



2021 Project Results

The Southeast Coral Reef Evaluation and Monitoring Project (SECREMP) provides local, state, and federal resource managers with an annual coral reef status report for the Kristin Jacobs Coral Reef Ecosystem Conservation Area (Coral ECA).

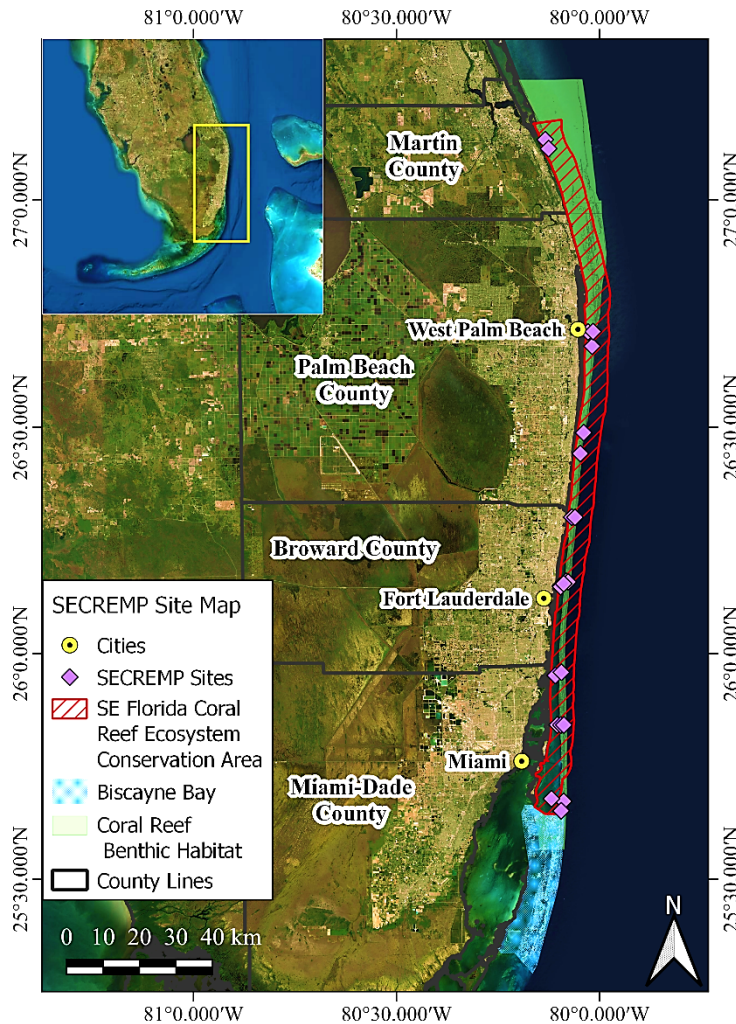


Figure 1. Map of the 22 SECREMP sites

The Southeast Florida Coral Reef Evaluation and Monitoring Project (SECREMP) was established as an expansion of the FWC managed Coral Reef Evaluation and Monitoring Project (CREMP) in the Florida Keys. SECREMP provides local, state, and federal resource managers annual reports on the status and condition within the Kristin Jacobs Coral Reef Ecosystem Conservation Area (Coral ECA) (Miami-Dade, Broward, Palm Beach, and Martin counties) coral reef system as well as information on temporal changes in resource condition. Survey methods of the 22 sites (Figure 1) include photographic transects to quantify percent cover of major benthic taxa (stony corals, sponges, octocorals, macroalgae, etc.) and demographic surveys to quantify abundance, size distribution, and overall condition of stony corals, octocorals, and the giant barrel sponge. SECREMP is a partnership between DEP, FWC, and NSU that facilitates collaboration and knowledge sharing benefiting coral reef ecosystems nationwide. The Coral ECA

experienced significant stony coral assemblage declines across the study period, with significant losses observed across all stony coral metrics examined (cover, live tissue area (LTA) and density). These losses were predominately driven by a significant increase in Stony Coral Tissue Loss Disease (SCTLD), which peaked in 2016 but has subsequently decreased in prevalence every year since. As regional disease prevalence across the 22 sites has stayed at < 1% every year since 2018, total loss from this event can begin to be quantified, and recovery can start to be addressed. No significant decline in stony coral LTA or density was identified from 2018 through 2021, and density in 2020 and 2021 was significantly higher than all previous years. However, from 2015-

2018, those species susceptible to SCTL D lost >50% of regional LTA, while low susceptible species did not experience any significant change in LTA. This shift in species contribution to the stony coral assemblage could have a lasting impact as recovery beings to occur. Although the majority of SCTL D susceptible species had juvenile colonies (<4 cm) in the sample sites, these juveniles were dominated by generalist, low relief species.

