**Thesis defense**  
  
Friday, January 17, 2020  
3:30 pm   
Bilger 150

**Growth and Skeletal Sensitivity of the Common Collector Urchin, *Tripneustes gratilla*, to Projected Climate Change: Effects of Warming and Acidification**

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Description automatically generatedAs climate change leads to alterations in ecosystem and organism functions, the need to explore the breadth of these effects is paramount. Increased sea surface temperatures (SST) and ocean acidification (OA) are major contributors leading to alterations in body size and calcification in marine invertebrates, however the impacts are not fully understood. Ecologically important invertebrates, such as sea urchins, calcify in both larval and post-metamorphic life stages, requiring long-term studies that cover changes into adulthood. This research seeks to contribute to the understanding of potential climate change impacts on the post-metamorphic calcifying marine invertebrate, the common collector urchin, *Tripneustes gratilla*. In this experiment, individual *T. gratilla*  from juvenile (±7 mm) to adult (±60 mm) were grown under projected environmental conditions of warming (+2°C) and increased acidity (-0.3 pH units) and a combination of both. The objectives were to explore the sensitivity of *T. gratilla* to warming and OA through comparisons of measurements of 1) growth and 2) calcification. Using Scanning Electron Microscopy (SEM), detailed images of cross-sections of urchin spines were analyzed to calculate a calcification ratio. Additional proxies of growth and calcification (relative spine length and number of dropped spines) were also measured. Results show that warmer temperatures increased growth while acidification (low pH) reduced calcification at the base of spines with no interactive effects of the two factors. Urchins in low pH treatments shed their spines more readily than those in ambient pH, regardless of temperature, indicating that calcification may be hindered in these acidic conditions. These results suggest that while survivorship and growth were normal, the energy required to keep up with calcification, regardless of temperature change, may be inhibitive for the long term.