F11-
88-HW

SAMPLE DESCRIPTION

Cruise Id: FI1-88-HW Size: 5.9×3.4×0.5 (cm) Location: _____

Sample Id: IID-1 Weight: 0.02 (kg) Depth: ~4000 (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.				

Comments and XRD Mineralogy:

Shark's tooth embedded in crust

ANALYSE

Subsample Number	Analysis	Layer	Thickness	Explanation
35mm slide				G. Smith

Substrate Description

Rock Type: _____

Description: _____

Biology ?: _____

Described By: Subsampled By:

SAMPLE DESCRIPTION

C. Id: EII-88-HW Size: 130 x 60 x 40 mm (cm) Location: _____

Sample Id: 11D-2 Weight: .2 kg (kg) Depth: _____ (m)

Mn Crust Description
Surface Texture: finely botryoidal

Mn Crust Thickness (mm):
Min: 25 mm Max: 35 mm Ave: 30 mm

botryoidal surface
massive - laminated
Fe-oxide mottled zone
basalt
phosphorite

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	10 mm	15 mm	12 mm	mottled, Fe-oxide zone
2.	10 mm	20 mm	12 mm	laminated / massive zone
3.	3 mm	4 mm	3 mm	botryoidal, oxidized zone
4.				
5.				
6.				

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation
11D-2	CC, XRD	0-33 mm

Substrate Description
Rock Type: basalt clast (volcaniclastic breccia, no visible matrix)

Description: basalt; altered alkali basalt, covered with phosphorite

Biology ?: —

F11-88-HW

[redacted] 11D-2

SAMPLE DESCRIPTION

Cruise Id: F-11-88-HW Size: 35x28x14 cm (cm) Location: see dredge log

Sample Id: 110-3 Weight: 10 kg (kg) Depth: dredge log (m)

Mn Crust Description

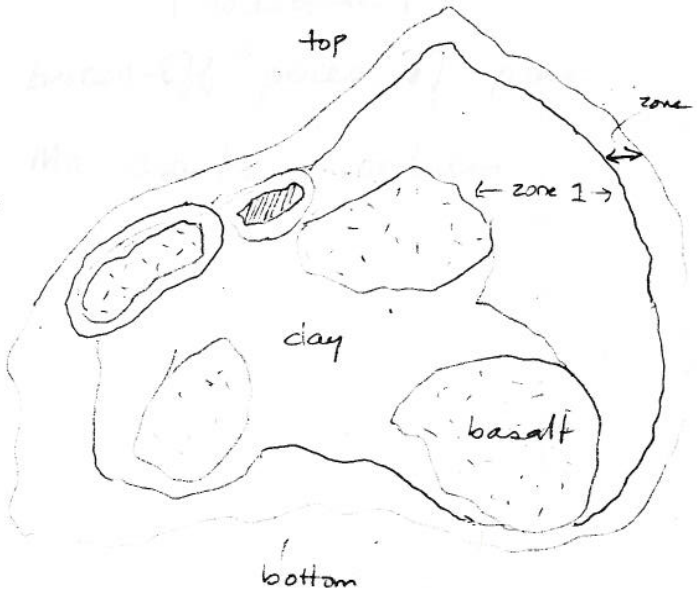
Surface Texture: botryoidal

Mn Crust Thickness (mm): 42

Min: 4mm Max: ~~3~~ mm Ave: 20 mm

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	0	32 mm	16mm	mottled, oxidized zone
2.	7mm	9 mm	8 mm	laminated - botryoidal
3.		↑		
4.		may be thicker (~ 40-45 mm) after cut-up		
5.				



Comments and XRD Mineralogy:

Substrate Description

Rock Type: volcanoclastic breccia
clay cement, phosphorite pockets

Description: basalt clasts covered with 10-30 mm Mn crust. Entire chunk covered with ~ 9 mm Mn crust.

ogy ?:

