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MISO Facility: MISO Facility Equipment Usage 2004-2006

Fall 2004

Sept.-Oct. 2004 - LauBasin - NSF Ridge2000 Integrated Study Site - PI - C. Langmuir, HarvardU.12 camera tows carried out in support of hydrothermal vent exploration.One vent 'TowCam vent' discovered by *TowCam* traverse #2.Exploration for other vent sites greatly enhanced by capability to explore seafloor areas with the *TowCam*.Rock samples and water samples were also recovered.

Nov. 2004 - HiT self recording temperature loggers provided to K. Von Damm as part of the R2K EPR ISS time-series data recording capability.

Nov.-Dec. 2004 - Offshore Papua New Guinea, Manam volcano - NSF MARGINS work, PIE. Silver - UC-Santa Cruz.10 camera tows carried out in support of sonar mapping and piston core sampling effort to understand seafloor slumps related to volcanic process and tsunamis in this arc settting.Camera tows provided important ground truth data to permit accurate interpretation of side-scan and high-resolution bathymetric sonar data to explain sediment transport processes.

2005

April-May 2005 - East Pacific Rise 9° 50'N - PI - T. Shank, WHOI.Alvin downlooking imaging and deep-sea digital time-lapse imaging at the NSF Ridge2000 Integrated Study Site (ISS).

May - 2005 - Galapagos Rift at 86°W - PI - T. Shank, WHOI. Alvin downlooking imaging, deep-sea digital time-lapse imagine and *TowCam* surveys along the rift valley at 86°W - NOAA Ocean Exploration funded.

Aug. 2005 - Arctic deep-sea imaging - deep-sea strobe system and junction box - PI - I. MacDonald, TAMU.A complete 600 watt/sec (2 head) strobe system, spares, cables, and junction box were leased to Dr. Macdonald to use with his camera system for imaging seafloor biota in the Arctic from the Healy.

Sept. 2005 - Gas hydrate research offshore SW Taiwan- National Univ. of Taiwan (NTU) PIs C-S. Liu and S. Lin- *TowCam* surveys offshore SW Taiwan for gas hydrate exploration.Small *TowCam* frame developed for use on the NTU ship OR1 for deployment through restricted opening mid-ship.Ten camera tows were carried out over a 5 day period, 2 days were spend waiting on weather, so 3 days were operational during which 24hr/day *TowCam* operations were carried out with 3 WHOI personnel (Fornari, Swartz, Soule).The surveys were very successful and NTU PIs are considering purchase of a *TowCam* system for their use.

October 2005 - New England Seamount biology - PI - L. Mullineaux, WHOI.NOAA-NURP funded cruise where *TowCam* was to be used at night, in between Alvin dives, to explore for specific biological communities, including coral communities on the summits of several seamounts.Because of expected bad weather in the NW Atlantic at this time of year a small, easily deployable *TowCam* frame for imaging only was built and put on board to help ensure that if weather limitations occurred and prevented Alvin from diving, that the *TowCam* could be deployed to collect baseline-imaging data.Six tows were carried out and the *TowCam* proved to be very valuable because Alvin diving was very restricted (only 3 dives made over 10 days) due to bad weather so camera surveys helped locate targets for Alvin and also provided data for some areas where otherwise the science party would not have been able to survey.In addition, the MISO facility provided the down looking digital camera and strobes used on Alvin for this dive series.

2006

March-April 2006 - Gulf of Mexico - deep-sea strobe system and junction box - PI - I. MacDonald, TAMU.A complete 600 watt/sec (2 head) strobe system, spares, and cables, were leased to Dr. Macdonald to use with his camera system for imaging seafloor biota at cold seeps in the Gulf.

May 2006 - East Pacific Rise 9° 50'N (New Horizon 06) - PI J. Cowen, U. Hawaii.NSF funded event response cruise to investigate the 2005-06 eruption at 9° 50'N. *TowCam* mobilized in 4 days and shipped to San Diego for operation on New Horizon as a key part of the event response data collection.7 tows successfully conducted, 24 rock samples collected, 20 Niskin samples collected.Rock cores and near-bottom water samples helped to characterize the newly erupted lavas and character of hydrothermal fluids at newly established vents.Over 11,000 images collected and confirmation of the new eruption established through *TowCam* imagery (see Figure 5 below).

June 2006 - East Pacific Rise 9° 50'N(Atlantis AT15-6) - PI K. Von Damm, U. New Hampshire.NSF funded event response cruise to investigate the 2005-06 eruption at 9° 50'N. *TowCam* equipment was used in conjunction with a rapidly mobilized fiber-optic camera/telemtry system to provide near real-time (every 10 seconds) imaging capability to further investigate the extent of the 2005-06 eruptions and to locate OBSs stuck in the new lava flows and attempt recovery (Figure 3).7 tows were successfully carried out on the cruise with over 27 hours of bottom observations and >10,000 digital still images.Two OBSs were located and imaged, however attempts to dislodge them from the lava or recover them using grappling hooks were not successful.

June 2006 - HiT self-recording temperature loggers - PI - K. Von Damm, UNH.Provided hiT loggers as part of the R2K EPR ISS time-

series data recording capability.Two of three recovered loggers provide the first recordings of the temperature response of hiT hydrothermal fluids to a seafloor volcanic eruption (K. Von Damm, pers. commun., 2006).

August 2006 - Lucky Strike Segment - Mid-Atlantic Ridge - PI S. Adam Soule, WHOI G&G, *TowCam* surveys of the MAR rift valley at night, in conjunction with Nautile diving from the N/O Atalante of IFREMER (currently underway, 4 tows completed to 8/16/06)

September 2006 - Puerto Rico Trench - PI - Nancy Grindlay, UNC-Wilmingon, *TowCam* surveys for possible seeps or hydrate deposits on the upper inner walls of the trench (scheduled for September).

September 2006 - Lau Basin - PI - Chuck Fisher, Penn State U., Provided six (6) hiT loggers as part of the R2K EPR ISS time-series data recording capability for Lau Basin ISS.

October 2006 - Offshore SW Taiwan, National Taiwan University (NTU) PI - S. Lin- *TowCam* surveys offshore SW Taiwan for gas hydrate exploration.A TowCam system was sold to NTU through the MISO Facility at WHOI with NSF and US government approvals.The planned cruise will serve as a training cruise for NTU engineers and technical staff and continue the surveys started in 2005. (scheduled for October).

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