

Appendix 1

Track Line Map,
Relation of Sound-Velocity
and water Depth,
Weather and Sea-state Data

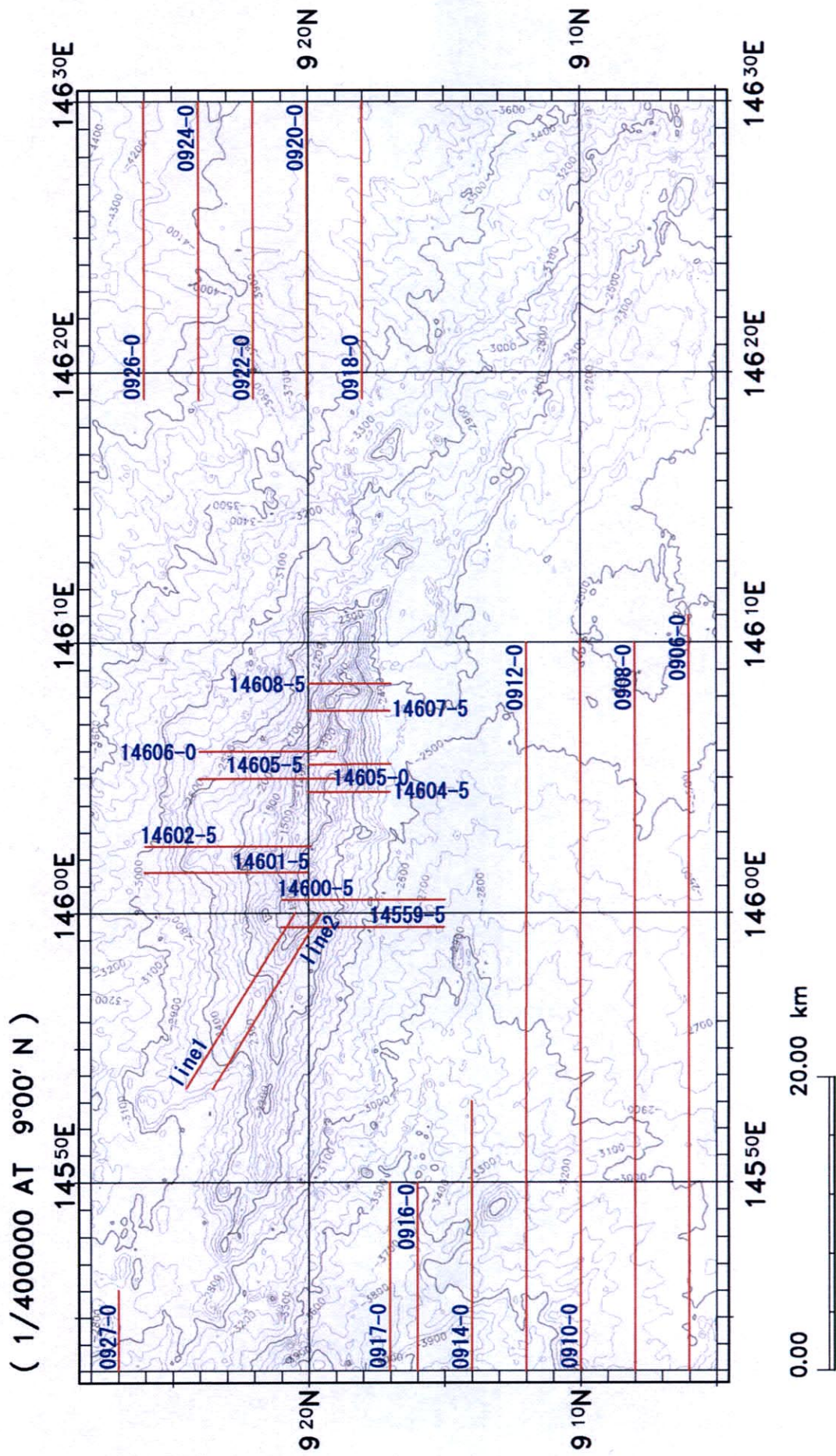


Fig. 1(1) Track Line Map (MC 12)

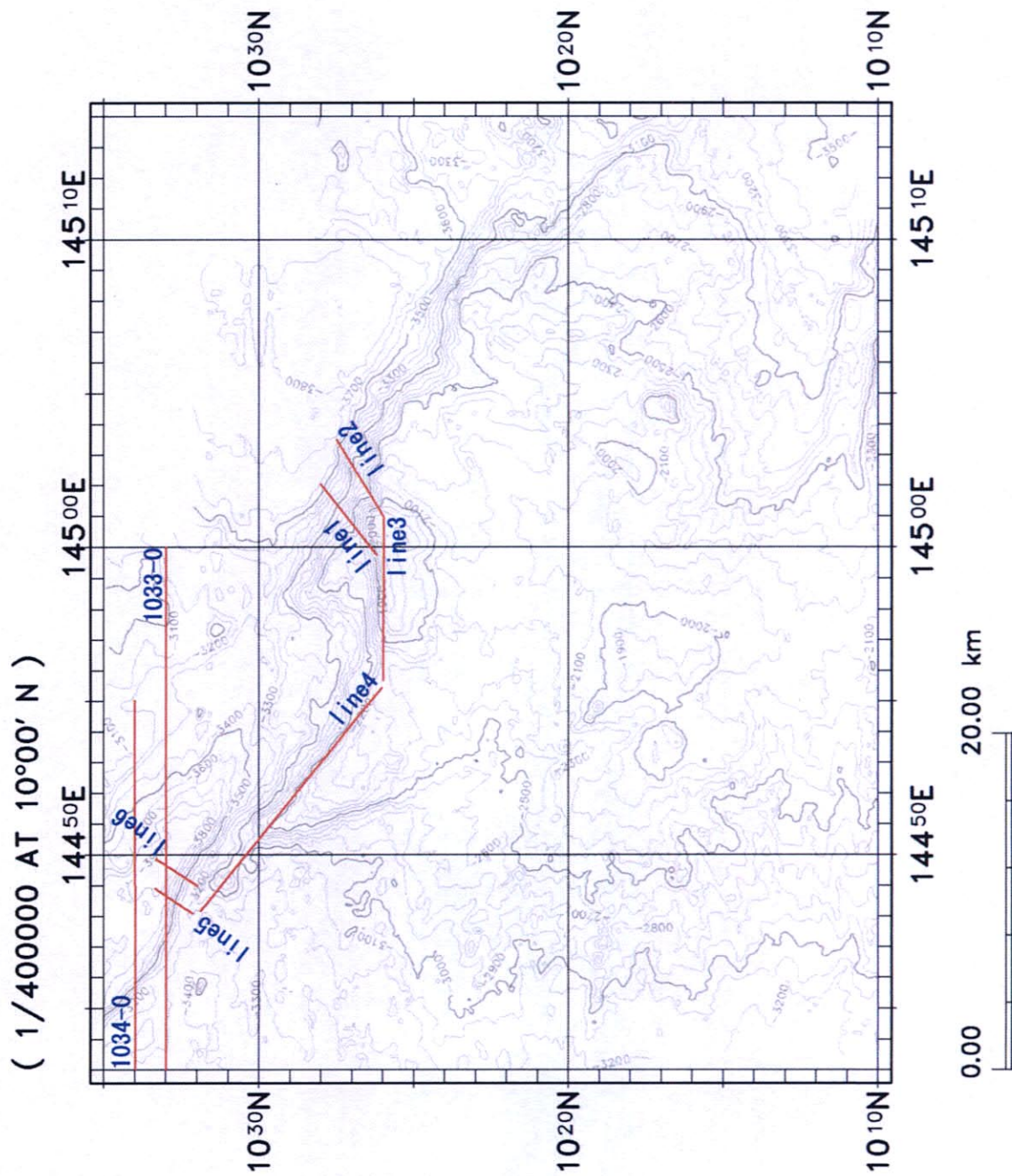
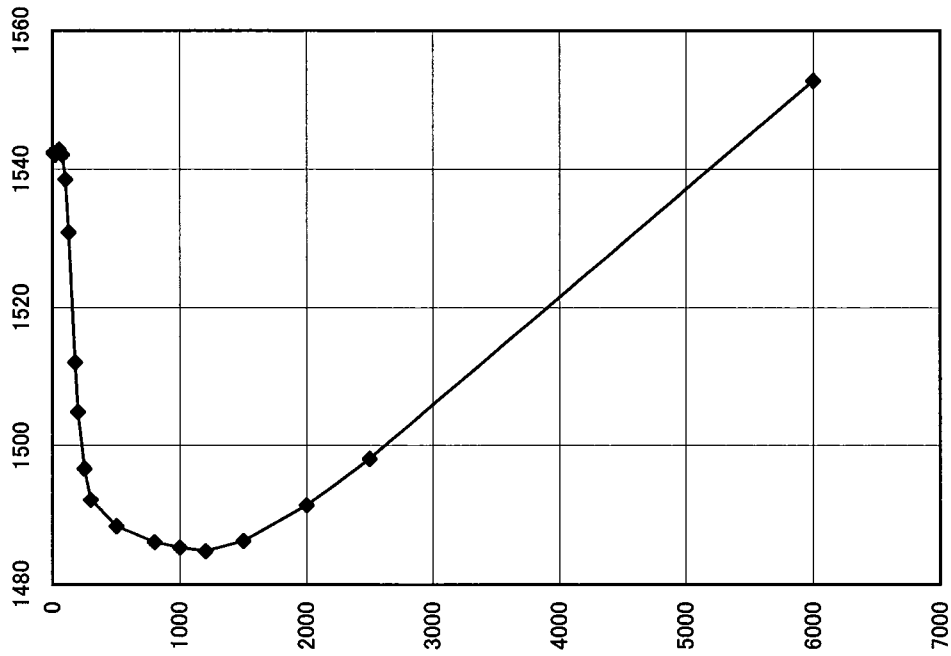


