

Lau Basin 2009

TN-235 Cruise Report
16 May - 8 June 2009

R/V Thompson
Jason II

C. Fisher, chief scientist
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CRUISE SUMMARY

East Lau Basin RV Thomas Thompson and ROV Jason II
Cruise TN 235, J II dives 421 – 433
Depart Apia, Samoa 5/16/09 at 0900
Arrive in Tonga at 0900 on 6/08
PIs: C. Fisher, P. Girguis and G. Luther

In addition to the members of the laboratories of the 3 PIs, the cruise included 1 observer/scientist from Tonga, 3 scientists from France, 1 from Austria and guests from 3 other US institutions.

This was a very successful cruise with less than 24 hours lost to weather and no time lost to equipment or ship problems. We conducted a total of 12 dives spread over 5 well-studied vent sites along the ELSC.

Our primary purpose was to study the physiological and behavioral ecology of ELSC vent fauna. Our methodology included a combination of in-situ imaging and habitat characterization through in-situ measurements of chemistry and temperature, in-situ behavioral experiments, an intensive ship-board series of experiments with live animals, and sampling for later laboratory analyses:

- We returned to 14 long-term monitoring sites and documented changes in vent communities along with changes in vent flow patterns and fluid chemistry.
- We “dissected” 15 aggregations of mussel and/or snails and used in-situ chemistry and temperature measurements to examine the effects of these animal aggregations on vent fluid flow and chemistry.
- We conducted behavioral experiments involving experimental small scale transplants of the two snail species to delineate behavioral interactions that might influence the realized distribution patterns we have documented.
- We made biological collections every dive for ship board experiments with live animals and fresh tissues and for future laboratory experiments.
- We made linked macrofauna/meiofauna collections from each of the communities formed around the primary symbiont-containing fauna.
- We recovered 2 thermistor arrays and 5 hobo’s which had been monitoring T in diffuse flow or chimneys for 2-3 years
- Recovered 7 osmo samplers deployed for 3 years and processed these for further chemical and microbial analyses in collaboration with Geoff Wheat.
- We recovered 30 larval settlement blocks for S. Kim

We have just begun analysis of our data, however a few observations are worth noting at this time:

- Overall there have been no large-scale changes at the sites, despite the volcanic activity in the area over the previous year. Some individual sites had waned, some

TN-235 Cruise Report: Cruise Summary

of our long-term monitoring sites died, some were more active, but most were basically the same. These communities are relatively stable.

- Nonetheless, we do have good evidence for successional patterns in megafauna communities that are similar to what we had predicted from our earlier studies.
- Chimneys on the ELSC can be very stable structures, effectively supporting long lived “diffuse flow” communities near the tops of cool chimneys without smokers.
- There are two species of Alviniconcha snails at Lau, with two types of symbiont.
- Both snails and mussels spread sources of vent flow and change the chemistry as it passes through them and as a result created an expanded and altered habitat for other animals and microbes.

Completed JASON dives:

Dive Number	Site	Start date/time	End date/time
421	Kilo Moana	2009/05/18 19:02	2009/05/19 11:05
422	Tow Cam	2009/05/19 23:00	2009/05/20 11:08
423	ABE	2009/05/20 23:05	2009/05/22 05:36
424	Kilo Moana	2009/05/22 19:04	2009/05/23 20:17
425	ABE	2009/05/24 05:11	2009/05/25 06:59
426	ABE	2009/05/25 18:59	2009/05/26 18:55
427	ABE	2009/05/27 03:04	2009/05/27 19:10
428	Tu'i Malila	2009/05/28 10:59	2009/05/30 03:03
429	Mariner	2009/05/30 15:07	2009/05/31 07:08
430	Tu'i Malila	2009/05/31 23:08	2009/06/02 19:09
431	ABE	2009/06/03 07:44	2009/06/03 20:55
432	Tow Cam	2009/06/03 20:09	2009/06/05 19:07
433	Kilo Moana	2009/06/06 03:00	2009/06/07 11:06

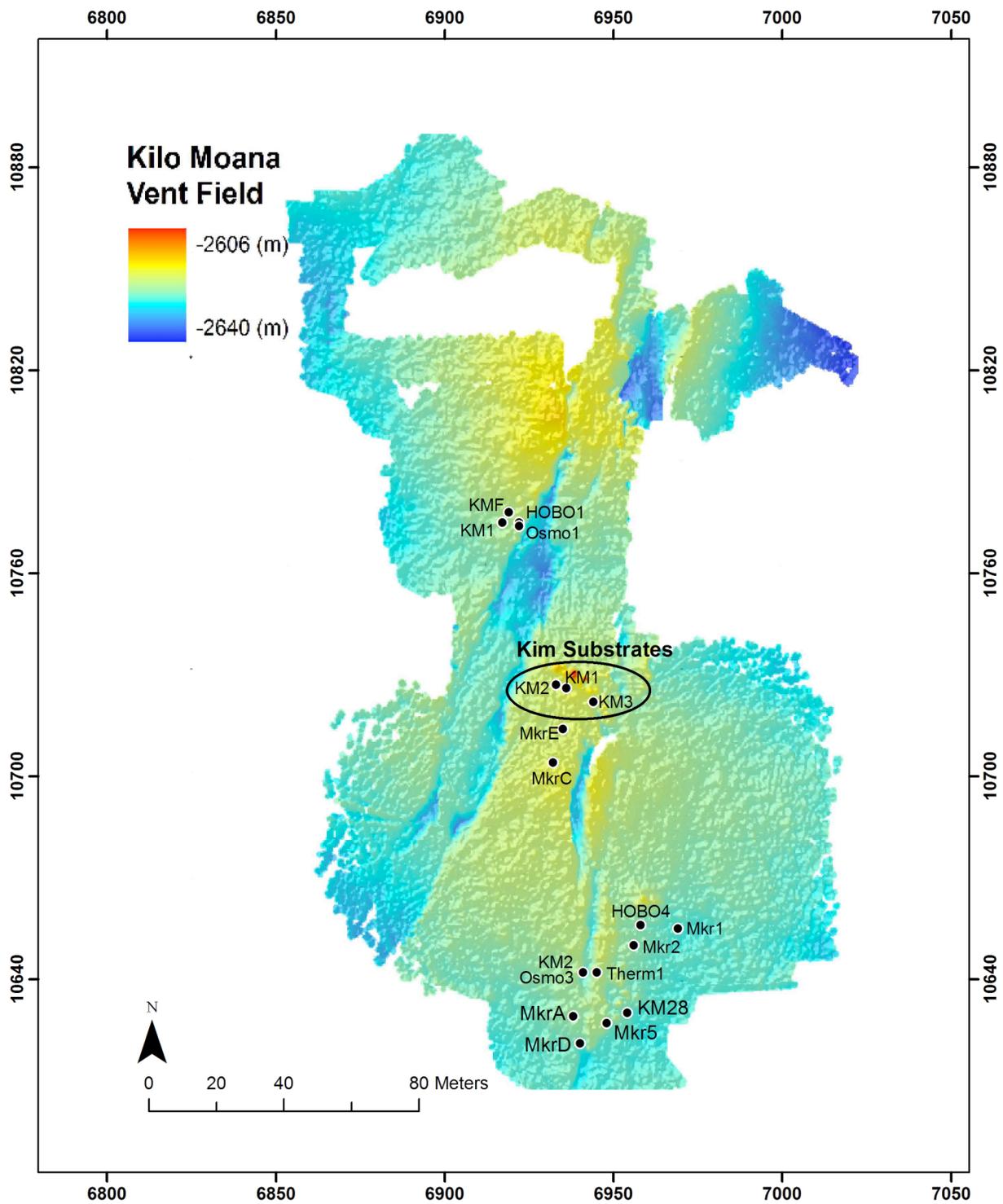
Approximate distances between sites:

	Kilo Moana	Tow Cam	ABE	Tu'i Malila	Mariner
Kilo Moana	-	29 km	79 km	219 km	241 km
Tow Cam		-	50 km	191 km	212 km
ABE			-	141 km	163 km
Tu'i Malila				-	22km
Mariner					-

CRUISE PARTICIPANTS

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KILO MOANA in Local X,Y



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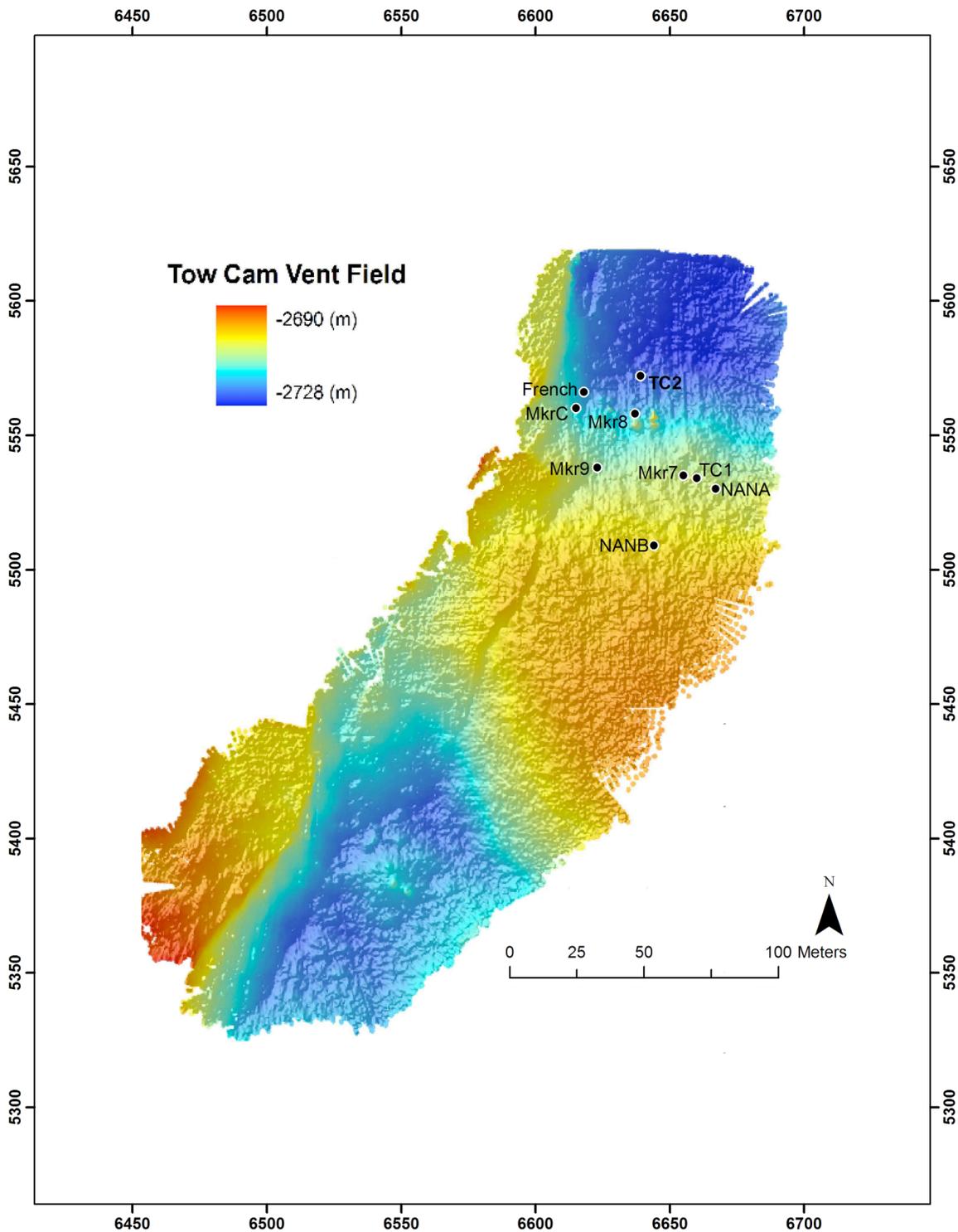
Kilo Moana Events

Event	Object	Date	Time	VentField	Latitude	Longitude	LocalX	LocalY	Depth (m)
HOBO	HOBO1	2006-09-06	19:08	KM	-20.05267	-176.13379	6922	10775	2621
HOBO	HOBO4	2006-09-17	03:14	KM	-20.05374	-176.13345	6958	10656	2615
Marker	Marker 1	2006-09-17	5:31	KM	-20.05375	-176.13335	6969	10655	2622
Marker	Marker 2	2006-09-17	2:38	KM	-20.05379	-176.13347	6956	10650	2616
Marker	Marker 5	2006-09-17	7:06	KM	-20.05400	-176.13354	6948	10627	2617
Marker	Marker A MBARI	2006-09-08	2:49	KM	-20.05398	-176.13364	6938	10629	2622
Marker	Marker C	2006-09-08	4:31	KM	-20.05331	-176.13370	6932	10704	2619
MosaicCH	Marker D	2006-09-17	08:44	KM	-20.05408	-176.13363	6941	10621	2620
MosaicCH	Marker E	2006-09-17	16:48	KM	-20.05323	-176.13369	6936	10714	2618
MosaicDF	Marker 29 (KM1)	2006-09-06	20:32	KM	-20.05266	-176.13384	6917	10776	2615
MosaicDF	Marker 54 (KM2)	2006-09-08	01:00	KM	-20.05388	-176.13363	6938	10641	2619
MosaicDF	Marker 55 (KM2)	2006-09-08	01:18	KM	-20.05390	-176.13360	6942	10638	2620
MosaicDF	Marker 56 (KM2)	2006-09-08	01:05	KM	-20.05386	-176.13361	6941	10643	2620
MosaicP	Marker 28 (KM28)	2006-09-07	17:17	KM	-20.05397	-176.13348	6954	10631	2625
MosaicP	Marker F (KMF)	2006-09-07	18:18	KM	-20.05263	-176.13382	6920	10779	2618
Osmosampler	Osmo1	2006-09-06	19:17	KM	-20.05267	-176.13379	6922	10774	2621
Osmosampler	Osmo3	2006-09-16	23:53	KM	-20.05387	-176.13361	6941	10642	2619
Substrate	KM1	2006-09-17	18:01	KM	-20.05311	-176.13366	6936	10726	2622
Substrate	KM2	2006-09-17	18:43	KM	-20.05310	-176.13368	6933	10727	2622
Substrate	KM3	2006-09-17	19:23	KM	-20.05314	-176.13358	6944	10722	2622
Thermistor	Therm1	2006-09-16	23:08	KM	-20.05386	-176.13357	6945	10642	2620

Kilo Moana Events (con't)

Object	Comments	Notes
HOBO1	In chimney with Osmosampler - @ northern extent of KM	
HOBO4	In chimney at Marker 2	
Marker 1	Chimney	
Marker 2	HOBO deployment; Base of chimney complex;	
Marker 5	Chimney; stalked barnacles	
Marker A MBARI	"Shrimp Sauna;" mussels	
Marker C	Chimney	
Marker D	Chimney mosaic	
Marker E	Chimney mosaic; "Bullseye"	
Marker 29 (KM1)	Diffuse flow mosaic	
Marker 54 (KM2)	Diffuse flow mosaic	
Marker 55 (KM2)	Diffuse flow mosaic	
Marker 56 (KM2)	Diffuse flow mosaic	
Marker 28 (KM28)	Periphery mosaic	
Marker F (KMF)	Periphery mosaic	
Osmo1	In chimney with High Temp probe	
Osmo3	Deployed with thermistor array in center of a mosaic site (KM2)	
KM1	HB2K,AA3K,MA1K,LB2K	
KM2	LB1K,HB3K, AA2K, MA2K	
KM3	LB3K,AA1K, MA3K, HB1K	
Therm1	Deployed in diffuse flow with osmosampler (KM2)	

TOW CAM in Local X,Y



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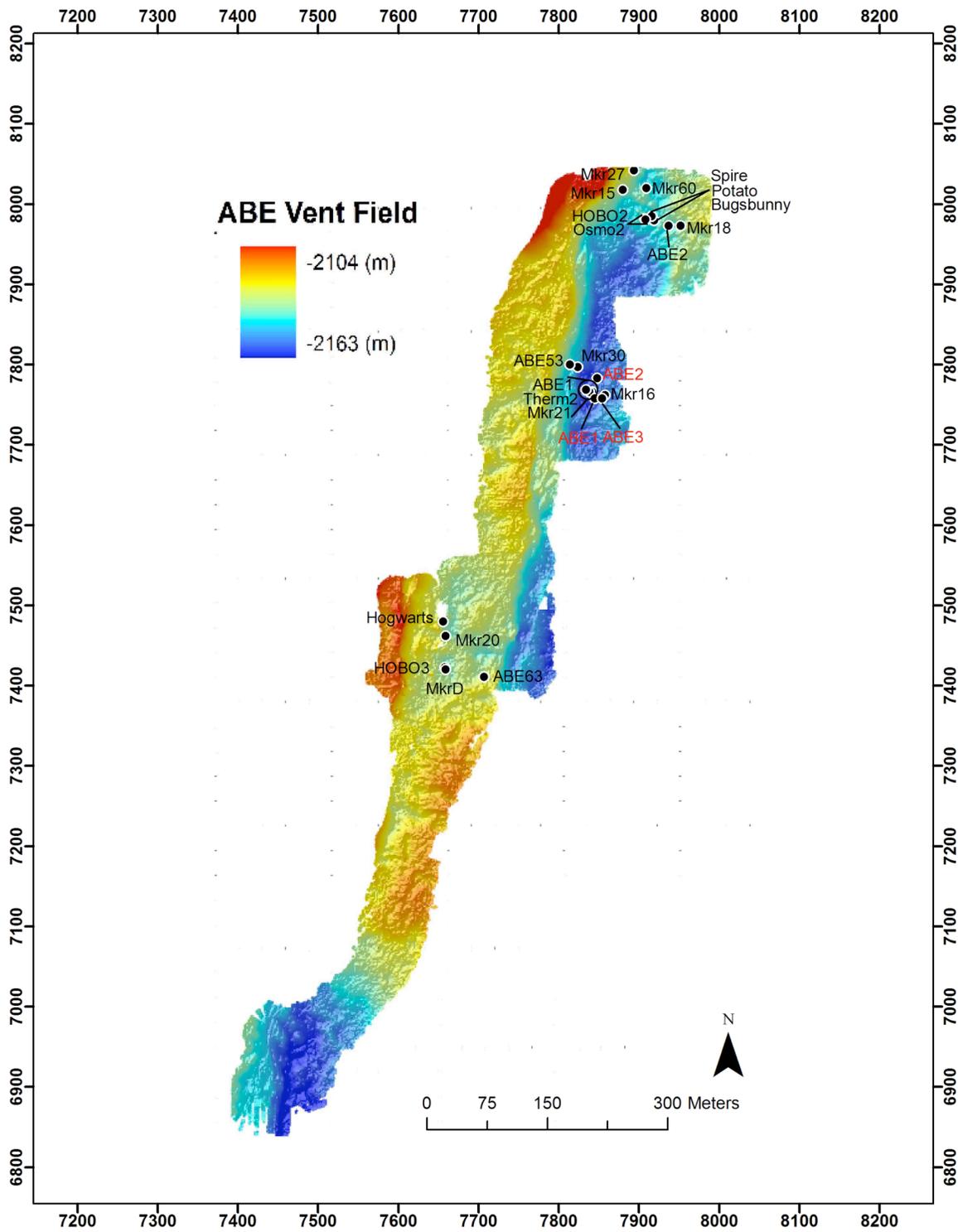
Tow Cam Events

Event	Object	Date	Time	VentField	Latitude	Longitude	LocalX	LocalY	Depth (m)
Marker	MkrC	2006-09-13	12:09	TC	-20.31644	-176.13664	6615	5560	2704
Marker	Mkr8	2006-09-29	14:38	TC	-20.31646	-176.13643	6637	5558	2718
Marker	Mkr7	2006-09-13	04:52	TC	-20.31667	-176.13626	6655	5535	2708
Marker	Mkr9	2006-09-29	22:19	TC	-20.31633	-176.13682	6596	5573	2704
MosaicCH	MkrJJ (French)	2006-09-29	16:55	TC	-20.31638	-176.13661	6619	5567	2716
MosaicDF	Mkr31 (TC1)	2006-09-13	03:27	TC	-20.31667	-176.13620	6661	5534	2706
MosaicDF	Mkr64 (TC2)	2006-09-29	15:12	TC	-20.31635	-176.13645	6635	5570	2723
MosaicDF	MkrJ (TC2)	2006-09-30	00:30	TC	-20.31626	-176.13645	6635	5580	2724
MosaicP	NANA	2006-09-13	17:38	TC	-20.31671	-176.13614	6667.11	5530.74	2705
MosaicP	NANB	2006-09-13	20:07	TC	-20.31690	-176.13636	6644.08	5509.89	2701
Collection	tubeworms	2006-09-29	10:38	TC	-20.31626	-176.13684	6594	5580	2704

Tow Cam Events (con't)

Object	Comments	Notes
MkrC		
Mkr8	chimneys	
Mkr7	chimney	
Mkr9	Alviniconcha and tubeworms	
MkrJJ (French)	Chimney mosaic	
Mkr31 (TC1)	Diffuse flow mosaic	
Mkr64 (TC2)	Diffuse flow mosaic	
MkrJ (TC2)	Diffuse flow mosaic	
NANA	Periphery mosaic (no marker)	
NANB	Periphery mosaic (no marker)	
tubeworms	Alviniconcha and tubeworms	

