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Purpose of the Dive

The primary objective of the dive was to investigate a ~60 m-long sidescan acoustic target, acquired using an industry AUV, composed of two parts with ~5 m seafloor relief, which suggested a shipwreck. This dive was nominated by personnel from the Bureau of Ocean Energy Management (BOEM) and archaeologists from NOAA.

Description of the Dive:

Geological Summary

The dive began and stayed at water depths of 1,925-1,930 m. The “wreck” was approached from the SW, across a ~flat, sedimented seafloor characterized by scattered black areas suggestive of bacterial mats associated elsewhere with the presence of cold seeps.

Within minutes of observing the first part of the “wreck”, it became clear that the feature was not man-made, but a natural phenomenon. Discussion between the beach and the ship zeroed in on the likeliest explanation – that this feature was a flower-like extrusion of asphalt at the seafloor. Other complex seafloor expressions of asphalt migrating from the subsurface have been documented in the Campeche Knolls part of the deep southwestern Gulf of Mexico, associated with the flanks of a rising salt dome there. Detailed visual examination of the perimeter of this feature confirmed its flower-like shape, which earned it a nickname of “tar lily”. Each petal of this flower was curved and had internal layering, which expertise onshore confirmed was a result of devolatilization of the asphalt rising from the sub-seafloor upon its contact with seawater.

The second part of the dive was used to investigate the second part of the “shipwreck”, which was confirmed to be a second (less flower-like) “tar lily”. Both asphalt extrusions were investigated in three dimensions, and photomosaics were completed on both prior to the end of the dive.

On both structures, there was evidence from seafloor staining near the bases of “petals” for the presence of hydrate. However, no bubbles of either gas or oil were observed escaping from either structure.

Biological Summary

In the soft bottom transiting towards the first asphalt feature, there were unbranched bamboo corals and holothurian - *Benthoodytes typical* - that were common to abundant throughout. Pennatulacea - *Umbellula* sp., shrimp and polychaetes were also present in this area. A wooden log was also found, heavily infested with *Munidopsis* sp.

The first “tar lily” was dominated by fly trap anemones, unidentified sponges, a goose neck barnacle, Octocorals: *Paramuricea* "B1", and unidentified white and branching bamboo corals. Pennatulacea - *Umbellula* sp., squat lobster- *Munidopsis* sp.. There were also a few chemosynthetic fauna, including tube worm - *Lamellibranchia* sp. and shrimp- *Alvinocaris* sp., as well as bacterial mats.

On the second feature, there were more chemosynthetic worms: *Lamellibranchia* sp., unidentified actinarians - similar to the ones found at brine pools and cold seeps. There was also spiral coral - *Iridogorgia* sp. (2), and *Paramuricea* (few), stoloniferous coral (purple and white), as well as branching bamboo corals (common).

Overall Map of ROV Dive Area

Close-up Map of Main Dive Site

