

Jason Operations: Navigation on KN209-02

1 November 2012

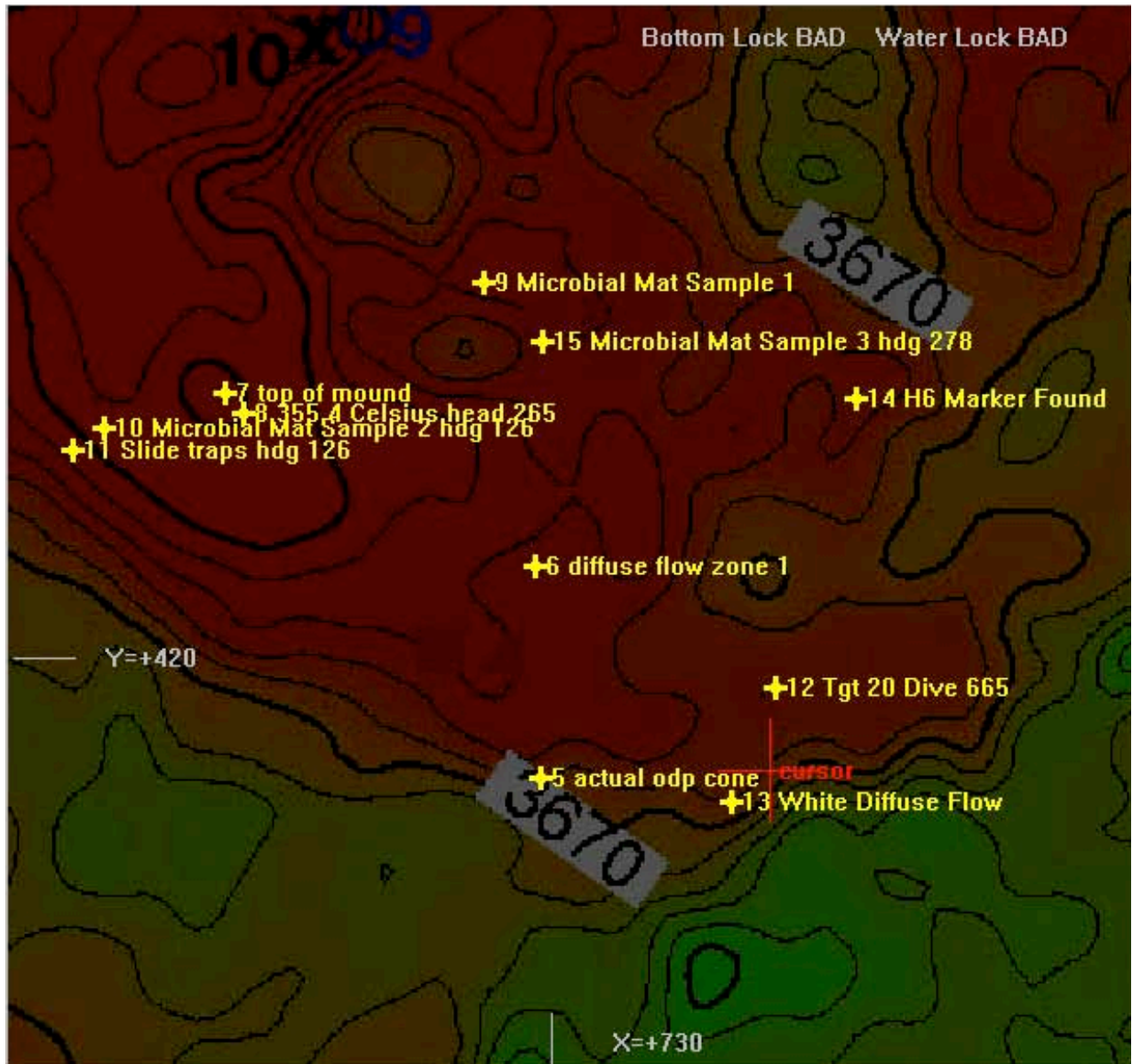
Dara Scott / Akel Kevis Sterling

Overview

Navigation on this cruise was with a combination of USBL and Doppler. The Jason position was obtained by taking an average of USBL hits and the Doppler was reset to that position. In general navigation was good. There were some mitigating factors which made navigation more difficult. These included difficult terrain for the Doppler to track the sea floor, large amounts of smoke and heat emitting from vents making USBL tracking more challenging and during some dives rolling seas giving a wider spread of fixes than usual. The setup of the split pole on the Knorr also added a margin of error as it was disassembled after most dives and it was not possible to align the two halves exactly the same as when the CASSIUS USBL calibration was performed. We did evaluate the horizontal rotation but this was never going to be as accurate as one single pole with no alignment issues between the gyro and USBL transceiver.

