

Coral Reef Ocean Acidification Sentinel Site in the Flower Garden Banks National Marine Sanctuary: Data Collection and Analysis

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Rising levels of atmospheric CO₂ due to human activities affect the marine environment of the Gulf of Mexico by decreasing the pH of seawater. This ocean acidification may impact coral reef ecosystems because it decreases the saturation state of seawater with respect to the carbonate minerals that marine organisms use to form their hard body parts and it affects other biochemical processes. It is therefore necessary to gain better understandings of present-day values of pH, other parameters that control the saturation state of carbonate minerals in seawater, variations of these parameters due to natural oceanic and anthropogenic processes, and the relationships between these variations and the health of corals. Toward this end, our team is establishing a “sentinel site” to make high-resolution time-series measurements of pertinent seawater and atmospheric parameters at the coral reefs of the Flower Garden Banks National Marine Sanctuary. A key element of this approach is the deployment of an instrumented mooring at the coral reef crest. Components of this mooring system and reasons for them are described. Next, aspects of data collected during the initial deployment of instruments are considered. Finally, the ongoing process of deploying the full suite of sentinel site instrumentation is discussed.