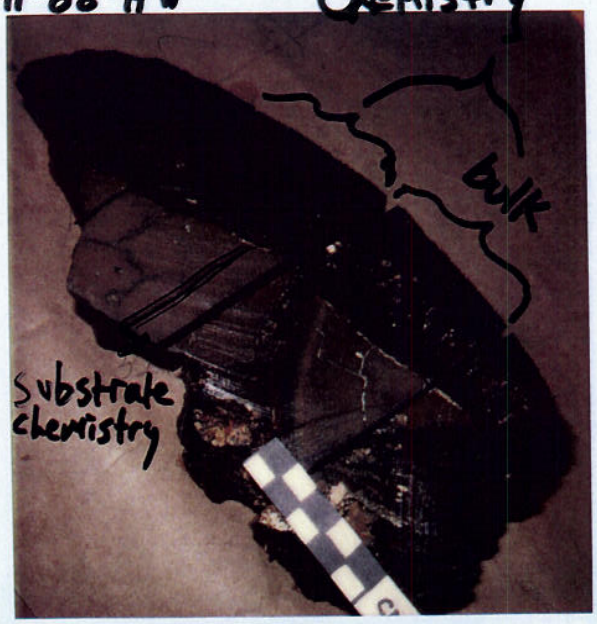
ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation

F11-88-HW

11D-4

F11-88-HW Chemistry



11D-4

SAMPLE DESCRIPTION

Ci Id: F11-88-HW Size: 5cm to 25cm long peices (cm) Location: _____

Sample Id: 11D-5 Weight: _____ (kg) Depth: _____ (m)

Mn Crust Description
Surface Texture: botryoidal

(no substrate)
broken-off ^ peices of pure Mn crusts + nodules

Mn Crust Thickness (mm):
Min: 5 mm Max: 25mm Ave: 10 mm

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-Explanation
No Substrate/No sample		

Substrate Description
Rock Type: no substrate attached

Description:

Biology ?:

FH-88-HW

1106

SAMPLE DESCRIPTION

C. : Id: ~~F~~ 11-88-HW Size: ~~2 kg~~ (cm) Location: seadredge log

Sample Id: 11D - 7 Weight: 2kg (kg) Depth: ↙ (m)

Mn Crust Description

Surface Texture: botryoidal crusts + nodules (10-15 peices)

Mn Crust Thickness (mm):
Min: 1mm Max: 12mm Ave: 10 mm

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	~~1mm in some crusts~~			
2.				
3.				
4.				
5.				
6.				

F11-88-HW
11D-7

Comments and XRD Mineralogy:

ANALYS

Subsample

A bulk CC, XRD 0-10mm

B substrate OC, XRD, Paleo.

Substrate Description

Rock Type: siltstone (phosphorite in nodule)

Description: fine gr ss & siltstone - maybe very altered basalt

Biology ?: Encrusting forams on top

Described By: Subsampled By:

USGS DREDGE LOG

SI ~/LEG Farnella F11-88-HW

STATION # 12D

DREDGE # 12D

DEPTH INTERVAL(m) 4175-4190 m

DEPTH(m)corrected _____

DATE JD 303 LOCAL _____

TIME GMT 1840 LOCAL 2000

LATITUDE 24°02.0 TO 24°02.3

LONGITUDE 158°41.3 TO 158°42.5

TOTAL WEIGHT: DREDGE 50 kg CRUST 10 kg

PERCENTAGE OF ROCK COVERED BY CRUST 100%

PERCENT BROKEN FROM: OUTCROP 20% TALUS 80%

THICKNESS OF MN CRUST: MAXIMUM ~~3~~ 30 mm MINIMUM ~~3~~ .3 cm AVERAGE 1cm

DOMINANT SURFACE TEXTURE knobby - botryoidal

SUBSTRATE LITHOLOGY laminated clay stone + mudstone, + siltstone - very altered basalt

NODULES PRESENT 5-10

REMARKS: dredged from caldera, probably Cretaceous or younger - sampled inside of caldera wall - identified on the GLORIA image

F11-88-HW
12-D1

SAMPLE DESCRIPTION

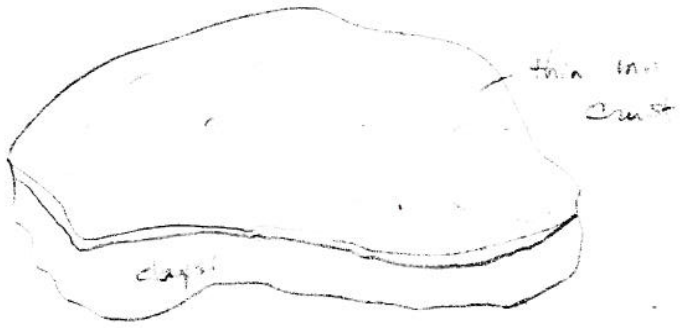
Cruise Id: F11-88-HW Size: pieces (cm) Location: see Dredge log

