

Appendix

Appendix 1: Extended list of operations

Appendix 2: Fluid Chemistry results and subsamples

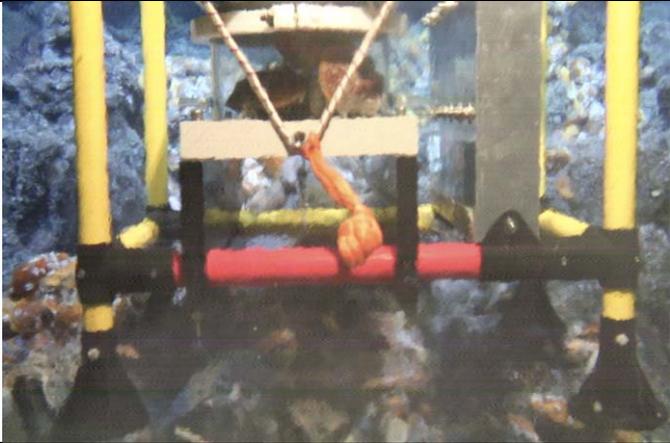
Appendix 3: ROV dive protocols

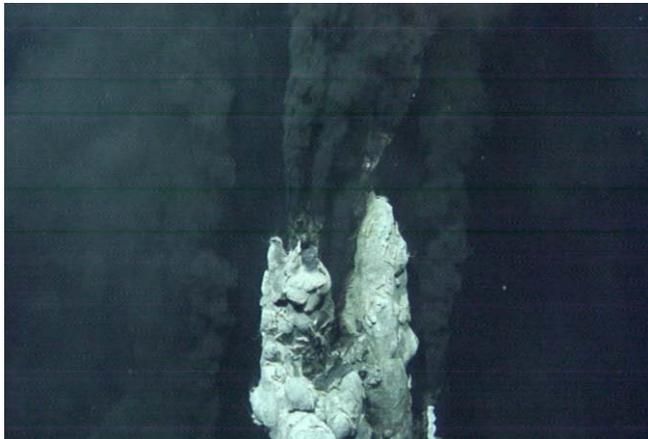
Appendix 1

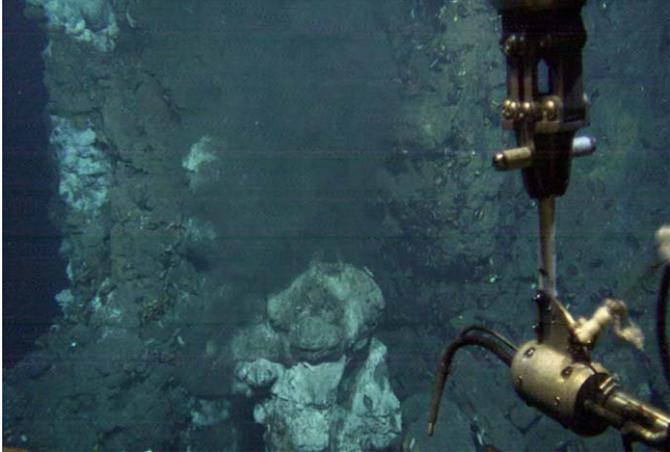
Extended list of operations

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
12.01.08		
ATA- 31CTD 17:17:57 – 19:11:30	LADCP, no MAPR, 21 bottles	05°22.396'S, 16°22.917'W @ 4164 m cable out
13.01.08		
ATA- 32CTD 21:57:00 – 23:49:35	LADCP, no MAPR, 16 bottles	04°47.701'S, 12°23.604'W @ 3017 m cable out
14.01.08		
ATA- 33CTD 01:05:33 – 02:58:26	LADCP, 1x MAPR, 21 bottles, 2 not closed, 1 not tight	04°47.422'S, 12°22.603'W @ 3088 m cable out
ATA- 34CTD 04:20:22 – 06:15:35	LADCP, no MAPR, 16 bottles	04°47.103'S, 12°21.635'W @ 3013 m cable out
ATA- 35ROV deployment 09:39 at bottom 11:13	<i>tools: SMoni, ROV-Beacon, 2x He tubes, 2x Titan Majors</i>	<i>ship at</i> 04° 48.5696S, 2°22.4497W
12:13 :22 deployment homer beacon		04°48.583'S, 12°22.414W homer beacon
12:17:50	Site Two Boats	

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
	KIPS fluids from hot vent, but bottled turn out to be not filled, thus no pH, chlorinity	
12:49:25	Bottle C9 =35ROV1; T _{KIPS} =406°C pH= Cl=	
12:54:24	Bottle C8 =35ROV2; T _{KIPS} =417°C pH= Cl=	
12:58:59	Bottle C7 =35ROV3; T _{KIPS} =412°C pH= Cl=	
13:04:20	Bottle B6 =35ROV4; T _{KIPS} = pH= Cl=	
13:09:12	Bottle B5 =35ROV5; T _{KIPS} = pH= Cl=	
13:14:14	Bottle B4 =35ROV6; T _{KIPS} =420°C pH= Cl=	
13:47:54	Ti-major bottle D1 = 35ROV7 pH= 6.44 Cl=550	
		Fluid sampling with Ti-majors
14:34:39	Ti-major bottle D2 = 35ROV8 pH=2.92 Cl=360	
14:43:32	SMoni measurement =35ROV9; T _{max} =393°C	
15:06:35	Bottle A3 =35ROV10; T _{KIPS} =451°C pH= Cl=	
15:12:13	Bottle A2 =35ROV11; T _{KIPS} =427°C pH= Cl=	
15:17:03	Bottle A1 =35ROV12; T _{KIPS} =427°C pH= Cl=	
15:31:26	SMoni measurement =35ROV13; T _{max} =396°C	
15:43:01	He-sample =35ROV14 (AA label)	
16:04:24	He-sample =35ROV15 (BB label)	
16:46:27	Sulfide sample 35ROV16	
16:46:27	Slurp gun sample (bottle 1) = 35ROV17	
17:34:00	Slurp gun sample (bottle 2) = 35ROV18	
17:40:09 leaving bottom 18:55 ROV on deck		
ATA- 36CTD 20:00:22 – 07:32:30	LADCP, 1xMAPR, keine Proben, JoJo bis 2600m	04°47.394'S, 12°22.600'W @ 3088 m cable out
15.01.08		
ATA- 37ROV 09:39	tools: ROV-Beacon, 8-channel, T-logger, "die fast", 5 bionets	ship at 04° 48.6186S, 12°22.339W

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
<i>deployment</i> 11:12:23 <i>at</i> <i>bottom</i>		
11:31:00 <i>deployment</i> <i>homer</i> <i>beacon</i>		04° 48.626'S, 12° 22.342'W
11:33:25	<i>Site Wideawake</i>	
		KIPS temperature measurement in mussel bed
	KIPS fluids ROV2-5 and ROV10-13 = Diffuse fluids	
11:54:47	Bottle C9 =37ROV1; T _{KIPS} = 7-11° pH=7.5 Cl=560	
11:59:21	Bottle C8 =37ROV2; T _{KIPS} = 4-11° pH=7.05 Cl=550	
12:04:44	Bottle C7 =37ROV3; T _{KIPS} =8-11° pH=7.29 Cl=550	
12:10:45	Bottle B6 =37ROV4; T _{KIPS} = pH=7.03 Cl=560	
12:14:53	Bottle B5 =37ROV5; T _{KIPS} = 12-16° pH= Cl=560	
12:31:05	8-channel T-probe, = 37ROV6, T from 16.7 to 4.4°	
13:49:46	Mussels with net #3; sample 37ROV7	
14:11:07	Slurp gun, bottle 1, sample 37ROV8	
14:48:00	Die-fast instrument is filled 37ROV9	
		"Die-fast" instrument
15:58:16	Bottle B4 =37ROV10; T _{KIPS} =8-9°C pH=7.5 Cl=550	
16:05:02	Bottle A3 =37ROV11; T _{KIPS} =5-7°C pH=7.42 Cl=560	
16:08:57	Bottle A2 =37ROV12; T _{KIPS} =6°C pH=7.39 Cl=550	

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
16:14:33	Bottle A1 =37ROV13; T _{KIPS} =9°C pH=7.7 Cl=550	
16:29:50	8-channel T-probe, = 37ROV14, 18°C at tip of lance	
16:50:10 <i>off bottom</i> 18:15 <i>ROV on deck</i>		
ATA- 38CTD 19:51:28 – 21:44:58	LADCP, no MAPR, 16 bottles, 1 bottle open	04°44.298'S, 12°20.698'W @ 3082 m cable out
ATA- 39CTD 23:51:30 – 01:51:10	LADCP, no MAPR, 20 bottles, 1 bottle not closed	04°45.147'S, 12°23.002'W @ 3250 m cable out
16.01.08		
ATA- 40CTD 03:07:20 – 04:55:10	LADCP, no MAPR, 16 bottles	04°45.999'S, 12°25.350'W @ 2929 m cable out
ATA- 41CTD 06:06:05 – 07:55:20	LADCP, 1x MAPR, 14 bottles	04°49.197'S, 12°22.199'W @ 2980 m cable out
ATA- 42ROV 9:20 <i>deployment</i> 10:48:04 <i>at bottom</i>	<i>Tools: SMoni, 2 bionets, 1x He tube, 2x Titan Majors, IB-sampler</i>	<i>Ship at</i> 4°48,188'S, 12°22,301'W
	<i>Site: Comfortless Cove</i>	
11:04:43	<i>Found Sister Peak</i> 	<i>ROV at</i> 4°48.222'S, 12°22.270'W Sister Peak
12:43:26	Sample from chimney = 42 ROV-1 KIPS fluids ROV2-5 from base of vent	

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
13:00:04	Bottle C9 =42ROV2; T _{KIPS} =367° pH=6.75 Cl=n.d	
13:05:26	Bottle C8 =42ROV3; T _{KIPS} =367° pH=4.33 Cl=380	
13:10:34	Bottle C7 =42ROV4; T _{KIPS} =368° pH=3.8 Cl=340	
13:16:30	Bottle B6 =42ROV5; T _{KIPS} =368° pH=4.28 Cl=360	
		KIPS sampler
14:26:42	IB sample = 42ROV6	
15:22:51	Ti-major bottle D1 = 42ROV7 pH=3.36 Cl=320	
15:40:32	SMoni measurement =42ROV8; shipboard examination failed	
15:53:28	SMoni measurement =42ROV9; shipboard examination failed	
	KIPS fluids ROV11-ROV14 from top of vent	
16:13:42	No bottle filled? =42ROV10; T _{KIPS} =220°	
16:49:06	Bottle B5 =42ROV11; T _{KIPS} =?° pH=5.69 Cl=520	
16:54:41	Bottle B4 =42ROV12; T _{KIPS} =?° pH=6.76 Cl=n.d.	
17:10:01	Bottle A3 =42ROV13; T _{KIPS} =?° pH= Cl=	
17:13:56	Bottle A2 =42ROV14; T _{KIPS} =?° pH=5.95 Cl=n.d.	
17:30:59	SMoni measurement =42ROV15; shipboard examination failed	
		pillow lava at Golden Valley
18:03:41	Lava rock sample = 42ROV16	ROV at 4°48.159 S, 12°22.298 W
18:08:28 <i>leaving bottom 19:24 ROV</i>		

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
<i>on deck</i>		
17.01.08		
entire day	ROV idle. Short circuit requires shortening of cable	
ATA-43CTD 20:38:50 – 08:10:40	LADCP, 3xMAPR, TOW-YO, no bottles, (starts on 16 th , ends on 17 th)	04°48.992S,12°25.002 @ 2804 m cable out, START 04°47.784'S,12°20.190'W bei 2700 m Tiefe, END
18.01.08		
ATA-44CTD 01:01:45 – 03:09:05	LADCP, no MAPR, 16 bottles,	04°50.500'S,12°11.898'W @ 3055 m cable out
ATA-45CTD 04:22:25 – 06:23:40	LADCP, no MAPR, 18 bottles,	04°46.503'S,12°22.798'W @ 3185 m cable out
ATA-46ROV 9:25 <i>deployment</i> 11:10:15 on <i>bottom</i>	<i>Tools: SMoni, IB-sampler, 1x He tubes, 2x Titan Majors, 2 bionets</i> <i>Sites: Wideawake and Turtle Pits</i>	<i>ship at</i> 04°48,620'S, 12°22,353'W
11:33:57	Bionet sample = 46ROV1 at Wideawake	
11:38:14 to 13:20:18	Mapping Wideawake lave fields	
11:57:45	Basalt sample = 46ROV2	
		Fossil submarine lava gauge in Wideawake field
13:10:25	Basalt sample = 46ROV3	04°48.656'S, 12°22.265'W; @ 2983 m water depth
13:45:43	Slurp gun sampling of mussels; bottle 1= 46ROV4	04°48.632'S, 12°22.331'W
13:58:36	Slurp gun sampling of mussels; bottle 2= 46ROV5	

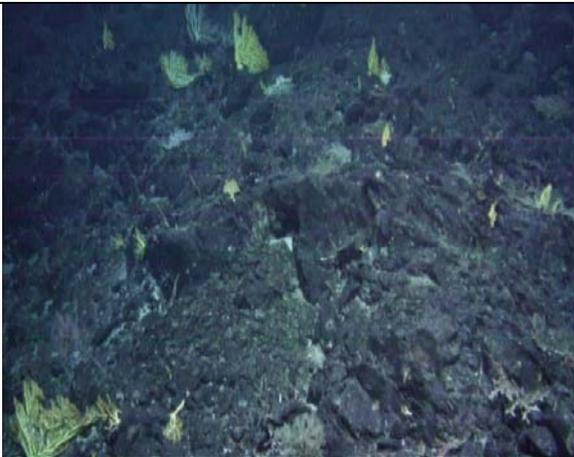
<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
		First colonialization (?) of lava by mussels
	<i>Site: Two Boats</i>	
16:15:30	IB sample = 46ROV6	4°48.577S, 12°22.412 W
16:57:54	Bottle C9 =46ROV7; T _{KIPS} = 180° sensor is displaced by 2 cm from nozzle	pH=3.47 Cl=470 KIPS temp.
17:01:52	Bottle C8=46ROV8,.....T _{KIPS} = 180° because of sensor problem	pH=n/a Cl=n/a no temp.
17:58:06 <i>leaving bottom 19:15 on deck</i>		
ATA- 47CTD 20:24:00 – 22:11:23	LADCP, no MAPR, 16 bottles, 1 bottle not closed	04°51.297'S, 12°19.504'W @ 2944 m cable out
ATA- 48CTD 23:09:30 – 01:03:10	LADCP, no MAPR, 20 bottles, 1 "Schöpfer" not closed	04°52.000'S, 12°21.453'W @ 3271 m cable out
19.01.08		
ATA- 49CTD 02:04:03 – 03:53:20	LADCP, no MAPR, 16 bottles	04°53.003'S, 12°23.350'W @ 3035 m cable out
ATAROV50 09:40:42 <i>deployment 11:29:15 on bottom</i>	<i>Tools: 1x Titan Majors, 2 bionets, IB-sampler, Shovel; port drawer configured for rocks</i> <i>Site: Inside Corner High 1</i>	<i>Ship coordinates</i> 5°05.3771'S, 11°39.393'W
13:26:05	Rock sample = 50ROV1, Mn-encrusted peridotite breccia	05°05.622'S, 11°39.764'W, depth 3094m
15:24:48	Rock sample = 50ROV2, melano-gabbro	05°05.746'S, 11°40.045'W

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
		depth 2775 m
16:21:56	Rock sample = 50ROV3, small serpentinite mylonite	05°05.830'S, 11°40.170'W, depth 2696 m
16:24:21	Rock sample = 50ROV4, small piece of microgabbro or dolerite	05°05.830'S, 11°40.170'W, depth 2696 m
16:34:58	Rock sample = 50ROV5, large piece of leucogabbro with corner of felsic intrusive	05°5.815'S, 11°40.191'W, 2670m
16:55:45	Rock sample = 50ROV6, gabbro with two merging high T shear zones	05,840'S, 11°40,289'W, depth 2592 m
17:22:19	Rock sample = 50ROV7, qtz-diorite intrusive into gabbro pegmatite and regular gabbro	05°05.827'S, 11°40.311'W, depth 2555m
17:32:25 <i>leaving bottom 18:43 on deck</i>		Leaving traverse for today at 05°05.833'S, 11°40.372'W, depth 2484 m
ATA- 51CTD 23:39:28 – 08:07:40	LADCP, 3x MAPR, 3 bottles, YoYo, hit ground from 05:22:33 to 05:26:09	04°47.998'S, 12°22.353'W @ 3005 m cable out
20.01.08		
ATA- ROV52 10:00 <i>deployment: 11:43 on bottom</i>	<i>8-channel T-logger; 4 bionets, He tube</i>	04°48.102' S, 12°22.286' W, depth 2992 m
	Site Golden Valley, further planned operations were cancelled due to failure of Posidonia position system 	Amazing volcanic morphology in Golden Valley

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
		mussel cemetery in Golden Valley area
13:59:38	Bottle C9 =52ROV1; T _{KIPS} =8.9°C° pH= 7.61 Cl=n.d.	
		view of mussel field in Golden Valley area
14:04:08	Bottle C8 =52ROV2; T _{KIPS} =8.6°C° pH=7.08 Cl= n.d.	
14:09:13	Bottle C7 =52ROV3; T _{KIPS} =8.5°C° pH=6.92 Cl= n.d.	
14:13:10	Bottle B6 =52ROV4; T _{KIPS} =8.9°C° pH=6.97 Cl= n.d.	
14:20:04	Bottle B5 =52ROV5; T _{KIPS} =8.0°C° pH=6.79 Cl= n.d.	
14:24:45	Bottle B4 =52ROV6; T _{KIPS} =8.3°C° pH= 6.84 Cl= n.d.	
14:28:43	Bottle A3 =52ROV7; T _{KIPS} =7.8°C° pH= 6.88 Cl= n.d.	
14:36:52	Bottle A2 =52ROV8; T _{KIPS} =8.8°C° pH=6.96 Cl= n.d.	
14:41:51	Bottle A1 =52ROV9; T _{KIPS} =8.8°C° pH= 7.29 Cl= n.d.	
15:09:10	8-channel T-probe, = 52ROV10, T _{max} = 6°C°	
15:51:39	mussels in net B = 52ROV11	
16:12:15	collecting rock fragments with shovel = 52ROV12	
16:35:26	placing bionet as marker = 52ROV13	
17:20:08 leaving bottom		

