

Thesis defense

Friday, January 17, 2020

3:30 pm

Bilger 150

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

Emily Sesno

Marine Biology Graduate Program

As climate change leads to alterations in ecosystem and organism function, the need to explore the breadth of effects is paramount. Increased sea surface temperatures (SST) and ocean acidification (OA) are major contributors that can lead to alterations in growth and calcification in marine invertebrates, however the full effects are not fully understood. This research seeks to contribute to the understanding of potential climate change impacts on a post-metamorphic calcifying marine invertebrate, the ecologically important common collector urchin, *Tripneustes gratilla*. In this experiment, individual *T. gratilla* from juvenile (~ 16 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 1) growth and 2) calcification measurements. Using Scanning Electron Microscopy (SEM), detailed images of cross-sections of urchin spines were analyzed to calculate a calcification ratio. Results of this research 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. 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.

