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The Effects of Substrate Architecture on L. vannamei

The purpose of this project is to create a substrate that will provide refuge for *Litopenaeus Vannamei* shrimp, and also remove pollutants from the surrounding water. This is a continuation of a project from last year, which examined the ability of substrates to remove ammonia from water. This year we focused on the how the shrimp interacted with substrates. We hypothesized that the shrimp would be interested in using the substrate. To test our hypothesis, we designed 3 separate substrates. The substrates consisted of a 1x1, a 2x2 and a 3x3. These substrates were placed in an observation tank containing 29 shrimp. The shrimp in the tank were all classified by their mass and age. The shrimp were observed 7 times each 5 minutes. A Manly-Chesson selectivity index was used to analyze the data. The alphas taken from the selectivity index showed the shrimp preferred the substrate with 4 compartments each 2.7cm by 2.7cm. The alphas for all sizes is 1.393, for small is 4.079, for medium is 0.714 and the large is 0. This data showed the small shrimp preferred the 2x2. We used this year's and last year's information to develop a new modular prototype. The prototype consists of two hexagons layered over each other. The hexagons are connected by 6 bridges, each with two locking mechanisms. The diameter of the internal hexagon is 3cm. we plan to test this prototype in the future.