

Baseline Mapping of Florida's Largest Yellow Finger Coral, *Madracis auretenra*, Patches Amidst Environmental Stress

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Coral reefs that persist in degrading environments offer critical insights into resilience capabilities under shifting climate and anthropogenic stressors. This study focuses on a set of four unique continuous dense patches of *Madracis auretenra* in 20 m water depth off Delray Beach, which are the largest known in Florida. Similar patches are found in the Flower Gardens National Marine Sanctuary at 30 m depth. Residing in a subtropical to temperate transitional zone, the presence of this tropical coral raises questions about its adaptability to higher latitudes. Additionally, this species is presumed to be susceptible to Stony Coral Tissue Loss Disease (SCTLD), yet it has persisted in the endemic region for over a decade, suggesting potential resistance or environmental buffering. Anecdotally, the condition of several patches have declined. Establishing a baseline for long-term monitoring is needed to provide valuable data on growth patterns, habitat stability, and potential stress responses. Utilizing structure-from-motion (SfM) photogrammetry, we generated high-resolution 3D reconstructions to document coral condition, reef morphology, structural complexity, and potential resilience mechanisms. Given their size and persistence in a highly impacted environment, these patches may serve as a model for understanding coral adaptability and inform future conservation strategies. The findings from this study could have significant management implications, contributing to broader efforts in marine spatial planning and reef restoration. By integrating advanced mapping techniques with ecological assessment, this research aligns with ongoing efforts to bridge science and management for sustainable marine ecosystems in a changing world.