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
18:39 <i>ROV on deck</i>		
ATA53VSR c. 20:30	volcanic glass = 53VSR1	Ship at 04°46.914'S, 12°22.596'W, depth at contact 3139 m
21.01.08		
ATA54VSR c. 23:30	volcanic glass = 54VSR	ship at 04°46.48'S, 12°22.52'W, depth at contact 3161 m
ATA55VSR c. 03:00	volcanic glass = 55VSR	ship at 04.46.093'S, 12°23.209'W, depth at contact 3207 m
ATA56VSR c. 06:00	sediment = 56VSR	ship at 04°43.962'S, 12°24.061'W, depth at contact 3321 m
ATA- ROV57	<i>Tools: IB sampler, 2 bionets; 1x He tubes, 2x Titan Majors</i>	Ship at 4°48.558'S, 12°22.463'W; depth 2989
09:36:00 <i>deployment</i> 11:03:43 <i>on bottom</i>		
	<i>Site: Turtle Pits</i>	
13:34:09	Rock sample from chimney = ATA-57ROV-1	
15:35:56	Bottle C9 =57ROV2; T _{KIPS} = >220°C	pH=6.57 Cl=n.d.
15:39:44	Bottle C8 =57ROV3; T _{KIPS} = >220°C	pH=5.38 Cl=n.d.
15:43:06	Bottle C7 =57ROV4; T _{KIPS} = >220°C	pH= 2.85 Cl=360
15:46:46	Bottle B6 =57ROV5; T _{KIPS} = >220°C	pH=4.51 Cl=430
16:47:22	IB tube = sample 57ROV6	
18:32:11	Collecting beacon 11	
19:01:09	Collecting beacon 10	
19:09:17	Bionet with mussels = 57ROV6	
19:29:31 <i>leaving bottom</i> 20:50 <i>on deck</i>		
ATA58VSR c. 22:30	volcanic glass = sample 58VSR	<i>ship at 04°49.36'S, 12°22.53'W, depth at contact 3019 m</i>
22.01.08		

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
ATA59VSR c. 1:30	volcanic glass = sample 59VSR, bulk of sample lost before on board	<i>ship at</i> 04°50.965'S, 12°22.024'W; depth at contact 3097 m
ATA60VSR c. 4:30	volcanic glass = sample 60VSR	<i>ship at</i> 04°51.959'S, 12°21.533'W, depth at contact 3233 m
ATA61VSR c. 7:30	sediment plus bit volcanic glass = 61VSR	<i>ship at</i> 04°52.985'S, 12°21.533'W, water depth at contact 3310 m
	<i>Service on ROV, no flying today</i>	
ATA- 62CTD 09:16:59 – 03:31:55 23.01.08	LADCP, 3x MAPR, no bottles	<i>ship at</i> 04°47.394'S, 12°22.600'W @ 3086 m cable out
ATA- 63ROV	<i>Tools: 1x Titan Majors, 2 bionets, IB-sampler, Shovel, port drawer configured for rocks</i>	<i>ship at</i> 5°05.848'S, 11°40.429'W
	<i>Site: Inside Corner High 2</i>	
09:00:00 <i>deployment;</i> 10:44:04 <i>on bottom</i>		05°05.798'S, 11°40.368'W 2489m depth
11:12:57	Rock sample = 63ROV1, coarse-grained gabbro	05°05.854'S, 11°40.356'W at depth 2472m
11:29:56	Rock sample = 63ROV2, medium-grained gabbro	05°05.863'S, 11°40.369'W at depth 2430m
12:01:49	Rock sample = 63ROV3, microgabbro	05°05.919'S, 11°40.382'W at depth 2324m
12:20:56	Rock sample = 63ROV4, medium-grained gabbro	05 05.927S, 11°40.433'W at 2265m
		steeply dipping fault plane developed in a gabbro cliff
12:51:22	Rock sample = 63ROV5, medium-grained gabbro	05°05.931'S, 11°40.527'W at depth 2175m

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
13:25:59	Rock sample = 63ROV6, medium-grained gabbro	05°05.968'S, 11°40.583'W. at depth 2082m
14:01:40	Rock sample = 63ROV7, coarse-grained gabbro	05°06.022'S, 11°40.698'W at depth 1978m
14:25:11	Rock sample = 63ROV8, medium-grained gabbro	05°06.013'S, 11°40.817'W at depth 1876m
15:01:56	Rock sample = 63ROV, microgabbro	05°06.059'S, 11°40.843'W at depth 1767m
15:25:58	Rock sample = 63ROV10, perhaps basaltic with felsic magmatic veins	05°06.081' S, 12°40.949'W at depth 1673.8 m
15:40:14	Rock sample = 63ROV11, microgabbro	05°06.089'S, 11°40.982'W at depth 1636m
16:34:02	Rock sample = 63ROV12, medium-grained gabbro with net veins	05°06.104'S, 11°41.061'W at depth 1521m
16:52:28	Rock sample = 63ROV13, peridotite breccia	05°06.118'S, 11°41.102'W at depth 1491m
17:18:11	Rock sample = 63ROV14, ultramylonitic rock?	05°06.093'S, 11°41.125W at depth 1529 m
		probable ultramylonitic peridotite 50 m below edge of inside corner high plateau
17:26:25	Rock sample = 63ROV15, peridotite breccia	5°06.116'S, 11°41.101'W at depth 1492 m
		coral grown ultramafic breccia on plateau of inside corner massif

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
17:32:39 <i>leaving bottom 18:29 .on deck</i>		
ATA- 64CTD 23:50:14 – 01:38:30	LADCP, 1x MAPR, 20 bottles	04°48.848'S, 12°22.298'W @ 2983 m cable out
24.01.08		
ATA- 65CTD 02:32:12 – 04:22:40	LADCP, 1x MAPR, 20 bottles	04°22.40'S, 12°22.395'W @ 2992 m cable out
ATA- 66CTD 05:07:45 – 07:06:00	LADCP, 1x MAPR, 20 bottles	04°47.902'S, 12°22.492'W @ 3023 m cable out
ATA- 67ROV	<i>Tools:</i> IB-sampler, 1x He tubes, 2x Titan Majors, 2 bionets, rock-bio box	<i>Ship at</i> 4°48.661S, 12°22.60'W, depth 2995 m
	<i>Site:</i> Red Lion	
09:20:00 <i>in water</i>	Fly one mile to correct location	
11:42:31 on bottom		04°47.821'S, 12°22.641'W at depth of 3048 m
13:15:27	Slurp gun collects shrimps = 67ROV1	
13:21:28	Slurp gun collects shrimps = 67ROV2	
14:29:54	Ti-major bottle D2 = 67ROV3	pH=3.51 Cl=490
14:48:17	Bottle C9 =67ROV4	T _{KIPS} = 350°C pH=4.01 Cl=530
14:51:51	Bottle C8 =67ROV5	T _{KIPS} = 363°C pH=2.85 Cl=540
14:54:39	Bottle C7 =67ROV6	T _{KIPS} = no T°C pH=3.62 Cl=560
14:58:58	Bottle B6 =67ROV7	T _{KIPS} = no T°C pH=5.06 Cl=540
15:05:43	Bottle B5 =67ROV8	T _{KIPS} = no T°C pH=3.22 Cl=560
15:17:12	He-sample = 67ROV9	
15:19:35 <i>leaving bottom 16:26 on deck</i>	Leaving ground early because of oil leak from slurp gun	
ATA-		<i>Ship at</i> 4°48.152'S,

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
ROV68		12°22.381'W, depth 2995 m
17:17:15 <i>in water</i> 18:33:16 <i>on bottom</i>	<i>Site: Comfortless Cove area</i>	4°48.090'S, 12°22.384'W, depth 3002 m
	Searching in a 120 x 120 m square for oceanographic tool (mooring) suspected in this area, but no success	
21:36:55 leaving bottom 22:45..on deck		
ATA- ROV69	Mooring loaded with MMP,700m length	
23:10 deployment 02.55 <i>released</i>		04°48.197'S,12°22.510'W, depth 3004 m
25.01.08		
ATA- ROV70	<i>Tools: 1x Titan Majors, 1 bionet, IB-sampler, Shovel, port drawer configured for rocks</i>	<i>Ship at 4°56.420'S,</i> 11°37.044'W, depth 4765m
	<i>Site: North wall of transform, 5°S at nodal basin</i>	
10:45:00 <i>in water,</i> 13:04:39 <i>at bottom</i>		11°36.987W, 04°56.473'S depth 4864 m
	Testing ROV functions at large depths	
16:53:37	Subvolcanic basalt = 70ROV-1	04°56.336'S, 11°37.057'W 4753 m
17:53:56	Microgabbro to diabase = 70ROV-2	04°56.258'S, 11°37.055'W depth 4654 m
18:11:10	Solidified foraminiferous ooze = 70ROV-3	04°56.231'S, 11°37.073'W depth 4617 m
18:15:26	Doleritic basalt = 70ROV-4	04°56.231'S, 11°37.073'W depth 4617 m
18:42:12	Microgabbro to diabase = 70ROV-5	04°56.145'S, 11° 37.088'W depth 4515 m
18:58:35	Doleritic basalt = 70ROV-6	04°56.124'S, 11°37.111'W depth 4468 m

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
19:44:17	Basaltic with flow texture = 70ROV-7	04 56.046'S, 11°37.131 depth 4343 m
		striations related to movement on a steep fault. They appear to truncate a sheeted dyke complex visible in foreground
20:12:40	Diabase = 70ROV-8	04 56.028'S, 11°37.114 depth 4252 m
		well developed sheeted dykes in cliff face of the transform wall
20:38:45	Diabase = 70ROV-9	04° 55.990'S, 11°37.124'W, depth 4175m
21:13:58	Diabase = 70ROV-10	04°55.983'S, 11°37.113'W, depth 4063m
21:37:21	Basaltic breccia = 70ROV-11	04°55.895'S, 11°37.148'W, depth 3996m
22:00:15	Diabase = 70ROV-12	04°55.816'S, 11°37.166'W, depth 3897m,
22:17:13	Diabase = 70ROV-13	04° 55,765'S, 11°37.201'W, depth 3825m

<i>Extended list of operations</i>		
station (date/time UTC)	instruments used /samples /comments	location
22:29:45	Diabase = 70ROV-14	04°55.757'S, 11°37.212' W, depth 3815m
22:32:08 <i>leaving bottom 00:06. on deck</i>		

Table A2: Results from on-board chemical analyses and measured data

Location	Station Nr.	Sample ID	Bottle	Sample Type	Date	T (C)	pH	Eh	H2S (µM)	H2S (µM)	Fe (II) mg/l	Fe (II) µM	Fe (tot) (mg/l)	Fe (tot) (µM)	Fe (tot) (mM)	Cl (mM)	O2 (µM)			
Two Boats, top	35 ROV	7	D1	hot fluid	14.01.2008	429-451*	6.44	5	n.d.	5	1.57	152.3	8.53	216	3323	216	3857	974	173.9	550
	35 ROV	8	D2	hot fluid			2.92	-245	3370		3323	3857	221						3946	310
Wideawake 1	37 ROV	1	C9	diffuse fluid	15.01.2008		7.5	-50			1.16	0.1	1.8	0.85	15.2	560	226			
	37 ROV	2	C8	diffuse fluid			7.05	-206			47.24	0.45	8.0	0.85	8.9	550				
	37 ROV	3	C7	diffuse fluid			7.29	-180			14.65	0.78	13.9	1.23	22.0	560				
	37 ROV	4	B6	diffuse fluid			n.a.	7.03	-217		76.16	0.38	6.8	0.41	7.3	560				
	37 ROV	5	B5	diffuse fluid			12-16	7.5	-213.6		27.96	0.45	8.0	0.74	13.2	560				
Wideawake 2	37 ROV	10	B4	diffuse fluid			8-9	7.42	-212.7		39.1	0.13	2.3	0.19	3.4	550	270			
	37 ROV	11	A3	diffuse fluid			5-7	7.42	-212.7		33.12	0.17	3.0	0.24	4.3	560				
	37 ROV	12	A2	diffuse fluid			6	7.39	-217.9		48.59	0.13	2.3	0.13	2.3	550				
	37 ROV	13	A1	diffuse fluid			9	7.5	-176.3		12.23	0.44	7.9	1.39	24.8	555				
Sisters Peak, bottom	42 ROV	2	C9	hot fluid	16.01.2008		6.75		390		100	4.42	79.0	4.36	77.9					
	42 ROV	3	C8	hot fluid			367	4.33	6650		6038	115.03	2054.1	119.26	2129.7	370				
	42 ROV	4	C7	hot fluid			367	3.8	9960		8494	174.06	3108	176	3141	330				
	42 ROV	5	B6	hot fluid			367	4.28	4300		3960	122.48	2187.2	111.35	1988.4	370				
	42 ROV	6	gas	hot fluid																
	42 ROV	7	D1	hot fluid				3.36	7800		9296	184.18	3289	205	3667	310				
	42 ROV	11	B5	hot fluid			n.d.**	5.69	530		2219	24.30	433.9	26.57	474.5	520				
Sisters Peak, top (1)	42 ROV	12	B4	hot fluid			6.76	<30		38	4.19	74.9	3.92	69.9						
	42 ROV	14	A1	hot fluid			5.95		110		251	20.78	371.0	23.08	412.1					
Two Boats, bottom	46 ROV	7	C9	hot fluid	18.01.2008		3.47	-222.7		1466	74.46	1330	83.67	1494	470					
	52 ROV	1	C9	diffuse fluid	20.01.2008		8.9	7.61	2.6		1	0	0.0	0.08	1.4					
Golden Valley	52 ROV	2	C8	diffuse fluid			8.6	7.08	-136		21	0.11	2.0	0.18	3.2					
	52 ROV	3	C7	diffuse fluid			8.5	6.92	-170		43	0.2	3.6	0.23	4.1					
	52 ROV	4	B6	diffuse fluid			8.9	6.97	-128		20	0.55	9.8	1.25	22.3					
	52 ROV	5	B5	diffuse fluid			8	6.79	-196		56		0	0	0					
	52 ROV	6	B4	diffuse fluid			8.3	6.84	-186		40		0	0.02	0.4					
	52 ROV	7	A3	diffuse fluid			7.8	6.88	-195		22		0	0	0					
	52 ROV	8	A2	diffuse fluid			8.9	6.96	-26.3		7	1.04	18.6	2.39	42.7					
	52 ROV	9	A1	diffuse fluid			8.8	7.29	68.4		1	0.79	14.1	1.65	29.5					
	57 ROV	2	C9	hot fluid	21.01.2008		max: 371	6.57	10		4	7.58	135.4	10.03	179.1					
Two Boats, bottom	57 ROV	3	C8	hot fluid			5.38	-290		925	27.01	482.3	30.54	545.4						
	57 ROV	4	C7	hot fluid			2.85	-189		4782	167.5	2991	216	3657	360					
	57 ROV	5	B6	hot fluid			4.51	-274		2561	63.28	1130.0	73.22	1307.5	430					
	67 ROV	3	D2	hot fluid	24.01.2008			3.51	-224.4		3865	15.88	280.0	21.54	384.6	490				
	67 ROV	4	C9	hot fluid			363	4.01	-207.4		3990	33.94	606.1	33.61	600.2	530	0			
Mephisto	67 ROV	5	C8	hot fluid			363	2.85	-180.2		7465	40.8	729	44.3	791	540				
	67 ROV	6	C7	hot fluid			363	3.62	-215.2		6336	37.39	667.7	46.74	834.6	560				
	67 ROV	7	B6	hot fluid			363	5.06	-241.2		2203	15.34	273.9	13.74	245.4	540				
	67 ROV	8	B5	hot fluid			363	3.22	-190.8		7593	47.88	855	52.19	932	560				

* max: T range measured in the same orifice

** T sensor failed

Table A2: Results from on-board chemical analyses and measured data (cont.)

Location	Station Nr.	Sample ID	Bottle	Sample Type	Date	T (C)	pH	Eh	H2S (µM)	H2S (µM)	Fe (l) mg/l	Fe (l) µM	Fe (tot) (mg/l)	Fe (tot) (µM)	Cl (mM)	O2 (µM)
Two Boats, top	35 ROV	7	D1	hot fluid	14.01.2008		6.44	5	n.d.	1.57	8.53	152.3	9.74	173.9	550	
	35 ROV	8	D2	hot fluid	14.01.2008	429-451*	2.92	-245	3370	3323	216	3857	221	3946	310	
Wideawake 1	37 ROV	1	C9	diffuse fluid	15.01.2008	7-11	7.5	-50		1.16	0.1	1.8	0.85	15.2	560	225
	37 ROV	2	C8	diffuse fluid		4-11	7.05	-206		47.24	0.45	8.0	0.5	8.9	550	
	37 ROV	3	C7	diffuse fluid		8-11	7.29	-180		14.65	0.78	13.9	1.23	22.0	560	
	37 ROV	4	B6	diffuse fluid		n.a.	7.03	-217		76.16	0.38	6.8	0.41	7.3	560	
	37 ROV	5	B5	diffuse fluid		12-16				27.96	0.45	8.0	0.74	13.2	560	
	37 ROV	10	B4	diffuse fluid		8-9	7.5	-213.6		39.1	0.13	2.3	0.19	3.4	550	
	37 ROV	11	A3	diffuse fluid		5-7	7.42	-212.7		33.12	0.17	3.0	0.24	4.3	560	270
Wideawake 2	37 ROV	12	A2	diffuse fluid		6	7.39	-217.9		48.59	0.13	2.3	0.13	2.3	550	
	37 ROV	13	A1	diffuse fluid		9	7.5	-176.3		12.23	0.44	7.9	1.39	24.8	555	
	42 ROV	2	C9	hot fluid	16.01.2008	367	6.75		390	100	4.42	79.0	4.36	77.9		
Sisters Peak, bottom	42 ROV	3	C8	hot fluid		367	4.33		6650	6038	115.03	2054.1	119.26	2129.7	370	
	42 ROV	4	C7	hot fluid		367	3.8		9960	8494	174.06	3108	176	3141	330	
	42 ROV	5	B6	hot fluid		367	4.28		4300	3960	122.48	2187.2	111.35	1988.4	370	
	42 ROV	6	gas	hot fluid												
	42 ROV	7	D1	hot fluid		n.d.**	3.36		7800	9296	184.18	3289	205	3667	310	
	42 ROV	11	B5	hot fluid		n.d.**	5.69		530	2219	24.30	433.9	26.57	474.5	520	
Sisters Peak, top (1)	42 ROV	12	B4	hot fluid		n.d.**	6.76		<30	38	4.19	74.9	3.92	69.9		
	42 ROV	14	A1	hot fluid		n.d.**	5.95		110	251	20.78	371.0	23.08	412.1		
Two Boats, bottom	46 ROV	7	C9	hot fluid	18.01.2008	max: 412	3.47	-222.7		1486	74.46	1330	83.67	1494	470	
	52 ROV	1	C9	diffuse fluid	20.01.2008	8.9	7.61	2.6		1	0	0.0	0.08	1.4		450
Golden Valley	52 ROV	2	C8	diffuse fluid		8.6	7.08	-136		21	0.11	2.0	0.18	3.2		
	52 ROV	3	C7	diffuse fluid		8.5	6.92	-170		43	0.2	3.6	0.23	4.1		
	52 ROV	4	B6	diffuse fluid		8.9	6.97	-128		20	0.55	9.8	1.25	22.3		
	52 ROV	5	B5	diffuse fluid		8	6.79	-196		56			0			
	52 ROV	6	B4	diffuse fluid		8.3	6.84	-186		40			0.02	0.4		244
	52 ROV	7	A3	diffuse fluid		7.8	6.88	-195		22	0	0.0	0			290
	52 ROV	8	A2	diffuse fluid		8.9	6.96	-26.3		7	1.04	18.6	2.39	42.7		
	52 ROV	9	A1	diffuse fluid		8.8	7.29	68.4		1	0.79	14.1	1.65	29.5		
	57 ROV	2	C9	hot fluid	21.01.2008	max: 371	6.57	10		4	7.58	135.4	10.03	179.1		
Two Boats, bottom	57 ROV	3	C8	hot fluid		5.38	-290		925	27.01	482.3	30.54	545.4			
	57 ROV	4	C7	hot fluid		2.85	-189		4782	167.5	2991	216	3857	360		
	57 ROV	5	B6	hot fluid			4.51	-274		2561	63.28	1130.0	73.22	1307.5	430	
	57 ROV	3	D2	hot fluid			3.51	-224.4		3885	15.68	280.0	21.54	384.6	450	
	67 ROV	4	C9	hot fluid	24.01.2008		4.01	-207.4		3990	33.94	606.1	33.61	600.2	530	0
Mephisto	67 ROV	5	C8	hot fluid		363	2.85	-180.2		7465	40.8	729	44.3	791	540	
	67 ROV	6	C7	hot fluid		363	3.62	-215.2		6336	37.39	667.7	46.74	834.6	560	
	67 ROV	7	B6	hot fluid		363	5.06	-241.2		363	15.34	273.9	13.74	245.4	540	
	67 ROV	8	B5	hot fluid		363	3.22	-190.8		7593	47.88	855	52.19	932	560	

