

# Marine ecosystems show resilience to climate disturbance

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Fish congregating on the Kitutia Reef. Credit: Jennifer O'Leary

Climate-driven disturbances are having profound impacts on coastal

ecosystems, with many crucial habitat-forming species in sharp decline. However, among these degraded biomes, examples of resilience are emerging.

Writing in *BioScience*, Jennifer O'Leary, a California Sea Grant Marine Biologist based at Polytechnic State University, and her colleagues describe these recoveries and highlight the possible implications for ecosystem-sparing management. To gain insight into disturbed coastal habitats, the authors surveyed 97 marine experts about their observations of climate-induced perturbations, including extreme storms, temperature changes, and ocean acidification. Eighty percent of those who had witnessed climate extremes also identified evidence of habitat resistance or rapid recovery.

According to O'Leary and her colleagues, the survey results indicated that "bright spots of [ecosystem resilience](#) are surprisingly common across six major [coastal marine ecosystems](#)." In some cases, resilience was marked by striking recoveries. In one bleaching event in Western Australia, up to 90% of live coral was lost as a result of severe bleaching. Despite reaching a low of 9% unbleached area, the healthy reef surface recovered to 44% within 12 years.

According to the survey of experts, the factors enabling resiliency were varied, but areas of remnant tridimensional habitat and high connectivity were the most frequently cited contributors. Sound management practices were also considered important, particularly the control of additional human stressors.

The authors hope that by elucidating the causes of resilience, they can "uncover local conditions and processes that may allow ecosystems to maintain their structure and function and continue providing ecosystem services to humans."

They argue that if [marine protected areas](#) "are spaced appropriately given the reproductive output and dispersal potential of species," it may be possible to mitigate the damage caused by climate disturbance events.

Nevertheless, O'Leary and her colleagues caution that local bright spots do "not contradict the overwhelming evidence that climatic impacts present a major stressor to [coastal ecosystems](#)," although they do provide "optimism that we can indeed identify and manage for conditions that facilitate [resilience](#) to climatic stress."

Provided by American Institute of Biological Sciences

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