55'</i>		
<i>5</i>	<i># 130</i>								
<i>A</i>	<i>CORE</i>	<i>0919</i>	<i>1100</i>	<i>2170</i>	<i>Pms</i>	<i>16 00</i>	<i>117 55</i>		<i>Livingograph pan film</i>
<i>U</i>	<i>CAMERA#</i>								<i>Note: — core head buried in mud</i>
<i>G</i>	<i># 6</i>								
<i>5</i>									
<i>A</i>	<i>CORE</i>	<i>0919</i>	<i>1100</i>	<i>2170</i>		<i>16 00</i>	<i>117 55</i>		<i>Livingograph pan film</i>
<i>U</i>	<i>NEPHELOMETER</i>								
<i>G</i>	<i># 37</i>								
<i>5</i>									
<i>A</i>	<i>CAMERA</i>	<i>0913</i>	<i>1100</i>	<i>2170</i>		<i>16 00</i>	<i>117 55</i>		<i>Livingograph pan film</i>
<i>U</i>	<i># 75</i>								<i>dredge attached</i>
<i>G</i>									<i>23 hits — 37 exposures: Hits taken at 1 minute intervals, so some exposures are close-ups of mud or water only</i>
<i>5</i>									
<i>A</i>	<i>PEBBLE</i>	<i>0913</i>	<i>1100</i>	<i>2170</i>		<i>16 00</i>	<i>117 55</i>		<i>No sample /</i>
<i>U</i>	<i>DREDGE</i>								<i>dredge attached to camera</i>
<i>G</i>	<i># 8</i>								
<i>5</i>									

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Research Vessel VEMA
CRUISE N°
CRUISE LEG—From To

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TIME ZONE 2-8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
A	PEBBLE	0931	1145	2222	Fms.	16° 12'	118° 31'		Notes: ① "A" will be used to designate KD stations in this series, to distinguish from previous pebble dredge stations. ② KD-6 brought no sample because dredge wire became entangled in hydrowire. Dredge attached to bottom camera. (KD = camera Dredge).
V	DREDGE								
G	#11								
2	#6								
AUG	CORE					16° 26'	119° 25'		
4	#129								
A	SP	1737	1807			16 26	119 25		
V									
G									
4									
A	MPS	1846	1900			16 26	119 25		
V									
G									
4									
A	BT	1845							
V									
G									
4									
A	CAMERA	1630	1810	1490	fathoms	16 26	119 25		Lithograph ram Film
V	#74								
G									
4									
A	PEBBLE	1630	1810	1490		16 26	119 25		No sample, although dredge released properly
V	DREDGE								
G	#7								
4									

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CRUISE N° 21

CRUISE LEG—From MANILA To ADOAK

142.

TIME ZONE - 8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
Aug 2	CORE #128	0934	1315	2224	2235	16° 12'	118° 31'		Total core : 1332 cm. Good core : 684 cm. Core is predominantly a greenish gray (56% ¹) slightly silty lutite. Many buff layers are found.
Aug 2	T-GRAB #117	0940		2224	2235	16° 12'	118° 31'		Recorder filled with water
A V G X 2	SP	1124	1159			16° 12'	118° 31'		
A V G X 2	MPS	1252	1302			16° 12'	118° 31'		
A V G X 2	BT	1030				16° 12'	118° 31'		
A V G X 2	W.B.B.L #161					16° 12'	118° 31'		
A V G X 2	CAMERA #73	0931	1145	2222	2235	16° 12'	118° 31'		Linaograph pan film Rubble Dredge attached 23 hits — 21 exposures
									Note: Dredge became tangled in hydrowire — no sample.

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CRUISE LEG—From .

Maha To Manila

TIME ZONE 2-8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J V L 24	SP	2325	2357			12 55	126 13		
J V L 24	MPS	2306	2318			12 55	126 13		
J V L 24	BT	2345				12 55	126 13		
J V L 25	SP	0843	0915			13 02	125 40		

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Naha To Manila

TIME ZONE 2-8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
JUL 21	0005 #126	0935	1155	2730	—	13° 00'	127° 03'		Manganese luteo.
23	SRP 27	0417	0910			14 19	131 07		Vema Shooting
J			0910			14 08	130 07		
U									
L									
Y	SRP 27R	1009	1440			14 08	130 05		Vema Receiving
24									
J	SRP 28	1029	1513			13 05	127 03		Vema Receiving
U			1513			12 56	127 03		Note: This is a split profile (end-to-end
L									unreversed) KM shot in and out a
Y									distance of ~ 20 miles. Passed Vema ~ 1226
J	T-6 grab	2140	0010	2886	2904	12 55	126 13		HF = 0.16 kcal/cm ² /sec.
U	#116								
L									
Y									
JUL 24	CORE	2140	0010	2886	—	12 55	126 13		luteo and bentonite gel.
	#127								
J	SP	0949	1019			12 55	126 13		
U		21	22						
L									
24									
J	BT	0945				12 55	126 13		
U		21							
L									
24									

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Naha To Manila

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2-8
TIME ZONE

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	ORE	2323	0108	2882	2912	13° 41'	128° 29'		Time Ret. From 2-9 to 2-8.
U	#125								lute and bentonite gel
L									
Y	T-6rad	2328	0115	2885	2881	13 41	128 29		HF = 1.2 kcal/cm ² /sec
23	#114								
J	SP	0000	0030			13 41	128 29		
U									
L									
24									
J	VP	0032	0115			13 41	128 29		
U									
L									
24									
J	BT	0000				13 41	128 29		
U									
L									
24									
J	T-6rad	0935	1155	2735	2696	13 00	127 03		HF = 1.4 kcal/cm ² /sec
U	#115								
L									
Y									
24									
J	SP	0949	1019			13 00	127 03		
U									
L									
24									
J	BT	0945				13 00	127 03		
U									
L									
24									

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CRUISE N° V21
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Naha To Manila

TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
July 23	T-6 vad #113	0940	1245	3052	—	14° 08'	130° 04'		HF = 1.8 mcal/cm²/sec
JULY 23	CORE #124	0940	1245	3052	OFF	14 08	130 04		Good hit! - Pullout - EASY moderate yellowish brown (10YR 5/4) lutite.
J U L 22	SP	1527	1559			14 11	131 04		
J U L 22	VP	1624	—			14 11	131 04		Wire snapped - lost net + 40 feet of wire - cause unknown
J U L 22	BT	1655				14 11	131 04		
J U L 22	SP	1115	1215			14 08	130 04		
J U L 23	BT	0930				14 08	130 04		

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J V L 22	MPS	0119	0130			15°05'	133°10'		
J V L 22	BT	0120				15°05'	133°10'		
July 22	CORE #123	1324	1615	2870		14°11'	131°04'		Manzanese crust fragments
July 22	T-Grad #112	1323	1615	2870	2849	14°11'	131°04'		HIT ROCK
J V L 22	WBBL #160	1328	1547			14°11'	131°04'		PM only. Near bottom
J V L 21	SRP 26	0755	1131			14°45'	134°24'		Vema Recovering - Palau Ridge
			1131			14°48'	134°20'		
	SRP 26R	1244	1621			14°50'	134°21'		Vema Shooting
			1621			15°27'	134°27'		
J V L 22	NEPHELO- METER #35	1321	1644	2858		14°11'	131°04'		Nephelometer #7 Linagraph pan film

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CRUISE N° V21
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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	SP	0818	0851			14° 46'	134° 22'		
U									
L									
21									
J	BT					14 46	134 22		
U									
L									
21									
July	CORE	0652	0825	1882	OFF	14 46	134 22		Pentamite gel underlain by a calcareous
21	#121								
July	T-6 rad	0652	0825	1882	—	14 46	134 22		H F = 1.4 kcal/cm ² /sec
21	#110								
July	T-6 rad	2235	0015	2507	2524	15 07	133 20		H F = 2.4 kcal/cm ² /sec
21	#111								
July	CORE	2235	0015	2507	—	15 07	133 20		Manganese sulfate
21	#122								
J	SP	0040	0110			15 07	133 20		
U									
L									
22									

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CRUISE N° V21
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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
JULY 20	CORE #120	2035	2315	2560	2660	15° 16'	135° 22'		Manganese Intell.
	WDBL #159	2043	2252	2560		15° 16'	135° 22'		PM only. Near bottom
JULY 20	T-Grad #109	2035	2305	2560	2650	15 16	135 22		HF = 8.4 kcal/cm ² /sec 88% based on one probe only
JULY 20	SRP 25	0544	0943			15 47	137 18		Vema Shooting
			0943			15 34	136 33		
JULY 20	SRP 25R	1058	1459			15 32	136 25		Vema Receiving
			1459			15 33	136 22		
JULY 20	NEPHELO-METER #384	2029	0005	2620	Battery	15 16	135 22		Nephelometer #7 Lithograph from Rilm
JULY 20	SP	2036	2107			15 16	135 22		
JULY 20	VP	2203	2248			15 16	135 22		
JULY 20	BT	2300				15 16	135 22		

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <u>N</u>	Long. <u>E</u>		
J	MPS	0138	0152			15° 53'	137° 23'		
V									
L									
20									
J	BT	0225				15 53	137 23		
V									
L									
20									
J	T-Grad	1037	1230	2310	2232	15 32	136 24		HF = 2.0 mcal/cm ² /sec
V	#108								
L									
Y									
20									
J	SP	1150	1235			15 32	136 24		
V									
L									
20									
J	MPS	1324	1336			15 32	136 24		
V									
L									
20									
J	BT	1200				15 32	136 24		
V									
L									
20									
JUL	CORE	1037	1232	2310		15 32	136 24		manganese nodules at top of an manganese
20	#119								lithol. 2 Turf layers: 134-137 cm. & 500-514 cm.

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
19	BT	0200				17° 51'	140° 56'		
J									
U									
L									
16	SRR 22	1837	2235			19 15	135 33		Vema Shooting
J			2235			19 09	136 12		
U									
L									
Y	SRP 22R	2339	0308			19 09	136 13		Vema Receiving
17			0308			19 08	136 16		
17	SRP 23	1430	1834			18 49	137 54		Vema Shooting
J			1834			19 12	138 33		
U	SRP 23R	1932	2348			19 14	138 37		Vema Receiving
L			2348			19 18	138 43		
Y									
18	SRP 24	1622	2015			18 36	140 57		Vema Shooting
J			2015			17 56	141 00		
U	SRP 24R	2117	0050			17 54	141 00		Vema Receiving
L			0050			17 54	140 58		
Y									
July 20	CORE #118	0128	0345	2690	2675	15 53	137 23		@ Pentonite gel (montmorillonite?) underlain by a lentite.
J	T-Grad #107	0120	0345	2690	2790	15 53	137 23		HF \approx 0.4 megal/cm ² /sec
U									
L									
Y									
20									
J	SP	0213	0245			15 53	137 23		
U									
L									
20									

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TIME ZONE Z-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	Loz.	0645	0800			18° 5'	139° 53'		Under way. 1 for C ¹⁴ - 1 for C ¹³ + Sr
U	#157								
L									
Y									
18									
July	CORE	2045	2325	2492	2400	17 54	140 59		Manganese luteo
18	# 117								
	117								
J	NEPHELO-	2035	2257	2470	PWS	17 54	140 59		Nephelometer #7
U	METER								Lithograph pan film
L	#33								
Y									
18									
J	T-grad	2040	2325	2491	—	17 54	140 59		HF = 2.6×10^{-6} cal/cm ² /sec
U	#106								
L									
Y									
18									
J	WBBL	2045	2255	2492		17 54	140 59		Near bottom. PM only.
U	#158								
L									
Y									
18									
12-19	SP	2352	0023			17 54	140 59		
J									
U									
L									
19	MPS	0016	0028			17 54	140 59		
J									
U									
L									

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Naha To Manila

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	CAMERA	0910		3055	Pattons	19° 24'	134° 30'		Camera 64-5
U	# 72								Hydroline parted at 3050
L									Lithograph pen film
Y									Pattons. Wire broke at reel.
16									Camera lost.
July	CORE	? NO STATION							A core was attempted but we were on
17	# 17								
									silent ship. The cable was rubbing against
									the ship. ∴ core station was cancelled.
J	SP	0250	0322			19 08	136 15		
U									
L									
17									
J	VP	0312	0321			19 08	136 15		
U									
L									
17									
J	BT	0000				19 08	136 15		
U									
L									
17									
J	SP	1954	2024			19 22	138 40		
U									
L	BT	1930							
17									
J	VP	1918	2010			19 22	138 40		
U									
L									
17									

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Research Vessel *VEMA*
CRUISE N° *V21*
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Naha To *Manila*

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TIME ZONE *Z-9*

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
15	SRP 21	0744	1215			20° 20'	131° 34'		Vema Shooting
J			1215			19 53	132 04		
U									
L									
V									Note: a short profile was shot to KM -
									Passed KM at 0805 and changed course
									to begin main profile
15	SRP 21R	1326	1726			19 50	132 07		
J			1726			19 53	132 08		Vema Receiving
U									
L									
V									
16									
J	T-Grad	0909	1145	3083	3083	19 24	134 30		HF = .4 kcal/cm ² /sec
U	#105								
L									
V									
16									
J	SP	0942	1017			20 08	131 48		
U									
L									
16									
J	MPS	1055	1108			20 02	131 55		
U									
L									
16									
J	BT	1130				19 58	131 58		
U									
L									
16									
J	CORE	0909	1145	3083	3083	19 24	134 30		Manometer broke with an altered temp
U	#116								at 308-321 cm.
L									

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	SP	1335	1405			22° 08'	130° 00'		
U									
L									
14									
J	VP	1516	1520			22° 08'	130° 00'		
U									
L									
14									
J	SP	1330	1400			19° 52'	132° 08'		
U									
L									
15									
J	VP	1300	1309			19° 52'	132° 08'		
U		1728	1732						
L									
15									
J	BT	1315				19° 52'	132° 08'		
U									
L									
15									
J	T-Grad	1300	1600	3154	—	19° 52'	132° 08'		HF = 2.0 kcal/cm ² /sec
U	#104								
L									
V									
15									
July	Laz.	0700	0800			19° 28'	134° 11'		Underway 1 for C ¹⁴ . 1 for C ¹³ +S ₀ .
16	#156.								

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Naha To Manila.

TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
JULY 13	CORE #113	1316	1630	3013	PDR OFF	23° 40'	128° 17'		moderate yellowish brown (10x12 3/4) lute.
JULY 14	CORE #114	1203	1512	2990	2972	22 00	130 00		manganese lute.
J U L Y 12	Laz #154	0600	0630	3630		24 35	127 51		Centrifuge 50 gallons for Biologist
J U L Y 14	WBL #155	1212	1441	2985		22 00	130 00		Near bottom. PM only
J U L Y 14	T-6rad #103	1203	1512	2990	2978	22 00	130 00		HF = 3.6 real/cm ² /sec
J U L Y 14	NEPHELO- METER #32	1208	1508	2987	2978	22 00	130 00		Nephelometer #7 Linograph pen film
JULY 15	CORE #115	1300	1600	3134	PDR OFF	19 52	132 00		manganese lute

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CRUISE LEG From Naha To Manila

TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
J	T-6 rad	1318	1630	3013	—	23° 40'	128° 17'		HF = 1.2 kcal/cm ² /sec
U	#102								
L									
Y									
13									
11	SRP 18	0647	1117			24 30	127 33		Vema Shooting
J			1117			24 52	128 08		
U									N.S. Trench
L									
Y									
11	SRP 18R	1232	1611			24 54	128 11		Vema Receiving
J			1611			24 56	128 12		
U									N.S. Trench
L									
Y									
12	SPR 19	0804	1211			24 40	127 31		Vema Shooting
J			1211			24 10	126 50		" "
U									
L									
Y									
12	SPR 19R	1329	1705			24 17	126 56		Vema Receiving
J			1705			24 23	126 56		" "
U									
L									
Y									
13	SPR 20	0750	1255			23 56	127 58		Vema Shooting
J			1255			23 38	128 19		
U									
L									
Y									
13	SPR	1440	1911			23 40	128 19		Vema Receiving
U	20 R		1911			23 45	128 17		
U									
Y									

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CRUISE LEG—From

Naha To Manila

TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	SP	0451	0517			23 55	127 58		
V									
L									
13									
J	VP	0437	0447			23 55	127 58		
V		0721	0725						
L									
13									
J	BT	0730				23 55	127 58		
V									
L									
13									
J	T-6 read	0430	0720	3123	3151	23 55	127 58		HF \approx 1.4 kcal/cm ² /sec
V	#101								
L									
V									
13									
J	CAMERA	0430	0730	3200	Peltrop	23 55	127 58		Camera 64-5
V	#71								Livegraph pen film
L									19 hits - 9 exposures
13									Note: film transported 19 times, but strobe light worked only a times. Cannot find trouble. Deck tests perfectly normal - relays & batteries excellent.
J	SP	1347	1417			23 40	128 17		
V	BT	1315							
L									
13									
J	VP	1370	—			23 40	128 17		Lost net on core wire
V									
L									
13									

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CRUISE LEG—From .

Naha To Manila

TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
J U L 11	SP	2104	2204			24° 30	128° 31		
		2230	2300						
J U L 11	VP	2213	2243			24 30	128 31		
J U L 11	BT	2300	2315			24 30	128 31		
J U L 12	SP	1247	1317			24 17	126 55		
J U L 12	T-6 vcd #100	2045	2315	2983	2977	24 30	128 31		H F \approx 0.6 kcal/cm ² /flc
July 13	CORE #112	0430	0724	3123		23 55	127 50		Total core 1298 cm. Moderate yellowest brown (10 YR 9/4) brittle.

