arm length, but the additive effects of these two

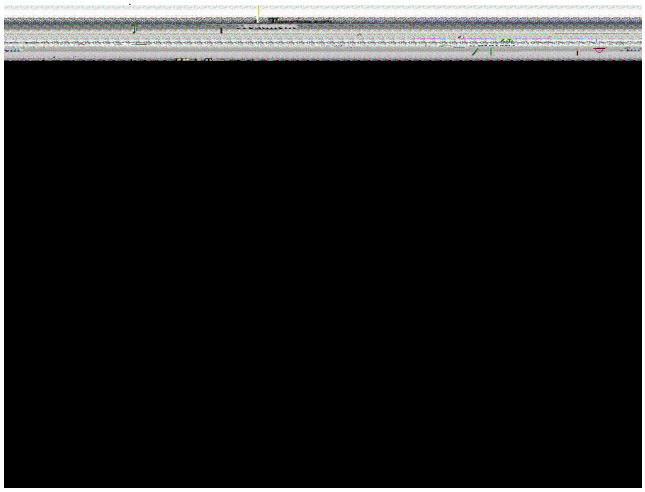
**Down in arms: Marine climate stress inhibits growth and calcification of regenerating (Echinodermata: ) arms**

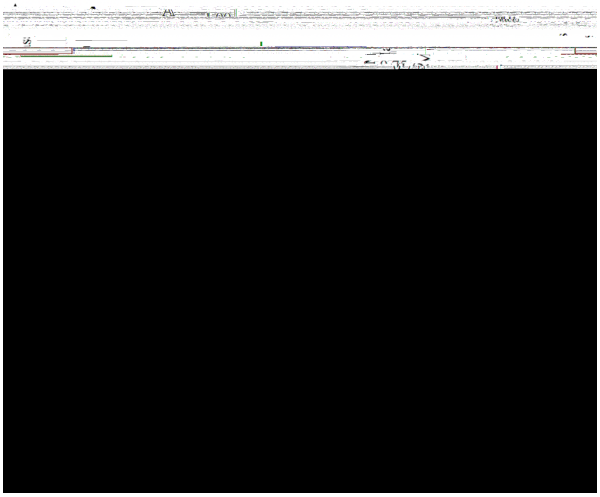
**Hannah Randazzo, 2021**

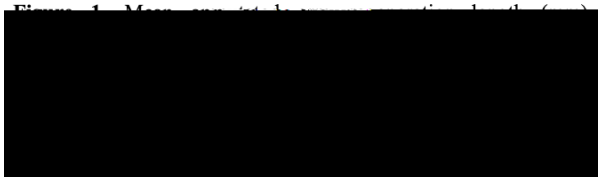
Anthropogenic $CO_2$ is s ficantly changing the $pCO_2$, temperature, and carbonate chemistry of seawater. Recent projections s t that, within the next century, ocean $pCO_2$ will increase by approximately 600–700 µatm ( cidification) and ocean temperatures will increase by 2.3–3.0 °C (ocean warming).[1] The combine of these variables is termed marine climate stress. Particular concern revolves around the cap arine climate stress to inhibit the ability of m ous studies suggest two opposing hypotheses for the ay in h marine climate stress will influence echinoderm calcification, metabolic efficiency, and reproduction er an additive or synergistic effect.[3,4]

In this study, were ed to ocean water of either ambient, high temperature, high $pCO_2$, or high temperature and high pC days, and the regeneration length of the amputated arm

factors resulted in smaller regenerated arms compared to ambient conditions (Figure 1). Sea stars regenerating under high $pCO_2$ exhibited a lower proportion of calcified mass, which could be the result of a more energetically demanding calcification process associated with marine climate stress (Figure 2). These results indicate that . calcification is sensitive to increasing $pCO_2$, and that climate change will have an overall net negative effect on sea star arm regeneration. Such effects could translate into lower predation rates by a key consumer in the temperate rocky intertidal of North America.







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