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TITLE: Evidence of coral bleaching avoidance, resistance and recovery in the Maldives during the 2016 mass-bleaching event

AUTHOR: ['Benjamin Cowburn', 'Charlotte Moritz', 'Gabriel Grimsditch', 'JL Solandt']

ABSTRACT:

MEPS Marine Ecology Progress Series Contact the journal Facebook Twitter RSS Mailing List Subscribe to our mailing list via Mailchimp HomeLatest VolumeAbout the JournalEditorsTheme Sections MEPS 626:53-67 (2019) - DOI: https://doi.org/10.3354/meps13044 Evidence of coral bleaching avoidance, resistance and recovery in the Maldives during the 2016 mass-bleaching event Benjamin Cowburn1,*, Charlotte Moritz1,2, Gabriel Grimsditch1, Jean-Luc Solandt3 1IUCN Maldives, Male 20006, Maldives 2CMOANA Consulting, BP1105, 98703 Punaauia, French Polynesia 3Marine Conservation Society, Ross-on-Wye HR9 7QQ, UK *Corresponding author: benjamindcowburn@gmail.com ABSTRACT: During the third global coral bleaching event in 2016, the Maldives experienced elevated water temperatures, inducing coral bleaching. We recorded the bleaching intensity and mortality of coral communities in different habitats, depths and wave exposure conditions around North Ari Atoll in the central Maldives to investigate the effect of physical and biological factors that may contribute to bleaching avoidance, resistance and recovery. Approximately 50% of coral cover bleached and ~20% died, with significant variation with wave exposure and depth. Deeper wave-exposed reefs were dominated by bleaching resistant massive and encrusting growth forms and experienced less thermal stress than shallow sheltered reefs. Shallow sheltered reefs showed rapid recovery from the previous mass-bleaching event in 1998, regaining high coral cover dominated by branching and tabular growth forms by 2015. However, these bleaching-sensitive growth forms experienced high bleaching and mortality in 2016, causing greater coral loss. Several of the reefs in central Ari Atoll simultaneously experienced a crown-of-thorn starfish (COTS) outbreak, resulting in very degraded reefs that lacked any apparent resilience in 2017. Our findings demonstrate the complex interactions between different components of resilience. In this case, wave exposure and depth appeared to promote avoidance and resistance of corals to bleaching, but reduced their recovery potential, while the reverse was true for shallow sheltered reefs. The resilience of reefs in the Maldives to date appears to be the result of low thermal and anthropogenic stress; therefore, their future condition will depend on the frequency and intensity of bleaching events and the level of human pressures such as construction and fishing. KEY WORDS: Coral bleaching · Resilience · Thermal stress · Resistance · Recovery · Maldives Full text in pdf format PreviousNextCite this article as: Cowburn B, Moritz C, Grimsditch G, Solandt JL (2019) Evidence of coral bleaching avoidance, resistance and recovery in the Maldives during the 2016 mass-bleaching event. Mar Ecol Prog Ser 626:53-67. https://doi.org/10.3354/meps13044 Export citation RSS - Facebook - Tweet - linkedIn Cited by Published in MEPS Vol. 626. Online publication date: September 12, 2019 Print ISSN: 0171-8630; Online ISSN: 1616-1599 Copyright © 2019 Inter-Research.

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