DREDGE 3

USGS DREDGE LOG

SHIP/LEG FARNELLA

STATION # 3

DREDGE # D3

DEPTH INTERVAL(m) 1450 – 1300

DEPTH(m)corrected 1450 – 1400

DATE JD 258 LOCAL 15 September 1989

TIME GMT 0530 LOCAL (off bottom)

LATITUDE 12°11.5' TO 12°11.69' N

LONGITUDE 166°17.2' TO 166°17.55'E

TOTAL WEIGHT: DREDGE 4 kg CRUST 3.5 kg

PERCENTAGE OF ROCK COVERED BY CRUST 99%

PERCENT BROKEN FROM: OUTCROP 100% TALUS —

THICKNESS OF MN CRUST: MAXIMUM 55 mm MINIMUM < 1 mm AVERAGE 20mm

DOMINANT SURFACE TEXTURE Botyroidal

SUBSTRATE LITHOLOGY Breccia with calcite cement, porphyritic basalt; completely altered volcanic clasts.

NODULES PRESENT 0

REMARKS: Difficulty in breaking off crusts because of calcite cement in the substrate, one tiny pebble of limestone.

SAMPLE DESCRIPTION

Cruise Id: F10-8 P Size: 16 x 12 x 5 (cm) Location: Seamount B

Sample Id: D3-1 Weight: 0.5 (kg) Depth: 1465 - 1470 (m)

Mn Crust Description

Surface Texture: Botryoidal (with high relief) various botroid size (3 ~ 10mm)

Mn Crust Thickness (mm):
Min: 23 Max: 35 Ave: 29

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	8	18	13	Porous
2.	11	15	13	Massive & dense
3.				
4.				
5.				
6.				

Comments and XRD Mineralogy:

layer 1: porous, manganite included only botryoidal relief

Layer2: pores filled with iron oxide and rarely with phosphorite; Lower boundary irregular and indistinct

Layer3: basaltic fragments (1~2mm) included

* Small pieces of substrate rock

Substrate Description

Rock Type: Breccia ?

Description: Basalt clasts cemented by (?) phosphorite and manganese

Biology ?: encrusting worm tubes and foram

F10-89-CP
D3-1

ANALYSIS

Subsample Number	Analysis	LayerThickness
SAMPLES TO KORDI		

Described By: JCOH Subsampled By:

F10-89-CP
03-1

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 17X10X 4.5 (cm) Location: SEAMOUNT B

Sample Id: D3-2 Weight: 1 (kg) Depth: 1450-1300 (m)

Mn Crust Description

Surface Texture: BOTYROIDAL (MEDIUM SIZED; DEPTH <1cm) GRADING TO SMALL BOTYROIDS ON SIDE. UNDERSIDE GRANULAR

Mn Crust Thickness (mm):
Min: 20 Max: 57 Ave: 35

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	6	12	10	DENSE, BLACK, BOTYROIDAL LAYER
2.	7	27	20	IRREGULAR, POROUS, FE STAINING
3.	10	26	23	IRREGULAR SHAPE, MOSTLY DENSE W/ MINOR POROSITY, AND PHOSPHORITE FILLED VUGS
4.				
5.				
6.				

Comments and XRD Mineralogy:
MINOR AMOUNT OF SUBSTRATE

F10-89-CP
D3-2

ANALY

Subsample Number	Analysis	LayerThickness
D3-2	CC	78.8 g Bulk 0-35 mm

Substrate Description

Rock Type: BASALT

Description:
SMALL PEBBLE SIZED POSSIBLY FROM A SEDIMENTARY BRECCIA; ALTERED SOMEWHAT

Biology ?: FISH BONE, ENCRUSTING FORAMS WORM TUBES / extensive

F10-89-CP
D3-2

Described By: R.C Subsampled By:

SAMPLE DESCRIPTION

Cruise: F10-89-CP Size: 10 x 6 x 5 (cm) Location: Seamount B

Sample Id: D3-3 Weight: 0.1 (kg) Depth: 1450-1450 (m)

Mn Crust Description

Surface Texture: Botryoidal

Mn Crust Thickness (mm):
Min: 30 Max: 50 Ave: 40

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	2	6	4	Massive, black
2.	5	10	8	Porous, brownish
3.	22	38	30	Massive, black
4.				
5.				
6.				

F10-89-CP
D3-3

Comments and XRD Mineralogy:

Layer 2: tiny pores filled with iron oxide and phosphoride
Layer 3: Basalt rock fragments (<12mm) included; some large empty pores (2-3mm) in lower part

ANALY

Subsample Number	Analysis	LayerThickness
SAMPLES TO KORDI		

Substrate Description

Rock Type: absent

Description:

Biology ?: encrusting worm tubes and forams

Described By: [illegible] Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 8.5x5.8x3 (cm) Location: SEAMOUNT B

Sample Id: D3-4 Weight: .2 (kg) Depth: 1450-1300 (m)

Mn Crust Description

Surface Texture: MEDIUM SIZED BOTYROIDAL (< 1 cm) SLIGHTLY SMOOTH

Mn Crust Thickness (mm):
Min: 15 Max: 32 Ave: 20

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	1	10	5	MASSIVE, SL. POROUS
2.	4	14	7	IRREGULAR, POROUS, FE STAINING & PHOSPHORITE INFILLED VUG.
3.	6	13	9	DENSE, MASSIVE, BLACK
4.				
5.				
6.				

