Characterisation of deep-sea communities in an area designated for oil and natural-gas exploitation off Trinidad and Tobago

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Trinidad and Tobago, the most southerly of countries in the Caribbean island chain, is the largest oil and natural-gas producer in the region. Deepwater exploration by the oil and gas industry is currently underway with exploitation due to begin in the near future. Despite this, Trinidad and Tobago's deep sea remains largely unexplored scientifically. The subduction of the Atlantic Plate under the Caribbean Plate east of Trinidad and Tobago, has resulted in an extensive accretionary prism. The tectonic compression of fluid-rich marine sediments during the subduction process has generated numerous mud volcanoes and cold seeps. During the 1980s, French scientists discovered extensive chemosynthetic communities associated with these features. Of these, El Pilar was the only site located within the Exclusive Economic Zone of Trinidad and Tobago, and was found to be inhabited by many previously-unknown species of seep fauna. In 2014, the E/V Nautilus, in collaboration with local scientists, visited previously-sampled as well as unexplored areas of the El Pilar site. Using the ROV Hercules and towed vehicle Argus, enormous beds of Bathymodiolus mussels, alvinocarid shrimps, Lamellibrachia tubeworms, serpulid worms, amphipods and Pachycara fish were discovered around an area where active venting of methane was occurring. There were also numerous sponges, bryozoans, Munidopsis squat lobsters, and crabs noted in peripheral areas of the seeps. This research highlights these unique deep-sea habitats, the fauna inhabiting them, and the increases in the knowledge of the biodiversity. At the same time, recommendations are made for the protection of these deep-sea resources given the high levels of exploration and possible exploitation activities.