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TITLE: Multi-decadal shoreline changes in response to sea level rise in the Marshall Islands

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ABSTRACT:

Low-lying reef islands are considered highly vulnerable to the impacts of climate change. Accelerating rates of sea level rise as a result of anthropogenic climate change are expected to destabilise islands and threaten to render entire nations uninhabitable. Using historic aerial photographs and recent high-resolution satellite imagery, shoreline changes on six atolls and two mid-ocean reef islands in the Republic of the Marshall Islands were analysed. Results reveal that since the middle of the 20th century more shoreline has accreted than eroded, with 17.23% showing erosion, compared to 39.74% accretion and 43.03% showing no change. The net result of these changes was the growth of the islands examined from 9.09 km<sup>2</sup> to 9.46 km<sup>2</sup> between World War Two (WWII) and 2010. Analyses of shoreline changes since the 1970s show that shorelines are accreting albeit at a slower rate, with rates of change between the 1970s and 2010 of 0.29 m/dec compared with 0.77 m/dec between WWII and 1970s. The observed shoreline changes occur in the context of locally rising sea level. As sea level continues to rise there is a critical need for regular monitoring of reef islands in order to better understand the spatio-temporal variability of reef island change and guide future adaptation efforts within atoll nations.

SOURCE: Anthropocene

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