Fig.1 (2) Track Line Map (MC 13)

Relation of Sound-Velocity and Water Depth

2005 SOPAC	
3rd May 2005	
Locality Lat.	9° 25.304' N
Long.	146° 09.793' E
Water Depth (m)	Acoustic Velocity (m · s ⁻¹)
5	1,542.4
10	1,542.4
20	1,542.1
40	1,542.7
50	1,542.8
75	1,542.1
100	1,538.5
125	1,530.9
175	1,512.1
200	1,504.9
250	1,496.7
300	1,492.2
500	1,488.4
800	1,486.1
1,000	1,485.3
1,200	1,484.8
1,500	1,486.3
2,000	1,491.4
2,500	1,498.1
6,000	1,552.8
Mean Acoustic Velocity	1,511.8



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Weather and Sea-state Data

Table1-1 Monthly Distribution of Wind Direction in 2005

W.D.	CALM	N	NE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	unknown	Total
May	0	0	0	26	117	38	5	1	0	0	0	0	0	0	0	0	187
%	0.00	0.00	0.00	13.90	62.57	20.32	2.67	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Table1-2 Monthly Distribution of Wind Velocity in 2005

(W.D. : m/sec)

W.D.	CALM	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
May	0	0	0	0	0	0	3	17	43	57	42	16	5	0	2	0	1	0	0	0	0	1	187
%	0.00	0.00	0.00	0.00	0.00	0.00	1.60	9.09	22.99	30.48	22.46	8.56	2.67	0.00	1.07	0.00	0.53	0.00	0.00	0.00	0.00	0.53	100.00

*) CALM : 0.0m/sec

W.D.0 : 0.1m/sec~1.0m/sec

W.D.3 : 3.0m/sec~4.0m/sec

W.D.20- : >20.0m/sec

Table1-3 Monthly Distribution of Weather in 2005

weather	fine	cloudy	rain	unknown	total	ligh day
May	7	0	2		9	3
%	77.78	0.00	22.22	0.00	100.00	33.33

*) rain: r,d,p,q>5 times in the day

fine: other than rain day and b,bc>half day

cloudy: other fine & rain day and r,d,p,q,c,o>half day

light rain: fine or cloudy and r,d,p,q day

*) Weather Mark

b: fine (clear and sunny)

bc: fine (fair)

c: cloudy

o: all cloudy

r: rain

d: light rain

p: showery rain

q: squall

f: fog

m: mist

Table1-4 Monthly Frequency Distribution of Atmospheric Pressure(daily average) in 2005

(A.P.:hpa)

A.P.	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	
May	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
A.P.	997	998	999	1000	1001	1002	1003	1004	1005	1006	1007	1008	1009	1010	1011	1012	1013	1014
May	0	0	0	0	0	0	0	5	15	45	47	50	23	2	0	0	0	
%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67	8.02	24.06	25.13	26.74	12.30	1.07	0.00	0.00	0.00	
A.P.	1015	1016	1017	1018	1019	1020	1021	1022	1023	1024	1025	1026	1027	1028	1029	1030-	N.A.	Total
May	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	187
%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00

*) A.P.1000: 1000.0hpa~1001.0hpa

A.P.-980: <980hpa

A.P.1030- : >1030.0hpa

Table1-5 Monthly Frequency Distribution of Swell 1 Direction in 2005

S.D.	N	N N E	N E	E N E	E	E S E	S E	S S E	S	S S W	S W	W S W	W	W N W	N W	N N W	unknown	Total
May	0	2	9	65	18	0	0	0	0	0	0	0	0	0	0	0	93	187
%	0.00	1.07	4.81	34.76	9.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.73	100.00

Table1-6 Monthly Frequency Distribution of Swell 1 Cycle in 2005

(S.C.: sec)

S.C.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	unknown	Total
May	0	0	0	0	0	0	73	21	0	0	0	0	0	0	0	0	93	187
%	0.00	0.00	0.00	0.00	0.00	0.00	39.04	11.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.73	100.00

Table1-7 Monthly Frequency Distribution of Swell 1 Height in 2005

(S.H.: m)

