



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Jack E. Turman, III	Project Number J2427
Project Title Environmental Determinants of Ghost Shrimp Migratory Behavior	
Abstract Objectives/Goals Objective: To determine if changing environmental conditions influences the migratory behavior of ghost shrimp. Methods/Materials Methods: I studied the migratory behavior of 4 ghost shrimp, either in a group (experiment 1) or individual (experiment 2) setting. Migratory behavior was defined as the number of times that a shrimp crossed the middle portion of tank (line crosses) that was marked externally with a piece of tape. The migratory behavior of the shrimp was tested in a tank environment with the following characteristics: gravel bottom (control), altered bottom gradient, plant gradient, and temperature gradient. In addition, the latency to food was also studied. Two trials (10 minutes each) were conducted for each environment, for both group and individual settings, and the mean number of line crosses was calculated. Results Results: Group Experiment: Line crosses with the bottom temperature gradient were significantly more than in the other environmental conditions, and when compared to the control condition. Individual Experiment: The mean number of line crosses across all four shrimp was lower than in the group setting. The latency to reach the food increased between the group mean and the individual mean. In the bottom temperature experiment, line crosses drastically dropped between the group mean and the individual mean. Conclusions/Discussion Discussion: My experiments showed that ghost shrimp had the most line crosses with changes in the bottom temperature gradient, thus proving my hypothesis, that a bottom temperature gradient promotes the most migration of ghost shrimp. There were differences in migratory behavior when shrimp were tested individually in all conditions. Differences between individual and group behavior experiments suggest that group behavior exerts some influence of ghost shrimp migratory behavior. My experiments show that ghost shrimp can respond to differences in environmental conditions and other ghost shrimp.	
Summary Statement My study explores how different environmental conditions influence ghost shrimp movement.	
Help Received My father helped in the design of the project and helped with data analysis using Excel.	