Marine Protected Area Size Effectiveness

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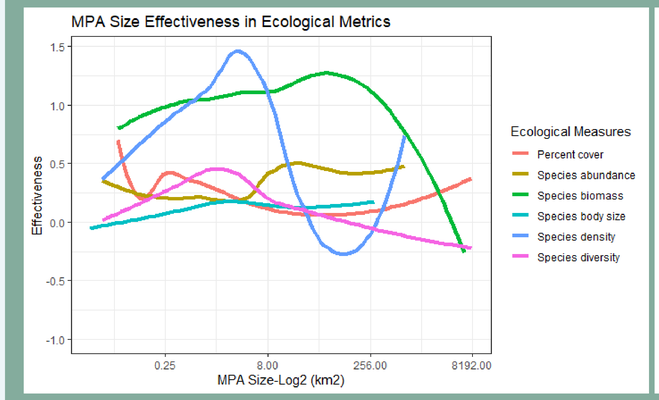
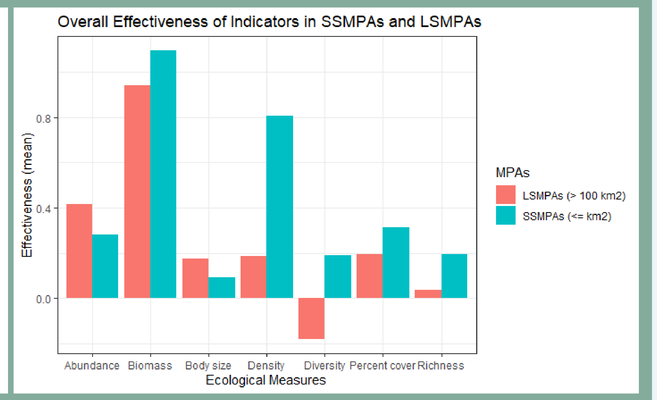
Introduction

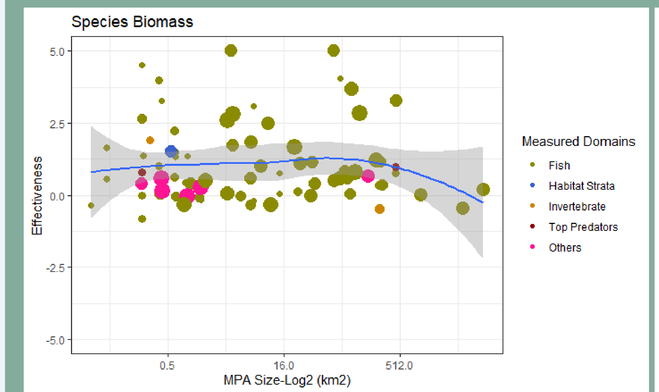
The question of whether Marine Protected Areas (MPAs) are effective has been a controversial topic among conservationists, scientists, government agencies, and other responsible organizations (Caveen et al., 2014; Christie, 2004). MPA size varies throughout the world depending on geographic location and resource availability to enforce management (Gallacher et al., 2016). Although the ecological role of large-scale MPAs (LSMPA) have been positively demonstrated in near shore environments (Clements & Hay, 2017), some studies have argued that the idea behind LSMPAs is to enhance political power over sea spaces which in some places, with the ownership of coastal areas belongs to indigenous communities but MPA formation being driven by extranational forces (Gruby et al., 2016; Leenhardt et al., 2013). These uncertainties lead us to conduct a systematic review to assess the role of MPA size in conserving and promoting marine resources.

