CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
34051

Project Title
Decreasing the Urban Heat Island Effect

Abstract

Objectives/Goals
This project explores a method of reducing the Urban Heat Island Effect, which has significant detrimental effects on densely populated cities. It is proposed that the addition of vegetation into the urban environment will result in a decline of this heating phenomenon. In my experiment, I tested the effect of placing plants in a model of an urban environment compared to one without plants.

Methods/Materials
I observed the ambient temperature of the room, and the temperatures inside the two model urban environments. I tracked these temperatures three times daily - morning, noon and evening - for ten consecutive days. Materials used included; two similar size aquariums, one Aloe Vera plant, one Geranium plant, one Baby Angel plant, a sod substitute, three Succulent plants, two 60 watt Grow Lights, two probe thermometers, one indoor/outdoor temperature thermometer, and a half-bag of Dolomite rocks to simulate the concrete in the urban environment.

Results
For each of the ten days of this experiment, the temperature of the experimental environment (containing plants) was found to be an average of 4.8-4.6 degrees less than the control (urban) environment (containing no plants). This data supports my hypothesis by demonstrating that vegetation does decrease the Urban Heat Island Effect.

Conclusions/Discussion
From these results, one may conclude that increasing urban vegetation is an excellent solution to the rising temperatures in highly urban and populated cities. Vegetation can reduce air pollution and is overall better for the population.
There are additional experiments that could be conducted to determine exactly how many or what types of plants are most effective in heat reduction. This is just one of the many experiments that can further our knowledge on how to decrease the Urban Heat Island Effect. In the future many have predicted that there will be an increasing number of highly populated cities. Consequently, we need to do more research on the use of plants to decrease air pollution resulting from rising urban temperatures. This is particularly important given the effects of global warming and drought, as we are currently experiencing in California.

Summary Statement
This project explores the effect vegetation has on urban environments by testing how we can decrease the urban heat island effect without having to move to outlying greenbelt areas.

Help Received
My science teacher, Mrs. Faircloth, for helping me with the requirements and the due dates. My mom, for helping me organize and graph my data, as well as doing the trials that fell at mid-day while I was at school.