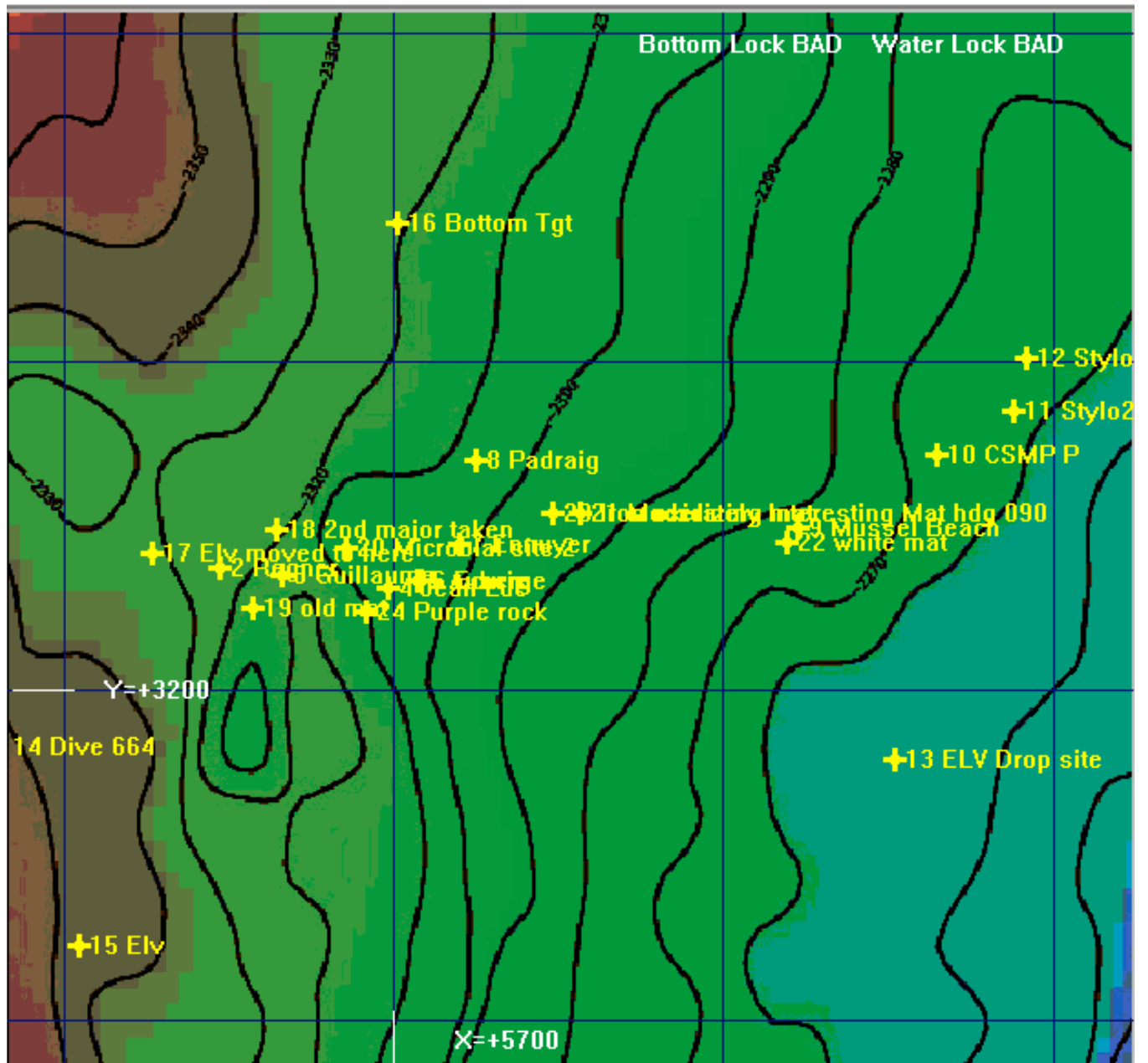
Saying that the margin of error was on average always under approximately 10m and navigation matched depths and terrain well.