Sample Id: 12D-2 Weight: 1 kg (kg) Depth: K (m)

Mn Crust Description

Surface Texture: botryoidal - knobby

Mn Crust Thickness (mm):
Min: 2 Max: 4 Ave: 3



Layers (Outer to Inner)(mm):

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

Comments and XRD Mineralogy:

Substrate Description

Rock Type: clayst, mudstone

Description: ~~pours~~ porous - laminated, or massive sediment

Biology ?: —

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation
12D-2	CC XRD	0-4 mm

F11-88-HW

12D-2

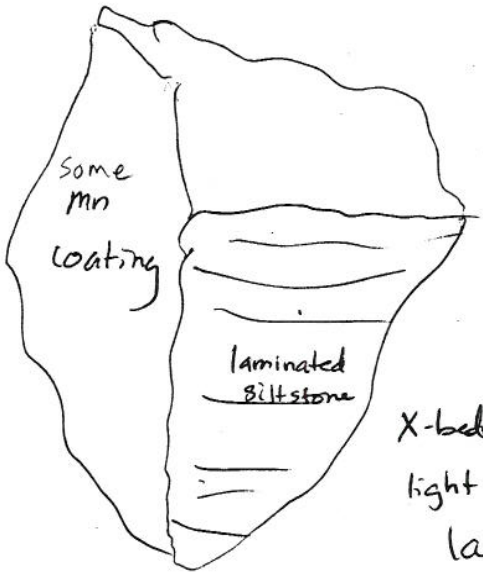
SAMPLE DESCRIPTION

Cruise Id: F11-88-HW Size: 20x12x9 (cm) Location: dredge log

Sample Id: 12D-3 Weight: .8 kg (kg) Depth: _____ (m)

Mn Crust Description
Surface Texture: thin coating of Mn on side of laminated siltst.

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



Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				.3 mm thick coating (in some places)
2.				
3.				
4.				
5.				

Comments and XRD Mineralogy:

Substrate Description
Rock Type: laminated silt/claystone

Description:

Biology ?: ~

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation
12D-3	Paleo	0-100 mm

F11-88-HW

12D-3

SAMPLE DESCRIPTION

(5-10 cm)

Cruise Id: F11-88-1+W Size: small nodules (cm) Location: see dredge log

Sample Id: 12D-4 Weight: .2 kg (kg) Depth: _____ (m)

Mn Crust Description

Surface Texture: botryoidal

Mn Crust Thickness (mm): nodules,
Min: 0.5 Max: 2 Ave: 1.5

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	0.5	2	1.5	black porous
2.				
3.				
4.				
5.				

F11-88-HW

12D-4

Comments and XRD Mineralogy:

ANALYSI

Subsample Number Analysis LayerThickness-Explanation

Substrate Description

Rock Type: claystone w/ Mn intergrown

Description:

Biology ?: [illegible]

Described By: Subsampled By:

SAMPLE DESCRIPTION

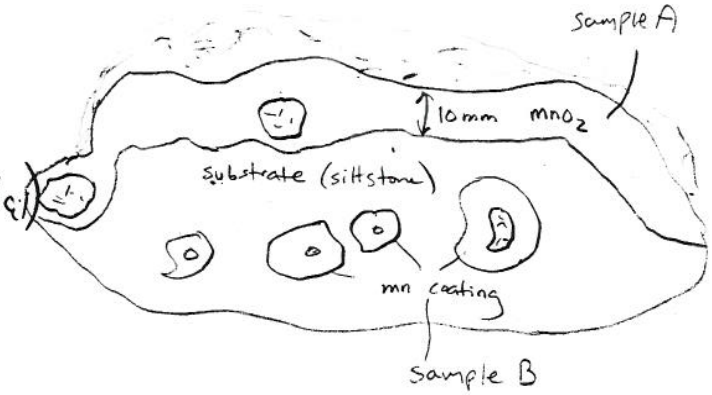
Cruise Id: F11-88-HW Size: 30x20x4 (cm) Location: see dredge log

