CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)
Stella L. Chen

Project Number
S1103

Project Title
Field Study of Carbon Dioxide Concentration Variability in Los Angeles County

Abstract

Objectives/Goals
My project objective is to compare the greenhouse gas carbon dioxide (CO2) concentrations at different times of the day in different locations of Los Angeles (LA) County. The goal is to observe the impact of human activities, geography and other factors on the CO2 concentrations.

Methods/Materials
Using gas cells, air samples were collected from four locations: the La Canada mountains, the La Canada town center, Jet Propulsion Lab and downtown LA (at USC). The collection times were around 11am to 12pm and 4 to 5pm. The air samples were measured using an Infrared (IR) spectrometer and the IR spectra of CO2 were obtained to determine its concentration.

Results
The town center has much higher CO2 concentration than the mountains at all times of the day. In the town center, which is close to the freeway, the CO2 concentration is greater during rush hours (around 4 pm) than at mid-day (around 11 am). In downtown LA and La Canada town center, the CO2 concentrations fluctuate significantly at different days, while in the mountain the concentrations are low and relatively stable.

Conclusions/Discussion
The primary source of CO2 in the air is human activities. Transportation is a major factor towards CO2 emissions. Human activity causes instability in CO2 concentration. Plants play an effective role absorbing CO2 in the mountains. CO2 is a good indicator of the amount of other, more dangerous, pollutants in the air.

Summary Statement
My project measured carbon dioxide concentrations at different times in different locations of LA County and provided important numerical evidence that human activities contributed greatly to the increase of CO2 concentration.

Help Received
used lab equipment at JPL