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Purpose of the Dive

Explore the biology and geomorphology of the Atlantis II seamount

Description of the Dive:

Setting: Dive 7 took place on the northwestern flank of the main edifice of the Atlantis II Seamounts. This seamount is a large (3200 m) guyot (flat-topped seamount), assumed to have reached above the ocean surface at some time in the past. The dive climbed the edge of a small mid-flank ridge feature then followed the top of the ridge towards the summit.

Exploration: The ROV touched down on a hard-bottom substrate composed of lava flows with minimal sediment coating. The dominant lava morphology appeared to be a lobate flow, although some large bulbous pillow-shaped features were also observed, draped over a break in the slope. Patchy sediment cover was observed in the valleys between the lava lobes. At the landing site a few fish were observed (ophidids and grenadiers), and the rocks had scattered hydroids, serpulid polychaetes and encrusting sponges. Very quickly we began to see red-pink colonies of *Corallium ?bathyrubrum*; this species proved to be the most abundant coral of the day, being seen throughout the dive along the entire depth range. Many other octocoral colonies were seen along the dive transect, including *Chrysogorgia* sp. (many with chirostylid squat lobsters), *Anthomastus*, *Paragorgia*, *Corallium ?niobe* (white morph), bamboo corals (*Isidella* sp. 1 and *I. sp.2*, *Jasonisis*, *Lepidisis*, and a node-less bramble); and black corals *Bathypathes*, and *Stauropathes*. Many rock sea pens (*?Calibelemon*) were seen on hard bottoms during the first half of the dive. "Ring" anemones (those with pedal disc fused around a coral branch) were common on many coral colonies.

Continuing upward, we entered an area of broken stair-step terrain composed of the eroded platey remains of one or more thick (15 cm) sheet flows. One boulder revealed two sheet flows stacked on top of each other, although camera zoom was insufficient to confirm a cooling margin. The ROV then continued upwards and came out onto the flatter ridge top and an adjacent plateau. The dominant flow here was a sort of bulbous lobate flow, possibly intermediate between pillow lavas and a lobate morphology. Hexactinellid glass sponges became very abundant and diverse beginning around 2690 m depth and were the dominant taxon along with *Corallium ?bathyrubrum*. At 2546 m we observed a distinct carbonate layer with a thick blanket of sediment at its base. We followed this contact for some distance and the unit appeared to be laterally continuous. The layer appeared quite white, but coarser and more porous than the chalky unit observed at the base of the submarine canyons. One hypothesis is that this unit represents a drowned reef that formed in shallow waters at a time when the seamount was still active and reached above the surface. A number of cerianthid tube anemones were seen extending from burrows in the chalk-like wall at 2543 m.

At one point we also observed small areas of very shiny black manganese-encrusted lobate lava tongues. They appeared almost sand-blasted and very smooth. One hypothesis is that an eddy in the strong currents moving through this area may have scoured off this surface. The rest of the dive continued over a flatter surface, with a uniform lobate morphology. Further up on the slope we observed piles of mostly biological

gravel-sized material in the valleys between lava lobes. This biological debris was dominated by Fe and Mn-stained coral remains and white pteropod shells. The small debris fans appear to have formed by creeping and tumbling of material from higher above.

Other species observations:

- At least 9 species of fish were observed and a list was provided by shore-based scientist Peter Auster and follows: Cutthroat eel (*Synaphobranchidae*), Cusk eels (*Ophidiidae* - 3 species); Grenadier (1 species); Blue hake (*Antimora* sp.); Hake (*Lepidion*); Anglerfish [sea toad] (*Bathychaunax roseus*); Snailfish (*Liparidae*)
- Two cephalopod sightings were made, one an extended view of a “dumbo” octopus (*Grimpoteuthis*), the other a view from the Seirios HD camera of a possible *Vampyroteuthis* (as noted by Mike Vecchione).
- Frequent observations of large *Arcoscalpellum* barnacles in clumps on the seafloor.
- Stoloniferous (ribbon growth) and *Paralcyonium* (or *Ceeceenus*)-like octocorals were very abundant encrusting the seafloor in many places throughout the dive (described in the eventlog by one scientist as a “carpet of octocorals”) as were arborescent foraminifera.
- A pycnogonid sea spider was observed carrying an egg mass, which was a highlight for several scientists who know males carry eggs but had not observed this in deep sea.

Other taxa:

- Porifera: stick-like cladorhizids
- Cnidaria: cup corals; dandelion siphonophore (*Thermopalia* sp.); zoanthids; Corallimorpharia
- Mollusca: gastropods were seen on sponges, bamboo coral skeletons and the bare substratum.
- Crustacea: red crab (*Chaceon quinquegens*), Hermit Crab (*Paguridae*), barnacles (*Glyptelasma*) on coral colonies, squat lobsters, nematocarcind shrimp, *Aristeopenaeus* shrimp, caprellid amphipods, munid isopod (“water walker”), lophogastrid
- Pycnogonida: *Colossendeis* sp.
- Echinodermata: Asteroidea (*Ceramaster*, *Hymenaster*, *Evoplosoma*, including some feeding on coral), brisingid; Ophiuroidea (many different types, including associates on corals); Crinoidea (both stalked and comatulid); Holothuroidea (*Aspidochirota* and two species of *Elasipodida*).

