Background

The recent global coral bleaching event in 2016 caused mass mortality of corals worldwide and affected even the best protected and most remote reefs. This challenges the common notion that reefs far removed from local human impacts are more resilient to the effects of climate change. To understand reef resilience under the exclusive influence of global impacts, we studied the susceptibility to, and recovery since, the 2016 global bleaching event at Aldabra Atoll, a UNESCO World Heritage site in the Western Indian Ocean.

Methods

We combined the annual long-term monitoring of benthic and fish assemblages with additional observations of coral larvae settlement, and turf algae height at 12 permanent sites to assess post-bleaching trajectories (i.e. stability/recovery/degradation) and how these differ on an atoll-wide scale.

Results

Aldabra lost 50% of its hard corals during the 2016 bleaching event and experienced reductions of taxonomic and morphological diversity within the benthic assemblages. Initial results reveal location-specific diverging post-bleaching trajectories, with easterly reefs indicating further reductions in hard coral cover and increasing cover of calcifying and fleshy macroalgae, while at the remaining ten sites, hard coral cover remained stable or increased, and turf algae cover decreased to pre-bleaching levels. Additional observations indicate atoll-wide similarities in turf algae height but marked differences in the density of settled coral larvae, which was substantially higher within Aldabra’s lagoon.

Conclusion

These results suggest that prevailing environmental conditions at individual reefs around the atoll are important drivers of reef resilience. Our results will contribute to our understanding of the natural drivers of coral reef resilience, thereby aiding the prioritisation of areas for conservation.