

# Patch dynamics and response to disturbance of the seagrass *Zostera novazelandica* on intertidal platforms in southern New Zealand

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**ABSTRACT:** We examined the patch dynamics of the intertidal seagrass *Zostera novazelandica* on 2 reef platforms in order to understand the processes governing the establishment, maintenance and mortality of patches. The size distribution of patches at 3 tidal heights (low, mid and high shore) was assessed. Eighty patches, ranging in initial size from 0.1 to 2.4 m<sup>2</sup> surface area, were tagged and video image analysis was used bi-monthly for 14 mo to calculate rates of expansion and contraction of these patches. Permanently marked 150 m<sup>2</sup> areas of reef were monitored monthly to record patch recruitment and mortality. Initially, 75% of patches were <0.5 m<sup>2</sup>. All patches decreased in size during winter, probably due to increased wave action, and expanded during spring and summer. The proportional expansion and contraction of patches was independent of initial patch size. At the end of the study the size distribution of patches was similar to the initial distribution. Patch mortality was restricted to those <0.4 m<sup>2</sup>, of which 60% disappeared during the study. Larger patches suffered partial mortality through fragmentation. No large patches were formed through the amalgamation of smaller patches. Seedlings recruited into small sediment pockets in tidepools during spring, but few survived through summer because of removal by wave action. Experimental perturbation of patches resulted in increased erosion followed by decreased growth rates and, in many small patches, mortality. Removing only seagrass blades, however, resulted in increased production of new shoots relative to controls. Overall, seagrass patches are susceptible to disturbance, successful recruitment by seedlings may be rare or at least episodic, and populations are probably long-lived and depend on slow vegetative growth for maintenance and expansion.

**KEY WORDS:** [Seagrass](#) · [Patch dynamics](#) · [Disturbance](#) · [Zostera novazelandica](#) · [Intertidal](#) · [New Zealand](#)

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