TAG



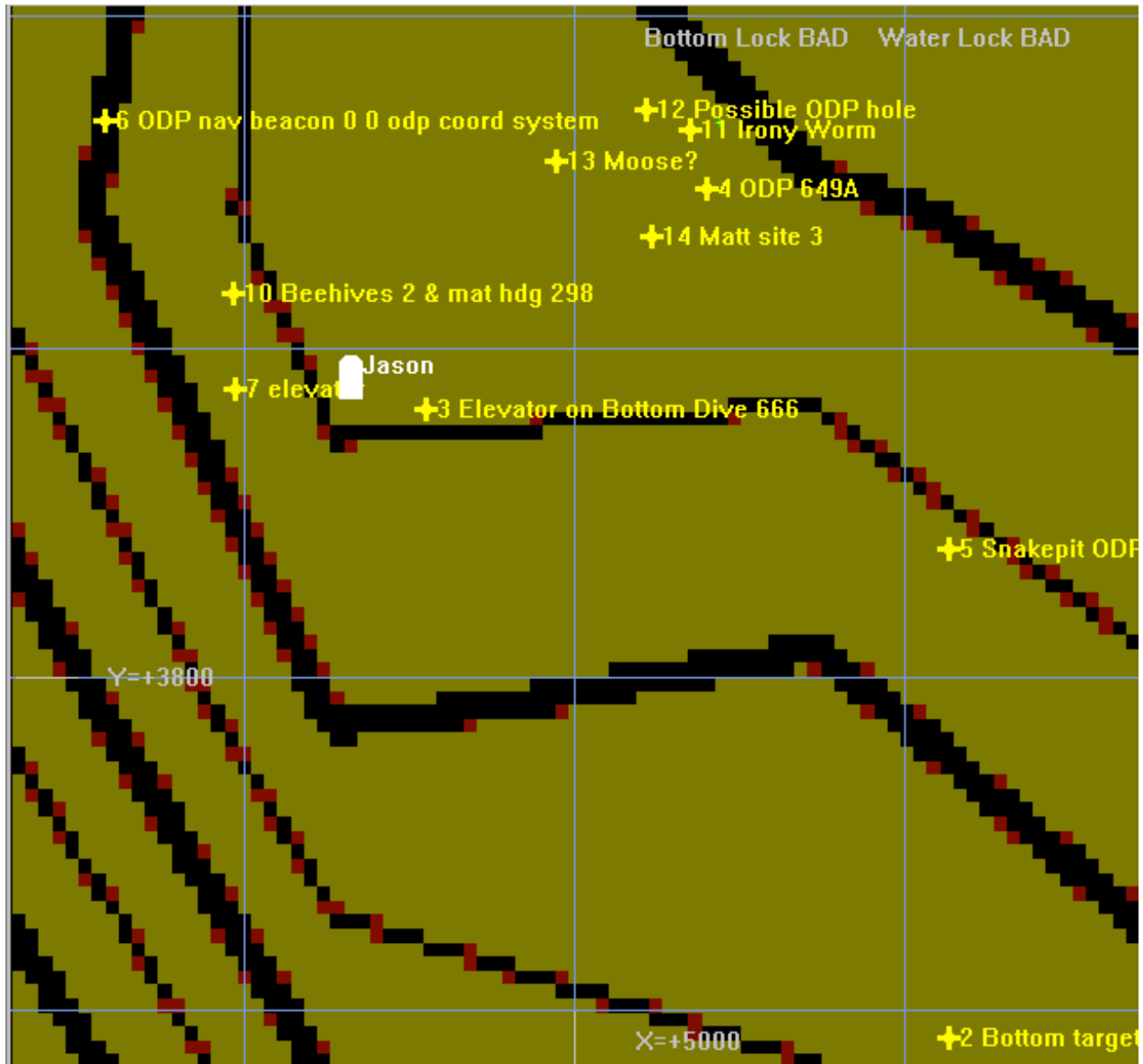
The source of the TAG map is unknown, possibly a DSL 120 map from 1994. This map was used in April 2008 on the Reville. No LBL or USBL navigation was used for the TAG dives on the Reville. When diving on TAG we found the map to be offset. The map was moved 74 m East and 58 m south. This offset was based on the alignment of the target for the ODP cone from 2008 and the where the cone was found on this cruise using USBL navigation. Once this was done navigation matched the terrain quite well.

