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TITLE: Deep-sea seabed habitats: Do they support distinct mega-epifaunal communities that have different vulnerabilities to anthropogenic disturbance?

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ABSTRACT:

Growing economic interest in seabed resources in the deep-sea highlights the need for information about the spatial distribution and vulnerability to disturbance of benthic habitats and fauna. Categorisation of seabed habitats for management is often based on topographic features such as canyons and seamounts that can be distinguished using regional bathymetry (?mega-habitats?). This is practical but because such habitats are contiguous with others, there is potential for overlap in the communities associated with them. Because concepts of habitat and community vulnerability are based on the traits of individual taxa, the nature and extent of differences between communities have implications for strategies to manage the environmental effects of resource use. Using towed video camera transects, we surveyed mega-epifaunal communities of three topographically-defined habitats (canyon, seamount or knoll, and continental slope) and two physico-chemically defined meso-scale habitats (cold seep and hydrothermal vent) in two regions off New Zealand to assess whether each supports a distinct type of community. Cold seep and hydrothermal vent communities were strongly distinct from those in other habitats. Across the other habitats, however, distinctions between communities were often weak and were not consistent between regions. Dissimilarities among communities across all habitats were stronger and the density of filter-feeding taxa was higher in the Bay of Plenty than on the Hikurangi Margin, whereas densities of predatory and scavenging taxa were higher on the Hikurangi Margin. Substratum diversity at small spatial scales (<1 km) and trawl history were significantly correlated with community composition in both regions. We conclude that, (1) a lack of consistent distinction between communities raises questions about the general utility of topographically-defined mega-habitats in environmental management, (2) fine-scale survey of individual features is necessary to identify the locations, characteristics, and extents of ecologically important or vulnerable seabed communities, and (3) evaluation of habitat vulnerability to future events should be in the context of previous and current disturbances.

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