Dredge 10

USGS DREDGE LOG

Depth Interval _____ Julian Date _____

Cruise I.D. _____ Local Date (m/d/y) _____

Station No. 13 Chief Scientist _____

Dredge No. _____ Tech on Watch _____

DREDGE 10 CONTINUED

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

Site Description and Target : _____

OPERATION*	GMT	DEPTH (m)	WIRE OUT (m)	TENSION	HDG/SPD	COMMENTS
Bringing in wire	1448	1560				PAY IN
STUCK	1453	"	2100			STOP WIRE IN
Bringing	1504	"	2000			PAY IN
in	1514	1680	1890			
wire	1518	1620	1800			
	1522	1575	1700			
	1526	1575	1600			
OFF BOTTOM	1528	1575	"		028/0.8	
OFF STATION	1555	1430	—		254/1.0	

*on/off bottom, bites, etc.

OTHER COMMENTS:

USGS DREDGE LOG

SHIP/LEG F10-89-CP

STATION # 13

DREDGE # D10

DEPTH INTERVAL(m) 1915-1575

DEPTH(m)corrected 2000-1800

DATE JD 262 LOCAL 20 Sept. 1989

TIME GMT 15:27:23 LOCAL

LATITUDE 11°50.9' TO 11°51.27'

LONGITUDE 161°28.7' TO 161°28.3'

TOTAL WEIGHT: DREDGE 80 kg CRUST 15 kg

PERCENTAGE OF ROCK COVERED BY CRUST 80% but only patina on Lms

PERCENT BROKEN FROM: OUTCROP 100 TALUS 0

THICKNESS OF MN CRUST: MAXIMUM 35 MINIMUM <1 AVERAGE 10

DOMINANT SURFACE TEXTURE Botryoidal; granular

SUBSTRATE LITHOLOGY ① limestone 65% ② basalt 25% (3) <10% Crust substrate + breccia ④ <2% Lms breccia

Several kilograms of foram sand

NODULES PRESENT 0

REMARKS: Medium-sized, high relief botryoids Lms bored; crusts from breccia or maybe basalt, but all basalts recovered have thin granular crusts

≈ 15 kg Thrown overboard

(D)

	Sample ID	Bulk CC	Layer CC	Pt & Au	REE	OC	DPTS/TS	XRD	35mm Ph	Archive	Paleo
	D10-1	✓	✓	✓	✓			✓			
Complete form	D10-2	✓	1/2 to	KORDI				✓			
	D10-3	KORDI									
	D10-4	1/2 TO KORDI									
	D10-5										
~~Paleo on core~~	D10-6										✓
~~who described~~	D10-7										
~~cut & described~~	D10-8										
~~who described~~	D10-9										
	D10-10	[illegible]				✓					
	D10-11										
~~who described~~	D10-12	SAMPLE PIECE TO KORDI, REST TO PRINGLE									
	D10-13	1/2 TO KORDI, 1/3 THROWN OVERBOARD					✓				
	D10-14	1/2 TO KORDI, 2 PIECES TO SCHLANGER									
	D10-15	1/2 TO KORDI,			"						
	D10-16	"	,	1 PIECE	"						
	D10-17						✓	✓			

USGS DREDGE LOG

Depth Interval 1945-1575

Cruise I.D. F10-89-CP

Station No. 13

Dredge No. 10

Julian Date 262

Local Date (m/d/y) 9/20/89

Chief Scientist Hein/Kang

Tech on Watch Corky O'Zanne

	On Station	Dredge on Btm	Dredge off btm	Off Station
GMT	12:07:42	12:43:25	15:27:53	15:55:04
LATITUDE	11 50.70 N	11 50.90 N	11 51.27	11 51.24
LONGITUDE	161 29.12E	161 28.68 E	161 28.33	161 28.03
WATER DEPTH	2120	1945	1575	1430

