

Effects of the 2005 Red Tide on Epibenthic Macroinvertebrate Communities in the Eastern Gulf of Mexico



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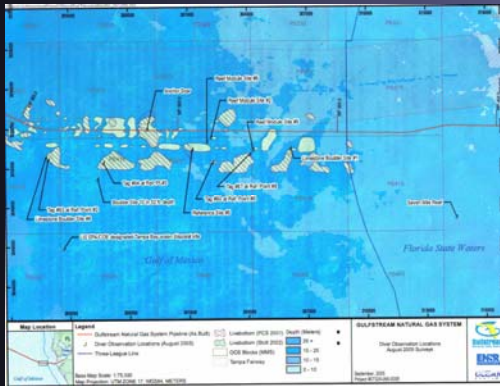
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Introduction

During the summer of 2005, epibenthic hard bottom communities in the Gulf of Mexico off west central Florida were radically changed by a persistent red tide and subsequent related hypoxic/anoxic conditions. The goals of this study are to quantitatively assess the immediate impacts from the red tide as well as the recolonization and succession of reef biotas in the years that follow using images and survey data from before and after the red tide event.

Study Sites

1. Gulfstream Natural Gas Systems (GNGS) mitigation modules: 8 sites (boulder fields and reef modules) in federal waters (16-22 m) off Tampa Bay, Gulf of Mexico



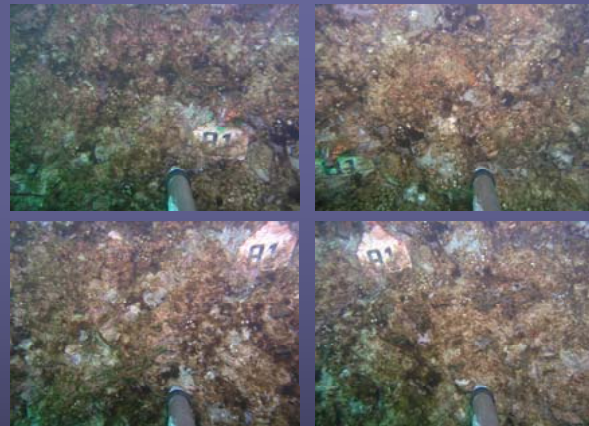
Methods

- GNGS photo station sampling: 4 images acquired around each .71 m² photo station using an Olympus underwater camera (40 cm from bottom) in March 2005 and again in August 2005
- Images (total of 64) were analyzed with ImagePro v.6.0 software. Each coral was circled, area cover (cm²) measured, and percent cover calculated; Other macroinvertebrates were also enumerated
- Primer v. 6.0 non-parametric statistics package used to analyze data

March 2005

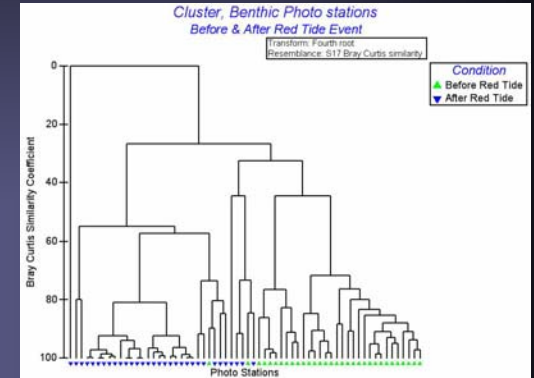


August 2005

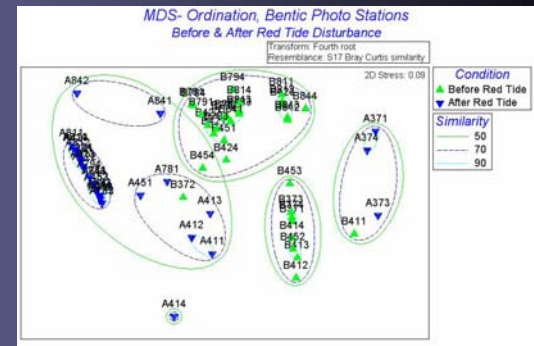


Benthic Invertebrate Percent Contribution

	March 2005	August 2005
<i>Cladocora arbuscula</i>	2.1	0.03
Bleached <i>C. arbuscula</i>	0	1.70
Sponge	0.65	0
<i>Diadema antillarum</i>	76	22



Before and after groups cluster according to percent similarity



Multidimensional scaling ordination of all photos with groups overlain by circles that represent 50, 70, and 90% benthic similarity.

Conclusions and Future Work

- The 2005 red tide and the related hypoxic/anoxic conditions shifted benthic communities significantly ($p < 0.1$)
- The decline in healthy *Cladocora arbuscula* (from an average of 36.82 cm² in March to 0.60 cm² in August) contributed to 49.89% of observed dissimilarity between March and August
- Photo stations will continue to be monitored to quantify temporal and spatial characteristics of recruitment and recolonization. Results will be correlated to fish surveys and water quality measurements

Acknowledgements

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