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CRUISE LEG—From

Naha

To

Manila

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TIME ZONE

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Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	BPS	0205	—			24 34	127 24		Net lost - cut by core wire
U									
L									
U									
J	BT	0245				24 34	127 24		
U									
L									
U									
J	SP	1209	1239			24 54	128 12		
U									
L									
U									
J	VP	1234	1246			24 54	128 12		
U		1622	1626			24 55	128 12		
L									
U									
J	BT	1215				24 54	128 12		
U									
L									
U									
U/L	CORE	2043	2315	2985		24 30	128 31		Moderate yellowish brown (10YR 5/4) siltstone.
U	# 111								total core length 569 cm.
J	CAMERA	2035	2315	2986	Photomys	24 30	128 31		Camera 64-5
U	#70								Note 30 hits - 9 exposures
L									See K-71
U									

Research Vessel VEMA
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CRUISE LEG From Naha To Manila

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
Jul 4	Core	0132	0530	3850	3850	24° 34'	127° 24'		no core: never able to hit - attempted a trench core.
11	# 110								
J	T-Grad	0132	0530	3850	3850	24 34	127 24		NO CORE - NEVER HIT - water > 4000 fms.
U	# 99								
L									
V									
11									
J	SP	0451	0524			25 10	126 56		
U		1144	1214						
L									
10									
J	VP	1202	1226			25 10	126 56		
U									
L									
10									
J	BT	1230				25 10	126 56		
U									
L									
10									
J	SP	0355	0425			25 10	126 56		
U						24 34	127 24		
L									
11									
J	MPS	0205	0227			24 34	127 24		
U									
L									
11									

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J U L 10	BT	0430				25° 44'	127° 34'		
JULY 10	CORE #109	1131	1231	1056	1048	25 10	126 56		brown top soil followed by silty beds (grayish green) Total length 598 cm.
10 J U L	SPR 17	0629	1105			25 11	127 00		Vema Shooting
			0629			25 41	127 42		
10 J U L	SPR 17R	1218	1709			25 10	126 56		Vema Receiving
			1709			25 14	126 51		
J U L 10	CAMERA #69	1120	1236	1056	Rathong	25 10	126 56		Camera 64-5 Liveograph para 01u 16 hits - 15 exposures
JULY 10	T-6 grad #97	0418	0545	1026	1020	25 44	127 34		HF \approx 2.0 kcal/cm ² /sec
J U L 10	T-6 grad #98	1130	1243	1056	1054	25 10	126 56		HF \approx 1.2 kcal/cm ² /sec

Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From

Naha

To

Tokyo

TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
<u>16</u>	<u>SPR 16</u>	<u>0704</u>	<u>1051</u>			<u>25° 24'</u>	<u>126° 59'</u>		<u>Vema Shooting</u>
<u>J</u>			<u>1051</u>			<u>26 01</u>	<u>127 11</u>		
<u>U</u>									<u>Note: Shortly after last shot (1100)</u>
<u>L</u>									<u>Vema reversed course 1 1/2 hours -</u>
<u>Y</u>									<u>until 1230 and stopped to receive</u>
<u>9</u>									
<u>16</u>	<u>SPR 16R</u>	<u>1329</u>	<u>1612</u>			<u>25 48</u>	<u>127 10</u>		
<u>J</u>			<u>1612</u>			<u>25 48</u>	<u>127 12</u>		<u>Vema Receiving</u>
<u>U</u>									
<u>L</u>									
<u>Y</u>									<u>Note: To shoot 16R KM also reversed</u>
<u>9</u>									<u>course about 1 1/2 hours from L.P.</u>
<u>J</u>	<u>CAMERA</u>	<u>1850</u>	<u>1950</u>	<u>1189</u>	<u>fathoms</u>	<u>25 36</u>	<u>127 25</u>		<u>Camera 64-5</u>
<u>U</u>	<u>#68</u>								<u>Liograph - pan film</u>
<u>L</u>									<u>and strobelight failed. Cause</u>
<u>Y</u>									<u>18 hits - 2 exposures unknown - Following station</u>
<u>9</u>									<u>(C-69) was O.K.</u>
<u>J</u>	<u>CORE</u>	<u>0419</u>	<u>0512</u>	<u>1030</u>	<u>995</u>	<u>25° 44'</u>	<u>127 34</u>		<u>Total length: 987cm. good core 374cm. Brown</u>
<u>U</u>	<u>#108</u>								<u>lute top with a gray silt lute for remainder</u>
<u>L</u>									<u>foraminiferal zones also found.</u>
<u>Y</u>									
									<u>Pullout - Moderate.</u>
<u>J</u>	<u>SP</u>	<u>0431</u>	<u>0521</u>			<u>25 44</u>	<u>127 34</u>		
<u>U</u>									
<u>L</u>									
<u>10</u>									
<u>J</u>	<u>MPS</u>	<u>0455</u>	<u>0507</u>			<u>25 44</u>	<u>127 34</u>		
<u>U</u>									
<u>L</u>									
<u>10</u>									
<u>J</u>	<u>BPS</u>	<u>0455</u>	<u>0507</u>			<u>25 44</u>	<u>127 34</u>		
<u>U</u>									
<u>L</u>									
<u>10</u>									

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Research Vessel VEMA

CRUISE N° 21

CRUISE LEG—From Naha To MANILA

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TIME ZONE -9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
July 9	CORE #106	1243	1307	368	370	25° 48'	127° 10'		NO CORE! The penetrator was only the cutting edge. The edge was mangled. The pipe slightly bowed.
July 9	CORE #107	1651	1948	1189	1190	25 36	127 25		Total core length 668cm. Good core 535cm. Penetrator 20'7". The cores top unit is a slightly silty beige colored unit. The remainder is gray & blue lutes. There is a tuffaceous layer also.
J U L 9	SP	1246	1316			25 48	127 10		
J U L 9	VP	1254	1312			25 48	127 10		
J U L 9	BT	1330	1345			25 48	127 10		
J U L 9	SP BT	2006 2010	2036			25 36	127 25		
J U L 9	MPS BPS	2026 2026	2038 2038			25 36	127 25		

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Tokyo To Naha

TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	VP	2110	2133			26° 28'	126° 09'		
L									
L									
31									
J	BT	2140				26 28	126 09		
L									
L									
31									
J	SPR 13	0850	1115			26 44	125 05		Vema Receiving
L			1115			26 46	125 10		
L									
3									
J	SPR 13R	1323	1619			26 48	125 16		Vema Shooting
L			1619			27 19	125 37		
L									
3									
J	SPR 14	1622	1937			27 20	125 37		Vema Shooting
L			1937			27 52	126 08		
L									End to End with profile 13
3									
J	SPR 15	1603	2042			25 49	125 23		Vema Shooting
L			2042			26 28	126 08		
L									
4									
J	SPR 15R	2217	0056			26 28	126 08		Vema Receiving
L			0056			26 29	126 10		
L									
4-5									

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CRUISE N° V21
CRUISE LEG—From

Tokyo To Maha

117.
TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
JUL 1 3	CORE #104	2146	2151	75	75	27° 48'	126° 13'		
JUL 4	CORE #105	2057				26° 28'	126° 09'		
JUL 4	T-Grad #96					26° 28'	126° 09'		
J U L 3	SP	2145	2158			27° 48'	126° 13'		
J U L 3	VP	2152	2158			27° 48'	126° 13'		
J U L 3	BT	2215				27° 48'	126° 13'		
J U L 4	SP	2057	2127			26° 28'	126° 09'		

Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From

Tokyo

To

Naha

116

TIME ZONE

2-9

-Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	SP					26° 30'	125° 09'		
V									
L									
Y									
3									
J	SP	1140	1235	72	Bottoms	26 30	125 09		Camera 64-5 Lithograph-pan film 29 hits - 0 usable exposures Note: Camera 64-5 has no shutter, and all the film was exposed by light at 72 Bottoms.
V	Camera	1140							
L	#66								
Y									
3									
J	CAMERA	2005	2048			27 54	126 12		camera 64-5 Lithograph-pan film 24 hits
V	#67								
L									
Y									
3									
J	VP					27 54	126 12		
V									
L									
3									
J									
V	SP					27 54	126 12		
L									
Y									
3									
J	VP					27 54	126 12		
V									
L									
3									
J	BT					27 54	126 12		
V									
L									
3									

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Tokyo To Naha

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TIME ZONE Z-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
J	WBBL	2123	2335	2797		23° 29'	131° 01'		Near bottom, P.M. Only
U	#153								
N									
E									
30									
J	SPR 12	1423	1400						Vema Shooting
U		0420	0827			23 26	131 05		
Y			0827			23 23	130 19		Note: After shooting P 12 Vema
SPR									Reversed course for approx 3 1/2 hours
I									KM reversed course approx 2 hours
J	SPR 12 R	1257	1537			23 21	130 54		Vema Receiving
U			1537			23 20	130 54		
L									
Y									
I									
JULY	CORE #					26 30	125 09		
3	102								
J	SP	1141	1211			26 30	125 09		
U									
L									
Y									
3									
J	VP	1152	1210			26 30	125 09		
U	BT	1130							
L									
3									
JULY	CORE #	2015	2021			27 54	126 12		
3	103								

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CRUISE N° V21

CRUISE LEG—From Tokyo To Naha.

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	SP								
V	105	2147	2349			23° 29'	131° 01'		
V	106	0004	0035						
30									
J	MPS	0047	0058			23 29	131 01		
V	55								
N									
30									
-1									
J	BPS-1	0047	0058			23 29	131 01		
V	44								
N									
30									
-1									
J	BPS-2	0047	0110			23 29	131 01		Lost Net
V									
N									
30									
-1									
J	BT	0015	0025			23 29	131 01		
V	95								
N									
30									
-1									
J	CAMERA	1535	1751	2780	Bottoms	23 35	131 26		Camera 64-5
V	#65								Lithograph pan film
N									23 hits - 17 exposures
30									
J	NEPHELO-	2039	2337	2804	Bottoms	23 29	131 01		Nepheloiden #7
V	METER								Lithograph pan film
N	#31								
30									

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CRUISE LEG—From Tokyo To Naha,

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TIME ZONE 2-0

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
JUNE 30	CORE #100					23 35	131 26		
J U N E 30	T-Grad #95					23 26	130 52		
J U N E 30	SP	1605	1635			23 35	131 26		
J U N E 30	MPS	1824	1835			23 35	131 26		
J U N E 30	BPS-1	1824	1835			23 35	131 26		
J U N E 30	BT	1645				23 35	131 26		
JUNE 30	CORE 101					23 29	131 01		

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CRUISE N° V21

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
28	SRP 10	2008	2335			23° 39'	136° 05'		Vema Receiving
J			2335			23 41	136 03		
U									
N									
E									
29	SRP 10R	0205	0552			23 43	136 09		Vema Shooting
J			0552			23 47	135 22		
U									
N									
E									
29	SRP 11	1655	2000			23 01	134 17		Vema Receiving
J			2000			23 02	134 16		
U									
N									Note: Short end-on profile phot
E									to Vema - KM passed close aboard
29-									~ 1720
30	SRP 11R	2156	0022			23 00	134 19		Vema Shooting
J			00 22			23 16	133 53		
U									
N									
E									
J	WBBL	0853	1100	2732		23 32	132 14		Near bottom P.M. only
U	#152								
N									
E									
30									
J	NEPHELO-	0835	1106	2732	Bottom	23 32	132 14'		Nephelometer #7
U	METER								Lithograph from film
N	#30								
30									
J	T-Grad					23 35	131 26		
U	#94								
N									
30									

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Tokyo To Maha

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	T-Grad					23° 32'	132° 14'		
U	#93								
N									
E									
30									
J	MPS	1451	1502			23 32	132 14		
U									
U						23 06	134 26		
29									
J	BPS-1	1451	1502			23 06	134 26		
U									
N									
29									
J	BPS-2	1451	1514			23 06	134 26		Net Failed to Open
U									
N									
29									
J	SP	1242	1312			23 32	132 14		
U		0938	1008						
N									
30									
J	VP	1015	1040			23 32	132 14		
U									
N									
30									
J	BT	1045				23 32	132 14		
U									
N									
30									

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J V N 29	VP	1258	1306			23° 06'	134° 26'		
J V N 29	BT	1430	1445			23 06	134 26		
JUNE 29	CORE #98					23 06	134 26		
J V N 29	CAMERA #64	1230	1343	1140	Rathbone	23 06	134 26		Camera 64-5 Lithograph pan R16 21 hits - 21 exposures
J V N E 28	WBBL #151					23° 28'	136° 05'		For PM only - near bottom
JUNE 29	T-GRAD #92					23 06	134 26		
JUNE 30	CORE #99					23 32	132 14		

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <u>N</u>	Long. <u>E</u>		
J	SP					23° 41'	136° 05'		
U	100								
N									
28									
J	VP					23 41	136 05		
U	44								
N									
28									
J	BT					23 41	136 05		
U	91								
N									
28									
J	MP5	0046	0102			23 41	136 05		
U	52								
N									
29									
J	BPS-1	0046	0102			23 41	136 05		
U	41								
N									
29									
J	SP	0013	0048			23 41	136 05		
U	101								
N									
29									
J	SP	1242	1312			23 06	134 26		
U	102								
N									
29									

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CRUISE LEG—From Tokyo To Naha

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J U N E 26	SRP 8	0944	1247			23 12	141 48		Vema Receiving
			1247			23 12	141 46		
J U N E 26	SRP 8R	1430	1815			23 12	141 46		Vema Shooting
			1815			23 51	141 35		
J U N E 27	SRP 9	1736	2034			23 28	139 02		Vema Receiving
			2034			23 27	139 03		
J U N E 27	SRP 9R	0031	0500			23 27	139 05		Vema Shooting
			0500			23 25	138 18		Note a short end-on profile shot to the west after passing close aboard.
JUNE 28	CORE #97					23 41	136 05		
JUNE 28	T-6 mod #91					23 41	136 05		
J U N E 28	NEAPHELO- METER #29	1645	1915	2576	Parham's	23 41	136 05		Nephelometer #7 Lithograph from film

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CRUISE LEG—From Tokyo To Maha

TIME ZONE 2-9.

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
J V N 27	SP	1035	1107			23 57	139 31		
J V N 27	VP	1118	1144			27 57	139 31		
J V N 27	BT	1150				27 57	139 31		
J V N 27	CAMERA #63	1030	1230	2475	Fathoms	27 57	139 31		Camera 64-5 Lithograph pan film 30 hits - 30 exposures
J V N 27	CORE #96					23 27	139 02		
J V N 27	T-Grad #90					23 27	139 02		

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long.		
J	ROCK DREDGE	1903	2015			24°00'	141°36'		Large rock dredge
U	#1								
N									
26									
J	SP	1909	1929			24 00	141 36		
U									
N									
26									
J	VP	1920	1928			24 00	141 36		
U									
N									
26									
J	BT	2045				24 00	141 36		
U									
N									
26									
J	CAMERA	1305	1355	690 fms.		24 00	141 36		Camera 64-5
U	#62								Linograph pan film
N									17 hits—10 exposures
26									
JUNE	CORE					23 57	139 31		
27	#95								
J	T-6rad					23 57	139 31		
U	#89								
N									
27									

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CRUISE N° V21
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Tokyo To Naha

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TIME ZONE

2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
J V N 25	CAMERA #61	2000	2140	1550		24° 37'	142° 28'		Camera 64-5 Livograph pan film
J V N 25	SP 97	2138	2208			24 37	142 28		
J V N 25	MPS 51	2216	2228			24 37	142 28		
J V N 25	BPS-1 40	2216	2228			24 37	22 28		
J V N 25	BT 88	2210				24 37	22 28		
JUNE 26	CORE #94	1320		690		23 12	141 47		
JUNE 26	T-GRAD #88	1320		690		23 12	141 47		

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CRUISE N° V21
CRUISE LEG—From

Tokyo To Naha

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
JUNE 25	CORE# 93	2003		1552		24 37	142 28		
JUNE 25	T-GRAD 87	2003		1552		24 37	142 28		
J U N E 24	SPR 6	0715	1147			24 08	143 18		Vema Shooting
			1147			23 24	143 25		
J U N E 24	SPR 6R	1333	1758			23 23	143 24		Vema Shooting
			17 58			23 27	143 22		
J U N E 25	SPR 7	0643	0924			23 05	142 45		Vema Receiving
			09 24						
J U N E 25	SPR 7R	1144	1539			23 04	142 45		Vema Shooting
			1539						
J U N E 25	SPR 7S	1542	1934			23 23			Vema Shooting
			1934			24 34	142 30		
									Note: Profile 7S is end to end with Profile 7 (Shot to the north of 7)

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CRUISE N° V21
CRUISE LEG—From Tokyo To Naha

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
J	SP	1245	1315			23 25	143 23		
V	95								
N									
E									
24									
J	MPS	1228	1250			23 25	143 23		
V	50								
N									
E									
24									
J	BT	1220				23 25	143 23		
V	86								
N									
24									
J	SP	2320	2350			23 00	143 10		
V	96								
N									
24									
J	VP	2338	2347			23 00	143 10		
V	41	0001	0004						
N									
24									
J	BT	0025				23 00	143 10		
V	87								
N									
24									
J	NEPHELO-	2250	0054	2284		23 00	143 10		Nephelometer #7
V	METER								Lithograph pen film
N	#28								
24									

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CRUISE N° V21

CRUISE LEG—From _____

CRUISE LEG—From Tokyo To Maha.

