



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Rachel Dokko; Shreya Ramayya	Project Number S1902
Project Title Environmental and Commercial Benefits of Carbon Sequestration by Encelia californica and Salvia leucophylla	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Global climate change is a widespread concern; therefore, studies that reduce the emissions of CO(2) and other greenhouse gases through plant carbon sequestration are of great interest. Plants are major reservoirs of atmospheric carbon, and CO(2) levels fluctuate with their photosynthetic patterns. Carbon sequestration refers to the storage of CO(2) into reservoirs and describes a method to delay global warming effects and slow the accumulation of greenhouse gases. Specifically, this study quantifies the biomass dry weight of two common drought-deciduous species, Salvia leucophylla and Encelia californica. These species are part of an ongoing coastal sage scrub CO(2) sequestration study also involving Eriogonum cinereum and Rhus integrifolia.</p> <p>Methods/Materials Two methods were used to collect S. leucophylla and E. californica samples. In Method 1, 12.5-50% of the sample was harvested and dried, and canopy measurements were recorded. Method 2 also required field measurements in addition to five branch samplings from each plant. This was the sub-sample later used to calculate the biomass. (Encelia californica was collected using only method 1.)</p> <p>Results Using regression analysis, the results showed that S. leucophylla displayed a strong correlation in its biomass and canopy dimension relationships. The correlation between the biomass and the surface area was $y = 185.37x^{1.4514}$ and the correlation between the biomass and volume was $y = 117.92x^2 + 420.93x + 659.72$. Encelia californica also displayed strong correlations. The correlation between biomass and surface area was $y = 149.86e^{1.5926x}$ and the correlation between biomass and volume was $y = 121e^{0.4317x}$.</p> <p>Conclusions/Discussion The results highlight the significance of these plant species in maintaining our community's environmental balance of carbon. These plants can be planted in other areas in order to achieve similar results and help maintain the natural balance of carbon between Earth and the atmosphere.</p>	
Summary Statement This project focused on steps that can be taken locally to reduce environmental impact, such as working with native sage scrub.	
Help Received Work was done independently.	