

Octocoral Population Response and Recovery to Reef Disturbances

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Among the many changes occurring on Florida Keys reefs are the shifting dynamics of octocoral (soft coral) communities, which in some areas are increasing in benthic cover and density following the decline of scleractinian corals. While the response of the scleractinian community to disturbances such as hurricanes and marine heatwaves is well-studied, the response of octocorals to specific disturbances receives less attention. The Coral Reef Evaluation and Monitoring Project (CREMP) annually surveys fixed sites throughout the Florida Keys and Dry Tortugas, with sites in the Keys stratified across patch reef, shallow forereef and deep forereef habitats, and sites in the Dry Tortugas spanning shallow patch reef, pinnacle reef, and deep reef habitats. Octocoral specific CREMP surveys conducted since 2011 include an assessment of the density of the entire arborescent octocoral community and population demography of a few target species: *Antillogorgia americana*, *A. bipinnata*, *Eunicea flexuosa*, *Gorgonia ventalina*, and *Pseudoplexaura porosa*. Declines in density on Keys forereefs after Hurricane Irma in 2017 were followed by significant increases in the subsequent two years. Within the target species populations, this rapid recovery was driven by successful recruitment events, particularly among *A. americana* and *G. ventalina*. Whereas the octocoral community was relatively resilient to the 2014-2015 marine heatwave, widespread mortality occurred during the 2023 marine heatwave, with target species population declines ranging from ~20-90% between the summer of 2023 and the winter of 2024. Declines were focused on patch reefs that sustained higher temperatures than forereef habitats and among *P. porosa* colonies, which are primarily found at patch reefs. Evidence of widespread recruitment was not observed in the summer of 2024, indicating recovery will be slower following the marine heatwave than was seen following Hurricane Irma. Continued impacts and recovery of octocorals will likely depend on the frequency and severity of disturbances.