DREDGE 14

USGS DREDGE LOG

SHIP/LEG FARNELLA

STATION # 22

DREDGE # D14

DEPTH INTERVAL(m) 2000 - 1825

DEPTH(m)corrected 2000 - 1825

DATE JD 266 LOCAL 23 Sept. 1989

TIME GMT 1825 LOCAL

LATITUDE 09°46.1 TO 09°45.28'N

LONGITUDE 160°31.20 TO 160°31.25'E

TOTAL WEIGHT: DREDGE 35 kg CRUST 25 kg

PERCENTAGE OF ROCK COVERED BY CRUST 100

PERCENT BROKEN FROM: OUTCROP 100 TALUS 0

THICKNESS OF MN CRUST: MAXIMUM 100 MINIMUM 5 AVERAGE 50

DOMINANT SURFACE TEXTURE Botryoidal-granular; smoothed Botryoida

SUBSTRATE LITHOLOGY Breccia, volcaniclastic sandstone

NODULES PRESENT 0

REMARKS: 2 boulders, 2 large cobbles, 4-6 smaller cobbles; pile of crust fragments
large (one of boulders) solid crust fragment

USGS DREDGE LOG

Depth Interval 2000 - 1825 Julian Date 266

Cruise I.D. F10-89-CP Local Date (m/d/y) _____

Station No. 22 Chief Scientist Hein/Kang

Dredge No. 14 Tech on Watch Olzanne

	On Station	Dredge on Btm	Dredge off btm	Off Station
GMT	13:12	14:17:54	19:52:39	20:24:29
LATITUDE	09 45.63 N	09 46.10 N	09 45.28 N	09 45.03N
LONGITUDE	160 31.32 E	160 31.20E	160 31.75 E	160 31.02 E
WATER DEPTH	1875m	2000m	1825 m	1930

Site Description and Target : NW slope of southernmost seamount in Group F. Dredge first ~2000, got caught twice, wound up slope + dredged ~1800-1900. Corrected depth 2000 - 1825.

OPERATION*	GMT	DEPTH (m)	WIRE OUT (m)	TENSION	HDG/SPD	COMMENTS
on bottom	14 17:54	2000	2029		135/0.9	on bottom
more wire out	1422	2000	2300			wire out
" " "	1434	1940	2700		170/0.7	" "
bites	1459	1890	2700			little bites
bite	1519	1740	"	2T	180/0.7	bite
"	1520	1730	"	2.1	176/0.8	"
"	1520	1720	"	2.0	176/0.8	"
"	1523	1715	"	2.5	157/0.7	"
"	1524	1700	"	3.1	159/0.7	"
Stuck	1532	1675	"		334/1.1	back ship down, bring in wi
"	1607	2050	2400		019/0.8	
off snag - new snag	1609	2050			000/1.8	snag
pulled loose	1643	2180	2285	10.6 T	014/0.3	loose
off bottom	1647	2200				off bottom pull some wire
wire out	1653	2220	1900 m			start again at 1900 m
on bottom	1801	1785 m	2096		347/0.8	on bottom
	1801	1785m	2125		"	wire out
snags	1810	1720m	"		151/3.9	some small snags

*on/off bottom, bites, etc.

OTHER COMMENTS:

USGS DREDGE LOG

Depth Interval _____ Julian Date 266

Cruise I.D. F10-89-CP Local Date (m/d/y) _____

Station No. 22 Chief Scientist Hein/Kang

Dredge No. 14 Tech on Watch O'Zanne

	On Station	Dredge on Btm	Dredge off btm	Off Station
GMT				
LATITUDE				
LONGITUDE				
WATER DEPTH				

CONTINUED

Site Description and Target : _____

OPERATION*	GMT	DEPTH (m)	WIRE OUT (m)	TENSION	HDG/SPD	COMMENTS
bite	1819	1660 m	2125	4T	171/1.7	bite
bite	1820	1660m	"	4.9T	023/1.7	bite
bite	1823	1650m	"	2.4 T	014/4.1	"
"	1825	1640m	"	4.5 T	019/3.9	"
"	1831	1585m	"	4.1T	180/0.9	"
"	1832	1580m	"	2.1 T	178/0.8	"
"	1832	1580m	"	2.4 T	178/0.8	"
"	1833	1580m	"	3.8 T	176/0.7	"
"	1833	1580m	"	2.1 T	174/0.7	"
STUCK	1842	1580m	"		118/0.4	stuck – anchored to bot
UNSTUCK	1851	1650m	"	4.9T	070/0.6	knocked off
bite	1852	1620m	~~bit~~ "	4.2T	113/0.5	bite
"	1856	1580m	"	3.2	157/1.0	"
"	1914	1480	"	2.0	178/0.8	"
"	1916	1475	"	3.5	152/0.9	"
"	1920	1490	"	2.2	027/1.1	"
"	1921	1495	"	2.6	037/1.0	several bites
"	1924	1500		3.3	315/0.3	bite

*on/off bottom, bites, etc.

