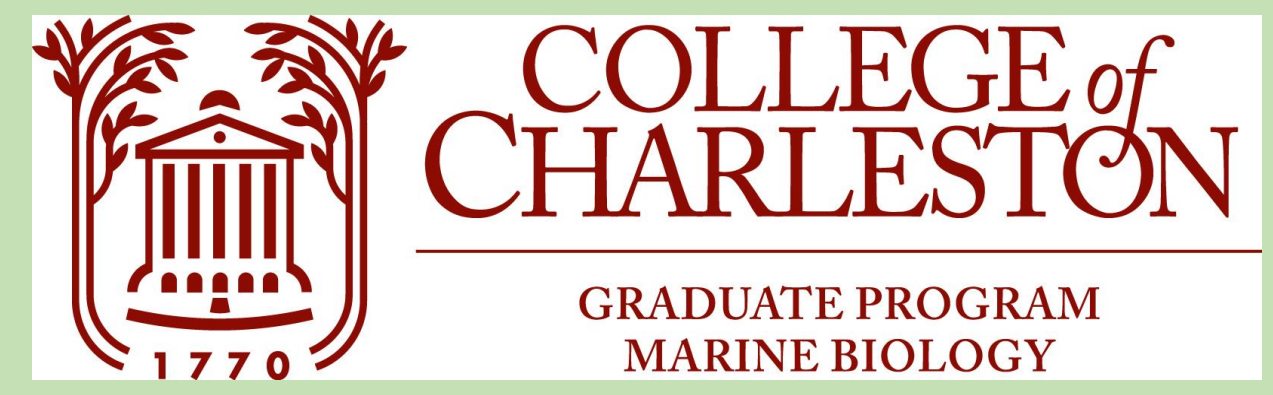


Temporal characterization of intertidal macroalgal microbiomes at 'Ewa Beach, O'ahu, Hawai'i



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Introduction

- Macroalgae and microorganisms form complex mutualistic relationships.
- Macroalgae act as key ecosystem engineers and have cultural importance to the people of Hawai'i.
- Macroalgal microbiomes (MAMs) can be impacted by abiotic factors (i.e., light and temperature).