Site Description and Target : Rocks from 2000-1800

GPS OK

OPERATION*	GMT	DEPTH (m)	WIRE OUT (m)	TENSION	HDG/SPD	COMMENTS
on BOTTOM	1243	1945	2148	—	335/1.8	starting up line/letting out scope
SCOPE IS OUT	1253	1885	2500	—	332/6.2	Starting to Dredge
Starting to snag	1312	1810	"	—	320/0.9	STARTING TO SNAG ALONG BOTTOM
BITE	1315	1850	"	2.1T	322/0.7	Break off
BITES	—	—	"	2's + 3's		SLIPS (REPORTED 1322)
BITE	1322	1570	"	4.9T	256/0.6	Break off
BITES	1326	1570	"	3.5T	307/0.7	Break off / Hung up again
BITE	1329	1545	"	2.1T	328/0.9	
ON A BITE	1330	"	"	2.4T	"	
Stuck	1334	1545	"	SAME		Paying out 25 m wire
Broke off	1338	1530	2525	4.2T		
BITE	1339	1530	"	2.2	319/0.6	
BITE	1342	1540	"	3.2T		Break off
"	"	"	"	2.2T		
BITE	1343	"	"	2.6T		Break off
BITE	1345	1540	"	4.6T		Break off
"	1345	"	"	2.4T		
"	1346	"		3.1T		

*on/off bottom, bites, etc.

OTHER COMMENTS:

USGS DREDGE LOG

Depth Interval _____ Julian Date _____

Cruise I.D. _____ Local Date (m/d/y) _____

Station No. 13 Chief Scientist _____

Dredge No. _____ Tech on Watch _____

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

DREDGE CANCELED

Site Description and Target : _____

OPERATION*	GMT	DEPTH (m)	WIRE OUT (m)	TENSION	HDG/SPD	COMMENTS
BITE	1347	1480	2525	3.6T	315/0.6	
"	"	"	"	2.2T	"	
"	1350	1475	"	2.2T	327/0.9	
"	"	"	"	2.0T	327/0.9	
"	1351	"	"	2.1T	"	
"	1352	1470	"	2.2T	"	
"	1353	"	"	2.2T	334/0.9	
"	1358	1460	"	2.1T	329/0.7	
"	1400	1455	"	2.4T	336/0.8	
"	1401	1455	"	3.4T	221/0.8	!
"	"	"	"	2.0T	"	-60m past established line
"	1403	1450	"	4.5T	224/0.6	"
"	1406	1440	"	2.5	320/0.6	-85m " " "
"	1408	1435	"	2.2	"	
"	1412	1430	"	2.8	340/0.7	back on end of line
Bringing in wire	1414	1430		—	—	Bringing in wire
SNAG / BITE	1414	1430	2515	2.5	344/0.5	
	1434	1550	2370			Paying in

*on/off bottom, bites, etc.

OTHER COMMENTS:

SAMPLE DESCRIPTION

Largest 13.5x[illegible]
Smallest 5.5x6.2x3.5

Cruise Id: F10-89-CP S[illegible] (cm) Location: D Seamount

Sample Id: D10-1 Weight: ~3 kg Total (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture: Botryoidal w/ micro botryoids superimposed. The depth between lobes is fairly deep

Mn Crust Thickness (mm):
Min: 30 Max: 35 Ave: 30

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	15	26	22	Dense, Black, Radial porous texture. Pockets w/ sed in lower in layer
~~2.~~				
2 ~~3.~~	5	11	8	Porous Fe & phosphate dispersed throughout sediment in larger pores clasts incorporated in crust
4.				
5.				
6.				

D10-1

Comments and XRD Mineralogy:

ANAL

Subsample Number	Analysis	Layer	Thickness
D10-1-1A	CC, Pt, Au, Ree	bulk 0-30mm	200gm
D10-1-1B	CC & Ree	0-22mm	100gm
D10-1-1C	CC & Ree	22-30mm	35gm
D10-1-2,3	CC	0-≤0.5mm	5.4g

Substrate Description

Rock Type: No Substrates w/ any of these crusts

Description:

Biology ?: encrusting foram

D10-1C - very porous layer w/ clasts cleaned out as much as possible

Described By: Jorie Subsampled By: Jorie

SAMPLE DESCRIPTION

Largest 12 x 10 x 8
Smallest 8.5 x 7 x 5.5

Cruise Id: F10-89-CP Size: _____ (cm) Location: D Seamount

Sample Id: D10-2 Weight: 2 (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture: Botryoidal, w/ granular texture superimposed

Mn Crust Thickness (mm):
Min: 30 Max: 40 Ave: 38

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	12	18	15	Black, porous w/ pores developed between coalesing bots
2.	4	6	5	Black, laminae w/ porous areas between layers
3.	10	15	12	Black, porous w/ bot. columns w/ Fe enriched between bots
4.				
5.				
6.				

