





# CONTRASTING IMPACTS OF DIFFERENT DISTURBANCE TYPES ON CORAL REEFS: WAVE DISTURBANCE VS. CORAL BLEACHING

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## Study Description

When habitat-forming organisms such as trees, corals, or oysters are killed by disturbance, their structural remains, known as material legacies, can persist in an environment and influence processes that drive ecosystem recovery. Coral reefs, in particular, are affected by two primary forms of disturbance: those that remove entire coral colonies from the reef (e.g., tropical storms), and those that kill corals but leave their skeletons intact (e.g., coral bleaching). We explored how the potential for coral reef recovery differs following these two different forms of disturbance, finding that dead skeletons greatly diminish the capacity for coral reefs to recover.

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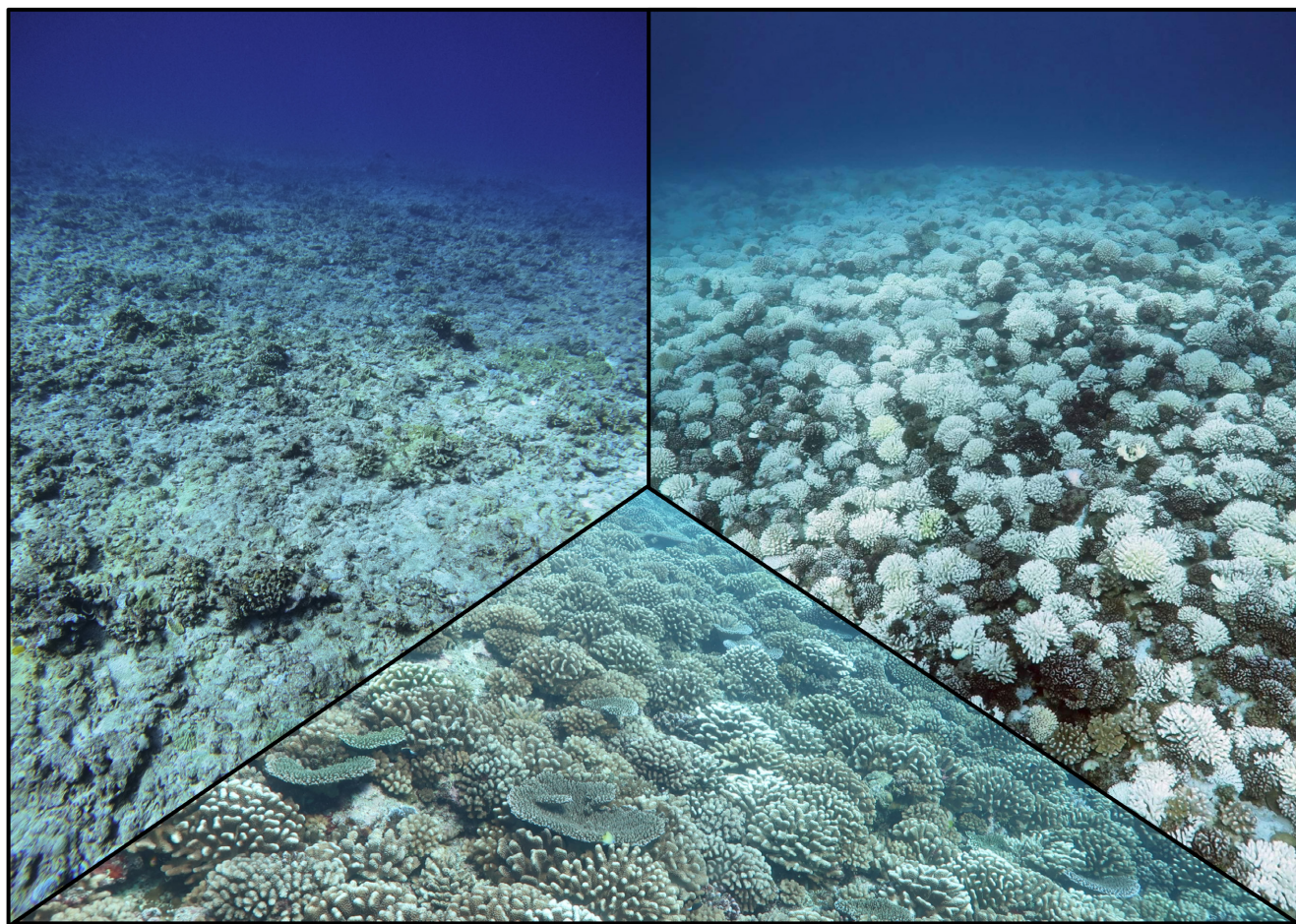


Photo 1. Coral reef environments on the island of Moorea, French Polynesia following two different types of major disturbance events: (left) a large wave disturbance and (right) a coral bleaching event. The reef affected by the wave disturbance has relatively little structural complexity remaining on the reef, while the reef affected by bleaching retained high structural complexity in the form of dead coral skeletons. The center triangle depicts an undisturbed reef characterized by high cover of living coral. Photo credit: Kai L. Kopecky (left panel), Andrew Thurber (right and central panels).

These photographs illustrate the article “Material legacies can degrade resilience: Structure-retaining disturbances promote regime shifts on coral reefs” by Kai L. Kopecky, Adrian C. Stier, Russell J. Schmitt, Sally J. Holbrook, Holly V. Moeller published in *Ecology*. <https://doi.org/10.1002/ecy.4006>