



CALIFORNIA STATE SCIENCE FAIR 2013 PROJECT SUMMARY

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Project Title Evaluating Black Carbon Concentrations in Urban Aerosols	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Recent studies indicate that Black Carbon (BC) is a major culprit of Global Climate Change, second only to CO₂ as the most important climate-warming agent. BC is the most strongly light-absorbing component of particulate matter and is formed by the incomplete combustion of fossil fuels. It absorbs solar radiation, influences cloud processes, and alters the melting of snow and ice cover. Regulation of BC emissions has been proposed to reduce future climate warming and to improve air quality. However, BC concentrations, as well as emission sources, are poorly constrained by measurements, posing a major challenge for developing future climate scenarios and mitigation strategies. The goal of this project is to measure BC concentrations for two urban areas: Irvine, California and Salt Lake City, Utah.</p> <p>Methods/Materials A time series of air filter samples, collected at the University of California, Irvine (UCI) over the summer of 2012 and in locations in Salt Lake City in the fall of 2012, were analyzed, using a sunset OC/EC aerosol analyzer. The instrument uses the IMPROVE_A temperature protocol, which allows a measurement of the BC, separate from the rest of the particulate matter on a given filter and is widely used for air quality monitoring.</p> <p>Results Concentrations of BC were highly variable in both basins and we found no significant differences between seasons. We found no difference in BC concentration between week and weekend days in either basin. BC concentrations were higher in the Salt Lake City than in the Los Angeles basin. BC accounted for a larger percentage of total carbon in the Salt Lake City than in the Los Angeles basin.</p> <p>Conclusions/Discussion Future studies will include collection and analysis of a larger data set to explore the effect of temporal and spatial variations on urban BC aerosol concentrations. In addition, more information about the contributions of different BC sources to the total BC load are needed to better understand and mitigate BC aerosols in urban air.</p>	
Summary Statement Evaluating Black Carbon Concentrations in Urban Aerosols	
Help Received My thanks to Professor Claudia I. Czimczik & Gergana O. Mouteva, Department of Earth System Science, University of California, Irvine, for allowing me to participate in this amazing project.	