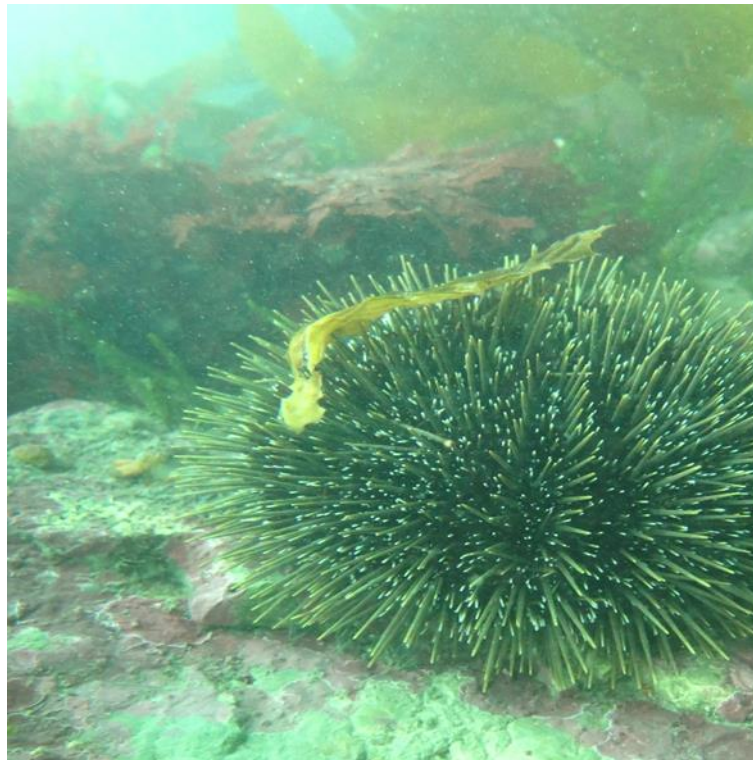


KINA IN KAIKŌURA



Evechinus chloroticus counts post-earthquake

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Kina in Kaikōura

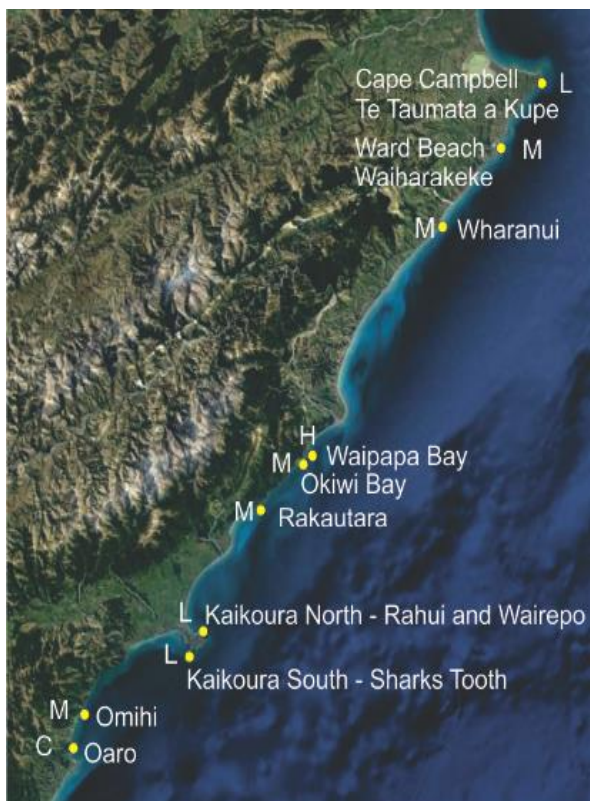
Evechinus chloroticus (kina) is a dominant grazer in many shallow subtidal ecosystems around New Zealand. It is an important species in customary and recreational fisheries, and is a commercial species fished under the Quota Management System (Kaikōura- SUR3). Along with other invertebrate and seaweed species, kina has been closed for fishing along the Kaikōura coast since the 7.8M_w earthquake of November 2016. The importance of kina to local fishers and its potential to over-graze seaweeds creating kelp barrens, makes it a species of interest to the Kaikōura community.

Here we present data collected by scientists from the Cawthron Institute (Cawthron) and compare it to previous surveys from around the Kaikōura Peninsula and elsewhere. These comparisons will highlight any significant changes in the Kaikōura kina population since the earthquake and may help to inform the opening of this species fishery as part of the broader fisheries opening discussions to be convened by Te Korowai o Te Tai o Marokura over the coming months. Cawthron (in collaboration with the University of Canterbury) have been surveying the Kaikōura coastline since the earthquake. The data presented is one part of the larger coastal science recovery package funded by Fisheries New Zealand, which has been presented to Kaikōura through community hui and can be read in FNZ report (Alestra *et al.* 2019).