S.H.	0	1	2	3	4	5	6	7	8	9	10	unknown	Total
May	0	3	72	19	0	0	0	0	0	0	0	93	187
%	0.00	1.60	38.50	10.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.73	100.00

Table1-8 Monthly Frequency Distribution of Degree of Cloudiness in 2005

D.C.	0	1	2	3	4	5	6	7	8	9	10	unknown	Total
May	0	0	0	39	67	43	23	9	6	0	0	0	187
%	0.00	0.00	0.00	20.86	35.83	22.99	12.30	4.81	3.21	0.00	0.00	0.00	100.00

Table1-9 Monthly Frequency Distribution of Swell 2 Direction in 2005

S.D.	N	N N E	N E	E N E	E	E S E	S E	S S E	S	S S W	S W	W S W	W	W N W	N W	N N W	unknown	Total
May	0	0	0	12	34	22	0	0	0	0	0	0	0	0	0	0	119	187
%	0.00	0.00	0.00	6.42	18.18	11.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.64	100.00

Table1-10 Monthly Frequency Distribution of Swell 2 Cycle in 2005

(S.C.: sec)

S.C.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	unknown	Total
May	0	0	0	0	0	0	41	27	0	0	0	0	0	0	0	0	119	187
%	0.00	0.00	0.00	0.00	0.00	0.00	21.93	14.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.64	100.00

Table1-11 Monthly Frequency Distribution of Swell 2 Height in 2005

(S.H.: m)

S.H.	0	1	2	3	4	5	6	7	8	9	10	unknown	Total
May	0	20	46	2	0	0	0	0	0	0	0	119	187
%	0.00	10.70	24.60	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.64	100.00

Appendix 2

Amount of Survey, MC and AD

Amount of Survey, MC snd AD (MC12 Area)