OTHER COMMENTS:

Dredge Sample Summary Sheet

Sample ID	Bulk CC	Layer CC	Pt & Au	REE	OC	DPTS/TS	XRD	35mm Ph	Archive	Paleo
D14-1	✓	✓	✓	✓		✓	✓			
D14-2	2/3 TO KORD1									
D14-3	✓(surface)				✓					
D14-4	✓						✓			
D14-5										
D14-6	✓(surface)		1/2 TO KORD1							
D14-7	1/2 TO	KORD1								
D14-8	1/2 TO	KORD1								
D14-9										
D14-10										

1/2 to KORD1

"

BASALT TO

BASALT TO

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 40x33x14 (cm) Location: F Seamount

Sample Id: D14-1 Weight: 11 (kg) Depth: ~~2000~~ - 1825 (m)

Mn Crust Description

Surface Texture: Smoothed botryoidal w/ microbotryoidal surface

Mn Crust Thickness (mm):
Min: 108 Max: 120 Ave: 109

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
radational 1.	20	25	23	Dense w/some laminae porosity massive
radational 2.	10	15	13	Porous w/narrow (up to 4mm) columns separated by light brown clay
sharp 3.	20	25	22	Porous w/a few clay infillings
4.	45	47	45	Dense - Massive older layer fracture fill in one area may have turned to phosphate
5.				
6.				

D14-1
F10-89-CP

Comments and XRD Mineralogy:
Dense lowest layer has a botryoidal surface in sharp contact w/ layer 3

Substrate Description

Rock Type: Vesicular Olivine, Plagioclase phyric basalt, brown

Description:

Biology ?:

Described By: Jorie Subsampled By: K.D.

ANAL

Subsample Number	Analysis		Layer Thickness
D14-1A:	XRD; BULK CC, REE	(111g) (18g)	0-120 mm
D14-1B:	XRD: CC	(127g)	0-30 mm
	REE	(18g)	
D14-1C:	XRD: CC	(25g)	30-45 mm
	REE	(7.9g)	
D14-1D:	XRD: CC	(21g)	45-70 mm
	REE	(6.4g)	
D14-1E:	XRD: CC	(59g)	70-120 mm
	REE	(7g)	

D14-1A DPTS

Basalt Pebble substrate to Malcolm

Various layers Sr, Pb isotopes Hein

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 38 x 37 x 14 (cm) Location: F Seamount

Sample Id: D14-2 Weight: 15 (kg) Depth: 2000 - 1825 (m)

Mn Crust Description

Surface Texture: Botryoidal on top
porous side

Mn Crust Thickness (mm):

Min: 80 / 10 Max: 90 / 50 Ave: 85 / 23

Top side

Layers (Outer to Inner)(mm):

Top layers

	Min	Max	Ave	Texture & Color
1.	6	9	8	massive, dense
2.	12	20	17	porous w/ some Fe stain
3.	5	15	8	Very porous w/ clay infillings
4.	30	49	40	porous in layers, very irregular outer contact
5.				
6.				

D14-2
F10-89-CP
↑ TO HORDI

Comments and XRD Mineralogy:

Piece seems to have been pulled from the side of an outcrop or ledge
Substrate of coelesing nodules cemented by phosphate

ANAL

Subsample Number Analysis LayerThickness

2/3 TO HORDI

Substrate Description

Rock Type: Phosphate cemented Mn Nodules, w/ various types of rock such as altered basalt, volcaniclastic sediments and

Description: phosphate

Biology ?: encrusting Foram

Described By: JURIC Subsampled By:

Layer 1
Layer 2
Layer 3
Layer 4
Substrate
CM

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 27x19x9 (cm) Location: f Seamount

Sample Id: D14-3 Weight: 7 (kg) Depth: 2005 - 1825 (m)

