Cruise Report

6/8/05 All aboard at 1600 and move to anchor to await arrival of replacement chief Pilot

6/9/05 Matt Heinz arrives on board with customs at about 0930 and we depart soon after

6/10/05 Transit: Seabeam and deploy PROVAR floats during transit

02 float deployed 6/10/05 1:43 PM local @ 20/04.9605 S,178/00.1840 W(sank)
07 float deployed 6/10/05 4:19 PM local @ 20/04.9061 S ,177/35.9938 W
09 float deployed 6/10/05 7:00 PM local @ 20/04.8840 S ,177/11.9228 W
06 float deployed 6/10/05 9:39 PM local @ 20/04.9685 S ,176/48.2853 W
08 float deployed 6/11/05 12:20 am local @ 20/04.8733 S ,176/24.0944 W
01 float not deployed, failed ARGOS test and was set aside. Did a comm check, all looked good except vacuum parameter was slightly outside range 765.

6/11/05 arrived on station about 2 am, but weather was bad, so no diving. We stayed near station Waiting On Weather (WOW). No ops to let people get their sea legs
Ran Seabeam lines at night: Due W from 21°11'S, 176°24' W to 177°07W and then back E along 21°17S, then back to KM

6/12/05 (Julian day 163)
Decided to dive at 10:00 am local time (22:00 zulu)
On bottom at kilo Moana at 23:40 Dive # J2 154
Worked the Southern end of the site near Vreijenhoek marker J2140A, our marker #2
Chemistry unit failed, so we tried mussel pots, ran a bunch of photo tests of scorpio and pixle fly, and collected mussels and snails for Jim.
Back on deck at 20:30 local time

6/13/05
WOW
Decided to try another seabeam line beginning at 3pm, but seas were to rough for some scientists to work and the lines barely made it to the W of previously run lines: W along a line at 20°21'S and back along 20°25' S. This was pretty much a waste of energy so will wait until seas are calm to try again.

6/14/05
Dived at 08:30 local time. Dive # J2 155. On N end of Kilo Moana Scanned and collected a mixed snail (both species) and mussel community on smoker near marker 6. then took a major here. And slurped scale worms and alvinellids. Moved N to Marker and decided to do a mosaik of mixed pillow basalt community N of 6 (3M x 4M mosaik). Left Marker 29 here. Moved S to marker 2 and picked up crab trap deployed on 6/12. found an anemone pillow basalt community site near marker 1and made another mosaik. Took another major from chimney complex here. Back on deck 20:30

6/15/05

Dived on dead KM transponder for Charlie. Dive # J2 156. Confirmed gone (like others) and wasted 5 hours of bottom time (3.8 km transit back…). Chemistry sensor died. So changed plans. Transit to S end of KM. Made a few temp measurement among anemones. LOTS of anomalies. Then collected rocks with anemones and scale worms among anemones. Additional slurp samples of worms. 2 majors taken from chimney/beehive complex near Marker 2. collected a mussel covered with barnacles and some tubeworms from chimney.

6/16/05 Move to Tow Cam. Both transponders working and will leave them for two dives. Dive on Tow Cam.. Dive # J2 J2 157 Chem failure

6/17/05 Second dive on Tow Cam. Dive # J2 158. Chem failure at 50 m. Abort and recover Jason.
and start again about noon. Dive # J2 159 Chem works for half of dive.
pull transponders after dive. Both come back, one with no pin…
move to ABE

6/18/05 Arrive in early am and find transponder gone. Call it back… no luck. Deploy new transponder and crunch net. Move to longer dive mode. Dive on ABE. Dive # J2 160. Chem. Not working

6/19/05 Still diving on ABE. Finish on bottom at 1400 and come up. Move to Tu'i Malila (7 hour transit). Deploy 2 transponders around midnight and crunch net

6/20/05 dive on TM at 0600. Dive # J2 161. Set up snail race. Do photo mosaic at E end of Snail Hollow in central site. Do photomosaic on top of Mothership flange (no follow up planned). Do photomosaic of peripheral site, along with chemical survey. It's working!)