Post-earthquake Data (2017 – 2020)

Sampling Locations

Ten locations between Oaro and Cape Campbell have been surveyed (Fig 1.), and two sites



were surveyed at each location. At each site, three areas were surveyed by scuba divers swimming along a transect (a straight line laid from the intertidal fringe seaward to <10 m; 50 m long and 2 m wide – 100 sq. m) recording and counting all invertebrate and seaweed species. Surveys occurred in spring 2017, autumn 2018, autumn 2019 and summer 2019-20, but not all sites were surveyed each time.

Figure 1. sites sampled along the Kaikoura coast between 2017 – 2020. Yellow dots mark sampling sites. M, medium degree of coastal uplift; L, low uplift; H, high uplift; C, site used as control due to extremely low change in elevation.

Results

Most sites surveyed had an average of 0 to 4 kina per transect (Figure 2). Exceptions to this were at the Kaikōura Peninsula sites (Shark’s Tooth (sth), Wairepo and Rahui (nth). Each transect covered an area of 100 sq. m, therefore, at most sites surveyed along the coast an average abundance of 0 – 0.04 kina per m² (/m²) were recorded.

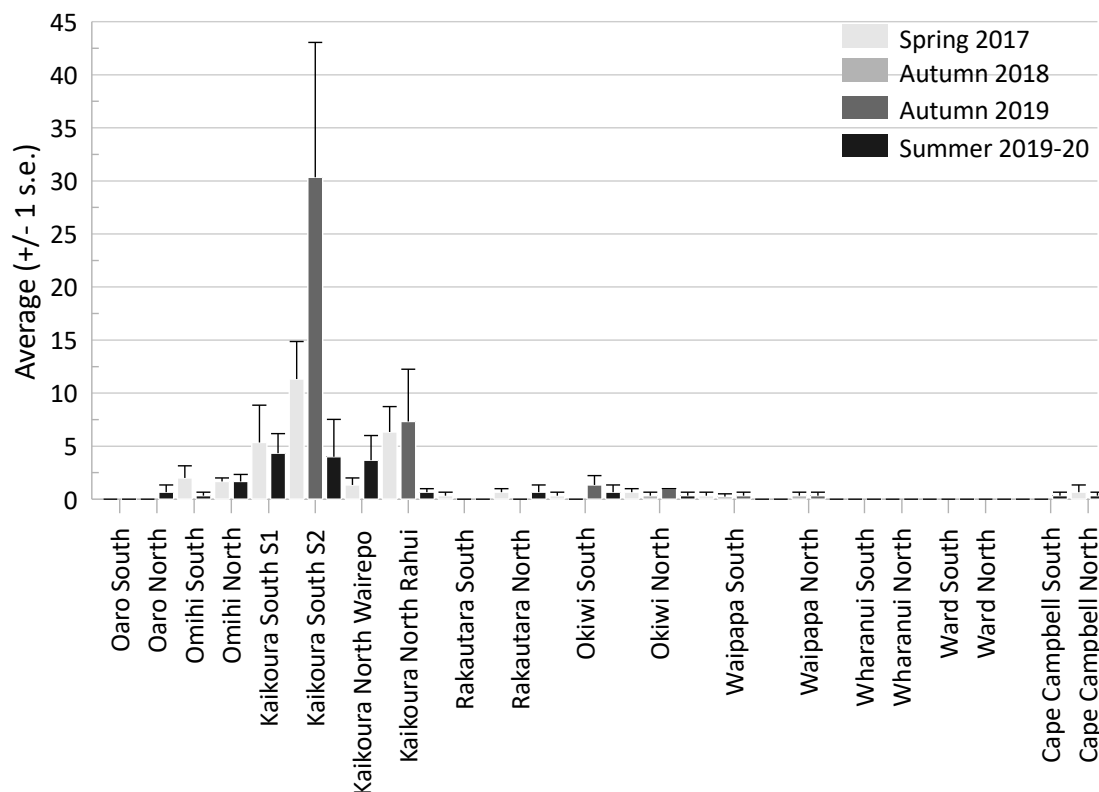


Figure 2. Average number of kina per transect at all sites sampled during all sampling periods (n=3).

The Kaikōura Peninsula was an exception where up to 50 kina were recorded on one transect on Shark’s Tooth reef to the south (Figure 3) and other transects ranging from 0 – 30 around the Peninsula sites, representing a higher number of 0 - 0.5 kina per m² for the Peninsula sites.

