

- **Climate change impact on calcifying macroalgae – understanding ocean acidification**

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Near-shore marine ecosystems, and their resident organisms, provide essential ecological services, acting as bioengineers in the construction and cementation of calcium carbonate structures, and maintaining biodiversity. Climate change is expected to have a profound impact on these important ecosystems. The anthropogenic release of greenhouse gasses into the atmosphere, predominantly in the form of carbon dioxide (CO₂), is resulting in more acidic conditions in the ocean's surface layer. As a result, due to lower pH and a reduced abundance of carbonate ions (CO₃²⁻) required to form their calcified structures, photosynthetic, calcium carbonate producing, marine organisms (calcifiers) inhabiting the near-shore zone are predicted to be significantly affected. Greater atmospheric CO₂ concentrations are also warming the atmosphere, subsequently elevating seawater temperatures. In some calcifying species, this change is expected to further compound the stress posed by ocean acidification.

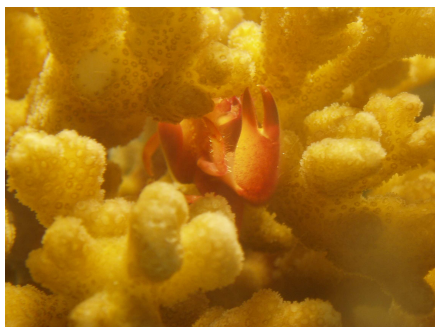
This project will provide critical data for climate change models and is supported by the skills and expertise developed at UTS over the past 5 years. The research will be undertaken at the Sydney Institute of Marine Science (SIMS), Heron Island in the Great Barrier Reef and UTS.

Aims:

1. To evaluate the individual and synergistic effects of elevated CO₂ conditions and elevated temperature on photosynthetic marine calcifiers.
2. Identify geographical differences in calcifying species responses to climate change.
3. Evaluate ecological interactions and the competitive advantage climate change may provide to non-calcifying marine macroalgae over calcifying taxa.

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Crab and coral on Heron Island



Snorkelling on Heron Island