6/21/05 Still diving on TM. Do photomosaic of new "Mushroom flange". Explore entire site. All high density/diversity biological activity is limited to the snail hollow area. Majors at S 285° chimney, N chimney, and 2 at Dara's smokey hole. Recover at about 15:00.

6/22/05 Dive on TM at 0400. Dive # J2 162. chem. Working. All mosaicked sites are surveyed chemically.

6/23/05 finish dive on Tui at noon, surface at 2. Pull transponders and head to ABE. Midnight, dive on Abe

6/24/05 Dive on Abe, J2 263. deploy crab trap, start snail race experiment, conduct chemical scans of a peripheral mosaic site and make collections for isotopes. Conduct chemical scans of the central mosaic site (near A), make 5 successful mussel/snail pot collections here, deploy themistor array here. Transit N to rich Bio for a chimney mosaic and scan, then revisit snail races and make collections, recover crab trap…

6/25/05 Finish dive on ABE. Leave bottom about 7:30 for 9 am recovery. Recover transponders and head for Kilo Moana.

6/26/05 Dive on Kilo Moana at 8 pm. J2 164. Chemistry fails, we dive anyway. We do not deploy the thermistor array because no chem., but leave it on the bottom. We complete another mosaic of the Anemone zone (this time at the N end near the mussel/snail mosaic) and do a pixle fly of the area. We complete two mosaics of chimneys (one small and one large). Jim sets up and revisits "snail raceways". We make assorted collections for physiology, isotopes and taxonomy and spend a few hours of time devoted to nice pictures with Scorpio. Note that we have a lot of excellent mosaicks at this site with no chemistry yet… these should be redone WITH chemistry in 2006.

6/27/05 Dive continues: We try for recovery at 8 pm. But winch level wind problems delay recovery for a hectic 8 hours. On deck about 4 am. Launch scheduled for 4 pm. First equipment problems further delay launch, then weather comes up. At 8pm we decide to wait until 6 am to check again.

6/28/05 WOW at 8 am we decide to call up the transponders as there is no sign of a break in the weather ahead, and at 10 am decide to head to the beach. Weather is bad and the report is for it to build. At 8 pm we deploy the last of the Provo floats. Heading home along "fresh territory" to multibeam will add a couple of hours to transit time.

6/29/05 arrive at sea buoy at 13:30.

Overall impressions of KM after 3 dives (Fisher): diversity of habitat types is much higher than at EPR and reminiscent of chimneys at Endeavour (but more different kinds of community types). Even in pillow basalt there are numerous different communities. Zonation between the snails (Alvinoconcha, Ifremeria) and mussels is impressive where they co-occur. To really see the assortment of community types takes close up camera work. Most times we stopped for a sample, we discover new communities/animals near by.

The chimney complex near marker 2 has a wide variety of communities, including an assortment of barnacles (in monospecific groups), mussels, alvinellids, snails (in small patches), and tubeworms (under a ledge embedded in rocks). Pillow basalt around this area is carpeted by sm anemones with many other larger ones scattered in between. This anemone community type is widespread at KM. All basaltic communities are bathed in diffuse flow. There is a large mussel community at the bases of the chimney, perhaps a good one to instrument.
The chimney complex near marker 4 is similar, but has larger communities of snails and mussels on the walls. Also decent mussel patches around the bases.
Up at marker 6 we saw several Thermarces (vent fish),(and then thought we saw others among pillow basalt in the S later). That chimney complex seems heavy on shrimp, scale worms, paralvenillids, but light on snails. However, all impressions of chimneys must be tempered by the fact that the more carefully you look the more you see…

Just N of Marker 6 chimney complex is a pillow basalt community that is very diverse, including both species of snails, mussels, barnacles, anemones, fish, and assorted crustaceans.
Note that after all dives were completed I feel that this is the most biologically and hydrothermal extensive and diverse of the basaltic sites (over Towcam).

