How Do Environmental Changes Impact Shell Formation and Function of Eastern Oysters?

Collyn Dungey[1], Luca Telesca[2]
[1]Tompkins Cortland Community College, [2]Lamont-Doherty Earth Observatory, Columbia University

Bivalve shellfish, which comprise a majority of commercial aquaculture, are experiencing rapid population declines due to anthropogenic impacts. The Eastern oyster, *Crassostrea virginica*, an important foundation species recognized for its economic and ecological value, has experienced a near 95% decline in the past century. Furthering our understanding of how this population responds to rapid environmental changes in natural systems is key to implementing restoration efforts. Here, we explore how shell formation and function of *C. virginica* respond to temperature and salinity gradients, as well as varying predation regimes. We studied size and composition in shells sourced from NJ, MD, VA and LA, which fall within warm temperate and subtropical climatic regions. Criterion such as area, chalk percent and density were looked at to understand how the formation of shells varies along temperature and salinity gradients, and to explore whether predator abundance impacts shell production. Our findings indicate that predation is a key driver of shell production, with significant differences demonstrated between wild caught and cultured populations. Regardless of predation, shells tend to increase in size at lower latitudes. Density appears to be dependent on predation, as wild populations have a higher density and lower chalk percentage than cultured populations. The rate of growth for cultured populations does not appear to change with latitude or salinity, but these populations exhibit a consistent response in chalk percentage.