No.	Sampling No.	BT/BR	Survey Date, Time		Locations Lon. - Lat	Dredge Direction	Water Depth (m)	Dredge Distance (m)	Sample	Sample Amount (kg)	Rock Type
			(UT)	(UT)							
1	05SMC12AD15	BT	5/5	23:09:23	146° 01.597' E 09° 24.419' N	94°	2,437	720	crust : 87.9kg etc. : 2.4kg	90.3	Mn Crust, calcareous conglomerate, calcareous sand
		BR	5/6	00:04:41	146° 01.990' E 09° 24.394' N		2,333				
2	05SMC12AD16	BT	5/6	2:08:41	146° 01.881' E 09° 22.559' N	106°	2,004	674	crust : 90.4kg rock : 193.0Kg etc. : 5.2kg	288.6	Mn Crust, volcanic braecia, basalt
		BR	5/6	2:54:40	146° 02.235' E 09° 22.456' N		1,934				
3	05SMC12AD17	BT	5/6	4:44:27	146° 01.662' E 09° 21.897' N	87°	1,772	412	crust : 1.4kg rock : 0.2Kg etc. : 2.0kg	3.6	Mn Crust, volcanic rock, calcareous sand
		BR	5/6	5:29:24	146° 01.887' E 09° 21.910' N		1,603				
4	05SMC12AD18	BT	5/6	7:01:03	146° 01.643' E 09° 21.014' N	88°	1,368	624	crust : - rock : 0.4Kg	0.4	limestone
		BR	5/6	7:33:44	146° 01.984' E 09° 21.026' N		1,451				
5	05SMC12AD19	BT	5/6	22:33:14	146° 01.821' E 09° 22.218' N	131°	1,873	594	crust : 2.6kg rock : 6.3Kg etc. : 1.6kg	10.5	Mn Crust, calcareous conglomerate, calcareous sand
		BR	5/6	23:12:29	146° 02.065' E 09° 22.006' N		1,662				
6	05SMC12AD20	BT	5/7	0:49:31	146° 01.812' E 09° 21.397' N	102°	1,562	247	crust : 15.1kg rock : 4.0Kg	19.1	Mn Crust, mud stone, limestone
		BR	5/7	1:30:03	146° 01.944' E 09° 21.369' N		1,557				
7	05SMC12AD21	BT	5/7	2:55:46	146° 02.559' E 09° 20.618' N	88°	1,324	435	crust:- rock : 7.6kg	7.6	limestone
		BR	5/7	3:28:59	146° 02.797' E 09° 20.628' N		1,326				
8	05SMC12AD22	BT	5/7	5:18:58	145° 59.797' E 09° 19.321' N	50°	1,822	479	crust : 0.8kg rock : 1.3Kg etc. : 0.7Kg	2.8	Mn crust, lapiilli stone, limestone
		BR	5/7	5:56:35	145° 59.998' E 09° 19.487' N		1,648				
9	05SMC12AD23	BT	5/7	22:32:25	145° 59.886' E 09° 18.864' N	36°	2,111	209	crust : 0.017kg rock : 0.005Kg etc. : 0.07Kg	0.092	Mn crust, limestone, calcareous sand
		BR	5/7	22:44:43	145° 59.954' E 09° 18.955' N		1,992				
10	05SMC12AD24	BT	5/8	0:36:38	145° 59.968' E 09° 18.317' N	47°	2,368	649	crust : - rock : 267.6kg etc. : 2.1kg	269.7	volcanic clastic rock
		BR	5/8	1:28:37	146° 00.228' E 09° 18.556' N		2,077				
11	05SMC12AD25	BT	5/8	3:45:31	146° 04.867' E 09° 17.632' N	91°	2,221	371	crust : - rock : 1.02kg etc. : 2.12kg	3.14	pumice, calcareous conglomerate
		BR	5/8	4:39:44	146° 05.070' E 09° 17.629' N		2,140				
12	05SMC12AD26	BT	5/8	6:22:23	146° 05.022' E 09° 18.852' N	121°	1,464	83	crust : Tr rock : Tr etc. : 2.02Kg	2.02	limestone
		BR	5/8	6:36:18	146° 05.061' E 09° 18.829' N		1,423				
13	05SMC12AD27	BT	5/8	23:11:12	146° 02.739' E 09° 17.583' N	45°	2,209	340	rock : 59.8kg etc. : 5.3kg	65.1	tuffaceous sand~silt, calcareous conglomerate
		BR	5/8	22:41:21	146° 02.871' E 09° 17.712' N		2,020				
14	05SMC12AD28	BT	5/9	0:39:49	146° 04.907' E 09° 21.16' N	109°	1,858	229	crust : 0.17Kg rock : 2.04Kg etc. : 2.45Kg	4.66	Mn crust calcareous sand
		BR	5/9	1:51:22	146° 05.025' E 09° 21.119' N		1,867				
15	05SMC12AD29	BT	5/9	3:43:09	146° 05.604' E 09° 22.788' N	96°	2,385	566	crust : 76.8Kg rock : 39.3Kg etc. : 1.9Kg	118.0	Mn crust, tuffaceous sand
		BR	5/9	4:28:07	146° 05.912' E 09° 22.755' N		2,306				
16	05SMC12AD30	BT	5/9	7:29:17	145° 54.696' E 09° 22.903' N	91°	2,370	1024	crust : 35.0Kg	35.0	Mn crust
		BR	5/9	8:26:10	145° 55.256' E 09° 22.889' N		2,312				
17	05SMC12MC01	BT	5/3	3:56:21	146° 09.783' E 09° 25.311' N	-	3,315	-	foraminiferal sand	10.1	
18	05SMC12MC02	BT	5/3	7:23:22	146° 06.692' E 09° 15.646' N	-	2,481	-	foraminiferal sand	11.3	
Total								7656.0		942.0	

Amount of Survey, MC and AD (MC13)

No.	Sampling No.	BT/BR	Survey Date, Time		Locations	Dredge Direction	Water Depth (m)	Dredge Distance (m)	Sample	Sample Amount (kg)	Rock Type
			(UT)		Lon. - Lat						
1	05SMC13AD15	BT	5/9	22:26:24	145° 00. 158' E 10° 26. 214' N	94°	1,724	513	crust:70.4Kg rock:13.5kg etc.:7.3kg	91.2	Mn crust, mud stone
		BR	5/9	23:08:47	145° 00. 439' E 10° 26. 195' N		1,719				
2	05SMC13AD16	BT	5/10	0:43:04	145° 00. 834' E 10° 26. 504' N	121°	2,061	534	岩石:7.3kg その他:0.4kg	7.7	basalt, calcareous sand
		BR	5/10	1:16:59	145° 01. 085' E 10° 26. 355' N		1,948				
3	05SMC13MC01	BT	5/5	0:17:13	144° 54. 688' E 10° 24. 253' N	-	2,358	-	foraminiferal sand	5.2	
4	05SMC13MC02	BT	5/5	3:22:33	144° 47. 981' E 10° 29. 008' N	-	3,163	-	foraminiferal sand	10.4	
Total								1047.0		114.5	

