NUS National University of Singapore | Department of Biological Sciences Faculty of Science

SEMINAR

Thurs, 29 Jun 2017 | 10 am | DBS Conference Room 1

Hosted by Dr Andrew Bauman

ReefBudget: a census based evaluation of coral reef carbonate budgets

By **Fraser Januchowski-Hartley**

MARBEC, Institut de recherche pour la développement
Université de Montpellier 2, France

Climate change is one of the greatest threats to the long-term maintenance of coral-dominated tropical ecosystems, and has received considerable attention over the past two decades. Coral bleaching and associated mortality events, which are predicted to become more frequent and intense, can alter the balance of different elements that are responsible for coral reef growth and maintenance. In particular, over the past 50 years there has been global decline in coral cover with associated shifts in the relative abundance of corals with different carbonate production potential. The geomorphic impacts of coral mass mortality and community change have received relatively little attention, particularly questions concerning temporal recovery of reef carbonate production and the factors that promote resilience of reef growth potential. To address this issue, my research focuses on how coral reef carbonate budgets can be estimated using underwater visual census of both carbonate producing (corals, crustose coralline algae) and eroding (parrotfishes, urchins, clionaid sponges etc.) guilds on coral reefs. First, I will present on how this method has been used to identify the different carbonate production potential of reefs in East Africa across a gradient of human influence, identify which aspects are of primary importance, and what this means for future vertical reef growth in the context of rising sea-levels. Second, I will demonstrate how these methods can be calibrated with widely used census methods at a local scale to estimate historical trends in carbonate budgets where this data exists, with examples from the Seychelles. We used data covering 20 years and at least one major bleaching event and the ReefBudget census method to identify that relatively high massive coral cover, and low macroalgal cover and abundance of excavating parrotfishes were essential in maintaining positive reef carbonate budgets. Further, we showed that reefs in the Seychelles were trapped into either positive or negative budget trajectories within a decade of bleaching, and that this was likely to persist after the 2016 bleaching event.

About the Speaker:

Fraser Januchowski-Hartley is a Scottish coral reef ecologist, with over a decade of experience working on coral reefs. His research has focused on the ecological dimension of coral reef socio-ecological systems, and its importance for conservation and management. These research topics cover: coral reef conservation, ecology and biogeomorphology; interactions between fishing, management and fish behavior; and impacts of ecosystem services on human wellbeing. Currently he is a postdoctoral researcher at the Marine Biodiversity, Exploitation and Conservation Research Unit in France which combines researchers from the French IRD, CNRS, and IFREMER research organisations and the Université de Montpellier 2.

Artwork by Ann Nee, DBS, NUS