Dredge 14

USGS DREDGE LOG

SHIP/LEG F7-91-WP

STATION # 21

DREDGE # D14

DATE JD 208 LOCAL July 28, 1991

TIME GMT 2011 LOCAL 0611

DEPTH INTERVAL(m) 4485-3685

LATITUDE 07°20.04' TO 07°17.56'

DEPTH(m)corrected 4300-3700

LONGITUDE 135°43.32' TO 135°43.25'

40 kg mud
30 kg rocks

TOTAL WEIGHT: DREDGE 70 CRUST <1

PERCENTAGE OF ROCK COVERED BY CRUST 50% patina

PERCENT BROKEN FROM: OUTCROP 90 TALUS 10

THICKNESS OF MN CRUST: MAXIMUM 5 MINIMUM <1 AVERAGE <1

DOMINANT SURFACE TEXTURE smooth + granular

SUBSTRATE LITHOLOGY 65% (1) chalk-limestone (recrystallized) - white mud
chert nodules (chalcedony, recrystallized) (2) strongly sheared rock
mudstone 35%

(3) mixed brown + white carbonate ooze, white is softer

overall 70% mud-ooze 30% rocks

NODULES PRESENT 0

REMARKS: all rocks sheared + recrystallized

Biology - 1 Holothurian?

Most of mud discarded

degassed, formed, slime when cut - like soap -
bubble-rich

USGS DREDGE LOG

Depth Interval 4300 - 3700

Cruise I.D. F7-91-WP

Station No. 21

Dredge No. D14

Julian Date 208

Local Date (m/d/y) July 28, 1991

Chief Scientist Hein/Ahn

Tech on Watch Walter/John

	On Station	Dredge on Btm	Dredge off btm	Off Station
GMT	1304	1429	1914	
LATITUDE	07° 20.04 N	07° 20.04	07° 17.56	
LONGITUDE	135° 43.4E	135° 43.32	135° 43.25	
WATER DEPTH	4450	4485	3685	

Site Description and Target : 4500 - 3500 m

OPERATION*	GMT	DEPTH (m)	WIRE OUT (m)	TENSION	HDG/SPD	COMMENTS
On Bottom	1429	4460	4485			
"	1439		4900			ALL SCOPE OUT - PROCEEDI UPSLOPE
	1528	4280				STARTING TO INCREASE TENSION
"	1545	4130	4900	2.7-2.8		DREDGE MOVING. NO REAL BITES YET
	1559	4010	4900	2.9		SMALL NIBBLES
pulling wire in	1601	3990				HOLDING SHIP POSITION - SLOWLY BRINGING WIRE
	1613	3990	4800	2.9-3.2		
Continuing up line	1635	3940	4400	2.8 to 2.9		looks like white muck again
Byte	1732	3705	"	3.2		
Byte	1733	3700		3.4		
Bites?	1752	3670		2.7 to 2.9	occasional 3.0	
Byte	1827	3680	4400	3.1		
Bite	1833	3680	4400	3.2		
Bite	1837		"	3.1		
Depth Increasing All stopped & pulling wire in. Have gone over the top of the slope						
Bite	1845	3690	4375	3.2		
Bite	1846	3690		3.1		
Bite	1847			3.3		

*on/off bottom, bites, etc.

OTHER COMMENTS:

OPERATION*	GMT	DEPTH (m)	WIRE OUT (m)	TENSION	HDG/SPD	COMMENTS
Bite	1848	3690	4312	3.4		
Bite	1850	3690		3.5		
Bite	1854	3690	4165	3.5		
Bite	1856	3690		3.8		
Bite	1857	3680		3.8 down to 3.0,		up to 3.5 down to 3.1 digging in an
~	~	~	~	~		dropping off mud.
Bite	1859	3675	4051	3.6		
OFF Bottom	1914	3685	3734			

*on/off bottom, bites, etc.

