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Purpose of the Dive

To explore the biology and geomorphology of the wholly unexplored Gosnold Seamount.

Description of the Dive:

Setting: Dive 8 took place on the northern flank of Gosnold Seamount. This seamount is a large (3400 m high) elongate guyot similar in size and shape to the main edifice of the nearby Atlantis II Seamounts. The dive track started on the upper flanks of the seamount and led upward along the top of a rift arm ridge to an unusual channel feature at the summit of the seamount.

Exploration: The ROV descended to a hard lava surface at 2138 m before proceeding up the slope to 2126 m to start the dive. Immediately seen in the area were several large *Corallium ?niobe* colonies that were extensively overgrown by zoanthids and held a variety of associates, including *Ophiacantha*-like brittlestars and a pycnogonid sea spider. For most of the dive the ROV traversed terrain dominated by jumbled sheet flows with small, irregular lobes. The flows were covered in a light dusting of sediment and large amounts of biological debris and overgrowth. Manganese-encrusted coral branches and cup coral skeletons mixed with shell fragments to form piles of debris between lobes. Especially striking were the large patches of bamboo coral bramble. Dense patches of fine intertwining coral branches covered most surfaces. These thickets were mixtures of live colonies of *Keratoisis* (possibly *K. flexibilis*) and many tissue-free branches. Some branches were heavily encrusted and stained, suggesting a long time period of being exposed, but others were relatively clean, suggesting recent stripping of the live tissue from the skeleton. A host of invertebrates were seen on or among the brambles, including hydroids, barnacles urchins and glass sponges (Hexactinellida), the latter of several morphs and colors (yellow-green, purple, white) that were very common all along the dive transect. White nudibranch(?) galatheid crabs were common, and on at least two occasions individuals with very fuzzy antennae were seen.

Although the jumbled lava morphology was the dominant surface for most of the dive we did observe the broken off edges of several smoother sheet flows as we moved up the cliff. At about 2043 meters depth we first encountered the sharp edge of the ridge we had been following. A rounded promontory stretched out into the water column, with the slope dropping off vertically beneath it. Unfortunately no distinct lava forms were revealed in cross-section on this face. Large *Corallium* and *Candidella* colonies and sponges extended from the vertical face of the upper wall into the water column, with occasional *Paragorgia* colonies as well. We had a brief but interesting observation of what appeared to be a crab carrying a dead hexactinellid sponge skeleton at 1965 m depth. Post-dive input from Darryl Felder (UL Lafayette) suggested, based on the part of legs exposed, that this was a brachyuran crab in the family Homolidae (carrier crabs or porter crabs), a group rarely observed alive.

Further up on the seamount (1912 m) we observed the almost perfectly flat top of a thin (8 cm) sheet flow that had clearly broken off and crumbled near the cliff edge, likely due to the massive landslide that must have formed this sharp edge. At 1854 m we moved into an area with greater sediment cover and also observed a subtle shift in lava flow morphology. Isolated lava mounds stood out from alternating sheet and lobate flow terraces. Just above this we began to move onto the flatter canyon summit and into the channel feature

identified in the bathymetry. Moving over the summit we crossed a large sand-filled depression characterized by ripple marks from strong currents and light-colored sediment. The depression did not continue further along the summit channel. Instead we observed a return to patchy sediment and lava flow surfaces. Even on these smaller outcrops in the channel a diverse collection of octocorals and sponges were seen. A test of the sediment probe revealed > 20 cm sediment thickness at one location and less than 5-10 cm in another. The sediment is generally covered by black debris, but is very white under this cover (predominantly pelagic calcareous ooze). These sediment thickness tests marked the end of the dive, and the ROV left bottom at 1851 m, shortly after reaching the summit of the seamount.

Other biological observations: At least 15 species of coral were observed on the transect, including bamboo corals *Acanella*, *Keratoisis* and *Lepidisis*, *Paragorgia* sp. - many overgrown by yellow zoanthids (presumptive *Bullagummizoanthus*), *Chrysogorgia* sp., *Iridogorgia magnispiralis* and *I. splendens*, *Metallogorgia melanotrichos* (with ophiuroid associate *Ophiocreas oedipus*), *Acanthogorgia*, *Candidella imbricata* (some with a zoanthid overgrowth, different looking from yellow *Bullagummizoanthus*), *Clavularia*, *Paramuricea* sp. (with ophiuroid *Asteroschema*), and black corals (*Bathypathes*, *Stauropathes*, *Telopathes*).

Among the 7 recorded sightings of asteroid seastars was an unusual “sunstar” that caught the attention of Chris Mah (NMNH), who noted it was in the genus *Myxaster*, and that “myxasterid species are rarely encountered and are known from very few specimens.”

Fish species diversity was fairly low, with 6 species observed. The following list was provided by shore-based scientist Peter Auster and follows: Halsosaur (*Aldrovandia* sp), Grenadier 1 (*Coryphaenoides armatus?*), Grenadier 2 (*Malacocephalus?*), Cusk eel 1 (*Brotulataenia* or *Diplocanthopoma?*) Cusk eel (3 other species ... who knows?), Blue hake (*Antimora rostrata*)

Porifera: Demospongiae *Polymastia*-like; “grapefruit”; Hexactinellida *Euplectella*-like

Cnidaria: cup coral; anemones (*Actinerus*, Hormathiidae)

Mollusca: gastropods

Crustacea: mysids; lepadomorph barnacles on octocoral skeletons (*Glyptelasma*); nematocarcinid shrimp; *Aristaeopsis edwardsiana* shrimp

Pycnogonida: *Colossendeis* sp.