Sample Id: 12D-5 Weight: 1.5 kg (kg) Depth: ↙ (m)

Mn Crust Description

Surface Texture: botryoidal - knobby

Mn Crust Thickness (mm):
Min: 2mm Max: 12 mm Ave: 9-10 mm



Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				all massive-laminated, (botryoidal)
2.				no distinctive zones
3.				* basalt clasts sampled by
4.				Dave Clague
5.				
6.	1	9	5	black porous, pores filled w/ phosphorite

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation
A	CC, XRD	0-10mm
B (clast cross)	CC, XRD	0-5mm

Substrate Description

Rock Type: clay-mudstone - contains mn coated clasts of basalt, phosphorite, also basalt

Description: clasts in Mn Crust

Biology ?: —

FH-88-HW
120-5

SAMPLE DESCRIPTION

Cruise Id: F11-88-HW Size: 1½ cm (cm) Location: _____

Sample Id: 12D-6 Weight: — (kg) Depth: _____ (m)
12D-7

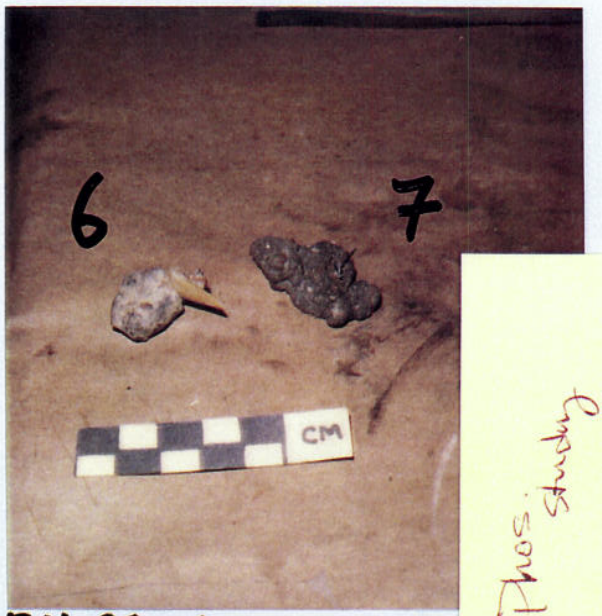
Mn Crust Description

Surface Texture: shark's tooth

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

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.				shark's tooth embedded in Mn
2.				12D-7 is very hard to see. It is orange and covered w/ Mn crust.
3.				
4.				
5.				



F11-88-HW
12D-6 12D-7

Thes. study
to be
DATED

Comments and XRD Mineralogy:

Substrate Description

Rock Type: mn oxide

Description:

Biology ?: _____

ANALYS

Subsample Number	Analysis	LayerThickness-Explanation
35 MM Slide		G. Smith

Described By: Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F11-88-HW Size: 20x20x4cm (cm) Location: dredge log

Sample Id: 12D-8 Weight: .9kg (kg) Depth: ↙ (m)

Mn Crust Description

Surface Texture: botryoidal - knobby

Mn Crust Thickness (mm):
Min: 6mm Max: 15 Ave: 10

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	6	15	10	black, porous, pores filled w/ phosphorite and rust
2.	crust on clasts within substrate			
3.	2	10	3	black, porous, pores filled w/ phosphorite and rust
4.				
5.				

F11-88-HW

12D-8-1

Comments and XRD Mineralogy:

No sample taken: it is very similar to 12D-5

ANALYSE

Subsample Number	Analysis	LayerThickness-Explanation

Substrate Description

Rock Type: mudst, claystone

x Worm burrowed

Description: two levels of claystone; bottom is brown + bioturbated, top is green/white-brown + bioturbated. Separated by a very thin Mn layer.

Biology ?:

Described By: Subsampled By:

SAMPLE DESCRIPTION

Id: F11-88-HW Size: 20x20x4 (cm) Location: _____

Sample Id: 12D-8-B Weight: 1.5 (kg) Depth: _____(m)

Mn Crust Description
Surface Texture: smoothed botryoidal

Mn Crust Thickness (mm):
Min: 2 Max: 4 Ave: 3

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	2	4	3	black, porous
2.				
3.				
4.				
5.				

