



CALIFORNIA STATE SCIENCE FAIR 2006 PROJECT SUMMARY

Name(s) Richard H. Livingston	Project Number J0915
Project Title Clean Air Secrets	
Abstract Objectives/Goals The objective is to determine which of two neighboring towns has better air quality, and why. The hypothesis is that the rural town of Woodside, CA has better air quality than a more urban neighboring city, Redwood City, CA, as measured by ozone levels. Methods/Materials The Woodside ozone data was collected in central Woodside using Vistanomics# Eco-badges, while Redwood City data was collected from the Internet using the Redwood City Bay Area Air Quality Measurement District (BAAQMD) monitoring site. 25 different days were tested, and analysis was done using different variables that might explain ozone levels, including wind direction, temperature, and solar insolation. Results The data showed that Redwood City and Woodside have equal ozone levels on average, but standard deviations show that the averages are not necessarily reliable. More analysis showed that on days when wind is blowing from the east, ozone levels in Woodside are actually higher than in Redwood City. When the wind is blowing from the West, ozone levels are higher in Redwood City. There is also a minor connection between relative ozone levels and temperature. Standard deviations show the wind direction data to be reliable for making predictions of relative ozone levels, but not temperature. Conclusions/Discussion Analysis of the data proved that when the wind is blowing from the densely populated and industrial East Bay through Redwood City to Woodside, Woodside will have worse air quality than Redwood City. Conversely, when the wind is blowing from the ocean, over the coastal mountains, through Woodside to Redwood City, Woodside has better levels of ozone. This project shows that cities really don't always have worse ozone than rural areas. More specifically, it shows that Woodside residents who are very sensitive to ozone should consider going jogging down on the bay on hot days when the wind is blowing from the east, instead of hiking in Woodside. But on hot summer days, when the wind is blowing from the west, those who are sensitive to ozone should exercise in Woodside, instead of Redwood City. The project also shows that averages can be misleading, and that you have to really have to dig beneath the surface to discover what is really going on.	
Summary Statement This project investigates the ozone levels in neighboring rural and urban towns, and analyzes data on factors that might explain the relative ozone levels.	
Help Received Father helped me figure out how to make my graphs; Math teacher taught me about standard deviation; Mother helped find the BAAQMD website and showed me how it works.	