Rainbow



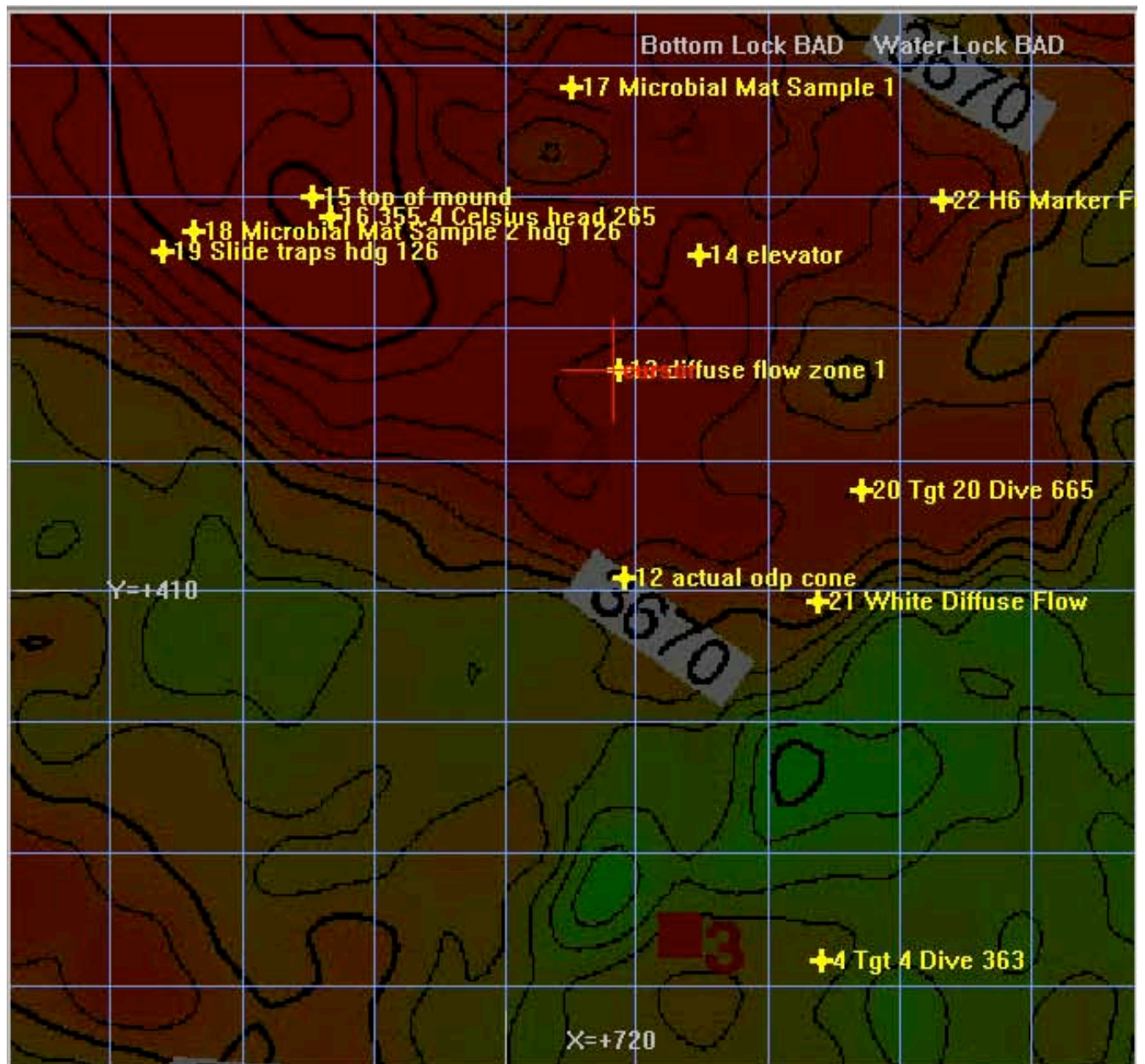
Rainbow navigation matched the basic terrain from the map used and worked well.

