Title: Assessment of benthic ecosystem changes post-outplanting with the use of Structure-from-Motion (SfM) Photogrammetry (??)

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It is well known that Caribbean reefs are suffering steep losses in coral density and biodiversity due to various stressors. Outplant-based restoration has been identified as a tool to mitigate damage sustained by reef communities. Monitoring post-restoration traditionally involves in-water surveying and measurements to determine change and success. Recently, Structure-from-Motion (SfM) Photogrammetry in conjunction with virtual surveys have been explored as a substitute for in-water surveys to facilitate ecological assessments. In less time than it takes to conduct in-water surveys, imagery from large portions of reef can be captured, allowing exponentially more hours for surveying. This project, which aims to restore portions of Eastern Dry Rocks (EDR) in the Florida Reef Tract, has surveyed approximately 10,200 square meters along 32 unique reef ledges. Each of these reef sites was imaged at baseline and again at one-year post-coral outplanting using a dual GoPro rig. Changes in diversity within the benthic community were assessed using Visual Point Intercept (VPI) surveys through the software Viscore. Change in coral cover across timepoints was measured with the 2D segmentation software, TagLab. These land-based survey methods allow for a longer, more thorough, analysis of these outplanted reef ledges. In turn, we are able to assess changes in multiple benthic communities through time, along with the pre-existing and post-outplanting coral communities. This ultimately gives us better insight on how the ecosystem, as a whole, changes with restoration.