Collecting evidence to inform management discussions within deep-sea canyon environments

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Submarine canyons are renowned for their importance to benthic biodiversity, promoting conservation efforts to secure their protection and management. However, policy makers require adequate evidence (for example physical and biological datasets) in order to underpin the protection and management of these submarine canyon environments.

In 2013 the Department for Environment, Food and Rural Affairs (Defra) designated The Canyons Marine Conservation Zone (MCZ) to protect a unique area of submarine canyons to the south-west of the UK. This MCZ is designated for its cold-water coral reef communities, amongst other features. These vulnerable cold-water coral communities need protection from potentially damaging human activities, but before management measures could be developed, further data collection was required.

Defra, in collaboration with other partners, undertook survey work in 2015 during a CODEMAP cruise. The aim was to improve our understanding of the habitats and species found within the Explorer and Dangeard canyon systems in The Canyons MCZ, and in particular the distribution, extent and condition of the cold-water coral reef communities. The Remotely Operated Vehicle (ROV) ISIS was deployed three times within Explorer Canyon, in the north of the MPA. The primary target was a known cold-water coral reef, first discovered in 2007 as part of the MESH project. Using ISIS ROV, the colony was mapped in high resolution for the first time, and covered an area approx 200m x 700m. This knowledge was used along with the MESH project bathymetry data and a predictive Lophelia pertusa reef model developed by the University of Plymouth, to aid the transect design for subsequent ISIS ROV deployments to search for coral reef in other areas of the canyon flanks.

The Autonomous Underwater Vehicle (AUV) Autosub 6000, was also deployed to collect side-scan sonar on a section of the interfluve between Explorer and Dangeard Canyon, allowing high resolution mapping of a field of mini-mounds, co-located over an area where Vessel Monitoring System (VMS) data suggests that fishing activity from multinational fleets occurs. In addition, the vessel mounted EM120 multibeam echosounder system collected imagery from the deeper canyon areas within the MCZ, which had previously not been surveyed in detail.

This successful collaboration between a number of organisations utilised novel technologies in a time efficient manner, producing a range of high quality datasets. This new evidence will be used to inform the development of fisheries management measures for The Canyons MCZ, and will form part of the wider evidence base presented by the UK Government during multinational fisheries management stakeholder events; these discussions will inform the need, location and degree of fisheries restrictions required to protect features within the MCZ.