Snakepit

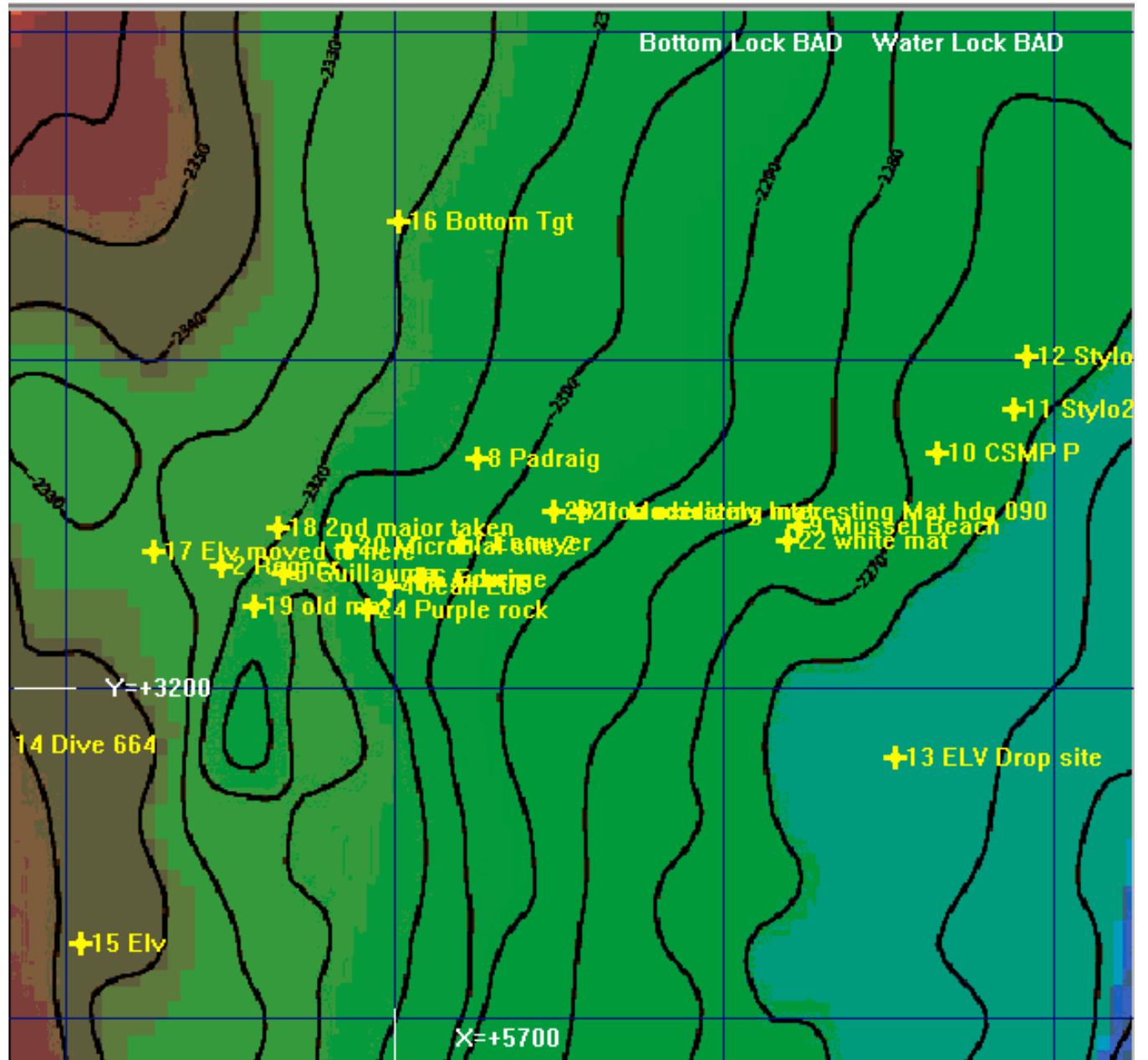


We had no map other than drawings for Snakepit so a Seabeam 2112 map was made with the ship. Based on a hand drawn map from a previous paper (P. Gente, 1991) we estimated the approximate position of the vents and surveyed the sea floor. The Moose was eventually found approximately 300m west at a bearing of 290 degrees. West again of Moose, 115 m bearing 250, were the Beehive vents.

