

In situ submersible observations of western Antarctic Peninsula deep sea fauna

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In January and February 2017 a submersible-based cruise was conducted along the western Antarctic Peninsula. The focus of the cruise, organized by Japanese NHK TV, was to obtain high-definition video footage of scientists exploring the deep waters of Antarctica for a documentary (Deep Antarctica). The three-person 1000m-capable submersible carried a scientist (CDB, MOA, or KSRB) in addition to the pilot and a cameraman. Logging a cumulative 100 hours of dive time, survey sites included an offshore continental break site (west of Smith Island), the Antarctic Sound, Fumarole Cove (Deception Island), Boyd Strait, Wilhelmina Bay, Buls Bay (Brabant Island), Fournier Bay (Anvers Island), and Palmer Deep. Numerous noteworthy pelagic and benthic observations were made during the eighteen dives. Two dives (Smith Is. and Boyd St.) were entirely water-column focused and included sightings of rarely seen swimming medusae and a lobate ctenophore, along with lengthy encounters with several species of squid, including one never before observed in the wild (KSRB). At all dive sites the water column was generally occupied by various species of fish, primarily *Neolepis coatsi*, and krill, chiefly *Euphausia superba*, but also *E. crystallorophias* (Antarctic Sound) and *E. triacantha* (Palmer Deep). Water temperature varied between the dive sites and at maximum dive depths ranged between -1.4 (Antarctic Sound) to 1.4°C (Palmer Deep). Video-based surveys of the seafloor communities were carried out at depths ranging from 180m at Buls Bay, Brabant Island, to 1000m at Palmer Deep. During the majority of the dives the biotic communities varied in terms of both species composition and relative abundances of taxa. Seafloor substrate was equally variable, encompassing featureless plains of soft sediment, rolling silty terrain with occasional dropstones, densely colonized vertical ledges and ice-scoured hard bottom. The dives also yielded in situ observations of gigantism, and both unknown or undocumented behaviors of crustaceans, echinoderms, and fish, recorded for the first time with high resolution cameras. Finally, a complete whale skeleton (probably a juvenile *Megaptera novaeangliae*) was discovered at 965m on the Palmer Deep slope. The intact skeleton is likely the southernmost discovery of its kind to date and possibly the best imaged natural whale fall in any ocean. Preliminary examination of the video footage revealed 30 different taxa (fishes, worms, crustaceans) on and around the bones and on the surface of the enriched sediments surrounding the whale skeleton.