ABE in Local X,Y



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ABE EVENTS

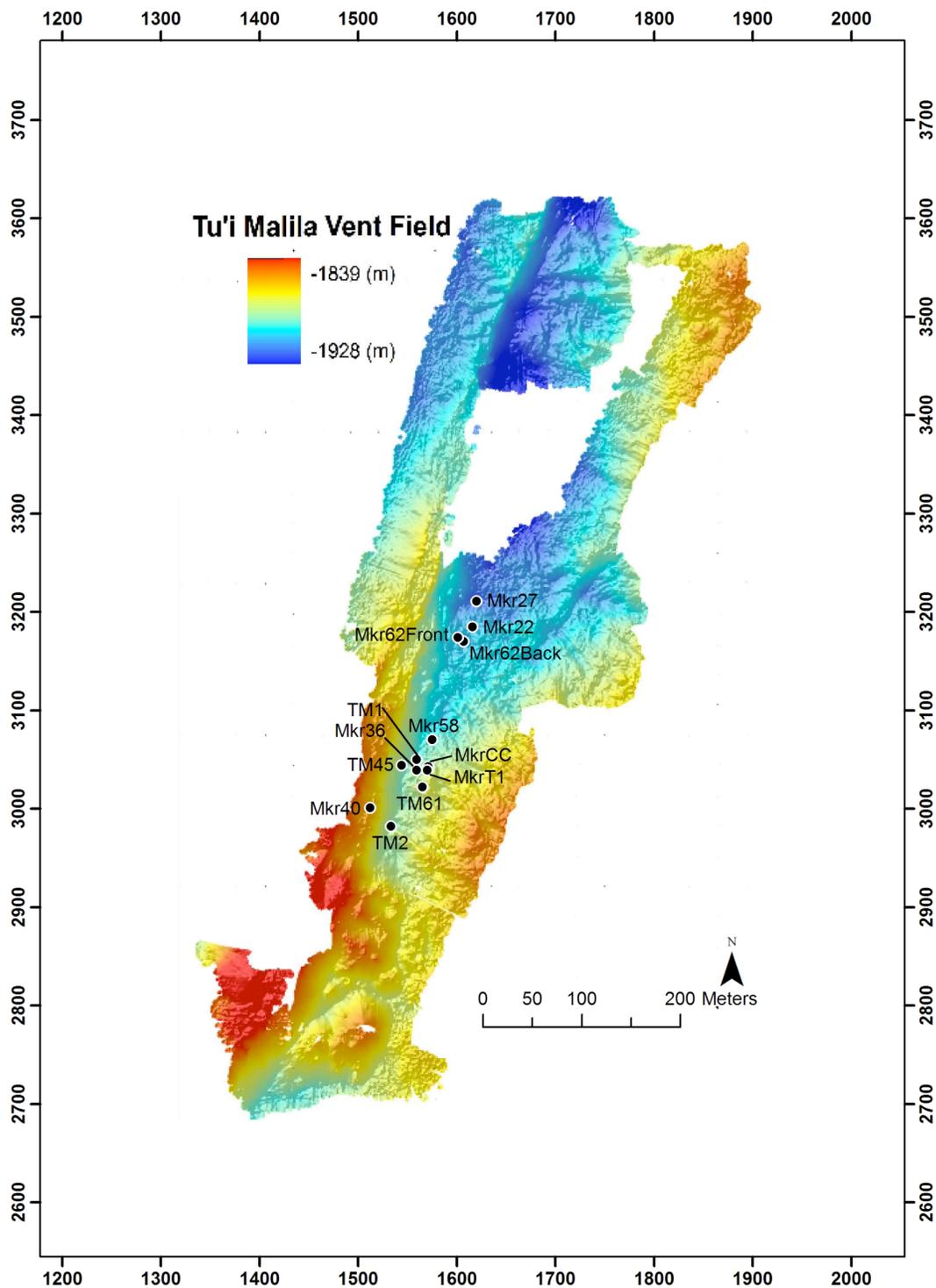
Event	Object	Date	Time	VentField	Latitude	Longitude	LocalX	LocalY	Depth (m)
HOBO	HOBO2	2006-09-09	01:05	ABE	-20.76124	-176.19070	7907	7982	2141
HOBO	HOBO3	2006-09-15	01:59	ABE	-20.76629	-176.19309	7658	7423	2129
Marker	Mkr15	2006-09-09	01:57	ABE	-20.76091	-176.19097	7880	8018	2133
Marker	Mkr16	2002-09-25	01:57	ABE	-20.76322	-176.19117	7858	7762	2149
Marker	Mkr18	2006-09-25	22:10	ABE	-20.76131	-176.19027	7952	7973	2141
Marker	Mkr20	2002-09-08	20:00	ABE	-20.76593	-176.19308	7659	7462	2132
Marker	Mkr21	2002-09-08	06:56	ABE	-20.76319	-176.19133	7842	7766	2151
Marker	Mkr27	2002-09-08	02:30	ABE	-20.76069	-176.19082	7894	8042	2131
Marker	Mkr30	2002-09-08	12:25	ABE	-20.76291	-176.19150	7824	7797	2138
Marker	Mkr60	2002-09-08	03:20	ABE	-20.76089	-176.19068	7909	8020	2138
Marker	MkrD	2002-09-18	11:10	ABE	-20.76631	-176.19308	7659	7420	2131
MosaicCH	MkrAA (Hogwarts)	2002-09-08	21:39	ABE	-20.76578	-176.19314	7653	7479	2131
MosaicCH	MkrG (BugsBunny)	2002-09-24	15:05	ABE	-20.76124	-176.19060	7917	7981	2141
MosaicCH	Potato	2006-09-25	11:54	ABE	-20.76125	-176.19058	7919	7980	2141
MosaicCH	Spire	2006-09-25	15:14	ABE	-20.76120	-176.19061	7916	7986	2141
MosaicDF	Mkr32 (ABE2)	2006-09-09	04:48	ABE	-20.76131	-176.19041	7937	7973	2142
MosaicDF	Mkr49 (ABE2)	2002-09-08	04:45	ABE	-20.76131	-176.19041	7938	7973	2140
MosaicDF	Mkr50 (ABE1)	2006-09-09	10:23	ABE	-20.76317	-176.19140	7834	7768	2144
MosaicDF	Mkr51 (ABE1)	2002-09-08	06:56	ABE	-20.76319	-176.19133	7842	7766	2151
MosaicDF	Mkr52 (ABE1)	2006-09-09	07:08	ABE	-20.76318	-176.19136	7839	7767	2147
MosaicP	Mkr46 (ABE53)	2002-09-08	12:31	ABE	-20.76285	-176.19159	7815	7803	2133
MosaicP	Mkr48 (ABE53)	2002-09-14	16:43	ABE	-20.76286	-176.19159	7814	7802	2135
MosaicP	Mkr53 (ABE53)	2002-09-08	12:38	ABE	-20.76288	-176.19159	7815	7800	2133
MosaicP	Mkr63 (ABE63)	2002-09-13	22:21	ABE	-20.76639	-176.19260	7710	7411	2131
MosaicP	Mkr65 (ABE63)	2002-09-13	22:27	ABE	-20.76639	-176.19258	7711	7411	2131
Osmosampler	Osmosampler2	2006-09-09	01:13	ABE	-20.76124	-176.19069	7908	7981	2142
Substrate	ABE1	2006-09-08	16:34	ABE	-20.76326	-176.19130	7845	7758	2153
Substrate	ABE2	2006-09-08	17:00	ABE	-20.76303	-176.19127	7848	7783	2153
Substrate	ABE3	2006-09-08	17:54	ABE	-20.76326	-176.19121	7854	7758	2156
Thermistor	Thermistor2	2002-09-17	22:01	ABE	-20.76316	-176.19140	7834	7769	2145

TN-235 Cruise Report: Site Maps

ABE EVENTS (con't)

Object	Comments	Notes
HOBO2	In chimney with Osmosampler	
HOBO3	In chimney - yellow and red majors taken here	
Marker 15	Mussels	
Marker 16	Chimney complex; snails	
Marker 18	flange	
Marker 20	Chimneys	
Marker 21	Near ABE1	
Marker 27	"wild symbiont"	
Marker 30	Peripheral area	
Marker 60	Potential diffuse flow mosaic (never mosaicked)	
Marker D	HOBO3 deployment; Base of chimney	
Marker AA (Hogwarts)	Chimney mosaic	
Marker G (BugsBunny)	Chimney mosaic	
Potato	Chimney mosaic	
Spire	Chimney mosaic	
Marker 32 (ABE2)	Diffuse flow mosaic	
Marker 49 (ABE2)	Diffuse flow mosaic	
Marker 50 (ABE1)	Diffuse flow mosaic	
Marker 51 (ABE1)	Diffuse flow mosaic	
Marker 52 (ABE1)	Diffuse flow mosaic	
Marker 46 (ABE53)	Periphery mosaic	
Marker 48 (ABE53)	Periphery mosaic	
Marker 53 (ABE53)	Periphery mosaic	
Marker 63 (ABE63)	Periphery mosaic	
Marker 65 (ABE63)	Periphery mosaic	
Osmosampler2	near ABE1	
ABE1	HB3A, AA2A, LB1A, MA31	
ABE2	AA3A, LB2A, HB1A, MA1A	
ABE3	HB2A, MA2A, LB31, AA1A	
Thermistor2	Deployed in diffuse flow (ABE1)	

TU'I MALILA in Local X,Y



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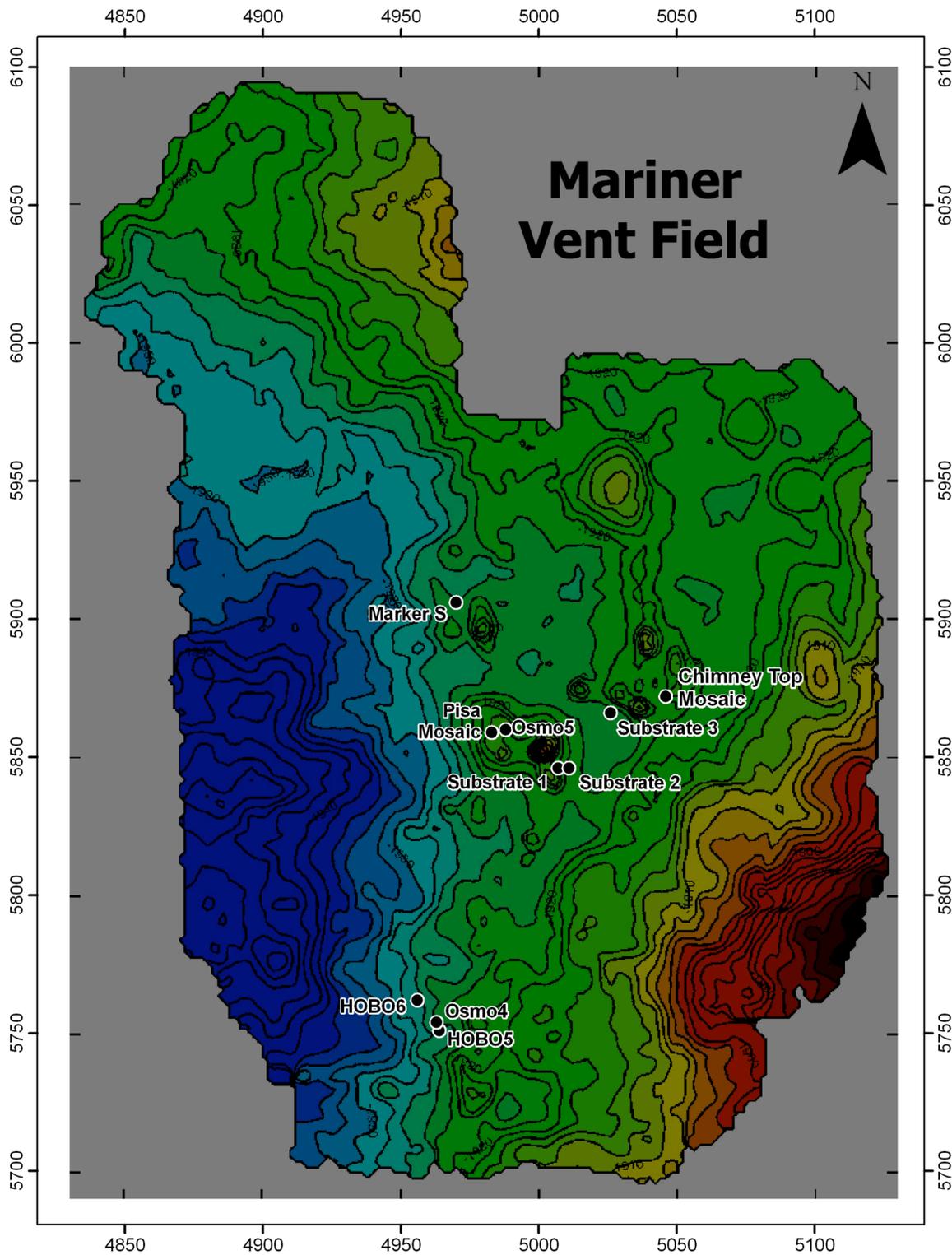
Tu'i Malila Events

Event	Object	Date	Time	VentField	Latitude	Longitude	LocalX	LocalY	Depth (m)
Marker	Mkr22	2006-09-11	03:32	TM	-21.98790	-176.56768	1616	3185	1893
Marker	MkrT1	2006-09-11	11:27	TM	-21.98922	-176.56813	1570	3039	1879
Marker	Mkr27	2006-09-11	02:53	TM	-21.98766	-176.56764	1620	3211	1899
Marker	Mkr40	2006-09-12	05:55	TM	-21.98957	-176.56869	1512	3001	1861
MosaicCH	Mkr62 (front&back)	2006-09-28	07:36	TM	-21.98799	-176.56783	1601	3175	1894
MosaicDF	Mkr43 (TM1)	2006-09-10	20:58	TM	-21.98911	-176.56823	1559	3051	1888
MosaicDF	Mkr44 (TM1)	2006-09-10	20:05	TM	-21.98916	-176.56827	1555	3045	1884
MosaicDF	Mkr42 (TM1)	2006-09-10	20:05	TM	-21.98916	-176.56827	1555	3045	1884
MosaicDF	Mkr35 (TM2)	2006-09-12	04:06	TM	-21.98973	-176.56848	1533	2982	1879
MosaicP	Mkr45 (TM45)	2006-09-11	12:13	TM	-21.98917	-176.56838	1544	3044	1883
MosaicP	Mkr41 (TM45)	2006-09-11	13:18	TM	-21.98914	-176.56840	1542	3048	1884
MosaicP	Mkr39 (TM45)	2006-09-11	13:40	TM	-21.98917	-176.56840	1542	3044	1883
MosaicP	Mkr38 (TM45)	2006-09-11	13:54	TM	-21.98919	-176.56841	1541	3042	1884
MosaicP	Mkr61 (TM61)	2006-09-11	18:18	TM	-21.98936	-176.56818	1565	3023	1879
MosaicP	Mkr60 (TM61)	2006-09-11	18:09	TM	-21.98937	-176.56817	1565	3022	1881
MosaicP	Mkr59 (TM61)	2006-09-11	18:12	TM	-21.98935	-176.56818	1564	3024	1881
Snail race	Mkr58	2006-09-10	23:15	TM	-21.98894	-176.56808	1575	3070	1890
Snail race	Mkr36	2006-09-11	06:56	TM	-21.98922	-176.56823	1559	3039	1888
Snail race	MkrCC	2006-09-11	22:28	TM	-21.98919	-176.56812	1571	3043	1887

Tu'i Malila Events (con't)

Object	Comments	Notes
Mkr22	St. James spires	
MkrT1	Dara's Smoking Hole	
Mkr27	Chimney complex	
Mkr40	Chimney complex	
Mkr62 (front&back)	Chimney mosaic	
Mkr43 (TM1)	Diffuse flow mosaic	
Mkr44 (TM1)	Diffuse flow mosaic	
Mkr42 (TM1)	Diffuse flow mosaic	
Mkr35 (TM2)	Flange mosaic	
Mkr45 (TM45)	Periphery mosaic	
Mkr41 (TM45)	Periphery mosaic	
Mkr 39 (TM45)	Periphery mosaic	
Mkr 38 (TM45)	Periphery mosaic	
Mkr 61 (TM61)	Periphery mosaic	
Mkr 60 (TM61)	Periphery mosaic	
Mkr 59 (TM61)	Periphery mosaic	
Mkr58	Snail Race	
Mkr36	Snail Race	
MkrCC	Snail Race	

MARINER
in Local X,Y



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Mariner Events

Event	Object	Date	Time	VentField	Latitude	Longitude	LocalX	LocalY	Depth (m)
HOBO	HOBO5	2006-09-26	23:34	Mariner	-22.18139	-176.60185	4964	5751	1917
HOBO	HOBO6	2006-09-27	01:33	Mariner	-22.18130	-176.60193	4956	5762	1919
Osmosampler	Osmo4	2006-09-26	20:40	Mariner	-22.18137	-176.60186	4963	5754	1917
Osmosampler	Osmo5	2006-09-27	13:21	Mariner	-22.18041	-176.60162	4988	5860	1913
MosaicCH	Chimney Top	2006-09-27	03:50	Mariner	-22.18030	-176.60105	5046.9	5872.7	1904
MosaicCH	Pisa Chimney	2006-09-27	11:03	Mariner	-22.18042	-176.60167	4983.5	5859.1	1912
Marker	Mkr92 (Japanese)	2006-09-27	7:28	Mariner	-22.17602	-176.60176	4973	6346	1842
Marker	Mkr S	2006-09-27	18:56	Mariner	-22.18000	-176.60179	4970	5906	1920
Substrate	Mariner1	2006-09-27	14:35	Mariner	-22.18054	-176.60143	5007	5846	1918
Substrate	Mariner2	2006-09-27	14:58	Mariner	-22.18054	-176.60139	5011	5846	1917
Substrate	Mariner3	2006-09-27	15:36	Mariner	-22.18036	-176.60125	5026	5866	1920

Mariner Events (con't)

Object	Comments	Notes
HOBO5	In Mariner Chimney Top chimney with osmosampler	
HOBO6	In smokers near osmosamplers	
Osmo4	In chimney orifice with High Temp probe	
Osmo5	At base of chimney mosaic "Pisa"	
Chimney Top	Chimney mosaic	
Pisa Chimney	Chimney mosaic	
Mkr92 (Japanese)	Dead tubeworms	
Mkr S	Base of chimney with lollipop sponges	
Mariner1	HB1M, LB1M, MA3M,AA2M	
Mariner2	LB2M,AA3M,MA1M, HB2M	
Mariner3	LB3M, AA1M, MA2M	

EXECUTIVE SUMMARY

Note: all times (and dates) are local however the Van is recording GMT

5/16/09

Depart Apia 0900 on schedule

5/17/09

A 40 hr transit and we arrived close to midnight. We crossed the dateline and at midnight put our clocks forward one day

5/19/09

The transponder net was deployed at KM in the early AM hours

5/19/09

Our first dive, JII #421, was launched at KM at 0800 for a 16 hr dive. Our primary purpose was to test all of our equipment and also the strobe and light placement for the two still cameras. We found a 34m offset between our VV #s and this years nav net, with an offset heading of 010° from VV# to this years net. We imaged the Marked D chimney site with the ESC, which worked fine for the working mosaic, but was not of sufficient resolution for the final product. Later in the dive we returned to this chimney and collected 49 e-chem points on the chimney. We used the DSC to collect images at Liz's KM2 diffuse flow mosaic site.

We searched for but could not find Marker 2 or Hobo #4. George took a major sampler very close to where our 2006 navigation indicated the chimney should be. We tested the ISMASH in situ blender with *A. hessleri*. It seemed to work on the bottom (good design and relatively simple to load and fill with RNA later), however on the surface it was apparent that the snails were only stirred, not blended. We spent about 2 hrs slurping assorted polynoids and shrimp and then made substantial collections of mussel and snails for the crowd. We left the bottom about 10:30 and were back on deck at midnight

5/20/09

An easy 2 hour transit to Tow Cam and 10 hours to prepare for the next dive.

5/20/09

JII #422 dive at TC at 1200 for 12hr dive without transponders. Navigation was fine at this small site without transponders. We found and imaged both of the diffuse flow sites and both imaged and conducted e-chem on the French chimney. It took a little while to find the mini tubeworms and were not sure we had until we inspected the rocks we collected on the surface. We tested the ISMASH blender again and it worked marginally better, but still no snail milkshake. Will give it one more try tomorrow. One major was collected from a chimney near marker 7 nav point (could not find marker 7). We collected baby tubeworms and *Alviniconcha hessleri* from the same site for Pete

and the crowd. The ship lost the bow thruster for a short time and we were pulled off for about 30 of our last 60 minutes. However, all in all a successful dive. Finishing here will not take long.

5/20/09

Recovered Jason at midnight and began Transit to ABE (30 n.m.)

5/21/09

Deploy transponders at ABE in early AM

Deploy elevator at ABE at 1100

5/21/09

JII 423 Dive at ABE at 1200 for a 32 hr dive. The primary purposes of this dive were to image all diffuse flow areas so we can begin collecting there next dive, to conduct some preliminary behavioral experiments, to collect Stacy's substrates, and to deploy Rays camera (Comode-Cam). The t-probe on the e-chem was back on line and working perfectly. We carried the camera down with Jason and deployed it at the beginning of the dive near the ABE 1 mosaic site. We mosaiced the two diffuse flow mosaics and the chimney and peripheral mosaic in the central and N areas. The Chimney mosaics were also e-chemed. Several hours were spent conducting some removal/replacement experiments in the N area. Collection of Stacy's substrates to the elevator took about 5 hours from elevator to elevator, with an extra 30 mins used to release it at the end of the dive. Comode Cam was very easy to deploy. The experiments went well, collections were very efficient so we spent about 2 hours at the end of the dive slurping assorted fauna for physiology.

5/22/09

Jason on deck at 0800.

Elevator on deck at 0830 shortly after.

Begin Transit to KM at 0900.

5/23/09

CTD cast at KM upon arrival on station, beginning at about 1am.

Elevator deployed at 0700.

5/23/09

JII 424, Dive at KM launched at 0800 for a 25 hour dive. We imaged all the remaining mosaics and conducted extensive e-chem surveys of the second KM chimney mosaic (E marker) and also the KM 2 diffuse flow mosaic. The KMF peripheral and KM1 diffuse mosaics actually overlap a bit we discovered. All of Stacy's blocks were recovered and sent up in the elevator. Collections went fine although all blocks are pretty large and one would not even fit in the recovery container, so is only partially jammed in. One of the boxes had sprung it's bungie, so we place an extra weight in the milk crates in that box to improve its chances of recovery and delayed the dive one hour (hence a 9 am recovery of Jason. The Starboard manip had a hard ground, so the dive was conducted with the port manip only. Since no plunger on the port manip, no majors were taken. We conducted several flow removal experiments on mussels in KM2 mosaic site

towards the end of the dive and conducted a SUPR survey of the plume at the very end of the dive. One transponder was malfunctioning during the elevator recovery and we decided to deploy another one and crunch the net before moving to ABE

5/24/09

Recover Jason at 0900.

Recover elevator at 0930.

1000 – 1300 Deploy a new transponder and recover the old.

Begin transit to ABE at 1300.

5/24/09

J II 425, Dive at ABE at 1800 for a 26 hour dive. On bottom at work site at 1945, but pulled off station by squall and lost about 2 hours getting back. We started in the Southern end of this site with mosaics and e-chems of Hogwart chimney and of the S peripheral site. Then spent a few hours finding chimneys to SUPR in the south before moving to the central area to SUPR a chimney there and finish the e-chem of the central mosaic sites (a peripheral site and ABE 1 diffuse flow site). All work is going a bit slow because the basket is stuck in the out position and we must work around the basket and its contents. We made three mussel pot collections of *Alvinoconcha* and the 4th mussel pot failed. We collected basalt samples from two of the mosaic sites, and collected samples of each species from the ABE 1 area for Pete's experiments. Erin also set up a l. n. removal and replacement with *A. h.* experiment before recovery. We decided to leave the thermistor array on the bottom for now, to avoid contaminating the MP collections.

