



Bleaching and Recovery of Boulder Corals on a Patch Reef in the Middle Florida Keys

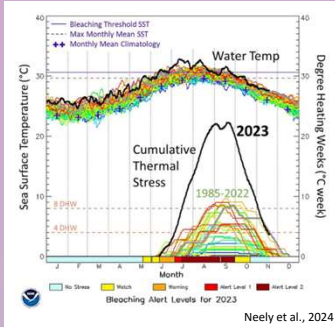
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2023 Marine Heatwave

- The summer of 2023 brought record-breaking temperatures to Florida.
- This triggered the most severe coral bleaching event in Florida's history.

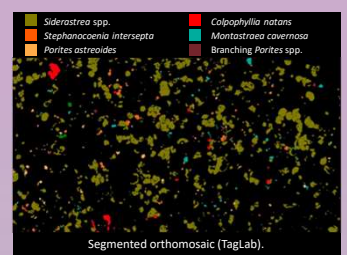


Study Site

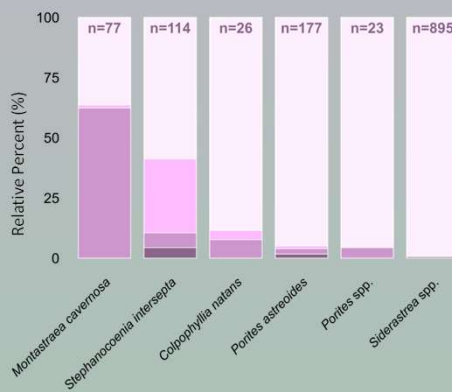
- "NOAA8" is a nearshore patch reef ~2.5 km off Marathon.
- The patch is ~600 m² and the depth ranges from 4.8 to 7.3 m.
- For this study, a rectangular subset of 130 m² was chosen for analysis.

Photomosaic Methodology

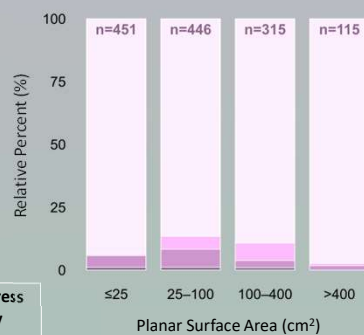
- Images were captured by swimming two GoPro cameras across the reef in a double lawnmower pattern.
- Targets were placed on the reef to provide scale, spatial accuracy, and depth standardization.
- Orthomosaics were created using Agisoft Metashape software.
- All visible corals were identified to the lowest taxonomic level possible, outlined for perimeter and surface area values, and assigned a thermal stress category using TagLab software.
- This study focuses on the six most dominant taxa found in the subset (n > 20).



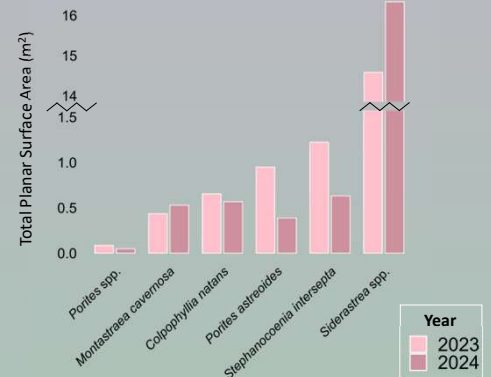
Bleaching Proportion by Taxa



Bleaching Proportion by Size



1-Year Community Recovery



Discussion

- Siderastrea* spp. comprised 80.6% of coral cover at the study site and had the highest proportion of fully bleached colonies (98.9%).
- Thermal stress susceptibility varied significantly between taxa, with *M. cavernosa* and *S. intersepta* showing the lowest severity of thermal stress.
- Colonies within the 25-100 cm² size class showed the highest thermal stress resistance, although taxa identity contributed more strongly to thermal tolerance.
- Total planar surface area differed among taxa but showed no overall change after 1 year, indicating community resilience.
- Future work will include individual colony fate-tracking, spatial analyses, and 2-year recovery patterns of the entire patch reef.

Acknowledgements

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