



**UNIVERSITY OF THE PHILIPPINES**

**Master of Science in Environmental Science**

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*Coral community types in Philippine fringing reefs and their representativeness in nationally  
protected seascapes*

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## ABSTRACT

The most recent national assessment of Philippine reefs reveals a decline in hard coral cover (HCC) over the last 40 years. While HCC is an important parameter to assess reef status, there is a need to further investigate coral diversity and composition to refine management goals and reassess conservation priorities for Philippine reefs, especially in the case of nationally protected seascapes, which seek to adequately represent coral community types and taxa in this center of reef diversity.

This study classified 206 Philippine fringing reef stations, surveyed from 2014 to 2017 and encompassing all marine bioregions, into coral community types in terms of hard coral composition at the genus-growth form level. Classification and ordination were performed on percent abundance of hard coral taxa to generate the typology. Forcing factors that influence the emergence of these community types were also determined through canonical correspondence analysis (CCA). Seven coral community types were distinguished: (1) SW-facing reefs with high relative cover of massive (=hemispherical) *Porites* and branching *Acropora*, (2) high-exposure, long-fetch, NE-facing reefs dominated by encrusting and massive forms, (3) low-exposure, high-HCC reefs dominated by branching *Porites* and other lagoon-preferring taxa, (4) low-HCC reefs dominated by weedy and stress-tolerant taxa, (5) *Heliopora*-dominated reefs, (6) low-HCC, low-diversity reefs indicative of macro-algal phase shift, and (7) *Galaxea*-dominated inshore reefs. Among the variables examined in the CCA, wave exposure and NE/SW station orientation most strongly influenced variations in coral composition. Inter-annual differences in coral composition were also observed in 10 monitoring stations through successional vector analysis, suggesting that successional stages may have occurred within the same biotic community following the 2010 and 2016/2017 mass bleaching events. 68 nationally protected reef stations belonging to 14 nationally protected seascapes were included into the typology scheme through classification and ordination. All coral community types except for Type 7 were represented in these protected seascapes.

This study shows that Philippine fringing reefs are heterogeneous in terms of coral community composition, and these distinct coral communities are well-represented among nationally protected seascapes. This work also supports previous findings that broad-scale hydrologic regimes influence the composition of coral communities in Philippine fringing reefs and highlights the possible consequences of chronic stressors and disturbance events on the formation of the identified community types. It is recommended that findings from this study be used in identifying candidate reefs for spatial management and optimizing existing zonation and conservation priorities in protected seascapes.