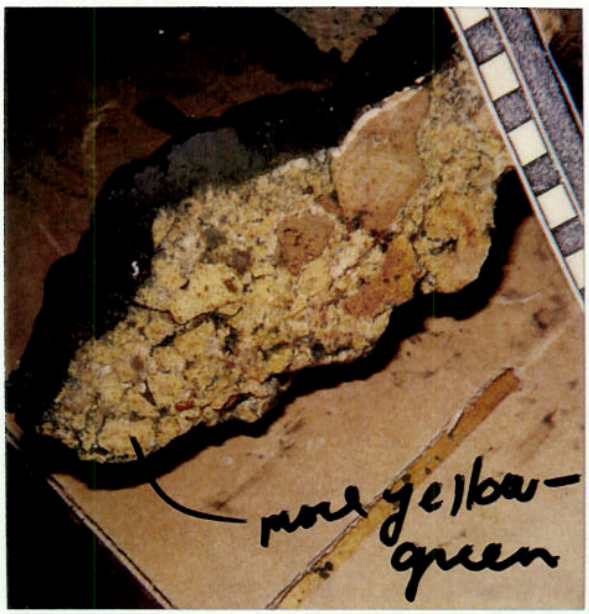
Mn Crust Description

Surface Texture: Porous botryoidal w/ large and small botryoids

Mn Crust Thickness (mm):
Min: 3 Max: 15 Ave: 10

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				
3.				
4.				
5.				
6.				



D14-3
F10-89-CP

Comments and XRD Mineralogy:

ANALY

Subsample Number	Analysis	LayerThickness
D14-3A	Scrapp. (5.5g)	≤ 0.5 mm
D14-3B	O.C (22.4g)	Substrate

½ To HORJ1

Substrate Description

Rock Type: Volcaniclastic Breccia

Description: Very altered, w/ some phosphate cement; clasts of altered vesicular basalt and altered glassy volcanic debris.

Biology ?:

Described By: Josie Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 19x18.5x16 (cm) Location: F Seamount

Sample Id: D14-4 Weight: 8 (kg) Depth: 2000-1805 (m)

Mn Crust Description

Surface Texture: botryoidal to porous

Mn Crust Thickness (mm):
Min: 7 Max: 22 Ave: 17

Layers (Outer to Inner)(mm):

Min	Max	Ave	Texture & Color
1.			
2.			
3.			
4.			
5.			
6.			

D14-4
F10-89-CP

Comments and XRD Mineralogy:
Crust is massive & dense, w/ lower laminae of Fe-staining or phosphorite which defines the surface of a previous mm Thin crust.

Substrate Description

Rock Type: Pinkish micrite w/ basalt clasts, Basalt cobble and white to cream fine grained micrite w/ Mn Stain → maybe

Description: cement pasty phosphatized at the crust boundary

Biology ?: encrusting Forams

ANALY

Subsample Number	Analysis	Layer Thickness
D14-4	BULK CC (19g), XRD	0-19 mm

½ TO HORDI

PIECE OF BASALT TO MALCOLM PRINGLE

Described By: JORIE Subsampled By: RO

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 15x11x6 (cm) Location: F Seamount

Sample Id: D14-5 Weight: 1.5 (kg) Depth: 2000-1825 (m)

Mn Crust Description

Surface Texture: Porous

Mn Crust Thickness (mm):
Min: 25 Max: 60 Ave: 40

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	14	25	18	Dense w/ phosphate in fractures
2.	11	35	15	porous w/ minor Fe-staining
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:

ANAL

Subsample Number Analysis LayerThickness

Substrate Description

Rock Type: Breccia

Description: several only moderately altered) vesicular olivine phyric basalt clasts; phosphate cement w/ fine (pebble-sized) yellow-green volcaniclastic matrix

Biology ?:

Described By: Jodie Subsampled By:

SAMPLE DESCRIPTION

14.5 x 11.5 x 6

Cruise Id: F10-89-CP Size: 11.5 x 9 x 5 (cm) Location: F Seamount

Sample Id: D14-6 Weight: 1.2 (kg) Depth: 2000-1825 (m)

Mn Crust Description

Surface Texture: Apiece botryoidal; Bpiece porous

Mn Crust Thickness (mm):

B. Min: 40 Max: 60 Ave: 50

A. 9 18 12

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
B 1.	28	37		Very porous
B 2.	12	17		Dense w/ phosphate at surface.
3.				
4.				
5.				
6.				

D14-6 Scraped

BF10-89-CP

Comments and XRD Mineralogy:

ANALY

Subsample Number	Analysis	LayerThickness
D14-6 CC (5.3g) surface of A		
½ to #ARD1		

Substrate Description

Rock Type: Altered volcaniclastic breccia

Description: Friable, yellow-green highly altered clasts of glassy volcanic debris & basalt fragments (small pebbles to granule) in a chocolate-brown matrix of fine-grained volcaniclastic debris.

Biology ?: encrusting Foram

Described By: Jodie

Subsampled By: Joan

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 11X10°X3 REST SMALLER (AVERAGE 9X7X3) (cm) Location: SEAMOUNT F.

