



CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

Name(s) Natalie G. Opalach	Project Number 31056
Project Title Redwood Rings and Rain	
Objectives/Goals The objective of this study was to find whether older or younger redwood trees are more affected by temperature and precipitation. I believe younger trees will be more affected by these factors, high elevation trees will be more influenced by temperature, and low elevation trees will be more influenced by precipitation. Abstract Methods/Materials Increment core samples were extracted from ten 30-year-old, and ten 80-year-old redwood trees at low and high elevation sites. A total of 40 increment cores were taken. The width of each tree ring for the past 16 years was measured and recorded for each increment core. I used this data to calculate 15 annual changes in ring growth for each set of ten trees which I then compared to changes in annual precipitation, summer precipitation, average annual temperature, and average summer temperature. The correlations of younger trees were compared to the correlations of older trees at both high and low elevations. Results Changes in annual precipitation matched up with changes in ring widths for young, low elevation trees 12 of 15 years; with old, low elevation trees 11 of 15 years; with young, high elevation trees 7 of 15 years; and with old, high elevation trees 10 of 15 years. Changes in summer precipitation were matched with changes in ring widths for young, low elevation trees 6 of 15 years; with old, low elevation trees 7 of 15 years; with young, high elevation trees 7 of 15 years, and with old, high elevation trees 9 of 15 years. Changes in average annual temperature were matched with changes in ring widths for all four sets of trees 8 of 15 years. Changes in average summer temperature were matched with changes in ring widths for all four sets of trees 6 of 15 years. Conclusions/Discussion Tree ring growth was strongly influenced by annual precipitation, and older trees appeared to be influenced to a greater degree than younger trees. Trees at the lower elevation site appeared to be influenced to a greater degree than the trees at the higher elevation site. Tree ring growth was not correlated with summer precipitation, average annual temperature, or average summer temperature. It is likely that temperature didn't influence tree growth because of its minimal amount of change from year to year. This study could be helpful to foresters because it demonstrates that water is a limiting factor to growth even in the north coast where precipitation averages 43.4 inches a year.	
Summary Statement This project studies whether younger or older trees are more affected by precipitation and temperature changes.	
Help Received Father helped use equipment and display data in charts	