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TIME ZONE 2-0

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
J U N 23	BT 85	1134				23° 57'	144° 23'		
J U N 23	MPS 49	1658	1710			23 59	144 21		
J U N 23	BPS-1 39	1658	1710			23 59	144 21		
J U 24 N E	CORE #91					23 25	143 23		
J U N E 24	T-Grad #85					23 25	143 23		
JUNE 24	CORE #92					23 00	143 10		
JUNE 24	T-GRAD #86					23 00	143 10		

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CRUISE N° _____

CRUISE LEG—From Naha To Tokyo

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
23	SRP 5	0635	1030			23°15'	144°53'		Vema shooting
J			1030			23 53	144 23		
U									
N									
E									
	SRP 5R	10	Start.			23 54			Vema receiving
			End.			24°01'	144 20		
23	CORE	1052				23 58	144 23		
J	#90								
U									
N									
E									
J	T-Grad					23 35	145 39		
U	#83								
N									
23									
J	T-Grad					23 58	144 23		
U	#84								
N									
E									
23									
J	SP	1214	1244			23 58	144 23		
U	94								
N									
23									
J	VP	1056	1106			23 57	144 23		
U	40	1115	1119						
N									
23									

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Tokyo To Naha

100

TIME ZONE Z-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
	CORE #89					23° 35'	145° 39'		
J	Laz.					23° 23'	145° 19'		
a	pump								
N	#149	1930	2000						
E	Underway								For C ¹⁴ Cs, + Sr. 1 only. Underway
22									
J	SP	1208	1238			23° 35'	145° 39'		
U	93								
N									
22									
J	VP	1210	1219			23° 35'	145° 39'		
U	39	1530	1533						
N									
22									
J	BT	1220				23° 35'	145° 39'		
U	84								
N									
22									
J	SRP 4	0602	1125			23° 36'	146° 37'		VEMA Shooting
U			1125			23° 34'	145° 41'		22 June 1700 - Informed by Japanese that they
E									will only shoot and record <u>one</u> profile / day. Strong
22									protest to no avail. Conditions for seismic work
									excellent! with
J	SRP 4R	1330	1641			23° 34'	145° 38'		VEMA RECEIVING
U			1641			23° 34'	145° 38'		
E									
22									

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG From Tokyo To Naha

99
TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
J	BT	0215				27° 53'	146° 35'		
U									
N									
21									
J	SP	1700	1731			25 20	146 30		
U									
N									
21									
J	VP	1742	1810			25 20	146 30		
U									
N									
21									
J	BT	1845				25 20	146 30		
U									
N									
21									
JUNE	CORE	9				25 20	146 30		
21	#88								
J	Camera	1646	1905	3047	Bottoms	25 20	146 30		Camera - 104-5
U	#60								Lithograph - pan film
N									24 hits
21									
J	T6041					25 20	146 30		
U	#82								
N									
21									

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CRUISE N° V21
CRUISE LEG—From Tokyo To Maha

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	CAMERA	1345	1546	3040	3025	27° 53'	145° 03'		Camera 64-5
V	# 58								Lithograph-pan film
N									25 hits - 24 exposures
20									
J	T-Grad					27 53	145 03		
V	# 80								
N									
E									
20									
J	CORE	0008				27 53	146 35		
V	# 87								
N									
E									
21									
J	T-Grad					27 53	146 35		
V	# 81								
N									
E									
21									
J	CAMERA	0003	0220	3112	3112	27 53	146 35		Camera 64-5
V	# 59								Lithograph pan film
N									25 21 hits
21									
J	SP	0018	0051			27 53	146 35		
V									
N									
21									
J	VP	0040	0138			27 53	146 35		
V									
N									
21									

Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Tokyo To Naha

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>M</i>	Long. <i>E</i>		
J	Laz. 146	1830	1900	2455		27 57	138 10		For C ¹⁴ Cs + Sr. Surface at station
U									
N	WBBL								
E	#147	1903	2056	2455		27 56	138 12		For Particulate Matter, Cs + Sr. ~ 4400 m.
18									
J									
U	WBBL								
N	#148	1519	1653	220		27 57	136 22		For Particulate Matter. Near bottom
E									
19									
JUNE	CORE	1330				27 53	145 03		
20	#86								
J	SP	1345	1416			27 53	145 03		
U									
N									
20									
J	VP	1407	1440			27 53	145 03		
U									
N									
20									
J	VD	1551	1558			27 53	145 03		
U									
N									
20									
J	BT	1535				27 53	145 03		
U									
N									
20									

Research Vessel VEMA
CRUISE N° V21
CRUISE LEG From Tokyo To Naha

TIME ZONE 2-9.

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	VP	1548	1613			27 57	141 22		
U	35								
N									
19									
J	BT	1645				27 57	141 22		
U	79								
N									
19									
J	SP	2331	0001			27 57	142 30		
U	89								
N									
19									
J	MPS	0053	0108			27 58	142 30		
U	48								
N									
20									
J	BPS-1	0053	0108			27 58	142 30		
U	38								
U									
20									
J	BT	0045				27 58	142 30		
U	80								
N									
20									
J	CAMERA	2310	0010	910 fathoms		27 58	142 30		Linagraph pan film
U	#57		(20-VI)						camera 64-5
N									
19									

Research Vessel VEMA
CRUISE N°
CRUISE LEG—From To

TIME ZONE

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J N 19	CAMERA #36	0634	0805	1978 fathoms		27° 54'	140° 03'		Camera 64-5 Linagraph-pan film 12 hits - 12 exposures
J U N E 19	CORE #84					27 57	140 22		
J U N 19	NEPHELO- METER #27	1509	1720	2199 fathoms		27 57	140 22		Nephelometer #7 Linagraph-pan film
J U N E 19	T-Grad #77					27 57	140 22		
J U N E 19	T-Grad #78								
J U N E 19	Core #85					27 58	142 30		
J U N E 19	T-GRAD #79					27 58	142 30		
J U N 19	SP 88	1533	1603			27 57	141 22		

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CRUISE N° V21

CRUISE LEG—From Tokyo To NAAHA

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
17 JUNE	SPR 3	2307	0318			29 02	136 29'		VEMA RECEIVING
18 "			0318			29 02	136 31		
18 JUNE	SPR 3R	0524	0924			29 02	136 32		VEMA Shooting
			0924			28 17	136 30		
									NOTE Passed Konan Maru about 0830
									Shot short end to end PROFILE
									to the south (until 0924)
J	T-6 rad					27 54	140 03		
U	#77								
N									
E									
19									
JUNE	CORE					27 54	140 03		
19	#83								
J	SP	0720	0750			27 54	140 03		
U	87								
N									
19									
J	VP	0736	0803			27 54	140 03		
U	34								
N									
19									
J	BT	0815				27 54	140 03		
U	78								
N									
19									

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CRUISE N° V21

CRUISE LEG—From Tokyo To Naha

93
TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J U N 18	MPS	0343	0402			29° 02	136 31		
JUNE 18	CORE #82					27° 56	138 13		
J U N 18	CAMERA NEPHELO- METER #26	1854	2056	2458	Pathways	27 56	138 13		Nephelometer #7 Linograph Pan film
J U N 18	T-Grad #76					27 56	138 13		
J U N 18	SP	1921	1951			27 56	138 13		
J U N 18	VP	1938	2036			27 56	138 13		
J U N 18	BT	2053				27 56	138 13		

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CRUISE N° V21
CRUISE LEG—From Tokyo To Naha.

TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
J	BT	1000				30° 38'	136 32		
U									
N									
17									
J	SP	0846	0916			29 02	136 30		
U		2046	2116						
N									
17									
J	BT	2130				29 02	136 30		
U		2225							
N									
E									
17									
J	VP	2139	2203			29 02	136 30		
U									
N									
17									
J	CAMERA	2050	2240	2348 fathoms		29 02	136 30		Camera 64-5
U	#55								Lithograph Pan Film
N									
17									
J	T-6 rad					29 02	136 30		
U	#175								
N									
E									
17									
JUNE	CORE	2054	2250			29 02	136 30		Coe pipe bent 15' above cutting edge.
17	#81								

Research Vessel VEMA
CRUISE N°
CRUISE LEG—From

Tokyo To Naha, Okinawa

TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long.		
16 June	SPR 1A	0302	0639			34°03'	138°22'		VEMA RECEIVING
									NORTHERN T. - SHOKOKU BASIN
16 June	SPR 1	1352	1710			33°26'	137°40'		VEMA Shooting
			1710			32°49'	137°32'		NOTE: PROFILE 1 AND 2 END TO END (KM RECEIVING)
16 June	SPR 2	1714	1958			32°49'	137°32'		VEMA Shooting
			1958			32°29'	137°08'		
17 JUNE	CORE #80	0904	1046	2370	2330	30°37'	136°32'		
J N 17	SP	0930	1030			30°37'	136°32'		
J N 17	MPS	1023	1037			30°37'	136°32'		
J N 17	BPS-1	1023	1037			30°37'	136°32'		

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CRUISE N° 21

CRUISE LEG—From TOKYO To NAHA

90

TIME ZONE -9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
JUNE 15	CORE #79	2345	0130			34° 02'	138° 23'		Core pipe bent at 25° about 10' above cutting edge. Trypan core approx 4cm. appears to have washed out.
JUN 15									
JUN 15									
JUN 15									
JUN 15									
JUN 15	CAMERA #54	1130		1873		34° 02'	138° 23'		Camera 62-1 Plus-X film Compass and Sail used
JUN 15									Camera lost through loose or broken shackle.
JUN 15									
JUN 15									
JUN 15	SP					34° 03'	138° 23'		
JUN 15									
JUN 15									
JUN 15									
JUN 15									
JUN 15	VP					34° 03'	138° 23'		
JUN 15									
JUN 15									
JUN 15									
JUN 15									
JUN 15	BT					34° 03'	138° 23'		
JUN 15									
JUN 15									
JUN 15									
JUN 15									
JUN 15	T-6rad #73	2345	0130			34° 02'	138° 23'		No record due to bottom probe being torn off no penetration of other 3 probes. No conductivity taken
JUN 15									
JUN 15									
JUN 15									
JUN 15	T-6rad #74					30° 37'	136° 32'		
JUN 15									
JUN 15									
JUN 15									

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG From Honolulu To Tokyo

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. N		
M	MPS	1051				33°08'	140°25'		
A	45	1032	1051						
Y									
26									
M	BPS-1	1051				33°05'	140°25'		
A	36	1032	1051						
Y									
26									
M	BT	1030	1100			33°05'	140°25'		
A	73								
Y									
26									
MAY	CAMERA	0907	1000	583		33°05'	140°25'		Camera 64-5
26	#53								Livograph - pan film
									Compass used
									15 hits - 15 exposures
MAY	CORE	0920	1050	588	612	33°05'	140°25'		Core was an uncompacted medium to coarse grained sand. Core length: 923cm
26	#78								Penetration - only cutting edge.
M	T-Grad	0920	1050	588	612	33°05'	140°25'		HF = 8
A	#72								Conductivity taken
Y									
26									
M	WBBL5					33 05	140 25		both ~ 300m. 1 for Cs + Sr. Other for C14
A	#144	0935	0946	585					
Y	#145	1012	1024	585					
26									

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Honolulu To Tokyo

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TIME ZONE 2-9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M	SP	1320	1420			30°49'	141°59'		
A	81								
Y									
25									
M	MPS	1208	1224			30°49'	141°59'		
A	44								
Y									
25									
M	BPS-1	1208	1224			30°49'	141°54'		
A	35								
Y									
25									
M	BPS-2	1208	1242			30°49'	141°59'		
A	23								
Y									
25									
M	VD	1625	1720			30°49'	141°59'		
A	17								
Y									
25									
M	BT	1600				30°49'	141°59'		
A	72								
Y									
25									
M	SP	1058	1124			33°05'	140°25'		
A	82								
Y									
26									

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Research Vessel YEMA

CRUISE N° V21

CRUISE LEG—From

Honolulu

To

Tokyo

87

TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M	MPS	1932	1944			30° 25'	144° 30'		
A	43								
Y									
24									
M	BB-1	1932	1944			30 25	144 30		
A	34								
Y									
24									
M	BT	1925				30 25	144 30		
A	#71								
Y									
24									
MAY	CORE	1130	1710	2530		30° 49'	141 59		Time change Ret To 2-9.
25	#77								medium to coarse grained andrist sand - core length 440cm. Penetration cutting edge.
M	WABC'S								
A	#140	1145	1548	3525		30 49	141 59		~6000 m. Stored, only for C ¹⁴ , Cs, Sr, + blanks.
Y	#141	1620	1640	3525		30 49	141 59		~600 m. Stored.
25	#142	1647	1705	3525		30 49	141 59		~600 m. Stored.
	Lat #143	0500	0530	3630		30 45	142 37		Underway, only for Cs + Sr. P. + log ~ 3136.95
M	T-6 grad					30 48	142 52		HF = ?
A	#71								No conductivity - very coarse gravel
Y									
25									
MAY	NEPHELU	1545	1719	2525		30° 49'	141° 55'		Livograph pan film
25	METER								
	#25								

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Research Vessel YEMA

CRUISE N° V21

CRUISE LEG—From

Honolulu To Tokyo

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TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>E</i>		
MAY 24	WBB CORE #76	1524	2010	3125	3130	30° 25'	144° 30'		Total length 940 cm. Penetration 34'6"
M	WBBLS								
A	#137	1601	1742	3125		30° 25'	144° 30'		~2000 m. - stored
X	#138	1848	1933	3125		30° 25'	144° 30'		~2000 m. - stored
24	#139	1946	1951	3125		30° 25'	144° 30'		~150 m. To LPT for Cs+Sr. only
M	CAMERA	1503	1850	3128	3135	30° 25'	144° 30'		Camera 62-1
A	#52								Livograph pan film
Y									Sail and compass used
24									Small dredge attached
									16 hits - 16 exposures
M	DREDGE	1503	1850	3128	3135	30° 25'	144° 30'		Small dredge attached to camera
A	#5								2 pieces volcanic ash brought up.
Y									
24									
M									
X	T-GRAD #	69.				30° 04'	147° 41'		Two probes penetrated - both torn off
Y									Conductivity taken
23									
M	T-GRAD #	70				30° 25'	144° 30'		Film hung up - no record - bottom
A									two probes torn off
Y									No conductivity
24									
M	SP	1943	1803			30° 25'	144° 30'		
A	80								
Y									
24									

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From Honolulu To Tokyo

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TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
MAY 23	DREDGE #4	1513	1830	3245		30 04	147 41		Small dredge Manganese nodules brought up
M	Laz. #132	0715	0745	3270		30 12	145 55		Underway. Pit Log 2778.80 only for Cs+Sr.
A	WBB's #133	1526	1533	3245		30 04	147 41		~200 m. only for Cs+Sr To UPT.
Y	#134	1540	1600	3245		30 04	147 41		~800 m. stored
23	#135	1626	1645	3245		30 04	147 41		~800 m. stored
	#136	1858	2130	3236		30 04	147 41		~4000 m. stored
M	SP	1819	1849						
A	79								
Y									
23									
M	MPS	1938	1952			30 04	147 41		
A	42								
Y									
23									
M	BPS-1	1938	1952			30 04	147 41		
A	33								
Y									
23									
M	BPS-2	1938	2007			30 04	147 41		
A	22								
Y									
23									
M	BT	1930				30 04	147 41		
A	70								
Y									
23									

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CRUISE N° V21

CRUISE LEG—From Honolulu To Tokyo

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TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M A Y 22	SP 78	1646	1716			29° 51'	150° 58'		
M A Y 22	MPS 41	2009	2021			29 51	150 58		
M A Y 22	BPS-1 32	2009	2021			29 51	150 58		
M A Y 22	BPS-2 21	2009	2041			29 51	150 58		
M A Y 22	BT 69	1900				29 51	150 58		
MAY 23	CORE #75	1816	2210	3220		30° 04'	147 41		Total length 912cm. Penetration 28 1/2"
MAY 23	CAMERA # 51	1513	1830	3245		30 04	147 41		Camera 62-1 Sail and Compass used Small dredge attached Lithograph pen film