* max. T range measured in the same orifices

** T sensor failed

Appendix 3

ROV dive protocols

ArcGIS Mapping with numbers below:

- 1 - pelagic sediment (totally covering seafloor)
- 2 - rocks (outcropping or blocks)
- 3 - hydrothermal sediment
- 4 - hydrothermal crust
- 5 - active sulfide chimney
- 6 - inactive sulfide chimney
- 7 - diffuse venting
- 8 - bacterial mat
- 9 - mussle field
- 10 - single mussels
- 11 - scarp
- 12 - fluid sampling
- 13 - mussle sampling
- 14 - geophysical instrument
- 15 - T logger
- 16 - T mooring

Cruise Number Atalante Leg 2
Station Number 35ROV
Dive Number #13
Location Turtle Pits
Coordinates 4°48.566'S 12° 22.4497'W
Water Depth 2988m
Vessel Atalante

Metadata **Observation**
Timecode allowed
default

Actions
allowed

9:00:00 Begin Station
9:39:00 ROV in Water
10:18:51 Stop at 1013m, pressure drop in Compensator Node 1

10:19:36 Time check - this computer is 6 seconds behind UTC
11:11:35 Bottom sighting
11:13:11 9 m off bottom, not much to see
11:15:01 Directly in front of us is Pinnocchio apparently, not visible in science lounge
11:15:55 Sheet flow, flat topped, striated surface
11:17:08 Mussels on top of flow, not sure if living or dead
11:18:08 Mussel beds in Turtle Pits
11:21:12 Ship 4 48.5696S 12 22.4497, ROV 4 48.562 12 22.415
11:23:38 Still adjusting winch
11:24:31 Slowly drifting northward, away from pits
11:26:46 White balance check on cameras
11:27:11 Marker 3 in front of us.
11:27:42 HD an, go south (young man)
11:30:03 HDTV shows no mussels but white mats
11:30:27 Shimmering water with hydroth. Deposits
11:31:18 Marker 2, at foot of Two Boats, net fish
11:31:41 Marker partially buried in sulphide talus.
11:36:02 Flying around smoker looking for a good point to sample
11:37:36 Strange root-like structure at base of smoker, isolated shrimps swimming around
11:40:28 Still filming HDTV, Southern tower visible in distance.
11:41:05 Preparing to deploy beacon
11:41:18 HDtV off
11:47:18 Looking for a place to putr beacon
11:50:59 On bottom, placing beacon
11:51:10 HDTV On Seafloor near beacon
11:52:07 HDTV Off
12:09:08 Trying to place beacon
12:13:22 Beacon placed at 12 22.418W 4 48.579S fix from Poseidonia now



HDTV ATA-35ROV_1

HDTV ATA-35ROV_2

12:14:11 HDTV On, fly round of Homer beacon
12:15:15 HDTV Off
12:17:50 Moving back to Two Boats to take temperature and samples
12:19:16 Chimney at Two Boats is 6 m high.
12:24:51 Looking for a sampling position
12:26:27 Nupsie ab!
12:26:51 Another try
12:28:50 Sampling of chimney material not easy, very friable
12:33:33 carb in sight
12:33:50 preparing for T measurement => KIPS deployment
12:35:30 HDTV On Foot of Two Boats smoker (not too exciting, some shrimp)
12:36:10 KIPS handle in ORION
12:36:28 HDTV Off
12:38:08 nozzle placed in smoking exit of chimney.
12:39:57 trying to find a suitable site
12:44:04 180°C measured max T
12:44:28 227°C measured max T
12:45:47 exit widened with nozzle
12:48:02 nozzle deep in exit 410 Tmax measured
12:49:25 starting to fill KIPS bottle C9
12:50:30 HD camera on, KIPS nozzle in Two Boats smoker
12:51:24 T constant at 407 - 408°C
12:52:42 HD camera off
12:53:12 pump shifted off

HDTV ATA-35ROV_3

HDTV ATA-35ROV_4

ATA-35ROV1

HDTV ATA-35ROV_5

12:53:51 pumps on bottle C8
 12:54:24 T max measured is 417°C
 12:58:18 pumps off
 12:58:46 T constant at 407 - 408°C
 12:58:59 pumps on bottle C7
 13:03:11 pumps off
 13:03:53 measured T: 400 to 410° currently 412°C
 13:04:20 pumps on bottle B6
 13:07:43 pumps off
 13:09:12 pumps on bottle B5
 13:10:19 ROV: 4 48.578S 12 22.412W
 13:13:32 pumps off
 13:14:14 pumps on bottle B4
 13:18:53 420°C measured max
 13:19:14 pumps off, KIPS finished, change to Ti-Majors
 13:21:20 HDTV On Two Boats smoker again
 13:21:49 KIPS back in garage; perfect drive
 13:22:09 HDTV Off
 13:23:23 handling Ti-Majors, positioning bottle D1
 13:23:30 HDTV On Preparing Ti-Majors deployment in Two Boats
 14.01.2008 13:24 HDTV Off
 13:28:12 positioning Ti-Majors nozzle in the same hole as before
 13:30:51 waiting for "clear" water at the fitting of the nozzle tube
 first try to close the valve of D1; probably problems with closing the valve ; probalby fluid was already
 13:36:16 sampled;current attempt interrupted, new try
 13:38:03 fine adjustment of nozzle
 13:43:11 still positioning the nozzle
 13:47:54 Filling of bottle D1 is finished; not clear whether bottle worked properly
 13:56:23 positioning Ti-Majors bottle D2
 13:58:23 positioning the nozzle auf bottle D2 in the hole
 14:01:28 waiting for "clear" water at the fitting of the nozzle tube; new try



14:06:32 still positioning the nozzle
 14:07:40 HDTV On Ti-Majors D2 in Two Boats chimney
 14:08:23 HDTV Off
 14:09:04 waiting for clear water at the fitting of the nozzle tube
 14:11:20 drop off of bottle D2 from ORION
 14:13:01 successful fishing of the bottle D2
 14:15:02 ORION positions bottle D2
 14:18:12 next try
 14:20:37 looking for locations in the chimney; breaking away some parts of the chimney
 14:26:09 positioning the nozzle auf bottle D2 in the hole
 14:29:37 next try in the same hole
 14:31:23 waiting for clear water at the fitting of the nozzle tube
 14:31:30 HDTV On Ti-Majors in Two Boats again
 14:32:51 not clear whether bubbles inside the fluid or not
 14:33:36 ready to fire: closing of valve D2
 14:34:39 sussessful closing of valve of D2
 14.01.2008 14:35 HD off
 14:40:25 positioning of bottle D2 in box
 taking up of S-Moni: attempt to measure temperature in the same hole where Ti-Majors bottle D2 was
 14:41:15 filled
 14:43:32 starting of T measurement with S-Moni in the same hole
 14:50:30 finishing of T measurement with S-Moni
 14:53:15 KIPS sampling st the same point; bottle A3
 14:57:42 seems that bubbles are present inside the fluid
 15:00:31 positionig of the KIPS nozzle, breaking some parts away
 15:00:52 HDTV On, 2nd KIPS sampling at Two Boats, Rimicaris sitting in black smoke
 15:01:11 Kipps-Temperatures: 370, 410, 420, 452 °C; 452°C stable
 15:02:16 pumps on
 15:03:16 measured T: 451°C
 15:06:35 pumps off
 15:06:40 HDTV Off
 15:07:18 KIPS bottle A2, pump on
 15:07:38 HD was running a while, now off
 15:12:13 pump off
 15:12:48 KIPS bottle A1, pump on
 15:14:41 Temperature decreases, now 427°C
 15:17:03 KIPS pump off, Temp nozzle stays inside for checking temperature evolution
 15:19:58 427-428 °C measured; further positioning for reproducing initial high Temperature (450°C)
 15:20:55 measured 438°C
 15:22:36 476°C
 15:23:05 506°C max T measured!!
 15:24:29 another S-Moni deployment in order to confirm these extemely high T

ATA-35ROV2

ATA-35ROV3

ATA-35-ROV4

ATA-35ROV5

ATA-35ROV6

HDTV ATA-35ROV_6

HDTV ATA-35ROV_7

ATA-35ROV7

HDTV ATA-35ROV_8

HDTV ATA-35ROV_9
 ATA-35ROV8

ATA-35ROV9

HDTV ATA-35ROV_10

ATA-35ROV10

ATA-35ROV11

ATA-35ROV12

15:31:26 S-Moni nozzle deeply inserted into the smoking exit of the chimney
15:31:40 HDTV On Smoni zoomed in at Two Boats
15:32:40 HD has been on for a while
14.01.2008 15:34 HD off
15:36:26 End of S-Moni deployment after 5 minutes
15:43:01 Deployment of Cu-tube for He-sampling (AA label)
15:44:40 HDTV On, He sampling handling
15:50:08 Cu-tube successfully placed in rigmaster
14.01.2008 15:50 HD off
15:53:01 funnel of Cu-tube being placed on top of exiting black smoke,
15:54:02 unexpected chimney collapse
15:55:53 looking for suitable place to locate the funnel
15:58:51 HD camera on, He sampling
15:59:25 black smoke exiting from Cu-tube
16:00:14 closing Cu tube: top closed
16:01:17 bottom valve closed
14.01.2008 16:01 HD off
16:04:24 deployment of second Cu-tube (Label BB)
14.01.2008 16:05 HD on, Smoke at Two Boats (uninteresting)
14.01.2008 16:07 HD off
16:09:02 Cu-tube in Rigmaster
16:10:45 smoke exiting Cu-tube
16:12:34 upper valve closed
16:14:12 lower valve closed
16:24:58 placement of both Cu-tubes into sample box
16:26:56 next target: taking sulfide rock sample
16:39:41 some fragments of a sample put into the white plastic box (no sample #)
16:43:09 attempt to use the net for sulfide sampling
16:46:27 fishing of very fragile samples with the net
16:47:53 attempt to use the slurp gun for fishing shrimps
16:54:00 HDTV On Slurp gunning shrimps
16:54:37 taking up slurp gun with ORION
16:56:03 positioning the slurp gun for shrimp fishing
16:59:31 slurp on: rock particles and shrimps visible flushing into the bottle 1
17:05:03 Another try to catch a big shrimp
17:07:28 Changing to bottle 2, slurp gun on
17:10:46 visible in bottle2: fragments of rocks, dust, shrimps
14.01.2008 17:11 HD off
17:14:50 still slurping; seems not very efficient to catch shrimps
17:17:18 at least one shrimp visible, swimming in the tube above bottle 2
17:28:21 slurping rock fragments and shrimps, visible in the tube above bottle 2
17:33:51 loss of slurp gun from ORION
17:34:00 finishing of slurp gun fishing for bottle 2
17:35:21 fishing of the "Schlauchschelle" and dropping into the container box
17:39:19 Southern Tower in sight
17:40:09 Leaving the bootom

ATA-35ROV13

HDTV ATA-35ROV_11

ATA-35-ROV14

HDTV ATA-35ROV_12

HDTV ATA-335ROV_13

ATA-35ROV15

HDTV ATA-35ROV_14

ATA-35ROV16

ATA-35ROV17

HDTV ATA-35ROV_15

ATA-35ROV18

Cruise Number Atalante Leg 2
Station Number 37ROV
Dive Number #14
Location Wideawake
Coordinates 4°48.549'S 12° 22.5051'W
Water Depth 2992m
Vessel Atalante

Metadata **Observation**
 Timecode allowed
 default

Actions
 allowed

9:30:00 Begin Station
 9:39:00 ROV in Water
 11:12:23 Bottom sighting, unsedimented lava, not fresh flow. 12°22,339W 4° 48,618'S.
 11:14:00 HDTV On, Flight over Wideawake field, camera too high and Die Fast in picture
 11:14:54 Going S, mussel beds
 11:16:23 Mussel bed,
 11:17:24 Taking close-ups of mussel beds, looking for clams
 11:17:12 HDTV Off
 11:18:03 12 22,338W 4 48,624S ROV Position
 15.01.2008 11:19 HDTV On, mussel bed
 11:21:41 Polyps
 11:26:09 Swimming worms in front of porch
 Fish and mussels
 11:26:21 HDTV Off
 11:29:33 Preparing to place beacon
 11:31:00 Beacon at 12 22,342W 4 48,626S
 11:33:25 Looking at mussels to see if alive or dead
 11:37:26 decide to check around for larger mussel field
 15.01.2008 11:39 HDTV On, mussel bed
 11:43:32 ROV set down, looking for sampling position
 15.01.2008 11:44 HDTV Off
 11:49:11 die-fast machine removed from ROV and employed on seafloor
 11:53:00 HDTV On, KIPS sampling of mussel bed
 11:53:22 KIPS measurement 14 degree W 12 22.339 S 04 48. 618 to S 04 48.622
 11:54:29 HDTV Off

HDTV ATA-ROV37_1

HDTV ATA-ROV37_2

HDTV ATA-ROV37_3

HDTV ATA-ROV37_4



11:54:47 pump is on
 11:57:18 KIPS zwischen 7 und 11 Grad
 11:58:57 pump off
 11:59:21 KIPS pump on, T varies between 4 and 7 degrees
 12:03:19 pump off
 12:04:44 KIPS pump on
 12:05:57 T zwischen 8 und 11 Grad
 12:07:13 for one minute T between 4 and 6 degrees
 12:07:17 pump off
 12:10:45 KIPS pump on, 9 degrees
 12:12:00 HDTV On, KIPS in mussel bed again
 12:13:00 HDTV Off
 12:14:15 pump off
 12:14:53 KIPS pump on
 12:16:17 T = 12 to 16 degrees
 12:18:54 pump off
 12:20:00 HDTV On, Close-up of mussels
 12:20:30 HDTV Off
 12:23:12 try release 8-channel T lance
 12:29:14 still finding best place to measure with 8 channel lance
 12:31:05 T in channel ranges from 16.7 to 4.4
 12:32:00 HDTV On, 8-channel T lance in mussel bed
 12:32:43 HDTV Off
 12:34:05 lance buried in mussel field for about 1/3, rest is out of water
 12:34:10 announce that measurement will take up to 20 mins
 12:50:53 taking lance from bottom; stop of T measurement, B9 35 min, T max 15°C, at the bottom tip
 12:52:56 next attempt: mussle fishing, use slurp gun
 12:53:37 lance back in garage
 12:56:25 first mussle gripped with ORION
 13:11:44 plan: taking mussels with net, the fishing shrimp for placing into die-fast
 13:13:01 taking of net #3
 13:16:02 trying to fish mussels in net#3
 13:29:31 still trying to fish mussels
 13:40:26 still trying to fish mussels

ATA 37ROV-1, Flasche C-9

ATA 37ROV-2, Flasche C-8

ATA 37ROV-3, Flasche C-7

ATA 37ROV-4, Flasche B-6

HDTV ATA-ROV37_5

ATA 37ROV-5, Flasche B-5

HDTV ATA-37ROV_6

ATA 37ROV-6

HDTV ATA-37ROV_7

13:44:02 successful fishing of a bunch of mussels
 13:46:15 successful fishing of another bunch of mussels into the same net
 13:49:46 drop of net#3 filled with mussels into box
 13:51:49 new positioning of die-fast
 15.01.2008 13:52 HD on, for taking movies of the diffuse fluid field
 15.01.2008 13:53 HD off

ATA 37ROV-7

HDTV ATA-ROV37_8

13:54:57 taking the slurp gun
 13:57:26 attempt to slurp shrimps where the diffuse fluid comes out
 14:00:12 first shrimp visible in the tube above the bottle....and finally escaped
 14:01:18 slurping more shrimps
 14:03:12 a slurped mussle is stucked in the slurp nozzle
 14:08:03 attempt to use the slurp gun for picking mussels bunches
 14:11:07 finishing of first shrimp sampling into bottle 1; eventually one shrimp inside
 14:13:58 new positioning of die-fast on the mussle field with shimmering water

ATA 37ROV-8

HDTV ATA-ROV37_9

HDTV ATA-37ROV_10

15.01.2008 14:17 HD on, for taking movies of the die-fast in the mussle bed
 15.01.2008 14:18 HD off
 15.01.2008 14:20 HD on
 14:21:20 Opening of die-fast
 15.01.2008 14:21 HD off
 new positioning of die-fast on the mussle field with shimmering water, since it was located at that
 14:24:49 plache where the former mussle sampling with net was performed
 14:28:40 starting to take mussels for die-fast
 14:33:09 try to use the slurp gun for carrying mussels into the die-fast
 14:40:26 finishing of use of slurp gun for mussle fishing
 notice: all the time gaz bubble visible in the camera observing slurp gun tube
 14:41:57 using ORION for taking bunches mussels
 14:42:54 dropping of first mussels from the same field of before into die-fast
 14:44:43 continuing of dropping mussels into die-fast
 14:48:00 "the pot is full"; closing the lid
 14:51:30 new positioning of die-fast

ATA 37ROV-9

HDTV ATA37ROV_11

15.01.2008 14:53 HDTV on MUSSELS IN DIE FAST
 15.01.2008 14:53 HD off
 14:56:35 check if lid of the chamber is closed properly



15:03:20 DIE-FAST initiated: mussels executed!
 15:25:24 leave this point heading for another mussel field
 15:26:00 HDTV on, flight across Wideawake
 15:30:33 heading: 249°, dense thicket of polyps
 15:32:18 sedimented lava flow, likely north of Wideawake
 15:32:30 HDTV Off
 15:34:00 HDTV On, flight back to Wideawake and landing on mussel bed
 15:34:25 heading 140°, search for the mussel bed
 15:38:50 large area covered densely with mussels, 4°48,639 S; 12°22,356 W
 15:47:01 new reading: 4°48,639 S; 12°22,343 W
 15:52:05 7,5°C temperature in mussel bed
 15:55:50 HDTV Off
 15:57:00 HDTV On, KIPS in 2nd mussel field
 15:58:16 8-9°C temperature in mussel bed, pump on, filling bottle B4
 16:00:04 HDTV Off
 16:01:02 HD camera off
 16:02:21 pump off
 16:05:02 pump on, 5-7°C, filling bottle A3
 16:08:19 pump off
 16:08:57 pump on, 6°C, filling bottle A2
 16:12:46 pump off
 16:14:33 pump on, 9°C, filling bottle A1
 16:19:26 pump off
 16:25:00 HDTV On, just a mussel bed
 16:25:11 HDTV Off
 16:29:00 HDTV On 8-channel T sensor in 2nd mussel field
 16:29:50 measuring with 8-channel T lance, 18° at the tip of lance (C1)
 16:34:01 hdtv 6ff
 16:39:49 end of T lance measurement. T max was 22°C
 16:49:45 lance back in holder
 16:50:10 leaving ground due to low oil pressure
 16:53:07 end of dive

