Coral-devouring seastar thrives in warming ocean

February 13 2015

An Australasian research team that includes a University of Otago marine scientist has found that rising sea surface temperatures could help promote outbreaks of crown-of-thorns seastars (COTS) that have devastated much of the coral on the Great Barrier Reef.

Otago's Dr Miles Lamare and colleagues at the Australian Institute of Marine Science (AIMS), and the University of Sydney published their findings in the international journal *Scientific Reports* today.

Outbreaks of COTS, which prey on stony coral polyps, are a significant stress on the survival of corals on the Great Barrier Reef (GBR). A range of scientific research indicates that COTS outbreaks are a major contributor to the estimated 50% decline in coral cover during the period

of 1985 and 2012.

Dr Lamare says it has been widely assumed that the outbreaks are caused by better COTS larval survival due by increased algal food availability.

"Warmer temperatures and runoff from agricultural land lead to increased production of algae. Overfishing, and ocean acidification are also seen as contributing, but our work has found that it's the combination of two factors—increased food availability and warmer temperatures together—that leads to such devastating population increases of the seastars."

The research group tested larval development times with increased water temperatures, and found that in the presence of abundant nutrients, an increase of 2^0 C in temperature shortened development time for the COTS considerably, increasing their likelihood of surviving to adulthood by 240%.

"This shorter development time between larva and settled adult also means the larvae have less time in which to be dispersed, so more are settling in a localised way."

The study lead author, AIMS scientist Dr Sven Uthicke, says that recognising the role of synergistic effects of increased nutrient flows and sea surface temperatures on COTS survival better enables scientists to understand the science behind outbreaks.

"Given that the most moderate climate change scenarios predict a 1-2^0 C increase in average sea temperatures, the present study further demonstrates the value of taking a holistic, multi-variable approach to understand better how cumulative factors affect the survival of species such as COTS," Dr Uthicke says.

Provided by University of Otago