Background

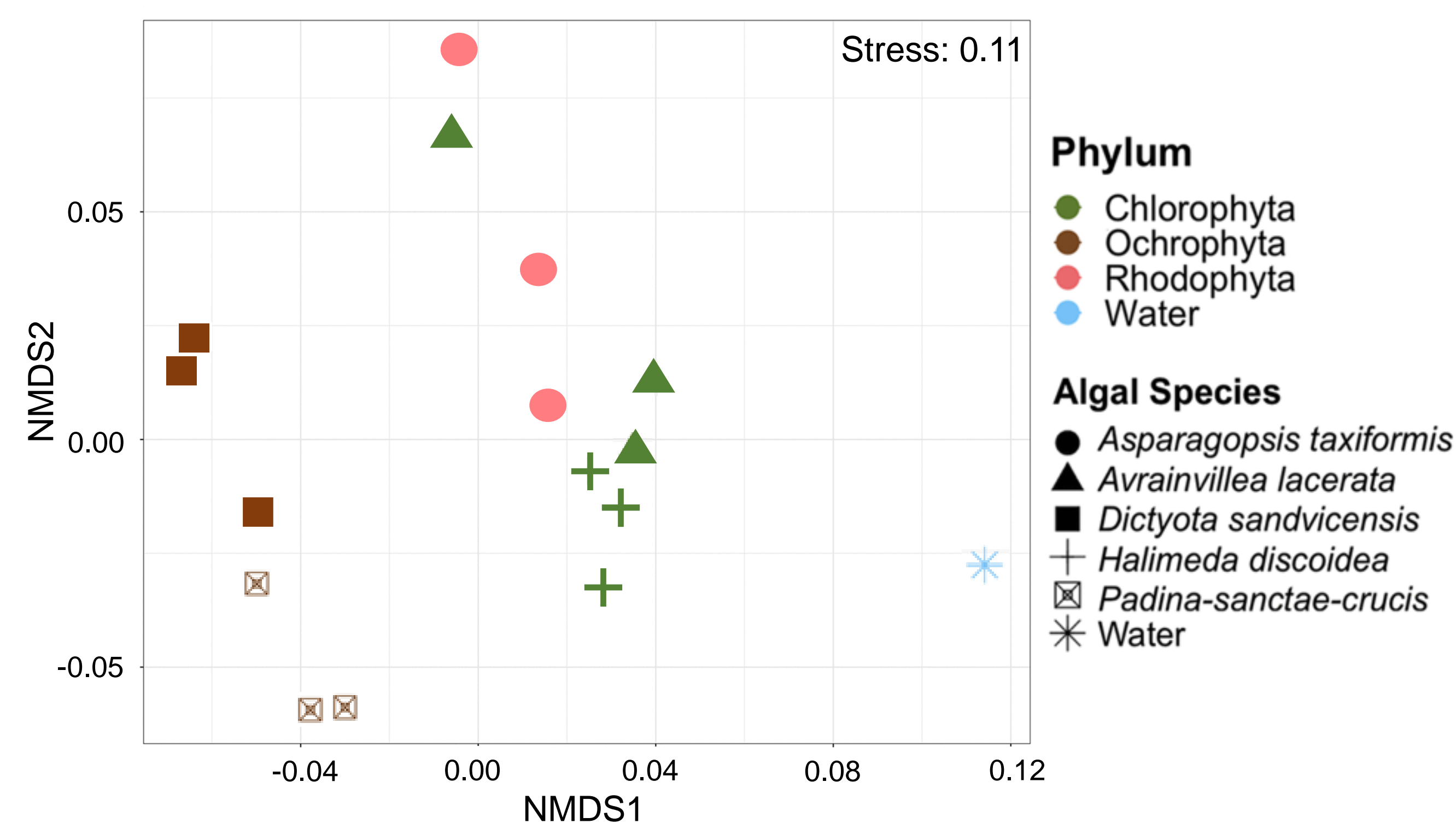


Figure 1. Pearson correlation nonmetric multidimensional scaling (NMDS) plot generated using Bray-Curtis dissimilarities for microbial communities associated with macroalgal species. Kuba *et al.*, 2021

