

The effect of structural complexity, prey density, and predator-free space on prey survivorship at created oyster reef mesocosms

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Oyster reefs created by *Crassostrea virginica* have been shown to be some of the most productive and complex habitats in an estuarine ecosystem. Predator-prey interactions on the oyster reefs are influenced by the complex structure of their habitat. In a series of lab experiments, we manipulated habitat structure to try and accurately simulate different oyster reef complexities. Two factors that were manipulated were volume and spatial arrangement, while the predator-prey relationship was that of the red drum (*Sciaenops ocellatus*) and grass shrimp (*Palaemonetes pugio*). We found that structure and complexity increased the survival rate of the grass shrimp, but only to a certain point. This experiment agrees with the theory that a threshold of diminishing returns exists between habitat complexity and predator-prey interactions. The results were not skewed by scaling prey density to reef complexity or the amount of predator-free space (Sp/Pr) within our created reef mesocosms. The structure and complexity of oyster reefs provide enhanced prey survival. In order to gain a better understanding of what is actually occurring in natural predator-prey relationships in complex habitats, more experiments are needed to try and accurately mimic the conditions found in nature, including using an extensive variety of predator-prey relationships.