C ments and XRD Mineralogy:

ANALYSE

Subsample Number	Analysis	LayerThickness-Explanation
12D-8-B	CC, XRD	0-3 mm

Substrate Description
Rock Type: bioturbated clay stone

Description:

F ?: _____

Described By: Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: FII-88-HW Size: — (cm) Location: _____

Sample Id: 120-9 Weight: 2 kg (kg) Depth: _____ (m)

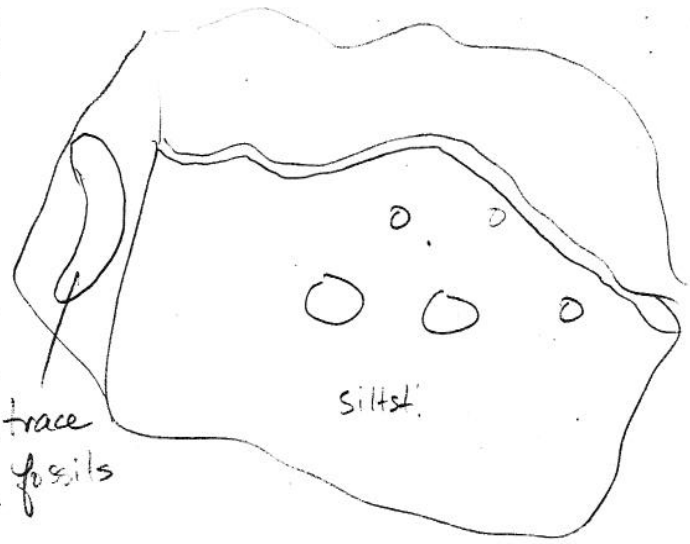
Mn Crust Description

Surface Texture: botryoidal

Mn Crust Thickness (mm):
Min: 2 Max: 3 Ave: 2½ mm

Layers (Outer to Inner)(mm):

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



Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation

Substrate Description

Rock Type: clayst, laminated, cross bedded siltst. with

Description: large (1-2 cm diameter) worm boring - some MnO_2 - lined

Biology ?: _____

F11-88-HW

12D-9

SAMPLE DESCRIPTION

Id: F11-88-HW Size: Many pieces (cm) Location: _____

Sample Id: 12D-10 Weight: 1.9 (kg) Depth: _____ (m)

Mn Crust Description

Surface Texture: smoothed botryoidal

Mn Crust Thickness (mm):

Min: 0 Max: 4mm Ave: 1mm

Layers (Outer to Inner)(mm):

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

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation

Substrate Description

Rock Type: claystone, some 4 or 5 pieces of phosphorite + basalt breccia w/ Mn crust.

Description: have holes bored in clay, other burrowing omnipotent.

Fossils?: _____

Described By: Subsampled By:

USGS DREDGE LOG

SHIP/LEG Farnella

STATION # 16 $D

DREDGE #

DEPTH INTERVAL(m) 4700-4705m

DEPTH(m)corrected

DATE JD 305 LOCAL

TIME GMT 0829-0549 LOCAL

LATITUDE 24°49.62 TO 24°50.76

LONGITUDE -158° 11.76 TO -158° 10.49

TOTAL WEIGHT: DREDGE 125kg CRUST 10kg

PERCENTAGE OF ROCK COVERED BY CRUST 80%

PERCENT BROKEN FROM: OUTCROP 90% TALUS 10%

THICKNESS OF MN CRUST: MAXIMUM 5cm MINIMUM .1 mm AVERAGE .5 cm

DOMINANT SURFACE TEXTURE botryoidal

SUBSTRATE LITHOLOGY claystone, mudstone, basalt, sandstone

sediment is layered, X-bedded, most of thick Mn-oxide (hydrothermal) is not attached to substrate

Sediments are covered by a very thin layer of MnO_2 (~.1mm)

Small micronodules are present within sediments

NODULES PRESENT 10-15

REMARKS:

SAMPLE DESCRIPTION

Id: F11-88-HW Size: _____ (cm) Location: _____

Sample Id: 16D Weight: _____ (kg) Depth: _____ (m)

Mn Crust Description Shark's Tooth

Surface Texture: _____

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

Layers (Outer to Inner)(mm):

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

Comments and XRD Mineralogy:

Substrate Description
Rock Type: _____

Description: _____

[illegible]?: _____

ANALYSES

Subsample Number	Analysis	Layer Thickness-Explanation
35mm Slide		5 Smith
(there are 2 teeth		Labled 1600

