

## **Effects of thermal stress on heat shock protein gene expression in the Eastern Oyster, *Crassostrea virginica*, juveniles in a warming Gulf of Maine**

Climate change is continuing to increase water temperatures in the global ocean, disproportionately effecting coastal waters in the Gulf of Maine (GoM). Temperature in the GoM is predicted to increase 1.1 °C to 2.4 °C, which may negatively impact the health and productivity of ecologically and commercially important marine organisms. *Crassostrea virginica*, commonly known as the eastern oyster, is an economically and ecologically important organism in estuarine environment. They are a valuable species in commercial aquaculture and assist in improving water quality throughout the GoM. Increasing water temperature may trigger a stress response in *C. virginica* that is indicated by an increase of the production in intracellular heat shock proteins (HSP). Expression of HSP's indicate stress, but also assist in the adaptation and resiliency in an organism. Juveniles *C. virginica* were chosen to be researched in this study because there is little information on the stress response of post-settlement *C. virginica* when exposed to temperature increases. *Crassostrea virginica* juveniles were exposed to a range of temperature based off the predicted GoM water temperatures in the year of 2050 in the summer at 21.1 °C, 21.8 °C, and 22.4 °C. Heat shock protein expression was quantified using quantitative polymerase chain reaction analysis. There was no significant difference in heat shock protein expression relative to the housekeeping gene when exposed to the predicted temperatures of the GoM. It is beneficial to determine *C. virginica*'s reaction to thermal stress to determine the potential for the species to respond and adapt to increasing ocean temperatures.

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