In the most recent survey by Cawthron (May 2020), an average of 30 kina per transect (0.3/m²) on Shark’s Tooth reef was again recorded. At Shark’s Tooth site in all sample periods it was noted that the transect was patchy, in that 39 kina were counted within a 2 x 2 metre area, and similarly in another transect 22 of the kina were counted in a 2 x 2 area, suggesting there are some areas of small aggregations for the kina to the south.

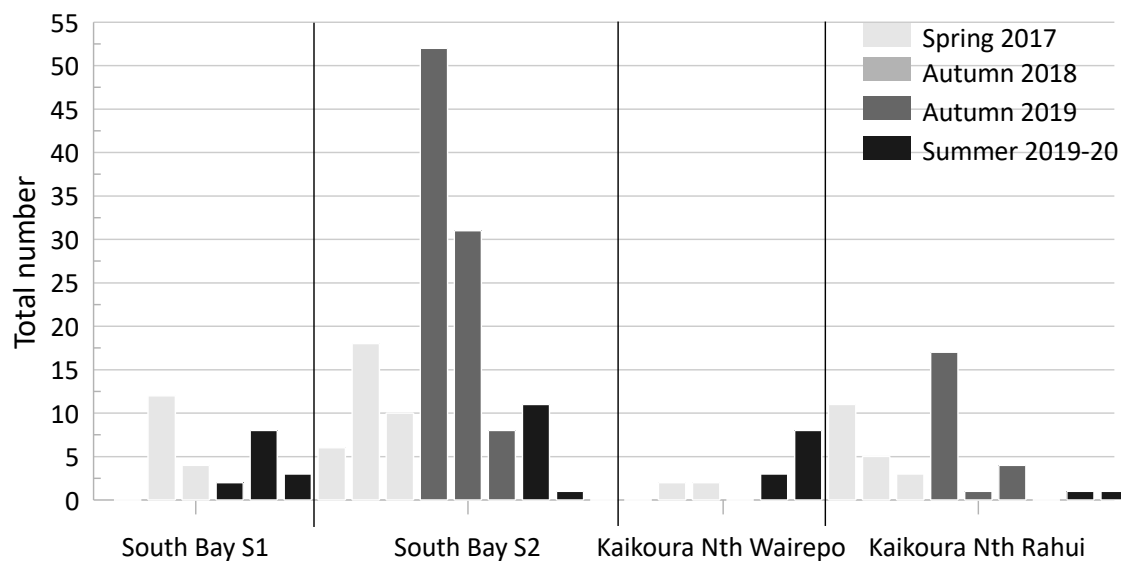


Figure 3. Total number of kina per transect at all sites sampled on the Kaikōura Peninsula during all sampling periods (n=1).

Comparison of Pre- and Post-earthquake kina numbers on the Kaikōura Peninsula

Several subtidal biodiversity surveys have been done around the Kaikōura Peninsula as part of nationwide biogeographic studies over the years. In 1970 researchers counted species along transects in a similar fashion to the present study (Dix 1970) – transects of 2 m x 30 m to 12 m of depth – and recorded the average number to be 2 – 6 kina per m^2 ($/m^2$). The highest number of 6/ m^2 was observed to south of the Peninsula at the Shark’s Tooth reef area. The lower numbers (2.65 kina/ m^2) were recorded at Wakatu Point reef to the north of the Peninsula. In 2001, Shears and Babcock (2001) used randomly placed quadrats (framed square measuring 1 m^2) down to 12 m depth to survey the subtidal diversity of the Kaikōura Peninsula. This survey recorded less than 1 kina/ m^2 to the north and south of the Peninsula.

These two previous studies show the highly variable nature of kina populations in local and regional areas. In comparison with the most recent counts, kina to the north and south of the Kaikōura Peninsula appear to be within the range of previous studies – at the lower end of the 1970 survey to the south and fewer kina to the north now, but greater numbers of kina to the south of the Peninsula than the 2001 survey, and comparable numbers to the north of the Peninsula.

The 2001 survey also gives us a comparison to other areas of the country. For instance, in the Wellington and Banks Peninsula regions the researchers also recorded less than 1 kina/ m^2 in 2001. In contrast, the surveys in the Nelson and Abel Tasman region recorded up to 5 kina/ m^2 in 2001, and 3 kina/ m^2 in 1970 – more similar to numbers observed in the 1970 survey to the south of the Kaikōura Peninsula, and higher than the number observed in South Bay in the most recent surveys.

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