Linking Patterns of the Ocean to Coral Bleaching Events on The Great Barrier Reef: The Role of Flow and Temperature Variability in Shaping Benthic Communities on Bleached and Healthy *Acropora* Reefs

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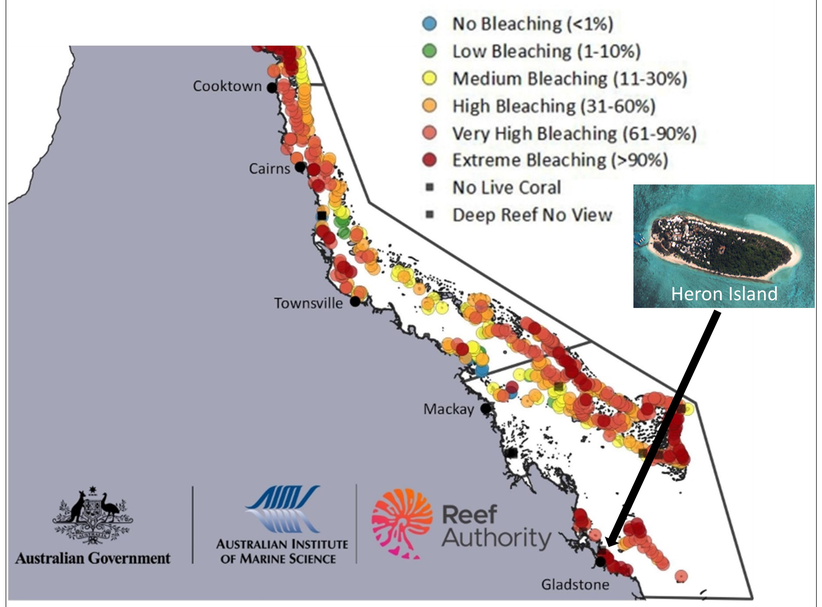
Introduction:

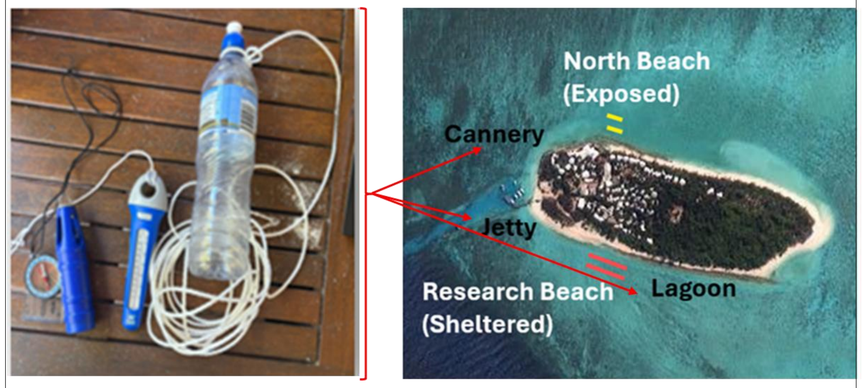
- Coral bleaching occurs when water temperature gets too high, killing coral
- Coral bleaching causes adverse effects on associated organisms
- I aim to link oceanographic variability to benthic communities on bleached and unbleached Acropora corals
- Research Questions:
    1. Is the temperature of the ocean influenced by water depth and air temperature?
    2. Is there a difference in the associated benthic communities between live and dead corals?
    3. Is there a difference in the health of *Acropora* corals on the North Beach versus the Research Beach?

Aerial Survey of the GBR



Aerial survey of coral bleaching events on the GBR.

Depth and Temperature:



1.) Measure ocean depth, ocean temperature, and air temperature at three locations for 12 consecutive hours.

Benthic abundance and Diversity:

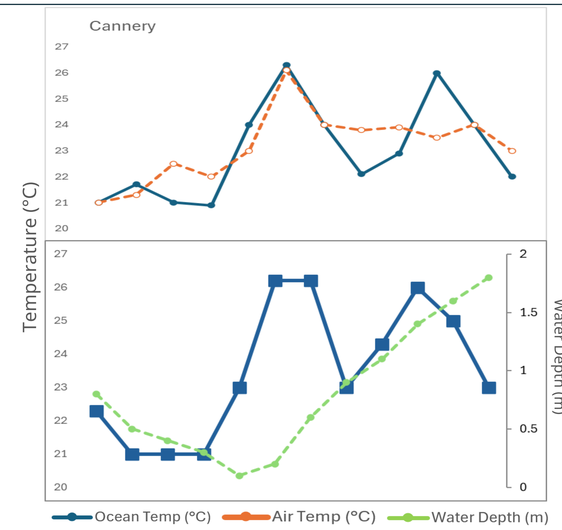
2.) Observe benthos on bleached and unbleached corals at three locations.

Coral Health Assessment:

3.) Determine coral bleach level from Coral Watch Chart.

Results:

Figure 1. Strong positive correlation between air and ocean temperaturee. No correlation between ocean depth and ocean temperature.



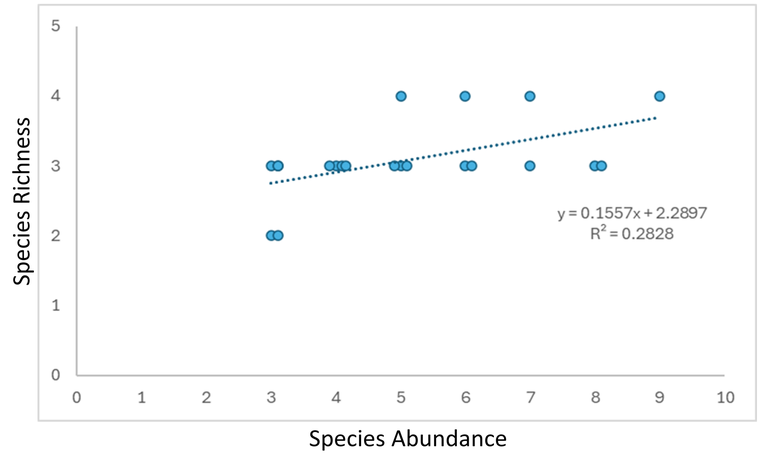


Figure 2. Alive *Acropora* sustain higher benthic abundance and diversity than bleached *Acropora*.

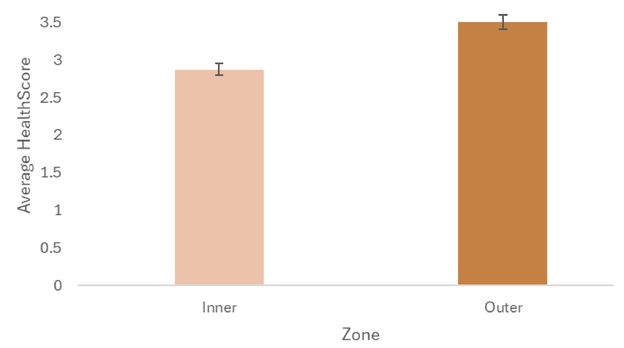


Figure 3. Outer coral experience less bleaching.

Conclusion: Global warming is an increasing problem that promotes excess algal coverage of dying and dead corals, causes habitat shifts, changes in species abundance, richness, and evenness, and ultimately worsens coral health scores.