HAWAI'I UNDERSEA RESEARCH LABORATORY

QUICK LOOK REPORT
DIVE: P5-701

MISSION STATUS

Location: North French Frigate Shoals Seamount, NWHI

Latitude: 24° 22.759 **Longitude:** 166° 3.409

Mission Date: 11/14/07 **Duration:** 8 hours 0 mins

Maximum Depth: 1330 m

Project Title: Megafauna of Deep Seamounts and Ridges in the NWHI Monument

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Observer 1: Christopher Kelley
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Observer 2: Jane Culp
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Pilot 1: Terry Kerby **Pilot 2:**

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

Objectives: The goal of this project is to census fish and invertebrate species in two under-surveyed but potentially high diversity habitat types: submarine ridges and seamounts, found inside the monument with the bathyal zone of 200-2000 m. The three ridge dives were conducted earlier in the cruise. This dive was the first to be conducted on our second study site, an un-named seamount located 25 miles north of French Frigate Shoals. HURL operations director, Terry Kerby, and the PIs of this project (Kelley and Smith) conducted a single exploratory dive (P5-464) on its north flank in 2001. The area covered during the dive was only a small strip of less than 1 km extending between 1100 and 1400 m. However, from that quick look, it was clear that this seamount is of consider geologic and biologic interest. The bedrock was coated in a thick manganese crust upon which a variety of cnidarians, sponges, echinoderms, crustaceans, and fishes were found. Similar to the ridge site, three submersible dives and up to six ROV dives were planned for the survey. For each submersible dive, a 200m wide by 3,000-4,000 m long sampling area will be selected that extends down from the top of the summit. Each dive will start at the bottom of the sampling area and end at the summit. The observers will attempt to identify and count all fish and invertebrates encountered. Two digital camera systems will record video as well as the audio records from each of the observers. A laser scale mounted on one of the cameras will provide the means by which to obtain size data. Specimens of unusual species that are potentially new to science will be collected for laboratory identification.

Aside from one narrow swath, this feature had not been previously mapped with multibeam sonar. Per our proposed plan, we arrived on the seamount the evening of 11/5/07 and conducted multibeam mapping operations until early morning. While the data could not be fully processed before the 4 planned dives, co-PI Smith was able to provide a good working image that we were able to use to select the dive sites. This particular dive was the fourth on the seamount and began at a depth of 1330 m on a rift zone ridge close to where the previous dive (P5-700) ended. The 4,000 m long sampling area extended up to the edge of the summit at approximately 800 m.

Observations, findings, etc:

We landed as planned in the middle of the coral and sponge bed near where the submersible left the bottom during dive P5-700. Unlike the previous dive, the current was very light. We then initiated the survey and quickly found ourselves in terrain consisting of outcrops and gulleys that made it very difficult to simply follow the ridge upslope. After approximately 1 hour, the tracking room informed us that we had actually moved downslope in the opposite direction. We then asked for a range and bearing to the summit of the seamount and decided to simply follow that heading regardless of what the terrain appeared to be doing. This worked and we had no problems moving in the correct direction for the remainder of the dive. The coral and sponge bed maintained a relatively constant character up to a depth of approximately 1270 m. The bed was dominated by a very dense population of Corallium spp mixed with less dense populations of Paragorgia regalis?, Calyptrophora clarki, other gorgonians, as well as a variety of sponges, particularly Semperella schultzi and sp 1, Caulophacus sp. and other pheronematids. In the bed, we observed a very unusual large hexactinellid sponge that we sampled and dubbed hexactinellid cauldron. At 1270 m, the Corallium sp noticeably thinned out decreasing the overall density of corals in the bed. A new species of yellow gorgonian appeared in a small patch followed by a similar sized patch of a white low lying fan we tentatively identified as a dendrophyllid. Both of these were sampled. Just upslope at 1245 m, we encountered a talus slope of possible dike rock and stopped to obtain a couple of rock samples. This was followed by an increase in the density of large Calyptrophora clarki fans along with smaller Calyptropora sp and possible Narella sp thus forming a primnoid dominated bed. At 1145 m, we crossed a cobble bed where we sampled a Lepidisis sp red to confirm what we were identifying on the audio recorders. We also encountered a different type of echinothurid urchin just upslope on a sediment patch that we photographed but did not sample (we didn't want it to mess up the coral specimens already in the box). The terrain continued to change and at approximately 1050 m, we encountered the first identifiable carbonate rock in the form of an interesting pitted and fractured pavement. A mixed bed of Semperella sp 1 and pheronematid 2 sponges were growing on the surface. Just beyond this formation at 1045 m was a large broken section of a volcanic dike from which we were able to obtain two rock specimens. These samples should allow co-PI Smith to obtain some information on the age of the seamount. The terrain changed again and became steeper manganese coated rock until a depth of 950 m where we found what appeared to be old notched aggregated sediment deposits that appeared to be old shoreline features. At 888 m, we collected a specimen of a leaf shaped sponge that we think is a new species/record then continued up to 831 m just over the edge of the more flattened summit. This is where we left the bottom.

