HAWAII UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT MISSION NO. P5-401

MISSION STATUS

Location: Loihi Seamount, North east side of summit and East side of summit

Mission Date: 16 Oct. 1998

Maximum Depth: 1165 m.

Project Title: Submarine Hyaloclastites

Principal Investigator: R. Batiza & D. Clague

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Observer 1: Rodey Batiza

Observer 2: Wouldn't it be Nice!

Address: (Above)

Address:

Scientific Data Acquired : Prepare an abstract outlining your objectives, techniques, findings, etc.

Objectives – to gather geologic observations and samples to test ideas on the causes and dynamics of submarine explosive volcanism.

techniques – Loihi, at a depth of ~1000 m, is an ideal laboratory for studying various possible modes of explosive volcanism We explored outcrops of pyroclastic rocks on Loihi and collected samples with sediment scoop samplers

Findings – We collected 8 scoops of unconsolidated pyroclastic material including scoria, the products of blast deposits and sands rich in "limu" shards. Lab analyses will aid in interpreting the causes and dynamics of eruptions.

Dive 401

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

The VHS tape inexplicably went blank toward the end of the dive
The digital recorder failed during recording of tape 2
except for these minor problems, the sub worked perfectly and the dive was very successful.

Recommendations for corrective action or improvement:

None

In your opinion, did the mission essentially achieve its purpose? Compare actual work accomplished with the work that was expected to be accomplished.

Yes - extremely successful dive due primarily to expertise of pilots and support team.

List specimens or samples collected on the mission.

8 Sediment scoop samples - see attachment for locations
1 temperature measurement
1 niskin bottle (at end of dive, just prior to dropping weights)

Dive 401

DATA RELEASE

Data may be retained by the project leader for up to 2 years after the mission date with the following exception. NOAA may request to use photos for publication or publicity purposes at any time.

Fill in the appropriate statement below and sign this form.

I hereby release the data archived by HURL for public consumption following mission

Submarine Hyaloclastites (project title)

held on 16 Oct 98 (date) in the following way:

a. CTD data by N/A (date)

b. voice transcripts, video, and still camera film by Oct '99 (date)

c. other N/A (date)

d. I will give my written consent to individuals wishing to use these data prior to the above dates depending on the nature of the request(s).

[signature] Principal Investigator

Pisces V- Dive 401
16 October, 1997

Pilot- Terry Kerby
co-pilot- Tym Catterson
Observer- Rodey Batiza
Launch 0815
on bottom 0910

time (HST) depth (m) heading

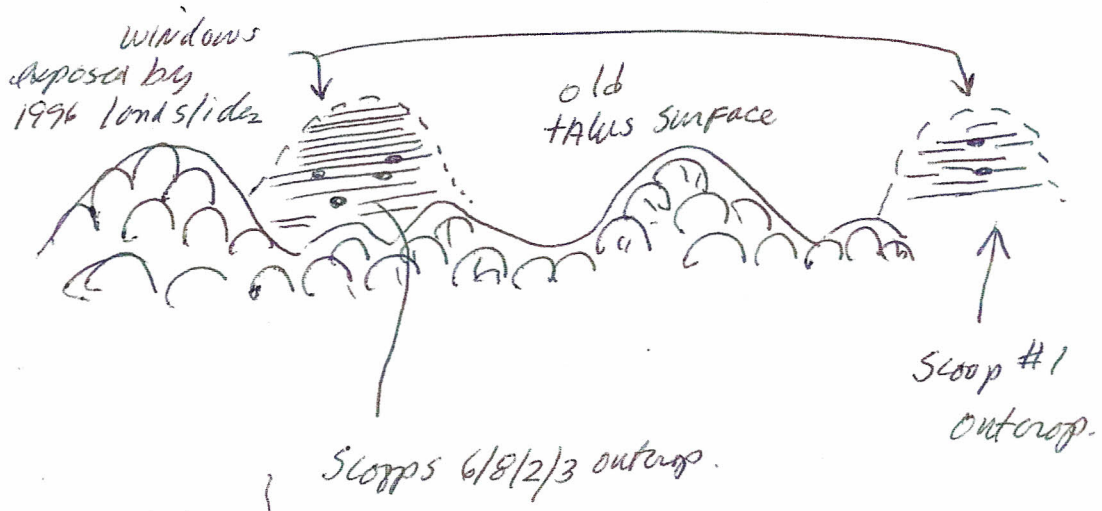
0910 1143 090 on the flat top of a ridge-NS strike, down to east (valley) with another ridge beyond. Rocky with thin sediment, loose talus blocks. current from NE, wall ahead on scanning sonar (SS). Position- lower right of ZW 13 (18°55,32, 155°14.92).
0920 1143 090 u/w
0924 1148 090 rubbly up-sloope talus and corals (old slope), steepening to angle of repose fist-size or smaller pieces.
0925 1134 055
0929 1150 113 no bottom
1150 250 med size talus, loose sedimnet, pebbly with some large rocks. turning clockwise.
0932 1158 090 on talus slope
0933 1161 090 on lip of vertical drop
0935 1161 090 still on lip, truncated pillows in cliff- recently exposed outcrop
0938 1176 270 loose talus at base of slope, E-facing wall.
0939 1176 south travel along wall-pillows, talus below wall. sand on horizontal ledges - recent land slide debris- at top of wall, black sand debris.
0941 1164 south- move back to wall
0942 1163 213 steep talus with black sand, sparkling. Wall is talus rubble and some in-place pillows- coral on talus.
0944 1158 327 along gentle slope of wall- old surface typical talus (10-15 cm) w/f.g. sediment- talus blocks
0945 (1160) north talus with different sized blocks top of small wall- corals mostly mottled sediment (mud)- no glass.
0947 (1160) 094
0950 (1160) 188 old talus slope w/recent landslide break. current up slope, talus, poorly sorted. will try for talus sample. (It is now clear that this fine grained talus is actually scoria overlying in-place pillows, exposed by recent landslide. Where landslide hasn't removed material, the surface looks like talus- this outcrop is a window. This scoria deposit is probably along-strike equivalent of the "Garcia" outcrop sampled later in dive).
0955 1155 241 scoop #1 18 56.48, 155 14.86
1004- good view of scoria outcrop, biology
1016 1157 leaving station 1 looking south for Garcia outcrop.
1016 1157 233 along slope- talus, alternating course/fine, E-facing scarp

