

## The effects of biodiversity on the temporal stability and resilience of subtidal marine communities: a global evaluation

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#### Background

The potentially unprecedented rate of change in the earth's biodiversity poses many challenges for contemporary ecologists. The most basic challenge is to accurately measure changes in biodiversity in order to predict the consequences of the losses, gains and re-distribution of species for the functioning of ecosystems and human societies. Progress in meeting this challenge has been hindered by a lack of quantitative biodiversity baselines and by the intensive amount of experimentation required to assess why the losses and gains of species matter to ecosystem functioning. One of the most recognized effects of biodiversity is an increase in stability, enabling communities to resist disturbance (resistance stability). This may be reflected in lower fluctuations over time (temporal stability), or a quick bounce back from disturbance (resilience stability). While substantial advances have been made, past research on the relationships between diversity and stability have not been evaluated by standardized methods over the large range of diversity representative of different marine biogeographic regions.

#### Research objectives and questions

The overall goals of this research program are to develop a global quantitative vision of the how and why the biodiversity of hard substrate benthic communities has changed over the past 3 decades and to predict conditions influencing their stability. We want to know if diverse communities are more resilient than those with few species and if Marine Protected Areas (MPA's) protect against biodiversity loss and consequently, loss of resilience. Ultimately, we aim create a global biodiversity database of the photo quadrats from all the study sites to serve as a baseline for future research on biodiversity changes, effects of conservation protection, invasive species and resilience to overfishing and climate change.

This research is being proposed to funding agencies.