



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.)

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Science Fair Use Only

J1631

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

Water-logged: Do Ground Water Levels Affect the Health of Redwood and Douglas Fir Trees?

Division

J Junior (6-8) J Senior (9-12)

Preferred Category (See page 5 for descriptions.)

16 - Plant Biology

Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.)

Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

Objective: The objective was to determine if ground water levels affect the health of redwood and Douglas fir trees. Based on my research I thought young redwoods would be healthiest with moderately high ground water levels, but Douglas fir trees would not need as much water.

Materials and Methods: Twenty redwood and 20 Douglas fir seedlings were grown in different levels of water, ranging from no ground water to fully flooded. Health was measured during a 6-month period in four ways: by growth of seedlings, number of brown needles, weight of roots, and weight of above-ground biomass. Soil moisture was also measured.

Results: Redwoods grew most in 4.5 in. of water, whereas Douglas fir grew best in 3 in. of water. The most brown needles occurred on the totally flooded Douglas fir (6.5 in. of water), and on the redwoods growing in 1.5 and 6.5 in. of water. The redwood seedlings with the highest root mass and above-ground biomass grew in moderately high ground water, whereas the Douglas fir seedlings with the highest biomass grew in moderately low ground water.

Conclusions: Douglas fir seedlings did the best with low ground water levels, but redwood seedlings did best with higher ground water levels. Douglas fir grew faster in all ground water levels, but redwood developed greater biomass. Both species were sensitive to completely flooded soils. These results can be used by foresters, timber companies, and restoration scientists.

Summary Statement (In one sentence, state what your project is about.)

My projects tests the effect of various ground water levels on the health of Douglas fir and redwood seedlings.

Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.

Simpson Timber Company donated the seedlings. Redwood National Park let me use their triple beam balance. My mother drove me to a forest to measure soil moisture by redwood and Douglas fir trees.