HDTV ATA-ROV37-12

HDTV ATA-ROV37_13

ATA 37ROV-10
 HDTV ATA-ROV37_14

ATA 37ROV-11

ATA 37ROV-12

ATA 37ROV-13

HDTV ATA-ROV37_15

ATA 37ROV-14
 HDTV ATA-ROV37_16

Cruise Number Atalante Leg 2
Station Number 42ROV
Dive Number #15
Location Comfortless Cove
Coordinates 4°48,188' S 12°22,301' W
Water Depth 2996m
Vessel Atalante

Metadata
 Timecode
 default

Observation
 allowed

Actions
 allowed

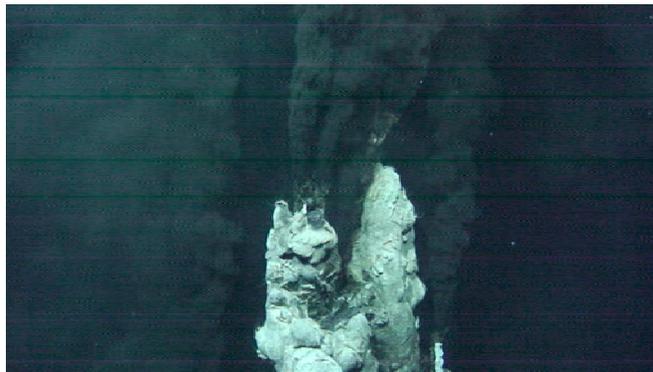
8:00:00 Begin Station
 8:20:00 ROV in Water
 10:48:04 Bottom sighting
 10:51:31 Sheet flow
 10:52:09 Pillows with sediment in gaps
 10:53:08 Lobate flows, flattened pillows
 10:57:25 Hydrothermal deposits
 10:58:00 HDTV On, flight to sister's peak
 10:58:30 Collapse structures in lava flow, white hydroth. Deposits (mats?)
 11:01:07 Turning to find smoker
 11:02:45 Lots of old smoker rubble, no active black smoke to see
 11:03:37 HDTV Off
 11:03:53 Oops, there it is
 11:04:43 Sister's Peak 4°48,222'S 12°22,270'W
 11:09:39 2nd inactive peak visible
 11:12:32 Waiting for computer reboot
 11:15:03 Still sorting computer out, 16m above ground.
 11:17:00 HDTV On, Sister's peak approach and lower third, wobbly
 11:18:44 Going to make a vertical profile of the smoker, computer problems sorted out apparently
 11:21:23 Hydrothermal rubble
 11:22:14 4 48, 227 S 12 22,272W
 11:22:52 Mussels visible in HDTV and shrimp
 11:24:18 Some shimmering water seen on flanks of structure
 11:25:11 HDTV close-up of shrimps and shimmering water
 11:25:57 HDTV Off
 11:26:39 Adjusting white balance of cameras
 11:31:55 HDTV on, top of Sister's Peak
 11:33:09 White colour not shrimps, looking with HDTV
 11:34:01 White colour not filamentous, looks like precipitates
 11:43:31 Top of smoker, fantastic view
 11:45:03 Sonar computer crashed again
 11:45:56 Chimney 10,3m high
 11:46:56 HDTV off
 11:53:27 HDTV on, top of Sister's Peak again then descent
 11:55:09 Going to try T measurement at top of active smoker
 12:01:08 Going down and around the chimney
 12:03:00 cloud of shrimps chases from chimney
 12:05:06 about 7m high, patches of dense shrimps
 12:06:26 HDTV off

HDTV ATA-42ROV_1

HDTV ATA-42ROV_2

HDTV ATA-42ROV_3

HDTV ATA-42ROV_4



12:07:27 shimmering water, 7m
 12:07:55 HDTV on, slow pan of Sister's peak summit
 12:10:18 Chimney is from the south side 16m 50cm high
 12:12:57 Looking at dead spire
 12:14:58 Marker 5 looking 345°
 12:19:02 looking 227°, in front of small chimney releasing black smoke
 12:20:05 diffuse outflows and dense shrimps, Bathymodiolus
 12:22:05 HDTV off
 12:43:26 opening at the top of little knob, two chimney pieces on porch
 12:45:13 computer crashed again
 12:48:15 HDTV on, KIPS foot Sister's Peak

HDTV ATA-42ROV_5

42 ROV-1

HDTV ATA-42ROV_6

12:49:19 HDTV off
 12:53:07 220°C, KIPS T Sensor close to orifice
 12:53:50 360°C
 12:57:58 stable 367°C, short-term 370°C
 12:58:31 start to sample with KIPS, water depth is 2996,1 m, ROV parking on talus
 13:00:04 pump on, bottle C9, T stable at 367°C 42 ROV-2
 13:04:54 pump off
 13:05:26 pump on, bottle C8, T stable at 367°C 42 ROV-3
 13:08:54 pump off
 13:10:34 pump on, bottle C7, T stable at 368°C 42 ROV-4
 13:14:52 pump off
 13:16:30 pump on, bottle B6, T stable at 368°C 42 ROV-5
 13:20:45 pump off
 parking the KIPS took longer than anticipated
 13:42:25 HDTV on, parking KIPS
 13:43:24 HDTV off

HDTV ATA-42ROV_7



13:49:24 KIPS handle on porch, cannot move to park position anymore
 14:15:23 prepare to utilize the isobaric sampler
 14:24:49 start taking a sample with the isobaric sampler by opening the valve a full turn
 14:26:42 sample taken 42 ROV-6
 14:27:12 closing valve again
 14:55:56 taking Ti-Majors D1 from the box
 15:02:18 trying to position D1 nozzle; bad conditions for viewing due to heavy smoke
 15:09:17 positioning of D1 nozzle into exit
 15:11:06 new try
 15:15:51 positioning of D1 nozzle in exit
 15:17:55 new try
 15:19:07 positioning of D1 nozzle in exit
 trying to close the valve of D1; problems with closing the valve; sample was taken, but eventually
 15:22:51 only filled partly 42 ROV-7
 15:25:32 stop with the attempt of sampling with Ti-majors; next step: S-Moni measurement
 15:31:43 dropping of Ti-Majors D1 bottle into the box
 15:32:43 Taking S-Moni from the box
 15:40:32 starting measuring with S-Moni 42 ROV-8
 15:46:33 stop T measurement
 15:47:11 looking for another position for S-Moni
 15:53:28 starting measuring with S-Moni at another location as before 42 ROV-9
 15:54:40 stop T measurement
 15:56:27 attempt to measure Temp in the same exit with KIPS
 16:06:58 positioning of KIPS in the same exit where second S-Moni measuring was performed
 16:13:42 measured T: max 220°C 42 ROV-10
 16:14:44 measured T: max 365°C
 16:16:33 HD on; moving to the top of Sister's Peak
 16:22:58 HD off
 16:30:46 HD on, smoke!
 16:31:26 HD off
 16:32:20 HD on, smoker fingers at top SP
 16:33:03 HD off
 16.01.2008 16:34 HD on, smoke
 16:34:50 HDTV Off
 16:40:22 Deployment of KIPS: nozzle apparently inserted in fluid exit but low T reading ("Badewanne")
 16:45:03 still trying to locate position for Sampling hot fluids
 T sensor of KIPS is faulty: constant reading of 27°C even in background water: plan sample fluids by
 16:47:38 KIPS
 16:49:06 pumps on filling bottle B5 42 ROV-11
 Plan: fill KIPS, fill one Ti-major then proceed towards Golden Valley in order to obtain a basalt
 16:51:26 sample. Expected time of leaving ground: 17:00
 16:53:50 pump is off
 16:54:41 pumps on filling bottle B4 42 ROV-12
 16:58:18 pump off; KIPS sampling finished.
 17:10:01 pumps on filling bottle A3 42 ROV-13

HDTV ATA-42ROV_8

HDTV ATA-42ROV_9

HDTV ATA-42ROV_10

HDTV ATA-42ROV_11

17:13:47 pumps off
17:13:56 pumps on filling bottle A2
17:17:35 pumps off, end of KIPS sampling
17:30:59 S-Moni deployment in order to obtain Temperature
17:33:20 S-Moni measurement finished
17:42:56 move 20 m North
17:46:50 HDTV on, pillow hill N of SP
17:47:38 pillow flow, looking for sampling site
17:51:22 HDTV off

42 ROV-14

42 ROV-15

HDTV ATA-42ROV_12



17:58:25 start sampling a piece of lave crust from pillow; 4°48,159 S, 12°22,298 W
17:59:15 HDTV on, sampling pillow
18:02:38 HDTV off
18:03:41 small piece of lava collected and placed into sampling drawer at front
18:08:24 collecting a second piece, placed in box 3
18:08:28 ROV off bottom

HDTV ATA-42ROV_13

42 ROV-16

Cruise Number Atalante Leg 2
Station Number 46ROV
Dive Number #16
Location Wideawake & Bturtle Pits
Coordinates 4°48.610'S/12°22.342'W
Water Depth 2987m
Vessel Atalante

Metadata	Observation	Actions
Timecode	allowed	allowed
default		

8:15:00 Begin Station
 8:25:00 ROV in Water
 9:43:47 533m
 10:06:05 1300m
 10:27:57 1600m
 10:44:53 2160m
 11:04:28 2800m
 11:08:51 seafloor in sight; ROV 2958m 22 m over ground, some high structure visible
 11:10:15 4°48,620'S 12°22,353'W
 11:11:34 Target find homer beacon, sonar on
 11:12:23 jumbled flow some mussle patches
 11:15:35 homer beacon found
 11:16:50 next action: take mussle sample from this site
 11:18:55 suitable site for mussle sampling located
 11:19:49 HDTV On, mussel patch in Wideawake
 11:20:48 HD off
 11:21:16 HDTV On, snails in mussel patch at Wideawake
 11:21:22 sonar off
 11:22:06 HD off
 11:24:51 Orion takes bio net (no lable) in claw
 11:25:54 HD on, unsuccessful mussel sampling at Wideawake
 11:29:27 Need to change bionet position in claw
 11:29:49 HD off
 11:31:08 orion manoever successful
 11:31:01 HDTV on, SUCCESSFUL MUSSEL sampling
 11:33:42 HDTV off
 11:33:57 bionet sampling completed
 11:37:52 shimmering water and mussle beds
 11:38:14 heading 110, search for lava flow front to the east
 11:38:58 jumbled flow
 11:39:50 reached flow front of 2002? Flow, lobate
 11:40:09 HD on, flying east 110 heading over fresh flow
 11:43:04 HD off
 11:43:19 4°48,612'S 12°22,316'W, lobate flow
 11:44:47 HD on, flying over contact and then into old sedimented flow
 11:45:50 strong sediment cover here, older flow
 11:46:42 turn heading to 270 to investigate contact
 11:47:47 HD off
 11:47:34 collapse structure

 11:48:19 HD on of contact young flow to older flow looking south; older flow east and young flow to the west.
 11:49:56 HD off
 11:50:23 4°48,612S 12°22.295W location of contact and sampling
 11:50:50 HDTV On, young flow to sampling of old flow
 11:51:29 HD on without thrusters
 11:51:52 ROV being pulled to the back, thrusters on

 found nice spot to take basalt sample. Overhang of older lava flow. The younger flow is located in the
 11:53:19 collapse structure of the older flow. Apparently utilizing the pre-existing lava tube drainage system.
 11:53:30 HDTV Off
 11:54:25 HD on, sampling old flow with Rigmaster
 11:57:45 sample in Rigmaster claw, 4°48,612S 12°22.295'W, 2985m
 11:58:04 HD off
 11:59:39 working with orion in order to place sample into sample box
 12:09:07 relocating for restarting mapping procedures
 12:19:08 proceeding towards south
 12:20:16 back in fresh glassy lobate flow
 12:20:40 HDTV On, flight over new flow
 12:20:44 crossing from older to younger flow
 12:21:05 just passed across the mapped (ABE) island of older lava
 12:21:59 flying over fresh lobate 2002 flow
 12:23:29 contact to lightly sedimented lava flow 4°48.660 12°22.293'W
 12:24:47 back in fresh glassy lobate flow
 12:25:52 very nice fresh luster on young lobate flow
 12:28:30 ROV flying to the south for a while. Ship needs to follow up.
 12:29:44 moved 140m south from sample 46ROV-2. Depth: 2984m
 12:30:38 still flying over fresh lobate lava flow
 12:32:46 Continue flying to the south. Still young lava flow.
 12:33:12 HD off
 12:34:13 HDTV On, southern boundary of flow with skylights in old flow
 12:34:18 Contact 183 m from last sampling, turning W to check surrounding
 12:35:47 the older sheet flow is highly sedimented, collapse structure in sight
 12:36:46 sonar off
 12:37:21 checking out collapse structure, very nice pillar 4°48,717'S 12°22.290'W

HDTV ATA-46ROV_1
HDTV ATA-46ROV_2

HDTV ATA-46ROV_3

HDTV ATA-46ROV_4
ATA-46ROV-1

HDTV ATA-46ROV_5

HDTV ATA-46ROV_6

HDTV ATA-46ROV_7

HDTV ATA-46ROV_8

ATA-46ROV-2
HDTV ATA-46ROV_9

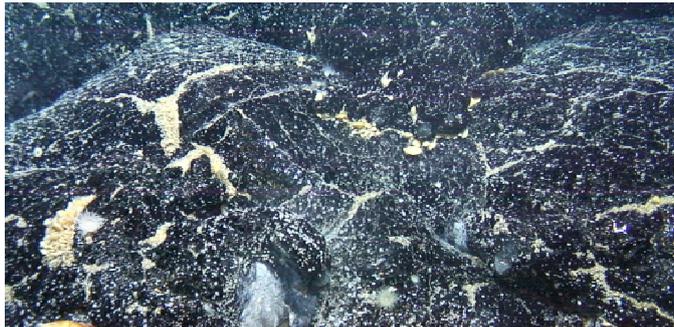
HDTV ATA46ROV_10

12:39:05 great view of pillar structures! Text book example!
12:40:22 Is the tube flow filled with rubble or younger jumbled flow? Difficult to make out.



12:41:15 Flying to the east heading 90
12:41:57 HD still on
12:42:18 Flying quickly to the east (0.4 kn)
12:43:17 back into older sedimented lava flow at 64 m distance from the collapse structure examined
12:43:54 HD off
12:47:53 moving north now, heading 10
12:49:10 back in fresh glassy lobate flow
12:49:53 flying across contact, young lobate lava flow overlying older, more sedimented jumbled flow
12:50:51 Flow front apparently shifting eastwards. New heading 10 to 20
12:51:57 small embayment of older lava flow ("Wideawake flow")
12:52:20 HD on, old flow
12:53:06 fresh young lobate lava flow with glassy luster
12:53:31 nice plastic deformation texture
crossing from older to younger flow; localized embayment. This serrated nature of the contact
12:54:25 indicates that we are really close at the eastern flow margin
12:54:49 HD off
Another contact; superbly exposed! Older flow is jumbled with pronounced hummocky structure.
12:56:10 Younger flow is flowing around this structure. Displaces niceropy, folded flow top structure, locally.
12:57:03 HDTV On, young flow and eastern contact to Wideawake flow
12:59:40 Returning to contact location in a wider turn to the south
13:01:30 HDTV Off
back at superb contact site, trying to obtain a sample of the older jumbled flow. It may well be the wideawake flow (i.e., the stuff the mussels are growing on). However, this is may as well be an independent flow.
13:04:20
13:06:44 4°48,656'S 12°22,265'W; 2983 m
13:08:35 sampling operations started with Orion
13:10:25 Basalt piece placed in Box 1 of sample sledge. Older jumbled flow sampled
13:11:40 Heading north, measuring distance from this sampling site
13:13:07 back in fresh glassy lobate flow
13:13:28 very nice flow top structures
13:13:44 Another contact: local embayment of old jumbled flow.
13:14:35 back in fresh glassy lobate flow
13:15:49 Another contact, local embayment of older jumbled flow.
13:16:12 back in fresh glassy lobate flow
13:16:24 lobes on flow top are aligned in N-S direction.
13:19:18 Impressive lava tube structures. 83 m from last sampling site. 4°48.606'S 12°22.275'W
13:20:18 Heading N on to of the older sheet flow, heavy sediment covering, local collapse structures.
13:21:16 Aiming for Turtle Pits beacon.
13:27:13 contact fresh lava

18.01.2008 13:28 HD on, west over new flow until a diffuse field found east of Wideawake boundary (i.e. on young flow)
13:32:54 HDTV Off
cluster of young mussels at the top of fresh lavas, at S4 48.632S W12 22.331; dusty water, not
13:33:09 shimmering
13:37:07 aim to investigate mussel cluster; looking for small species
13:39:27 attempt to use slurp gun for small mussels
13:43:44 taking slurp gun
18.01.2008 13:45 HD on, slurping larger mussels
13:45:43 starting to slurp small mussels into bottle 1
13:50:34 slurp gun back to garage
13:50:42 HDTV Off
13:51:45 attempt to look in detail for the mussel field nearby
18.01.2008 13:51 HD on, zoom in on small mussel site
13:56:06 attempt to zoom in with HD to check whether the whitish structures visible are really mussels
13:57:28 taking slurp gun
13:58:36 Slurping young, small mussels into bottle 2



HDTV ATA-46ROV_11

HDTV ATA-46ROV_12

HDTV ATA-46ROV_13

ATA-46ROV-3

HDTV ATA-46ROV_14

ATA-46ROV-4
HDTV ATA-46ROV_15

HDTV ATA-46ROV_16
ATA-46ROV-5



14:04:03 HDTV Off
dropping of slurped mussels into front slit near IB sampler of the box; same smple# as a above.
14:05:58 INCLUDES basalt glass chips (some appear to have also dropped into box 1)
14:08:06 finishing slurp gun sampling; aim to fly to Turtle pits
14:10:48 next step: finding Wideawake beacon
14:16:06 attempt to get posidonia data failed
14:17:10 got signal from beacon
14:19:18 got signal from Turtle Pits beacon: 180m away, heading 305
14:23:08 Posidonia is running again
14:25:53 fresh young lobate flow above older lava ; 4° 48.606S 12° 22.369W
14:26:42 heavy sediment cover
14:27:12 jumbled flow
14:27:33 minor sediment cover
14:28:30 old smoker in sight
14:30:18 Turtle pits beacon in sight
14:35:05 Southern Tower? in sight
14:37:36 Two boats in sight
14:47:01 moving ship
14:57:40 attempt to find smoker
14:59:22 smoker in sight, two boats?
15:01:11 marker in sight;
15:11:02 waiting for the final ship position
15:16:11 still waiting for the ship
15:17:00 finding marker 2, the position where fluid samples from first day were taken
15:23:02 found lot to park ROV, 4°48.577S and 12°22.412 W
15:28:07 artificial hole of T measurement from first day still smoking away
15:32:53 preparing to release the tube = IB sampler
15:42:04 problems to release the tube
15:46:47 handing over the tube to the rig master
little chimney has grown already on the new outlet, broken off to place the tube, will attempt to pick
15:54:33 up later
15:56:48 tube apparently place properly
16:01:32 after new grip on tube with rig master, tube now placed onto vent
16:07:46 problems to open valve, also funnel no more over vent.
16:13:00 HDTV On IB-Sampler
16:13:24 HDTV Off
16:13:28 tube turned so that opening the valve will be easier
18.01.2008 16:14 HD on, IB sampler at Two Boats
16:15:30 opening valve! Of IB samples.
18.01.2008 16:15 HD off
16:16:30 closing valve
16:20:00 rigmaster has released the IB sampler
16:25:45 placing IB sampler into drawer
16:27:53 KIPS fever measurement is being prepared
16:33:19 KIPS is out of garage
16:33:20 HDTV On, KIPS at Two Boats
16:34:00 HDTV Off
16:36:52 T = 412°C
16:37:12 T = 370°C
16:41:18 T = 380°C
16:48:55 announcement that T-sensor of nozzle ripped off
16:51:19 KIPS inlet and T nozzle have been twisted during search for hot fluid exit
16:57:54 Filling bottle C9, 180°C measured but sensor about 2 cm displaced from nozzle
17:00:45 pumps off
17:01:52 pumps on, bottle C8
17:04:32 stopped filling of bottle C8. Not enough fluid discharging from KIPS exhaust.
17:06:11 interruption of KIPS sampling, potentially nozzle is blocked
17:14:16 nothing much happening
17:17:41 leaving current sampling site
17:19:20 HDTV On, black smoke, nothing else
17:19:40 looking at top of two boats smoker
17:20:11 >HDTV Off
17:22:03 or is it southern tower?
17:24:25 looking for a suitable orifice
17:26:16 KIPS deployment
17:32:09 looking for a suitable orifice
17:36:39 T measurement by KIPS sensor at intensely discharging orifice. Abandoned.
18.01.2008 17:39 HD on, bent KIPS
18.01.2008 17:40 HD off
17:47:59 reapproaching orifice, T measurement?
17:51:58 KIPS away from orifices
17:52:18 new attempt
KIPS T sensor in orifice (max T measured is 300°C... But this is not the discharge T, T sensor not
17:55:20 properly inserted in orifice).
17:58:06 end of dive. Leaving bottom.