Impression of Tow Cam (Fisher): note that I did not write this at sea. At the time, although the little tubeworms were exciting (and will be revisited), there was little else to bring us back to Tow Cam that was not more abundant at KM. It is similar to KM in basic substrate types and has similar diffuse flow communities among pillow basalt. A good replicate site for KM. KM has a lot more of about everything. It would be hard for more than one or two groups to work at TowCam without tripping over each other. I also was not present for much of the work here and requested general impressions from others.

General impressions of ABE (**Fisher**). At the central diffuse flow area where we mosaiced and collected there is a spectacular aggregation of Alviniconcha (tan form) and a great place to mosaic. This is staceys "condom" site. We found a wide variety of microhabitats here and also found that the substrate was very "potable" rocks are small and loose. We deployed the thermistor array at this site. The best place for this type of work in the area. North and south of here are extensive active chimney areas and a diversity of habitat types including abundant diffuse flow communities. Abe is larger, has more microhabitats, more venting and areas of venting, and more biomass than TM. This is the most diverse and significant Andesitic site. More impressions from Jim and Daniel to come, as I "spent" very little time N of this area, although there was a lot there..

Overall impression of TM: (**Fisher**). The area around marker 25 was nicknamed Snail Hollow. This area has abundant diffuse flow and high density snail and mussel patches. Most of it is very rough terrain, high relief, but parts are workable (not mosaicable). Lots of places for mussel/snail pots, with large patches of each of the three dominant diffuse flow species. Area of most intense diffuse flow action in rough terrain is about 20 sq meters. At east edge is a fairly flat area, with similar activity, but generally less Alvinoconcha. Mosaic is in this area, and the "snail race" was at interface between the Hollow and the mosaic. Also in this area are patches where terrain is more amenable to thermistor arrays, or perhaps cameras in the future. The substrate is apparently andesite, which is generally smaller chunks of rock and easier to work in the biology than in the pillows up at the northern site.
Dara's Smoky Hole, is about 12 meters SSW of the mosaic site and is a pillow with a 30 x 10 cm hole (Window) into the "subsurface biosphere" The top of the pillow is covered with snails, mostly Ifremeri. A thermistor array was deployed here among the two species of snails and in the hole. Chemistry was working as well for this deployment. This area around Snail Hollow is the only area at TM that has significant diffuse flow biological communities.
The mothership flange is a large fairly flat flange, with little activity on top. It is mostly around the edge. There is shimmering water on the bottom surface. We mosaicked the top of this flange, it was fairly boring biologically.

Another flange, “the mushroom flange” is a bit South. This relatively short flange structure is very active on top and we mosaicked it for follow up. It is covered with Alvinellids (largest single community I have seen, with some very large individuals and very large scale worms). Also terebellids in tubes with very long thin feeding tentacles). To the north we came up on tall and mostly cold chimneys, we nicknamed Saint James Spires (probably the N edge of the S set…) There is very little activity on the bottom 9/10’s of many of these, but many have white tops and mini smokers or behives. Mostly clear water. At first we so No snails (but alvinella and shrimp on the tops, and occasional white polychaetes on cold parts). We did see a few with snails or mussels. There are also occasional small active spires. I did not explore further N, Jim and Daniel should have impressions.

To the S there is a long line of similar spires on the W edge of the ASC, on the wall and on top. (at least 60 m extent N to S, with LOTS of spires). Not much in the way of snails or mussels up here either. There is abundant hydrothermal sediment on the slope into the ASC, and slow diffuse flow coming through in many places. Small mussel patches, patches of bacteria, and visible “cracks” of hydrothermal staining (white) and bacteria in the sediment and rocks. We spent some time looking in the sediment in various places. One area had abundant spionids?? Which we scooped, and another spot we saw (clearly) three Echiurans (but did not catch any). This site has less activity colonized by abundant foundation species, less hydrothermal activity, and less overall workable area than ABE.