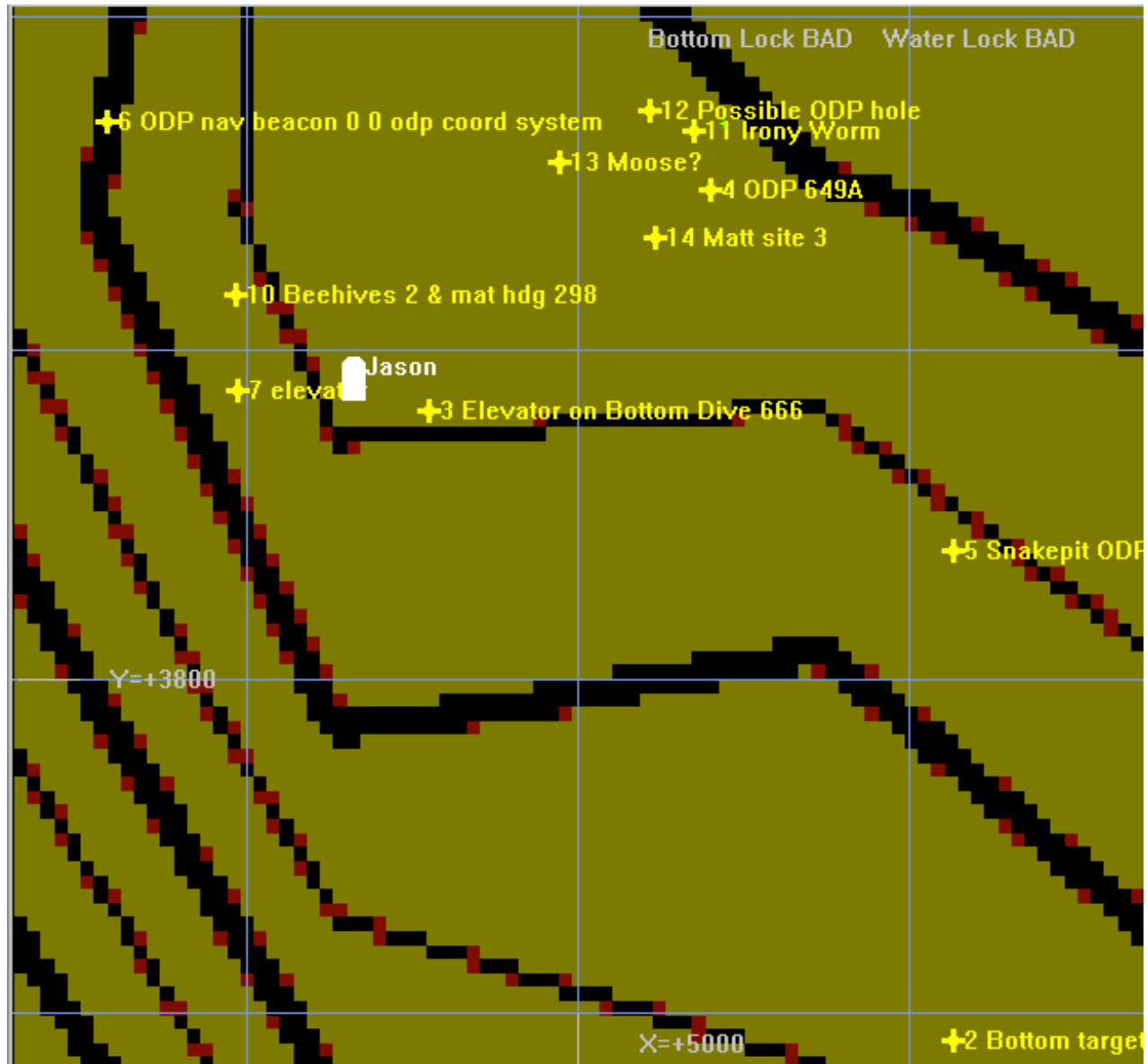
Tag



Rainbow



Snakepit



Tag 2012 11 01 13 51 Targets

TGT Label	TGT LAT	TGT LON	TGT Depth	TGT Time/Alt	TGT X	TGT Y	XY ORIGIN LAT	XY ORIGIN LON	TGT X UTM	TGT Y UTM	UTM ZONE
ORIGIN	26.1333333	-44.833333	0	19:17.3	0	0	26.1333333	-44.833333	516660.752	2890460.47	23
ODP reentry Dive 363	26.1363724	-44.825462	0	11:51.4	787.136	336.683	26.1333333	-44.833333	517447.109	2890798.07	23
Shinkai marker?	26.1365036	-44.825951	0	44:36.8	738.278	351.215	26.1333333	-44.833333	517398.253	2890812.53	23
target 9 marker m	26.1367436	-44.825525	0	41:41.7	780.9	377.807	26.1333333	-44.833333	517440.821	2890839.17	23
actual odp cone	26.1370424	-44.826042	0	38:01.2	729.153	410.908	26.1333333	-44.833333	517389.053	2890872.19	23
diffuse flow zone 1	26.1371861	-44.826046	0	49:28.1	728.738	426.825	26.1333333	-44.833333	517388.616	2890888.1	23
top of mound	26.1373047	-44.82628	0	20:49.4	705.347	439.974	26.1333333	-44.833333	517365.218	2890901.21	23
355.4 Celsius head 265	26.1372916	-44.826266	3621.7	36:48.7	706.731	438.52	26.1333333	-44.833333	517366.604	2890899.76	23
Microbial Mat Sample 1	26.1373797	-44.826084	3631.3	25:23.7	724.932	448.278	26.1333333	-44.833333	517384.783	2890909.54	23
Microbial Mat Sample 2 hdg 126	26.1372815	-44.826371	3627	03:52.1	696.288	437.396	26.1333333	-44.833333	517356.167	2890898.62	23
Slide traps hdg 126	26.137267	-44.826394	3627	31:08.3	693.957	435.79	26.1333333	-44.833333	517353.839	2890897.02	23
Tgt 20 Dive 665	26.1371046	-44.825863	0	46:43.9	747.037	417.796	26.1333333	-44.833333	517406.919	2890879.1	23
White Diffuse Flow	26.1370271	-44.825896	0	05:52.7	743.784	409.215	26.1333333	-44.833333	517403.679	2890870.52	23
H6 Marker Found	26.137302	-44.825803	0	16:50.2	753.127	439.665	26.1333333	-44.833333	517412.977	2890900.97	23
Microbial Mat Sample 3 hdg 278	26.1373406	-44.82604	3633	26:44.8	729.426	443.948	26.1333333	-44.833333	517389.281	2890905.22	23