HDTV ATA-46ROV_17

ATA-46ROV-6
HDTV ATA-46ROV_18

HDTV ATA-46ROV_19

ATA-46ROV-7

ATA-46ROV-8

HDTV ATA-46ROV_20

HDTV ATA-46ROV_21

NOTE ADDED chimney fragment from Southern Tower in the back of ROV - sample number assigned after dive

ATA-46ROV-9

Cruise Number Atalante Leg 2
Station Number 50ROV
Dive Number #17
Location Inside Corner High #1
Coordinates 5°05,3771'S 11° 39,393'W
Water Depth 3403m
Vessel Atalante

Metadata	Observation	Actions
Timecode default	allowed	allowed

9:30:00 Begin Station
 9:40:42 ROV in Water
 11:08:16 2700 m
 11:25:53 20m above bottom 5°05.451 S; 11°39.300 W
 11:29:15 bottom sight
 11:30:49 heavily sedimented
 11:32:56 start traverse with heading 252°
 11:40:00 HDTV on, prawn on sedimented seafloor
 11:41:08 HDTV off
 11:42:00 HDTV On, strange slug
 11:47:47 HDTV Off
 11:47:35 HDTV on, 5°05.522S; 11°39.428W, still only sediment
 11:53:24 HDTV off
 11:59:07 sonar shows solid structures in the distance
 11:59:25 large boulders, ? Talus; 5°05.524S; 11°39.468W, near WP 1, 3390 m
 12:04:48 trying to get a better picture of the rocks, also waiting for the ship
 12:06:45 waiting for ship
 12:15:28 continue traverse with direction 252°, sedimented area
 12:17:52 more boulders, 5°05.545S; 11°39.508W, 3356 m
 12:18:54 slope steepens now
 12:21:19 reaching foot of the slope at 3320m, start measuring the distance
 12:23:59 3300m water depth
 12:25:06 more large blocks and plenty of sediment
 12:28:46 large boulders
 12:31:40 more blocks, 3230m depth, 5°05.620S; 11°39.624W
 12:38:29 Large boulder, 3207 depth
 12:41:45 sediment
 12:42:03 boulder, looking for suitable spot in order to take a rock sample
 12:42:46 steep hill side, highly sedimented some blocks sticking out of the ground
 12:48:24 suitable rock in sight. 5°05.610'S 11°39,658'W, 3143m
 12:52:36 sompling of this particular fragment abandoned
 12:53:50 proceeding towards 270
 12:55:21 new sampling target localized
 12:57:40 proceeding a little further to the west
 12:59:05 more large blocks and plenty of sediment
 13:02:14 shift change of ROV pilots
 13:07:29 more large blocks and plenty of sediment
 13:08:16 3110m 5°5,618S 11°39.753W
 19.01.2008 13:10 HD on, boulders in sediemtn
 19.01.2008 13:11 HD off
 13:12:24 sampling initiated
 13:19:06 sampling abandoned
 13:19:45 continue heading 270. bolders and sediment.
 13:22:59 another go at sampling
 19.01.2008 13:24 HD on, sampling
 13:25:32 HD off
 Sampling was successful! Sample: looks like breccia with thick layer of solidified foram ooze.
 13:26:05 5°05.622S 11°39.764'W. 3094m
 13:29:58 proceeding to the W. Still large boulders and sediment.
 13:34:10 more large blocks and plenty of sediment
 13:35:56 sediment
 13:36:03 blocks
 13:36:22 big blocks
 13:37:05 steep rocky cliff, in-situ rocks?
 19.01.2008 13:38 HD on, flight over boulder field
 13:38:41 terrace full of sediment
 13:39:09 5°05.647'S 11°39.831W 3013M
 19.01.2008 13:39 HD off

HDTV ATA-50ROV_3

HDTV ATA-50ROV_5

This video is not present

HDTV ATA-50ROV_7

HDTV ATA-50ROV_8

ATA-50ROV-1

HDTV ATA-50ROV_9

13:40:23 proceeding towards 242, boulders and sediment.
13:41:09 sediment
13:41:43 3000 m, sediment
13:41:58 sediment and boulders
13:44:31 sediment and boulders. Heading 246, try to find another sample
13:48:07 sediment and boulders. 2960m
13:52:12 try to take sample
19.01.2008 13:57 Hd on, sampling attempt
19.01.2008 13:58 HD off
14:01:40 sampling abandoned
14:01:53 still slope with abundant blocks and sediment
14:06:52 HD on, capture a panoramic view of the slope
14:07:52 HD off
14:30:44 2875m depth
14:36:35 trying to collect a sample
14:44:00 sediment and boulders
14:49:40 still trying to sample. 2842m.
14:50:34 sampling abandoned
14:52:51 sediment and boulders
19.01.2008 14:53 HD on, boulders on slope
19.01.2008 14:54 HD off
15:01:36 trying to take sample
15:02:17 2810 m 5°05.728'S 11°40.016'W
15:07:15 sampling abandoned
15:08:26 very steep slope, big blocks
15:09:51 investigating blocks
15:11:05 proceeding heading 272
15:11:41 sediment on slope
15:11:53 heading 290
15:13:45 5°05.746'S 11°40.045'S 2775 m, ROCK FACE striking N-S
investigating outcrop: black rock with 10s of cm wide vein running parallel (NO. The white stuff
is sediment.) and vertically across the outcrop
15:14:44 is sediment.) and vertically across the outcrop
15:13:30 HDTV On, big rock face and then nothing
19.01.2008 15:16 HD has been on; now switched off
15:16:53 wall is not really high, flying over
15:17:05 HDTV on, massive rocks
15:17:31 trying to grab a particular sample (knobby clast on a cliff poarch) with the rigmaster!
15:24:48 sampling SUCCESSFUL. Round knobby sample placed on poarch. Size ca. Rigmaster claw.
15:27:58 HD is on and has been on for a while
15:30:23 moving up the flank of the cliff, starting at 2783.6 m
15:30:57 passed fantastic deed sea corals (hydrozoan) living at the cliff edge
15:31:39 2768.8m Still moving up.
15:32:00 2767.5m Total of 16 m for the cliff.
15:33:17 Reached peak of a MEGA-BLOCK. Hence sample take was not in-situ.
15:34:13 Flying around cliff peak.
15:35:39 Examining cliff surface: striation are recognizable. HD still on.
15:37:00 Moving closer.
15:38:14 Rock type: Gabbro
19.01.2008 15:38 HD off
15:38:54 Examination finished. Progressing dive.
15:39:40 Cliff top colonized by Hydrozoan
15:40:32 Flying across sedimented cliff surface
15:44:33 very steep slope, heavily sedimented, abundant ripple
15:45:29 Sedimented terrace, 2772m
15:45:56 Still heading towards the west. 251
15:48:07 waiting for ship
15:49:39 Moving to the west, 250, sediment and boulders
15:54:33 sediment and boulders
15:55:47 Large boulder (size range: several m to 10s of meters) field, massive blocks, clast-supported.
15:56:59 5°5.796'S 11°40.140'W; 2730m
15:59:03 still large boulder field
16:02:35 trying to take sample
16:10:00 Huge slabby blocks, interlocking
16:11:32 Steep cliff face of large block
16:12:27 reached sedimented top of cliff
Observation: In the lower portion of the dive investigated earlier the blocks were rounded
(reminiscent of "Wollsack Verwitterung"). In contrast, in this area up here the blocks are slabby
16:13:02 with sharp angular outlines.
16:16:06 2700m
19.01.2008 16:17 HD on, landing in sedimented talus
16:17:35 Preparing for taking a sample from a local scree slope
19.01.2008 16:17 HD off

HDTV ATA-50ROV_10

HDTV ATA-50ROV_11
(Timemarks wrong on video?)

HDTV ATA-50ROV_12

HDTV ATA-50ROV_13

ATA-50ROV-2

HDTV ATA-50ROV_14

HDTV ATA-50ROV_16

sample placed in box 1 (smaller than sample ATA-ROV-1) This sample is black an shiny and may be a glassy blast crust or a Mn-crust	ATA-50ROV-3
16:23:28 5°05.830'S 11°40.170'W 2696 m. About 100m away from WP2	
16:24:21 Second sample from this location placed in box 2.	ATA-50ROV-4
16:28:29 sediment and boulders. Proceeding to W 268	
16:29:54 giant scree field.	
16:30:05 HD on.	No film
16:31:54 HD off	
16:32:39 Preparing for taking a sample from a local scree slope	
16:32:56 Rigmaster	
16:33:59 sample in rigmaster!	
16:34:58 sample with white crust, angular clast, lying on Orion side of poarch	ATA-50ROV-5
16:35:53 5°5.815'S 11°40.191'W 2670m	
16:36:48 Progressing to the west. Heading 256	
16:37:55 sediment and boulders	
16:39:32 traveling up the slope	
16:41:03 Blocks have grey surfaces, some banding perhaps visible.	
19.01.2008 16:41 HD On, boulder	
16:43:11 Was that banding or sediment? Not sure.	HDTV ATA-50ROV_17
16:43:18 HDTV Off	
16:45:00 Lots of boulders which are flat, angular. Dickbankig is the expression	
16:47:34 Still large, flat blocks,	
16:48:53 These boulders are loose - can see collision marks between them	
19.01.2008 16:51 HD On, looking for sampling site, small talus	
16:52:40 Attempting sampling	HDTV ATA-50ROV_19
19.01.2008 16:53 HD Off	
Got sample, black surface top and bottom, brown fracture surface on side, placed in rear big compartment 5°S05,824 ??? Depth??	ATA-50ROV-6
17:01:16 11 39,525 5 06,510??? Posidonia problem??	
17:02:26 5 05,840 11 40,289 is perhaps good fix	
17:05:43 Boulder field	
All joint surfaces look to dip OUT of teh slope - i.e. Towards the east, perhaps also slightly to the S	
17:06:03 S	
17:07:35 Blocks becoming more plate-like	
17:08:47 Looking at a place which looks like slickensides	
19.01.2008 17:09 HD on, big gabbro boulder	
17:10:31 Günter is sure it is slickensides	HDTV ATA-50ROV_20
17:10:53 HD Off	
17:16:00 HD Off already	
17:18:16 Facing block, steady. Going to sample	
17:22:19 Getting a sample. 5 05.827S 11 40.311W 2555m	ATA-50ROV-7
19.01.2008 17:28 HD On, in situ gabbro wall	
17:29:08 Wall strikes 340°	
17:30:10 Looking to find strike and dip of structures	HDTV ATA-50ROV-21
19.01.2008 17:31 HD Off	
17:32:25 5 05.833S 11° 40,372 2484m end of dive, coming up	
during coming up: the last wall shows a height of ~ 150 m, monitored by sonar; strike: 330°	

Cruise Number Atalante Leg 2
Station Number 52ROV
Dive Number #18
Location Golden Valley & Red Lion
Coordinates 4° 48.102'S 12° 22.286'W
Water Depth 2992m
Vessel Atalante

Metadata	Observation	Actions
Timecode default	allowed	allowed

9:00:00 Begin Station
 10:00:00 ROV in Water, problem with Posidonia signal in van, changing cables out whilst diving to 1000m
 11:27:20 2473m
 New plan for the dive: Locate golden valley without Posidonia positioning signal. Return ROV on deck immediately after sampling in order to fix this problem on deck.
 11:35:28
 11:38:14 2820m
 11:42:34 seafloor in bottom sonar
 11:43:58 seafloor in view: 2990 m
 11:44:28 sedimented sheet flow with intense laminar striations
 11:45:10 search for Sisters peak chimney structure using the sonar
 11:45:55 great view of sedimented sheet flow plain
 11:47:23 turning vehicle at 60 degrees intervals in order to locate smoker in the sonar
 11:52:30 positioning ROV several m above the ground in order to pick up Sisters peak in the sonar
 sonar shows structure that may represent Sisters Peak in the SW. Hence Golden Valley should be towards the north. Plan: Dive to the north
 11:59:57
 12:02:26 returning to seafloor
 12:03:01 round circular patches and larger domains filled with sediment on top of sheet flow
 12:04:08 turning vehicle around: Large sheet flow plain
 12:04:36 HDTV On, fight over pillows
 12:04:37 moving northwards
 12:04:56 hummocky structures
 12:05:27 contact of sheet flow to overlying pillow flow.
 12:05:55 climbing up pillow flow front
 20.01.2008 12:06 HD off
 12:07:58 very nice pillow flow morphologies, minor sediment in interstices
 20.01.2008 12:08 HD on, volcanic flight and first mussel patches
 12:10:33 mussels! Dead ones...
 12:11:37 trying to follow the "mussle gradient"
 12:12:02 living mussels and shimmering water!
 12:12:53 HD Off
 12:14:10 still trying to locate the valley. Low mussle density
 12:15:01 there is the fracture/valley!
 12:15:17 HDTV, flying south in volcanic fissure
 HD on flying southwardthis is the fissure of a major lava flow eruption, passing site of sheet flow emissions
 12:15:53
 12:18:02 great volcanic morphology

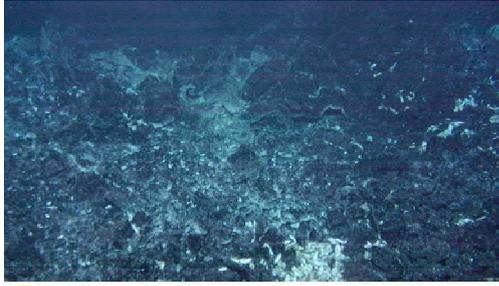


 12:18:52 multiple sheetflow tops and lava tube structures
 12:20:07 HD still on, "Grand canyon-like" views
 12:24:56 some dead mussle on fissure floor
 12:25:26 HD Off
 12:26:05 plenty of crabs! Sitting on pillows
 HD on, lots of mussel patches in valley, most look dead, shimmering water everywhere (looks like activity is waning, far fewer mussels living now than shells lying around.
 20.01.2008 12:26
 12:27:32 abundant polyps around the mussel beds. Very similar situation to Wideawake.
 12:29:05 abundant dead mussels
 12:29:52 following large patches of dead mussels
 12:30:29 abundant dead mussels
 12:31:24 shimmering water around. BUT no live mussels near shimmering water. Too hot?

