



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Jacquelyn Opalach	Project Number J1920
Project Title Investigating the Accuracy of the Current Method Used to Measure Growth Rate on Redwood Trees	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment is to determine if the current method used to measure growth rate on redwood trees is accurate. I suspect that the method may be inaccurate because redwood trees grow in clusters, and the side of a tree that is accessible for extracting an increment core is not facing one of its neighbors in the cluster.</p> <p>Methods/Materials A recently thinned redwood forest was visited where fourteen tree disks were collected from accessible tree stumps. These tree disks came from stumps that had varying amounts of neighbors within their own sprout clump. The place on the disk where radial growth would most likely be measured by a forester was determined, followed by calculating the average growth by measuring radial growth in four places, adding them together and dividing by four. The forester's estimate of growth was then compared to the average growth for each disk.</p> <p>Results It was found that nine out of fourteen times growth rate is overestimated by the forester's method that relies on a single measurement. The average overestimation is eleven percent, and while there is no obvious relationship between the amounts of neighboring trees a tree has, it is believed that there would be a relationship between stand-alone trees and trees from sprout clumps.</p> <p>Conclusions/Discussion Although measuring in only a single place is expected to be accurate, this method is flawed when applied to redwood trees from sprout clumps. Estimates of growth rate are more likely going to accurate if the subject tree is either measured in more than one place, or the average growth rate is decreased by eleven percent if the current method based on a single measurement must be used.</p>	
Summary Statement This experiment tested the accuracy of the current method used to measure growth rate on redwood trees which is expected to be questionable because redwood trees grow in sprout clumps.	
Help Received My Father helped me cut tree disks from stumps and he helped me with Microsoft Excel.	