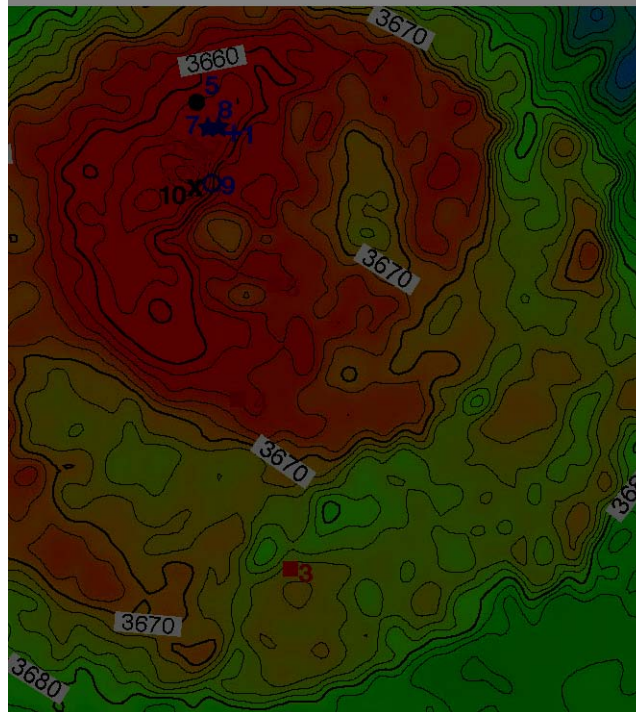
Rainbow 2012_10_24_16_40 Targets

TGT Label	TGT LAT	TGT LON	TGT Depth	TGT Time/Air	TGT X	TGT Y	XY ORIGIN L	XY ORIGIN L	TGT X UTM	TGT Y UTM	UTM ZONE	
Origin	36.2	-33.966667	0	no date		0	0	36.2	-33.966667	413095.889	4006564.75	25
Regner	36.2291727	-33.903879	0		5647	3237	36.2	-33.966667	418770.888	4009746.24		25
Guillaume	36.2291547	-33.903667	0		5666	3235	36.2	-33.966667	418789.855	4009744.06		25
Jean Luc	36.2291186	-33.903312	0		5698	3231	36.2	-33.966667	418821.793	4009739.76		25
Auberge	36.2291366	-33.903212	0		5707	3233	36.2	-33.966667	418830.805	4009741.68		25
Ecurie	36.2291366	-33.9032	0		5708	3233	36.2	-33.966667	418831.805	4009741.67		25
Ennuyer	36.2292358	-33.903067	0		5720	3244	36.2	-33.966667	418843.898	4009752.55		25
Padraig	36.2294701	-33.903011	0		5725	3270	36.2	-33.966667	418849.136	4009778.5		25
Mussel Beach	36.2292898	-33.901922	0		5823	3250	36.2	-33.966667	418946.876	4009757.59		25
CSMP P	36.2294881	-33.901455	0		5865	3272	36.2	-33.966667	418989.048	4009779.2		25
Stylo2	36.2296053	-33.901199	0		5888	3285	36.2	-33.966667	419012.152	4009791.98		25
Stylo1	36.2297495	-33.901155	0		5892	3301	36.2	-33.966667	419016.297	4009807.94		25
ELV Drop site	36.22865	-33.9016	0	53:17.6	5851.9	3179	36.2	-33.966667	418975.094	4009686.35		25
Tgt 14 Dive 664	36.2286821	-33.90488	0	42:52.5	5556.962	3182.57	36.2	-33.966667	418680.41	4009692.66		25
Elv	36.2281407	-33.904352	0	33:08.3	5604.429	3122.491	36.2	-33.966667	418727.281	4009632.16		25
Bottom Tgt	36.2301215	-33.903281	0	18:29.7	5700.761	3342.284	36.2	-33.966667	418825.589	4009850.99		25
Elv moved to here	36.2292142	-33.904103	2332	25:49.3	5626.785	3241.609	36.2	-33.966667	418750.731	4009751.03		25
2nd major taken	36.229281	-33.903687	2309	26:17.1	5664.224	3249.014	36.2	-33.966667	418788.211	4009758.09		25
old mat	36.229065	-33.903762	2319	54:14.2	5657.475	3225.052	36.2	-33.966667	418781.244	4009734.2		25
Microbial site 2	36.2292297	-33.903451	2301	44:26.4	5685.433	3243.322	36.2	-33.966667	418809.351	4009752.2		25
Moderately Interesting Mat												