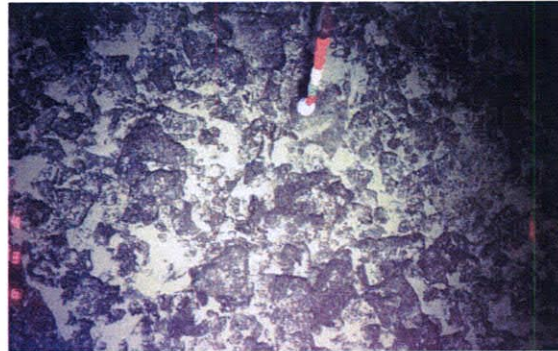
Appendix 3
Photographs of FDC and AD

Photo No.003



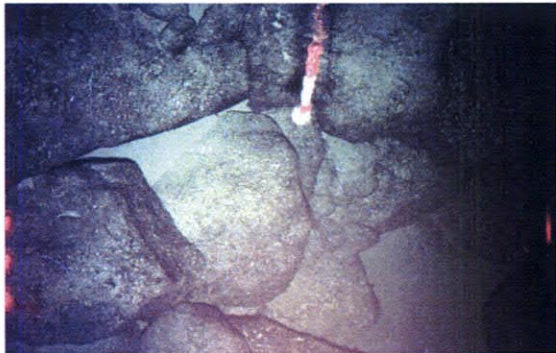
2005/5/3 22:09:39
9° 20.764' N, 146° 01.837' E
Water depth : 1,192 m
Limestone showing irregular corrosion surface near summit without Mn oxide coating

Photo No.019



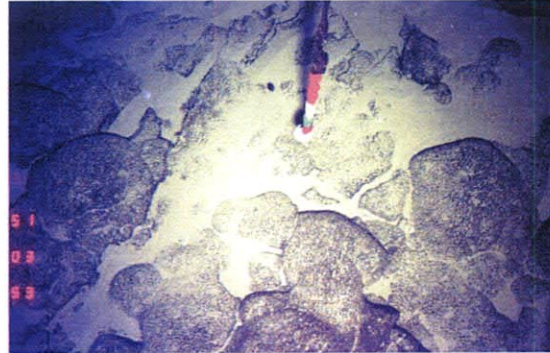
2005/5/3 22:24:22
9° 20.944' N, 146° 01.855' E
Water depth : 1,251 m
Boulder size talus of limestone in gentle slope

Photo No.028



2005/5/3 22:34:17
9° 21.080' N, 146° 01.880' E
Water depth : 1,339 m
Sub angular shaped limestone talus in steep slope

Photo No.046



2005/5/3 22:51:32
9° 21.361' N, 146° 01.901' E
Water depth : 1,506 m
Bedrock showing torose surface with botryoidal Mn oxide coating

Photo No.067



2005/5/3 23:14:11
9° 21.720' N, 146° 01.951' E
Water depth : 1,546 m
Terrace part of bedrock with unconsolidated sandy sediments

Photo No.078



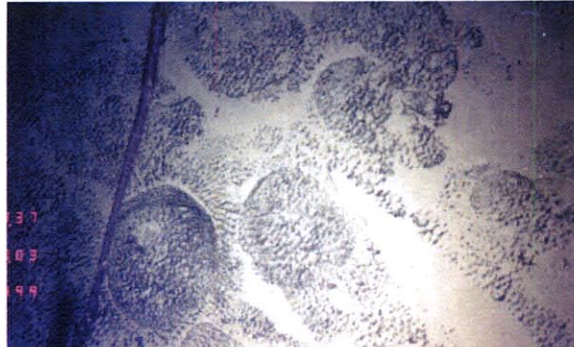
2005/5/3 23:24:50
9° 21.903' N, 146° 01.965' E
Water depth : 1,567 m
Bedrock showing rounded surface with botryoidal Mn oxide coating

Photo No.086



2005/5/3 23:31:08
 9° 22.004' N, 146° 01.976' E
 Water depth : 1,626 m
 Bedrock showing torose surface with botryoidal Mn oxide coating

Photo No.092



2005/5/3 23:37:08
 9° 22.103' N, 146° 01.980' E
 Water depth : 1,687 m
 Bedrock showing boulder like torose surface with Mn oxide coating, covered by unconsolidated sandy sediments due to locating at gentle slope

Photo No.098



2005/5/3 23:44:11
 9° 22.221' N, 146° 01.990' E
 Water depth : 1,721 m
 Massive bedrock showing rounded surface with botryoidal Mn oxide coating

Photo No.115



2005/5/4 00:01:02
 9° 22.477' N, 146° 02.032' E
 Water depth : 1,819 m
 Rounded massive bedrock in steep slope with botryoidal Mn oxide coating