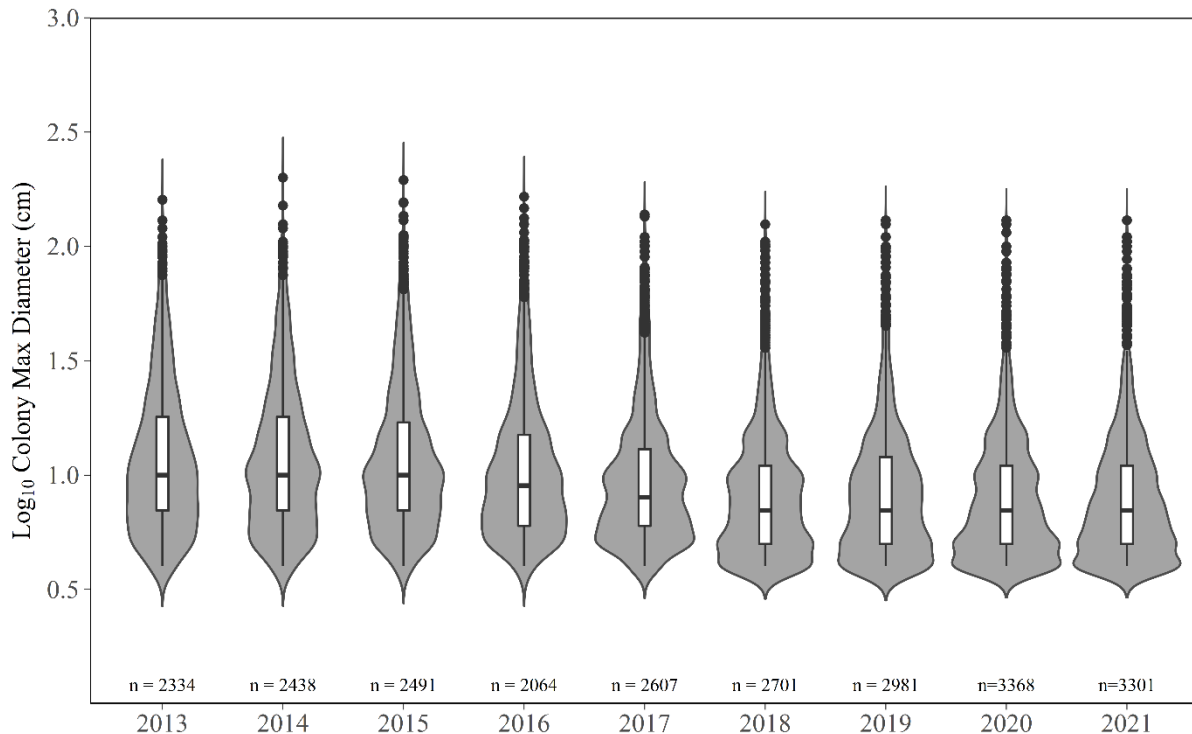


Figure 2. Distribution of colony diameter by year for all species. The grey areas indicate the density distribution of colony diameter where the wider the plot is the higher the probability that members of the population will take on that given value and skinnier sections have lower probabilities. The inset boxplots represent the median (solid middle bars), interquartile range (box length), and maximum and minimum values (whiskers) of colony maximum diameter.

This shift in species composition has occurred concurrently with a shift in the species size distribution. From 2013 to 2015 no significant change in species size distribution was observed. Beginning in 2016 the size distribution was significantly different than previous years and has significantly changed every year until 2020 and 2021. These sites are now dominated by small colonies, as seen by the wideness of the violin at the bottom in 2020 and 2021, illustrated in Figure 2. Reefs containing only smaller colonies, relative to species usual size distribution, decreases the amount of habitat and structural complexity provided by these species. Additionally, this shift to smaller colonies is important as colony size is directly related to fecundity and as a result changes in colony size can have detrimental effects on reproductive capabilities. The composition of these small colonies is dominated by species that generally do not form large colonies in the area, even if given time and conditions to grow. *Porites astreoides*, *Porites Porites*, *Siderastrea siderea* and *Agaricia agaricites* complex accounted for 75% of all corals (≥ 4 cm) recorded in 2021. *Porites astreoides* was the most abundant coral species in 2021 (1096 colonies), followed by *S. siderea* (724 colonies) and *A. agaricites* complex (465 colonies). The chronic nature of disturbances to and the significant economic value of the coral reefs within the Southeast Florida Coral Reef Ecosystem Conservation Area requires comprehensive, long-term monitoring to define and quantify change and to help identify threats to the ecosystem. The value for a long-term region-wide monitoring program is highlighted by the information in this report, which will be vital in planning and monitoring the potential future recovery of this resource.