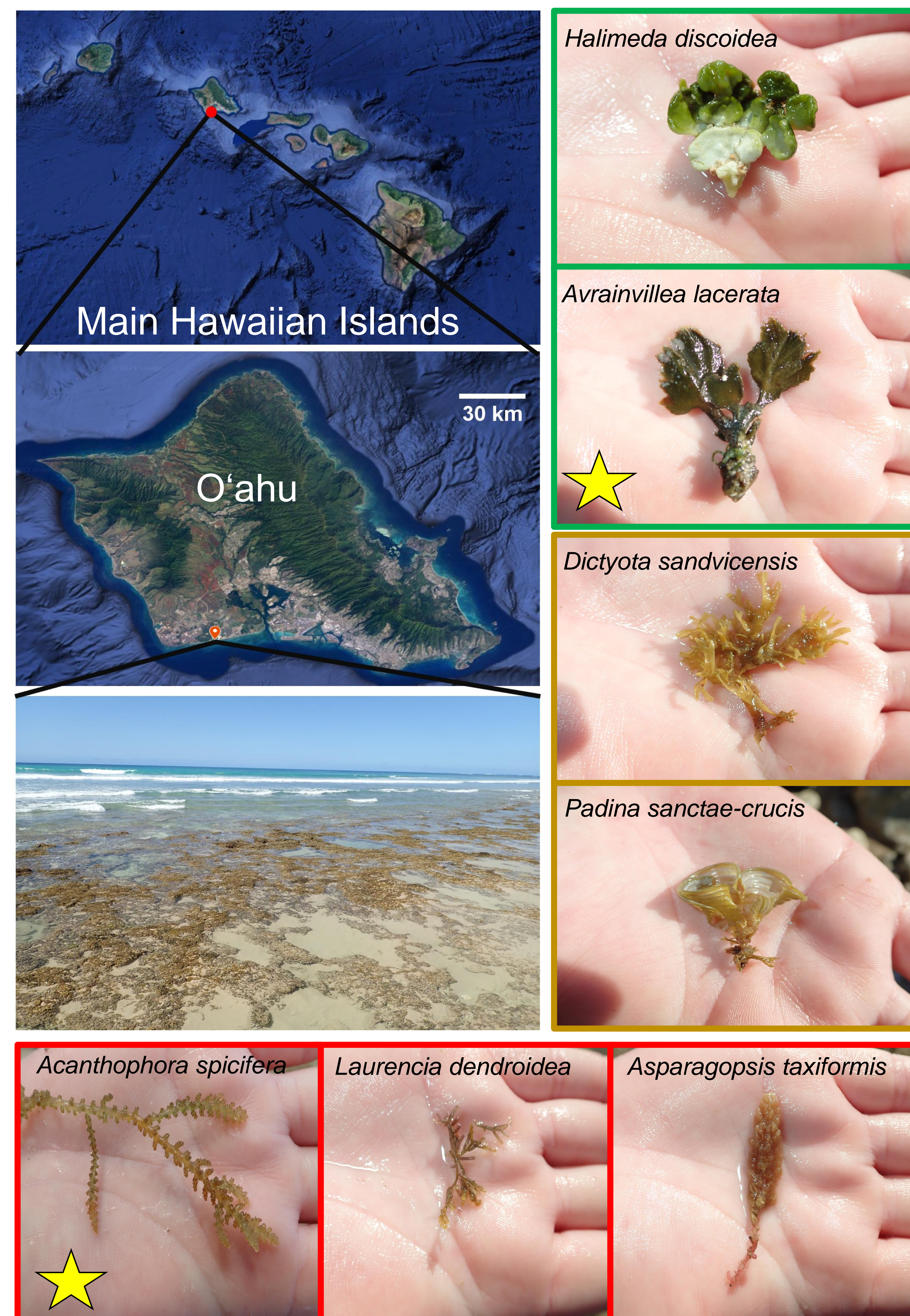
Methods



Figure 2. Methodology flowchart for macroalgal microbiome analysis.

How do macroalgal microbiomes change over time at low tide?

Sample Site and Species



- Maps from Google Maps
- Images courtesy of Heather L. Spalding
- ★ = Invasive species

Figure 3. Maps the Main Hawaiian Islands, the island of O'ahu, and image of 'Ewa Beach intertidal bench. Images of each study species with outline indicating macroalgal phyla (green = Chlorophyta, brown = Ochrophyta, red = Rhodophyta). Star indicates invasive species included in collection.