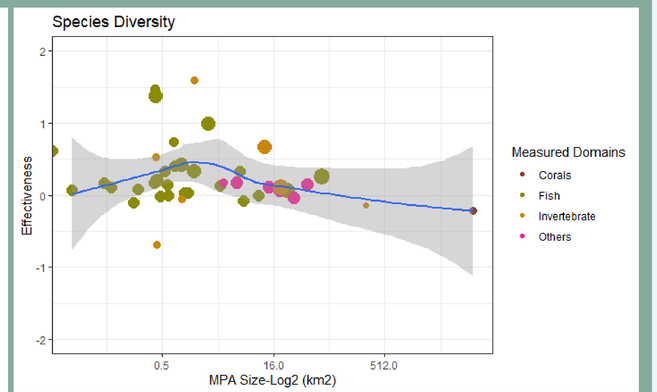
Methods

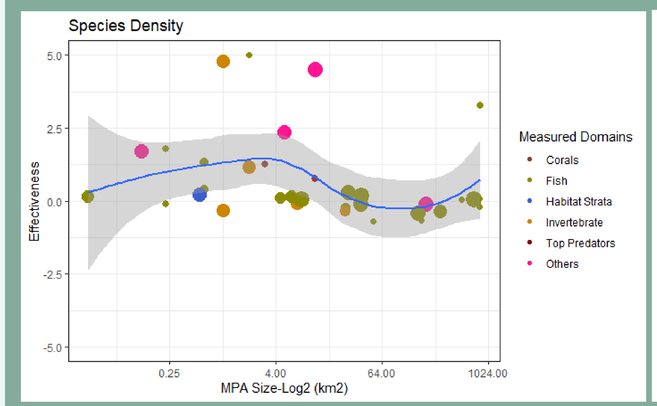
We did a systematic review where we used three databases to search for peer-reviewed journal articles which were Web of Science (WOS), Biotechnology Research Abstracts (ProQuest), and Google Scholar. From the 1957 total publications from our literature search we narrowed down our usable documents to 60. We narrowed down the original publications first by removing duplicates which brought our publication number down to 971. Then we removed 471 papers because or their unrelatedness to our topic. 157 were then found to have data recorded inside and outside of the MPA or data taken in a previous year which was counted like data being taken outside of the MPA. The 97 that were then discarded were mostly removed due to the duplication of results which left us with 60 usable documents. There were six ecological metrics that we were using to determine the effectiveness of the MPAs. Those metrics are diversity, abundance, biomass, species richness, species density, and benthic cover.

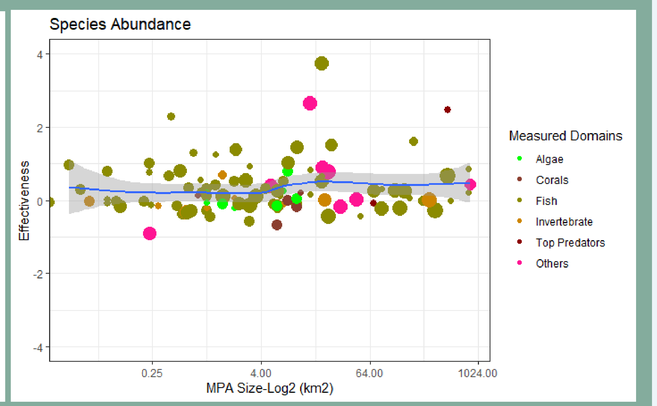


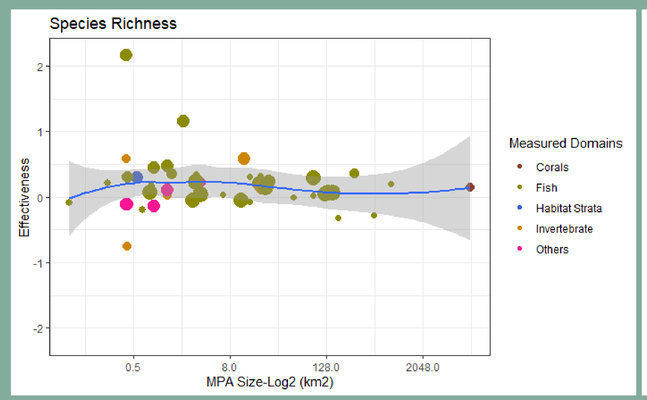


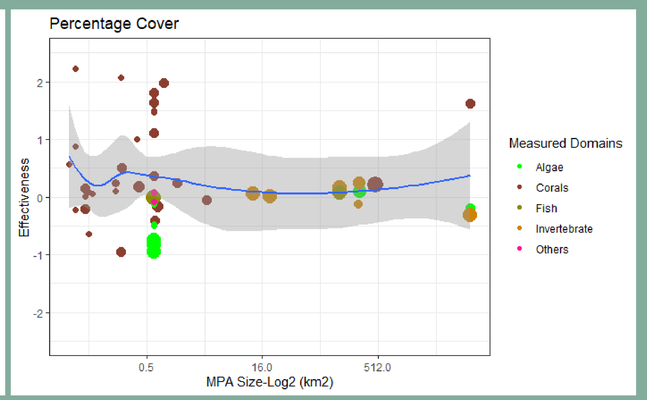












Discussion

We determined that it is important to evaluate MPA effectiveness in the small-scale MPA (SSMPA) category and the LSMPA category.

SSMPA's

Although 70% of indicators had positive responses in SSMPAs, the changes of each indicator as MPA size increases within SSMPAs range (≤ 100km^2) was insignificant. In spite of MPA size, SSMPAs performance may be shaped by better planning and execution of management plan and the involvement of local fishermen in MPA committee (Di Franco et al., 2016).

LSMPA's

Our systematic-review showed a great need of applying the six ecological measures or indicators to evaluate LSMPAs (> 100) effectiveness. From the collected results, only 21 % of ecological measurements were done in LSMPAs. There were excluded publications with LSMPAs assessment due to the lack of adjacent-nonMPA surveys or lack of assessments in previous years. In this case, the effectiveness of MPAs could not be calculated.

Work Cited

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