Described By: Subsampled By:

SAMPLE DESCRIPTION

Cruise Id: F11-88-HW Size: 20x15x6 (cm) Location: _____

Sample Id: 16D-1m Weight: 2 Kg (kg) Depth: _____ (m)

Mn Crust Description

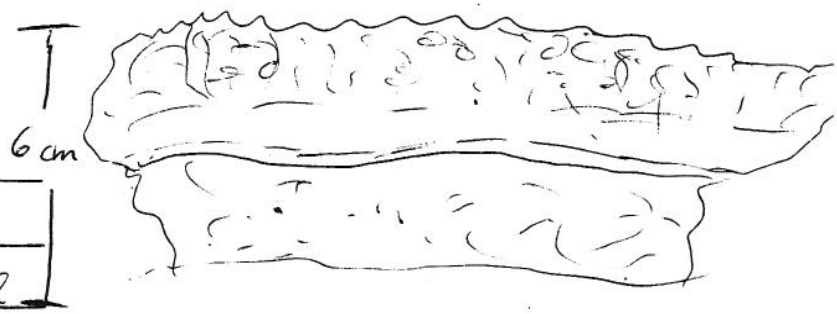
Surface Texture: botryoidal, porous

Mn Crust Thickness (mm):

Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	4 cm	6cm	5cm	
2.	large-scale layers			
3.	(4-5) of hydrothermal			
4.	mn crusts			
5.				
6.				



Comments and XRD Mineralogy:

crust is technically a coarse-grained sandstone cemented by Mn. The clasts are soft [illegible] stone (mostly brown clasts, a few bright orange). Matrix supported, sub-rounded clasts

Substrate Description

Rock Type: no substrate attached

Description: 3 peices

I[illegible]gy ?: _____

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation
16D-1m	CC, XRD	0-50mm

Chemistry

F11-[illegible]-HW

16D-1M

SAMPLE DESCRIPTION

2cm, to 10 cm long

ruise Id: F11-88-HW Size: ~~20 x 15 x 6~~ (cm) Location: _____

mple Id: 16D-2m Weight: 2 kg (kg) Depth: _____(m)

n Crust Description
rface Texture: botryoidal

n Crust Thickness (mm):
Min: .2 mm Max: 1cm Ave: 5mm

yers (Outer to Inner)(mm):

Min	Max	Ave	Texture & Color

F11-88-HW

16D-2m

omments and XRD Mineralogy:

ANALYSES

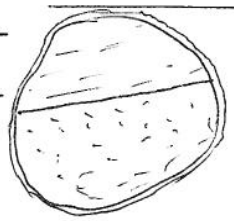
Subsample Number	Analysis	LayerThickness-Explanation

note: probably near a vent - basalt has features (tubes, spatter) that indicate proximity to volcanic center. Basalt very young (lots of fresh glass with very little Mn oxide or palagonite)

~~ubstrate~~ Description
ock Type: Hydrothermal Mn oxides encrusting mud-claystone as nodules + coatings

escription: worm borings in claystone very common, X-bedded & laminated siltst & sandst. One nodule had sandst. of

ogy ?: hyaloclastite material + clay on top - .1-2 mm MnO_2



SAMPLE DESCRIPTION

Cruise Id: F11-88-HW Size: 3 cm nodule (cm) Location:

Sample Id: 17D-1m Weight: small mn oxide chip (kg) Depth: (m)

Mn Crust Description

Surface Texture: botryoidal - looks hydrothermal

Mn Crust Thickness (mm):

Min: .1 Max: 3mm Ave:

Layers (Outer to Inner)(mm):

Min	Max	Ave	Texture & Color

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation
missing		

Substrate Description

Rock Type: Mn nodule with basalt center

Description: Chip of Mn oxide 3mm thick

gy ?:

SAMPLE DESCRIPTION

Id: F11-88-HW Size: 2pieces ~5x4x2.5 (cm) Location: _____

Sample Id: D22 Weight: 0.075 (kg) Depth: _____ (m)

F11-88-HW

D22

Mn Crust Description

Surface Texture: small scale botryoidal

Mn Crust Thickness (mm):

Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	0.5	1	0.75	black
2.				
3.				
4.				
5.				

