

Benthic community structures with varying sedimentation and water quality conditions in Mabini, Batangas

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Abstract

Marine protected areas have long been used as tools for protecting reef ecosystems in the Philippines. No-take marine zones are established to limit direct human activity which is one of the primary causes for the degradation of coral reefs and reef associated organisms. However, Philippine reefs are not only at risk from direct human activities in reef areas but from nonpoint sources such as sedimentation and poor water quality. This study assessed and compared the hard coral cover with physical and chemical water quality parameters such as sedimentation rate, TSS, pH, nitrate concentration, and phosphate concentrations on reefs inside and outside a marine protected area. Samples were obtained through the photo-transect method, use of sediment traps, and standard methods for water quality assessment. Hard corals were significantly higher in the MPA although no spatial differences were observed for sedimentation rate and water quality. Sedimentation rates, TSS, and nutrient concentrations were significantly higher during the wet season while no temporal differences were observed for the benthic cover. Principal Component Analysis (PCA) revealed that sites were differentiated through hard coral cover, pH, and TSS concentrations while seasons are influenced by sedimentation rates and nutrient concentrations. This study highlights the need for a ridge to reef approach in conserving coastal ecosystems. The current management practices of the MPA do not entirely inhibit the effects of sedimentation and nutrient pollution in the reef which occur when run-offs from land-based activities such as infrastructure developments happen along the coast without proper management measures being set in place.

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