



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

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Project Title Hot & Cramped: The Impact of Global Warming and Habitat Fragmentation on Microbial and Floral Diversity: Year II	
Abstract Objectives/Goals This first of two objectives of this study is to analyze the effects of gradual warming on microbial diversity in southern Californian beach, mountain, and urban environments. The second is to compare the microbial and floral diversity within fragments of different sizes resulting from habitat fragmentation. Methods/Materials In order to test microbial diversity as a result of warming, soil samples were incubated at an elevated temperature of 21.6 degrees Celsius and then analyzed using the BIOLOG EcoPlates and BIOLOG EcoPlate reader. The plate test utilized 31 carbon-based substrates in order to determine both microbial diversity and the unique signatures of individual microbes within each soil samples. A similar test was run to study the impact of habitat fragmentation on microbial diversity. Flora samples were catalogued in a comprehensive database. Results From the data, it was evident that elevated temperatures resulted in a distinct increase in microbial activity. A relationship could also be determined between the size of a fragment tested and microbial and floral diversity within that particular fragment. It was evident that as temperature and fragment size increased, microbial and floral diversity heightened as a result. Conclusions/Discussion This experiment provides both an observational and analytical basis for the effects of global warming and habitat fragmentation on microbial and floral diversity. The data suggests that with continual increases in global temperatures and the destruction of natural ecosystems, microbes and flora will suffer a decrease in diversity. This experiment contains applications in mathematics, as it established general formulas relating the size of a fragment and microbial and floral diversity within that particular fragment.	
Summary Statement This experiment analyzed the impact of global warming and habitat fragmentation upon microbial and floral diversity within southern California.	
Help Received Used lab equipment at UCI under the supervision of Professor Kathleen Treseder; Lab Manager Maria Garcia helped form the experimental procedure.	