OTHER COMMENTS:

5000
9000

D14

Between Yap + Palau arcs
Palau A

Dredge Sample Summary Sheet

ICP-minors

Sample ID	Bulk CC	Layer CC	Pt & Au	~~Reg~~	OC	DPTS/TS	XRD	35mm Photo	Paleo	Archive
D14-1							X		X	
-2							X		X	
-3							X			
-4						X	3 X			
-5										
-6										
-7				X	X		X		X	
-8						X	X			
-9					X		4 X		X	
-10	X						X			
-11							X			
-12										
-13							2 X			
-14							X			
-15							X			
-16							X			
-17							X			

ICP

X

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): —— Location: Between Yap + Palau [redacted] Arcs

Sample Id: D14 Weight (kg): Mud x 40 kg Depth (m): 4300-3700

D14-1,2,3 most disgarded

Mn Crust Description

Surface Texture:

no

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

photo

Outer to Inner Layers (mm)

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

Comments and XRD Mineralogy:

Analyses

Subsample No.	Analysis	Layer Thick.	Wt.(g)
D14-1	Paleo, XRD		
D14-2	Paleo, XRD		
D14-3	Paleo in Rose Bengal		

Substrate Description

Rock Type: ~~Carbonate ooze~~ Biology smectite

Description:
- 1 Sheared stiff white mud
- 2 sheared stiff brown mud
- 3 Mixed mud of 1 & 2

Biology (?): D14- Holothurian-whole - For Ken Smith S10

Described by: HEIN

Subsampled by: HEIN JSS AD

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 55 x 20 x 10 Location: between Yap & Palau Arcs [redacted]

Sample Id: D14-4 Weight (kg): 12 Depth (m): 4300 - 3700

Mn Crust Description

Surface Texture: Patchy brown Patina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D14-4

Comments and XRD Mineralogy:

Subsampl

D14-4	TS
-4A	XRD inner nod
-4B	XRD adjacent to Nod
-4C	Outer Rock margin (XRD)

Substrate Description

Rock Type: Chert - Porcelanite

Description: blue-gray, gray & milky chalcedony lens surrounded by sheared, fractured Porcelanite w/ white soapy mud on exterior - Sheared & Recrystallized - silicification decreases out from the central Qtz lens

Biology (?): —

Described by: HEIN

Subsampled by: HEIN

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 5×4×3 (2×2×1 ~) Location: [redacted]

Sample Id: D14-5 Weight (kg): 0.1 Depth (m): 4300-3700

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D14-5

Comments and XRD Mineralogy:

Sut

Kordi ~ 30%

USGS ~ 70%

Substrate Description

Rock Type: Pumice

Description: porous

Biology (?):

Described by: T.W. Moore

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 5×3×3 Location: between [redacted]

Sample Id: D14-6 Weight (kg): 0.1 Depth (m): 4300-3700

Mn Crust Description

Surface Texture:

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D14-6

Comments and XRD Mineralogy:

Su

Substrate Description

Rock Type: Andesite (?)

Description: Vesicular, phaneritic fine grained andesite or basalt pebble. Sub- to well rounded.

Biology (?):

Described by: ASD

Subsampled by:

SAMPLE DESCRIPTION

between Yap and Palau arc

2×1×1 ~ many pieces

Cruise Id: F7-91-WP Size (cm): 25×14×5 Location: [redacted]

Sample Id: D14-7 Weight (kg): 20 kg Depth (m): 4300-3700

Mn Crust Description

Surface Texture: Patina smooth

Mn Crust Thickness (mm):

Min:_____ Max: P Ave:_____

Outer to Inner Layers (mm)

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

D14-7

Comments and XRD Mineralogy:

Smectite - 100%

Su

D14-7-1 OC, = 72.062 gm (Bulk w/ Mn dendrites)
XRD, Palau
ICP = 4938 gm
KORDI 20%
USGS 80%

Substrate Description

Rock Type: Mudstone
ash?

Description: bedded, pinkish-tan better indurated than D14-9 horizontal layers of Mn ox. define layers and Mn dendrites in fractures orthogonal or at other angles to bedding plane.