HDTV ATA-52ROV_1

HDTV ATA-52ROV_2

HDTV ATA-52ROV_3



- still abundant mussels. This is no longer a valley structure. Difficult for orientation. Following towards the south.
- 12:32:06 abundant dead mussels
 - 12:33:54 abundant shimmering water emitting from interstices of lava lobes.
 - 12:34:18 We crossed the southern margin of the pillow flow. Jumbles lavaflow morphologies are abundant. ROV touched the ground=> lava sample of sheet flow sitting on poarch.
 - 12:35:03 Abundant hot water emitting from the seafloor. Becoming more intense: Foggy. However, no macrofauna.
 - 12:35:41 Sheet flow top, lightly sedimented.
 - 12:36:37 NO more shimmering water. Some (minor) dead mussels.
 - 12:38:01 Bach in more active region progressing towards the east. Fissure reappears.
 - 12:38:43 Again abundant dead mussle patches and shimmering water.
 - 12:39:39
 - 20.01.2008 12:40 HD off
 - 12:40:29 Lifting ROV up into the water column in order to locate Sisters Peak using the sonar.
 - 12:50:03 returning to seafloor
 - 12:50:23 Landed on abundant mussle beds alive and dead mussels + shimmering water
 - 12:51:13 abundant living mussels!
 - 12:51:56 passing over steep cliff
 - 12:53:01 floor of fissure colonized by some mussels
 - 13:00:12 pilot change, biologists resign to idea to sample whatever they get because orientation remains difficult without Possidonia
 - 13:08:31 plan to take Ti-majors once find fluid vent
 - 20.01.2008 13:17 HD on, mussel patch
 - 20.01.2008 13:20 HD off
 - 20.01.2008 13:21 HD on, more mussels
 - 13:24:29 HD off
 - 20.01.2008 13:29 HD on, polyp close up
 - 20.01.2008 13:30 HD off
 - 20.01.2008 13:30 HD on, shrimp feeding
 - 13:31:05 HD off
 - diffuse fluid vent over entire area, trie to measure now T at margin of the mussel field with 8 channel lance, but difficult to find proper landing place
 - 13:32:53 searching for a proper sampling spot according to KIPS temperature readings. Current readings are in the 2-5 degree C range
 - 13:48:27 T 3-3.5°C and one time 5°
 - 13:55:06 T = 6.9°C!
 - 13:56:40 T = 8.6°C
 - 13:57:26 T = 8.6°C
 - 13:59:38 KIPS pump on, bottle C9, T = 8.9°C
 - 14:00:01 HDTV On, view over mussel field whilst sampling
 - 14:00:23 HDTV Off

HDTV ATA-52ROV_4

HDTV ATA-52ROV_5

HDTV ATA-52ROV_6

HDTV ATA-52ROV_7

HDTV ATA-52ROV_8

52 ROV-1

HDTV ATA-52ROV_9



- 14:03:35 pump off
- 14:04:08 KIPS pump on, bottle C8, T = 8.6°C
- 14:08:40 pump off
- 14:09:13 KIPS pump on, bottle C7, T = 8.5°C
- 14:12:38 pump off
- 14:13:10 KIPS pump on, bottle B6, T = 8.9°C
- 14:15:45 HDTV On, view over mussel field whilst sampling
- 14:17:27 pump off
- 20.01.2008 14:17 HD off
- 14:20:04 KIPS pump on, bottle B5, T = 8.0°C
- 14:24:07 pump off
- 14:24:45 KIPS pump on, bottle B4, T = 8.3°C
- 14:28:02 pump off
- 14:28:43 KIPS pump on, bottle A3, T = 7.8°C
- 14:33:28 pump off, T = 8.0°C

52 ROV-2

52 ROV-3

52 ROV-4

HDTV ATA-52ROV_10

52 ROV-5

52 ROV-6

52 ROV-7

14:34:42	remove nozzle from site and return it again for a second set of fluid samples	
14:36:52	KIPS pump on, bottle A2, T = 8.8°C	52 ROV-8
14:41:08	pump off	
	Site is called "Clueless Site"	
14:41:51	KIPS pump on, bottle A1, T = 8.8°C	52 ROV-9
14:46:27	pump off, T remained constant between 8.5 and 8.8°C	
14:47:09	next task will be the 20 minute 8-Channel temperature measurement	
14:55:07	start deployment of the 8-Channel T-Logger	
15:09:10	8-Channel T-logger in position, start measuring for 20 minutes, T-max 6°C	52 ROV-10
15:35:48	stop of T-measurement	
15:36:32	next step: fishing mussels for Nicole	
15:37:50	8-Channel T-logger back in garage	
15:42:41	taking net # B	
15:51:39	fishing mussels into net # B	52 ROV-11
15:53:22	drop of of net # B into box 1	
15:55:25	opening of of lid from plastic box	
	taking rock sample covered with bio; sample broke; only small fragments placed into plastic box with	
15:58:54	lid; no sample number	
15:58:58	taking another rock sample covered with bio, attempt failed	
16:04:09	tainkg the shovel for taking a rocks sample	
16:11:54	HDTV On, tin-panning for rocks	
16:12:15	taking rock fragments with shovel; surface covered with bio; placing into plastic box	52 ROV-12
16:13:19	HDTV Off	HDTV ATA-52ROV_11
	taking a second rock sample with shovel, surface covered with bio; placing into plastic box; same	
16:28:21	sample numer	
16:35:26	attempt to place a bio net as marker;	52 ROV-13
16:47:52	taking the Ti Majors which was lost from porch during operation for rock sampling	
16:52:29	HDTV On, lookng for somewhere to drop net	
16:57:35	HDTV Off	HDTV ATA-52ROV_12
17:00:56	HDTV On, bionet on seafloor	
17:01:14	placing the bio net as marker; marker gets a sample number	52 ROV-13
20.01.2008 17:02	HD off	HDTV ATA-52ROV_13
	17:03:44 sampling location was on the eastern flank of a fissure; a sheet flow is visible not covered with mussels	
	attempt to fly some 100 meters in the direction of "Sisters Peak"; 350° heading; some 100 meters with	
	17:03:51 the aim to find to sisters peak	
	17:07:23 lobate flow associated with sheet flow	
20.01.2008 17:07	HD on, for the whole flight N across lava looking for Sister's Peak	
17:10:28	80 m from start of traverse	
17:11:24	very massive flow of lobates/pillows without bio	
17:13:51	water seems to get smoky	
17:14:15	looking around if smokers are visible	
17:17:07	big sediment carpet	
17:17:33	HDTV Off	
17:17:20	HDTV On, more flight over seafloor and looking for S.P.	
17:19:24	HDTV Off	HDTV ATA-52ROV_14
17:20:08	end of dive	HDTV ATA-52ROV_15

Cruise Number Atalante Leg 2
Station Number 57ROV
Dive Number #19
Location Turtle Pits#3
Coordinates 4°48,558' S 12°22.463' W
Water Depth 2989m
Vessel Atalante

Metadata
 Timecode
 default

Observation
 allowed

Actions
 allowed

9:00:00 Begin Station
 9:36:00 ROV in Water
 11:03:43 Bottom sighting
 11:14:35 ABE dive weight
 11:19:27 Turtle Pits
 11:24:14 A smoker is visible, not clear which one it is.
 11:30:34 AT southern tower, making HD film as some bubbles coming out
 11:34:33 Looks like venting vapour on side of southern Tower
 11:37:00 HD did not want to work
 11:37:31 Moving to Two Boats
 11:40:38 Slowly moving to Two Boats
 11:42:17 Marker 2 found
 11:43:11 HD On, flying around Two Boats
 11:48:18 HD Off
 11:55:27 HD On, landing base of Two Boats
 11:56:07 HD Off
 11:59:29 HD On, base of Two Boats
 12:00:19 HD Off
 12:03:40 HD On, shrimps and fluid at base of Two Boats
 12:04:57 want to measure temp.
 12:05:15 HD off
 12:05:36 HD On, small smoker with shrimps
 12:05:56 HD Off
 12:06:48 HD On, more small shrimp on smoker
 12:07:19 HD Off
 12:11:44 HD On, shrimps and the end of something, smoke in bkgnd
 12:13:00 HD Off
 12:14:01 Temperature: 334, 370, not hot enough, the vent also does not look very active
 12:16:27 Deciding where to go
 12:28:45 HD on, fly round top of smoker
 12:29:10 HD Off
 12:32:23 ROV touched smoker
 12:49:33 HD On, lots of prop. Wash on top of smoker
 12:52:06 HD Off
 12:54:03 Want to approach smoker with Rig Master extended
 12:59:26 Trying at base of Tower
 13:01:35 Landed on SE base of Southern Tower, looks hopeful but is difficult to get to.
 13:13:12 taking KIPS for T-measurement; measurement failed
 13:19:06 still looking for a good place
 13:20:48 HD on, flight around base of Southern Tower
 21.01.2008 13:23 HD off
 13:23:00 HD On, top of smoker
 13:23:31 HD Off
 13:34:09 Taking a large sample from chimney with Riggmaster, placing on porch
 13:39:00 HD On, smoke at top of smoker
 13:39:51 HD off
 13:55:37 HD on, approach to base of smoker
 13:57:18 HD off
 14:10:42 taking KIPS for T-measurement
 14:17:42 stop of the attempt to measure Temp..
 21.01.2008 14:25 HD on, Two Boats from a distance
 14:26:50 HD off
 14:26:00 HD On, another flight to Two Boats?
 14:27:10 HD Off
 14:32:20 proceeding to two boats, attempt to measure temp
 14:35:00 HD On, rigmaster on smoker outlet
 14:35:36 HD Off
 14:36:02 now trying to make a vent with rig master
 14:41:59 still working with rig master on two boats
 14:48:04 several attempts to get a temp reading from a vent
 14:52:39 Tmax currently at 200°C
 14:55:43 relocating ROV to new position at two boats vent
 15:03:32 still cruising
 15:07:56 irrespective of the temperature reading to come, sampling will go ahead now
 T max now 340°C though opening small, vent openings apparently are very dynamic, they close and
 open in a day or two
 15:18:17 try to make 340°C vent bigger
 15:23:21 another KIPS deployment still at Two Boats
 15:32:03 T measurements in the range of 270 to 370°C
 15:35:56 pumps on filling bottle C9
 measured T is about 220°C however, nozzle is placed more directly above discharging fluid so that
 15:36:56 fluid sample temperatures are probably higher
 15:39:24 pumps off
 15:39:44 pumps on filling bottle C8
 15:42:31 pumps off
 15:43:06 pumps on filling bottle C7
 15:46:17 pumps off
 15:46:46 pumps on filling bottle B6
 15:50:02 pumps off
 15:52:03 next deployment: IB sampler
 15:58:53 still working on putting KIPS in garage...
 16:03:35 KIPS in garage. ROV 20 m off the ground

HDTV ATA-57ROV_1

HDTV ATA-57ROV_2

HDTV ATA-57ROV_3

HDTV ATA-57ROV_4

HDTV ATA-57ROV_5 (note times wrong on video)

HDTV ATA-57ROV_6 (note times wrong on video)

HDTV ATA-57ROV_7 (note times wrong on video)

HDTV ATA-57ROV_8 (note times wrong on video)

HDTV ATA-57ROV_9 (note times wrong on video)

HDTV ATA-57ROV_10 (note times wrong on video)

HDTV ATA-57ROV_11 (times wrong)

ATA-57ROV-1

HDTV ATA-57ROV_12 (times wrong)

HDTV ATA-57ROV_13 (times wrong)

HDTV ATA-57ROV_14 (times wrong)

HDTV ATA-57ROV_15 (times wrong)

HDTV ATA-57ROV_16 (times wrong)

ATA-57ROV-2

ATA-57ROV-3

ATA-57ROV-4

ATA-57ROV-5

16:07:13 landing on sheet flow, lightly sedimented
16:08:09 great striations!
16:10:29 still sheet flow
no more communication to ROV container. Walkie-Talkie stopped working for some non apparent reason. Difficult to relocate Turtle Pits. No beacon reading. Trying to locate using Posidonia.
16:14:50 Dead mussels
16:16:51 beacon found
16:20:02 sheet flow agin
16:24:49 back at Turtle Pits, Two Boats
16:35:59 next deployment: IB sampler
16:47:22 IB sampler opened
16:48:00 HD On, IB Sampler sampling
16:48:33 HD Off
16:49:49 HD was on for IB sampling
16:50:59 HD on, trying to close He tube with Orion
16:51:51 HD off
17:01:08 IB sampler closed
17:14:13 Major D2 is next
17:34:32 could not be released
17:42:06 try again
17:54:17 Major D2 released by error, no sample
18:06:20 stowing IB sampler
18:32:11 Beacon 11 found and collected
18:36:28 next target: Wideawake beacon
crossing from jumbled flow to sedimented lobate flow (mapped as "old flow" in ABE volcanological interpretation by C.Devey)
18:46:46 beacon found even without signal
18:52:47 Attempt to take mussels with bionet
19:01:09 chnage of plan: First beacon 10 placed on poarch
19:01:32 now start of biosampling
19:04:29 bionet "J" fallen out of Orion into sample box
19:07:00 "it is one of these f...ing stupid days..."
19:09:17 bionet in Orion!
19:12:31 mussels in bionet!
19:13:20 HD On, mussel net with Orion
19:13:58 more mussels
19:14:12 bionet in big sample box
19:18:39 HD Off
19:22:52 manipulating beacon in order to ensure its fixed position
19:26:44 beacon fixed. Rigmaster bings in second beacon.
19:29:31 leaving ground

ATA-57 ROV-6

HDTV ATA-57ROV_17 (times wrong)

HDTV ATA-57ROV_18 (times wrong)

ATA-57ROV-7

HDTV ATA-57ROV_19 (times wrong)

Cruise Number Atalante Leg 2
Station Number 63 ROV
Dive Number #20
Location Inside Corner High #2
Coordinates 5°05.848'S 11°40.429'W
Water Depth 2400m
Vessel Atalante

Metadata **Observation**
 Timecode allowed
 default

Actions
 allowed

8:50:00 Begin Station
 9:00:00 ROV in Water
 9:52:14 ROV Descent stop at 1130m
 10:10:07 ROV descends. 1562m
 10:22:48 2000m
 10:34:16 Wand in sonar zu sehen in 40m entfernung
 10:34:40 Bottom sighting, sediment and small stones 20m W of steep wall
 10:38:54 boulder field
 10:41:15 No sign of steep wall! Sonar picture probably just this boulder field
 10:42:13 Looking for steep wall.
 10:43:33 Probably 150m north of steep wall from dive#1 according to map
 10:44:04 5°05.798 11°40.368 are ROV coords, 2489m depth, going south
 10:46:18 Something on sonar in 30m distance
 10:47:26 HDTV On, talus blocks with sed cover
 10:48:19 Looking at rocks, trying for an interpretation
 10:49:25 Interpretation difficult due to sediment
 10:51:39 HDTV Off
 10:51:53 Climbing wall slowly
 10:52:19 Vertical crack - fault or joint
 10:52:31 HDTV On, joint may be cliff face, dips 70° to E 2476m
 10:53:39 Strong jointing 70°E, internal Strukturen dip 30° to W
 10:54:31 A Ruschel-Zone
 10:55:01 Going to try sampling
 10:55:38 HDTV Off
 10:56:10 Deploying Rigmaster
 10:58:00 HDTV On, massive rock wall
 10:59:21 Attempting sampling, looks very broken, lozenge-shaped pieces
 10:59:43 HDTV Off
 11:01:59 Still trying
 11:02:27 Not sure whether tectonics or rock-type responsible for the look of this rock
 11:06:05 Going to try to put porch on
 11:07:51 Docked!
 11:11:24 Rocks keep falling down between porch and wall!
 11:12:57 A good day for Dan, a bad day for a rock (and one giant leap for mankind)
 5° 05.854 11°40.356 2472m rock on porch, sample in-situ
 11:15:45 Klüftung 70° in den Hang, nach W
 11:16:00 HD On
 11:16:29 Thinly bedded/jointed
 11:16:46 HD Off
 11:16:51 HD On
 11:17:03 Thinly-banked units, jointed dipping steeply W
 11:18:21 The thick banks have disappeared, looks much more broken. It is tectonic effect
 11:19:26 HD Off
 11:20:01 Looking West onto the short end of the eastward-dipping blocks
 11:20:29 The cliff is tectonic surface, not just a landslide surface
 11:20:47 HD On
 11:21:22 Joint surfaces well seen dipping 70° into cliffs
 11:21:56 HD Off
 11:23:14 HD On
 11:23:40 On E-W striking wall, see two joint systems, one dipping steeply to W, one slightly shallower to E
 11:24:40 Attempting another sampling
 11:24:53 HD Off
 11:26:42 Sampling attempt, dropped in the slips
 11:29:56 Trying again, huge piece
 5° 5.863 11°40.369 2430m
 11:32:59 Wall strikes 300° in sonar
 The structure which we have been calling joints dipping W looks irregular and like banking -
 magmatic contracts/Layering??
 11:36:54 Small step, in 10m it continues
 11:37:43 Going over step
 11:38:49 Stripes on rock probably sediment
 11:41:01 Wall strike 315°
 11:41:14 HD On
 11:42:35 Want to go W to try and find another wall orientation, we appear to be climbing a joint surface
 11:42:56 HD Off
 11:43:33 Corner of wall, can look from both sides
 11:44:03 HD On
 11:44:22 Lots of structures dipping to east
 11:45:11 Already ascended 130m wall
 11:45:54 Joint system dipping 70° to E is clearly visible
 11:46:14 HD Off
 11:46:55 HD On
 11:47:03 Lots of tectonic L, to right a big joint
 11:47:31 HD Off
 11:47:36 Heavily tectonised possible fault surface
 11:48:59 Wall strikes 300° in sonar
 11:50:09 Vertical movement surfaces visible, harnisch is the word which is being banded about
 11:52:02 Still on wall
 11:52:38 Moving to SE to try and get another viewing angle
 11:53:54 Heavily colonised surface
 11:54:18 Traversing slope to see what is going on
 11:55:16 HDTV On
 11:56:27 HDTV Off
 11:55:45 IN small talus pile, looking for a piece to take
 11:56:33 Sampling attempt, putting in drawer, box 2
 12:01:49 5°05.919 11°40.382 2324m
 12:04:57 Sonar shows no hard echos, looks more like talus slope
 12:06:24 Found a solid face, ascending
 12:08:25 ON broken surface, hoping to see some structure when the surface is continuously breaking
 12:10:51 Many more small blocks here, may be different rock although in container does not look like it
 12:14:05 HD On
 12:14:53 HD Off
 12:14:59 Steep slope in front of ROV, possibly parallel to dip direction

