DOES A CORAL REEF ENHANCE THE PRODUCTIVITY OF ITS SURROUNDING WATERS?

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ABSTRACT

Coral reefs have long been assumed and continually claimed to be origins of very high productivity, but how they attract organisms from and export nutrients to their neighboring waters remains largely unknown. Specifically, this study aimed at determining the space-time dynamics of nutrients and biomass redistribution around Hibotkan Rock Sanctuary (HRS), Banate, Iloilo, a sanctuary reef established by Municipal Fisheries Ordinance No. 12 covering an area of 25 ha. Twelve (12) sampling stations were established for space-time nutrient profiling, phytoplankton count, and supplementary measurements of water parameters, and four (4) stations for fish (biomass) visual survey. Results were analyzed using spatio-temporal plots and the Pearson correlation matrix (5% significant level). Nitrite was observed to be limiting, while nitrate was the most abundant in the waters of HRS. The predominant temporal variations of nutrients followed the flood tide (FT) and ebb tide (ET) cycles. In general, the tidal current direction appeared to control the redistribution of the nutrients (NO_3^-, NO_2^-, PO_4^{3-}, and SiO_4^{4-}). This study further revealed that stations of high nutrient concentration usually coincided with low levels of dissolved oxygen (DO). Species of fish observed were all indigenous and well-known inhabitants of the coral reefs. Furthermore, no other families of fishes (such as those of commercial value) were caught on record. Overall, there was no clear indication of import or export of living biomass in the HRS area. It can be inferred from the results that the fabled high productivity of coral reefs has no clear scientific basis; consequently, the Marine Protected Areas (MPAs) concept also appears to have no solid foundation.

Keywords: coral reefs, nutrient redistribution, tidal current, biomass import and export, protected area