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CRUISE N° V21

CRUISE LEG—From

Honolulu To Tokyo

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TIME ZONE 2-10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <u>N</u>	Long. <u>E</u>		
<u>M</u>	<u>SP</u>	<u>2206</u>	<u>2236</u>			<u>29° 28'</u>	<u>154° 36'</u>		
<u>A</u>	<u>77</u>								
<u>Y</u>									
<u>21</u>									
<u>M</u>	<u>MPS</u>	<u>2238</u>	<u>2252</u>			<u>29° 28'</u>	<u>154° 36'</u>		
<u>A</u>	<u>40</u>								
<u>Y</u>									
<u>21</u>									<u>Time change. From 2-11 to 2-10.</u>
<u>M</u>	<u>BT</u>	<u>1800</u>				<u>29° 28'</u>	<u>154° 36'</u>		
<u>A</u>	<u>68</u>								
<u>Y</u>									
<u>21</u>									
<u>MAY</u>	<u>CORE</u>	<u>1856</u>	<u>2215</u>	<u>3180</u>	<u>3180</u>	<u>29° 51'</u>	<u>150° 50'</u>		<u>Total length 1143m. Penetration 41'0"</u>
<u>22</u>	<u>#74</u>								
<u>MAY</u>	<u>T-6000</u>	<u>1856</u>	<u>2215</u>	<u>3180</u>	<u>3180</u>	<u>29° 51'</u>	<u>150° 50'</u>		<u>HF 3-1.1 mcal/cm²/sec</u>
<u>22</u>	<u>68</u>								<u>Conductivity taken</u>
<u>MAY</u>	<u>NEPHELO-</u>	<u>1633</u>	<u>1910</u>	<u>3175</u>		<u>29° 51'</u>	<u>150° 50'</u>		<u>Limagraph run film</u>
<u>22</u>	<u>METER</u>								
	<u>#24</u>								
<u>M</u>	<u>WBLS</u>								
<u>A</u>	<u>#128 #129</u>	<u>1656</u>	<u>1825</u>			<u>29° 51'</u>	<u>150° 50'</u>		<u>~1000m. both stored.</u>
<u>Y</u>	<u>#130</u>	<u>1924</u>	<u>2143</u>			<u>29° 51'</u>	<u>150° 50'</u>		<u>~4000m. stored</u>
<u>22</u>	<u>Laz. #131</u>	<u>Station</u>				<u>29° 51'</u>	<u>150° 50'</u>		<u>Taken underway most of day. Using station as location.</u>

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Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Honolulu To Tokyo

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TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M	T-Grad	1515	1915	2820	2850	28°41'	158°50'		HF \approx 8 Two probes penetrated both of which were torn off No conductivity
A	#66								
Y									
20									
MAY	CORR	1614				29°28'	154°36'		
21	#73								
M	CAMERA	1600	1907	3100		29°28'	154°36'		Camera (62-1) Sail and Compress used Small dredge attached Lithograph from Film Dredge tangled around camera wire during descent
A	#50								
Y									
21									
M	DREDGE	1600	1907	3100		29°28'	154°36'		Small dredge — Too-rapid descent caused dredge to wrap around camera wire. No sample.
A	#3								
Y									
21									
M	WBBL'S								
A	#124	2001	2150	3100		29°28'	154°36'		~ 3000 m. Left. in WBBL ~ 450 m. stored ~ 450 m. stored ~ 200 m. To U.P.T.
Y	#125	1758	1812	3100		29°28'	154°36'		
21	#126	1820	1834	3100		29°28'	154°36'		
	#127	1843	1853	3100		29°28'	154°36'		
M	Lat.	0500	0530	3053		29°08'	156°48'		Pit Log ~ 2869.26. 1 only Underway for Cs + Sr,
A	Pump								
Y	#123								
21									
M	T-Grad	1613	2230	3105	3106	29°28'	154°36'		HF \approx 1.1 mcal/cm ² /sec Conductivity taken
A	#67								
Y									
21									

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CRUISE N° V 21
CRUISE LEG—From Honolulu To Tokyo

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TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M	WBBL'S					28° 47'	158° 50'		
A	#119	1547	1738	2825		28° 47'	158° 50'		~3000 m. Stored
Y	#120	1754	1803	2825		28° 47'	158° 50'		~150 m. Stored
20	#121	1810	1817	2825		28° 47'	158° 50'		~150 m. Stored
	#122	1823	1828	2825		28° 47'	158° 50'		~150 m. Left in WBBL
M	NEPHELO-	1457	1726	2835					Lithograph Pan Film
A	METER					28° 47'	158° 50'		
Y	#23								
20									
M	SP	1627	1657			28° 47'	158° 50'		
A	76								
Y									
20									
M	MPS	1825	1839			28° 47'	158° 50'		
A	39								
Y									
20									
M	BPS-1	1825	1839			28° 47'	158° 50'		
A	31								
Y									
20									
M	BPS-2	1825	1855			28° 47'	158° 50'		
A	20								
Y									
20									
M	BT	1900				28° 47'	158° 50'		
A	67								
Y									
20									

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PALISADES

Research Vessel VEMA

CRUISE N° V 21

CRUISE LEG—From Honolulu To Tokyo

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TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M	WBBL'S					27° 54'	162° 31'		
A	116	1540	1820	3115		27° 54'	162° 31'		~5000 m. Stred.
Y	117	1840	1853	3115		27° 54'	162° 31'		~600 m. Stred.
19	118	1908	1925	3115		27° 54'	162° 31'		~600 m. Left in WBBL
	Lat. #45	0430	0500	3085		27° 27'	164° 33'		Underway. Cs only. Pit log ~ 1944.53
MAY	COPE	1515	1903	2789	2869	28° 47'	158° 50'		
20	#72								
M	SN	1550	1620			27° 54'	162° 31'		
A	75								
Y									
19									
M	MPS	1932	1945			27° 54'	162° 31'		
A									
Y									
19									
M	BPS-1	1932	1945			27° 54'	162° 31'		
A									
Y									
19									
M	BT	1830				27° 54'	162° 31'		
A									
Y									
19									
M	SP	1627	1657			28° 47'	158° 50'		
A									
Y									
20									

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CRUISE N° V21
CRUISE LEG—From

Honolulu To Tokyo

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TIME ZONE 211

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M	SP	1753	1825			27°05'	166°04'		
A	74								
Y									
18									
M	MPS	2052	2105			27°05'	166°04'		
A	37								
Y									
18									
M	BT	2115				27°05'	166°04'		
A	65								
Y									
18									
MAY	MOORE	1524	1950	3154	3149	27°54'	162°31'		Core tapered by large manganese nodules, followed by moderate yellowish brown lumps. Total length 1058 cm. Penetration 32'1"
19	#71 CORE								
MAY	T-GRAD	1524	1950	3154	3149	27°54'	162°31'		HF ≈ 1.2 meq/cm ² /sec Conductivity taken
19	#65								
MAY	CAMERA	1508	1900	3102		27°54'	162°31'		Camera 62-1 Sail and Compass used Small dredge attached Lithograph Pan film 18hds - 2 exposures
19	#49								
MAY	DREDGE	1508	1900	3102		27°54'	162°31'		Small dredge - manganese nodules brought up attached on camera.
19	#2								

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CRUISE N° V21

CRUISE LEG—From Honolulu To Tokyo

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TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M A Y 12	VD	2235	2348			26°26'	166°02'		
M A Y 18	BT	0005	0010			26°26'	166°02'		
MAY 18	COPE #70	1524	2105	3153	3150	27°05'	166°04'		Many layered core - लगभग 2 पार ब्रॉन (5.10 3/4) मॉनोकोम हिल. Total length 1237cm. Diameter 30' 4"
MAY 18	T-GRAD #69	1525	2105	3153	3150	27°05'	166°04'		HF = 1.3 kcal/cm ² /sec Conductivity taken
MAY 18	CAMERA #48	1510	2015	3148	3150	27°05'	166°04'		Camera 62-1 Lithograph from film Sail and Compass used Dredge Attached (small) 27 hits - 26 exposures
MAY 18	Dredge #1	1510	2015	3148	3150	27°05'	166°04'		Manganese nodules brought up,
M A Y 18	WBBL'S #112	1545	1822	3153		27°05'	166°04'		~5000m. stored.
	#113	1950	2010	3153		27°05'	166°04'		~300m. stored.
	#114	2021	2038	3153		27°05'	166°04'		~300m. left in WBBL

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CRUISE N° V21
CRUISE LEG—From Honolulu To Tokyo

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TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M	WBA's					26° 26'	169° 02'		
A	#105	1504	1642	3165		26° 26'	169° 02'		~ 2000 m stored
Y	#106	1659	1738	"		26° 26'	169° 02'		~ 800 m "
17	#107	1754	1828	"		26° 26'	169° 02'		~ 800 m "
17	#108	1944	2030	"		26° 26'	169° 02'		~ 1250 m "
17	#109	2045	2127	"		26° 26'	169° 02'		~ 1250 m "
17	#110	2155	2238	"		26° 26'	169° 02'		~ 1500 m "
17	#111	2258	2342	"		26° 26'	169° 02'		~ 1500 m Left in WBBL
M	CAMERA	1440	1705	3162		26° 26'	169° 02'		CAMERA 621
A	#47								Lithograph pen film
Y									Sail used
17									Compass used
									15 exposures
M	NEPHELO-	1934	0022(18)	3128		26° 26'	169° 02'		Plus-X film
A	METER								
Y	#22								
17									
M	SP	1541	1611			26° 26'	169° 02'		
A									
Y									
17									
M	SP	2311	2341			26° 26'	169° 02'		
A									
Y									
17									
M	MPS	1728	1739			26° 26'	169° 02'		
A									
Y									
17									

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CRUISE N° V21

CRUISE LEG—From _____

Honolulu To Tokyo

TIME ZONE 2-11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M A Y 16	MPS	1816	1830			25° 31'	172° 45'		
M A Y 16	BPS-1	1816	1830			25° 31'	172° 45'		
M A Y 16	BPS-2	1816	1846			25° 31'	172° 45'		
M A Y 16	T-Grad #62								No record due to burned out light bulb. No conductivity
MAY 17	CORE #69	1422	2350	3163	3109	26° 26'	169° 02'		Moderate brown (512414) manganese bits Total length 1590 cm, Penetration 30'6"
MAY 17	T-GRAD #63	1422	2350	3163	3109	26° 26'	169° 02'		HF ≈ 1.2 ucal/cm ² /sec Conductivity taken

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CRUISE N° V21

CRUISE LEG—From

Honolulu

To

Tokyo

TIME ZONE

2-12

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M A Y 13	BT	1855				24° 50'	176° 16'		
M A Y 15	CAMERA # 46	1455	1835	3110	3110	24° 58'	176° 16'		Camera 62-1 Linagraph Pan Film Dredge attached to trigger weight Compass used 16 hits — 0 exposures Dredge caused fluttering in descent. Film expended before reaching bottom.
MAY 16	CORE # 68	1426		3155		25° 31'	172° 45'		Modest brown (3/4) manganese int. Total length 1192 cm. Diameter 34'1"
M A Y 16	NEPHEL- OMETER # 21	1414	1703	3150 pm		25° 31'	172° 45'		Plus-X Film
M A Y 16	WBBL'S # 102	1506	1642	3155	~2000m	25° 31'	172° 45'		Stored.
	# 103	1703	1722	3155	~450m	25° 31'	172° 45'		Stored.
	# 104	1738	1810	3155	~450m	25° 31'	172° 45'		Left in WBBL.
M A Y 16	SP	1632	1703			25° 31'	172° 45'		
M A Y 16	BT	1830				25° 31'	172° 45'		

Research Vessel VEMA

CRUISE N° _____

CRUISE LEG—From _____ To _____

TIME ZONE 2+12.

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. E		
M A Y 13	BT	2130				24° 31'	179° 21'		
									change data line. Adv. 1 day. to 2-12
M A R 13	CAMERA #45	1638	1910	2973	2974	24° 31'	179° 21'		Camera 62-1 Linagraph Pan Film 16 hits - 15 exposures
MAY 15	CORE #67	1513	1920	3110	3110	24° 58'	176° 16'		Moderate brown (51R 4/4) manganese and very pale orange tint (10YR 8/2) Total length 1166 cm. Ophiotriton 32' 5"
MAY 15	T-GRAD #61	1513	1920	3110	3110	24° 58'	176° 16'		H F ≈ 1.0 meq/cm ² /sec Conductivity taken
M A Y 15	WBBL'S #100 #101 Lab. pump #99	1536 1830 0030	1756 1852 0100	3110 3110	~4000m ~600m Surface	24° 58' 24° 58' 24° 30'	176° 16' 176° 16' 179° 03'		Stored. For Cs + Sr. Mixed with #98. Left in WBBL. For Radon + Radium. Underway. P.T. Log ~1121.88. For C ¹⁴
M A Y 15	SP 70	1832	1902			24° 58'	176° 16'		
M A Y 15	MDS 34	1854	1909			24° 58'	176° 16'		

Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Honolulu To Tokyo

TIME ZONE +12

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W. E		
M	T-Grad	1520		2840	2828	23°50'	176°51'W		HF = 1.1 megal/cm ² /sec
A	#59								Conductivity taken
Y									
12									
MAY	CORE	1859	2215	2979	2958	24°31'	179°21'E		Modestly yellowish brown (10 y 10 5/4) manganese lute. Total length 1162 cm. Penetration 33 1/6"
13	#66								
M	T-Grad	1859	2215	2979	2958				HF = 1.3 megal/cm ² /sec
A	#60								Conductivity taken
X									
13									
M	WBAL'S								
A	#96	1729	1758	2975	~300m	24°31'	179°21'E		Good. Stored in fire-stick barrel for Radon + Radium
Y	#97	1852	1925	2975	~450m	24°31'	179°21'E		No Good after 2 tries.
13	#98	1930	2147	2975	~4000m	24°31'	179°21'E		Good. ~4000m. For Radon + Radium
M	SP	2022	2122						
A									
Y									
13									
M	MPS	1953	2005			24°31'	179°21'E		
A	33								
Y									
13									
M	BPSA	2035	2056			24°31'	179°21'E		
A									
Y									
13									

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CRUISE LEG—From _____ To _____

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TIME ZONE +12

[illegible]

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CRUISE N° ✓ 21

CRUISE LEG—From Honolulu To Tokyo

TIME ZONE 2 + 11

[illegible]

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PALISADES

Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Honolulu To Tokyo

70.

TIME ZONE +11

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long.		
M	CORE	1625	2020	2502	2487	22° 51'	169° 41'		Whole core is a moderate yellowish brown (10 YR 5/4) loess. Total length 550 cm. Penetration!
A									
Y	# 63								
10									
M	SP	1855	1925			22° 51'	169° 41'		
A									
Y									
10									
M	VD					22° 51'	169° 41'		
A									
Y									
10									
M	BT					22° 51'	169° 41'		
A									
Y									
10									
M	T-Grad	1725	2020	2494	2488	22° 51'	169° 41''		HF \approx 1.4 kcal/cm ² /sec Conductivity taken
A	# 57								
Y									
10									
M	WBBL								For Radon + Radium, ~ 3000 m.
A	# 91	1757	1948	2492		22° 51'	169° 41''		
Y									
10									
M	CORE	1555	2595	1813	2588	23° 27'	173° 13'		Moderate yellowish brown (10 YR 5/4) loess. Total length 124 cm. Penetration 31' 4"
A	# 64								
Y									
11									

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Research Vessel VEMA

CRUISE N°

CRUISE LEG—From

To

TIME ZONE 2+10

69

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
MAY 9	CORE #62	1618	1832	2465	2463	22°14'	165°14'		Midwater yellowish brown (10 YR 5/4) lutite with two lenses of fine grained white sand. Total length. 616 cm Penetration 19'3"
MAY 9	NEPHELO- METER #20	1601	1756	2464	2462	22°14'	164°14'		Plus -X film
M A Y 9	Loz. pump #89	1315	1415	2470		22°09'	164°54'		Underway. Pit Log ~ 0184.00. 1 for C ¹⁴ and 1 for Radium.
M A Y 9	WBAL #90	1655	1752	2463		22°14'	165°14'		~1000 m. for Radon and Radium
M A Y 9	T-6 RAD #56	1615	1832	2463	2463	22°14'	165°14'		HF = 1.5 meq/cm ² /sec Conductivity taken
M A Y 9	SP 65	1646	1717			22°14'	165°14'		
M A Y 9	MPS 30	1817	1825			22°14'	165°14'		Nets fouled - no sample
M A Y 9	BT 57	1730				22°14'	165°14'		

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Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Honolulu To Tokyo

TIME ZONE Z+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long.		
M A Y 7	BT 53	1320				20° 53	158° 07		
M A Y 8	WBBL #88	1809	1817	2440		21° 36	161° 26		Transferred to LPT for Radium processing. Door latched when up
M A Y 8	SP 64	1801	1801			21° 36	161° 26		
M A Y 8	MPS 29	1745	1757			21° 36	161° 26		
M A Y 8	BT 56	1820				21° 36	161° 26		
M A Y 8	VD	1903	1910						
MAY 8	CORE #61	1558	1855	2440	2440	21° 36	161° 26		Moderate yellowish brown (10 YR 5/4) luteo. with a dark yellowish brown silty unit. Core length 1212 cm. Penetration 19'

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From Bonolulu To Tokyo

67
TIME ZONE +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
7 MAY	CORE #59	1405	1612	2025	2000	20° 55'	158° 06'		Top unit a pale yellowish brown (10YR 6/2) siltstone - section is burrowed one has a sand unit Total length 440 cm. Penetration 15' 8" 410 cm
		1135	1250	1594	1608 cm				
	Laz. Pump #185	1315	1345	2006		20° 53'	158° 07'		To C ¹⁴ tank, begin processing. Underway. Pit Log ~ 9720.29. 60 gal.
7 MAY	CORE #60	1405	1612	2025	2000	20° 51'	158° 09'		
	WBRL #86	1550	1556	2000		20° 51'	158° 09'		Left in WBRL. Does not latch when up.
	Laz. Pump #88	1631	1700	1477		20° 54'	158° 08'		To C ¹⁴ + SF tank. Underway - 67 gal. Pit Log ~ 9728.96
M A Y 7	SP 63	1127	1227			20° 55'	158° 06'		
M A Y 7	MPS 28	1123	1240			20° 55'	158° 06'		Counter shiv froze & had to be replaced

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CRUISE N° V-21
CRUISE LEG—From Bahia To Honolulu

