

IN SITU TIME-SERIES EXPERIMENTS TO DEFINE THERMAL AND COMPOSITIONAL VARIABILITY IN TIDALLY PERTURBED SUBMARINE HYDROTHERMAL SYSTEMS

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Table 1. Data Collected, and Equipment Deployed and Utilized and Recovered

<i>JASON</i>	<i>Alvin</i>	Instruments	
SM2000 Sonar	Navigation	9 High-T Probes	12 Vemcos
Digital Still and Video Grabs	Hi-8	5 T-Resistivity Probes *	3 Gamma Detectors
Data-Event Logger	SVHS Copies	3 MAVS Current Meters	1 Pressure Sensor
HTEFP Sampler (Beast) *	8 Gas Tight Water Bottles	Stand Alone McLane (RAS) *	4 Thermistor Arrays
Gas-tight Manifold	5 Major Water Bottles	2 SUCUP data loggers *	Beast-14 samples/ea *
35 mm stills	35 mm stills	3 Medusa/GTX	4 OsmoSamplers
3-Chip video	ICL comms		
ICL comms	Digital stills		
Hi-8			

*Newly developed instruments being used for first time.

Instruments were deployed in June/July during the *Jason/Alvin* program (AT03-53), and recovered in September using *Alvin* (AT03-56). Hobos were placed at Hulk, Grotto, Salut, and a T-Resistivity probe

placed at Grotto. All other instruments were placed within a 150 m x 150 m area encompassing the Bastille cluster, the S&M structure, and MilliQ. Instruments were placed in 6 areas of diffuse flow (north of S&M, southeast of S&M, Easter Island, at the north point of MilliQ (DK-1), and just west of MilliQ (DK-2)). Instruments monitored high-T activity at Bastille, Peanut (just south of Easter Island), Cannaport, Puffer, Sully, MilliQ, and S&M. Digital stills were taken as well as video mosaics of faunal communities at instrumented sites. Repeat fluid sampling was done at numerous sites allowing characterization of diffuse and focused fluids, and investigation of temporal changes in fluid chemistry.

Night program: CTD and Sea Beam

Discovered two new areas:

- Cathedral Complex west of MEF
- New field north of Salty Dawg Field

ICL communications and SUCUP dataloggers allowed communication with instruments while they were in place on the seafloor.

The ICL (Inductively Coupled Link) interface allows:

- non contact serial communication using the pulsed ac magnetic field of a coil of wire
- communication between instrument and sub or ROV *without* direct electrical contact
- half duplex bi-directional communication at any baud rate up to 9600

It uses two or more loops with associated electrical interfaces ("modems"), operates on an unregulated supply between 8 and 15 volts, and uses only about a microwatt of power while waiting for a signal.

The ICL can be used:

- to talk to small ROV or sub tools (e.g., temperature sensors attached to water bottles; includes "wake up on incoming data" capability so instrument can shut down when idle and wake up whenever queried)
- to monitor an instrument's performance (eavesdrop) and sample data being collected
- as a terminal interface to an instrument (with the ICL providing total electrical isolation)
- to change data sampling rates or other parameters

The SUCUP Data Recorder (Standalone Underwater Communications UPLink) is a flea powered data logger w/16 Mbytes of storage and two serial ports interfaced to ICL coils

It can be used:

- to "eavesdrop" on instruments to get snapshots of their data or to verify proper operation
- as "inquisitors" to initiate and record data dumps without disturbing instruments