1017 1155 talus
1018 1155 153 countouring along talus- (scoop 1 to scoop 2 locations gives idea of lateral continuity of the Garcia outcrop). external camera frame at 20, getting to promontory on slope, turning east to follow slope.
1158 turning south (sub travelled north previously).
1024 1157 136
1157 197 course talus, near vertical slope
1024 1155 165 along talus slope- drops off ahead- vertical spires and outcrop- Terry sees "dikes"
1155 NW big pllars on edge of steep slope, these are fresh outcrop (new landslide) and "old" outcrop is rubbly coated talus- another "window". The pillars and outcrop are stratified (horizontal bedding) with intact pillows at base.
1037 1160 258 scoop #6 18 56.29, 155 14.79 near top of stratified unit. Above the well-bedded stratified deposit is rubble- could be talus or more likely a very course, massive phase of pyroclastic unit.
1056 1165 scoop 2 near bottom of stratified unit, same lat, long as scoop 6.
1104 contact of old outcrop with new landslide window.
1106 good view of rubble on top of pyroclastic unit.
1110 end tape #1.
1110 start tape #2
1113 scoop #8 1162m between the other two scoops in the more rubbly, massive facies which includes whole pillows- very poorly sorted. Large pillow dislodged during sampling of scoop 8 is at top of talus below outcrop.
1123 pillows at edge of outcrop- steep contact between pyroclastic unit and underlying pillow unit.
1131 1162 scoop #3 near contact of pyroclastic unit with pillows- about 4m from the other three scoops.
1144 182 dike cutting fragmental unit
1147 back to old surface NOT exposed by landsliding
1148 1162 180 driving south through water
1155 talus
1157 pillow talus, moving south, climbing talus slope (NS wall- heading east)
1202 climbing side of triangular peak located at 18 56.2, 18 56.1 on edge of east slope.
1206 nolntronite
1207 truncated pillow wall, much coral
1210 large fish, NS trending wall, bacterial mat
1213 1064 yellow flock at base of talus slope on f.g. sediment. temperature probe- 7°C.
1223 another fish
1223 1064 climbing vertical pillow wall from flock site
1226 1061 up wall more flock and crust material- recent landslide-fresh outcrop.

1229 nontronite crust at top with coral (old) near top of wall at 1022m- ridge runs NS.
1231 1014 summit of wall
1232 1012 position18 56.05, 155 14.85- actually, based on bathymetry- it is probably 18 55.99, 1`55 14.79.
1236 1012 357
1252 bottom in view- nontronite crust and dark sand- rippled, w/talus
1255 1063 stopped toi sample rippled sand- scoop #4 18 55.88, 155 14.85
1314 1100 fresh landslide debris in wall horizontal bedded sand- probably on south-facing north bounding fault of the northern (of two) dropped blocks (see sketch)-
1315 1086 114- good view of bedded sand deposits
1319- end of video tape #2.
1319- start tape #3.
1320- digital tape used up (turns out later there was a malfunction on tape 2 (digital).
1327 1125 170 across talus and crust
1334 fine grained mud
1335 AA flow
1338 117 196 up slope on pillow talus covered with sediment
1340 1088 up slope talus wall
1344 1074
1348 1064
1350 1064 fix- 18 55.246, 155 15.043 will head east, then north
1402 running ENE 1070m
1410 1136 18 55.303, 155 14.962
1415 1136 090 mud and talus
1425 crossed HUGO cable going east
1430 no bottom
1436 mud
1444 talus slope, fresh talus
1445 1120 061 up talus slope vertical pillow wall, large pillows, with glass on vertical ledges.
1445 1109 053 vertical wall striking NW-SE (south wall of block 2)
1454 1060- still on wall- video went off unexpectedly

(from notes)
1503 scoop #9 from sand at top of pillow wall- 18 55.567, 155 14.64- sand is well-bedded (horizontal), with mostly thin beds (1-4 cm).
1517 1052 18 55.547, 155 14.691 scoop #5 on rippled sand NW of scoop #9 (actual position of scoop- 18 55.68, 155 14.68)
1520 dropped weights
1630 at surface

samples- 8 scoops of sediment



Scoops 6/8/2/3 outcrop.