TIME ZONE 66
+ 10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
A P R 19	VD	1520	1715			1°08	158°26		
APRIL 19	L5m #19					1°08	158°26		
A P R 23	Laz. pump #81 Underway	1500		3126		07°14'N	172°51'W		1 only for processing. Pit Log - 7974.67
A P R 25	Laz. pump #82 Underway	0130		2805		12°02'N	170°45'W		1 processed; 1 stored. Pit Log ~ 8332.42
A P R 27	Laz. pump #83 Underway	0130		2815		12°18'N	163°39'W		1 only for processing. Pit Log ~ 8785.45
A P R 29	Laz. pump #84 Underway	0230		2992		13°55'N	158°12'W		1 processed; 1 stored. Pit Log ~ 9219.62

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Research Vessel VEMA

CRUISE N° V-21

CRUISE LEG—From

Tahiti To Honolulu

TIME ZONE

65

+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
APRIL	LSM					11°06	153°58		
16	#18								
A	Lazarette	1338	1458	4'46	156'58	4'46	156'58		Very small sample - not enough water available via the pump
P	Plankton								
R	sample								
18									
A	Laz. pump	2140		2586					Pit Log ~ 692.8-. 1 stored, 1 processed.
P	#80					00°24	158°50		
R	Under-								
19	way								
A	SP	1349	1450			1°08	158°26		
P	62								
R									
19									
A	MPS	1241	1300			1°08	158°26		
P	27								
R									
19									
A	BPS	1241	1300			1°08	158°26		
P	25A								
R									
19									
A	BT	1400				1°08	158°26		
P	54								
R									
19									

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PALISADES

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG-From

Tahiti To Honolulu

64
TIME ZONE +10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
A	MPS	1920	1936			13°46'	152°08'		
P	26								
R									
15									
A	BPS A	1920	1936			13°46'	152°08'		
P	24A								
R									
15									
A	BT	2130				13°46'	152°08'		
P	52								
R									
15									
A	SP	1730	1800			11°06'	153°58'		
P	61								
R									
16									
A	VP	1806	1811			11°06'	153°58'		
P	30	1925	1934						
R									
16									
A	BT	2000				11°06'	153°58'		
P	53								
R									
16									
APRIL	AMER					11°06'	153°58'		
16	STATION								
	#43								

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Research Vessel VEMA

CRUISE N° V-21

CRUISE LEG—From

Tahiti To Honolulu

TIME ZONE

63
+10

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
APRIL 14 th	ASIM 17					16°15'	150°27'		
APRIL 14 th	CAMERA STATION #42					16°15'	150°27'		
A P R 14	SP 59	2151	2221			16°15'	150°27'		
A P R 15	VP 29	0112	0118			16°15'	150°27'		
A P R 15	BT 50	0015				16°15'	150°27'		
APR 15	WBBL'S #77+78	2038	2156	2580		13°46'	152°08'		#77 Stowed + #78 left in WBAL. Both ~ 150 m
APR 16	Loz pump 279	0400		2668		12°58'	152°46'		Under way - pit log ~ 6035 - 1 only Began processing
A P R 15	SP 60	2026	2052			13°46'	152°08'		

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Balboa To Tahiti

TIME ZONE $\frac{62}{+10}$

[illegible]

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PALISADES

CRUISE N° V. 21

CRUISE LEG—From Bul.boa To Tahiti

TIME ZONE +10

[illegible]

Chief Scientist

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Bahia To Tahiti

TIME ZONE 60
+9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
A P R 7	MPS 23	0255	0310			26°29'	143°38'		
A P R 7	BPS 21 A, B (BPS-1 2) BP-2 (1)	0255	0310 0332			26°29'	143°38'		
A P R 7	BT 48	0000				26°29'	143°38'		
A P R 7	NEPHELO METER # 15	2030	2303	2333		28°03'	145°38'		Plus-X film
A P R 7	SP 57	2050	2220			28°03'	145°38'		
A P R 7	MPS 24	2340	2353			28°03'	145°38'		
A P R 7	BPS 22 A	2340	2353			28°03'	145°38'		

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PALISADES

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Balboa To Tahiti

59
TIME ZONE +9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
A	MPS	1230	1243			25°36'	142°23'		
P	22								
R									
G									
A	BPS	1230	1243			25°36'	142°23'		
P	20A								
R									
G									
A	BT	1200				25°36'	142°23'		
P	47								
R									
G									
APRL 7 th	CORE# #58					26°39'	143°38'		CORE WINCH FROZEN UP - PLANETARY DRIVE SHAFT APPARENTLY DAMAGED CUT AWAY 2000 ⁺ CORE HEAD, FILE TWO CORE PIPE (1/4" WALL), THERMOGRAPH, AND 2020 fms 1/2" WIRE
APRIL 7 th	T-GRAPH #55					26°39'	143°38'		LOST - SEE ABOVE
A	CAMERA	2335	0118	2015		26°39'	143°38'		Camera 64-5
P	#40								Sail and Compass used
R									Lithograph from film
7									16 hits
A	SP	0018	0148			26°39'	143°38'		
P	56								
R									
7									

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Bolboa To Tahiti

TIME ZONE +58
+9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
A	MPS	1636	1649			23°47'	140°26'		
P	21								
R									
S									
A	BPS-A	1636	1649			23°47'	140°26'		
P	19								
R									
S	(BPS-1)								
APRIL 6 th	CORE #57	1035	1249	2315	2321	25°36'	142°23'		Core length 515 cm. Core is a Mangrove mud. Penetration 23'8"
APRIL 6 th	T-GRAD #54					25°36'	142°23'		
A	WBBL'S								
P	#75	1040	1226	2315		25°36'	142°23'		#75 ~ 4000 m - stored
R	#76	1305	1357						#76 ~ 2000 m - stored
G									
A	CAMERA	1022	1320	2314		25°36'	142°23'		Camera 62-1
P	#39								Sail used
R									Livagraph pan film
G									16 hits - 15 exposures
A	SP	1058	1120			25°36'	142°23'		
R	55								
R									
G									

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Bahia To Tahiti

57
TIME ZONE +9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
A	NEPHELU-	1641	1918	2273		21°07'	138°49'		Plus-X film
P	METER								
R	#14								
4									
APRIL	CORE	1431	1743	2310	2310	23°47'	140°26'		Core length 420 cm. Core is a megamylonite. Pentamylon 25'8"
5 th	#56								
APRIL	T-GRAD					23°47'	140°26'		
5 th	#53								
A	CAMERA	1415	1708	2305	2307	23°47'	140°26'		Camera 64-5
P	#38								Sail used
R									Compass used
S									Lithograph Pan film
									16 hr
A	WBBL'S			2305		23°47'	140°26'		
P	#73	1441	1615						~4000 m. Good + stored in old #62 barrel.
R	#74	1621	1721						~2000 m. Good + stored in barrel by hydro winch.
S									Light rain contamination.
A	SP	1521	1551			23°47'	140°26'		
P	54								
R									
5									
A	BT	1600				23°47'	140°26'		
P	46								
R									
S									

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG From

Balboa To Tahiti

56
TIME ZONE +9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
A	T-GRAD					21°07'	138°49'		
P	#52								
R									
I									
L 4 th									
Apr 4	WBAL-7 72	1707	1846	2270		21°07'	138°49'		~4000 m. stored in dd barrel #58
A	SP	1752	1854			21°07'	138°49'		
P	53								
R									
L 4 th									
A	MPS	1833	1850			21°07'	138°49'		
R	20								
K									
L 4 th									
A	BPS-1	1833	1850			21°07'	138°49'		
P	18								
R									
L 4 th									
A	BT	1840				21°07'	138°49'		
P	45								
R									
L 4 th									
A	NP	1830				21°07'	138°49'		
P	130								
R									
L 4 th									

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PALISADES

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG-From

Balboa To Tahiti

TIME ZONE 55
+9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
APRIL 4	T-GRAD #51					18°58'	137°36'		
A P R 4	CAMERA #37	0013	0221	2173		18°58'	137°36'		Camera 64-5 Sail and Compass used Lithograph from film 18 hits
A P R 4	SP 52	0120	0150			18°58'	137°36'		
A P R 4	VP 28	0129	0134			18°58'	137°36'		
		0151	0203						
A P R 4	BT 44	0220	—			18°58'	137°36'		
A P R 4	NP 128	0246	—			18°58'	137°36'		
APRIL 4	CORE #55	1700	1910	2273	2277	21°07'	138°49'		core length 695 cm. Top unit a breccia followed by alternating magnesian limestone breccia. Penetration —

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Balboa To Tahiti

54
TIME ZONE +9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
A	SP	1231	1331			17°39'	136°43'		
P	51								
R									
3									
A	MPS	1652	1408			17°39'	136°43'		
P	19								
R									
3									
A	BPS-1	1652	1408			17°39'	136°43'		
P	17								
R									
3									
A	BPS-2	1652	1428			17°39'	136°43'		
P	16								
R									
3									
A	BT	1550				17°39'	136°43'		
P	43								
R									
3									
A	NP	1613				17°39'	136°43'		
P	125								
R									
3									
APRIL	CORE	0028	0216	2173	2173	18°58'	137°36'		Core length 498 cm. Topmost 2 m. very much intact. Units following are very highly compacted. Penetration 16'3"
4	#54								

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PALISADES

Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From Bulboe To Tahiti

TIME ZONE

53
+9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
A	BT	1725				14°53'	135°03'		
P	42								
R									
Z									
A	SP	1545	1615			14°53'	135°03'		
P	50								
R									
Z									
A	ND	1557				14°53'	135°03'		
P	125								
R									
Z									
APRIL 3	CORE #53	1149	1529	1814		17°39'	136°43'		Core length 1135cm. whole core a buttle between grayest orange (104R7/4) and very pale orange (104R8/2) Dontation 29'2"
APRIL 3	T-GRAD #50					17°39'	136°43'		
APR 3	WBBL'S ⁷ 68	1157	1314	1813		17°39'	136°43'		Near bottom - PM only. - To UAT.
	69	1345	1403						No Good - door didn't latch.
	70+71	1411	1509						#70 to LPT. #71 stored bath ~ 600m
A	NEPHLO-	1140	1515	1815		17°39'	136°43'		Plus-X film
P	METER								
R	#13								
Z									

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PALISADES

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Balboa To Tahiti

52
79
TIME ZONE

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
April 2	CORE #52	1412	1559	2362	2350	14°53'	135°03'		CORE length 600 cm. top unit a micaceous mudstone. There is a disturbance that appears to be due to shoring. Penetration 20'3"
April 2	T-GRAD #491					14°53'	135°03'		
Apr 2	WBBL'S #66 #67	1627 1701	1644 1718	2340		14°53'	135°03'		#66 to LPT #67 stored off-center section. Both ~ 450 m.
A P R 2	NEPHELO- METER #12	1403	1725	2363		14°53'	135°03'		Plus-X film used Operated with plankton net
M A R 2	MPS 18	1623	1638			14°53'	135°03'		
M A R 2	BPS-1 16	1623	1638			14°53'	135°03'		
M A R 2	BPS-2 18	1623	1655			14°53'	135°03'		

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PALISADES

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From Balboa To Tahiti

51
TIME ZONE +9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
A	CAMERA	1505	1835	2010 fms		12°02'	133°15'		Camera 62-1 Sail used Linagraph pen film Film was completely overexposed and strobelight failed to operate upon surfacing the camera.
P	#36								
R									
I									
A	SP	1554	1624			12°02'	133°15'		
P	49								
R									
I									
A	MPS	1729	1746			12°02'	133°15'		
P	17								
R									
I									
A	BPS-1	1729	1746			12°02'	133°15'		
P	15								
R									
I									
A	BPS-2	1729	1808			12°02'	133°15'		
P	14								
R									
I									
A	BT	1630				12°02'	133°15'		
P	41								
R									
I									
A	UP	1557				12°02'	133°15'		
P	123								
R									
I									

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PALISADES

Bulboea Tahiti

TIME ZONE + 9

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M A R 31	SP 48	2325	2358			11° 10'	131° 05'		
A P R I	VP 27	0007	0018			11° 10'	131° 05'		
		0033	0038						
A P R I	BT 40	0030				11° 10'	131° 05'		
M A R 31	NP 122	2349				11° 10'	131° 05'		
APRIL 1	DORE #51	1514	1655	2012	1978	12° 02'	133° 15'		Core length 1093m. Top sent a later- ward grad into a marginate lute Pentamer 33' 17"
APRIL 1	7-GRAD #48					12° 02'	133° 15'		
WBBLS A P R I	#64 + #65	1736	1751	1808	1826	12° 02'	133° 15'		Both ~300m. #64 to LPT, #65 to fore- starboard section

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PALISADES

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Bahia To Tahiti

TIME ZONE +8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M	MVP	1039	1051			10°29'	129°08'		
A	26	1107	1114						
R									
31									
M	BT	1145				10°29'	129°08'		
A	39								
R									
31									
M	VD	1200	1220			10°29'	129°08'		
A	13								
R									
31									
M	NP	1135				10°29'	129°08'		
A	121								
R									
31									
MAR	CORE	2309	0045	2206	2229	11°10'	131°05'		Core length 1068 cm. pale yellowish brown top 400 followed by marjanis. later punctured 41'6"
31	#50								
MAR	T-GRAD					11°10'	131°05'		
31	#47								
A	CAMERA	Lowered:		2300	2205	11°10'	131°05'		Camera 104-5
P	#35	1st exposure:		2326	2243				Linagraph pan film
R		Last exposure:		0011	2345				Soil and compass used
I		Surfaced:		0150					10 hrs

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PALISADES

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Bahia To Tahiti

48
TIME ZONE +8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M	BT	1605	1612			9°31'	126°22'		
A	38								
R									
30									
M	Nauo Phn/ton	1734				9°31'	126°22'		
A	119								
R									
30									
MAR	CGRE	1005	1216	2225	2199	10°29'	129°08'		Core length 1244 cm. pentatier 33'5"
30	#49								Core is manjamen. Intake.
MAR	WBBL#	1015	1150	2225		10°29'	129°08'		~4000 m PM + profile.
31	62 Laz								
	Pamp #63	1645	1215	2198		10°44'	129°50'		Underway about 3289 log miles.
MAR	T-GRAD					10°29'	129°08'		
31	#46								
M	NEPHEW	Turned on		0948:15	2228 fms	10°29'	129°08'		Plus-X film
A	METER	Hit Bottom		1047:10	2352 fms				
R	#12	STARTED UP		1047:20					
31		Turned off		1157:25					
APRIL	CORE								
1	#50								
	CGS								
M	SP	1014	1044			10°29'	129°08'		
A	47								
R									
31									

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PALISADES

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Balboa To Tahiti

47
+8
TIME ZONE

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long.		
MAR 30	CORE #48	1401	1442	2130	2091	9°31'	126°22'		Cs length 1860 cm. Pale yellowish brown (104R4/12) lentic. Orientation 52°6"
M	WBL'S								
A	WBL'S					9°31'	126°22'		Both ~ 150 m. # 60 transferred directly to C14 tank via bottom coupling with some difficulty and loss of sample water. # 61 stored above in fore starboard section.
R	# 60 +	1618	1626	2066					
30	# 61	1645	1652						
M	CAMERA	Lowered		1340	2130 PM	9°31'	126°22'		Camera 64-5
A	# 34	1st exposure		1417	2280				Sail and compass used
R		Last exposure		1447	2356				Lithograph pen film
30		Surfaced		1711	2130				16 hits - 15 exposures
M	SP	1412	1442			9°31'	126°22'		
A	46								
R									
30									
M	MPS	1609	1622			9°31'	126°22'		
A	16								
R									
30									
M	BPS-1	1609	1622			9°31'	126°22'		
A	14								
R									
30									
M	BPS-2	1609	1638			9°31'	126°22'		
A	13								
R									
30									

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PALISADES

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From Balboa To Tahiti

TIME ZONE +8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
Mar 29	WBBL #58	0925	1101	2240		8°06'	122°22'		Processed for PM, + then stored above as part of profile—24000 m.
	Laz.								
29	Pump #59	1820	1845	1941		8°31'	123°24'		~2876 Log miles
						8°06'	122°22'		Taken underway—PM for biologist.
M	CAMERA	Lowered		2245	2240	8°45'	124°05'		Camera 64-5
A	#33	1 st exposure		2241	2371				Lithograph Pan Film
R		Last exposure		2346	2380				Sail and compass used
29		Surfaced		2300	2300				16 hits
M	CORE	1056	0036	1953	2290	8°45'	124°05'		Cat length 1162 cm. Pale yellowish brown later followed by a marjane dentils. Penetration 41'5"
A	47								
R									
29									
M	T-GRAD					8°45'	124°05'		
A	45								
R									
29									
M	SP	2258	2328			8°45'	124°05'		
A	45								
R									
29									
M	VP	0015	0020			8°45'	124°05'		
A	25								
R									
30									
M	BT	0030				8°45'	124°05'		
A	37								
R									
30									

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PALISADES

Research Vessel VEMA

CRUISE N° V-21

CRUISE LEG—From

Balboa To Tahiti

TIME ZONE

45
+8

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M	BT	1400				7°08	119°54		
A	35								
R									
28									
MAR	CORE	0906	1126	2243	2242	8°06	122°22		Core length 1200 cm. pale yellowish
29	# 46								brown lute on top followed by
									manjarose layering. Penetration 40'9"
MAR	T-GRAD					8°06	122°22		
29	# 44								
M	SP	0932	1002			8°06	122°22		
A	44								
R									
29									
M	VP	0945	0955			8°06	122°22		
A	24								
R									
29									
M	BT	1015				8°06	122°22		
A	36								
R									
29									
M	NEPHELO	Turned on.		0849.50	2220	8°06	122°22		Plus-X film
A	METER	Reached bottom		0945.45	2250				
R	# 11	Started up		0946.00					
29		Turned off		1113.15					