Intertidal Light & Temperature Data

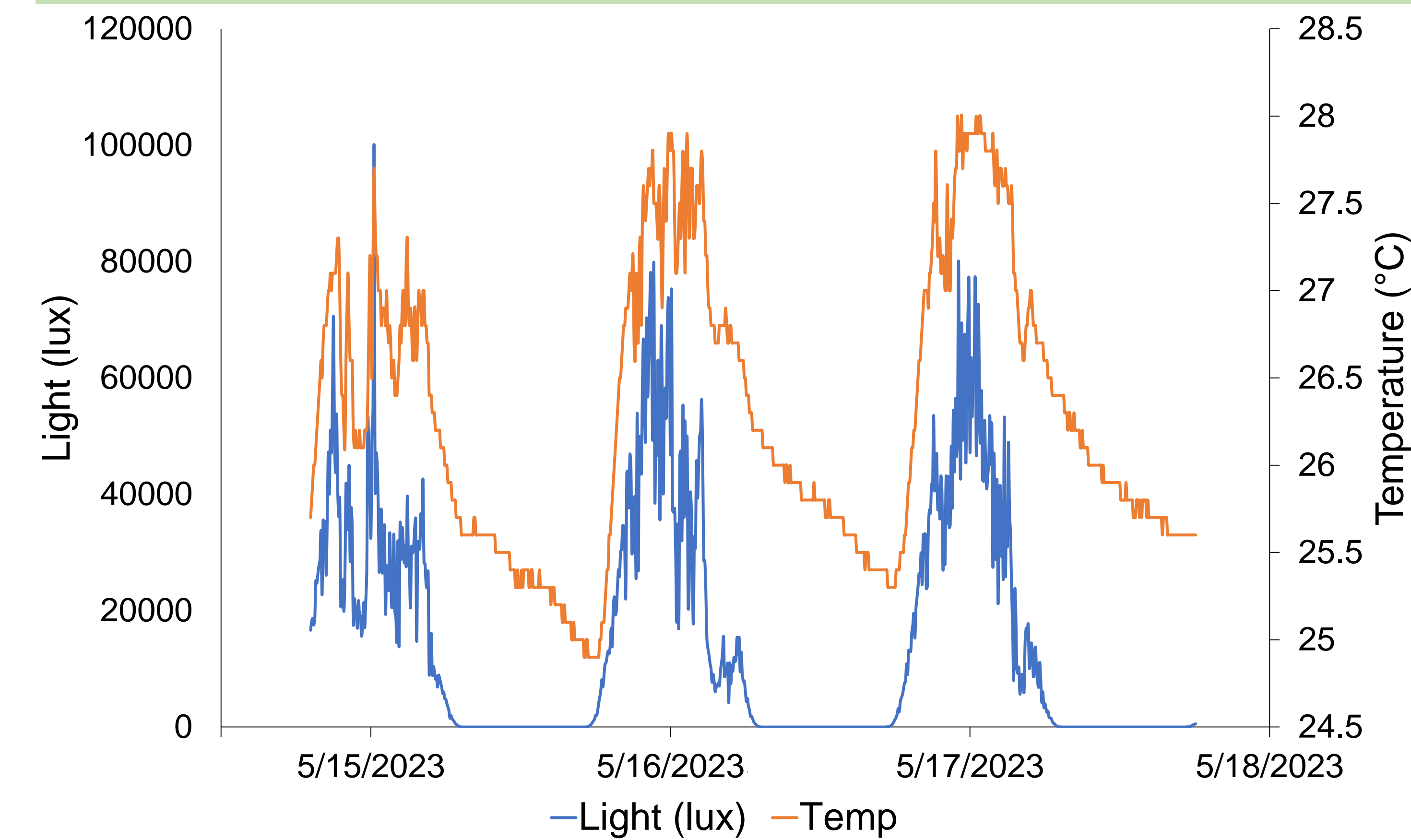


Figure 4. Light (lux) and temperature (°C) profiles over three consecutive days at 'Ewa Beach collected in May 2023.

