Summary

Cruise: AT-41

Pilot: Bruce **Dive:** A4964 **Stbd Observer:** Alexis

Date: 8/25/18 **Site: Blake Deep** **Port Observer:** Cheryl

This dive took place on the Blake Escarpment at a south-facing portion of the feature between two Deep Discoverer (D2) ROV dives done from the Okeanos Explorer in June, 2018. We expected to find a steep wall, as had been observed on the D2 escarpment dives, but instead found a sediment, rubble and rock covered slope that got steeper towards the top of the escarpment. A rocky ledge of approximately two meters rimmed the top of the escarpment. The plateau was covered with sandy sediment, coral rubble, and smaller rocks covered with an iron-manganese coating. Some larger outcrops of rock occurred both at the base of the escarpment and on the plateau. On the dive, more time was spent at the base of the feature, moving up the slope, and running along the rocky rim, with little time devoted to exploring the plateau.

From the initial view of the sea floor, substantial coral diversity was observed. Numerous large (approximately a meter tall) bamboo corals (*Keratoisis* sp.?) were observed, along with several other bamboo corals including *Lepidisis*? whip corals that were over a meter tall and either squiggly or straight, and black coral species including the genera *Bathypathes, Antipathes*, *Leiopathes*, *Stichopathes* and *Stauropathes*. Our initial on bottom location was in front of one of the large, orange bamboo corals growing on a rock outcrop. Also visible were synaphobranchid cutthroat eels, an octopus and a *Coryphaenoides* abyssal rattail at a rock outcrop slightly upslope, *Farrea* glass sponges and a yellow plate-like sponge, stalked crinoids, several colonies of *Solenosmilia* stony corals and skeletons of *Desmophyllum dianthus*. The sea floor was covered with a layer of coral rubble (mostly *Solenosmilia variabilis*) and flat rocks of various sizes that had a black covering of iron manganese. The current was very light and visibility was excellent.

Given the diversity we observed initially, we set up to do some initial collections, including the bamboo coral, several black corals, *Solenosmilia* stony coral, a small *Paragorgia* (possibly *P. johnsoni*) with an ophiuroid associate, and a niskin sample. Push cores were attempted, but failed due to lack of penetration and sandy

nature of sediment. Bruce noticed a delay in the starboard brow and Pat cams, and communicated to surface about remedies. A reboot improved the situation.

We then moved about 15 m to starboard and found a spot with more exposed sediment for push cores. These also were mostly failed attempts. At this spot, we collected a *Bathypathes* black coral.

As we continued towards our T1 target, we observed conger eels, many more octocorals including large *Keratoisis*, rocks of various sizes, and coral rubble that consisted of both *Solenosmilia* and *Madrepora* skeletons. We past T1 and continued towards T2. We soon found a large *Enallopsammia rostrata* colony with a crinoid on a small rock next to a *Keratoisis*, *Farrea* sponge and another yellow hexactinellid sponge, with a skeleton of a *Keratoisis* next to it. We took 4K video, collected a piece of the E. rostrate, fired a niskin, and attempted more push cores, this time with success, for a total of 8 cores at this spot. We put the *Keratoisis* skeleton on top of the basket for aging work, then dropped two weights from the basket and moved on towards T2. As we moved upslope, we continued to see coral rubble mostly covering the sediment, but at one steeper spot, we saw ripples in the sand (small sand waves), along with occasional rock ledges. Numerous *Farrea* sponges were observed, along with a hexactinellid sponge with a branching structure but of the same convoluted ruffles (like *Farrea)* that were also observed further south on the Blake Escarpment on the *Okeanos Explorer*.

As we approached the second target (about 1207 m), the terrain flattened out, but fauna remained similar, with both large and small bamboo corals, small rocks, and *Farrea* sponges. Given the good working conditions and low current, we decided to move toward target 4 and a corner of the scarp feature. As we traversed along the edge of the scarp, we found several large white colonies of *Madrepora oculata* and sampled one of them, along with a niskin water sample. A large lithodid crab was observed and video was taken with the 4K camera. We collected a chrysogorgid coral and associate, as well as a plexurid octocoral. We then moved further in on the plateau to try more push cores, but again we hit hard substrate and they failed. We continued to move along the scarp edge, seeing more black corals, octocorals, and fishes such as oreos, *Caryophenoides* and *Nezumia* rattails, , and a shark. The sediment was more exposed just below the scarp edge, so we dropped down to 1221 m and were able to collect 8 push cores and several *Desmophyllum* that grew on *Keratoisis* skeleton. As we continued down the scarp edge, we found another octocoral and black coral to collect, the latter hadn't been observed previously. We continued along the scarp, seeing more *Madrepora*, rocks of various sizes, *Farrea* and branched sponges- sometimes very numerous, octocorals

and black corals. We took three final push cores and took the final niskin at 1222 m, made a rock collection, and took 4K video of a *Keratoisis* before leaving the bottom at 20:15. There were many octocoral species observed that we were not able to sample.