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Balboa To Tahiti

44
TIME ZONE +7

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start S	End W	Lat. S	Long. W		
MAR 28	CORE #45	1342	1845	2260	2264	7°08'	119°54'		Cole length 1332 cm. Top unit a foraminiferal ooze—followed by grayish brown lutite. Penetration 31' 2".
MAR 28	T-GRAD #43			7°08'	119°54'	7°08'	119°54'		
MAR 28	CAMERA #32	Lowered: 12' exposure Last exposure Surface		1326 1403 1445 1845	2260 2445 2637 2221	7°08'	119°54'		Camera ok-5 Lithograph Pan film Sail and compass used 10 hits - 15 exposures Notes: Negatives too apparently underexposed.
MAR 28	SP 43	1407	1437			7°08'	119°54'		
MAR 28	MPS 15	1630	1650			7°08'	119°54'		
MAR 28	13PS-1 13	1630	1650			7°08'	119°54'		
MAR 28	VP 23	1420	1430			7°08'	119°54'		

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From Bahoe To Tahiti

42

TIME ZONE +7

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M	SP	1840	1900			6°10'	116°58.5'		Pulled in early due to ship maneuvering
A	42								
R									
27									
M	VP	1933	1939			6°10'	116°58.5'		
A	22								
R									
27									
M	BT	1925				6°10'	116°58.5'		
A	34								
R									
27									
M	CAMERA	Lowered		1814	2400 fms	6°10'	116°58.5'		Camera 6x5
A	# 31	1st exposure		1928	2550				Compass used
R		Last exposure		2000	2555				Nephelometer attached to camera
27		Surfaced		2056	2447				Lithograph Pan Film
									15 hits — 13 exposures
M	NEPHELO-	Turned on		1813:00		6°10'	116°58.5'		Camera attached to nephelometer
A	METER	hit bottom		1928:00	2550				Plus-X film
R	# 10	Started up		2000:00					
27		Turned off		2100					
M	CORE	1927	2040	2397		6°10'	116°58.5'		Core length 1875 cm. a yellowish brown lute. some manganese layering. Destruction - 63' 3"
A	#								
R	44								
27									
M	T GRAD					6°10'	116°58.5'		
A	#								
R	42								
27									

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Balboa To Tahiti

42
TIME ZONE +7

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M	CAMERA	Lowered		2215	2230	4°57'	114°01'		Camera 64-5
A	#30	1st exposure		2254	2478				Sail and compass used
R		Last exposure		0008	2870				Linograph pen film
27		Surfaced		0120	2960				27 hits
27									
MAR		2230	0145	2268		4°57'	114°01'		Core length 1291 cm. A pale yellowish
27	CORE								brown (10YR 6/2) lith. Penetration 41'5"
	#43								
MAR	T-GRAD					4°57'	114°01'		
27	#41								
M	SP	2327	2357			4°57'	114°01'		
A	41								
R									
28									
M	VP	0012	0023			4°57'	114°01'		
A	21	2347	2355						
R									
28									
M	BT	0033	0042			4°57'	114°01'		
A	33								
R									
29									
M	VD	0105	0123			4°57'	114°01'		
A	12								
R									
29									

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PALISADES

Research Vessel VEMA
CRUISE N° V21
CRUISE LEG—From

Balboa To Tahiti

41
TIME ZONE +7

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long. W		
MAR 26	CORE #42	0915	1155	2202		4°20	112°22		Coe length 376 cm. Mottled grayish orange (10 yr 7/4) inner pale yellowish brown (10 yr 1/2) white. Orientation 24°10"
MAR 26	T-GRAD #40					4°20	112°22		
MAR 26	VP 20	0940				4°20	112°22		Wire sawed off by camera line lost 500 ft of 1/8" wire rope, one vertical net + frame, one 6 lb wt, 2 Nansen bottles, + 4 thermometers: 3557, 3562, UP 3505, UP 3512
MAR 26	SP 40	0926	0956			4°20	112°22		
MAR 26	VD 11	1106	1205			4°20	119°22		
MAR 26	BT 32	1135				4°20	112°22		
MAR 26	CAMERA #29	Lowered		0905	2200	4°20	112°22		Camera 64-5
MAR 26		1st Exposure		0940	2538				Note - became entangled in sail and compass used the core and did some damage to it. *COULD HAVE BEEN BROKEN
MAR 26		Last Exposure		1031	2773				Linagraph pan film
MAR 26		Surfaced		1131	2180				16 hits - 15 exposures
									BLOWWIRE THAT FOULLED CORE RIG

*

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

Balboa To Tahiti

TIME ZONE 40
+7

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M	BT	2350	2400			5° 31'	106° 46'		
A	30								
R									
24									
MAR	CORE	1530	1652	1840	1829	4° 43'	109° 25'		Total length 1098 m. Penetration 35" 9"
25	#41								one is a purplish orange (10 1/2 7/4) tubule.
MAR	7-GRAD					4° 43'	109° 25'		
25	#39								
M	CAMERA	Lowered		1521	1865 fms.	4° 43'	109° 25'		Camera 64-5
A	#28	1st Exposure		1555	2063				Sail and Compass used
R		Last Exposure		1628	2177				Lithograph Pan film
25		Surfaced		1658	1825				16 hits — 15 exposures
M	SP	1629	1657			4° 43'	109° 25'		
A	39								
R									
25									
M	UP	1611	1630			4° 43'	109° 25'		
A	19	1648	1700						
R									
25									
M	BT	1704	1710			4° 43'	109° 25'		
A	31								
R									
25									

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

BALBOA To TAHITI

39
TIME ZONE +7

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start S	End L	Lat. S	Long. W		
M	VP	0950	1007			6°19'	104°44'		
A	17	1029	1038						
R									
24									
M	BT	1045	1055			6°19'	104°44'		
A	29								
R									
24									
MAR	CORE	2332	0059	1698	1730	5°31'	106°46'		Total length 1065cm. Penetration 36'7"
24	#40								
						5°31'	106°46'		
MAR	T-GEAD								
24	#38								
N	CAMERA	Lowered		2320	1707 Pms	5°31'	106°46'		Camera 64-5
A	#27	1st Exposure		2353	1873				Sail and Compass used
R		Last Exposure		0018	1903				Livograph Pan Film
24		Surfaced		0050	1730				15 hrs
M	SP	0036	0104			5°31'	106°46'		
L	38								
R									
25									
M	VP	0037	0052			5°31'	106°46'		
A	18								
R									
25									

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CRUISE N° V-21
CRUISE LEG From

BALBOA To TAHITI

38
TIME ZONE + 6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M A R 23	SP 36	1505	1536			7°07'	101°35'		
M A R 23	VP 16	1507	1525			7°07'	101°35'		
		1547	1558						
M A R 23	BT 28	1400				7°07'	101°35'		
MAR 24	CORE # 34	0918	1043	1900	1867	6°19'	104°44'		Total length 1140 cm.
MAR 24	T-GRAD # 37					6°19'	104°44'		
M A R 24	CAMERA # 26	Lowered		0903	1200	6°19'	104°44'		Camera 64-5
		1st exposure		0940	2114				Sail and Compass used
		Last exposure		1024	2278				Livingston Pan Film
		Surfaced		1100					14 hits — 12 exposures
M A R 24	SP 37	0926	0956			6°19'	104°44'		

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CRUISE N° V-21
CRUISE LEG—From BALBOA To TAHITI

37
TIME ZONE + 6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M	BPS-2	1827	1905			7°42	98°43		
A	12								
R									
22									
M	BT	1520				7°42	98°43		
A	26								
R									
22									
M	BT	2112				7°42	98°43		
A	27								
R									
22									
M	VD	2045	2058			7°42	98°43		
A	10								
R									
22									
MAR	CORE	1355	1535	2268	2163	7°07	101°35		Good core. Total length 1238 cms. Core is a manganese sulfate on top
23	# 38								
MAR	T-GRAD					7°07	101°35		
23	#36								
M	CAMERA	Lowered:		1344	2220 hrs	7°07	101°35		Camera 64-5
A	# 25	1st Exposure:		1446	2790				Linagraph Pan film
R		Last Exposure:		1523	3075				Sail and Compass used
23		Surfaced:		1620	2172				16 hits - 14 exposures

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CRUISE N° V-21
CRUISE LEG—From BALBOA To TAHITI

TIME ZONE +6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
MAR 22	CORE #37	1516	1740	2270	2062	7°42'	98°43'		Good core. Total length 1170 cm. The core is a manganese sulfate. Penetration 41'8"
	T-GRAD #35	1517	1740	2270		7°42'	98°43'		Top probe developed a leak at 2000 FM. otherwise a good record. HF = 4.4 mcd. Conductivity test made
MAR 22	CAMERA 24	Lowered		1506	2270	7°42'	98°43'		Camera 64-5
		1st exposure		1542	2495				Sail and Compass used
		Last exposure		1620	2637				Liveograph Pan Film
		Surfaced		2000	2000 PMS				16 hrs
MAR 22	WBBL'S #55					7°42'	98°43'		All good + stored (~4000 m)
	#56	1519	1708	2267					
	#57	1755	1920						
		1942	2055		2088				
MAR 22	SP 35	1541	1616			7°42'	98°43'		
MAR 22	MPS 14	1827	1850			7°42'	98°43'		
MAR 22	BPS-1 12	1827	1850			7°42'	98°43'		

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Research Vessel VEMA

CRUISE N° V.21

CRUISE LEG—From BALBOA To TAHITI

35
TIME ZONE + 6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M	CAMERA	Lowered		0927	1919	8'18	96'14		Camera 64-5
A	#23	1st Exposure		2005	2025				Sail and Compass used
R		Last Exposure		2103	2159				Lithograph Pan Film
21		Surfaced		0010	1940				20' WTS
22									
M	WBBL'S				1940	8'18	96'14		All ~ 2000m. #52 to U.P.T. Others stored
21	#52	2000	2145						
22	53	2244	2342						
	54	0002	0050						
M	SP	2012	2042			8'18	96'14		
A	34								
R									
21									
M	MPS	2256	2309			8'18	96'14		
A	13								
R									
21									
M	BPS-1	2256	2309			8'18	96'14		
A	11								
R									
21									
M	BPS-2	2256	2331			8'18	96'14		
A	4								
R									
21									
M	BT	2000				8'18	96'14		
A	25								
R									
21									

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

BAHBOA To TAHITI

34
+ 6
TIME ZONE

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
MAR 21	T-GRAD #33					7°31'	95°19'		
M	NEPHELO-	Turned on:		102900	2103PM	7°31'	95°19'		Plus-X Film
A	METER	Hit Bottom:		1145.15	2178				
R	#9	Started Up:		1147:00					
21		Turned off:		1232:42					
M	SP	1120	1150			7°31'	95°19'		
A	33								
R									
21									
M	VP	1143	1157			7°31'	95°19'		
A	15	1217	1223						
R									
21									
M	BT	1110	1115			7°31'	95°19'		
A	24								
R									
21									
MAR 21	CORE # 36	1945	2205	1913	1960	8°18'	96°14'		
MAR 21	T-GRAD #34					8°18'	96°14'		Core length: 5cm. Core had a layer of manganese. Angular fragments gave position for manganese & iron. Orientation cutting edge. Pipe went @ 47 110°

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PALISADES

Research Vessel VEMA
CRUISE N° V-21

CRUISE LEG—From BALBOA To TAHITI

TIME ZONE 33
+ 6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M	CAMERA	Lowered		1670 fms	1110	5°22	93°38		Camera 64-5
A	#22	1st exposure		1784 fms	1140		93°22		Sail and compass used
R		Last exposure		1847 fms	1218				Lithograph Pan film
20		Surfaced		1650 fms	1300				12 hits—13 exposures
M	SP	1136	1208			5°22	93°38		
A	33						93°22		
R									
20									
M	MPS	1429	1443			5°22	93°38		
A	12						93°22		
R									
20									
M	BPS-1	1429	1443			5°22	93°38		
A	10						93°22		
R									
20									
M	BPS-2	1429	1506			5°22	93°38		
A	10						93°22		
R									
20									
M	BT	1545				5°22	93°38		
A	23						93°22		
R									
20									
MAR	CORE	1049	1219	2698	2124	7°31	95°19		Good core, Total length 1242 cm. composed
21	#35								primarily of dark yellowish brown (10 YR 4/6)
									inter. Penetration 36'3"

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PALISADES

Research Vessel VEMA

CRUISE N° V-21

CRUISE LEG—From BAH BOA To TAHITI

32
TIME ZONE + 6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M A R 19	BPS-1 9	2020	2035			3°48'	92°05'		
M A R 19	BPS-2 9	2020	2055			3°48'	92°05'		
M A R 19	T-6 grad 31					3°48'	92°05'		
MAR 19	CORE #33	2000	2135	1986	1978	3°48'	92°05'		Good Core: Total length 1217cm. The core is a firm pale greenish yellow (10Y 8/2) to pale olive (10Y 4/2) lute. The layers are many and alternating. Penetration: 6 1/2" 3"
MAR 20	CORE #34	1135	1304	1667	1652	5°22'	93°38' 93°22'		Good Core. Total length 740cm. Top unit is fine to medium grained luteous sand. Bedges are many and alternating. Penetration 21' 3"
M A R 20	T-6 grad 32	1135	1304	1667	1656	5°22'	93°38' 93°22'		
M A R 20	WBBL'S #48 #49 #50 #51	1324	1555	1650		5°22'	93°38' 93°22'		#48 (~450m) good + stored for port gray barrel. #49 (~450m) good - to UPT. #50 (~600m) good - to Aft starboard gray barrel. #51 (~600m) good - left in WBBL.

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From BABOIA To TAHITI

TIME ZONE 31
+6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
M	SP	2130	2203						
A	31					1°50	90°28		
R									
18									
MAR	CORE								length 19m. The trip mechanism did not
19	#32					3°48	92°05		Work. Penetration 28'1"
MAR	T-GRAD					3°48	92°05		
19	#30								
M	CAMERA	Lowered:		1528	1852 PM	3°48	92°05		Camera #64-5
A	#21	1st exposure:		1602	1916				Livograph Pan Film used
R		Last exposure:		1637	1948				Sail & compass used
19		Surfaced:		1715	1900				16 hits — 15 exposures
M	SP	1546	1616			3°48	92°05		
A	32								
R									
19									
M	BT	1800				3°48	92°05		
A	22								
R									
19									
M	MPS	2020	2035			3°48	92°05		
A	11								
R									
19									

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PALISADES

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

BABOA To TAHITI

30
TIME ZONE + 6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. S	Long. W		
MAR 18	CORE #31					1°50'	90°28'		Length 1281 cm. Top unit a moderate yellowish brown (10YR 5/4) - very soupy - followed by grayish green. Penetration 42'5"
MAR 18	T-GEAD #29					1°50'	90°28'		
MAR 18	NEPHELO- METER #8	Turned on.		2024:00	1785 Pms	1°50'	90°28'		Livograph Pan Film
		Reached Bottom		2138:15	1845 Pms				
		Started up.		2140:00					
		Turned off.		2231:00					
MAR 18	WBBL'S #45			1783		1°50'	90°28'		#45 near bottom for PM - to UPT. #46 #47 good (~300m). #46 fore part + #47 in WBRL.
	46								All taken on core #31. Pumped off on wire
	47		2335						
MAR 18	MPS 10	2257	2313			1°50'	90°28'		
MAR 18	VD 9	2355				1°50'	90°28'		
MAR 18	BT 21	2150				1°50'	90°28'		

29

TIME ZONE + 6

CRUISE LEG—From _

Bolboa To Takiti

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PALISADES

Research Vessel VEMA

CRUISE N° _____

CRUISE LEG—From _____ To _____

28
+6
TIME ZONE

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
M	T-GRAD	0939	1405	1460		1.05	87.11		Very good record. All three probes penetrated. H.F. = 4.8 μ cal/cm ² /sec Conductivity test made
A	# 26								
R									
17									
M	SP	1021	1036			1.05	87.11		
A	29					00.57	89.21		
R									
18									
M	VP	1023	1031			1.05	87.11		
A	13					00.57	89.21		
R									
18									
M	DT	1000				4.05	87.11		
A	19					00.57	89.21		
R									
18									
M	CAMERA	Lowered:		0932	4000	0.57	89.21		Camera 64-5
A	19	12 th exposure:		0953	4160	0.57	89.21		Sail used
R		Last exposure:		1012	4060	0.57	89.21		Camera used
18		Surfaced		1018	377	0.57	89.21		Liograph Pan Film 10 hits - 9 exposures
MAR	CORE					0.57	89.21		GOOD CORE: Length - 488 cm. The core is a sandy lute between moderate olive brown (5Y 4/4) and grayish olive (10Y 4/2). Penetration 21'6"
18	# 29								
MAR	T-GRAD					0.57	89.21		
18	# 27								

