HAWAIʻI UNDERSEA RESEARCH LABORATORY
QUICK LOOK REPORT
DIVE: PIV-141

MISSION STATUS

Location: Volcano 1, South Tonga (Tofua) Arc

Latitude: ***Begin*** 21° 09.3624S **Longitude:** ***Begin*** 175°44.520W

Mission Date: June 24, 2005 **Duration:** 5 hours (Bottom Time)

Maximum Depth (m): 202 m

Project Title: SITKAP
(Submersible Investigations of the Tonga-Kermadec arc using PISCES)

Principal Investigator: Prof. Peter Stoffers, Kiel University

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Observer 1: Peter Stoffers **Observer 2:** None
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Pilot 1: Terry Kerby **Pilot 2:** Max Cremer

Scientific Data Acquired: Video, hand-held still photos, rock samples, bio sample, scoop samples, geological map

Objectives:
The goals of the dive were to (1) explore the extension of the mussel field and localize the plume source in the southern and central craters; (2) to sample the vent fluids, gases; (3) to collect rock samples at the northern slope of the southern cone.

Observations, findings, etc: (Also see Appended Dive Log)

Summary: The dive commenced on the eastern side of the southern crater and went into the southern crater. At the base at 198 m abundant large mussels occur. Then heading NW over the northern rim of the southern crater into the central crater passing an outcrop of highly altered volcanic rocks. At a depth of 199 m abundant mussel beds surrounded by white sulfur occur. Intense venting and strong bubbling was observed. Venting at 68 deg.C was found and sampled for fluid and gases. Then proceeding south to the summit of the southern cone crossing scoriaceous material and Fe crust and at 98 m water depth, a field of abundant mussels with white sulfur was found. Signs of hydrothermal activity

stopped at 76 m water depth, followed by gravel-like iron-stained scoriaceous material up to the summit of 64 m.

Species List:
PIV-141 Biology 6/24/2005 Volcano 1

Biology Samples:
PIV-141-A1 – A5 Bathymodiolus
PIV-141-A6 Platyhelmenthes?, Red worms (found in mussels, usually on gills)
PIV-141-A7 Limpets (2, found on mussels)
PIV-141-A8 Polychaetes (from mud scoop 5, lots of sulfer)
PIV-141-A9 Polynoidae?
PIV-141-A10 Polychaetes

Observed in video

Midwater:
Mysida

Benthic:
Bacterial mat (dense, filamentous, white)
Pennatulacea (small)
Bathymodiolus (dense)
Pleuronectiformes (numerous in mussel bed)
Asteroidea
Limpets (numerous on mussels)
Gorgonacea (corkscrew whip)
Gastropoda
Brachyuran crabs (numerous in mussel beds)
Echinoidea
Grouper sp.1
Grouper sp.2
Elasmobranchii
Idols
Wrasses
Moray eels
(numerous other tropical fish, but I don't know the species)

MISSION EVALUATION:

A. Limitations, failures, or operational problems noted:

None.

B. Recommendations for corrective action or improvement:

None.

C. In your opinion, did the mission essentially achieve its purpose?

Yes, for the objectives of reconnaissance and sampling.

D. Compare actual work accomplished with the work that was expected to be accomplished.

Actual work fully met the expectations for a reconnaissance and sampling dive.

E. List specimens or samples collected on the mission. (See Sample List Below):

Dive PIV-141

Sample Number	Time (L)	Latitude Min/decM 21degS	Longitude Min/decM 175degW	Depth(m)	Comments
PIV-141-A1 - A5	13:01	9.339	44.629	198	mussel
PIV-141-R1	13:12	9.340	44.633	198	highly altered grayish material
PIV-141-R2	13:25	9.316	44.659	155	small piece of highly altered volc
PIV-141-Scoop 5	14:02	9.293	44.655	198	white sulfur crust material
PIV-141-Major (yellow)	14:30	9.201	44.662	196	clear flow
PIV-141-Gas Tight (yellow)	14:35	9.201	44.662	196	clear flow
PIV-141-Major (White)	15:40	9.270	44.702	199	T=68C, lots of bubbles, not trigg
PIV-141-Gas Tight (red)	15:55	9.270	44.702	199	T=68C, lots of bubbles
PIV-141-bubble scoop	16:05	9.270	44.702	199	T=68C, lots of bubbles
PIV-141-Scoop 4	16:05	9.270	44.702	199	black sand (vent site)
PIV-141-R3	16:22	9.270	44.702	199	white sulfur crust (2 pieces)
PIV-141-R4	16:30	9.270	44.702	199	piece of yellow elemental sulfur
PIV-141-A6	13:01	9.339	44.629	198	Platyhelmenthes (red, from mus
PIV-141-A7	13:01	9.339	44.629	198	Limpets (2, from mussels)
PIV-141-A8	14:02	9.293	44.655	198	Polychaetes (from mud scoop 5
PIV-141-A9	13:01	9.339	44.629	198	Polynoidae?
PIV-141-A10	13:01	9.339	44.629	198	Polychaetes