5/25/09

Recover Jason at 2000.

5/26/09

Conduct CTD cast over ABE starting at 0100.

Launch elevator at 0700 with Bidet-cam, Pete's pressure system, and empty box

5/26/09

J II 426, Dive at ABE at 0800 for a 24 hour dive. We started in the N end of ABE by deploying Bidet-cam. The first attempted deployment lasted about 5 minutes as the position was not stable and the camera fell off a small ledge. It was then moved onto a new clump of *lfremeria* near to the Hobo/Osmo deployment, where it stayed. The experiments started at marker 9-2 were revisited and control deployments of *lfremeria* conducted. The ISMASH was tested once again. It appeared to be working better, but on the surface it was confirmed that the snail was not mashed. The ABE 2 diffuse flow community was e-chemed, but no suitable locations for additional experiments were located so this site was left undisturbed. The experiment at 9-2 was visited before heading down to the ABE 1 site for extensive work. At ABE 1, 3 mussel pots in *lfremeria* were taken successfully. One was attempted in the andesite substrate and would have worked except the bag on the pot worked up to far on the pot and would not

close. In addition to visiting the one experiment started here during the last dive, two additional experiments were initiated by adding Alviniconcha to established Ifremeria communities and then Ifremeria were added to the central Alviniconcha community. One manipulator started leaking hydraulic fluid and its use was discontinued, but the dive went on. Pete made a substantial collection of all three foundation species from ABE 1. A control piece of Andesite was collected from near ABE 1, but away from any vent flow, into the empty biobox for Sabine. We transited to ABE 2 and collected a sample of the typical substrate (andesite) and also some orange rocks visible in the mosaic. The other manipulator failed and so neither the Major sampler or return of instruments to the elevator could be accomplished. The elevator was left on the sea floor for the next dive. SUPR samples were taken from a smoker mouth up into the buoyant plume and then the Jason was recovered shortly before 0800

5/27/09

Recover Jason at 0800.

5/27/09

J II 427, Dive at ABE at 1600 for a 16 hour dive. We started the dive by taking 3 mussel pots in Bathymodiolus clumps in and near the ABE 1 mosaic site. At two of these we also did clearance flow experiments and deployed Ifremeria over the clearing. We then took a mussel pot substrate sample in an area with 4° temperatures, but no visible macrofauna. All went well. ISMASH was tested again for quite a while. It seemed to work, but once again it was apparent on the surface that although it wounds the snails, it does not chop em up and blend them. All collections for Pete were made in and around the mosaic site and then the entire site was re-mosaiced and the experimental sites revisited for brow cam imaging. A basalt sample was collected into a clean biobox for a background sample for Sabine, and we returned to the northern area where Erin monitored experiments she had set up on earlier dives. We recovered both the thermistor array and linked Osmo that had been deployed at ABE 1, as well as the other osmo-sampler and linked Hobo from the chimney deployment using the elevator. The SUPR sampler was used to sample particulates from three chimneys in the northern area and a major sampler was taken at one of these chimneys. At the end of the dive the Bidet-cam was recovered to the elevator and we tried to load Pete's pressure recover system but it was missing a valve, so we pulled the pin on the elevator and came on back.

5/28/09

Recover Jason at 0800.

Recover elevator at 0830.

Conduct GLOBE telephone/web interview with school children from 0830 – 0915.

Begin Steam to Tui Malila at 0915.

Arrive Tui at 1630 and deploy transponder net.

Launch elevator at 2300 with Bidet-cam and Pete's Bomb.

5/29/09

J II 428, Dive at Tu'l Malila at 0000 for a 40 hr dive. We began by mosaicing both sides of the chimney at Mkr 62. We then moved the elevator and picked up the Bidet-cam for deployment near Dara's Smokey Hole. Next the TM1 diffuse flow site was mosaicked from two altitudes and Erin began setting up an assortment of behavioral experiments by carefully e-cheming aggregations of Alviniconcha or Ifremeria, then removing and e-cheming again, and finally replacing one with the other. After about 8 hours of this the scoop net failed and we rigged a milk crate with a new net, 2 more markers, and beacon and sent it down (dropped it off the fantail). It landed about 40m away and after finishing the work at one site the Jason retrieved the net and markers and took the milk crate and beacon to the elevator. Shortly after a hard ground fault in the 240 volt system forced a stop in the operations. It was decided to recover the vehicle and weights were dropped and the Jason headed up. The ground was isolated about half way to the surface and the Jason headed back to the elevator to pick up two weights to finish the dive. A revised dive plan, 428.2 was begun. After retrieving the weights to the Jason operations were resumed by transiting to the Alvinellid flange and mosaicking it. It had grown appreciably and was quite active. Stephane looked for background fauna to slurp (unsuccessfully) for about an hour and they spent some additional time trying to find peripheral mosaic 61 with no luck. The Jason transited to peripheral mosaic 45 and mosaicked it, conducted selective e-chem on the site and collected a voucher lava for analysis. The Jason went back to the Mkr 62 chimney and e-chemed one side before the e-chem failed. A major was then taken at or near "Georges Hole". At that point Erin came back on watch and initiated 4 additional behavioral experiments over the next 8 hours. Many of the collections were made during that time and then additional collections of black Alviniconcha were added and one of these collected for ISMASH. The Bidet-cam was retrieved along with a scoop of Ifremeria to the elevator. Bidet-cam was stored in its box and Pete's chamber was successfully loaded with 4 snails, the top put on and the valve closed. With about 1.5 hours of bottom time left Erin revisited her experiments to document snail movement and then the pin was pulled on the elevator and both vehicles headed to the surface

5/30/09

Jason recovered at 1600.

Elevator recovered at 1630 and transit to Mariner begun.

Arrived mariner and began deployment of transponders at 1800.

5/31/09

Elevator launched at 0300.

Jason Dive 429 at Mariner launched at 0400 for a 16 hour dive. The elevator was blown way north and ended up about 500 m N of where we needed it (launch target was about 100mN). Elevator was retrieved to the area, but terrain was much steeper than anticipated. It was left on the side of a hill. We searched for Stacy's deployments 1 or 2 for about 45 minutes, and ran into deployment 3. Navigation is off by about 35 m from 2006 and the renamed points. We returned to the elevator to trade out the rock baskets and returned to find Stacy deployment #2. We were unable to locate #1 either after collecting #2 or after returning with a fresh rock basket. The niskin was fired near the elevator. We completed the dive carrying the empty rock basket, which came in handy

when we collected a piece of chimney for Pete/Jason into one compartment and a piece of andesite with a sponge attached for Yvette into another. We were also unable to locate the diffuse flow osmo-sampler or the Pisa Chimney nest to which it was left. A lot of chimney debris in these areas suggest that both Stacy's deployment and this osmo were buried by fallen chimneys. We proceeded to the osmo/hobo deployments around the southern chimney complex and worked there for several hours, e-cheming, slurping animals, and also collecting both Hobos to the basket and the paired osmo samplers to the elevator. We took a major at the osmo deployment orifice. We left a marker next to Hobo 6 deployment site. After offloading the osmo-samplers and major to the elevator, and picking up an unused Major we returned to the area of the former Pisa chimney, where several very vigorous chimneys were seen to obtain another major and slurp some more fauna. After about one hour of work it was determined that the major sampler was not functional and efforts shifted to another chimney collection followed by animal collection for the remaining 30 min of the dive. We returned to the elevator, offloaded the last milk crate array and sent it to the surface before coming up with Jason.

5/31/09

Jason recovered at 2000.

Elevator recovered at 2030.

Began short transit back to Tu'i Malila site.

6/1/09

Elevator launched at 0700 with Pete's bomb and empty boxes.

The planned 0800 launch is delayed due to moderate waves and building winds.

Jason II 430 launched at 1200 for a 44 hr dive. Weather was marginal, but a forecast of diminishing winds encourage a dive. Shortly after launch the tether wrapped around the Jason and 20 minutes of intense activity and apprehension followed. The Jason group was able to untangle the tether with spins and rolls and the dive continued. The Bidet cam was deployed in the central diffuse flow area after several failed attempts to find a level spot for it. Over the next 10 hours each of the behavioral experiments set up during the last Tui dive were revisited and the outcomes recorded. Several of these were modified by conducting an additional control addition or adding the other species of snail for direct competition experiments. We then visited the adjacent Tui 1 diffuse flow mosaic and e-chemed the site extensively. The next stop was the Chimney mosaic at Mkr 62, which was re-mosacked with Scorpio and the back side which was not finished on the last dive was e-chemed. We then spent several hours looking for the peripheral species of polynoids and the snail *Phymoranchus* around the cold bases of chimneys and among dead and dying mussels. 2 snails and a few of the white polynoids were slurped. After this we visited chimney tops in this area and around Mkr 22 (Saint James Spires) looking for older robust chimneys with populations of large snails and mussels. However, the chimneys in this area are more delicate and generally the fields are composed of many small, active and fragile edifices. So, we moved to the ridge on the west and then flew south along the edge of this ridge looking for more chimneys. There were lots of chimneys along the ridge, but again we did not find any with robust and apparently old communities of snails or mussels on them like

we have seen on the northern sites. We transited south several hundred meters, then came back up to the flange mosaic site which we imaged with Scorpio and e-chemed. Then spent some time again slurping the low T polynoids. We are now about 24 hours into the dive, however the weather has not abated and the decision is made to leave Jason in the water until the following day and recover in daylight with hopefully calmer seas. We then headed back to the central diffuse flow area to monitor the behavioral experiments and set up two additional competition experiments. That was completed by midnight. The ISMASH was loaded and spun, all needed collections of animals made. We then collected a few snails into a can for Pete's bomb and picked up the bidet-cam for transit to the elevator (which had set considerably to the NE). Pete's bomb was loaded and sealed effectively and the bidet cam secured on the elevator. The Jason then began transit back towards the chimneys at Mkr 62 for additional collections. They ran into a chimney complex along the way and stopped to slurp polynoids and collect two pieces of sulfide. They then decided to go to the other flange and slurp paralvinella and look around in other areas for chimneys with Alviniconcha. None were found, so the Jason returned to the central area and slurped more polynoids before making a last visit to the experiments to document the outcomes before leaving the bottom. The elevator was called off the bottom when Jason was about 500m from the surface. Both Jason and the elevator were recovered in moderately rough seas with no hitches.

6/3/09

Recover Jason at 0800
 Recover Elevator at 0900
 Steam to ABE, 7 hr transit
 Deploy elevator at ABE 1900

6/3/09

J II 431 launched at ABE at 2000 for a 14 hour dive. This dive is planned to be a quick revisit to complete needed collections at ABE for the meiofauna/macrofauna community ecology project, image the study chimneys with scorpio, and revisit the behavioral experiments started on earlier dives here. We began with a visit to the Hogwarts Chimney mosaic site to re-image this southern chimney with the Scorpio digital still camera. We then stopped by each of the two peripheral mosaic sites (ABE 63 and ABE 53) and collected a voucher lava sample for analysis. From there we went to the ABE I diffuse flow mosaic for most of the rest of the work. We collected to net bags of rubble from an area in the mosaic without megafauna for analysis of macrofauna and meiofauna. We backed off about 10 meters to collect a background basalt into a clean biobox for an additional meiofauna sample outside the influence of hydrothermal flow. Erin then spent a couple of hours visiting all of the behavioral experiments set up in this area before collections. Snails and mussels for shipboard analyses were then collected from the area where the thermistor array crate had been deployed and 2 mini-osmo samplers were deployed by Jason for a colleague. An Alviniconcha collection was made from the central patch of this mosaic and the ISMASH was loaded. Finally a can of snails was collected for transport to Pete's bombs on the elevators. After loading the bombs, we transited to the N area of activity to revisit the experiments up there. From

these snail races we transited to MkrG and re-mosaiced Bugsbunny and Spire, and then were able to e-chem spire (thought not to be possible on previous dives). We spent some time e-cheming the base of Potato, which had been toppled on a previous dive, and looked around a bit for other chimneys with old mussel or snail populations. Most of the chimneys here are of the short and brittle white variety up here (and also at the southern end). We left the bottom a bit after 0800 and called up the elevator on the way up.

6/4/09

Recover Jason 1000.

Dive at TC was delayed because of weather. The 1800 launch was canceled and an overnight CTD planned.

1900 Transited to KM for CTD operations.

0000 CTD operations, including 3 lowerings over a 6 hour period.

6/5/09

Transit back to Tow Cam in early am

JII 432 launched at 0800 at Tow Cam for a 24 hour dive. There was no elevator on this dive because we are working without an LBL net, but Bidet Cam was taken down with Jason with a stink-pot (of hydrogen sulfide) attached in the field of view. We began with the work at the established study sites. The Diffuse flow TC2 was e-chemed and a voucher lava collected. The French Chimney at Marker JJ was mosaiced with Scorpio and the the Diffuse flow TC 1 mosaic site was e-chemed and a voucher lava collected. This work took substantially longer than expected. At this point we returned to the TC 2 mosaic site and several experiments were initiated by adding *Ifremeria* to established *Alviniconcha* communities. Two additional clearcut experiments were conducted with linked e-chem. *Alviniconcha* from two nearby chimlets were collected for shipboard studies and one was ISMASHed (and another not smashed but placed in an ISMASH container as a control). *Paralvinella* were slurped from this location. Jason then transited to the “baby tubeworm” site. However, they could not find the site and looked west because that was where it was found on the previous dive here. The XY’s recorded for the collection on this dive were 30 m W and 50m S of the XYs from 2006. Rocks with baby tubeworms were successfully collected from this site and additional babies were seen in areas cleared of *Alviniconcha*. This went fairly quickly so Jason transited S to the 2006 “mussel oasis” site and searched for *Phymorhynchus*, with no luck. They then transited back to TC2 to revisit the manipulative experiments and collect *Ifremeria* from those sites. The experimental markers were collected and Jason left the bottom at 6:15 for an on time recovery at 0800.

6/6/09

Recover Jason at 0800.

Transit to KM.

Elevator launched at 1500.

JII 433 launched at 1600 for a 32 hour dive at Kilo Moana. The tether was wrapped around Media immediately after launch, so Media was recovered and re-launched after

20 minutes. We began this dive with chimney work. The chimney with stalked barnacles was found (although we never saw marker 5). The barnacles were mostly dead. Three chimney community clearance experiments were conducted: Two of Alviniconcha aggregations (#1 and 3), and one of mussels (#2). Alviniconcha from each were collected for ship board analyses and complemented with about 25 additional individuals from another chimney. A few of the mussels were collected for size/age analyses. We looked again for Mkr 2 and Hobo #4 with no luck. We visited all chimneys in this region. A pair of vigorous smokers around Marker 1 were found and a major sampler taken in one. There are smaller chimlets near the KM 2 diffuse flow area. The KM 28 peripheral mosaic site was e-chemed and 2 rocks were collected for voucher experiments. MrkD chimney was mosaiced. 3 clearcut experiments were conducted in the diffuse flow site: 2 with Ifremeria and one with mussels. This finished the planned work for this southern area. We transited to the middle area to find and mosaic Marker E chimney. After finishing the mosaic, a few mussels were collected from the top. Another chimney here was located with a vigorous smoker near the top and the second major was taken here. Jason then transited to the N area and went straight to the Hobo Osmo dead chimney. Both the Hobo and Osmo were easily removed from this cold and collapsed structure and the Hobo was placed in the basket. The osmo cable was seriously buried by debris from fallen chimneys. The osmo was left for the time being to do the e-cheming of the combined peripheral KM28/KM diffuse flow mosaic site. The activity here has almost stopped and very little temperature anomalies were detected and on sulfide was detected in the mosaic site. After mosaicing, the Osmo sampler was gathered to the basket and we had to transit south to Chimney E to collect Alviniconcha and Ifremeria to load into Pete's bomb. We then transited to the elevator to offload the Osmo sampler and load both of Pete's pressure vessels with snails. This took quite a long time because the elevator landing was in a difficult location and the pressure vessels were difficult to close. After completing this task we returned to the N site to a single old chimney near the other work sites where a few small clumps of Ifremeria were seen earlier. One of these was e-chemed, collected, and re e-chemed. Numerous very small snails were visible after the collection of the larger snails so we finished off this site by slurping some of those snails and other associated fauna. Because of the general lack of hydrothermal activity up here, we transited back to the Southern most area to pick up a rock from the KM2 diffuse flow site and then worked on clumps of Ifremeria on chimneys in this area until about one hour before leaving the site. This last dive was finished off with an hour of slurping at will, concentrating on paralvinella. The elevator was called up at 2210 and Jason left the bottom at 2230 for an on time recovery at midnight.

6/8/09

Recover KM at 0000

Recover Elevator at 0030

Transit to port in Tonga for 0900 arrival at the sea buoy: 7 hr transit

SITE SUMMARIES

KILO MOANA 2006

C. Fisher, after 1 dive:

There are basically 2 sulfide complexes at the northern end of KM, both are very near to the peripheral and diffuse flow mosaics made in 2005. The two mosaics are actually quite close to one another, and all three work sites (the instrumented chimney and both mosaics) are within site of each other. At a first glance, the diffuse flow site seemed to be waning, as the few snails in this mosaic were replaced by mussels. The active area is up on top of a small scarp, with a bit of diffuse flow and scattered animals down the slope, but nothing “pot-able”.

In the middle area, there are a few chimneys, but not very much else and the chimneys are mostly only warm (and covered with diffuse flow communities). The communities on the chimney we mosaicked last year did not seem to have changed much, but the snail race site (of Tim’s paper), seemed much more robust and active. There are a few mounds of mussels here, and scattered patches of snails. NOTE that Marker #C and the “Vrijenhoek marker” are one and the same.

At the southern end there are quite a few chimneys, and we did not get a chance to look at the tops of them yet. We did find and mosaic a very nice and active diffuse flow area (KM2). I think this is the area of the MBARI marker #A, where Bob sampled mussels last year. However, the area mosaicked seems to be a few meters from that point (according to Robbie and Stéphane who recognized the area from last year). Diffuse flow communities amenable to mussel pots are rare or absent on horizontal surfaces, although we will try a mussel patch or two next dive here. This site is RICH with peripheral communities of anemones, with occasional Brisingids and holothurians. Holothurians can also be abundant in mussel patches here.

C. Fisher, after 2 dives:

During our second dive here we found the rich chimney communities. They are in the S complex, and include numerous multiple-active black smokers, communities of stalked barnacles, a few tubeworms, and lots of areas with shrimp swarms, scale worms and paralvinellids. Chimneys are 10+ m high and as Bob W. says, “its Indian Country.... Lots of stuff here that can hurt you.” The mosaic site with the thermistors is quite active diffuse flow on a peninsula. Mostly Ifremeria and mussels, with anemones. At last years snail race site (site of Tim’s paper), the activity had picked up. Two little smokerettes were on the ground right in front of it. We collected quite a few alviniconcha from here, in a mussel pot and scooped for Stacy et al. We again effectively cleared this site of snails, this time with abundant e-chem.

KILO MOANA 2009***E. Becker:***

I conducted a few mussel clearance experiments within the KM2 diffuse flow mosaic. This mosaic is on a large peninsula that drops off by several meters on three sites. There were several manageable patches of *B. brevior* for these experiments.

We also did some mussel clearances with before and after chemistry on the sides of chimneys at this site. Kilo Moana has several impressive large chimneys that host communities of mussels and snails, mostly *Ifremeria*. What was striking to me was how different the chemical conditions can be over very small distances when there are small point sources that leak out of the sides of chimneys. At one chimney there was a large difference in sulfide between points only a few millimeters apart where we could see a small trickle of shimmering water coming from the side of the chimney below a mussel patch. Many of the mussel communities appear to be old, in that their shells do not have the light brown edges usually observed on smaller actively growing mussels. It could be that these very small point emissions on the sides of less active chimneys can persist for long periods of time and sustain long-lived mussel, and possibly *Ifremeria*, aggregations. We collected some of these mussels to perform condition indices to determine whether these mussels are healthy or starving.

L. Podowski:

Northern region: We re-imaged a diffuse flow (KM1) and peripheral mosaic (KMF). After the mosaics were constructed, we realized that these two mosaics overlap almost completely. KMF covers approximately 9m² in the northeastern section of the KM1 mosaic. The chimney complex in the southern region of KM1, where we had deployed a HOBO and osmosampler in 2006, was completely inactive and there was no sign of diffuse flow anywhere within KM1 - temperatures were consistently near ambient, no sulfide was detected, and the only symbiont-containing fauna present were scattered mussels. Overall, we had a difficult time finding any symbiont-containing fauna in this northern region for collections.

Southern region: The diffuse flow mosaic, KM2, did not seem to have changed substantially from 2006. This is the site where, in 2006, we deployed an osmosampler and thermistor array into a patch of white *Ifremeria* surrounded by mussels. When we recovered the instruments in 2009, the probes of the thermistor array appeared to be in a very similar location in relation to where they were deployed. This site, shaped like a peninsula, is characterized by one large patch of white *Ifremeria* and numerous, homogenous mussel aggregations, which were manipulated in several experiments (in 2009) testing how mussels affect the flow of vent fluids. Actinostolid anemones are distributed throughout the site, frequently occurring directly on mussel shells.

Kilo Moana, in general, hosts a few, scattered snail aggregations and abundant homogeneous mussel aggregations. Also common in this vent field are Actinostolid anemones, holothurians, brisingids, and zoanthids.

TOW CAM 2006***C. Fisher, after 1 dive:***

Tow cam has several nice areas to work and very diffuse flow is fairly widespread resulting in abundant fields of anemones on pillow basalt. The communities like Liz's first mosaic here (anemones mixed with snails and mussels, TC1) are spectacular in their diversity and I am again struck by the difference between basalt and andesite in this regard. We found a second very nice area that could be mosaicked, which was nicknamed mussel oasis, it is south of the area we did most of our work and the site where Kevin did two of the mussel pots. South of that was another area with very limited communities. The chimneys are in general not heavily populated with fauna, compared to the other sites, although many short and somewhat fat structures seem to be part lava and part sulfide. Mussels are in general not abundant here, although there are plenty of them in small groups, both in diffuse flow and on chimneys. Patchy. The tubeworm site was similar to last year, although it had increased in vigor and a small chimney with alvinellids was growing on the left side of the "tuby cave". A bit to the north of Liz's mosaic is an area with a few chimneys. These chimneys are inhabited with a diversity of animals, but sparsely. All in all not many Alviniconcha at this site compared to the others (but see updated comments below).