Research Vessel VEMA

CRUISE N° V-21

CRUISE LEG—From

Balboa

To

Tahiti

TIME ZONE

+6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <u>N</u>	Long. <u>W</u>		
MAR 17	CORE #28					1-05	87-11		Good. CORE. Length 1334 cm. The core is composed of a greenish gray lutite.
M A R 17	MPS 9	1203	1216			1-05	87-11		
M A R 17	BPS-1 8	1203	1230			1-05	87-11		
M A R 17	BPS-2 8	1203	1251			1-05	87-11		
M A R 17	SP 28	1343	1413			1-05	87-11		
M A R 17	DT 18	1353				1-05	87-11		
M A R 17	WBBL's #40 41	1450 0950		1450		1-05	87-11		#40 good to UPT for PM (light scattering) #41 + #42 both good mixed + stored (~150m) # 43 + 44 (~300m) no good as don't latch. Found out about thermometer equilibrium procedure
	R 42 43								
	17 44		1352						

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PALISADES

Research Vessel VEMA

CRUISE N° Y-21

CRUISE LEG—From

Bahoa To Tahiti

TIME ZONE

26
+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
M	CAMERA	LOWERED		1228	1520 fms	3.14	84.26		Camera coll-5 Scal Used Compass Used Lithograph Pan Film 27 hits — 4 exposures Note: Light became in- sufficient after 4 hits. Trigger weight broke loose.
A	#18	1st EXPOSURE		1300	2010				
R		LAST EXPOSURE		1353	2415				
16		SURFACED		1435	1160				
M	SP	1249	1319			3.14	84.26		
A	27								
R									
16									
M	VP	1321	1339			3.14	84.26		
A	12	1403	1416						
R									
16									
M	BT	1422	1430			3.14	84.26		
A	17								
R									
16									
Mar	Laz. pump	Underway				2.20	85.30		1 sample processed for C ¹⁴ , Cs, + Sr. log miles ~ 0226
16	#39	2200	2230	1604					
M	T-Grad	1235	1410	1722	1402	3.14	84.26		
A	#25								
R									
16									
M	NEPHELO-	Camera on:	0913:00						Lithograph Pan Film used
A	METER	Reached Bottom	1205:40	1521 fms					
R	#7	Started up:	1009:45						
17		Camera off	1047:00						

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PALISADES

Research Vessel VEMA

CRUISE N° V-21

CRUISE LEG—From

Balboa

To Tahiti

TIME ZONE

25
+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>W</i>		
MAR 15	CORE #26					4-36	82-44		GOOD CORE: LENGTH 1280 cm. Core is on olive gray little Penetration: 44 ft.
MAR 15	T-GRAB 24	2105		1660		4-36	82-44		T-Grab not working. No usable record. No conductivity test made
M A R 15	CAMERA 17	Lowered 1st exposure Last exposure Sunbed		2047 2025 2200 2230	1664 1920 1992 1644	4-36	82-44		Camera 64-5 Sail used Compass used Lithograph Pan Film 14 hits - 6 exposures Note: Camera operated on hits 7-14, but there was insufficient light
M A R 15	SF 26	2137	2207			4-36	82-44		
M A R 15	MPS 8	2325	2353			4-36	82-44		
M A R 15	BT 16	2205				4-36	82-44		
MAR 16	CORE #27					3-14	84-26		Disturbed core of a coarse basalt gravel. The length of core - 167 cm. Two large basalt cobbles were found in upper 3 ft. of pipe #2. Penetration about 3 ft.

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CRUISE N° Y-2

CRUISE LEG—From

CRUISE LEG—From DALBOA To TAHITI

CRUISE LEG—From

TIME ZONE

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>W</i>		
MAR 15	CORE #25	0956	1045	740	752	5-43	81-30		GOOD CORE! LENGTH: 1029 cm. Core composed of a dark greenish brown, sandy, granular material. The color becomes greener & the core more firm with depth. Penetration 20'8"
MAR 15	T-GRAD #23	0956	1045	740	730	5-43	81-30		One probe penetrated - good film record. Conductivity test run
MAR 15	S.P. 25	1000	1030			5-43	81-30		
MAR 15	VP 11	1026	1043			5-43	81-30		
MAR 15	BT 15	1056				5-43	81-30		
MAR 15	Nephelometer #1	Camera on	0947						Linagraph Pan Film
MAR 15		Lowered	0951	735 fms		5-43	81-30		Note: Part of film exposed in developing tank.
MAR 15		Hit bottom	1014	774					
MAR 15		Surfaced	1040:30						
MAR 15		Camera off	1041:40						

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23

TIME ZONE 245

CRUISE LEG—From Miami To Cristobal

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PALISADES

22

Research Vessel VEMA
CRUISE N° U-21

CRUISE LEG—From Miami To CRISTOBAL

TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>W</i>		
M	VP #10	0730	0743			1301	7915		
A		0808	0820						
R									
U									
M	BT #13	1825				1301	7915		
A									
R									
U									
V	CAMERA	Lowered		0612	1822	1301	7915		Camera 64-5
A	#16	1st exposure		0647	1994				Lineograph Pan Film
R		Last exposure		0733	2205				Soil used
U		Surfaced		0805	1813				Compass used
									14 hits — 11 exposures
M	T-GRAB					1301 7915	1057 7943		Cove pulled out immediately after
A	#21								penetration. I don't believe it. July
R									Pull out after 5 min in Bottom loss for
U									obvious on the accumulator. July
M	WBBL #36	0634	0756	1822		1301 7915	1057 7943		~3500 m. stored and mixed with #38. T.T. ok.
A									
R	Laz. #37	1230	1400	1770					about 9538 logmiles at end. 1 stored + 1 processed.
U									
	WBBL #38	1902	2017	1887		1057	7943		~3500 m. stored + mixed with #36. T.T. ok.
M	T-Grab	1855	2025	1887	1885	1057	7943		Penetration up to top probe. Bottom probe
A	#22								turn off of pipe at penetration. good record
R	Cove #24								on middle probe.
U									
MAR	CORE	1855	2025	1887	1885	1057	7943		GOOD CORE! LENGTH: 1224 cm. Top mud a
U	#24								foraminiferal brown silt followed by greenish
									gray silt. Penetration 31"

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PALISADES

CRUISE LEG—From MIAMI To CRISTOBAL

TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long.		
MAR 9	BT #12	0710	0716			18° 38'	82° 11'		
MAR 9	CORE # 22					17° 57'	81° 42'		
MAR 9	T-GRAD #20					17° 57'	81° 42'		
MAR 9	SP 21	1513	1543			07 57	81 42		
MAR 9	VD#7	1615	1620			17 57	81 42		
MAR 11	CORE # 23					13 01	79 15'		
MAR 11	SP#22	0622	0652			13 01	79 15'		

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PALISADES

Research Vessel VEMA

CRUISE N° V-21

CRUISE LEG—From Miami To CRISTOBAL

20
TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long.		
M	SP#20	1014	1044			17°39	83°29		
A									
R									
9									
M	T-6RAD	0513	0631	2990		18°38	82°11		
A	#19								
R									
9									
M	CORE	#21				18°38	82°11		
A		0513	0631	2990					
R									
9									
M	CAMERA	lowered!							
A	#16	1st exposure!							
R		Last exposure!							
9		surfaced!							
M	SP#21	0554	0732			18°38	82°11		
A	BPS-2#6								
R									
9									
M	MPS #6	0554	0612			18°38	82°11		
A									
R									
9									
M	BPS-1#6	0554	0640			18°38	82°11		
A									
R									
9									

Camera 64-5
Lithograph Pan Film
Sail Used
Compass Used
Exposures — 11

Research Vessel VEMA

CRUISE N° V21

CRUISE LEG—From Miami To CRISTOBAL

19

TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. S		
M	T-GRAP	1611	1810	2610		1728	8437		Good record
A	#17								
R									
7									
MAR	CORE	1611	1810	2610	2640	1728	8437		GOOD CORE, LENGTH: 663 cm. Top unit is a framingul lutite, followed by greenish gray lutite. Penetration: 26' 5".
7	#19								
M	CAMERA								
A	#14	Lowered:		1555	2610				Linograph Pan film
R		1st exposure:		1641	2749				Camera 64-5
7		Last exposure:		1720	2830	1728	8437		Sail used
		Surfaced:		1810	2650				Compass used
									16 hits — 4 exposures
M	CORE	0914	1125	3036		1739	83 29		Good core. Extruded length 566 cm. Top unit was a "red clay" followed by greenish gray lutite. Penetration 16' 3".
A	#20								
R									
8									
M	T-GRAP	0914	1125	3036		1739	83° 29		One probe in which was no good. No usable record and no conductivity test taken
A	#18								
R									
8									
M	CAMERA	0845	3048 PM	Lowered		1739	83° 29		Linograph Pan film
A	#15	0947	3385	1st exposure					Camera 64-5
R		1039	3712	Last exposure					Sail used
8		1145	3039	Surfaced					Compass used
									16 hits — 14 exposures
M	VD# 6					1739	83° 29		
A									
R									
9									

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CRUISE N° V-21

CRUISE LEG—From MIAMI To CRISTOBAL

18
TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
MAR 6	CORE #18	1151		2405		18°40	86°02		MULTIPLE CORE HEAD LOST. NO CORE.
M A R 6	CAMERA #13					18°40	86°02		Never REACHED BOTTOM — CAUGHT IN CORE WIRE AND PULLED UP
M A R 6	CORE CAMERA #4					18°40	86°02		MULTIPLE CORE HEAD LOST. NO EXPOSURES
M A R 6	CORE NEPHELO- METER #5					18°40	86°02		MULTIPLE CORE HEAD LOST. NO EXPOSURE
Mar 6	Laz Pump #28 WBRL's	1030	1100	2410		18°40	86°02		Only 1 barrel stored on #28 Laz pump sample. #29 WBRL with TIG #1 was lost, along with deep water reversing thermometer. #30 (~3500m) good + stored. Switched rack positions of WBRL's. #31 (new position) no good + discarded. #32 (150m) #33 (300m) + #34 (450m) good.
	#s 29+ 30 31 32 33 34	1210	1517	2405					
		1915	2010	2460		1816	85°42		
M A P 6	T-GRAD #16					18°40	86°02		Multiple core head lost.
Mar. 7	Laz. pump #35	1200	1215			1822 1711	84°40		PM sample for Biologist

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PALISADES

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Research Vessel YEMA
CRUISE N° V-21
CRUISE LEG—From MIAMI To CRISTOBAL

TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
M	T-GRAP	1436	1636	2413	2412	20°24	85°17		Four probe penetration. Good record
A	#15								
R									
5									
M	CAMERA	Lowered		1600	2414	20°24	85°17		CAMERA 64-5
A	#12	1st Exposure		1658	2500				Remarks: Sail collapsed
R		Last Exposure		1726	2525				Lithograph Pan Film
5		Surfaced		1825	2412				Sail Used
									compass used
									15 hits, 14 exposures
M	CORE	Turned on		1435		20°24	85°17		Lithograph Pan Film
A	NEPHELO-	HIT Bottom		1533:20					
R	METER #4	Started up		1540:00					
5		Turned off		1641:15					
M	CORE	HIT Bottom		1533:20		20°24	85°17		Core head buried itself in mud and film failed to expose.
A	CAMERA								
R	#3								
5									
M	SP #19	1221	1251			18°40	86°02		
A									
R									
6									
M	VD #5	1430	1435			18°40	86°02		
A									
R									
6									
M	BT #11	1300	1310			18°40	86°02		
A									
R									
6									

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PALISADES

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Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From MIAMI To CRISTOBAL

TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
MAR 4	CORE #16	1500	1545	1145	1110				GOOD CORE. LENGTH: 477 cm. Top 2' NIT is a pteropod sand, followed by white calcareous. Penetration: 6' 11".
Mar 5	WBBL# 23	1446	1800	2412		20°24'	85°17'		23+24 are 3500m. #23 discarded, as door flapped. #24 stored. #25 is 600m, stored; used wrong thermometers in it. #26+27 are 450m. Door flapped on both so they were discarded. Replacing shock cord on WBBL (aft) with Bowdon #1.
	24								
	25								
	26+27								
MAR 5	CORE #17	1436	1636	2413	2412				GOOD CORE. There are many small units. Several sand layers. Penetration 42'.
M 5	SP# 18	1441	1511			20°24'	85°17'		
A									
R									
5									
M 5	VP# 9	1744	1746			20°24'	85°17'		
A									
R									
5									
M 5	VD# 4	1524	1705			20°24'	85°17'		
A									
R									
5									
M 5	BT# 10	1725				20°24'	85°17'		
A									
R									
5									

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Research Vessel VEMA
CRUISE N° 21
CRUISE LEG—From

Miami To Cristobal C. Z.

15
TIME ZONE +5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat.	Long.		
M	Surface	1446	1517			22°43'	84°24'		
A	Plankton								
R	#17								
4									
M	Vertical	1545	1615			22°43'	84°24'		
A	Plankton								
R	#8								
4									
M	BT	1700	1705			22°43'	84°24'		
A	#9								
R									
4									
M	T-6 RAD	1500	1545	1145		22°43'	84°24'		One probe in. No gradient
A	#14								
R									
4									
M	CAMERA	Lowered:		1555	1150 P.M.	22°43'	84°24'		CAMERA 64-5
R	#11	1st exposure:		1620	1331 "				LINAGRAPH PAN FILM
R		Last exposure:		1652	1721 "				SAIL USED
4		Surfaced:		1717	1150 "				COMPASS USED
									10 HITS - 8 EXPOSURES
M	CORE	TURNED ON:		1456		22°43'	84°24'		LINAGRAPH PAN FILM
A	NEPHELO-	HIT BOTTOM:		1522					
R	METER #3	LEFT BOTTOM:		1525					
4		TURNED OFF:		1555					
M	CORE					22°43'	84°24'		CORE CAMERA NOT USED BECAUSE TRIGGER MAGNET
A	CAMERA								WAS CARRIED AWAY AS THE CORE WAS LOWERED
R									FROM ITS DECK FRAME.
4									

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Research Vessel VEMA

CRUISE N° 21

CRUISE LEG—From

Miami To Cristobal C.Z.

TIME ZONE

+5

14

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
<u>4/3/65</u>	<u>T-6 RAD</u>	<u>1545</u>	<u>1730</u>	<u>1808</u>	<u>1818</u>	<u>24°41'</u>	<u>84°39'</u>		
	<u>#13</u>								
<u>M</u>	<u>MPS</u>	<u>1923</u>	<u>2016</u>			<u>2441</u>	<u>8439</u>		
<u>A</u>	<u>#5</u>								
<u>R</u>									
<u>3</u>									
<u>M</u>	<u>BPS-1</u>	<u>1854</u>	<u>2057</u>			<u>2441</u>	<u>8439</u>		
<u>A</u>	<u>#5</u>								
<u>R</u>									
<u>3</u>									
<u>M</u>	<u>BPS-2</u>	<u>1759</u>	<u>2116</u>			<u>2441</u>	<u>8439</u>		<u>Net did not close because did not reach minimum depth of 1300m even tho let out 2188 Fms. Wire angle of 60° must have increased with depth</u>
<u>A</u>	<u>#5</u>								
<u>R</u>									
<u>3</u>									
<u>M</u>	<u>CAMERA</u>	<u>Lowered:</u>		<u>1524</u>	<u>1809</u>	<u>2441</u>	<u>8439</u>		<u>Camera 64-5</u>
<u>A</u>	<u>#10</u>	<u>1st Exposure:</u>		<u>1621</u>	<u>2434</u>				<u>Soil used</u>
<u>R</u>		<u>Last Exposure</u>		<u>1645</u>	<u>2764</u>				<u>Compass used</u>
<u>3</u>		<u>Surfaced</u>		<u>1743</u>	<u>1820</u>				<u>Lithograph Pan Film</u>
									<u>9-hits — 9 exposures</u>
<u>M</u>	<u>CORE</u>	<u>Lowered:</u>		<u>1546</u>	<u>1809</u>	<u>2441</u>	<u>8439</u>		<u>Lithograph Pan Film</u>
<u>A</u>	<u>NEPHELOME</u>	<u>HIT Bottom:</u>		<u>1634</u>	<u>2158</u>				
<u>R</u>	<u>TER #2</u>	<u>Started up:</u>		<u>1637</u>	<u>2158</u>				
<u>3</u>	<u>L.S.M</u>	<u>Surfaced:</u>		<u>1726</u>	<u>0</u>				
		<u>Turned off:</u>		<u>1732</u>	<u>0</u>				
<u>M</u>	<u>CORE</u>	<u>Lowered:</u>		<u>1546</u>		<u>2441</u>	<u>8439</u>		<u>Lithograph Pan Film.</u>
<u>A</u>	<u>CAMERA</u>	<u>HIT Bottom:</u>		<u>1634</u>					<u>Note: Film transported properly but showed no images upon development; Trigger magnet carried away, probably during ascent.</u>
<u>R</u>	<u>#2</u>	<u>Started up:</u>		<u>1637</u>					
<u>3</u>									

