Resilient responses to disturbance in island social-ecological systems: facilitating factors from across the tropics

Georgina Cullman∗, Eleanor Sterling†, Kate Holmes†, and Daniel Brumbaugh†

1Center for Biodiversity and Conservation, American Museum of Natural History (CBC-AMNH) – Central Park West at 79th St New York, NY 10024, United States

Abstract

Island social ecological systems have shown resilience in the face of local and global challenges. Calling on existing networks of reef managers and researchers, we disseminated a self-administered online survey that aimed to gather local knowledge about marine ecological and social changes in tropical island ecosystems and how people who manage and use reefs adapt to change. We then contacted and interviewed a subset of these respondents who had observed or participated in resilient responses to disturbance. Through semi-structured Skype interviews, we elicited narratives of social-ecological resilience. We found a diversity of resilient responses across scales and sectors: in some cases, ecological systems resisted disturbance; in others, social systems used disturbance as an opportunity for transformation; and in other cases ecological resilience was enhanced in the short-term but without adequate integration with social dynamics, undermining the long-term resilience of the social-ecological system. We iteratively coded the narratives in order to draw out factors that may have contributed to a resilient response. Social factors that were found across cases included: robust traditional ecological knowledge; flexible funding agencies; and congruence between the scale of the managing institution and the reef ecosystem. Physical and oceanographic characteristics of reef ecosystems were found to be coincident with resilience, including upwelling, high-energy currents, and proximity to other reefs as larval sources. In addition to the analysis across cases, we have created a repository of the narratives collected through this research on the American Museum of Natural History’s Center for Biodiversity and Conservation website, in order to share stories across diverse groups in order to further understanding of the patterns of ecological and social resilience seen at the global and local levels.

Keywords: Adaptive capacity, Marine, Disturbance, Resilience, Narratives, Social, ecological systems

∗Corresponding author: gcullman@amnh.org
†Speaker