Species list:

Fishes: Hydrolagus purpurescens, Synaphobranchus affinis, Synaphobranchus brevidorsalis, Hexatrygon bickelli, bathygadid, ophidiid, Aldravandria phalacra, macrourid, Sladenia remiger, Centrocyllium nigrum, Apristurus sp, Unidentified shark

Echinoderms: synallactid-like holothurian, Pannychia mosleyi, echinothurid new black spot, comatulid brown, Atelecrinus conifer, comatulid black with yellow cirrhi, Ptilocrinus sp yellow, Asthenactis papyraceus, unidentified seastar, Hypasteria imperialis, Henricia pauperima and H. robusta, Pteraster reticulatus, Zoroaster spinulosus ophiuroids, gorgonocephalid (no paired parallel divisions), Aspidodiadema hawaiiensis, Aspidodiadema-like with thicker spines, Antedon yellow

Arthropods: galatheid, Lithodes longispinna, crab, Acanthophyra, Nematocarcinus tenuirostris, mycid, Homeryon asper

Cnidarians: Actinoscyphia sp 3, Marianactis sp, Actinernus sp, Actinostolid tan, hormathiid, Anthomastus red, Calibellemnon like, Cerianthid pink, Corallimorphus sp, Iridogorgia megaspiralis, chrysogorgiid, Calyptrophora agassizii, Narella sp, Narella nuttingi, Calyptrophora sp 5, Lepidisis sp red, Acanthogorgia sp, Calyptrophora spinosa, Chrysogorgia geniculata, Anthothelia nuttingi, Plumerella sp, Corallium new (Amy) and Corallium ducale, Corallium abyssale, Iridogorgia superba, isidid branch, Candidella gigantea, Metallogorgia melanotrichos, Paragorgia dendroides and P. sp 1, Calyptrophora sp 5, Calyptrophora clarki, Halipterus willimoesi, Enallopsammia rostrata, unidentified dendrophyllid, Paragorgia regalis

Sponges: chonelasmatinid leaf, Walteria sp 2, W. sp 3, and W. flemingi, Saccocalyx sp?, euretinid grammaphone-like, Sericolophus hawaiicus, Endorete sp, Farrea sp 1 and 2, Farrea occa, Tracoramorpha sp 1, Hertwigia sp, Poliopogon sp 1, 2, 3, 4, pheronematid 2, Semperella schultzi, Semperella sp 1, Caulophacus multipuff, Caulophacus sp 3, Trachasterina sp, Basthydoris sp, hexactinellid massive stalked, Tretodictyid waffle

Other:

MISSION EVALUATION:

Limitations, failures, or operational problems noted:

None.

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. This was one of the most interesting productive dives that this PI has ever been on. We accomplished all of our objectives.

List specimens or samples collected on the mission.

Biological specimens

2 pieces of a large unidentified hexactinellid sponge
1 unidentified yellow gorgonian fan
1 piece of an unidentified dendrophyllid?
1 Lepidisis sp
1 chondelasmatinid? leaf sponge

Rock specimens

2 pieces of talus
2 pieces of dike rock
1 mn-coated piece of carbonate

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 P5-701 (Megafauna of Deep Seamounts and Ridges in the NWHI Monument)

held on 11/14/07 (date) in the following way:

a. CTD data by 11/14/09 (date)

b. video and images by 11/14/09 (date)

c. other 11/14/09 (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).

_____ Principal Investigator