Scientists call for new strategy to study climate change impacts on coral reefs

March 28 2016

Scientists recommend a new focus on coral reef research that combines the power of traditional laboratory experiments with field-based experiments to best inform adaptation and environmental policy. Credit: Ken Anthony

An international research team calls for a targeted research strategy to better understand the impact multiple stressors will have on coral reef in the future due to global climate change. The scientists published their new approach to coral reef research in the journal *Frontiers in Marine Science*.

The researchers conducted a literature review to evaluate recent research on the ecological health impacts of corals when exposed to more than one stressor, such as increased ocean temperature and increased ocean acidification.

More than just bleaching and a loss of calcium shells, changes in temperature and ocean acidification - driven by increased CO2 in the atmosphere - can cause corals to grow more slowly and can inhibit reproduction, according to the researchers. The researchers suggest that when stresses occur simultaneously, they have dangerous effects on corals that are not anticipated by studies that only evaluate a single stressor to corals.

"The evidence is stacking up that the interaction of multiple stressors and ecological complexity may mean that negative effects on coral reefs will happen sooner, and be more severe than previously thought," said Chris Langdon, a professor of marine biology and ecology and co-author of the study. "In order to answer the challenge to produce more accurate predictions, coral reef scientists will need to scale-up their studies to better encompass the complexity of natural systems."

The researchers call for a new focus on coral reef research that combines traditional laboratory experiments with more realistic field-based experiments that attempt to mimic the types of changes in multiple stressors that are expected to impact corals in the future.

"Because the species that make up coral reefs differ from region to region, we need a global strategy for choosing where to locate these larger, field-based experiments, called mesocosm studies, to better inform adaptation and environmental policy that are regionally appropriate," the researchers said.

The paper, titled "Multiple Stressors and Ecological Complexity Require A New Approach to Coral Reef Research," was published in the March 25 issue of the journal Frontiers in Marine Science.

More information: Linwood H. Pendleton et al. Multiple Stressors and Ecological Complexity Require a New Approach to Coral Reef Research, *Frontiers in Marine Science* (2016). DOI: 10.3389/fmars.2016.00036

Provided by University of Miami