Echinodermata: Ophiuroidea (many different types, including *Asteroschema* associated with *Paragorgia*);

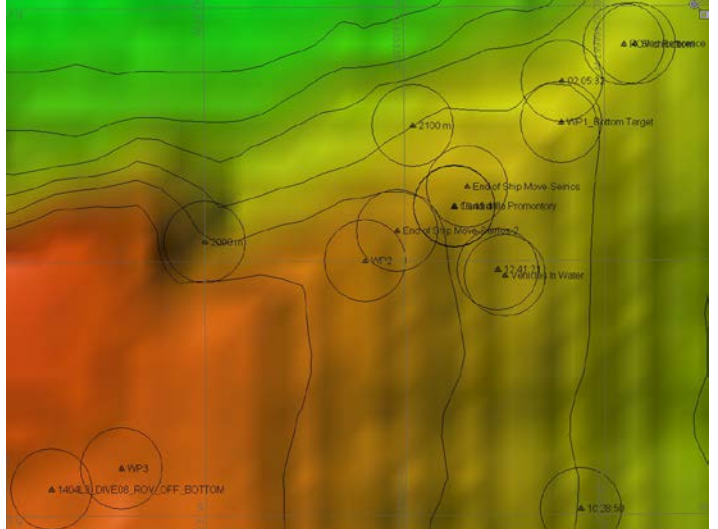
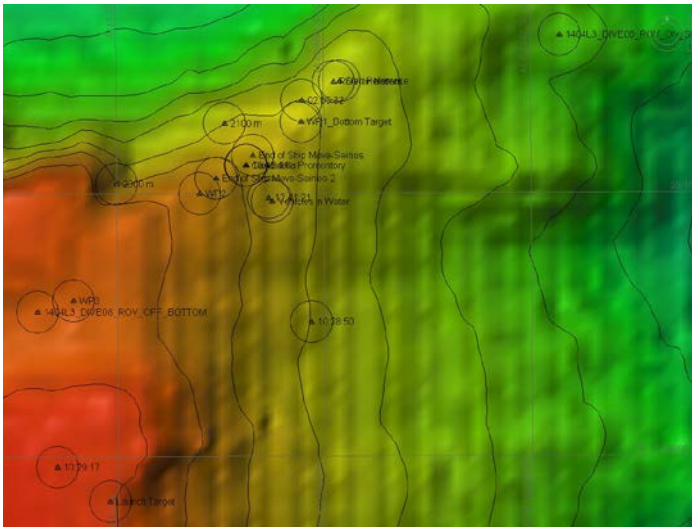
Crinoidea (stalked and comatulid); Holothuroidea (pink ?Aspidochirotida); Echiuroidea (*Echinus*-like).

Interesting highlights: Steep landslide headwall scarp dropping off to the west, rapid transition into patchy rippled sediments at seamount summit.

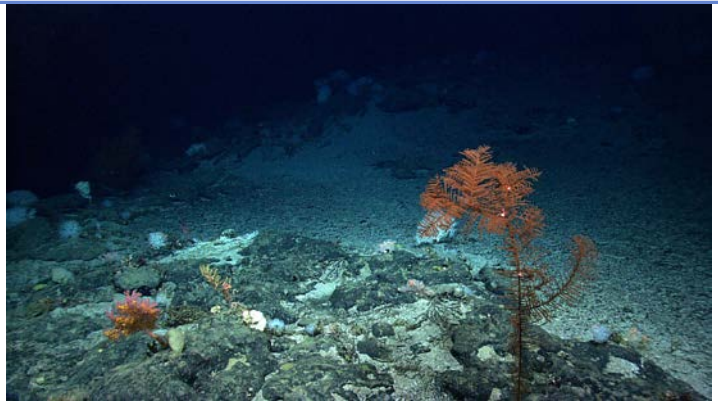
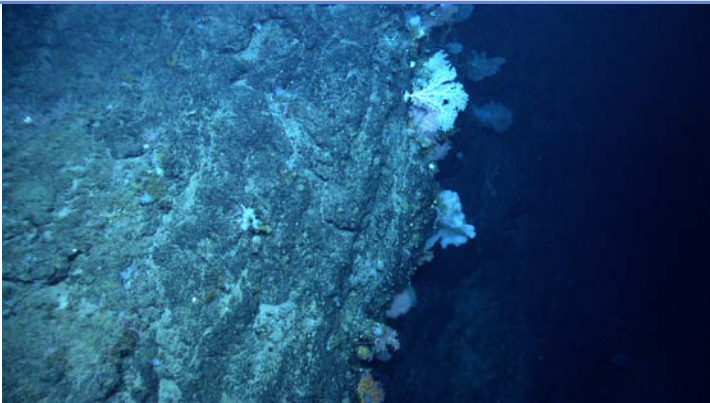
High densities of bramble bamboo coral colonies throughout the entirety of the dive transit over hard bottom on the ridge.

Overall Map of ROV Dive Area

Close-up Map of Main Dive Site



Representative Photos of the Dive



Please direct inquiries to:

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