C. Fisher, after 2 dives:

A second mosaic site in the N (Not Mussel Oasis), was set up in an area of quite active diffuse flow and many patches of Alvinellids. This site and the tubeworm rock are quite interesting as they look like fairly new vent communities. The "tubeworm rock" was imaged from three sides as it has about 10 distinct patches of Alviniconcha, and a very few small mussels. The Mussel Oasis site is similar to Liz's other mosaic site, but perhaps even older. There are numerous patches of mussels that seem to be dying, as well as others with abundant live mussels and even *Ifremeria*. This site has very abundant anemones and *Phymorhynchus*. We have been looking for these snails for 3 dives, and seen none. At Mussel Oasis they were present in apparent densities of about 5 per m². This would have been another site worth mosaicking for a return visit, but this was the last dive and we simply ran out of time.... Although my original impression was of a paucity of Alviniconcha at this site, after this dive I have changed my mind: There are definite areas with at least as many Alviniconcha as at most other places we visited (the new mosaic site (TC2) and the tubeworm rock are the "hot" sites here), as well as other large areas of diffuse flow and chimneys virtually devoid of Alviniconcha.

TOW CAM 2009

E. Becker:

Here we had a short dive, during which I set up two experiments adding *Ifremeria* to an existing patch of *Alviniconcha* and mixing them up. I also did a couple of *Alviniconcha* clearances just to obtain before and after clearance chemical measurements.

L. Podowski:

We have really only worked in the northern region of this vent field and most of our established sites are within a 100m² area. We re-imaged our 2 diffuse flow mosaics here, TC1 and TC2, but did not attempt to re-locate the 2 peripheral mosaics (NANA and NANB), as no markers were deployed.

TC1 appeared to be quite similar to 2006. This site is still biologically very lush with many areas of discrete venting surrounded by aggregations of *Alviniconcha* and white *Ifremeria*. The basalts in this site form large, expansive, stable substrata and are covered in zoanths, barnacles, and hundreds of Actinostolid anemones - often the dense populations of anemones completely obscure any view of the substrata on which they are settled. Abundant aggregations of mussels, *Ifremeria*, and *Alviniconcha* are present on top of and in between the pillow basalts. Also abundant throughout the site are galatheid and bythograeid crabs, stalked barnacles, and holothurians.

In 2006 we hypothesized that the mosaic site TC2, located ~50m to the northwest of TC1, was a relatively new diffuse flow vent site in the early stages of succession. 3 years later, a community that was previously (in 2006) dominated by *Alviniconcha* spp., bythograeid crabs, and barnacles, now hosted dense aggregations of *Ifremeria nautilei* and *Alviniconcha* spp. There was also a visible presence of *Bathymodiolus brevior*, however, the mussels didn't form any large aggregations like the 2 snails, instead individuals were scattered throughout the site as if they were slowly moving in and establishing themselves between basalt pillows. Barnacles and bythograeid crabs were still abundant in 2009 and a couple of small chimneys, whose walls were colonized by *Alviniconcha* spp., were actively venting within the mosaicked area. TC2 still seems to be a very hydrothermally active site, but less so than in 2006. This shift in hydrothermal activity may have created a greater diversity of microhabitats in 2009 that were amenable to colonization by other species.

S. Hourdez:

My involvement here was centered on the 'tuby cave' only. The small chimney with alvinellids that was growing in the cave in 2006 has grown more. The top of the mound has not noticeably changed but most of the mound and opening of the cave is now covered with *Alviniconcha*, several individuals thick. Besides the obvious presence of the snails, the temperature and chemistry seem similar to 2006. Once the snails were removed, the rocks that form the roof and walls of the cave were covered with very small tubeworms, mostly on the faces exposed to the outside of the cave.

ABE 2006***C. Fisher, after 1 dive:***

The west side of this site is bounded by a scarp that runs N to S. There are 3 general zones of activity at ABE. In the S and N ends are multiple active chimneys, some with smokers. These look quite different from most at KM in that they are white, quite delicate, and arranged in complex groups of spires. My impression is that they are generally not as tall as at KM, but more spires in a given complex. We spent quite a long time looking for marker 19 in the N. It was never found, but the most active black smoker found was only about a meter high and was spewing from the center of a pile of sulfide rubble, with a large orifice. I believe this is likely the #19 Chimney. There are a few other black smokers in this area, and quite a few areas of diffuse flow communities around the bases of the chimneys and close to the chimneys. Lots of areas good for quantitative collections around here. And LOTS of fish swimming everywhere. At the S end there are perhaps more chimneys, but less extensive diffuse flow communities around their bases. We spent a long time in the S end looking for a diffuse flow community to mosaic, but found nothing workable. Chimney complexes down here are beautiful and delicate. I get the impression of fewer vigorous black smokers, although lots of beehives and some smokers were found. I am not confident that we visited all active areas in the S.

The central area is dominated by diffuse flow on a slope in the area of Liz's big mosaic (ABE1). There are extensive patches of snails and mussels all around the mosaic area and the mussel pots work well here. There appears to be more extensive patches of snails here than at KM. I get the impression of a substrate that acts as a diffuser releasing diffuse flow over an area rather than at a semi point source such as from between pillows of basalt (a la EPR or KM). Hence the large patches of snails.

Anemones are much rarer in general at ABE than at KM, both in active diffuse flow and in the less active areas. Peripheral areas are often dominated by sponges.

ABE 2009***Dominique Cowart:***

Bugs Bunny chimney mosaic: In 2006, more fauna were present at Bugsbunny, including mussels, snails, and squat crabs. In 2009, there were fewer animals on the chimneys. However, similar to the 2006 photos, the 2009 photos have clusters of snails near the top of the chimneys. The Bugsbunny chimney structure looks quite different in 2009 than it did in 2006. The chimney complex is not as wide in 2009 as in the 2006 photos; it appears that a section of the chimney collapsed in the last three years.

Hogwarts chimney mosaic: Hogwarts had many more *Ifremeria* snails in 2009 than in 2006. There were *Ifremeria* present in 2006, but in smaller clusters than in 2009. The 2009 Hogwarts photos show more *Ifremeria* near the top of the chimney complex. However, in general, the chimney structure of Hogwarts looks mostly similar in 2009 and 2006.

Potato chimney mosaic: Potato in 2006 had mussels located around the midsection and base of the chimney complex. In 2009, there were fewer mussels and more squat crabs and anemones in the midsection and base of the chimney complex. Although there are fewer mussels at the base of the Potato chimney in 2009, there are more mussels near the top. In contrast, the 2006 photos of Potato show no mussels at the top of this chimney. The structure of Potato in 2006 is different from 2009. In 2009, Potato appears more robust in width than in 2006, as if the chimney complex was built up in the past three years.

E. Becker:

We set up several *Ifremeria* removal/*Alviniconcha* addition experiments in the ABE 1 diffuse flow mosaic. This mosaic had one large patch of *Alviniconcha* and many large and small patches of *Ifremeria* and mussels. We set up 5 experiments in the mosaic, 2 where we removed *Ifremeria* and replaced *Alviniconcha* and three where we added *Alviniconcha* to *Ifremeria* and mixed them together. We also set up two *Ifremeria* removal/*Alviniconcha* addition experiments to the North close to the Bugsbunny, Spire, Potato chimney cluster. These patches were small to begin with but seemed to follow fissures in the rock. After removal and addition of *Alviniconcha*, the *Alviniconcha* moved away pretty quickly, some going up the nearby chimney. The *Ifremeria* moved in slowly starting at the source and gradually filling in the fissure where they were originally. We took chemical measurements during several follow-up observations of these experiments. It is possible that the *Ifremeria* are channeling the fluid as they add more individuals, allowing individuals to colonize areas that would not receive any flow without channeling.

At the northern chimney cluster containing the Bugsbunny, Spire, and Potato chimneys, all three chimneys looked markedly different from in 2006. These chimneys are all pretty active at their tops, with shimmering water and often some beehive formations. Bugsbunny had formed some new upward extensions where we had broken them off during chemical sensing in 2006. The potato chimney became taller and the base

narrower compared to the added mass of the upper part of the chimney. This may be why this chimney broke off easily close to the base while chemical sensing in 2009. Several small smokers appeared around this chimney cluster, making it difficult to safely get the submersible into position to re-mosaic and survey the Spire chimney. We did manage to get a descent mosaic from farther away and take some chemical measurements from a different heading.

Liz Podowski:

Northern area: We re-imaged one diffuse flow mosaic in this area, ABE2. The mosaic is a small, relatively flat area, ~10 m², located at the base of a chimney complex. This chimney complex is within a few meters of Erin's chimney mosaics: Bugsbunny, Spire, and Potato. ABE2 was dominated by mixed aggregations of mussels and *Ifremeria* and homogenous aggregations of *Ifremeria* in both 2006 and 2009. However, in 2009 it appears that hydrothermal activity shifted slightly, reflected in a distributional shift of white *Ifremeria*. Otherwise, the mosaic site does not appear to have changed much. In both years, there was a small andesitic outcrop colonized by Actinostolid anemones and Austinograeid crabs tend to dominate the areas occupied by symbiont-containing megafauna, while galatheids are frequently observed in the peripheral areas of the mosaic on bare substrata. In 2009, after mosaicking, we collected what appeared to be a sulfide that had fallen into the middle of this mosaic site.

Central area: We worked extensively in this area, particularly within the ABE1 mosaic area due to the significant presence of all three types of symbiont-containing megafauna. We initially had some difficulty finding the site as many of the markers had slid downslope and out of the diffuse flow area. However, the characteristic large patch of *Alviniconcha* and the thermistor array milkcrate (recovered during this cruise) helped us identify this site.

After mosaicking, we collected 12 mussel pots within and near ABE1 (3 replicates each of *Alviniconcha*, *Ifremeria*, *Bathymodiulus*, and nonsymbiont-containing (sediment near diffuse flow) faunal communities. Erin set-up a variety of behavioral experiments within and near ABE1, and Pete was able to collect lots of animals from this area for physiological experiments. Jason Sylvan deployed his incubator on mussels and snails here - just to the north of the big patch of *Alviniconcha* on a slope, which leads up to where the thermistor array was deployed in 2006. Ray Lee's camera was deployed on the plateau north of ABE1 during one dive (near thermistor array milkcrate).

The mosaicked area of ABE1 did not seem to have changed much in terms of community composition from 2006 to 2009. However, minor shifts in snail and mussel distributional patterns were apparent, likely in response to local changes in vent flow.

TU'I MALILA 2006***C. Fisher, after 1 dive:***

TM has three general areas of activity. In the central area is a rather extensive area of diffuse flow over generally rough terrain. This includes the area we named Snail Hollow, the mosaic site (TM1), and Dara's Smokey Hole. All are in about a 30 m radius. The communities are often mixed, although there are areas of only one foundation species. There are numerous patches of very white *Alviniconcha*. Mussels and snail in this area are generally smaller than we often find on the chimneys... Very few anemones are present in this diffuse flow area, although they are present. This is a great place to study mixed communities.

To the north are areas of beautiful chimney complex and a bit of diffuse flow around the base. The mussels on the basalt are often in beds with numerous disarticulated shells and seem to be cooling off with very little shimmering water. We did not get to the northern edge of this activity and should explore further north (at least I did not see it, and there are targets further to the N). This area includes St James Spires and the areas we mosaicked chimneys (Mkr 62 front and back) during this dive. When we looked for a thriving mussel patch around marker 22 and environs, we could not find one. However, there are small patches of large snails and mussels on the chimneys. Perhaps these are long-lived cool chimneys?

To the South, the main activity is on the scarp on the W: Either on top or on the drop off. Very pretty chimneys, with a few smokers, but very few mussels, and not too many snails. Very little in the way of diffuse flow around the bases. Often the only activity is on top of the chimneys. Again, we did not go as far south as last year and will have to venture farther south on our next dive. The alvinellid flange (mosaic flange, TM2) is pretty much by itself, with not much around it.

C. Fisher, after multiple dives:

The rough terrain of the Snail Hollow area is a good place for the proposed behavioral experiments as there are numerous sites with mixed aggregations. The challenge will be to find good areas for camera deployments. The *Alviniconcha* are very active animals, especially when disturbed. Although *Ifremeria* do not seem to move much when watched (compared to Ah), they are relatively mobile when moved into good or bad habitat. On the last dive we approached the Alvinellid flange by running down the top of the ridge to the west of it, before dropping down to the flange. There are multiple active chimney complexes on this ridge, with lots of fauna on them. The flange is not as far from the ridge as I originally thought. Many of the small structures at this site in general are covered with mussels and snails.

TU'I MALILA 2009

E. Becker:

I did a lot of work at this site for the competition experiments with *Ifremeria* and *Alviniconcha*. The TM1 diffuse flow mosaic site and the area adjacent to it both contained some smaller patches of both *Alviniconcha* and *Ifremeria*, which is what we were looking for to do removal/addition experiments. On the edge of the mosaic area, there was a slope with a large patch of *Alviniconcha* on the side, which was ideal as a source for addition to cleared *Ifremeria* patches. We performed 6 removal/addition experiments in the area adjacent to the mosaic. We performed two additional *Alviniconcha* removal and *Ifremeria* addition experiments at some isolated *Alviniconcha* patches we came upon by chance when going to retrieve the elevator. These *Alviniconcha* appeared to be darker than we usually see in diffuse flow areas, possibly because they are a different species or because they did not have a lot of white free-living bacteria covering their shells. The *Alviniconcha* were mostly adults and there was no adult *Ifremeria*; however we did observe some juvenile *Ifremeria* here. The adult *Ifremeria* that we added to the area where we cleared *Alviniconcha* moved away quickly to inhabit the area "uphill" that appeared to still get some of the vent flow, but it was more diluted.

L. Podowski:

Northern region: Most of my work was concentrated in the central and southern regions at Tu'i, but I was present for some of the marker 62 chimney mosaic and subsequent transit to marker 22 (St. James' Spires). The chimney mosaic is in the middle of a rather large chimney complex and it took awhile to find the right one. Most of the chemosynthetic megafauna were on the chimney structures, most of which seemed to be relatively inactive. I don't recall any diffuse flow communities at the chimney mosaic site nor on the transit to or at St. James' Spires. However, there was a huge bed of disarticulated mussel shells skirting the periphery of St. James' Spires (unfortunately no *Phymorynchus*) and we slurped lots of polynoids from the chimneys here for Stéphane.

Central region: We re-imaged and re-surveyed the diffuse flow mosaic, TM1, and no drastic changes in the community were evident from 2006. TM1 is still characterized by one patch of white *Alviniconcha* and then a large patch of white and dark *Alviniconcha* in the central area of the mosaic. Mussels were relatively rare and often formed mixed communities with *Ifremeria*. Just downslope from the eastern corner of TM1 were large patches of snails and mussels, mixed and homogenous; Erin set-up many behavioral experiments in this area. TM1 and the surrounding area host many *Eosipho desbruyeresi*, a typically solitary snail. However, near some of Erin's behavioral experiments we observed *E. desbruyeresi* forming small, dense aggregations.

Southern region: We don't have many established sites in this region, primarily the TM2 alvinellid flange mosaic. The flange appeared to have an increased amount of hydrothermal activity relative to 2006, particularly in the central region where many white deposits had formed. The flange hosted abundant populations of polynoids, alvinellids, bythograeid and galatheid crabs, and a few solitary mussels.

MARINER 2006***C. Fisher, after 1 dive:***

This was my first visit to Mariner. We had Stacy's and Meg's maps and input, as well as Ken Takai's dive report. We landed on a chimney/smoker complex in the SW quadrant of Meg's SM 2000 map. First impression was of a lot of smoke. We were looking for smokers fairly near to the ground to deploy Geoff's Osmos on, and it took us a while to get figure out where the smokers were and get to the ground. I was impressed by the fact that many of the most active smokers were fairly close to the ground, and not on the tops of chimneys. We had lots to choose from. Later when we went up to the top of the chimneys we were working on, I found they were not as hot (few and small smokers) as the spots on their sides and near the ground. Is this due to a re-invigoration of an old site? Although we did not see any mussels or chemo snails, I was impressed by the numbers of shrimp on the chimneys (many aggregations of 10's to 100's), and a moderate abundance of *Austinogrea* crabs, a relative paucity of *Munidopsis*, and good numbers of large scale worms in cool areas on the base of chimneys along with lots of little (apparently non symbiotic) snails. A few scale worms typical of hotter areas were present on the white areas of the chimneys along with the shrimp. We visited Anna Louise's rock (tooth), and Stacy Kim confirmed it was the same rock. It has cooled off quite a bit as only a bit of the top and a multi-tiered flange on the side were still white. Another rock next to it was similar. A little diffuse flow here, but nothing much. And very little megafauna on this rock, other than a very few shrimp. We then transited up to the top of the hill where Ken had found dead tubeworms. They were still there and still dead. The tubes were rust colored and falling apart. It is a sedimented area with no sign of activity, except some hydrothermal staining among the dead clumps (small curled up little tubes). In transit to the north we passed over what we nicknamed "lava bombs". Black rocks very noticeably out of place, spotted among the generally grey sediment covered landscape. When we tried to sample them we found they were extremely friable and could not be collected even with a resistance setting of 1 on the manipulator (which can pick up an egg without breaking it). Other than that the transit was non-eventful for a vent biologist; sediment lightly covering lava, although we did find and collect some Crinoids. We then returned to the main complex of chimneys, first visiting an old spire covered with peripheral fauna (lollipops, starfish, etc), then into some with smoke. In general the central area here is quite impressive with very different looking chimneys, with multiple fragile spires (most spires are inactive, although there is plenty of activity in general), sometimes with considerable height (10 – 20 m).

S. Hourdez, after 1 dive:

Northern area: We did find the Japanese marker (92) on top of a mound (1850 m). There is no sign of activity in the Northern area. Only dead tubeworms were found, as reported earlier. The area is heavily sedimented.

Southern and central areas: We did not find any markers from previous cruises during this dive. Overall, there is a lot more sediment here than anywhere else we had a dive in the Lau Basin. When there is activity, it is very focused, with no a little diffuse areas.

The smokers, when present, are black smokers, with temperatures above 300 °C. The chimneys are very large, sometimes forming complexes. Some of the chimneys reach 25 meters in height. The active chimneys are rust-colored where no diffusion is visible.

Two osmosamplers were deployed in the southern area, in a single opening, along with a Hobo probe. The second Hobo probe was deployed on a very low group of small chimneys, a few meters away. Temperature was 326°C.

In the central area, one osmosampler was deployed in diffuse flow at the base of the Pisa chimney (mosaicked, E-chemed and sampled for fauna). Temperature in the diffuse flow was 16-20°C.

Anna-Louise Reysenbach's chimney looks like a stump with few shelves and round protuberances. Manganese was found in high levels in the fluid. It was not possible to break a piece of that chimney for analysis. Very few animals were found on it.

There is some fauna in this area. The main symbiotic species (the snails *Ifremeria nautilei* and *Alviniconcha hessleri*, and the mussel *Bathymodiolus brevior*) were not found, suggested that either the conditions are not right to support symbiosis or these species are sensitive to a factor found in large amounts here (heavy metals?). However, the typical chimney fauna was found and collected: the scaleworm *Branchinotogluma segonzaci*, the shrimps *Nautilocaris saintlaurentae* and *Chorocaris vandoverae*, and the crab *Austinograea alaysae*. Other fauna is typically associated with very diffuse flow: the scaleworm *Levensteiniella* sp. (reaching very large sizes), the shrimp *Lebbeus* sp., and the snails *Desbruyeresia* spp.

MARINER 2009***E. Becker:***

We had a lot of trouble navigating this site since we never had a transponder net. We searched for a couple of hours and never found either of the two chimneys we mosaicked in 2006 nor did we find the diffuse flow mosaic site that Stacy Kim mosaicked in 2006. We later found a marker that was close to the Pisa chimney in 2006 but the chimney was nowhere around. We presume that this chimney toppled over and so was no longer there. As in 2006, the most distinguishing characteristics of Mariner are the reddish appearance of the chimneys due to high amounts of iron and manganese in the vent effluent, the large amount of “smoke” emanating from the chimneys, and the lack of animals with chemoautotrophic endosymbionts that dominate biomass at the other sites. One of the most violently venting chimneys had white flames emanating from the orifices below the billowing “smoke” cloud. The same mobile species are present here as at other sites on the ELSC, such as galatheid and bythogreid crabs, alvinocarid shrimp, polynoid polychaetes, and limpets. We sampled more of these, in addition to samples from 2006, for stable isotopes as well as the same species from chimneys at other sites for comparison of their nutrition.

S. Hourdez:

The southern area and its big chimney complex have not changed noticeably since our last visit in 2006. The osmosamplers and Hobo probes in this area were where we deployed them in 2006 and the chimneys were still active. The two osmosamplers placed in the same chimney opening were difficult to remove, embedded in the grown chimney. The group of very short chimneys where the last Hobo was deployed had grown to about 1-1.5 m. They easily toppled over where we tried to remove the Hobo. The fauna in this area was very similar to what it was in 2006: the main symbiotic species are conspicuously missing. The crabs *Austinograea*, as well as the shrimp *Nautilocaris* and *Chorocaris*, are very common. The base of this main group of chimneys is a slope made of piled chimney debris and red sediment. Here the, species are typical of peripheral areas: the scale-worms *Levensteiniella raisae* and *Harmothoe* sp., the shrimp *Lebbeus* sp., and small gastropods.

DIVE PLANS

J2-421

2009 Lau Basin, Cruise TN 235

Kilo Moana 1st JII lowering, 5/19/2009 JII 421

this should be a relatively short dive, approx 16 hours

Basket/vehicle loading:

Chemical sniffer, 5 chamber slurp sampler, JII T probe

Scorpio in down looking mode with 2 strobes and 1 HMI

Pixlefly on Sci Cam pan and tilt with lasers and additional strobe forward

Two bioboxes on swing arms

One major sampler, Dual banger ISMASH, niskin

milk crates for rocks, hobos...

2 markers, 1 collection net, 1scooper

Slurp chambers: Orange is flow through for cleaning system, large mesh

Blue has 1 mm mesh, Green and Red 300 micron mesh, Black has 32 micron mesh

Dive plan (times are a fantasy to help me plan, watch leaders in (...)):

1) Dive on Chimney mosaic site in southern area of activity: (2 hrs)

Marker D x 6941, y10621, 2620m

2) Run Georges protocols for Descent, and then bottom transit...

3) Go to Marker D for chimney mosaic at a heading of 026° (1 hr, Erin/Arunima)

4) Move to diffuse flow KM2 mosaic site and collect images at heading of 195° from 2 diff altitudes

Markers 54,55,56: x 6930, y 10640, 2620m (Liz/Arunima, 2 hrs)

5) Find some snails to scan and sample for ISMASH (1 hr, John+ chem. watch)

6) Collect Hobo #4 from Chimney at Marker 2: x6956, y10650-56, 2615m (.5 hr, George)

7) Take a major sampler here. (.5 hr, George)

8) Return to chimney to do chem. scans if ready. (2 hrs, Erin + chem. watch)

9) If not slurp some scale worms and shrimp for phys/genetics (1 hr) (Stephane)

9.5) need to burn time? Head N and look for sites for experiments, check out status of other areas and also to slurp. Could mosaic the N chimney if it seems appropriate and also collect the hobo/osmo from N chimney (leave marker).NOTE: do not head N until after e-chem for S chimney mosaic

10) Collect Both snails and mussels for Pete at end of dive. For at least one species get large excess for pop gen (2 hr pete)

11) return (2 hrs)

Total 14 hours, so a 16 hour dive is reasonable

Planned collections: Images for mosaics, ISMASH, 1 or 2 Hobo, perhaps an Osmo, lots of meat for pete et al.

J2-422

2009 Lau Basin, Cruise TN 235

Tow Cam, 5/20/2009 JII 422

this should be a relatively short dive, approx 12-16 hours

Basket/vehicle loading:

Chemical sniffer, 5 chamber slurp sampler, JII T probe

Scorpio in down looking mode with 2 strobes and 1 HMI

Pixelfly on Sci Cam pan and tilt with lasers and additional strobe forward

Two bioboxes on swing arms

One major sampler, Dual banger ISMASH, niskin

milk crates for rocks, hobos...

2 markers, 1 collection net, 1scooper

Slurp chambers: Orange is flow through for cleaning system, large mesh

Blue has 1 mm mesh, Green and Red 300 micron mesh, Black has 32 micron mesh

- 1) Dive on Center of active area: **X 6650, Y 5550, ~ 2710m**
 - 2) Run Georges protocols for descent, and then bottom transit... (2 hrs)
 - 3) Find a marker and set Nav to last year's XY for that marker (.5hr) (chuck)
 - 4) Go to Marker JJ (French Chimney) for chimney mosaic at a heading of 234°
(1 hr, Erin/Arunima) **Marker JJ x 6619, y5567, 2716m**
 - 5) Move to diffuse flow TC2 mosaic site and collect images at heading of 271° from one altitude
Markers 64,J: x 6635, y 5575, 2723m (Liz/Arunima, 1 hrs)
 - 6) Move to diffuse flow TC1 mosaic site and collect images at heading of 206° from 2 diff altitudes
Marker 31: x 6661, y 5534, 2706m (Arunima/Liz, 1.5 hrs)
 - 7) Find some snails to scan and sample for ISMASH (1 hr, John+ chem. watch)
 - 8) go to Chimney at Marker 7: x6655, y5535, 2708m and take a major (.5 hr, george)
 - 9) Return to French chimney to do chem. scans. (2 hrs, Arunima/Erin + chem. watch)
 - 10) Find the baby tubeworms, scan and collect (1 hr) (Chuck/Stephane)
x6595, y5580, 2704
 - 10) Collect XXX for Pete at end of dive. For at least one species get large excess for pop gen (2 hr pete)
 - 11) return (2 hrs)
- Total about 16 hour

Planned collections: Images for mosaics, ISMASH, 1 major, baby tubeworms, lots of meat for pete et al.

J2-423

2009 Lau Basin, Cruise TN 235

ABE, 5/21/2009 JII 423

A longer dive

Basket/vehicle loading:

Chemical sniffer, 5 chamber slurp sampler, JII T probe

Scorpio in down looking mode with 2 strobes and 1 HMI

Pixlefly on Sci Cam pan and tilt with lasers and additional strobe forward

Two bioboxes on swing arms

One major sampler, Dual banger ISMASH, niskin

milk crates for rocks, hobos...

2 markers, 2 collection nets, 2 diff scoopers

Rays camera

Basket compatible with carrying Stacy's crude around

Slurp chambers: Orange is flow through for cleaning system, large mesh

Blue has 1 mm mesh, Green and Red 300 micron mesh, Black has 32 micron mesh

Deploy elevator near Stacy's deployments before dive: **X 7850, Y 7758, ~ 2153m**1) Dive on Central active area: **X7840, Y7766, 2147m**

Run Georges protocols for Descent, and then bottom transit... (1.5 hrs)

3) Find a marker and set DVL Nav to last year's XY for that marker. Note offset (Liz)

4) Deploy Rays camera anywhere except in a mosaic (Ray/liz)

5) Head to Elevator. Move it close to Stacy's deployments and pick up weight to compensate for Ray's camera. Start the transit to Abe 2 diffuse flow mosaic (Liz).

5.5) Go to Abe2 diffuse flow mosaic and collect images from two altitudes.

ABE 2 Diffuse flow mosaic at Mkr 32,49: **X7937, Y7973, 2141m**, H342° (Liz, Arunima)6) Transit to BugsBunny, potato and spire Chimney mosaic at Mkr G **X7917, Y7981, 2141m**, H331° and collect images of all three (Erin/Arunima) Arunima, go to sleep.

7) find place to conduct behavioral experiments and try first one. Keep at it until you burn out. (Erin and chem. team) Erin, wake up Arunima and go to sleep

8) e-chem the chimneys at Mkr G **X7917, Y7981, 2141m**, (Arunima and chem. team)

9) Go to Mkr53 peripheral mosaic and collect images from XX alt. (Arunima)

ABE53 Peripheral mosaic at Mkr 46,48,53: **X7815, Y7802 2134m**, H314°

10) Transit back to elevator and pick up a stacy 4-banger milk crate (Ray)

11) Find and collect Stacy deployments: 4 each at ABE1, ABE2, ABE3

X 7845, Y 7758, ~ 2153m**X 7848, Y 7783, ~ 2153m****X 7854, Y 7758, ~ 2156m**12) Go back and forth to elevator and fill all boxes. **Do Not send up elevator**

13) find a smoker in this central area and take a major (George)

14) Go to ABE1 diffuse flow mosaic and collect images from two altitudes (Liz)

ABE 1 Diffuse flow mosaic at Mkr 50,51,52 **X7838, Y7767, 2150m**, H270°

15) Collect scan and liquefy snails in ISMASH (John and chem. team)

16) Depending on time, Slurp fest for about 2 hrs (Stephane)

17) Additional behavior experiments and make collections for Pete (Erin and chem. team)

Do clearance chemistry experiments for one or two species ass. with collections

19) Retrieve Rays camera (Ray)

20) Send up elevator and come on home

Planned collections: Images for mosaics, ISMASH, 1 major, Stacy rocks, lots of meat for pete et al., Slurp

J2-424

2009 Lau Basin, Cruise TN 235
 Kilo Mauna 4th JII lowering, 5/23/2009 JII 424
NEW VERSION

Basket/vehicle loading:

Chemical sniffer, 5 chamber slurp sampler, JII T probe
 Scorpio in down looking mode with 2 strobes and 1 HMI
 Pixelfly on Sci Cam pan and tilt with lasers and additional strobe forward
 Two bioboxes on swing arms
 One major sampler, Dual banger ISMASH, niskin
 milk crates for rocks, hobos, 2 markers, 1 collection net, 1scooper
SUPR sampler Remove 5-chamber slurp and replace with single chamber **IF necessary.**
Room to deal with Stacy's milk crates (rocks)
 Slurp chambers: Orange is flow through for cleaning system, large mesh
 Blue has 1 mm mesh, Green and Red 300 micron mesh, Black has 32 micron mesh
Deploy elevator before dive to Stacy deployments. X 6935, Y10725, 2622m

- 1) Dive on Chimney mosaic site in Central area of activity: (2 hrs)
Marker E x 6936, y10714, 2618m
- 2) Run Georges protocols for Descent, and then bottom transit...
- 3) Go to Marker E for chimney mosaic at a heading of 026° (Erin)
X6936, Y10714, 2618m
- 4) Go north to KM1 diffuse flow mosaic site and collect images at a heading of 123° (Liz)
Marker 29, x6917, y10776, 2615m
- 5) go to KMF peripheral mosaic site and collect images at a heading of 122° (?) (Arunima)
Marker F, X6920, Y10779, 2618m.
- 6) Go back to Marker E chimney mosaic and collect e-chem (Erin)
X6936, Y10714, 2618m
- 7) Take a major here at chimney of your choice (E would be nice)
- 8) Go to Elevator and move it to near Stacy deployments if necessary
X 6935, Y10725, 2622m Remove one set of milk crates
- 9) Find and collect Stacy deployments: 4 each at KM1, KM2, KM3
X 6936, Y 10726, ~ 2622m X 6933, Y 10727, ~ 2622m X 6944, Y 10722, ~ 2622m
- 10) Go back and forth to elevator and fill all boxes.
- 11) Move to southern KM28 peripheral mosaic site and collect images at a heading of 249° (Arunima)
Marker 28, X6954, Y10631, 2625m
- 12) go to KM2 diffuse flow mosaic site and e-chem (Liz)
Markers 54,55,56: x 6930, y 10640, 2620m
- 13) Make collections here Erin clear cut experiment if possible. (Erin)
- 13.5) Find some snails to scan and sample for ISMASH (John)
- 14) Collect thermistor array to basket (Chuck)
- 15) Slurp if time allows (Stephane)
- 16) Begin SUPR work with 4 hours till surface
- 17) Call up elevator: Collect elevator and head back to ABE

Planned collections: Images for mosaics, ISMASH, Therm array with Osmo, Major, Kim Rocks, Assorted animals for the ship, SUPR plume samples

J2-425

2009 Lau Basin, Cruise TN 235

ABE, 5/24/2009 JII 425

20 – 28 hour dive

Basket/vehicle loading:

Chemical sniffer, **SUPR sampler**, JII T probe

Scorpio in down looking mode with 2 strobes and 1 HMI

Pixlefly on Sci Cam pan and tilt with lasers and additional strobe forward

Two bioboxes on swing arms, One major sampler, Dual banger ISMASH, niskin

4 mussel pots, 2 markers, 1 collection net, 2 scoopers, 1 pusher

Single chamber slurp.

***No Elevator this dive**

Note, functional e-chem with T is mission critical. Test on launch.

1) Dive on Hogwarts Chimney mosaic and collect images (Erin/Arunima)

Mkr AA, **X7653, Y7479, 2131m** H 097°

Pass images to Dominique for mosaicing asap

2) Go to Hobo 3 chimney, collect Hobo and take a major (George)

X7658, Y7423, 2619m, heading 307°

3) SUPR this chimney

4) Find another chimney to SUPR in this southern complex

5) Go to ABE 63 Peripheral mosaic and collect images (Arunima)

Mkr 63, 65: **X7710, Y 7411, 2131m**, H052°

6) Use Stacy's mosaic to do some very selective e-cheming here (Arunima/chuck/chem. team)

7) Return to Hogwarts and e-chem (Arunima/liz/chem. team)

Mkr AA, **X7653, Y7479, 2131m** H 097°

8) Go to Mkr53 periph. Mosaic and selective e-chem (Arunima/chuck/chem. team)

Mkr 46,48,53: **X7815, Y7802 2134m**, H314°

14) Move to chimney major site and SUPR a central chimney ("chimney major") (Sheri)

9) Go to ABE1 diffuse flow mosaic and SUPR over a mussel bed. (Sheri/Liz)

9.5) E-chem ABE 1 well, keeping in mind we will more (Liz and chem. team)

Mkr 50,51,52, **X7838, Y7767, 2150m** H270°

10) Bundle thermistor array and set aside

11) Do mussel pots combined with clearance flow experiments (Erin/Sabine/liz)

3 Alvinococoncha and 1 andesite.

13) Liquefy 1 Alvinococoncha in ISMASH (John), **during A. h. musselpot collections**

14) Spend a little time and identify areas for behavioral/flow experiments (Erin) **Leave 1.5 hours for collections and thermistor array recovery.**

15) Make collections to Biobox:

Collect about 10 A.h. from central clump and move to the top near the thermistor array. Collect a few scoops of mussels and Ifremeria. We don't need a lot, Pete's needs only.

16) Collect thermistor array to basket and come on home. (chuck)

CTD while on surface

Planned collections: Images for mosaics, ISMASH, major, meat for Pete, mussel pots (Ah), thermistor array and osmo

J2-426

2009 Lau Basin, Cruise TN 235
ABE, 5/26/2009 JII 426
Approx 28 hr dive
Updated during #8

Basket/vehicle loading: Same as last dive

Chemical sniffer, SUPR sampler, JII T probe
Scorpio in down looking mode with 2 strobes and 1 HMI
Pixelfly on Sci Cam pan and tilt with lasers and additional strobe forward
Two bioboxes on swing arms, One major sampler, Dual banger ISMASH, niskin
4 mussel pots, 2 markers, 1 collection net, 2 scoopers, 1 pusher
Single chamber slurp.

Deploy elevator with Pete's chamber and Bidet-Cam to N. area: **X7937, Y7973, 2141m**

- 1) Dive on Elevator and move closer to ABE 2 diffuse flow area if necessary.
- 2) Remove Rays camera and deploy in this area, near Ifremeria
- 3) Go to new marker 9-2 and deploy ifremeria for behavioral experiment controls
More experiments here??? (no ready supply of A. h.)
- 4) Collect and liquefy a snail in ISMASH (John)
- 5) Go to ABE 2 Diffuse flow mosaic and e-chem
Mkr 32,49: **X7937, Y7973, 2141m**, H342
- 6) Conduct some clearance/replacement experiments here?? (no ready supply of A. h.)
- 7) Return to observe controls at Mkr 9-2
- 8) Go to ABE1 diffuse flow mosaic and take 4 mussel pots (Erin and chem. team)
Mkr 50,51,52, **X7838, Y7767, 2150m** H270°
Take 3 in Ifremeria and 1 andesite
If any are suitable for removal experiments, finish the job and survey, then either add A.h. or try control If not conduct other manip experiments. (add A.h and mix...)
- 8.5) Pick up a control rock to a clean biobox for Sabine**
- 9) Make collections for Pete's group from this area
- 9.5) Stop by ABE 2 mosaic and pick up a typical rock and an orange rock to the basket?**
- 10) Return to Mkr 9-2 to observe controls
- 11) Go to Hobo 2 Osmo chimney, recover Hobo to the basket
take Osmo to elevator
X7907, Y7982, 2141m, 350°
- 12) Get Bidet Cam and a few Ifremeria in the can (can you do both at once??)
- 13) go to elevator, load Pete's chamber and Bidet-cam
- 14) Take a major and start the plume SUPR survey.**
- 15) Call up elevator with approx 30 min left in SUPR survey

Planned collections: ISMASH, 1 major, Hobo, Osmo, mussel pots with Ifremeria, meat for Pete, camera

J2-427

2009 Lau Basin, Cruise TN 235

ABE, 5/27/2009 JII 427

Basket/vehicle loading: Same as last dive

Chemical sniffer, SUPR sampler, JII T probe

Scorpio in down looking mode with 2 strobes and 1 HMI

Pixlefly on Sci Cam pan and tilt with lasers and additional strobe forward

Two bioboxes on swing arms, One major sampler, Dual banger ISMASH, niskin

4 mussel pots, 2 markers, 1 collection net, 2 scoopers, 1 pusher

Single chamber slurp.

1) Dive on ABE 1 mosaic site

X7838, Y7767, 2150m

2) Go to ABE1 diffuse flow mosaic and take 3 mussel pots in mussels and 1 in andesite with before and after e-chem (Chuck, Erin, Liz)

Do clearance experiments associated with some of these collections.

While doing this, put about 20 mussels in the biobox

Add Ifremeria to these clearance experiments if appropriate

While doing this, put about 20 Ifremeria in the biobox

3) Collect 20 Alviniconcha into the biobox, w/o disturbing the area with added Ifremeria. (Erin)

4) Collect and liquefy a smallish Alviniconcha in ISMASH (John)

5) Monitor Experiments at ABE 1: (Erin, Liz)

-Photo mosaic ABE 1 from about 4 m

-Collect Brow cam images of old experiments

6) Collect a background basalt near ABE I for Sabine (Sabine)

7) Grab thermistor array (at top of ABE 1), hold it out in front (not over mussel pots) and carry to elevator (Chris or Ray)

8) Monitor Experiments in North (at 9-2) (Erin, or do this at the very end, #12.5)

9) Go to Hobo/Osmo chimney and collect Hobo to basket (Break off tip at score) and Osmo to elevator (George or Chris): **X7907, Y7982, 2141m, 350°**

10) Collect Bidet cam and 2-3 Ifremeria in can to elevator (do both at once?) (Pete, Ray)

Load and lock Pete's chamber (Pete)

11) SUPR 3 chimneys in the northern complex (Sheri, Jason)

12) Take Major at appropriate chimney (George, Sheri)

13) go to Elevator and pull the pin

Come on home

Planned collections: ISMASH, 1 major, 3 mussel pots of mussels and one of rocks, meat for pete, hobo, 2 osmos, thermistor array, bidet cam

J2-428

2009 Lau Basin, Cruise TN 235

Tu'i Malila, 5/28/2009 JII 428 Part II

**Hard ground fault 18 hours in to dive caused weight drop and partial surface
Dive finished through most of original #6 and reordered appropriately below**

Basket/vehicle loading:

Same as when left the surface but an additional net and two new markers were sent down about 6 hours into the dive.

- 1) Dive on Elevator to get weights and balance Jason appropriately
- 2) Go to flange mosaic (TM2) and mosaic (Liz)
Mkr 35, X1533, Y2982, 1879m, H68°
Evaluate if it is similar enough to e-chem now or should we wait for re-mosaic?
If it is similar enough, then e-chem now (liz) and slurp after (Stephane)
- 3) Slurp your way towards Marker 61 (Stephane)
- 4) Go to peripheral mosaic 61 and mosaic and selective e-chem (Arunima)
Mkr 59, 60, 61, X1565, Y3023, 1880m, H144°
Grab a rock here to the basket and note location
- 5) Go to peripheral mosaic 45 and mosaic and selective e-chem (Arunima)
Mkr 39, 41, 45, X 1542, 3045, 1883m, H 257°
Grab a rock here to the basket and note location
- 6) Go back to Mkr 62 to e-chem both sides of the chimney (Arunima)
Mkr 62, X1601, Y3175, 1894m, deployed at 227°
- 7) Find Mustafa or George and Wake up Erin**
- 8) Go to "Georges hole" to take major ("**near Mkr 22**"): **X 1612 Y 3175, H 160°** (Mustafa)
- 9) Return towards crusty marker 36 and Find a place for the Ifremeria removal/A.h. replacement experiment. (Erin)
Deploy Marker and e-chem
Gather a bag of Ifremeria. Place in biobox
Slurp or use can to clean up and put Ifremeria in biobox for collection to ship
e-chem again
- 10) Go to Crusty marker 36 and remove the rest of the A. h. into biobox
Slurp some bacteria flock from here
then deploy Ifremeria here
- 11) go to the deployment 9.7 experiment and slurp up 15 of Liz's favorite snails.
- 12) find next A.h. removal spot, deploy a marker and e-chem
get a bag of A.h.
Remove rest of A.h. and e-chem
- 13) Find next Ifremeria removal spot, deploy a marker and e-chem
get a bag of Ifremeria
remove rest of Ifremeria (Into biobox if need more) and e-chem
Deploy bag of A.h. here
- 14) go back to last A.h. spot (#12) and deploy the Ifremeria here
- 15) ISMASH (**Iterative Snail Molestation And Skinning Harvester**) a snail (John)
- 14) finish collections for the ship: You may need more mussels. Fill both bioboxes. (Erin)
- 16) collect 2-3 Ifremeria to Pete's bomb (Pete, John, or Roxanne)
- 17) retrieve the Bidet-cam to elevator, Pull the pin and come on home

J2-429

2009 Lau Basin, Cruise TN 235

Mariner, 5/31/2009 JII 429

16 hr dive max

Basket/vehicle loading:

Change Cameras, Add one major

Dive with one rock crate in place

5 chamber slurp and milk crate array.

Chemical sniffer, JII T probe

Scorpio in forward looking mode with strobes and HMI

Pixlefly on brow cam bar and additional strobe forward

Two bioboxes on swing arms, **Two major samplers**, ISMASH, niskin

Milk crate array 1 marker , 1 collection net, 1 scooper

5 chamber slurp

Deploy Elevator with Stacy's boxes and Rays box (empty) to safe spot: Perhaps **~X 5000, Y 5800, 1918m** (to primarily access Stacys deployments between X5000-5040 and Y5840-5870)

1) Dive on Stacy's rocks, load up with 4 rocks and find good spot to move elevator to if necessary (Ray)

Mar1 X 5007, Y5846, 1918m

Mar2 X 5011, Y5846, 1917m

Mar3 X5026, Y5866, 1920m

2) Go get elevator and move if necessary. (Chuck/Ray)

IF elevator is off to the south, then do southern work (#8 and 9 below) next, then move elevator

If Not, Finish with rock collection

3) Finish with Stacy's rocks. **NOTE: only 11 rocks total**

4) Find Pisa and mosaic and e-chem at a heading of 64° (Erin)

X4983, Y5859, 1912m.

4.5) Grab a sulfide for Pete into biobox

5) Slurp here for stable isotopes (Chuck, Stephane)

Fire Niskin here

6) Collect osmo (base of pisa, heading of deployment 061°) and take it to the elevator

7) go look for the elusive chimney top to mosaic and e-chem from a heading of 324° (Erin)

X5047, Y5873, 1904m,

8) Go South to collect Hobo 5 and Hobo 6 to the basket (Stephane)

Hobo5- X4964, Y5751, 1917m, 037°, Hobo6- X4956, Y5762, 1919m, 307°

Take a major from each hobo chimney or other spot near here (George)

Get sulfide for Pete into biobox

9) Collect the two Osmo samplers and carry to the elevator (Stephane)

X4963, Y5754, 1917m, 049°

Put a marker at this chimney if it is still active.

10) Time left? Slurp and e-chem. head for elevator with ~1.5 hours to surface

J2-430 Part I

2009 Lau Basin, Cruise TN 235

Tu'i Malila, 6/1/2009 JII 430

Approx 36-40 hr dive

Basket/vehicle loading: Basically same as last dive

Chemical sniffer, JII T probe

Scorpio in Forward looking mode on basket with 2 strobes

Pixelfly on Bar (needs to tilt down a titch) and additional strobe

Two bioboxes on swing arms, ISMASH, niskin

Milk crate array 1 marker, **2 collection nets** (a spare), 1 scooper, 1 spanker

5 chamber slurp

Carry Bidet cam on Jason during descent

Launch elevator to central area X1555, Y3045, **1885m**

Elevator with boxes and pressure recovery system

1) Dive on Tui 1 mosaic. Deploy Bidet cam (Ray)

X1555, Y3045, 1885m

2) go to Mkr 9-10. Document and evaluate (Erin: #2-10)

Mix and see who wins?

3) head back towards mosaic and collect a bag of Ifremeria

4) find a place to remove Ah and add Ifremeria

5) get more Ifremeria if needed

6) go to Marker 9-9 Document and evaluate.

Perhaps clear and add Ifremeria

Perhaps add Ifremeria to A.h.

Mix and see who wins?

7) go to marker 34 document and evaluate

Needs e-chem

perhaps clear and add ifremeria

8) go to marker 9-5: document and evaluate

perhaps add A.h. ?

9) go to marker 36. Document

10) go to marker 9-7 document

11) Go to Diffuse flow mosaic site and look around for places for experiments (erin)

Mkr42, 43, 44, X1555, Y3045, 1885m, H132°

12) e-chem this site (Arunima or Liz)

Collect a rock

13) Go to Chimney mosaic at MKR 62

Mkr 62, X1601, Y3175, 1894m, deployed at 227° (Arunima/Liz)

14) mosaic both sides of this Chimney, Headings 78° and 339°

e-chem remaining side (Arunima)

15) visit tops of chimneys in this area and look for old mussel/snail communities

Image and e-chem (record on frame grab) (Liz/Chuck/Stephane)

Make sure and visit Saint James Spires (mkr 22)

16) when done here, head to the S towards the main area and go up on the ridge and run the ridge to the south imaging and e-cheming chimneys communities.

17) Go to flange mosaic (TM2) and e-chem

Mkr 35, X1533, Y2982, 1879m, H68°

Image with Scorpio

Slurp

18) Wake erin and head back to central area to monitor experiments

TN-235 Cruise Report: Dive Plans

When at 9-9 (isolated black A.h. site), collect 30-40 black A.h. from here for the ship
Also put one in ISMASH (Instantly **Send a Mussel And/or Snail to Hell**) (John)

- 19) Make additional appropriate collections for the ship (details to follow)
- 21) collect snails for Pete's bomb and grab Rays camera.
- 22) visit elevator, off load camera and load Pete's bomb
- 23) pull the pin and come on home

J2-430 Part II

2009 Lau Basin, Cruise TN 235

Tu'i Malila, 6/1/2009 JII 430

Approx 36-40 hr dive

Part II

Dive plan for Pete's midnight fun:

- 1) Collect Black Alviniconcha
- 2) ISMASH (Instantly **Send a Mussel And/or Snail to Hell**) (John)
- 3) Go back to Bidet Cam (in central area by all the experiments)
Collect whatever you want to put in your pressure vessel into the can, and grab bidet cam 4)
head to the elevator. Keep your eyes open, you are the first to traverse this terrain
- 5) Off load bidet cam and load the bomb
If you loose the snails in the can, I suggest you use the suction sampler to get some out of a
biobox and drop them in.
Leave the elevator here, we will call it up during ascent.
- 6) Head up to Mkr 62 area for sulfides if you have not run into any and have time. Wake up Stephane
who will want to slurp up here as well
X1601, Y3175, 1894m, deployed at 227°
(mkr 22) is also chimney complexes. There are lots up here
- 6.5) **Note to Stephane:** there are a bunch of white polynoids just to the south (SSE perhaps) of marker
34, down in a valley full of mussels, with no markers down in this area.
- 7) **You need to be back in the central area with all the experiments by 0530. You will need to
leave the chimneys by 0500 to make sure of this.**
- 8) Wake Erin by 5:20 so she can visit all experiments and be ready for a 0630 retreat from the sea floor

J2-431

2009 Lau Basin, Cruise TN 235

ABE, 6/03/2009 JII 431

A short dive 12 – 14 hrs

Basket/vehicle loading: Basically same as last dive

Chemical sniffer, JII T probe

Scorpio in Forward looking mode on basket with 2 strobes

Pixelfly on Bar and additional strobe

Two bioboxes on swing arms, ISMASH, niskin

Milk crate array 1 marker, **2 collection nets**, 1 scooper, 1 spanker

5 chamber slurp with X in intake as before

Slurp chambers: Orange is flow through for cleaning system, large mesh

Blue has 1 mm mesh, Green and Red 300 micron mesh, Black has 32 micron mesh

Deploy elevator near Central active area: **X7840, Y7766, 2147m**

Actual bottom location may alter order of dive plan (but not launch sites)

- 1) Dive on Chimney mosaic site, Hogwarts, in southern area of activity (Erin,Arunima):
Mkr AA, **X7653, Y7479, 2131m** H 097°
Mosaic this with Scorpio from two distances
- 2) Go to ABE 63 Peripheral mosaic and grab **two rocks** into basket (Arunima/chuck)
Mkr 63, 65: **X7710, Y 7411, 2131m,**
- 2.5) Go to ABE53 Peripheral mosaic and grab a rock into basket (Arunima/chuck)
Mkr 46,48,53: **X7815, Y7802 2134m**
- 3) Go to ABE 1 (**Liz will be the tour guide for ABE I**)
Mkr 50,51,52, **X7838, Y7767, 2150m**
- 4) Go to rock slide (bottom middle of mosaic) and net two bags of rocks (Liz/Sabine)
stash on basket
- 5) Back up 10 meters from site and pick up a rock into clean biobox (Sabine)
- 6) Visit Erins Snail Race (Snail Race 3) and image (Erin/Liz)
- 7) Sit down to collect Ifremeria and mussels from a flat area (Above Alviniconcha patch, near area of original thermistor crate deployment) (Liz/Jason)
Scoop about 40 of each into empty biobox using the can
Deploy mini-osmos here
- 8) Visit central Alviniconcha patch and image (Erin)
- 9) Sit down here and Load ISMASH, but continue working. (you can grind and watch the blender in transit to elevator) John/Pete
- 10) collect about 40 **into same biobox with other animals** using the can (John/Pete)
- 11) Scoop a few snails into can for transit to Pete's bombs (Pete/John)
- 12) Go to elevator and load Pete's bomb. (Pete/John)
- 13) go to Snail race 1 and 2 and image. Pick up marker to bring home.
Snail race 1 and 2: Mkr 9-2: **X7923, Y8002, 2140m**, H 019°
- 14) Go to BugsBunny and mosaic chimney from two distances (Arunima)
Mkr G **X7917, Y7981, 2141m**, H331°
Mosaic Spire if you can get shots
- 15) E-chem base of potato (Arunima/chuck)
- 16) Depending on time, image tops of a bunch of chimneys and consider e-chem.
We need to be on the surface well before 1000. 0900 is much better
- 17) Send up elevator and come on home

J2-432

2009 Lau Basin, Cruise TN 235

Tow Cam, 6/5/2009 JII 432

Midnight fun, Planned recovery at 8 am 6/6/09

Basket/vehicle loading:

Chemical sniffer, 5 chamber slurp sampler, JII T probe

Scorpio in Forward looking mode with strobes

Pixlefly on brow cam bar (works best with no strobes)

Two bioboxes on swing arms

ISMASH, niskin

milk crates with 3 markers, 2 collection nets, 1 scooper, 1 spanker, 1 chimlet collector

Carry bidet cam on basket

Slurp chambers: Orange is flow through for cleaning system, large mesh

Blue has 1 mm mesh, Green, Red, and Black has 300 micron mesh

1) Dive on Center of active area: **X 6650, Y 5550, ~ 2710m**

2) Head towards TC 2 mosaic site, Find a marker and set Nav to last year's XY for that marker

3) deploy Bidet (Bodacious Insitu Deployment for Elucidation of Temperatures) cam near TC2

4) Move to diffuse flow TC2 mosaic site and e-chem (watch for Phymorhynchus and collect)

Markers 64,J: x 6635, y 5575, 2723m (Liz/Arunima and chem. watch)

Fire the niskin

Grab a rock

5) Set up 2-4 addition and mix experiments here without e-chem (Erin)

6) Go to Marker JJ (French Chimney) for chimney mosaic with scorpio at a heading of 234°

(Arunima) **Marker JJ x 6619, y5567, 2716m**

7) Move to diffuse flow TC1 mosaic site and e-chem (watch for Phymorhynchus and collect)

Marker 31: x 6661, y 5534, 2706m (Arunima/Liz and chem. watch)

Grab a rock

8) Conduct some careful aggregation dissection/flow experiments here **finish no later than 0100**

Mussels have been collected but that is it for collections (confirm with Erin)

9) Collect Alviniconcha from the chimlets near Marker J (here, erin will direct). There appears to be white and black, on the ground and on the chimlets. Get a selection of about 50 (Stephane)

10) ISMASH (InSane Mechanism to Aggravate a Snails Health) a snail (John)

11) If there are paralvinellids here, slurp them. (Stephane)

12) Look for a good place to collect some Ifremeria here get about 50 if you don't find any, forget it

(Stephane) **Leave here no later than 0215**

13) Find the baby tubeworms, **e-chem** and collect an assortment of rocks to assure a good baby tubeworm collection, get some A. h. as well (Stephane and chem. watch)

x6595, y5580, 2704 m

14) At 0400, Go back to TC2 and image experiments, E-chem if appropriate, retrieve experiment markers, Collect Ifremeria if it has not been done yet. collect bidet cam, remove the stink pot. (Erin)

15) If there is time visit mussel oasis to slurp Phymorhynchus (Stephane)

X6614, Y5440

16) Leave bottom at about 6:15 for 0800 recovery

J2-433

2009 Lau Basin, Cruise TN 235
Kilo Mauna, 6/6/2009 JII 433
32 hr dive

Basket/vehicle loading:

Chemical sniffer, 5 chamber slurp sampler, JII T probe
Scorpio in Forward looking mode with strobes
Pixlefly on brow cam bar (works best with no strobes)
Two bioboxes on swing arms, ISMASH, niskin, **2 major samplers**
milk crates with markers, 2 collection nets, 1 scooper, 1 spanker, 1 chimlet collector
Slurp chambers: Orange is flow through for cleaning system, large mesh
Blue has 1 mm mesh, Green, Red, and Black has 300 micron mesh

Deploy elevator before dive to Northern area x6917, y10776, 2615m

- 1) Dive on Marker 5 and E-chem stalked barnacles (chuck)
XX6948, Y10627, 2617m, 191°
Take good chimney scorpio pics.
- 2) Look around the chimneys here for big animals for chimney clearance experiments (Chuck)
- 3) Try again to find and Collect Hobo #4 from Chimney at Marker 2 (Chuck)
Mkr2, x6956, y10650-56, 2615m, H 125°
Take a major here if you find it, Stash the Hobo on the basket (add George/Mustafa)
- 4) Go to Marker D for chimney mosaic at a heading of 026° (Arunima start ~ 2300 - 2400)
Marker D x 6941, y10621, 2620m
- 5) Move to southern KM28 peripheral mosaic site and e-chem (Arunima)
Marker 28, X6954, Y10631, 2625m
Grab a two rocks
- 6) Go to KM2 diffuse flow site area and look for mussels/snails for clearcut experiments (Erin)
Grab a rock and fire the Niskin
Work for 4-6+ hours in this southern area if it is productive You can also look at the middle area, but do #7 before heading North.
- 7) Go to Marker E for chimney mosaic at a heading of 350° (Arunima)
X6936, Y10714, 2618m
Look around at the chimneys here for one to take a major in and to describe to chuck tomorrow.
Take a major here if you find a good smoker (George/Mustafa)
- 8) Go to KM1/KMF diffuse flow/Peripheral mosaic site and e-chem (Liz, Arunima)
Marker 29, F, x6917, y10776, 2615m
Grab a rock
- 9) Grab the Osmo sampler and Hobo. Put hobo in the basket and carry the osmo
- 10) Grab a can of snails to load up petes bomb
- 11) Transit to elevator, off load Osmo, and load up the bomb.
- 12) come back to north end and look at chimneys around here
TIME to EVALUATE the dive and decide how to end..... Still to do:
- 13) either more chimney or diffuse flow clearcut flow experiments (Chuck and or Erin)
- 14) finish collections for the ship: 50 individuals of each snail species, slurp
Release elevator remotely during ascent. Arrive on deck by 2400

DIVE LOGS**Watch Schedule**
(GMT time)

Shift	Virtual Van Logger	DVD Logger
11:00 - 15:00	Ray Lee	Eric Simms
15:00 - 19:00	Yvette Luyten	Sabine Gollner
19:00 - 23:00	Sheri White	Sophie Plouviez
23:00 - 03:00	Baptiste Faure	Jason Sylvan
03:00 - 07:00	Yvette Luyten	Dominique Cowart
07:00 - 11:00	Chris Janzen	Arunima Sen

J2-421, Kilo Moana, 5/18/2009

TIME	COMMENTS
5/18/2009 20:20	Begin shift - Sophie
20:24	Begin the first DVD (001)
20:45	Jason on the bottom (Anemone)
20:59	Barnacle?
21:06	Black vent fluid
21:23	Discover of the Marker D
21:27	Crab, Mussels on chimney, Snails
21:56	Smoker
21:59	Discover of the Marker 28
22:07	T-array
22:13	Begin DVD 002
	End shift - Sophie
	Begin shift - Jason
23:05	Echem of unlucky, to be blended, snail (ISMASH snail 1, in aft blender)
23:15	sampling ISMASH snail 1
23:36	sampling ISMASH snail 2 --> will go in forward blender
23:52	snail sampling done, look for Marker 2
5/19/2009 00:02	taking majors sample from black smoker
00:31	oops! Dropped Major sampler
01:00	Major sample taken after recovery of sampler
	End shift - Jason
	Begin shift - Dominique
03:08	Temperature measurement
03:10	Chimney top knocked off
03:15	Temperature measurement
03:23	Temperature measurement
03:30	Temperature measurement
03:32	Mosaic Point change
03:34	Temperature measurement
03:37	Mosaic point/temperature measurement
03:40	Probe released
03:45	Marker retrieved
03:57	Bed of mussels identified

TN-235 Cruise Report: Dive Logs

5/19/2009 04:24 Scaleworm sampling
 04:34 Change to the red box
 05:04 Slurping scale worms
 05:16 Slurping scale worms
 05:36 Move to Marker C
 05:48 Marker identified
 06:31 Found Marker 29
 End shift - Dominique
 Begin shift - Arunima
 06:32 JASON Transit start back to marker E
 06:57 arrive marker C
 07:03 mussel group for Erin's experiments
 07:16 Frame grabs before chemistry for mussel removal expt
 07:18 Electrochemistry before mussel removal
 07:21 JASON Doppler reset reset to marker C
 07:24 Electrochemistry Point 3 Temp 2.5
 08:04 Scoop Mussels into port swing arm bio box
 08:26 Electrochemistry Post collection electrochemistry was NOT done
 08:35 Scoop Net to collect Ifremeria snails
 08:55 Scoop Net to collect A.h snails
 09:00 Scoop Net placed in starboard swing arm bio box
 09:18 **Off the bottom. End J2-421**

J2-422, Tow Cam, 5/20/2009

TIME	COMMENTS
5/20/2009 00:23	Begin shift - Jason
00:24	begin DVD set 008, DVD logger --> Jason S.
00:32	bottom sited
00:41	fixed screen problem (Casey did)
00:59	found Marker 8, mostly buried
01:09	found French Chimney (marker JJ), beginning mosaic
01:30	French Chimney mosaic done, now look for diffuse site
01:38	found Marker J, beginning to mosaic
02:13	done with mosaic, now looking for Marker 31
02:19	begin DVD set 009
02:25	found marker 31, beginning mosaic
02:53	shift change --> Dominique
	End shift - Jason
	Begin shift - Dominique
03:30	End of down looking mosaic
03:36	Complete down looking mosaic
03:49	Mosaic done
03:52	Snails for blender identified
03:58	Blender lid open
04:02	Chemical probe being used
04:11	Temperature probe being used
04:16	Snail grasped for blender, refusing to let go
04:23	Blending begins
05:10	Going back to active chimneys
05:17	Temperature taken of active chimney (324 degrees)
05:44	Arrive at French chimney
05:52	Temperature probe arm caught on something
	End shift - Dominique
	Begin shift - Arunima

TN-235 Cruise Report: Dive Logs

5/20/2009 06:51 Electrochemistry on French Chimney (points 19 through 35)
 07:39 Electrochemistry French Chimney Point #35
 07:45 Jason temp. probe Temperature in smoker at top of French Chimney Tc 127
 07:47 Jason temp. probe Temperature in smoker at top of French Chimney new position Tc 249
 07:54 Transit start In search of Baby Tube Worms
 07:59 Marker (unreadable)
 08:17 Found marker
 08:19 JASON Transit end Found site
 08:20 Tried to clean marker to read it
 08:21 Marker 9
 08:27 Scoop Net to collect snails. Placed in port swing arm bio box
 08:40 Ship lost a bow thruster momentarily. Waiting for ship to return to position
 09:01 Collected more snails with scoop
 09:02 Scoop Placed in Port side Swing arm bio box on top of net.
 09:06 Grabbed a piece of rock from under where snails were just collected
 09:10 Placed in Port Side swing arm bio box
 09:18 Tried to collect a large rock from face where snails were collected. Failed. Rock was a bit too heavy
 09:20 Marker labelled C found at base
 09:21 **Off the bottom. End J2-422**

J2-423, ABE, 5/21/2009

TIME	COMMENTS
5/21/2009	00:18 Begin shift - Jason
00:20	start dive at bottom, start DVD set 013
00:26	found marker for Stacy's larval work
00:39	deploying Ray Lee's camera
00:41	put down Ray's camera
01:23	found Marker 32 after ~25 minute transit
01:25	this is ABE2 --> beginning to mosaic
01:51	at Bugs Bunny, Marker G --> beginning to mosaic
02:13	start DVD set 014
02:15	check 013 BC-W- I started to record again instead of finalizing. it should be OK, but make sure it works
02:23	looking for spot for behavioral study
02:26	found osmo and hobo, will come back for them later
	End shift - Jason
	Begin shift - Dominique
04:53	Clearing space to put snails
04:58	Temperature probe used
05:47	Snail dumping commences
05:53	Snail dumping completed
06:16	Snails collected in sampling bag
06:30	Move black snails (Ifremeria) out
06:46	Temperature probe
	End shift - Dominique
	Begin shift - Arunima
06:50	Electrochemistry snail race 2 site point 3
07:15	Electrochemistry snail race 2 site point 14
07:25	snail race 2 site alviniconcha placed where Ifremeria were removed
07:30	circling around chimney in search of more alviniconcha to place back in cleared area
07:44	alviniconcha were collected from a nearby chimney into net
07:55	Collected 8-10 alviniconcha.

TN-235 Cruise Report: Dive Logs

5/21/2009 07:55 searching for more
08:03 Collected another 10 or so
08:04 searching for more
08:08 collected more
08:17 Collecting more alviniconcha
08:25 Moving back to snail race 2 site
08:33 snail race 2 site: alviniconcha were dumped in area cleared
08:54 looked back in on snail race site 2
09:07 Done watching snail races
09:07 JASON Transit start Off to bugs bunny
09:19 At marker G
09:22 JASON Transit end Back at Bugs Bunny
09:24 JASON Doppler reset to marker G
09:30 Electrochemistry Bugs Bunny start (point 1)
10:49 Bugs Bunny electrochemistry done (point 30)
11:02 Jason temp. probe Temperature of vent fluid at the top of Bugs Bunny Tc 182
11:11 Electrochemistry potato #1 start 0.5 C
End shift - Arunima
Start shift - Eric
11:12 E-chem started
12:30 Located Marker 9-2
12:56 Moving to Marker 53 - peripheral mosaic
13:09 troubleshooting ground fault w/ Medea
End shift - Eric
Start shift - Sabine
15:10 transit with elevator
15:22 change dvd
15:38 reposition elevator
16:10 still looking for Stacy's experiments
16:13 found experiments
16:14 start recover Stacy's experiment #1 (in box1) at ABE 2
16:17 recover Stacy's experiment #2 (in box2) at ABE 2
16:24 recover Stacy's experiment #3 (in box3) at ABE 2
16:27 recover Stacy's experiment #4 (in box4) at ABE 2
16:30 back at elevator
16:34 put experiments back on elevator (blue)
16:49 experiment (empty, from B) on Jason
17:01 at ABE 1
17:09 recover exp. # 1 (stone is too big!)
17:15 change dvd
17:19 recover exp. 2
17:20 recover exp. 3
17:23 recover exp. 4
17:25 go back to elevator
17:47 put experiments back on elevator (B)
17:55 experiment (empty, from A) on Jason
17:59 transit to ABE 3
18:05 at ABE 3
18:13 recover exp. 1
18:17 recover exp. 2
18:24 recover exp. 3
End shift - Sabine
Begin shift - Sophie
18:36 Try to recover Exp#4... Too difficult, abandon
18:53 Go to the elevator
19:00 Put box in the A orange elevator box
19:06 Smoker

TN-235 Cruise Report: Dive Logs

5/21/2009 19:18 Measure temperature in the fluid T=285
 19:27 Sampling fluid
 19:51 Mosaic on ABE 1 Marker 52
 21:42 Echem (T=7.5 Spot1, T=2.5 Spot2)
 21:49 ISMASH on Alviniconcha Spot1
 21:53 Close the ISMASH with Alviniconcha inside
 22:02 2nd snail in ISMASH then close box
 22:17 Search patch of 1 species for behavioral experiment
End shift - Sophie
Begin shift - Jason
 22:52 Jason S. on DVD watch
 23:47 removal expt
5/22/2009 00:01 Echem for removal expt
 00:03 start DVD set 025, end 024
 00:05 Echem continues
 00:41 grabbed a tube worm
 00:57 start DVD set 026, end 025
 00:58 looking for Pete's meat
 01:37 collected 3 Alviniconcha for Pete
 01:40 collecting Bathymodiolus and Ifremeria for Pete
 02:04 collecting beige Alviniconcha
 02:13 done with Pete's collection, maybe slurping?
 02:23 collected rock, looks like a sulfide
 02:39 slurp- black chamber w/ 32 mm mesh
 02:44 slurp, blue chamber
 02:53 start DVD set 027, end 026
 02:53 shift change- Dominique on
End shift - Jason
Begin shift - Dominique
 03:16 Slurp Fest resumes
 03:23 Finishing the dive
 03:31 Ray's camera spotted
 03:35 Niskin bottle tripped
 03:39 Weight dropped
 03:49 Elevator tripped, ascending
 03:51 **Off the bottom. End J2-423**

J2-424, Kilo Moana, 5/22/2009

TIME	COMMENTS
5/22/2009 20:35	Begin shift - Sophie
20:36	Jason on the bottom, DVD set 028
20:46	Found maker C
20:52	Mosaic
21:24	Marker F
21:31	Mosaic
	End shift - Sophie
	Begin shift - Jason
22:25	start DVD set 029
22:50	jason on watch
23:20	electro chem
23:27	echem measurements
5/23/2009 00:01	new DVD set 030
00:02	echem and mosaicing during this DVD set
02:14	start DVD set 031

TN-235 Cruise Report: Dive Logs

5/23/2009 02:15 more echem
 02:50 shift change, Dominique on
 End shift - Jason
 Begin shift - Dominique
 03:12 Searching for rock begins
 03:47 Elevator spotted
 05:05 Collection Box B filled
 05:13 Collection Box A gathered
 05:36 Collection Box A completed
 05:41 Bungee cord to Box 1 lid broken
 05:45 Collection box 1 secured
 06:07 Collection box 1 completed
 06:21 Rock collections completed
 06:28 Transit to mosaic site, contains plethora of anemones
 End shift - Dominique
 Begin shift - Arunima
 06:37 JASON Transit end arrive marker 28
 06:59 JASON Transit start Moving to KM2
 07:13 Electrochemistry KM2 start (point 1)
 11:01 Electrochemistry at KM2 point 123
 End shift - Arunima
 Begin shift - Eric
 11:23 attempted ISMASH of mussels and sea cucumber
 End shift - Eric
 Begin shift - Sabine
 15:16 thermistor array collected
 15:21 transit back to elevator (need to put weights on)
 15:36 at elevator
 15:37 change dvd
 15:58 at smoker
 17:32 change dvd
 18:46 **Off the bottom. End J2-424**

J2-425, ABE, 5/24/2009

TIME	COMMENTS
	Begin shift - Dominique
5/24/2009 06:38	Jason hits bottom
	End shift - Dominique
	Begin shift - Arunima
07:01	waiting for a squall to pass
08:24	Jason on bottom again after returning to station after squall
08:30	Marker 20
08:36	Hogwarts
08:39	Still searching for marker
08:48	Marker AA
08:54	Mosaic forward-looking start
08:55	Marker AA Hogwarts
09:02	Mosaic forward-looking end
09:02	JASON Transit start HOB03 Chimney
09:26	Marker D
09:26	Found HOB03
09:27	12 meter offset from last years
09:27	RECOVER HOB0 3

TN-235 Cruise Report: Dive Logs

5/24/2009 09:31 Video best of Trying to recover Hobo three
09:36 HOBO placed in port side swing arm biobox
09:42 Jason temp. probe Looking for 300 degree smoker
09:47 Jason hydraulic issue with basket
09:58 Jason temp. probe Tc 294.1
09:59 Video best of Major collection
10:01 Major collected at Marker D HOB03 chimney
10:06 Major collection done
10:17 SUPR sampler beginning
10:30 SUPR sampler Port 8 (last)
10:34 Electrochemistry Position where SUPR 1 was just collected
10:37 E-chem done
10:38 Searching for another chimney to SUPR
End shift - Arunima
Begin shift - Eric
11:00 temperature measurement - 232C
11:04 transit to another area to see if it is a better site for SUPR sampling
11:17 may be at Hogwarts
11:23 taking temperature - 192C
11:36 super sampling
11:37 port 10
11:43 port 12
11:53 echem "super2" temp: 3C
11:59 going to sample at marker AA
12:05 confirmed marker AA
12:08 Echem start at marker AA
14:00 Echem done - 52 total points
14:10 transit to marker 63
14:26 marker 63
End shift - Eric
Begin shift - Sabine
15:04 PHOTO Mosaic down-looking start DOP x=7715 Y=7410 heading 48.5 depth 2127
Marker 63
14:58 change dvd
15:52 start e-chem Marker 63 (2.5C, 2.25C, 2.25C, 2.5C, 2.25C)
16:09 go to Marker 53
16:52 change dvd
16:56 at Marker 53
16:59 start e-chem
End shift - Sabine
Begin shift - Sophie
17:00 echem, pt 1 done
17:17 echem done, 5 total points
17:19 Move to chimney major
17:25 Same site as major 2009/05/21 - orig X: 7852 Y:7788 Hdg 139 Depth 2154
17:28 SUPR sampler background measurements
17:52 SUPR sampler starting measurements using Jason Temp probe
18:03 SUPR sampler 0.5-1.0m from opening for measurements
18:05 port 15 10L 7L/min
18:08 port 16 10L 7L/min
18:10 port 17 20L 8L/min
18:15 port 18 20L 8L/min
18:20 port 19 20L 8L/min
18:26 port 20 20L 8L/min
18:30 SUPR sampler done with this vent
18:34 head to ABE1

TN-235 Cruise Report: Dive Logs

5/24/2009 18:46 SUPR sampler over small mussel patch: X=7841 Y=7759 Hdg 280 Depth 2145m
 18:49 port 21 30L 8L/min
 18:55 port 22 30L 8L/min
 19:01 SUPR sampler done
 19:01 Start echem at ABE1 mosaic
 21:09 still echeming, pt 70
 22:40 still echeming, pt 120
 23:14 echem done, 135 total points at ABE1
 23:17 Start echem on Alviniconcha before musselpot F - numbering continued from mosaic (start pt 136)
 23:26 echem done, end pt 139, 4 total points
End shift - Sophie
Begin shift - Jason
 23:30 Jason S on watch
 23:34 musselpot F tried, but did not close
 23:41 Start echem on Alviniconcha before musselpot F - start pt 140
 23:48 echem done - end pt 143, 4 total points
 23:50 collecting musselpot F at small patch
 23:51 musselpot F didn't close again, trying a new area
 23:55 start echem of alviniconcha patch again, prior to mussel pot - start pt. 144
5/25/2009 00:06 echem done - end pt 149, 6 total points
 00:14 cleared snails with mussel pot F, sniffing echem in new hole (pts 150-154)
 00:33 musselpot B on alviniconcha- did not close completely
 00:35 start echem on alviniconcha (points 155-158)
 00:37 start DVD set 049
 00:42 echem finished
 00:46 musselpot A of alviniconcha
 00:49 start echem prior to musselpot D - (pts 159 - 162)
 00:58 echem pt 163 on MPA scar
 01:05 trying new place for MPD
 01:06 start echem for MPD (pts 164-166)
 01:17 MPD of alviniconcha
 01:19 start echem of MPD scar (pts 167-169)
 01:36 ISMASH! 1 snail in blender
 02:01 collecting Alviniconcha for Pete
 02:04 collecting Ifremeria and mussels for Pete
 02:58 shift change- Dominique on
End shift - Jason
Begin shift - Dominique
 03:09 Headed to collection site for Alviniconcha
 03:14 Collection for Alviniconcha begins
 03:18 Alviniconcha collection ends
 03:26 Snail race #3
 03:31 Temperature point taken
 03:37 E-chem point completed
 03:50 E - chem continues
 03:53 Clearing away Ifremeria
 04:56 Finished clearing snails, more E-chem
 05:03 Alviniconcha dumped on bare substrate
 05:12 Collection of themistor array
 05:26 Thermistor in bad spot; is stored for later collection
 05:30 **Ascending - end J2-425**

J2-426, ABE, 5/25/2009

	TIME	COMMENTS
		Begin shift - Sophie
5/25/2009	20:28	Jason on the bottom
	20:33	Jason at the elevator
	21:07	Elevator near chimney ABE 2
	21:14	Deployment of the Bidet Cam
	21:21	Alvinellids, Alviniconcha, Mussels, Ifremeria
	21:31	Put the Bidet Cam near the fluid
	21:36	Bidet Cam fall down
	21:46	New area for the Bidet Cam below Osmo and Hobo
	22:15	Behavioral experiments for Erin (Ifremeria put out)
		End shift - Sophie
		Begin shift - Jason
	22:55	jason on watch
5/26/2009	00:14	new DVD set- 054
	02:07	new DVD set- 055
	02:19	mosaicing ABE2 site, including echem
		End shift - Jason
		Begin shift - Dominique
	03:00	Chem probe analyses
	03:31	Still making mosaic and chemical probings
	03:48	Done with mosaic and Echem
	03:52	Headed to marker 9-2 for Erin's experiments
	03:58	Squall present, interferes with course
	04:29	Reached site
	04:58	Taking still photos
	05:23	Viewing snail manipulation site
	05:30	Echeming begins (Ifremeria pots)
	05:40	Mussel pot being deployed
	05:43	One mussel pot taken (1st grab is good)
	05:50	Echeming
	05:56	Fish runs into brow camera
	06:00	Second mussel pot taken
	06:02	Echeming again
	06:25	Mussel pot being deployed
	06:30	Mussel pot taken
	06:34	Echeming again
	06:45	Echeming completed for past site
		End shift - Dominique
		Begin shift - Arunima
	06:55	Echem for mussel pot #4 Point #22 done
	07:04	Mussel Pot D Collecting bare substrate
	07:06	pot did not close completely
	07:06	tried to very smoothly move pot back to its holster in the basket
	07:14	Electrochemistry point #23: bottom of hole where Mussel pot D was collected
	07:16	Electrochemistry Point #24 bottom of hole where pot D was collected
	07:17	JASON Transit start Looking for a good place to do another of Erin's snail race experiments
	07:26	JASON Transit end (Snail Race 4)
	07:30	Electrochemistry SnailRace4 begin (point #1)
	07:41	Electrochemistry SnailRace4 end (point 8)
	07:43	JASON Doppler reset Rest Doppler to jason lbl
	07:46	Marker 9-3 placed at SnailRace4 Heading 269

TN-235 Cruise Report: Dive Logs

5/26/2009 07:47 JASON Transit start In search of alviniconcha to add to SnailRace4
07:49 JASON Transit end marker in shimmering water. Unreadable but close to new marker 9-3
07:54 Scooping up alviniconcha for busing to their new location
08:10 Heading back to marker 9-3 SnailRace4 to place alviniconcha
08:10 Photograph down-looking
08:14 Placed alviniconcha at SnailRace4 at marker 9-3
08:18 Mixed new snails with old
08:31 Photograph down-looking SnailRace4 after mixing
08:33 Electrochemistry SnailRace4 after addition of alviniconcha and mixing
08:34 JASON Doppler reset
08:34 JASON Doppler reset to 9-3 marker
08:37 electrochemistry SnailRace4 point #9
08:45 Electrochemistry SnailRace 4 point #14
08:47 JASON Transit start In search of a new location for a snail race
08:50 JASON Transit end heading at 260 at marker 9-3 one meter from marker
08:51 Electrochemistry SnailRace5
09:11 Electrochemistry End of before e-chem
09:14 Scraping SnailRace5 clean
09:22 Collected Ifremeria (mostly). Placed in port side swing arm biobox
09:40 Scoop collecting mussels and placing them in port side swing arm biobox
09:47 Scoop collecting alviniconcha and placing them in port side swing arm bio box
09:49 DEPLOY Marker placed marker 9-1
09:50 heading 273
09:59 Collected more alviniconcha to bring back to SnailRace5
10:12 held onto the bag full of alviniconcha for a while and scooped Ifremeria to put where alviniconcha were just collected
10:17 Photograph down-looking Area where alviniconcha were collected
10:25 Several more downward-looking photos of the same area
10:32 Back to moving Ifremeria to site where alviniconcha were collected
10:51 Mosaic down-looking start Alviniconcha patch
End shift - Arunima
Begin shift - Eric
10:55 Start downward mosaic
11:05 Debating change in altitude
11:09 Shimmering fluid disrupting Doppler - continuing to image
11:14 Done imaging - move to Marker 9-3
11:17 Begin to clear Ifremeria and will release Alviniconcha
11:21 Port Jason manip leaking oil - shut it down
11:24 Attempt to release Alviniconcha from bag with starboard manip only
11:26 Clearing an area of Ifremeria
11:33 Start E-chem
12:07 Releasing Alviniconcha from bag
12:14 Bag empty
12:21 Imaging downward of snail deployment
12:31 Heading to ABE-2 diffuse flow area to collect rocks
12:35 Looking for rock sample at ABE-2
12:40 Rock in BioBox
12:42 En route to collect rocks for Liz Podowski
12:52 En route to collect rocks for Liz Podowski
13:13 En route to collect rocks for Liz Podowski
13:23 Doppler reset
13:25 Rock sample collected - andesite
13:30 Second rock sample collected - andesite
13:42 Problem w/ hydraulics - can't do any tasks tat require hydraulics
13:49 Transit to Marker 9-2 - observation of E. Becker's experiments
13:56 Observation at Marker 9-2 of E. Becker's experiments

TN-235 Cruise Report: Dive Logs

5/26/2009 14:04 Framegrab - E. Becker's Snail Race 2
 14:16 Preparing for SUPR sampling - collecting background samples
 14:27 Doppler reset
 14:29 Port 3, 1 meter above plume, 10 liters
 14:32 Port 4, 10 liters
End shift - Eric
Start shift - Sabine
 14:35 SUPR sampler port 5 10L
 14:37 SUPR sampler port 6 10L
 14:40 port 7 10L
 14:42 SUPR sampler port 8 10L
 15:01 SUPR sampler port 9 10m (~2125m) 20L
 15:06 SUPR sampler port 10 20L
 15:11 SUPR sampler port 11 20L
 15:17 SUPR sampler port 12 20L
 15:22 moving to 40m above chimney (~2095m)
 15:28 SUPR sampler port 13 40L
 15:36 SUPR sampler port 14 40L
 15:46 SUPR sampler port 15 40L
 15:55 SUPR sampler port 16 40L
 16:02 go to 200m
 16:12 SUPR sampler port 17 60L
 16:26 port 18 60L
 16:41 SUPR sampler port 19 60L
 16:57 SUPR sampler port 20 60L
 17:12 **Jason off bottom, end J2-426**

J2-427, ABE, 5/27/2009

TIME	COMMENTS
5/27/2009 04:00	Begin shift - Dominique
04:07	Descending to the bottom
04:17	On the bottom!
04:23	Headed to mussel pot locale
04:28	Reached mussel post locations
04:53	Echeming
05:05	Mussel pot deployed
05:08	Mussel pot collection unsuccessful. Try again
05:12	Mussel pot A collected
05:17	Mussels added to biobox using coffee can
05:27	Clearing mussels
05:30	Clearing ends, Echem begins
05:41	Echeming completed
05:49	Marker 9-4 deployed
05:53	Ifremeria collected to move back to marker 9-4
05:57	Dumping snails on markers
06:05	Remaining bag of snails added to bio box
06:10	Mussel patch spotted for second mussel pot collection
06:17	Echeming again
06:22	Mussel pot F being deployed
06:24	Mussel pot F collected
06:31	Moving snails with metal spatula
06:33	Echeming again

TN-235 Cruise Report: Dive Logs

5/27/2009 06:46 Identifying mussel pot locale
06:51 Echeming begins
End shift - Dominique
Begin shift - Arunima
06:52 Mussel Pot Electrochemistry Point #25 (from points 25 through 43)
07:18 Mussel Pot B Mussels at Marker A
07:20 Video best of "The mussel pot of the day" says Chuck
07:22 Ifremeria were under mussels
07:25 Used scoop to remove mussels and Ifremeria that were under the mussels where mussel pot B was collected
07:43 Took bag of Ifremeria from starboard swing arm bio box and dumped them on spot just cleared and e-chemed
07:51 JASON Doppler reset
07:58 Mussel pot D control substrate collection from uncolonized granular andesite
08:02 Electrochemistry Undisturbed andesite for control for mussel pot
08:08 Mussel Pot Electrochemistry Point #43
08:17 Mussel Pot D collected this time
08:20 Pot D did not seem to close all the way
08:22 Cleaning off the top of the mussel pots
08:24 Slurp was not pulling very well
08:29 Several smallish rocks placed in port side swing arm bio box for Sabine
08:39 Collected Ifremeria with tin can and placed them in starboard swing arm bio box
08:45 Moved to marker 9-1
08:52 Used tin can scoop to collect alviniconcha and place them into the starboard side swing arm bio box
09:02 Blender! Grabbed one small alviniconcha and placed it in the iSmash
09:13 mixed manually with manipulator tines
09:13 Tried operating the blender with the lid off
09:14 added a second small alviniconcha
09:23 removed both intact shells
09:23 Grabbed one more small alviniconcha
09:39 Mosaic down-looking start All of ABE1 at altitude of 4 meters
10:01 Mosaic down-looking end
10:03 Photograph down-looking photos of active experiments
10:27 Recover thermistor array and move it to elevator
10:29 Located thermistor
10:31 T-array in stbd arm
10:32 Carrying T-array to elevator
10:32 JASON Transit start To elevator
End shift - Arunima
Begin shift - Eric
10:55 transiting to elevator
10:57 arrive at elevator
11:03 lid on one elevator box won't stay open
11:07 dropped thermistor array
11:08 problems with Jason controls
11:14 thermistor in box
11:17 resetting manip - mechanical problem?
11:23 holding position to check mechanical issue
11:25 searching for Osmo and Hobo
11:30 located chimney w/ Osmo and Hobo - R. Lee's camera laying on its side
11:32 Doppler reset
11:35 Hobo retrieval attempted
11:37 Significant chimney collapse during Hobo retrieval
11:40 Chimney now venting at point of Hobo insertion
11:41 Hobo free of chimney

TN-235 Cruise Report: Dive Logs

5/27/2009 11:45 Testing hydraulics of port manipulator
 11:48 Hobo in basket
 11:50 Osmo cable housing/wiring looks 'fried' where it connects to the T-bar at vent chimney
 12:06 Calibrating manipulator (port)
 12:11 Calibrating manipulator (port)
 12:16 trouble-shooting manipulator (port)
 12:21 attempt to put Osmo in elevator box
 12:27 Osmo in elevator box
 12:30 enroute to pick-up R. Lee's camera
 12:35 R. Lee's camera on side - being retrieved
 12:46 R. Lee's camera in box on elevator
 12:49 repositioning elevator to access P. Girguis's pressure bomb
 13:00 Elevator repositioned - preparing to collect Ifremeria for bomb
 13:09 Ifremeria collected
 13:15 Ifremeria placed in pressure bomb (N=6)
 13:32 Lid on pressure bomb wouldn't close/seal
 13:36 going to take major sample where Hobo and Osmo collected earlier
 13:44 taking temp measurement
 13:49 temp 150C - not hot enough for a major sample -looking elsewhere
 14:01 taking temp at new vent
 14:14 took major sample during previous few minutes
 14:16 transiting to check on E. Becker experiments
 14:21 at Marker 9-2 (Snail Race) for E. Becker
 14:26 E-chem Snail Race 1 area - Point 1 (10C)
 14:32 continuing E-chem of site
 14:38 continuing E-chem of site
 14:41 Starting E-chem of Snail Race 2 site
 14:49 continuing E-chem of Snail Race 2 site
 14:51 done w/ E-chem
 End shift - Eric
 Begin shift - Yvette
 15:47 DVD change-set 070 in
 17:05 SUPR done
 17:08 Go to elevator and pull pin
 17:16 Killing time before sending elevator up
 17:41 Released elevator
 17:42 **Stop Recording-Jason off bottom. End J2-427**

J2-428, Tu'i Malila, 5/28/2009

TIME	COMMENTS
5/28/2009 12:14	Begin shift - Eric
12:15	arrived on bottom
12:20	Looking for Marker 62
12:23	found Marker 22
12:30	still looking for Marker 62
12:35	found Marker 62 - difficult to see - adjusting camera
12:45	begin forward-looking mosaic of chimney at Marker 62
12:51	stop mosaic - changing heading to 339
12:57	mosaic of opposite side of chimney at Marker 62
13:00	done mosaic
13:02	transit to elevator
13:13	still in transit to elevator
13:22	still in transit to elevator

TN-235 Cruise Report: Dive Logs

5/28/2009 13:33 arrival at elevator
13:37 pausing to calibrate manipulator (port)
13:50 pausing to calibrate manipulator (port)
13:58 calibration complete
14:00 reset Doppler
14:01 removing R. Lee's camera from elevator box
14:04 en route to Dara's Smoky hole w/ camera
14:20 looking for Marker T1 at Dara's Smoky hole
14:42 looking for Marker T1 at Dara's Smoky hole - found Marker 44 - other markers fouled and can't read
14:57 search continues
End shift - Eric
Begin shift - Yvette
15:06 Looking for Dara's smoking hole
15:09 Dara's smoking hole, frame grabs for Ray. Site is deceptively slanted
15:09 pictures of Left and right front legs, let back leg
15:09 edge of bidet camera is over the hole
15:22 deploy marker 9-6
15:25 Ray's camera fell down, try to place again a little to the left
15:37 move back to diffuse flow mosaic site & find Ifremeria patch to deploy over
15:47 marker CC-deploy Ray's camera (@ potential snail race site), can be moved if need be
15:58 Go to TM1 marker 43 for mosaic
16:03 Change DVD
16:08 looking for mosaic site
16:11 1st mosaic @ 3.5m beginning
16:40 2nd mosaic @9m beginning (same site)
17:13 Pulling Niskin
17:25 Erin Becker's experiments starting
End shift - Yvette
Begin shift - Sophie
19:00 Echem
19:15 Erin's experiments
19:19 Deployment of the Marker 9-5
19:33 Put Ifremeria in a clear patch (from net)
19:52 Ifremeria in an Alviniconcha patch
20:03 Deployment of the Marker 9-7
20:51 Move Marker 36 to X=1557 Y=3039
20:57 Echem
21:41 Erin behavioral experiments
22:34 Echem
End shift - Sophie
Begin shift - Jason
22:50 Jason S on watch
22:50 change DVD set to 075
22:51 continuing echem and Erin's experiment
23:47 start DVD set 076
23:50 continuing echem and Erin's experiments
23:51 removing snails/mussels for removal expt
5/29/2009 00:07 dropping scoop instrument w/ homer over side of deck to be picked up by ROV
00:38 starting echem for removal expt at snail race 9
01:41 start DVD set 077
01:48 collecting animals w/ bag
02:10 going to grab scoop dropped from ship
02:36 found dropped scoop, picking it up
End shift - Jason

TN-235 Cruise Report: Dive Logs

5/29/2009

Shift begin - Dominique

03:04 Picking up scoop
03:15 Reached elevator
03:22 Milk crate collected, placed in elevator box
03:37 Headed to marker 36
04:09 Attempting to isolate ground fault
05:11 Decision made to recover Jason, earlier than scheduled
06:13 Issues resolved, descending again
06:24 Jason on the bottom
06:32 Elevator in sight. Pick up weights
06:38 Head to marker 35

Shift end - Dominique

Shift begin - Yvette

07:18 found marker 35
07:19 at marker 35
07:40 finished with TM2 down looking & going to repeat backwards, zoomed in
09:28 marker 25 (unknown marker)
10:14 SC-W started 1:42 min late

End shift - Yvette

Begin shift - Eric

10:58 E-chem prior to picking up rock sample
11:06 collected rock sample w/ 2 sponges and a snail attached (?) - placed in port-most milk crate
11:10 transit to marker 62 for E-chem
11:30 arrive at marker 62
11:38 starting E-chem - Marker 62 - front of chimney
11:45 continuing E-chem
11:53 continuing E-chem
12:00 continuing E-chem
12:08 continuing E-chem
12:19 continuing E-chem
12:32 continuing E-chem
12:42 continuing E-chem
12:52 continuing E-chem
13:02 E-chem not working
13:10 transiting to take a major sample
13:20 taking temp prior to major sample
13:22 repositioning for different attempt
13:24 taking temp measurement -250C
13:30 taking major sample
13:38 transiting to Marker 36 for E. Becker
13:49 transiting to Marker 36 for E. Becker
13:57 arrived at Marker 36
14:14 collecting Ifremeria to move to another site
14:27 done collecting Ifremeria
14:37 moving to use slurp to clear area

End shift - Eric

Shift begin - Yvette

14:54 collecting into black slurp chamber (particles)
15:15 transfer Eosipho into biobox
15:18 Done slurping
15:22 Dumping snails on EB's snail race site
15:35 Take Ifremeria out and replace with Alviniconcha
15:50 Remove Ifremeria from site (put some into biobox)
16:10 collecting Ifremeria into biobox
16:30 Detangling cables of Jason Temp probe & E-chem probe

TN-235 Cruise Report: Dive Logs

5/29/2009 16:45 Removing remaining Ifremeria
 16:57 fill-in Alviniconcha-after adjust heading
 16:58 New Heading=136
 17:35 Go to snail race #9 @ marker 36 for observation
 17:48 go to Alviniconcha site near elevator
End shift - Yvette
Begin shift - Sophie
 18:55 Echem
 19:26 Erin's experiments
 20:00 Sampling mussels to the port biobox (full)
 20:25 Ifremeria in the net (Erin behavior experiment)
 21:11 Echem
 21:31 Alviniconcha slurped and put after in the starboard biobox
End shift - Sophie
Begin shift - Jason
 23:44 new DVD set, 088
 23:54 Pete's pressure bomb on elevator- operations commence
5/30/2009 00:15 monitoring Marker 9-7
 00:35 monitoring snail race #9
 01:36 slurping some unusual snails
 01:40 start DVD set 089
 01:48 pulled elevator
 01:54 *Jason* off bottom
 01:55 **End dive J2-428**

J2-429, Mariner, 5/30/2009

TIME	COMMENTS
5/30/2009 16:23	Jason on bottom
16:30	Located elevator
17:01	moving elevator
18:05	trying to find spot to put elevator
18:10	elevator located at this position (heading=331.4)
18:11	Open up elevator to prepare
18:18	Going to collect Stacey Kim's rocks
18:18	PC-A & PC-W are 40 & 30 seconds behind respectively
18:38	Stacey Kim's Marker 3
	End shift - Yvette
	Begin shift - Sophie
18:50	Collecting rock for Stacy
20:03	Stacy's rock (Marker2)
20:39	Put Stacy's rock into the Elevator
21:35	Cannot find Marker 1, Go to Pisa
22:03	2 big chimneys: Pisa?
22:08	Marker 94
22:22	Broke chimney by trying to keep it for Pete
22:28	Keep a rock on chimney (with bacteria) to biobox
	End shift - Sophie
	Begin shift - Jason
5/31/2009 00:07	new DVD set, 094
00:21	taking temp of smoker, max = 220 deg C
00:34	taking temperature of different smoker, one with hobo
01:01	taking Major sample
01:28	collected sulfide for Pete/Jason
02:02	start DVD set 095

TN-235 Cruise Report: Dive Logs

End shift - Jason

Shift begin - Yvette

5/31/2009 03:10 try to collect Lollipop sponge (on rock) for Yvette--didn't get it (pictures)
 03:45 Squat lobster slurp (red chamber)
 04:21 Deploy Major--didn't take
 04:55 collect orange rock on chimney
 05:08 slurping shrimp & scaleworms
 05:37 released elevator
End shift - Yvette
End of dive J2-429

J2-430, Tu'i Malila, 6/01/2009

TIME	COMMENTS
6/01/2009 00:36	Begin shift - Jason
00:37	start DVD set 097 --> on bottom
00:57	deploying bidet cam
02:00	echem site 9-10
02:32	start DVD set 098
02:38	here is the marker 9-5
02:40	at 9-9
02:40	sr12 at 9-9
02:40	sr7 now 9-7
02:43	transit to marker34
	End shift - Jason
	Begin shift - Yvette
02:55	Yvette on watch
02:57	Begin echem at snail race 11
03:30	E-chem done (pts 1 -15)
03:38	going to marker 34
03:48	Moving marker (K9) - putting it in the basket
03:50	Collecting Alviniconcha in biobox (using the SluRpMiester)
04:01	Slurping other animals as well (Ifremeria and like)
04:05	Slurping done
04:16	Scooping Ifremeria
04:45	taking Ifremeria to dump at Marker 34 (snail race 11)
04:50	sr11 snail race 11 site (Marker 34) heading 132
04:51	Start echem at sr11 before adding Ifremeria (pts 16-27)
05:25	Dumping Ifremeria into the hole
05:29	sr11 Smacking snails off another ledge
05:41	Looking for new snail site
05:48	Scooping snails (both species)
05:57	transit to new site to dump bag of snails
06:02	sr14
06:05	Start echem sr 14 (pts 1 - 8)
06:21	Placing marker K9
06:23	Dumping bag of snails
	End shift - Yvette
	Begin shift - Arunima
06:45	Arunima on watch
06:50	sr14 Finished slurping
07:02	Start echem at sr 14 post-clearance (pts 9 - 16)
07:14	Done with sr14 e-chem
07:18	Scraped nearby Ifremeria onto cleared site

TN-235 Cruise Report: Dive Logs

6/01/2009 07:22 JASON Transit start Moving to marker 9-9
07:31 SR12 Marker 9-9 Added a bag of mixed Ifremeria and alviniconcha then mixed
07:49 Collected a bag full of alviniconcha from an unreadable marker spot
07:54 dumping bag as there were too many Ifremeria in the bag
07:59 looking for a place to harvest more alviniconcha
08:20 At long last collecting alviniconcha
08:29 JASON Doppler reset reset to marker 9-8 "Bidet Cam"
08:39 Ended up with a small bag of Ah
08:39 headed over to marker 9-10
09:02 Arrived at marker 9-10
09:06 sr13 Using the slurp to remove current snail residents
09:25 Electrochemistry test scans with probe at sr13
09:39 sr13 dumped sack full of alviniconcha onto cleared spot
09:45 sr8 Go to bidet cam collect more alviniconcha then 9-5
09:55 Change in plan. Down to one electrode and it is failing. Going to do as many e-chem expts as possible before it fails
09:59 off to marker 43
10:16 JASON Doppler reset reset to marker 44
10:19 Start echem at TM1 diffuse flow mosaic
10:41 TM1 pt 15
10:51 TM1 pt 20
11:01 TM1 pt 25
11:01 Eric on watch
End shift - Arunima
Begin shift - Eric
11:03 E-chem TM-1
11:16 E-chem TM-1 (point 35)
11:24 E-chem TM-1 (point 38)
11:32 E-chem TM-1 (point 44)
11:43 E-chem TM-1 (point 51)
11:53 E-chem TM-1 (point 56)
12:03 E-chem TM-1 (point 60)
12:13 E-chem TM-1 (point 65)
12:23 E-chem TM-1 (point 71)
12:53 E-chem TM-1 (point 88)
13:03 E-chem TM-1 (point 96)
13:13 E-chem TM-1 (point 101)
13:23 E-chem TM-1 (point 107)
13:33 E-chem TM-1 (point 114)
13:46 E-chem TM-1 (point 124)
13:58 E-chem TM-1 (point 132)
14:08 E-chem TM-1 (point 137)
14:38 Done TM-1 E-chem
14:41 Searching for a rock sample
14:44 Collecting rock
End shift - Eric
Begin shift - Yvette
14:58 moving Ray's camera, right & away
15:14 collecting Eosipho
15:17 moving to marker 62 for mosaic
15:21 very nice spires (near St. James)
15:46 arrive @ marker 62
15:47 marker 22 not 62
15:51 marker 62 (mosaic & e-chem)
16:08 started 2nd forward looking mosaic front close up
16:30 started 2nd forward looking mosaic front close up

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6/01/2009 16:41 finished with front mosaic
 16:49 mosaic forward looking back
 16:52 done forward looking mosaic of back marker 62
 17:03 start back forward-looking close up
 17:21 beginning e-chem of marker 62
 17:32 e-chem point 4 (Ifremeria)
 17:47 e-chem point 10 (next to Ifremeria)
End shift - Yvette
Begin shift - Sophie
 18:45 Echem
 19:23 Dead mussels bed
 19:41 Marker 27
 19:46 Slurp (black chamber)
 20:42 Slurp (orange)
 20:43 Slurp snail (Black)
 20:45 Slurp snail (red)
 20:49 Slurp another dark snail to port biobox
 21:20 Go to the East
 21:36 At the Marker 22 (Saint James Spires)
 22:22 Old Marker 41
 22:29 Marker 99
 22:31 At the Bidet Cam
 22:35 put Alviniconcha on the net to Erin experiments
End shift - Sophie
Begin shift - Jason
 22:50 jason on watch
 22:53 scooping snails near Ray's camera
 23:08 dumping some Alviniconcha back out, Marker 9-5
 23:45 start DVD set 109
 23:46 this DVD 95% transit
 23:49 going to monitor Snail Race 13, Marker 9-10
6/02/2009 01:40 Start DVD set 110
 01:55 found a chimney after searching along ridge
 01:57 found Marker 40
 01:58 much of this DVD is exploring a beautiful chimney field w/ a little activity and few animals
End shift - Jason
Begin shift - Yvette
 03:03 looking for little critters (snails, crabs, & snails)
 03:17 going to marker 35 flange ~30 meters away
 03:24 arrived at flange 7 found marker
 03:25 pictures of flange before e-chem, Scorpio
 03:39 starting e-chem
 03:42 point 1 on flange white part
 03:47 point 4 e-chem
 04:21 e-chem point 21
 04:31 e-chem point 26
 05:19 e-chem point 49
 05:33 end e-chem
 05:34 slurp into green container
 05:48 collecting scaleworms and shrimp
 06:01 collecting shrimp into green slurp container
 06:26 moving to marker 9-9
End shift - Yvette
Begin shift - Chris
 07:05 Snail Race 12

TN-235 Cruise Report: Dive Logs

6/02/2009 08:25 Partially emptied port bio box
08:32 Moved to marker 36
08:38 Moved to marker 9-7
08:52 Moved to marker 34
09:01 collected mussels to starboard bio box
09:39 collected dark snails for Pete to stbd bio box
09:50 collected small dark alviniconcha for ISMASH
10:24 Back to Bidet cam. Retrieved
10:32 collected alviniconcha for Pete
10:38 Moved to elevator
End shift - Chris
Begin shift - Eric
10:58 en route to elevator
11:10 en route to elevator
11:21 arrived at elevator - putting snails (Alviniconcha) into P. Girguis's pressure bomb
11:28 placing snails in pressure bomb
11:35 adjusting snails in bomb with temp probe
11:45 snails in bomb - trying to seal bomb
11:56 adjusting position to seal bomb
12:00 valve on pressure bomb closed
12:16 recovering R. Lee's camera to elevator
12:20 R. Lee's camera in box on elevator
12:30 checking clearance on leg of elevator
12:33 en route to Marker 62
12:52 taking temp at chimney encountered on way to Marker 62 - taking sulfide sample
13:02 using coffee can to get sulfide sample
13:06 small sulfide sample collected
13:11 looking for animals for S. Hourdez - seeing dead mussel and snail shells
13:15 heading to Marker 25 for S. Hourdez
13:38 arrive at Marker 25 - large flange
13:49 preparing to slurp - paralvinella worms (?)
13:55 slurping worms
13:57 switching from black to red slurp jar
14:07 finished slurping
14:10 transiting to Marker 34
14:20 surveying the area
14:32 in the area of Marker 9-8
14:47 attempt to slurp white snail and place in starboard box
End shift - Eric
Begin shift - Yvette
15:00 Watch change
15:01 arrive at marker 9-8
15:39 done slurping
15:40 Transit to SW chimney on ridge
15:42 reset Doppler
16:03 collect snails from chimney (if find them)
16:17 didn't find snails
16:18 headed back to central area
17:35 **J2-430 ends**

J2-431, ABE, 6/03/2009

TIME	COMMENTS
6/03/2009 09:16	Begin shift - Eric
09:17	mosaic Hogwarts with Scorpio, Marker 'M'
10:23	moved to ABE 63, grabbed 2 rocks
11:27	transit to ABE 53
11:34	collecting rock sample
11:37	rock sample in milk crate on basket - transit to ABE 1
12:02	collecting rock samples - netting 2 bags of rocks
12:14	taking second rock bag sample
12:34	put rock in BioBox
12:42	visiting E. Becker's Snail Race 3 site
13:13	visiting E. Becker's Snail Race 3 site
13:59	collecting bio samples for P. Girguis
14:10	done collecting bio samples
14:25	taking temp readings for incubation deployment
	End shift - Eric
	Begin shift - Yvette
15:00	change watch (Yvette)
15:03	transiting to elevator
15:13	problem with printer-black cartridge is out
15:17	arrive @ elevator
15:28	Pete's bomb #1 loaded @ elevator
15:33	5 animals in bomb #2
15:33	remaining animals into port biobox
15:46	Pete's bomb #2 closed and done
15:48	headed to marker 9-2
16:14	arrive at site and looking for marker
16:21	found marker 9-2
16:25	measure temp with jason probe
16:30	e-chem snail race #1 (point 1)
16:39	SC-W started 30 sec late
16:43	snail race 2 (Bugsbunny)
16:55	imaging bugsbunny
17:27	done imaging bugsbunny
17:31	trying to get shots of spire
17:47	try one last thing for spire imaging
17:48	continue imaging spire (close-up)
17:50	finished imaging spire
17:51	e-chem spire
18:23	done e-chem spire (13 points)
18:24	move to potato and e-chem base
18:30	e-chem potato fallen over
18:39	done e-chem potato (2 pts total)
	End shift - Yvette
	Begin shift - Sophie
18:56	At Bugs Bunny and go to the North
19:00	Searching bunch of chimneys
19:18	Sampled the top of chimneys (old sulfide)
19:28	Jason off bottom. End dive J2-431

J2-432, Tow Cam, 6/04/2009

	TIME	COMMENTS
6/04/2009	21:53	Begin shift - Sophie
	21:54	Jason on the bottom
	22:08	At the maker 33
	22:14	At the maker J
	22:22	Deploying Bidet Cam
	22:41	Bidet Cam
		End shift - Sophie
		Begin shift - Eric
	22:56	moving to site TC2 to E-chem
	23:20	continuing to E-chem
23:35	continuing to E-chem (point 19)	
23:43	continuing to E-chem (point 22)	
23:57	continuing to E-chem (point 28)	
6/05/2009	00:15	continuing to E-chem (point 38)
	00:34	continuing to E-chem (point 48)
	00:47	continuing to E-chem (point 54)
	01:03	continuing to E-chem (point 61)
	01:23	continuing to E-chem (point 69)
	01:31	done E-chem - firing Niskin
		End shift - Eric
		Begin shift - Yvette
	02:57	New Watch (Yvette)
	03:05	start e-chem point 1 TC1
	03:27	start DVD 128
	03:29	start DVD 127
	03:35	still e-chem at TC1 (point 24)
	03:50	still e-chem (point 32)
	04:07	still e-chem (point 40)
	04:27	still e-chem (point 58)
	05:19	still e-chem (point 83)
	05:44	still e-chem (point 95)
	05:52	still e-chem (point 100)
	05:54	done e-chem
	06:01	measuring temp with Jason probe (80.3 in seepage hole)
	06:10	collect rock from mosaic with anemones
	06:16	collecting mussels into starboard biobox
	06:37	done collecting mussels
	06:37	get full bag of Ifremeria
		End shift - Yvette
		Begin shift - Chris
	07:09	Pictures of interesting critters enroute to TC2
	07:25	Transited to TC2
08:04	Snail Race 15	
08:18	Placed Marker 4 @ Snail Race 15	
08:25	Snail Race 16	
08:40	Grabbed rock	
09:05	Snail Race 17	
09:11	Snail Race 18	
09:23	Placed Marker C3-P	
09:33	E-Chem TC Alviniconcha Clear-cut	
09:53	Removed snails with spanker	
10:01	E-Chem After	
10:26	E-Chem Clear-cut 2	

TN-235 Cruise Report: Dive Logs

6/05/2009 10:47 Scooped some alviniconcha into starboard bio box
End shift - Chris
Begin shift - Jason
 11:09 new DVD set- 132
 11:14 e-cheming near snails on rock
 11:30 redeploying Ray's camera
 12:02 grabbing snails for ISMASH
 12:36 looking for Paralvinella/baby tube worms on chimneys
 12:59 slurped few Paralvinellids (slim pickins), headed to baby tube worms
 13:05 new DVD set - 133
 13:22 at Marker 9, getting ready to Echem and look for baby tube worms
 13:49 done with Echem, time to look for baby tube worms here
 14:23 trying to break off rock that may have baby tube worms
 14:38 slurping alvinellids
 14:53 slurping Alvinellids for real now
 15:01 new DVD set- 134
 15:13 headed to Snail Race for Erin's expts
 15:31 at Marker JJ, need to turn around
 15:43 e-chem at Snail Race
 16:30 picked up Ray's camera, headed to 'mussel oasis' site to look for Phymorynchus
 16:54 new DVD set - 135
 16:55 most of this DVD is a survey of mussel oasis
End shift - Jason
 17:18 **Off bottom - J2-432 end**

J2-433, Kilo Moana, 6/06/2009

TIME	COMMENTS
6/06/2009 04:46	Begin shift - Sheri
04:47	At bottom
05:05	EChem at Chimney Top 1
05:28	Collecting snails from Chimney Top 1 (and ISMASH)
05:59	EChem again
06:36	EChem (again) at Chimney Top 2
	End shift - Sheri
	Begin shift - Chris
07:03	Mussels to starboard biobox
07:12	knocked off a few mussels
07:15	E-chemed area cleared of mussels
07:52	Found another chimney with good snails CT-3
07:57	E-chem Chimney Top 3
08:17	Collected alviniconcha from CT3 to port biobox
08:26	E-Chem after snail removal
08:43	Collecting chimney alviniconcha to port biobox
08:52	138-SC-W started 17 minutes late
09:10	Found Marker 1
09:29	Took black major on chimney near Marker 1
09:56	Found diffuse flow area
10:12	Scorpio pics of Marker 1 chimney CT-4
10:20	E-chem Chimney Top 4
10:25	correction: Unable to sample at above site
10:34	Moved to Marker 28
10:45	E-chem diffuse flow area
	End shift - Chris
	Begin shift - Eric

TN-235 Cruise Report: Dive Logs

6/06/2009 11:19 E-chem diffuse flow
 11:36 En route to Marker 'D' to mosaic
 11:53 positioning to start mosaic -previous heading 31, not 25? -start forward mosaic
 12:08 start a second, closer mosaic
 12:29 transit to Marker 28 for rock samples
 12:47 collecting rock samples
 13:07 at Marker 56 - E-chem and clear mussels
 13:26 E-chem at Marker 56
 13:38 clearing mussels from area
 14:00 E-chem (point 20) at KM2
 14:24 preparing to clear a second mussel patch
 14:48 E-chem (point 45) at KM2
End shift - Eric
Begin shift - Jason
 15:10 echem, pt 48
 15:29 done with echem, looking for Ifremeria
 16:03 more echem, KM2
 16:17 start DVD set 142
 16:25 cleared snails, echem to come
 17:04 looking for new Ifremeria spot to do removal expt
 17:13 found spot, echeming it
 18:10 clearing snails
 18:14 start DVD set 143
 18:27 starting echem of cleared spot
 18:43 still echeming, pt 55
 18:45 watch change- Sophie on
End shift - Jason
Begin shift - Sophie
 18:53 Still E chem
 19:00 Slurp snails and crabs (orange) to leave them out
 19:13 E chem
 20:13 Mosaic
 21:00 Still mosaic
 21:26 Mussels put into the port biobox
 21:44 Sampling fluid from chimney, temperature measure
 21:56 Pieces of chimney fell in Jason, kept one piece
 22:41 Still sampling fluid
End shift - Sophie
Begin shift - Jason
 22:58 on way to KME diffuse flow
 23:03 grabbing old hobo and osmo
 23:10 left osmo for later
 23:13 at KMF, begin mosaic
 23:55 start KM1 mosaic

6/07/2009 00:03 start DVD set 146
 00:16 echeming KM1
 00:51 still echeming KM1
 01:05 done w/ echem, time to grab a basalt
 01:30 recovered osmo
 01:58 start DVD set 147
 02:07 grabbed Alviniconcha for Pete's bomb, Ifremeria next
 02:12 transit to elevator, 150 m
 02:32 elevator in sight
 02:39 dumped 3 Ifremeria into one of Pete's bombs
 02:45 dumping into other bomb, 3-4 snails, one crab
End shift - Jason
Begin shift - Sheri

TN-235 Cruise Report: Dive Logs

6/07/2009 03:07 Loading OSMO onto elevator
03:13 Trying to close one of Pete's bombs
03:22 Closing the other bomb
End shift - Sheri
Begin shift - Chris
07:15 E-chem at Chimney Top 5
07:45 removed snails and mussels
07:56 Re-E-chemed CT-5
08:18 collected Ifremeria to port biobox
08:22 slurped into blue chamber
08:32 switched to red chamber
08:43 back to blue
09:00 switched to green
09:25 **Off the Bottom, end J2-433**