



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

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<b>Project Title</b> Testing Genetic Diversity of Sequoia sempervirens from Three Locations	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of my project was to figure out if Sequoia sempervirens, also known as coast redwood trees, from different locations were genetically diverse in one microsatellite region of their DNA. This is important because if the trees do not have genetic diversity and climate change is bad for them, it may harm all of the trees. If coast redwoods do have genetic diversity then if something is bad for one tree it might not be the same for others. My hypothesis was that I would find genetic diversity between samples from three different locations. <b>Methods/Materials</b> In my experiment, I collected two needle samples from coast redwood trees from three different locations: Sunny Brae Community Forest, Arcata Community Forest, and Lady Bird Johnson Grove. I then isolated the DNA using a QIAGEN DNeasy plant mini kit. Next, I performed the Polymerase Chain Reaction with all six samples and ran gel electrophoresis so I could compare the base pair size of the samples from each location. <b>Results</b> When I analyzed my gel electrophoresis results, both samples from the Sunny Brae Community Forest and both samples from the Arcata Community Forest samples had bands at 160 base pairs, while both samples from Lady Bird Johnson Grove showed bands at 170 base pairs. <b>Conclusions/Discussion</b> My results did not support my hypothesis. I thought there would be genetic diversity in one microsatellite region between samples from all three locations. Instead, Sunny Brae Community Forest trees and Arcata Community Forest trees were not diverse, but Lady Bird Johnson Grove trees were diverse from the other two. This is good because genetic diversity can help species survive. While this was only a small number of base pairs out of the 30 billion base pair genome, hopefully it is an indication of diversity within the species.	
<b>Summary Statement</b> The objective of my project was to figure out if Sequoia sempervirens from different locations were genetically diverse in one microsatellite region of their DNA.	
<b>Help Received</b> I performed my experiment at Humboldt State University using supplies and equipment that were donated by the Biological Sciences Department. I was mentored and supervised by my dad.	