Photo No.123



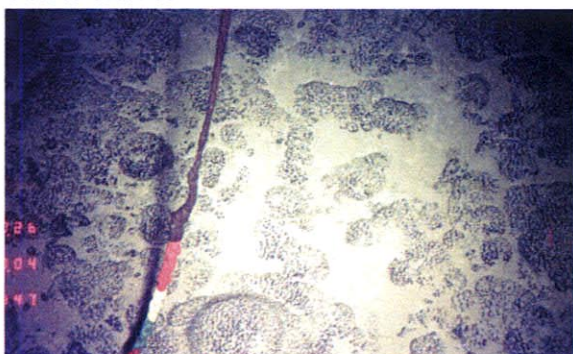
2005/5/4 00:09:17
 9° 22.603' N, 146° 02.036' E
 water depth : 1,890 m
 Continuous outcrop of rounded bedrock with botryoidal Mn oxide coating

Photo No.134



2005/5/4 00:20:17
 9° 22.784' N, 146° 02.072' E
 Water depth : 2,043 m
 Continuous outcrop of rounded, partly brecciated bedrock with botryoidal Mn oxide coating

Photo No.140



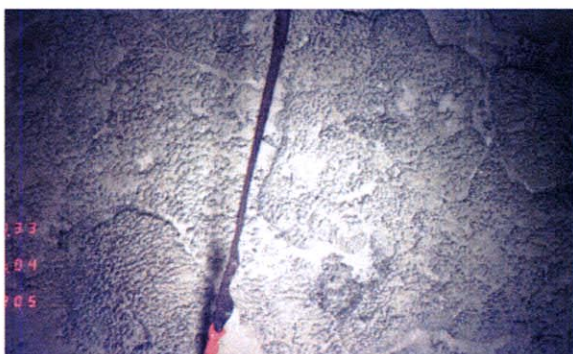
2005/5/4 00:26:11
 9° 22.858' N, 146° 02.070' E
 Water depth : 2,109 m
 Bedrock showing torose surface with botryoidal Mn oxide coating, covered by unconsolidated thin sandy sediments

Photo No.162



2005/5/4 00:54:35
 9° 23.445' N, 146° 02.150' E
 Water depth : 2,189 m
 Tarrace part on ridge, covered by unconsolidated sandy sediments with ripple mark

Photo No.198



2005/5/4 01:33:17
 9° 24.130' N, 146° 02.216' E
 Water depth : 2,271 m
 Bedrock showing torose surface with botryoidal Mn oxide coating

Photo No.222



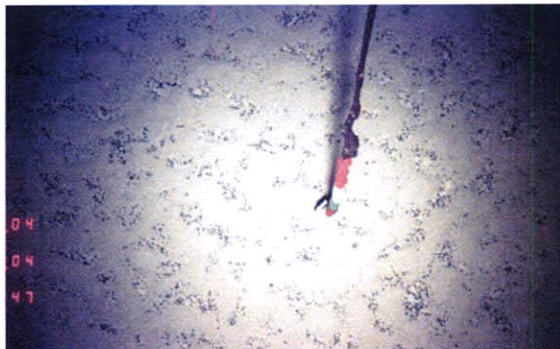
2005/5/4 01:46:08
 9° 24.374' N, 146° 02.237' E
 Water depth : 2,294 m
 Massive bedrock showing rounded surface with botryoidal M oxide coating in steep slope

Photo No.228



2005/5/4 01:52:02
 9° 24.473' N, 146° 02.242' E
 Water depth : 2,395 m
 Rounded massive bedrock with botryoidal Mn oxide coating and brecciated talus in situ

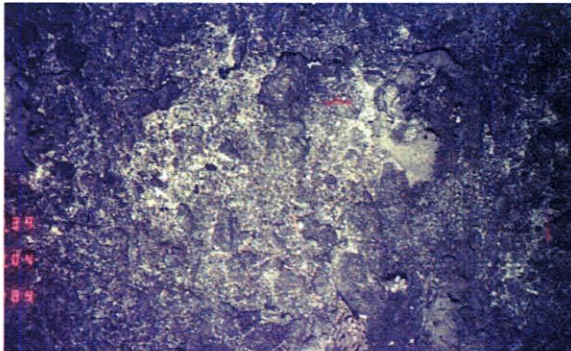
Photo No.240



2005/5/4 02:04:10
 9° 24.781' N, 146° 02.288' E
 Water depth : 2,520 m
 Gentle slope covered by unconsolidated sandy sediments and partly breccia or nodule in cobble size

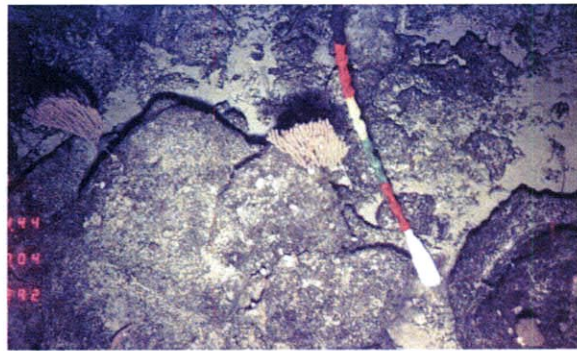
05SMC12 FDC03

Photo No.005



2005/5/4 04:39:39
9° 20.457' N, 146° 02.699' E
Water depth : 1,205 m
Limestone like brecciated outcrop near summit
without Mn oxide coating

