The Decline in Coral Cover and its Causes

Based on the world’s most extensive time series data on reef condition (2258 surveys of 214 reefs over 1985–2012), we have shown a major decline in coral cover from 28.0% to 13.8% (0.53% year−1), a loss of 50.7% of initial coral cover on the GBR. Tropical cyclones, coral predation by crown-of-thorns starfish (COTS), and coral bleaching accounted for 48%, 42% and 10% of the respective estimated losses, amounting to 3.38% year−1 mortality. The relatively pristine northern region showed no overall decline.

The estimated rate of increase in coral cover in the absence of cyclones, COTS and bleaching was 2.85% year−1, demonstrating substantial capacity for recovery of reefs. In the absence of COTS, coral cover would increase at 0.89% year−1, despite ongoing losses due to cyclones and bleaching. Thus, reducing COTS populations, by improving water quality and developing alternative control measures, could prevent further coral decline and improve the outlook for the GBR.

Diversity of the GBR in Space and Time

Diversity is a key concept for understanding and managing global and local ecosystems. These systems are under severe pressure from growing human populations and water quality and developing alternative control measures, could prevent further coral decline and improve the outlook for the GBR.

References:
