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Purpose of the Dive

The plans for Dive 04 are to conduct detailed biological characterization of hotspot areas identified at the Von Damm site and also aim to include an experiment of opportunity for fluid flow:

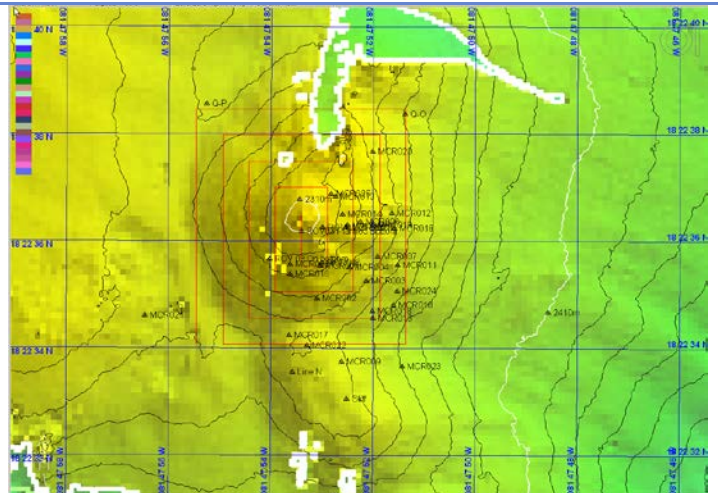
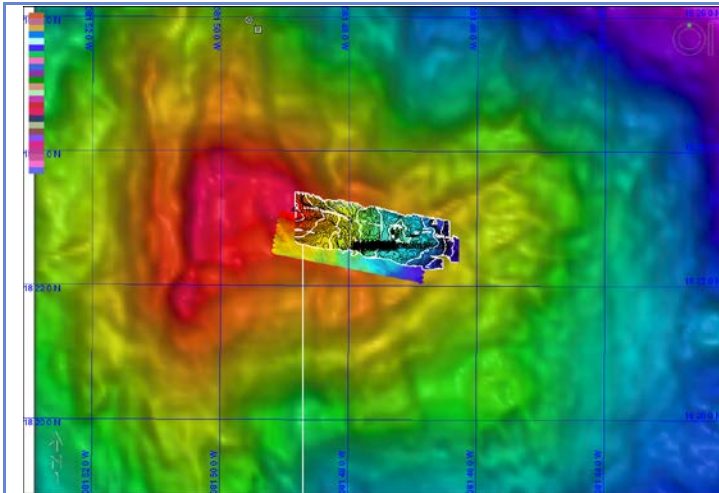
- 1) Start at central spire for orientation
- 2) Drive East toward markers 19 and 20 to study live tube worm site
- 3) Aim to region of UK marker (bucket lid) to study patches of shrimp there and assess feasibility of fluid flow experiment (Jill McDermott request).
- 4) Head to main spire for detailed biological study.
- 5) If time permits, conduct single transect South and East away from Central Spire along SE trending ridge in Connelly et al map.

Description of the Dive:

Little Herc was deployed and landed at the top of the Von Damm hydrothermal site at 2292m depth. From that point the ROV proceeded towards the northeast to find the patch of tubeworms located on 6th August. This was rapidly located and a substantial and useful amount of time was spent carefully video-recording the tubes (waypoint MCR027), many of which on first sight appeared to be empty but careful examination showed that the obturaculum (the 'plug') was closing the end of the tube, providing clear indication that each such tubeworm was alive. Careful examination was made as to how the distal end of the worm tube penetrated the sediment. On completion of this study, Little Herc moved back towards the Spire, video-documenting patches of shrimp and small gastropods. Near the main Spire, Little Herc was set up to measure the flow of hydrothermal fluid out of a 5-6cm orifice on the side of the main Spire (MCR028). This was completed successfully. Little Herc then proceeded back uphill to the Spire where careful video-based observation was undertaken of both the dominant shrimp species and associated shrimp-types. Little Herc also re-located a large 1m diameter orifice (the 'Hole' MCR030) emitting hot hydrothermal fluid on the North side of the central spire and continued to video this feature, even though the turbulence created by the hot water rising up the uppermost flanks of the central Spire was considerable. Toward the end of the dive, Little Herc flew over the top of the spire registering a temperature of 14 degrees Celcius, 2 meters above its summit (2290m ROV depth). Near the orifice was a patch of ? Alvinocaris many with eggs in their ovaries and some incubating eggs on the legs of their abdomen. The ROV video-captured a large area of the Spire before returning to the surface.

Overall Map of ROV Dive Area

Close-up Map of Main Dive Site

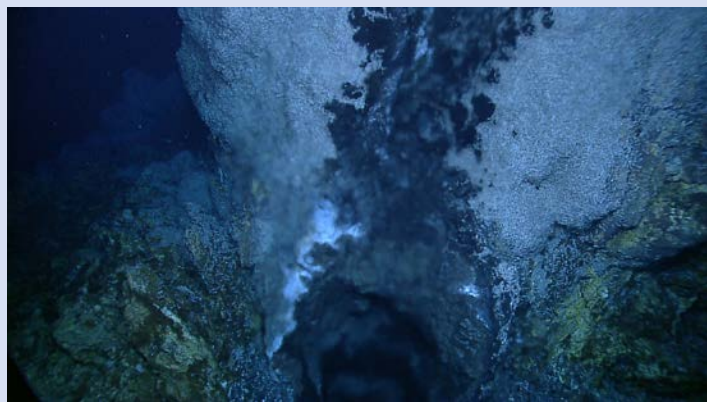


Bathymetry courtesy of D.P.Connelly et al.

Representative Photos of the Dive



The hydrothermal shrimp *Rimicaris* right next to a small chimney of about 6cm diameter



Looking down the main ~1m diameter orifice near the summit of the ~8m chimney spire at the center of the Von Damm field from which hot, clear, hydrothermal fluid billows.

Please direct inquiries to:

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