CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
Dylan T. Lerner

Project Number
S1118

Project Title
Investigating Whether Varying Altitudes Affect Aerial Emission/Dispersion Rates of Ash Particulates in the Environment

Abstract

Objectives/Goals
My objective was to determine whether varying altitudes (the mountains-2185 meters, the Central Valley of California-113 meters, and the coast-5 meters) affect the aerial emission/dispersion rate and level of ash particulates in the environment. My hypothesis was if the altitude/elevation decreases, then the dispersion rate and level of ash particulates in the environment will increase.

Methods/Materials
I used the two types of wood previously determined in the year 1 and 2 studies to be the least harmful (Douglas Fir) and most harmful (store bought) for burning in the Central Valley of California. In order to measure whether varying altitudes/elevations affect the emission/dispersion rates, I kept track of how long each type of wood ash stayed in the air and measured how far the wood ash traveled when it was disturbed at three different altitudes (the mountains-2185 meters, the Central Valley of California-113 meters, and the coast-5 meters.)

Results
As the altitude decreased from 2185 meters above sea level to 113 meters above sea level, the dispersion rate and level of ash particulate did increase. However, when traveling from 113 meters above sea level to 5 meters above sea level, the dispersion rate and level of ash particulate was similar to the figures at 2185 meters, but still less than the figures at 113 meters above sea level. Even when you consider human error, the store bought wood has the potential to still be the most harmful type of wood to burn.

Conclusions/Discussion
Based on this Third Year Study, it is clear that altitude/elevation plays a significant role with respect to the amount of pollution that is dispersed in either direction of the Central Valley of California. The Central Valley is prone to increased pollution when compared to the mountain and coastal regions particularly when burning store bought wood. The results indicate that air pollution from ash particulates is better when measured in places significantly distant from the Central Valley. However, in addition to elevation, the temperature and humidity levels must also be considered as was tested in the second year study.

Summary Statement
My project was to determine the affect of varying altitudes on the dispersion rate and level of ash particulates in the environment.

Help Received
My mom helped type my project.