Photo No.013



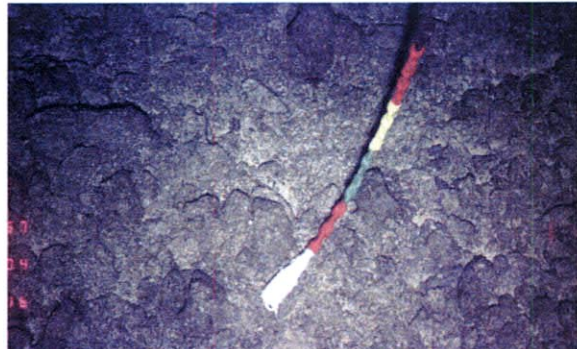
2005/5/4 04:44:08
9° 20.519' N, 146° 02.699' E
Water depth : 1,219 m
Massive limestone showing corrosional surface with
weakly botryoidal Mn oxide coating

Photo No.027



2005/5/4 04:52:12
9° 20.625' N, 146° 02.701' E
Water depth : 1,300 m
Bedrock showing rounded surface with botryoidal Mn
oxide coating

Photo No.037



2005/5/4 04:57:02
9° 20.681' N, 146° 02.712' E
water depth : 1,369 m
Bedrock showing corroded rough surface without Mn
oxide coating

Photo No.043



2005/5/4 04:59:47
9° 20.720' N, 146° 02.710' E
Water depth : 1,409 m
Massive bedrock showing rounded surface with
botryoidal Mn oxide coating

Photo No.045



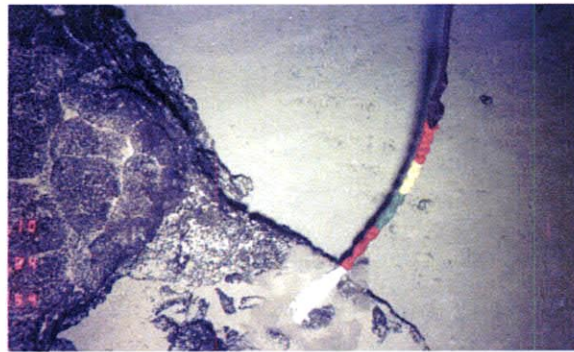
2005/5/4 05:00:57
9° 20.732' N, 146° 02.714' E
Water depth : 1,416 m
Talus like large block of bedrock at immediately
below of cliff

Photo No.058



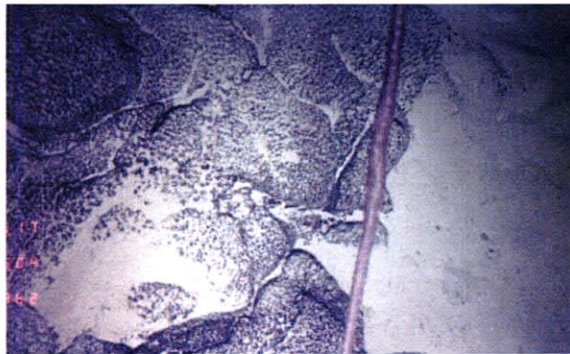
2005/5/4 05:05:19
 9° 20.758' N, 146° 02.717' E
 Water depth : 1,439 m
 Bedrock showing flat surface with botryoidal Mn oxide coating in gentle slope

Photo No.075



2005/5/4 05:10:26
 9° 20.861' N, 146° 02.735' E
 Water depth : 1,461 m
 Bedrock showing torose surface bounded with unconsolidated sandy sediments

Photo No.083



2005/5/4 05:17:26
 9° 20.959' N, 146° 02.750' E
 Water depth : 1,503 m
 Bedrock showing torose surface with botryoidal Mn oxide coating, surrounded by unconsolidated sandy sediments

Photo No.108



2005/5/4 05:40:32
 9° 21.340' N, 146° 02.778' E
 Water depth : 1,648 m
 Bedrock showing large torose rough surface with botryoidal Mn oxide coating partly

Photo No.115



2005/5/4 05:47:35
 9° 21.461' N, 146° 02.787' E
 water depth : 1,698 m
 Scattered boulder or torose bedrock surroiunded by unconsolidated sandy sediments

Photo No.137



2005/5/4 05:59:14
 9° 21.651' N, 146° 02.815' E
 water depth : 1,761 m
 Flat slope with unconsolidated sandy sediments showing weak ripple mark and biotic trace