Climatological Significance of Sea Temperature Extremes on the Florida Reef Tract in 2010

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Effects of differing bottom relief
Persistent extremes in sea temperature on the Florida reef tract (FRT) were observed in January, March, and June of 2010, on

G,  
A, Reidenbach MA,  
Responded weakly to atmospheric extremes in 2010
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Large  
reached historical extrema in early 2010  
By considering this process and its effect on reef resilience, Marine Protected Area managers may be able to
At shallow sites with relatively strong response, an important distinguishing criterion was sea

January, March, and June of 2010

D, Taylor J,  
residents. Proceedings of the National Academy of Sciences of the United States of America

Conclusions
1. Large-scale climatic indices – the Arctic Oscillation index of atmospheric pressure height, and El Nino-Southern Oscillation indices of equatorial Pacific SST anomaly – reached historical extrema in early 2010. Atmospheric forcing in Florida and the Caribbean reflected these extremes for several months following. Ocean waters on Florida reefs responded to this forcing.

Why do similar sites within Florida’s reef tract persistently respond differently under similar atmospheric forcing?

References and Acknowledgments
Thermistor data at eight shallow reef sites courtesy of Dr. Diego Lirman, UM RSMAS. Coastal Relief Model 3-arcsec sea-floor topography courtesy of NOAA National Geodetic Data Center. Gulf of Mexico 1/25o HYCOM data courtesy of Naval Research Lab and HYCOM Consortium. Climate indices courtesy NOAA National Centers for Environmental Prediction. Hendee JC, Grager LJ, Manzello DP, Mooers CNK, Graber HC (2009) Thermal siphon. An oceanographic mechanism that can explain this difference is the small-scale heat advection process called the “thermal siphon” (Monismith 2007). This process is sensitive to spatial variations in sea-floor topography on scales of 100s of meters. A notable feature of this small-scale difference was its persistence.

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