F10-89-CP
D3-4

Comments and XRD Mineralogy:
SUBSTRATE BROKEN OFF, ONE EMBEDDED BASALT PEBBLE.

ANALY

Subsample Number	Analysis	LayerThickness

Substrate Description

Rock Type:

Description:

Biology ?: ENCRUSTING FORAMS, WORM TUBES

Described By: RO Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 8x6x3 (cm) Location: Seamount P

Sample Id: D3-5 Weight: 0.01 (kg) Depth: 1460-1450 (m)

Mn Crust Description

Surface Texture: botryoidal & granular

Mn Crust Thickness (mm):
Min: 8 Max: 12 Ave: 10

Layers (Outer to Inner)(mm):

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

F10-89-CP
D3-5

Comments and XRD Mineralogy:

Slightly porous; tiny pores filled with iron oxide

ANALY

Subsample Number	Analysis	LayerThickness

Substrate Description

Rock Type: altered basalt

Description:
phosphorite veinlets and grains
calcite grains included

Biology ?: encrusting foram

Described By: Yoon Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: Pebble to cobble (cm) Location: B Seamount

Sample Id: D3-6 Weight: 1.5 (kg) Depth: 1450-1300 (m)

Mn Crust Description

Surface Texture: Botryoidal, fine-grained

Mn Crust Thickness (mm):
Min: 2 Max: 15 Ave: 25

Layers (Outer to Inner)(mm):

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

Comments and XRD Mineralogy:

Various Crust Fragments
most volcanic substrate

Side, underside, top, also a
younger generation represented

ANALYS

Subsample Number	Analysis	Layer Thickness

Substrate Description

Rock Type: NONE

Description:

Biology ?: Encrusting Foram's

Described By: HSW

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: Various (cm) Location: 3 Seamount

Sample Id: D3-7 Weight: .75 (kg) Depth: 1450-1300 (m)

Mn Crust Description

Surface Texture: granular

Mn Crust Thickness (mm):

Min: _____ Max: _____ Ave: 1

Layers (Outer to Inner)(mm):

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

F10-89-CP

D3-7

Comments and XRD Mineralogy:

mostly underside Crust on basalt

mostly substrate

Substrate Description

Rock Type: porphyritic vesicular Basalt

Description:

v. altered to mod. Fresh gray w/ large vesicles filled w/ Calcite + Sandy phosphorite

Olivine? altered to brown iron oxide

Biology ?: _____

ANALYS

Subsample Number	Analysis	LayerThickness

Described By: Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: various (cm) Location: B Seamount

Sample Id: D3-8 Weight: 0.2 (kg) Depth: 1450-1300 (m)

Mn Crust Description

Surface Texture: none

Mn Crust Thickness (mm):

Min: _____ Max: _____ Ave: _____ NONE

Layers (Outer to Inner)(mm):

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

F10-89-CP

D3-8

Comments and XRD Mineralogy:

ANALY

Subsample Number	Analysis	Layer Thickness
D3-8	OC	Substrate
	XRD	(16.5gm)

Substrate Description

Rock Type: Breccia

Description: Altered brown basalt granules + pebbles in Calcite cement

Freshly broken from outcrop in plates

Biology ?:

Described By: Lein

Subsampled By: Lein

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: Pebble (cm) Location: B Seamount

Sample Id: D3-9 Weight: 0.1 (kg) Depth: 1450-1800 (m)

Mn Crust Description

Surface Texture: Patina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Layers (Outer to Inner)(mm):

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

F10-89-CP

D3-9

Comments and XRD Mineralogy:

mostly Substrate

Substrate Description

Rock Type: Basalt ? , Basalt

Description:

1. basalt? completely altered to clay + zeolite? + iron oxide

2. basalt w/ iron oxide - clay - calcite filled circular vesicles in gray basalt

Biology ?: —

ANALYSI

Subsample Number	Analysis	LayerThickness

Described By:

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: pebble (cm) Location: B Seamount

Sample Id: D3-10 Weight: 0.001 (kg) Depth: 4550-4300 (m)

Mn Crust Description

Surface Texture: none

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Layers (Outer to Inner)(mm):

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

No photo

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness
D3-10	Palar	

Substrate Description

Rock Type: Limestone ball

Description: Foraminifera Sand

Biology ?: Forams

Described By: DCM

Subsampled By: