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TITLE: Eco-geomorphic processes that maintain a small coral reef island: Ballast Island in the Ryukyu Islands, Japan

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ABSTRACT:

Landform changes in Ballast Island, a small coral reef island in the Ryukyu Islands, were investigated by remote sensing analysis and a field survey. The area of the island almost doubled after a mass coral bleaching event in 1998. Coral branches generated by the mass mortality and broken by waves were delivered and stocked on a reef flat and accumulated to expand the area of the island. In 2012 high waves generated by typhoons also changed the island's topography. Overall, the island moved in the downdrift direction of the higher waves. Waves impacting both sides of the island piled up a large volume of coral gravels above the high-tide level. Eco-geomorphic processes, including a supply of calcareous materials from the corals on the same reef especially during stormy wave conditions, were key factors in maintaining the dynamic topographic features of this small coral reef island.

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