C[illegible]nts and XRD Mineralogy:

Substrate Description

Rock Type: basalt; including very fresh glass

Description:

fresh gray basalt surrounded by fresh glass; surrounded by altered glass (orange color) surrounded by Mn crust

Bi[illegible]?: _____

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation

Described By: Subsampled By:

USGS DREDGE LOG

I '/LEG F11-88-HW

TATION # ~~HD~~ 26D

REDGE # ~~HD~~ 26D

DATE JD 308 LOCAL 0730

TIME GMT _____ LOCAL _____

EPTH INTERVAL(m) 4335 - 4270

EPTH(m)corrected _____

LATITUDE 23°34.1 TO 23° 36.1

LONGITUDE 157°42.4 TO 157°42.1

OTAL WEIGHT: DREDGE 250 kg CRUST 5 kg

ERCENTAGE OF ROCK COVERED BY CRUST 30 %

ERCENT BROKEN FROM: OUTCROP _____ TALUS _____

HICKNESS OF MN CRUST: MAXIMUM 3-4 mm MINIMUM .1 mm AVERAGE 1 mm

OMINANT SURFACE TEXTURE botryoidal

UBSTRATE LITHOLOGY vesicular basalt and hyaloclastite / basalt breccia, and siltstone

NODULES PRESENT none

REMARKS:

SAMPLE DESCRIPTION

Cruise Id: FI1-88-HW Size: _____ (cm) Location: _____

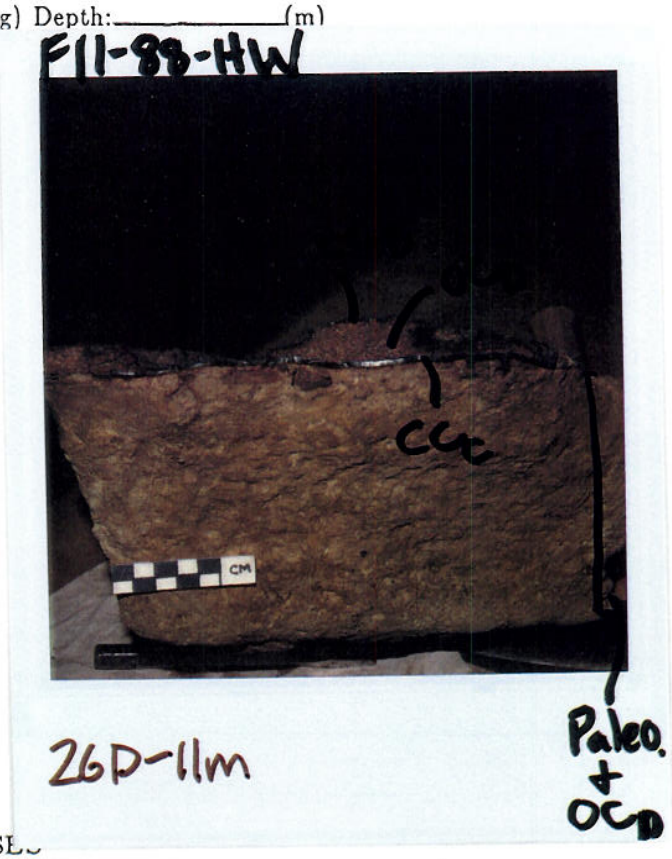
Sample Id: 26 D-11m Weight: _____ (kg) Depth: _____ (m)

Mn Crust Description
Surface Texture: botryoidal

Mn Crust Thickness (mm): 4
Min: 2mm Max: 5mm Ave: 3mm

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	0.5	1	0.75	black
2.	2	3	3	black massive
3.				
4.				
5.				



Comments and XRD Mineralogy:
Top crust grades into hyaloclastite, so there is contamination of the hyaloclastite in the crust sample.

A very very thin layer of this hyaloclastite occurs inbetween the two crusts & will show up in the bulk sample (A).

Substrate Description
Rock Type: Siltstone - claystone - massive - worm burrowed
In between crusts is a matrix-(clay)-supported sandstone
Description: with volcanic glass clasts (not rounded) hyaloclastite.

