

Life on the seabed



Finding out exactly what's living on the seabed can be a technically challenging and expensive exercise, requiring deep sea sampling and video surveys. As an alternative, this study 'recycled' existing data to see whether it could accurately predict the diversity of seabed life.

Invertebrates like kelp, sponges, corals and shellfish add structure to the seabed, transforming it from a barren and inhospitable landscape into a place that provides bottom-dwelling fish and other invertebrates with shelter, food, spawning sites and nurseries. Orange roughy are often seen near deep-water coral thickets and more and more studies show a link between fish and these seabed communities. The abundance and diversity of these animals can be an indicator of the health of a marine ecosystem.

This study investigated if the diversity of fish living near the seabed (recorded in fisheries survey data) could help predict the number of different non-fish species (such as corals, shellfish and seaweed) living on the seabed in the same area.

Study sites



Data collections

Fisheries survey data

Ministry for Primary Industries (MPI) carries out regular stock assessments of fish and other marine species in the quota management system. Regular trawl surveys gather data to assess the number and size of the target species in an area.

Commercial catch rates and catch by recreational and Māori customary fishers also inform the computer models used to set the quota limits.

Environmental data

General information about climate, water temperature and depth, and slope and type of seabed surface is publicly available for the seas around New Zealand, down to a scale of 1 km.

Seabed survey data

As part of the Ocean Survey 20/20, 101 sites on the Chatham Rise and 49 sites on the Challenger Plateau were sampled from depths of 200–1,200 metres. A small dredge with a filter bag collected all the bottom-dwelling species larger than 25 mm in more than 9,000 tows. At Spirit's Bay, 52 sites at depths of 22–100 metres were sampled.

Video camera footage taken by a sled towed below a boat was used to identify different habitats and species in the regions above and from the Bay of Islands to Spirit's Bay. These data were collected as part of a MPI survey programme in northern New Zealand.



Measuring seabed diversity

Seabed diversity in two large (Challenger Plateau and Chatham Rise) and two small sites (Spirit's Bay and Bay of Islands) was measured as described above, by counting the number of different species found in an area. It ranged from a single species to more than 70 across the sites. The photograph on the previous page, taken at 500 metres depth by NIWA's deep towed imaging system (DTIS) on the Chatham Rise, shows five species – clumps of stony branching coral, lacy hydrocorals, a sponge, sea snails and banded bellows fish.

Predicting seabed diversity

The diversity of life on the seabed was predicted for the same sites using environmental data in a mathematical model. However the modelled results did not accurately represent seabed diversity. When fisheries survey data was added into this model, the accuracy of the predictions did not improve.

The study recommended that mapping different species and habitats would be a better way to manage seabed diversity.



Special equipment is needed to survey the deep seabed. DTIS is equipped with high-definition video and still cameras, floodlights and a depth sensor. Towed behind a research vessel, DTIS relays a live stream of underwater footage to the vessel above.

Find out more

Read the full publication: Evaluating demersal fish richness as a surrogate for epibenthic richness in management and conservation.

<http://onlinelibrary.wiley.com/doi/10.1111/ddi.12336/abstract>
Ocean Survey 20/20 website: <http://www.os2020.org.nz/>

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