F10-89-CP
D10-2

Comments and XRD Mineralogy:

Substrate Description

Rock Type: Limestone; porous micrite w/ boring. Mn Desseminated into the limestone

Description:

Biology ?:

ANAL

Subsample Number	Analysis	Layer Thickness
D10-2-1	CC (bulk)	29.0 gm (0-35 mm

½ TO GORDI

Described By: JS Subsampled By: Yoon

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: Largest 7.5 x 9 x 8 Smallest 4 x 3 x 2.5 (cm) Location: D Seamount

Sample Id: D10-3 Weight: 41 kg (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture: Botryoidal and knobby granular

Mn Crust Thickness (mm):
Min: 20 Max: 65 Ave: 40

Layers (Outer to Inner)(mm):

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

F10-89-CP
D10-3

Comments and XRD Mineralogy:

Various crust all but one without substrate

ANAL

Subsample Number	Analysis	LayerThickness

All To HORDI

Substrate Description

Rock Type: The one piece w/ substrate has massive olivine phyric basalt

Description: Olivine is altered, rest relatively fresh

Biology ?:

Described By: Joyce

Subsampled By:

SAMPLE DESCRIPTION

Largest 9x9x8
Smallest 4x6x8

Cruise Id: F10-89-CP Size: _____ (cm) Location: D Seamount

Sample Id: D10-4 Weight: ~2 (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture: granular to porous outer texture
Dark Black Dense cross-section

Mn Crust Thickness (mm):
Min: patchy Max: 3 Ave: 2

Layers (Outer to Inner)(mm):

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

F10-89-CP
D10-4

Comments and XRD Mineralogy:

ANAL

Subsample Number	Analysis	LayerThickness

½ TO RORDI

Substrate Description

Rock Type: Volcaniclastic Breccias; cement Supported

Description: Cemented by fine grained micrite which maybe partially phosphatized
Volcanic clasts are well Altered

Biology ?:

Described By: Jorie Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 3x4x5 (cm) Location: D Seamount

Sample Id: D10-5 Weight: <1 (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture: granular

Mn Crust Thickness (mm):

Min: [illegible] Max: 2mm Ave: 1mm

Layers (Outer to Inner)(mm):

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

F10-89-CP

D10-5

Comments and XRD Mineralogy:

ANAL

Subsample Number	Analysis	Layer Thickness

Substrate Description

Rock Type: Altered Volcaniclastic Breccia

Description: Altered basalt fragments in Fe-rich matrix of altered glassy (?) material

Mn staining in Matrix.

Phosphate cement (?) on several sides

Biology ?:

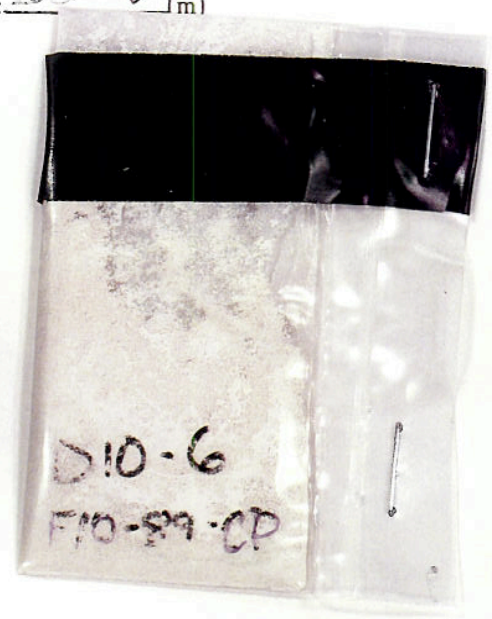
Described By: [illegible]

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: ~2+3 liters (cm) Location: D Seamount

Sample Id: D10-6 Weight: _____ (kg) Depth: 2000-1800 (m)



Mn Crust Description

Surface Texture: _____

Mn Crust Thickness (mm):
Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness

Substrate Description

Rock Type: _____

Description: Foraminiferal Ooze Dredged up with Rock Sample. 3+4 1/2 feet of ooze still in bag once it was on deck.

Biology ?: Sharks tooth washed out of Limestone in this dredge.