HDTV ATA-63ROV_1

HDTV ATA-63ROV_2

HDTV ATA-63ROV_3

ATA-63ROV-1

HDTV ATA-63ROV_4

HDTV ATA-63ROV_5

HDTV ATA-63ROV_6

HDTV ATA-63ROV_7

ATA-63ROV-2

HDTV ATA-63ROV_8

HDTV ATA-63ROV_9

HDTV ATA-63ROV_10

HDTV ATA-63ROV_11

ATA-63ROV-3

HDTV ATA-63ROV_12

12:15:38 ROV oriented 300° to find that wall
12:16:21 Possibly end of wall, sample attempt
12:17:14 HD On, approach for sampling
12:18:06 HD Off
12:19:40 Grabbed, will it fit in drawer?
12:20:56 5 05.927 11 40.433 2265m, box 3
12:22:31 Vehicle still positively buoyant
12:23:59 Talus slope
12:24:33 Top of slope or talus pile. Sonar is also less clear. The big wall is visible on sonar behind through
12:28:21 Basic topo map no good in this terrain
12:29:49 Still on talus slope
12:31:40 HD On
12:31:41 Xenolith in gabbro??
12:32:58 May be a surface covering, not a xeno though
12:33:38 HD Off
12:35:24 Joints steep, dipping to NW
12:39:05 Rocks more rounded, more sediment and animals - slope older?
12:39:41 Sonar picture is diffuse, no wall visible, probably talus + seds.
12:40:27 Moving N looking for wall
12:43:26 On a wall again, now looking 214°
12:44:29 Looking for a place to take a sample
12:45:16 Massive rock wall
12:45:30 HD On
12:46:19 Pentagon scalöe bar
12:46:34 HD Off
12:47:22 ON bottom, starting sampling
12:48:19 Difficult to grab anything
12:49:05 5°05.934'S 11°40.527'W 2175m, let's see if we get a sample
12:51:22 5°05.931' 11°40.527' 2175m have a sample now, in box 2 closer to ROV
12:57:08 Still on blocky talus, moderately sedimented
Solid wall, still gabbro, less jointing (perhaps reason for old talus, or we are looking at main joint surface)
12:58:09
12:59:31 Now more broken
13:01:15 Main fault surface, dipping east
13:02:50 passing through another "Ruschelzone" 2130 m
13:03:31 Changing course in order to gain another view on the western cliff face
13:05:26 looking on western face of cliff, blocky scree
13:08:14 ROV pilot shift change
13:09:43 progressing up the hill. 2113m
13:10:00 passing plastic bag? NO. Its a "Fächerkoralle". On scree slope.
13:11:30 Facing 320. Blocky scree slope.
13:12:37 Blocky outcrop. 2106m
13:15:01 scree slope. Sediment. 2092m
13:16:29 climbing scree slope, platy blocks.
13:17:57 ROV still facing W: 246
Looks like a good spot to take another sample. Also, sonar indicates that steep slope may terminate a little further up.
13:19:19
13:25:59 Sample in Orion. Placed in box 1 next to shovel. 5°5.968'S 11°40.583'W. 2082m
13:29:12 NOTE for the ROV Weight Watchers: After this sample the ROV has no more Buoyancy.
After an area dominated by rounded blocks we are back in area with blocks/slabby scree. ROV still travelling westward.
13:30:21
13:31:26 passing over in-situ outcrop.
13:32:19 HD on. In order to document the structures in this upper region.
13:33:56 ROV parallel to main thrust plain which is striking 300. 2065m
13:35:17 HD off.
13:36:18 Steep nose ahead. Travelling up this outcrop. Little sediment cover. Abundant Gorgonaria.
13:41:39 HD on.
13:42:32 HD off
steep cliff ahead. Climbing steeply facing massive rock outcrop. Strike 330. Rock type: gabbro.
13:43:15 2015m
13:46:23 Still climbing vertically. 1996m
13:46:48 Reaching blocky scree slope. Abundant sediment.
Reached top of 20m high cliff. Terrace covered with blocky scree. Looks like in-situ material. Good opportunity to look for a sampling spot.
13:47:48
13:51:33 HD on and off.
13:53:52 passing over in-situ outcrop and in-situ blocky breccia.
13:55:19 Found a good spot for sampling
13:57:42 Sample in Orion claw. Dropped.
13:58:39 sample in Orion claw. Too big => dropped.
14:01:40 Suitable rock found. 5°6.022'S 11°40.698'W 1978m Placed in big sample box. Middle position.
14:05:40 Travelling S in order to return to the old track followed before towards waypoint 3.
14:11:15 Strongly sedimented boulder slope. Reached track. Heading upwards.
14:12:10 1945m 5°5.987'S 11°40.775'W
14:14:57 Climbing steep cliff face. Joints running ~N-S.
14:15:54 Strongly sedimented blocky boulder slope.
14:16:36 Back in seep rocky outcrop face. Heading 217
14:19:41 Found suitable sampling location.
14:22:23 Orion deployed
14:22:51 HD on
14:24:52 HD off
14:25:11 Sample with Hydrozoa shaft. 5°6.013'S 11°40.817'W 1876m Sample in box 3.
14:30:44 Traveling across blocky boulder field. Sedimented. Heading 218
14:33:41 Blocky outcrops. Huge slabby blocks, lightly sedimented.
14:35:51 1810m. Heading 236
14:38:35 Morphology: Steeply terraced terrain.
14:40:08 just a joint... ROV facing 180. 1782m
In this area the slope is striking N-S with little opportunity to investigate the inner structures (i.e., looking at E-W oriented outcrop faces)
14:41:49
14:42:58 Looking for suitable sampling spot. However this is rather steep rocky terrain.
14:45:15 HD on
14:45:33 HD off
14:46:10 HD on
14:47:12 HD off
14:49:48 Orion deployed but this site is not quite suitable.
14:54:30 HD on targeting new sampling site.
14:55:30 HD off
14:56:44 Sampling successful at new site. 5°6.059'S 11°40.843'W 1767m
14:58:01 shift change of ROV pilots
14:58:59 Leaving sampling site in order to put rock sample in a save place on the ROV.
15:01:56 Sample placed in big sample box. On the Orion side of sample ROV-7 (below IB sampler)
300° striking cliff surface ahead. Orientation unchanged. Seems peculiar since ridge axis is striking
15:04:04 at 330°
15:04:06 HD on, fish
15:04:19 HD off
15:04:42 strongly sedimented terrace. We are travelling westward.
15:05:45 boulder field with sediment
15:07:42 slope is dipping with 30°, sediment covered
15:08:29 approaching a steep wall, the cliff face is striking North-South

HDTV ATA-63ROV_13

ATA-63ROV-4

HDTV ATA-63ROV_14

HDTV ATA-63ROV_15

ATA-63ROV-5

ATA-63ROV-6

HDTV ATA-63ROV_16

HDTV ATA-63ROV_17

HDTV ATA-63ROV_18

ATA-63ROV-7

HDTV ATA-63ROV_19

ATA-63ROV-8

HDTV ATA-63ROV_20

HDTV ATA-63ROV_21

HDTV ATA-63ROV_22

ATA-63ROV-9

HDTV ATA-63ROV_23

15:10:21 climbing up

15:11:48 surface is covered with sediment and rock debris

15:14:29 big blocky debris on sediment covered surface

15:17:12 searching for a place to park and collect a rock sample

15:18:12 HD on

15:18:30 rocks look more tectonized than previous exposures

15:19:32 HD off

15:25:58 sampling: 5°6.081 S, 12°40.949 W, 1673.8 m, sample placed in drawer in box 2, on top of everything in the back of this box

15:32:22 continue up the steep slope

15:34:46 HD on

15:34:53 surface of rocks look darker in comparison to further down, may be even the fresh material is darker, rocks slap more flat

15:35:55 HD off

15:40:14 black rock sample with white dots (two pieces) in box3 at 5°06.089S 11°40.982W, 1636m

15:48:26 HD on

15:49:31 HD off

15:50:47 Dip of the rocks appears to have changed. Was 70° below.
The little valley in front has steep flanks. This may be one of the corrugated streaks? Valley is 16 wide and 18 m at its deepest point. The valley is horseshoe shaped. Strike: 260. However, the corrated streaks visible in bathymetric maps are in 100 meters dimensions (each pixel is about 200m). Maybe this is a smaller scale version not detectable in bathymetric maps?

15:51:09 HD on. There are differences in structure. 1603m

15:57:16 HD off.

15:58:45 Steep rocky outcrop. No sediment. Facing 270. Streaky vertical structures.

16:00:09 HD on. The rock face is striking N-S. There are prominent slicken side structures! Dip is to steeply to the east.

16:01:22 1573m Sediment filled crack looks like whitish vein...

16:04:16 HD off.

16:05:04 HD on. Vertical view on shear zones. Dipping South to southwest.

16:05:19 HD off.

16:06:52 Still climbing wall strike is 10°; 60° dipping to the east. Which has a total height in the order of 30 to 40m

16:07:20 keep on climbing. 1541m. Cliff face heavily jointed.

16:09:57 Plan: Taking another sample...

16:12:24 HD on.

16:13:48 HD off

16:14:25 HD On

16:15:00 Trying to take sample here.

16:15:05 HD Off

16:15:33 too difficult. Moving to a different spot.

16:20:54 The rocks look massive with some jointing. Looks like blocky to columnar jointing.

16:24:34 HD On

16:25:00 HD Off

16:25:39 Moving to yet another site.

16:26:35 Still having problems with sampling.

16:31:05 Sample in Orion claw.

16:32:43 5°6.104'S 11°41.061'W. 1521m. Placed on top of box1.

16:34:02 This location here is about 100 m to the north of the planned waypoint 3. The terrain is still very steep. Plan: Continue straight to the west to reach top of inside corner high structure.

16:38:19 HD on

16:39:12 HD off

16:39:58 Climbing to 1510m Facing 270. Moving along surface.

16:40:50 Changing position facing 210. Steep rocky black surfaces.

16:42:18 HD on

16:43:25 Abundant corals. Looking at SW striking flank.

16:43:33 Blocky rocky scree.

16:44:15 HD off

16:45:39 1493m

16:46:10 It is getting more shallow and the rock character has changed. The black rocky scree is sedimented and abundant deep sea corals.

16:46:28 SHARK! HD movie.

16:50:04 HD Off

16:50:42 Reached plateau at 1489 m

16:50:20 Taking sample.

16:50:39 5°6.118'S 11°41.102'W 1491m Sample with intense Mn crusting.

16:52:28 HD on, nice sampling shot!

16:53:11 HD off

16:54:08 Fist sized, knobby sample placed in big sampling compartment. Apparently the other samples have moved around...

16:54:48 flat sedimented area, top of escarpment reached

17:06:12 move north now

17:06:50 try to reach the cliff face again, searching for a less sedimented area

17:08:09 steep slope down in front, turn west to search for cliff

17:09:14 wall appears in sonar to the west

17:09:58 reached the wall, moving up

17:10:26 HD On

17:11:26 investigated a vertical structure, more massive to the left, more structured to the right

17:11:45 HD Off. looks like a sediment debris flow (HD on for short time)

17:12:27 HD on

17:13:17 narrowly spaced exhumation (tectonized) streaks

17:13:32 strongly tectonized area, trying to collect sample

17:14:29 HD off

17:15:30 sampling: 5°6.093 S, 11°41.125 W, 1529 m, small triangular sample placed in drawer in box 1, next to shovel

17:18:11 sample is pervasively sheared material

17:21:42 HD on

17:21:58 slope is dipping at shallow angle

17:22:27 HD off

17:24:35 almost reached the top at 1497 m, looking for final sample

17:24:48 reached the top, searching for a parking lot in order to sample

17:25:56 sampling at 5°6.116 S, 11°41.101 W, 1492 m

17:26:25 sample placed at the left corner of the porch

17:30:33 ROV is leaving the bottom. (almost) on time!

HDTV ATA-63ROV_24

ATA 63 ROV-10

HDTV ATA-63ROV_25

ATA 63 ROV-11

HDTV ATA-63ROV_26

HDTV ATA-63ROV_27

HDTV ATA-63ROV_28

HDTV ATA-63ROV_29

HDTV ATA-63ROV_30

HDTV ATA-63ROV_31

HDTV ATA-63ROV_32

ATA-63ROV-12

HDTV ATA-63ROV_33

HDTV ATA-63ROV_34

HDTV ATA-63ROV_35

ATA-63ROV-13

HDTV ATA-63ROV_36

HDTV ATA-63ROV_37

ATA 63ROV-14

HDTV ATA-63ROV_38

ATA 63 ROV-15

Cruise Number Atalante Leg 2
Station Number 67ROV
Dive Number #21
Location Red Lion
Coordinates 4°48.661S 12°22.606
Water Depth 2995
Vessel Atalante

Metadata	Observation	Actions
Timecode default	allowed	allowed

Begin Station
 9:20:00 ROV in Water
 9:30:00 Coordinates wrong in plan, need to move ship 1 mile N
 9:51:41 Fahrleiter not very happy with himself
 11:40:37 2966m depth approaching target
 11:42:31 bottom contact for ROV
 11:47:08 4°47.821/12°22.641 at depth of 3048 m
 11:47:43 hackly to pillow flow transition here
 11:48:22 Posidonia tells us that ROV direct west of smoker
 11:50:10 Proceeding towards east. Aim: locating Red Lion
 11:54:30 FOUND smoker! Shrimp Farm. NO shrimp. Apparently no hydrothermal activity.
 11:55:06 HD on, Shrimp farm
 11:55:47 4°47.822'S 12°22.602'W 3040m
 11:59:55 Proceeding towards Tannenbaum smoker
 12:00:17 Pillows are intensely covered by hydrothermal sediment
 Tannenbaum located, Mephisto visible in the distance. Tannenbaum still actively discharging black fluids from its top. Vigorous.. No shrimp. No apparent biological colonization. Ca. 5m high including
 12:01:41 foot hill of sulfide talus.
 12:02:53 HDTV Off
 12:02:54 HDTV On Tannenbaum
 12:04:44 HDTV Off
 Mephisto located. Hydrothermal discharge at top, three small orifices. Discharge appears reduced compared to last years observations. Also the colonization by shrip is substantially reduced. Only
 12:05:43 some white, shrimp patches on the to region.
 12:05:50 HD On
 12:07:42 HD Off
 12:07:54 HD ON
 12:09:21 HD Off
 12:10:05 preparing for video mapping
 12:12:25 start video mapping
 12:14:00 HD On
 12:14:10 HD Off
 12:15:21 HDTV crashed, start all over again
 12:17:06 start video mapping again
 12:26:39 HDTV circle at foot of structure completed, starting a similar round towards the top of the structure
 12:33:42 video mapping finished
 12:33:56 moving west to smoker structure that was visible in the back
 12:37:19 distance between Mephisto and Tannenbaum measured to be 8 m
 12:37:50 HD On
 12:38:20 HD on at Sugar Head
 12:39:40 shrimps almost gone from Sugar Head, moreover from the entire Red Lion field
 12:39:59 HD Off
 12:42:29 back at Mephisto, searching for landing spot
 12:44:50 HD On
 12:48:51 landing on top of structure
 12:48:59 HD Off
 12:50:51 start sampling for shrimp with slurp gun
 12:55:44 HD On
 12:55:59 HD Off
 12:57:52 left the ground...
 12:59:23 Back at Mephisto
 13:07:10 Still trying to slup shrimp while flying
 Difficulty is to find a suitable spot for landing and fixing the ROV. Slurping while flying is apparently
 13:11:41 not an option.
 13:13:59 ROV apparently fixed in the same position than previously, just before slup sampling initiated
 Slurping going on, apparently 1 or 2 shrimp caught + one carb! Sitting in Slup container 1. Caroussel
 13:15:27 turned to position 2.
 13:19:37 One shrimp is caught in the sample shamber.
 13:20:40 Trying to obtain samples while flying but there is apparently a lot of turbulence making flying difficult.
 Trying to suck shrim one by one... But there does not seem to be enough strength in the slurping.
 However, at least 2 shrimp have been caught. Sample in slurp container 2. Slurp gun container
 13:21:28 shifted to position 3.
 13:24:08 Slurp gun broken. T handle ripped off.
 13:28:54 ROV pilot shift change.
 13:32:14 next operation: Get fluid sample with Ti major.
 13:33:17 HD on. Nice picture

HDTV ATA-67ROV_1

HDTV ATA-67ROV_2

HDTV ATA-67ROV_3

HDTV ATA-67ROV_4

HDTV ATA-67ROV_6

HDTV ATA-67ROV_7

HDTV ATA-67ROV_8

ATA-67ROV-1

ATA-67ROV-2

13:34:10	HD off	HDTV ATA-67ROV_10
13:37:10	oil bubbles visible in slurp gun image	
13:39:06	slowly approaching top smokers	
13:39:15	HD On	HDTV ATA-67ROV_11
13:39:45	HD off nice picture of shimmering beehive	
13:41:32	New orifice open due to sudden beehive collapse.	
13:45:13	Plan: Fill Ti major bottles	
13:47:18	Ti major number D2 in Orion.	
13:49:42	HD on	HDTV ATA-67ROV_12
13:50:22	Placing Ti major nozzle in new orifice is difficult	
13:54:30	Ti major nozzle upright in orifice	
13:56:44	HD off	
14:01:05	Ti major release is difficult...	
	Technical note: ROV is losing oil. Projected time left for diving: 3h 20 min. Priorities: Filling KIPS and	
14:05:56	locating oceanographic tools.	
14:07:54	Still working on releasing Ti major	
14:14:43	this Ti major bottle does not seem to be able to be released...	
14:15:30	Rigmaster comes to the rescue	
14:26:46	Ti major now held by Rigmaster, will be released with the Orion arm	
14:29:54	Ti major released, D2 sampled	ATA 67ROV-3
14:34:11	compensator pressure is at 50%	
14:36:20	placing Ti major in back part of the sample box	
14:39:36	HD on	HDTV ATA-67ROV_13
14:40:12	HD off	
14:44:42	sampling smaller chimney near to the big hole, believed to be more vigorously emanating	
14:46:31	measured T max is 340°C, 365°C	
14:48:17	pump on, filling bottle C9, clear fluid at exhaust	ATA 67 ROV-4
14:49:27	HD on	HDTV ATA-67ROV_14
14:51:46	pump off, then pump on	ATA 67 ROV-5
14:51:51	filling bottle C8, T stable at 363°C	
14:52:23	HD off	
14:54:29	pump off	
14:54:39	pump on, filling bottle C7	ATA 67 ROV-6
14:58:45	pump off	
14:58:58	pump on, filling bottle B6	ATA 67 ROV-7
15:03:14	pump off and on again, filling bottle B5, clear fluid coming out of exhaust	ATA 67 ROV-8
15:05:43	pump re-started for bottle B5	
15:07:37	pump off, KIPS sampling finished	
15:15:55	filling He tube at large orifice where beehive structure "collapsed" before	
15:17:12	He tube filled	ATA 67 ROV-9
15:19:13	compensator pressure is at 30% ! Coming up	
15:19:35	ROV off bottom	

Cruise Number Atalante Leg 2
Station Number 68ROV
Dive Number #22
Location NW of Comfortless Cove area
Coordinates 4°48.152'S 12°22.381'W
Water Depth 2995
Vessel Atalante

