HAWAIʻI UNDERSEA RESEARCH LABORATORY
QUICK LOOK REPORT
DIVE: Pisces IV 144

MISSION STATUS

Location: Jarvis Island

Latitude: ***Begin*** 00° 22.940'S **Longitude:** ***Begin*** 160° 01.457'W

Mission Date: 20 July 05 **Duration:** 8hrs 36min

Maximum Depth (m): 676m

Project Title: Past Decadal-Centennial Climate Variability Revealed by Deep Sea Corals from the Central North Pacific Gyre

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Observer 1: R.B. Dunbar **Observer 2:** T.P. Guilderson
Address: RBD (as above). T Guilderson: Center for AMS, UC/LLNL, Livermore CA also at Dept. of Ocean Sciences, UC Santa Cruz, Santa Cruz CA

Pilot 1: Terry Kerby **Pilot 2:**

Scientific Data Acquired:
Video record of distribution and abundance of deep-sea corals along a vertical transect on western end of Jarvis Island. Select fossil, sub-fossil, and living deep-sea macrofauna were sampled using the manipulator arm and returned to the surface in a coral collection basket.

Objectives: Acquire direct observation (e.g., video and notes) of the i) vertical distribution of deep-sea invertebrate macrofauna with an emphasis on deep-sea corals and related genera; ii) substrate/topography with a view towards establishing the relationship with benthic community properties. A primary mission goal is to collect fossil, sub-fossil, and live specimens of deep-sea corals across a range of depths and habitats.

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

Terrain at depth was dissolution-pitted carbonate with sporadic manganese coatings. Sediments were restricted to small fans at the end of descent channels and included much

macro-coral debris (*Dendrophyllia*, cup coral fragments). No basalt outcroppings were observed at depth. Shallower than 400m the terrain was composed of sedimentary rock outcrops (possibly Cretaceaous given the age of the Line Islands), most likely limestones with a shallow water carbonate platform provenance. Vertical features are quite rugged – current and or sand swept - including a spectacular 200m wall between ~400 and ~600m water depth with blue gorgonins (*Paramucea* spp?)

Echinoderms were the dominant macrofauna observed over the survey transect including a plethora of brittle stars, basket and sea-stars, crinoids, and urchins. The deep-sea coral community was composed of *Corallium, Acanella,* and *Desmophyllia*, and at least two types of solitary cup corals. Corals were attached to exposed (sediment-free) carbonate substrates. Over the survey track, *Desmophyllia* was very abundant between ~500 and ~600m water depth and appears to provide a large source of detrital carbonate to depth (sloughing off of upper or small branches) as reflected in the coral talus/debris at depths below 600m. *Corallium* and *Acanella* were rare – less than 10 of each were observed and usually in cuts or clefts of steep walls. Fish included the standard assortment of eely-fishes (e.g., rat tails, Jelly-nose eels, cusk eel), something akin to John Dory (very common below ~600m), Orange Roughy, Beryx, and at least one *Echinorhinus cookei* approaching 10-feet in length.

Species List: (not meant to be completely inclusive)

Deep sea corals observed: *Acanella* spp (minor), *Corallium* spp. (minor), *Dendrophyllia* (major)

Echinoderms: *Acanthocidaris, Antedon, Anthenoide, Araeosoma, Asteroschema, Astroceramus, Brisingia, Comatulid, Diadema, Histocidaris variabilis, Ophiomyxa*

Other: *Parapagurus* and associated *Stylobates*, *Echinorhinus cookei,* rat tails, Jelly-nose eels, cusk eels, *Beryx,* Orange Roughy, Goosefish (*Sladenia sp.*), *Satyrichthys sp.* (rake fish)

MISSION EVALUATION:

A. Limitations, failures, or operational problems noted:

NONE of major note**.**

B. Recommendations for corrective action or improvement:

This was a dual-sub dive, it would be beneficial to have similar CTD systems on both submarines so that T/S and dissolved O_2 can be recorded and not require one to be without or the mission support crew to have to swap seabirds out. Both submarines should be equipped with laser size calibration systems.

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

YES.

D. Compare actual work accomplished with the work that was expected to be accomplished. All expected work was accomplished with the exception that we did not encounter *Gerardia* ourselves. Pisces V encountered *Gerardia* nearby.

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

Dive PIV-144

Sample Number	Time (L)	Latitude Min/decM	Longitude Min/decM	Depth(m)	Comments
P4-144-1	1025			665 m	Live Corallium spp. (regale?)
P4-144-2	1043			628 m	Sub-fossil (but fresh) Dendrophyllia (x2)
P4-144-3	1108			579 m	Live Dendro with dead base
P4-144-4	1117			580 m	Sub-fossil Dendro
P4-144-5	1123			570 m	Live Dendro (x2)
P4-144-6	1137			544 m	Live Dendro
P4-144-7	1158			509 m	Live Dendro with dead base
P4-144-8	1209			485 m	Bambo coral (Fossil)
P4-144-9	1253			355 m	Unknown coral spp?
P4-144-10	1310			300 m	Live Hexacoral
P4-144-11	1416			555 m	Live Corallium spp.
P4-144-12	1417			556 m	Sub-fossil Dendro
P4-144-13	1453			650 m	Fossil Dendro
P4-144-14	1548			532 m	Live Dendro (x2)
P4-144-15	1600			510 m	Sub-fossil (but fresh) Dendrophyllia (x2)
P4-144-16	1605			508 m	Sub-fossil Dendrophyllia
P4-144-17	1617			499 m	Sub-fossil Dendrophyllia