

Kia Ora!

Welcome to the first *Recover* newsletter from the Marine Ecology Research Group (MERG) at the University of Canterbury. *Recover* is designed to keep you updated on our MBIE funded earthquake recovery project called RECOVER (Reef Ecology, Coastal Values & Ecosystem Recovery). This first issue provides a summary of some of the big changes we've seen. In the next issue we'll be profiling some of the current research as well as ways you can get involved!

About our project

What is RECOVER?

RECOVER is collecting data on recovery of the natural environment with a focus on the short to mid-term prospects for key species and habitats along the coast. We are particularly interested in understanding the nature of earthquake impacts, detecting barriers to a full recovery, and investigating how long it might take.

Why?

RECOVER is aimed at helping the coastal environment return to a 'new-normal' following the earthquakes. As we already know the earthquakes have caused massive changes, RECOVER focuses more on what happens next. Some main themes of the project include predicting the recovery trajectory of taonga species and natural resources along the coast, and working out how we can help them fully recover. We hope that the research will be particularly useful to local government, iwi and rūnanga, local industry and the wider community.

When?

RECOVER will progress through a series of stages over the next 3 years. There will be several opportunities to get directly involved and we'll be providing regular updates of our results via the *Recover* newsletter as well as through public talks and other community events. If you'd like to find out more please contact us anytime!

Initial Impacts

Soon after the earthquake MERG began re-surveying our long-term research sites that span the coast. Many of these sites have been monitored for over 20 years. These surveys gave us a good understanding of the immediate impacts on coastal habitats and species. This work also provided a great foundation for our post-earthquake research. The following sections provide a snapshot of some important changes that resulted from the Kaikōura earthquake.

Coastal fishes & invertebrates

By chance, the earthquake happened to coincide with a high tide. This meant increased devastation to marine animals that inhabited the intertidal zone during this time. Around big uplift areas such as Waipapa, coastal fishes such as butterfish (*Odax pullus*) and wrasses (*Notolabrus fucicola* and *N. celidotus*) were scattered over the uplifted reefs, left high and dry. Lobsters and several species of snails (cat's eye *Lunella smaragdus* and Cook's turban *Cookia sulcata*) were also found dead around the reef at Waipapa. The impact of this scale of reef community death is huge. Water quality became extremely poor in tide pools and around the new low intertidal zone due to oxygen levels dropping to or below the minimum for supporting life.



Figure 1: Uplifted reef near Waipapa.

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On the plus side, there was a short-term feeding frenzy for sea-birds, but of course this didn't last!

Paua

Along the coastline, paua mortality from the earthquake was high. At some sites the uplift caused thousands of paua to be exposed, many of which were greater than the minimum harvestable size. Even more crucial was the loss of settlement and recruitment habitat for juvenile paua.

Over the last few years research into juvenile paua populations along the coast has led to the identification of several 'hot-spots' for paua recruitment. Our next round of research will be focussing on these areas as well as the fate of juvenile paua in general. This information will be very important for understanding longer term impacts on paua along the coast and implications for reopening the fishery.

Seaweeds

The seaweed gardens that are a distinctive feature of Kaikōura's coastline have suffered major impacts. Many large habitat forming species such as bull kelp were left exposed on stretches of uplifted reef (*Figure 1*). On Kaikōura Peninsula, previously flourishing intertidal communities characterised by Neptune's necklace (*Hormosira banksii*) perished over large areas due to uplift effects (*Figure 2*).

Since the earthquake, algal blooms of species such as sea lettuce (*Ulva lactuca*), have been common in the intertidal zone. This has likely been assisted by the absence of grazing invertebrates. In combination, this amounts to a set of complex changes that are still occurring along the coast. Unravelling these events and the implications on other species will be a key focus for RECOVER.

Resources

Schiel, D. R. et al. (2018). Kaikōura earthquake: Summary of impacts and changes in nearshore marine communities. In: Hendlass, C. Borrero, J., Neale, D., and Shand, T. (eds). *Shaky Shores: coastal impacts & responses to the 2016 Kaikōura earthquakes*. New Zealand Coastal Society, Special Publication 3, 2018, 44pp.



Figure 2. Before (left) and after (right) rocky intertidal reef, Kaikōura Peninsula. Once one of the highest diversity reefs in New Zealand.

📷 Shawn Gerrity

Keep in touch!

To date our research has provided a comprehensive understanding of immediate and short term impacts of the earthquake on the Kaikōura coast. Our current research has a focus on the capacity of key species and habitats to recover looking ahead. We're investigating several different sections of the coastline between Oaro and Cape Campbell to help understand the bigger picture and identify the extent of the changes we've seen. This 'new' coastal environment also presents a variety of management issues that we are committed to working with the community and local iwi to solve.

Thank you for tuning in to our first *Recover* issue. We are looking forward to keeping you involved and up-to-date with our research activities and progress as the RECOVER project evolves. If you have any questions please feel free to contact us!

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