Metadata	Observation	Actions
Timecode default	allowed	allowed

Begin Station
 17:17:15 U17r.U17r ROV in water. Starting dive to recover oceanographic tool.
 17:20:57 U17r.U17r No Posidonia???
 17:26:00 U17r.U17r Posidonia Si, oui, JA.
 17:26:21 U17r.U17r 350m
 18:32:27 U18r.U18r bottom recognized with ROV sonar
 18:33:16 U18r.U18r bottom visible, depth 3002 m, position 4°48.090'S and 12°22.384'W
 18:36:38 U18r.U18r ROV over pillow lavas with plenty of sediment filling in between, searching for mooring
 18:39:44 U18r.U18r ROV flies 270
 18:40:12 U18r.U18r jumbled flow with no sediment, i.e. Is younger
 18:42:58 U18r.U18r course now 295
 18:43:32 U18r.U18r now at predicted mooring location
 18:44:09 U18r.U18r heading bit north, heavily jumbled flow, hummocky terrane
 18:46:17 U18r.U18r 4°48.098'S and 12°22.451'W
 18:47:53 U18r.U18r now checking terrane in south, heavily jumbled, hummocky terrane, bit sediment
 18:50:03 U18r.U18r proceeding south
 18:50:35 U18r.U18r 4°48.136 and 12°22.432 entering pillow terrane, pillows are above jumbled flow!
 18:52:19 U18r.U18r heading east, jumbled terrane with sediment
 18:52:55 U18r.U18r now pillows with sed with initial transitions to tubular flow
 18:56:35 U18r.U18r heading north
 18:57:40 U18r.U18r heading west 12°22.405W and 4 48.110'S
 18:58:35 U18r.U18r jumbled flow no sed
 12°22.458'W and 4°48.119'S marks contact of jumbled flow against pillow, pillow appears younger,
 19:02:23 U19r.U19r however, pillowed flows has more sediment....
 19:06:38 U19r.U19r 12°22.470'W 4°48.132'S jumbled flow
 19:10:46 U19r.U19r continue to head east
 19:13:22 U19r.U19r 12°22.427 and 4°48.098'S, contact jumbled (so far) into pillow
 19:15:41 U19r.U19r pillows with abundant collapse structures
 19:18:09 U19r.U19r 12°22.405 and 4°48.104'S, turning south
 19:19:53 U19r.U19r heading west 4°48.109 and 12°22.403 pillows with sediment
 19:22:11 U19r.U19r all jumbled now with no sediment
 perhaps lobate at tip transitional to pillow, only lobate can collapse to form jumbled, thus jumbled
 against pillows, both have same age
 19:26:38 U19r.U19r continue west in jumbled flows
 19:30:31 U19r.U19r 12°22.472'W and 4°48.1109 S, heading south
 19:30:54 U19r.U19r now into pillows then into jumbled
 19:32:59 U19r.U19r 12°22.467'W and 48.116°S heading E
 19:33:49 U19r.U19r still jumbled
 19:36:29 U19r.U19r heading north 12.22.433'W and 4°48.097'S
 19:38:12 U19r.U19r heading east 12.22.432 and 4.48.096'S
 19:39:04 U19r.U19r contact to Pillow flow marked by lobate structures
 19:39:51 U19r.U19r big pillows
 19:40:59 U19r.U19r looking around. Pillows everywhere
 19:42:11 U19r.U19r 22.412W 48.087S Pillows
 19:43:35 U19r.U19r Turned back W. Crossing over into jumbled flow.
 19:48:13 U19r.U19r jumbled flow heading W
 19:53:57 U19r.U19r No Posidonia readings. Turning back east.
 19:54:44 U19r.U19r still jumbled flow
 Crossing into lobate flow overlying jumbled flow to the east. However, as usual this lobate to pillowed
 flow appears to be more strongly covered by sediment than the jumbled flow. Still it is lying on top of
 it...
 19:59:19 U19r.U19r moving upwards, 3004m This is a pillow mound.
 20:03:23 U20r.U20r Turning around. Pillows everywhere. 3004m
 20:04:54 U20r.U20r 22.417'W 48.068'S Pillows
 20:10:15 U20r.U20r Heading West
 20:10:36 U20r.U20r Back in jumbled flow
 20:10:47 U20r.U20r Rather: contact zone between lobate flow structures and jumbled flow.
 20:11:30 U20r.U20r Heading further south over jumbled flow.
 20:12:28 U20r.U20r 22.439'W 48.094'S jumbeld flow. 3006 m
 20:14:20 U20r.U20r Heading west across jumbled flow
 20:15:42 U20r.U20r jumbeld flow. 3008m. Still heading West.
 20:18:06 U20r.U20r heading north
 20:19:14 U20r.U20r jumbled flow. 3010m
 20:21:30 U20r.U20r turning around. Jumbled flow everywhere.
 20:23:25 U20r.U20r Jumbled flow. Steeplly hummocky terrain.
 20:24:09 U20r.U20r Heading south.
 20:26:02 U20r.U20r Heading east. Jumbled flow.
 20:26:27 U20r.U20r Contact to lobate flow in the east appears. Clearly this is overlying the jumbled flow!
 20:27:28 U20r.U20r Turning around. To the south: Jumbled flow.
 20:28:21 U20r.U20r 22.451'W 48.072'S: Contact zone.
 20:29:22 U20r.U20r Lobate to pillowed flow.
 20:30:01 U20r.U20r Pillows. 3008m
 22.421'W 48.067'S Pillow flow. Apparently the pillow flows are enclosing the jumbled flow to the
 north.
 20:31:08 U20r.U20r

20:36:19 U20r.U20r Heading south.
20:36:47 U20r.U20r 22.417°W 48.084°S Pillows. 3005m,
20:38:46 U20r.U20r Turning around. To the west there is the transition to lobate flow.
20:39:53 U20r.U20r Heading south across pillows.
20:41:19 U20r.U20r 22.400°W 48.120°S Pillows. 3002m
20:44:56 U20r.U20r pillows
20:45:26 U20r.U20r Heading W crossing into jumbeld flow
20:45:43 U20r.U20r jumbeld flow. 3005m.
20:48:44 U20r.U20r 22.436°W 48.123°S jumbeld flow. 3005 m
20:49:36 U20r.U20r heading west
20:51:20 U20r.U20r Crossing over contact: Lobate flow overlying jumbeld flow. Lobate is about 1m thick at most.
20:54:06 U20r.U20r 22.480°W 48.127°S
20:55:31 U20r.U20r Heading south.
20:58:38 U20r.U20r heading north 22.472 and 4° 48.138S
20:59:14 U20r.U20r continue in jumbeld flow
21:02:09 U21r.U21r 12°22.447°W 04°48.124°S heading east
21:02:58 U21r.U21r continue in jumbeld flow, turning to 110°
21:07:00 U21r.U21r in pillows 22.408 and 48.116
21:09:15 U21r.U21r 22.393 and 48.113 turning W
21:10:33 U21r.U21r heading west in pillows
21:14:34 U21r.U21r 22.430 and 48.115 in jumbeld flow continue west
21:19:57 U21r.U21r 22.450 and 48.116 break of search in jumbeld flow
21:31:00 U21r.U21r abandoned attempt to get a nice piece of jumbeld flow
21:34:07 U21r.U21r abandoned attempt to get a nice piece of jumbeld flow
21:34:22 U21r.U21r ready for take off
21:36:55 U21r.U21r we have a lift off

Cruise Number Atalante Leg 2
Station Number 70ROV
Dive Number #23
Location 5°S Fracture Zone
Coordinates 4°56.420'S / 11°37.044
Water Depth 4765m
Vessel Atalante

Metadata	Observation	Actions
Timecode default	allowed	allowed

Begin Station
 10:45:00 ROV in Water
 13:04:39 at bottom, depth 4864 m!!, coordinates 11°36.987W 4°56.473S
 13:08:19 test have started, working with Orion arm
 13:16:38 one horizontal thruster seems dead as of 4300 m, possible water ingress
 video looks at our payload: painted styrofoam cups. The question is: will they be more compressed at
 13:17:12 this depth than before (at 3000 m)
 13:25:12 test start
 13:59:21 tests ongoing
 14:08:20 sediment on porch, drawer does not open, will try to wipe off with knife
 feedback problem with Orion, extra 180 bars starts causing more problems than hoped, thus problems
 14:09:22 getting knife out with Orion
 14:17:24 porch cleared with knife, but drawer still does not open
 14:19:52 drawer opens! Orion has still a feedback problem, operation thus difficult
 14:20:59 knife put back, this time into drawer
 14:33:08 ongoing tests of unknown nature
 14:42:33 a rock in the sediment
 15:06:22 attempt to deploy a marker; can be difficult, since the orion has problems
 15:11:43 Orion has still problems; delay in operation; moves very slowly and not accurate
 15:13:06 stop the attempt to work with Orion
 15:16:28 stop to work with Orion
 15:44:40 technical tests completed
 15:44:48 HD on
 15:47:02 Heading N
 15:48:34 HD off
 15:50:01 Sonar: big boulders ahead at about 30 m distance
 15:50:38 passing over sediment with occasional rocks
 15:51:53 rocky blocks and boulders partly covered by sediment. 4840m
 15:54:04 Proceeding to the N
 15:55:11 sediment
 15:55:38 Sonar: blocks in about 20 m distance
 15:56:22 reached foot of rocks boulder rising about 10 m from 4820m.
 15:58:59 Sonar: Boulder ahead.
 16:00:02 Heading N. Over sediment.
 16:00:50 4800. Sediment.
 16:02:20 ROV speed: ca. 1 km/h.
 16:03:12 4780m Sediment. Heading N.
 16:08:47 Located plastic water bottle on the seafloor sediment. 4772m
 16:10:24 Heading N. Reaching sedimented boulder.
 Climbing up steep E-W striking cliff face. Looks like in-situ outcrop. Plan: Take sample with Rigmaster
 16:11:13 (since Orion is out of action...)
 16:11:41 HD On
 16:13:55 HD has been on for a while in order to document the outcrop. 4760m. 4°56.347'S 11°37.055'W
 We may spend some time here since getting a sample from this deep outcrop would be important for
 16:18:49 comparison with the previous samples from shallower depths.
 Morphology of the outcrop surface looks distinctive from the previous dives. Knobbly texture suggests a
 16:21:44 serpentinitic lithology. However, maybe this is gabbro with a different type of weathering/alteration.
 16:24:37 Orion deployment. At least a try. However, movements are hardly controllable...
 16:31:01 Orion is catastrophic, parked and de-activated
 16:33:35 Rigmaster not good at this place,
 16:35:34 Rock looks massive but heavily jointed, probably Serpentinite
 16:36:04 HD On
 16:37:21 HD Off
 16:41:12 Attempting landing
 16:51:55 Attempting sampling 4°56.336'S 11°37.057'W 4753m
 Sample taken, hopefully it will go on porch. Crumbled and just fell on porch, front right position on the
 16:53:37 porch, in front of Orion
 17:02:28 crumbly piece of rock, totally different from inside corner high, could be serpentinite
 17:13:22 HD on, rocks look more and more like serpentinite
 17:14:21 HD off
 17:16:01 climbing up heading N, rocky boulders and sediments. 4710m
 17:17:21 approaching steep cliff
 17:17:54 HD On
 17:18:01 60° dipping, N-S striking fractures.
 17:19:01 HD off, has been on for a while.
 17:20:02 4690m
 17:21:01 HD on. Investigating vertical structure. May be just a feature due to particular sediment cover
 17:22:27 HD off. The structure is due to sediment dripping down a rock face.
 Climbing up passing blocky boulders and sediment covered slopes. Rock still look similar to the lithology
 17:26:49 sampled below.
 17:27:46 HD on.

HDTV ATA-70ROV_1

HDTV ATA-70ROV_2

HDTV ATA-70ROV_3

ATA-70ROV-1

HDTV ATA-70ROV_4

HDTV ATA-70ROV_5

HDTV ATA-70ROV_6

17:27:59 Blocks present may be different types of lithologies. Investigating some whitish looking blocks. HDTV ATA-70ROV_7

17:29:09 HD off. White block may be solidified sediment tumbled down from above.

17:29:39 The knobby rock type appears to be mixed with more blocky to platy rock types.

17:30:58 Retrying Orion with one function disabled (6 of 7 working functions).

17:32:08 HD on

17:32:28 some blocks are banded HDTV ATA-70ROV_8

17:32:50 HD off.

17:37:22 Looking for parking spot in order to take a sample

17:41:40 Trying to work with Orion arm.

17:44:22 Difficult. Looking for other spot.

17:46:14 Reached steep nose-like rock cliff. Climbing up over sedimented boulder field. 4652 m. NO biology.

17:48:46 Found a new place for sampling operations.

17:51:20 "What a guy" Sample in Orion claw. Very elegantly done.

17:53:56 4°56.258'S 11°37.055'W 4654m ATA-70ROV-2

17:56:26 Placing dislodged Timajor bottle in big sampling box. So it is safely stowed now.

18:00:29 Based on morphology of the rocks there appear to be more blocky lithologies and more knobby rocks. HD on. Strange breccia-like rock with white matrix. Rounded clasts (got rounded when rolling down this slope). Internal layering visible.

18:01:32 slope). Internal layering visible.

18:02:36 HD off

18:03:14 climbing up. 4630m

18:04:10 Scree slope of rocky blocks. Little sediment cover. "Felsenmeer"

18:06:23 Probably formed as an avalanche deposit. This is a tectonically active zone!

18:06:58 Parking in order to take samples.

18:07:43 HD on. Pictures of "Felsenmeer"

18:08:14 HD off

whitish rock sample (strongly rounded) breaks apart under Orion claw. Foraminiferous Ooze? Placed in

18:11:10 Box 1. 4°56.231'S 11°37.073'W 4617m

18:15:26 Placed big platy block of Gabbro in the big sample box. Outside margin.

18:18:27 sediment and some boulders. 4605m Left "Felsenmeer"

18:20:25 Passing white rounded blocks and black platy blocks.

18:20:52 35° slope, strike 270 (E-W). Turning to get images of the slope that we have been traveling up. Apparently we have moved up into different lithologies now. The earlier rock types below (serpentine) are no more present up here. Rather this looks like avalanche and scree deposits fed by gabbroic

18:22:34 lithologies further up slope.

18:23:56 "Hangschutt" deposits.

18:24:15 Passing possible in-situ cliff of gabbro?

18:26:37 Scree slope with sediment locally with apparently young, unsedimented blocky avalanche patches.

18:27:52 Climbing N. 4557m, sedimented scree slope.

18:28:41 occasional white block, rounded together with dark platy blocks

18:32:29 Step in the topo., looks like massive gabbro makes a small cliff

18:32:53 HD On

18:33:50 HD Off

18:42:12 4°56.145'S 11° 37.088'W 4515m

18:51:09 In situ, we will take a sample

18:51:35 HD On

18:52:59 HD Off

18:55:24 Landed, full of sed. Clouds

18:58:35 4°56.124'S 11°37.111'W 4468m. Sample taken and put on top of 1a

19:02:06 Large wall in front of us.

19:04:09 Going sidewaysw to look at slope

19:10:27 Think we are still in gabbros

19:12:57 Big gabbro block

19:14:20 HD On

19:14:32 Heavily tectonised

19:15:11 Banded, bands dipping ca. 45° to E, start of cliff 4350m

19:16:14 HD Off

19:16:21 Going back down for sample, cliff is >20m high and vertical

19:19:42 HD On

19:20:52 Lava tube cut so that cooling joints visible, although Günter thinks it is a shear zone

19:21:09 HD Off

19:23:41 HD On

19:24:10 HD Off

19:27:17 Going to land, no sampling possible in hover

19:28:08 HD On

19:29:36 HD Off

19:32:29 No chance to take sample, going up

19:34:37 HD On

19:35:21 HD Off We see small intrusions with hyaloclastites around

19:37:02 HD On

19:38:50 OK; Günter may be correct, several zones with lineations dipping 45° to E.

19:39:30 HD Off

19:42:08 Going in again

19:44:17 Sample grabbed 4 56.046'S 11°37.131 4343m in Box 2

19:45:06 Hdon

19:45:15 HD Off

19:46:52 Cliff strikes E-W, difficult to determine orientation of other structures

19:47:27 Schichten 50° nach SE einfallen, lineation is 20° on this

19:50:42 Still climbing up the cliff, 4310m Lithology unchanged.

19:52:32 Steep vertical cliff face. Some biology, occasional sediment dusting.

19:54:00 Reaching strongly sedimented portion of slope. 4295m Still rising steeply but with thick sediment cover.

19:54:53 4292m

19:56:00 Climbing steep cliff. 4289m

HDTV ATA-70ROV_9

HDTV ATA-70ROV_10

ATA-70ROV-3

ATA-70ROV-4

HDTV ATA-70ROV_11

ATA-70ROV_5

HDTV ATA-70ROV_12

ATA-70ROV_6

HDTV ATA-70ROV_13

HDTV ATA-70ROV_14

HDTV ATA-70ROV_15

HDTV ATA-70ROV_16

HDTV ATA-70ROV_17

HDTV ATA-70ROV_18

ATA-70ROV_7

HDTV ATA-70ROV_19

19:59:27 HD On
 20:00:18 Going to structure dipping to ESE
 20:01:48 HD Off
 20:02:46 Wall is vertical, the marks on wall dip to E and S, perhaps two ages of structures
 20:03:20 HD On
 20:04:20 HD Off
 20:06:46 Going in for sample
 20:09:31 HD On
 20:09:46 HD Off
 20:12:40 Sample grabbed 4 56.028 11 37.114 4252m taken on the fly, put in box 3
 20:13:00 HD On
 20:14:49 HD Off
 20:16:47 Break in slope, 4242 m depth
 20:20:42 Strike E-W, dip to S with 45°, clearly visible on sedimented slope
 20:22:03 Taking a sample, easy to get. But didn't work
 20:26:24 Joints dipping to W with 80°
 20:29:24 4 56.006° S 11°37.118 4218m sampling attempt
 20:31:20 HD On
 20:32:12 HD Off
 20:32:18 Seespinne (8 legs)
 20:34:11 Steep slope down to S
 20:37:11 Looks massive, lots of joints, not apparently fully deformed
 20:38:45 4 55.990 11 37.124 4175m, sample in box 2
 20:38:58 HD On
 20:39:14 HD Off
 20:40:58 HD On
 20:41:56 HD Off
 20:42:04 HD On
 20:42:14 Hyaloclastites in background E-W strike, 80° S dip
 20:42:51 HD Off
 20:43:35 HD On
 20:48:17 HD Off
 20:48:38 Steep wall again
 20:49:20 HD On
 20:49:54 HD Off
 20:51:27 Last sampling attempt
 20:51:35 HD On
 20:52:41 HD Off Even Jürgen and Günter think that this is volcanic!!
 20:53:29 Completely steep wall, different rock type
 20:54:08 HD ON
 20:55:06 HD Off
 20:56:57 HD On
 20:58:44 HD Off
 20:59:26 sonar shows a flat surface some 300 m above
 21:00:02 wall: strike 25°, dip SW 30° ???
 21:06:10 HD on for landscape pictures
 21:06:45 HD off
 21:07:43 planning to collect a sample
 21:13:58 collect a sample at: 4°55.983 S, 11°37.113 W, 4063m, placed in large box in the back
 21:21:31 HD on - fish
 21:22:09 HD off
 21:23:59 more sedimented somewhat flat area
 21:27:07 crossing a large flat surface, sediment covered, some blocks, looked more like gabbro
 21:30:05 depth is 4000m in contrast to existing map that shows 3900m
 21:30:51 again some rocks
 21:33:58 Strike E-W, dip to S with 25 to 30°
 21:37:21 collect a sample at: 4°55.895 S, 11°37.148 W, 3996m, angular+platy, placed in box 2
 21:43:34 steepness of the slope is increasing again which fits the topographic map
 21:45:26 HD on, rocks look more volcanic again
 21:46:42 HD off
 21:54:34 slope shows lots of sediment and debris flows/talus, no real outcrop for sampling
 21:58:58 HD on, looking for spot to sample
 22:00:15 collecting sample at: 4°55.816 S, 11°37.166 W, 3897m, placed in the back box, fist size
 22:03:04 HD off
 22:07:54 changing NNW, topographic map shows a high
 22:09:56 HD on
 22:10:34 HD off
 22:11:55 HD on
 22:12:23 HD off
 22:13:58 HD on
 22:16:55 HD off
 22:17:13 collecting a small sample of presumed serpentinite breccia, placed in the back box
 22:26:17 HD on
 22:26:58 HD off
 22:27:28 problems with thruster
 22:28:53 4° 55.765 S, 11° 37.201 W, 3825m (noted a few moments later)
 22:29:45 collecting another sample at 4°55.757 S, 11°37.212 W, 3815m, box 2, front part
 22:32:08 ROV leaving the bottom
 22:33:42 HD on
 22:34:16 HD off

HDTV ATA-70ROV_20

HDTV ATA-70ROV_21

HDTV ATA-70ROV_22
ATA-70ROV_8

HDTV ATA-70ROV_23

HDTV ATA-70ROV_24

ATA-70ROV_9

HDTV ATA-70ROV_25

HDTV ATA-70ROV_26

HDTV ATA-70ROV_27

HDTV ATA-70ROV_28

HDTV ATA-70ROV_29

HDTV ATA-70ROV_30

HDTV ATA-70ROV_31

HDTV ATA-70ROV_32

HDTV ATA-70ROV_33

ATA 70ROV-10

HDTV ATA-70ROV_34

ATA 70ROV-11

HDTV ATA-70ROV_35

ATA 70ROV-12
HDTV ATA-70ROV_36

HDTV ATA-70ROV_37

HDTV ATA-70ROV_38

HDTV ATA-70ROV_39
ATA 70ROV-13

HDTV ATA-70ROV_40

ATA 70ROV-14

HDTV ATA-70ROV_41