XNOTE - give 1/2 of sample back to Dave Clague

Biology ?:

ANALYSES

Subsample Number		Analysis	LayerThickness-Explanation
A	bulk	CC, PM, Au, REE, XRD	0-4mm
B	top	CC, XRD	0-1mm
C	middle	CC, XRD	18-21mm
D	substrate	OC, XRD	1-18mm
E	bottom substrate	OC, XRD, Paleo	21-136mm

Described By: _____ Submitted By: _____

SAMPLE DESCRIPTION

on 23° 21.75' N
157° 50.21' W
off 23° 23.3' N
157° 49.62' W

Id: FII-88-HW Size: 6.5 x 6.1 x 1.9 (cm) Location:

Sample Id: 35D Weight: 0.02 (kg) Depth: 4465 (m)

Mn Crust Description
Surface Texture: Smooth botryoidal

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

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	2	3	3	black, massive
2.				
3.				
4.				
5.				

FII-88-HW

35D

Comments and XRD Mineralogy:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation

Substrate Description
Rock Type: claystone

Description:

Biology?:

Described By: Subsampled By:

SAMPLE DESCRIPTION

Id: F11-88-HW Size: 9 x 4.1 x 4.3 (cm) Location: _____

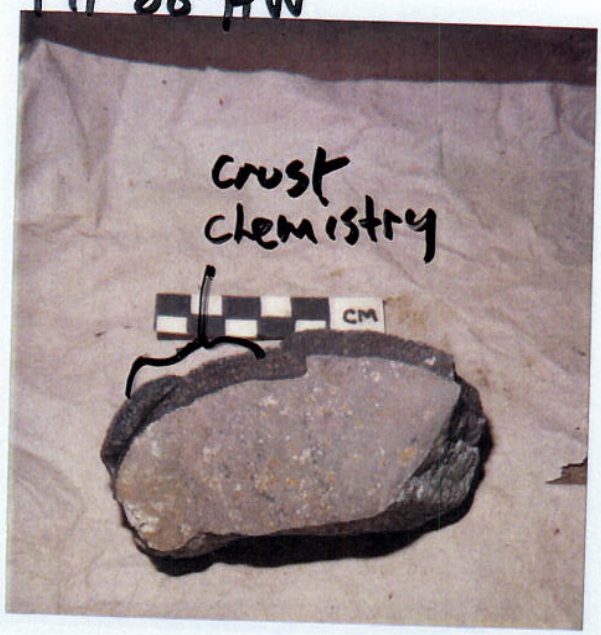
Sample Id: 35D-5 Weight: 1.5 (kg) Depth: _____ (m)

Mn Crust Description
Surface Texture: smooth

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

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	6	8	7	black, porous, pores filled w/ rust
2.				
3.				
4.				
5.				



C[illegible]nts and XRD Mineralogy:

Substrate Description
Rock Type: basalt

Description:

B[illegible] ?:

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation
A crust	CC, XRD	0-6mm
B substrate	OC, XRD	

Described By: Subsampled By:

SAMPLE DESCRIPTION

Id: F11-88-HW Size: 11.5 x 7.1 x 3.0 (cm) Location: _____

Sample Id: 35D-6 Weight: 0.15 (kg) Depth: _____ (m)

Mn Crust Description
Surface Texture: Very smooth botryoidal

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

Layers (Outer to Inner)(mm):

	Min	Max	Ave	Texture & Color
1.	4	7	6	black, porous rust-filled pores
2.				
3.				
4.				
5.				

Comments and XRD Mineralogy:

Substrate Description
Rock Type: breccia

Description:
Basalt cobbles and volcanic glass pebbles supported by a mudstone matrix. A coarse grained purple & pink sandstone surrounds the mudstone.

B: ?: _____

ANALYSES

Subsample Number	Analysis	LayerThickness-Explanation

Described By: Subsampled By:

SAMPLE DESCRIPTION

Id: F11-88-HW Size: _____ (cm) Location: _____

Sample Id: 36D Weight: _____ (kg) Depth: _____ (m)

Mn Crust Description Shark's Tooth

Surface Texture: _____

Mn Crust Thickness (mm):

Min: _____ Max: _____ Ave: _____

Layers (Outer to Inner)(mm):

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

F11-88-HW

36D

C... ...ments and XRD Mineralogy:

ANALYS...

Subsample Number	Analysis	LayerThickness-Explanation

Substrate Description

Rock Type: _____

Description:

[illegible] ?: _____

Described By: Subsampled By: