

Broad-scale habitat mapping of deep-sea benthic environments around New Zealand

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Since vast areas of the sea-bed are at best only poorly mapped, it is important to implement and test standardised methods for quantifying broad-scale relationships between sea-bed habitats and biodiversity in order to characterise large areas of the ocean domain. Over the next 15 years, a series of systematic surveys will be conducted under the auspices of an ambitious New Zealand government-funded programme known as Ocean Survey 20/20 (OS 20/20). The first surveys associated with this programme have been completed recently in 2006-07 and focused on two large, deep-ocean domains: Chatham Rise to the east of the New Zealand landmass, and Challenger Plateau to the west. These two regions are physically and oceanographically dissimilar with the Challenger Plateau bathed in warm, nutrient-poor subtropical water and the Chatham Rise located below the dynamic Subtropical Front where subtropical and cold, nutrient-rich subantarctic waters meet. However, broad-scale marine environmental classification schemes using physical proxy data suggest some similarities at a certain classification level.

The Chatham-Challenger OS 20/20 project involved initial, detailed bathymetric mapping of the sea-floor with a hull-mounted multi-beam echo-sounder (Simrad EM300) across pre-determined environmental and/or disturbance gradients. This geo-referenced back-scatter, and bathymetric data was analysed with benthic terrain modelling and multivariate statistical techniques to identify environmental zones, or strata, which were then sampled directly for biological and sedimentological data (physical, chemical, compositional) on subsequent voyages. Direct sampling used a variety of instruments, such as towed camera systems (video and still photography), sleds, corers and trawls. The methodological approaches and initial results from the Chatham-Challenger surveys will be presented, focusing on links between substrate and biodiversity on spatial scales that range from 10's of metres (within video transects), 10's of kilometres (between broad transects) and 100's of kilometres (between ocean domains).