Described By: JORIE Subsampled By:

SAMPLE DESCRIPTION

Cru... F10-89-CP Size: 16 x 10 x 6 cm (cm) Location: D[illegible] SEAMOUNT

Sample Id: D10-7 Weight: 1.5 kg (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture: micro-botryoidal and smooth (positive parts of crust were probably polished by current)

Mn Crust Thickness (mm):
Min: 1 Max: 3 Ave: 2

Layers (Outer to Inner)(mm):

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

F10-89-CP
D10-7

Comments and XRD Mineralogy:
· Massive and dense
· Thicknes of crust relatively constant

ANA[illegible]

Subsample Number	Analysis	LayerThickness

Rock Taken Ar-Ar Isotopes Staudigel (See box 1 of 13)

Substrate Description

Rock Type: massive olivine and sparsely-plagioclase-phyric basalt

Description: olivine altered orange but rest of rock appears fresh, especially 3 cm core

Biology ?:

Described By: MSP / Hon substrate → MSP

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 25 x 20 x 16 cm (cm) Location: D SEAMOUNT

Sample Id: D10-8 Weight: 10 kg (kg) Depth: 2000 - 1800 (m)

Mn Crust Description

Surface Texture: out + describe @ Menlo Park/ granular, small botryoids

Mn Crust Thickness (mm):
Min: 1.5 Max: 3 Ave: 2

Layers (Outer to Inner)(mm):

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

F10-89-CP
D10-8

Comments and XRD Mineralogy:

ANAL

Subsample Number Analysis LayerThickness

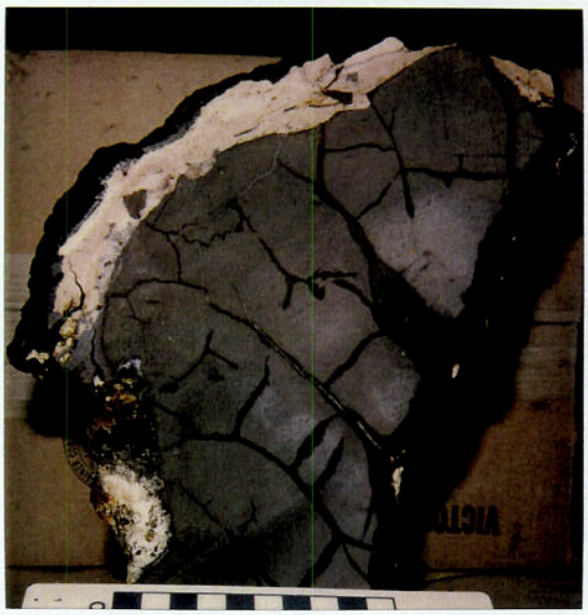
Substrate Description

Rock Type: massive olivine-phyric basalt

Description: olivine altered orange but rest of rock appears relatively fresh

Layer of phosphorite btwn basalt and Mn Crust [min 2mm, max 20mm, av. 15mm], fewer

~~Biology~~ ?: floating pieces of basalt in phosphorite.



F10-89-CP
D10-8

Rock Taken Ar-Ar, Isotopes Standigel

Described By: Pringle Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 15 x 8 x 7 cm (cm) Location: D SEAMOUNT

Sample Id: D10-9 Weight: 600 g (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture: Micro-botryoidal; positive part of botryoid are smooth (probably due to current activity)

Mn Crust Thickness (mm):
Min: 1 Max: 3 Ave: 2

Layers (Outer to Inner)(mm):

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

F10-89-CP
D10-9

Comments and XRD Mineralogy:
Dense and massive

ANA

Subsample Number	Analysis	LayerThickness
Rock Taken	Ar-Ar, Isotopes	Staudigel

Substrate Description

Rock Type: massive olivine, pyroxene, and sparsely plagioclase basalt

Description: olivine altered orange but rest of rock appears relatively fresh

Biology ?:

Described By: Pringle/Young substrate = M Pringle

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 17x14x7 (cm) Location: D seamount

Sample Id: D10-10 Weight: 1 (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture: Granular (patina)

Mn Crust Thickness (mm):
Min: 0 Max: 4 Ave: 2

Layers (Outer to Inner)(mm):

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

F10-89-CP
D10-10

Comments and XRD Mineralogy:

Irregular and granular surface;