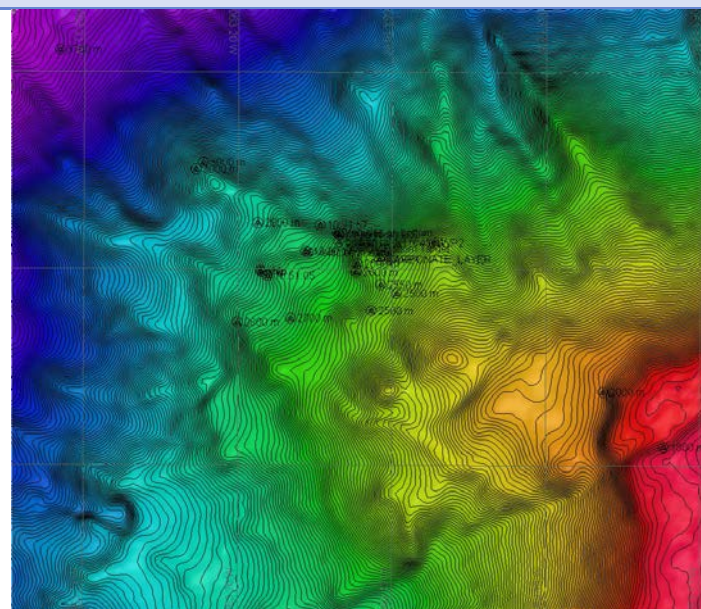
Interesting highlights:

Distinct carbonate layer at 2546 m with thin overlying lobate sheet flow, very shiny black manganese-encrusted lobate lava tongues.

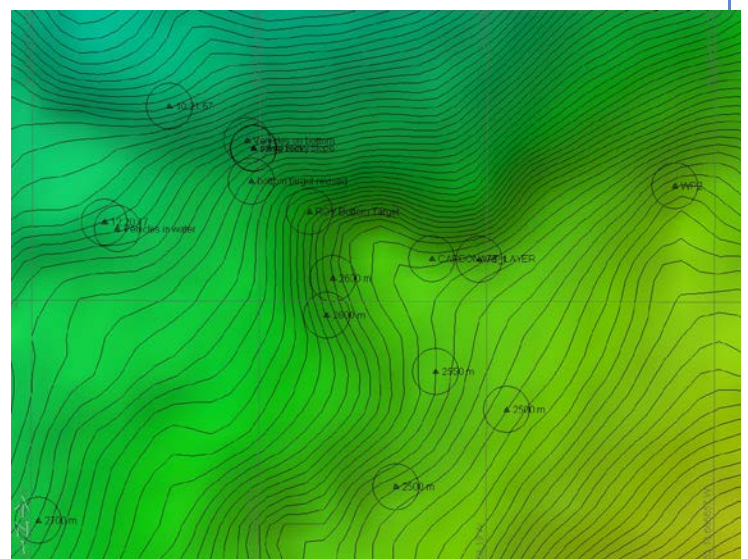
High abundance of *Corallium bathyrubrum*

Hexactinellid sponge “zone” of high abundance and diversity beginning around 2692 m depth

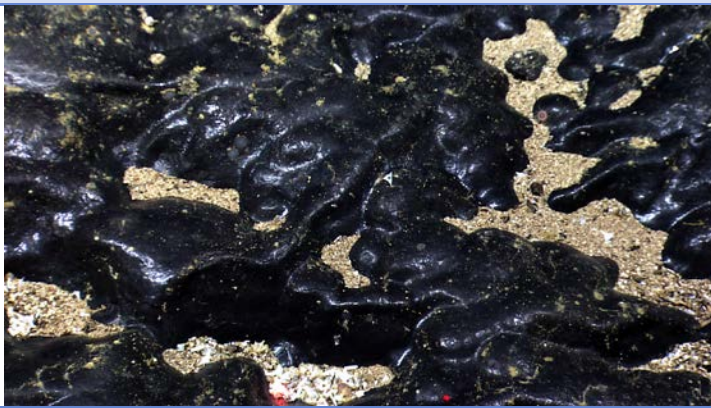
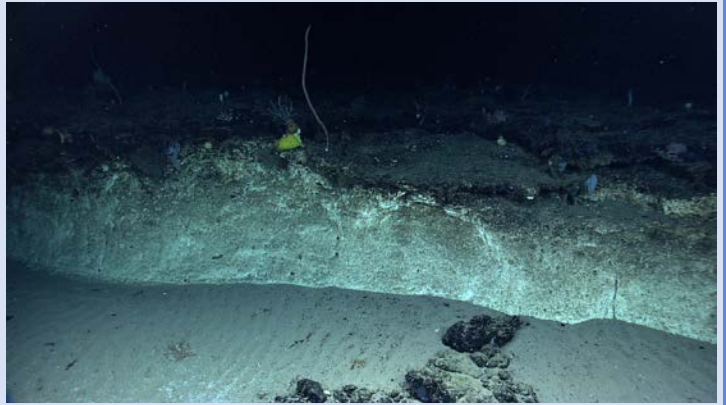
Overall Map of ROV Dive Area



Close-up Map of Main Dive Site



Representative Photos of the Dive



Please direct inquiries to:

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