

## **Investigating Optimal Foraging Theory with *Cancer irroratus* on *Mytilus edulis* and *Mercenaria mercenaria***

Optimal Foraging Theory (OFT) states that a predator will pick a prey item that provides the most energy gain while using the least effort. Chipping strength of both bivalves was determined using a crushing device. Chipping is a factor in handling time as stronger bivalve shells required more time to chip open by crab species. The energy content of *Mercenaria mercenaria* and *Mytilus edulis* were determined by protein assay. A regression was used to determine the relationship between the shell length and the dry mass of each *Mytilus edulis* and *Mercenaria mercenaria* individual. Using these data, a relationship between the length of the shell and the dry mass of a bivalve was determined. *Cancer irroratus* specimen were allowed to make a prey choice to verify the expectations of OFT and select the optimal prey item. This study evaluated whether *Cancer irroratus* follows the expectations of Optimal Foraging Theory and selects the prey option, *Mercenaria mercenaria* or *Mytilus edulis*, with the most energy content per unit of handling time. Based on the results of this study a shorter handling time was a more important factor in selection than a higher nutritional value.

Advisor: Ann Cleveland