ANALYS

Subsample Number	Analysis	LayerThickness
D10-10	O.C.	29 gms

to m Poingle

Rock Taken Ar-Ar, Isotope Studies (See box 1 of 13)

Substrate Description

Rock Type: Basalt (massive, plagioclase-olivine phric)

Description:
- Phosphorite along cracks
- dense and massive feature
- olivine altered (orange color)
- plagioclase fresh

Biology ?: foram

Described By: Yoon Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Siz.. 10×9×5, 6×7×4, 15×7×7, 10×6×5.5 (cm) Location: D SEAMOUNT

Sample Id: D10-11 Weight: 1.5 (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture: Botryoidal to granular

Mn Crust Thickness (mm):
Min: 0 Max: 4 Ave: 2

Layers (Outer to Inner)(mm):

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

F10-89-CP
D10-11

Comments and XRD Mineralogy:

massive; partially porous; tiny pores filled with iron oxide

Substrate Description

Rock Type: massive olivine-phyric basalt, assorted pieces fine-grained limestone

Description: olivine altered but rest relatively fresh, some pieces sparsely pyroxene and/or plagioclase-phyric also

Biology ?: forams

ANAL

Subsample Number	Analysis	LayerThickness
D10-11-1	Rock Taken for Ar-Ar Isotopes Studies to M Pringle for ts dating	
D10-11-2		
D10-11-3	Rock Taken Ar-Ar Isotopes Studies	
D10-11-2 (2)	Rock Taken Ar-Ar Isotopes Studies	

Described By: Yoon / malcolm Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: ~30x20x20 cm (cm) Location: D SEAMOUNT

Sample Id: D10-12 Weight: 12 Kg (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture: Micro-botryoidal and granular

Mn Crust Thickness (mm):
Min: 0 Max: 4 Ave: 2

Layers (Outer to Inner)(mm):

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

F10-89-CP
D10-12

Comments and XRD Mineralogy:
boulder broken + substrate slabed only crust on piece in bottom left corner of picture

Substrate Description

Rock Type: massive olivine and sparsely pyroxene and plagioclase (?)-phyric basalt

Description: olivine altered orange but rest of rock relatively fresh

Biology ?: foramo

ANAL

Subsample Number	Analysis	LayerThickness

piece w/ Crust to KORDI

Rest to Malcolm for dating

(Rock Taken Ar-Ar, Isotopes Staudigel also - see box 1 of 13)

Described By: Malcolm/Yoon

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 14x8x10, 17x10x9, 20x17x12, 20x19x13, 13x7x8 (cm) Location: D Seamount

from on boulder

Sample Id: D10-13 Weight: ~5 (kg) Depth: 2000~1800 (m)

Mn Crust Description

Surface Texture: Granular (patina)

Mn Crust Thickness (mm):
Min: 0 Max: 1 Ave: 0.5

Layers (Outer to Inner)(mm):

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

D10-13

Comments and XRD Mineralogy:

No patina along surface and along the interia of worm tubes

Substrate Description

Rock Type: Fine-grained Foram limestone

Description:

· manganese dendrites (black spots) included

Biology ?: Boring by benthic organism

ANALYS

Subsample Number	Analysis	Layer Thickness
D10-13	OC	25 gms

Thin Section

½ TO KORDI

partly phosphatized

⅓ Thrown overboard

Described By: Yoon Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: Largest 27 x 19 x 17 Smallest 4.5 x 4 x 3 (cm) Location: D Seamount

Sample Id: D10-14 Weight: 15 kg (kg) Depth: 2000-1800 (m)

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min: patina Max: Ave:

Layers (Outer to Inner)(mm):

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

D10-14
F10-89-CP

Comments and XRD Mineralogy:

Mn

ANALY

Subsample Number	Analysis	LayerThickness

½ to FORDI

Substrate Description

Rock Type: Porous Micrites w/ borings borings often infilled

Description: Fe & Mn staining along brees and into micrite body

2 pieces to Schlanger

Biology ?:

Described By: Jack

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: ~ 8 x 6 x 5 (cm) Location: D seamount

Sample Id: D10 - 15 Weight: ~ 1 (kg) Depth: 2000 - 1800 (m)

Mn Crust Description

Surface Texture: Botryoidal to granular

Mn Crust Thickness (mm):
Min: 0 Max: 3 Ave: 1.5

Layers (Outer to Inner)(mm):

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

D10-15

Comments and XRD Mineralogy:

ANALY

Subsample Number	Analysis	Layer Thickness
½ TO HORDI		
2 pieces to Schlanger		

Substrate Description

Rock Type: Impure limestone containing fragments of altered basalt and cream-colored limestone.