Sample Id: D14-7 Weight: 2 (kg) Depth: 2000-1825 (m)

Mn Crust Description

Surface Texture: Granular to irregular; one piece rippled; smoothed botryoidal

Mn Crust Thickness (mm):
Min: 10 Max: 50 Ave: 30

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				
3.				
4.				
5.				
6.				

F10-89-CP

D14-7

Comments and XRD Mineralogy:

ALL BUT ONE MISSING SUBSTRATE, MOST PIECES CONSIST OF ONLY UPPER CRUSTS, GENERALLY POROUS WITH IRON STAINING, AND SOME PHOSPHORITE INFILLING. TWO PIECES have two layers THE UPPER CRUST (AS ABOVE), AND A LOWER DENSE MASSIVE CRUST WHICH IS PARTIALLY MISSING

ANALYS

Subsample Number	Analysis	Layer Thickness

Substrate Description

Rock Type: SEDIMENTARY BRECCIA (one piece)

Description: glassy debris ALTERED BASALT CEMENTED WITH MANGANESE fine-grained volcaniclastic yellow-green debris

½ TO XORDI

Biology ?: ENCRUSTING FORAMS

Described By: R.D. Subsampled By:

Cruise Id: F10-89-CP Size: ASSORTED: SMALL COBBLE TO mostly MEDIUM PEBBLE (cm) Location: SEAMOUNT F

Sample Id: D14-8 Weight: 3 (kg) Depth: 2000-1825 (m)

Mn Crust Description

Surface Texture: Mostly granular, some irregular

Mn Crust Thickness (mm):
Min: 4 Max: 130 Ave: 20

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				
3.				
4.				
5.				
6.				

NO PICTURE

Comments and XRD Mineralogy:

BITS AND PIECES - generally porous and ironstained

about 130 pieces

ANALYSES

Subsample Number	Analysis	LayerThickness

Substrate Description

Rock Type: SEDIMENTARY BRECCIA AND LIMESTONE

Description: BRECCIA - yellow-green coarse to medium grained angular to subangular volcanic clastic debris calcite, manganese chips cemented with clay and silt sized volcanic debris.

PHOSPHORITE - white, ironstaining, manganese dendrites

Biology ?: encrusting forams

½ to TORDI

Described By: R.D.

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: LARGE PEBBLES (cm) Location: SEAMOUNT F

Sample Id: D14-9 Weight: <1 (kg) Depth: 2000-1825 (m)

Mn Crust Description

Surface Texture: GRANULAR - TO IRREGULAR, PATINA

Mn Crust Thickness (mm):
Min: <1 Max: 4 Ave: <1

NO PICTURE

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				
2.				
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:

MANGANESE PARTIALLY COVERS ONE FRAGMENT. VERY POROUS, HAS AN ERODED LOOK. PATINA COVERS THE REST OF THE FRAGMENT

ANALYSES

Subsample Number	Analysis	LayerThickness

Substrate Description

Rock Type: BASALTS, PHOSPHORITE

Description:
ALTERED BASALTS, APHANITIC & SOME PHENOCRYSTS. LIGHT YELLOW to RUST BRECCIATED ALTERED VOLCANICS WITH CALCITE OR PHOSPHORITE CMT. PHOSPHORITE WITH MANGANESE DENDRITES.

~~Biology~~ ?: BUFF COLORED, CALCITE DEPOSIT ON SURFACE WITH OVERLYING, IRON OXIDE-LIKE DEPOSIT; EMBEDDED VOLCANIC GRAINS ON ONE SURFACE

Described By: RO Subsampled By:

Cruise Id: F10-89-CP Size: 6×6×3, 8×4×5 6×5×4, 7×6×4 (cm) Location: Seamount F

Sample Id: D14-10 Weight: ~0.5 (kg) Depth: 2000-1825 (m)

Mn Crust Description

Surface Texture: Botryoidal and granular

Mn Crust Thickness (mm):

Min: 4 Max: 34 Ave: 19

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	4	8	6	Massive and dense
2.	0	>20	10	Highly porous
3.				
4.				
5.				
6.				

* Three of five samples show two distinctive layer.
* Two of five samples show entirely porous texture

NO picture

Comments and XRD Mineralogy:

- foras in layer 2 filled with iron oxicia and phosphorite

ANALYSES

Subsample Number	Analysis	LayerThickness

Substrate Description

Rock Type: Altered basalt / breccia
basalt probably piece of breccia

Description:

- olivine relatively fresh (dark gray)
- breccia cemented with phosphorite

Biology ?: forams

Described By: Yoon Subsampled By: