

# Climate change refuge for corals discovered (and how we can protect it right now)

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*Acanthurus leucosternon* corals -- some of the healthy corals observed off Vamizi Island. Credit: Tim McClanahan Wcs

WCS scientists have discovered a refuge for corals where the environment protects otherwise sensitive species to the increasing

severity of climate change. The bad news is that the reefs are showing signs of being overfished and weak compliance with local fisheries laws needs to be reversed to maintain the fish that help to keep reefs healthy. The scientists describe their findings in the journal *Ecosphere*.

The authors say reefs located in northern Mozambique and the Quirimbas Islands supports two types of refuges and a gradient of environments that create the potential for corals to adapt to climate change.

The first refuge is an environment that has enough variability for corals to adapt but lacks temperature extremes that would kill them. A second is deeper, cooler water but with the full spectrum of light that allows many species to thrive and avoid heat stress.

The second refuge area is associated with shipping channels that support coastal people and centers of heavy fishing. The authors found that many nearby reefs were not fished sustainably and fishers were therefore migrating to the second refuge to find profitable fishing.

Identifying climate-resistant reefs, called "Reefs of Hope," is a high priority among conservation groups as corals are collapsing globally due to higher water temperatures.

The authors found warning signs of overfishing including small fishes, reduced numbers of species and the increasing occurrence of [sea urchins](#) and algae growth. Sea urchins can damage corals if not controlled by predators such as triggerfish, while algae can suffocate corals unless kept in check by grazing fish species.

The authors recommend that these coral refuge areas maintain a fish biomass of greater than 500 kilograms per hectare, which, as previously published WCS research shows, is the threshold to maintain ecological

functions while sustaining local fisheries.

Said Tim McClanahan, WCS Senior Conservation Zoologist and lead author of the study: "Northern Mozambique Quirimbas reefs have a variety of refugia, environmental variability, and high diversity that give these reefs a high potential to adapt to rapid climate change. If this region is to provide adaptive potential to [climate change](#), fishing at a sustainable level and maintaining reef fish biomass, life histories, and functions is a high priority."

Management recommendations include gear restrictions and closing certain areas to fishing, and enforcing regulations in the Quirimbas National Park, which was established many years ago, but has failed to implement restrictions. Research is showing that properly managing marine protected areas (MPAs) continues to remain a challenge due to insufficient personnel and expenditures needed to enforce management. Another recent WCS-co-authored study said widespread lack of personnel and funds are preventing MPAs from reaching their full potential.

Global awareness continues to grow about the immediate threats facing coral [reef](#) ecosystems, as is a global commitment to address those threats. Last February, at the Economist World Ocean Summit in Bali, Indonesia, the '50 Reefs' initiative was launched by the Global Change Institute of the University of Queensland and the Ocean Agency. The initiative brings together leading ocean, climate and marine scientists to develop a list of the 50 most critical [coral](#) reefs to protect, while leading conservation practitioners are working together to establish the best practices to protect these reefs.

**More information:** Timothy R. McClanahan et al, Environmental variability indicates a climate-adaptive center under threat in northern Mozambique coral reefs, *Ecosphere* (2017). [DOI: 10.1002/ecs2.1812](https://doi.org/10.1002/ecs2.1812)

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