Description: Basalt fragments angular

Biology ?: forams

Described By: Yoon Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 22.5x18.5x11 (cm) Location: D Seamount

Sample Id: D10-16 Weight: ~10 (kg) Depth: 2000-1800 (m)

Mn Crust Description

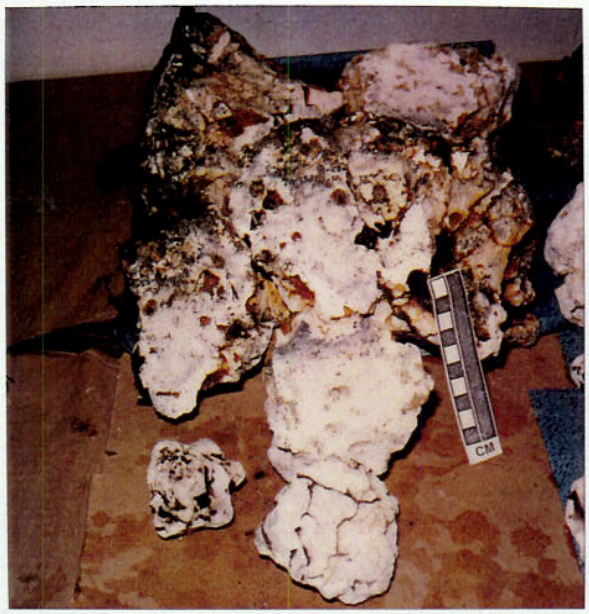
Surface Texture: porous, granular

Mn Crust Thickness (mm):

Min: patina Max: 1 Ave:

Layers (Outer to Inner)(mm):

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



D10-16

Comments and XRD Mineralogy:

ANAL

Subsample Number	Analysis	LayerThickness
½	TO	FORDI
1	piece	to S. Wanger

Substrate Description

Rock Type: Micrite, very porous.

Description: Bored micrite w/ clay and Foram sand infilling. Fe and Mn stainings of micrite

Biology ?:

Described By: Jorie

Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F10-89-CP Size: 13x9x5 (cm) Location: D Seamount

Sample Id: D10-17 Weight: 1.5 kg (kg) Depth: 2000-1800 (m)

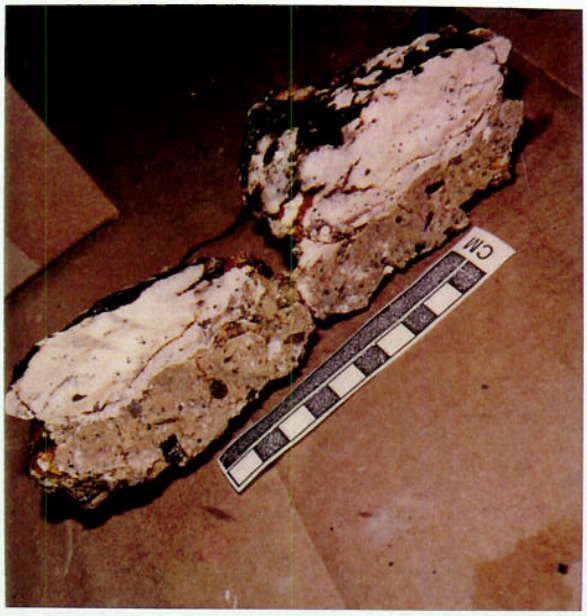
Mn Crust Description

Surface Texture: granular

Mn Crust Thickness (mm):
Min: patina Max: 1 mm Ave: _____

Layers (Outer to Inner)(mm):

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



D10-17
F10-89-CP

Comments and XRD Mineralogy:

completely phosphatized

Substrate Description

Rock Type: Cream Colored Foraminiferal limestone, over a limestone (cemented) breccia

Description: Light Brown cement of breccia maybe partially phosphatised

Biology ?: _____

ANAL

Subsample Number	Analysis	LayerThickness
D10-17A	XRD of Breccia	
D10-17B	XRD of Foram - Sand	
Thin Section	Completely phosphatized	

Described By: Jorio

Subsampled By: