

Award ID: OCE04-26109 Determining the Limits to Life in Submarine Hydrothermal Systems: Active Sulfide Deposits as Natural Laboratories (Kelley, Baross, Lilley, Girguis, Wheat) - AT15-09

1) Two incubators were recovered from Mothra at the structures Giraffe and Roane. They were recovered in 2007. One incubator was recovered from a one-year deployment in the structure Hulk in the Main Endeavour Field.

DMO Status: Microbiological work in ongoing at the UW (postdoc) and at Harvard University (P. Girguis, and post doc). Sequencing and culturing work is on-going. The temperature data and microbiological results will be submitted when the post-doctoral work and student work at Harvard is completed.

2) Twenty five rock samples were collected during this program.

DMO Status: All basalt samples were given to Jim Gill at UC Santa Cruz to augment his on-going petrologic studies at Endeavour. The sulfide samplers were collected in part for microbiological studies for Jim Holden (UMASS), and to augment samples for the UW collaboration with Mark Hannington (University of Ottawa). The sulfide samples are archived at the UW and any investigator interested in obtaining subsamples can submit a request to Kelley (kelley@u.washington.edu). The sulfide samples were collected by multiple PI's on the cruise, in part as ancillary samples acquired during water sampling. All samples are labeled, stored in a clean laboratory in Oceanography at the UW, and are documented with photographs. The pending NSF proposal has been submitted by Kelley to continue work at the stockwork area discovered on this program: the stockwork samples would be analyzed as part of that study.

Products: A subset of the Holden microbiological analyses were published in Ver Eecke, H.C., D.S. Kelley, and J.F. Holden (2009) Abundances of hyperthermophilic autotrophic Fe(III) oxide reducers and heterotrophs in hydrothermal sulfide chimneys of the northeastern pacific ocean. Applied and Environmental Microbiology, 75(1), 242-245.

Rock Samples Collected by Alvin

Sample	Dive	Area	Region	Material	Location
A4230_082606_rock_174224	A4230	Mothra	Hot Harold	sulfide	UW
A4230_082606_rock_185800	A4230	Mothra	Finn	sulfide	UW
A4232_082806_rock_173400	A4232	MEF	Puffer	sulfide	UW
A4232_082806_rock_184600	A4232	MEF	Dudley	sulfide	UW/Holden
A4233_082906_rock_180400	A4233	Mothra	Mothra	basalt	J. Gill
A4233_082906_rock_182000	A4233	Mothra	Mothra	basalt	J. Gill
A4233_082906_rock_185600	A4233	Mothra	Mothra	basalt	J. Gill
A4233_082906_rock_190900	A4233	Mothra	Mothra	basalt	J. Gill
A4233_082906_rock_195300	A4233	Mothra	Mothra	basalt	J. Gill
A4233_082906_rock_200400	A4233	Mothra	Mothra	basalt	J. Gill
A4236_090106_rock_1745	A4236	Sasquatch	Sasquatch	sulfide	UW
A4236_090106_rock_1805	A4236	Sasquatch	X-mas tree	sulfide	UW
A4238_090306_rock_170000	A4238	High Rise	Boardwalk	sulfide	UW/Holden/Girguis
A4238_090306_rock_175500	A4238	High Rise	Godzilla	sulfide	UW
A4238_090306_rock_191000	A4238	High Rise	Fairy Castle	sulfide	UW
A4238_090306_rock_211200	A4238	Raven?	Raven?	basalt	J. Gill
A4241_090606_rock_212700	A4241	Raven	Raven	sulfide	UW

A4242_090706_rock_182700	A4242	Mothra	Finn	sulfide	UW
A4242_090706_rock_191100	A4242	Mothra	Mothra	basalt	J. Gill
A4242_090706_rock_192500	A4242	Mothra	Mothra	basalt	J. Gill
A4242_090706_rock_194500	A4242	Mothra	Mothra	basalt	J. Gill
A4245_091009_rock_170400	A4245	Stockwork	Stockwork	basalt	J. Gill
A4245_091009_rock_183800	A4245	Stockwork	Stockwork	basalt	J. Gill
A4245_091009_rock_185500	A4245	Stockwork	Stockwork	sulfide	UW
A4245_091009_rock_191800	A4245	Stockwork	Stockwork	basalt	J. Gill

3) CTD data: A total of 18 CTD stations were completed by UW Ph.D. candidate to support dissertation research

DMO Status: All data have been submitted to DMO, and remain under proprietary restriction until the Ph.D. research is complete.

Expected data Products and Delivery Date: Eric Cordes is working on two manuscripts that we anticipate will be submitted this year, at which point all data from Roane will be submitted to DMO and GenBank. Eric is now a new faculty member in Carolina. Eric's work includes analyses of 8 incubators collected from 2003-2007, with 193 bacterial and 156 archaeal clones sequenced, and four phylogenetic trees constructed. In addition QPCR and t-RFLP analyses were completed on both core and two of the incubator samples (2003-2004 and 2005-2006). We anticipate that Hakon will complete his work 1-year from now, and all data will then be submitted to DMO and GenBank. A second year Ph.D student with Mark Hannington, is working on Endeavour sulfides and has contacted us about coming down to subsample the rocks for on-going dating and geochemical studies. If he chooses any of the samples listed above, then the geochemical analyses will be included in Hannington's database.