Tale? or smectite? or Polygorskite? or Sepiolite?
soapy,

Biology (?): No borings or burrows

Described by: RSD,

highly sheared & deformed w/ microfolds

Subsampled by:

D14-7

D14-7

SAMPLE DESCRIPTION

Cruise Id: F7-91-WD Size (cm): 13 x 5 x 5 Location: Btw Yap and Palau ~~V3-91-NP~~

Sample Id: D14-8 Weight (kg): 0.3 Depth (m): 4300 - 3700

Mn Crust Description

Surface Texture: Patina in some areas

Mn Crust Thickness (mm):

Min:_____ Max: P Ave:_____

Outer to Inner Layers (mm)

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

D14-8

Comments and XRD Mineralogy:

Subs

D14-8-1 TS XRD Central chert & immediately adjacent rx rest removed during sawing

→ mostly Non-chert outer part

KORDI ~30%

USGS ~70%

Substrate Description

Rock Type: Chert IBW/ porcelanite

Description: Beige to greenish-beige to grey-violet to grey lenses or beds (layers) of chert with yellow-brown mudst - to whitish - They are interbedded Mn oxide in undulating hairline fractures.

Biology (?): No borings, some cherts show relict burrows -

Described by: ASD Subsampled by: HLM

8-1 chert has one gradational & 1 sharp contact w/ mudst - porcelanite

SAMPLE DESCRIPTION

Cruise Id: F7-91WP Size (cm): from a 4cm to 14 cm max. Diam. many pieces Location: ~~[illegible]~~ between Yap + Palau

Sample Id: D14-9 Weight (kg): ~4 kg Depth (m): 4300-3700

D14-9

Mn Crust Description

Surface Texture: patina in a few rare spots

Mn Crust Thickness (mm):

Min: ____ Max: P Ave: ____

Outer to Inner Layers (mm)

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

Comments and XRD Mineralogy:

Subsa

close up on back →

Substrate Description

Rock Type: ~~Mudstone~~ lms dark + medium brown

Description: Brown, sheared ~~mudstone~~ lms, with many small borings and bigger burrows, Mn oxides fills fractures and lines burrows.

microbored outer surface →

Biology (?): Some burrows and clasts of lighter colored mud (not calcareous) - but harder than host mudst. and some darker than mudstone.

KORDI 20%

USGS 80%

D14-9-1 XRD - white shear plane deposit 50% host mudst

D14-9-2A XRD - hard nodules, burrow fill?

9-2B fracture fill 70% host Rx XRD

D14-9-2C XRD, Paleo, OC. Bulk mudst (80 gm

Described by: Subsampled by: Hein TS & XRD (again)

ASD

White mineral on shear planes

2 sets of orthogonal fractures

or nearly so - maybe up to 110°

Some conjugate sets of fractures forming diamond shaped fracture pattern

fractures filled with Mn oxide and some light colored material (no fizz!)

D14-9-2

lighter mud & harder than hms mudst.

9-2A

2 sets of fractures

D14-9

D14-9

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 4×3×2 ~ 15×6×3 Location: [redacted]

Sample Id: D14-10 Weight (kg): 0.5 Depth (m): 4300-3700

Mn Crust Description

Surface Texture: [illegible]