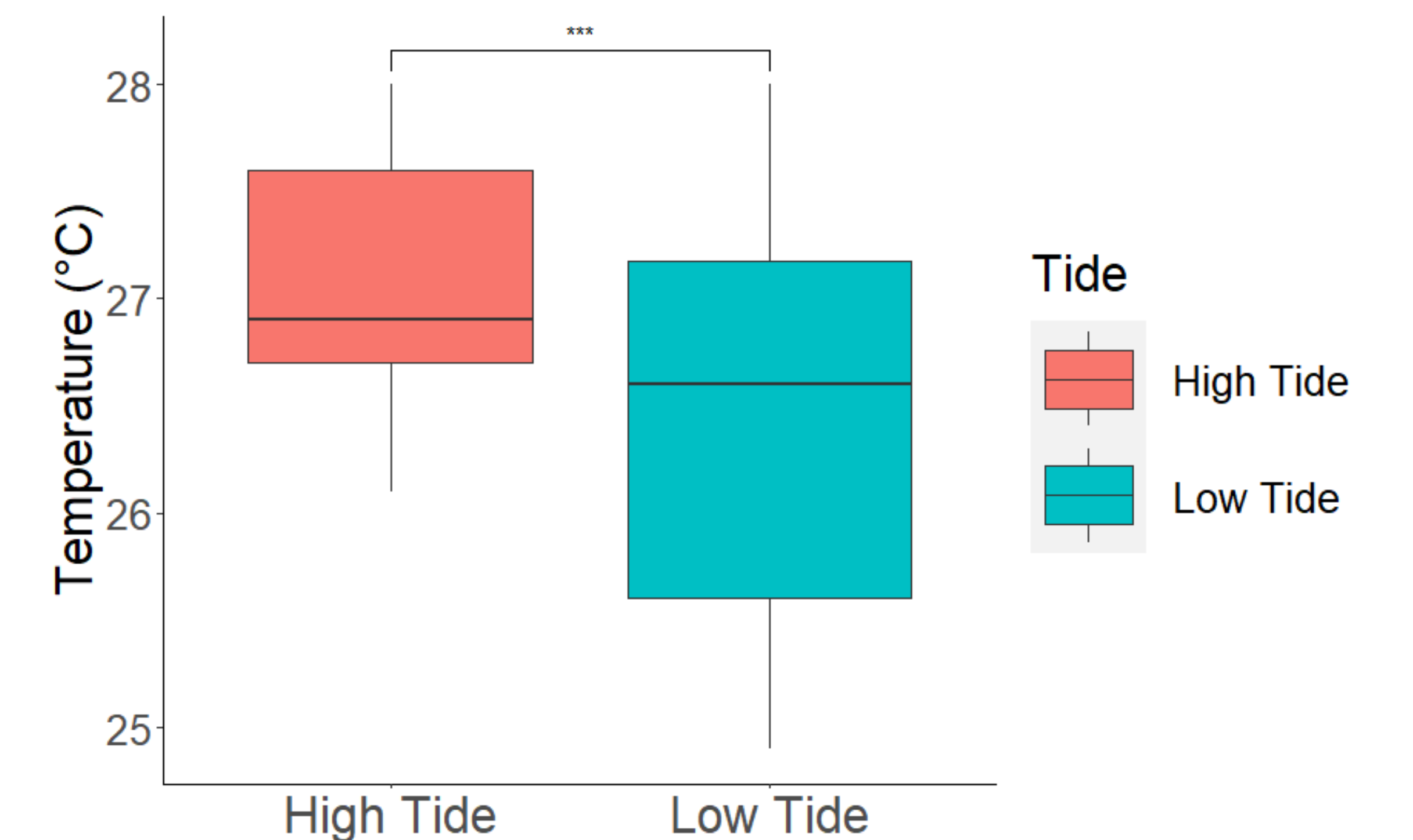


Figure 5. Comparison of temperatures (°C) between high tide and low tide at 'Ewa Beach collected in May 2023.

Significance & Preliminary Results

- Representative data showed a significant difference (Kruskal-Wallis, $p < 0.05$) in temperature between high and low tide.
- Understanding variability in MAMs composition in response to extremes in temperature and lights is relevant for modeling macroalgal health in future climate scenarios.

Acknowledgments

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Literature Cited

Kuba, G. M., Spalding, H. L., Hill-Spanik, K. M., Fullerton, H. (2021). Microbiota-Macroalgal Relationships at a Hawaiian Intertidal Bench Are Influenced by Macroalgal Phyla and Associated Thallus Complexity. *Mosphere*, 6(5), eoo665-21.