

Lord Howe Island Marine Park News

Crustose Coralline Algae: Pretty in Pink

Crustose coralline algae (CCA) are related to seaweeds but grow rock-hard crusts instead of fleshy fronds. Many species are candy or pastel pink, adding a splash of colour to reefs and rockpools. They also play a vital role in constructing and maintaining coral reefs.

CCA crusts act like cement, binding together old coral fragments to create a solid foundation for the reef to continue growing. Without CCA a reef structure could be washed away by waves or collapse under its own weight. These smooth, hard crusts are also ideal surfaces that cue larvae of coral and other species to settle and grow on reefs, supporting the recovery of coral populations and reef resilience.



*A species new to science – the crustose coralline algae *Porolithon howensis*. Photo credit Professor Guillermo Diaz-Pulido.*

Despite their importance, less is known about CCA than other reef species. Researchers Dr Tessa Page and Professor Guillermo Diaz-Pulido from Griffith University visited the Lord Howe Island Marine Park (LHIMP) in 2019 to investigate how climate change might affect CCA in the marine park. However, it is important to understand the differences between species first. A component of their research aims to clarify the taxonomic identity of CCA species because many of them look very similar. They have spent the last few years carefully analysing their results; this work is still in progress.

One of the findings from their ongoing studies was the discovery of a new CCA species, *Porolithon howensis*. It grows in gutter formations called spur and grooves along the outer edge of the Lord Howe Island lagoon, typically between 4 to 7m deep. This species also occurs on the Great Barrier Reef. What makes it different from other related CCA is that it grows protuberances (or bumps) as shown in the photo above, whereas other related species are completely smooth.

The researchers are also analysing data to determine how sensitive CCA species are to global warming, and we look forward to learning from their results.

Coral Health Update

This summer saw the highest global Sea Surface Temperatures on record (see link below for Climate Change Institute - Climate Reanalyzer) and waters in the LHIMP followed this global trend.

When water temperatures are warmer than average, marine "heat stress" builds up over time and can lead to various impacts including coral bleaching. You can find more information on coral reef health and how marine heat stress is measured in the links below. Whether bleaching occurs also depends on the species, depth, location and local weather conditions. Deeper reefs with high water flow are less likely to be impacted than shallow and sheltered lagoon reefs.

Lord Howe Island Marine Park News

Some corals in the LHIMP have shown heat stress impacts this summer, including bleaching. Targeted coral health surveys took place in late January and late February 2024 by visiting researchers from the University of New South Wales and the University of Newcastle with support from LHIMP staff.

Data from these coral health assessments show that the site most impacted is Sylphs Hole. Impacts have also been documented at other sites including Comets Hole, Horseshoe Reef, North Bay, Stevens Hole and Neds Beach. Other areas within the lagoon and offshore have experienced fewer impacts. The majority of observed bleaching has affected a few (three to four) susceptible coral species that are both common and widely distributed, with the ability to quickly recover on reefs. Many other coral species, which have higher stress tolerance, have not shown signs of bleaching. Despite these impacts, reefs in the LHIMP provide world-class opportunities to observe and experience an incredible diversity of marine life including tropical fishes and other species which occur nowhere else in the world.

Forecast and Local Response

Water temperatures are now forecast to decrease (see below links for NOAA Coral Reef Watch/Bureau of Meteorology) and heat stress may begin to ease by April. The LHIMP team will continue collaborating with researchers to complete systematic in-water visual surveys to assess heat stress impacts and recovery over the coming months. In addition, aerial drone mapping is used to identify heat stress impacts in collaboration with Southern Cross University.

Coral Reef Resilience

The resilience and recovery of marine life is supported by the presence of the marine park, with management rules and programs implemented to conserve biological diversity and maintain ecosystem integrity and function. DPI Fisheries is closely monitoring key marine habitats and species throughout the state as well as researching ways to boost resilience. This is a core component of the DPI Marine Heatwave Response Plan 23/24.

Useful links

- Climate Change Institute - Climate Reanalyzer world daily sea surface temperature: https://climatoreanalyzer.org/clim/sst_daily/
- Coral Reef Health explanation of coral bleaching: <https://coralreefhealth.com/coral-bleaching/>
- National Ocean and Atmospheric Administration - Coral Reef Watch (NOAA CRW) heat stress gauge for Lord Howe Island: https://coralreefwatch.noaa.gov/product/vs/gauges/lord_howe_island.php
- Bureau of Meteorology (BOM) sea surface temperature forecast: <http://www.bom.gov.au/oceanography/forecasts/idyoc300.shtml?region=LordHowe&forecast=SSTCur#>
- Statewide NSW Marine Estate Heatwave Response Plan 2023/2024: https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0008/1500956/DPI-Marine-Heatwave-Response-Plan.pdf