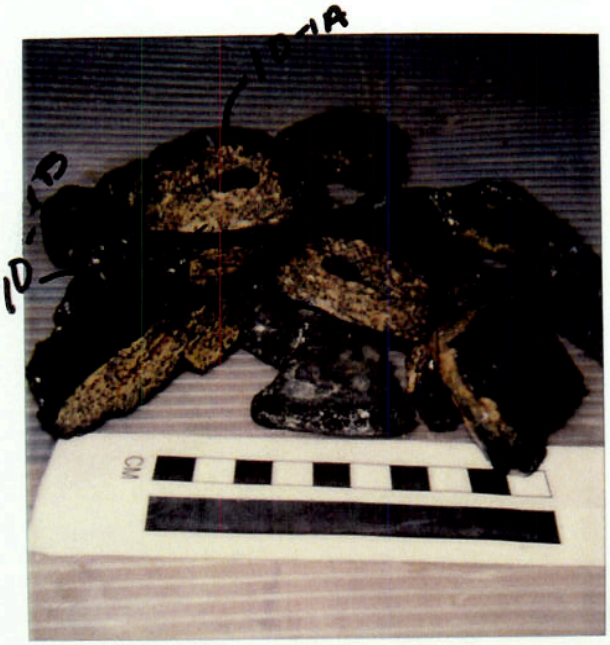
Lizard Skin

Mn Crust Thickness (mm):

Min: 1 Max: 5 Ave: 3

Outer to Inner Layers (mm)

	Min	Max	Ave	Texture & Color
1				Black, Massive
2				
3				
4				
5				
6				



D14-10

Comments and XRD Mineralogy:

Phillipsite; qtz, smectite

Su

D14-10-1A CC, XRD Bulk 0-5 mm 9.60

10-1B XRD ~~Phosphorite~~ mudst

KORDI 50%

USGS 50%

Substrate Description

Rock Type: Mn-Crust with impregnated mud stone or ~~Phosphorite~~

Description: Yellow to brown [illegible]. Mn-oxides also fills along fracture and pore spaces developed in the impregnated mud stone-Phosphorite

Biology (?):

Described by: J.W. Moon

Subsampled by: G.S.

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 8×7×5 (3×2×1) Location: [redacted]

Sample Id: D14-11 Weight (kg): 2 Depth (m): 4300-3700

Mn Crust Description

Surface Texture: Pattern, Patchy

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D14-11

Comments and XRD Mineralogy:

Sub

KORDT ~25%
USGS ~75%

D14-11-1 XRD

TS, OC, 44EL, S, Te, Au

30.592g

1.045g

XRD (Again) 1.249g

Substrate Description

Rock Type: Burrow fill-(Casts)? derived from mudst.

Description: Yellow colored. Weathered but no [illegible] recrystallization — Qtz-clay??

Biology (?):

Described by: J. W. Hein

Subsampled by: HEIN

HEIN

SAMPLE DESCRIPTION

Cruise Id: FM-91-WP Size (cm): 5x2x2 ~ 12 x 8 x 4 Location: between Yap & Palau [redacted]

Sample Id: D14-12 Weight (kg): 0.2 Depth (m): 4300-3700

Mn Crust Description

Surface Texture: Patina granular

Mn Crust Thickness (mm):

Min:_____ Max: P Ave:_____

Outer to Inner Layers (mm)

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

D14-12

Comments and XRD Mineralogy:

Subs

KORDI ~40%
USGS ~60%

Substrate Description

Rock Type: Breccia Cataclastic - white mudst (D14-7) clasts

Description: White to off white brecciated with nearly rectangular pieces of white mudstone (like in D14-7) darker between clasts

Biology (?): have Mn patina

Described by: XSD

Subsampled by:

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 3×3×2 ~ 6×5×2 Location: between Yap + Pal[illegible] [redacted]

Sample Id: D14-14 Weight (kg): ~0.1 Depth (m): 4300-3700

Mn Crust Description

Surface Texture: traces of patina

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

D14-14

Comments and XRD Mineralogy:

100% smectite

Subsam

D14-14 XRD

KORDI ~ 45%
USGS 55%

Substrate Description

Rock Type: Mudstone

Description: Soft, white homogeneous looking (not calcareous). No borings or burrows

Probably same as D14-7

Smectite Palygorskite? Talc

Biology (?):

OC 17.425g, XRD (again)

Described by: ASD

Subsampled by: HEIN

SAMPLE DESCRIPTION

Cruise Id: [illegible] Size (cm): small pebbles [illegible] Location: Btw. Pap and Palau [illegible]

Sample Id: [illegible] 15 Weight (kg): 0.2 Depth (m): 4300-3700

Mn Crust Description

Surface Texture: Patina
Smooth to eroded

Mn Crust Thickness (mm):

Min:_____ Max: P Ave:_____

Outer to Inner Layers (mm)

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

DIK-15

Comments and XRD Mineralogy:

100% smectite

Subs

DIK-15-1 XRD Pink mudst.

