

New 3-D imaging technology maps Scottish coral reefs

October 4 2019



Healthy coral in the Darwin mounds. Credit: University of Southampton

Newly developed 3-D imaging technology has allowed scientists to map an area of cold-water coral reefs off the coast of Scotland to see whether it has recovered since being declared a Marine Protected Area 16 years ago. The images show that in areas of the Darwin Mounds that had been heavily trawled, coral growth is still very sparse, and there has been no real recolonization. However, healthy coral growth was found in parts that had only been minimally damaged by bottom trawling, indicating that marine conservation measures are most effective when they are put

in place before damage occurs. The team also discovered a large amount of plastic waste snagged on the coral.

Dr. Veerle Huvenne from the National Oceanography Centre (NOC), and Chief Scientist of the expedition that made these discoveries, said "This proves once again that ecosystem recovery in the deep sea is very slow, and that it is better to put protective measures in place before damage occurs. However, encouragingly, settlement experiments deployed in 2011 and recovered on this expedition indicate that new coral larvae can indeed settle in the area."

These findings are the result of a three week research expedition in the North East Atlantic on board the Royal Research Ship Discovery, which is currently sailing home to Southampton. This expedition was a collaboration between the National Oceanography Centre, the University of Southampton, the Joint Nature Conservation Committee, the University of Edinburgh, University College Cork and the Scottish Association for Marine Science. Using the latest in marine and robotic technology, the team collected data to evaluate the status of the Darwin Mounds, a series of cold-water coral reefs lying at water depths of 1000 meters deep, once that were formerly heavily impacted by bottom trawling fisheries.

This expedition saw the first deployment of a newly developed 3-D imaging system called BioCam, a combined stereo camera and laser scanner built by the University of Southampton under NERC's Oceanids program, which was used to create multi-hectare 3-D visual reconstructions of the seabed. Mounted on Autosub6000, a robot-sub developed and operated by the NOC, the system successfully mapped more than 50 hectares of seabed in less than 48 hours at photographic resolution.



A fishing net and a plastic bag were among the rubbish found. Credit: University of Southampton

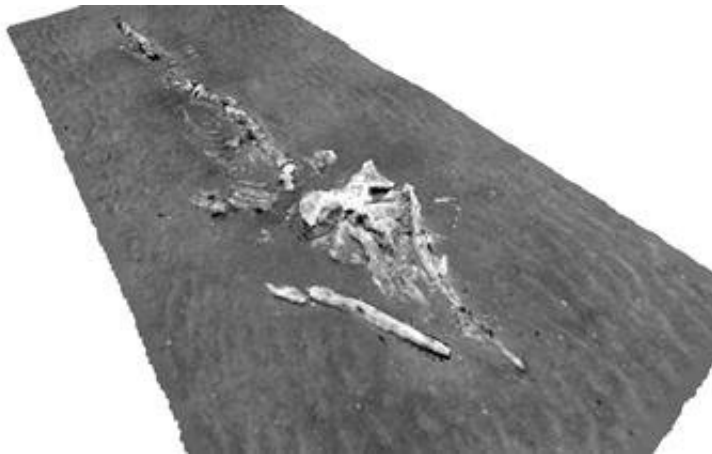
Together with an extensive series of samples, and more than 75 hours of high-definition video data collected by the HyBIS Robotic Underwater Vehicle, the BioCam images provided evidence of healthy coral growth in locations that previously had seen only a minimal impact of bottom trawling.

Cold-water corals are coral species that can live without light, and the reefs they build are important habitats for a wide variety of deep-sea life, including commercially important fish. The Darwin Mounds have been protected from bottom contact fisheries since 2003, and were last studied in 2011, at which point they had not yet recovered from the fishing impacts.

Dr. Veerle Huvenne continued "It was very encouraging to see the recruitment of new coral polyps on the settlement experiments, although this has not yet translated into widespread new coral growth in the heavily impacted areas. We will continue to monitor the site over the coming years, to learn more about how deep-sea ecosystems recover after disturbance."

"Working with the new BioCam system gave us an unprecedented

insight into the spatial pattern of the [coral growth](#). It also showed us how the associated marine animals are living with and around the coral, and it even provided us with unexpected discoveries, such as a complete whale skeleton which we had no idea was on the seabed in the area."



The team also found a whale carcass more than 8 metres in length. Credit: University of Southampton

Dr. Blair Thornton of the University of Southampton, Co-Chief Scientist and leader of the BioCam team said: "The multi-hectare scale maps generated by BioCam highlight a wide range of patterns in the spatial distribution of coral and the ecology at this site. These range from the fine, meter-scale patterns seen in video surveys, to much larger patterns in the distribution of live coral over several hundreds of meters. The data will help scientists identify these and make quantitative measurements of the distribution of live coral in this area."

"The fact that BioCam was able to collect data that is useful for scientific monitoring from its first deployment is a tribute to the hard work that went into preparations for this expedition from the teams at

the University of Southampton, the MARS team at the National Oceanography Centre, local industry partners and the captain and crew of the RRS Discovery. We are looking forward to its next deployment."

Unfortunately, the imagery also demonstrated the presence of a large amount of manmade litter. The area is characterized by strong tidal currents, and coral colonies form natural obstacles on which plastic debris can get snagged easily.

Hayley Hinchin from the Joint Nature Conservation Committee said: "It has been fascinating to see first-hand the coral mounds in the area, some of which are thriving and others which are struggling to recover. This survey has confirmed that even after more than 15 years of fisheries closures, the impacts of bottom trawling are still evident, and some more novel pressures seem to be growing. The level of litter that we observed across the site is quite shocking, and we still don't know how this is affecting the seabed communities we've seen over the last three weeks.

The wealth of data collected on this expedition will allow us to assess the current status of the habitats and species in the Darwin Mounds both at the small and large scale, and define how it has changed over time. The amazing 3-D imagery from the BioCam system allows us to investigate huge areas of the seabed at millimeter scale resolution—a tool that could really support marine monitoring and conservation efforts in the future."

Provided by University of Southampton

Citation: New 3-D imaging technology maps Scottish coral reefs (2019, October 4) retrieved 27 April 2024 from <https://phys.org/news/2019-10-d-imaging-technology-scottish-coral.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is

provided for information purposes only.