hdg 090	36.2293294	-33.902656	2293	15:12.7	5756.99	3254.394	36.2	-33.966667	418880.957	4009762.6		25
white mat	36.2292446	-33.901963	2277	34:30.3	5819.274	3244.983	36.2	-33.966667	418943.106	4009752.61		25
Iron oxidizing mat	36.2293301	-33.902753	0	44:19.3	5748.271	3254.464	36.2	-33.966667	418872.245	4009762.75		25
Purple rock	36.2290519	-33.903381	2310	39:56.0	5691.8	3223.599	36.2	-33.966667	418815.529	4009732.42		25

Snakepit 2012 10 27 10 33 Targets

TGT Label	TGT LAT	TGT LON	TGT Depth	TGT Time/Ai	TGT X	TGT Y	XY ORIGIN L	XY ORIGIN LI	TGT X UTM	TGT Y UTM	UTM ZONE
ORIGIN	23.3333333	-45	0	19:17.3	0	0	23.3333333	-45	500000	2580420.45	23
Bottom target	23.3666671	-44.95	0	44:01.0	5113.5	3691.5	23.3333333	-45	505110.093	2584111.53	23
Elevator on Bottom Dive 666	23.3683835	-44.95155	0	29:35.5	4955	3881.58	23.3333333	-45	504951.635	2584301.49	23
ODP 649A	23.3689833	-44.950717	0	24:59.1	5040.2	3948	23.3333333	-45	505036.755	2584367.92	23
Snakepit ODP paper NOT?	23.3679999	-44.95	0	51:28.8	5113.5	3839.1	23.3333333	-45	505110.042	2584259.08	23
ODP nav beacon 0 0 odp coord system	23.3691666	-44.9525	0	44:58.3	4857.9	3968.3	23.3333333	-45	504854.573	2584388.15	23
elevator	23.3684392	-44.952116	0	11:58.7	4897.173	3887.75	23.3333333	-45	504893.845	2584307.64	23
Shank pos 2	23.3693336	-44.9345	3480	55:18.0	6698.7	3986.8	23.3333333	-45	506694.104	2584407.36	23
Shank pos 3	23.3696668	-44.954666	3486	55:45.1	4636.3	4023.7	23.3333333	-45	504633.107	2584443.46	23
Beehives 2 & mat hdg 298	23.368696	-44.95212	3463.7	21:49.5	4896.753	3916.193	23.3333333	-45	504893.416	2584336.07	23
Irony Worm	23.3691423	-44.950766	3515.573	14:46.1	5035.212	3965.615	23.3333333	-45	505031.764	2584385.53	23
Possible ODP hole	23.3691997	-44.950896	3511.789	18:29.9	5021.863	3971.973	23.3333333	-45	505018.422	2584391.88	23
Moose?	23.3690568	-44.951167	0	10:39.0	4994.191	3956.139	23.3333333	-45	504990.774	2584376.04	23
Matt site 3	23.3688518	-44.950881	3506	38:43.8	5023.402	3933.442	23.3333333	-45	505019.973	2584353.36	23

Tag Zoom



Rainbow 5m II