Substrate Description

Rock Type: Mudstone "pebbles"

XRD [illegible]
US [illegible]

Description: "Pinkish" beige mudstone pebbles coated with thin layer of Mn oxide. Small chunks or dendritic Mn layers. Massive except for some hairline fractures

OC 19.44 g, XRD (Again)
Pure pink Mudstone (No Mn)

Biology (?): No borings, no burrows

Described by: ASD

Subsampled by: HEIN

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 4 x 3 x 2 ~ 15 x 15 x 6 Location: ~~V2-91-CP~~ between Yap + Palau

Sample Id: D14-16 Weight (kg): 0.5 Depth (m): 9300-3700

Mn Crust Description

Surface Texture: Patina finely granular

Mn Crust Thickness (mm):

Min:_____ Max: ? Ave:_____

Outer to Inner Layers (mm)

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

D14 - 16

Comments and XRD Mineralogy:

Subs

D14-16 XRD

KORDI ~ 40%
USGS ~ 60%

yellow + yellow-green shear plane deposits

OC, O isotopes, XRD (Again)
18.408g 1.697g

Substrate Description

Rock Type: Mudstone - Porcelanite

Description: Siliceous, beige mudstone, well indurated massive, crisscrossed by many fine fractures. Some Mn in fractures.

Biology (?): No borings or burrows

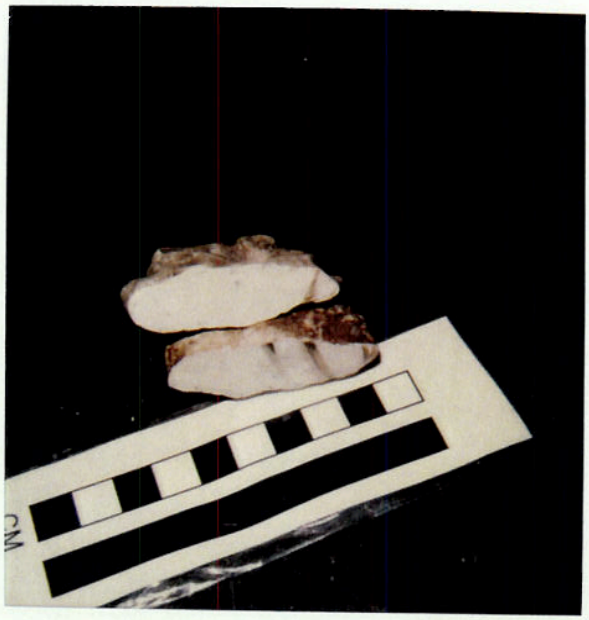
Described by: ASD

Subsampled by: HEIN

SAMPLE DESCRIPTION

Cruise Id: F7-91-WP Size (cm): 1.6x5.8x7.3 Location: [redacted] Between Yap + Palau arc

Sample Id: D14-17 Weight (kg): 0.066 Depth (m): 4300-3700 m



D14-17

Mn Crust Description

Surface Texture: Patina - 90% eroded off

Mn Crust Thickness (mm):

Min:_____ Max:_____ Ave:_____

Outer to Inner Layers (mm)

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

Comments and XRD Mineralogy:

Sul

D14-17 XRD

Substrate Description

Rock Type: Limestone? Calcareous Porcelanite - Concretion

TS, OC, 44 El, S isotopes, 22.98, 1.188, 0.96 kg

Description: Center is light grey, dense with patches of Mn dendrites minor fractures across the width 1mm Rim around the clast - cream colored w/ streaks of Brown

white toward spots center

XRD (Again)

Te, Au

~~Biology~~ (?): the surface is concretonary?

Described by: G.S.

Subsampled by: G.S