# CALIFORNIA STATE SCIENCE FAIR
# 2013 PROJECT SUMMARY

**Name(s)**
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**Project Number**
**J1111**

**Project Title**
## Forest Recovery after Logging

**Abstract**

**Objectives/Goals**
My objective was to measure the distribution of tree sizes in a secondary-growth Redwood forest to see if topography affects the distribution. I also used the distribution of sizes to determine tree growth patterns and the stage of forest development.

**Methods/Materials**
Using a satellite photo of the Redwood forest in the undeveloped part of the UC-Santa Cruz campus, I picked two areas (60 m X 30 m each) with different topographies, one steep and one flat. I measured the circumference of each Redwood tree at 1 meter from the base of the tree. I measured 81 trees in the steep area and 137 trees in the flat area. I binned the data into groups to look for patterns.

**Results**
The average circumference of the trees is almost the same in the two areas. In both areas, the distribution is spread out with three most abundant circumferences at 25-50 cm, 150-175 cm, 300-375 cm in the flat area, and at 50-75 cm, 150-200 cm, 350-275 cm in steep area. Taking all trees together, the three main size peaks are 25-50 cm, 150-175 cm, 300-325 cm.

**Conclusions/Discussion**
This area was logged about 100 years ago, and there are now three clusters of tree sizes that represent three cycles of sprouting. The topography did not affect the rate of trees sprouting because the two areas I measured are close to each other and probably received the same amount of fog and rainfall. The 300-325 cm cluster may include either small trees not cut down during logging, or the first to grow after the forest was cut. Because of their size and number, the 150-175 cm trees are probably most of the mass of the forest. I would not expect the trees in the 25-50 cm cluster to all survive because they have to compete with the adult trees for light and nutrients. This forest is at the second stage of development called step exclusion. The forest has not reached the old growth stage because the distribution is not dominated by the largest tree sizes.

**Summary Statement**
About 100 years after logging, the distribution of tree sizes in a Santa Cruz Redwood forest shows that it is recovering, but is not yet mature.

**Help Received**
Mother helped me measure trees. Father helped me make graphs.