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PALISADES

13

Research Vessel VEMA
CRUISE N° V-21
CRUISE LEG—From

MIAMI To PANAMA

TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
III/1/65	Laz-#14	1300	1400	2428	8115	24°44'	84°36'		1 barrel stored fore-part. 2 samples processed (14416)
III/2/65	Laz-#16	1700	1800	2347	8458	23°56'	84°29'		for Cs, Sr, + C ¹⁴ . Taken from Laz. pump Log miles about 7442 - 1 barrel stored aft of #14
III/2/65	WBBL-#15	1149	1319	1580		23°56'	84°29'		TT OK. Transferred to two (2) storage tanks as this is 1 of 2 3500m. samples. centistar tanks
III/2/65	CORE #14	1136	1335	1580	1618	23°56'	84°29'		GOOD CORE: LENGTH: 1157 cm. This is the 1st core with the multiple core. Top 25 cm. "red mud". Remainder a grayish to bluish lutite. Penetration: 22'8"
III/2/65	T-GRAD #12	1136	1335	1580	1618	25°56'	84°29'		Used new T-Grad. Fairly good record
M	CORE	1136	1335	1580	1618	25°56'	84°29'		Linagraph Pan Film
A	NEPHELO-	Bottom reached:		1233					Remarks: No time marks on film - timer watch
R	METER #1	Started up:		1237					not wound. Film excessively dark -
2									will reduce aperture for CN-2
M	CORE	Bottom reached:		1233		25°56'	84°29'		Linagraph Pan Film
A	CAMERA	Started up:		1237					14 exposures
R	#1								
2									
Mar	WBBL'S	1546	2016	1809	1830	24°41'	84°39'		#17 (3500m) ok. + put it in halves in other 2 tanks.
3	17, 18,								#18 ++ no good, door flapped. (600m) #19 good,
	19, 20,								but door only partially closed; stored it (150m)
	21, 22								#20 good + stored (300m). #21 good + stored (450m).
									#22 good + stored (600m). Picked up on PDR
MAR	CORE	1545	1730	1808	1818	24°41'	84°39'		GOOD CORE. LENGTH: 926 cm (good core) Top 23 cm.
3	#15								"red clay" (foraminiferal) remainder 1 unit of medium
									gray lutite. Penetration: 38'5"

Chief Scientist

Research Vessel VEMA

CRUISE N° 121

CRUISE LEG—From BERMUDA To MIAMI

12

TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
2/23	T-GRAD	1830	2001	2498	2508	25°40' 20	75°30'		
	#11								
F	Surface	1903	1933			25°40' 20	75°30'		
E	Plankton								
B	#15								
23									
F	MPS	1856	1908			25°40' 20	75°30'		
E	Plankton								
B	#3								
23	0-500m								
F	BPS-1	1856	1908			25°40' 20	75°30'		
E	Plankton								
B	#3								
23	500-1000m								
F	BPS-2	1842	1933			25°40' 20	75°30'		
F	Plankton								
B	#3								
23	1000-2000m								
F	BT	2120	2130			25°40' 20	75°30'		
E	#8								
B									
23									
F	CORE	1830	2001	2498	2508	25°40' 20	75°30'		GOOD CORE. length 1241 cm. core is of "red clay",
E	#13								grayish white and fine calcareous sand
B									length Penetration 4210"
23									

Research Vessel VEMA

CRUISE N° V.21

CRUISE LEG—From BERMUDA To MIAMI

TIME ZONE Z +5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. Δ	Long. Δ		
F	Vertical	0132	0230			25°23'	74°15'		
E	Plankton								
B	#7								
23									
F	BT	0243	0250			25°23'	74°15'		
E	#7								
B									
23									
F	Van Dorn	0300	0320			25°23'	74°15'		
E	#3								
B									
23									
23	CAMERA	LOWERED		0045	2580 Fms	25°23'	74°15'		27 HITS - 26 EXPOSURES
F	#9	1 ST EXPOSURE		0125	2679 Fms				64-5 LINAGRAPH PAN FILM
E		LAST EXPOSURE		0230	2696 Fms				SAIL & COMPASS USED
B		SURFACED		0345	2582 Fms				
2/23	T-GRAD	0102	0314	2580	2576	25°23'	74°15'		3 probes penetrated. Good film. Conductivity made.
	#10								
2/23	CORE	0102	0314	2580	2578	25°23'	74°15'		6000 CORE. Length: 1287 cm. Top layer of "red mud" followed by grayish green sediment. Little. Penetration: 40' 0"
	#12								
2/23	WBBL #10	0120	0253			25°40'	75°30'		all + ok. took salinity. #10 aft of #7.
	+ 11					20			#11 aft of 9. #'s 12 + 13 to be processed
	12 + 13	1854	2036						for Sr + Cs. Leave in WBBL's closed overnight.

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CRUISE N° U-21

CRUISE LEG—From BerBERMUDA To MIAMI

TIME ZONE Z +5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
F	Vertical	1900	1914			25°11'	73°40'		
E	Plankton								
B	#6								
22									
F	BT	1923	1930			25°11'	73°40'		
E	#6								
B									
22									
F	Van Dorn	1935	1940			25°11'	73°40'		
E	#2								
B									
22									
2/22	WBBL #8+9	1800	1942	2690		25°11'	73°40'		Both tt ok. Transferred # 8 to storage barrel alt of #2, and #9 to barrel aft of #5. No thermometers in #9. Took salinity.
2/22	T-GRAD #9	1737	2005	2690	2693	25°11'	73°40'		Fairly good T-Grad record. Conductivity made
F	CAMERA	Lowered		1723	2690	25°11'	73°40'		Camera 64-5
E	#8	1st exposure		1805	2798				Lithograph - Pan film
B		Last exposure		1930	2774				Sail used
22		Surfaced		2023	2702				compass used
									27 hits - 25 exposures
F	Surface	0142	0212			25°23'	74°45'		
E	Plankton								
B	#14								
23									

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CRUISE N° V.21

CRUISE LEG—From BERMUDA To MIAMI

TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
F	Surface	1127	1158			25°04	73°20		
E	Plankton						7320		
B	#12								
22									
F	BT	1109	1118			25°04	73°20		
E	#5						7320		
B									
22									
F	CAMERA	Lowered:		1120	2772	25°04	73°20		CAMERA 64-5
E	#7	1st exposure:		1202	2929		7320		LINAGRAPH PAN FILM
B		Last exposure:		1245	2922				SAIL USED
22		Surfaced:		1335	2780				COMPASS USED
									16 hits — 14 exposures
F	CORE	1131	1329	2780	2780	25°04	73°20		GOOD CORE. LENGTH: 1261 cm. Top 23 cm. a "red mud"
E	#10						7320		followed by yellowish gray lutite, at 717 cm.
B									a large manganese nodule (6 cm x 5 cm) was found.
22									Penetration: 31'7"
2-22	T-GRAD	1131	1329	2780	2780	25°04	73°20		Top probe not working. Good record on bottom
	#8						7320		Two probes. Conductivity record run
F	CORE	1757	2006	2690	2700	25°11	73°40		GOOD CORE. LENGTH: 1240 cm. Top 26 cm a
E	#11								red mud. Remainder a yellowish gray lutite.
B									Two manganese layers found around 650 cm.
22									Penetration: 26'4"
F	Surface	1819	1849			25°11	73°40		
E	Plankton								
B	#13								
22									

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CRUISE N° V. 21

CRUISE LEG—From BERMUDA To MIAMI

8
TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
F	CORE	0731	0939	2892	2892	25°38'	71°59'		CORE LENGTH: 1178 cm. The core was a good core, 57 cm. of "Red mud" and the remainder a gray lutite. Penetration: 40'4".
E	#7								
B									
21	T-GRAB	0731	0939	2892	2892	25°38'	71°59'		
	#6								
F	CORE	1606	1742	2795	2690	25°21'	72°41.5'		Attempt to core A Horizon. The messenger did not reach the release before contact. The sediment is a light brown lutite. Penetration 20'2".
E	#8	1744							
B									
21									
F	Surface	1611	1711			25°21'	72°41.5'		
E	Plankton								
B	#10								
21	(1 hour)								
F	Surface	1719	1749			25°21'	72°41.5'		
E	Plankton								
B	#11								
21									
2/21	T-GRAB	0731	0939	2892	2892				Good record - Conductivity taken
	#6					25°38'	71°59'		
	#7	1606	1742	2795	2690	25°41'	72°41.5'		Fair record - No Core from A horizon
F	CAMERA	Lowered:		1604	2710 fms	25°21'	72°41.5'		25 hits - 24 exposures camera 64-5 Linagraph - Pan film Sail Used Compass Used
E	6	1st Exposure:		1655	2955				
B		Last Exposure:		1808	2991				
21		Surfaced:		1905	2735				
F	CORE								GOOD CORE. Length: 1136 cm. Top sediment is a light brown lutite. Remainder is a firm orange lutite. Penetration 29'3"
E	#9	1950	2013	2860	2860	25°17'	72°40'		
B									
21									

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CRUISE N° V21

CRUISE LEG—From BERMUDA To MIAMI

7
TIME ZONE Z+5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. <i>N</i>	Long. <i>W</i>		
2/21	WBBL #7	0748	0918	2892		25°38'	71°59'		TT OK
F	Camera	Lowered:		0717	2892 fm.	25°38'	71°59'		Camera 64-5
E	5	1 st exposure:		0817	3010 fm.				Sail used
B		Last exposure:		0849	3008 fm.				compass used
21		Surfaced:		0955	2892 fm.				Lithograph Pan Film
									12 hits - 8 exposures
F	Surface	0730	0800			25°38'	71°59'		
E	Plankton								
B	#9								
21									
F	Vertical	0753	0905			25°38'	71°59'		
E	Plankton								
B	#5								
21									
F	BT	0936	0942			25°38'	71°59'		
E	#4								
B									
21									
F	Van	0945	0950			25°38'	71°59'		
E	Dorn								
B	#1								
21									
F	Hydro	0753	0835			25°38'	71°59'		
E	ST. #3								
B									
21									

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CRUISE N° V21

CRUISE LEG—From BERMUDA To MIAMI

TIME ZONE Z+5

6

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
2/20	WBBL 5+6	1531	1724	2430		26°41.5'	73°54'		#5 good. #6 (above 5) no good; door flapped; sample discarded. #5 transferred to storage tank immediately right of #2. No thermometers in #5. No salinity taken. Bubble developed in Hg column of protected therm. due to horiz. position.
2-20	T-6RAG #5	1531	1724			26°41.5'	73°54'		Good record
2/20	CORE #6	1531	1733	2430	2430	26°41.5'	73°54'		1219 cm core. Top 63 cm. a pale brown little. The remainder is a greenish gray little. Highly mottled throughout, approx 1 m. of flow in.
F	Surface	1633	1733			26°41.5'	73°54'		
E	Plankton								
B	#8								
20									
F	MPS	1503	1725			26°41.5'	73°54'		
E	#2								
B	0-100m								
20	100-250m								
	250-500m								
F	BPS-1	1503	1725			26°41.5'	73°54'		
E	#2								
B	500-1000m								
20									
F	BPS-2	1503	1725			26°41.5'	73°54'		
E	#2								
B	1000-2000m								
20									

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CRUISE N° U 21

CRUISE LEG—From BERMUDA To MIAMI

5
TIME ZONE Z+4.

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
2-19	T-GRAD # 4					29°32'	73°10'		Good T-GRAD Record + Conductivity
F	CORE	1405	1552	2080	2188	29°32'	73°10'		CORE OF 1091 CM WAS OBTAINED. APPROX 10' OF FLOW-IN. The sediment is a layer of light BROWN LUTITE OVER A LAYER OF A BLuish-GREEN LUTITE.
E	# 5								
B									
19									
F	Surface	1416	1446			29°32'	73°10'		
E	Plankton								
B	# 7								
19									
F	Vertical	1430	1524			29°32'	73°10'		
E	Plankton								
B	# 4								
19									
F	BT	1545	1653			29°32'	73°10'		
E	# 3								
B									
19									
F	Camera	Lowered		1359	2080	29°32'	73°10'		Camera 64-5
E	# 4	1st Exposure		1440	2494				Sail Used
B		Last Exposure		1518	2627				Compass used
19		Surfaced		1630	2888				17 hits - 16 exposures
									Lithograph - Pan Film
2/19	WBBL #4	1432	1534	2120		29°32'	73°10'		TT ok. Hydro #3 Transferred to upper port tank for S ⁹⁰ + Cs ¹³⁷ processing. WBBL #2 still not processed. Equipment should be in repair today

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CRUISE N° V21 BERMUDA

CRUISE LEG—From NEW To MIAMI

TIME ZONE +4

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
Feb 18	WBBL #3	0859	1045			30°14'	69°55'		Door flapped coming up. Sample discarded. No salinity sample from barrel. Thermometers did not complete reverse arc.
E	Camera	Lowered:		0840	2850 fms	30°14'	69°55'		Camera 64-5
E	Station	1 st Exposure:		0935	3100 fms				Note: sail ripped at seam as
B	#3	Last Exposure:		1008	3195 fms				Sail Used
18		Surfaced		1120	2845 fms				It did at K-1 and K-2.
									Compass Used
									14 hits - 13 exposures
F	Surface	0915	0945			30°14'	69°55'		
F	Plankton								
B	#6								
18									
F	Vertical	0939	1074			30°14'	69°55'		
F	Plankton								
B	#3								
18									
E	Hydro	1110	1137			30°14'	69°55'		
E	Station								
B	#7								
18									
F	CORE	0857	1046	2858	2836	30°14'	69°55'		PRESSURE RELEASE SET FOR 2100 FMS. did NOT release.
E	#4								Therefore, we got NO CORE AT ALL. SOME SEDIMENT WAS
B									SCRAPED OFF THE PISTON. IT IS A LIGHT BROWN
18									LUTITE. PENETRATION WAS 30'3".
2-18	T-6RAD	0857	1046	2858	2836	30°14'	69°55'		Good T-6rad record. No conductivity
	#3								record because of no core

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CRUISE N° V. 21

CRUISE LEG—From NEW YORK To _____

TIME ZONE + #5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
7/14/65	Hydro station #1	1457	1651			34°02'	67°06'		
F	Camera	Lowered		0850	2570	31°12'	65°13'		14 hits - 8 exposures
E	Sta.	1st Exposure		0950	2632 fms.				NOTE: Trigger Weight got jammed up after
B	#2	Last Exposure		1021	2621 fms.				64-5 camera no. 8 exposures,
17		Surfaced		1125	2569				Sail used compass used linagraph pen film
F	CORE	0919	1045	2559	2540	31°12'	65°13'		18cm. CORE due to NON release of pressure mechanism. Core
E	#3								is a "RED MUD" & TOP 2cm. is a Foraminiferal ooze.
B	WBRL #2	0919	1045	2559		31°12'	65°13'		TT OK. Thermometers still don't complete the
									reverse arc. Transferred sample to fore-part
									storage barrel. Transfer pump not working
F	Surface	0921	0952			31°12'	65°13'		properly. Aux. Therm. in UP 2874
EP	Plankton								broken
B	#5								
17									
F	Vertical	1033	1125			31°12'	65°13'		
E	Plankton								
B	#2								
17	0-150m	1106	1125						
	0-300m	1033	1050						
F	B.T. #2	1004	1013			31°12'	65°13'		
E									
B									
17									
7/17	T-GRAD	0919	1045	2559	2540	31°12'	65°13'		Had no core by which to measure
									conductivity. Film on T-Grad didn't unroll
									due to loose screw in drive chain.

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CRUISE N° Y-21

CRUISE LEG—From NEW YORK To

TIME ZONE +5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
2/13/65	#1 CS ST PM WBRL	0826				3605	7024		TI O.K. Rain water contamination. Breakage and Difficulty in processing equipment. Sample left in open water barrel overnight. Difficulty in flushing system and clearing old water from tubing
F	CAMERA	Lowered:		1310	2362 fms	3605	7024		10 hrs - 1 exposure 64-5 (camera no.)
E	#1	1st Exposure:		1352	2410 fms				Note: film did not Plus-X film
B		last "		1440	2410 fms				advance properly. Sail used
13/65		Surfaced:		1535	2360 fms				Poor focus on the single exposure
13/65	T-GRAD #1					3605	7024		This station is no good due to core barrel not penetrating enough. Bottom probe completely broken off. Middle probe ruined. Water probe readings OK
14/65	MPS #1	1547	1609			3402	6706		
	0-100								
	100-250								
	250-500								
	Plankton								
	BPS-1	1533	1609			3402	67°06		
	Plankton								
	(500-1000)								
	#1								
	BPS-2	1505	1634			34°02	67°06		
	Plankton								
	(1000-2000)								
	#1								
	Surface	1607	1638			34°02	67°06		
	Plankton								
	#4								

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CRUISE N° V-21

CRUISE LEG—From NEW YORK To MIAMI

TIME ZONE +5

Date	STATION and N°	TIME		SOUNDING		POSITION		LOG	REMARKS
		Start	End	Start	End	Lat. N	Long. W		
F	CORE	0837	0934	1192	1172	38 43	72 39		DIFFICULTY ENCOUNTERED REMOVING CORE FROM LOWER CORE BARREL. SOME CORE WAS SQUEEZED OUT BEHIND PISTON AND SECTION OF CORE FROM 62 CM TO 65 CM WAS DISTORTED. CORE IS PRIMARILY A GRAY TO GRAYISH TAN LUTACEOUS SILT WITH ALTERNATING SAND LAYERS. LUTITE CONTENT INCREASES WITH DEPTH.
E	#1								
B									
12									
F	Surface	0845	0915			38 43	72 39		
E	Plankton								
B	#1								
F	Surface	0839	0909			36 05	70 24		
E	Plankton								
B	#2								
13									
F	Vertical	1025	1045			36 05	70 24		
E	Plankton								
B	#1								
13	100m								
F	BT	0945	1000			36 05	70 24		
E	#1								
B									
13									
F	Surface	1329	1429			36 05	70 24		
E	Plankton								
B	#3								
13	CORE	0810	1210	2361	2362				TUBE #1 bent at 25°. EXTRUSION BY NORMAL METHOD. CORE WAS GOOD. LENGTH: 215 CM. The CORE WAS A GRAY SANDY LUTITE.
	#2								